RMXdigital

Broadcast Console

Operations & Technical Manual

PRE75-53

Revision C.1 • 12/10

HARRIS
Broadcast Communications Division

www.broadcast.harris.com

Contents

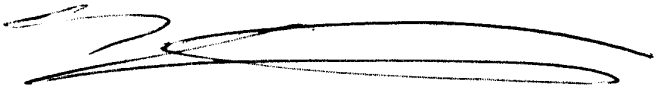
Declaration of Conformity

Application of Council Directive: 89/336/EEC

Standards To Which Conformity Is Declared:	EN55103-1 (Studio Environment) EN55022 Class A Magnetic Field Emissions EN55103-2 (Studio Environment) EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-6 EN61000-4-8 Magnetic Field Immunity
Manufacturer's Name:	Harris Corporation BCD
Manufacturer's Shipping Address:	4240 Irwin Simpson Road Mason, Ohio USA 45040 513.459.3400
Manufacturer's Mailing Address:	4593 Digital Way Mason, Ohio USA 45040 513.459.3400
Equipment Description:	Radio Mixing Console
Equipment Class:	Audio Equipment - Studio
Model Numbers:	RMXdigital Broadcast Console

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

Ted Staros
Full Name

Director–Console Product Development
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.

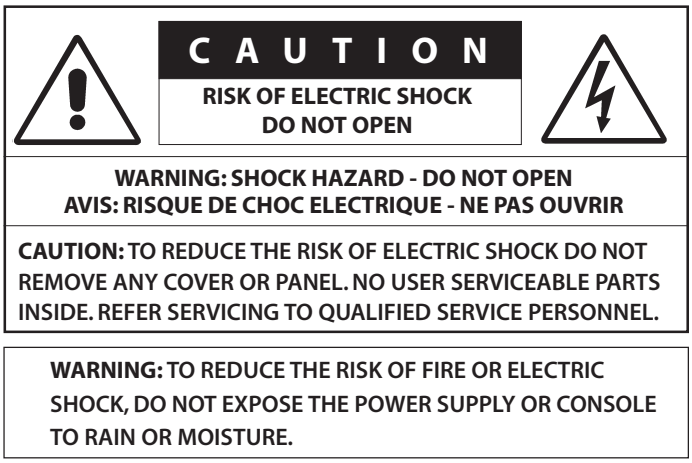
18. **Damage Requiring Service.** Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions:
    a. When the AC cord or plug is damaged.
    b. If liquid has been spilled or objects have fallen into the product.
    c. If the product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



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*	*6/04 First Release*
B	*All pages*	*8/05 VMCC info added*
C	*All pages*	*10/07 reflective meter & 500-series code information added*

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.

To obtain the maximum benefit from the console's capabilities, read through the chapters on *Installation*, *Operation* and the *RMXd Server* prior to actual product installation.

An RMX*digital* console ships with the following items:

- **Mainframe**, with 12, 20 or 28 input slots
- **Universal Dual Fader Panels**, installed, as ordered
- **Monitor Control Panel**, 1 standard
- **KSU Card**, 1 standard
- **DSP Card**, one standard on the 12-input; two standard on the 20-input; three standard on the 28-input)
- **8-Input Expansion Card**, optional, total number installed: up to the number of DSP Cards installed in the mainframe
- **Single or Dual Width Blank Panels**, as required, to cover unpopulated input slots
- **48 VDC Power Supply**, 1 standard
- **Console Display**, 1 low-profile display standard; original display, optional
- **Installation Kit**, 1 standard
- **Tool Kit**, 1 standard
- **CD-ROM**, 1 standard

Product Overview

The RMX*digital* is a low profile, digitally-controlled, routable audio console that sits in a countertop cutout. Framesizes with 12, 20 or 28 control strips are available. The console can operate in a stand-alone capacity or, for maximum flexibility and usability, be integrated with a VistaMax Audio Management System.

A separate Console Display, with two stereo bargraph meters, an ESE/SMPTE-compatible Clock and Event Timer, is included. The display sits on the countertop near the mainframe and plugs into the frame using a captive six-foot cable harness.

The console is designed for 24/7 operation. It has two power connections, with integral coupler, for a main and a redundant supply (PRE99-1205). One supply is included with the mainframe.

All RMX*digital* components (console, display, and power supply) are convection cooled for completely silent operation.

RMX*digital* circuit board electronics are contained within an aluminum chassis for strength and RFI immunity. All user connections are made from the top surface. The connectors, and cable access openings, are located below a hinged cue speaker panel behind the main control surface.

Each RMX*digital* mainframe (and the rackmount RMX*d*8-HL) comes standard with a KSU Card that has these connections:

- Four program and one send output (each has a dedicated analog and an AES digital output)
- Analog control room outputs (for a monitor amp, and for operator and guest headphone amps) *
- Analog studio outputs (for a monitor amp, and for host and guest headphone amps) *

- Cue speaker and Cue monitor output *
- Three talk audio outputs (Talk to: control room, studio, and an external location) *
- Eight routable audio inputs (four analog and four digital inputs, independently routable to any channel strip) that are VistaMax sources
- Eight routable audio outputs (four analog and four digital outputs, independently routed from any console bus) that are VistaMax destinations
- Dedicated control room, studio and cue/talk/external logic connectors, with three Assignable Logic I/O connectors *
- VistaMax facet Link connectors (two copper RJ-45, standard; two optical MT-RJ connectors, optional) plus an Ethernet connection for communicating with a VistaMax LAN
- Serial Test Interface connection for diagnostic and system software maintenance

* These connections are typically not used on the RMX*d*-8HL

Additional audio inputs and logic I/O can be added in a mainframe by installing the optional 8-Input Expansion Card onto a DSP card. Each Expansion Card has eight audio inputs (individually switch set as an analog or a digital input) and eight Assignable Logic I/O connectors to associate logic with the eight inputs. The audio inputs are independently routed to channel strips through session file settings or by manually selecting a source using a channel strip source selector. During console setup, audio inputs can be "bound" to logic I/O connectors for channel logic control to and from peripheral devices and mic control panels.

One 8-Input Expansion card can be added to a 12-input frame, up to two cards can be added to a 20-input frame and up to three cards can be installed in a 28-input frame.

VISTAMAX CONTROL CENTER

The RMX*digital* is set up for daily use through configuration files that are maintained by the supplied VistaMax Control Center (VMCC) software. Monitor switch functions, channel button settings and audio routing is "soft controlled" through setup parameters—initially auto-loaded through a control file, called `init.mac`, and adjusted as required through session file settings.

The initial console settings can be changed, as required by board operators, through manually selecting different input signal sources and changing control surface button assignments, or by loading a session file—a pre-saved file that reconfigures the console for a different daypart or function.

SESSION FILES

Session files are initially created right on the console by selecting input sources and setting desired switch conditions, then pressing *Save* on the Monitor Control panel. This action creates a new session file—which never affects previously saved session files. The new session file can then be edited using a text-only editor on a Windows® computer, if required, and then saved back to the console over the LAN connection. The session is then "dialed up" by the operator using the Monitor Control panel session selector and *Take* button.

For some facilities, a single customized session file may be sufficient to set up a console for all users but it is more likely that multiple session files will be created to set the console for different dayparts or different operations (e.g., one console could serve split duty, being a newsroom feeding live audio to air during the day, but then changing to a production room at night).

Since session files can change any number of console settings, dayparting the console is as easy as selecting the desired session file and pressing *Take*—once the session files have been created, edited and saved back to the console.

For example, if the "morningzoo" session is currently loaded on a RMX*digital-12* console, and it has configured the console inputs as: five mics (each with the talent's name shown in the channel display), three Telco channels (two phone hybrid caller inputs and an ISDN live remote input) and four line inputs (three digital delivery inputs for sound FX, music beds, commercials, etc., and a traffic or weather service feed).

To switch the console for the midday daypart (one board operator/jock who takes requests and plays back all sources from a digital delivery system), means there is some extensive switching that must take place on a non-programmable console.

On the RMX*digital*, however, it is done simply by dialing up and taking the "midday" session—which immediately reconfigures the console, resulting in Input 1 being the control room mic (with the jock's name shown in the channel display, if desired); the next four inputs are routed from the digital delivery system for music, liners and commercials, while Input 6 remains the hybrid input (for those call-in music requests). The remaining Telco and input channels could be left alone or they could be routed to silence, remaining available for the board operator to use as required.

To prevent on-air interruptions, any channels that are On-Air when a session file is taken do not immediately change settings. Instead, those channels only change to the new session file settings when that channel is turned off in order to effect seamless show transitions.

MAIN COMPONENT DESCRIPTIONS

An RMX*digital* console has only three components—as seen and used by the board operator: Universal Dual Fader panels, a Monitor Control panel and the Console Display.

Additional descriptions are presented in this section for the power supply, KSU and DSP cards, and for the optional 8-Input Expansion cards.

Universal Dual Fader Panels

Each Dual Fader panel has two sets of channel strip controls with these functions: channel on/off; fader level control; cue on/off; momentary talkback control to remotes or callers (active when the channel strip is set as a Telco channel); input source selector and take button; input mode buttons with pan/balance pot; send bus on/off, mode and level control; and assignment buttons for four program and one offline bus.

A ten-character display on each channel strip normally shows the input source name. Alternate source names are shown when the yellow Next LED is lit during source selection.

A channel strip control can be assigned to control any type of audio source: mic; line; router; Telco, as required by a particular daypart.

The audio source for each fader is initially set by loading a session file. The input's source name (or an alias name) is shown in the ten-character display above each fader. If no signal is routed to the fader, then `SILENCE` is displayed.

The capacity to change the source—via a source selector and *Take* button, is a standard part of each channel strip since the physical audio source for each channel is "virtual"—it can be any physical console input (analog or digital) and, when the console is tied into a VistaMax system, any input source on any VistaMax device networked with the RMX*digital* console. To simplify operation, the available sources can be individually limited on a channel strip through session file settings.

The input audio may also be linked with logic from a peripheral or mic control panel to provide fully independent parallel logic control functions for remote control of the channel strip and/or channel strip control of the source equipment. Again, all of these parameters are set during console configuration so that the operator never has to concern themselves about logic or signal routing when the session files are properly crafted.

Monitor Control Panel

This standard panel is divided into three functional sections: Session, Control Room, and Studio, by graphic lines on the panel.

Session Section

The middle of the left section has the session controls for selecting and saving session files (rotary session selector, take and save buttons) along with two ten-character displays for showing the current session (in the top line) and a next session (in the bottom line).

The Auxiliary Meter source selector buttons are above the session controls. These allow one of seven sources (defaults assignments are: Real Air, the send bus, the Telco record bus, and the four program buses) to feed the Auxiliary Meter located on the Console Display. The selected source name is shown below the Auxiliary Meter.

Just below the session controls are the Monitor Mode buttons that are covered in the Control Room Section that follows.

Five event timer control buttons are found at the bottom of this section. Start, Stop, Hold, and Reset manually control the event timer in the Console Display. When the Auto Reset button is lit, the timer can be reset automatically when a channel is turned on. Which channels reset the timer are set by session file commands.

Control Room Section

The center section of the Monitor Control panel has monitor source selector buttons for the control room monitor and operator headphone outputs. A source can be selected from among the seven buttons at the top of the center section (the defaults are the same as for the Aux. Meter), or by using the monitor source selector and take button to select between an additional fifteen sources. The selected source button lights to indicate its selection, while blanking the selected name display. When a source is selected using the source selector, the name is shown in the ten-character display and all source buttons are turned off.

Just above the monitor source display are two level pots for setting the output levels of the cue speaker and the control room talkback output.

Independent control room monitor and headphone fader level controls are at the bottom of this section. The selected source is routed through the monitor mode controls in the left-hand section next to the top of the faders, which control whether the monitor signal is stereo, left only, right only, or mono (left and right summed together).

AutoCue, another mode control, sets whether cue feeds the headphone output. When unlit, cue activity does not affect the headphone output. When AutoCue is lit, the headphone output automatically switches to listen to the cue bus while cue is active.

The AutoCue function has two modes, as set using the VMCC program. The default setting is Split Cue where the monitor and cue audio are separately summed to mono before going to the headphones. Cue audio is sent to the left ear while the monitor audio goes to the right ear. An alternative mode is Stereo Cue, where cue audio replaced the monitor audio with the Cue audio (in stereo in the headphones).

Studio Section

The right-hand section of the Monitor Control panel has controls for a separate talk or voice studio. Monitor source selection is done in the same manner as the control room: a source selector button (at the top of this section) can be pressed, or a source can be selected using the monitor source selector and take button.

Level control of the dedicated studio monitor and talkback outputs is done through the two volume pots above the monitor source display.

This section of the Monitor Control panel also has two talkback buttons so the board operator can talk to the studio and/or to an external location using the board operator's microphone.

Console Display

The separate Console Display sits or stands on the countertop behind or to the side of the console control surface. The Main Meter shows the PGM 1 output levels. The Aux Meter shows the cue bus, when active, or a source selected using the Aux Meter source controls on the monitor panel.

An ESE and SMPTE-compatible time of day clock and an event timer (controlled by Monitor Control panel buttons and/or reset commands from one or more channels) are also on the Console Display.

The display plugs into the console motherboard using a six-foot captive cable harness.

KSU Card

Each RMX*digital* (including the RMX*d*8-HL) has one KSU Card with eight assignable audio inputs and eight assignable outputs; three Assignable Logic I/O connectors; dedicated logic connectors for control room, studio, and cue/talk/external logic; eighteen dedicated analog and digital program and monitor outputs; a VistaMax LAN connector; a serial test connector; and two copper (RJ-45) VistaMax Link connectors.

A KSU card with two MT-RJ optical VistaMax Link connectors (PRE99-2672-2) is available for interconnecting the console to a VistaMax system when the distance between console and VistaMax frame exceeds 100 meters (the maximum length supported using CAT-5e or CAT-6 cables). The MT-RJ optical connections support runs up to 2 km. An optical Link RMX*d*8-HL (PRE99-1910-2) is also available.

On the consoles, the KSU card plugs into the motherboard behind the Monitor Control panel and the two adjacent Dual Fader Input panels. In normal use it's hidden below the cue speaker panel.

The KSU consists of an SBC (Single Board Computer), a VistaMax interface, and DSP for the eight routed KSU inputs/outputs and the bus outputs.

DSP Card

The number of DSP (Digital Signal Processor) cards installed is frame size dependent (RMX*d*-12 has one DSP Card, RMX*d*-20 has two, and RMX*d*-28 has three cards). DSP Cards plug into the lower motherboard behind the Universal Dual Fader Input panels, hidden below the cue speaker panel in normal use. Each card handles routing for eight stereo audio inputs and eight Assignable Logic I/Os. Each card has DSP "heartbeat" and automation LEDs to indicate operational status.

8-Input Expansion Card

This optional audio input and logic I/O card (PRE99-2665) adds eight audio inputs and eight Assignable Logic I/O connectors to any DSP Card, in lieu of the blank panel between the DSP card and the control surface. An 8-Input Expansion card can be added to each DSP card.

Each audio input is physically set as an analog or a digital input by a board-mounted DIP switch. The input is assigned to a channel strip (or set as a VistaMax input) by the session file. The Assignable logic connections can be "bound" to any one of the audio inputs, and then jointly assigned to a channel strip, or they can be used separately from any of the audio inputs as determined by the current session file settings.

Power Supply

A separate rackmount power supply (PRE99-1205) supplies +48 VDC to the console mainframe. One supply comes standard with each mainframe.

The RMX*d*8-HL has a built-in 48-volt supply. All are supplied with a 110 VAC IEC input cord.

Two keyed 48-volt power cables are supplied with the console mainframe Installation Kit so that a second PRE99-1205 supply (optional) can easily be added for redundant supply operation. The mainframe and the RMX*d*8-HL include an integral power coupler so a second redundant supply can be connected.

The power supply (and the RMX*d*8-HL) has a recessed front panel On/Off switch along with a green LED that indicates the +48 volt output is good.

The power supply is designed for continuous 24/7 operation and is fully regulated and protected against excessive current by internal fuses and electronic safeguards.

Specifications

Specifications are for the basic signal paths, per channel, with 600 ohm loads connected to the analog program outputs in a fully loaded RMX*digital* 28-input slot mainframe.

0 dBu equals 0.775 volts RMS regardless of circuit impedance, which equals 0 dBm into a 600 ohm circuit. Noise specs based on 22 kHz measurement bandwidth. A 30 kHz bandwidth measurement increases noise by about 1.7 dB.

Total Harmonic Distortion (THD+N) is measured at a +18 dBu output, using a swept signal and a 22 kHz low pass filter.

FSD = Full Scale Digital, +24 dBu

Analog Line Inputs

Input Impedance: >60 k ohms, balanced
Input Level Range: -10 dBv to +4 dBu (soft trim)
Input Headroom: 20 dB above nominal input

Analog Outputs

Output Source Impedance: <3 ohms balanced
Output Load Impedance: 600 ohms minimum
Nominal Output Level: +4 dBu
Maximum Output Level: +24 dBu

Digital Inputs and Outputs

Reference Level: +4 dBu (-20 dB FSD)
Signal Format: AES-3, S/PDIF (input only)
AES-3 Input & Output Compliance: 24-bit sample rate conversion
Digital Reference: Crystal (internal) or VistaMax slave (external) at 48 kHz ±100 ppm
Internal Sample Rate: 48 kHz
Output Sample Rate: 48 kHz (PGM 1, PGM 2 or Send can be set for 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, input 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

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

Dynamic Range

Analog Input to Analog Output: 104 dB referenced to FSD, 107 dB "A" weighted to FSD
Analog Input to Digital Output: 105 dB referenced to FSD, 108 dB "A" weighted to FSD
Digital Input to Analog Output: 110 dB referenced to FSD, 113 dB "A" weighted to FSD
Digital Input to Digital Output: 125 dB

Total Harmonic Distortion + Noise

Analog Input to Analog Output: <0.003%, 20 Hz to 20 kHz, +18 dBu input, +18 dBu output
Digital Input to Digital Output: <0.0005%, 20 Hz to 20 kHz, -6 dB FSD input, -6 dB FSD output
Digital Input to Analog Output: <0.003%, 20 Hz to 20 kHz (<0.001%, typical at 1 kHz), -6 dB FSD input, +18 dBu output

Crosstalk Isolation

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

Stereo Separation

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

Console Power Requirements

RMX*d8-HL:* 48 watts
RMX*d-12:* 99 watts
RMX*d-20:* 141 watts
RMX*d-28:* 186 watts
Measured at 115/230 VAC, ±12%, 50/60 Hz

Power Supply Voltage

Console power: +48 VDC at 6.25 Amps. (The console includes an integral power coupler for a primary and a redundant supply. One supply is included with the mainframe, along with two DC power cables.)

Power Supply Ground

Rack mounted power supply: grounded through AC cord

Power Supply Connection

AC input: IEC power cord
DC output: Keyed multi-pin connector

Dimensions

For all RMX*digital frames*: height above countertop is 2.25" [57]. Depth below countertop is 9.85" [250] at the rear of the frame. Front-to-back depth is 22" [559]. See page 2-1 for a side view with dimension details.
RMX*d-12 is* 27.4" [696] wide
RMX*d-20 is* 40.2" [1021] wide
RMX*d-28 is* 53.0" [1346] wide

RMXd8-HL (Rack mounted):
2 RU: 3.5" [89] x 19" [483] x 10" [254]

Console Display (sits/stands on countertop):
Original Tall Display: 11.13" [283] x 14.25" [362] x 5.1" [130]
Low-Profile Display: 5" [127] x 17.25" [438] x 5.25" [133]

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

All dimensions: Height x Width x Depth.

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

Warranty

Each RMX*digital* console, RMX*d*-8HL and 48-volt power supply carry a standard manufacturer's warranty of **15 months** from the DATE OF SHIPMENT from Harris.

A copy of the domestic (USA) product warranty policy, dated July 1, 2007, is presented on the following two pages.

To view or download the current Harris Broadcast Communications Standard Warranty Policy Statement for either domestic or international locations, visit this Harris corporate website page:

`http://www.broadcast.harris.com/support/warranties.asp`

PRODUCT WARRANTY (USA)
TECHNICAL SUPPORT

For information about products or support services:

Call: +1 888 534 8246
Website: www.broadcast.harris.com

To register products or update company information visit:
https://premier.harris.com/broadcast/warranty_registration.asp

PROFESSIONAL SERVICES COMMITMENT

We are serious about our professional services business. We strive to provide the highest level of support in the industry and offer a complete set of integrated support solutions designed to help our customers across every phase of their business. Harris works with you to provide the type of coverage you need. We are committed to service excellence.

Standard Warranty Services

Technical support 9 hours a day, 5 days a week
After-hours emergency "Down or Off-air" phone support
5-day advance exchange of parts
Software updates and bug fixes
Access to technical knowledge bank

Optional Gold ServicePAK

Technical phone support 24 hours a day, 7 days a week
Next-day advance exchange of parts

HARRIS BROADCAST COMMUNICATIONS
STANDARD WARRANTY POLICY STATEMENT

Effective July 1, 2007

STANDARD EQUIPMENT WARRANTY

Harris Corporation ("Harris") warrants that all Harris Broadcast Communications-manufactured equipment will be free of any defect in materials or workmanship for the period of time specified in the table below (or such other time period as agreed in writing by the parties). Warranty begins from the date of shipment from a Harris facility. The warranty is ex-tended to customers and applies to all Harris Broadcast Communications-manufactured equipment purchased, installed, and used for the purpose for which such equipment was originally designed.

Product Family	Standard Equipment Warranty Period
Transmitters (except Platinum VHF transmitters), Storage, Servers, Automation, Graphics, Post Production, Consoles and Audio Management Equipment	15 months from shipment
Test & Measurement, Routing & Distribution Equipment	27 months from shipment
Digital Exciters (Radio)	39 months from shipment
Platinum VHF Transmitters	63 months from shipment
B-Stock Equipment	Same as applicable product warranty
Replacement Parts – within Standard Warranty Period	Longer of (i) applicable product warranty or (ii) 90 days from shipment
Replacement Parts – post Standard Warranty Period	90 days from shipment

WARRANTY CLAIMS AND PROCEDURES

1. During the applicable Standard Equipment Warranty Period outlined above, customer's sole and exclusive remedy for any breach of the Standard Equipment Warranty will be, at Harris' sole discretion and option, repair or replacement of the defective product. Components that customer claims to be defective must be available to Harris for inspection and evaluation. Unless otherwise agreed in writing by Harris, customs clearance for all replacement parts under the warranty or otherwise will be customer's sole responsibility. To be entitled to rights under the Standard Equipment Warranty, the customer must notify Harris in writing within thirty (30) days after discovering a suspected defect in any product, but in any event prior to the expiration of the applicable Standard Equipment Warranty Period. Notice to a Harris dealer, systems integrator, sales representative or other third party is not notice to Harris. Following its receipt of any such customer notice, Harris will determine whether the reported problem is covered by this Standard Equipment Warranty. If Harris determines that the problem is covered, Harris will authorize repair or replacement of the defective product, as deemed appropriate by Harris in its sole discretion. For clarification purposes, any technical support provided by Harris will be for the sole purpose of fulfilling Harris' warranty obligations. If Harris determines that customer is using technical support as a substitute for training of customer's personnel, then such technical support will be subject to additional charges at Harris' then prevailing unit rate for such services.
2. Before shipping any product to Harris, the customer must obtain a written return authorization from Harris, and provide any proof of warranty eligibility requested by Harris. Any product received by Harris without a return authorization may, at Harris' option, be returned to the customer collect. Once a return authorization is obtained, the customer is responsible for packing and shipping the product to which its warranty claim relates to a service facility designated by Harris, with all shipping charges prepaid by Harris, within thirty (30) days after receipt of the return authorization. Harris will pay for return of the repaired or replacement product to the customer if the repaired or replacement product is shipped to a designated Harris service facility. In the event that the foregoing procedure is not followed by customer, Customer shall pay for return shipping of the defective equipment (or part thereof) to Harris and Harris shall only pay delivery charges of the replacement equipment (or part thereof) to customer. Harris will use commercially reasonable efforts to supply equipment (or part thereof) from the geographical region of customer's site, so as to minimize freight and duty. Harris bears the risk of loss or damage while the equipment (or part thereof) is in transit to customer from the Harris service center, and customer bears the risk of loss or damage while the equipment (or part thereof) is in transit back to the Harris service center.
3. Upon receipt of replacement equipment (or part thereof), customer has thirty (30) days to tender the defective equipment (or part thereof) to the return carrier for shipment to the service center designated by Harris. If customer does not timely return the defective equipment (or part thereof), Harris shall invoice customer for the list price of such equipment (or part thereof), plus applicable shipping. Such failure to return the equipment (or part thereof) may, in Harris' discretion, be grounds for termination of the warranty and/or suspension of any future advance exchange privileges until such outstanding defective equipment has been returned. Under the Standard Equipment Warranty Harris will provide customer with new, rebuilt, refurbished or alternate equipment (or part thereof) of equal or improved quality, as exchange equipment (or part thereof) to replace eligible defective equipment (or part thereof). Any alternate equipment (or part thereof) will meet or exceed the specifications of the replaced equipment (or part thereof). Rebuilt or refurbished equipment may bear cosmetic blemishes that do not affect performance. Unless otherwise specified by Harris in writing, repaired or replaced equipment (or parts thereof) are covered only for the remainder of the term of the applicable Standard Equipment Warranty. All defective equipment (or parts thereof) replaced by Harris become the property of Harris. Harris has no obligation to (i) service, exchange or otherwise replace any equipment (or part thereof) that has been damaged, modified, abused, misused or over-used as determined by Harris or has been used with non-Harris supplies or products that have caused damage or malfunction; (ii) paint, refinish, refurbish, restore or exchange any equipment (or part thereof) with cosmetic blemishes; (iii) service, exchange or otherwise replace any equipment (or part thereof) if the same would interfere with, impede or be redundant with normal or scheduled maintenance of such equipment (or part thereof); (iv) service, exchange or otherwise replace any equipment (or part thereof) that is within sixty (60) days of the end of its production life; or (v) provide any application software support or service involving application hardware or replace any accessories. If Harris elects to perform any such services at customer's request, then such services will be deemed a service call and all labor, parts and materials used for the service call will be charged at Harris' then-prevailing rates.

Part Number: 158-000026-01

EQUIPMENT WARRANTY EXCLUSIONS

Harris does not warrant or guarantee, and is not responsible for:

1. Defects, failures, damages or performance limitations caused in whole or in part by (A) power failures, surges, fires, floods, snow, ice, lightning, excessive heat or cold, highly corrosive environments, accidents, actions of third parties, or other events outside of Harris' control, or (B) customer's abuse, mishandling, misuse, negligence, improper storage, servicing or operation, or unauthorized attempts to repair or alter the equipment in any way. Customer must provide qualified technical personnel to maintain and repair the equipment.
2. Equipment built to customer's specifications that are later found not to meet customer's needs or expectations.
3. The performance of the equipment when used in combination with equipment not purchased, specified, or approved by Harris.
4. Signal coverage delivered by antenna equipment whether or not supplied by Harris.
5. Batteries and other consumable goods.

ADDITIONAL WARRANTY NOTES

1. OEM or third-party equipment that is incorporated into Harris equipment is covered under the applicable Harris Standard Equipment Warranty unless the OEM or Third-Party equipment carries its own limited warranty, in which event the OEM or third-party warranty will apply to such equipment incorporated into Harris equipment. For example and not limitation, CRTs, LCDs, FSMs and Optical Test products are OEM products that have a limited 1 year manufacturer's warranty.
2. Items Sold As Resale. Items sold as resale are such items that are not manufactured by Harris but may be utilized in conjunction with or independently of Harris manufactured equipment (such as tubes, printers and antenna transmission lines) and shall be covered only by the specific warranty terms of the supplier or original equipment manufacturer of those items. IF AN ORDER COVERS EQUIPMENT NOT OWNED BY HARRIS, IT IS SOLD SUBJECT TO HARRIS' ACQUISITION OF POSSESSION.
3. B-Stock Equipment. B-Stock equipment for non-transmitter related equipment is defined as any non-out-of-production product that is less than three (3) years old. B-Stock equipment related to transmitters is defined as equipment repurchased by Harris that is reconditioned or refurbished for sale to a second generation owner by Harris or its reseller.
4. Used Equipment. IF THE EQUIPMENT SPECIFIED IN AN ORDER IS DESCRIBED AS USED, UNLESS OTHERWISE AGREED IN WRITING BY THE PARTIES, IT IS SOLD "AS IS" AND WITH NO WARRANTY.

SERVICES WARRANTY

Harris warrants that the services will be performed in a professional manner (the "Services Warranty"). Notice of a breach of the Services Warranty must (i) specify in reasonable detail, the nature of the claim, and (ii) be received within ninety (90) days from the last day of performance of the services. Upon notice of a breach of the services warranty and Harris' determination of the validity of such breach of the Services Warranty, Harris will re-perform the applicable services at Harris' expense. If after reasonable opportunity Harris is unable to re-perform such services to the reasonable satisfaction of customer, customer may, as its exclusive remedy, obtain a refund of the fees paid to Harris under the applicable order for such services.

SOFTWARE WARRANTY

1. Physical Media. Harris warrants all physical media ("software media") for the licensed programs, including without limit custom software and traffic translators ("Licensed Programs"), to be free of defects in material or workmanship for a period of ninety (90) days from the date of completed installation, or if customer should assume responsibility for installation of the software, for a period of ninety (90) days from the date of shipment of the Licensed Programs by Harris (the "Software Warranty Period"). This limited warranty extends only to customer as the original licensee. Customer's sole and exclusive remedy under this limited warranty will be, at Harris' option, repair or replacement of the software media.
2. Licensed Programs. Harris warrants that during the Software Warranty Period (or such other time period as agreed in writing by the parties) the Licensed Programs shall operate substantially in compliance with Harris' specifications for the Licensed Programs (the "Software Warranty"). The entire liability of Harris under this limited warranty is to provide, free of charge, a corrected copy of any portion of the Licensed Programs which is found by Harris inspection not to be in substantial compliance with its specifications. If Harris is unable to provide a corrected copy of the Licensed Programs within a reasonable time, as customer's sole and exclusive remedy, Harris will replace the same with a functionally similar program or refund to customer the amounts customer paid Harris to purchase or license such Licensed Programs. Harris does not warrant that such programs are error free or that customer will be able to operate such programs without problems or interruptions. Corrections to the Licensed Programs beyond the Software Warranty Period will only be made by Harris pursuant to a separate software maintenance agreement.
3. Cost of Corrections. During the Software Warranty Period, Harris will bear the material cost and shipment of corrected or replacement Licensed Programs at no charge to customer. Software corrections will be sent via e-mail. In the rare event customer requires a Harris customer support engineer to visit the site, related reasonable pre-approved on-site time and travel expenses will be billed at the prevailing daily rates, unless otherwise agreed to in writing prior to the visit. A ONE-DAY MINIMUM CHARGE APPLIES TO ALL ON-SITE VISITS.
4. Software Warranty Exclusions. The Software Warranty does not apply to any software media or Licensed Program that (A) has been altered or modified, except by Harris; (B) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Harris; (C) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident; or (D) is used in ultra-hazardous activities.

