BMXdigital

Broadcast Console

99-1200-0 (14-input mainframe)
99-1200-1 (22-input mainframe)
99-1200-2 (30-input mainframe)
99-1200-3 (38-input mainframe)
99-1200-8 (8-input mainframe)

Operations & Technical Manual

PRE75-50

Revision D.1 • 12/10

HARRIS
Broadcast Communications Division

www.broadcast.harris.com

Contents

Declaration of Conformity

Application of Council Directive: 89/336/EEC

Standards To Which Conformity Is Declared:	EN55103-1:1997 EN55103-2:1997
Manufacturer's Name:	Harris Corporation BCD/Harris Pacific
Manufacturer's Shipping Address:	4240 Irwin Simpson Road Mason, Ohio USA 45040 513-459-3400
Manufacturer's Mailing Address:	4393 Digital Way Mason, Ohio USA 45040 513-459-3400
Equipment Description:	Digital Broadcast Console
Equipment Class:	Professional Audio / Visual
Model Numbers:	BMX Digital Broadcast Console, Inclusive of Legacy Digital Product Line

I the undersigned, hereby declare that the equipment specified above, conforms to the above Directive(s) and Standard(s).

Harris Corporation – Mason, Ohio USA
Place:


Signature:

Douglas A. Bevington
Full Name:

Manager – Product/Technical Services Consoles and Studio Products
Position:

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.

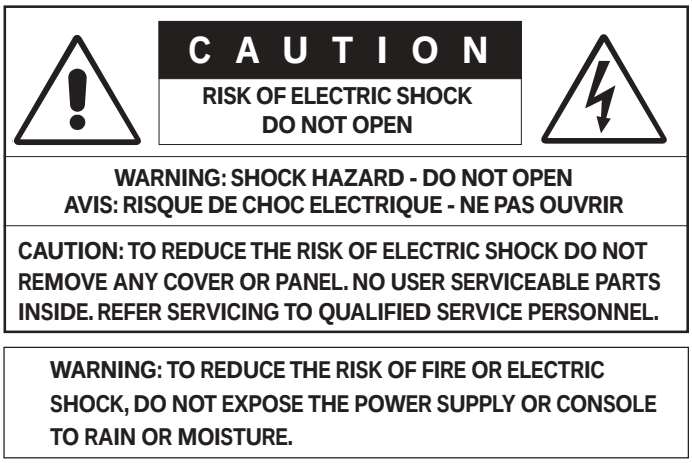
18. **Damage Requiring Service.** Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions:
    a. When the AC cord or plug is damaged.
    b. If liquid has been spilled or objects have fallen into the product.
    c. If the product 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



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE POWER SUPPLY OR CONSOLE TO RAIN OR MOISTURE.

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*	*10/01 First Release*
A.1	*Contents, Ch 1, Index*	*12/01 corrected info in Specifications.*
B	*All pages*	*8/02 updated various installation and operation information. Incorporated firmware and hardware updates.*
B.1	*Appendix B pages*	*3/03 add software release 3.24 info.*
C	*All pages*	*1/04 Added info on the BMXd-8 & BMXd-14 frame sizes and the VistaMax audio management system.*
D	*Contents,Ch. 4, 5, Appendix A, index*	*Added information on VMCC.*

General Information

1

Thanks for joining the growing ranks of broadcasters employing Harris Corporation products designed by PR&E. Our mission: provide the finest quality products, systems, documentation and after-sale support.

The BMX*digital* 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* sections prior to product installation.

Product Overview

Each BMX*digital* console ships with the following installed into the mainframe assembly:

- **Microphone Preamplifier Module** (1 Mic Preamp standard, 1 optional)
- **Universal Input Modules** (as ordered)
- **Telco/Codec Modules** (up to 6, as ordered)
- **Remote Line Selector modules** (as ordered)
- **Session Module** (1 standard)
- **Control Room Module** (1 standard)
- **Studio Module** (1 optional)
- **Output Modules** (3 standard)
- **DSP Cards** (1 to 5, depending on frame size)
- **Net Card** (1 optional)
- **Blank Panels** (as required)

The BMX*digital*'s motherboard and module/card area is surrounded by a sheet metal and extruded aluminum chassis for strength and RFI immunity. The meter panel—hinged at the rear, closes over the upper part of the modules, covering the audio and logic connectors, the DIP switches and DSP and Net Cards. Cable access to modules is done from below the meter panel.

MODULE & CARD DESCRIPTIONS

Full-featured Input modules are described throughout this manual. Limited-function versions (minus the Send or Utility bus controls), Net-only versions (no connectors) and Limited-function Net-only versions (no connectors nor Send and Utility bus controls) are also available.

Microphone Preamplifier Module

Five mic preamps, each with a trim pot under a security cover, come standard on the BMX*digital*-8 and -14. Ten preamps come standard on the other frame sizes. A second five or ten input Mic Preamp Module can be field installed.

Mic preamps take balanced input signals (from -65 dBu to -30 dBu) and output balanced +4 dBu outputs for direct connection to a Universal Input module or to outboard processing equipment.

Universal Input Module

This module features two inputs (A and B), each can come from an analog or a digital source (source selection is set via a module DIP switch). DIP switches also set the analog input level or the digital attenuation. Each input has a fully independent parallel logic circuit for remote control of the module and/or module control of the source equipment. Each module has independent mic/

line logic functions for both inputs, also set using the module's Setup DIP switches.

The Universal Input module has controls for the following functions: A/B input selection, input mode selection, channel on/off, fader level, solo, cue, pan/balance, two Send selectors and level controls, and ten output bus selectors (four program, four utility, and two off-line buses). A two-line display shows the A and B input source names.

Two 24-pin connectors connect logic wiring to/from external peripherals or control panels for the A and B inputs. Two 14-pin connectors allow remote talkback (active when microphone logic is selected) for the A and B inputs. Four 8-position DIP switches set logic and module function options independently for the A and B inputs.

Telco/Codec Input Module

An optional module that provides audio and logic connections for a telephone hybrid or a codec (satellite transceiver, ISDN interface, etc.). Up to six Telco modules can be installed in the frame.

Telco modules have digital and analog inputs (the active input is set via DIP switch) and the same controls as a Universal Input—minus the A/B input selector. Additional module controls include: telco monitor bus and telco record output assignment buttons, a Talk to Codec function, a Source Selector and a Take button (for source selection with a VistaMax, Ext. RLS or a router).

Each Telco module has an associated mix-minus (Foldback) of any combination of the program, utility or send buses and two off-line mix buses. An Auto-Foldback function can automate switching Foldback between an off-line mix and the assigned bus with module off and on.

Remote Line Selector Input Module

An optional module that offers source selection from a VistaMax system, an external remote line selector or a router. Each module has a digital and an analog input (active input set by module DIP switch). Front panel controls are the same as the Universal Input, minus the A/B selection. Instead, there is a Source Selector and Take button.

Session Module

This module provides session control, auxiliary meter source selection, and event timer controls. There are eleven Aux Meter selector buttons (for viewing any External Input, Send, Utility bus, or Telco Record output) and two Main Meter selectors (PGM 1-4 and UTL 1-4) for viewing the Program or the Utility buses on the four Main Meters (on the BMX*digital*-8, the two buttons cycle through the buses to show one at a time on the Main meter).

The session control section has a Session Selector and two buttons: Take and Save. A two-line display shows the session currently being used and either the next session to be loaded, or when the Session Selector is being turned, the various sessions available in alphanumeric order.

The Timer Control section has the event timer controls: Start, Stop, Hold, and Reset, as well as the Auto Reset control, which adds automatic module on resetting of the event timer.

Control Room Module

This module has the monitor selection and control facilities for the console operator. It has parallel logic control for control room speaker dim and mute, and to provide a control output for the Control Room warning lamp controller.

The Control Room module has independent monitor and headphone source selectors and monitor and headphone fader level controls. The module also has input mode controls, Cue and talkback level controls and a solo clear button. Additional headphone controls include an Autocue selector and a button to force the headphones to follow the monitor source selection.

Studio Module

This optional module has the monitoring and talkback controls for two separate studios or voice booths, plus talkback audio and control inputs for a producer/call screener position and for an external position.

The Producer and External audio inputs are line level. The Mic Preamp module may be used as needed for these inputs. A Producer Talkback / IFB Panel (PRE99-1188) is also available. It provides a mic and preamp for the Producer along with Talk buttons for thirteen locations.

The Studio module has two parallel logic connectors for the Studio 1 and 2 dim, mute, and Studio Warning Lamp interface controls.

The Studio module also has monitor and talkback selector controls, and monitor and talkback level controls. All of the controls operate independently for each studio.

Output Modules

There are three Output modules. The Output 1 module has the digital-to-analog converters and mix matrices for creating mix-minus foldbacks to support up to six Telco/Codec modules. It also contains individually mixed outputs for Telco monitoring and recording. Two monaural mix-minus outputs for each Telco/Codec module, one with talkback (IFB) and one with a clean feed, are on this 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 gain trim controls for the analog Telco record mix output and IFB level.

The Output 2 and Output 3 modules contain the AES digital output drivers, digital-to-analog converters, and analog line amplifiers for the Program, Utility, and Send outputs. For digital outputs, sample rates of 48 kHz and 44.1 kHz are supported. These modules feature output sample rate selectors for the Program auxiliary outputs and the Utility and Send outputs, as well as gain trim controls for the Program, Utility, and Send analog outputs.

DSP Cards

The number of standard DSP (Digital Signal Processor) cards installed is frame-size dependent (BMX*d*-8 has one DSP Card, BMX*d*-14 has two, and so on up to the BMX*d*-38 with five cards).

DSP cards plug into the motherboard behind the input modules, hidden below the meter panel in normal use. Each card has a "heartbeat" LED to indicate operation. An optional External Input DSP (99-1355-1) adds an external AES-3 reference input for the first DSP Card position.

Net Card

This optional card allows the BMX*digital* to directly interface to a VistaMax Audio Management System. It plugs into the motherboard behind the Output modules, hidden below the meter panel in normal use. There are eight VistaMax inputs and outputs on the card for connecting intercom, external monitors and other in-room equipment that does not need to have local module control.

POWER SUPPLY

The separate rack-mount power supply (99-1205) supplies +48 VDC and a voltage monitor signal to the console. One supply comes standard. An optional second 99-1205 supply and a +48 VDC Coupler (99-1203) can be installed for redundant supply operation. Each power supply has its own AC input, On/Off switch and LED power good indicator. Each power supply is fully regulated and protected against excessive current by internal fuses and electronic safeguards.

Specifications

The specifications for the BMX*digital* 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 BMX-*digital* 38-input mainframe.

Test Conditions:

Specifications are for the basic signal paths, per channel, with >1 k 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 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, Utility, Send, Telco/Codec Mix-Minus, Telco Record Mix Feed: +4 dBu, adjustable between +3 dBu and +9 dBu

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

Digital Inputs and Outputs

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

Digital I/O: Thru digital input and digital Program, Utility, 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 Main outputs are 48 kHz; Program Aux, Utility, Mix-Minus and Telco Record Mix outputs, individually DIP switch set for 48 kHz or 44.1 kHz

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, Utility, 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

Analog Input to Analog Output: <0.005%, 20 Hz to 20 kHz, +18 dBu input, +18 dBu output

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

Digital Input to Analog Output: <0.005%, 20 Hz to 20 kHz, -6 db FSD input, +18 dBu output

Crosstalk Isolation

Program-to-Program or to-Utility 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 BMX*digital 22:* 250 watts at 115/230 VAC, ±12%, 50/60 Hz

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

Fully configured BMX*digital 38:* 320 watts at 115/230 VAC, ±12%, 50/60 Hz

Power Supply Voltage

Console power: +48 VDC at 6.25 Amps, optional redundant supply can be added with 48 volt coupler

Power Supply Ground

Rack mounted power supply: grounded thru AC cord

Power Supply Connection

AC input: IEC power cord, one per plug-in power supply

DC output: Keyed multi-pin connectors

Dimensions

BMX*d-8:* 9.8" [249] x 29.2" [742] x 33.4" [848]

BMX*d-14:* 9.8" [249] x 42.0" [1067] x 33.4" [848]

BMX*d-22:* 9.8" [249] x 54.8" [1392] x 33.4" [848]

BMX*d-30:* 9.8" [249] x 67.6" [1717] x 33.4" [848]

BMX*d-38:* 9.8" [249] x 80.4" [2042] x 33.4" [848]

48V Power Supply (Rack mount): 2 RU: 3.5" [89] x 19" [483] x 10" [254]

48V Coupler (Rack mount): 1 RU: 1.75" [45] x 19" [483] x 10" [254]

All dimensions are Height, Width, Depth.

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

WARRANTY

The BMX*digital* console and power supply carry 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.

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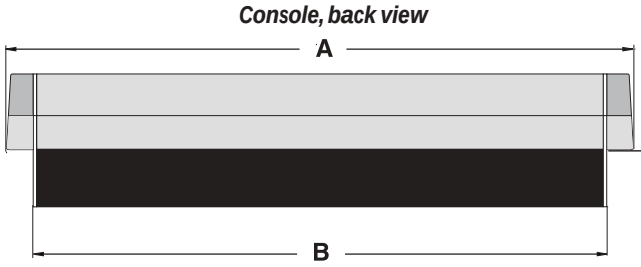
Installation

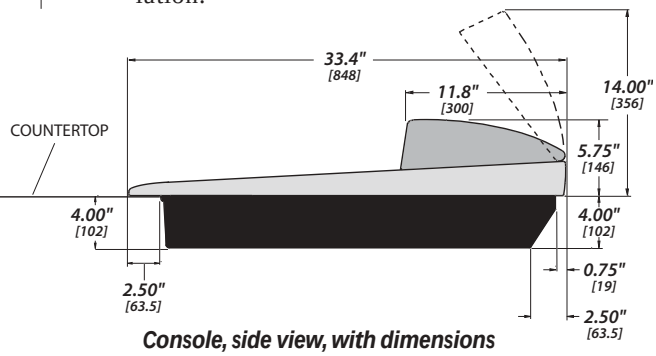
The BMX*digital* mainframe "drops into" a cutout (shown below) in the studio furniture countertop. A minimum of 14 inches [356 mm] of vertical clearance above the countertop is required to fully open the meter panel. The rear 2.5 inches [63.5 mm] of the mainframe bottom is open so wiring can be easily dressed up through the mainframe to the module connectors, which are hidden below the meter panel in normal use.

The BMX*digital* console shipment consists of:

- The 8, 14, 22, 30 or 38 input frame with the standard modules (Mic Preamp, Session, Control Room, three Outputs and DSP Cards) installed. Also installed are any optional items that were also ordered (Universal Input, Telco/Codec and RLS modules, blank panels, Net Card).
- A 2RU rack-mount 48 volt power supply with interconnecting cable.
- A BMX*digital* 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, back view

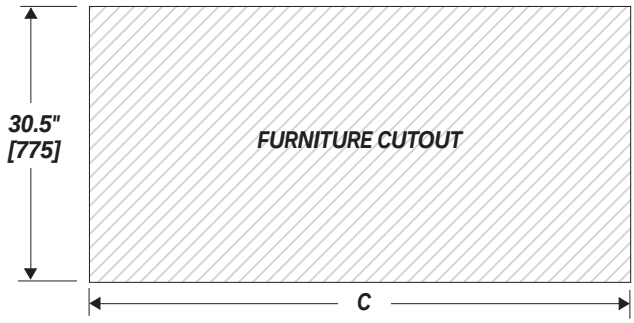


Console, side view, with dimensions

Dimension Table

Mainframe	A	B	C
BMX*digital-8*	29.2" [742]	26.1" [663]	26.4" [671]
BMX*digital-14*	42.0" [1067]	38.9" [988]	39.2" [996]
BMX*digital-22*	54.8" [1392]	51.7" [1313]	52.0" [1321]
BMX*digital-30*	67.6" [1717]	64.5" [1638]	64.8" [1646]
BMX*digital-38*	80.4" [2042]	77.3" [1963]	77.6" [1971]

Millimeter dimensions in brackets. All dimensional tolerances are: +¼" [6.4], -0" [0.0]. Typical setback from countertop edge to the front of the console is 12" [305]. There must be 14" [356] of clearance above the countertop to open up the meter panel.



Console Installation

To simplify console installation, logic cable wiring diagrams for specific peripheral equipment are available from Harris Technical Support. Refer to page 5-1 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 BMX*digital* and neighboring equipment. Route audio cables to achieve maximum practical distance from all AC power mains wiring.

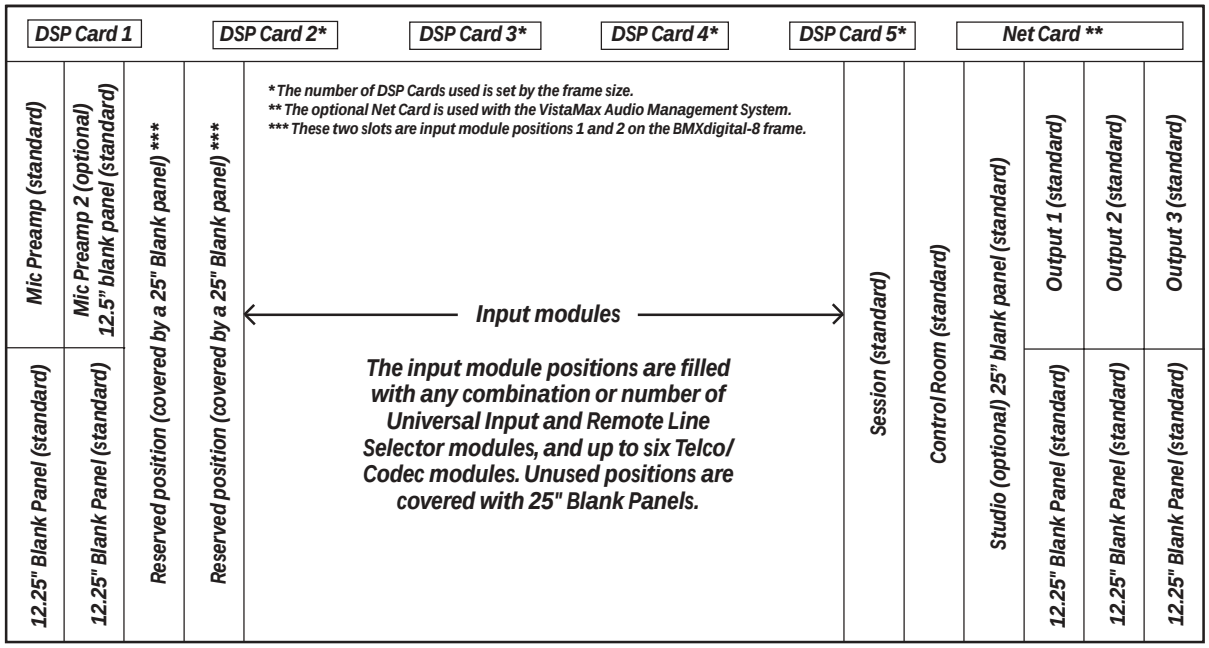
MAINFRAME CONFIGURATION

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

Module Placement

The 8, 14, 22, 30 or 38 input module positions can have any combination or order of the following modules installed: Universal Input, Telco/Codec (six maximum), and Remote Line Selector (RLS). The remaining console positions are fixed. The Microphone Preamp module(s), Session module, Control Room module, optional Studio module, and Output modules must be positioned as shown below.

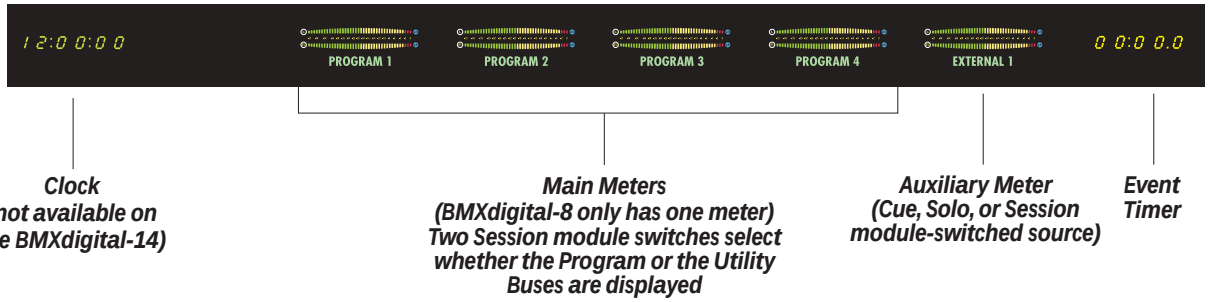
BMX*digital* Mainframe, Module Configuration



NOTE: *The number of input module positions matches the console model number (e.g., BMXdigital-22 has 22 input positions). There is one DSP card in the BMXd-8, two DSP cards in the BMXd-14, three in the BMXd-22, four in the BMXd-30, and five in the BMXd-38.*

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.

BMX*digital* Meter Panel



Meter Panel

The meter panel has five horizontal Stereo Bargraph Meters, except for the BMX*digital*-8, which has two meters. An alphanumeric display below each meter identifies the current signal source (PROGRAM 1, UTILITY 1, etc.).

Four of the meters provide simultaneous level monitoring of the four Program or the four Utility bus outputs, as selected by two Session module buttons. On the BMX*digital*-8, these two Session module buttons cycle through the four Program and the four Utility buses to select which bus to display on the single main meter.

The right-hand meter (Auxiliary) shows the Cue or Solo bus levels. When neither function is active, the meter shows a source selected on the Session module (from between the four external inputs, the two Sends, the four Utility buses or the Telco Record output).

The meter display mode (peak hold or non-peak hold) and the level where the peak indicators turn on are set for each meter via DIP switches on each meter display board.

On the left end of the meter panel is an ESE-slaveable 12/24-hour digital clock (on all sizes except for the BMX*digital*-14). On the right end there is an event timer that can be controlled manually, through buttons on the Session module, or automatically, through module On reset commands.

CONNECTOR ACCESS

Module connectors are hidden below the meter panel, which is hinged on the rear of the mainframe. To access the connectors, open up the meter panel by lifting up on the middle of the meter panel while allowing it to pivot rearward to fully extend the two gas springs.

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

To facilitate initial wiring, the meter panel can be entirely removed from the mainframe:

1. Open up the meter panel fully and unplug the meter power cable (attached to the rear panel) and the three signal cables plugged into the Session module.
2. With another person assisting to hold the meter panel, remove the screw and bushing 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 99-1205 power supply requires 2 RU of rack space within the console cabinetry, below and to the left or right of the supporting countertop. The 48 Volt Power Supply must be installed so that the 30 foot power supply cable (90-1709) is not under any tension when routed through the cabinet and connected to the mainframe's rear panel connectors.

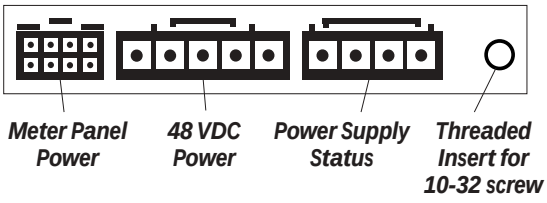
Connecting the Power Supply

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 status information (Imminent Power Loss) to the console.

Both connectors must be attached to the back of the BMX*digital* 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.

Redundant Power Supply

To provide redundant console power, two 99-1205 power supplies can be connected to the console through a 99-1203 48 Volt Coupler.

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 should NOT be installed until the console is completely installed and is ready for everyday use.~~

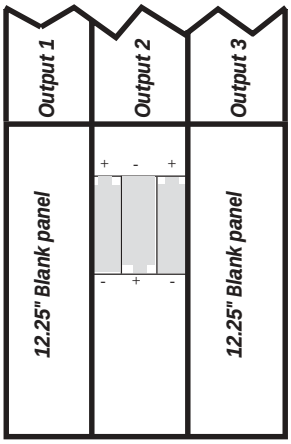
~~The batteries supply a "Keep Alive" voltage that holds each module's logic state during momentary power outages. They mount in a battery clip located below the three 12.25" blank panels on the right end of the console.~~

To install the backup batteries:

1 Remove the blank panels in front of the Output modules using the supplied hex driver.

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

Backup Battery Installation



Middle 12.25" Blank Panel removed to show the battery clip

Note: Replace the batteries yearly to ensure continuous backup protection. Use only Panasonic P-50AAH or equivalent batteries designed for continuous slow charge operation. To prolong battery life, remove the batteries when the console is powered down for an extended period.

SETTING THE CLOCK

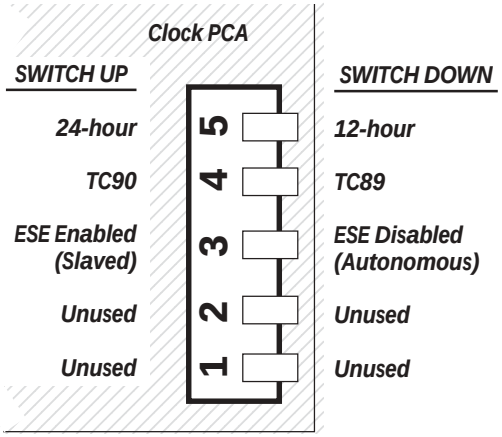
The digital time-of-day clock (not available on the BMX*digital*-14) can operate in autonomous or slave modes. When used autonomously (the factory preset), a temperature-controlled quartz crystal oscillator controls the clock timing. In slave mode, clock timing comes from a TC89- or TC90-compatible ESE 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)



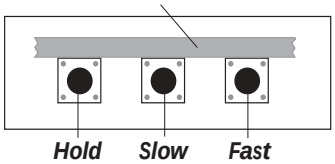
Clock circuit board DIP switch.
Factory default settings are DOWN.

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 external time reference, then press and hold

Setting the Clock

Clock Circuit Board, lower left front edge



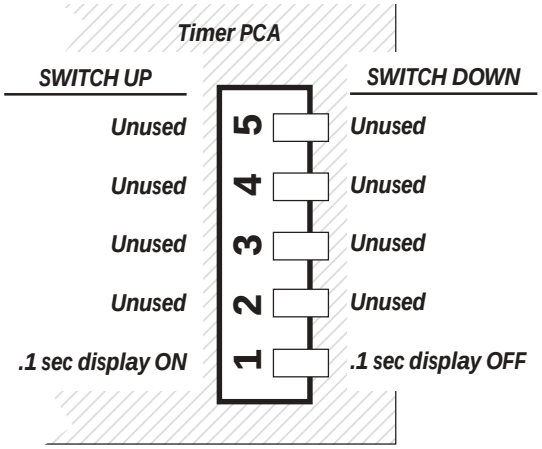
the HOLD button to freeze the time. When the external time reference reaches the time on the BMX *digital* clock, release the HOLD button to start the clock.

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	Set DOWN for Meters 2 - 5

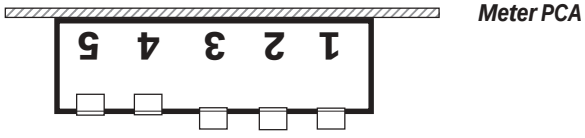
* Active only when meters are set to display Average and Peak (Session module DIP switch 1 set to Off)

Switch 1 and 2 Table

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

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

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 2-57, 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 BMX*digital* uses the following types of cables and wires:

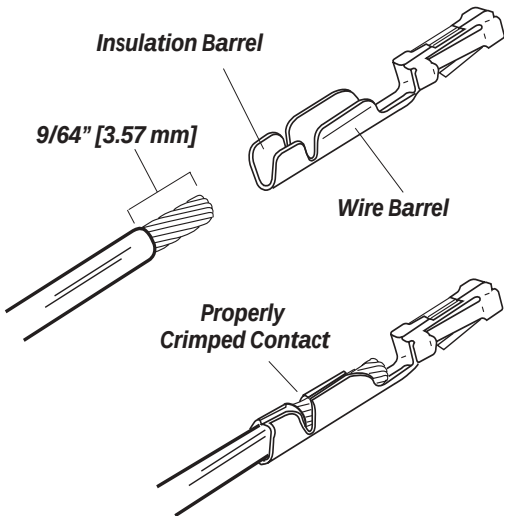
- Analog audio connections require two-conductor, stranded, insulated, foil-shield cable using a separate shield drain wire (equivalent to Belden 8451, 9451 or 8761).

- 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 BMX*digital* 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.

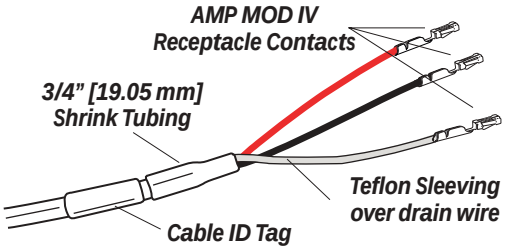


AMP MOD IV Receptacle Contacts

Follow these steps for audio wire preparation:

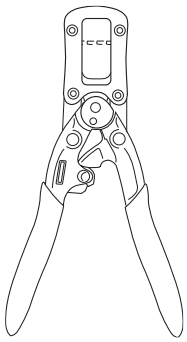
1. Strip the cable insulation jacket and foil shield back 1½" [38.10 mm].
2. Remove the foil shield and sleeve the drain wire with 20 AWG Teflon sleeving. Leave 9/64" [3.57 mm] of the drain wire exposed.
3. Cover the cut end of the jacket with 3/4" [19.05 mm] of heat-shrink tubing. Shrink this tubing, 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 Shielding Note: To follow recommended grounding procedures, the drain wires must be sleeved with Teflon sleeving and heat shrink tubing must cover all cable jacket cut ends to insulate the shield wiring.



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].

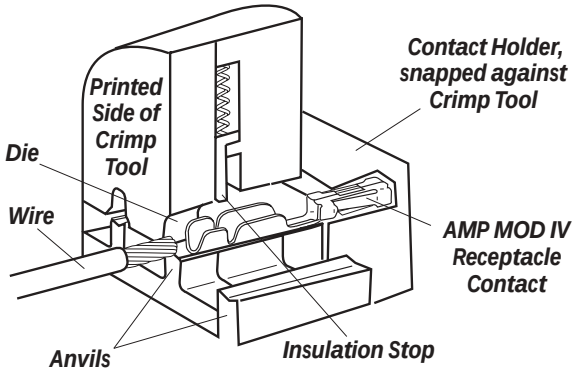


AMP MOD IV Contact Crimp Tool

CRIMP TOOL OPERATION

A ratcheting AMP crimp tool with contact holder is included. The tool crimps both the insulation and wire barrels on the AMP MOD IV receptacle contact in one crimp. To use the ratcheting crimp tool:

1. Insert the contact into the contact holder with the barrel openings up. Typically the middle holder is used (for 20 - 24 AWG wire). Flip the holder up so it magnetically latches against the crimp tool. The end of the insulation barrel will be about 2 mm from the end of the die. Close the tool one click (only until the anvil holds the contact in place, as shown in the cutaway view, above.)
2. Insert the prepped wire into the contact until the insulation 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.

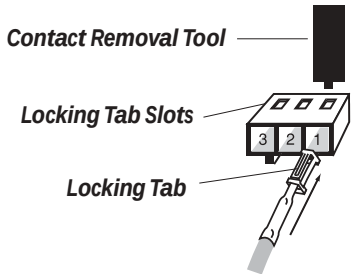


Crimp Tool — Cutaway View

Once the contact has been crimped, insert and lock the contact receptacle into the appropriate connector housing following the pinout diagrams found in the Quick Connection Guides on pages 2-16 to 2-57.

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 PRE76-2001 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.

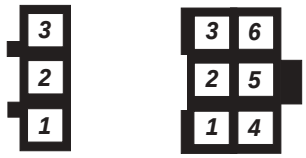


Receptacle Contact, Insertion & Removal Detail

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 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 3-5 for L/R Mode information on the Universal Input Module).

Analog Connections

There are no analog interstage patch points within the BMX*digital* 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 BMX*digital*'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

Digital inputs and outputs are wired like the Microphone Input shown above.

The Universal Input, RLS and Telco/Codec modules have digital inputs. The three-pin 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 Output module has multiple digital outputs. Each outputs an AES-3 compatible signal.

Note: The digital outputs cannot connect directly to an S/PDIF input. A signal translation interface is required.

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

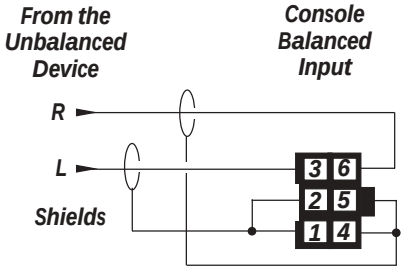
Pin	Signal Description
1	Shield for AES/EBU signal
2	Low (- output)
3	High (+ output)

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 BMX*digital* input using the following illustration.

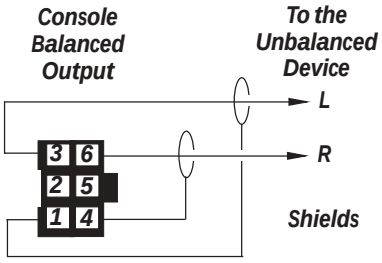
Connecting an Unbalanced Device to a BMX*digital* Analog Input



When an unbalanced device must be connected to a BMX*digital* 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 BMX*digital* output, as shown in the following illustration.

Connecting an Unbalanced Device to a BMX*digital* Analog Output

(Nominal Output is -2 dBu)

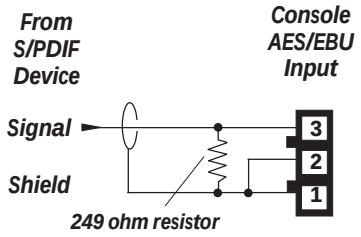


(Make no connections to pins 2 & 5)

S/PDIF Signals

Digital devices with only an S/PDIF digital output can connect to a BMX*digital* input, but only when a 249 ohm resistor is used 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 BMX*digital* 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.

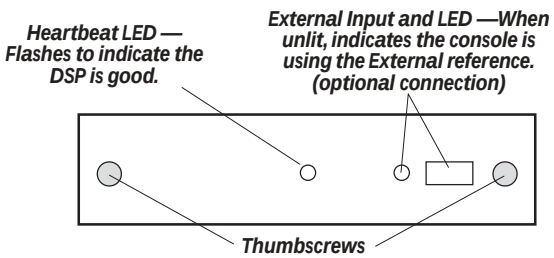
Note 2: Some S/PDIF signals may not work with the BMX*digital*'s inputs, even with the additional load resistor or a transformer, because of nonstandard levels or protocols in the S/PDIF product.

DIGITAL CLOCK REFERENCE

The BMX*digital* 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 synchronize to an external AES-3 digital reference signal (of 48 kHz, ±100 ppm only) when using the optional Ext. Input DSP card (99-1356-1). A 3-pin connector on the card has a green LED next to it to indicate whether the internal or external reference is active. When a valid external reference signal is present, the LED is off. If the LED is still lit with an external signal connected, it indicates the reference signal is not present or is out of range.

DSP Card Features



LOGIC CONNECTIONS

BMX*digital* 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.

BMX*digital* modules have the following logic connectors:

- Universal Input modules have two MAIN connectors for the devices connected to the A and the B inputs and two T/B OPTION connectors for separate talkback control for the A and B mic inputs.
- Telco/Codec and RLS modules have a single LOGIC I/O connector for the device connected to the module.
- The Session module has three EXT TIMER connectors for resetting studio or producer timers, a DATA (RJ-45) connector for connecting the console to a local LAN 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, mute, dim, and talkback. A CUE CNTL connector allows external cue input control.
- The optional Studio module has two LOGIC connectors for dim, mute, and warning indications and two talkback connectors (PRODUCER and EXTERNAL).
- The Output 1 module has a PRODUCER IFB LOGIC connector.

MODULE QUICK GUIDES

Pages 2-16 to 2-57 have Quick Guides to configuring logic connections and DIP switch settings. Each guide covers the audio and logic connector pinouts and signal descriptions, DIP switch setting definitions, and, for some modules, logic block diagrams. The Module Quick Guides:

- **Mic Preamp**: pages 2-16 & 2-17
- **Universal Input**: pages 2-18 to 2-23
- **Telco/Codec**: pages 2-24 to 2-27
- **RLS**: pages 2-28 to 2-31
- **Session**: pages 2-32 & 2-33
- **Control Room**: pages 2-34 to 2-38
- **Studio**: pages 2-40 to 2-49
- **Output 1**: pages 2-50 to 2-53
- **Output 2**: pages 2-54 & 2-55
- **Output 3**: pages 2-56 & 2-57

Note: There are four versions of each Input module: full-featured (shown in the Quick Guides); limited-function modules (without the Utility or Send bus controls); and full-featured or limited-featured Net-only modules (which have no input and logic connectors).

Pages 2-58 to 2-63 show examples of typical logic connections to the Universal Input module from a mic remote control panel, a CD player and a digital delivery system. Pages 2-64 thru 2-66 cover the Net Card and Net-Only modules.

Note: For complete isolation of the console and a peripheral device, use only the opto-isolated control connections. Both logic ground and +5 VDC are referenced to the console's power supply and ground and should only be connected to isolated devices like mic control panels or other Harris Accessory Panels. Connecting logic ground to a non-isolated device may result in a ground loop between the console and the peripheral device.

UNIVERSAL 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 of up to 60 volts at 350 mA.

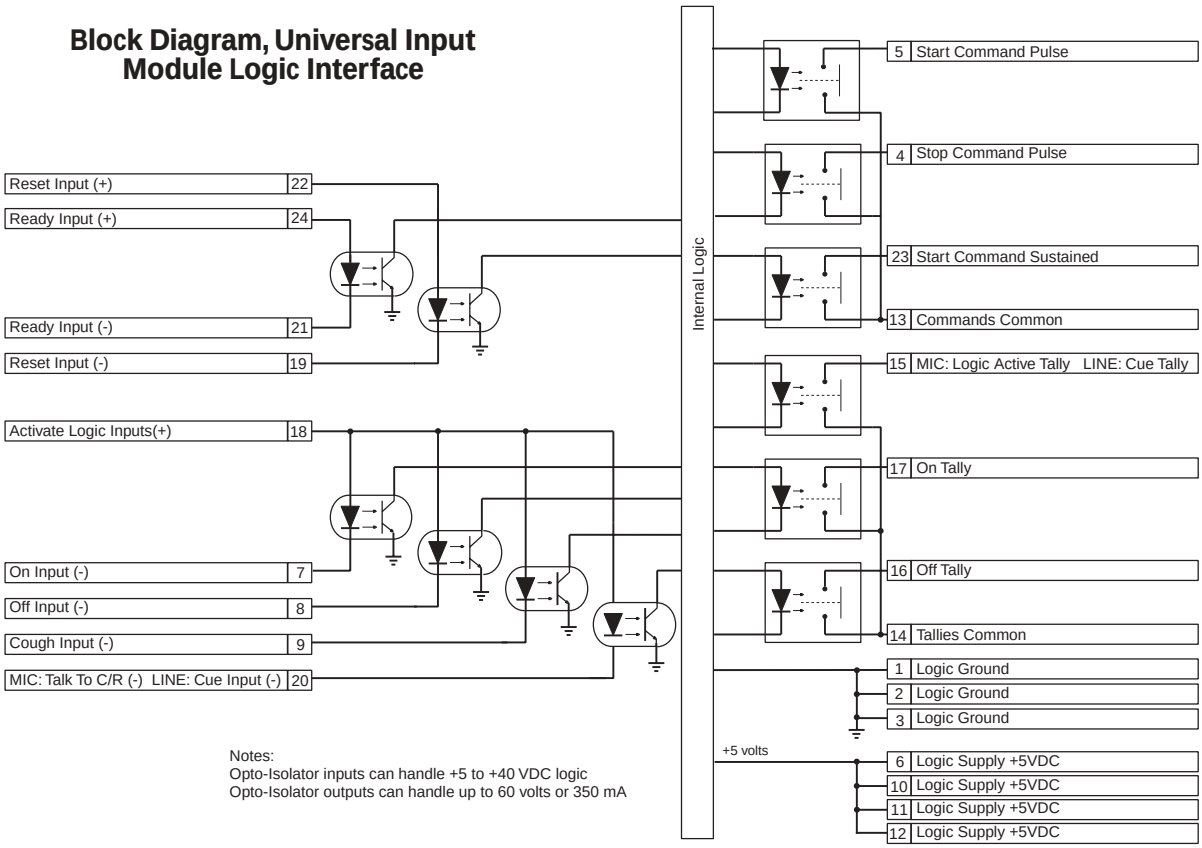
Pressing the On button generates a 220 ms contact closure from pin 5 (Start Command Pulse). A sustained contact closure while On is available on pin 23 (Start Command Sustained). It stays closed as long as the module is On. Pressing the Off button generates a 220 ms closure from pin 4 (Stop Command Pulse). 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 Tallies Common [pin 14]. They present sustained logic outputs for each function.

There are six logic inputs on the left side of the illustration: Reset, Ready, 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 and Ready 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 device). To use these inputs, pin 18 (Activate Logic Inputs) must be jumpered to the + logic voltage. Typically

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

this is pin 6 (Logic Supply +5 VDC), but it can also be supplied by the peripheral device.

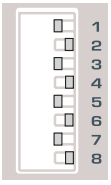
The Audio Reset and Ready inputs can use either active low logic (pull to ground) or active high logic (pull to +VDC) from peripheral devices. With active high logic, Ready (-) and Audio Reset (-) are tied to logic ground on the peripheral device. Ready (+) and Audio Reset (+) then connect to the appropriate logic outputs on the peripheral device.

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

Pin 15's signal (Logic Active Tally / CueTally) changes depending upon whether the channel logic switches (DS1/DS3) are set to mute any location. When any mute is set (DS1/DS3, switches 2 - 5 are 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 Mics

Microphone logic has three main functions: to mute the monitor speakers in the room with a "hot" mic; to command a hot mic warning light; and to activate logic functions like talkback and cough.

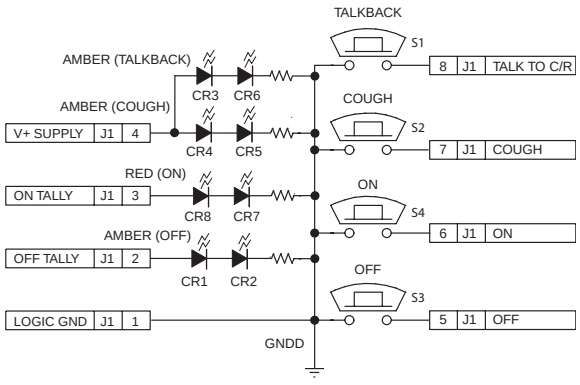
The warning commands come from the Control Room or Studio modules, but it is the Universal Input modules that tell the monitor modules that the input is a mic and where that mic is located (control room, a studio, or an external site).

Setting a Universal input module as a mic input is done by either setting DIP switch 2, 3, 4 or 5 to On on DS1 (A input) or DS3 (B input) or, when a console is tied into a VistaMax system, by assigning the input using its Room Code. The Room Code is a VistaMax system function that sets the room using a Session file setting that is typically used when the mic is routed through the VistaMax system.

Direct Mic Connections

Pages 2-58 and 2-59 summarize setting up a Universal Input module as a direct microphone input, utilizing a PRE99-1198 Mic Panel (simplified schematic shown below). This is typically how mics in the control room or in a dedicated studio are connected. Both the mic audio and the mic logic are wired directly to an input module's connectors. This is typically how mics are wired even when the console is connected to a VistaMax system since the active input mic audio can be made available as a VistaMax source—allowing the mic audio to be routed to another console or other destination in the VistaMax system.

Mic Control Panel (Simplified Schematic for PRE99-1197 or PRE9-1198)



J1: TO/FROM CONSOLE CHANNEL LOGIC

VistaMax Mic Connections

When a studio, voice-over booth, or other external location will be shared by multiple control rooms, then the shared mics should be routed through the VistaMax system. This then allows each BMX*digital* console to independently control the mics (just as if they were directly connected to the console) via the VistaMax system.

The shared mics and their mic panels are wired directly to an Analog I/O and a Logic I/O card in a VistaMax frame. The logic signals for the mic panel are "bound" to the mic audio during setup. Thus, selecting a mic as a source by any console automatically routes both the audio and logic to that console through its Net Card. Tally commands from the console to the mic panel are routed through the Net Card and the Logic I/O Card.

For additional networked audio information refer to the VistaMax manual (Harris # 75-52).

Mic Logic To/From a BMXdigital Module

A mic panel connects to a Universal Input module using the MAIN logic connector (a simplified schematic is on page 2-13). To enable the remote control inputs (On, Off, Cough, Talkback), pin 18 (Activate Logic Inputs) must jumper to the +5VDC supply (pin 6, 10, 11, or 12). The On Tally output (pin 17) drives the LEDs in the On button and the Off Tally (pin 16) drives the LEDs in the Off button. The other LEDs (Cough and Talkback) connect to +5 VDC. Switches and LEDs are commoned to Logic Ground.

To make a custom mic panel, 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 MAIN connector). The other side of the Cough and Talkback lamps are tied 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).

Tallies Common (pin 16) is jumpered to +5VDC (pin 6, 10, 11 or 12). Pin 18, Activate Logic Inputs (+), is also jumpered to +5 VDC (typically pin 6 is used).

Input Module Logic (Universal Input, Telco/Codec, RLS) 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 2-60 and 2-61, active low logic is used, thus Commands 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 2-62 and 2-63, active high logic is used, thus Commands Common connects to +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 2-60 and 2-61, 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.

Pages 2-62 and 2-63 show an example where Reset (+) and Ready (+) connect to +5 VDC 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 devices requiring a steady On signal, the Start Command Sustained output can be used.