DISCLAIMER OF WARRANTY

EXCEPT AS EXPRESSLY PROVIDED IN THIS STANDARD WARRANTY POLICY STATEMENT, HARRIS HEREBY EXPRESSLY DISCLAIMS ALL REPRESENTATIONS, CONDITIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING BY WAY OF EXAMPLE AND NOT LIMITATION, THE IMPLIED WARRANTIES OF TITLE, MERCHANTABILITY, NONINFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION ON LIABILITY

NOTWITHSTANDING ANYTHING HEREIN TO THE CONTRARY, IN NO EVENT WILL HARRIS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING LOSS OF PROFITS, WHETHER ARISING IN CONTRACT, TORT, WARRANTY OR OTHERWISE, EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE LIMITATIONS SET FORTH HERE WILL APPLY EVEN IF THE REMEDIES OF ERROR CORRECTION, REPAIR OR REPLACEMENT, REPERFORMANCE OF SERVICES AND REFUND OF PAYMENTS COMPLETELY FAIL OF THEIR ESSENTIAL PURPOSE. NOTWITHSTANDING ANYTHING HEREIN TO THE CONTRARY, THE LIMIT OF HARRIS' LIABILITY (WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY, BY STATUTE OR OTHERWISE) TO CUSTOMER OR TO ANY THIRD PARTY CONCERNING THE HARRIS EQUIPMENT OR SOFTWARE LICENSES SOLD TO CUSTOMER AND WARRANTED HEREUNDER, HARRIS' PERFORMANCE OR NONPERFORMANCE, OR IN ANY MANNER RELATED TO THIS STANDARD WARRANTY POLICY STATEMENT, FOR ANY AND ALL CLAIMS WILL NOT IN THE AGGREGATE EXCEED THE ACTUAL AMOUNTS RECEIVED BY HARRIS FOR THE SPECIFIC PRODUCT WITH RESPECT TO WHICH SUCH CLAIM IS MADE.

GOVERNING LAW AND JURISDICTION

1. Applicable Law, Venue and Jurisdiction. This Standard Warranty Policy Statement, and any disputes related hereto, shall be governed by and interpreted in accordance with the laws of the state of Florida, USA, regardless of any law principles requiring the application of any other law. The parties agree that the exclusive venue for any action related to the dispute or interpretation of this Standard Warranty Policy Statement shall be in the courts with the appropriate jurisdiction located in Orlando, Florida, and each party irrevocably submits to the jurisdiction of each such court in any such action and waives any objection it may now or hereafter have to venue or personal jurisdiction in each such court. The prevailing party in any action related to the dispute or interpretation of this Standard Warranty Policy Statement shall be entitled to recover its reasonable attorneys fees incurred in pursuing the action, including those fees incurred throughout all bankruptcy and appellate proceedings.
2. Jury Waiver. THE PARTIES FURTHER AGREE, TO THE EXTENT PERMITTED BY LAW, TO WAIVE ALL RIGHTS TO A TRIAL BY JURY OF ANY ACTION RELATING TO THE DISPUTE OR INTERPRETATION OF THIS STANDARD WARRANTY POLICY STATEMENT, WHETHER SOUNDING IN CONTRACT, TORT, OR OTHERWISE. THE PARTIES SPECIFICALLY ACKNOWLEDGE THAT THIS WAIVER IS MADE KNOWINGLY AND VOLUNTARILY AFTER AN ADEQUATE OPPORTUNITY TO NEGOTIATE ITS TERMS.

2

Installation

The RMX*digital* mainframe "drops into" a cutout (as shown below) in the furniture countertop.

The console card cage, which extends below the console, can be positioned to fall within the cabinet or above a cable tray.

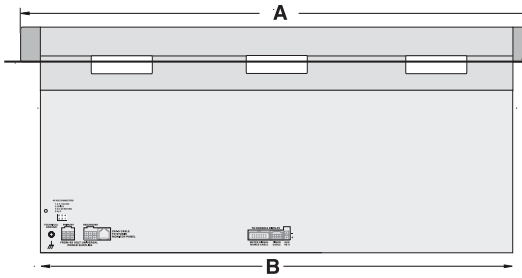
The low-profile Reflective Display (footprint: 17.25" x 5.25") is only 5" tall. It can set behind the frame or on top of the rear cover. If the optional Tall Console Display is used, it stands on the countertop behind the frame (its footprint: 14" x 6", and it stands 11" tall).

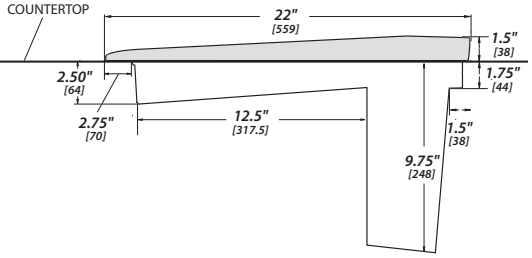
Locate a 3" cable grommet near the display to route the 6-foot cable harness thru the countertop in order to plug into the back of the frame.

The RMX*digital* console shipment contains:

- The 12, 20 or 28 input mainframe with a Monitor Control panel, a KSU card, and the DSP cards installed with the optional items ordered (Universal Dual Fader Panels, Blank Panels, 8-Input Expansion Cards)
- 2 RU rackmount 48-volt power supply
- Installation and tool kits (AMP MOD IV connector housings and receptacle contacts, crimp and contact removal tools, hex driver, backup batteries, removable clear lenses and clear insert sheet), two 48 VDC power cables, and CD-ROM
- Stand alone Console Display with integral cable and power supply

Console, back view



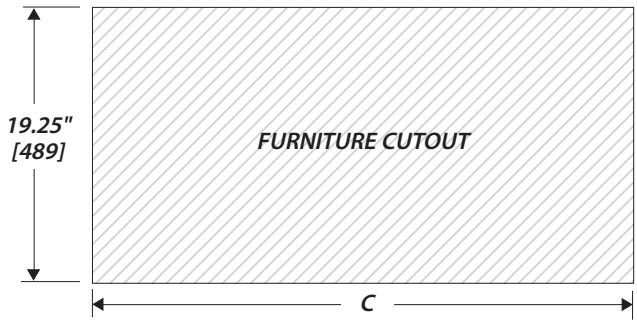


Console, side view, with dimensions

Dimension Table

Mainframe	A	B	C
RMX*digital-4*	14.6" [371]	13.3" [337]	13.5" [343]
RMX*digital-12*	27.4" [696]	26.1" [662]	26.25" [668]
RMX*digital-20*	40.2" [1021]	38.9" [987]	39.25" [993]
RMX*digital-28*	53.0" [1346]	51.7" [1312]	52.0" [1320]

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: 6" [152] to 12" [305].



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 position the console near intense electromagnetic hum fields such as those created by audio amplifiers that use inexpensive power transformers operating in or near saturation. Strong electromagnetic fields may impair the performance of the RMX*digital* and neighboring equipment. Route audio cables to achieve maximum practical distance from all AC power mains wiring.

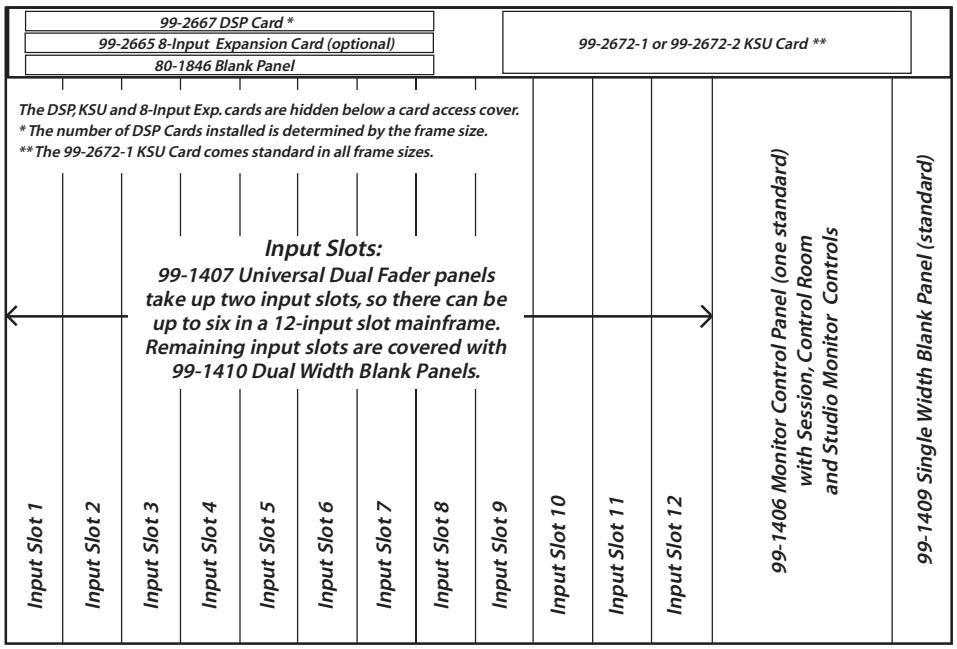
FRAME CONFIGURATION

Two panels are available for the RMX*digital*: the Universal Dual Fader Input and the Monitor Control, which is standard on the mainframe. The Dual Fader panel is two input slots wide, while the Monitor Control panel is three slots wide. Typical panel positions are shown below, but panels can be positioned up to two slots from their standard slot designations since each panel connects to the mainframe using a single red CAT-5 cable.

Input slots can have any combination of Dual Fader panels, single or dual width blank panels, single or dual width divider kits, or custom switch/control panels installed.

Contact a Harris sales representative for more details on available RMX*digital* options.

RMX*digital-12,* Frame Configuration



NOTE: *The number of available input slots equals the console model number (e.g., RMXd-20 has 20 input slots). All RMXdigital frames have one KSU card with DSP for the buses, four input channels and four special purpose phantom channels. Each DSP card adds the DSP for another eight input channels (e.g., RMXd-4 has no DSP card, RMXd-12 has one DSP card, RMXd-20 has two DSP cards, and RMXd-28 has three DSP cards).*

The RMXd Divider Kit allows standard Harris/PR&E Turret Accessory Panels to be installed in a frame. There are two kits available: 99-1411-1 is one input slot wide and holds one or two single width turret panels; 99-1411-2 is two input slots wide and holds two dual width panels, four single width panels, or a combination thereof. A kit can be installed into any input slot location. Dual Fader panels or the Monitor Control panel can be moved left or right one or two slots to accommodate a divider kit. Blank turret panels 99-1714-3 (1.6" x 6") or 99-1740-3 (3.2" x 6") cover unused accessory panel openings when using the divider kit.

CHANNEL CONFIGURATION

Each Dual Fader panel's specific operations and functions are established through the settings in the **init.mac** file and the current session file.

In general, Dual Fader channels are divided into two types: VistaMax control channels and Telco channels—which can also function as VistaMax router control channels, but which have a special IFB or mix-minus output assigned to each Telco channel. Each channel in a frame comes standard as a VistaMax control channel, but only up to six channels can be uniquely identified as Telco channels. The Telco channels are readily apparent by their lighted Talkback buttons.

Each channel's functions are also configured by the selected source signal. When a mic input is the source, the channel strip becomes a mic channel (which means it may be controlled by a mic remote panel, it may mute outputs and trigger a warning lamp output when On). When a peripheral device is the source, the channel becomes a line input channel (which means it may control, and be controlled by, the peripheral device).

The six mix-minus outputs in a console can be assigned to any six channels in the frame through rotary switch settings on each Dual Fader panel.

NOTE: Either or both channel strips on a Dual Fader panel can be set as a Telco input channel, but only six total channels can be set as the six unique Telco channels on the console.

The remaining channels in the mainframe must have their rotary switches set to either 0 or 7. The 0 setting (the default setting for each channel) identifies it as a VistaMax control channel. The 7 setting identifies that channel as being available to be a source for control room talkback audio.

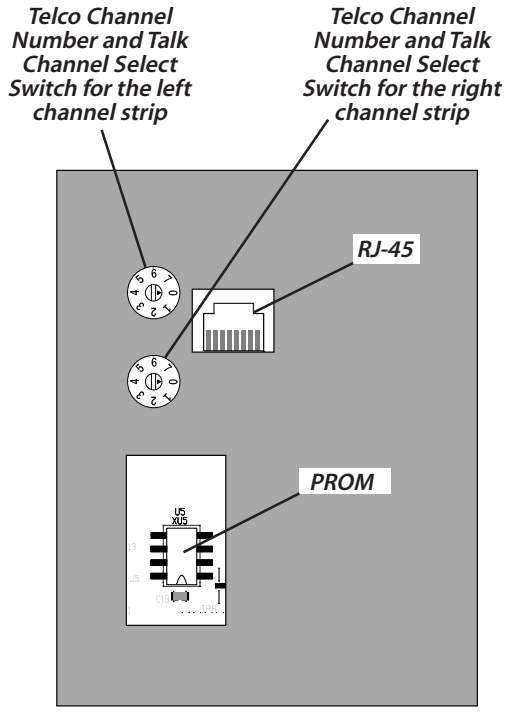
The talkback function only becomes active when a control room mic is set as the channel's source and that channel's rotary switch is set to 7.

Setting Dual Fader Panel Rotary Switches

Determine which channels will be designated as Telco channels (up to six can be assigned) and which channel(s) should be assigned as the control room talkback source(s).

Typically, the Telco channels are grouped together but they do not have to be. For ease of configuration and system troubleshooting, however, it is best to number the Telco channels in order from left to right in the frame (e.g. set Telco 1 as the left-most Telco channel, then set Telco 2 as the next one to the right, and so on).

Determine which channels will typically have the control room mics routed to them that may need to talk to the Telco mix-minus outputs, to the studio and to an external location. This is typically the board operator's mic and a producer mic, but any number of mics could be assigned. If the CR mics are dedicated to certain channels, than only those channels would need to be set to 7. If complete flexibility is required, every channel—except for the Telco channels, could be set to 7.



Dual Fader Panel, bottom view

Remove the Dual Fader panels that need to have their rotary switches changed (from the default 0 settings) from the mainframe (see page 5-3 for panel removal instructions). The console power can be left on while unplugging and reconnecting the Dual Fader panels.

Unplug the red CAT-5 cable from the panel and turn the panel over. Several openings—for the RJ-45 jack, two rotary switches and the PROM, are on the back cover (shown on the previous page).

The two rotary switches are labeled 0 - 7 with an arrow indicating the currently selected number. The upper switch sets the Telco number or CR mic setting for the left channel strip. The lower switch sets the Telco number or CR mic setting for the right channel strip. If a channel strip is not a Telco channel or a possible CR talk source, set the switch to 0.

Change the rotary switch to position 1 to set that channel strip as Telco 1; to position 2 to set that channel strip as Telco 2; and so on up to position 6 which sets that channel strip as Telco 6.

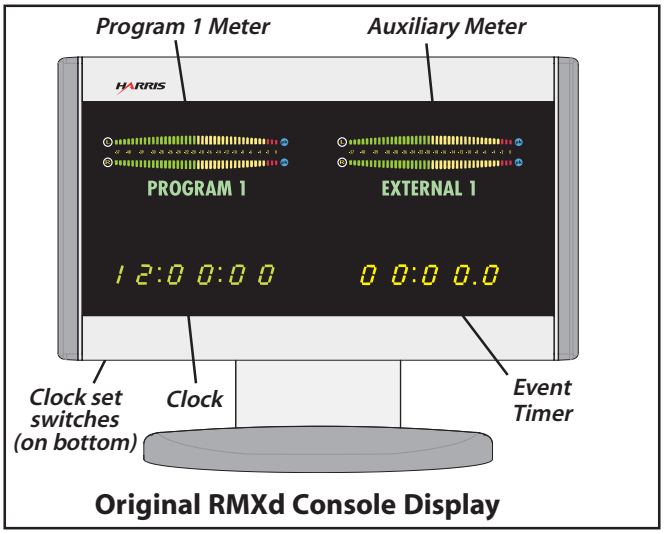
Change the rotary switch to position 7 for those channels that will have the control room talkback mic as a source.

Once the Dual Fader panel's rotary switches are set, plug the red CAT-5 cable back into the RJ-45 connector and refasten each panel to the mainframe. Verify that all channels set as Telco channels have lighted Talkback buttons. If desired, the Talkback button cover can be replaced by a clear cover and a label to identify each Telco channel.

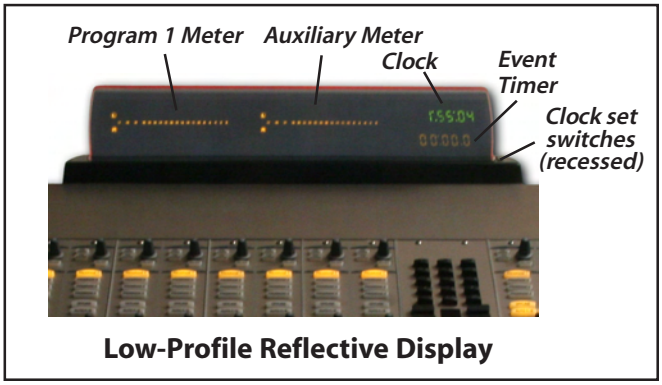
There are no other adjustments or settings required on the Dual Fader panels.

CONSOLE DISPLAY

Two console displays are available: the original tall direct-view display (90-1950) and the low-profile reflective display (99-1975-1). Each is positioned on the countertop behind the back of the mainframe. The 99-1975-1 is supplied standard and the original display (90-1950) is available as a special order. The 90-1950 is powered by a separate 5-volt wall-wart supply (included) that plugs into the back of the display. The low-profile display uses 48 VDC from the console. Each display has a captive six-foot umbilical cable to carry the meter signals, meter name display data and timer control wires. These cables plug into keyed connectors on the back of the mainframe.



Original RMXd Console Display



Low-Profile Reflective Display

Two horizontal stereo bargraph meters, with alphanumeric displays (PROGRAM 1, CUE, etc.) to identify the signals, a slaveable clock, and an event timer, are provided on each display.

The meters provide simultaneous level monitoring of the Program 1 bus on the left-hand meter and another bus or system signal on the right-hand Auxiliary Meter. The Aux Meter buttons on the Monitor Control panel select the source for

the right-hand meter, which switches to display the cue bus level while Cue is active.

The meter display mode (average only or average and peak) is set by an **init.mac** file setting (which is edited using the VMCC program). The level where the blue peak indicators turn on is set via internal DIP switches on the meter display boards. To change these settings, the rear/bottom cover of the Console Display must be removed.

The 12/24-hour digital clock can be slaved to an ESE (or SMPTE in the low profile display) master clock. An extender cable is provided in the display umbilical cabling for the original display so that an ESE cable can be connected at the back of the frame. On the reflective display, an ESE or SMPTE cable plugs into a clock board connector. See page 6-3 for details on master clock cabling.

The event timer is controlled manually, through buttons on the Monitor Control panel, or automatically, through channel On timer reset commands.

Setting The Clock

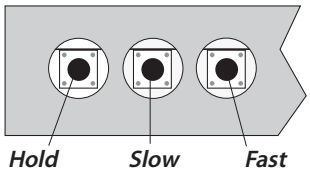
The clock can operate in autonomous or slave mode. When used autonomously (the factory preset), a quartz crystal oscillator controls clock timing. After power is applied, set the clock manually to the current time using a nonconductive tool (wooden swab, toothpick, etc.) to press the recessed time-set switches (bottom left of the original display, top right on the reflective display).

- Press **Fast** to increment time by minutes at a time.
- Press **Slow** to increment time by seconds at a time.
- Press and hold **Hold** to freeze the clock to synch it to a time reference. Set the time slightly ahead of the reference time. Release **Hold** to start the clock.

NOTE: When slave mode is selected (see Clock Settings), if the clock is not properly connected to an ESE or SMPTE master clock, the clock runs off its internal oscillator. Both display colons flash to indicate ESE timecode is not detected.

Manually Setting the Clock

(Original Display, bottom, left side)



(Reflective Display, top, right side)

Hold
Slow
Fast

Setting Console Display DIP Switches

To change DIP switch settings on the meters, timer or clock requires that the rear or bottom cover be removed to access the various printed circuit assemblies (PCAs) in the display.

SAFETY NOTE: Even though the switches can be changed with power applied, for safety, turn off the console supply (and unplug the 5-volt wall wart on the original display) before removing the cover. Do not touch any components on the PCAs, other than the DIP switches, as shown in this section.

Lay the display facedown on a padded surface (on the reflective display remove the reflector before doing this) to remove the rear/bottom cover. On the original display the Main Meter is the upper right PCA, the Aux Meter is the upper left PCA, the clock is the lower right PCA, and the timer is the lower left PCA. On the reflective display there are only two boards: a clock-timer board and a meter board.

Clock Settings

The operating mode (autonomous, ESE slave or SMPTE slave, which is only available on the reflective display) and the clock display format (12- or 24-hour display) are set using DIP switch DS1 on the clock PCA on the original meter and DS1 on the clock-timer PCA on the reflective meter. For the switch settings see the illustrations for the two displays on this and the next page.

Event Timer

The event timer displays time in minutes, seconds and tenths of seconds. The only timer option is whether the tenths of seconds digit is displayed in Run mode. The tenths of seconds are always shown in the Stop and Hold modes. For the switch setting see the illustrations for the two displays on this and the next page.

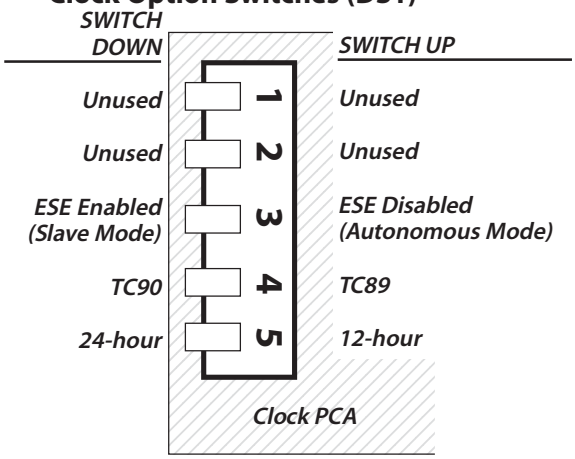
Meters

On the original display, each meter is set independently. The Aux Meter is the left PCA, the Program 1 Meter is the right PCA (as viewed with the rear cover removed). On the reflective display one set of switches set the parameters for both meters.

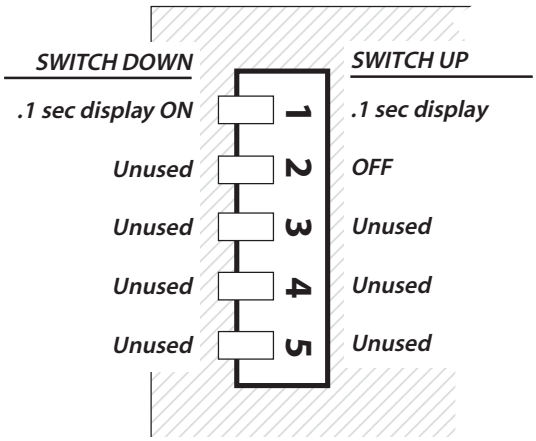
The switches set these parameters: the level where the blue peak indicators turn on; whether peak hold is active or not; and whether average and peak or average only is displayed.

On the original display, the Program 1 Meter has to have DSW2-5 set Down to terminate the meter names data cable. A second DIP switch (DSW1) assigns the meter names for each meter. Make sure DSW1-1 is set On for the Aux Meter and that DSW1-2 is set On for the Program 1 Meter. All other DSW1 switches must be set to Off. For the switch settings see the illustrations for the two displays on this and the next page.

Clock Option Switches (DS1)



Event Timer Option Switches (DS1)



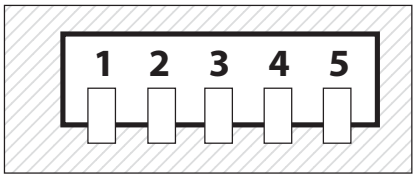
Meter Switch DSW2 Definitions

#	Switch Name	DOWN Function	UP Function
1	Peak Level	See Switch Table	See Switch Table
2	Peak Level	See Switch Table	See Switch Table
3	Display Mode	Peak hold active	No Peak hold
4	unused		
5	Termination	Set (Main Meter)	None (Aux Meter)

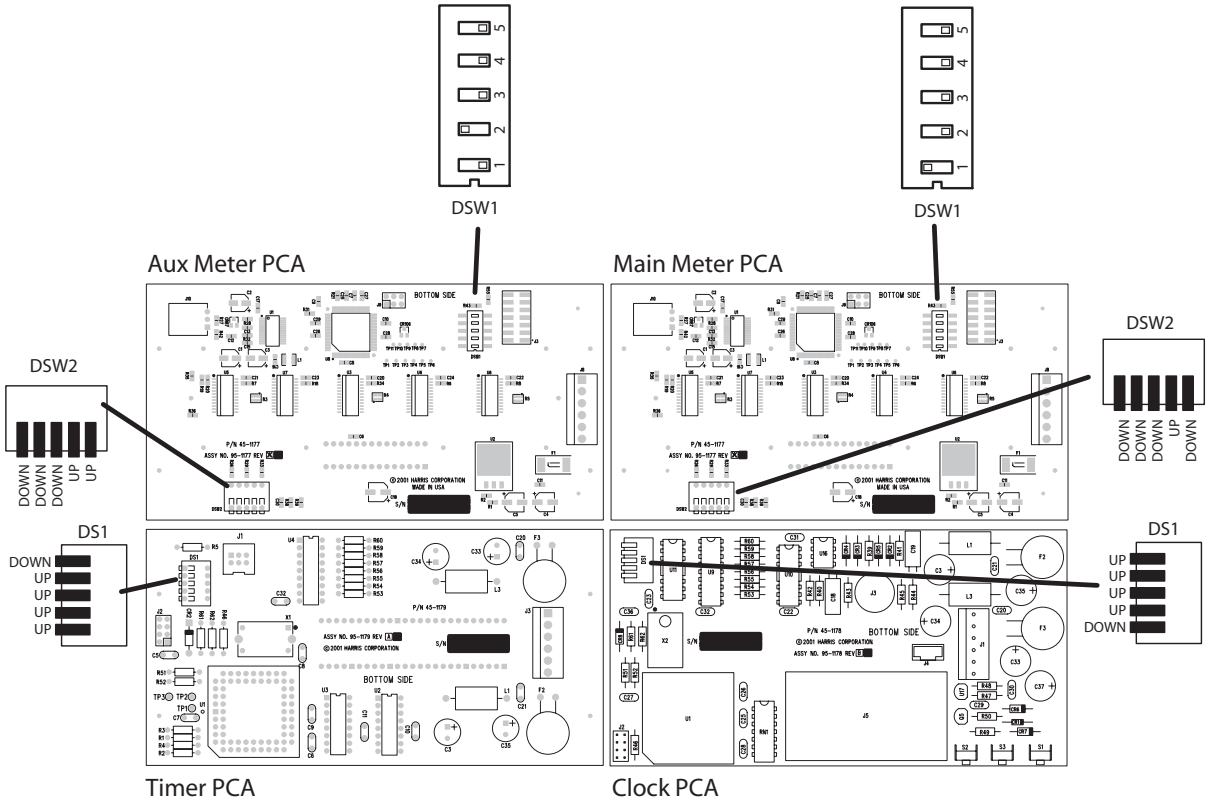
Switch Table

DSW2, switch 1 and 2 set the level where the Blue peak LEDs light.

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



Meter Option Switch (DSW2)



ORIGINAL DISPLAY SETUP CONTROLS, REAR COVER REMOVED

Pin 4 = +5 VDC

Meter Boards
Switch DS3 Settings

Switch - Off Function / On Function
1 - Average & Peak / Average only
2 - 2 sec. Peak Hold / No Peak Hold
3 - Blue LED turn on level*
4 - Blue LED turn on level*
5 - NetWave / RMXdigital
6 - Display: mirrored /direct view

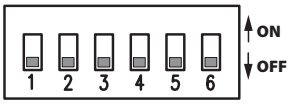
* Blue Peak LEDs turn on at:
-6 dBFS when both 3 and 4 are off
-4 dBFS when 3 is on and 4 is off
-2 dBFS when 3 is off and 4 is on
0 dBFS when both 3 and 4 are on

J4 SIGNALS

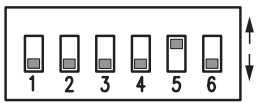
1 - TIMER RESET INPUT
2 - GROUND
3 - TIMER RESET OUTPUT
4 - ~~GROUND~~
5 - ESE/SMPTE INPUT +
6 - ESE/SMPTE INPUT -

Clock & Event Timer Board
Switch DS1 Settings

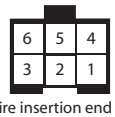
Switch - Off Function / On Function
1 - Timer .1 secs display / Timer .1 secs off
2 - ESE not used / ESE master clock
3 - unused
4 - 12-hour time / 24-hour time
5 - SMPTE not used / SMPTE master clock
6 - Display: mirrored / direct view



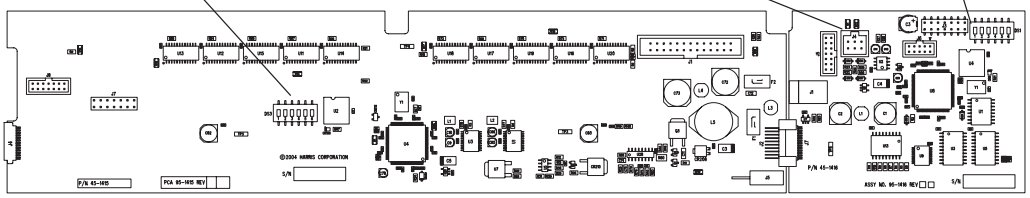
(Default Settings)



(Default Settings)



Wire insertion end view



Meter PCA **Clock-Timer PCA**

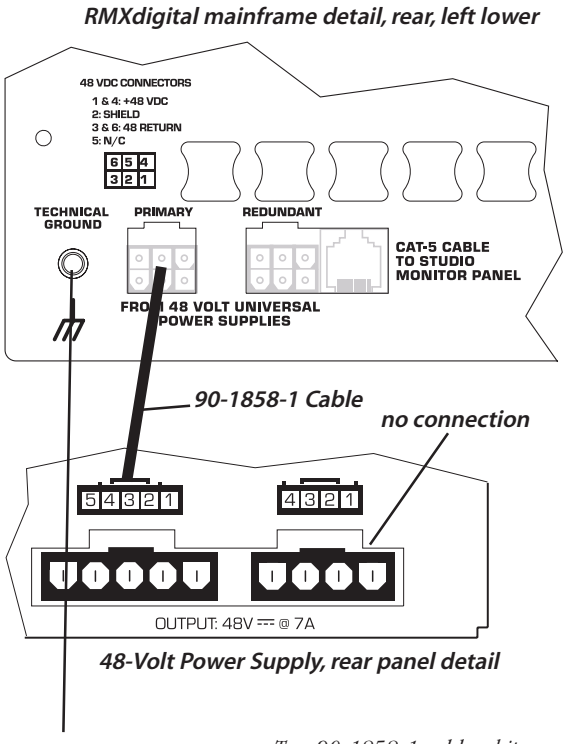
REFLECTIVE DISPLAY SETUP CONTROLS, BOTTOM COVER REMOVED

POWER SUPPLY

The 48-volt Power Supply (99-1205) requires 2 RU of rack space within the console cabinetry, typically below and to the left or right of the console. The supply must be installed such that the keyed fifteen foot DC supply cable (90-1858-1) is not under any tension when routed through the cabinet. It locks into the Primary power connector on the frame's rear panel (see drawing below).