Additional Logic Connections

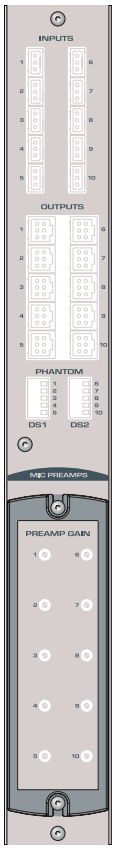
There are additional logic connections on the Session module, Control Room module, optional Studio module, and Output 1 module.

Three 3-pin connectors on the Session module interface remote timers so they can be reset by the console timer reset logic. The Session module also has factory-installed cabling for the clock and timer, the talkback mic, the digital meters and the meter legend display data. For more information on the Session module's logic connections and settings, see pages 2-32 and 2-33.

A 14-pin connector on the Control Room module carries the logic interface for the Control Room warning light, mute, dim and talkback. An 8-pin connector on the Control Room module controls the External Cue input. For more information on the Control Room module's logic connections and settings, see pages 2-34 to 2-38.

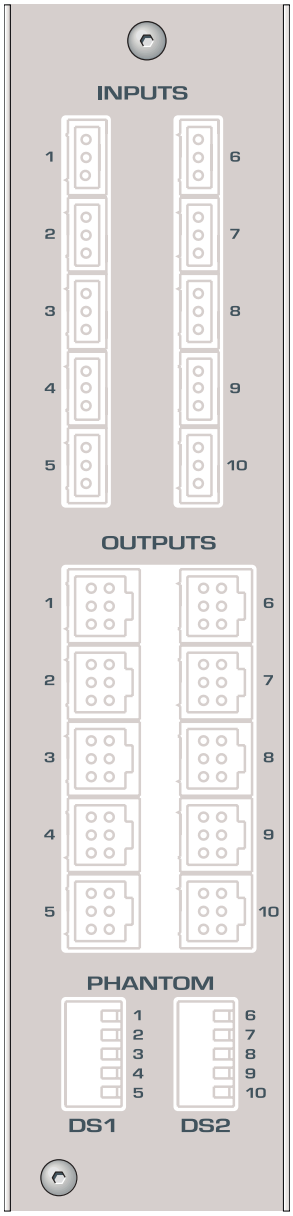
The optional Studio module has two 14-pin connectors to control the two studios' logic (warning lights, mutes, dims). The Studio module also has two 16-pin connectors: one for the talkback audio and logic for a producer, the other for talkback audio and logic from an external site. For more information on the Studio module's logic connections and settings, see pages 2-40 to 2-49.

The Output 1 module includes an 8-pin connector to control the producer's talkback to each mix-minus output. For more information on the Output 1 module's logic connections and settings, see pages 2-50 to 2-53.



QUICK GUIDE TO THE MICROPHONE PREAMPLIFIER MODULE

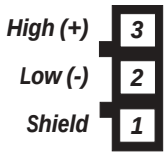
The BMX*digital* mic preamp contains two separate PCAs with five mic preamps on each board. The BMX*digital*-8 and -14 come standard with five mic preamps, whereas the BMX*digital*-22, -30 and -38 come standard with ten mic preamps. Each 3-pin input connects to a separate mic preamp driving its own 6-pin line-level balanced analog output connector. The connectors are hidden by the meter panel in normal operation.



INPUTS

Inputs— *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

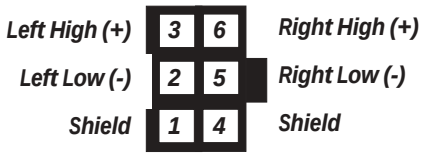


(wire insertion end view)

OUTPUTS

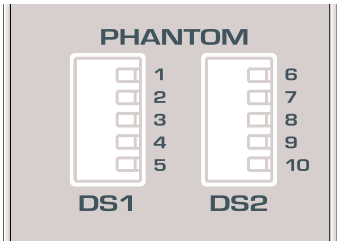
Outputs — *The 6-pin analog outputs are wired in parallel (mono) using the standard pinout sequence. This allows these outputs to connect directly to Universal Input modules without requiring any setting changes to be made to the Input Mode from a standard stereo input. The preamp output signal level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

Analog Preamp Outputs



(wire insertion end view)

MICROPHONE PREAMPLIFIER MODULE SWITCHES



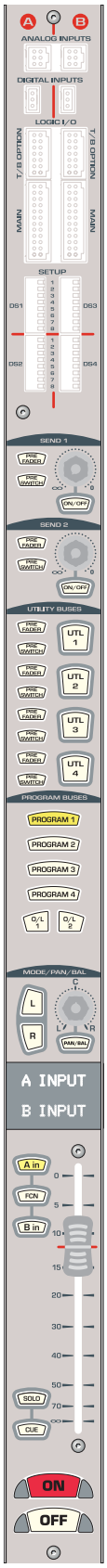
PHANTOM

DS1/DS2 — *These DIP switches set whether phantom power is applied to each mic input. The factory default setting for all switches is OFF.*

Microphone Preamplifier Module Switch Definitions

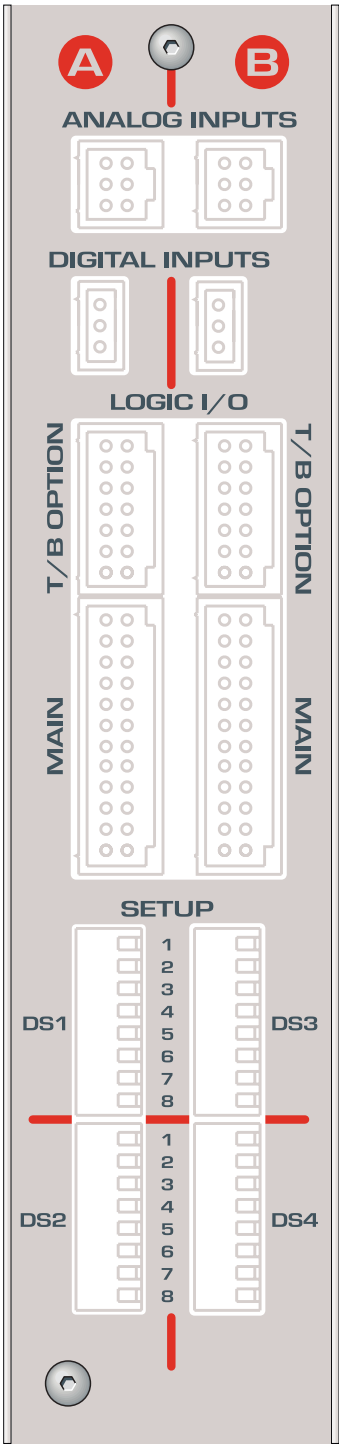
	#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
DS1	1	Mic Input #1	Phantom power on	Phantom power off
	2	Mic Input #2	Phantom power on	Phantom power off
	3	Mic Input #3	Phantom power on	Phantom power off
	4	Mic Input #4	Phantom power on	Phantom power off
	5	Mic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

** Optional on the BMXdigital-8 and BMXdigital-14, standard on the other frame sizes.*



QUICK GUIDE TO THE UNIVERSAL INPUT MODULE

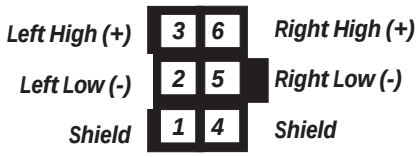
Eight connectors come standard on each Universal Input module: two 6-pin analog audio input connectors, two 3-pin digital audio input connectors, two 14-pin logic connectors, and two 24-pin logic connectors. The connectors are hidden by the meter panel in normal operation.



AUDIO INPUTS

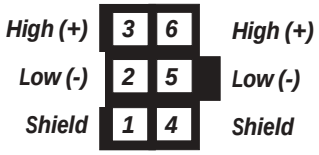
ANALOG INPUTS A & B — *The 6-pin analog inputs accept stereo or mono line level signals. Mono signals, like those from a preamplified microphone, should be paralleled to the left and right inputs.*

Analog Inputs - Stereo



(wire insertion end view)

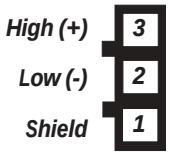
Analog Inputs - Mono



(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



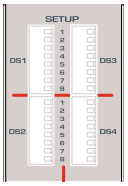
(wire insertion end view)

LOGIC I/O

T/B OPTION A & B — *Two 14-pin Talkback connectors allow separate A/B input control of talkback when microphone logic is active. Connects to a PRE99-1199 Mic Remote Panel with five Talks, or a custom talkback control panel. For additional information, see pages 2-22 and 2-23.*

MAIN A & B — *Two 24-pin logic connectors allow separate A/B input control of the peripheral devices 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	Analog
	2	CR Mute	Mutes C/R speakers at module on [1]	No monitor muting
	3	Studio 1 Mute	Mutes Studio 1 speakers at module on [1]	No monitor muting
	4	Studio 2 Mute	Mutes Studio 2 speakers at module on [1]	No monitor muting
	5	External Site Mute	Mutes external site speakers at module on [1]	No monitor muting
	6	Local On Cough	Hold down On button as Cough button	On button not used for Cough
	7	Timer Reset	Resets timer at module on	No timer reset
	8	Off Lamp Control	Local (Off lamp follows on/off status)	Remote (Off lamp follows ready logic)
DS2 / DS4	1	Fader Start	Moving Fader from/to full-off (bottom) turns module On/Off	Fader movement does not affect module On/Off
	2	Start/Stop Pulses	Multiple (each press of On/Off button generates another pulse)	Single (pulse is only generated when changing state, Off to On, or On to Off)
	3	Start/Stop Control (no mute location set)	All (pulses are generated no matter where On/Off control originates)	Local (pulses are only generated by module On/Off buttons)
		Dim Function Control (mute location is set)	Disables the Dim function when receiving talkback	Enables the Dim function (the default setting)
	4	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)
	5	Mute Setting Control	Use local DIP switches to set Mute location	VistaMax Room Code sets Mute location
	6	Spare Switch		
	7	Input Level Set	See table below	See table below
	8	Input Level Set	See table below	See table below

Switches 7 & 8 Table

These switches are used together to set the nominal reference levels for the A and B inputs. The factory default settings are both OFF.

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

[1] The module logic is set as Microphone when any of these switches are set to On with a directly connected mic. When the mic is a net source, then switch DS2/4-5 sets how the mute location is set (using a DIP switch or using Room Code).

[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 — MAIN LOGIC

The left connector connects to the A Input device; the right connector connects to the B Input device.

Pins 15 and 20 have dual logic functions. With the module set as a Mic Input (DS1 or DS3 switch 2, 3, 4, or 5 is set to ON) then pin 15 is a Logic Active Tally and pin 20 is the Talk to Control Room logic input. However, when the module is used as a Line Input (DS1 or DS3 switches 2, 3, 4, and 5 all set to OFF), then pin 15 is a Cue Tally output and pin 20 is an external Cue command.

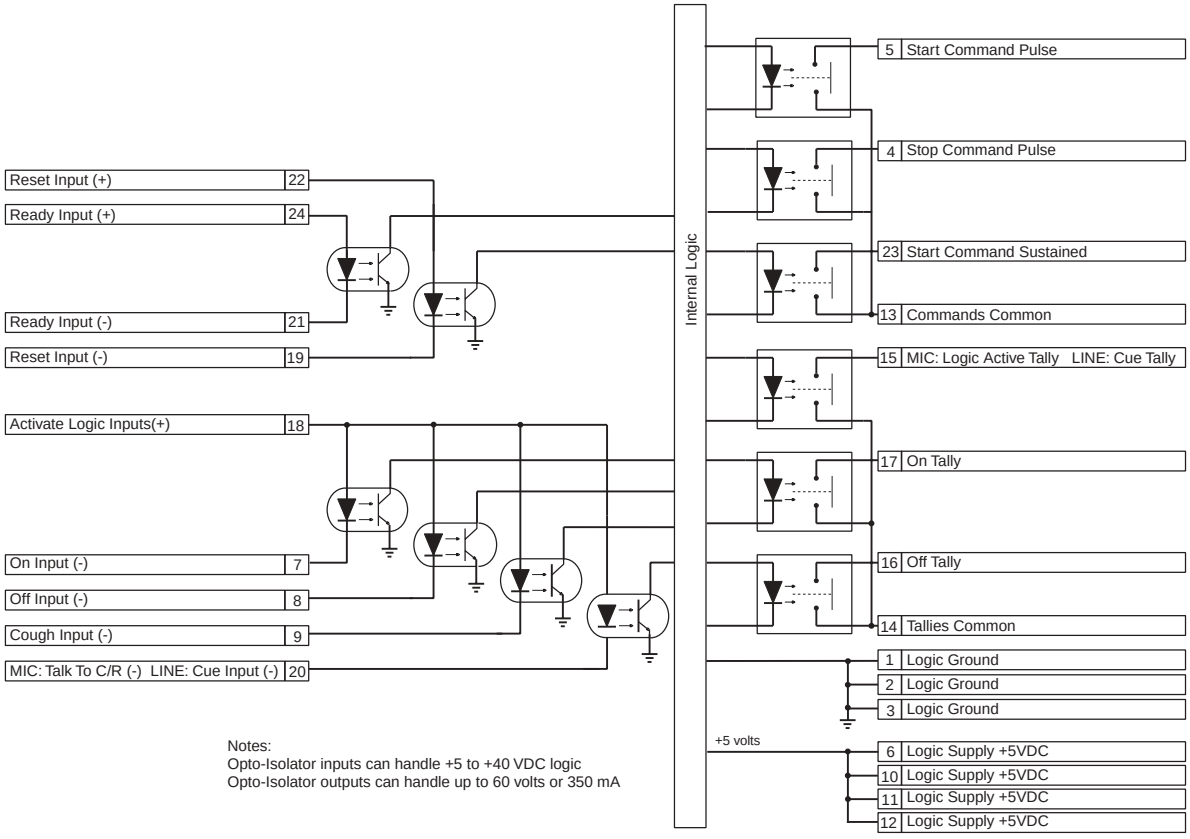
See pages 2-58 to 2-63 for examples of typical logic connections.

MAIN Connector

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

(wire insertion end view)

Universal Input Module, MAIN — 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 MAIN Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
START COMMAND PULSE (pin 5)	Equivalent to a Normally Open (N/O) relay contact. A momentary "contact closure" of 220 ms is generated when the module On button is pressed. Typically connects to the Remote Start logic input on the peripheral device. When DS2-2 or 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)	Same as Start Command Pulse, except it is a maintained contact closure 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.
COMMANDS 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 +5 VDC (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 DS2-3 or DS4-3 is set to On. Input is ignored if the module is already on, unless DS2-2 or DS4-2 is set On (each press generates a Start Pulse output).
OFF (-) (pin 8)	When pulled low, turns the module off from on, generating a Stop Pulse if DS2-3 or DS4-3 is set to On. Input is ignored if the module is already off, unless DS2-2 or DS4-2 is set On (each press generates a Stop Pulse output).
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 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 Tallies Common (pin 14).
OFF TALLY (pin 16)	This output connects to Tallies Common while the module is off when DS1-8 or DS3-8 is set to On. When DS1-8 or DS3-8 is set to Off, then this output is controlled by the Ready logic.
ON TALLY (pin 17)	This output connects to Tallies Common while the module is on.
LOGIC ACTIVE TALLY or CUE TALLY (pin 15)	This output connects to Tallies 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 Tallies Common while Cue is active.
TALLIES COMMON (pin 14)	The "C" relay contact for the three Tallies, it must be tied high or low to provide the return path for the Tallies. Typically, the tally lamps are all tied to ground and Tallies 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 (+) & (-) **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 24 & 21)	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 lamp to indicate device status. Typically, no lamp indicates the peripheral is not ready to play, a steady lamp on indicates the device is ready, and a flashing lamp indicates the device has already played or is not yet cued up.
RESET (+) & (-) (pins 22 & 19)	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 +5 VDC (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.

UNIVERSAL INPUT MODULE — T/B OPTION LOGIC

The left logic connector has the talkback features for the A input; the right logic connector has the talkback features for the B input. Talkback is only active when the module is set as a Microphone (a mute location is set on switches 2 thru 5 on DS1 and/or DS3).

The control logic can come from a PRE99-1199 Mic Panel with Five Talks, or from a custom talkback panel. Each Talk command input (Talk to Studio 1 (-), Talk to Studio 2 (-), etc.), when held low, routes the pre-fader, pre-switch module audio to the selected talk destination.

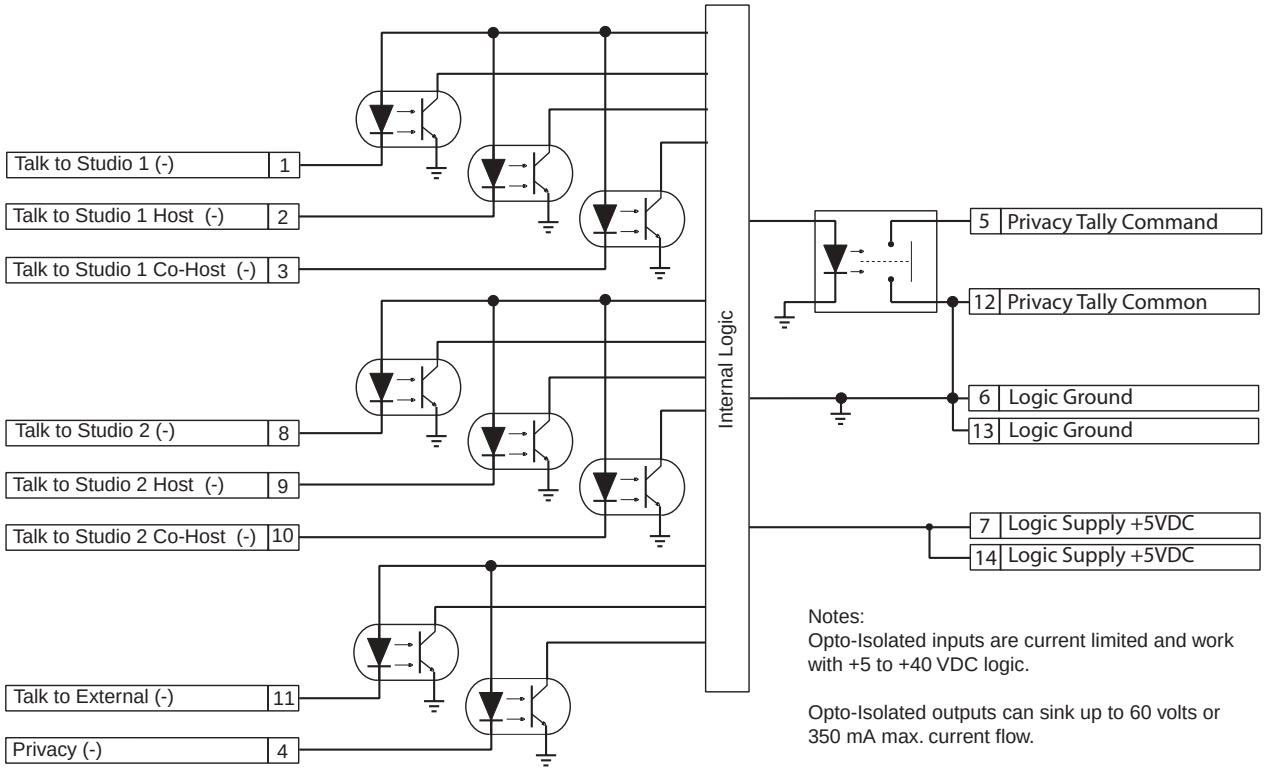
Privacy, when active, prevents anyone from monitoring the pre-switch audio in the console. While Privacy (-) is pulled low, Privacy Tally Command (pin 5) is tied to Privacy Common (pin 12), to provide a low output for activating a lamp or LED Privacy Active indicator.

T/B OPTION Connector

Logic Supply +5 VDC	7	14	*Logic Supply +5 VDC*
Logic Ground	6	13	*Logic Ground*
Privacy Tally Command	5	12	*Privacy Tally Common*
Privacy (-)	4	11	*Talk to External (-)*
Talk to Studio 1 Co-Host (-)	3	10	*Talk to Studio 2 Co-Host (-)*
Talk to Studio 1 Host (-)	2	9	*Talk to Studio 2 Host (-)*
Talk to Studio 1 (-)	1	8	*Talk to Studio 2 (-)*

(wire insertion end view)

Universal Input Module, T/B OPTION — Simplified Logic Diagram

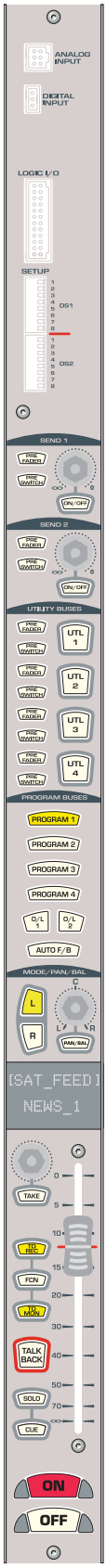


Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

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

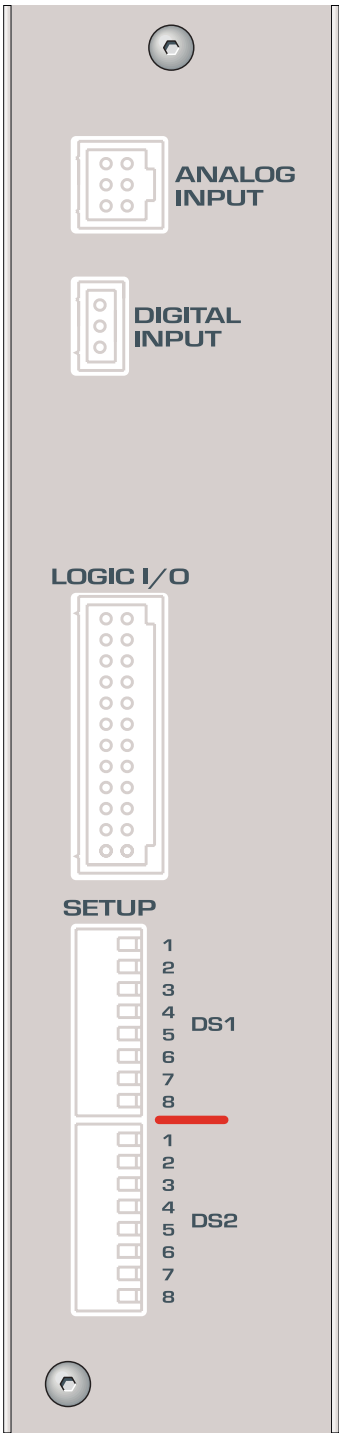
Universal Input Module T/B OPTION Signal Definitions

PIN NAME/NUMBER	FUNCTIONAL DESCRIPTION OF CONNECTION
TALK TO STUDIO 1 (-) (pin 1)	When pulled low, routes the module audio to the Studio 1 outputs.
TALK TO STUDIO 1 HOST (-) (pin 2)	When pulled low, routes the module audio to the host's headphones in Studio 1.
TALK TO STUDIO 1 CO-HOST (-) (pin 3)	When pulled low, routes the module audio to the co-host's headphones in Studio 1.
PRIVACY (-) (pin 4)	When pulled low, prohibits the console operator from hearing the talent mic unless the channel is turned On. Privacy applies to solo, cue, and any pre-switch assignments.
PRIVACY TALLY COMMAND (pin 5)	Output that goes low when Privacy is active.
TALK TO STUDIO 2 (-) (pin 8)	When pulled low, routes the module audio to the Studio 2 outputs.
TALK TO STUDIO 2 HOST (-) (pin 9)	When pulled low, routes the module audio to the host's headphones in Studio 2.
TALK TO STUDIO 2 CO-HOST (-) (pin 10)	When pulled low, routes the module audio to the co-host's headphones in Studio 2.
TALK TO EXTERNAL (-) (pin 11)	When pulled low, routes the module audio to the external output.
PRIVACY TALLY COMMON (pin 12)	Common connection to logic ground for the Privacy Tally Command.
LOGIC GROUND (pins 6 & 13)	Module logic ground. Connects to the Talkback control panel to provide switch returns.
LOGIC SUPPLY +5 VDC (pins 7 & 14)	Module logic voltage output source that can deliver up to 300 mA of current.



QUICK GUIDE TO THE TELCO / CODEC MODULE

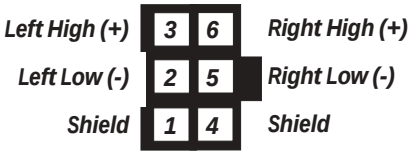
Three connectors come standard on the optional Telco module: one 6-pin analog audio input connector, one 3-pin digital audio input connector, and one 24-pin logic connector. The connectors are hidden by the meter panel in normal operation.



AUDIO INPUTS

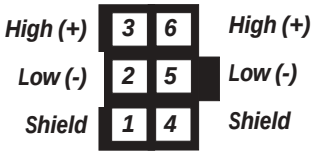
ANALOG INPUT — *The 6-pin analog input accepts line level stereo or mono signals. When a mono signal is connected, parallel the signal to the left and right input pins.*

Analog Inputs - Stereo



(wire insertion end view)

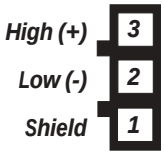
Analog Inputs - Mono



(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

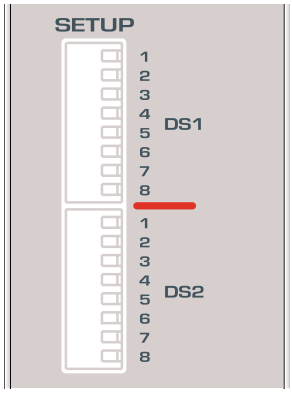


(wire insertion end view)

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. When the device connects to the module through a switcher (router or External RLS), source selection addressing is output from this connector. The source (analog or digital input), whether a switcher is used and other logic selections are configured by the SETUP DIP switches (see Switch Definitions, page 2-25). For additional module information, see pages 2-26 and 2-27.*

TELCO / CODEC MODULE SWITCHES



SETUP

DS1 / DS2 — *These 16 DIP switches set logic functionality for the module, per the Telco/Codec 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	Set Telco ID	On (sets the module as Telco / Codec #5) [1]	Off
	6	Set Telco ID	On (sets the module as Telco / Codec #6) [1]	Off
	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	Source Type	Switcher (VistaMax or External RLS is used)	Direct (device plugs into module)
	5	Switcher Type	VistaMax (see Appdx. A about other routers)	External RLS (PRE99-947)
	6	O/L & Record Source	Pre-fader with module off (only when Session module 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	+4 dBu	0 dB
Off	On	+6 dBu	-6 dB
On	Off	+8 dBu	-12 dB
On	On	-10 dBV	-18 dB

[1] Caution: Set only one of these six DIP switches to ON. This setting identifies the module, affecting signal routing and module controls. Each Telco module in the console MUST have a unique ID setting.

[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 / CODEC MODULE — LOGIC I/O

The 24-pin LOGIC I/O connector allows the module to control, or be controlled by, the device attached to the module.

A device can connect directly to the module or it can connect through a switcher. Two types of switchers are supported: VistaMax and the PRE99-947 External Remote Line Selector (Ext. RLS). The source (switcher or direct) and the switcher type (VistaMax or Ext. RLS) are set via DIP switches DS2-4 and DS2-5.

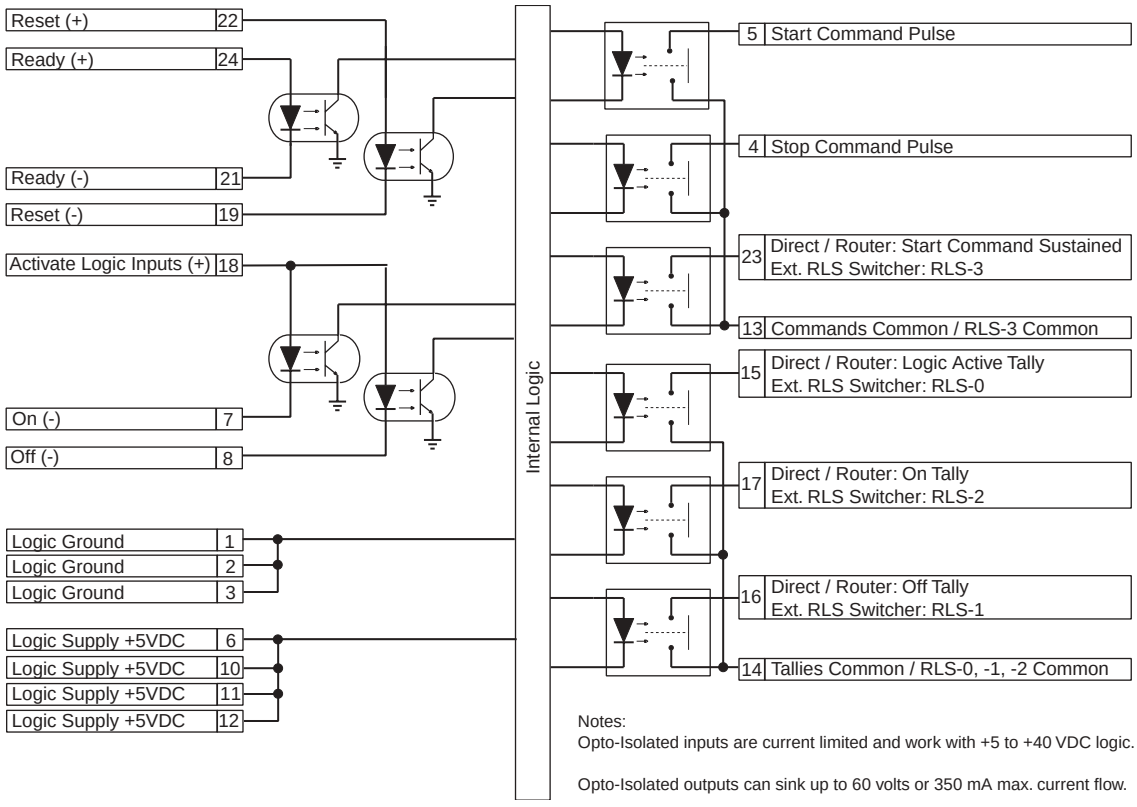
When the module connects to an Ext. RLS, several logic connections (pins 15, 16, 17 and 23) become RLS address outputs. This change occurs only when DS2-4 is set ON and DS2-5 is set to OFF. When a VistaMax or other router is used (DS2-5 is set ON), these pins do not change function since addressing is done through the Session module.

LOGIC I/O Connector

Logic Supply +5 VDC	12	24	*Ready (+)*
Logic Supply +5 VDC	11	23	*Start Command Sustained / RLS-3*
Logic Supply +5 VDC	10	22	*Reset (+)*
no connection	9	21	*Ready (-)*
Off (-)	8	20	*no connection*
On (-)	7	19	*Reset (-)*
Logic Supply +5 VDC	6	18	*Activate Logic Inputs (+)*
Start Command Pulse	5	17	*On Tally / RLS-2*
Stop Command Pulse	4	16	*Off Tally / RLS-1*
Logic Ground	3	15	*Logic Active Tally / RLS-0*
Logic Ground	2	14	*Tallies/ RLS-0, -1, -2 Common*
Logic Ground	1	13	*Commands/ RLS-3 Common*

(wire insertion end view)

Telco / Codec Module, Logic I/O — Simplified Logic Diagram

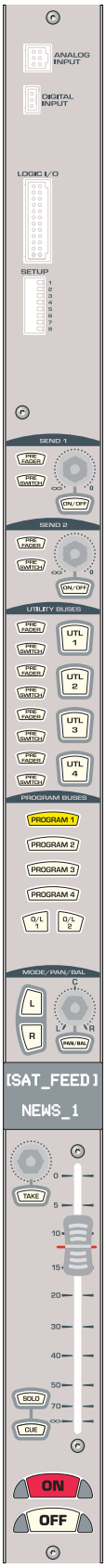


Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

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

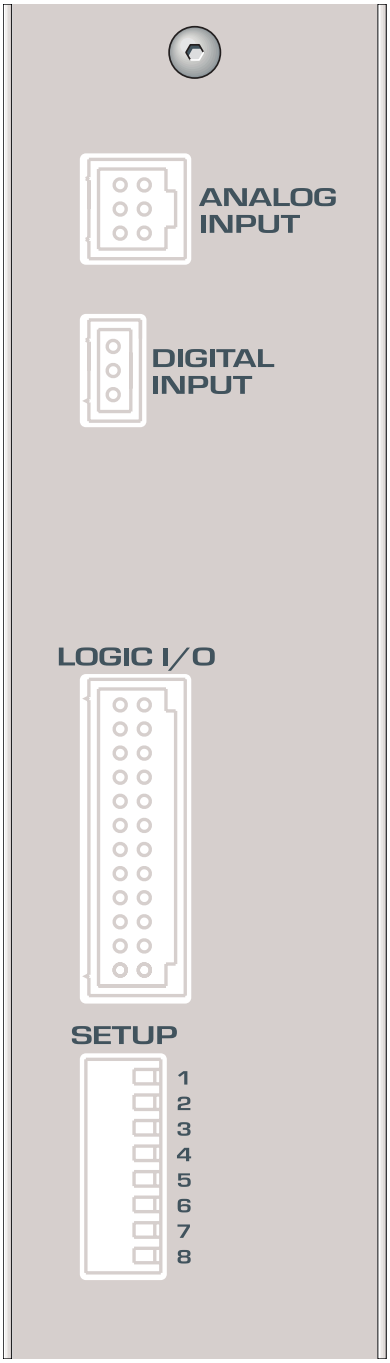
Telco / Codec Module LOGIC I/O Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
START COMMAND PULSE (pin 5)	Equivalent to a Normally Open (N/O) relay contact. A momentary "contact closure" of 220 ms is generated each time the module turns on from off. Typically connects to the Remote On logic input on the peripheral device.
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 Off logic input on the peripheral device.
START COMMAND SUSTAINED / RLS-3 (pin 23)	**Direct:** Same as Start Command Pulse, except it is a maintained contact closure for as long as the module is on. Typically connects to the Remote On logic input on a peripheral device that cannot use a start pulse. **Ext. RLS:** Outputs addressing bit 3.
COMMANDS / RLS-3 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, tie this pin to + logic voltage (+5 to +40). When tied to an isolated device like a remote panel, use the Logic Supply +5 VDC (jumper pin 18 to pin 6, 10, 11 or 12).
ON (-) (pin 7)	When pulled low, turns the module on. Input is ignored if the module is already on.
OFF (-) (pin 8)	When pulled low, turns the module off. Input is ignored if the module is already off.
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 Tallies Common (pin 14).
OFF TALLY / RLS-1 (pin 16)	**Direct:** This output connects to Tallies Common while the module is off. When DS2-1 is set OFF, then this output is controlled by the Ready logic. **Ext. RLS:** Outputs addressing bit 1.
ON TALLY / RLS-2 (pin 17)	**Direct: This** output connects to Tallies Common while the module is on. **Ext. RLS:** Outputs addressing bit 2.
LOGIC ACTIVE TALLY / RLS-0 (pin 15)	**Direct:** This output connects to Tallies Common when module is powered up. **Ext. RLS:** Outputs addressing bit 0.
TALLIES / RLS-0, -1, -2 COMMON (pin 14)	The "C" relay contact for the three Tallies, it must be tied high or low to provide the return path for the Tallies. Typically, the tally lamps are all tied to ground and Tallies 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 (+) & (-) 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 24 & 21)	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 lamp to indicate device status. Typically, no lamp indicates the peripheral is not ready to play, a steady lamp on indicates the device is ready, and a flashing lamp indicates the device has already played or is not yet cued up.
RESET (+) & (-) (pins 22 & 19)	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 +5 VDC (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 REMOTE LINE SELECTOR (RLS) MODULE

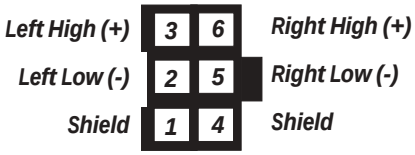
Three connectors come standard on the optional Remote Line Selector (RLS) module: one 6-pin analog audio input connector, one 3-pin digital audio input connector, and one 24-pin logic connector. The connectors are hidden by the meter panel in normal operation.



AUDIO INPUTS

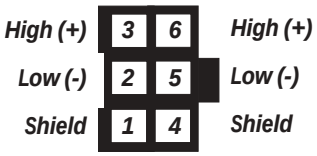
ANALOG INPUT — *The 6-pin analog input accepts stereo signals or mono signals. When a mono input is used, parallel the signal to the left and right inputs.*

Analog Inputs - Stereo



(wire insertion end view)

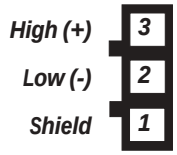
Analog Inputs - Mono



(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

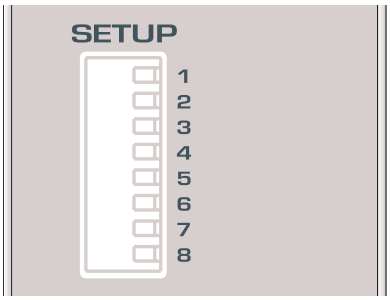


(wire insertion end view)

LOGIC

LOGIC I/O — *The 24-pin logic connector controls the device connected to the module. Devices typically connect through a switcher (an External RLS under module control or a router), although a device can connect directly to the module as well. The source type and switcher type are configured via the module's SETUP DIP switches (settings listed on page 2-29). Logic connections vary depending on the type of device connection. For more information, see pages 2-30 and 2-31.*

REMOTE LINE SELECTOR (RLS) MODULE SWITCHES



SETUP

Setup — *These eight DIP switches set logic functionality for the module per the Switch Definitions table below.*

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	Timer Reset	Resets timer at module on	No timer reset
3	Bypass Sample Rate Converter (SRC)	Bypasses internal SRC (use only when the console and all the audio sources are locked to an external reference)[1]	Uses internal SRC (normal setting)
4	Source Type	Switcher (VistaMax or External RLS)	Direct
5	Switcher Type	VistaMax (see Appdx. A about other routers)	External RLS (PRE99-947)
6	Spare Switch		
7	Input Level Set	See table below	See table below
8	Input Level Set	See table below	See table below

SETUP — Switches 7 and 8

These switches are used together to set the nominal reference level for the inputs. The factory default settings are both OFF.

7	8	Analog[2]	Digital[3]
Off	Off	+4 dBu	0 dB
Off	On	+6 dBu	-6 dB
On	Off	+8 dBu	-12 dB
On	On	-10 dBV	-18 dB

[1] *Refer to page 2-11, Digital Clock Reference for details.*

[2] *The nominal analog input to achieve -20 FSD (equal to a +4 dBu output), with the fader set to the red reference line.*

[3] *The amount of gain reduction applied to the digital input.*

REMOTE LINE SELECTOR MODULE — LOGIC I/O

The 24-pin LOGIC I/O connector allows the RLS module to control, or to be controlled by, the device connected to the module. A device can connect directly to the module, but more commonly input selection would be done through a switcher. Two types of switchers are supported: VistaMax (or other routers) and the PRE99-947 External Remote Line Selector (Ext. RLS).

The source type (switcher or direct) and the switcher type (VistaMax or Ext. RLS) are set via the module's SETUP DIP switches (see page 2-29).

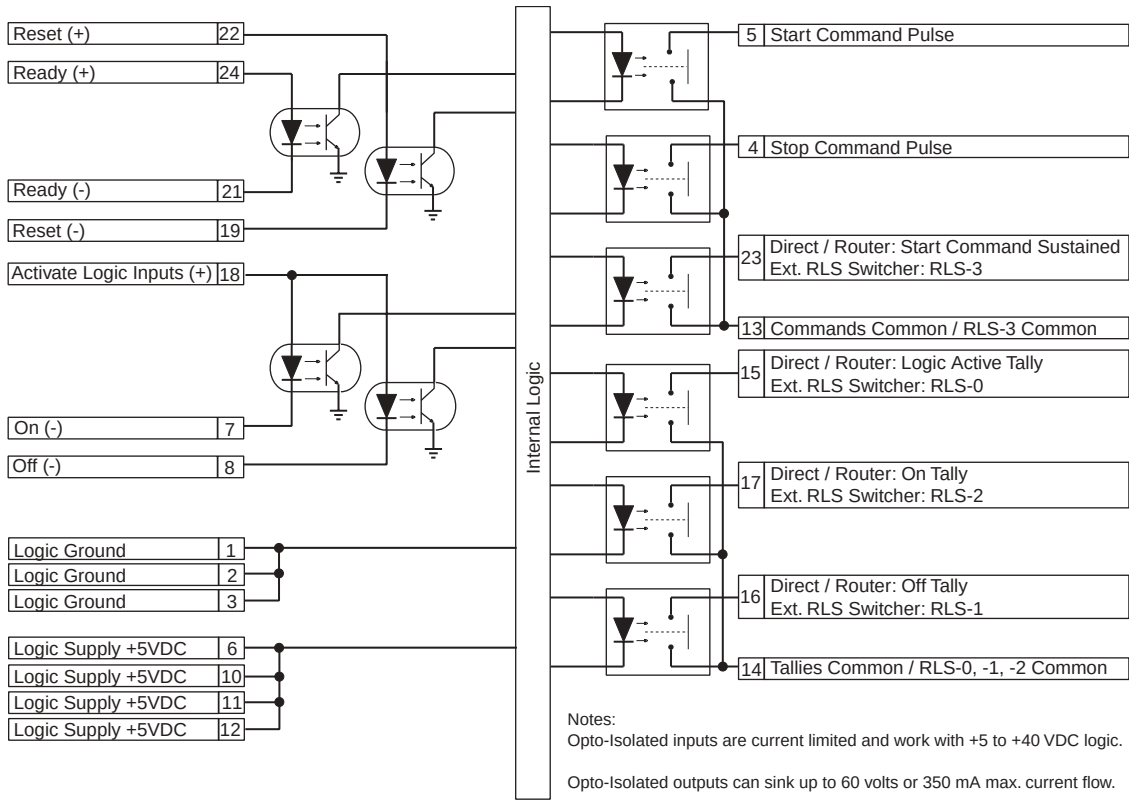
When the module connects to an Ext. RLS, several logic connections (pins 15, 16, 17 and 23) become RLS address outputs. This change occurs only when DS2-4 is set ON and DS2-5 is set to OFF. When a VistaMax or other router is used (DS2-5 is set ON), these pins do not change function since addressing is done through the Session module.

LOGIC I/O Connector

Logic Supply +5 VDC	12	24	*Ready (+)*
Logic Supply +5 VDC	11	23	*Start Command Sustained / RLS-3*
Logic Supply +5 VDC	10	22	*Reset (+)*
no connection	9	21	*Ready (-)*
Off (-)	8	20	*no connection*
On (-)	7	19	*Reset (-)*
Logic Supply +5 VDC	6	18	*Activate Logic Inputs (+)*
Start Command Pulse	5	17	*On Tally / RLS-2*
Stop Command Pulse	4	16	*Off Tally / RLS-1*
Logic Ground	3	15	*Logic Active Tally / RLS-0*
Logic Ground	2	14	*Tallies / RLS-0, RLS-1, RLS-2 Common*
Logic Ground	1	13	*Commands / RLS-3 Common*

(wire insertion end view)

Remote Line Selector (RLS) Module, LOGIC I/O — Simplified Logic Diagram

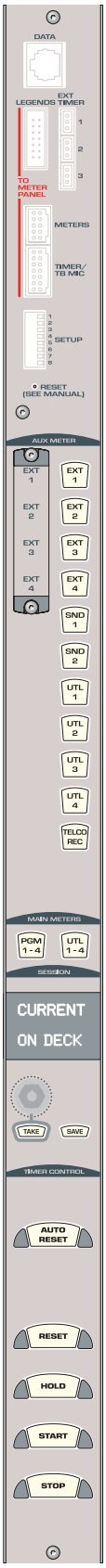


Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

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

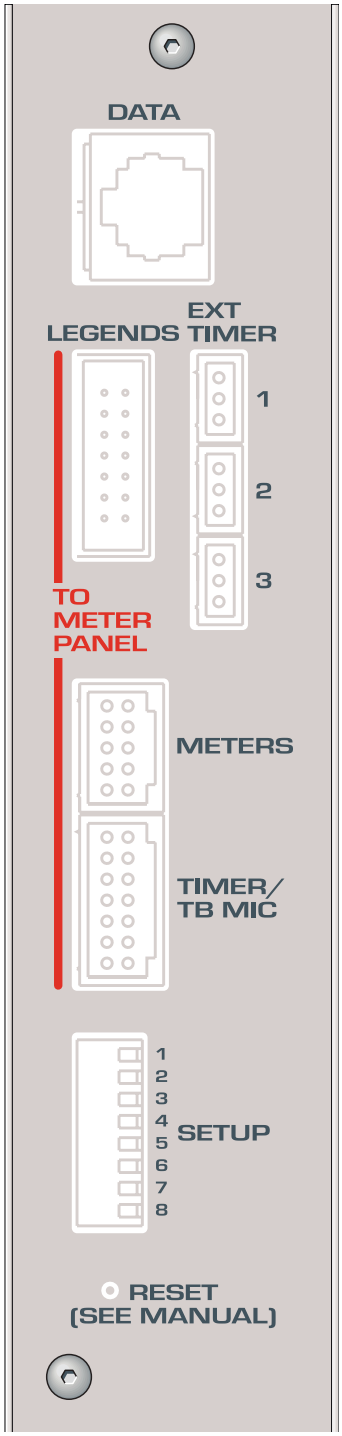
RLS Module LOGIC I/O Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
START COMMAND PULSE (pin 5)	Equivalent to a Normally Open (N/O) relay contact. A momentary "contact closure" of 220 ms is generated each time the module turns on from off. Typically connects to the Remote On logic input on the peripheral device.
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 Off logic input on the peripheral device.
START COMMAND SUSTAINED / RLS-3 (pin 23)	**Direct:** Same as Start Command Pulse, except it is a maintained contact closure for as long as the module is on. Typically connects to the Remote On logic input on a peripheral device that cannot use a start pulse. **Ext. RLS:** Outputs addressing bit 3.
COMMANDS / RLS-3 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 to C/R, tie this pin to + logic voltage (+5 to +40). When tied to an isolated device like a remote panel, use the Logic Supply +5 VDC (jumper pin 18 to pin 6, 10, 11 or 12).
ON (-) (pin 7)	When pulled low, turns the module on, generating a Start Pulse. Input is ignored if the module is already on.
OFF (-) (pin 8)	When pulled low, turns the module off, generating a Stop Pulse. Input is ignored if the module is already off.
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 Tallies Common (pin 14).
OFF TALLY / RLS-1 (pin 16)	**Direct:** This output connects to Tallies Common while the module is off. When DS2-1 is set OFF, then this output is controlled by the Ready logic. **Ext. RLS:** Outputs addressing bit 1.
ON TALLY / RLS-2 (pin 17)	**Direct: This** output connects to Tallies Common while the module is on. **Ext. RLS:** Outputs addressing bit 2.
LOGIC ACTIVE TALLY / RLS-0 (pin 15)	**Direct:** This output connects to Tallies Common when module is powered up. **Ext. RLS:** Outputs addressing bit 0.
TALLIES / RLS-0, -1, -2 COMMON (pin 14)	The "C" relay contact for the three Tallies, it must be tied high or low to provide the return path for the Tallies. Typically, the tally lamps are all tied to ground and Tallies 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 (+) & (-) **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 24 & 21)	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 lamp to indicate device status. Typically, no lamp indicates the peripheral is not ready to play, a steady lamp on indicates the device is ready, and a flashing lamp indicates the device has already played or is not yet cued up.
RESET (+) & (-) (pins 22 & 19)	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 +5 VDC (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 SESSION MODULE

Four user connectors come standard on the Session module: one 10base-T connector (DATA) and three 3-pin EXT. TIMER connectors. There are also three meter panel connectors, which are factory connected. All connectors are hidden by the meter panel in normal operation.



INPUTS/OUTPUTS

DATA — *Connect a standard CAT-5 cable to this 10base-T connector to tie the BMXdigital Server into a Local Area Network (LAN). See Chapter 4 for more information on configuring and using the BMXdigital Server.*

LOGIC OUTPUTS

EXT TIMER — *Three 3-pin External Timer connectors are available to reset external event timers. For more information, see page 2-33.*

TO METER PANEL

LEGENDS — *Factory harnessed connector that outputs the alphanumeric meter names.*

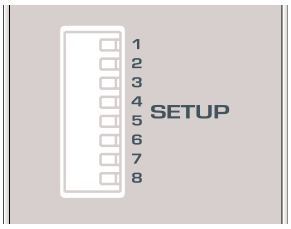
METERS — *Factory harnessed connector that outputs the meter level data.*

TIMER / TB MIC — *Factory harnessed connector that has the audio from the meter panel-mounted talkback microphone and the timer control signals from the Session module Start, Stop, Reset, and Hold buttons.*

RESET (SEE MANUAL)

RESET — *This switch resets all operational parameters on all modules. Typically, this switch is* ***only used for test or servicing purposes*** *and has no normal operational use since this switch does not reset the DSP cards nor the BMXdigital Server–it only resets the input module operational parameters.*

SESSION MODULE SWITCHES



SETUP

SETUP — *These eight DIP switches affect logic settings for the meters and for the entire console per the Session Module Switch Definitions table below.*

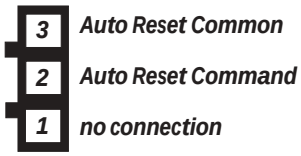
Session Module Switch Definitions

	#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
Meters	1	Meter Display Mode	Average only	Average and peak
	2	Auxiliary Meter Display Priority	Cue is displayed (when both Cue and Solo are selected)	Solo is displayed (when both Cue and Solo are selected)
Console-wide Settings	3	Channel On Cancels Cue or Solo	Cue and Solo are canceled when channel is turned on	Cue and Solo are not affected by channel on
	4	Cue Lamp Control	Cue indicators blink when Cue is on	Cue indicators are solid when Cue is on
	5	Solo function latch	Solo buttons are latched (alternate action)	Solo buttons are momentary
	6	Off-Line buses signal source	All modules Post-fader, but Pre-Switch * See page 2-25 about an additional Telco module switch that affects their Off-Line source.	Universal/RLS, Pre-fader and Pre-Switch *
	7	PGM/UTL 1- 4 function	BMXd-8 sequential meter source selection	Meter switching for all other frame sizes
	8	Spare Switch		

SESSION MODULE — EXTERNAL TIMER

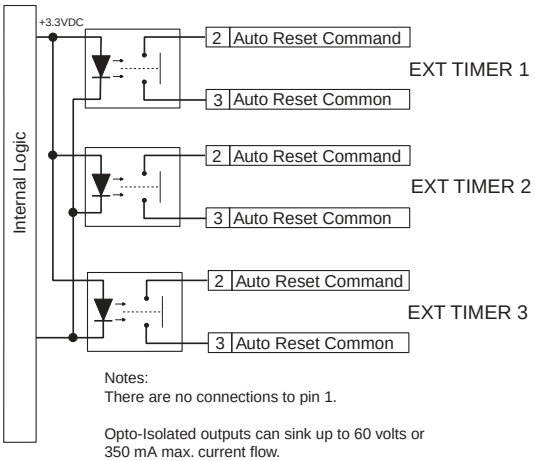
These connectors reset up to three external timers (like the timer in the PRE99-1211 Turret Clock & Timer). They operate independently of the Session module timer buttons. The two active pins (pins 2 and 3) momentarily short together when a reset command is issued by turning on a module that is set to reset the timer.

EXT TIMER 1, 2, 3 Connectors



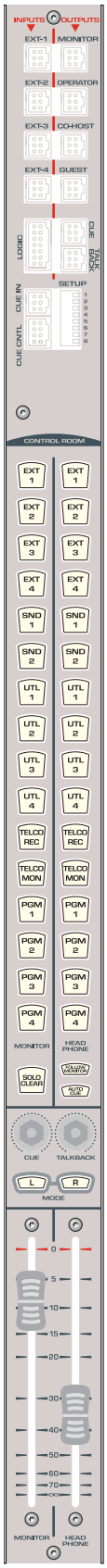
(wire insertion end view)

Session Module, External Timer Reset — Simplified Logic Diagram



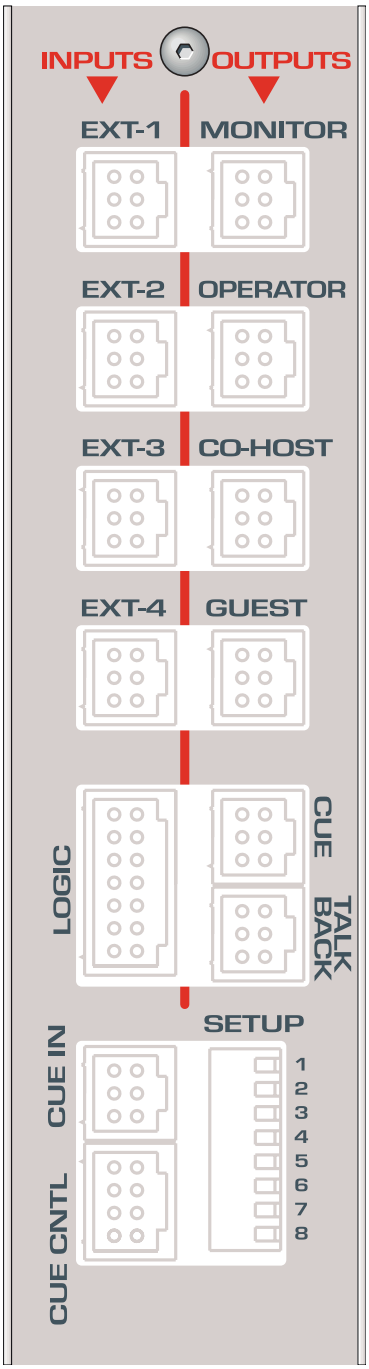
Session Module EXT TIMER Logic Signal Definitions

PIN NAME/NUMBER	FUNCTIONAL DESCRIPTION OF CONNECTION
AUTO RESET COMMAND (pin 2)	Equivalent to a Normally Open (N/O) relay contact. A momentary "contact closure" of 220 ms (to the Auto Reset Common pin) is generated each time a module is turned on that has the Timer Reset Command active (DS1-7 or DS3-7 is set ON). Connect this pin to J4-4 on the PRE99-1211 timer.
AUTO RESET COMMON (pin 3)	The Common (C) relay contact for the Auto Reset Command. Tie this pin to the Timer's logic ground pin when an active low logic is required or tie it to the Timer's Logic Voltage when an active high logic is required. Connect this pin to J4-3 on the PRE99-1211 timer.



CONTROL ROOM MODULE CONNECTORS

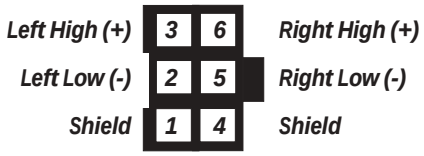
Thirteen connectors come standard on each Control Room module: five 6-pin analog audio input connectors, six 6-pin analog audio output connectors, one 14-pin logic connector, and one 8-pin logic connector. The connectors are hidden by the meter panel in normal operation.



AUDIO INPUTS

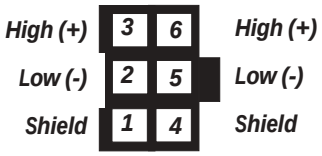
EXT-1, EXT-2, EXT-3, EXT-4, CUE IN — *These 6-pin analog inputs accept stereo or mono signals from external monitor sources such as off-air tuners, a synthetic air monitor, VistaMax monitor output, etc. When a mono source is connected, parallel the signal to the left and right inputs.*

Analog Inputs / Outputs - Stereo



(wire insertion end view)

Analog Inputs - Mono



(wire insertion end view)

AUDIO OUTPUTS

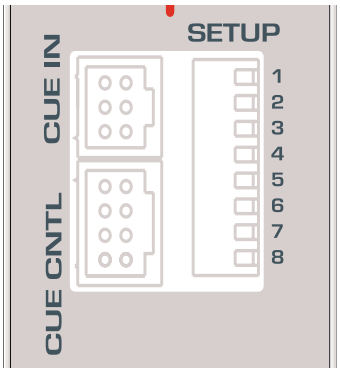
MONITOR, OPERATOR, CO-HOST, GUEST, CUE, TALKBACK — *The 6-pin analog outputs for the control room monitor speaker amplifier (Monitor); three outputs for the headphone amplifiers for the board operator (Operator), co-host or host (Co-host) and for one or more guests (Guest); a Cue amplifier feed (Cue); and a separate Talk to Control Room output (Talkback) for a powered Talkback monitor speaker or amplifier.*

LOGIC I/O

LOGIC — *This 14-pin connector has four "relay" outputs (Control Room warning, mute, dim, and talkback) and two remote inputs (Dim and Mute). See pages 2-36 and 2-37 for details on these signals.*

CUE CNTL — *This 8-pin connector has an external cue control input See page 2-38 for details on this signal.*

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	Headphone AutoCue functions (when active)	Cue is summed to the left channel, monitor is summed to the right channel	Cue feeds both headphone channels (Cue in stereo), monitor is muted
2	Talkback to Co-Host Headphones	Adds talkback to the co-host's headphones	Does not add talkback to the co-host's headphones
3	Talkback to Cue	Adds talkback audio to the Cue output	Talkback audio does not go to Cue
4	Dim Monitors when Receiving Talkback	Monitors dim by 12 dB when receiving talkback	Monitors do not dim when receiving talkback
5	Auto-switch External Inputs 1 & 2 [1]	Automatic switching from External Input 1 to Input 2 while there is a hot mic in the Control Room	No automatic monitor source switching with a hot mic in the Control Room
6	Auto-switch External Inputs 3 & 4 [2]	Automatic switching from External Input 3 to Input 4 while there is a hot mic in the Control Room	No automatic monitor source switching with a hot mic in the Control Room
7	Spare Switch		
8	Spare Switch		

[1] When set to ON, the monitor source automatically switches between External Input 1 (which typically has the off-air monitor, with delay) and External Input 2 (which has a synthetic air signal with little or no delay). When External 1 is selected as the monitor source, and a Control Room mic module is turned on, the monitor source automatically changes to External Input 2. When all Control Room mic modules are off, then External Input 1 is automatically selected.

[2] When set to ON, the monitor source automatically switches between External Input 3 (which would be the off-air monitor, with delay), and External Input 4 (which has a synthetic air signal with little or no delay). When External 3 is selected as the monitor source, and a Control Room mic module is turned on, the monitor source automatically changes to External Input 4. When all Control Room mic modules are off, then External Input 3 is automatically selected.

CONTROL ROOM MODULE — LOGIC

The 14-pin LOGIC connector has the hot mic warning output (Warning Relay) for a control room warning lamp interface, two remote inputs; Mute (-) and Dim (-), and various tally outputs (Mute, Dim and Talkback Tally).

The two Warning Relay outputs short together when a control room mic is on. They can be used as two"dry contacts"or one can be jumpered to + voltage to present a high logic, or to ground to present a low logic (on isolated ground devices, these can come from the Logic Supply +5 VDC or Logic Ground on the connector).

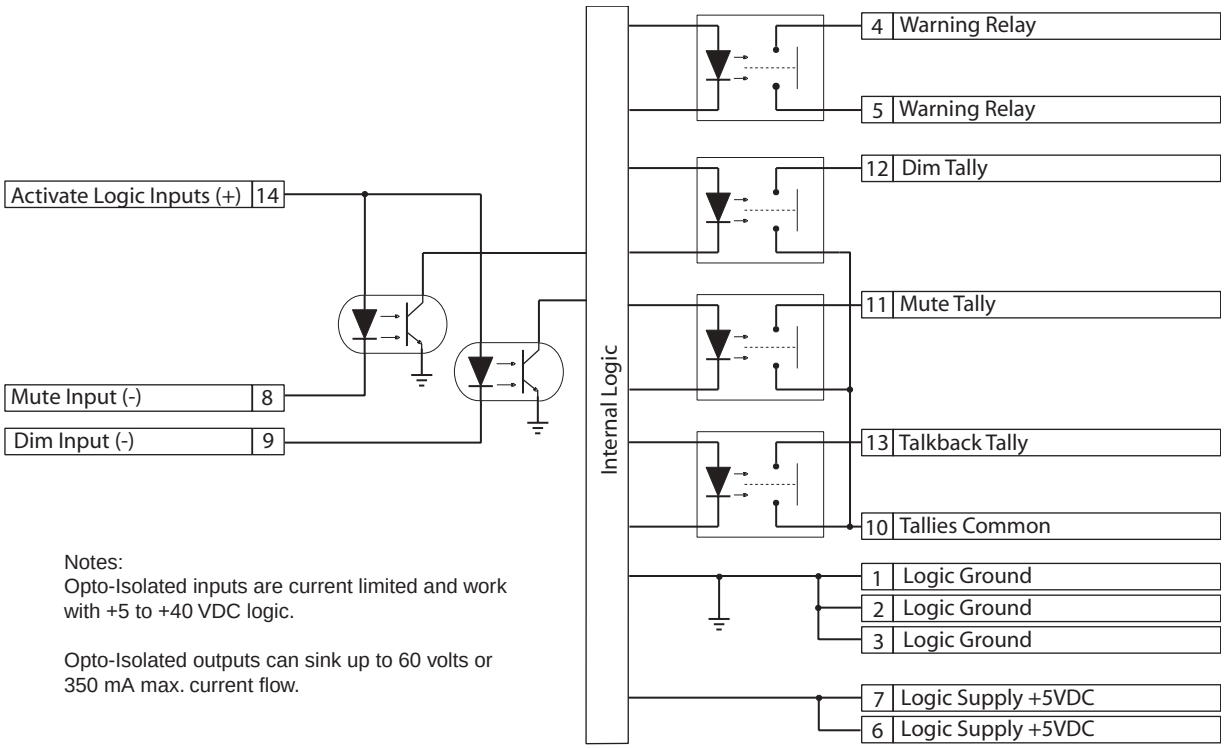
Note: The warning relay and control room mute functions are only activated by modules set as control room microphones (DS1/DS3, switch 2 is On) and that are assigned to at least one PGM or UTL bus.

LOGIC Connector

Logic Supply +5 VDC	7	14	*Activate Logic Inputs (+)*
Logic Supply +5 VDC	6	13	*Talkback Tally*
Warning Relay	5	12	*Dim Tally*
Warning Relay	4	11	*Mute Tally*
Logic Ground	3	10	*Tallies Common*
Logic Ground	2	9	*Dim (-)*
Logic Ground	1	8	*Mute (-)*

(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, Logic Signal Definitions

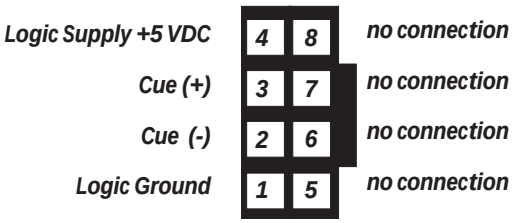
PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
WARNING RELAY (pins 4 and 5)	A pair of Normally Open (N/O) relay contacts. The two contacts maintain a "contact closure" while a Control Room mic module (with DS1-2 or DS3-2 set to ON) is turned on. The two pins can be used as a "dry contact" output, or one can be connected to the Warning Lamp control input while the other is tied to ground (to generate an active low logic output) or to + logic voltage (to generate an active high logic output).
MUTE TALLY (pin 11)	This Normally Open (N/O) contact connects to Tallies Common while the control room speakers are muted.
DIM TALLY (pin 12)	This Normally Open (N/O) contact connects to Tallies Common while the control room speakers are dimmed.
TALKBACK TALLY (pin 13)	This Normally Open (N/O) contact connects to Tallies Common while Talkback is received by the Control Room.
TALLIES COMMON (pin 10)	This pin must be tied high or low to provide the return path for the various Tally outputs. Typically, the tally lamps (or external relays) are all tied to ground and Tallies Common is the source for the lamp / relay supply voltage (+5 to +60 VDC). If the Tallies / relays are tied to +VDC, then this pin ties to ground.
ACTIVATE LOGIC INPUTS (+) (pin 14)	To enable the control inputs: Mute and Dim, tie this pin to + logic voltage (+5 to +40). When tied to an isolated device like a remote panel, use the Logic Supply +5 VDC (jumper pin 14 to pin 6 or 7).
MUTE (-) (pin 8)	When pulled low, mutes the Control Room monitors.
DIM (-) (pin 9)	When pulled low, dims the Control Room monitors by 12 dB.
LOGIC SUPPLY +5 VDC (pins 6 and 7)	Module logic voltage output sources that can deliver up to 300 mA of current to isolated control panels. The pins are simply paralleled for convenience.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground. Should be connected to isolated control panels only.

CONTROL ROOM MODULE — CUE CONTROL LOGIC

The 8-pin CUE CNTRL connector has the External Cue on/off logic. Only four pins (1 - 4) are used on this connector.

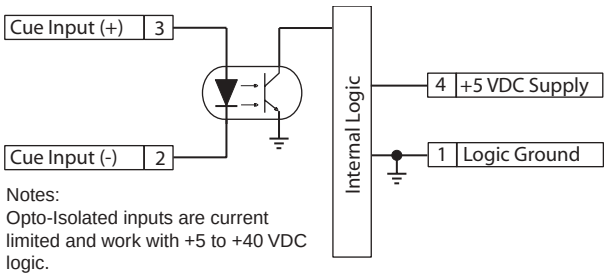
Typically the Cue (+) pin is jumpered to Logic Supply +5 VDC and the Cue (-) and Logic Ground go to an External Cue switch (maintained SPST). The logic connector is hidden by the meter panel in normal operation.

CUE CNTRL Connector



(wire insertion end view)

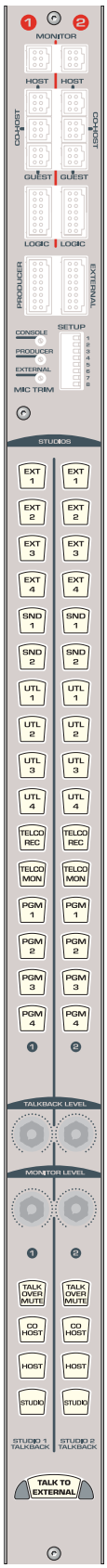
Control Room Module, CUE CNTRL — Simplified Logic Diagram



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

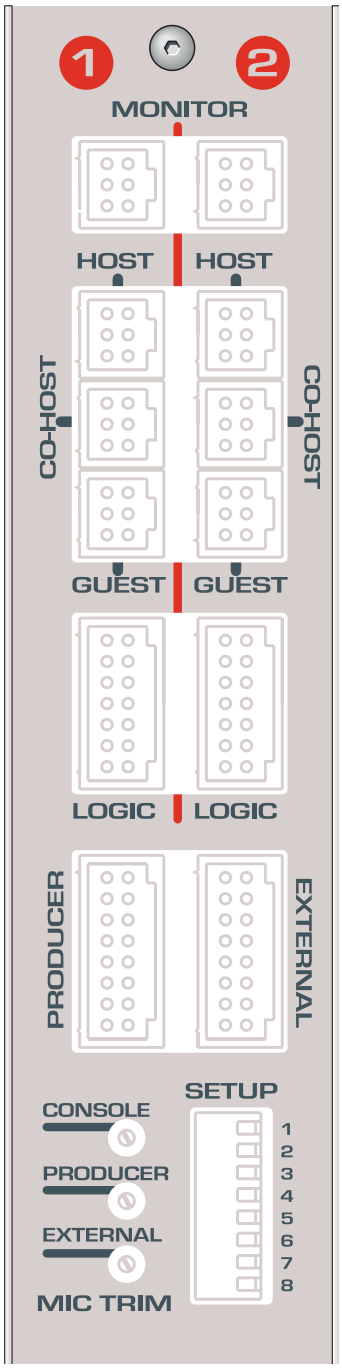
Control Room Module, CUE CNTRL , Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
CUE (+) (pin 3)	Tie this input to +5 to +40 VDC to use the Cue (-) input as the External Cue trigger. Conversely, when the Cue (-) input is tied to ground, then this input requires a high logic voltage (+5 to +40 VDC) to add the External Cue audio to the Cue bus.
CUE (-) (pin 2)	When this input is tied to ground, then the Cue (+) input requires +5 to +40 VDC to activate External Cue. Conversely, when Cue (+) is tied to +V (+5 to +40 VDC), then a low logic input to this pin adds the External Cue audio to the Cue bus.
LOGIC SUPPLY +5 VDC (pin 4)	Module logic voltage output source that can deliver up to 300 mA of current to an isolated control panel.
LOGIC GROUND (pin 1)	Module logic ground. Should be connected to an isolated panel only.



QUICK GUIDE TO THE STUDIO MODULE

Twelve connectors come standard on the Studio module: eight 6-pin analog audio output connectors (four for each studio), two 14-pin main logic connectors (one for each studio), and two 16-pin logic connectors (one for a Producer's talkback and one for an External location talkback). The connectors are hidden by the meter panel in normal operation.

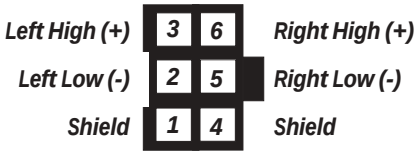


AUDIO OUTPUTS

MONITOR — *The 6-pin analog outputs for the monitor speaker amplifiers in Studio 1 and Studio 2. The outputs are wired using the standard pinout sequence.*

HOST, CO-HOST, GUEST — *The 6-pin analog outputs for the headphone amplifiers for a host, co-host, and the guests in Studio 1 and Studio 2. The outputs are wired using the standard pinout sequence.*

Analog Outputs



(wire insertion end view)

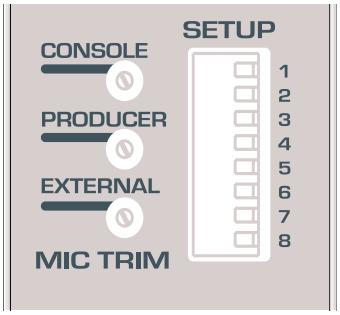
LOGIC I/O

LOGIC 1, LOGIC 2 — *The two 14-pin Main logic connectors have dimming, muting, and warning light commands for the two studios. For more information, see pages 2-42 and 2-43.*

PRODUCER — *The 16-pin Producer connector has the producer's talkback audio and logic inputs and Tally outputs. For additional information, see pages 2-44 and 2-45.*

EXTERNAL — *The 16-pin External connector has the external location's talkback audio and logic inputs and Tally outputs. For additional information, see pages 2-46 to 2-49.*

STUDIO MODULE SWITCHES AND MIC TRIMS



SETUP

SETUP — *These eight DIP switches set logic functionality for Studio outputs per the Studio Module Switch Definitions table below.*

MIC TRIM

CONSOLE, PRODUCER, EXTERNAL — *These three trimpots set the talkback levels for the console mic, the producer's mic, and the external location's mic.*

Studio Module Switch Definitions

#	*Switch Name*	*ON Function (set to operator's left)*	*OFF Function (set to operator's right)*
1	Studio 1: Auto-switch External Inputs 1 & 2 [1]	Automatic switching from External Input 1 to Input 2 while there is a hot mic in Studio 1	No automatic monitor source switching with a hot mic in Studio 1
2	Studio 1: Auto-switch External Inputs 3 & 4 [2]	Automatic switching from External Input 3 to Input 4 while there is a hot mic in Studio 1	No automatic monitor source switching with a hot mic in Studio 1
3	Studio 2: Auto-switch External Inputs 1 & 2 [1]	Automatic switching from External Input 1 to Input 2 while there is a hot mic in Studio 2	No automatic monitor source switching with a hot mic in Studio 2
4	Studio 2: Auto-switch External Inputs 3 & 4 [2]	Automatic switching from External Input 3 to Input 4 while there is a hot mic in Studio 1	No automatic monitor source switching with a hot mic in Studio 2
5	Studio 1: Co-host receives talkback only	Allows co-host in Studio 1 to receive talkback only and disables selector audio	Selector audio is enabled
6	Studio 2: Co-host receives talkback only	Allows co-host in Studio 2 to receive talkback only and disables selector audio	Selector audio is enabled
7	External mute/dim output enable	Pins 4 and 5 are logic outputs: pin 4 is an External Mute Command and pin 5 is External Dim Command.	Pins 4 and 5 are logic inputs: pin 4 is Talk to Studio 1 (-) and pin 5 is Talk to Studio 1 Host (-)
8	Spare Switch		

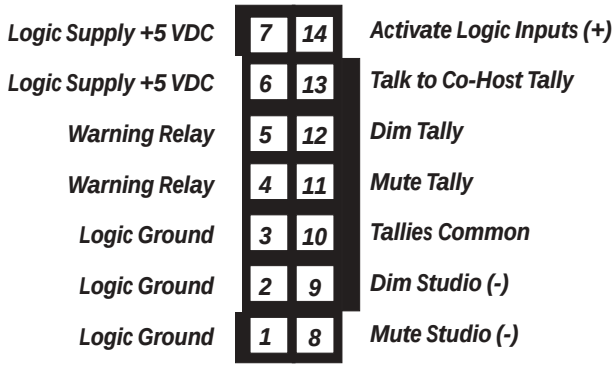
[1] When set to ON, the monitor source automatically switches between External Input 1 (which typically has the off-air monitor, with delay) and External Input 2 (which has a synthetic air signal with little or no delay). When External 1 is selected as the monitor source, and a Control Room mic module is turned on, the monitor source automatically changes to External Input 2. When all Control Room mic modules are off, then External Input 1 is automatically selected.

[2] When set to ON, the monitor source automatically switches between External Input 3 (which would be the off-air monitor, with delay), and External Input 4 (which has a synthetic air signal with little or no delay). When External 3 is selected as the monitor source, and a Control Room mic module is turned on, the monitor source automatically changes to External Input 4. When all Control Room mic modules are off, then External Input 3 is automatically selected.

STUDIO MODULE — STUDIO 1 & 2 LOGIC SCHEMATIC AND DESCRIPTION

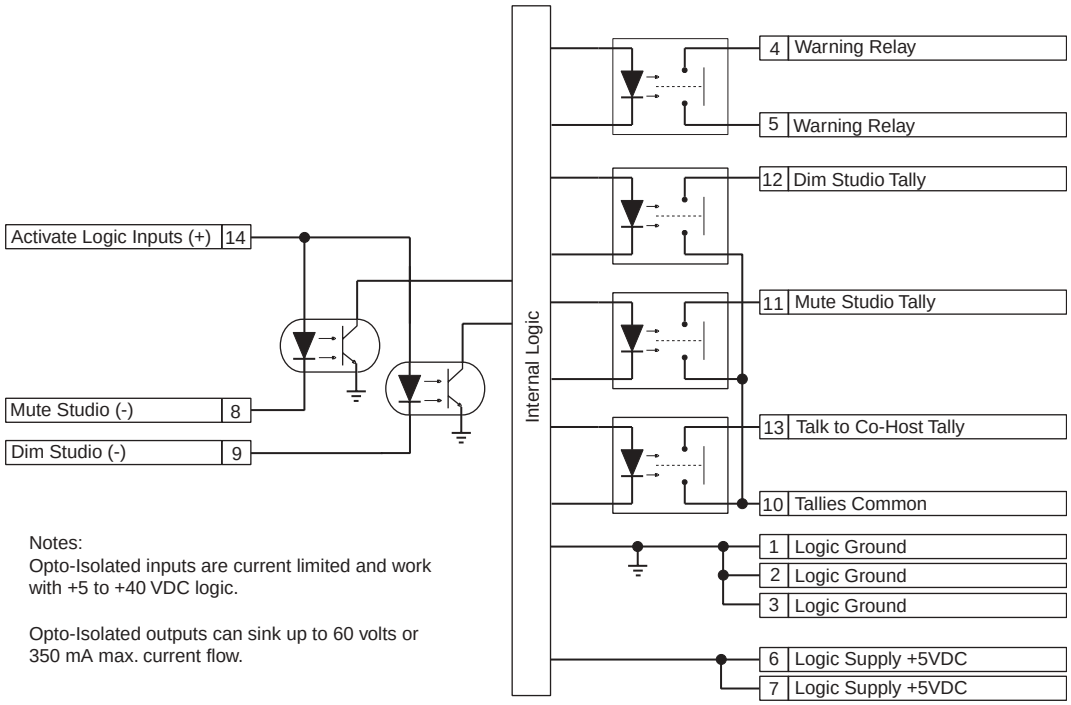
The two 14-pin Logic connectors (one for each Studio) control the warning, mute, and dim functions of the module. The logic connectors are hidden under the meter panel in normal operation.

LOGIC Connectors



(wire insertion end view)

Studio Module, Studio 1 & 2 — Simplified Logic Schematic



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, Studio 1 & 2 LOGIC — Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
WARNING RELAY (pins 4 and 5)	A pair of Normally Open (N/O) relay contacts. A "dry contact closure" between the pins is generated each time the studio has a live mic.
ACTIVATE LOGIC INPUTS (+) (pin 14)	Connect +V logic to this input to enable the active low inputs: Mute and Dim Studio. If the inputs are isolated from other devices (e.g., on a remote control panel), the +VDC can come from Logic Supply +5 Logic.
MUTE STUDIO (-) (pin 8)	When pulled low, mutes the studio MONITOR output.
DIM STUDIO (-) (pin 9)	When pulled low, dims the studio MONITOR output by 12 dB.
TALK TO CO-HOST TALLY (pin 13)	Normally Open (N/O) contact output. A "contact closure" to Tallies Common (pin 10) is generated while any location talks to the Co-Host.
MUTE TALLY (pin 11)	Normally Open (N/O) contact output. A "contact closure" to Tallies Common (pin 10) is generated when the studio MONITOR output is muted.
DIM TALLY (pin 12)	Normally Open (N/O) contact output. A "contact closure" to Tallies Common (pin 10) is generated when the studio MONITOR output is dimmed.
TALLIES COMMON (pin 10)	The Common (C) contact output for the Mute, Dim, and Talk to Co-Host Tally outputs.
LOGIC SUPPLY +5 VDC (pins 6 and 7)	Module logic voltage output source that can deliver up to 300 mA of current to an isolated control panel. Outputs are paralleled for convenience.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground for isolated control panels only.

STUDIO MODULE — PRODUCER AUDIO & LOGIC

The 16-pin PRODUCER connector has the producer's talkback switch inputs and talkback audio input (+4 dBu, balanced).

The PRODUCER signals come from a PRE99-1188 Producer Talkback/IFB panel or from a custom panel. The switch inputs (Talk to Studio 1 (-), Talk to Studio 2 (-), etc.) are activated by a logic low. This is done through SPST momentary switches commoned to Logic Ground (pin 16).

When the Producer is in the control room, the Control Room Dim (-) input (pin 10) can be used to dim the C/R MONITOR output. Use DPST talkback switches to connect separately to the switches and to pin 10; or use signal diodes to sum SPST talkback switches.

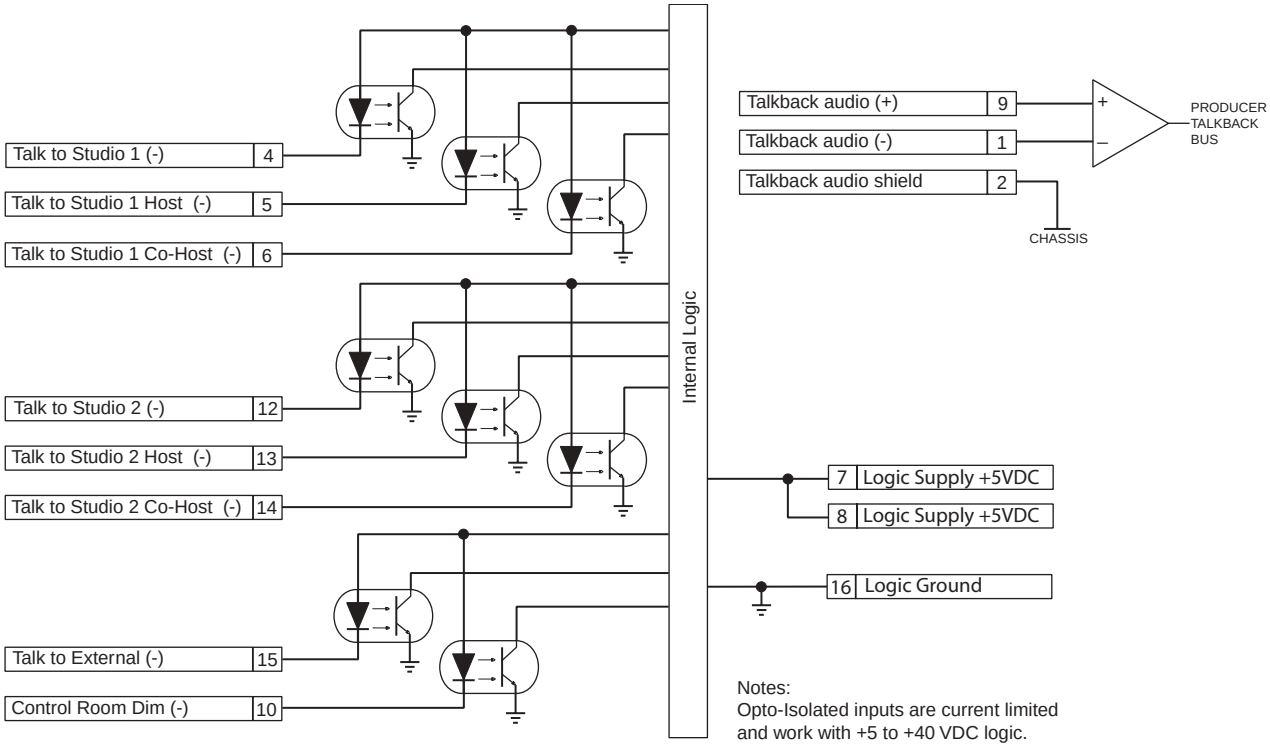
PRODUCER Connector

Logic Supply +5 VDC	8	16	*Logic Ground*
Logic Supply +5 VDC	7	15	*Talk to External (-)*
Talk to Studio 1 Co-Host (-)	6	14	*Talk to Studio 2 Co-Host (-)*
Talk to Studio 1 Host (-)	5	13	*Talk to Studio 2 Host (-)*
Talk to Studio 1 (-)	4	12	*Talk to Studio 2 (-)*
no connection	3	11	*no connection*
Talkback Audio Shield	2	10	*Control Room Dim (-)*
Talkback Audio (-)	1	9	*Talkback Audio (+)*

Audio Connection
(pins 1, 2, 9)

(wire insertion end view)

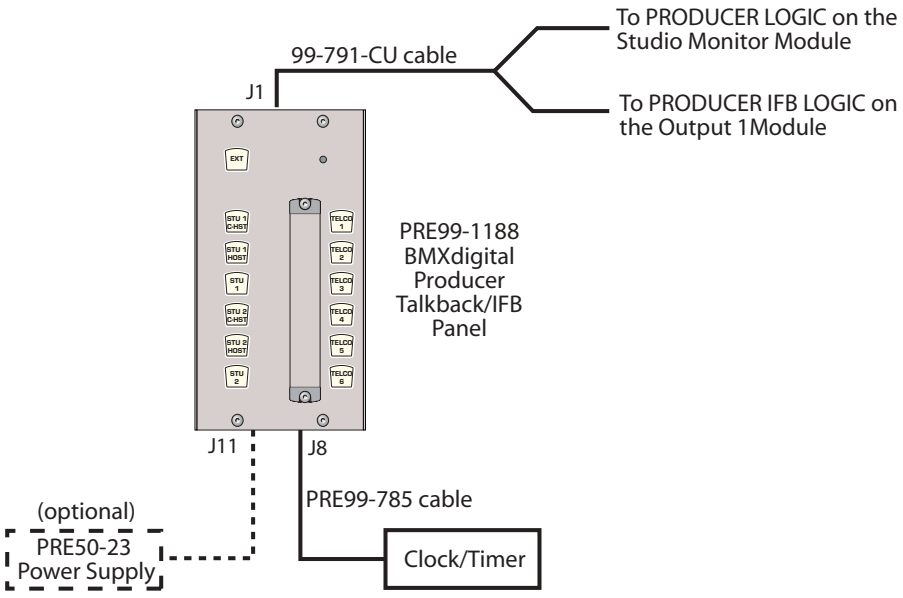
Studio Module, PRODUCER — Simplified Logic & Audio Diagram



Studio Module, PRODUCER — Logic & Audio Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TALK TO STUDIO 1 (-) (pin 4)	When pulled low, routes the Producer talkback audio to Studio 1 MONITOR and HOST outputs.
TALK TO STUDIO 1 HOST (-) (pin 5)	When pulled low, routes the Producer talkback audio to the Studio 1 HOST output only.
TALK TO STUDIO 1 CO-HOST (-) (pin 6)	When pulled low, routes the Producer talkback audio to the Studio 1 CO-HOST output only.
TALK TO STUDIO 2 (-) (pin 12)	When pulled low, routes the Producer talkback audio to Studio 2 MONITOR and HOST outputs..
TALK TO STUDIO 2 HOST (-) (pin 13)	When pulled low, routes the Producer talkback audio to the Studio 2 HOST output only.
TALK TO STUDIO 2 CO-HOST (-) (pin 14)	When pulled low, routes the Producer talkback audio to the Studio 2 CO-HOST output only.
TALK EXTERNAL (-) (pin 15)	When pulled low, routes the Producer talkback audio to the EXTERNAL connector, Talkback audio output.
CONTROL ROOM DIM (-) (pin 10)	When pulled low, dims the Control Room MONITOR output by 12 dB. Only used when the Producer is located in the control room.
LOGIC SUPPLY +5 VDC (pins 7 & 8)	Module logic voltage output source that can deliver up to 300 mA of current to an isolated control panel. The two outputs are paralleled for convenience.
LOGIC GROUND (pin 16)	Module logic ground that can connect to an isolated control panel.
AUDIO CONNECTION:	
AUDIO SHIELD (pin 2)	Tied to chassis ground.
TALKBACK AUDIO (+) & (-) (pin 9 & 1)	Producer's talkback microphone input. The input is line-level (+4 dBu), differential. If not using a Producer Panel, route the producer's talkback mic through a Mic Preamp module preamp to boost it to line level.

PRE99-1188 Producer Panel connection to the BMX*digital* console



STUDIO MODULE — EXTERNAL AUDIO & LOGIC, WITH SETUP DIP SWITCH 7 OFF

The 16-pin EXTERNAL connector has the external site's talkback logic inputs and command output as well as the External site's talkback audio in and out.

Both audio in and out are balanced +4 dBu analog connections. A mic preamp is required for the External site's talkback microphone. One of the Mic Preamp module's ten mic preamps could be used for this function.

A Talk to External Tally (that pulls low) is available to command a lamp or LED indicator that talk to external is being received.

Pins 4 and 5 change their functions depending upon whether SETUP DIP switch 7 is set On or Off. When DIP switch 7 is off (the default setting, as shown on this page), pins 4 and 5 are the logic inputs Talk to Studio 1 and Talk to Studio 1 Host.

When DIP switch 7 is on (see pages 2-50 and 2-51), pins 4 and 5 become the command outputs External Mute and External Dim.

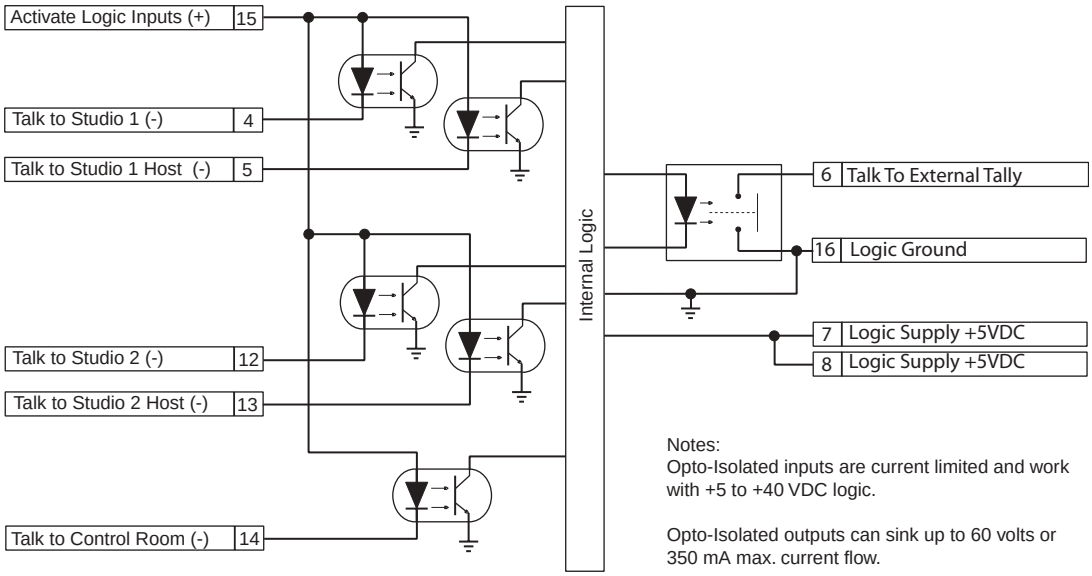
EXTERNAL Connector, with DIP Switch 7 set Off

Logic Supply +5 VDC	8	16	*Logic Ground*
Logic Supply +5 VDC	7	15	*Activate Logic Inputs (+)*
Talk to External Tally	6	14	*Talk to Control Room (-)*
Talk to Studio 1 Host (-)	5	13	*Talk to Studio 2 Host (-)*
Talk to Studio 1 (-)	4	12	*Talk to Studio 2 (-)*
Talkback Audio Out (-)	3	11	*Talkback Audio Out (+)*
Talkback Audio In Shield	2	10	*Talkback Audio Out Shield*
Talkback Audio In (-)	1	9	*Talkback Audio In (+)*

(wire insertion end view)

Talkback Audio Pins
Audio Out (pins 3,10,11)
Audio In (pins 1, 2, 9)

Studio Module, EXTERNAL (DIP switch 7 Off) — 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 (DIP switch 7 Off) Audio & Logic Signal Definitions

PIN NAME / NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TALK TO STUDIO 1 (-) (pin 4)	When pulled low, routes the External Talkback Audio Input to Studio 1 MONITOR and HOST outputs. **NOTE:** When DIP switch 7 is on, Talk to Studio 1 is disabled (see page 2-51).
TALK TO STUDIO 1 HOST (-) (pin 5)	When pulled low, routes the External Talkback Audio Input to the Studio 1 HOST output. **NOTE:** When DIP switch 7 is on, Talk to Studio 1 Host is disabled (see page 2-51).
TALK TO STUDIO 2 (-) (pin 12)	When pulled low, routes the External Talkback Audio Input to Studio 2 MONITOR and HOST outputs.
TALK TO STUDIO 2 HOST (-) (pin 13)	When pulled low, routes the External Talkback Audio Input to the Studio 2 HOST output.
TALK TO CONTROL ROOM (-) (pin 14)	When pulled low, routes the External Talkback Audio Input to the control room TALKBACK and OPERATOR outputs.
ACTIVATE LOGIC INPUTS (+) (pin 15)	Connect this pin to Logic Supply +5 VDC (pin 7 or 8) to enable the active low logic inputs (Talk to C/R, and the four Talk to Studios) when they come from an isolated control panel.
EXTERNAL TALK TALLY (-) (pin 6)	Normally Open (N/O) contact. A "contact closure" to ground is generated whenever Talk to External is activated from the Control Room, the Producer, or a microphone module.
LOGIC SUPPLY +5 VDC (pins 7 & 8)	Logic voltage source that can deliver up to 300 mA of current to isolated remote panels. Pins 7 and 8 are simply paralleled for convenience.
LOGIC GROUND (pin 16)	Logic ground. Connect only to isolated remote panels only.
AUDIO CONNECTIONS:	
TALKBACK AUDIO OUTPUT (-) & (+) (pins 3 & 11)	The balanced line-level Talk To External audio output. This can drive a powered talkback speaker, or, if the External location goes on-air, it can be summed into the External location's headphone feed.
TALKBACK AUDIO INPUT (-) & (+) (pins 1 & 9)	The balanced line-level Talkback From External audio input. One of the Mic Preamp module's preamplifiers can be used to boost the External location's talkback microphone to line-level to feed this input.
TALKBACK IN & OUT SHIELDS (pins 2 & 10)	Shields for the balanced Talkback Audio Input and Output. Connects to the chassis.