A second 99-1205 supply can be installed as a redundant supply since the console has an integral power coupler. It plugs into the Redundant power connector using a second power cable, supplied with the console mainframe.

99-1205 Power Supply and Technical Ground Connections



Two 90-1858-1 cables ship with the RMXdigital mainframe. Use one cable for the primary 48-volt supply, use the second one for a redundant 48-volt supply.

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

AC GROUNDING NOTE: Do not defeat the power cord "U" safety ground in any way. Doing so may create a potentially dangerous condition to the operator.

GROUNDING AND SHIELDING

Connect the broadcast facility's technical ground to the *RMXdigital* mainframe, using the threaded insert provided on the rear of the chassis near the power connectors. Use a 10-32 machine screw and crimp lug to terminate the facility's technical ground wire.

Connect audio cable shields at both the console and the peripheral ends 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 shield at the console end only. 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.

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 an AC power line. To avoid audio ground noises, do not route audio wires in the same wireway as an AC power line.

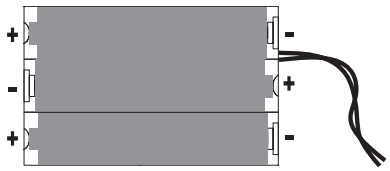
BACKUP BATTERIES

Three AA rechargeable NiCad batteries (part of the Tool Kit) supply a "Keep Alive" voltage to maintain the console assignments during momentary power outages.

Do NOT install the batteries until the console is powered 24/7 and is ready for everyday use.

To install the backup batteries:

1. Open the card access cover.
2. Install the three batteries into the battery clip located behind the KSU card on the frame. Observe the polarity as marked on the battery clip, and shown below.



Backup Battery Polarity

NOTE: Check/replace the batteries yearly to prevent leakage damage and ensure continuous backup protection. Use only Panasonic P-50AAH or equivalent batteries designed for continuous slow charging. To prolong battery life and prevent leakage damage, remove the batteries when leaving the console off for any extended period.

Cabling and Wiring

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

Refer to the Quick Connection Guides, on pages 2-18 to 2-24, for information on audio and logic connection. See page 2-13 for a block diagram for each type of logic interface.

CONNECTOR ACCESS

All audio, logic and data connections are made on plug-in connectors. They are hidden in normal operation below a card access cover that extends across the console behind the user control panels.

To access the connectors, open up the card access cover by lifting from the front using the thumb catches on either end of the cover. It is hinged to open toward the rear and stay open.

Caution: Make sure the cover is fully open so that it does not accidentally fall shut.

REQUIRED CABLES AND WIRE

The following types are required:

- Analog audio connections require two-conductor, stranded, insulated, shielded cable using a separate shield drain wire (equivalent to Belden 8451, 9451 or 8761).
- AES/EBU connections use 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 needed is determined by the application. Typically, cables with five or eight wires are most often used for constructing logic cables since even though there are twelve or fourteen pins on the logic connectors, only a handful are typically connected for any given application.
- Crossover CAT-5e/6 cable to connect the KSU Facet connectors to a VistaMax frame.
- Straight-thru CAT-5 cable to connect the KSU Ethernet connector to a VistaMax system LAN switch.

WIRE PREPARATION

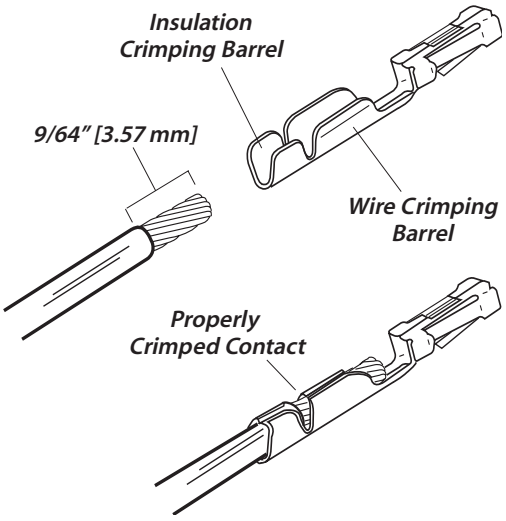
All RMX*d* audio and logic wiring terminates in AMP MOD IV receptacle contacts at the console. Stranded wires, of 22 to 26 AWG with insulation diameters of .040 to .060 inch, can be used with the AMP MOD IV receptacle contacts.

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.

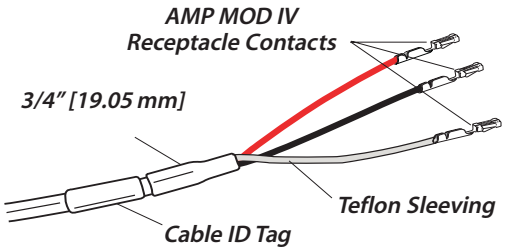
Audio Cable Shielding Note: To follow recommended grounding procedures, the drain wires must be sleeved with Teflon sleeving and heat shrink tubing must cover all cable jacket cut ends to insulate the shield wiring.

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



AMP MOD IV Receptacle Contacts

with 3/4" [19.05 mm] of shrink tubing and strip the insulation from each wire 9/64" [3.57 mm].

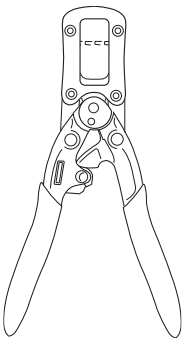


Audio Wire, ready for insertion into an

CRIMP TOOL OPERATION

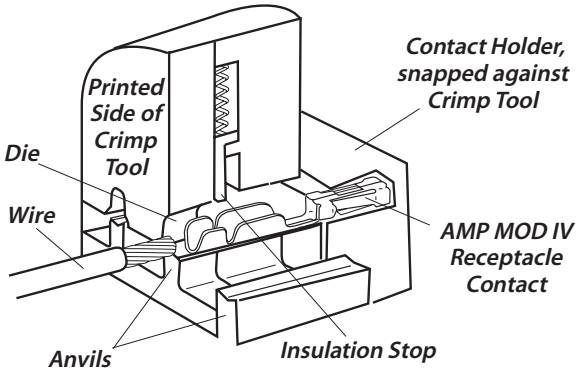
A ratcheting AMP crimp tool with contact holder is included. The tool crimps both the insulation and wire barrels on the AMP MOD IV receptacle contact in one crimp. To use the ratcheting crimp tool:

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.)



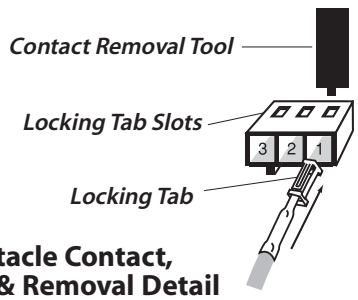
AMP MOD IV Contact Crimp Tool

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 on pages 2-10 (for audio) and 2-13 (for logic).



Receptacle Contact, Insertion & Removal Detail

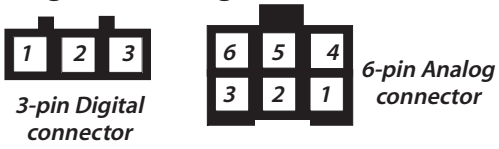
A receptacle contact is inserted into the housing with its locking tab side toward the locking tab slots on the side of the connector housing. A slight click can be heard when the contact's locking tab springs up into the locking tab slot.

To remove a contact from a housing, the 70-129 Contact Removal Tool (included in the 76-1401 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.

AUDIO CONNECTIONS

Analog and digital audio connections take advantage of the three-pins per row design of the AMP MOD IV housings. Three-pin housings are used for digital connections and six-pin housings are used for analog connections.

Digital & Analog Audio Connectors



3-pin Digital connector

6-pin Analog connector

Pin numbering, wire insertion end view, KSU connector orientation

Audio wiring has this orientation:

- The audio shields connect on pins 1 and 4
- The audio low wires, typically black, connect to the middle pins (pins 2 and 5)
- The audio high wires, typically red, connect to pins 3 and 6

When inputs come from mono sources like mic processors or hybrids, two separate signals can connect to each six-pin connector to maximize input connector usage.

Analog Connections

There are no analog interstage patch points in the RMX*digital* console. To use the console with a patch bay, connect line level analog outputs from the peripheral devices directly to the patch bay. Normal these signals to the appropriate analog inputs.

Likewise, the RMX*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.

Each analog input is designed for line level (+4 dBu). Session file settings allow any input to be software level trimmed (by up to +/-15 dB) so that unbalanced -10 dBv devices can be directly connected to the console. Note that microphones must be separately preamplified and processed before being connected to the console.

Stereo Analog Audio Connections
Line Input or Output — 6-Pin Housing

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

Two Mono Analog Connections
Line Input or Output — 6-Pin Connector

Pin	*Signal Description*
1	Shield for signal 1
2	Low (-) for signal 1
3	High (+) for signal 1
4	Shield for signal 2
5	Low (-) for signal 2
6	High (+) for signal 2

Digital Connections

Three-pin digital inputs accept AES-3 (AES/EBU) compatible signals with sample rates of 25 to 50 kHz. Each digital input goes through sample rate conversion (the console's internal sample rate is 48 kHz). In most cases, digital inputs can also accept unbalanced S/PDIF signals. Refer to Unbalanced Connections on the next page for details.

Each digital output is an AES-3 compatible signal. AES-3 outputs cannot connect directly to an S/PDIF input. To do this requires a signal translation interface.

AES/EBU Digital Inputs & Outputs

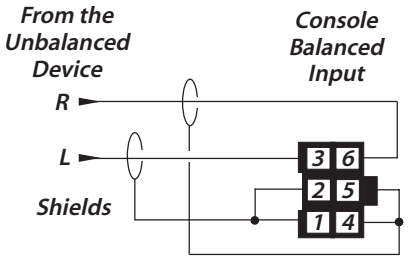
Pin	*Signal Description*
1	Shield (connects directly to the chassis)
2	Low (-)
3	High (+)

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 directly to a RMX*digital* input using the following illustration.

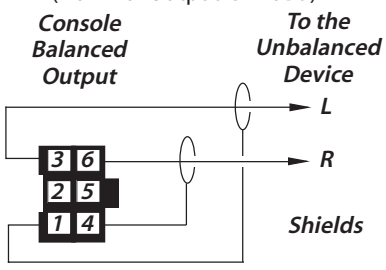
Connecting an Unbalanced Stereo Device to an RMX*digital* Analog Input



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

Connecting an Unbalanced Device to an RMX*digital* Analog Output

(Nominal Output is -2 dBu)

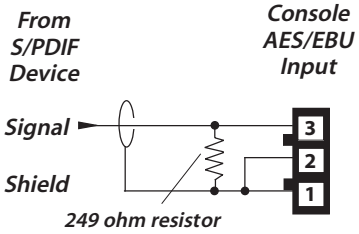


(Make no connections to pins 2 & 5)

S/PDIF Signals

Digital devices with only an S/PDIF digital output can connect to an RMX*digital* input, but only if a 249 ohm resistor is used to impedance match the S/PDIF cable. Install the resistor in the AMP MOD IV housing per the following illustration.

Connecting an S/PDIF Device to an RMX*digital* AES/EBU Input



An unbalanced-to-balanced line transformer can alternately 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 RMX*digital*'s inputs, even with the additional load resistor or a transformer, because of nonstandard levels or protocols in the S/PDIF product.

RMXDIGITAL SAMPLE RATE

The RMX*digital* uses the professional audio sample rate of 48 kHz for all its internal audio mixing and routing. Each digital input has an integral sample rate converter to convert sample rates from 25 to 50 kHz to the console's internal 48 kHz sample rate.

The console's digital outputs are fixed at 48 kHz, except for PGM 1, PGM 2, Send, and KSU Outputs A and B. Each can be set for 44.1 kHz in the `init.mac` file (see Chapter 4 for how to change the sample rates on these outputs).

When the console is used in a stand-alone application, the console cannot be locked to an external time reference. To accomplish this, the RMX*digital* must be networked in a VistaMax system

(the RMX*digital* is then automatically synchronized to the VistaMax system's master clock).

An external AES-3 digital reference signal (48 kHz, ±100 ppm) can connect to the master Hub card in a VistaMax frame. Refer to the VistaMax manual (75-52) for details.

AUDIO CONNECTIONS

There are eighteen dedicated analog and digital outputs on the KSU card (see pg 2-19) for the bus outputs (PGM 1-PGM 4 and Send), monitor outputs for the control room and a studio, three Talkback audio-only outputs, a mono cue output, and four analog and four digital routable outputs.

There are also four analog and four digital inputs on the KSU. The signals on these connectors are routed to channel strips by session file commands or by "dialing" them up using the Dual Fader panel source selectors. During console configuration, the inputs can also be made available to any VistaMax device in the network.

The eight routable outputs can have dedicated signals routed to them in the `init.mac` file; by assigning a signal in a session file; or they can be assigned as a destination controlled by a VistaMax source selector.

Each routable connector defaults to stereo linking, but any analog input or output connector can be set to function as a two mono outputs. See Chapter 4 for more information on stereo versus mono signals.

Additional audio inputs are available on all frame sizes, except the RMX*d*-4, by adding one or more optional 8-Input Expansion Cards. One 8-Input Expansion card can be added to each DSP Card. The cards have eight audio inputs and eight logic I/O connections. Card DIP switches set each audio input as an analog or a digital input. The eight logic connectors are associated with one of the audio connections, as detailed in the next section.

LOGIC CONNECTORS

The RMX*digital* console has the following logic connections:

- Assignable Logic I/O (three on the KSU and eight on each 8-Input Expansion card).
- Control Room logic for warning light, external mute, dim, and talkback control.
- Studio logic for warning light, external mute, dim, and talkback control.
- Cue/Talk/External logic from a remote cue logic input; a remote timer reset output; an external location mute, dim and talk commands; and an external talk to CR logic input.

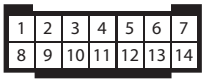
Page 2-13 has block diagrams for the four types of logic interfaces. All logic inputs and outputs are opto-isolated through opto-couplers on their inputs and solid state relays on their outputs. The inputs handle logic from +5 to +40 volts. The outputs are solid-state "dry-contact relays" that can switch up to 60 volts, AC or DC.

The CR, Studio and Cue/Talk/Ext. logic connectors are dedicated to the functions that are shown in the block diagrams. There are no soft configurations required on these connections.

The Assignable Logic I/O connectors have default logic functions, as shown throughout this manual, but the logic inputs have additional functions that can be substituted for the default settings during configuration using VMCC.

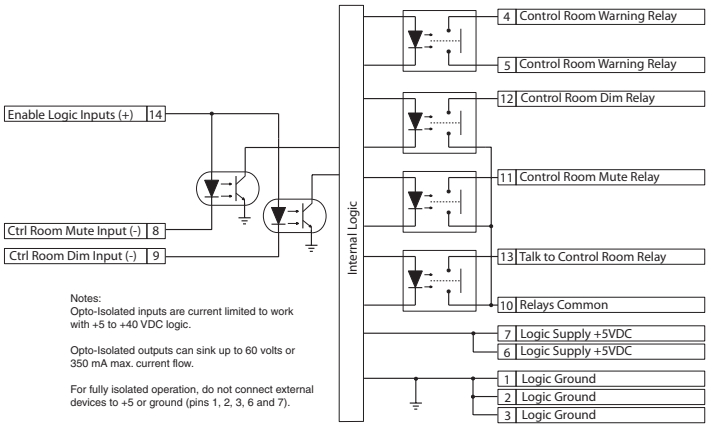
An Assignable Logic connector can be "bound" or associated to an audio connector. On the KSU Card, audio input A is typically connected to the Board Operator's mic preamp and hence does not have a logic connector associated with it, thus the three Assignable Logic I/O connectors are labeled: B, C and D since they are associated with KSU audio inputs B, C and D. Thus, if audio input B connects to CD1, CD1's logic would connect to the B Logic I/O connector. Likewise, audio inputs C and D are associated with the C and D Logic

Control Room Logic Interface, Connector Pinout and Block Diagram



Wire insertion end view

1 - LOGIC GND
2 - LOGIC GND
3 - LOGIC GND
4 - WARNING RELAY
5 - WARNING RELAY
6 - +5 VOLT LOGIC SUPPLY
7 - +5 VOLT LOGIC SUPPLY
8 - MUTE C/R (-)
9 - DIM C/R (-)
10 - RELAYS COMMON
11 - MUTE RELAY
12 - DIM RELAY
13 - TALK TO C/R RELAY
14 - ENABLE LOGIC INPUTS (+)

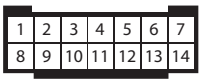


Notes:
Opto-Isolated inputs are current limited to work with +5 to +40 VDC logic.

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

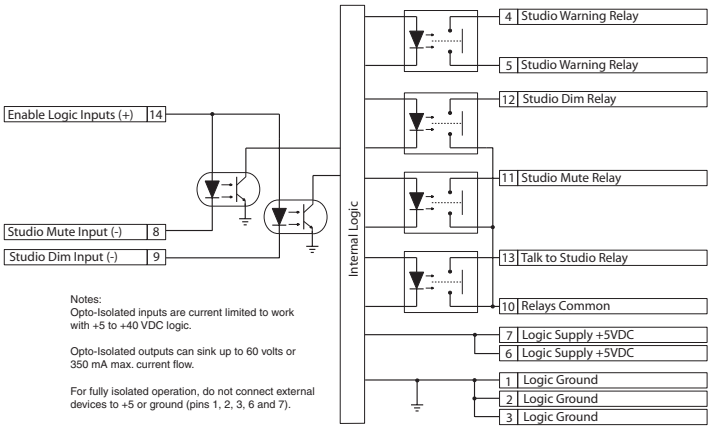
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 2, 3, 6 and 7).

Studio Logic Interface, Connector Pinout and Block Diagram



Wire insertion end view

1 - LOGIC GND
2 - LOGIC GND
3 - LOGIC GND
4 - WARNING RELAY
5 - WARNING RELAY
6 - +5 VOLT LOGIC SUPPLY
7 - +5 VOLT LOGIC SUPPLY
8 - MUTE STUDIO (-)
9 - DIM STUDIO (-)
10 - RELAYS COMMON
11 - MUTE RELAY
12 - DIM RELAY
13 - TALK TO STUDIO RELAY
14 - ENABLE LOGIC INPUTS (+)

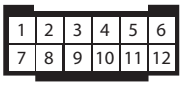


Notes:
Opto-Isolated inputs are current limited to work with +5 to +40 VDC logic.

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

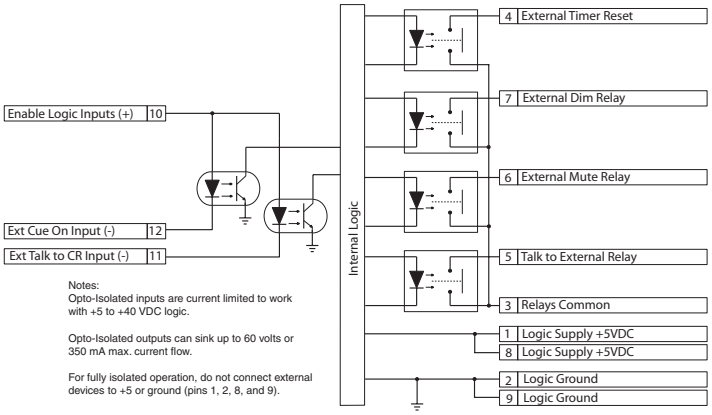
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 2, 3, 6 and 7).

Cue/Talk/External Logic Interface, Connector Pinout and Block Diagram



Wire insertion end view

1 - +5 VOLT LOGIC SUPPLY
2 - LOGIC GND
3 - RELAYS COMMON
4 - TIMER RESET
5 - TALK TO EXT. RELAY
6 - EXTERNAL MUTE RELAY
7 - EXTERNAL DIM RELAY
8 - +5 VOLT LOGIC SUPPLY
9 - LOGIC GND
10 - ENABLE LOGIC INPUTS (+)
11 - EXT TALK TO C/R (-)
12 - REMOTE CUE (-)

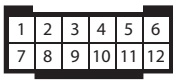


Notes:
Opto-Isolated inputs are current limited to work with +5 to +40 VDC logic.

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

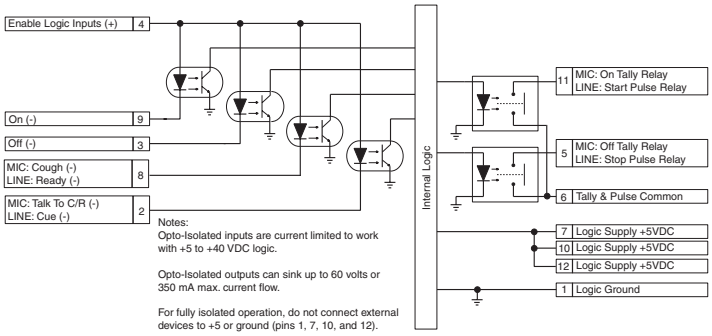
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 2, 8, and 9).

Assignable Logic Interface, Connector Pinout and Block Diagram, default signals



Wire insertion end view

1 - LOGIC GND
2 - TALK TO C/R / CUE (-)
3 - OFF (-)
4 - ENABLE LOGIC INPUTS (+)
5 - OFF TALLY / STOP PULSE
6 - TALLY & PULSE COMMON
7 - +5 VOLT LOGIC SUPPLY
8 - COUGH / READY (-)
9 - ON (-)
10 - +5 VOLT LOGIC SUPPLY
11 - ON TALLY / START PULSE
12 - +5 VOLT LOGIC SUPPLY



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

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

For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 7, 10, and 12).

connectors. The "binding" of the audio and logic connections is set using VMCC which is covered in chapter 4, RMX*digital* Server and in Appendix A, VMCC.

CONNECTION QUICK GUIDES

Pages 2-18 to 2-24 have Quick Guides covering the connections for each card or component along with audio and logic connector pinouts and signal descriptions. Logic block diagrams are shown on page 2-13. Here are the Quick Guide pages:

- **Frame and Console Display**: page 2-18
- **KSU card**: pages 2-19 thru 2-22
- **8-Input Expansion card**: page 2-23
- **VistaMax connections**: page 2-24

Pages 2-25 to 2-27 show examples of typical logic connections to the Assignable Logic connectors from a mic remote control panel, a CD player and a digital delivery system.

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.

LOGIC INTERFACE

Logic connector pinouts and block diagrams for the four types of logic connections on the RMX*digital* (Control Room, Studio, Cue/Talk, Assignable) are shown on page 2-13.

Logic inputs are shown on the left side and logic outputs are shown on the right side of the block diagrams. Logic inputs, noted by the (-) symbol, are active low. They are isolated by opto-couplers that must be tied to +5 to +40 volts through the Enable Logic Inputs pin.

Most outputs are isolated solid-state relay contacts commoned to one pin. The exceptions are the two warning relay outputs which are isolated dry contacts. The common pin can tie to ground (for low logic outputs) or to a logic voltage of up to 60 volts at 350 mA (for high logic outputs).

Several +5 volt supply and ground pins are available on each connector, but these should only be used to power isolated control panels. Ground and logic voltages should always be sourced from the peripheral device to maintain isolated operation.

Control Room Logic

This 14-pin connector has two isolated relay contacts (pins 4 and 5) for controlling a warning lamp interface like the Harris WL-2. It is activated when any channel with a control room mic as its source is turned On. This action will also mute the Control Room Monitor audio output.

The other three logic outputs (commoned together on pin 10) are: CR dim on pin 12 (typically activated when receiving talkback), CR mute on pin 11 (activated when the warning output is active), and talkback on pin 13 (activated by receiving Talk to CR logic). These outputs can be used to control external speaker switching circuitry or be used for tally indicators.

There are two external logic inputs for remotely dimming monitors (on pin 9) or muting the monitors (on pin 8). To use these inputs, pin 14 must be tied high (+5 to +40 VDC). The logic inputs are triggered by being pulled low.

Studio Logic

This 14-pin connector has the same connections as the control room connector, except they're for a talk studio or voice room. There are two isolated relay contacts (pins 4 and 5) for controlling a warning lamp interface like the Harris WL-2. It is acti-

vated when any channel with a studio mic as its source is turned On.

The other three logic outputs (commoned together on pin 10) are for studio dim (pin 12), studio mute (pin 11), and studio talkback (pin 13). These can be used to control external speaker switching or be used for tally indicators.

There are two external logic inputs for remotely dimming the studio monitors (on pin 9) or for muting the studio monitors (on pin 8). To use these inputs pin 14 must be tied high (+5 to +40 VDC). The logic inputs are triggered by being pulled low.

Cue/Talk/External Logic

This 12-pin connector has a remote cue logic input (pin 12) and an External Talk to C/R logic input (pin 11). To use these inputs pin 10 must be tied high (+5 to +40 VDC). The logic inputs are triggered by being pulled low.

Four logic outputs (commoned together on pin 3) are for an external location dim (pin 7), mute (pin 6), and talkback (pin 5). These can control external speaker switching or tally indicators. The fourth logic output is used to reset an Event Timer (pin 4) in a studio or an external location.

Assignable Logic

There are three of these 12-pin connectors on the KSU (labeled B, C, D). Additional Assignable Logic connectors can be added by installing one or more optional 8-Input Expansion Cards (not available on the RMX*d*-4).

Each Assignable Logic I/O connector is typically connected to either a remote mic control panel (using Mic logic) or to a peripheral device (using Line logic). Mic logic is primarily used when the audio input that the logic connector is assigned to is set to mute a control room, studio or external location.

A remote control panel is connected to an Assignable connector so its buttons can control a channel strip while tally outputs control the button tallies in sync with the channel strip buttons. The `init.mac` or the active session file sets the binding for the Assignable connector logic (to associate it with the mic's audio input).

When assigned as a line input, the functions for pins 2, 5, 8 and 11 can be set to interface peripheral devices. Pin 2 typically is set as a remote cue switch input that can be triggered by a digital delivery system or from a studio or producer cue switch. Pin 8 typically is set as a ready logic input that is used by a peripheral device to turn off the channel audio as well as control the off button illumination to indicate that an event has been completed.

Pins 11 and 5 typically are set as start and stop outputs to automatically start or stop/pause a peripheral device when the channel is turned on or off. These typically generate single 220 msec contact closures between pin 6 and pin 5 or 11, but they can also be set to output additional pulses for each button press, or be set to output sustained contact closures. These choices are set in the `init.mac` file or by the current session file.

Microphone Logic

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

The warning commands come from the control room or studio logic connectors, but it is the session file settings for the Universal Dual Fader Input panels that tell the monitor logic that a certain input is a mic and where that mic is located (control room, studio, or an external site). Setting a Universal input as a mic input is done in the session file by setting its Room Code, a VistaMax system function that assigns each room in the facility a code used to identify where a mic is located in the VistaMax system.

Mic Connections

Microphones must be preamplified to line level before being connected to an RMX*digital* audio input. Typically, mics are routed through a mic processor to preamplify, equalize, and compress or limit the audio. The mic processor output then connects to an analog or digital input.

If there is a mic control panel associated with the mic, then it is wired to an Assignable Logic connector and that logic connector is "bound" or associated with the mic audio input connector in VMCC. This means that regardless of which channel strip the mic is assigned to, the logic signals are routed with the audio.

When the console is part of a VistaMax system, then the mic audio and panel logic could be assigned to, or come from, a completely different console or VistaMax frame. This allows easy sharing of a common voicing studio between two or more consoles, with only one physical connection of the mic processor and mic control panel.

For additional networked audio information, see the VistaMax manual (75-52). For information on software setup of the console features see Chapter 4, which covers using the VMCC program.

Mic Logic To/From a RMXdigital

Two mic control panels are available for the RMX*digital*: PRE99-1197 (On, Off, Cough) and PRE99-1198 (On, Off, Cough and Talkback). Either one connects to the Assignable Logic I/O connector that is bound to the mic audio input. A wiring diagram of the interconnect wiring (90-1875) is shown on page 2-17.

The remote control switches (On, Off, Cough, Talkback) connect to the four remote inputs on pins 2, 3, 8 and 9. Pin 4 is jumpered to pin 10 to enable the external inputs.

The switch LEDs connect to pins 5, 7 and 11 with pin 1 supplying a ground connection. The On Tally output (pin 11) drives the LEDs in the On button and the Off Tally (pin 5) drives the LEDs in the Off button. The other LEDs (Cough and Talkback) connect to +5 Volts. Switches and LEDs are commoned to Logic Ground (pin 1).

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). The other side of the Cough and Talkback lamps are tied together to +5 volts.

Each switch is tied to its logic counterpart (the On switch goes to the On (-) input, pin 9, the Off switch goes to Off (-) input, pin 3, etc. The on/off lamps are tied to their Tally outputs (On lamp to On Tally, pin 11; Off lamp to Off Tally, pin 5).

Tally Common (pin 6) is jumpered to +5 Volts (pin 12). Pin 4, Enable Logic Inputs (+), is also jumpered to +5 Volts on pin 10.

Assignable Logic I/O and Peripherals

Peripheral devices are controlled through Start and Stop Commands. These commands can be set to output a single 220 msec pulse, multiple pulses (additional pulses with each button press), or they can be set for sustained logic.

In the basic logic connection example on page 2-26, active low logic is used, thus Tally & Pulse 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 page 2-27, active high logic is used, thus Tally & Pulse Common connects to +5 VDC.

Note: This voltage is more typically supplied directly by the peripheral device in order to prevent ground loops, but in this example the peripheral has isolated connections as well.

Peripheral devices control the channel strip through the Ready logic input. The Ready logic performs both an audio reset, which turns off the

channel, then controls the off LED illumination, when Ready control is active for that channel. Otherwise, the off LEDs turn on automatically at channel off.

For devices requiring a steady on or off tally rather than pulses, the logic can be set to do so using VMCC.

Additional Logic Connections

An external event timer reset command is on the Cue/Talk/Ext connector (pin 4). It connects to a studio or external location Event Timer so it can be reset by the console timer reset logic.

The frame has two connectors for the Console Display's umbilical cable. These carry the timer control wires, the digital bargraph meter signals and the meter legend display data. Signal information for these connections is shown below.