STUDIO MODULE — EXTERNAL AUDIO & LOGIC, WITH SETUP DIP SWITCH 7 ON

The 16-pin EXTERNAL connector has the external site's talkback logic inputs and command outputs as well as the External site's talkback audio in and out.

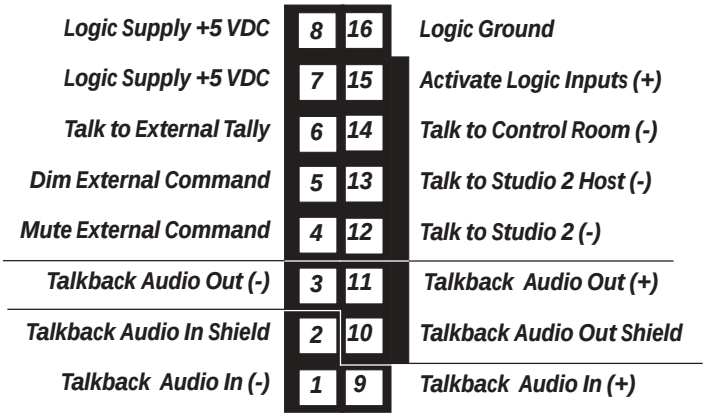
Both audio in and out are balanced +4 dBu analog connections. A mic preamp is required for the External site's talkback microphone. One of the Mic Preamp module's ten mic preamps could be used for this function.

A Talk to External Tally (that pulls low) is available to command a lamp or LED indicator that talk to external is being received.

Pins 4 and 5 change their functions depending upon whether SETUP DIP switch 7 is set On or Off. When DIP switch 7 is on (as shown on this page), pins 4 and 5 are the command outputs Mute External and Dim External. These are used to control the monitor speakers at the external location.

When DIP switch 7 is off (the default setting as shown on pages 2-48 and 2-49), pins 4 and 5 are the logic inputs Talk to Studio 1 and Talk to Studio 1 Host.

EXTERNAL Connector, with DIP Switch 7 set ON

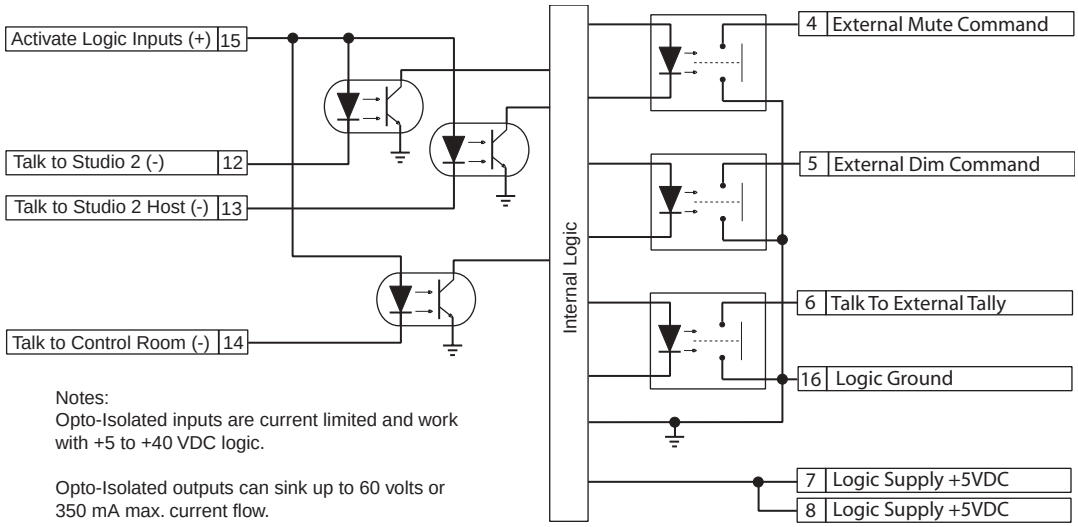


(wire insertion end view)

Talkback Audio Pins

Audio Out (pins 3,10,11)
Audio In (pins 1, 2, 9)

Studio Module, EXTERNAL (DIP switch 7 On) — Simplified Logic Diagram

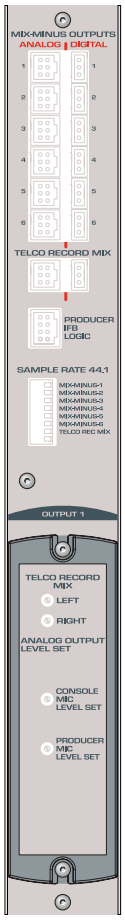


Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

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

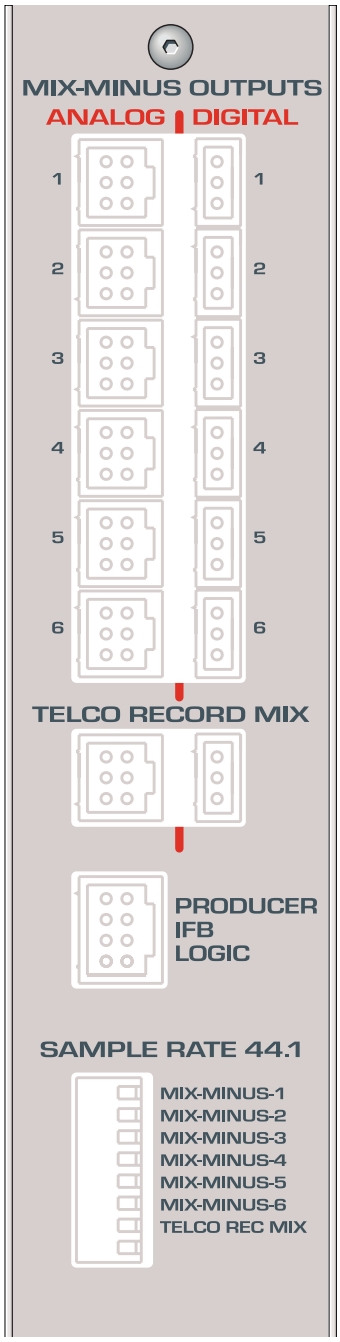
Studio Module, EXTERNAL (DIP switch 7 On) Audio & Logic Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TALK TO STUDIO 2 (-) (pin 12)	When pulled low, routes the External Talkback Audio Input to Studio 2 MONITOR and HOST outputs.
TALK TO STUDIO 2 HOST (-) (pin 13)	When pulled low, routes the External Talkback Audio Input to the Studio 2 HOST output.
TALK TO CONTROL ROOM (-) (pin 14)	When pulled low, routes the External Talkback Audio Input to the control room TALKBACK and OPERATOR outputs.
ACTIVATE LOGIC INPUTS (+) (pin 15)	Connect this pin to Logic Supply +5 VDC (pin 7 or 8) to enable the active low logic inputs (Talk to C/R, and the four Talk to Studios).
MUTE EXTERNAL COMMAND (-) (pin 4)	Normally Open (N/O) contact. A "contact closure" to logic ground (pin 16) is generated whenever a Universal Input module, that is set to Mute External (DS1-5 or DS3-5 is set to On), is on. Consult Harris Radio Systems Engineering for design information on using this logic output.
DIM EXTERNAL COMMAND (-) (pin 5)	Normally Open (N/O) contact. A "contact closure" to logic ground (pin 16) is generated whenever another location is talking to External. Consult Harris Radio Systems Engineering for design information on using this logic output.
TALK TO EXTERNAL TALLY (-) (pin 6)	Normally Open (N/O) contact. A "contact closure" to logic ground (pin 16) is generated whenever Talk to External is activated from the control room, the producer, or a microphone module.
LOGIC SUPPLY +5 VDC (pins 7 & 8)	Logic voltage source that can deliver up to 300 mA of current to isolated remote panels. Pins 7 and 8 are simply paralleled for convenience.
LOGIC GROUND (pin 16)	Logic ground. Connect only to isolated remote panels only.
AUDIO CONNECTIONS:	
TALKBACK AUDIO OUTPUT (-) & (+) (pins 3 & 11)	The balanced line-level Talk To External audio output. This can drive a powered talkback speaker, or, if the External location goes on-air, it can be summed into the External location's headphone feed.
TALKBACK AUDIO INPUT (-) & (+) (pins 1 & 9)	The balanced line-level Talkback From External audio input. One of the Mic Preamp module's preamplifiers can be used to boost the External location's talkback microphone to line-level to feed this input.
TALKBACK IN & OUT SHIELDS (pins 2 & 10)	Shields for the balanced Talkback Audio Input and Output. Connects to the chassis.



QUICK GUIDE TO THE OUTPUT 1 MODULE

Fifteen connectors come standard on the Output 1 module: seven 6-pin analog audio output connectors, seven 3-pin digital audio output connectors, and one 8-pin logic connector. The connectors are hidden by the meter panel in normal operation.



MIX-MINUS AUDIO OUTPUTS

ANALOG — *The 6-pin analog outputs are wired using the standard pinout sequence. All mix-minus analog outputs are MONO audio outputs with a fixed level of +4 dBu. The left output includes talkback; the right output is a "clean mono feed" that does not have talkback. For more information on the composition of this signal pair, see page 3-8 and 3-9.*

DIGITAL — *The 3-pin digital outputs send AES-3 (AES/EBU) compatible signals. The left channel contains the mono mix-minus audio plus talkback; the right channel is a "clean mono feed" that does not have talkback. The sample rate (48 kHz or 44.1 kHz) for each output is set independently by the SAMPLE RATE DIP switches.*

TELCO RECORD MIX

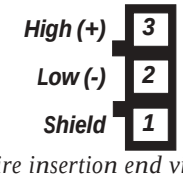
Analog Output — *The 6-pin analog output is wired using the standard pinout sequence. The left channel has those Telco/Codec modules that have TO REC active; the right channel has the base record mix. For more information on the composition of this signal pair, see pages 3-8 and 3-9.*

Digital Output — *The 3-pin digital output is an AES-3 (AES/EBU) compatible signal. The left channel has those Telco/Codec modules that have TO REC active; the right channel has the base record mix. The sample rate (48 kHz or 44.1 kHz) is set using SAMPLE RATE DIP switch 7.*

PRODUCER IFB LOGIC

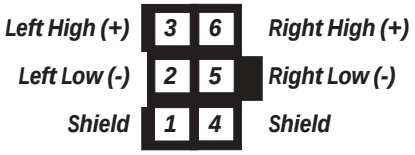
Producer IFB Logic — *The 8-pin Producer IFB logic connector controls talkback from the Producer to the Mix-Minus outputs. For more information, see pages 2-52 and 2-53.*

Digital Outputs



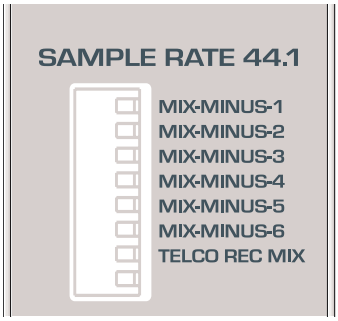
(wire insertion end view)

Analog Outputs



(wire insertion end view)

OUTPUT 1 MODULE SWITCHES



SAMPLE RATE 44.1

Sample Rate 44.1 — *These eight DIP switches set the sample rate for each digital output per the Output 1 Module Switch Definitions table below.*

Output 1 Module Switch Definitions

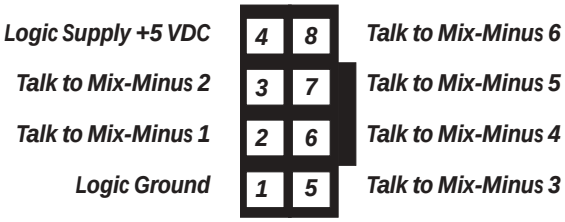
#	*Switch Name*	*ON Function (set to operator's left)*	*OFF Function (set to operator's right)*
1	Mix-minus Output 1	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
2	Mix-minus Output 2	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
3	Mix-minus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

OUTPUT 1 MODULE — PRODUCER IFB LOGIC

The 8-pin PRODUCER IFB LOGIC connector has the talkback commands to add Producer talkback to the various Mix-Minus outputs.

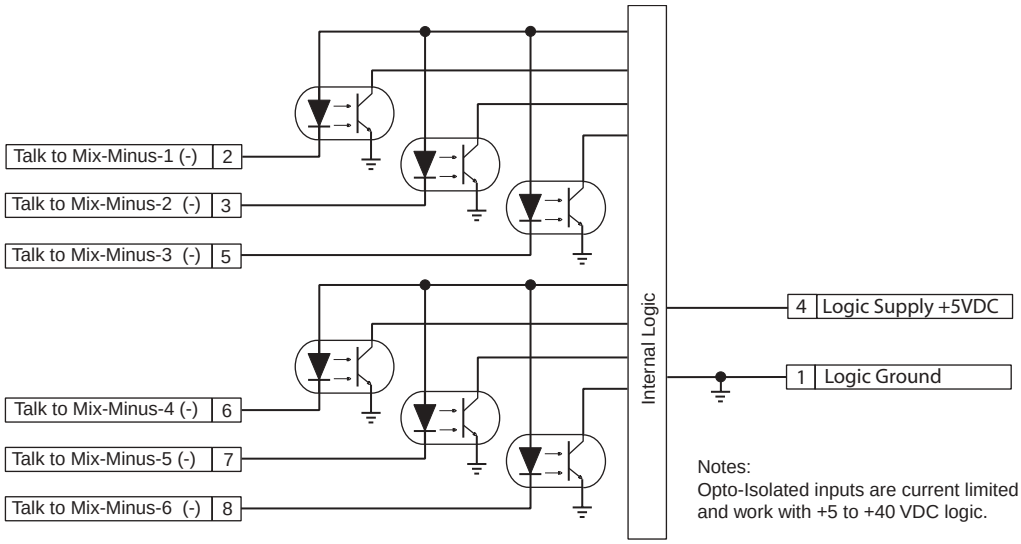
The Talk to Mix-Minus 1 to 6 logic inputs come from the Producer Talkback IFB Panel (PRE99-1189), or from a custom talkback panel. Use cable PRE99-791-CU to connect the Producer Panel to this connector and to the PRODUCER logic connector on the Studio module.

PRODUCER IFB LOGIC Connector



(wire insertion end view)

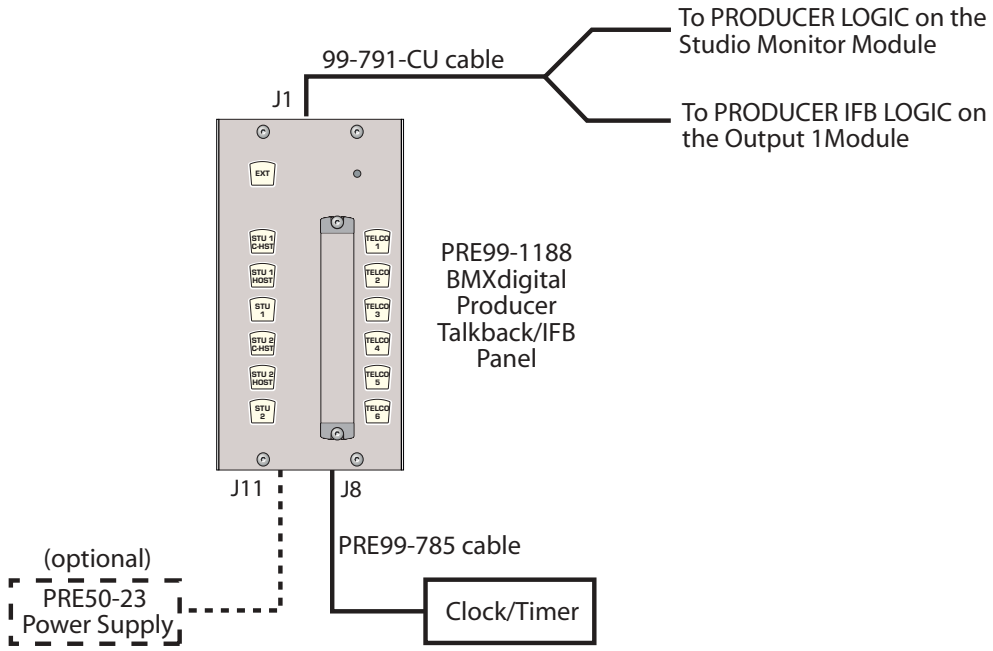
Output 1 Module, PRODUCER IFB LOGIC — Simplified Logic Diagram



Output 1 Module, PRODUCER IFB LOGIC Signal Definitions

PIN NAME / NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TALK TO MIX-MINUS-1 (pin 2)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 1 outputs.
TALK TO MIX-MINUS-2 (pin 3)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 2 outputs.
TALK TO MIX-MINUS-3 (pin 5)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 3 outputs.
TALK TO MIX-MINUS-4 (pin 6)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 4 outputs.
TALK TO MIX-MINUS-5 (pin 7)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 5 outputs.
TALK TO MIX-MINUS-6 (pin 8)	When pulled low, Producer talkback audio is added to the left channel of the Mix-Minus 6 outputs.
LOGIC SUPPLY +5 VDC (pin 4)	Module logic voltage output source that can deliver up to 300 mA of current to an isolated control panel.
LOGIC GROUND (pin 1)	Module logic ground. Should connect to isolated control panels only.

PRE99-1188 Producer Panel connections to the console (Studio module PRODUCER LOGIC, and Output 1 Module PRODUCER IFB LOGIC)



PRE99-791-CU Producer Panel Interface Cable, connector pin outs

J1 on Producer Talkback / IFB Panel

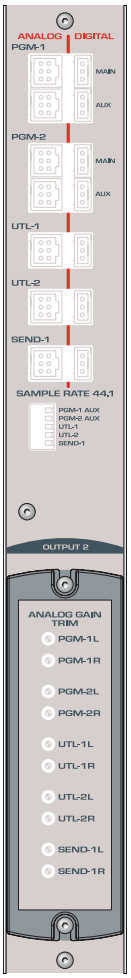
P1	Signal	Pin		Pin	Signal	P2
	Telco 1 switch	1	BLK	2	Talk to Mix-Minus 1	
	Telco 2 Switch	2	WHT	3	Talk to mix-Minus 2	
	Telco 3 Switch	3	RED	5	Talk to mix-Minus 3	
	Telco 4 Switch	4	GRN	6	Talk to mix-Minus 4	
	Telco 5 Switch	5	ORG	7	Talk to mix-Minus 5	
	Telco 6 Switch	6	BLU	8	Talk to mix-Minus 6	

Output 1 Module, Producer IFB Logic

				Pin	Signal	P3
	Talk Audio (-)	8	RED / BLK	1	Talkback Audio (-)	
	Talk Audio (+)	9	GRN / BLK	9	Talkback Audio (+)	
	Talk to Studio 2 Switch	10	ORG / BLK	12	Talk to Studio 2 (-)	
	Talk to St 2 Host Sw	11	BLU / BLK	13	Talk to St 2 Host (-)	
	Talk to St 2 Co-Host Sw	12	BLK / WHT	14	Talk to St 2 Co-Host (-)	
	Talk to Studio 1 Switch	13	RED / WHT	4	Talk to Studio 1 (-)	
	Talk to St 1 Host Sw	14	GRN / WHT	5	Talk to St 1 Host (-)	
	Talk to St 1 Co-Host Sw	15	BLU / WHT	6	Talk to St 1 Co-Host (-)	
	Talk to External Switch	16	BLK / RED	15	Talk to External (-)	
	Dim Monitors	17	WHT / RED	10	C/R Dim (-) ***	
	Ground	18	ORG / RED	16	Logic Ground	

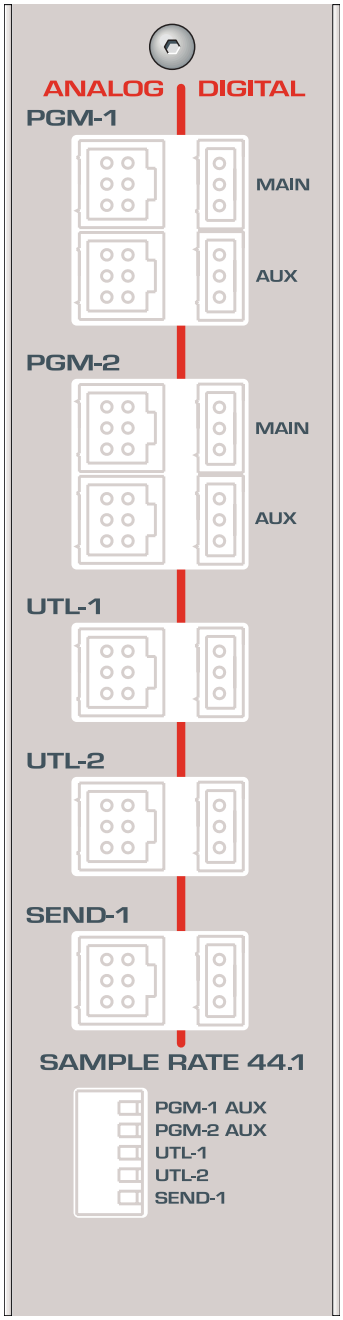
Studio Module, Producer Logic

**** C/R Dim is only connected when the Producer Panel is located in the control room. Each time the producer talks to any location the C/R monitors are dimmed by 12 dB.*



QUICK GUIDE TO THE OUTPUT 2 MODULE

Fourteen connectors come standard 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.



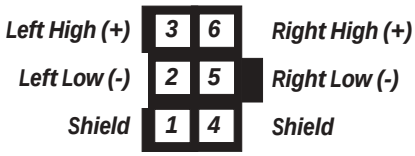
ANALOG OUTPUTS

PGM-1, PGM-2 — *The 6-pin analog outputs for the Program 1 and Program 2 buses are wired using the standard pinout sequence shown below. The MAIN and AUX connectors are isolated outputs that carry the same signals (the Program 1 bus or the Program 2 bus).*

UTL-1, UTL-2 — *The 6-pin analog outputs for the Utility 1 and 2 buses are wired using the standard pinout sequence shown below.*

SEND-1 — *The 6-pin analog output for the Send 1 bus is wired using the standard pinout sequence shown below.*

Analog Outputs



(wire insertion end view)

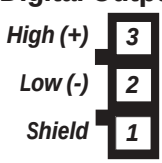
DIGITAL OUTPUTS

PGM-1, PGM-2 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs of the Program 1 and Program 2 buses. The MAIN and AUX connectors are isolated outputs that carry the same signals (the Program 1 bus or the Program 2 bus), but the AUX output can be set to either 48 kHz or 44.1 kHz sampling by SAMPLE RATE DIP switches. The MAIN output is fixed at 48 kHz sampling.*

UTL-1, UTL-2 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs of the Utility 1 and Utility 2 buses. The outputs can be set to either 48 kHz or 44.1 kHz sampling by SAMPLE RATE DIP switches.*

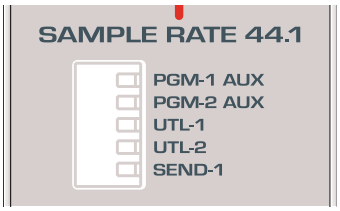
SEND-1 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs the Send 1 bus. The output can be set to either 48 kHz or 44.1 kHz sampling by a SAMPLE RATE DIP switch.*

Digital Outputs



(wire insertion end view)

OUTPUT 2 MODULE SWITCHES

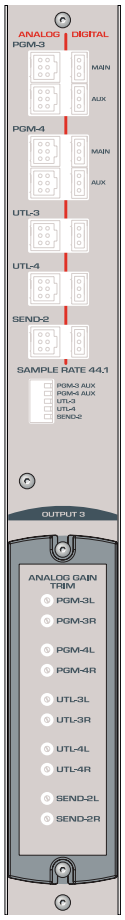


SAMPLE RATE 44.1

Sample Rate 44.1 — *These five DIP switches set the sample rate for the Output 2 module's digital outputs per the Output 2 Module Switch Definitions table below.*

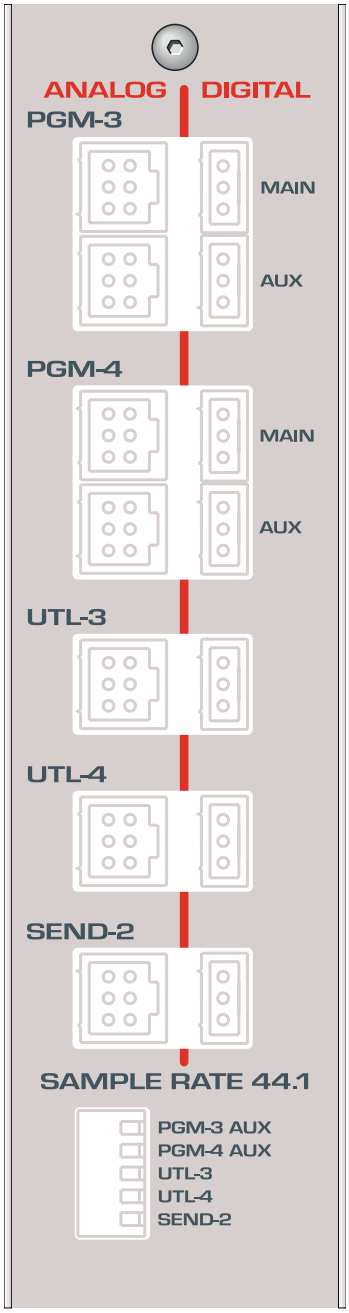
Output 2 Module Switch Definitions

#	*Switch Name*	*ON Function (set to operator's left)*	*OFF Function (set to operator's right)*
1	PGM-1 Aux Out	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
2	PGM-2 Aux Out	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
3	UTL-1 (Utility 1 bus)	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
4	UTL-2 (Utility 2 bus)	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
5	SEND-1	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz



QUICK GUIDE TO THE OUTPUT 3 MODULE

Fourteen connectors come standard on the Output 3 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.



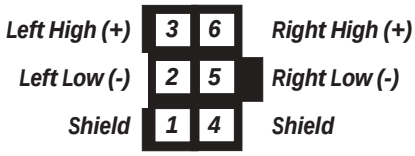
ANALOG OUTPUTS

PGM-3, PGM-4 — *The 6-pin analog outputs for the Program 3 and Program 4 buses are wired using the standard pinout sequence shown below. The MAIN and AUX connectors are isolated outputs that carry the same signals (the Program 3 bus or the Program 4 bus).*

UTL-3, UTL-4 — *The 6-pin analog outputs for the Utility 3 and 4 buses are wired using the standard pinout sequence shown below.*

SEND-2 — *The 6-pin analog output for the Send 2 bus is wired using the standard pinout sequence shown below.*

Analog Outputs



(wire insertion end view)

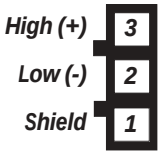
DIGITAL OUTPUTS

PGM-3, PGM-4 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs of the Program 3 and Program 4 buses. The MAIN and AUX connectors are isolated outputs that carry the same signals (the Program 3 bus or the Program 4 bus), but the AUX output can be set to either 48 kHz or 44.1 kHz sampling by SAMPLE RATE DIP switches. The MAIN output is fixed at 48 kHz sampling.*

UTL-3, UTL-4 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs of the Utility 3 and Utility 4 buses. The outputs can be set to either 48 kHz or 44.1 kHz sampling by SAMPLE RATE DIP switches.*

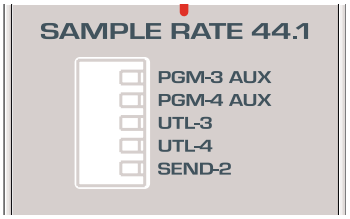
SEND-2 — *The 3-pin AES-3 (AES/EBU-compatible) digital outputs the Send 2 bus. The output can be set to either 48 kHz or 44.1 kHz sampling by a SAMPLE RATE DIP switch.*

Digital Outputs



(wire insertion end view)

OUTPUT 3 MODULE SWITCHES

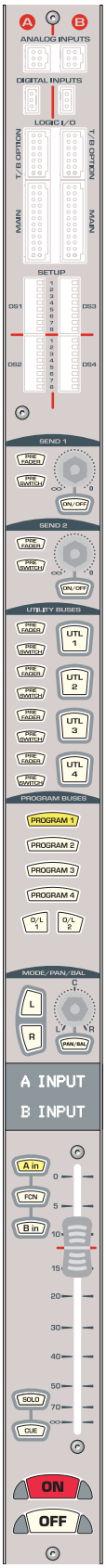


SAMPLE RATE 44.1

Sample Rate 44.1 — *These five DIP switches set the sample rate for the Output 3 module's digital outputs per the Output 3 Module Switch Definitions table below.*

Output 3 Module Switch Definitions

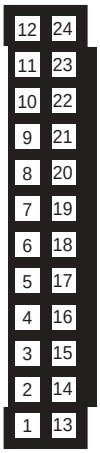
#	*Switch Name*	*ON Function (set to operator's left)*	*OFF Function (set to operator's right)*
1	PGM-3 Aux Out	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
2	PGM-4 Aux Out	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
3	UTL-3 (Utility 3 bus)	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
4	UTL-4 (Utility 4 bus)	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
5	SEND-2	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 setting up a Universal Input module as a control room mic using the A input, with a mic remote control panel connected to the module. Additional information on logic connections and DIP switch settings for the Universal Input module are on pages 2-18 through 2-23.

UNIVERSAL INPUT MODULE MAIN 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 +5 VDC**	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 +5 VDC**	5 volt source.
11	LOGIC SUPPLY +5 VDC	5 volt source.
12	LOGIC SUPPLY +5 VDC	5 volt source.
13	COMMANDS COMMON	Start/Stop Pulse, Start Sustained common. C contact.
14	**TALLIES COMMON**	Tally relays 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 relay contact.
24	READY (+)	+VDC to enable the Ready function (Off lamp control).

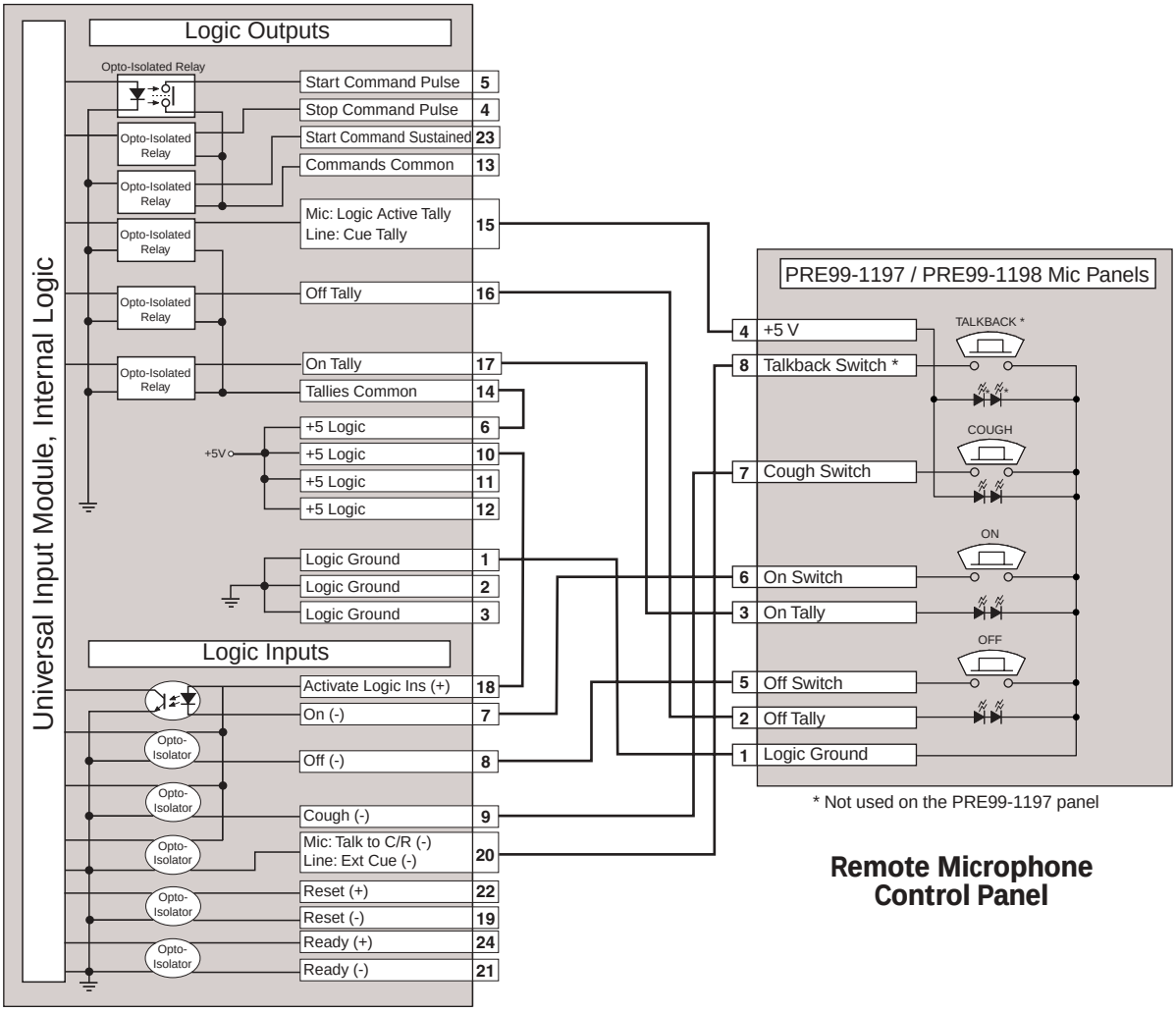
Notes: +VDC is between +5 and +40 VDC.
Output tallies/relays can switch voltages up to +60 VDC
Bold indicates connections used in this example.

UNIVERSAL INPUT MODULE SWITCH SETTINGS

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

Note: ON settings are to the operator's left. OFF settings are to the operator's right.

SIMPLIFIED DIAGRAM FOR INTERFACING A MIC REMOTE CONTROL PANEL



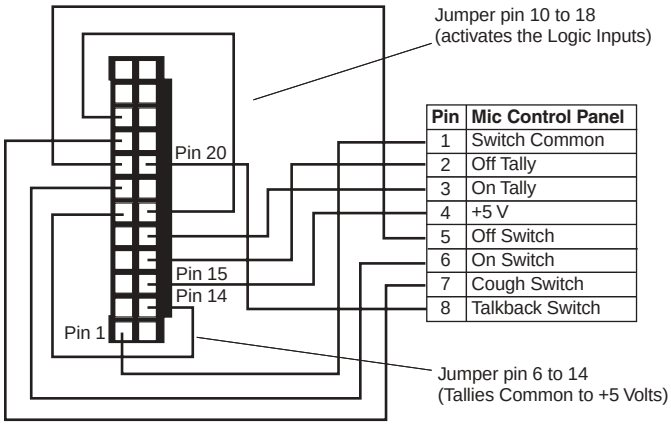
* Not used on the PRE99-1197 panel

Remote Microphone Control Panel

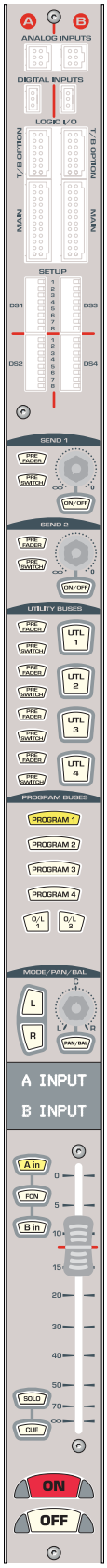
Universal Input Module

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

This diagram shows the wiring for the PRE99-787-CU cable. It connects either the PRE99-1197 Mic Panel (with On/Off/Cough buttons) or the PRE99-1198 Mic Panel (with On/Off/Cough/Talkback buttons) to a Universal Input module..



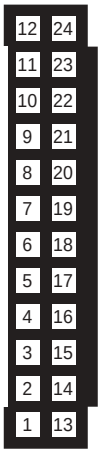
Pin	Mic Control Panel
1	Switch Common
2	Off Tally
3	On Tally
4	+5 V
5	Off Switch
6	On Switch
7	Cough Switch
8	Talkback Switch



Basic Peripheral Device Logic Connection Example

This example shows a Universal Input module set up as a line, using the A analog input, to interface a CD player (Denon DN-951/961 shown in the example). For more information on logic connections and DIP switch settings for the Universal Input module, see pages 2-18 through 2-23.

UNIVERSAL INPUT MODULE MAIN LOGIC CONNECTOR SIGNAL TABLE

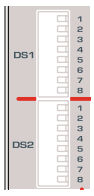


(wire insertion end view)

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 +5 VDC	5 volt source.
7	ON INPUT (-)	Remote On switch input (active low).
8	OFF INPUT (-)	Remote Off switch input (active low).
9	CUE INPUT (-)	Remote Cue switch input (active low).
10	LOGIC SUPPLY +5 VDC	5 volt source.
11	LOGIC SUPPLY +5 VDC	5 volt source.
12	LOGIC SUPPLY +5 VDC	5 volt source.
13	**COMMANDS COMMON**	Start/Stop Pulse, Start Sustained common. C contact.
14	TALLIES COMMON	Tally relays common connection. C contact.
15	CUE TALLY	Cue 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	REMOTE CUE (-)	Activates Cue function (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 tallies/relays can switch voltages up to +60 VDC
Bold indicates connections used in this example.

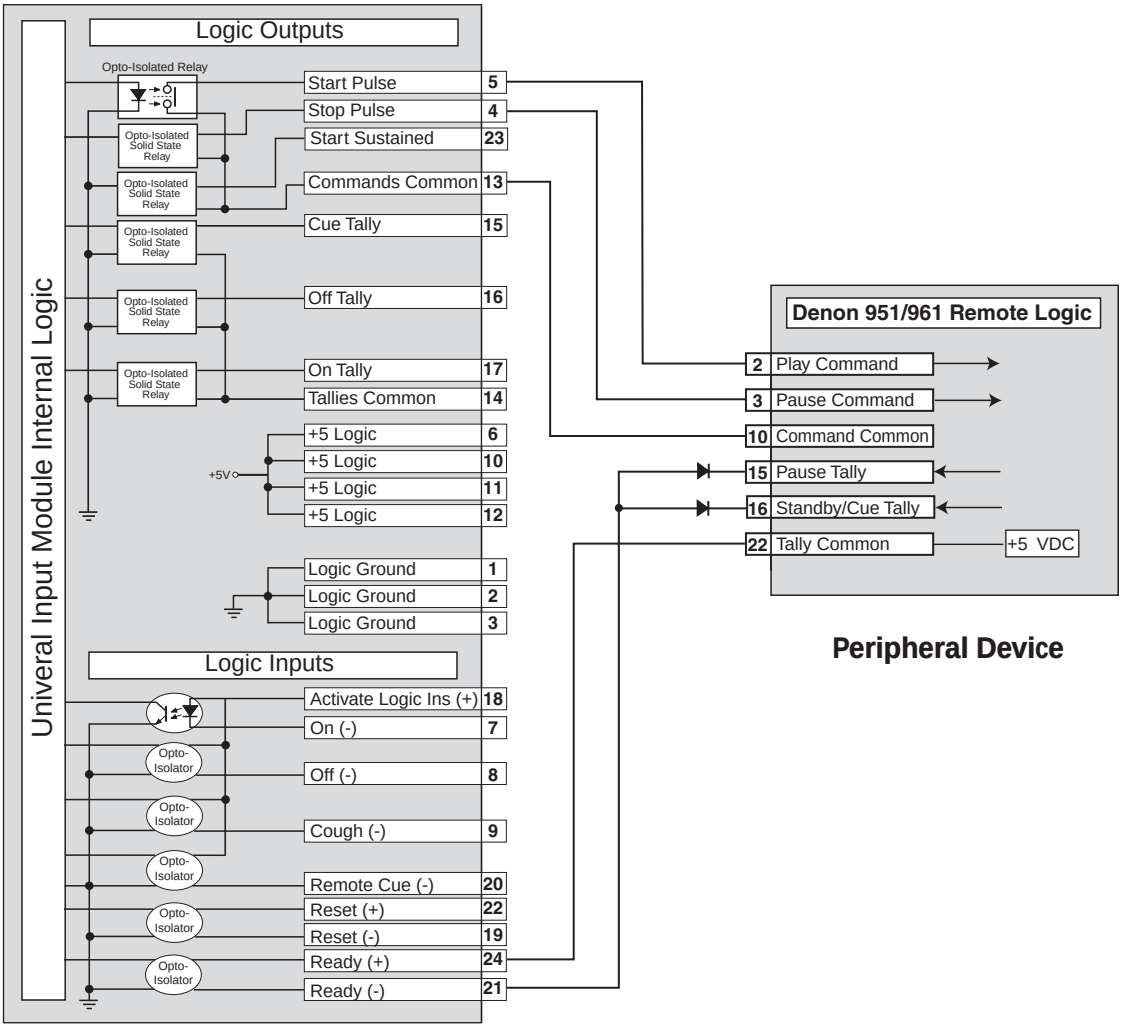
UNIVERSAL INPUT MODULE SWITCH SETTINGS



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 1 Mute	OFF	3	Start/Stop Pulse	OFF
4	Studio 2 Mute	OFF	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	OFF
8	Off Lamp Status	OFF	8	Input Level Set	OFF

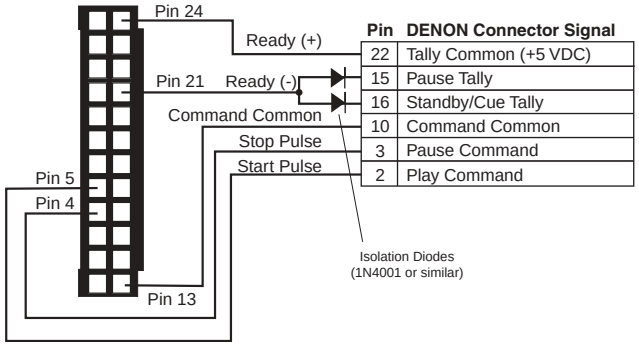
Note: ON settings are to the operator's left. OFF settings are to the operator's right.

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

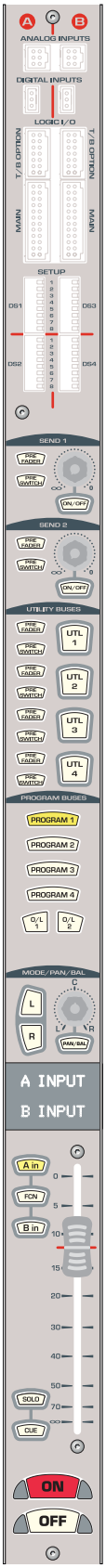


Wiring diagram for a Denon DN-951/962 CD Player

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



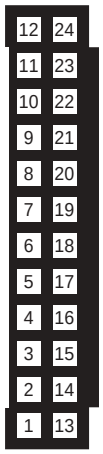
Pin	DENON Connector Signal
22	Tally Common (+5 VDC)
15	Pause Tally
16	Standby/Cue Tally
10	Command Common
3	Pause Command
2	Play Command



Complex Logic Connection Example

This example shows setting up a Universal Input module (A input, analog) to interface with a remote logic device, such as an ENCO DADpro. For more information on logic connections and DIP switch settings for the Universal Input module, see pages 2-18 through 2-23.

UNIVERSAL INPUT MODULE MAIN LOGIC CONNECTOR SIGNAL TABLE

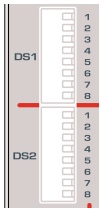


(wire insertion end view)

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 +5 VDC**	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 +5 VDC**	5 volt source.
11	**LOGIC SUPPLY +5 VDC**	5 volt source.
12	**LOGIC SUPPLY +5 VDC**	5 volt source.
13	**COMMANDS COMMON**	Start/Stop Pulse, Start Sustained common. C relay contact.
14	TALLIES COMMON	Tally relays common connection. C relay contact.
15	CUE TALLY	Cue 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 LOGIC INS (+)**	+VDC to enable external inputs On, Off, Cough, Talkback.
19	**RESET (-)**	Remote Audio Off input (active low).
20	REMOTE CUE (-)	Activates the Cue function (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.