ASSIGNABLE LOGIC CONNECTOR

SIGNAL	PIN
Logic Ground	1
Off Tally	5
On Tally	11
+5 VDC Supply	7
Off Switch (-)	3
On Switch (-)	9
Cough Switch (-)	8
Talk Switch (-)	2
Tally Common	6
+5 VDC supply	12
Enable Logic Inputs (+)	4
+5 VDC Supply	10

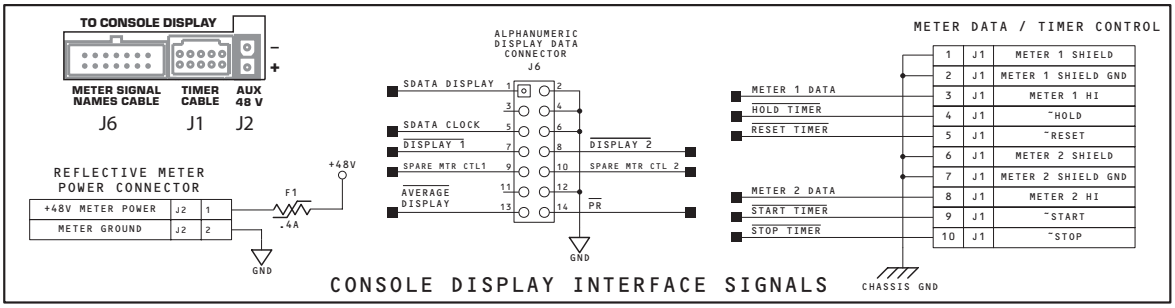
BLK	
WHT	
RED	
GRN	
BRN	
BLU	
ORG	
YEL	

99-1197 or 99-1198 MIC CONTROL PANEL

PIN	SIGNAL
1	Logic GND
2	Off Tally
3	On Tally
4	Power Supply
5	Off Switch
6	On Switch
7	Cough Switch
8	Talkback Switch

PARTS LIST
Cable: Belden 9421 or equiv.
8-pin MOD IV Housing: 14-486 (Tyco-AMP 87631-4)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

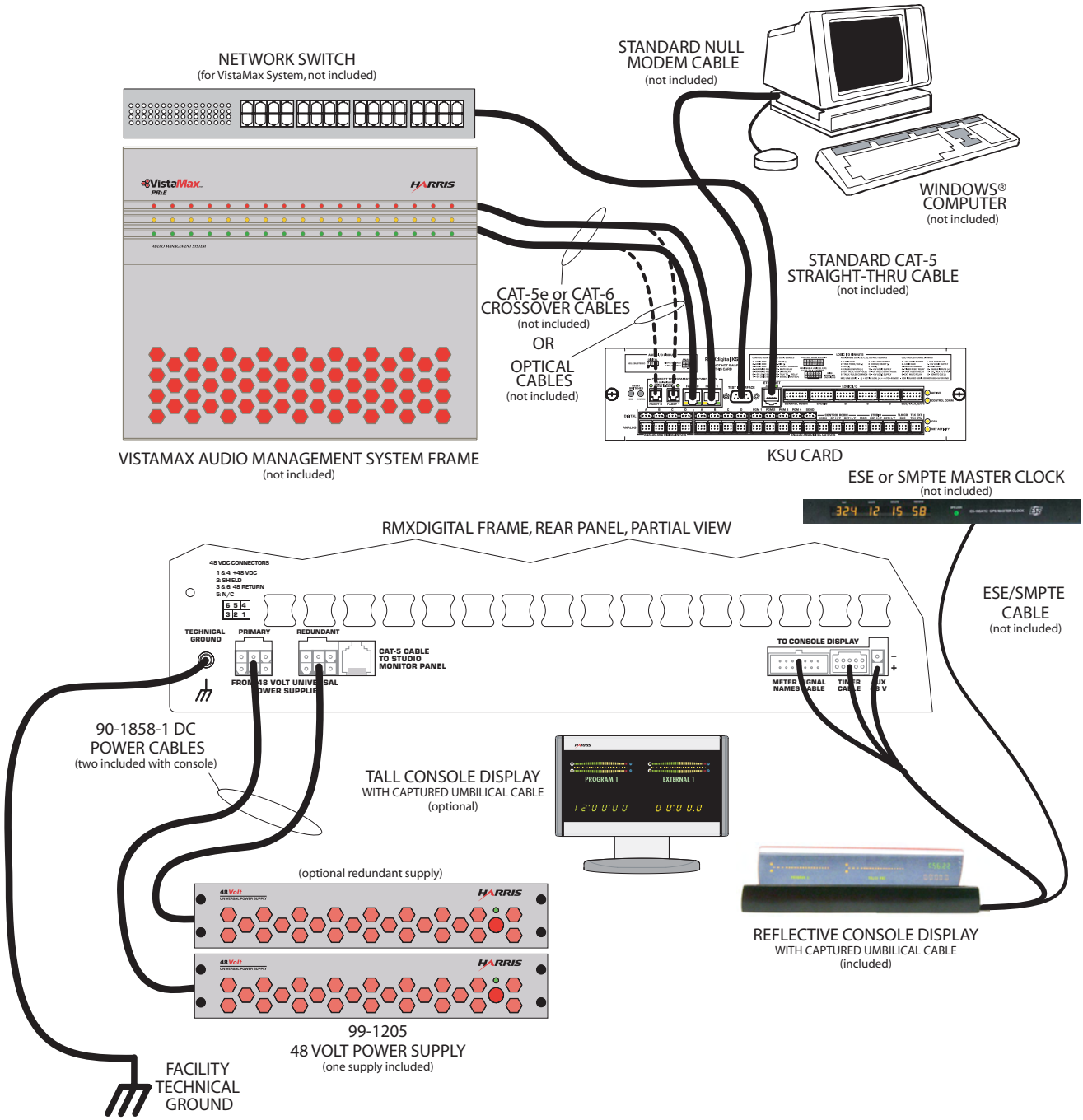
90-1875 Cable for Mic Control Panel to an Assignable Logic Connector



Console Display Mainframe Chassis Connectors and Interface Signals

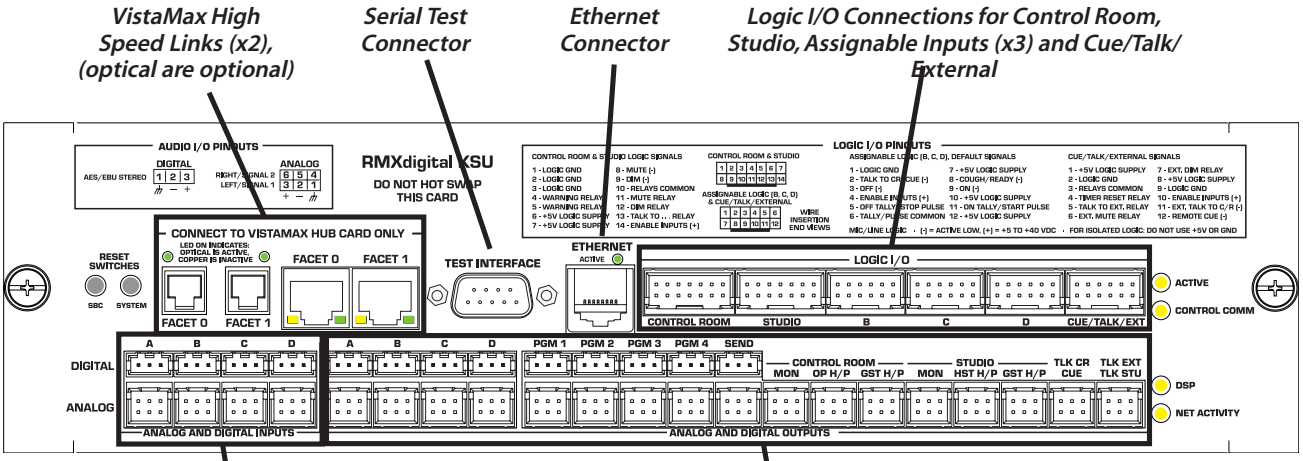
QUICK GUIDE TO FRAME AND CONSOLE DISPLAY CONNECTIONS

The Console Display has a captive umbilical cable that plugs into the rear panel of the frame (connector detail shown on page 2-17). Rackmount the 48-volt power supply below and to the left or right of the mainframe, such that the supplied fifteen foot power cable can plug into the rear of the supply and the rear of the mainframe without being under any tension. A redundant supply can rackmount immediately above or below the main supply. For power supply and technical ground wire connection details, see pages 2-6 and 2-7. For VistaMax connection details see page 2-24. For audio and logic connections see the KSU and 8-Input Expansion card Quick Guides that follow on pages 2-19 to 2-23.



QUICK GUIDE TO THE KSU CARD CONNECTIONS

The KSU card has most of the user connections for the RMX*digital*. There are two types of KSU cards available: the standard card (99-2672-1) does not have optical Facet connectors. The optional card (99-2672-2, shown below) has two optical Facet connections in addition to the two copper Facet connections.



AUDIO INPUTS AND OUTPUTS

ANALOG — *Each routable 6-pin analog connection (A, B, C, D) can be used for one stereo, or two mono, line level signals. The nominal level for inputs and outputs is +4 dBu, balanced, but each input is software trimmable for use with unbalanced -10 dBv connections. The analog connector pinout and signals were detailed on page 2-10.*

DIGITAL — *3-pin digital inputs accept AES-3 (AES/EBU) signals with sample rates from 25 to 50 kHz. An integral SRC (Sample Rate Converter) converts each input to the console's internal rate of 48 kHz, which is also the default digital output sample rate. The PGM 1, PGM 2 and Send outputs can each be set for 44.1 kHz outputs in teh VMCC program. Any digital input can accept an S/PDIF signal (see page 2-11 for details). The digital connector pinout and signals were detailed on page 2-10.*

LOGIC I/O

CONTROL ROOM & STUDIO — *Two 14-pin connectors for separate control of control room and studio logic. See page 2-20 for signal details.*

CUE/TALK/EXT — *A 12-pin connector with a remote cue logic input, talkback logic control and control logic for an external location. See page 2-22 for signal details.*

LOGIC I/O (CONT.)

B, C, D — *Assignable Logic I/O connections associated with their matching audio input (analog or digital B, C, D. Which type input is assigned to the logic is using VMCC). Each 12-pin connector typically connects to a peripheral device or to a mic remote control panel. See page 2-21 for signal details*

COMMUNICATIONS CONNECTIONS

ETHERNET — *This RJ-45 connector ties the console into a restricted-access LAN for console setup, software maintenance and for VistaMax network communications. It should NOT connect to the facility's general computer LAN. Use a crossover cable when connecting directly to a computer with a network card, or use a straight-thru cable when connecting to a network switch (recommended) or network hub.*

TEST INTERFACE — *A 9-pin serial I/O interface to connect to the serial port on a computer using a null modem cable. Use HyperTerminal or other comm port program to monitor RMXdigital activity.*

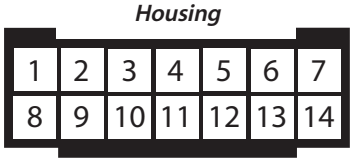
FACET 0, 1 — *Two RJ-45 "copper" connectors (standard) carry the VistaMax High Speed Link signals to/from a VistaMax Hub card. Each Facet uses a CAT-5e or CAT-6 crossover cable. The two optional optical connectors take precedence over the matching copper connector when connected to an active optical connection on a VistaMax Hub card.*

KSU CARD CONNECTIONS (CONT.)

Control Room and Studio Logic I/O Signal Definitions
(see page 2-13 for a simplified circuit block diagram)

PIN NAME / NUMBER	*FUNCTIONAL DESCRIPTION*
ENABLE 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 talk panel, jumper to pin 7 (+5 volts) to enable the inputs. When tied to a peripheral device, connect to the peripheral device + voltage pin.
MUTE (-) (pin 8)	When pulled low, mutes the speaker monitor output and triggers the Mute Relay output. May also turn on the Warning Tally output, depending upon session file settings.
DIM (-) (pin 9)	When pulled low, dims the speaker monitor output and triggers the Dim Relay output.
RELAYS COMMON (pin 10)	The Common (C) relay contact output for the Talk, Dim, and Mute Relays. It can be set for active low or high logic: for an active low output jumper this pin to logic ground; for active high output, jumper this pin to the + voltage logic supply. For isolated operation, the ground and/or logic supply should be supplied by the peripheral device. When used with a remote panel, jumper to pin 3 for active low logic or pin 6 for active high logic. Relay outputs can sink or source up to 60 volts at 350 mA (combined current).
MUTE RELAY (pin 11)	Connects to Relays Common (pin 10) while mute is active. Output is a N.O. dry contact type that is typically used to drive a mute indicator or to mute talk and cue speakers.
DIM RELAY (pin 12)	Connects to Relays Common (pin 10) while dim is active. Output is a N.O. dry contact type that is typically used to drive a dim indicator or to control a switch to dim talk and cue speakers.
TALK RELAY (pin 13)	Connects to Relays Common (pin 10) while receiving a talk command. Output is a N.O. dry contact type that is typically used to drive an indicator or to control an incoming talk speaker switch.
WARNING RELAY (pins 4, 5)	Isolated N.O. dry contacts for control of a warning lamp interface (like the Harris WL-2) when a mute command is received. Up to 60 volts at 350 mA can be switched through the contacts.
+5 VOLT LOGIC SUPPLY (pins 6 and 7)	Console logic voltage output source that can deliver up to 300 mA of current for isolated devices. Pins are paralleled for convenience.
LOGIC GND (pins 1, 2, 3)	Console logic ground. Should be connected to isolated devices only.

Control Room & Studio Logic 14-Pin Logic Connector Housing



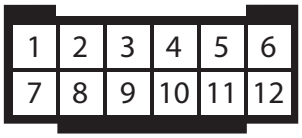
Pin numbering order, wire insertion end view, as plugged into the console

KSU CARD CONNECTIONS (CONT.)

Assignable Logic I/O Default Signal Definitions (also applies to the 8-Input Expansion Card Logic I/O)
(see page 2-13 for a simplified circuit block diagram)

PIN NAME / NUMBER	*FUNCTIONAL DESCRIPTION*
START PULSE (pin 11, Line logic)	Equivalent to a Normally Open (N.O.) relay contact (the common contact is pin 6). The output logic type is set in the session file for: one momentary 220 msec contact closure when the channel is turned On from Off; a 220 msec contact closure each time the On button is pressed or; a maintained contact closure while the channel is on. Typically connected to the Remote On logic input on a peripheral device.
ON TALLY (pin 11, Mic Logic)	Connects to Tally Common (pin 6) while the channel is on. Output is a N.O. dry contact type that is typically used to drive the On switch LEDs. Tally outputs can sink or source up to 60 volts at 350 mA.
STOP PULSE (pin 5, Line logic)	Follows the logic setting for the Start Pulse. This command is initiated by the channel strip Off button. Typically connects to a Remote Stop, Off, or Pause logic input on a peripheral device.
OFF TALLY (pin 5, Mic logic)	Connects to Tally Common (pin 6) while the channel is off. Output is a N.O. dry contact type that is typically used to drive switch LEDs. Tally outputs can sink or source up to 60 volts at 350 mA.
PULSE COMMON (pin 6, Line logic)	The Common (C) relay contact for the Start and Stop Pulse contacts for line logic. For active high logic outputs, connect this pin to the logic supply voltage on the peripheral device. For active low outputs, connect this pin to logic ground on the peripheral device.
TALLY COMMON (pin 6, Mic logic)	The Common (C) relay contact output for the On and Off Tallies. When used with mic control panels, this pin is typically jumpered to pin 12 to supply +5 volts for the switch LEDs.
ENABLE LOGIC INPUTS (+) (pin 4, Mic or Line logic)	To enable the control inputs: On, Off, Cough (Ready), Talk to C/R (Cue), tie this pin to +5 to +40 volts. When tied to an isolated device like a mic remote panel, jumper to pin 10 (+5 volts) to enable the inputs. When tied to a peripheral device, connect to the peripheral device + voltage pin.
ON (-) (pin 9, Mic or Line logic)	When pulled low, turns the channel on, turning on the On Tally output and generating a Start Pulse when Line logic is active. This is a momentary connection that is latched by the channel strip logic.
OFF (-) (pin 3, Mic or Line logic)	When pulled low, turns the channel off, turning on the Off Tally output and generating a Stop Pulse when Line logic is active. This is a momentary connection that is latched by the channel strip logic.
COUGH (-) (pin 8, Mic logic)	When pulled low while the channel is on, turns off the channel On lamp and mutes the channel audio on all assigned buses. Has no effect when the channel is off.
READY (-) (pin 8, Line logic)	When pulled low, while the channel is on, turns the channel off without generating a stop pulse. When pulled low while the channel is already off (and Ready lamp control is set active), controls the Off button illumination to indicate device status. Typically, no light indicates the peripheral is not ready, a steady light indicates the device is ready, and a flashing light indicates the device has played or is not yet cued up.
TALK TO C/R (-) (pin 2, Mic logic)	When pulled low, routes the channel's input audio (pre-fader/pre-switch) to the control room talkback bus. This is a momentary connection that is only active while being held low (e.g., the Talk button is pressed).
CUE (-) (pin 2, Line logic)	When pulled low, routes the channel's input audio (pre-fader/pre-switch) to the cue bus. This is a toggle On/Off connection. The session file determines whether the cue bus resets at channel on or is left active.
+5 VOLT LOGIC SUPPLY (pins 10 and 12)	Console 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 GND (pin 1)	Console logic ground. Should be connected to isolated control panels only.

Assignable Logic I/O 12-Pin Logic Connector Housing



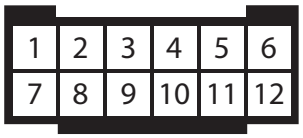
Pin numbering order, wire insertion end view, as plugged into the console

KSU CARD CONNECTIONS (CONT.)

Cue/Talk/External Logic I/O Signal Definitions
(see page 2-13 for a simplified circuit block diagram)

PIN NAME / NUMBER	*FUNCTIONAL DESCRIPTION*
RELAYS COMMON (pin 3)	The Common (C) relay contact output for the Talk, Dim, Mute, and Timer Reset relays. It can be set for active low or high logic: for an active low output jumper this pin to logic ground; for active high output, jumper this pin to the + voltage logic supply. For isolated operation, the ground and/or logic supply should be supplied by the peripheral device. When used with remote panels, jumper to pin 9 for active low logic or to pin 1 for active high logic. Relay outputs can sink or source up to 60 volts at 350 mA (combined current).
EXT TIMER RESET (pin 4)	A single momentary connection to Relays Common (pin 3) occurs whenever a channel resets the event timer in the Console Display. This connection typically connects to the reset logic input on a studio or external location event timer.
EXT MUTE RELAY (pin 6)	Connects to Relays Common (pin 3) while mute is active. Output is a N.O. dry contact type that is typically used to drive a mute indicator or to mute talk and cue speakers.
EXT DIM RELAY (pin 7)	Connects to Relays Common (pin 3) while dim is active. Output is a N.O. dry contact type that is typically used to drive a dim indicator or to control a dim switch for talk and cue speakers.
TALK TO EXT RELAY (pin 5)	Connects to Relays Common (pin 3) while receiving a Talk to External command. Output is a N.O. dry contact type that is typically used to drive an indicator or to switch a signal to a talk speaker.
ENABLE LOGIC INPUTS (+) (pin 10)	To enable the two external control inputs: Talk to C/R and Cue, tie this pin to + logic voltage (+5 to +40). When tied to isolated devices like remote control panels, jumper to pin 8 (+5 volts) to enable the inputs. When tied to a peripheral device, connect to the peripheral device + voltage pin.
EXT CUE (-) (pin 12)	While held low, routes the input designated as the External Cue Input onto the cue bus .
EXT TALK TO C/R (-) (pin 11)	While held low, routes the input designated as the External Talk Audio input to the talk to C/R bus.
+5 VOLT LOGIC SUPPLY (pins 1 and 8)	Console 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 GND (pins 2 and 9)	Console logic ground. Should be connected to isolated control panels only.

Cue/Talk/Ext Logic 12-Pin Logic Connector Housing



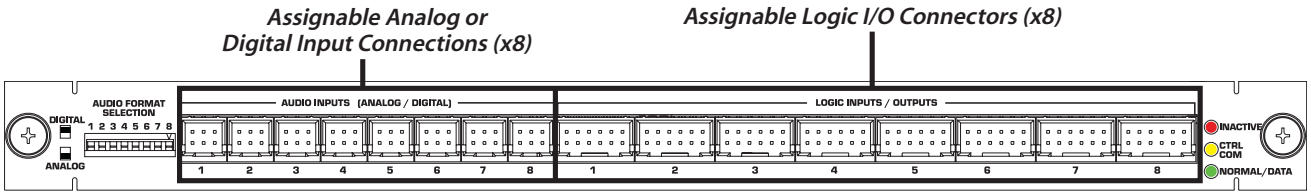
Pin numbering order, wire insertion end view, as plugged into the console

QUICK GUIDE TO THE 8-INPUT EXPANSION CARD CONNECTIONS

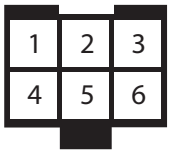
The optional 8-Input Expansion card adds eight audio inputs and eight Assignable Logic I/O connections to a DSP Card. There can be one 8-Input Expansion card added to each DSP card in a console. Since the RMX*d*-4 does not have a DSP card, an 8-Input Expansion card cannot be used in that size frame.

The eight 6-pin audio connectors are individually set as an analog or a digital input by the eight Audio Format DIP switches next to audio input 1. Digital signals connect using a 3-pin connector plugged into the back row of pins in the same orientation as on the KSU card. There is no connection to the front row of pins on a digital signal. Each analog input uses a 6-pin connector with either one stereo pair or two separate mono signals on the connector. Note that the 6-pin connectors are reversed from the analog connector orientation on the KSU card.

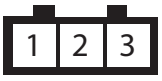
The eight Assignable Logic I/O connections can be bound to any audio input on this 8-Input Expansion card. See page 2-21 for the Assignable Logic I/O signal summary.



AUDIO INPUTS 1 - 8

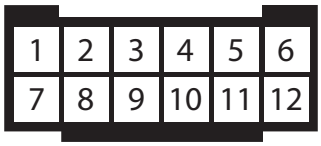


FOR AN ANALOG INPUT — *Set the matching numbered DIP switch toward the board operator to select analog. Connect one stereo or two mono line level signals to the input using one 6-pin AMP MOD IV connector. Each input can be trimmed in VMCC for unbalanced -10 dBv connections. Note that these connectors have reversed orientation from the analog connectors on the KSU Card (the left input is on the back row of pins).*



FOR A DIGITAL INPUT — *Set the matching numbered DIP switch toward the back of the console to select digital. Use a 3-pin AMP MOD IV connector to plug an AES/EBU signal into the rear row of pins (the front row of pins is not used). See page 2-11 on how to connect a S/PDIF signal. The digital connections use the same orientation as the digital connectors on the KSU Card.*

ASSIGNABLE LOGIC I/O

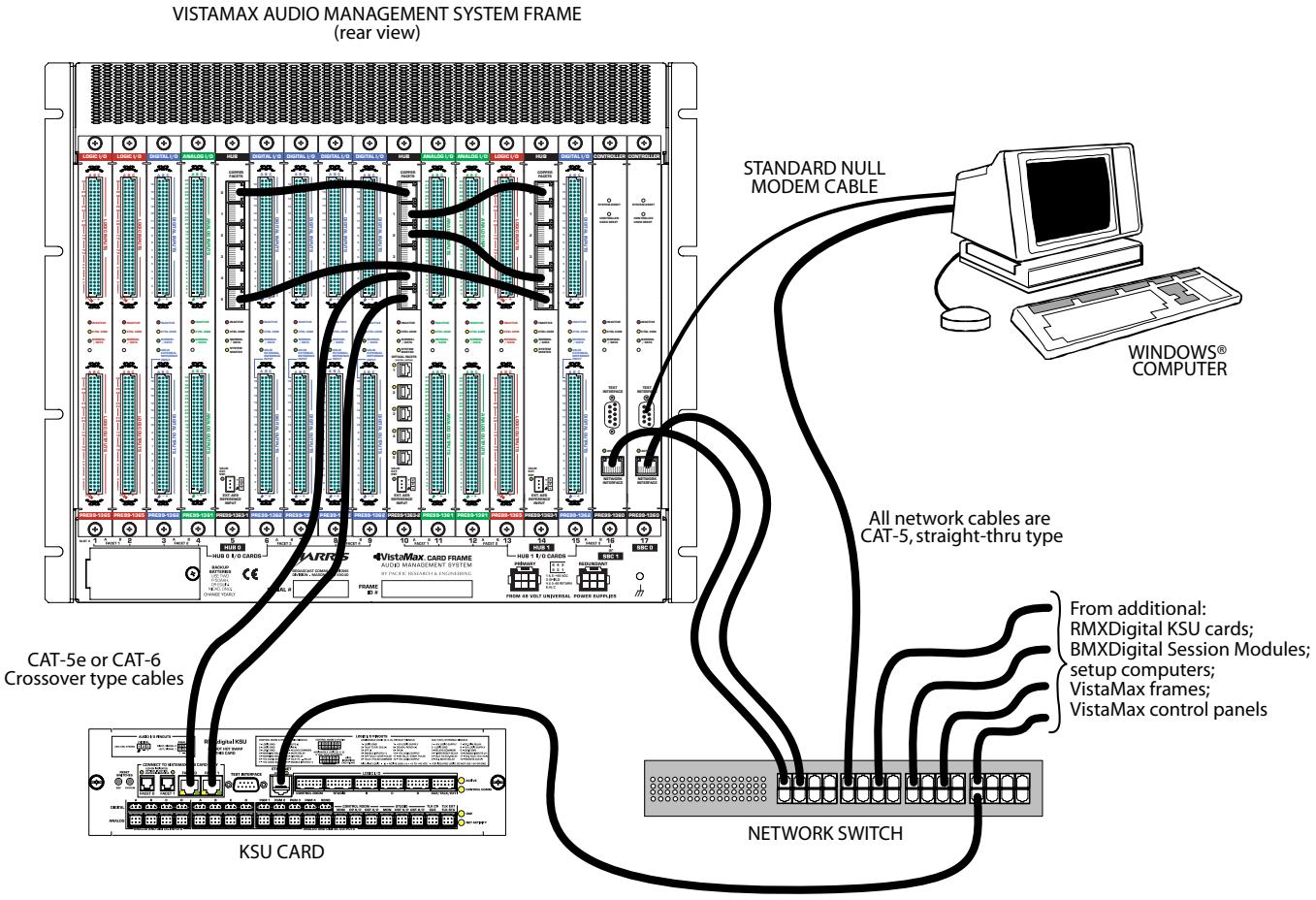


1 - 8 — *A peripheral, peripheral control panel or a mic control panel can connect to each 12-pin connector. For the default logic signals, see page 2-21. For a block diagram of the Assignable Logic I/O interface, see page 2-13. Each Assignable Logic connection can be bound to an audio input on this card. See chapter 4 for additional setup and application information.*

QUICK GUIDE TO VISTAMAX CONNECTIONS

The KSU card has two Facet connections to integrate the console with a VistaMax Audio Management System. Each connection can tie to a facet on a VistaMax Hub card. Each facet carries 64 audio channels and associated logic to a VistaMax frame as well as 64 audio channels, with associated logic, from the VistaMax frame to the console. By using two CAT-5e or CAT-6 cables, 128 bidirectional signals can be connected simultaneously up to 100 meters away. To go beyond this distance, the optional optical connections must be used. These connections allow a console to connect to a VistaMax Hub card that is up to 2 km away from the console.

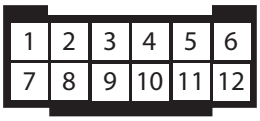
The RJ-45 Ethernet connector ties the console into a LAN for communications and control within a VistaMax system. This is done through a network switch which also has all of the VistaMax frames, control panels, additional RMX*digital* consoles, BMX*digital* consoles, and setup computers in the network connected to it. Each device connected to the network switch has a unique TCP/IP address assigned during installation. Each RMX*digital* console has the address: 192.168.100.22 assigned at the factory. This address MUST be changed prior to connecting the console to a VistaMax LAN. See chapter 4, RMX*digital* Server for details on changing this address. Refer to the VistaMax operating manual (75-52) for additional configuration details.



MIC REMOTE CONTROL CONNECTION EXAMPLE

This example shows a mic remote control panel connected to an Assignable Logic I/O connector, using the default logic settings. Information on binding the logic to the mic audio input and the channel strip session settings for microphones are covered in chapter 4, RMX*digital* Server and in Appendix A, VMCC.

ASSIGNABLE LOGIC I/O CONNECTOR SIGNAL TABLE



(wire insertion end view)

PIN #	SIGNAL	FUNCTION
1	**LOGIC GROUND**	Logic ground
2	**TALK INPUT (-)**	Remote Talkback switch input (active low)
3	**OFF INPUT (-)**	Remote Off switch input (active low)
4	**ENABLE LOGIC INPUTS (+)**	Jumper to +VDC to enable switch inputs
5	**OFF TALLY**	Off tally output, N.O. contact
6	**TALLY COMMON**	Tally relays common connection, C contact
7	**+5 VOLT LOGIC SUPPLY**	5 volt source for Cough and Talkback Tallies
8	**COUGH INPUT (-)**	Remote Cough switch input (active low)
9	**ON INPUT (-)**	Remote On switch input (active low)
10	**+5 VOLT LOGIC SUPPLY**	5 volt source to enable switches
11	**ON TALLY**	On tally output, N.O. contact
12	**+5 VOLT LOGIC SUPPLY**	5 volt source for switch tallies

Notes: +VDC is between +5 and +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA total
Bold indicates connections used in this example.

ASSIGNABLE LOGIC CONNECTOR

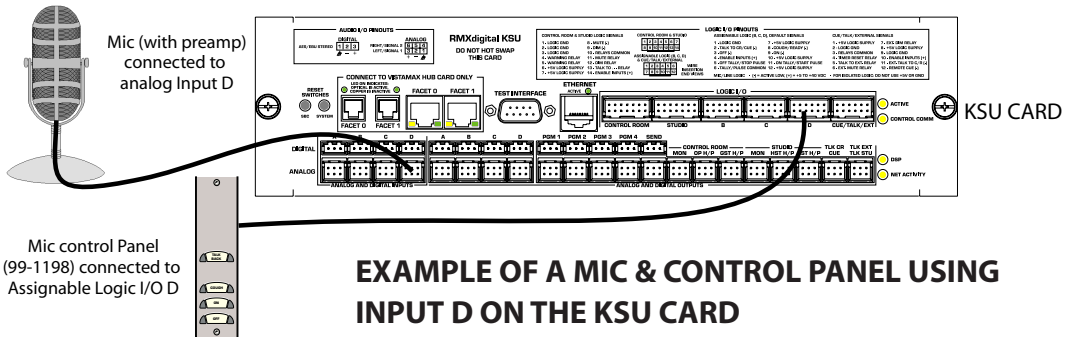
SIGNAL	PIN
Logic Ground	1
Off Tally	5
On Tally	11
+5 VDC Supply	7
Off Switch (-)	3
On Switch (-)	9
Cough Switch (-)	8
Talk Switch (-)	2
Tally Common	6
+5 VDC supply	12
Enable Logic Inputs (+)	4
+5 VDC Supply	10

BLK	
WHT	
RED	
GRN	
BRN	
BLU	
ORG	
YEL	

99-1197 or 99-1198 MIC CONTROL PANEL

PIN	SIGNAL
1	Logic GND
2	Off Tally
3	On Tally
4	Power Supply
5	Off Switch
6	On Switch
7	Cough Switch
8	Talkback Switch

PARTS LIST
Cable: Belden 9421 or equiv.
8-pin MOD IV Housing: 14-486 (Tyco-AMP 87631-4)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

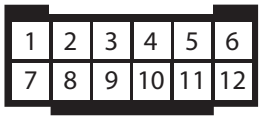


EXAMPLE OF A MIC & CONTROL PANEL USING INPUT D ON THE KSU CARD

BASIC PERIPHERAL DEVICE LOGIC CONNECTION EXAMPLE

This example shows a peripheral device (with basic logic functions like the CD player shown below) connected to an Assignable Logic I/O connector using the default logic settings. Information on binding the logic with the peripheral's audio inputs and the channel strip session file settings for peripherals are covered in chapter 4, RMX*digital* Server and in Appendix A, VMCC.