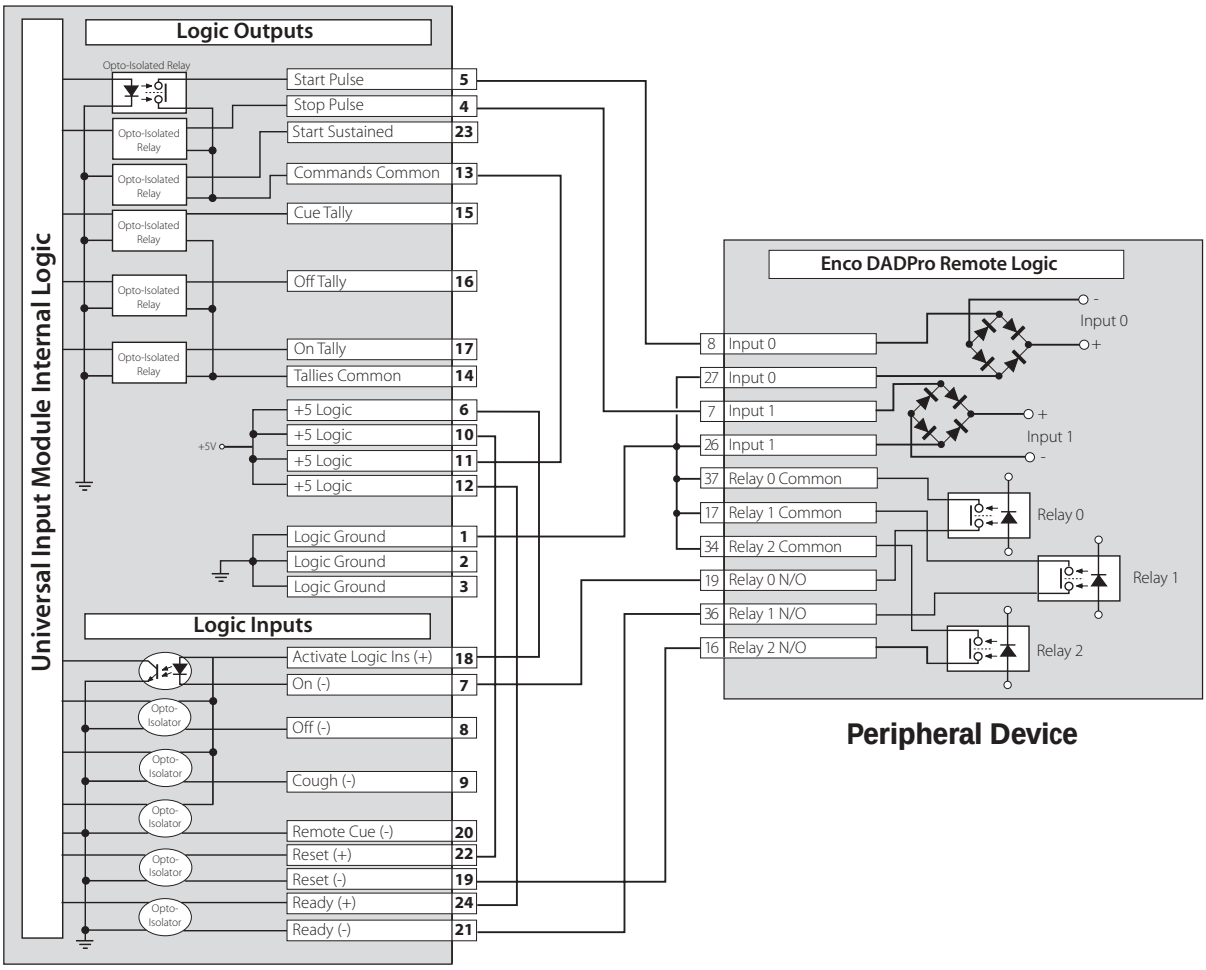
UNIVERSAL INPUT MODULE SWITCH SETTINGS



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 1 Mute	OFF	3	Start/Stop Pulse	OFF
4	Studio 2 Mute	OFF	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	OFF
8	Ready Lamp Status	OFF	8	Input Level Set	OFF

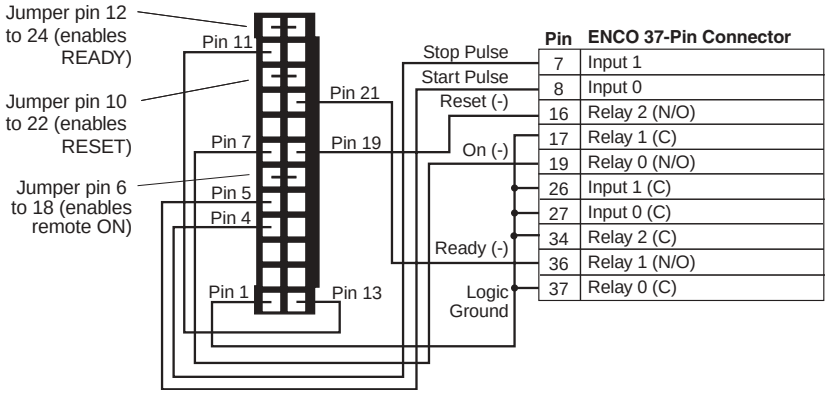
Note: ON settings are to the operator's left. OFF settings are to the operator's right.

SIMPLIFIED DIAGRAM FOR INTERFACING AN ENCO DADPRO



Wiring diagram for an ENCO DADpro Digital Delivery System

This diagram shows the wiring between a typical Digital Delivery System 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)

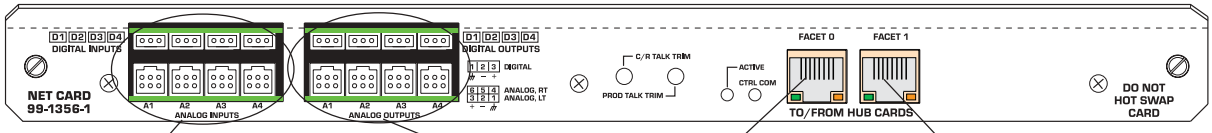
NET CARD

Only BMX*digital* consoles with the optional Net Card installed can directly communicate with and control a VistaMax system. The Net Card (shown below) plugs into the motherboard at the right rear corner of the mainframe, behind the output modules. It is hidden by the meter panel in normal use. There are two talkback level trim controls on the card to set control room and producer talkback levels at installation. A blank panel covers the Net Card slot when the card is not present.

Some typical uses of the Net Card outputs include routing analog audio to the External Monitor inputs on the control room module, VistaMax intercom talk into the External Talk input, and for in-room recording equipment.

The Net Card inputs can connect Talk from External audio into the VistaMax system along with outputs of in-room equipment that do not require an input channel on the console yet still need to be made available throughout the facility through the VistaMax system.

BMXdigital Net Card Front Panel Features



Local Analog & Digital Sources *Local Analog & Digital Destinations* *Signals to/from VistaMax frame(s)*

Without the Net Card, a BMX*digital* console is treated like any other console connected to a VistaMax system: input channel sources and console outputs must connect to VistaMax frame I/O inputs while I/O card outputs connect to the console inputs. Any in-room devices connected directly to the console would only be available through a bus output connection. VistaMax selector panels would then be used to select the input sources for the console inputs tied to the VistaMax.

With the addition of the Net Card, the BMX*digital* console is integrated into the VistaMax system. A Net Card functions as the audio, logic and control interface between the entire console and the VistaMax system through the two Facet connectors. It automatically makes available to the VistaMax system any, or all, of the console input sources and console bus outputs.

The Net Card also provides eight local audio sources (four analog and four digital inputs) and eight local destinations (four analog and four digital outputs) for the VistaMax system.

The two Facet connections (CAT-5e, as shown above, or alternately Optical connections, not shown) each simultaneously send 64 signals to the VistaMax frame with 64 return signals coming from the VistaMax frame. Each signal may consist of: one channel of audio; any number of common logic commands; or it can be an audio signal with logic "bound" to the audio.

Although only one facet cable is required to tie the BMX*digital* into the VistaMax system, both facet connections can be used to double the signal carrying capability (128 signals coming from the console with another 128 signals returning to the console) or for connection redundancy.

Refer to the VistaMax manual (75-52) for additional connection and applications information.

NET-ONLY MODULES

These are input modules that do not have any of the external audio or logic connections found on the full-featured and limited-feature input modules. They are designed to directly interface with a

VistaMax system. To use Net-Only modules, the BMX*digital* console must have the optional Net Card installed, and it must be connected to a VistaMax system.

Although the same type of VistaMax direct routing can be done using standard input modules, if no in-room audio connection is required on a module, then a less-expensive Net-Only input module can be used in lieu of any standard module.

There are two types of Net-Only modules: full-featured and limited feature (without Send and Utility bus controls) available for each type of input module (Universal Input, Telco, and RLS).

Net-Only Module Operation

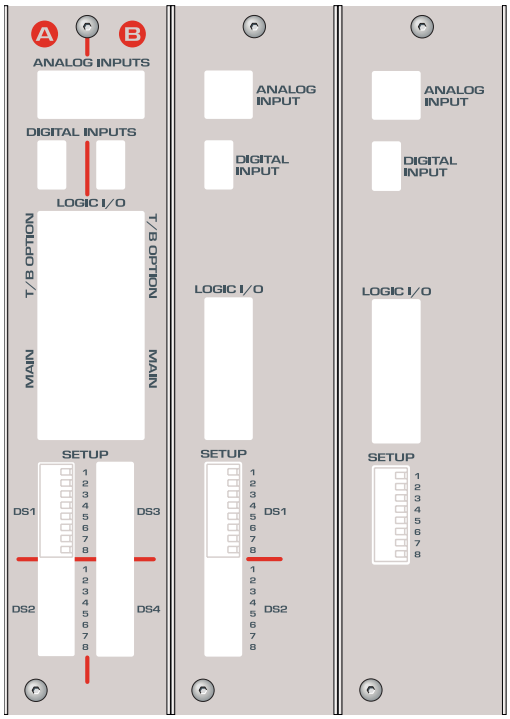
Net-Only modules look identical to, and function the same as, standard modules—at least as far as the operator is concerned. They have the same controls as the standard modules. It is only when the meter panel is opened up that any differences can be seen.

Net-Only modules do not have audio or logic connections and only have one set of DIP switches on them (as shown to the right). Their inputs can only be a VistaMax source. But, that input can be controlled by the console logic, if set to do so in the Session file. Likewise, the logic from the source signal can be set to control the module (e.g., control the Off lamp and turn the module on or off).

Net-Only Module Installation

Net-Only modules can be placed into any input module position. The only limitation is on Telco modules: there can only be six Telco modules in a frame (regardless of what type of Telco module—standard or Net-Only, full-featured or limited feature set, is installed).

Both the Telco and RLS Net-Only modules are automatically setup as "switchers"—controlling a single destination on the VistaMax system. Input source selection for the Net-Only Universal Input



Net-Only Module DIP Switches

module is made by a Session file setting. The Net-Only Telco and RLS modules also have Session-specific settings (the destination they are assigned to, a source include list, a source exclude list, etc.). Refer to Chapter 4: Server or to the VistaMax manual (Harris # 75-52) for additional information on VistaMax source selection.

The eight DIP switches on Net-Only modules have different settings than on standard modules. Net-Only Module Switch Definition tables are on page 2-66. On Net-Only Universal Input modules, mute locations can be automatically set following the VistaMax Room Code. If Room Code is not used, then the mute location is set using the mute location DIP switches. On the Net-Only RLS modules the switches are not active. On the Net-Only Telco the switches set the Telco ID number and set whether the Off-line and Record source is pre or post fader.

NET-ONLY MODULE DIP SWITCH SETTINGS

Net-Only Universal Input Module: DS1 Switch Definitions

#	*Switch Name*	*ON Function (set to operator's left)*	*OFF Function (set to operator's right)*
1	Spare Switch		
2	CR Mute	Mutes C/R speakers at module on [1]	No monitor muting
3	Studio 1 Mute	Mutes Studio 1 speakers at module on [1]	No monitor muting
4	Studio 2 Mute	Mutes Studio 2 speakers at module on [1]	No monitor muting
5	External Site Mute	Mutes external site speakers at module on [1]	No monitor muting
6	Spare Switch		
7	Spare Switch		
8	Spare Switch		

[1] These switches are only active if the VistaMax Room Code function is not being used. Set only one switch to On to activate mic logic functions (trigger room warning command and mute monitor speakers at channel on).

Net-Only Telco / Codec Module: DS1Switch Definitions

#	*Switch Name*	*ON Function (set to the operator's left)*	*OFF Function (set to the operator's right)*
1	Set Telco ID	Sets the module as Telco / Codec #1 [1]	Off
2	Set Telco ID	Sets the module as Telco / Codec #2 [1]	Off
3	Set Telco ID	Sets the module as Telco / Codec #3 [1]	Off
4	Set Telco ID	Sets the module as Telco / Codec #4 [1]	Off
5	Set Telco ID	Sets the module as Telco / Codec #5 [1]	Off
6	Set Telco ID	Sets the module as Telco / Codec #6 [1]	Off
7	O/L & Record Source	Pre-fader when module is off (only when Session module switch 6 is set for Pre-Fader)	Post-fader regardless of module on/off
8	Spare Switch		

[1] Caution: Set only one of these six DIP switches to ON. This setting identifies the module, affecting signal routing and module controls. Each Telco module in the console MUST have a unique ID setting.

Net-Only Remote Line Selector (RLS) Module: DS1 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	Spare Switch		
4	Spare Switch		
5	Spare Switch		
6	Spare Switch		
7	Spare Switch		
8	Spare Switch		

3 Operation

This chapter covers module and meter panel component operation for the BMX*digital* console. Refer back to the illustration on page 2-2 for the module and card placement within the mainframe.

Module & Card Overview

INPUT MODULES

BMX*digital* has four types of input modules:

- **Microphone Preamplifier**
- **Universal Input**
- **Telco/Codec Input** (limited to six)
- **Remote Line Selector Input** (RLS)

One Mic Preamp module comes standard. A second Mic Preamp module can be installed next to the standard Mic Preamp. Any combination, or order, of Universal Input, Telco/Codec (up to six), and RLS modules may be installed into the input module positions.

Refer to these Quick Guide pages on using the various input modules:

- Mic Preamp module, page 3-2
- Universal Input module, pages 3-3 to 3-5
- Telco/Codec module, pages 3-6 to 3-10
- RLS module, page 3-11

SESSION MODULE

The Session module is standard, installed immediately to the right of the input module positions. A Quick Guide to using the Session module is on pages 3-12 and 3-13.

MONITOR MODULES

BMX*digital* has two types of monitor modules:

- **Control Room**
- **Studio**

The Control Room module is standard, installed next to the Session module. The optional Studio module is installed next to the Control Room module. Refer to these Quick Guide pages on using the monitor modules:

- Control Room module, pages 3-14 & 3-15
- Studio module, page 3-16

OUTPUT MODULES

BMX*digital* has three standard output modules installed in dedicated positions at the right end of the mainframe. The Quick Guides to using the output modules are on pages 3-17 and 3-18.

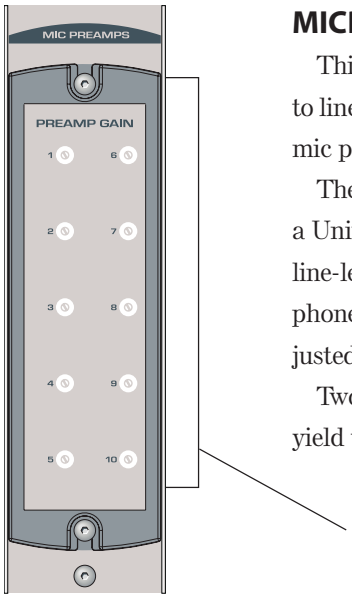
DSP AND NET CARDS

One or more DSP cards and the optional Net Card are installed behind the modules, below the meter panel. There are no user controls on these cards.

- DSP Card, page 3-20
- Net Card, page 3-20

Meter Panel Overview

The BMX*digital* meter panel attaches at the rear of the mainframe and closes down over the upper part of the modules, hiding all of the module connectors from the board operator's view. It has the meters, a clock (except on the BMX*digital*-14) and an event timer. A Quick Guide to the meter panel components is on pages 3-18 and 3-19.



MICROPHONE PREAMPLIFIER MODULE QUICK GUIDE

This module amplifies five or ten low-level (-65 to -30 dBu) microphone signals up to line-level (+4 dBu). The BMX*digital*-8 and BMX*digital*-14 come standard with five mic preamps, the other frame sizes come standard with ten mic preamps.

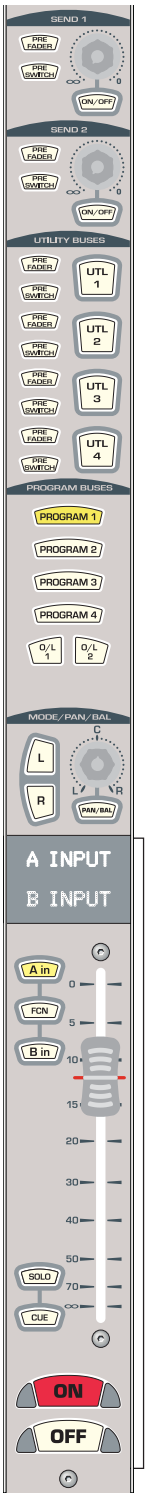
The line-level balanced mono output from each preamplifier can jumper directly to a Universal Input module; be routed through a patch bay; or connect to an external line-level mic processor. The trim controls set the gain as required for each microphone preamp. These are normally set during installation and should NOT be adjusted by the board operator.

Two Microphone Preamplifier modules may be installed in a BMX*digital* frame to yield twenty microphone preamplifiers.

MIC PREAMPS

Remove the security cover to access the individual preamp gain trim pots. These adjust the preamp gain to yield a nominal +4 dBu output for microphone input levels between -65 dBu and -30 dBu.

PREAMP GAIN — *Separate trim controls for each microphone preamp.*



UNIVERSAL INPUT MODULE QUICK GUIDE

This module has two inputs (A and B). The Input Source Display shows the active input in bold in the top line (the alternate input source is shown in the bottom line). With a Net Card installed, the module's input can be a VistaMax source, which is set via the Session file. A VistaMax source is identified by a blinking dot in the display's left character. A full-featured module is shown. A limited-feature version (no Utility bus or Send controls) is also available.

FADER SECTION

This section has the Input Source Display, the buttons for input source selection, Solo, Cue, On and Off, and the module fader.

Input Source Display — *A two-line ten-character display that shows the current selected input in bold in the top line with the alternate input name in the bottom line.*

A in — *When lit, indicates the A input is selected, and its name is in the top line of the display. To change the input, the **FCN** button must be lit (see below).*

FCN — *Function button. Press for a full second (until it lights), then press the **A in** or **B in** button to change the input source. The **A in** and **B in** buttons can only be selected while the **FCN** button is lit. It automatically turns off after about three seconds.*

B in — *When lit, indicates the B input is selected, and its name is in the top line of the display. To change the input the **FCN** button must be lit (see above).*

Fader — *A 100mm module level control with dB indications along the left side to show the relative attenuation. Setting the fader to the red reference line (-12 dB) sets the module for unity gain. This means a nominal +4 dBu analog input signal will appear as a -20 indication on the meters. This is equivalent to a 0 VU indication on a mechanical meter.*

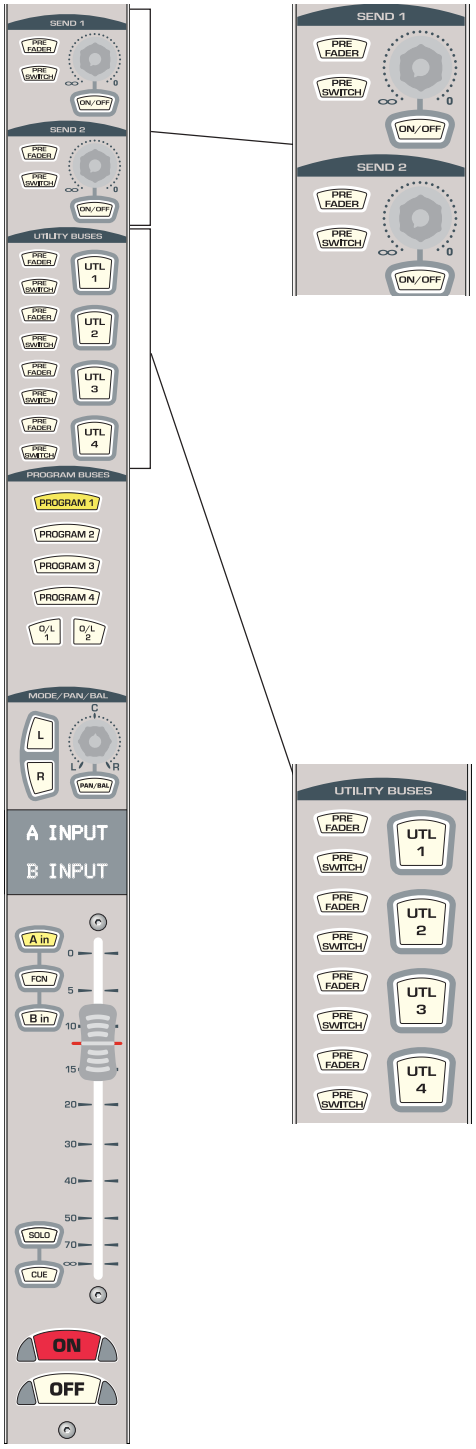
SOLO — *When lit, adds the module's post-fader, post-switch audio to the Solo bus and interrupts the monitor and operator headphone outputs, but does not affect the on-line signal, the co-host, or guest outputs. Solo can be a momentary or a latched function. See page 2-33 (Session module DIP switch settings) for details.*

CUE — *When lit, routes the module's pre-fader, pre-switch audio to the Control Room module's cue output. This does not affect the on-line signal. When the module is set as a mic input, the Cue button is momentary. When the module is a line input, the Cue button is latched, toggling the cue feed on and off.*

ON — *When pressed, turns the module on, lighting the button and routing the module audio to the selected buses. Logic control commands (timer reset, start pulse, Cue reset, etc.), may be initiated, depending upon the SETUP DIP switch settings.*

OFF — *When pressed, turns the module off, removing the module audio from all selected buses (except for those set for pre-switch operation). Logic control commands (Stop Pulse, Off Tally, etc.) may be initiated, depending upon the SETUP DIP switch settings. This button can also be set to indicate peripheral device status, thus it may not light up when pressed.*

Universal Input, Telco/Codec & RLS Modules



SEND 1 and SEND 2 (not present on limited-feature modules)

This section has the on/off control, level, and signal routing controls to feed the module's audio to the Send 1 and Send 2 buses. The controls are identical for each Send bus.

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

PRE SWITCH — *When lit, the send audio is always available (it is not affected by the module On/Off buttons). When unlit, the send output follows the module's on/off status.*

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

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

UTILITY BUSES (not present on limited-feature modules)

This section has the module controls for the four Utility buses: UTL 1, UTL 2, UTL 3, and UTL 4.

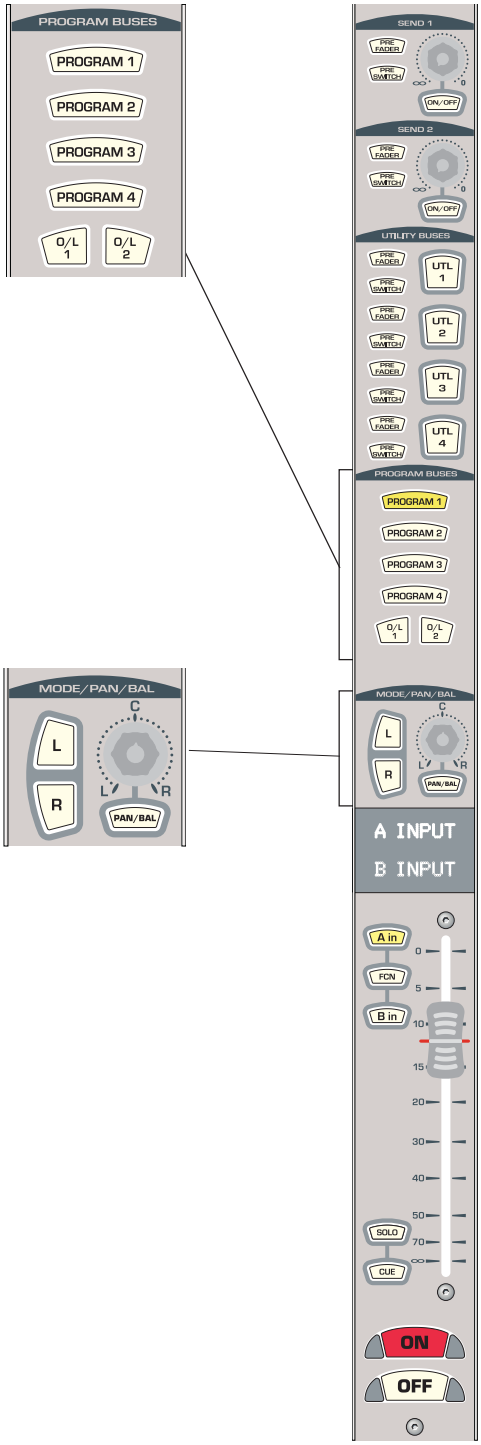
UTL 1, UTL 2, UTL 3, UTL 4 — *When lit, routes the module audio to Utility bus 1, 2, 3, or 4. The module can be assigned to any combination of buses. When the button is unlit, no audio is fed to that Utility bus.*

PRE FADER — *When lit, the audio feed to that Utility bus is taken before the module's fader (thus adjusting the fader level does not affect the level to the bus). When unlit, the feed level to the Utility bus is controlled by the module's fader setting.*

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

*Both the **Pre Fader** and the **Pre Switch** buttons can be selected on any Utility or Send Bus.*

Universal Input, Telco/Codec & RLS Modules



PROGRAM BUSES

This section has the selectors for the four Program buses and the two off-line buses.

PROGRAM 1, PROGRAM 2, PROGRAM 3, PROGRAM 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.*

O/L 1, O/L 2 (Off-Line 1, Off-Line 2) — *When lit, routes the module audio to any combination of the Off-Line 1 and Off-Line 2 buses (which are used for building up off-air mix-minuses). The Off-Line feeds are always pre-switch, but whether they are pre-fader or post-fader is set for all Input and RLS modules through a DIP switch on the Session module. For details on setting this option, see page 2-33 (Session Module DIP switch settings).*

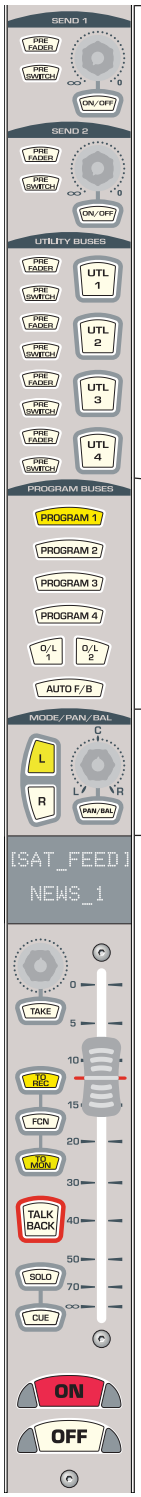
MODE/PAN/BAL

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 and R — *These buttons set the mode (stereo or mono). When both buttons are unlit, the module is 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, which then feeds both the left and right outputs.*

Rotary Pan/Balance Control — *Controls where the input is placed in stereo aural space when the PAN/BAL button is lit. On a stereo signal, it functions as a balance control. On a mono signal (either L or R, or both, are lit), it functions as a pan pot.*

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

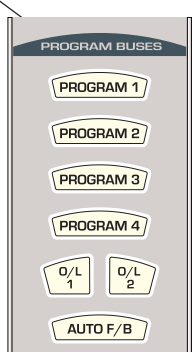


TELCO/CODEC MODULE QUICK GUIDE

Up to six Telco/Codec modules may be installed in the console. Most controls are the same as a Universal Input module (On/Off, Fader, mode selection, and bus selection), but since the module may be connected to an External RLS or router, or may come from a VistaMax System, there is a Source Selector and Take button on this module (taking the place of the A/B selectors). There is also a Talkback button for talking to the caller or remote in addition to Telco record enable and monitor select buttons. Additional operational details on special Telco functions are presented on pages 3-8 to 3-10. A limited-feature version module is also available, which does not have the Send and Utility bus controls.

SEND & UTILITY BUSES

This section has the selectors for the four Utility outputs and the two Send. Refer to page 3-4 for their functions.



PROGRAM BUSES

This section has the selectors for the four Program outputs and the two off-line buses. The AUTO F/B button sets up how the Foldback (the return feed to the caller) is selected.

PROGRAM 1, PROGRAM 2, PROGRAM 3, PROGRAM 4 — *When lit, routes the module to any combination of the Program 1, Program 2, Program 3, and Program 4 buses. The "winking" button indicates the bus that is being used as the Foldback Mix source (see pages 3-8 and 3-9 for foldback details). When unlit, the module audio does not feed that bus. These outputs are always post-switch and post-fader.*

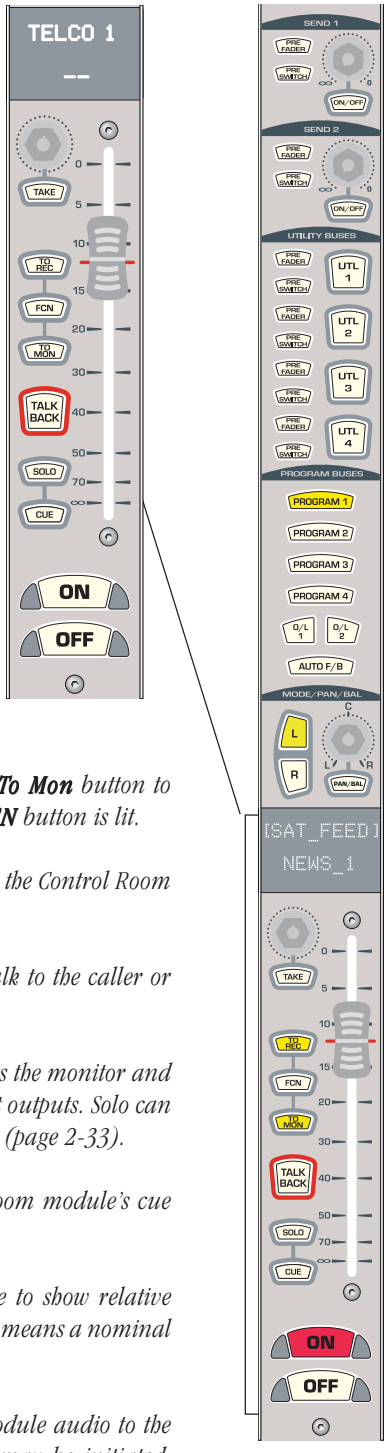
O/L 1, O/L 2 (Off-Line 1, Off-Line 2) — *When lit, routes the module audio to any combination of the Off-Line 1 and Off-Line 2 buses (which are used for building up off-air mix-minuses). A "winking" button indicates the bus that is being used as the Foldback Mix source (see pages 3-8 and 3-9). The Telco Off-Line feeds are always pre-switch and pre-fader.*

Auto F/B — *Automatic Foldback. When lit, automatically switches the Foldback Mix source between the "winking" off-line bus (when the module is off) and the "winking" program bus (when the module is on). For details on this function, see pages 3-8 and 3-9.*

MODE/PAN/BAL

This section has the controls for setting the module's mode (stereo or mono) and the pan or balance of the module's bus outputs. Refer to page 3-5 for their functions.

Telco/Codec Module



FADER SECTION

This section has the Input Source Display; input Source Selector and Take controls; Telco Monitor and Record Feed assignment buttons; the Talkback, Solo, Cue, On, and Off buttons; and the signal level fader.

Input Source Display — *A two-line ten-character display that shows the module's name in the top line (TELCO 1). When the input is a Switcher, as shown in the full module illustration, the top line shows the current source (SAT_FEED) and the bottom line shows the selected source (NEWS_1).*

Source Selector — *A rotary encoder to scroll through the available VistaMax, router or Ext. RLS sources (shown in the Display's bottom line). Only active when the module is set as a Switcher (see page 2-25 for DIP switch settings).*

TAKE — *When pressed, "takes" the selected source shown in the display's bottom line. This makes it the current source, thus its name will be shown in both the top and bottom lines. The Take button and Source Selector are only active when the module is set as a Switcher (see page 2-25 for DIP switch settings).*

TO REC — *When lit solid, adds the module's audio to the Telco record output. When flashing, indicates the module is not feeding the record output (see pages 3-9 and 3-10 for additional information on this function). To select or deselect this button, the **FCN** button must be lit (see below).*

FCN — *Function button. Press for a full second to light, then press the **To Rec** or **To Mon** button to change the setting. The **To Rec** and **To Mon** buttons can only be changed while the **FCN** button is lit.*

TO MON — *When lit, adds the module to the Telco monitor mix that is available on the Control Room and Studio modules. To select or deselect, the **FCN** button must be lit (see above).*

TALKBACK — *A momentary press to talk button so the board operator can to talk to the caller or remote on the left output of that Telco Input's mix-minus output.*

SOLO — *When lit, adds the module's post-fader audio to the Solo bus and interrupts the monitor and operator headphone outputs, but does not affect the on-line signal, the co-host or guest outputs. Solo can be a momentary or a latched function, following a Session module DIP switch setting (page 2-33).*

CUE — *When lit, routes the module's pre-fader, pre-switch audio to the Control Room module's cue output. This does not affect the on-line signal.*

Fader — *A 100mm module level control with dB indications along the left side to show relative attenuation. Set the fader to the red reference line (-12 dB) for module unity gain. This means a nominal +4 dBu analog input will show a -20 indication on the meters (equivalent to 0 VU).*

ON — *When pressed, turns the module on, lighting the button and routing the module audio to the selected buses. Logic control commands (timer reset, start pulse, Cue reset, etc.), may be initiated, depending upon the SETUP DIP switch settings.*

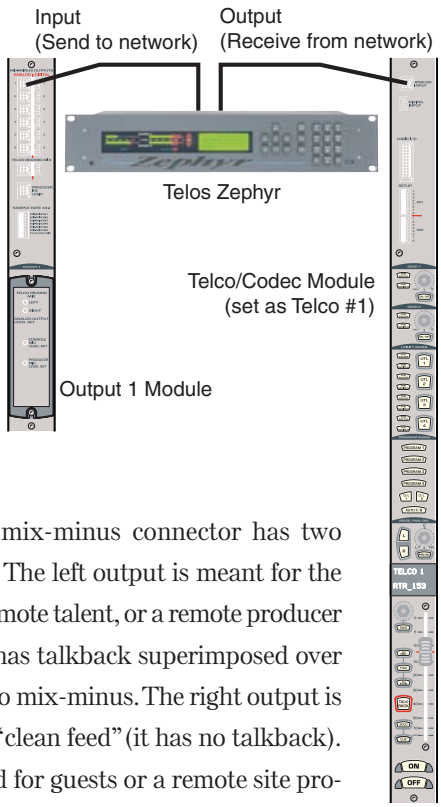
OFF — *When pressed, turns the module off, removing the module audio from all selected buses (except those that are set for pre-switch operation). Logic control commands (Stop Pulse, Off Tally, etc.) may be initiated, depending upon the SETUP DIP switch settings.*

TELCO/CODEC MODULE OPERATION

Up to six "callers" (any remote send and receive device like a telephone hybrid, satellite transceiver, ISDN interface, etc.) can connect to six Telco/Codec modules (Telco), as illustrated below.

Each Telco is set to a unique Telco ID number (see page 2-25) and has two mono mix-minus outputs on the Output 1 module. The mono mix-minus outputs, also called Foldback mixes, send a sum of one of the program or off-line buses back to the caller—but always minus the caller's audio. Hence the mix-minus nomenclature, and why there are six separate Foldback outputs.

Typical Telco/Codec



Each mix-minus connector has two outputs. The left output is meant for the caller, remote talent, or a remote producer since it has talkback superimposed over the mono mix-minus. The right output is a mono "clean feed" (it has no talkback). It is used for guests or a remote site program feed. The board operator talks to any caller by pressing the Talkback button on that Telco module. A local Producer can talk to any caller using a custom switch panel or a Producer Talkback/IFB panel (PRE99-1188).

TELCO FOLDBACK MIX

The Telco Foldback mix source, indicated by its "winking" assignment button on each Telco module, is derived from a program or off-line bus. The bus used is determined by which buses are assigned and by whether an Auto-Foldback button is on. If it is, then the Telco's state (module On or Off) also affects which bus is the Foldback source.

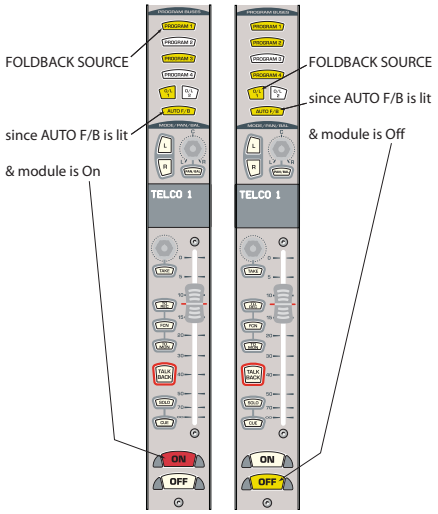
The program bus Foldback feeds are derived post-switch and post-fader, but the off-line bus feeds are pre-switch and either pre-fader or post-fader (determined by Session module DIP switch 6, see page 2-33). The Telco modules have a separate DIP switch (see page 2-25) active when pre-fader is selected on the Session module. This allows the Telco modules to be post-fader even when Universal and RLS modules are pre-fader.

Note: When a Telco is set for pre-fader O/L feed, this setting forces the active Send and Utility buses to also be pre-fader, when the module is off.

Auto-Foldback On

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

Foldback Sources



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 1, Off-Line 2.

While the Module is Off: Off-Line 1 is the primary Foldback mix. If it's not assigned, then Off-Line 2 is the source. If neither Off-Line is assigned, there will be no mix-minus audio (except for any talkback on the left output).

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 input and the caller's Telco are assigned to O/L 1. With the Telco module Off, the caller can hear the talent thru the O/L 1 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 switches to Program 1 (assuming the air feed is Program 1), so the caller can hear everything going to air—minus their voice.

Auto-Foldback Off

When Auto-Foldback is off (the AUTO F/B 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 1. If it is not assigned, then Off-Line 2 is the source. If it is not assigned then the program buses are selected in this order; Program 1, Program 2, Program 3, Program 4.

Foldback Source when Auto F/B is not

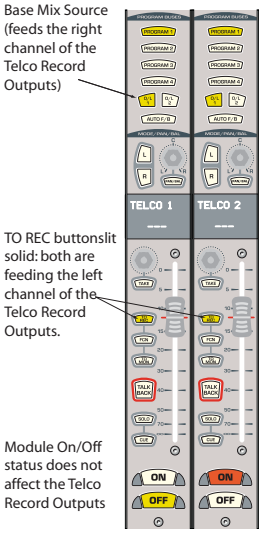
Auto-Foldback Off is the most common setting for recording callers for later broadcast and for doing a live remote where a "broadcast" feed to the remote site is required. In a remote broadcast, when the remote talent goes on-air, the mix-minus should not change, thus only Program 1 can be selected on the Telco and the Program 1 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 1 or Off-Line 2 as well, and it will be the return feed, regardless of the Program bus assignments and whether the module is On or Off.

TELCO RECORD MIX

A two-channel Telco Record Mix output is available on the Output 1 module.

The left channel has only the callers from those Telco modules that have their TO REC buttons lit solid (see page 3-7 for more info on this button).

Typical Record Enabled Telco Button Settings



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

Typically, only one caller is recorded at a time, but, because there can be up to six 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.

When the TO REC buttons are lit solid, as shown above, those callers are feeding the left channel of

the record output. When the TO REC button is "winking," (as shown to the right) 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 F/B turned On! Thus, the easiest way to record a caller is to keep AUTO F/B 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:

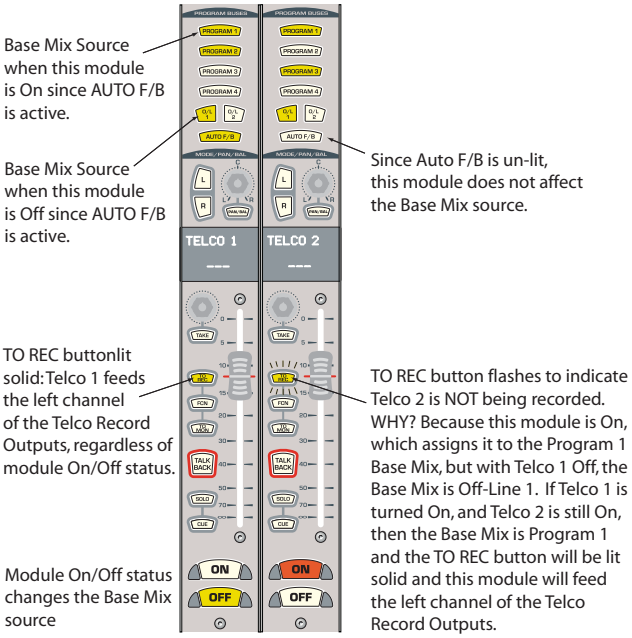
AUTO F/B is off on all TO REC Telcos: The Base Mix source is Off-Line 1. If it is not assigned, then Off-Line 2 is the source. When either of these buses are selected, the TO REC Telco module On/Off settings do not affect the record output as shown on the previous page. It is the easiest method to record callers.

When neither Off-Line bus is assigned, then the Program buses are used in this order; Program 1, Program 2, Program 3, Program 4. In this case the TO REC Telco module must be turned On in order to record the caller. If the TO REC module is Off, then TO REC will wink, indicating that caller is NOT being recorded.

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

When any of these modules are Off, then Off-Line 1 becomes the base mix. If it's not assigned, then Off-Line 2 is the base mix. If neither Off-Line is 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.

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

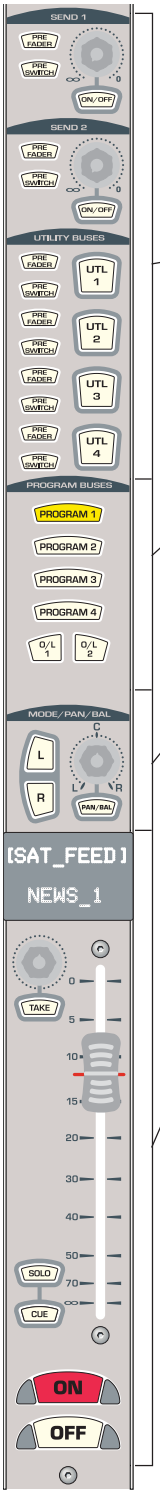


Here is a summary table of what is, or is not, recorded:

TELCO RECORD MIX, CHANNEL ASSIGNMENT SUMMARY

LEFT CHANNEL	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

Note: Off-line feeds from Universal Input and RLS modules are always pre-switch and are set for either Pre- or Post-Fader by a Session module global DIP switch (see page 2-33 about this setting). The Telco modules' Off-Line bus feeds are also pre-switch, but each has a separate Post-/Pre-Fader DIP switch (see page 2-25 about this setting) when the Session module switch is set for Pre-fader.



REMOTE LINE SELECTOR (RLS) MODULE QUICK GUIDE

This module has one input from a Switcher (VistaMax System, External RLS or Router). It has the same features as the Universal Input module, except that a Source Selector and Take button replace the A/B Input selector buttons. A limited-feature version is also available, which does not have the Send and Utility bus controls.

SEND & UTILITY BUSES

This section has the selectors for the four Utility outputs and the two Send. Refer to page 3-4 for their functions.

PROGRAM BUSES

This section has the selectors for the four Program outputs and the two off-line buses. Refer to page 3-5 for their functions.

MODE/PAN/BAL

This section has the controls for setting the module's mode (stereo or mono) and the pan or balance of the module's bus outputs. Refer to page 3-5 for their functions.

FADER SECTION

This section has the Input Source Display, the controls for input Source Selection, the Solo, Cue, On and Off buttons, and the module fader.

Input Source Display — *A two-line ten-character display that shows the current source (SAT_FEED) in the top line. The bottom line shows the selected source (NEWS_1). The brackets on the current name indicate that the router source change is still pending. See Appendix B for details on router control functions.*

Source Selector — *A rotary encoder that scrolls through the available sources (shown in the Display's bottom line) when the module is set as a switcher. Used with the Take button (see below).*

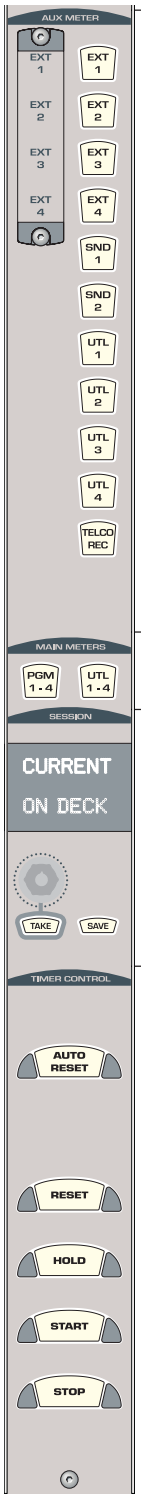
TAKE — *Press to take the selected source shown in the display's bottom line. It then becomes the current source, and is thus shown in both lines. The Take button and Source Selector are only active with a Switcher input. For details, see page 2-25.*

SOLO — *When lit, adds the module's post-fader audio to the Solo bus and interrupts the monitor and operator headphone outputs, but does not affect the on-line signal, the co-host or guest outputs. Solo can be a momentary or a latched function. See page 2-33 for details.*

CUE — *When lit, routes the module's pre fader, pre switch audio to the Control Room module's cue output. This does not affect the on-line signal.*

ON — *When pressed, turns the module on, lighting the button and routing the module audio to the selected buses. Logic control commands (timer reset, start pulse, Cue reset, etc.), may be initiated, depending upon the SETUP DIP switch settings.*

OFF — *When pressed, turns the module off, removing the module audio from all selected buses (except those that are set for pre-switch operation). Logic control commands (Stop Pulse, Off Tally, etc.) may be initiated, depending upon the SETUP DIP switch settings.*



SESSION MODULE QUICK GUIDE

This module has the controls for the timer, and for saving and recalling Sessions (server files holding different console setups), and the Main and Auxiliary Meter source selectors.

AUX METER

This section allows one source to be selected for the Auxiliary meter. The selection is overridden by Cue or Solo, which display on the Auxiliary meter while active.