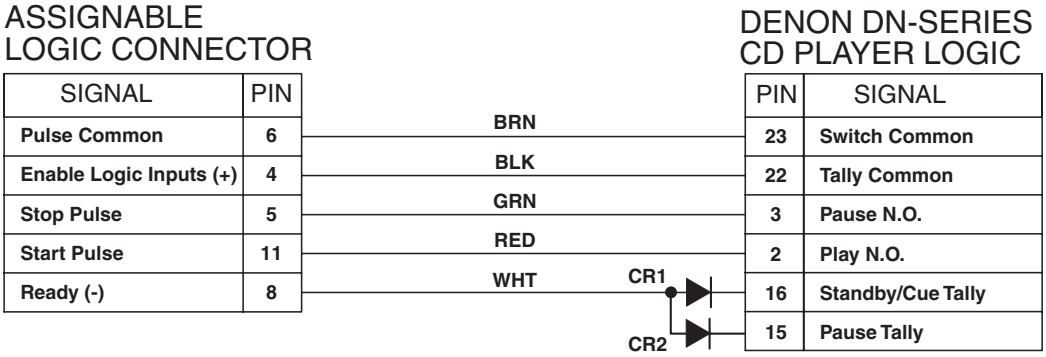
ASSIGNABLE LOGIC I/O CONNECTOR SIGNAL TABLE



(wire insertion end view)

PIN #	SIGNAL	FUNCTION
1	LOGIC GROUND	Logic ground
2	CUE INPUT (-)	Remote Cue switch input (active low)
3	OFF INPUT (-)	Remote Off switch input (active low)
4	**ENABLE LOGIC INPUTS (+)**	Jumper to +VDC to enable switch inputs
5	**STOP PULSE**	Stop command output, N.O. contact
6	**PULSE COMMON**	Start/Stop Pulse common, C contact
7	+5 VOLT LOGIC SUPPLY	5 volt source
8	**READY INPUT (-)**	Remote Ready switch input (active low)
9	ON INPUT (-)	Remote On switch input (active low)
10	+5 VOLT LOGIC SUPPLY	5 volt source to enable switches
11	**START PULSE**	Start command output, N.O. contact
12	+5 VOLT LOGIC SUPPLY	5 volt source for switch tallies

Notes: +VDC is between +5 and +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA total
Bold indicates connections used in this example.

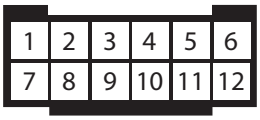


PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
25-pin DSub: 15-854 (DB-25P)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

COMPLEX LOGIC CONNECTION EXAMPLE

This example shows a peripheral device with complex logic functions (a digital delivery system) connected to an Assignable Logic I/O connector, using default logic settings. For most peripheral devices, the logic ground and +5 volt supply connections are not used, but in this example all of the digital delivery system connections are also isolated. Information on binding the logic to the peripheral's audio inputs and the channel strip session file settings for peripherals are covered in chapter 4, RMX*digital* Server and in Appendix A, VMCC.

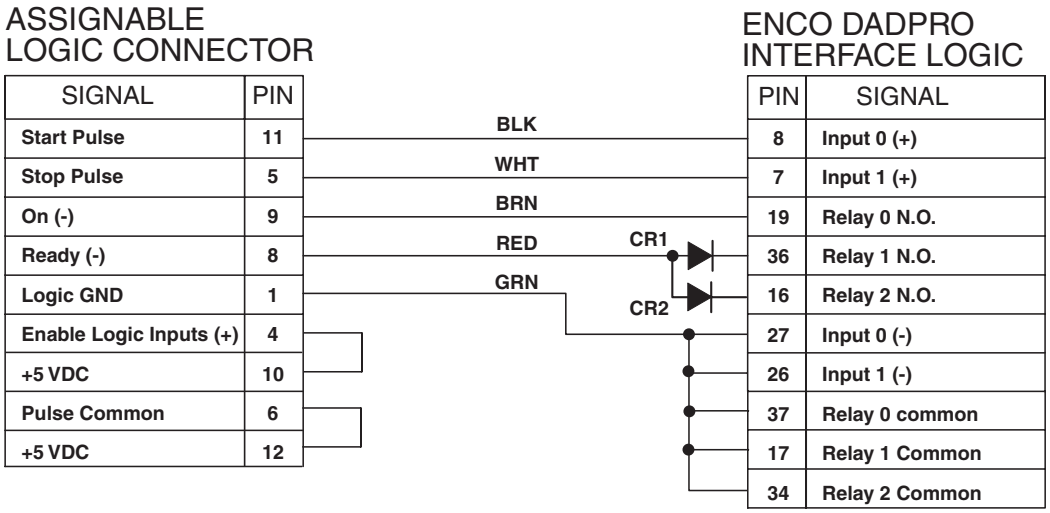
ASSIGNABLE INPUT LOGIC CONNECTOR SIGNAL TABLE



(wire insertion end view)

PIN #	*SIGNAL*	*FUNCTION*
1	**LOGIC GROUND**	Logic ground
2	CUE INPUT (-)	Remote Cue switch input (active low)
3	OFF INPUT (-)	Remote Off switch input (active low)
4	**ENABLE LOGIC INPUTS (+)**	Jumper to +VDC to enable switch inputs
5	**STOP PULSE**	Stop command output, N.O. contact
6	**PULSE COMMON**	Start/Stop Pulse common, C contact
7	+5 VOLT LOGIC SUPPLY	5 volt source
8	**READY INPUT (-)**	Remote Ready switch input (active low)
9	**ON INPUT (-)**	Remote On switch input (active low)
10	**+5 VOLT LOGIC SUPPLY**	5 volt source to enable switches
11	**START PULSE**	Start command output, N.O. contact
12	**+5 VOLT LOGIC SUPPLY**	5 volt source for switch tallies

Notes: +VDC is between +5 and +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA total
Bold indicates connections used in this example.



PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
37-pin DSub: 15-885 (DC 110963-4)
DSub crimp pins: 15-884 (DB-37P)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

Buttoncap Lenses

All buttoncaps on the RMX*digital* are shipped from the factory with laser-etched lenses with standard labeling (as shown on pages 3-2 and 3-4). Laser etching ensures each buttoncap's labeling withstands millions of button pushes.

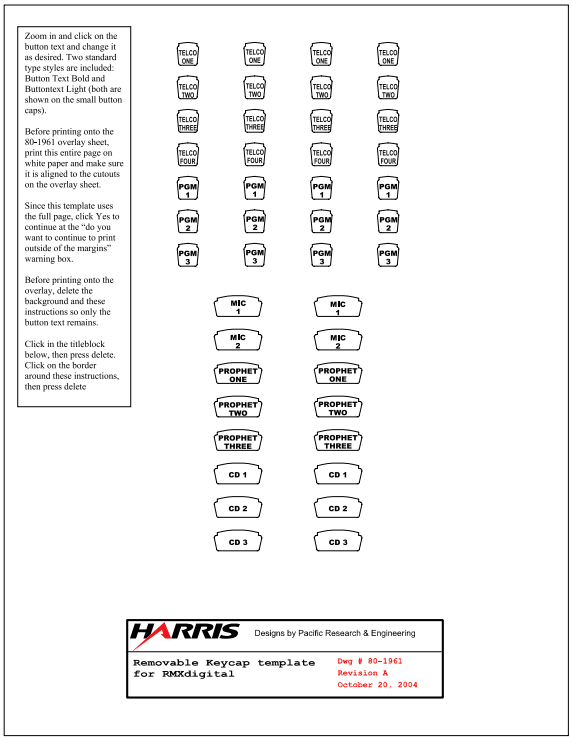
Selected buttoncaps feature removable lenses for field installation of custom printed inserts. Two sizes of clear lenses and inserts are available: large, for the Off buttons on the Dual Fader panels and the two talk buttons on the Monitor Control panel; and small, for the Talkback buttons on the Dual Fader panels and for the twenty-one selector buttons on the Monitor Control panel.

Clear lenses for both size buttoncaps are included in the 76-1400 install kit. They hold printed inserts in place on the removable lens buttoncaps. Additional clear lenses of both sizes are available in the 76-1403 kit for the Monitor Control panel (twenty-one small and two large lenses) and the 76-1404 kit for the Universal Dual Fader Input panel (two large and two small lenses).

A Microsoft® Word template file (71-1961, shown in the right column) is available on the CD-ROM or on the Harris FTP site (see page 5-1 for access info). It is used with the 80-1961 clear insert sheet to create custom lens labels. The 80-1961 sheet, with diecut inserts for both small and large lenses, can be laser or inkjet printed. One 80-1961 sheet is included in the 76-1400 kit.

To use the 71-1961 template, open it up in Word and replace the default lens text for the number of buttons that require new labels. Print the template onto a blank sheet of paper. Note its orientation as it comes out of the printer. Compare the printed sheet to the blank 80-1961 sheet by aligning both sheets over a light. If the lens cutouts match the printed sheet lens outlines, then delete the outlines and instructions on the template (click on the title block, then click delete, click in the instructions, then click delete). Only the lens text should remain on the page. Place the 80-1961 sheet into the printer so it is properly oriented and print the page.

If the printed test sheet does not line up with the blank 80-1961 sheet, then try printing using manual feed to adjust the page or adjust the template button outlines and text slightly on the page until they are properly aligned—which, unfortunately, is easier said than done in Word.



INSERT TEMPLATE, FOR USE ON BUTTONS WITH REMOVABLE LENS

LENS REMOVAL

Catch a thumbnail under the top edge of the lens and pull up to remove it. Place the printed clear insert into the buttoncap, and then snap a clear lens onto the buttoncap.

Be sure to retain the factory-etched lenses for possible future reuse.

Console Operation 3

This chapter covers how to use the RMX*digital* console controls.

Console Overview

RMX*digital* consoles consist of: a mainframe; one Monitor Control panel; multiple Universal Dual Fader panels; a Console Display (with two stereo bargraph meters, clock, and timer); and a rack-mount power supply.

UNIVERSAL DUAL FADER PANELS

Input audio is selected and level controlled using the "channel strip" controls on Universal Dual Fader panels. The initial input source for each channel strip is set by loading a **session file**—a console setup file previously created by engineering or operations.

Multiple session files can be saved to the console to set-up that console for specific dayparts or for specific applications (e.g., a morning zoo show setup versus a single board operator setup, or voice tracking versus commercial production). Session files are selected and "taken" using the session selection controls on the Monitor Control panel.

Each dual fader panel has two separate channel strips for controlling two audio signals independently. The audio signals may be connected to the RMX*digital* or, when the console is networked in a VistaMax system, may come from other RMX*digital* consoles or VistaMax or Envoy cardframes.

A Quick Guide to using Universal Dual Fader panels is on pages 3-2 and 3-3.

MONITOR CONTROL PANEL

This standard panel is installed near the right side of the frame. The panel is divided into three columns:

- **Session / Timer / Aux Meter controls**
- **Control Room Monitor controls**
- **Studio Monitor controls**

A Quick Guide to using the Monitor Control panel is on pages 3-4 to 3-7.

CONSOLE DISPLAY

Two displays are available for the RMX*digital*: the original direct-view display and a low-profile Reflective Console Display. Each is set onto the countertop behind the control panels. Each type has two signal level meters (which show the Program 1 bus and a selectable auxiliary source), a time of day clock, and an event timer. A Quick Guide to the Console Displays is on page 3-8.

POWER SUPPLY

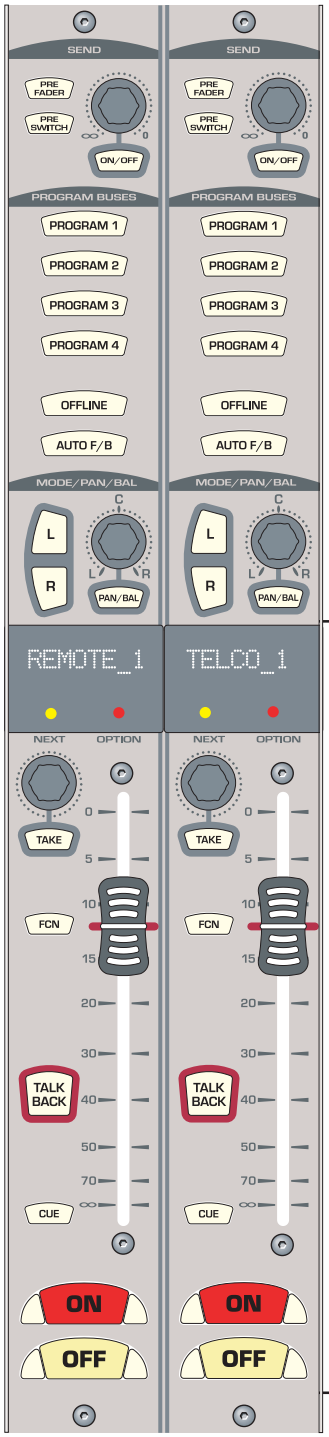
The RMX*digital* power supply is designed specifically for 24/7 operation and should not be powered down since doing so will cause complete signal interruption.

A recessed power switch on the front panel of the supply is used to turn off the power supply. If it is turned off, wait at least fifteen seconds before turning the supply back on.

NOTE: Mainframe backup batteries hold the channel settings for a limited amount of time during momentary power outages. However, it will still take about 90 seconds for the console to "boot up" and become available after the power supply is turned on.

UNIVERSAL DUAL FADER PANEL QUICK GUIDE

Each panel has two identical "channel strips" for independent control of two audio sources. The initial audio source for each channel strip is set by taking a session file. Sources may then be manually changed on the panel using the Source Selector and Take button, or by taking a different session file.



FADER SECTION

FADER SECTION CONTROLS

Input Name Display — *The ten-character displays show each channel's input source. When the Source Selector is actively being used, the yellow Next LED lights to indicate the display is now showing an alternate source name.*

Source Selector — *A rotary encoder used to scroll alpha-numerically through a list of alternate input sources. The source names shown can be limited by the session file, thus there might only be the assigned source (plus Silence) shown when this control is used.*

TAKE — *Selects the alternate input source when TAKE is pressed while the Next LED is lit and the channel is Off. If TAKE is pressed while the channel is On and the Next LED is lit, the channel "pends" (the On button flashes) to indicate the new source will be taken as soon as the channel is turned off.*

FCN — *Function button. Press and hold to access special channel strip features. It is not active at this time.*

Fader — *100mm channel level control with dB indications to show relative attenuation. For unity gain, set the fader to the red line (-12 dB). This makes a nominal +4 dBu analog input signal appear as a -20 dBFS (0 VU) signal on the meters.*

TALKBACK — *Active (lit) only when a channel strip is set as a Telco channel during console setup. While pressed, the control room talk mics, pre-switch and pre-fader, are sent to that Telco channel's Mix-Minus output. Up to six faders can be set as Telco channels.*

CUE — *When lit, routes pre-fader, pre-switch audio to the cue output without affecting the on-air signal. On CR mic channels, the cue button is momentary and the input only goes to the Cue meter display. On all other inputs it latches (toggle cue on and off) and the input goes to both the Cue speaker and the Cue meter display.*

ON — *Press to turn the channel on. The button lights, routing the audio to the selected buses. Logic control commands may also be initiated, depending upon session file logic settings for the source.*

OFF — *Press to turn the channel off. This removes the audio from all selected buses except those set for pre-switch operation. Logic control commands may also be initiated, depending upon session file logic settings for the source. The button may not light up when pressed since some inputs may be set to indicate peripheral device status.*

UNIVERSAL DUAL FADER PANEL (CONT.)

SEND
This section has the send bus controls.

ON/OFF — *When lit, routes the input audio to the send bus through the send volume control and the Pre Fader and Pre Switch controls. When unlit, no audio on this channel goes to the send bus.*

Rotary Volume Control — *Sets the level of the audio going to the send bus.*

PRE FADER — *When lit, any audio going to the send bus is not affected by the channel fader. When unlit, the audio level to the send bus is also affected by the channel fader.*

PRE SWITCH — *When lit, the audio going to the send bus is not affected by the channel On/Off buttons. When unlit, the audio to the send bus follows the channel on/off status.*

PROGRAM BUSES
This section has the Program and Offline bus assignment buttons.

PROGRAM 1, 2, 3, 4 — *When lit, routes the channel audio, post fader and post switch, to any combination of the four Program buses. When unlit, the channel audio does not go to that bus.*

OFFLINE — *When lit, routes the channel audio to the Offline bus. The Offline feed is always pre-switch and is typically pre-fader as well (it can be set to be post-fader through a session file setting). This bus is used to create offline mixes for the Telco return feeds.*

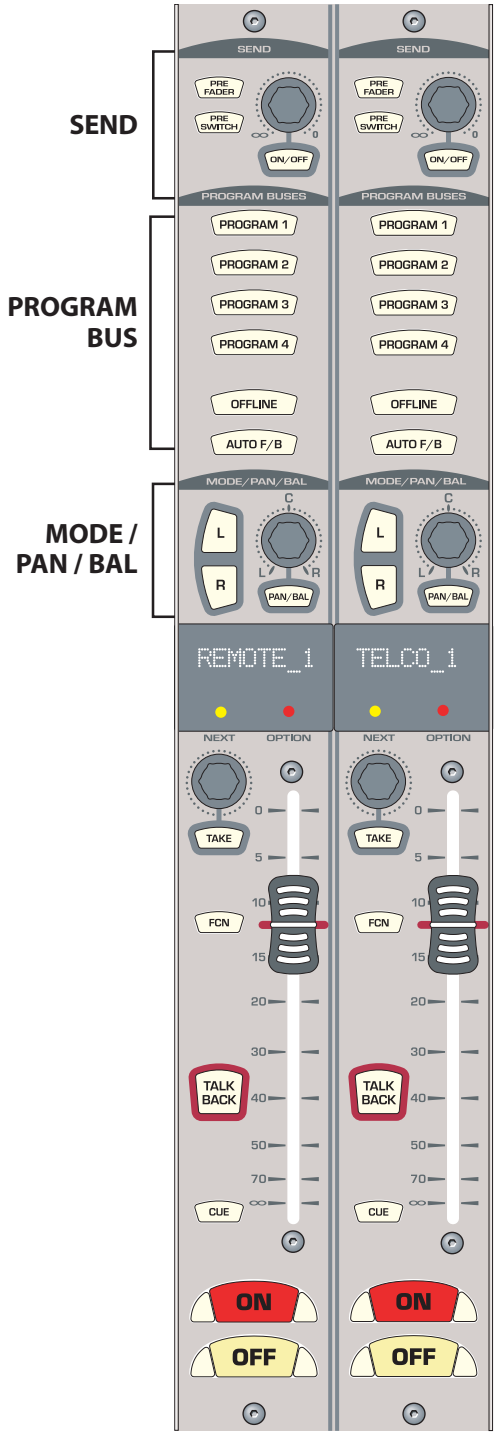
AUTO F/B— *The Automatic Foldback button is only active on Telco channels. When lit, it automatically toggles the caller's return feed between Offline (when the Telco channel is Off) and an active Program bus (when the Telco channel is On). Page 3-10 has operational details.*

MODE / PAN / BAL
This section has the channel mode and pan/balance controls.

L and R — *Sets the audio mode. For stereo, both buttons are unlit. With L (left) lit, the left input feeds both left and right bus outputs. With R (right) lit, the right input feeds both left and right bus outputs. With both L and R lit, the inputs are summed to mono and then fed to both left and right bus outputs.*

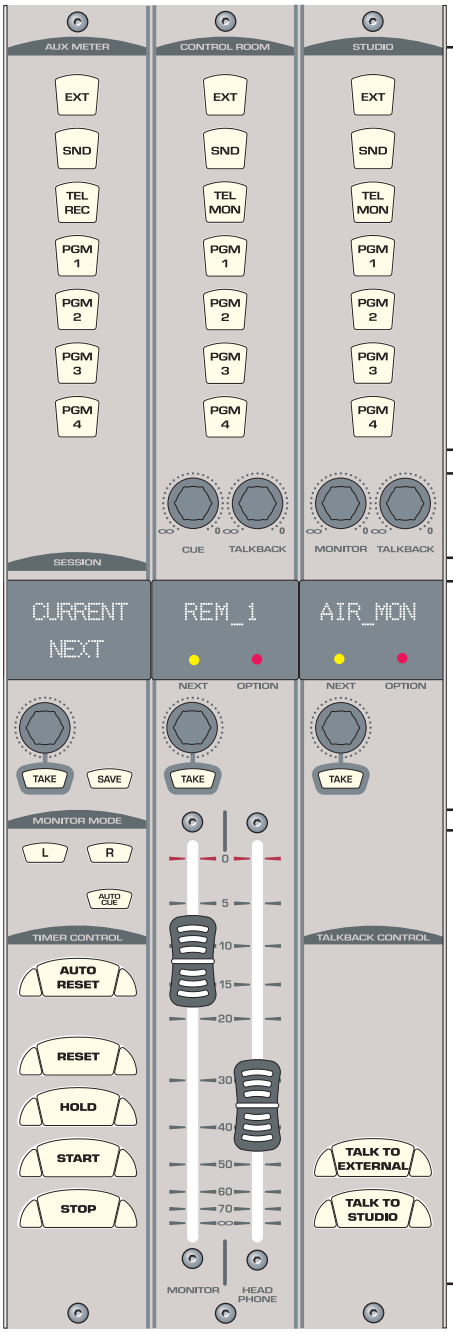
PAN/BAL — *When lit, the pan/balance control is active. When unlit, the pan/balance control position does not affect the audio.*

Rotary Pan/Balance Control — *When PAN/BAL is lit, controls how the audio input is placed in aural space. On a stereo signal it is a balance control. On a mono signal (L, R, or both lit) it is a pan control.*



MONITOR CONTROL PANEL QUICK GUIDE

This card is divided into three columns by function: the left column has the auxillary meter source selectors, the session file controls and timer control buttons; the center column has the control room monitoring controls (monitor source selectors and level controls for the control room speakers and operator headphones); the right column has the studio monitoring controls (monitor source selectors and level controls for studio speakers). Each column's functions are separately detailed over the next three pages. A card overview follows.



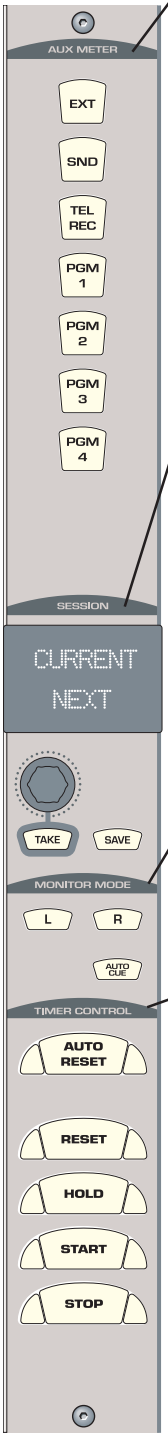
AUX METER, CONTROL ROOM & STUDIO MONITOR SOURCE SELECTOR BUTTONS

LEVEL CONTROLS FOR CUE, TALKBACK AND STUDIO MONITOR

DISPLAYS FOR SESSION NAME AND MONITOR SOURCES, SESSION SELECTION CONTROLS AND ADDITIONAL MONITOR SOURCE SELECTORS FOR THE CONTROL ROOM AND STUDIO

CONTROL ROOM MODE AND TIMER CONTROL BUTTONS, CONTROL ROOM FADER CONTROL, TALKBACK CONTROL

MONITOR CONTROL PANEL QUICK GUIDE, LEFT COLUMN CONTROLS



AUX METER

The buttons in this section have removable lenses for custom labels. The signal assigned to each button is set during console configuration. As shipped from the factory, the assigned signals are:

EXT — *When lit, assigns an External input (like Real Air) to the Aux meter.*
SEND — *When lit, assigns the Send bus to the Aux meter.*
TEL REC — *When lit, assigns the Telco Record output to the Aux meter.*
PGM 1-4 — *When lit, assigns one of the four Program buses to the Aux meter.*

SESSION CONTROLS

These controls allow the operator to load and save a session file.

Session Name Display — *The top line (Current) shows the name of the currently loaded session. The bottom line (Next) shows the name of another session, as selected using the Session Selector. The Next session is made the Current session by pressing the Take button.*

Session Selector — *A rotary encoder to alphanumerically list the names of previously saved session files, which appear in the bottom line of the Session Name Display.*

TAKE — *Press to make the Next session active. The Current and Next names will be the same until the Session Selector is rotated.*

SAVE — *Press to save the Universal Dual Fader panels' button settings, input source names and other information as a new session saved locally in the console. The new session name is the current session name plus a numerical suffix.* ***Note:*** *Save always creates a new session. Operators cannot overwrite or damage any existing session.*

MONITOR MODE

L & R — *With both buttons unlit, the CR monitor and CR headphone outputs are stereo. With only L (left) lit, the left bus source feeds both the left and right outputs. With only R (right) lit, the right bus source feeds both outputs. With both lit, the left and right outputs are a sum of the bus source.*

AUTO CUE — *When lit, allows cue to interrupt the operator headphone output following the routing method set during console configuration. When unlit, cue does not go to the operator headphone output.*

TIMER CONTROL

This section has the controls for the event timer in the Console Display.

AUTO RESET — *When lit, allows the timer to reset when a channel—with its timer reset function enabled by the session file, is turned on. The timer resets to 00:00.0 and starts counting upward. When unlit, the timer ignores channel timer reset commands.*

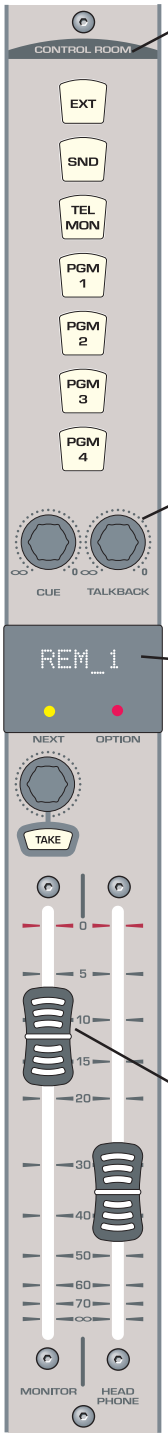
RESET — *Resets the timer to 00:00.0. The timer then counts up from 00:00.0.*

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 — *Starts the timer from the displayed time.*

STOP — *Stops the timer with the elapsed time displayed. Press START to continue counting up from the displayed time. Press RESET and STOP together to reset the timer to 00:00.0.*

MONITOR CONTROL PANEL QUICK GUIDE, CENTER COLUMN CONTROLS



CONTROL ROOM

All CR outputs use the same monitor source. The selected source is usually indicated by a lit button but, if Auto Mic Switching is enabled (to switch between the Real Air source (typically EXT) and a Synthetic Air source while a CR mic channel is On), then the Real Air button (typically EXT) flashes to indicate Synthetic Air is the monitor source. Alternate monitor sources can be selected using the CR Monitor Source Selector and Take button. Its name is shown in the Name Display, which turns off all selector buttons.

The buttons in this section have removable lenses for custom labels that identify the source assigned during console setup. Here are the assigned signals as shipped from the factor:

EXT — *When lit, typically assigns the Real Air audio to the Control Room monitor outputs.*
SEND — *When lit, assigns the Send bus to the Control Room monitor outputs.*
TEL REC — *When lit, assigns the Telco record output to the Control Room monitor outputs.*
PGM 1-4 — *When lit, assigns the selected Program bus to the Control Room monitor outputs.*

LEVEL CONTROLS

Cue — *Adjusts the output level of the built-in cue speaker and dedicated CUE output.*

Talkback — *Adjusts the output level of the dedicated Talk to Control Room (TLK CR) output and the talkback level into the Cue speaker (when Talk to Cue is set during console setup).*

CONTROL ROOM MONITOR SOURCE

CR Monitor Source Name Display — *Shows the selected monitor source name (selected by the source selector) while the Next LED is off. When the Next LED is lit, it shows an alternate source name that is being selected using the Source Selector. The alternate source is selected by pressing TAKE. There is no display if a source is selected using the seven monitor source buttons.*

Source Selector — *A rotary encoder to alphanumerically list all of the alternate monitor sources. Turning the selector turns on the Next LED. "No List" is displayed if no alternate sources were assigned during console setup.*

TAKE — *Press to select the alternate monitor source while the Next LED is lit. Has no effect if pressed while the Next LED is off.*

Option LED — *This LED is not used at this time.*

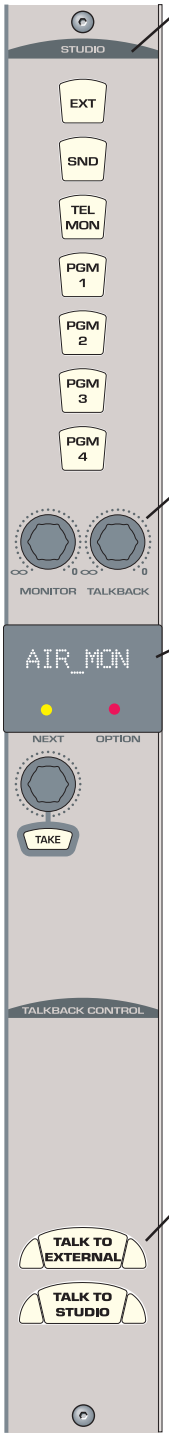
FADERS

MONITOR — *100mm fader for adjusting the volume of the Control Room monitor speakers. It affects the level of the Control Room MON output.*

HEADPHONE — *100mm fader for adjusting the volume of the operator's headphones. It affects the level of the Control Room OP H/P output.*

.

MONITOR CONTROL PANEL QUICK GUIDE, RIGHT COLUMN CONTROLS



STUDIO

All Studio outputs use the same monitor source. The selected source is usually indicated by a lit button but, if Auto Mic Switching is enabled (to switch between the Real Air source (typically EXT) and a Synthetic Air source while a Studio mic is active), then the Real Air button (typically EXT) flashes to indicate the Synthetic Air is the source. Alternate monitor sources are selected using the Studio Monitor Source Selector and Take button. Its name is then shown in the Studio Monitor Name Display, which turns off all selector button lights.

Buttons in this section have removable lenses for custom labels (the sources associated with each button are set during console setup). The assigned signals, as shipped from the factory, are:

EXT — *When lit, typically assigns the Real Air audio to the Studio monitor outputs.*
SEND — *When lit, assigns the Send bus to the Studio monitor outputs.*
TEL MON — *When lit, assigns the Telco channels to the Studio monitor outputs.*
PGM 1-4 — *When lit, assigns the selected Program bus to the Studio monitor outputs.*

LEVEL CONTROLS

Monitor — *Adjusts the output level of the stereo Studio Monitor (MON) output.*

Talkback — *Adjusts the output level of the dedicated Talk to Studio (TLK STU) output.*

STUDIO MONITOR SOURCE

Studio Monitor Source Name Display — *Shows the selected monitor source name (selected by the source selector) while the Next LED is off. When the Next LED is lit, it shows an alternate source name that is being selected using the Source Selector. The alternate source is selected by pressing TAKE. The display is turned off when a source is selected using the seven monitor source buttons.*

Source Selector — *A rotary encoder to alphanumerically show all of the alternate monitor sources. Turning the selector turns on the Next LED. "No List" is displayed if no alternate sources were assigned during console setup.*

TAKE — *Press to select the alternate monitor source while the Next LED is lit. Has no effect if pressed while the Next LED is off.*

Option LED — *This LED is not used at this time.*

TALKBACK CONTROL

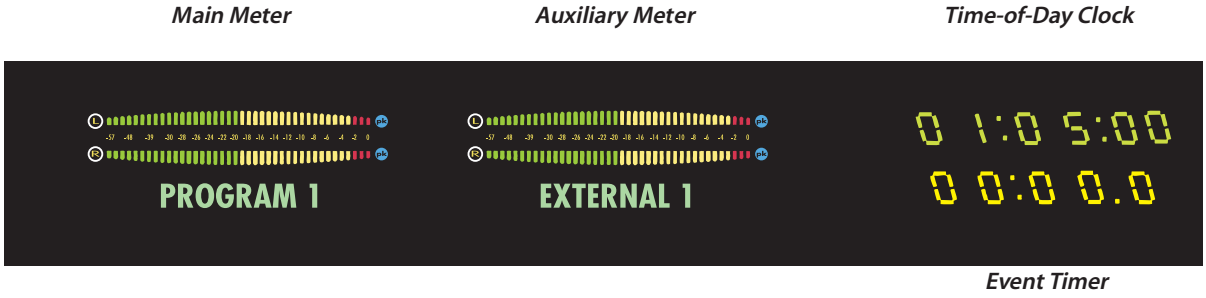
These buttons route talkback audio from the talk channels to External or Studio 1 if the talk channels have a CR mic as their source. If the talk channels are On, they are unassigned from all buses while either talk button is pressed. Both buttons have removable lenses for custom labeling.