EXT 1, EXT 2, EXT 3, EXT 4 — *When lit, assigns an External input to the Auxiliary meter.*

SND 1, SND 2 — *When lit, assigns a Send bus to the Auxiliary meter.*

UTL 1, UTL 2, UTL 3, UTL 4 — *When lit, assigns a Utility Bus to the Auxiliary meter.*

TELCO REC — *When lit, assigns the Telco Record output to the Auxiliary meter. See pages 3-9 and 3-10 for more information about this mix.*

MAIN METERS

This section has the source selectors for the Main meters.

PGM 1-4 — *When lit, assigns the four Program buses to the main meters on all size frames except for the BMXd-8. On the BMXd-8, each press displays the next PGM bus (the first press shows PGM 1, the next press shows PGM 2, then PGM 3, then PGM 4, etc.).*

UTL 1-4 — *When lit, assigns the four Utility buses to the main meters on all size frames except for the BMXd-8. On the BMXd-8, each press shows the next UTL bus (the first press shows UTL 1, the next press shows UTL 2, then UTL 3, then UTL 4, etc.). Each Utility bus signal can also be sent individually to the Auxiliary meter.*

SESSION

This section allows the console operator to recall or save Sessions. Sessions hold the console setup parameters (settings such as which Input module buttons are lit and the module input source names). Sessions are stored on the BMXdigital Server, which is on the Session module. Chapter 4 covers the BMXdigital Server in detail.

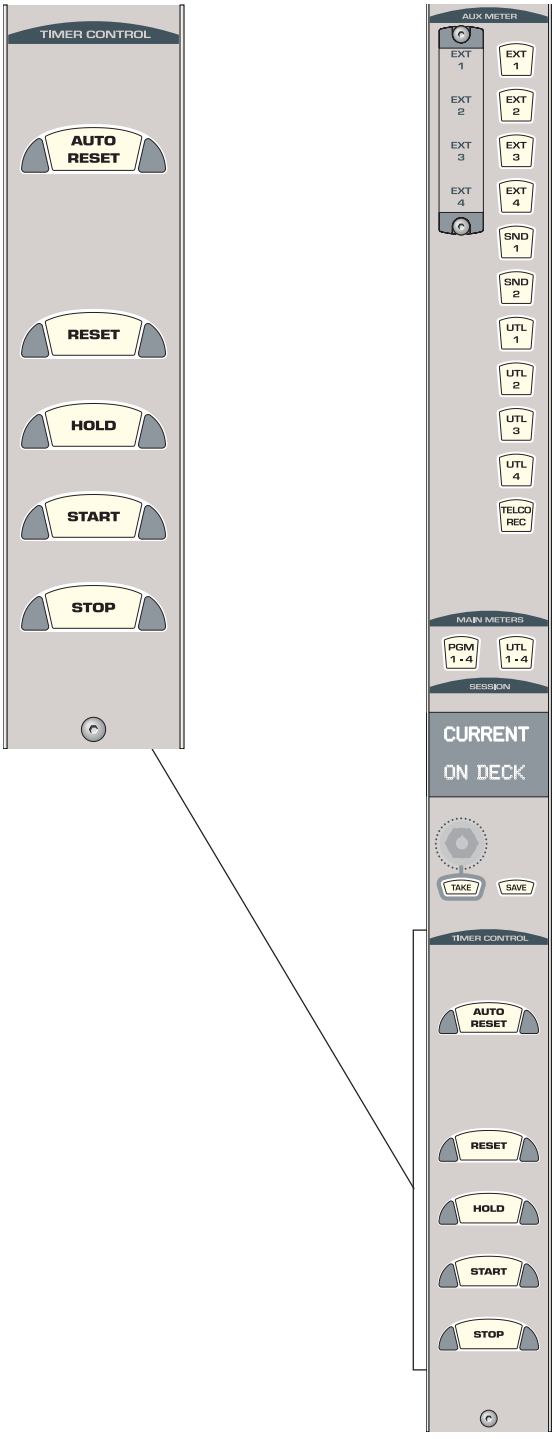
Session Display — *The top line shows the current Session name (the file that is currently loaded into the console). The bottom line shows the selected or "on deck" Session name, as dialed up by the Session Selector. This selected Session is loaded into the console by pressing the TAKE button.*

Session Selector — *A rotary encoder to alphanumerically show previously saved Session file names in the bottom line of the Session Display.*

TAKE — *Loads the Session file shown in the bottom line of the Session Display into the console. The current and selected names will then be the same, until the Session Selector is rotated.*

SAVE — *Saves all of the Input modules' button settings, input source names and button lockout information as a new Session on the BMXdigital Server using the current session name with a new numerical suffix added (operators cannot overwrite existing sessions).*

Session Module



TIMER CONTROL

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

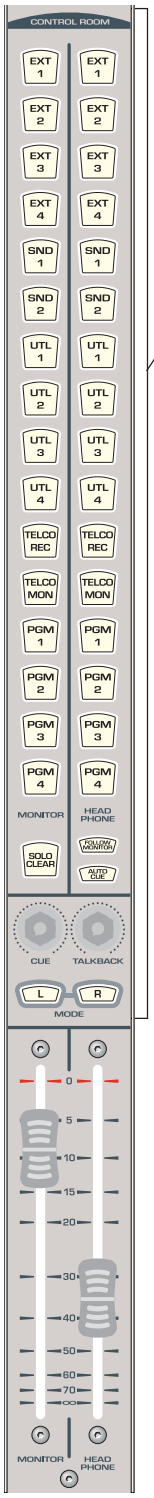
AUTO RESET — *When lit, allows the timer to be automatically reset whenever an input module, with its timer reset function enabled, is turned on. When a reset command is detected, the timer resets to 00:00.0 and immediately starts counting upward. When inactive (not lit), the timer ignores module timer 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 monitor source selection and control facilities for the console operator's headphones and the control room monitor speakers.

CONTROL ROOM

This section controls the audio source(s) for the various Control Room outputs. The left column buttons select the audio for the monitor speakers, the co-host, and guest headphones; the right column buttons select the audio for the operator's headphones. Multiple buttons can be selected (hold down one button and press additional buttons), however, only two digital sources (the Send, Program, and Utility buses are all digital) can be selected simultaneously.

EXT 1, EXT 2, EXT 3, EXT 4 — *Routes an External Input to the Control Room outputs.*

SND 1, SND 2 — *Routes a Send bus to the Control Room outputs.*

UTL 1, UTL 2, UTL 3, UTL 4 — *Routes a Utility bus to the Control Room outputs.*

TELCO REC — *Routes the Telco Record Base Mix to the Control Room outputs.*

TELCO MON — *Routes the Telco Monitor Mix to the Control Room outputs.*

PGM 1, PGM 2, PGM 3, PGM 4 — *Routes a Program Bus to the Control Room outputs.*

SOLO CLEAR — *Flashes to indicate a module has Solo active. Press to clear the Solo function.*

FOLLOW MONITOR — *When lit forces the right column selector buttons (HEADPHONE) to follow the left column buttons (MONITOR). When unlit, the Headphone selector buttons function independently of the Monitor select buttons.*

AUTO CUE — *When lit, allows cue to interrupt the operator headphone output. When unlit, cue does not affect the operator headphone output.*

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

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

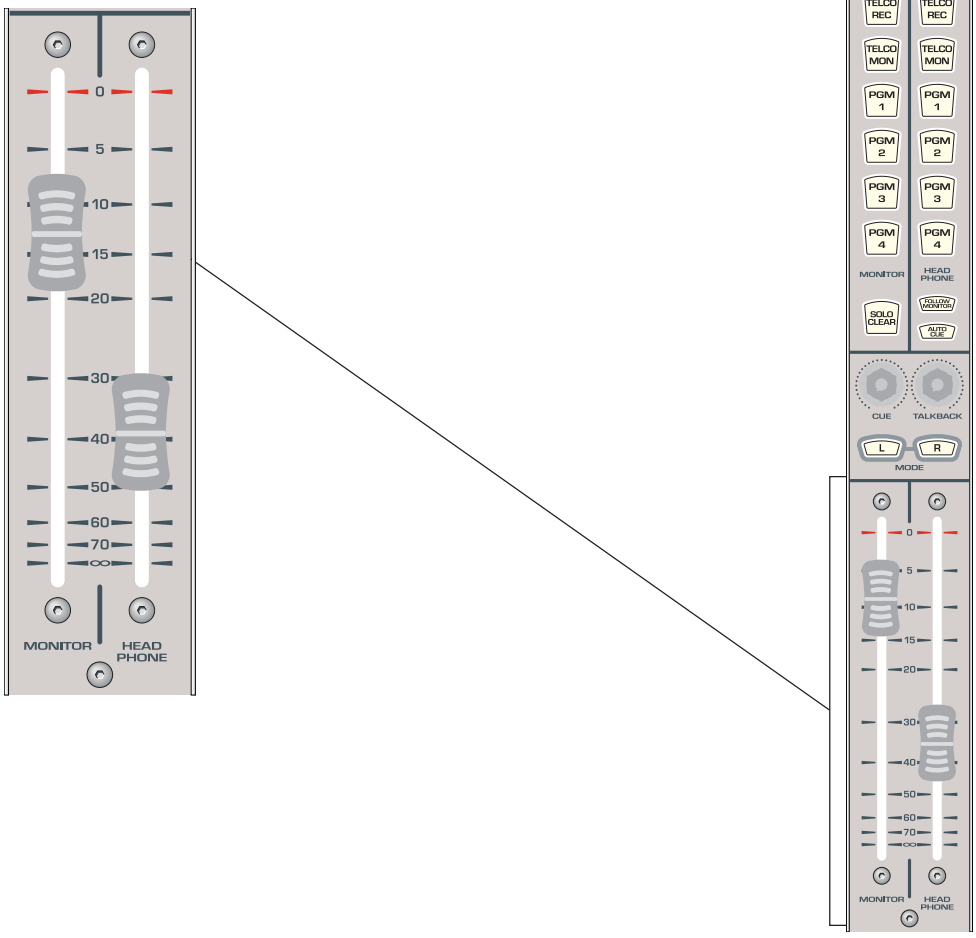
Control Room Module

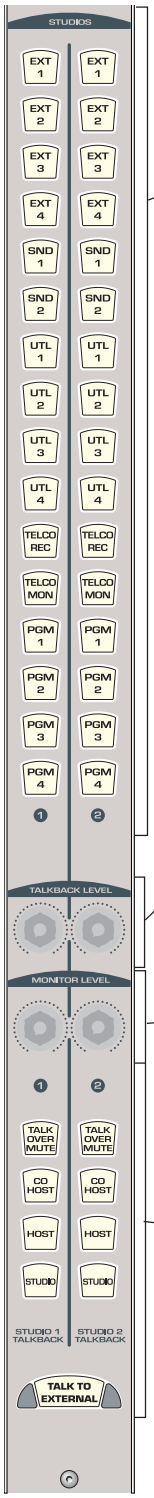
FADER

This section has the two faders to control the levels of the Monitor speakers and Operator headphones. The Co-Host and Guest headphone outputs are fixed-level outputs that are typically controlled by a headphone jack panel with volume control like the PRE99-103-2.

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

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





STUDIO MODULE QUICK GUIDE

This optional module has the monitor source and talkback controls for two studio locations.

STUDIO

This section has the source selector buttons for all the outputs (monitor and headphone) for two air studios, voice booths, or other locations. The left column buttons control the source(s) for the Studio 1 outputs; the right column buttons control the source(s) for the Studio 2 outputs. Multiple sources can be selected simultaneously by holding down one source button while pressing additional buttons.

EXT 1, EXT 2, EXT 3, EXT 4 — *Selects an External input for the Studio outputs.*

SND 1, SND 2 — *Selects a Send bus for the Studio outputs.*

UTL 1, UTL 2, UTL 3, UTL 4 — *Selects a Utility Bus for the Studio outputs.*

TELCO REC — *Selects the Telco Record Base Mix for the Studio outputs.*

TELCO MON — *Selects the Telco monitor mix for the Studio outputs.*

PGM 1, PGM 2, PGM 3, PGM 4 — *Selects a Program Bus for the Studio outputs.*

TALKBACK LEVEL

This section has the talkback level controls for the two studios. The left control is the talkback level for Studio 1; the right control is the talkback level for Studio 2.

TALKBACK Volume Pots — *Each pot sets the level for the associated studio's talkback.*

MONITOR LEVEL

This section has the controls for the monitor levels for the studios. The left control is for Studio 1; the right control is for Studio 2. The control is not active when a Studio Selector panel (PRE99-1189) with a Volume Control panel (PRE99-1192) is connected to the console.

MONITOR Volume Pots — *Each pot sets the level for the associated studio's Monitor output.*

STUDIO 1 & 2 TALKBACK

This section has the controls for talking to the two studios.

TALK OVER MUTE — *A latching button that, when lit, permits talkback audio to the studio's monitor output even when it is muted. When unlit, talkback is muted with the studio monitors.*

CO-HOST — *While pressed, routes the console talkback audio to the Co-Host output.*

HOST — *While pressed, routes the console talkback audio to the Host output.*

STUDIO — *While pressed, routes the console talkback audio to the studio's Monitor output.*

TALK TO EXTERNAL — *While pressed, routes the console talkback audio to the External audio output.*

OUTPUT 1 MODULE QUICK GUIDE

This module has the mix-minus outputs for up to six Telco modules and a telco record output. Separate trim controls set the analog record output level and the talk-back levels for the producer and console mics. 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 and the talkback levels for the console and producer.

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

CONSOLE MIC LEVEL SET — *Sets the talkback level to the mix-minus outputs when the TALK BACK buttons are pressed on the Telco modules.*

PRODUCER MIC LEVEL SET — *Sets the talkback level of the producer's microphone on the Producer Talkback/IFB Panel (PRE99-1188) going to the mix-minus outputs.*

OUTPUT 2 MODULE QUICK GUIDE

This module has the outputs for Program 1, Program 2, Utility 1, Utility 2, and Send 1. 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.

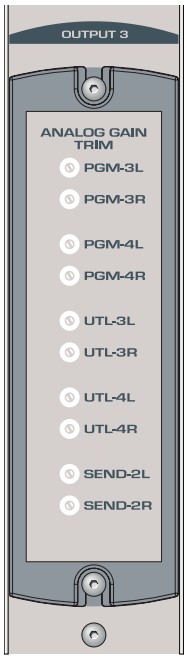
PGM-1L/-1R — *Sets the left/right output levels for the Program 1 analog outputs. Both the Main and Aux output are affected equally.*

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

UTL-1L/-1R — *Sets the left/right channel output levels for the Utility 1 analog output.*

UTL-2L/-2R — *Sets the left/right channel output levels for the Utility 2 analog output.*

SEND-1L/-1R — *Sets the left/right channel output levels for the Send 1 analog output.*



OUTPUT 3 MODULE QUICK GUIDE

This module has the outputs for Program 3, Program 4, Utility 3, Utility 4, and Send 2. 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 3

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

PGM-3L/-3R — *Sets the left/right output levels for the Program 3 analog outputs. Both the Main and Aux outputs are affected equally.*

PGM-4L/-4R — *Sets the left/right output levels for the Program 4 analog outputs. Both the Main and Aux outputs are affected equally.*

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

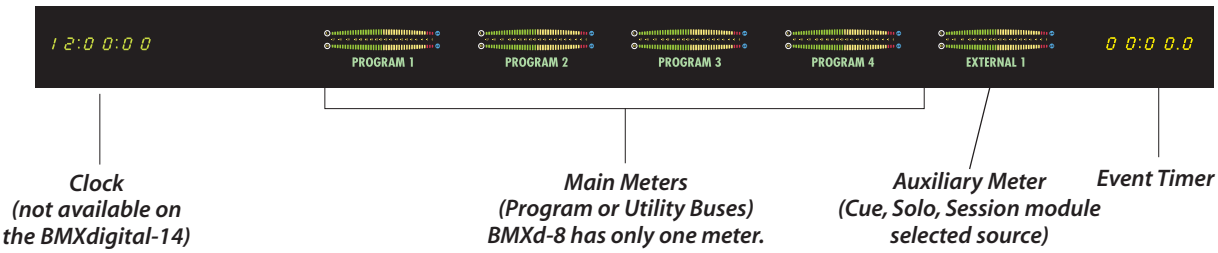
UTL-4L/-4R — *Sets the left/right channel output levels for the Utility 4 analog output.*

SEND-2L/-2R — *Sets the left/right channel output levels for the Send 2 analog output.*

METER PANEL QUICK GUIDE

Each meter panel has a clock (except for the BMX*digital*-14), an event timer, and five stereo bargraph meters (except for the BMX*digital*-8, which has two meters).

BMX*digital* Meter Panel



CLOCK

The clock displays time in hours:minutes:seconds in either 12- or 24-hour time. 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 3-13 for descriptions of the timer controls on the Session module.

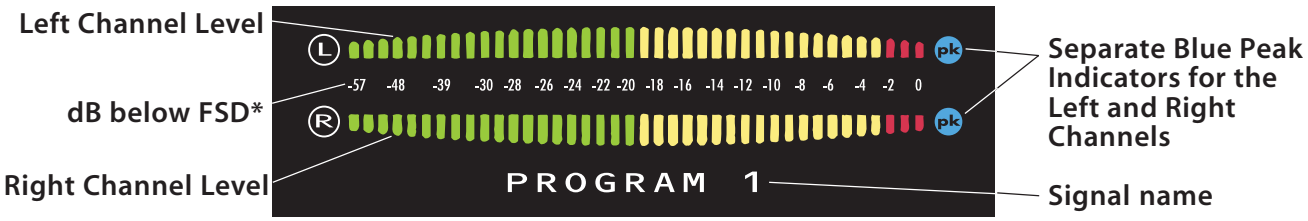
BARGRAPH METERS

Horizontal bargraph meters display stereo outputs as detailed below. The name of the signal being metered is shown below each meter.

The first four meters from the left, except for the BMX*digital*-8, provide separate level monitoring for the four Program or four Utility buses (toggled by the PGM 1-4 and UTL 1-4 buttons on the Session module, see page 3-12). On the BMX*digital*-8, the left hand meter shows one Program or Utility bus. Repeatedly press the PGM 1-4 or UTL 1-4 buttons to display each bus in numeric order on the left hand meter.

The fifth meter, Auxiliary (the right hand meter on the BMX*digital*-8), shows the cue or solo bus level, or a source (an external input, a Send bus, a Utility bus, or the Telco Record Base Mix) set by the Source Selector buttons in the Aux Meter section of the Session module (see page 3-12). The meter's alphanumeric display identifies the name of the selected source (e.g., CUE, SOLO, SEND-2, EXTERNAL-1, etc.).

BMX*digital* 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 always 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 attempting to go beyond, Full Scale Digital (the digital clipping point).

A Session module DIP switch (see page 2-33) sets the meter displays for average only (a solid moving bargraph indicates the average signal level) or for average and peak (a solid bargraph represents the average level with a single bar, typically 6 to 10 dB higher than the average bargraph, representing the peak level).

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

DSP CARDS

The DSP Cards (one in the BMX*digital*-8, two in the BMX*digital*-14, three in the BMX*digital*-22, four in the BMX*digital*-30 and five in the BMX*digital*-38) mount into the console perpendicularly behind the input modules. They are hidden by the meter panel in normal use since there are no operator controls on the cards.

Each card has a "heartbeat" LED to indicate the card's status. One DSP, typically the left hand card, is the master DSP, as evidenced by its heartbeat LED blinking at twice the rate of the remaining DSP Cards.

NET CARD

The optional Net Card (shown below) mounts in line with the DSP cards at the right rear corner of the frame, behind the output modules. It is hidden by the meter panel in normal use since there are no operator controls on the card.

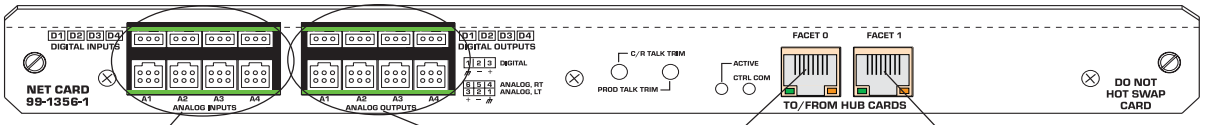
The Net Card has eight local inputs and eight local outputs from the VistaMax Audio Management System. These travel to/from the console to the VistaMax frame with the other console signals through the two Facet connectors on the Net Card.

The Net Card's inputs are used as sources in the VistaMax system. They are made available to one or more VistaMax destinations depending upon how each input is published in the VistaMax system.

The eight Net Card outputs show up as VistaMax destinations. The source for each destination is selected via a Session file setting or are manually selected using a VistaMax hardware Selector Panel or an on-screen software panel, to select the source.

Refer to the VistaMax manual (Harris # 74-52) for additional information on VistaMax sources and destinations.

BMXdigital Net Card



Local Analog & Digital Inputs *Local Analog & Digital Outputs* *Signals to/from VistaMax frame(s)*

BMX*digital* Server Setup

4

The BMX*digital* Server physically consists of a single-board computer (SBC) with an integral Flash Disk to store the operating system, configuration files, setup files and user-created session files.

The SBC is part of the Session module.

The BMX*digital* Server stores these file types:

- Sessions (`.ses` suffix)
- Macros (`.mac` suffix)
- Console setup (`.ini` suffix)
- Console configuration (`.cfg` suffix)

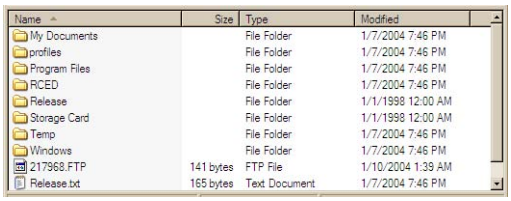
The BMX*digital* Server also functions as an FTP (File Transfer Protocol) server. This allows files to be easily transferred between a networked Windows® computer and the console using an FTP program. A computer networked with the console is generically referred to as the "setup computer," which serves as the editing interface for the BMX*digital* Server files.

All `.ini` and `.cfg` files on the BMX*d* Server are maintained using VistaMax Control Center (VMCC)—an editor program included on the 99-5000 CD-ROM. It is installed and runs on the setup computer. Using the program is covered later in this chapter and in Appendix A.

Because BMX*digital* uses the same operating system as RMX*digital* consoles and VistaMax frames, only one setup computer running VMCC is required to maintain all of the files on all of the VistaMax devices that are networked together in the VistaMax LAN.

BMX*d* File Structure

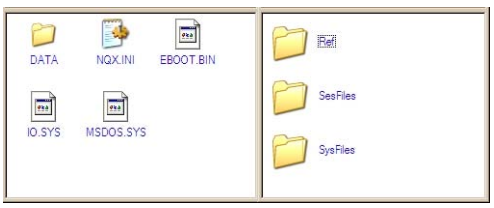
The BMX*digital* console's setup and configuration files must be properly saved into specific folders to ensure proper operation. The following screen shot shows the folders and files in the user-accessible area of the flash disk. Except for `Release.txt`, all BMX*d* server files are located within the Storage Card folder.



Files and Folders on the BMXdigital Server

An FTP program is used to access the console's flash disk. Internet Explorer can be used, but FTP Voyager, a dedicated FTP file management program (a demo version is included on the 99-5000 CD-ROM), is recommended. The default factory IP address assigned to each BMX*digital* console is 192.168.100.22. Enter this IP address into the FTP Site address field in FTP Voyager in order to view the console files on a new console.

Inside the Storage Card folder is a Data folder, an `nqx.ini` file, and three other system files that should not be changed. Inside the Data folder are the SesFiles, SysFiles and Ref folders. The Ref folder is never changed.



Storage Card and Data folder contents

The SesFiles folder holds session and macro files. The SysFiles folder holds these console config and setup files: `ROUTERS.INI`, `INVENTORY.TXT`, `LOCAL_PUBLISH.CFG`, `EDGEDEVICE.INI`, `SERVERID.TXT` and, when the console is networked in a VistaMax System, a device publish file (`Dx_PUBLISH.CFG`) for other devices (consoles and racks) in the VistaMax community.

BMXDIGITAL SERVER FILES OVERVIEW

RELEASE.TXT

This text file—stored at the top level of the flash drive, lists the operating system version, build number and build date. This can be compared to the current operating system build on the Harris FTP site (see page 5-1 for access details). The `release.txt` file looks like this:

```
VistaMax Platform Version 4.20 [SJP]
CE.NET 4.2 + 2004 Q1 and Q2 QFEs applied

#build 441 - built 08:09:2005 @ 16:46.08

Technology of Pacific Research & Engineering
Copyright 2003 - 2005 Harris Corp.
```

NQX.INI

This essential setup file is in the Storage Card folder. It is read as the SBC starts after power up, when the SBC Reset button is pressed or when the SBC is reset via an FTP command.

The file stores the console's IP address, server name, device number and several other start-up parameters. The file is maintained using VMCC. The most commonly edited file entries are covered in on page 4-5, BMX*d* Server Configuration.

PROVISIONED.HASH

This file is also in the Storage Card folder. It is created by VMCC, which uses it to determine which files are to be replaced when Distributing files. Deleting this file will cause the next Distribute files action to replace all files. This is equivalent to selecting the Force Download option.

SESFILES FOLDER

The SesFiles folder holds all of the user-created session and macro files, and the `init.mac` file, which is a special macro file created and maintained using VMCC.

A session file is used to instantly change console channel settings for particular dayparts or for specific applications like voice tracking, production, newsroom use or on-air use. A session is created by first selecting the channel sources and setting the channel button assignments as required for a particular daypart or application. Pressing *Save* on the Monitor Control panel saves these console settings as a new session file into the SesFiles folder.

A session file is loaded into the console by first using the Monitor Control panel's rotary Session Selector to alphanumerically list the `.ses` files in the SesFiles folder. With the desired session file name displayed, press *Take* to load that session into the console. This reconfigures the channel settings—except for those channels that are On, they do not change to the new session settings until they are turned Off to prevent any on-air signal interruption.

Macro files are text files like sessions, but they are not selected using the Session Selector. If a board operator would need to load a macro they can be assigned to a router channel, otherwise they are loaded using FTP commands (either manually using FTP Voyager or automatically by using the Task Scheduler program included on the 99-5000 CD-ROM). Macro files have a `.mac` suffix.

A special macro file maintained by VMCC, called `init.mac`, loads automatically each time the SBC starts up to set the sample rates on the two adjustable rate outputs on the Net Card.

Editing session files as well as creating and editing macro files are covered in later sections of this chapter and in Appendix A.

SYSFILES FOLDER

The SysFiles folder holds the remaining console configuration and initialization files. It also has a number of files automatically maintained by the BMX*digital* server. These include route persistence files (PF_xx.bin) that allow audio routes to be automatically reestablished if power is lost to the console.

The following descriptions cover user files in the SysFiles folder:

SERVERID.TXT

This text file lists the ID number of the KSU card's Single Board Computer (SBC). It consists of a single line of text:

`Server ID is 123-456-789.`

The number (e.g., 123-456-789) is the Server ID for that particular SBC. This number can be given to a Harris tech support representative in order to receive a License Code (entered into VMCC) to unlock optional extended features on a specific console.

INVENTORY.TXT

This text file lists the modules plugged into the console and how many DSP cards are in the frame. This information is updated whenever the console is restarted or a module is removed or changed. The inventory is also saved in the Mapping section of each session file.

Modules are listed by hex numbers. The numbers are the hex equivalent of session file channel ID numbers.

```
Map_0_to_7=ff ff ff 01 02 03 04 05
Map_8_to_15=06 ff ff ff ff ff ff ff
Map_16_to_23=ff ff ff ff ff ff ff ff
Map_24_to_31=ff 07 08 09 0a 0b 0c 0d
Map_32_to_39=0e 0f 10 11 12 13 14 15
Map_40_to_47=16 17 18 19 1a 1b 1c 1d
Map_48_to_55=1e 1f 20 21 22 91 92 61
Map_56_to_63=61 b1 b2 ff ff ff ff ff
DSP=4
```

Typical BMXd-38 INVENTORY.TXT file contents

ROUTERS.INI

This file, also maintained using VMCC, sets which sources and destinations are available for routing on a console. There are three sections to the file: router definitions; source include list; destination include list, as shown below:

```
[Routers]
; Router types supported: VistaMax
Type_1=VistaMax
;
[SrcInclude]
Include_1_1=D3.225-231
Include_1_2=D11.173-233,257-291
;
[DstInclude]
Include_1_1=D11.129-159,209-215
```

Headers (`[Routers]`, `[SrcInclude]`, `[DstInclude]`) define the sections. `[Routers]` sets whether a VistaMax or another type of router is networked with the console. `[SrcInclude]` (Source Include) lists all of the input signals that could be shown on the router or telco modules' source selectors. In the example above, only signals 225-231 on device 3 and signals 173-233 and 257-291 on device 11 would be shown in the source selectors.

`DstInclude` (Destination Include) lists the destinations that are available to Edge Devices served by the console. In the example, the only destinations that would be shown on a VM-SDS (source/destination selector) would be those on device 11, destinations 129-159 and 209-215.

Each include statement line lists sources from a single VistaMax device. However, when there are a lot of sources from one device, there could be multiple `Include_x=` statement lines for that one device.

EDGEDEVICE.INI

This file, maintained using VMCC, configures edge devices (console or rack-mount source or source/destination selector panels) that receive their information from the BMX*digital* Server. An `edgedevice.ini` file example, for a single VM-SSD selector panel, is shown on the next page.

```
[System]
;=============================================================
;TimeServerIP=192.168.100.11:123;
;LogServerIP=192.168.100.11:514;   ;
;VMCommunityIP=234.5.6.7:5100;default value
;
;=============================================================
[EdgeDeviceIndex]
;=============================================================
EdgeDevice_1=00-60-35-01-e8-ff     ; SS_1_6_Dst
;
;=============================================================
[00-60-35-01-e8-ff]                ; SS_1_6_Dst
;=============================================================
EXEFile=rced/rced.tini      ;Location of tini
FTPServerIP=192.168.100.22  ;server IP address
DeviceIP=192.168.100.201     ;edge IP address
DeviceMask=255.255.255.0     ;Device mask
GatewayIP=0.0.0.0            ;Gateway
LogServerEnable=1
;ServerName=BMXd_1;
DeviceName=SS_1_6_Dst        ;Edge device name
VMServerIP=192.168.100.22:4001 ;IP add:port#
;
Destination_1=D1.243
;
Include_1_1_1=D2.225-231
Include_1_1_2=D3.71,77,129,131
Include_1_1_3=D1.173,175,225,227,257-291
;
Include_2_1_1=D1.257-271
Include_2_2_1=D2.225
Include_2_2_2=D3.71,77,129,131
Include_2_2_3=D1.225
Include_2_3_1=D1.273-287
Include_2_4_1=D2.225-231
Include_2_4_2=D1.225,227,233,289,291
Include_2_5_1=D1.273-287,337,339
Include_2_6_1=D1.257-271
;
;Button Assignments =============
Button_1_1=D3.71
Button_1_2=D3.129
Button_1_3=D3.131
Button_1_4=D1.225
Button_1_5=D1.273
Button_1_6=D1.275
;
Button_2_1=D1.245
Button_2_2=D1.247
Button_2_3=D1.249
Button_2_4=D1.251
Button_2_5=D1.253
Button_2_6=D1.255
```

Although edge devices are typically served by a VistaMax frame, they can be served by a console, as shown above. This is typically only done when the controlled destinations are the console's Net Card outputs. As shown, a dual selector panel (VM-SSD) is configured so that the left buttons (identified as Button_1_1 thru 6) are hot source keys to control the source for destination 1 (signal 243: the Net A2 analog output). The right hand buttons are conversely set as six destination selectors (Button_2_1 thru 6) for signals 245 - 255: the net Card A3 and A4 analog outputs and the four digital outputs, D1 thru D4).

Each destination covered by the edge device has an included signal list (identified by the Include_1 and the Include_2 entries). Again, all of these entries are set using the VMCC program, covered later in this chapter and in Appendix A.

LOCAL_PUBLISH.CFG

This file, again created by VMCC following the parameter entries entered into the program, lists all of the sources and destinations on the console by their In Room Names. It further identifies whether the signal is hidden or not and whether it is stereo linked. The following example of a `local_publish.cfg` file shows just a portion of the KSU card audio signals:

```
;AudioSrc Card#: 63
src=241,NET A1
src=242,NET A1R
src=243,NET A2,244
src=244,{NA2R
src=245,NET A3,246
src=246,{NA3R
src=247,NET A4,248
src=248,{NA4R
;
;AudioDst Card#: 63
dst=241,A1 ALG,242
dst=242,{NA1R
dst=243,A2 ALG,244
dst=244,{NA2R
dst=245,A3 ALG,246
dst=246,{NA3R
dst=247,A4 ALG,248
dst=248,{NA4R
```

Each line identifies one signal as either a source (`src=`) or a destination (`dst=`), along with two characteristics: whether the signal is hidden and whether it is mono or stereo. For example, the first source shown: `src=241,NET A1`, identifies signal 241 as the left output of Net Card connector A1. It is a mono signal since the next entry (`src=241,NET A1R`) is not linked to the previous entry by a `,242` at the end of the entry. Both signal 241 and 242 are available and are not hidden (an open bracket, {, placed in front of the name hides that signal from being selected or seen by the other VistaMax community devices).

The first destination signal that is shown (`dst=241,A1 ALG,242`) identifies the signal as the A1 analog output of the net Card (signal 241); that its displayed name is A1 ALG; and that the signal is stereo linked to the next signal (by the

,242 at the end of the entry). The "right channel" of the A1 analog output (dst=242,{NA1R) is hidden because of the { (open bracket) in front of the signal name. On stereo signals the right channel is always hidden by default.

Dx_PUBLISH.CFG

As part of a VistaMax system, each console and frame has a unique device number assigned in its nqx.ini file. In order for a device to know what sources are available from other devices, a Device Publish file is created by VMCC in the form of Dx_publish.cfg where x is the console's device number. The example below shows the same section as the local_publish file shown previously:

```
;AudioSrc Card#: 46
src=161,11.MM1
src=162,11.MM1R
src=163,11.MM2
src=164,11.MM2R
src=165,{11.MM3,166
src=166,{11.MM3R
src=167,{11.MM4,168
src=168,{11.MM4R
;
;AudioDst Card#: 46
dst=241,11.NA1,242
dst=242,{11.NA1R
dst=243,11.NA2,244
dst=244,{11.NA2R
dst=245,11.NA3,246
dst=246,{11.NA3R
dst=247,11.NA4,248
dst=248,{11.NA4R
```

VMCC distributes a device publish file to every other device in the community. The file is like the local_publish.cfg file except that the names consist of: the Call Group entry (11 in the example above), the community Name Radix entry (a period in the example above) and the four-character Community Name (as defined in the VMCC Signal Summary).

BMXd Server Configuration

Several software programs must be installed on the setup computer in order to configure the BMX*digital* server files. These programs are supplied on the 99-5000 CD-ROM. They can also be downloaded from the Harris FTP site (see page 5-1 in Maintenance for FTP access details).

COMMUNITY MONITOR

Community Monitor (CM) runs as a process on the setup computer (it initially appears as only a tray icon:  . Right-click on the icon and select Show Monitor Display).

The Community Monitor listens to communications on the VistaMax LAN from all VistaMax community members. It obtains such parameters as IP address, device name and MAC address for each community member. It also writes a text file on the setup computer, Community Monitor.txt, that identifies each community member. This file is updated with each community member change. Thus, CM should always be run prior to inspecting a community in VMCC.

VISTAMAX CONTROL CENTER

The VistaMax Control Center (VMCC) is the user interface for editing and maintaining the settings of the various BMX*d* server setup files (nqx.ini, init.mac, edgedevice.ini, routers.ini, local_publish.cfg and dx_publish.cfg) so the console fits into a particular VistaMax community. This is covered in more detail throughout the remainder of this chapter.

The VMCC program (icon: ) not only sets up and maintains files for any BMX*digital* console—it also does the same thing for all VistaMax community members (any RMX*digital* or BMX*digital* console, VistaMax rack or VistaMax edge device connected to the LAN). It also automatically updates each interdependent file when any

change is made, automatically deciding how each community member reacts to the new download files—when the `nqx.ini` file is changed, the console must be restarted; when a publish file or the `routers.ini` file is changed, an Init Router procedure must be run to read the new files; and an Init RCED must be run to restart edge devices when the `edgedevice.ini` file changes. VMCC allows for staggered file distribution, so that on-air consoles can be updated in non-drive time, even if a production room has already been updated.

FTP VOYAGER

A program demo is included on the CD-ROM. This is the best FTP file transfer program to use on a VistaMax system. The program transfers session and macro files between a console and the setup computer, where they can be manually edited using Notepad, and then can upload them back to the console or frame. The program is also useful for downloading files from the Harris FTP site.

3CDAEMON

This program has a syslogger to monitor the VistaMax network operations. Another main function is to serve as a TFTP server so that new operating system code can be easily uploaded to a VistaMax device during start-up.

Each of these programs has a readme.txt file on the 99-5000 CD-ROM (and the FTP site) with full installation and setup information.

CONFIGURATION PREREQUISITES

The following items are required before the BMX*digital* Server can be configured for a specific VistaMax system:

- A setup computer running Windows® 98/NT/2000/Me/XP with one 10Base-T or 100Base-T Ethernet port assigned to a fixed IP address of 192.168.100.11.
- A crossover or a straight-thru CAT-5 cable (depends upon the type of connection between the setup computer and the console).
- A fixed IP address that can be assigned to the BMX*digital* Server for use within the VistaMax local area network.
- An installed and working BMX*d* console.

If unsure of network configuration procedures, check with a network administrator.

There are the two methods of connecting the setup computer to the BMX*d* Server:

Direct Connection

1 Connect a **crossover** CAT-5 cable between the KSU card's Ethernet connector and the Ethernet port assigned to IP 192.168.100.11 on the setup computer.

Connecting Thru a Network Switch*

1 Connect a **straight-thru** CAT-5 cable from the KSU card's Ethernet connector to an open port on the network switch.

2 Connect a **straight-thru** CAT-5 cable from the Ethernet port on the setup computer to another open port on the network switch.

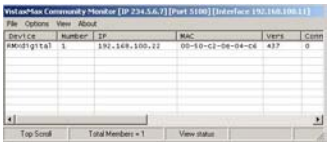
* A network hub could be used during installation, but it is not recommended for normal use. Only a network switch should be used. Before making this connection make sure that the console's IP address (the default address assigned at the factory is 192.168.100.22) does not conflict with an existing network address.

INITIAL CONFIGURATION PROCEDURE

This procedure requires that both CM and VMCC be installed on the setup computer; that the BMX*digital* console is installed and powered up using the factory IP setting of 192.168.100.22; and that the setup computer and the BMX*digital* are networked together.

1 Start Community Monitor

Click the desktop icon ( ) on the setup computer to start Community Monitor. This adds a miniature icon to the taskbar tray. Right-click on the tray icon to select Show Monitor Display. An example is shown below:



Community Monitor display

The new console should be shown in the display with an IP address of 192.168.100. 22. If the console is not shown, then CM may be listening to the wrong Ethernet port on the setup computer.

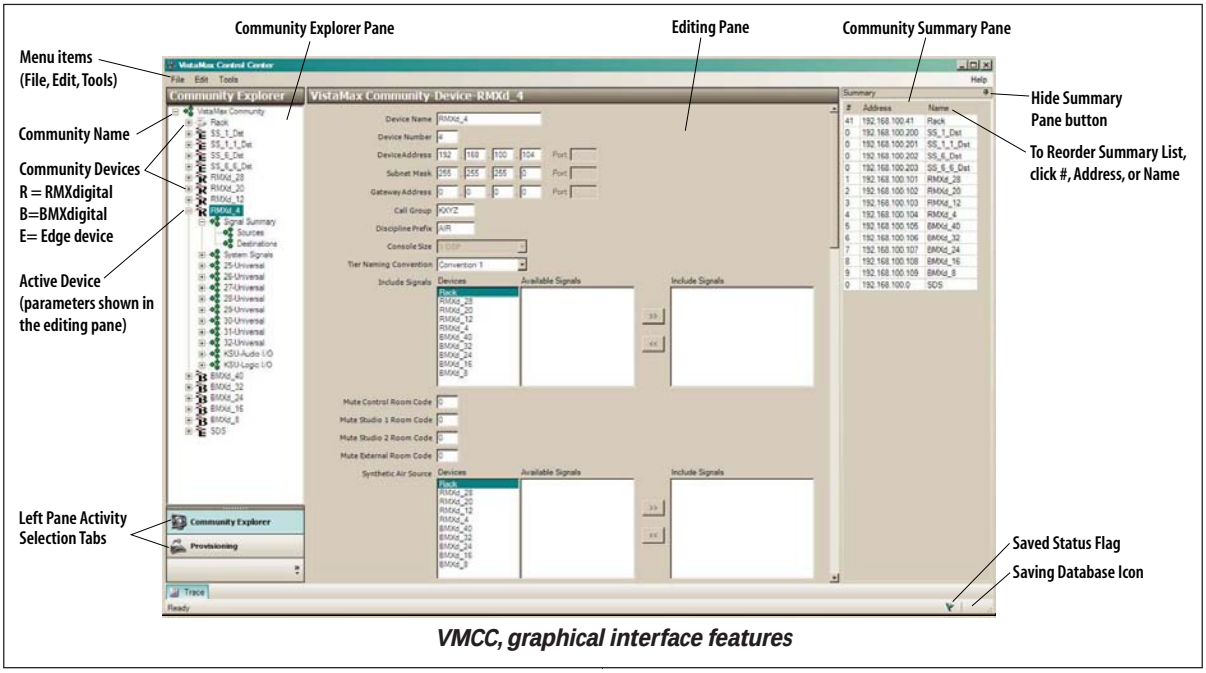
To change which port CM uses, click *Options*, then select *Setup*. If 192.168.100.11 is not shown in the Community Local IP address window, click the window's down arrow, select that address, then close and restart CM.

Once the new BMX*digital* console is shown in the CM display, the setup computer is properly communicating with the new console.

2 Start VMCC (desktop icon:)

The first time VMCC starts up, no community is displayed. Click the *Tools* menu and select *New Community* to start setting up a new community. Use the illustration below to identify the VMCC user interface features.

The Editing pane, in the middle of the program window, allows global parameters for the VistaMax community to be set when the community name is highlighted in the Community Explorer pane along the left side. These parameters include naming the new community and changing the administrator address (which uses the setup computer's IP address: 192.168.



VMCC, graphical interface features

100.11). The other settings can be left at their default settings at this time.

The Editing pane is also where configuration parameters for the consoles, racks, panels, cards and signals are shown and edited. Which set of parameters are currently shown is set by highlighting the item in the Community Explorer pane. The Explorer pane uses a tree structure to expand and collapse items as required. Click the + button next to a console name expands its tree to show individual panels and cards and a Signal Summary. Clicking the - button collapses the tree, hiding the items.

Along the right side of the VMCC screen is a Community Summary pop-open window that lists the IP address, device number and name for each community member. It is most often used when creating a community or when adding new community members. The Community Summary can be hidden by clicking on the upper right push-pin icon. The summary window can also be dragged to another location within the main program window.

3 Inspect the VistaMax Community

Click the VMCC *File* menu item, then select *Inspect Community*. A community inspection window opens to show all the VistaMax devices detected—which in this case should be only one, the new BMX*digital* console.

If the console is not found, then the VMCC VistaMax Network Interface setting may need to be changed under the *Tools* menu. Click *Tools*, then select *Options*. In the Option window, click the *Administration* tab. In the VistaMax Network Interface list box, click the down arrow to list the NIC cards on the setup computer. Select the 192.168.100.11 card, click OK, and reinspect the community.

Verify there's a check mark under the Inspect heading for the BMX*d* console (doubleclick the box to add the check mark). Click the Inspect button to inspect the console's information. The information line shows "done" when the inspection is completed. Click Continue to move to the window showing the inspection results. With a new console there will be no slot conflicts or critical issues, so click the Accept button.

After a few seconds the console shows up as a new community member in the Community Explorer pane along the left side of the window. This pane shows each device in the VistaMax community.

4 Edit Console Settings

Click once on the console's name in the Community Explorer pane to highlight the name. This switches the editing pane to show Device parameters where a unique device name, unique device number and a unique IP address for the BMX*d* console are set.

Additional parameters, which affect how this device interacts with the other consoles and racks in the VistaMax community, are also set in the Device pane. Setting the device parameters are covered in the Configuration Notes and Tips later in this chapter.

5 Provision Files

Once the console parameters are edited as required, the new settings must be used to create new console configuration files. Creating the configuration files is called Provisioning. Click the *Provisioning* tab at the bottom of the Community Explorer pane to switch the display to show the provisioning panes.

The provisioning panes have only two buttons at the top: *Provision* and *Distribute...* Clicking the *Provision* button creates the setup and configuration files from the parameters entered in the editing pane, as required for the console. The provisioned files can be double checked in

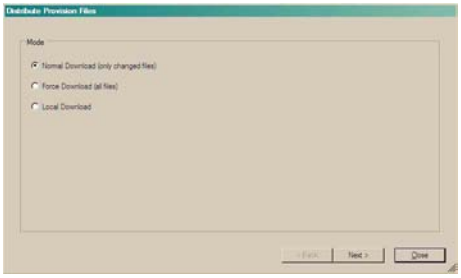
the middle pane by clicking the + button next to the console name to drop down a list of the setup files VMCC created.

Provisioned File List for BMXdigital

Clicking on a filename displays the file contents in the provision editor pane. Even though files can be manually edited in the provision editor pane, this should NOT be done on a normal basis as the edits will be overwritten the next time the *Provision* button is clicked.

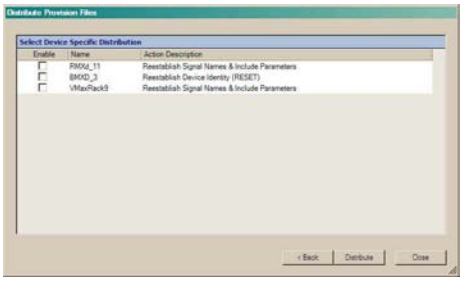
6 File Distribution

After double-checking the provisioned files, the final step is to distribute the provisioned files to the console. Clicking the *Distribute...* button opens a dialog box with the three distribution options: perform a normal console download (where only changed files are replaced on the console); perform a force download (where all console files are replaced by the files provisioned by VMCC); or save the provisioned files to the setup computer's hard drive.



File Distribtuion Selection window in VMCC

Click a radio button to select the distribution method, then click the *Next* button. If Local Download is selected, a save dialog box opens to the My Documents folder. If necessary, change folders, then click *Save*. When Normal or Force Download was selected, VMCC opens a Device Specific Distribution window, while checking that it can communicate with the various community devices. This window also lists the action that will be taken after the files are distributed. To send the files the device must be enabled (doubleclick on the Enable boxes to add a check mark).



Device-Specific Distribution List Window

Click *Distribute* to download the provisioned files to the enabled devices. If `nqx.ini` has changed (as shown above for BMXd_3), the console will be reset. If Force Download was selected in the previous screen, then every device will "Reestablish Device Identity (RESET)." When the publish files have changed, then an initialize router will be performed (as shown above on VMaxRack9 and RMXd_11). If the edgedevice.ini file has changed the an initialize RCED (Remote Control Edge Devices) will be performed so that the edge devices will read the updated information.

Now that a community has been created, adding new community members is a matter of opening up the community and, following steps 3 thru 6, add each new console or frame following the recommendations and tips presented in the following sections. For additional information on VMCC refer to Appendix A.

CONFIGURATION NOTES AND TIPS

If a console is not networked with a VistaMax system, it could continue to use the factory default IP address (192.168.100.22). In such a case, a network switch is not required since the setup computer could be directly connected to the console, using a crossover CAT-5 cable, whenever any files require editing.

With multiple BMX*digital* consoles, RMX*digital* consoles, VistaMax racks and VistaMax Edge Devices networked together, it is essential that a list of all devices on the VistaMax LAN be kept so that nonconflicting IP addresses can be assigned and set on each device before connecting them to the network switch. Sequentially list network devices (consoles, racks, edge devices, switches and computers), assigning a unique IP address and, for the consoles and VistaMax racks, assigning unique device names and numbers (from 1 to 63).

Here is a suggested network addressing scheme, using the default 192.168.100.xxx addresses, for assigning devices in easy-to-remember blocks of IP addresses:

Suggested IP Addressing for a VistaMax LAN

Networked Device	*IP Address*
Network switches, local computers	192.168.100.1 up to .10
default TFTP server (setup computer)	192.168.100.11
spare addresses	192.168.100.12 up to .21
default console IP address	192.168.100.22 *
spare addresses	192.168.100.23 up to .32
default VistaMax frame IP address	192.168.100.33 *
spare addresses	192.168.100.34 up to .40
VistaMax frames	192.168.100.41 up to .49
VistaMax Intercoms	192.168.100.50 up to .100
Consoles (BMX*d* or RMX*d*)	192.168.100.101 up to .199
VistaMax Edge Devices	192.168.100.200 up to .299

* to avoid conflicts when adding a new console or frame, do not assign these addresses to any LAN device.

Note: Major network communications problems will occur if two devices are assigned the same IP address and are plugged in together on the network. Always confirm all IP addressing choices with a knowledgable network administrator.

Before the setup computer can access the BMX*d* Server, its IP address must be changed so it is inside the local subnet mask assigned to the BMX*d* Server. The default IP address for the console, as shipped from the factory, is 192.168.100.22 with a default subnet mask of 255.255.255.0.

Note: If the IP address has been changed and is not known, it can be recovered using a serial port connection. See Settings Recovery on page 4-27.

Contact a network administrator if additional information is required to change the setup computer's IP address.

NQX.INI FILE SETTINGS

These are the `nqx.ini` file settings that are set using the VMCC program (highlight the console name in the Explorer pane to show these settings).

Device Name Enter a unique Device Name to identify the console. It can have a maximum of ten alphanumeric characters, but it **cannot contain spaces or any special characters. This** entry sets the `NAME=` parameter in the `nqx.ini` file.

Device Number Enter a unique number, from 1 to 63, to identify the console as a VistaMax device. The number used is typically related to the console IP address (e.g., if the console IP is set as 192.168.100.122, the device number would be set to 22). This entry sets the `Device_number=` parameter in the `nqx.ini` file.

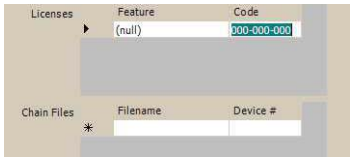
Device Address Each console and frame must have a unique fixed IP address. The first three octets (e.g. 192.168.100.xxx) are identical for all devices in the system. The last octet identifies the device. See the suggested IP Addressing Table adjacent for suggested addresses. This entry sets the `NET_IP=` parameter in the `nqx.ini` file.

Subnet Mask Typically, the default subnet mask (`255.255.255.0`) is left as is. Check with a network administrator before making any changes to the subnet mask.

Gateway Address This is normally left at the default setting (`0.0.0.0`) to prevent external access to the VistaMax LAN. Again, check with a network administrator before making any changes to the gateway address.

These are all of the entries that must be changed by VMCC in order to add a new BMX*digital* console into an existing VistaMax community.

An additional entry (Licenses) may be required if customized features must be unlocked. The License Code is entered into the Licenses dialog box located near the bottom of the console editing pane.



Device License Entry Box

There are two parts to a License Code: the feature name and the code number. The feature name is the name of the License (automation, router, control extension, etc.). The code number is a nine-digit number (e.g., 123-456-789).

To obtain a License, the Server ID number for the console (listed in the `serverid.txt` file) must be given to a Harris Technical Services or Sales Representative so that they can generate a License Code for that specific BMX*digital* console.

When the `nqx.ini` file is provisioned and distributed, the console automatically restarts so that the file changes can take effect. Use Community Monitor to verify the new console was setup correctly. CM will list the console name, device number and its IP address.

CONSOLE SIGNAL SETUP

Having configured the `nqx.ini` file means the BMX*digital* console can safely be networked with other VistaMax devices in the community—but it doesn't mean the console is "ready for air" yet. There are a number of source and destination parameters that need to be set properly to integrate a console into a VistaMax community:

1. In Room names, Community Names and signal descriptions can be edited to specifically identify the signals.

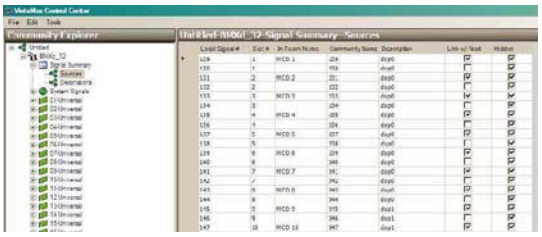
2. The signal mode (stereo or mono) needs to be set. All user inputs and outputs defaults are stereo (odd number signals are Linked to the Next even numbered signal), but any could be changed to mono.

3. Set whether a signal is Hidden (cannot be seen by other community members). Hidden signals cannot be a routed source or destination.

4. Set whether the signal is added on various Include Lists.

5. Set whether a Universal Input module is assigned as a router on either the A or B input source.

Most of these settings are done in the Signal Summary pane (shown above). To open it, click the console name + button to open its tree, click the Signal Summary + button and then highlight either Sources or Destinations. This pane is where signal names are assigned, mono/stereo selection is set and setting whether a signal is hidden or available is made.



Signal Summary Pane in VMCC

Additional signal settings are done in the module detail pane. This pane is opened by selecting a specific source or destination signal. In the example

below, a Universal input module is shown, which is the only module that has anything set in this pane. To view this pane, click on the module name. Checkmark either the *A Input is routed* box or the *B Input is routed* box to set that input as a routed source. The opposite input should be left unchecked to allow the local source to be selected. Selecting both inputs as routed does no harm, but since there is only one signal that can be routed to a Universal input module, it is not useful.

Module Detail Pane in VMCC

The following parameters are edited in the Signal Summary pane:

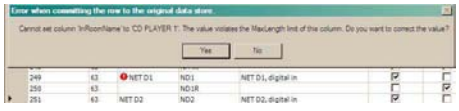
In Room and Community Names, Description

The In Room Name identifies the signal in the module source selectors using up to nine alphanumeric characters.

The Community Name is a four-character name to identify the signal on other community members' console or edge device source selectors. It follows the Call Group prefix (which is set in the console pane) and the Name Radix (set in the community pane).

The description helps to identify the signal to other VMCC users.

To enter the signal names and definitions, click on the In Room Name, Community Name or Description and edit them as required. If too many characters are entered or if an illegal character is entered, a red exclamation point and error warning box will be shown so the error can be corrected.



Name Length Error in VMCC

Signal Format (Stereo or Mono)

All AMP MOD IV audio connectors on the BMX*d* carry two signals. By default, each is set as a stereo connection, with the left signal being assigned an odd signal number and the right signal being assigned the next even signal number. This ensures the two signals are treated as one source or destination for proper phase, timing and routing of the two signals.

This stereo relationship is set by a check mark in the column *Link w/Next*. The check mark sets the signal as stereo linked with the next signal. Typically this is only done on the odd-numbered signals so that a stereo signal is on one connector.

To change a stereo signal into a pair of mono signals, remove the check mark in the *Link w/Next* column by double-clicking on it. The two signals will now be treated as two separate mono signals. When a mono signal is routed to a module, it automatically appears on both the left and right outputs of the module.

Hidden Signals

Each console has many signals that are set as Hidden. These include each stereo signal's right channel (which is hidden so that only the left channel name shows up in source selectors) and all of the internal console-only signals (several mix-minus primitive and talkback signals).

A Hidden signal has a check mark in the *Hidden* column to indicate it is not available to add to any signal include list. For most installations, the default settings for Hidden will work fine. To change the Hidden status, doubleclick on the check mark to remove it, or doubleclick in the empty box to add a check mark.

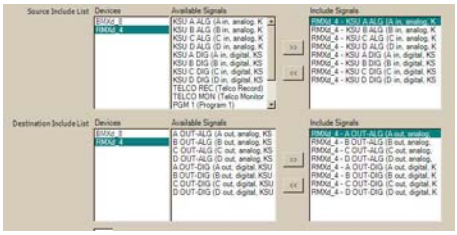
A quick way to set the check marks for an en-

tire console is to click once to highlight any column entry and then use the keyboard space bar to check or uncheck that check box. Use the up and down arrow keys to quickly move through the list, pressing the spacebar as required to change check mark status.

Remaining entries are set in the Console pane. Highlight the console name to see these items.

Create Console Include Lists

Only those signals without checkmarks in the Hidden column can be added to an include list. An Include List is the master signal source or destination list for a console. The source include list sets which signals are available for routing (e.g. which ones are shown in the source selector displays). The destination include list sets which destinations can have signals routed to them. This typically only affects edge devices (e.g. Source Selector panels or Source/Destination selector panels) since the console does not have any destination selection device.



Setting Signal Include Lists

To create the signal lists, first highlight a Devices name. All of the unhidden sources or destinations on that device are shown in the Available Signals box. Using standard Windows selection techniques, select the desired signals, then click the double right arrow key (>>) to add these signals to the Include Signals list. Repeat for the other devices.

To remove any sources from the Include List, highlight the signals then click the double left arrow key (<<).

Net Card Sample Rate Selection

There are two output sample rate selection boxes for the first two digital Net Card outputs (Output A is D1 and Output B is D2). Each can be set for either 48 kHz or 44.1 kHz. The remaining Net Card digital outputs have a fixed 48 kHz sample rate output.

Net Card Sample Rate, License and Chain Files Entry Box

Chain to a Session File

After the operating system completes loading at console start up, the `init.mac` file is loaded. In the init.mac file, there's a Chain Files section where one or more session files can be listed to automatically load after `init.mac`. Typically, this is for a setup file to load that configures the console for its standard function (air, production, voice tracking, etc.). In some applications, a session file on another device will also need to be loaded, so it is also entered here.

In the example, `mix-minus.ses` is a setup file on device 3. It will be loaded after the `daypart_0.ses` file loads on the local console (the Device # 0 entry indicates the file is on the local device).

ADDITIONAL VMCC INFORMATION

Appendix A has additional details on usingVMCC to accomplish various system setup tasks. Examples of system design and console setup commands are also presented with additional session file and macro file information beyond that covered in the remaining section of this chapter.

Session Files

Session files are text files with the suffix `.ses`. Pressing *Save* on the Monitor Control panel saves the current console settings and source selections as a new session file in the SesFiles folder on the BMX*digital* Server (`storage card/DATA/SesFiles`).

There is no limit to the number of session files saved, however, since every session saved to the SesFiles folder is listed in alphanumeric order on the Session Selector, only active session files should be keep in this folder. Periodically use the setup computer to delete old or unused session files from the folder using FTP Voyager. Old sessions and engineering test sessions could be kept in a folder created inside the SesFiles folder since session files in this folder are not seen by the operator.

To create a new session, set the console's assignment buttons to reflect a particular console function (e.g., a morning show, a midday program, an interview show, etc.). The button settings and source selections are then saved into a new session by pressing *Save* on the Session module.

Each time *Save* is pressed, all of the current input module button settings and source names are saved to a new session file. If no session was loaded, the new session has the default filename: `undefined.ses` with a numeric suffix (e.g., `undefine01.ses`, `undefine02.ses`, etc.).

If a session was previously loaded, then the name used is the current session name with a numbered suffix. Since session names are limited to 10 alphanumeric characters, the original session name will be truncated as required (as in `undefine01.ses`) to add the numbered suffix.

EDITING SESSION FILES

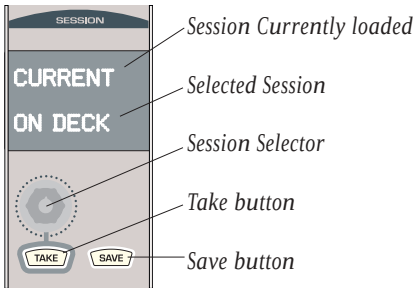
Once a session is saved, any LAN-connected computer can retrieve and edit the `.ses` file as required. Use a text-only editor (Windows® Notepad) to add or update any session settings (e.g., adding labels, changing the channel source, adding button lockout information, etc.). This same computer could also be used to perform other session management duties like renaming or deleting session files.

MAKING A TEMPLATE SESSION

To simplify creating new sessions, it's recommended that a session file be created with the most common settings used on the console including channel source selections, labels and button lockouts. This session file, placed in the SesFiles folder, is then selected and taken on the console as the basis for creating new sessions by adjusting the channel settings and then pressing *Save* to create a new session file. Rename the session file, using the setup computer, as required.

LOADING A SESSION FILE

Use the Session Selector on the Session module to list the session files in the SesFiles folder. Files are listed in alphanumeric order in the bottom line of the session display. Turn the selector clockwise (CW) to move up through the list or counterclockwise (CCW) to move down through the list. Once the desired session name is in the bottom line of the Session display, press *Take* to load the session.



Monitor Control panel, Session File Controls

For example, to recall and load the "undefined" session file, which is a session file that ships with the BMX*digital*:

1 Use the Session Selector to find and display `UNDEFINED` in the bottom line of the session display.

2 With `UNDEFINED` in the bottom line, press *Take* to immediately load the session.

Note: When a session is loaded, any modules that are On do not immediately update to the new session information. Instead, those channels' On buttons flash to indicate there are pending changes to that module. When a pending module is turned off, the new session file settings take effect.

DOWNLOADING SESSION FILES

Before downloading any session files to the setup computer, create a Session Files folder to save the files while editing and uploading them back to the BMX*digital* Server.

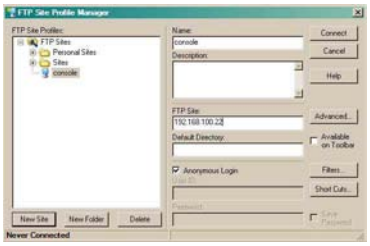
To download a session from the BMX*digital* Server to a setup computer:

1 Start FTP Voyager.

2 In the connection window, select the console, then click Connect.

If the setup computer has never connected to the console, click *New Site*, then enter the console's name and IP address in the entry boxes, as shown below:

Click Connect to connect and display the console's file tree, as shown below:



FTP Voyager Connection Dialog Box

3 Open the Storage Card folder, then the Data folder, then the SesFiles folder. The folder's contents were shown on page 4-1.

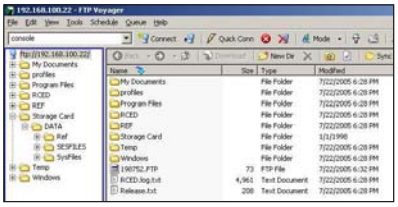
Note: Folder shortcuts can be created in FTP Voyager to go directly to the SesFiles folder in any console. Click *Tools*, then *Folder Shortcuts*. Click *Add* and then type in the SesFiles folder path name into the Path entry box: `Storage Card/Data/SesFiles`. Click *OK* twice (to close the entry box and to accept the new shortcut). A green SesFiles folder is now shown in the file tree. Clicking once on this folder opens the SesFiles folder.

4 Drag the desired session file from the SesFiles folder to the Session Files folder created on the setup computer.

Editing and Renaming Session Files

After downloading the session file, use Notepad® to open the session file and add any channel labels, button lockouts or other changes required. After editing the file, use *Save As. . .* to give it a more descriptive name like `template.ses`.

Note: Session files can also be renamed using standard Windows® functions (e.g., right-click the file name and choose *Rename*) or click, pause, click on the name to highlight it. This can be done using Windows® Explorer on the setup computer or while viewing the BMX*digital* Server's FTP site using FTP Voyager.



BMXd Server Files using FTP Voyager

Note: Session names can be up to ten alphanumeric characters plus the `.ses` suffix. Special characters are not allowed but spaces and underlines are OK. File names appear in upper case letters in the session display even when named using upper and lower case.

Uploading Sessions

To use an edited session file, it must be uploaded to the BMX*digital* Server's FTP site. If a template file (`template.ses`) was created, it can be uploaded and then used as the basis for creating new session files. The template session file must have the file extension `.ses`.

To upload the template session file to the BMX*digital* Server:

1. Open the BMX*digital* Server's FTP site, if it is not already open, and navigate to the SesFiles folder.
2. Drag the `template.ses` file from the local computer to the SesFiles folder on the BMX*digital* Server's FTP site.
3. Dial up and then take the TEMPLATE session to load it into the BMX*digital* console. Confirm that all of the settings and input sources are set correctly before using it as a template to create standard sessions.

Session and Macro Files

Session and macro files can have these sections:

- General File Information
- Universal Input Module Source Labels
- Routed Channel Source Selections
- Channel-Specific Include Lists
- Channel-Specific Button Settings
- Channel-Specific Button Lockouts
- Channel Mapping

Channel IDs identify each module or channel by frame position, module type (Universal Input, Telco or RLS) and whether the module is set for a routed input. Signal IDs uniquely identify each source and destination in a VistaMax system. These different numbering systems are covered in the following sections.

Channel ID Numbers

BMX*digital* components (input modules, monitor modules, Net Card connections) are assigned unique ID numbers based upon their position in the mainframe and by their DIP switch assignment settings to specifically identify local signals.

Universal Input modules are numbered from the left end of the frame (number 1) sequentially to the right.

Telco and RLS modules are numbered separately because each type has three modes of operation (assigned through module DIP switches) although typically only two (Direct and Router) are used in a VistaMax system. Telco modules are further identified by a Telco number, from 1 thru 6, that associates a dedicated mix-minus output with each Telco module.

Channel ID numbers are used in both section headings for signal assignment, and in the channel assignment settings within these sections, in both session and macro files. An ID summary follows:

Channel ID Numbers

Type	*Channel #*	*Assignment Method*
Universal Input	1 - 63	As installed, left to right
Telco 1 - 6 (Direct)	65 - 70	As configured by DIP switches
Telco 1 -6 (Router)	81 - 86	As configured by DIP switches
Telco 1 - 6 (Ext. RLS)	97 - 102	As configured by DIP switches
RLS (Direct)	113 - 127	As installed, left to right
RLS (Router)	129 - 143	As installed, left to right
RLS (Ext. RLS)	145 - 159	As installed, left to right

Here's an example of how channel ID numbers are used on a networked BMX*digital* console:

```
[Router_81]
Include_1=D1,65-96
Include_2=D2,241-256
```

In the section of a session file shown above, the two Include lines set which sources are shown on the source selector for Router 81 (e.g., Telco 1 set as a router input). `Include_1=D1,` sets which

sources on device 1 are shown (which in the example are the 32 inputs on the I/O card in slot 1 of a VistaMax frame, set as device 1).

`Include_2=D2,` sets which sources are shown on device 2, which in this case is the BMXdigital console. `241-256` are the analog and digital inputs on the Net Card.

Signal ID Numbers

Each signal in a VistaMax system can be uniquely identified by using either a Global ID number—a five to seven digit number that uniquely identifies every possible signal in a VistaMax system; or by using a universal number, which consists of a device number shortcut (D plus the community member's device number) followed by a local number.

Universal numbering was shown in the previous example where `D1,65-96` uniquely identified signals 65 to 96 on device 1.

When referring to signals within one console or a rack, a local number can be used. But local numbers are repeated on all devices of the same type, for example, all consoles use local number 225 for the PGM 1 bus signal. Needless to say, this means that a local number is only usable on a local console or rack to refer to signals on that console or rack.

To turn the local number into a unique universal number simply add the device number (e.g., D1, D2, and so on, up to D63) before the local number to refer to a specific signal on a specific console or rack in the system.

The operating system does the same thing but it uses global ID numbers, which are not very intuitive for end users to easily use. In the previous example, the Global numbers for signals 65 to 96 on device 1 are 65601 to 65632. On device 2, the signals 65 to 96 are expressed as D2, 65-96 in universal numbering, but in global ID numbering they are 131137 to 131168.

Global ID numbers precisely identify the origination or destination of each signal since the console's or rack's device number is implied by the global ID number. Thus every audio and logic signal on a console, as well as every console bus signal has a unique global ID number.

A Signal ID Calculator is included on the 99-5000 CD-ROM and is also available from the Harris FTP site (see page 5-1 for access) in the customer_support/99-5000_CD-ROM folder. The calculator is an Excel file to list local number versus Global number for every signal on a console by entering the console's device number.

Whenever a signal ID is required in a session file to identify a signal, either the universal or the global ID can be used. If the entry refers to a local signal then only the local signal number is required, as in assigning local Net Card inputs to a channel-specific include list, only the local number is required although using the universal number or the global ID number will also work.

SESSION FILE SECTIONS

Session files consist of sections. Each section begins with a section header followed by one or more entries. The following sections highlight the typical sections found in session files.

Information Section

The information section header `[Information]` is used to provide a brief description of the file. The default description must be manually edited to add information on how or why the session file was created (e.g., `sets the console to prerecord network feeds`).

To change the file description, scroll down to the line that begins with `Description=`. Edit the existing description. If required, additional comments can be placed anywhere in the session file when proceeded by a `;` (semicolon). Comments help clarify session file settings to other users.

Labels Section

Each Universal Input module has two labels to identify the module's A and B input sources. These labels are what are shown in the two lines in the input source display when the Session is loaded.

Telco and RLS modules that are set as direct have only one input so, typically, the source name is listed in the top row (the A label) with a couple dashes in the bottom row (the B label) although both lines could be used to further identify the source. On Telco and RLS modules that are set as routed inputs the label is controlled by the routed signal name and the Labels entries are ignored.

There are two Labels sections—one for the A input names and one for the B input names.

The A input labels section begins with:

`[Labels_A]`

The B input labels section begins with:

`[Labels_B]`

Labels (e.g., `Label_1=1 A, Label_145=RLS 1`, etc.) use the Channel Number Assignments (shown on page 4-16) to specifically identify each module.

Labels can be up to ten alphanumeric characters long—including standard punctuation and spaces and, even though labels can be entered using upper and lower case letters, the labels are always are shown in upper case, centered in the module's display.

Adding Channel Labels

1. Scroll through the session file to the Labels section for the input to edit (A or B).
2. Highlight and replace the default or existing labels (e.g., `Label_1=1 A, Label_2=2 A`) with more descriptive labels for the inputs. For example, if the input to the first Universal Input module (the left most module in the console) is the output of Mic Preamp 1, then the new label could be entered as: `Label_1=MIC PRE 1`.

BUTTON SETTING SECTIONS

Each assignment button on an input module has its own section in the session file where the button state for each module can be set when the session file loads. The default settings in the `undefined.ses` file is for all buttons as `=0`, which sets the button state to Off. Settings that require other types of entries are typically also undefined.

Although the on/off settings could be manually edited—by changing each `=0` setting to `=1`, it's generally far easier to simply set the buttons to their desired states (on or off) on the input modules and then press *Save* on the Session module to save all the button states at one time into a new session file. This session file can then be edited as required to add labels, etc.

[On]

Normally, there are no entries listed in this section since this section affects what happens when a session file loads. With no entries, all channels that are Off immediately load the settings from the new session file. All channels that are On go into pending and do not load their new settings until the channel is manually turned Off.

However, entries in this section override this default method of changing sessions—forcing listed channels On or Off automatically when the session is taken.

For instance, if the On section looks like this,

```
[On]
Channel_1=1
Channel_2=0
```

when the session file is taken, channel 1 is immediately turned On with the new session settings, while channel 2 is immediately turned Off—even if either channel is on-air.

Typically, there are no entries under the `[On]` heading unless the console is being setup for non-attended operation (e.g. slaved to a digital delivery system).

SESSION FILE SECTION SUMMARY

Within each of these sections, each channel button can be set either On (=1) or Off (=0) when the session file loads:

- [On] Sets whether any module is forced On or Off when the session file loads.
- [Source] Sets whether the A or the B input is the selected source for the module.
- [Mode] Sets each module's default mode (Stereo, Left, Right, or Mono Sum).
- [Cue] Sets whether cue is on or off for each module.
- [Send_1, Send_2] Sets whether the module is assigned to one or both send buses.
- [Utl_1, Utl_2, Utl_3, Utl_4] Sets whether the module is assigned to any of the Utility buses.
- [Prog_1, Prog_2, Prog_3, Prog_4] Sets whether the module is assigned to any of the Program buses.
- [Offline_1, Offline_2] Sets whether the module is assigned to either Off-line bus.
- [Send_1_PF, Send_2_PF] Sets whether the module's send is pre-fader or post-fader.
- [Send_1_PS, Send_2_PS] Seta whether the module's send is pre-switch or post-switch.
- [UTL_1_PF, UTL_2_PF, UTL_3_PF, UTL_4_PF] Sets whether the module's Utility bus feed is pre-fader or post-fader.
- [UTL_1_PS, UTL_2_PS, UTL_3_PS, UTL_4_PS] Sets whether the module's Utility bus feed is pre-switch or post-switch.
- [PanBalance] Sets whether the module's pan/balance control is on or off.
- [Solo] Sets whether solo is on or off for each module.
- [TelcoAuto] Sets whether the Auto Foldback feature is on or off on the Telco modules.
- [TelcoRecord] Sets whether the Telco to Record feature is on or off for the Telco modules.
- [TelcoMonitor] Sets whether the Telco to Monitor feature is on or off for the Telco modules.

CHANNEL LOCKOUT SECTION

This section sets whether any channel buttons are locked out, preventing changes to the session file settings by the board operator. Channel lockouts are typically set for unattended console operation or when a special console setup must be maintained.

The channel lockout template section begins with [ChannelLockout_0].

Setting Channel Lockouts

1. Copy the entire channel lockout section of the session file. It begins with ChannelLockout_0 and ends with PanBalance=0.
2. Paste the copied channel lockout section back into the session file. Although it can be pasted anywhere in the file, it is recommended that all of the channel lockout sections be kept together in one area of the session file.
3. Change the heading (ChannelLockout_0) of the pasted section to the channel number to which the lockout information is being added. Refer to the ID Number Assignments table on page 4-12 for what number to use for each channel.

   For example, to add lockout information for the left most Universal Dual Fader channel, change the header Channel Lockout_0 to ChannelLockout_1. To add button lockout information for the Telco 2 channel, change Channel Lockout_0 to Channel Lockout_82.
4. Edit the channel lockout section as needed. Each button is locked separately. To allow the

button to be changed by the operator, leave the setting for the button as `0`. To lockout that particular button, change the setting to `1`.

5 Repeat steps 1 - 4 for each channel that requires any buttons to be locked out.

MAPPING SECTION

The mapping section `[Mapping]` lists the BMX*digital* channels, as detected at the time the session was saved, into a table that is identical to the inventory.txt file (see page 4-3). The section is automatically rewritten by the BMX*digital* Server at each save so it should not be edited.

The table entries are in hex, with `Map_0` being a reserved position listed as `ff` for no channel detected. `Map_9` up to `Map_24` are reserved for the Net Card facet connections and are never populated. Each installed Universal module is numbered sequentially left to right in the frame from `01` to `3f`. Telco channels are numbered `41` to `66`. RLS modules are numbered from `71` to `9f`. Which numbers are used is set by the type of RLS and Telco input (direct, router or RLS), the Telco number and the RLS position.

`Map_57` and `Map_58` identify the CR Monitor and Studio Monitor modules as `b1` and `b2`.

The channel map ends with `DSP=x`. which identifies how many DSP cards are installed in the frame.

ROUTER ASSIGNMENT SECTIONS

Each console is assigned a unique device number by the `nqx.ini` file during start-up. Though typically left at `device=1` for non-networked consoles, when multiple BMX*digital* consoles and VistaMax frames are networked together, each must have a unique device number assigned (from 1 to 63) to distinctly identify its signals to the other networked devices. The device number is used to create the Global Signal ID number that uniquely identifies every signal in a networked system.

RouterCommand

Either Global or Local signal ID numbers can be used in the 'Take commands' section of the session or macro file to identify sources and destinations. The section header `[RouterCommand_1]`, is used to set up the default routing for each routed module by 'taking' or routing a source to a Universal module with a routed input.

A typical `[RouterCommand_1]` section on a BMX*digital* is shown below:

```
[RouterCommand_1]
take_1=65777,65665 ; Net Card A1 to channel 1
take_2=65779,65667 ; Net Card A2 to channel 2
take_3=65781,65669 ; Net Card A3 to channel 3
take_4=65783,65671 ; Net Card A4 to channel 4
```

Each Take command `(take_x=source, destination)` must be on a separate line and be listed in numerical order. Both source and destination can be identified using their Global signal IDs, as shown above. `65777` identifies this signal as the left channel of the A1 analog input on the Net Card in the console assigned as device number 1. The `65665` identifies that it goes to module 1 which is in the first slot at the left end of the console.

Up to sixty-four of these Take commands can be listed in numeric order in any one session file to route sources to destinations. This routing occurs when the session file is loaded (unless a module is On, in which case it is pending until the module is turned off).

Routes assigned by a session file are continuously maintained until another session file is loaded that changes the routing or until a new source is selected on a module, by using a FTP command or by using an Edge Device. All routes are held, even if the console is turned off or loses power, by a "persistence file" that gets updated after every route is taken.

In previous examples, one source has been shown being routed to one destination, but any one source can be routed to any number of desti-

nations by adding separate Take command lines from that source to the other destinations.

Include Lists

Sources can only be routed on an RLS module's source selector if the source is listed on the console's Source Include List. This list is stored in the console's `routers.ini` file. The Source Include list (its header is `[srcinclude]`, is created and maintained using VMCC. It must list every signal that may be required to be routed on a console.

Since this list could include every signal from every device in the VistaMax community, the include list could have several hundred sources. This would make finding the desired source very difficult for the board operator.

To limit the total number of sources shown on a module's source selector, each module can have a channel-specific source list assigned by the session file. It should include only those sources required for a particular daypart or application. In most applications, some modules will keep all sources available while others will have specific subsets with only the required signals listed.

It should be noted that once a channel-specific include list has been assigned in a session file, that list will be used for subsequent sessions, unless a different channel-specific include list is specified for that module. To return the list to the master include list, the channel-specific include list would have this command: `include_1=all`.

The following is an example of the channel-specific include lists for four channels set as Telcos. In this example Telco 1 (channel ID 81) and Telco 2 (channel ID 82) are active, while the Telco 3 (channel ID 83) and 4 (channel ID 84) entries are file placeholders since they are not assigned:

```
[Router_81]
Include_1=D1,65-96,161-192
Include_2=D2,257-272,337-352,
Take=65873

[Router_82]
Include_1=D1,65,67,69,71,73
Include_2=D2,257-272
Take=macro_2

[Router_83]
Take=0

[Router_84]
Take=0
```

The `Take=` line sets the source for the module when the session file loads, with `Take=0` or `Take=-1` routing silence. The Take command can also call a macro file, as shown in `Router_82`. A macro is a mini-session file, with a `.mac` suffix, that is called from within a session file or via FTP commands. In this case, the file `macro_2.mac` is called up in order to set up a special mix-minus feed for Telco 2.

The channel-specific include statements (`Include_x=Dy, channel number range`) set a range of sources, or individual sources separated by commas, that can be selected by the module listed in the section heading (e.g., `[Router_81]`). Each include line must be listed in sequential numeric order, where x equals 1 in the first line, then 2, 3 and so on. Typically, all the sources for one device are listed on a single line, but they could be divided into separate entry lines to make it more legible for someone editing the session file contents.

The y entry (as in `=D1`) is the device number. In the example, there are two devices in the system that the Telco 1 and Telco 2 channels can select sources from: `D1` (device 1) and `D2` (device 2).

Channel ID numbers identify the available sources just like they identify the section headings. A table listing of the Channel Number Assignments is on page 4-17.

INIT.MAC FILE

The `init.mac` file is very important in the RMX *digital*, but in the BMX *digital* it is only used to assign the sample rates on the Net Card D1 and D2 outputs and chain a session file.

The `init.mac` file is maintained and edited using VMCC.

Refer to Appendix A for additional command entry information for session and macro files.

Software Updates

Harris Corporation may periodically issue software revisions for the BMX*digital* Server at no charge. New feature enhancements may also be offered at a nominal fee. In either case, updating the operating system software on the BMX*digital* Server is quick and easy since a TFTP Server program is included with each software release. It is also available from the 99-5000 CD-ROM and from the Harris FTP site: `ftp://ftp.pre.com`. See page 5-1 Service for access information.

TFTP SERVER

TFTP stands for Trivial File Transfer Protocol. TFTP Servers transfer and update software for routers, switchers, hubs and other networked devices like the BMX*digital* Server.

The following steps describe how to install and configure the 3CDaemon TFTP Server—which is included on the CD-ROM along with the new files, although any TFTP Server can be used to update the BMX*digital* Server software.

To install and configure the TFTP Server:

1. Install the TFTP Server on the setup computer following the instructions included with the software update.
2. From the TFTP Server's **File** menu, choose **Configure Selected Service**.
3. On the TFTP **Upload/Download Directory** tab, select the folder on the CD-ROM that contains the new BMX*digital* files.
4. Click **OK**.

UPDATING THE SOFTWARE

Once the TFTP Server is installed on the setup computer, and configured to point to the folder holding the new system software, the update is performed automatically after the BMX*digital* console is power cycled. The BMX*digital* must be taken off-air during this procedure.

To update the BMX*digital* software:

1. Configure the TFTP Server to point to the folder on the CD-ROM that contains the updated system software following the instructions in the previous procedure.
2. Make sure the TFTP Server computer is properly communicating with the BMX*digital* Server.
3. Turn off the BMX*digital* console power supply. Wait at least 10 seconds, then turn it back on. The TFTP Server will automatically begin to download and update the BMX*digital* Server software after the SBC boots up (this typically takes between 30 and 60 seconds).
4. Once the update has finished loading, quit the TFTP Server.
5. To use the new software, power cycle the BMX*digital* console. Again, wait at least 10 seconds before turning it back on.

Settings Recovery

A quick method to try to recover a forgotten or inadvertently changed IP address is to use Community Monitor's Status display. It shows every VistaMax device connected to the VistaMax LAN, even those devices that have an IP address outside of the system's subnet mask, so the unknown IP address can easily be noted.

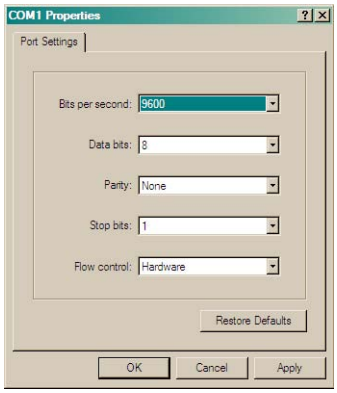
Once the IP address is noted, the setup computer's fixed IP address can be reassigned to fall into the subnet mask of that console's IP so the `nqx.ini` file can be edited, which is covered later in this section.

ACCESSING A LOST USERNAME OR PASSWORD

To recover the username or password on a BMX*digital* Server requires using a 2x5 Port to 9-pin DB9 adapter along with a Null Modem Cable to connect the Single Board Computer (SBC) on the Session module to a Windows computer running HyperTerminal.

Follow these steps to recover a lost username or password:

1. Remove the Session Module from the console. The console may remain turned on, as hot swapping of modules is permitted.
2. Connect the 2x5 header on the adapter to the HDR4 COM1 header on the SBC. The SBC is the PCA toward the board operator end of the module that does not have a motherboard connector. The HDR4 header is right below the Timer Control label on the Session module faceplate. Orient the flat-cable so that its red stripe is toward pin 1 on the header (which is toward the board operator end of the module).
3. Connect a DB9 female to female null modem cable to the 2x5 Port adapter and to a DB9 serial port on a Windows computer.
4. Start HyperTerminal (a Windows Communications Accessories program) and establish a new connection using these Port Settings:



HyperTerminal Port Settings for communicating with the RMXdigital Server

DB9 Male to 2x5 - Port Connection Cable (available from Cables N Mor, http://www.cablesnmor.com/f27200.html)

DB-9 female to female null modem cable (available from Cables N Mor, *http://www.cablesnmor.com/null-modem-cable.html)*

5. Reinstall the Session module into the console with the flat cable feeding up between the Session module and the Control room module.
6. As the BMX*digital* Server starts up, the terminal will show multiple screens of information. Within the NQXcompare section will be the entry: `USER = username,password`. Use the HyperTerminal scroll feature to re-display this information if required.
7. Run FTP Voyager on the setup computer and enter the username and password as required to view the Storage Card folder contents.

5

Service

The BMX*digital* console is designed to give many years of trouble-free operation. If it does require service, please read through this section. It provides information on maintenance and service for the BMX*digital* console, including the spare or replacement parts that are available.

Parts and Repair Services

The only parts that are field replaceable are faders, fader knobs, and rotary knobs (see page 5-2 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.

BMX*digital* technical information (this manual, schematics, software, 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 5-2. Modules and other assemblies may have lead times exceeding two weeks, so order accordingly.

Assemblies 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

These tables list the replaceable or serviceable assemblies and parts for the BMX*digital*.

Replaceable Parts

The following are field-replaceable parts:

Harris #	*Description or Use*
12-93	10-character Display
19-327	Flex cable, 30 conductor
21-227-1	Universal Input module SPROM
21-227-2	Telco/Codec module SPROM
21-227-3	Remote Line Selector module SPROM
21-227-4	Session module SPROM
21-227-5	Control Room module SPROM
21-228-1	DSP module SPROM
21-332-1	Output 1 module SPROM
21-332-2	Two-Studio Monitor 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
80-1752	Display cover lens, Inputs & Session modules
80-1753	Trimpot Cover Lens, Outputs & Mic Pre modules
80-1754	Label Cover Lens, Session module
90-1709	30' Power cable (power supply to console)
90-1713-1	Fader Assembly, Input modules
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 or replaceable modules and assemblies:

Harris #	*Description or Use*
90-1704	Power Stick Assembly (w/regulator PCAs)
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 (not used on BMX*digital*-14)
95-1179	Timer PCA
99-1151-1	Microphone Preamp module, 10 Input
95-1151-1	Left PCA (Mics 1 - 5)
95-1151-2	Right PCA (Mics 6 - 10)
99-1152-1	Universal Input module
90-1714-1	Faceplate switchboard assembly
95-1152-1	Main PCA
95-1162-1	Input PCA
99-1152-3	Universal Input module w/o Sends & Utilities
90-1714-3	Faceplate switchboard assembly
95-1152-1	Main PCA
99-1153-1	Telco/Codec module
90-1715-1	Faceplate switchboard assembly
95-1152-2	Main PCA
99-1153-3	Telco/Codec module w/o Sends & Utilities
90-1715-3	Faceplate switchboard assembly
95-1152-2	Main PCA
99-1155	Output 1 module
95-1155-1	Main PCA
95-1165-1	Connector PCA
99-1156-1	Output 2 module
95-1156	Main PCA
95-1176	Connector PCA
99-1156-2	Output 3 module
95-1156	Main PCA
95-1176	Connector PCA
99-1157	Control Room module
90-1719	Faceplate switchboard assembly
95-1157	Main PCA
95-1167	Connector PCA
99-1158	Studio module
90-1718	Faceplate switchboard assembly
95-1158-1	Main PCA
95-1168-1	Connector PCA
99-1159	Session Module
90-1717	Faceplate switchboard assembly
95-1159-1	Main PCA
95-1170	Connector PCA
99-1160-1	Master DSP module
95-1160-1	Main PCA
99-1160-2	Slave DSP module
95-1160-2	Main PCA
99-1163-1	RLS Module
90-1716-1	Faceplate switchboard assembly
95-1152-3	Main PCA
99-1163-3	RLS module w/o Sends & Utilities
90-1716-3	Faceplate switchboard assembly
95-1152-3	Main PCA
99-1177	Digital meter assembly
99-1201	1RU 48 Volt Power Coupler
99-1205	2RU 48 Volt Power Supply
99-1800	Single-board computer module (mounts on Session module)

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 76-2001 Tool Kit are listed below:

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 shipped depends on the mainframe size ordered:

- BMX*digital*-8: 76-2000-8
- BMX*digital*-14: 76-2000-0
- BMX*digital*-22: 76-2000-1
- BMX*digital*-30: 76-2000-2
- BMX*digital*-38: 76-2000-3

The contents and quantities of the installation kits are listed below:

Quantities for each BMXdigital framesize

P/N	*Description*	*-8*	*-14*	*-22*	*-30*	*-38*
14-482	1x3 Housing	40	54	70	86	102
14-484	2x3 Housing	57	80	86	102	118
14-486	2x4 Housing	1	1	1	1	1
14-492	2x7 Housing	7	15	15	19	19
14-494	2x8 Housing	2	2	2	2	2
14-513	2x12 Housing	12	20	36	55	71
15-938-1	Receptacle Contact	900	1250	1534	1966	2366

Module Servicing

Most modules consist of two assemblies: a faceplate/switchboard assembly and a Main PCA. A Connector PCA may also be used for additional input or logic connectors. Assemblies are field-replaceable, but they are not field-serviceable. Do not disassemble the faceplate/switchboard assembly, as these are assembled using a fixture.

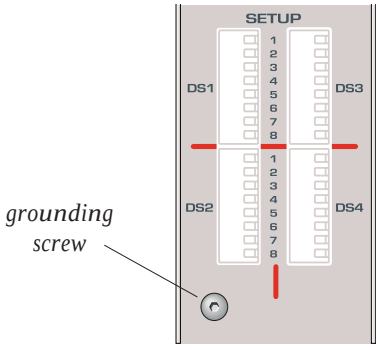
Any module not currently in the console's on-air signal path can be removed or installed with the console powered, and on-air, without causing any audio interruption or noises in the program audio.

NOTE: Prior to removing any module from the mainframe, turn off all its bus assignments and unplug all input, output, and logic cables.

REMOVING MODULES

To remove a module from the mainframe:

1. Open the meter panel.
2. Use the included hex tool (PRE70-90) to remove the two screws located at the top and bottom of the module, and the grounding screw located directly below the dip switches.
3. Screw the module pull tool (PRE70-43) 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, please contact Harris Technical Services Department for further instructions.

INSTALLING INPUT MODULES

To install a module into the mainframe:

1. Open the meter panel.
2. 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.
4. Fasten the module to the mainframe using two 38-88 screws and install the module grounding screw.

NOTE: If the module does not work after installation, remove the module and visually check to make sure no connector pins are bent.

DSP AND NET CARD SERVICE INFO

Unlike the input, control room, studio or session modules, DSP and Net cards cannot be removed or plugged in with the console power on.

DSP Cards

There are two versions of DSP cards in use—the original design (identified by a solid green LED on each card, with one master DSP with 3-pin MOD IV connector) and the current VistaMax-compatible cards (identified by a flashing yellow LED on each card with the left-most card automatically set as the master—with an LED flash rate that is twice as fast as the other DSP cards).

The two DSP card versions cannot be intermixed, they must be replaced as a set. When a Net card is installed, the current version (with the flashing yellow LED) must be installed.

DSP cards of either version do not have any user settings or adjustments.

Net Card

There are two Net card models available: with optical and without optical VistaMax connctors. Both models are specifically setup for the mainframe size the card is installed into through rotary switches DS1 and DS2. The following table lists the rotary switch settings by frame size.

NET CARD ROTARY SWITCH SETTINGS

Framesize	*DS1*	*DS2*
8	6	1
14	7	1
22	8	1
30	A	2
38	B	2

FADER SERVICING

There are no replaceable nor rebuildable parts on the BMX*digital* 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 the 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. 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 using the following procedure.

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. Wipe off excess lubricant. Normally only the top rail that the fader slider bushings glide on requires lubricant.

CLOCK AND TIMER ASSEMBLY

The clock and timer assemblies are located in the meter panel. Note that the BMX*digital*-14 does not have a clock assembly.

Clock Troubleshooting

If the clock is not working properly, check to be sure that the cable leading to the assembly is installed correctly. Also check the DIP switch settings that control the clock's operating mode. The clock's DIP switches are located on the clock circuit board. For more information about the clock circuit board, see page 2-5.

Timer Troubleshooting

If the timer is not working properly, check to be sure that the cable leading to the assembly from the Session module is installed correctly.

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

If the timer is not Auto resetting as expected, check the various input module DIP switch settings. On the Universal input modules, DS1-7 sets timer reset for the A input and DS3-7 sets it for the B input. On the RLS modules, switch 2 sets timer reset. On the Telco modules, switch DS1-8 sets timer reset. For more information about setting the module DIP switches, see the Installation chapter sections for each module.

METER ASSEMBLY

The meter assemblies are field-replaceable only. There are no user-serviceable parts on the meter assembly.

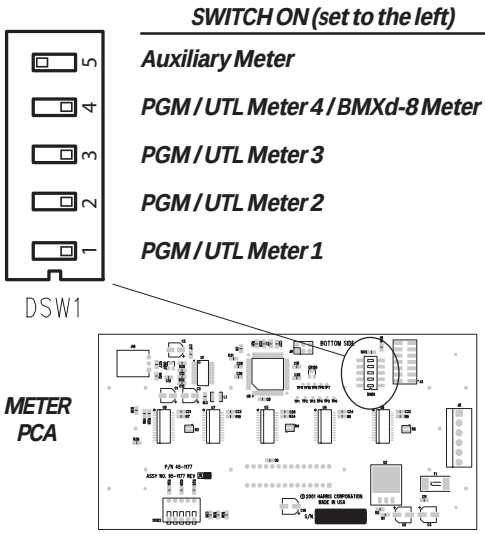
Meter Troubleshooting

Each meter has three connections: 5VDC power via a six wire cable that jumpers the meters, clock, and event timer to the rear chassis power connector; a ribbon cable that carries the serial data signal for the meter name display; and an AES/EBU digital audio cable.

If a meter is not working properly, check that the three cables are installed correctly. Also check that the two DIP switches, located on the meter circuit board, are set correctly. DSW2 is the DIP switch at the front edge of the board. Its settings are covered on page 2-6.

The other DIP switch (DSW1) sets the meter number (Meters 1 - 5, as viewed from left to right). This switch must be set properly when replacing a meter since each meter position has a specific setting, as shown on the next page.

Meter Number Table for DSW1



DSW1 is next to the ribbon cable connector (J3). Set only one DSW1 switch to On, per the above table. Move switch away from the J3 connector to set to On.

POWER SUPPLY

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

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

Power Supply Connections

Both connectors must be attached to the back of the BMX*digital* mainframe and the power supply. See page 2-4 for additional details.

5-pin Connector

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

4-pin Connector

Pin	*Signal*	*Wire Color*
1	Power Supply 1 Collector	Orange
2	Power Supply 1 Emitter	Brown
3	Power Supply 2 Collector	Blue
4	Power Supply 2 Emitter	Red with Black Stripe

~~BACKUP BATTERIES~~

~~A "Keep Alive" voltage is generated by three AA nickel cadmium (NiCad) batteries (supplied in the tool kit). These batteries supply a voltage, to hold each module's logic state during power outages, so the console powers back up in the same state it was in when power was lost. For information on installing these batteries, see pages 2-4 and 2-5.~~

6

Accessories

Harris offers a number of accessories and services to complement your BMX*digital* console. Available products range from the VistaMax Audio Management System to integrate multiple BMX-*digital* consoles into a facility-wide network, to an External RLS for multiple-source selection, to host and guest panels, monitor control panels, headphone panels, console drop-in peripheral control panels, a host turret with clock and timer and space for eight control panels, and a 3 x 6 headphone distribution amp with digital level control panels. Harris services range from supplying logic wiring for common peripheral devices to complete system wiring design and installation packages.

FURNITURE AND CABINETRY

Harris offers a full line of standard and custom furniture and cabinetry, to house the BMX*digital* console and studio peripheral equipment, as well as complete turnkey studio design and implementation services. Contact your Harris sales representative for details.

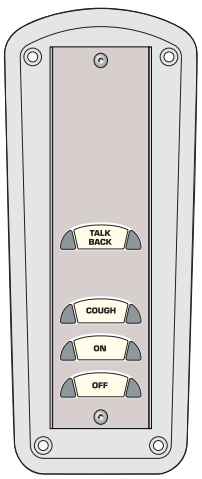
FURNITURE MOUNTED PANELS

Furniture-mounted accessory panels maintain the console's look and feel while providing remote control for important studio functions. All BMX*digital* accessory panels are 6" long by either 1.6" or 3.2" wide. Single width panels (1.6" x 6" panels) include various mic control panels, studio and headphone level panels, and peripheral control panels. Cabinet skirt-mounted panels include two headphone panels (jack-only and jack with level control). Custom-designed switch and indicator panels are also available.

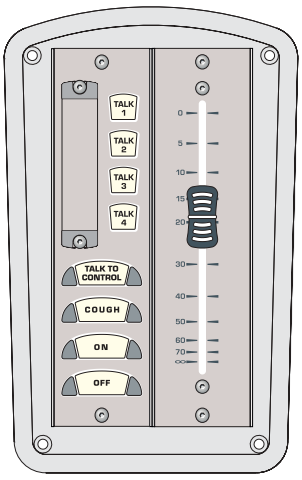
The PRE99-1788-1 Single Cabinet Plate allows any single 1.6" x 6" panel to mount into a countertop. The PRE99-1788-2 Dual Cabinet Plate allows two 1.6" panels or a 3.2" double-width panel to mount into a countertop.

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 A PRE99-1198)

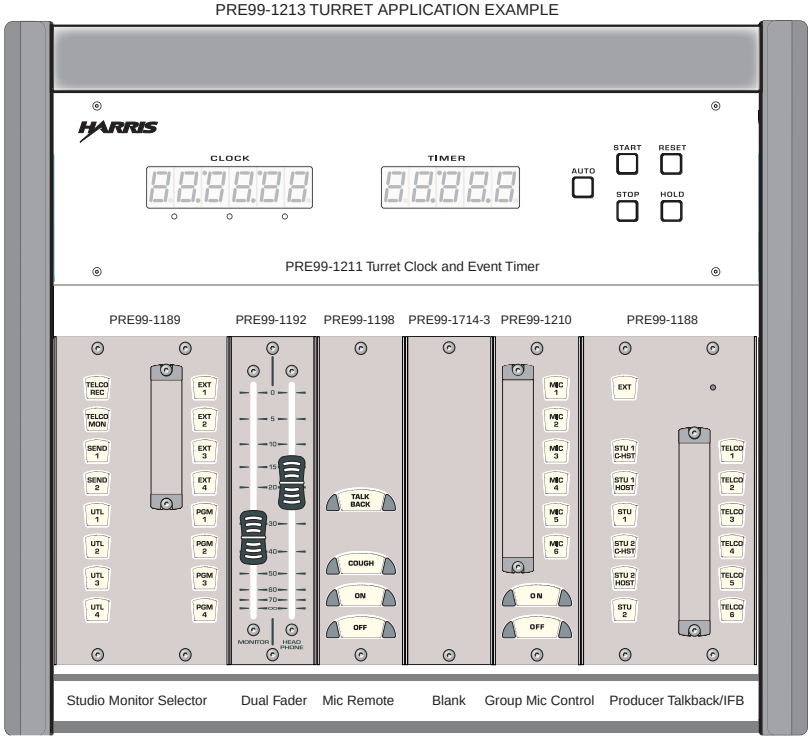


PRE99-1788-2 DUAL POSITION CABINET PLATE (SHOWN WITH A PRE99-1199 & A PRE99-1191)

PERIPHERAL PANELS

These panels allow the console operator to use 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 BMX*digital*. The basic panel is the PRE99-1197, with On, Off, and Cough buttons. The PRE99-1198 (shown in the turret example) adds a Talkback button to the three basic panel buttons. A simplified schematic, and connection information, for these panels is shown on page 6-3.

The PRE99-1199 Mic Control panel (shown in the dual cabinet plate example on the previous page) 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 two studios, directly to a host or a co-host, or 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 the Control Room or Studio modules).

Headphone level control is done digitally 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.

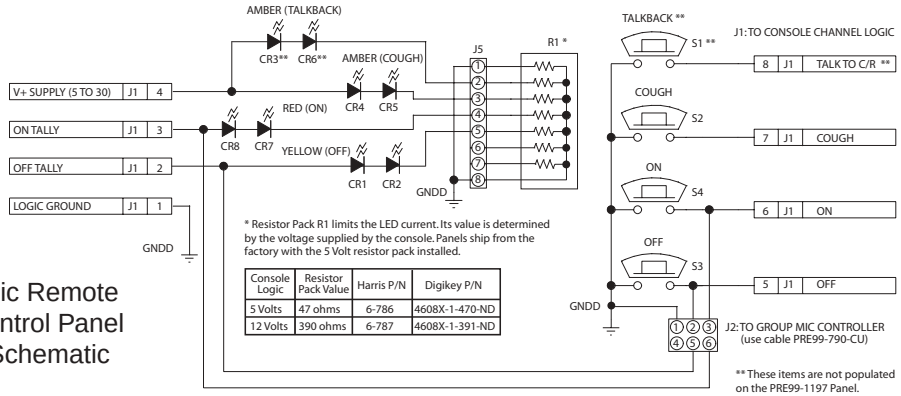
LOGIC WIRING DIAGRAMS & CABLES

To assist in logic cable design and construction, Harris' Technical Services Department can supply logic wiring diagrams for many popular peripheral devices.

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 INFORMATION (FOR PRE99-1197 AND PRE99-1198)

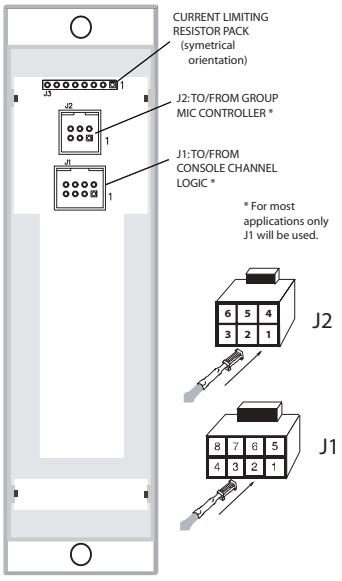
Mic Remote Control Panel Schematic



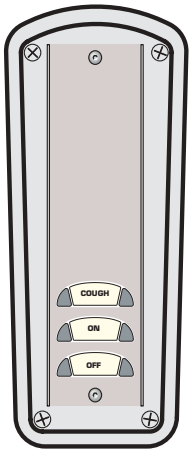
* Resistor Pack R1 limits the LED current. Its value is determined by the voltage supplied by the console. Panels ship from the factory with the 5 Volt resistor pack installed.

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

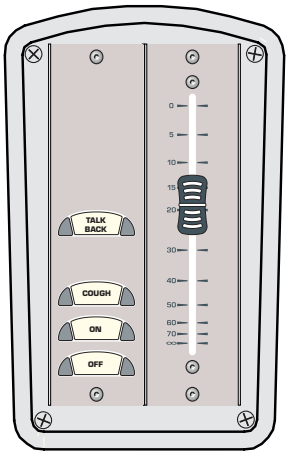
Mic Remote Control Panel Connections



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)

Mic Remote Panel P1	Signal	Pin		Console MAIN Logic Connector 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	

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

EXTERNAL REMOTE LINE SELECTOR (EXT. RLS)

The Ext. RLS (PRE99-947) is a rack-mount stereo source selector with 16 balanced inputs and a single balanced output that connects to any Telco or RLS module. It works with both balanced analog and AES/EBU digital signals, however, each Ext. RLS can only route analog or digital audio, not both. To route both analog and digital audio, two External RLSes are required to provide up to 32 source selection—sixteen analog and sixteen digital, to a single module.

The External RLS's rear view, connector pinout and typical wiring diagrams are shown below.

External RLS and BMX*digital* Modules

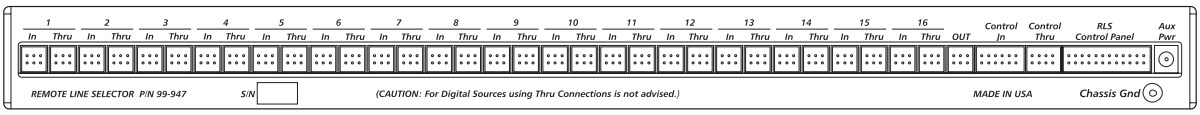
RLS or Telco modules can be set as a control module for an External RLS. Once a module is configured to control an Ext. RLS (see below), the source can be dialed up and taken using the module's Source Selector and Take button.

To configure an RLS or Telco module for use with an External RLS, set their DIP switches as follows:

Remote Line Selector Module

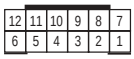
DIP Switch	*#*	*Setting*
DS1	4	On
DS1	5	Off

EXTERNAL REMOTE LINE SELECTOR (PRE99-947), REAR VIEW



NOTE: The RLS Control Panel and Aux Pwr connections are not used when the Ext. RLS connects to a BMX*digital* module.

EXT. RLS CONNECTOR PINOUTS



P39
CONTROL IN
(WIRE ENTRY END)

P35
CONTROL THRU
(WIRE ENTRY END)

P39	CONTROL IN	
PIN	SIGNAL	FUNCTION
1	RLS-0	RLS RELAY CONTROL 0
2	RLS-1	RLS RELAY CONTROL 1
3	RLS-2	RLS RELAY CONTROL 2
4	RLS-3	RLS RELAY CONTROL 3
5	unused	none
6	unused	none
7	RLS-0 DSP	RLS SELECTION TO I/F 0
8	RLS-1 DSP	RLS SELECTION TO I/F 1
9	RLS-2 DSP	RLS SELECTION TO I/F 2
10	RLS-3 DSP	RLS SELECTION TO I/F 3
11	GNDD	DIGITAL GROUND
12	V+5D	+5 VOLTS (FOR DIGITAL)

P35	CONTROL THRU	
PIN	SIGNAL	FUNCTION
1	RLS-0	RLS RELAY CONTROL 0
2	RLS-1	RLS RELAY CONTROL 1
3	RLS-2	RLS RELAY CONTROL 2
4	RLS-3	RLS RELAY CONTROL 3
5	V+5D	+5 VOLTS (FOR DIGITAL)
6	GNDD	DIGITAL GROUND
7	V+5D	+5 VOLTS (FOR DIGITAL)
8	GNDD	DIGITAL GROUND

P1 - P16	AUDIO INPUTS (1 - 16)		
PIN	SIGNAL	ANALOG FUNCTION	DIGITAL FUNCTION
1	Left Shield	Audio Left Shield	AES/EBU Shield
2	Left Low	Audio Left Low	AES/EBU Low
3	Left High	Audio Left High	AES/EBU High
4	Right Shield	Audio Right Shield	unused
5	Right Low	Audio Right Low	unused
6	Right High	Audio Right High	unused

P1 - P33
IN / THRU / OUT
(WIRE ENTRY END)

P17 - P32	AUDIO THRU (1 - 16)		
PIN	SIGNAL	ANALOG FUNCTION	DIGITAL FUNCTION
1	Left Shield	Audio Left Shield	unused
2	Left Low	Audio Left Low	unused
3	Left High	Audio Left High	unused
4	Right Shield	Audio Right Shield	unused
5	Right Low	Audio Right Low	unused
6	Right High	Audio Right High	unused

P33	AUDIO OUTPUT		
PIN	SIGNAL	ANALOG FUNCTION	DIGITAL FUNCTION
1	Left Shield	Left Shield	AES/EBU Shield
2	Left Low	Left Low	AES/EBU Low
3	Left High	Left High	AES/EBU High
4	Right Shield	Right Shield	unused
5	Right Low	Right Low	unused
6	Right High	Right High	unused

PARTS LIST
P1 - P33: Housing, 6-pin, MOD IV
AMP 87631-2 (PRE14-484)
P35: Housing, 8-pin, MOD IV
AMP 87631-4 (PRE14-486)
P38: Housing, 24-pin, MOD IV
AMP 2-87631-0 (PRE14-513)
P39: Housing, 12-pin, MOD IV
AMP 87922-2 (PRE14-490)
All contacts: Crimp, Gold, MOD IV
AMP 102128-1 (PRE15-938-1)

WIRING DIAGRAM, EXTERNAL RLS CONTROL CABLE, TO RLS OR TELCO MODULE

BMX*digital* RLS or Telco/Codec Module LOGIC I/O Connector

RLS CONTROL IN Connector

P1	SIGNAL	PIN		PIN	SIGNAL	P2
	LOGIC GROUND	3	WHT	11	COMMON	
	LOGIC +5VDC	10	BLK	12	+5VDC	
	RLS-0	15	RED	1	RLS CONTROL 0	
	RLS-1	16	GRN	2	RLS CONTROL 1	
	RLS-2	17	BRN	3	RLS CONTROL 2	
	RLS-3	23	BLU	4	RLS CONTROL 3	
	LOGIC GROUND	1				
	COMMAND COMM.	13				
	LOGIC GROUND	2				
	TALLY COMMON	14				

PARTS LIST
P1: Housing, 24-pin AMP MOD IV (PRE14-513)
P2: Housing, 12-pin AMP MOD IV (PRE14-490)
Contacts: AMP MOD IV (PRE15-938-1)
Cable: 7-conductor Belden # 9430 or equivalent
Jumper Wire: 26 AWG white hookup, UL1429 or equiv.

WIRING DIAGRAM, FOR RLS THRU

1st RLS Chassis (Control THRU)

2nd RLS Chassis (Control IN)

P1	SIGNAL	PIN		PIN	SIGNAL	P2
	RLS-0	1	BLK	1	RLS-0	
	RLS-1	2	WHT	2	RLS-1	
	RLS-2	3	RED	3	RLS-2	
	RLS-3	4	GRN	4	RLS-3	
	V+5D	5	BRN	12	V+5D	
	GNDD	6	BLU	11	GNDD	

PARTS LIST
P1: Housing, 8-pin AMP 87631-4 (PRE14-486)
P2: Housing, 12-pin AMP 87922-2 (PRE14-490)
Contacts: Crimp, Gold, AMP 102128-1 (PRE15-938-1)
Cable: 7 Cond. Belden #9430 or equivalent.
Length is 12.0" for stacked configuration.

Telco/Codec Module

DIP Switch	*#*	*Setting*
DS2	4	On
DS2	5	Off

Refer to pages 2-28 to 2-31 for more information on configuring the RLS module. Refer to pages 2-24 to 2-27 for more information about configuring the Telco/Codec module.

External RLS and the BMX*digital* Server

Connecting an External RLS, and properly setting up the controlling module, results in a module display that simply lists the sources as: Input 01, Input 02, Input 03, etc., as the Source Selector is rotated. These new settings must be saved to a session file in order to change these default names (see Chapter 4 for details), to more accurately reflect the RLS input sources.

In the session file, a typical External RLS entry looks like this:

[RLS_145]

<The range for RLS modules is 145 (for the first RLS module from the left end) to 159. The range for Telco modules is 97 (for Telco 1) to 102 (for Telco 6). Each Telco or RLS module has one of these unique numbers (see page 4-7).>

Selection=4

<This is the current selection from the last time the session file was saved. It can be any number from 1 to 32.>

Label_1=Delta

Label_2=Foxtrot

Label_3=Hotel

<Label_1 through Label_16 are reserved for the sixteen possible analog sources.>

Label_17=Golf

Label_18=Echo

<Label_17 through Label_32 are reserved for the sixteen possible digital sources.>

Labels appear alphabetically in the module's display (e.g. Alpha, Bravo, Charlie, Delta). The source type (analog or digital) is transparent to the board operator. Missing or empty entries are not displayed on the module.

When the Ext. RLS is used with digital sources, physical input 1 on the External RLS uses Label_17, input 2 uses Label_18, and so up to input 16 which uses Label_32. An analog device can also be connected to the analog input on the module, and it can be selected like the RLS sources by simply adding an entry line for Label_1 (when Label_1 is selected the module automatically switches to the analog input).

Conversely, when an Ext. RLS is used with analog sources, the input entries match the inputs on the External RLS (e.g., input 1 uses Label_1, input 2 uses Label_2 and so on up to input 16 which uses Label_16). A digital device can also be directly connected to the digital input and selected using the Source Selector by adding an entry line for Label_17, which, when taken, switches the module to use the digital input.

For more information on the BMX*digital* Server and session files, see Chapter 4.

Typical External RLS Applications

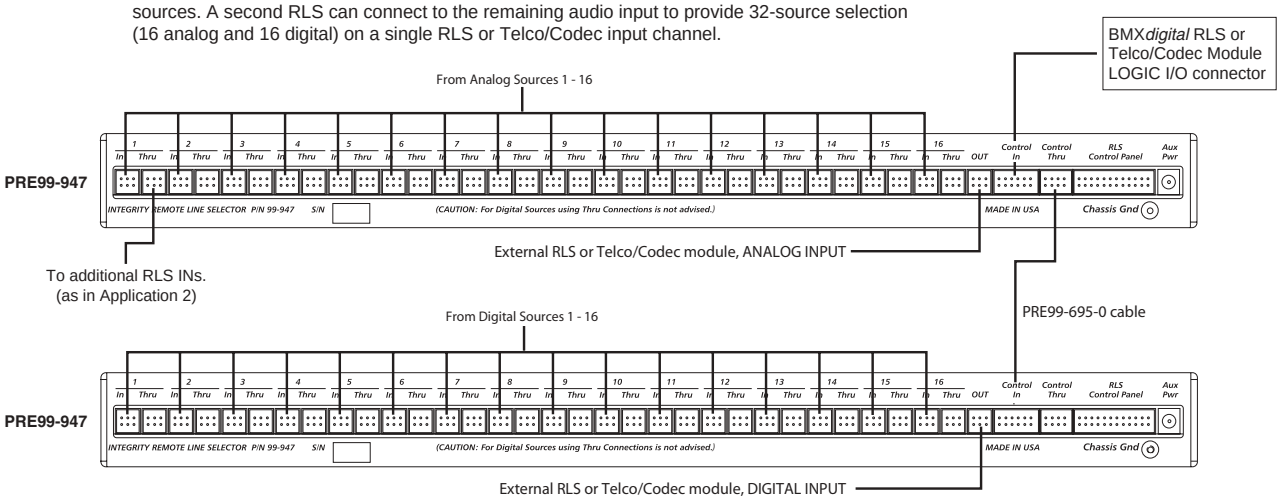
Two typical applications for the External RLS and the BMX*digital* are shown page 6-6.

In Application 1, one or two External RLSes are connected to a single controlling module. The first External RLS is used for either analog or digital signals; the second External RLS is used for the other type of signal. For example, if the first External RLS is used for analog signals, the second is used for digital signals.

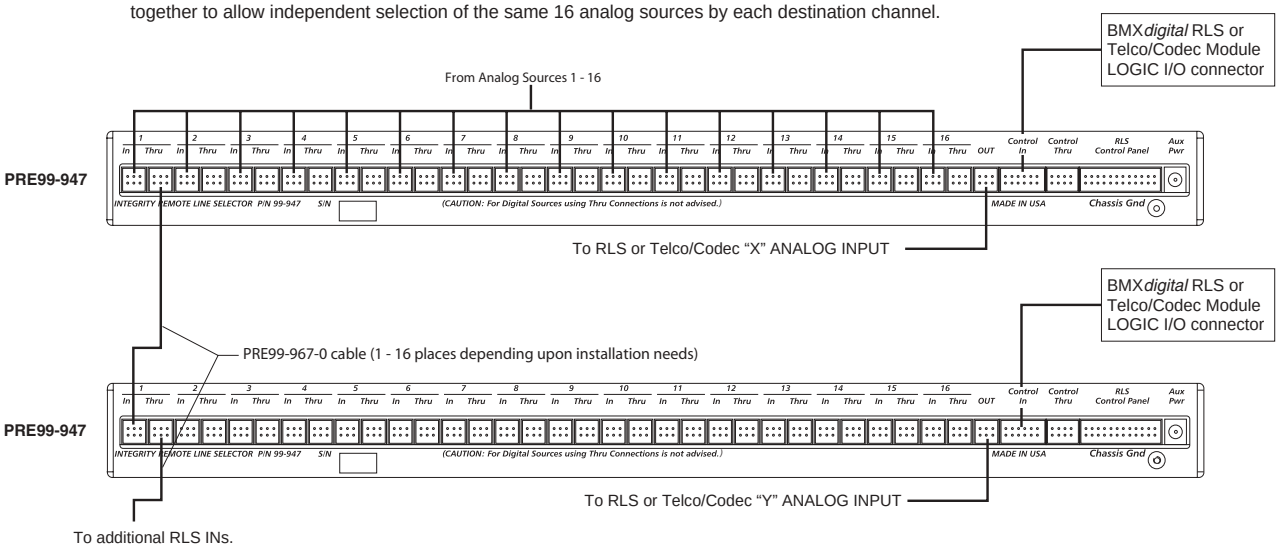
In Application 2, multiple External RLSes are used for analog sources. In this example, some or all of the analog sources are made available to multiple BMX*digital* modules. Each analog input can cascade, using the THRU output, to additional External RLSes. In this way, the same analog

TYPICAL EXTERNAL RLS APPLICATIONS

Application 1: One External Remote Line Selector (PRE99-947) can connect to the ANALOG INPUT, for selecting analog sources, or it can connect to the DIGITAL INPUT, for selecting digitial sources. A second RLS can connect to the remaining audio input to provide 32-source selection (16 analog and 16 digital) on a single RLS or Telco/Codec input channel.



Application 2: Up to 16 analog sources need to be simultaneously available on multiple channels. Connect External RLSes to several RLS or Telco/Codec modules. The inputs to each External RLS are daisy-chained together to allow independent selection of the same 16 analog sources by each destination channel.



sources are made available to multiple RLS or Telco/Codec modules at the console.

Other installations are possible by combining the techniques of Application 1 and Application 2. The External RLS can also be used with an external controller (PRE99-953) to feed recording devices or other line-level devices needing multiple analog or digital source selection.

Note: Cascading, as shown in Application 2, cannot be done with digital signals. AES/EBU signals need to have one terminated destination. A digital distribution amplifier (Digital DA) must be used to provide similar functionality.

VMCC, Session and Macro Files

A

The VistaMax Control Center (VMCC) is the software program station engineers use to create and maintain the configuration files needed by all VistaMax community devices—including the BMX*digital* console.

Chapter 4 covers console configuration, basic VMCC operations and standard commands for session and macro files. This appendix presents addition details on using VMCC and using Notepad® to edit session and macro files. An errata section on VMCC covers program use notes and an application section presents information on setting up command entries for specific tasks in session and macro files.

The revision D release of the BMX*digital* CD-ROM (Harris # 99-5000) introduced two major changes to the console's operating system. The first is that all VistaMax devices now run release 4.2 of the BMX*digital* Server operating system. The second is that two Harris-proprietary software programs: VistaMax Community Monitor (CM) and VistaMax Control Center (VMCC) are now used to create, maintain and properly distribute configuration files for all VistaMax community devices. Previously, configuration files were created manually using a text-only editor and were distributed to all the community members by hand. See chapter 4 for details on installing these files. It should be noted that session and macro files must still be edited using Notepad®.

VMCC FILE MAINTENANCE

The VMCC application (icon: ) not only simplifies rack configuration, it also allows one-stop file maintenance for every VistaMax community member—any RMX*digital* or BMX*digital* console, VistaMax rack or VistaMax edge device.

After VMCC distributes the setup and config files to each community device, a `PROVISIONED.HASH` file is written into the storage card folder. The next time Normal Download is selected to distribute updated files, VMCC reads the hash file to identify which files match the newly provisioned files so they are not re-downloaded and so only those files with changes are downloaded.

If the hash file is not found (as in the first time VMCC downloads files), then VMCC will download all files, which is equivalent to selecting Force Download. This always causes consoles or racks to restart since the `nqx.ini` file is replaced.

COMMUNITY MONITOR (CM)

CM (tray icon: ) is not only a valuable tool for setting up a VistaMax system, it's also helpful for troubleshooting and analyzing a VistaMax system since it sees all VistaMax devices connected to the network—even those with IP addresses outside the network's assigned subnet.

IP addressing problems can occur if a new console is added to a system that's not using the default IP addressing scheme (as presented on page 4-10). A factory-fresh console has an IP address of 192.168.100.22 but, if the system is set for IP addresses using another subnet (say 137.237.207.xxx) then the new console will not be seen by the setup computer. Another way this might happen is if the IP address entered into VMCC had a

typo which was not caught and the file was distributed to the console. When the Controller Card restarts after file distribution, FTP Voyager would no longer be able to see it, nor would any other community devices. But, since every community device reports its IP address to CM, it will be shown in the CM status window.

To access such a "missing" device, change the setup computer's fixed IP address so it falls within the missing device's subnet, as listed in the CM status display. Once that is done, use FTP Voyager to view the device's storage card and open up the `nqx.ini` file and correct the IP address manually so that the device again is within the community's subnet. Return the setup computer back to its previous fixed IP address.

Restart the device (reset the rack's Controller Card, the Session module on a BMX*digital* console or the KSU on a RMX*digital* console) to now use the corrected IP address. If the problem was caused by a typo, correct the IP address in VMCC and then redistribute the corrected files to the device to update the hash table.

Command Client

CM includes an application called Command Client. It is accessed from the *Start* menu (under *Programs/Harris Corp/VistaMax* on the setup computer). The application allows a session or macro file to be loaded onto a VistaMax device from the setup computer. It can alternately be set to take one or more routes on a console or rack.

To use the application, the following entry line must be added to the `nqx.ini` file on each device that will be controlled in this manner:

```
VMCS_Port = 2006,T ;TCP/IP protocol
```

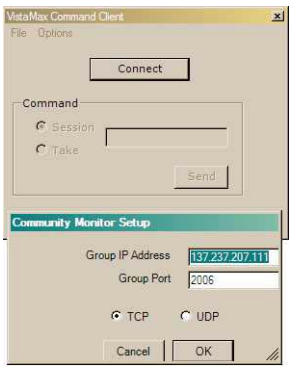
It is best to add this command to the VMCC `nqx.ini` template files. There is one for each type of VistaMax device in the VMCC templates folder (`C:\Program Files\Harris Corp\Vista Max Control Center\Templates`).

Use Notepad to open each `nqx.ini` template file: `BMX_Nqx.ini`, `RMX_Nqx.ini`, and `Rack_Nqx.ini`, as required to add in the entry line. Enter it just after the *Jones period* entry, as shown in the following example:

```
; Set the Jones period (default is 500)
jones_period = 500
;
VMCS_Port = 2006,T ;TCP/IP protocol
;---------------------------------------
```

After saving the modified template files, use VMCC to reprovision files so the modified `nqx.ini` templates are used, then force distribute the changed files to the consoles and racks.

After the console or rack restarts, start Command Client. Click *Options* then select *Setup* to configure the Command Client.



Command Client Setup Windows

In the pop-up window, shown above, enter the IP address for the console or rack that will be remotely controlled. The group port is always 2006 for TCP/IP communications. Make sure the TCP box is checked, then click *OK* to close the window. Click *Connect* to connect to the device.

Once connected, the lower half of the window is activated and a session or macro file name can be entered in the text box when the *Session* radio button is filled. To enter a session or macro, type the full name and suffix, then press *Send* to load the session or macro.

Click the *Take* radio button in order to route one or more signals. To enter routes, each route is

in the form of: [source, destination]. Multiple routes can be entered when they are separated by commas, as in the following:

```
[161,241],[163,243],[165,245]
```

Pressing *Send* takes the routes to the selected console.

The entry example above routes the first three mix-minus signals to the first three analog outputs on an RMX*digital* console's KSU card. If routes are made between devices, then either the universal signal ID form (e.g., `D10.225`) or the global number form must be used (e.g., `65585`). Both of these refer to the PGM 1 bus signals from a console set as device 10.

UDP Commands

There is an alternate function to the Command Client that allows UDP commands from peripherals like digital delivery systems or programming automation systems to function like the Command Client to remotely load session or macro files and to take routes.

To command a VistaMax device using UDP commands, the following line is entered into the `nqx.ini` file—in lieu of the previous command line that allowed manual takes and file loading from the Command Client:

```
VMCS_Port = 2002,U ;UDP protocol
```

The commanding device would then use standard UPD command protocol to load a session file (again using the session or macro name with suffix) and, by using the source and destination structure that was shown above, be able to take routes on any device that has the UDP entry line in their `nqx.ini` file.

VMCC OPERATIONS ERRATA

The VMCC program released with the rev D version of the 99-5000 CD-ROM is build 2044. The following operational tips and function warnings apply to this build. Each build of the VMCC software includes a ReleaseNotes.txt file in the VMCC folder (`C:\Program Files\Harris Corp\VistaMax Control Center` is the default path to the folder). The latest release build is available for downloading from the Harris console FTP site (see page 5-1 for access details).

Duplicate Community Names

VMCC currently allows multiple files to be saved with the same name. To avoid confusion, assign a unique name for each new community.

Editing Card Complement on a Device

When editing the card complement on a device, wait for the processing to complete or errors may be introduced. Processing is complete once the community text blinks.

BMXd & Telcos

VMCC does not limit the number of Telco channels that can be assigned. Do not set more than six channels as Telco channels.

Signal Naming Conventions

VistaMax devices, like the BMX*d* console, can show a 10-character source name or session file name in their displays. The displayed source names may be either the In Room Name or the Community Name plus other identifiers. The type of name used is determined by which Tier Naming Convention is set on each device in the community.

The Tier Naming Convention is set in the device edit pane, just above the Source Include List. The default setting is Convention 1, which uses the In Room names in all local and device publish files. This is mainly used in smaller installations

where all of the community members are associated with a single station or a common purpose. For example: a single station facility where three consoles (one air studio, an image studio and a production/backup air studio) are networked with one rack; or a network origination facility where two racks are networked with six studio consoles.

When a single community has devices associated with multiple stations—where each station group has dedicated Air, Production and Image studios, then Tier Convention 2 or 3 can be used to identify where each source is from by including a Call Group name or Discipline Prefix along with the signal's Community name.

Here's a summary of how the three levels of naming are used to create local and device publish files:

TIER NAMING CONVENTION	DISPLAYED SOURCE NAMES BY DEVICE: LOCAL	GROUP	SYSTEM
TIER 1 (LOCAL)	MINIDISK1	MINIDISK1	MINIDISK1
TIER 2 (GROUP)	MINIDISK1	XYZ.MD1	XYZ.MD1
TIER 3 (SYSTEM)	MINIDISK1	-PROD.MD1	XYZP.MD1

VMCC SETTINGS THAT GENERATED THE ABOVE NAMES:
In Room Name[1] = MINIDISK1
Community Name[1] = MD1
Call Group[2] = XYZ
Discipline Prefix[2] = PROD
Name Radix[3] = . (PERIOD)
Discipline Sort Character[3] = - (DASH)
In Room Prefix[3] = (BLANK)

1 - Entry set in the Signal Summary edit pane
2 - Entry set in the Device edit pane
3 - Entry set in the Community edit pane

Tier Naming Convention Summary

When Tier 1 naming is used, local names are displayed on all devices. This is fine for small facilities, but when multiple consoles have output signals being routed which have identical names (like PGM 1, for instance), it will be difficult to know where those signals are from if each signal is not given a unique name. To get around this limitation, Tier 2 naming can be used.

Tier 2 names use the In Room Prefix followed by the first nine characters of the In Room name to identify signals on the local device. The other members of the community will not see the In Room name, but will see the Tier 2 name in the example above (e.g., Call Group Name, Name Radix, Community Name).

When multiple stations are in one facility, then Tier 3 naming can be used. This differentiates between fellow group members (those with the same Call Group name) and everyone else in the community by showing names on the other group devices using the Call Group (XYZ in the example), the Discipline Sort Character and the Discipline Prefix.

On devices with different Call Group names, the System Name is used. It consists of the Call Group name plus the first character of the Discipline Prefix. The Call Group name then identifies the station—narrowing the possible source locations to a few rooms. The Discipline Prefix name is typically the room function, e.g. Air, Production, Image, Rack, thus by combining the call letters with the first letter of the room function one can easily identify where the signal originates.

Setting Signal Include Lists

The Source Include list, set in the console edit pane, is the master list of sources that will be available for selection on router modules and source selector panels. The `routers.ini` file is where this list gets used to create the [SrcInclude] section list.

The Destination Include list set sets those destinations (Netcard outputs) that are available to be controlled by destination panels. The [DstInclude] list in `routers.ini` is equal to the Destination Include list entries.

Edge Device Parent Reassignment

Each edge device has an assigned "parent" which is that community member with that edge device's setup information in its `edgedevice.ini` file.

If an existing edge device is assigned a new parent in VMCC, new `edgedevice.ini` files will have to be provisioned and distributed to all of the affected consoles and racks to effect the parent change on the edge device.

When there are dozens of edge devices in a community, the affected edge device may not "hear" the Init RCED command issued by VMCC after new parent files are distributed. To ensure the edge device grabs the correct files, power cycle the edge device to force it to retrieve its setup information from the new parent.

Nesting Edge Devices

When *Nest edge devices* is checked under *Tools\Options\General tab*, adding a new edge device or changing the parent on an existing edge device does not automatically update the edge device location in the Explorer pane.

Edge device positions get updated when: a new device is added to the community; when the community is reopened (*File, Open Community*); when the *Nest edge devices* selection is cycled (To cycle the Nest selection, open the *Options* window, uncheck *Nest edge devices*, then click *OK* to close the options window. Reopen the *Options* window and recheck *Nest edge devices* and click *OK* to close the options window.). The edge devices will now be properly nested under the correct parent.

Un-Installing Cards from Devices

Use caution when uninstalling cards from the community devices. There is no warning issued for the removal of cards which have signals assigned to include lists or as button assignments.

Inspection and Merge Devices Issues

Matching a Physical Community with an Existing VMCC-created Community

Inspecting a physical community, with the intent to populate the null MAC addresses of a VMCC-created matching community, brings up a *Merge Devices* pane. This pane shows a list of all devices which match in both IP address and physical configuration to those in the VMCC community.

There is no distinction, however, in this pane between devices that match completely and devices that need to have their MAC address populated. Click *Accept* to populate the MAC addresses in the community members. Even though it may appear that no action is required, if *Cancel* is clicked, the MAC addresses will not be populated.

Merging a Physical Device into a VMCC-Entered Device

Inspecting a community, with the intent to merge an inspected device with a VMCC-entered device, will only work if the inspected device and the VMCC device match exactly in regards to frame-size, card type installed and their slot locations.

If the two devices do not match exactly, VMCC only allows the inspected device to be added as a new community member.

The differences between the VMCC device and the inspected device will be shown in the Inspect window. Make note of the differences and update the VMCC device accordingly. Again inspect the community. Once the inspected device matches the VMCC device, VMCC will allow the inspected device to be merged into the existing VMCC device.

Merge Devices List

If there is a changed device near the bottom of a long device list in the "Merge Devices" pane, there is no immediate indicator that decisions may be required. Be sure to scroll down through the device list looking for devices with changes.

Merge Devices, Multiple Changes

If there are multiple devices with changes in the "Merge Devices" pane, contiguous selections of changed devices will display only the list of "Critical Issues" specific to the first changed device selected. Selection of a device with no changes causes the next changed device selected to display correctly.

SETUP, CONFIG, SESSION, MACRO—GENERAL FILE INFO

All VistaMax device setup and configuration files are text-only files that share common formatting rules like: each section begins with a [Section Name] header, which is limited to 32 characters; that each entry line has an absolute maximum length of 1,000 characters (the line length may be further limited by other constraints imposed by the section); and that all text proceeded by a semicolon (;) is a comment line, which is limited to 80 characters.

Config (`.cfg`) and setup (`.ini`) files are created and maintained using VMCC so this information is more applicable to session and macro files, which are created and/or edited manually using Notepad.

Here's how each section and its entries appears in each VistaMax file:

```
[Section Name]
;Section Comment Line
KeyValue=EntryValue ;Comment
```

The `[Section Name]` defines what the section entry values set up. The name is specific and must be entered using exact characters. Following each `[Section Name]` heading is space available for one or more comment lines. Up to 32 comment lines could be added. Each comment line begins with a semicolon (;).

Each section is limited to 64 data entry lines. Each data entry line is composed of a KeyValue followed by = (equals) and then the EntryValue. The KeyValue may be up to 32 characters in length. The EntryValue may be up to 80 characters in length, plus each entry can be followed by an optional comment—which can also be up to 80 characters in length (after the ;).

The format of the Entry Value is Section Name specific, and it may have multiple components, each separated by a comma.

When an EntryValue refers to a specific signal in the VistaMax system it can be identified in three ways: by its global number (*65697*); by its local number (*161*); or, when the signal is on another device, by its universal number (*d1.161*). Each of these numbers reference the Mix-Minus 1 signal on the console set as device 1.

The following command shows the use of local numbering,

```
[RouterCommand_1]
take_1=161,241; MM-1 > KSU A1
take_2=163,243; MM-2 > KSU A2
```

The following command shows the use of universal numbering,

```
[RouterCommand_1]
take_1=d1.161,d1.241; MM-1 > KSU A1
take_2=d1.163,d1.243; MM-2 > KSU A2
```

The following command shows the use of global numbering,

```
[RouterCommand_1]
take_1=65697,65777; MM-1 > KSU A1
take_2=65699,65779; MM-2 > KSU A2
```

There are three Excel spreadsheets included on the 99-5000 CD-ROM that can be used to determine the local and global numbers for each signal in any console or rack. The universal number is simply the device indicator (`d`) and the device number (1 up to 63) followed by a period and the local number, as shown in the above examples.

There are also PDF files for each spreadsheet that show the local and global numbers for device 1 of each console type and rack.

Section Headings

In session files most section headings define the button states of each channel strip on the control surface when the session loads. Thus there are section headings for PGM 1, PGM 2, Mode, Cue, etc. and under each heading is an entry for each channel strip in the console. These types of headings were covered in chapter 4.

[chain]

This section allows one or more session files to be automatically loaded on other consoles or racks when the session is loaded. It is more often used in macro files than in session files, but it works equally well in either. The chain command entry looks like this:

```
[chain]
call_1=remote_1.ses,9
```

This is most often used to route a return signal (mix-minus, IFB) for a remote or for a shared two-way device like an ISDN interface that connects to another device. In the example, the KeyValue is `call_1=` and the EntryValue is `remote_1.ses` which is loaded on device 9.

[RouterCommand_1]

This section allows one or more routes to be set when the session loads. Typical usage was shown in the examples on signal numbering on the previous page.

Each `take_x` KeyValue, numbered sequentially from 1, defines one route. Each EntryValue defines the source and the destination for that route. In `take_1=161,241` signal 161 is the source and signal 241 is the destination.

MACRO FILES

Macro files are text-only command files that have a `.mac` suffix. They are created using a text-only editor like Notepad®. Macro files contain session file-type commands to perform one or more tasks. A simple macro might consist of a couple commands to route signals for setting up a live remote.

A more complex macro could not only route bidirectional signals, but could also command session files to load on several community devices. One use for this would be to setup a facility for unattended overnight operation. When the morning show staff comes in, they would run another macro to return the consoles back to standard daytime operations.

Macros are loaded into a console or VistaMax rack just like a session file: they can be run manually through using a file load FTP command; they can be added to the Task Scheduler so they are run at specified times; or they can be added to a router channel for board operator selection and loading.

Macro files are stored in the SesFiles folder. Since they do not have a `.ses` suffix they do not show up in the Session selector. If a board operator needs to load a macro, the macro can be assigned as a "source" on a router channel. The macro is executed when the operator selects the macro and presses *Take* on the router channel. The only downside: adding a macro to a router channel means that channel is exclusively set aside for macros—no normal audio sources are displayed.

Here is part of an RMX*d* session file showing a standard router definition and one set for loading macros:

```
[Router_4]
include_1=257-287,321-335
Take=259

[Router_5]
macro_1=dallas
macro_2=chicago
macro_3=tucson
macro_4=bayonne,6
```

Router 4 is a typical router section with a channel-specific include list (to limit the sources displayed), and a take command that routes a signal on the channel when the session file is taken.

Router 5 is set to display four macros in its source list. Macros 1, 2 and 3 are on the local device. Macro 4 (bayonne) is run on device 6. The session file command syntax for assigning macros to a router channel is as follows:

```
[Router_x]
Macro_n=Filename,d
```

x is the channel ID of the router channel.

n sequentially numbers the macro entries, starting from 1. Up to 64 macros could be assigned to any one router channel.

Filename is the macro's file name *minus* the `.mac` file extension.

,d is an optional entry to specify a device number. The device number identifies which device has the macro file. The macro is loaded on that device. No entry says the macro is on the local device.

Channel Displays

When a session file that has macros assigned on a router channel is taken, the console automation checks the SesFiles folder, on the **local** device only, to verify the macro files listed in the session file are present. If a macro file is not found, the name is displayed with arrows,

```
> Macro name <
```

when it is dialed up on the router channel. If a macro with the arrows is taken, the macro does not load and the name is displayed with brackets,

```
[ Macro name ]
```

indicating the macro did not run. Since this function only checks the local device, macro files called on other devices are assumed to execute as requested and there is no indication that the macro file did not load as requested.

Router channels with macros should be left turned Off since there is no audio on the channel and taking a macro in this state causes it to execute immediately. While the router channel with macros is On, taking any macro—local or remote, will also show brackets around the name, but in this case it is because the macro is pending. It will not be executed until the channel is turned Off.

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