TALK TO EXTERNAL — *While pressed, routes the control room talk mic(s), pre-switch and pre-fader, to the TLK TO EXT output.*

TALK TO STUDIO 1 — *While pressed, routes the control room talk mic(s), pre-switch and pre-fader, to the TLK TO STU 1 outputs.*

CONSOLE DISPLAY QUICK GUIDE

There are two displays available: a low-profile reflective display (standard) or the original direct-view display on a stand (optional). Each has the same display elements: two bargraph meters, a clock and an event timer.



RMXdigital's Low-Profile Reflective Display

CLOCK

The clock displays time in hours: minutes: seconds in either 12- or 24-hour time. See page 2-4 for information on setting the clock.

EVENT TIMER

The event timer displays time in minutes: seconds: tenths of seconds. Page 3-5 shows the timer controls on the Monitor Control panel.

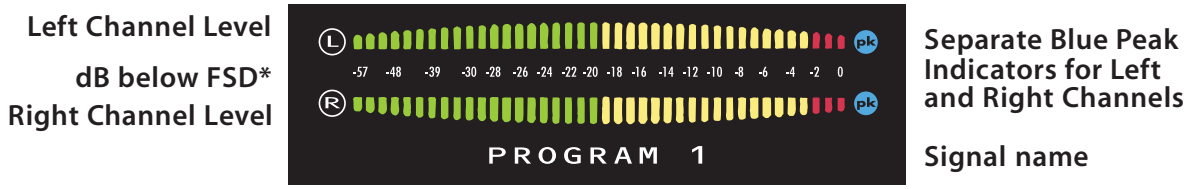
BARGRAPH METERS

The left meter provides level display for the Program 1 bus. The right meter (Aux meter) shows a selected meter source set by the Aux Meter buttons on the Monitor Controller (see page 3-5)—except when cue is active, then the meter displays the cue bus levels. An alphanumeric display below each meter identifies the selected source by name (e.g., CUE, PGM 1, SEND, EXT, etc.).

A detailed bargraph meter is shown below. Each bar segment, from 0 to -30, represents a 1 dB level change between bars. From -30 to -57, each bar represents a 3 dB difference in level. Bars are green from -57 to -20, which is equivalent to a 0 VU setting on a mechanical meter. With a properly set up console this level (-20) results in a +4 dBu analog output.

From -20 to -3 the LEDs are yellow. Signal 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).

The meters can be set to display average only (a solid moving bargraph indicates the average sig-



RMX*digital* Bargraph Meter

** FSD = Full Scale Digital, or 0 on the meters—the maximum console output level. To compare to a VU meter: 0 VU is equivalent to the bargraph -20 dBFS setting.*

nal level) or 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 dBFS), 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 during installation.

RMX*digital* Applications

The RMX*digital* is a very flexible on-air, production, newsroom, or voicing studio console that may be installed as a stand-alone console or as an integral part of a VistaMax audio management system. Because of its flexibility and its compact design, some features require knowledge beyond the typical console operation of select a bus, run the fader up and turn the channel on. Here's an overview of some of these operator features.

VISTAMAX INTEGRATION

When the RMX*digital* console is tied into a VistaMax audio management system, an almost unlimited number of audio and audio-with-logic signals become available to the console. These signals can originate locally (by being connected directly to a console input) or they can be networked signals that are physically connected to remotely located VistaMax frames (typically located in the terminal or rack room) or to other networked RMX*digital* and BMX*digital* consoles located elsewhere in the facility.

To a console operator, a VistaMax system consists of two parts: sources and destinations. A source is simply an analog or a digital signal from a satellite receiver, a Telco interface, a remote traffic feed, a processed mic, a digital delivery system output, an ISDN output—any audio signal needed in the facility that is plugged into a RMX*digital* console, a BMX*digital* console or a VistaMax rack card.

Once a source is connected, it can then be made available to be selected for any number of destinations. A destination is an output on a VistaMax rack card, a channel on an RMX*digital* console or a KSU card routed output.

Each channel strip in an RMX*digital* console is a destination and, as such, can be allowed complete access to every source in the entire VistaMax system or, to simplify source selection, to a limited subset of sources deemed most valuable to that channel. This can mean the channel is limited to only one source, as would typically be the case with a mic input channel. Just how large a selection list is shown when the source selector is rotated is set by the session file.

Thus, accessing networked VistaMax signals is done in the same manner as accessing any locally connected input source: use the source selector rotary knob to select a new source—which is shown in the 10-character display, and while the Next LED is lit, press *Take* to select that source as the new input for the channel.

Since each channel shares a single display for the current source name and the next source name, as soon as the source selector is turned, a Next LED turns on to indicate the display is now showing other available source names in alphanumeric order. This same type of control is used to select session files and select alternate monitor sources for the control room and studio.

Once the desired source is shown in the display and the Next LED is still lit, firmly press *Take* to select the new source. If the Next LED goes out before *Take* is pressed, the display reverts to the current source name and no source change is performed.

VistaMax sources can also be routed directly by loading a session file with the desired VistaMax sources preassigned to the input channels. VistaMax sources can also be directed to in-room recording devices by using a rack mount VistaMax source selector panel in similar fashion.

To route a console signal to a VistaMax location requires only that the source name be "published" (which is a setup function that simply lists the sources that each destination can select from). When a destination has a source published to it, that source name shows up in the next source list as the source selector is turned on the console or on a VistaMax selector panel.

For a more complete description of the VistaMax audio management system, see the VistaMax manual (Harris # 75-52).

TELCO / CODEC OPERATION

Up to six channels in an RMX*digital* can be designated as Telco channels 1 - 6. The term Telco, at least in the RMX*digital*, generically refers to any type or model of remote send/receive device, which includes telephone hybrids, satellite transceivers and ISDN codecs.

When a channel is set as a Telco, several changes occur including activating two buttons on the channel strip: AUTO F/B (Automatic foldback) and TALKBACK (which lights up). Bus assignments on Telco channels not only assign the channel input to one or more buses, they also affect the foldback signal returned to the Telco device as detailed in the following sections.

TELCO FOLDBACK MIX

There are two mono foldback signals (alternately termed IFB, for Interruptible Foldback, or mix-minus signals) associated with each Telco channel. One output adds talkback audio over the mix-minus feed, while the second is a "clean feed" without talkback. Either or both of these outputs may be used in the console, depending upon how the console was configuration during installation.

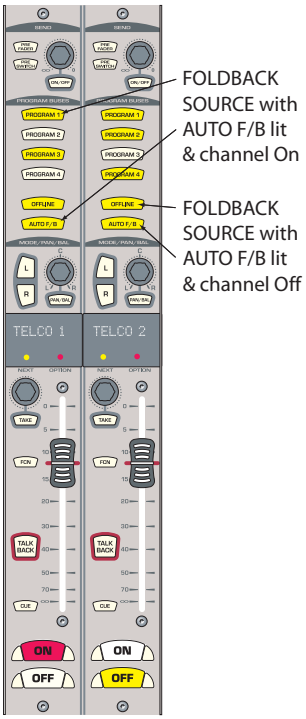
The Telco foldback signal with talk allows the board operator to talk to any caller or remote by pressing that channel's Talkback button while talking to the caller or remote through the board operator's microphone (pre-fader and pre-switch). The Telco channel's clean feed output is typically used as a guest headphone feed or as a remote site program feed.

The bus source for the two foldback outputs is indicated by the "winking" program or offline bus assignment button on each Telco channel. The bus used is determined by which buses are assigned and by the status of the AUTO F/B button, which when lit uses the Telco channel's state (channel On or Off) to automatically select which bus is used as the foldback source.

All program bus foldback feeds are derived post-switch and post-fader. The Offline bus foldback feed is pre-switch and is set as pre-fader or post-fader in the session file.

Auto-Foldback On

When the AUTO F/B button is lit, as shown adjacent, that Telco channel's foldback mix automatically toggles between an assigned program bus, while the channel is On, and the Offline bus, while the channel is Off, using this bus priority:



While the Channel is On: PGM 1 is the foldback mix source. If it's not as-

signed, then the source is selected in bus order; PGM 2, PGM 3, PGM 4, then Offline.

While the Channel is Off: The Offline bus is the foldback mix bus. If it's not assigned (unlit), then there is no foldback audio—except for talkback.

Auto-Foldback On is the most common setting for call-in contests or interviews where the caller also goes live on-air. Typically, only the talent mic channel and the caller's Telco channel are assigned to Offline. While the Telco channel is Off, the caller can hear the talent thru their mic feeding the Offline bus. The talent can hear the caller by listening to Telco monitor or by putting the Telco channel into cue. In this setup, the talent mic is live all the time it is assigned to Offline.

If, while the caller is waiting to go on-air, they must listen to something like a "contest rules and regulations" recording, then it is best to only assign the recording playback channel and the caller to Offline. The talent can then press the caller's Talkback button to talk to the caller, or can momentarily assign their mic to Offline to talk to the caller without pressing Talkback.

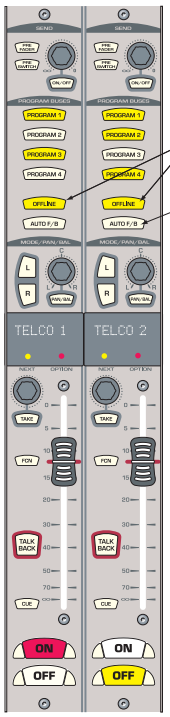
When the caller then goes live on-air (the Telco channel is On), the foldback automatically switches to PGM 1 (assuming the air feed is the Program 1 bus) so that the caller hears everything else going out on-air, but of course, minus their own voice.

Auto-Foldback Off

When Auto-Foldback is off (the AUTO F/B button is unlit), the Telco channel has a different bus priority order for selecting which is the foldback feed.

While the Channel is On or Off, the primary foldback source is Offline. If it is not assigned, then the program buses are selected in order: PGM 1, PGM 2, PGM 3, PGM 4.

Auto-Foldback Off is the most common setting for recording callers for later broadcast or for doing a live remote where a "broadcast" feed to the remote site is required.



In a remote broadcast, when the remote talent goes between being off-air and on-air, the foldback mix shouldn't change. In this case select only PGM 1 on the Telco channel and the PGM 1 foldback will always be sent to the remote, regardless of whether the channel is On or Off. If a special remote broadcast mix is required, construct it using the Offline bus and it will be the foldback feed, regardless of the program bus assignments and whether the channel is On or Off.

TELCO RECORD OUTPUT

A two-channel Telco Record output, assigned during console configuration, sends a "caller" on the left output along with the "talent" on the right output to an editor like a VoxPro®.

The "caller" output are those Telco channels that are assigned as To Record Telcos by the session file. The "talent" output is a base mix of one program bus or the Offline bus (the source for the base mix is set using a bus priority order, just like how the foldback mix source is selected). Typically, just the talent mic channel is assigned to the bus for the base mix, but any channels assigned to that bus will be recorded.

The base mix bus is the highest priority bus assigned on any To Record Telco—even if more

lower priority buses are assigned on more To Record Telco channels.

As in creating the foldback mix, the bus priority order changes when any To Record Telco has AUTO F/B On. Since multiple channels could have AUTO F/B turned On, it is easiest to record callers with AUTO F/B turned off on all Telco channels or only set one Telco as the To Record Telco.

To summarize, here are the two Telco recording priorities and what happens in each condition:

AUTO F/B is off on all To Record Telco channels:

The Base Mix source is Offline. If it is not assigned, then the program buses are used in order; PGM 1, PGM 2, PGM 3, PGM 4.

If Offline is the base mix source, then it doesn't matter whether the channels are On or Off, all To Record Telco channels will be recorded (as shown in the adjacent illustration).

If a program bus is the base mix source, then the To Record Telco channel must be On to record the caller. If a To Record Telco channel is Off, then that caller is NOT being recorded.

AUTO F/B is lit on at least one To Record Telco:

In this mode, the base mix source follows the On/Off state of all of the To Record Telcos with Auto F/B lit. When all of the Telcos with Auto F/B lit are On, then PGM 1 is the primary base mix (if it is not assigned then PGM 2, then PGM 3, then PGM 4, then Offline is used).

When any To Record Telco channel, with Auto F/B lit is turned Off, then Offline is the base mix source and if it's not assigned, no callers will be recorded. This is summarized below.

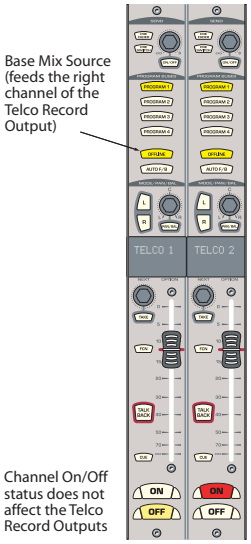
TELCO RECORD OUTPUT SUMMARY

LEFT CHANNEL	All Telco channels which are assigned **TO RECORD** by the session file.
RIGHT CHANNEL	All channels assigned to the Base Mix bus, including those Telco modules that are not assigned **TO RECORD**.
NOT RECORDED	Any channel NOT assigned to the Base Mix bus.

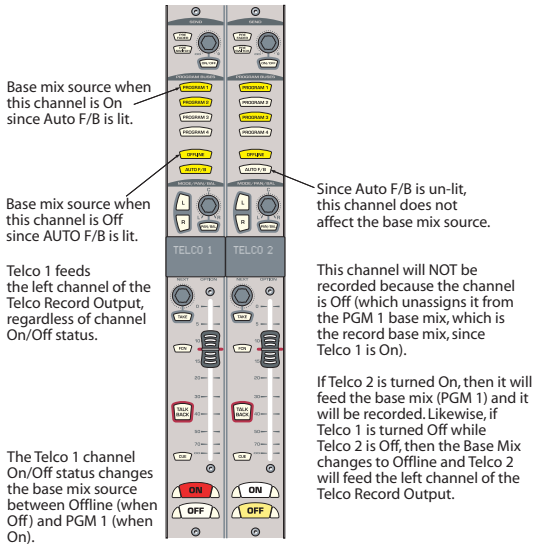
Note: Offline feeds from non-Telco channels are always pre-switch. They were set to Pre- or Post-Fader during console setup. The Telco channels' Offline bus feeds can be separately set for Pre- or Post-Fader by session file settings.

The Telco Record bus should be in the CR monitor selector list and may be assigned to a monitor select button so it can easily be monitored since this is the other method to verify the correct Telco channels and talent signals are being recorded.

Recording Functions with Auto F/B Off on all To Record Telcos



Recording Functions with Auto F/B On—on any To Record Telco Channel



RMX*digital* Server Setup

4

The RMX*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 KSU Card assembly.

The RMX*digital* Server stores these file types:

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

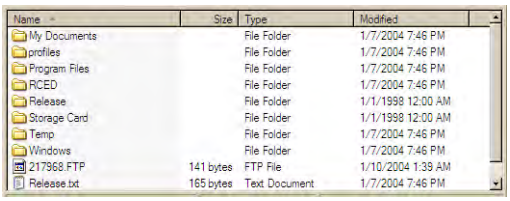
The RMXd*igital* Server also functions as an FTP (File Transfer Protocol) server. This allows files to be easily transferred between a networked Windows® computer and the console using an FTP program. A computer networked with the console is generically referred to as the "setup computer," which serves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

All `.ini` and `.cfg` files on the RMX*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 RMX*digital* uses the same operating system as BMX*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.

RMX*d* File Structure

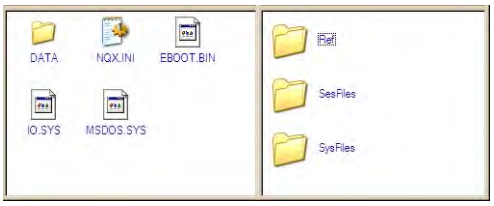
The RMX*digital* console's setup and configuration files must be properly saved into specific folders to ensure proper operation. The following screen shot shows the folders and files in the user-accessible area of the flash disk. Except for `Release.txt`, all RMX*d* server files are located within the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



Files and Folders on the RMXdigital 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 RMX*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.

RMXDIGITAL 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 439 - built 08:04:2005 @ 14:38.39

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, RMX*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.

INIT.MAC

This text file is a special macro file maintained by VMCC. It loads automatically each time the SBC starts up. It sets: default routes; default logic settings and logic I/O bindings to audio sources; monitor and meter selection button assignments; mute codes; and various audio input settings.

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 RMX*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 Dual Fader panels plugged into the console and how many DSP cards are in the frame (the KSU card counts as one DSP). This information is updated whenever the console is restarted or a card or channel strip is removed or changed. The inventory is also saved in the Mapping section of each session file.

```
Map_0_to_7=00 01 02 03 04 05 06 07
Map_8_to_15=08 09 0a 0b 0c 0d 0e 0f
Map_16_to_23=20 21 22 23 24 25 26 27
Map_24_to_31=28 41 42 43 44 29 2a 2b
Map_32_to_39=2c b1 b2 b3 ff 91 81 92
Map_40_to_47=82 93 83 94 84 ff b4 ff
DSP=4
```

Typical RMXd-28 INVENTORY.TXT file contents

Cards and control strips are listed by hex numbers (`01` to `2c` are the channel strips and phantom channels, `b1` to `b3` are the three sections of the Monitor Control panel, `81` to `84` and `91` to `94` are the 8-Input Expansion cards and the KSU's audio and logic connections). The numbers are the hex equivalent of session file channel ID numbers.

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 channel strips' 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 RMX*digital* Server. An `edgedevice.ini` file example, for a single VM-SSD selector panel, is shown below:

```
[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=RMXd_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 KSU 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 KSU B analog output). The right hand buttons are conversely set as six destination selectors (Button_2_1 thru 6) for signals 245 - 255: the KSU C and D analog outputs and the four KSU digital outputs).

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#: 46
src=161,MM1L
src=162,MM1R
src=163,MM2L
src=164,MM2R
src=165,{MM3,166
src=166,{MM3R
src=167,{MM4,168
src=168,{MM4R
;
;AudioDst Card#: 46
dst=241,KSU A ALG,242
dst=242,{NA1R
dst=243,KSU B ALG,244
dst=244,{NA2R
dst=245,KSU C ALG,246
dst=246,{NA3R
dst=247,KSU D 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=161,MM1L`, identifies signal 161 as the left mix-minus signal for Telco 1. It is a mono signal since the next entry (`src=162,MM1R`) is not linked to the previous entry by a `,162` at the end of the entry. Both signal 161 and 162 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,KSU A ALG, 242`) identifies the signal as the A analog output of the KSU (signal 241); that its displayed name is KSU A 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 KSU A 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).

RMXd Server Configuration

Several software programs must be installed on the setup computer in order to configure the RMX*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 RMX*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 RMX*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 RMX*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 RMX*digital* Server for use within the VistaMax local area network.
- An installed and working RMX*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 RMX*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.

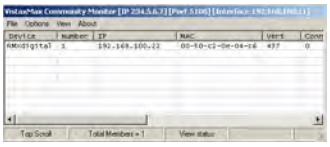
* A network hub could be used during installation, but it is not recommended for normal use. Only a network switch should be used. Before making this connection make sure that the console's IP address (the default address assigned at the factory is 192.168.100.22) does not conflict with an existing network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

INITIAL CONFIGURATION PROCEDURE

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

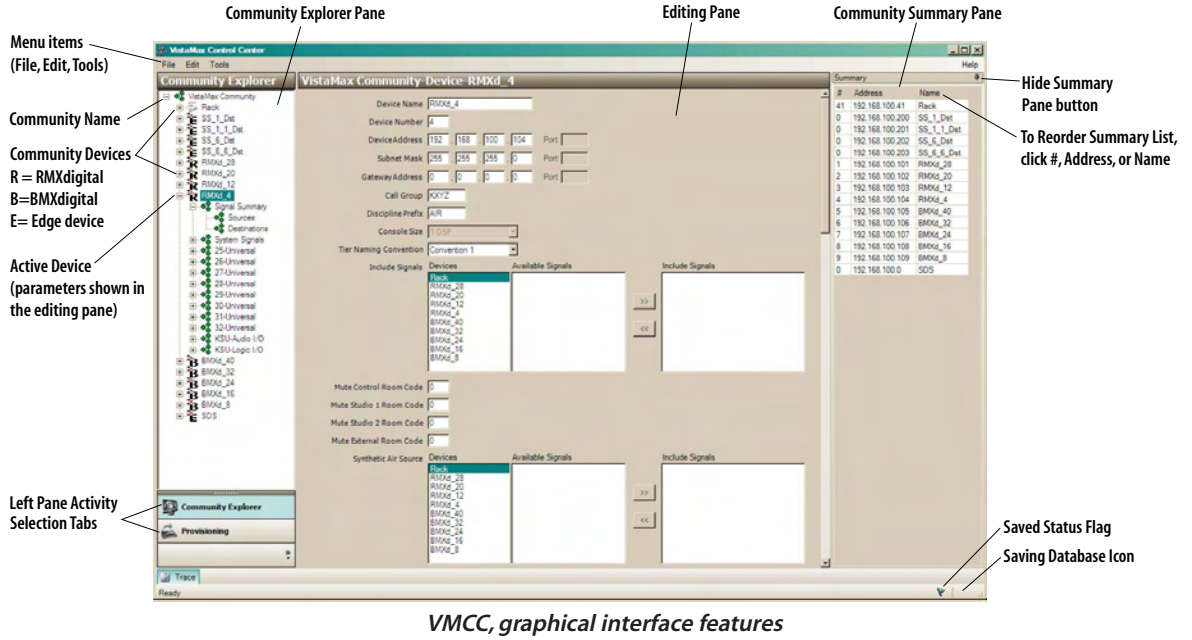
To change which port CM uses, click *Options*, then select *Setup*. If 192.168.100.11 is not shown in the Community Local IP address window, click the window's down arrow, select that address, then close and restart CM.

Once the new RMX*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 RMX*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 RMX*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 RMX*d* console are set.

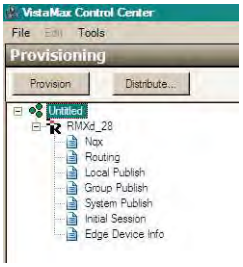
Additional parameters, which affect how this device interacts with the other consoles and racks in the VistaMax community, are also set in the Device pane. Setting the device parameters are covered in the Configuration Notes and Tips later in this chapter.

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.

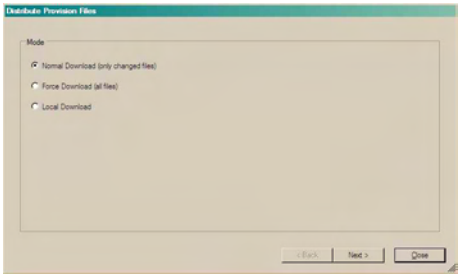


Provisioned File List for RMXdigital

Clicking on a file name 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.

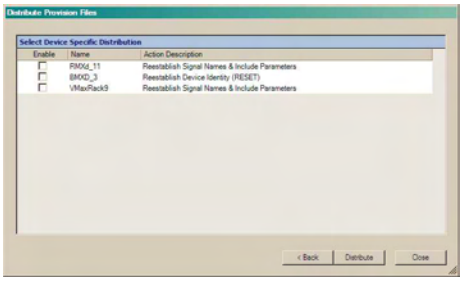
6 File Distribution

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 Distribution 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 RMX*digital* consoles, BMX*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 (RMX*d* or BMX*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 RMX*d* Server, its IP address must be changed so it is inside the local subnet mask assigned to the RMX*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.

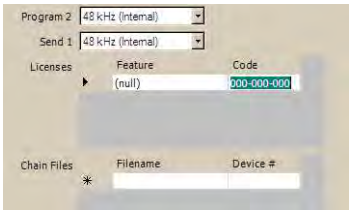
Device Address Each console and frame must have a unique fixed IP address. The first three octets (e.g. 192.168.100.xxx) are identical for all devices in the system. The last octet identifies the device. See the suggested IP Addressing Table adjacent for suggested addresses. This entry sets the `NET_IP=`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

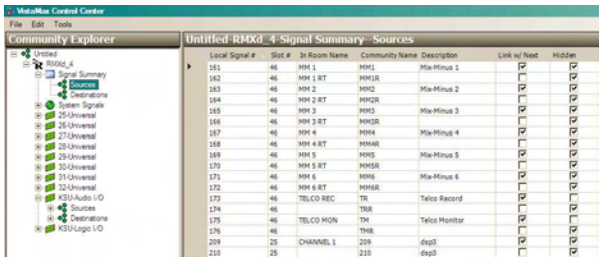
4. Assign a Mute Code (to mute a monitor output when the signal is active) on inputs.

5. Associate (or bind) audio inputs to logic I/O connections for logic control of a remote panel or a peripheral device when the audio signal is routed to a channel strip.

6. Set any input gain trims (+15.5 dB or -16 dB from 0 dBu in .5 dB steps).

7. Set whether the signal phase gets inverted.

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

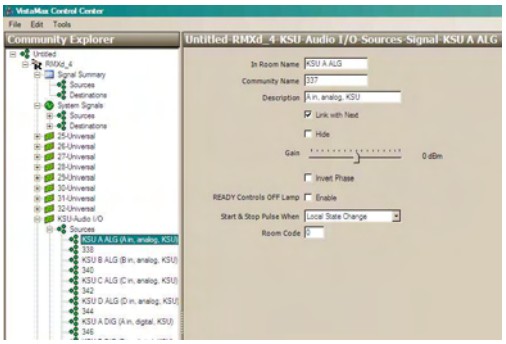


Signal Summary Pane in VMCC

Some 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.

Additional signal settings are done in the signal detail pane. This pane is opened by selecting a specific source or destination signal. In the example below, the KSU A Analog input is shown. To view this pane, click the KSU-Audio I/O + button to open the KSU tree, click the Sources + button, then highlight the desired signal name.



Signal Detail Pane in VMCC

The following parameters can be edited in either the Signal Summary pane or the Signal Detail pane:

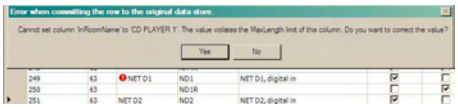
In Room and Community Names, Description

The In Room Name identifies the signal in the channel strip 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 RMX*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 channel strip, it automatically appears on both the left and right outputs of the channel strip.

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. This means it is not available to be added 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 entire 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.

The following entries can only be set in the Signal Detail pane:

Input Gain and Trim

Nominal console inputs are +4 dBu for analog and -20 dBFS for digital. The Gain control allows signals to be raised by up to +16 dB (to compensate for an unbalanced analog input or low signal level) or trimmed by up to -15.5 dB (to compensate for hotter-than-normal outputs). Gain and trim is set in .5 dB steps. Note that gain and trim is set independently for each channel of a stereo pair.

Invert Phase

A check mark in the Invert Phase box inverts the phase of the signal. Note that phase invert is set independently on each channel of a stereo pair.

Ready Controls Off Lamp

A check mark in the Enable box says that this signal is coming from a peripheral device like a CD player or a digital delivery system with a Ready command output to indicate status of the device. The Off lamp on the channel strip that this signal is routed to will then be controlled by the incoming Ready logic command. A solid Off light indicates the source is ready to play. A blinking Off light indicates the source is paused or that it has completed playing the track or segment. Note that only the left channel of a stereo pair needs to have the Enable box checked.

Start/Stop Pulse Control

This setting is only used on signals from peripheral devices that are bound to logic. When the channel strip that this signal is routed to is turned On, a start pulse is output to start the peripheral. Likewise, when the channel strip is turned Off, a stop pulse is output to pause or stop the peripheral.

The Start and Stop Pulse outputs are set for one of four logic conditions: **Local State Change** causes one pulse to be output whenever the channel is changed from Off to On (one start pulse is output) or from On to Off (one stop pulse is output); **Local or Remote Change** performs the same logic functions but it also responds to remote logic On/Off commands; **Local Actuation** causes a start or stop pulse to be output each time the On or Off button is pressed, regardless of the channel state; **Local or Remote Actuation** adds multiple start or stop pulse outputs in response to remote logic On/Off commands.

Room Code

This setting is only used with microphones in order to associate the mic to a specific room in the facility in order to properly mute monitor outputs and trigger hot mic warning signs.

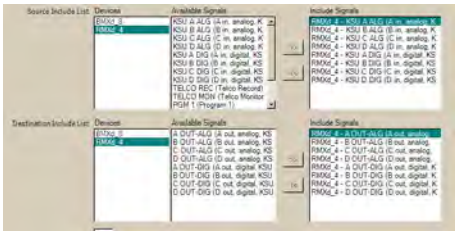
A Room Code (a number from 1 to 127) is assigned to each room in the facility with mi-

crophones. The appropriate Room Code is then set on each mic input. When the mic is routed to a channel strip, its room code is compared with the assigned room codes on the console so that the appropriate monitor output is muted and the correct warning command is output while the mic channel is On.

The remaining signal entries are set in the Console pane. Highlight the console name, then scroll up or down 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.

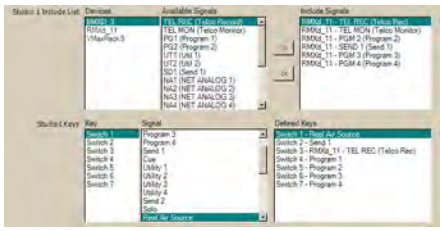


Setting Signal Include Lists

To create the signal lists, first highlight a Device 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 (<<).

Select Monitor/Meter Include Lists & Sources

There are three columns of seven buttons on the monitor module to select the Aux Meter source, the Control Room monitor source and the Studio monitor source. In addition, there are two source selectors to select an alternate source for the Control Room and the Studio.



Setting Meter and Monitor Include Lists and Selector Button Sources

Each selector button is assigned a bus or a routed signal in VMCC. Up to fifteen routed signals can be set for each Monitor and Meter Include list. Any one of these routed signals can then be assigned to a button. The ones not assigned to a monitor button are called up using the monitor source selector controls.

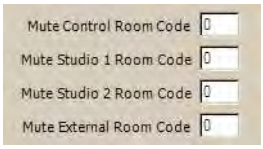
Buttons have default sources assigned (PGM 1 thru PGM 4, Send, Real Air) by VMCC, but any button can be reassigned, and relabeled, as needed. The monitor and meter include lists are set just like the console include lists by highlighting a device, selecting which signals should be assigned, then clicking the double right arrow (>>) key to add them to the list. Note that each of these lists can only have fifteen sources in their include lists.

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

Assign Room Mute Codes

Each console has three monitor outputs that can be muted (CR, Studio 1 and External) to prevent "hot mics" from feeding back through in-room monitor speakers. A numeric code

(from 1 to 127), called the Room Code, is assigned to each room. When this code is also assigned to a mic input, when that mic is routed to a channel strip, and the channel is turned On, the appropriate room output mutes.



Room Code Assignments

Note: the Studio 2 entry is not used in RMXdigital.

The room code entry boxes are just below the Destination Include List entry.

Assign Real Air & Synthetic Air Sources

These two signal settings are found just below the Room Mute Code settings. They are typically only set on on-air consoles that have a several second profanity delay in the on-air signal path.

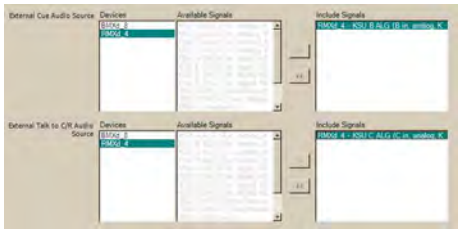
Assigning sources to these two signals tells the control room monitor logic that it will automatically switch between the off-air signal (called the Real Air source—used when no mic channel is On), and a non-delayed signal (called the Synthetic Air source—used whenever any control room mic channel is On). The Synthetic Air source can simply be set to the PGM 1 bus, but more often it is the output of a backup air processor that simulates the processed sound of the Real Air signal.

If no source is set in the Synthetic Air selection box, then automatic signal switching does not occur. Both Real Air and Synthetic Air default to PGM 1 if there are no selections made. To use automatic monitor switching, Real Air must be used as the control room monitor source. It is the default signal assigned to the top button on the monitor selection buttons.

Assigning the Synthetic Air and the Real Air Sources

Assign Ext. Cue & Ext. Talk to CR Sources

These two signal selections—just below the Real Air source selection box, assign two console or system inputs as the sources for an External Cue input and an External Talk to Control Room input.



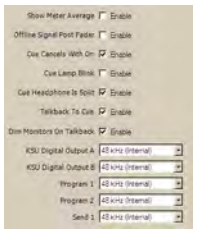
Assigning the External Cue and External Talk to Control Room Sources

The External Talk signal could be from a VistaMax intercom or from another switched source. The External talk to Control Room signal is automatically routed to Phantom channel 3 to the Talk to CR bus, while the External Cue signal is automatically routed to Phantom channel 4 to the Cue bus. The phantom channels are controlled by the Ext. Cue and Ext. Talk to CR logic signals on the Cue/Talk/Ext logic connector (see page 2-22 for connection details).

Set Operational Parameters

There are seven operational functions that are turned on by checking each function's Enable box (see illustration on the next page).

When **Show Meter Average** is checked, the peak display is not shown on the meters. When **Offline Signal Post Fader** is checked, the channel fader affects the offline bus levels. Un-



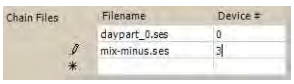
Setting Operational Parameters and Output Sample Rates

checked, the offline bus is pre-fader. When **Cue Cancels With On** is checked, turning any channel On turns off Cue on that channel. When **Cue Lamp Blink** is checked, the cue buttons blink while active. When **Cue Headphone is Split** is checked, the CR Headphone audio is split and summed, with one ear having the monitor source and the other having cue. When it is unchecked, cue is fed in stereo to the headphones, cutting off the monitor signal. When **Talkback to Cue** is checked all Talk to CR signals also feed the cue speaker. When **Dim Monitors on Talkback** is checked, the monitors dim by 12 dB while Talk to CR is active.

Just below the seven check boxes are five output sample rate selection boxes. They set the sample rate for these digital outputs: the first two KSU outputs (A and B), the first two program outputs (PGM 1 and PGM 2) and the Send output. Each can be set for either 48 kHz or 44.1 kHz. The other digital outputs have a fixed 48 kHz sample rate output.

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.



Chain Files Entry Box

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 using VMCC 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 RMX*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.

A new session is created by first setting 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 Monitor Control panel.

Each time *Save* is pressed, all of the current channel strip button settings and source names are saved to a new session file. If no session was loaded, the new session has the default file name: `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., changing the default 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.

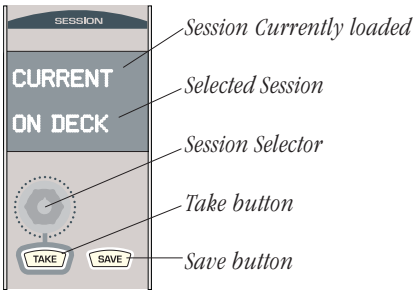
MAKING A TEMPLATE SESSION

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 and button lockouts. This session file can then be placed in the SesFiles folder and used as a template to create new sessions by first Taking the template session, adjusting the settings and then pressing Save to create a new session file. The session file would then be renamed using the setup computer.

The next sections cover recalling and loading sessions, saving sessions, downloading sessions for editing on a LAN-connected computer and uploading the sessions back to the RMX*digital* Server for operator use.

Recalling and Loading a Session

Use the Session Selector on the Monitor Control panel to find previously saved session files in the SesFiles folder on the Storage Card. Session files are listed in alphanumeric order in the bottom line of the session display.



Monitor Control panel, Session File Controls

Rotate the Session selector clockwise (CW) to move up through the list. Rotate it counterclockwise (CCW) to move down through the list. When the desired session is shown in the bottom line of the Session display, press the Take button to load the session.

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

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

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

Note: When a session is loaded using the Take button, any channels currently On are not immediately affected by the new session information. Instead, those channels' On buttons flash to indicate changes to that channel are pending. When a pending channel is then turned off, the changes from the new session file are loaded and take immediate effect.

Creating and Using a Template Session

1 Load the undefined session following the steps in the preceding section.

2 Assign buses and change any channel buttons and input sources to the most common settings for the RMX*digital* console.

Note: Session files save all channel button settings, but rotary knob and fader settings are not saved as part of the session file.

3 Press the Save button to save the channel settings. A new session file, named undefine01, has been saved to the RMX*digital* Server. This file will become the template session file for this console.

Note: A new session is automatically given a name based on the name of the session that was loaded when the Save button was pressed.

The newly created template session (`undefine01.ses`) now contains the standard console surface settings. To add lockout information, or to rename this file, it must be downloaded from the RMXd*igital* Server to a setup computer for editing.

Note: The RMX*digital* Server must be connected to and configured for a network before the template session can be downloaded.

Downloading Sessions

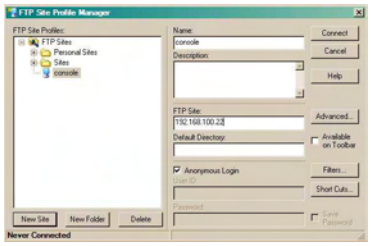
Before downloading the new template session to the setup computer, create a Session Files folder to save files while editing and then uploading back to the RMX*digital* Server.

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

1 Start FTP Voyager.

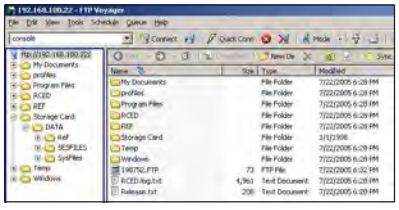
2 In the connection window, select the console, then click Connect.

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:



FTP Voyager Connection Dialog Box

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



RMXd Server Files using FTP Voyager

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: Create a shortcut to go directly to the SesFiles folder in FTP Voyager by clicking *Tools*, then *Folder Shortcuts*. Click *Add* and then type the SesFiles path name into the Path entry box: `Storage Card/Data/SesFiles`. Click *OK* to close the entry box and click *OK* 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 Copy the session template file that was just saved (`undefine01.ses`) to the Session Files folder created on the setup computer.

Editing and Renaming Session Files

After downloading the `undefine01.ses` file, use Notepad® to open up the session file and add any channel button lockouts (which prevent one or more channel buttons from being changed by the operator) and other changes as required. After editing this file, use *Save As. . .* to give it a new, more descriptive name (e.g., `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 RMX*digital* Server's FTP site using FTP Voyager.

To edit/rename the new template session file:

1 Use Notepad® to open the local copy of `undefine01.ses`.

2 Edit the file as required.

Note: See Session and Init.mac Files (starting on the next page) for more information on editing session files.

3 Save the file with a new name, such as `template.ses`. This name, minus the `.ses` extension, is what appears in the session display as the Monitor Control panel's Session Selector is rotated.

Note: Session names can have up to ten alphanumeric characters, but cannot use special characters (spaces and underlines are OK). Upper and lower case letters can be used to name the file, but all file names appear in upper case letters in the session display. The file name must have `.ses` added to the name in order to be recognized as a session file.

4 Upload the renamed file to the RMX*digital* Server following the steps in the next section.

Uploading Sessions

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

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

1 Open the RMX*digital* Server's FTP site, if it is not already open, and navigate to the SesFiles folder.

2 Copy the template.ses file from the local computer to the SesFiles folder on the RMX*digital* Server's FTP site.

3 Dial up and take the `TEMPLATE` session to load it into the RMX*digital* console. Confirm that all of the settings and input sources are set correctly before using it as a template for creating other sessions.

Session and Init.mac Files

A session or `init.mac` file has these sections:

- General File Information
- Channel Source Selector Settings
- Channel Button Settings
- Channel Button Lockouts
- Channel Mapping

In order to identify specific channels or signals in the system, two numbering systems are used: channel IDs and signal IDs.

CHANNEL ID NUMBERS

RMX*digital* components (channel strips, monitor control sections, audio inputs, audio outputs, and logic I/O ports) are assigned unique ID numbers, based upon their position in the mainframe or by the card or panel that they reside on, to specifically identify local signals.

The Universal Dual Fader channel strips are numbered from the left end of the frame (number 01) to the right. The maximum number of Universal channel strip numbers is 32 because there are also four "phantom" channels available on the KSU (28 channel strips could be installed on the RMX*d*-28, plus the four phantom channels).

The channel strips set as Telcos are numbered separately from their sequential channel strip number. The six Telco channels are assigned channel ID numbers 81 to 86. See page 2-3 for information on setting a Universal Dual Fader channel as a Telco channel.

ID Numbers

Type	*Channel #*	*Assignment Method*
Universal channels	1 to 32*	CAT-5 cables, left to right
Monitor Control	33 to 35	Next to last CAT-5 cable
Effects panel (future)	47	Last CAT-5 cable
Audio Inputs/Outputs	37, 39, 41, 43	8-Input Exp cards and KSU
Logic Inputs/Outputs	38, 40, 42, 44	8-Input Exp cards and KSU
Telco Channels	81 to 86	As set by their rotary switches

* there can be a maximum of 28 channel strips installed plus the four phantom channels, which are numbered 29, 30, 31 and 32

Since similar channel ID numbers are likewise assigned to BMX*digital* console components and to the audio and logic I/O connections on the VistaMax frames, when a channel ID is used to identify a network signal, the channel ID number must be proceeded with `Dx`, where `x` is the device number of the console or frame where that signal resides. Here's an example of how channel ID numbers are used on a networked console:

```
[Router_81]
Include_1=D1,65-96
Include_2=D2,337-352
```

In the section of the `daypart_0.ses` file shown above, the two Include lines set the available sources shown on the source selector for Router 81 (e.g., Telco 1). `Include_1=D1,` sets the sources on device 1 that can be selected (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 the sources that can be selected from device 2, which in this case is the RMXdigital console. `337-352` are the analog and digital inputs on the KSU card.

GLOBAL SIGNAL ID NUMBERS

Each signal in a VistaMax system can be uniquely identified through using the Dx (device number) plus the local channel ID number. This makes things easy for the end user since every signal (like the PGM 1 bus signal which is 225 on every console) just needs the device number followed by the local number. To the system, however, the fastest method is to use global ID numbers, a unique number assigned to each possible signal in a VistaMax system.

In effect, these Global ID numbers precisely identify the origination or destination of each signal since included the number also indicates the console's or frame's device number by the Global number. Thus every audio and logic signal on every KSU card and every 8-Input Expansion card, as well as every console bus signal (which includes

each routed channel strip signal and the four 'phantom' channels available in the KSU) has a unique Global ID number.

As an example, the Global IDs for sources and destinations, on an RMX*digital* console set as device 1, are numbered from 65665 (for audio Input 1 left, on the left-hand 8-Input expansion card in a RMX-28 frame) to 65904 (RMX*digital* Producer Mic input). The same signals, on an RMX*digital* console set as device 2, have Global ID numbers from 131201 up to 131440, while the signals on device 63 (the highest device number) are assigned Global ID numbers from 4128897 to 4129136.

These Global ID signal numbers are used by the system to define "Takes" which route one source to one destination.

A Global ID Number Calculator is included on the 99-5000 CD-ROM and they are also available from the Harris FTP site (see page 5-1 for access) in the customer_support/rmxdigital folder. The calculator is an Excel file that lists Global ID numbers by entering the console's device number.

INFORMATION SECTION

The information section begins with the header `[Information]`. This section has a channel ID number chart along with a brief default description of the file. The description must be manually edited to describe 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 notes can be placed anywhere in the session file following a `;` (semicolon). Any text proceeded by a `;` are comments used to clarify the session file.

BUTTON SETTING SECTIONS

Every channel strip button has their own section in the session file where the button state for each channel strip can be preset when the session file loads. The default settings in the `undefined.ses` file for all buttons is `=0`, which sets the button state as 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 control panels and then use the Monitor Control panel Save button to save all the button states at one time into a new session file. This session file can then be edited for use as a template for creating session files for daily use.

However, there are a few button entries that have to be manually edited as they do not have control surface buttons. These include the sections `[ON]`, `[TelcoRecord]`, and `[TelcoMonitor]`. These are covered separately in the sections that follow.

[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 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 the 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).

[TelcoRecord] and [TelcoMonitor]

Each Telco channel can be assigned to the Telco Monitor bus and/or to the Telco Record bus under these two sections. To assign the Telco channel, the default setting (=0) is changed to =1. This sets that Telco channel as active on that bus as in:

```
[TelcoRecord]
Channel_81=1
Channel_82=0
Channel_83=0
Channel_84=0
```

This sets Telco channel 1 (ID # 81) as feeding the Telco Record output, while the other Telco channels do not feed the Telco Record output.

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:

- [Cue] Sets whether cue is on or off for each channel.
- [Send_1] Sets whether the channel is assigned to the send bus.
- [Prog_1, Prog_2, Prog_3, Prog_4] Sets whether the channel is assigned to any of the Program buses.
- [Offline_1] Sets whether the channel is assigned to the Offline bus.
- [Send_1_PF] Sets whether the channel's send feed is pre-fader or post-fader (default).
- [Send_1_PS] Sets whether the channel's send is pre-switch or post-switch (default).
- [PanBalance] Sets whether the channel's pan/balance control is on or off.
- [TelcoAuto] Sets whether the Auto Foldback feature is on or off for each Telco channel.
- [TelcoRecord] Sets whether the Telco channel feeds the Telco Record bus.
- [TelcoMonitor] Sets whether the Telco channel feeds the Telco Monitor bus.
- [Mode] Sets the channel's default mode. This section has four values: Stereo (=0), Left only (=1), Right only (=2), or Mono Sum (=3).
- [local_cough] Sets whether the On button functions as a cough button when the channel source is a mic and it is On. Pressing and holding the On button removes the mic's audio from all assigned buses.
- [timer_reset] Sets the channel to reset the event timer, when the timer's Auto button is lit, when the channel is turned On. If Auto is not lit, or if the entry is =0, then there is no timer reset at channel on.
- [fader_start] Sets the channel to automatically turn on when the fader is moved up from full off and to turn off when moved back to full off. =0 means fader movement does not affect on/off status.
- [port_event_card_x] Commands a logic output for any Assignable logic connector on the KSU (card_4) and the three possible 8-Input Expansion cards (card_1, card_2, card_3).

  There could be up to sixteen line entries under the heading: port_event_j=k to define each port. j is the port number (from 1 to 16) with the event function k (0 is a null event and 1 is a trigger).

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 lock-

outs 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. Replace the 0 in the pasted section's heading (ChannelLockout_0) with the channel number that needs the lockout information. Refer to the Channel ID Number table on page 4-20 for which 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 RMX*digital* channels, as detected at the time the session was saved, in a table. The section is automatically rewritten by the RMXd*igital* 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 00 for no channel detected. Map_1 up to Map_28 identify whether a channel strip is installed. Channel strips are numbered sequentially from 01 to 2c. Channel strips set as Telco channels are numbered 41 to 46.

Map_29 up to Map_32 identify the four phantom channels in the KSU card.

Map_33 to Map_35 identify the Monitor Control panel sections as b1 to b3. Map_36 will always be ff for no channel detected.

Map_37 and Map_38 identify the KSU card audio and logic. Map_39 through Map_44 identify the optional 8-Input Expansion cards. The entries in these sections are 81 to 84 for the logic section and 91 to 94 for the audio sections.

Map_47 identifies the optional Effects card as ff when no card is detected.

The channel map ends with DSP=x. The number listed is one more than the physical number of DSP cards installed since the KSU has DSP. Thus, an RMX*d*-4 will show DSP=1 even though no separate DSP card is installed.

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 RMX*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

The Global signal ID numbers are predominantly used in the 'Take commands' section of the session file or init.mac file to identify sources

and destinations. The section header `[Router Command_1]`, is used in the `init.mac` file to set up the default routing for the audio and assignable logic connections on the KSU and 8-Input Expansion cards by 'taking' or routing each source to a DSP destination.

A typical `[Router Command_1]` section on a RMX*d*-4 is shown below:

```
[RouterCommand_1]
take_1=65873,65745 ; KSU A ALG to KSU channel 1
take_2=65875,65747 ; KSU B ALG to KSU channel 2
take_3=65877,65749 ; KSU C ALG to KSU channel 3
take_4=65879,65751 ; KSU D ALG to KSU channel 4
take_5=65881,65753 ; KSU A DIG to phantom fader 29
take_6=65883,65755 ; KSU B DIG to phantom fader 30
take_7=65885,65757 ; KSU C DIG to phantom fader 31
take_8=65887,65759 ; KSU D DIG to phantom fader 32
```

Each Take command `(take_x=source, destination)` must be listed in numerical order and be on separate lines. Signals can be identified by their Global signal IDs, as shown above. `65873` identifies the signal as the KSU card A analog left channel in the console assigned as device number 1. The `65745` identifies that it goes to "input 1" of the DSP in the KSU card.

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 channel strip is On, in which case it is pending until the channel 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 channel strip, 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 destinations by adding separate Take command lines from that source to the other destinations.

Include Lists

A source can only be routed or selected on a channel strip source selector if it's a source listed on the console's Source Include List, which 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 channel's source selector, each channel 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 channels 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 has been assigned a channel-specific include list, that list will be used for subsequent sessions, unless a different channel-specific include list is specified for that channel. 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 channel strip 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 of 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 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 channel strip listed in the section heading (e.g., [Router_81]). Each include line must be listed in 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 4-20.

INIT.MAC SECTIONS

The init.mac file sets up the console for daily use. Any init.mac section listed here could be inserted into a session file and manually changed to override the default console settings for a particular daypart or application.

The init.mac file is maintained and edited using VMCC, so none of these entries are manually edited in the init.mac file:

- [room_code_mute] Assigns a room code for the three console destinations: control room, studio 1 and external. There is also a definition for Studio 2, but that is not used by RMX*digital*.
- [room_code_card_x] Assigns a room code to a console input. This identifies mic inputs by their room location. The code is used to control which monitor output mutes, and which warning command or tally is output, when the channel an input is assigned to is turned On.
- [system_properties] This section sets various global properties for the console. When the entries are set to =1: the meters display average signals only; the cue is cancelled with channel On; the cue button LEDs blink when active; and the offline signal source is post-fader.

```
[system_properties]  ;0=not selected
meter_average_only=0
cue/solo_cancel_w_ON=0
cue_lamp_blink=0
offline_sig_post=0
```

- [monitor_properties] This section sets various CR monitor settings. The last entry, real_air_src_=225 defines the real air input signal (the default setting is the PGM 1 bus, signal 225). The other settings, when set to =1 have these properties: when cue is active it goes to one side of the CR HP output and monitor goes to the other side; talkback also feeds the cue bus, CR monitors dim when talkback is received, and the synthetic air function is active.

```
[monitor_properties]
cue_hp_is_split=1
tkbk_to_cue=1
dim_on_tkbk=1
synth_air_enable=0
Real_Air_Src=225
```

- [monitor_selection] This section defines the monitor include list for the monitor source selector (which can include up

to 15 sources), and defines the sources for the seven monitor select buttons.

```
[monitor_selection]
Include_1=D9.337-351,173,175
definekey_1=10
definekey_2=5
definekey_3=0
definekey_4=1
definekey_5=2
definekey_6=3
definekey_7=4
```

- `[meter_selection]` This section has the include list and the seven button definitions for the auxiliary meter buttons. The entries are like those in the `[monitor_selection]` section above.
- `[studio1_selection]` This section has the include list and the seven button definitions for the studio monitor buttons. The entries are like those in the `[monitor_selection]` section above.
- `[on_out_port_card_x]` This section sets the relationship of the output logic for each Assignable logic connector on the KSU (`card_4`) and the three possible 8-Input Expansion cards (`card_1`, `card_2`, `card_3`) and the timeslots the logic signals will use.

  There can be up to sixteen line entries: `on_out_port_a=b,c` that define the two logic outputs (called ports) on pin 5 and pin 11 of each Assignable Logic connector.

  a is the port number. It will be 1 to 6 on the KSU (to define the outputs on the B, C and D connectors) and from 1 to 16 on each 8-Input Expansion card (to define the two outputs on each logic connector).

  b defines the logic action. It can be 121 (for an On Tally output), 122 (for an Off Tally output), 123 (for a start pulse) or 124 (for stop pulse).

  c defines which timeslots are used by the logic commands. Typically the odd numbered timeslots, starting with slot 1, are used in order. This gets automatically assigned by the VMCC as the ports are defined.

- `[port_config_card_x]` This section defines logic outputs (those not defined in the `[on_out_port_card_x]` section) for use as directly addressed outputs. One of four logic commands can be assigned to each output, but only two: 1, which defines the output as closed or 2, which defines it as an open command, are very useful.

  There could be up to sixteen line entries (for an 8-Input Expansion card) under this heading. The entries `port_config_h=i` define each port.

  h is the port number (from 1 to 16) which is set for one of the four types of logic functions.

  i is the logic function: 0 is a pulsed close command, 1 is a sustained close, 2 is a sustained open, and 3 is a pulsed open command.

- `[on_out_ts_card_x]` This section sets the binding of the logic inputs on the Assignable logic connectors on the KSU (`card_4`) and the three possible 8-Input Expansion cards (`card_1`, `card_2`, `card_3`). There can be up to sixteen line entries under this heading. The entries: `on_out_ts_d_i=e,f,g` define each port.

  d is the port number (from 1 to 16), and **i** is a sequential entry number starting with 1. The port used as the input is set by **e** (from 1 to 32). The logic function is defined by **f** (a logic binding bit between 1 and 255) and it is assigned to the input timeslot **g** (from 1 to 16).

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 RMX*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 RMX*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 RMX*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 RMXd*igital* 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 RMXd*igital* 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 RMX*digital* console is power cycled. The RMX*digital* must be taken off-air during this procedure.

To update the RMX*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 RMX*digital* Server.
3. Turn off the RMX*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 RMX*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 RMX*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.

If a username or password was assigned to an RMX*digital* Server to limit FTP access, and then it was forgotten, to recover it requires connecting a null modem cable between the KSU card's Test Interface connector and Com Port 1 on a Windows® computer running HyperTerminal. This requires the console to be power cycled, so the

console must be taken offline before following this procedure:

1 Connect a DB-9 female-to-female null modem cable from the KSU card's Test Interface connector to the Com 1 serial port on the setup computer.

2 Start HyperTerminal (a standard Windows® Communications Accessories program) and establish a new connection using the Port Settings shown adjacent.

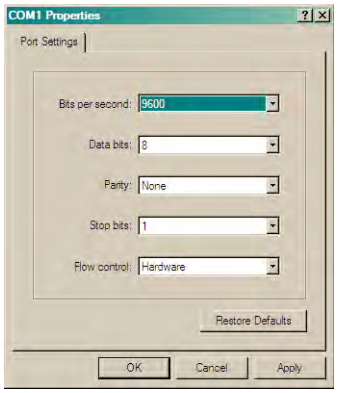
3 Power cycle the RMX*digital* console. As the RMX*digital* Server starts up, HyperTerminal will show multiple screens of information. Look for the USER= entry a shown below:

```
USER = username,password
```

Use the HyperTerminal scroll feature to redisplay this information as required to see what the username and password are.

4 Run FTP Voyager on the setup computer and enter the username and password as required to view the Storage Card folder contents.

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



HyperTerminal Port Settings for communicating with the RMXdigital Server

5 Service

The RMX*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 servicing the RMX*digital* console, including information on the spare and replacement parts that are available.

Parts and Repair Services

There are only a few parts that are field replaceable on the RMX*digital* (see page 5-2 for part number listing). Assemblies are field replaceable, but are generally not field-serviceable. For servicing, assemblies should be returned to Harris Technical Services Department.

RMX*digital* technical information (this manual, selected schematics, software, PROM revision information, etc.) are available at this Internet support site: `ftp://ftp.pre.com`.

Log in (username) as: `customer.` The password is: `pacific`. All documents and schematics are published in PDF format, so Acrobat Reader 5.0 or later is required.

PARTS ORDERING AND REPAIR INFORMATION

Spare panels, cards and assemblies can be purchased through a sales representative or through the Harris Technical Services Department. To expedite the ordering process and to ensure the correct parts are ordered, have the Harris part numbers available when ordering. For a list of parts, see page 5-2. Panels, cards and assemblies may have lead times exceeding two weeks, so order accordingly.

Panels, cards and 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. Items received without an RA number written on the shipping label side of the packaging may be refused or subject to additional handling fees.

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: 513.701.5450
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 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.

Services can be charged to AmEx, VISA or Mastercard or can be shipped COD, if not on account with Harris. Contact a sales representative for account information.

SPARE AND REPLACEMENT PARTS

Serviceable Assemblies

These are the serviceable or replaceable panels, cards, assemblies or PCAs used in the RMX*digital*:

Harris #	Description or Use
90-1950	Original Console Display (tall display)
95-1178	Clock PCA
95-1179	Event Timer PCA
99-1177	Bargraph Meter PCA
95-2670-1	Left motherboard PCA (for DSP)
95-2670-2	Middle motherboard PCA (for DSP)
95-2679	Right motherboard PCA (for KSU)
99-1205	48 Volt Power Supply (2 RU)
99-1406	Monitor Control Panel
99-1407	Universal Dual Fader Panel
99-1975-1	Reflective Console Display (low-profile)
90-2129	Dual Meter PCA
90-2130	Clock-Timer PCA
99-2665	8-Input Expansion Card
95-2665	8-Input Expansion PCA
99-2667	DSP Card
95-2667	DSP PCA
99-2672-1	KSU Card (no optical connectors)
95-2672-1	KSU, main PCA
95-2675	KSU, analog connector PCA
95-2677	KSU, digital connector PCA
99-1800	Single-board computer PCA
99-2672-2	KSU Card (with optical connectors)
95-2672-2	KSU, main PCA
95-2675	KSU, analog connector PCA
95-2677	KSU, digital connector PCA
99-1800	Single-board computer PCA

Replaceable Parts

These are the field-replaceable parts:

Harris #	Description or Use
12-93	10-character display
17-122	Headphone jack
19-327	Flex cable, 30-conductor (KSU card)
19-335	18" Red CAT-5 cable (panel power & comm)
19-336	36" Black CAT-5 cable (motherboard jumper)
21-226-6	PROM, Monitor Control panel
21-226-7	PROM, Universal Dual Fader panel
21-349-1	PROM, DSP card
21-352-1	DSP PROM, KSU card (U55)
21-352-2	Net PROM, KSU card (U60)
21-353-1	PROM, 8-Input Expansion card
~~30-51~~	~~Battery holder~~
23-132	Cue speaker
32-725	Rotary control 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)
38-88	Silver hex panel screw
50-26	5 Volt power supply (for Console Display)
76-1403	Monitor Control panel, removable lens kit
76-1404	Universal Dual Fader panel, removable lens kit
80-1752	Lens (covers 10-character display and LEDs)
80-1846	Card cage slot blank panel
80-1924	Rear cover, Universal Dual Fader panel
80-1929	Rear cover, Monitor Control panel
80-1961	Insert Sheet (for printing removable lens labels)
80-1975-1	Reflector (for low-profile display)
90-1858-1	15-foot DC cable (power supply to console)
90-1873	Cue Speaker assy (23-132 speaker and cable)
90-1713-2	Fader and cable assy
90-1722	Battery holder assy (30-51 holder and cable)
90-1872-1	RMXd-4 H/P jack assy (17-122 jack and cable)
90-1872-2	RMXd-12 H/P jack assy (17-122 jack and cable)
90-1872-3	RMXd-20 H/P jack assy (17-122 jack and cable)
90-1872-4	RMXd-28 H/P jack assy (17-122 jack and cable)
90-1999	Cable Harness (for low-profile display)
99-1411-1	One slot wide divider kit (to add two turret panels)
99-1411-2	Two slots wide divider kit (to add four turret panels)
99-1409	14.25" blank panel, one slot wide
99-1410	14.25" blank panel, two slots wide
99-1714-3	6" Turret blank panel, one slot wide

TOOL AND INSTALLATION KITS

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

76-1400 Installation Kit

Harris #	Description or Use	Qty.
14-482	3-pin AMP MOD IV housing	13
14-484	6-pin AMP MOD IV housing	21
14-490	12-pin AMP MOD IV housing	4
14-492	14-pin AMP MOD IV housing	2
15-938-1	AMP MOD IV contact receptacles	241
38-88	4-40 x 1/4" buttonhead screws	12
76-1403	Lens Kit, Monitor Control panel	1
76-1404	Lens Kit, Universal Dual Fader panels	*
80-1961	Insert Sheet, for removable lenses	1

* one per installed panel

76-1401 Tool Kit

Harris #	Description or Use	Qty.
~~50-7~~	~~AA NiCad batteries~~	~~3~~
70-90	Hex/Allen screwdriver	1
70-126	AMP MOD IV crimp tool	1
70-129	AMP MOD IV pin extractor tool	1

76-2665 8-Input Expansion Card Kit

Harris #	Description or Use	Qty.
14-482	3-pin AMP MOD IV housing	8
14-484	6-pin AMP MOD IV housing	8
14-490	12-pin AMP MOD IV housing	8
15-938-1	AMP MOD IV contact receptacles	144
38-88	4-40 x 1/4" buttonhead screws	12

Console Troubleshooting

There are diagnostic test modes built into each Universal Dual Fader panel and the Monitor Control panel. The Control Test Mode allows each button, fader and rotary encoder to be tested so correct operation can be verified.

A Logic States Test mode is also built into the Monitor Control panel to allow the state of the CR, Studio and External logic functions to be displayed. There is a full-size overlay on page 5-4 (and a PDF file in the 99-5000 CD-ROM) that can be printed out to go over the monitor selector buttons. Its use is shown below, in the right column.

CONTROL TEST MODE

To enter the Control Test mode on a Universal Dual Fader panel, remove the panel and unplug the red CAT-5 cable to remove power. Plug the cable back in, then press and release either *Off* button within three seconds of applying power. To exit Control Test mode press either channel's *On* and *Off* buttons together.

To enter Control Test mode on the Monitor panel, unplug the red CAT-5 cable. Plug the cable back in, then press and release the Timer *Stop* and Session *Take* buttons together within three seconds of applying power. To exit Control Test mode, press the Timer *Reset* and *Start* buttons together.

When Control Test mode is active the following

Test Mode Displays

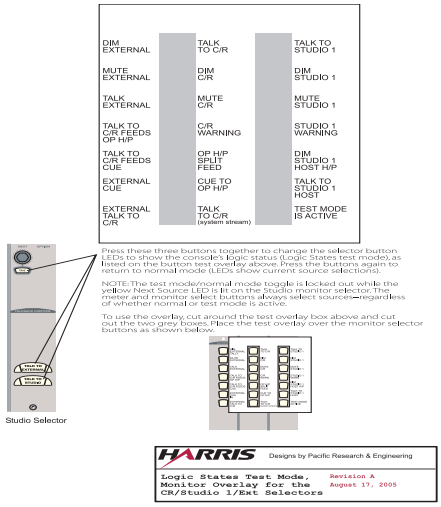
is shown in the source name display:

Move each rotary control and fader and observe their encoder pulse output count (in hex), which is shown in the channel source name display. Which control is being shown is identified by the yellow and red LEDs under each source display. The operation of each button is tested in this mode by pressing the button. The button LEDs toggle on and off with each press each button.

LOGIC STATES TEST MODE

This test mode is entered and exited during normal console operation to display the logic states for the Control Room, Studio and External logic signals. To enter or exit the test mode, press the *Talk to Studio*, *Talk to External* and Studio *Take* buttons together while the Next LED is off.

This mode does not affect source selection button operation, so new monitor and meter sources



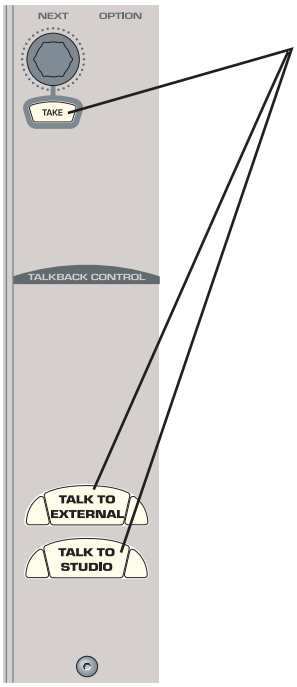
Logic State Test Mode Overlay over the Monitor panel buttons to identify logic activity

can be selected while in this test mode.

The button LEDs indicate the logic states for the logic signals shown above. Lit LEDs indicate true or on conditions, while the unlit LEDs indicate false or off conditions.

This test mode is useful for verifying that external devices like mic remote panels, intercom panels and warning interfaces are properly setup and properly wired and that they are sending the proper logic to the console.

DIM EXTERNAL	TALK TO C/R	TALK TO STUDIO 1
MUTE EXTERNAL	DIM C/R	DIM STUDIO 1
TALK EXTERNAL	MUTE C/R	MUTE STUDIO 1
TALK TO C/R FEEDS OP H/P	C/R WARNING	STUDIO 1 WARNING
TALK TO C/R FEEDS CUE	OP H/P SPLIT FEED	DIM STUDIO 1 HOST H/P
EXTERNAL CUE	CUE TO OP H/P	TALK TO STUDIO 1 HOST
EXTERNAL TALK TO C/R	TALK TO C/R (system stream)	TEST MODE IS ACTIVE

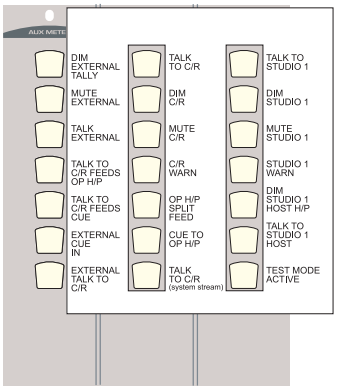


Studio Selector

Press these three buttons together to change the selector button LEDs to show the console's logic status (Logic States test mode), as listed on the button test overlay above. Press the buttons again to return to normal mode (LEDs show current source selections).

NOTE: The test mode/normal mode toggle is locked out while the yellow Next Source LED is lit on the Studio monitor selector. The meter and monitor select buttons always select sources--regardless of whether normal or test mode is active.

To use the overlay, cut around the test overlay box above and cut out the two grey boxes. Place the test overlay over the monitor selector buttons as shown below.



HARRIS Designs by Pacific Research & Engineering

Logic States Test Mode, Monitor Overlay for the CR/Studio 1/Ext Selectors

Revision A
August 17, 2005

Control Panel Servicing

Control panels are a "button sandwich" consisting of separate buttons and conductive plastic contact sheets between a switchboard PCA and a metal faceplate with plastic inlay. Control panels are not a field-serviceable assembly, but they do have limited field-replaceable parts. All replaceable parts (10-character display and lens, rotary and fader knobs, fader, rear cover) are listed on page 5-2.

NOTE: Do NOT disassemble the faceplate/switchboard subassembly on the Universal Dual Fader panel or the Monitor Control panel, as these are assembled using a fixture.

Universal Dual Fader panels can be removed or installed, with the console powered and on-air, without causing any audio interruption or noises in the program audio. The new panel assumes the removed panel's button settings when plugged in, but all fader and pot levels will change to the new panel's control settings. It is recommended that all bus assignments be turned off prior to unplugging a Universal Dual Fader panel.

Before removing a powered Monitor Control panel, turn off all speaker power amplifiers.

REMOVING CONTROL PANELS

To remove a Dual Fader or Monitor Control panel from the frame:

1. Use the included hex tool (70-90) to remove the top and bottom silver hex screws (38-88). There are two screws top and bottom on each Dual Fader panel. There are three screws top and bottom on the Monitor Control panel.
2. Carefully lift the panel up from the top edge, so the red CAT-5 cable can be reached and unplugged from the bottom of the panel.

NOTE: If you need to replace one of the assemblies, please contact Harris Technical Services Department for service or replacement parts.

Installing Control Panels

To install a Dual Fader or a Monitor Control panel into the frame:

1. Remove any blank panels covering the slots where the control panel is to be installed.
2. Set the bottom end of the panel on the front rail support fingers. Lower the panel toward the top rail until the red CAT-5 cable can be plugged into the panel's RJ-45 jack (bottom panel, upper middle section).
3. Lower the panel onto the top rail.
4. Fasten the panel to the frame using the 38-88 silver hex screws removed previously.

FADER SERVICING

There are no replaceable or rebuildable parts on the RMX*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. Other oils or lubricants may cause contamination by migrating to the contact fingers and damaging the conductive plastic or causing intermittent operation.

Fader Disassembly and Cleaning

To disassemble and clean a fader:

1. Remove the control panel with the problem fader from the frame.
2. Remove the rear cover from the control panel (four screws per side).
3. Unplug the problem fader, pull off the fader knob, and remove the two fader hex screws (use 70-90 tool) to remove the fader from the control panel.
4. Remove the snap-on fader cover (held in place by plastic end tabs).
5. Clean the fader using a dry cotton swab or one dampened only 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.

Always use a clean dry swab to dry off the conductive plastic tracks after cleaning. If the fader rails are noticeably dirty, wipe them off using a dry cotton swab, then lubricate the glide rail.

If coffee, a soft drink, or other sugared liquid has been spilled into the fader, remove the fader from the panel as soon as possible. Remove the fader top cover and hold it under hot running water while moving the fader slider back and forth to dislodge any sugars. Thoroughly dry the rails and conductive plastic using dry cotton swabs, taking care not to touch the fader fingers, then lubricate the glide rail.

Lubricating the Glide Rail

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

Console Display Service

The meters and clock-event timer PCAs are located in the Refelctive Console Display. To access these PCAs, first turn off the console power supply, then remove the reflector and lay the display chassis face down onto a protective surface (towel or other non-scratching surface) to remove the bottom cover. The PCAs are shown as they appear in the display on page 2-7. This page also has the setup switch setting information.

CLOCK TROUBLESHOOTING

If the clock's colons are blinking, it indicates the clock is set for slave mode, but the ESE or SMPTE timecode signal is not being received. If an ESE or SMPTE master clock is not being used, switch the clock-timer board switch DS1-2 and DS1-5 to off to set the clock for autonomous mode. See pages 2-6 and 2-7 for information on the clock-timer PCA and DS1 switch settings.

To use an ESE or a SMPTE master clock, connect the balanced, or unbalanced, signal to a six-pin AMP MOD IV housing. The signal uses pins 4 (GND), 5 (+) and 6 (-). This connector plugs into J4 on the clock-timer PCA. Note the signal polarity, if reversed the clock will not detect the time code. Also, make sure the terminals are locked into the housing otherwise intermittent operation could result.

EVENT TIMER TROUBLESHOOTING

If the timer is not working properly, check that the interconnecting cable is properly seated at the back of the RMX*digital* mainframe and at the connector on the clock-timer PCA.

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

If the timer is not auto-resetting as expected, make sure the Auto button is lit on the Monitor Control panel, and that the [timer_reset] section of the session file section is properly configured.

Auto Timer Reset Section of Session File

```
[timer_reset]
Channel_1=0
Channel_2=0
Channel_3=0
Channel_4=1
Channel_5=1
Channel_6=1
```

In this example, channels 1 - 3 do not reset the timer when turned on because their entry is =0.

Channels 4 - 6 do reset the timer because their entry is =1

Any channel that should reset the timer when turned on needs to be set as =1. Those channels set as =0 do not reset the timer when turned on.

For more information about session file settings, see Chapter 4 RMX*digital* Server.

METER TROUBLESHOOTING

The meter PCA plugs into the clock-timer PCA. If the meters are not working properly, check that the DIP switches are set correctly. The settings are covered on page 2-6 and 2-7.

~~Backup Batteries~~

~~A "Keep Alive" voltage is generated by three AA nickel cadmium (NiCad) batteries supplied in the tool kit. These batteries supply voltage to hold each channel strip's button state and signal selection during momentary power outages so the console returns to the same state when power is restored.~~

~~If the console does not return to its previous state after being powered down for only a few minutes, then the batteries probably need replacing, although there could be a problem in the battery charging circuit or motherboard connection. Check the charging circuit and motherboard connection by removing one battery and then measuring the voltage (should be about +4.5 VDC) on the battery terminals while the console is powered.~~

~~Although the batteries should last several years when under continuous trickle charging, it is recommended that they be replaced yearly. See page 2-9 for replacement information.~~

48 Volt Power Supply

Periodically check that vent openings are not blocked and there is no dust buildup on the top cover openings. The green LED on the power supply front panel indicates its 48 volt output is good.

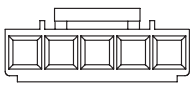
CAUTION: To reduce the risk of electric shock, do not disassemble the power supply. Refer servicing to qualified service personnel.

POWER SUPPLY CONNECTIONS

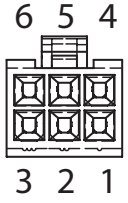
See page 2-8 for interconnection details. Only one connection is required from the supply's 5-pin connector. 90-1858-1 is the interconnection cable from the power supply to the console frame.

90-1858-1 Cable Color Code/Pinout

Supply End	*Signal*	*Wire Color*	*Console End*
1	+48 V	Red	1
2	+48 V	White	4
3	Shield	Clear cover	2
4	+48 V Return	Black	6
5	+48 V Return	Green	3
-	-	no connection	5



PIN NUMBERING
WIRE INSERTION VIEW



PIN NUMBERING
WIRE INSERTION VIEW

Frame Component Info

The +48 volts from the main and redundant power supplies connect on J18 and J19 on the KSU motherboard. The motherboards and their connections are detailed on page 5-10. The +48 volts from each connector is coupled through dual Schottky diode CR1, which is mounted on the right end of the KSU motherboard. Its output is the +48 volt source for the console.

The +48 volts is routed to each control panel on pin 6 of the RJ-45 connectors with red CAT-5 cables (J13 - J16 on the KSU MB and J1 - J4 on the DSP MBs). Pin 3 has the 48 volt return.

Each red CAT-5 is routed through a round access hole up to the control panel section of the frame (see below). There are four red CAT-5 cables in the RMXd-4 frame, eight in the RMD-12, twelve in the RMXd-20 and sixteen in the RMXd-28.

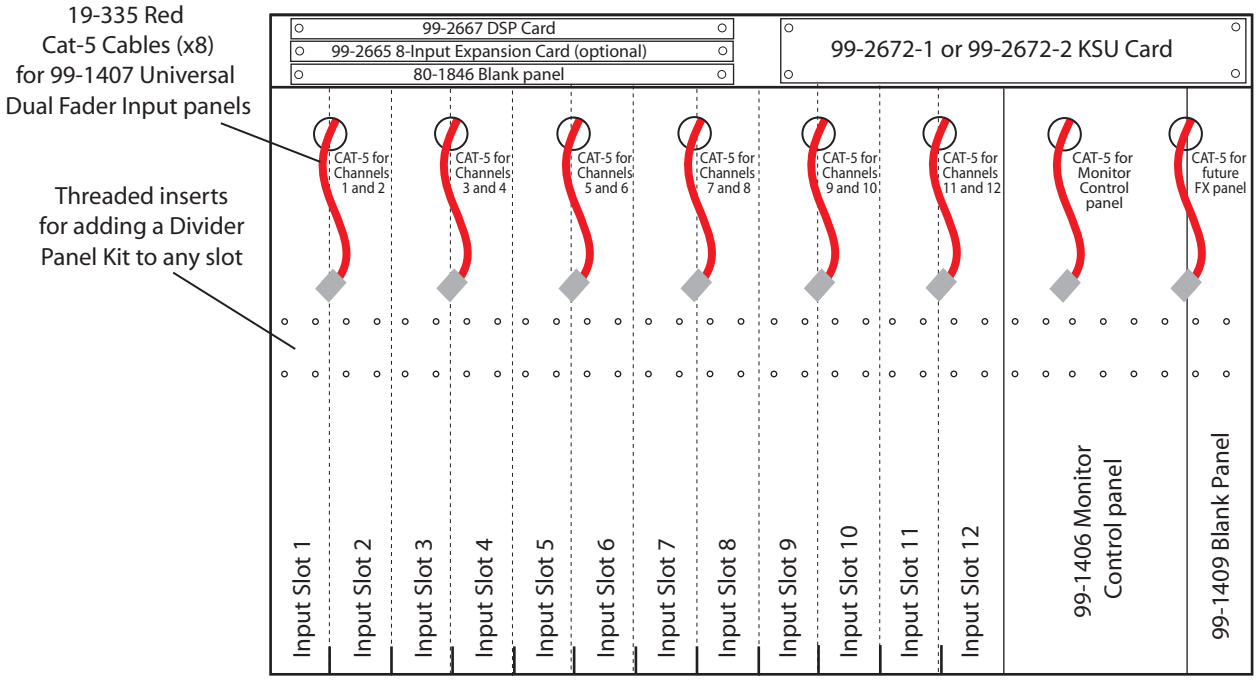
The last red CAT-5 cable (closest to the right end of the frame) is available for an optional effects panel. The next red CAT-5 cable plugs into the Monitor Control panel. The remaining red CAT-5 cables in the frame plug into Universal Dual Fader panels.

The red CAT-5 cables for the Dual Fader panels are oriented from the left end of the console frame, with the farthest left cable designated for channel strips 1 and 2 (it plugs into the first Universal Dual Fader panel). The next cable is for channel strips 3 and 4 (the next Dual Fader panel), and so on, up to the two used for the Monitor Control and optional panel.

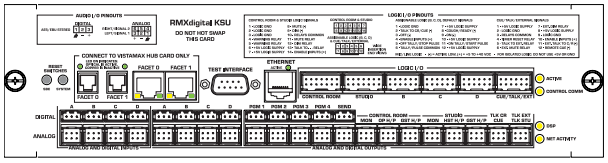
Red CAT-5 cables are 18" long which allows any panel to be moved a few slots left or right of its standard position to allow installation of a blank panel or a Divider Kit (used to add Harris turret control panels into the frame).

Each DSP card routes signals for eight channels with the control signals from four Universal Dual Fader panels (two channels strips per panel). The last four channels (two Universal panels) are routed by the KSU card's DSP. The KSU DSP also handles summing buses and monitoring. In addi-

RMXdigital-12, Frame Components



tion, the KSU is the network interface for the VistaMax system for both communications and for the VistaMax Link I/O.



KSU Card Service Info

There are four yellow LEDs near the right end of the card that indicate operational status:

• Active LED. On solid indicates normal operation. It is off when the system is starting or if a card problem is encountered.

• Control Comm LED. Flashes to indicate Ethernet communications.

• DSP LED. Blinks with a "heartbeat rhythm" to indicate the DSP is active. On the RMX*d*-4, the LED flashes twice as fast as on other frame sizes to indicate the KSU is the master DSP. On larger frame sizes the leftmost DSP card's LED will flash twice as fast as this LED to indicate the master.

• Net Activity LED. Flashes to indicate VistaMax network activity.

The Active LED on the Ethernet connector lights up to indicate a good connection when a CAT-5 cable is connected to an active port on a computer or a network hub or switch.

The green LED on the optical Facet connection or both the yellow and green LEDs on the copper connection must be on solid to indicate a good connection to a VistaMax Hub card.

Two reset switches are on the left end of the panel. Pressing the SBC reset switch resets the Single Board Computer on the KSU card, which does not affect console settings and signals. It only causes the SBC to reestablish its Ethernet connection with the network, which typically requires one to two minutes. During this time no new routes can be made or sessions taken or saved.

Pressing the other reset switch (System) causes audio signal interruption by resetting the console. It is equivalent to power cycling the console by turning off the power supply.

The Test Interface connector can connect the console to the serial port on the setup computer. Use HyperTerminal to view serial communications from the console during start-up. This includes such data as the IP address and network name for the console (see page 4-27 for added details on using the serial port)

NOTE: This card cannot be plugged in, or unplugged, while the console is powered up.

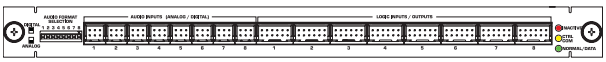
DSP Card Service Info

There are two yellow LEDs near the right end of the card that indicate operational status:

• DSP LED. Blinks with a "heartbeat rhythm" to indicate the DSP is active. The leftmost DSP card's LED will flash twice as fast as the LEDs on the other DSP cards and the KSU to indicate it is the master DSP card.

• Automation LED. Flashes to indicate VistaMax network activity.

NOTE: This card cannot be plugged in, or unplugged, while the console is powered up.



8-In Exp Card Service Info

There are three LEDs near the right end of the card that indicate operational status:

• Inactive LED (red). This LED is off during normal operation. It is on when the system is starting up or if a card problem is encountered.

• Ctrl Com LED (yellow). Flashes to indicate system communications.

• Normal/Data LED (green). On solid when the card is operating with no active audio or logic connections. Flashes to indicate audio or logic network activity.

NOTE: This card can be plugged in or unplugged while the console is powered up, but any signals connected to this card will be affected.

Motherboard Service Info

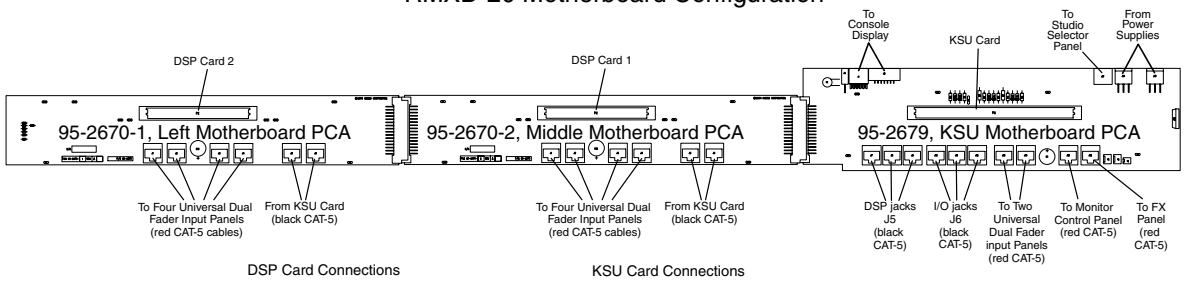
There are three types of motherboards—two DSP and one KSU as shown below, used in the RMX*digital*. They plug directly into one another and fasten to the bottom of the card cage. Which card types are installed depend upon frame size, as shown in the Motherboard Orientation illustration below. The motherboards can be accessed from the front side of the card cage by removing a cover panel (two panels on the RMX*d*-28). The panel hooks at the top and is fastened along the bottom using Phillips screws.

The DSP and 8-Input Expansion card signals connect to the KSU card using black CAT-5 cables to tie the DSP motherboards to the KSU motherboard. One is connected per DSP (DSP Cable) with a second one (I/O Cable) installed for the optional 8-Input Expansion cards.

Red CAT-5 cables carry +48 volts and data to/from the Universal Dual Fader panels, the Monitor Control panel and the FX panel. See page 5-8 for their frame orientations.

RMXDIGITAL MOTHERBOARDS

RMXD-20 Motherboard Configuration



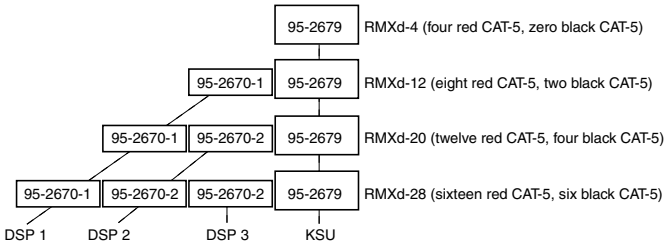
DSP Card Connections

J1 To Universal Dual Fader panel 1
J2 To Universal Dual Fader panel 2
J3 To Universal Dual Fader panel 3
J4 To Universal Dual Fader panel 4
J5 From KSU (DSP cable)
J6 From KSU (I/O cable)

KSU Card Connections

J1 Console Display (Meters/Timer)
J2 Auxiliary +48 VDC
J3 C/R Headphones
J4 Cue Speaker
J5 Battery Holder
J6 Meter Signal Names
J7 To DSP 1
J8 To DSP 2
J9 To DSP 3
J10 To I/O 1
J11 To I/O 2
J12 To I/O 3
J13 To Universal Dual Fader panel 1
J14 To Universal Dual Fader panel 2
J15 To FX Panel
J16 To Monitor Control Panel
J17 To Studio Selector Panel
J18 From 48 Volt Supply (primary)
J19 From 48 Volt Supply (redundant)

Motherboard Orientation and Cabling, by Frame Size



6 Accessories

Harris offers a number of accessories and services to complement your RMX*digital* console. Available products range from the VistaMax Audio Management System (to integrate multiple RMX-*digital* and BMX*digital* consoles into a facility-wide network), to host and guest mic control panels and headphone panels, peripheral control panels, a host turret with clock and timer and space for eight turret 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 specifically designed to house the RMX*digital* console with studio peripheral equipment. Complete turnkey studio design and implementation services are also available. Contact your Harris sales representative for details.

Accessory Panels

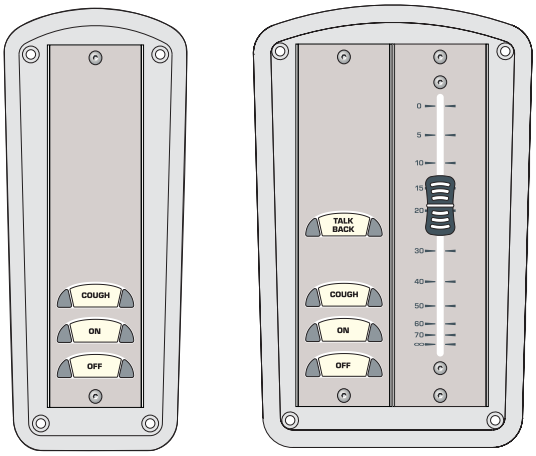
Turret accessory panels maintain the console's look and feel while providing remote control for important studio functions. RMX*digital* accessory panels are 6" long and either 1.6" or 3.2" wide. Single width panels (1.6" x 6" panels) include various mic control panels, studio and headphone level panels, and peripheral control panels.

There are two types of cabinet skirt-mounted headphone panels (jack-only and jack with rotary level control). Custom-designed switch and indicator panels are also available.

The 99-1788-1 Single Cabinet Plate allows any single 1.6" x 6" panel to mount into a countertop. The 99-1788-2 Dual Cabinet Plate allows two 1.6" panels or a 3.2" double-width panel to mount into a countertop (shown below).

To install more than one or two Accessory panels in a studio use the 99-1213 Host Turret. It has eight 1.6" turret panel slots and an integral Clock and Event Timer, as shown on page 6-2.

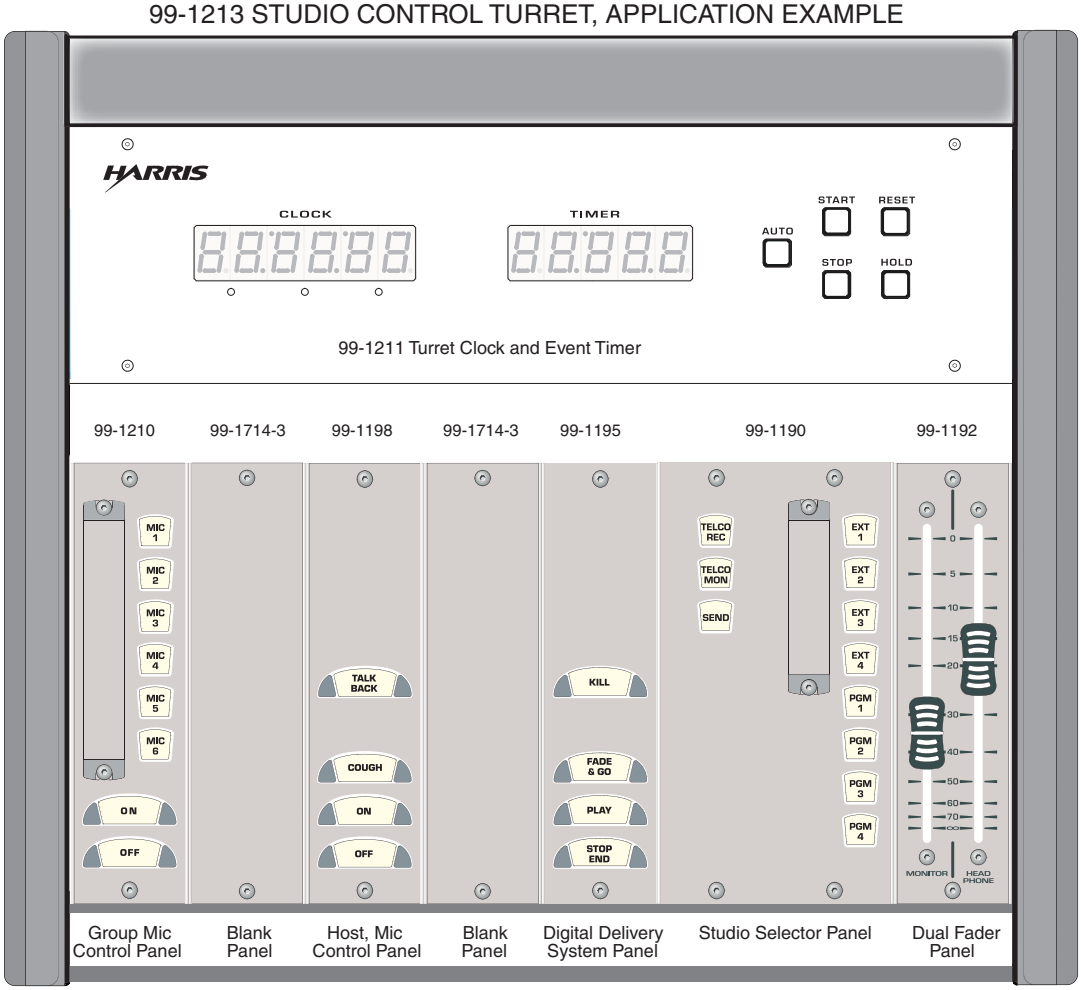
CABINET PLATE APPLICATION EXAMPLES



99-1788-1 SINGLE POSITION CABINET PLATE (SHOWN WITH A 99-1197)

99-1788-2 DUAL POSITION CABINET PLATE (SHOWN WITH A 99-1198 & A 99-1191)

99-1213 STUDIO CONTROL TURRET, APPLICATION EXAMPLE



MIC REMOTE CONTROL PANELS

Three mic remote control panels are available for the RMX*digital*. The most basic panel is the 99-1197 with On, Off, and Cough buttons (shown on page 6-1). The 99-1198 (shown in the Host Turret example above) adds a Talkback button to the three basic panel buttons. A simplified schematic, and connection information, for these panels is shown on page 6-4.

The 99-1210 Group Mic Controller (also shown above) is used when separate guest mic control panels are not installed. The panel gives one host On/Off control for up to six microphones on a single 1.6" panel.

STUDIO MONITOR SELECTOR & FADER PANELS

The studio monitor's source selection can be controlled in the studio by using a Studio Monitor Selector Panel (99-1190) with the RMX*digital*. The panel connects to the rear of the RMXdigital using a straight-thru CAT-5 cable.

A Single (99-1191) or a Dual Fader Level Panel (99-1192) can be plugged into the Studio Monitor Selector for controlling the output level of the studio monitors. A Dual Fader is used with a 99-1214-1 or -2 headphone jack panel to control the host's headphone level when using the 99-1215 headphone amplifier.

HOST TURRET

The 99-1213 Host Turret (shown on page 6-2) includes a 99-1211 Clock and Event Timer. It has space for eight 1.6" panels, four 3.2" panels, or a combination thereof. The Host Turret requires a countertop cutout of 12.8" x 10".

Some of the most commonly used Accessory panels, as shown in the Host Turret example, are the Studio Selector panel (99-1190) that allows host control over monitor source selection; the Dual Fader panel (99-1192) for host control of the studio speaker and the host headphone levels; and the Group Mic panel (99-1210) with On/Off control of up to six microphones. Control panels for tape machines, digital delivery systems, and delay units are also available.

RMXDIGITAL DIVIDER KIT

Mounting an accessory panel into the RMX-*digital* mainframe requires a 99-1411-1 or a 99-1411-2 Divider Kit (see page 2-2 for additional information) be installed in the mainframe.

The 99-1411-1 kit takes up one input slot and holds two 1.6" x 6" panels.

The 99-1411-2 takes up two input slots and holds two 3.2" x 6" panels, four 1.6" x 6" panels, or a combination thereof.

Headphone Distribution Amp

The 99-1215 Headphone amp has six discrete outputs (for one Host and up to five Co-Hosts and/or Guests) and three inputs. The amplifier's inputs can come from the Control Room and/or Studio Host and Guest headphone outputs.

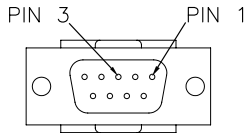
Headphone level is digitally controlled when the 99-1214-series headphone panels are used. Headphone panels are available with and without a volume control pot. Those without a pot are designed to use the headphone fader panel (shown in the dual cabinet plate example on page 6-1).

Existing headphone control panels, which use a pot to directly control the audio to the headphones, can also be used with the 99-1215 Headphone Amplifier.

ESE Cable

An ESE timecode signal extension cable is included in the original display's umbilical cable. It terminates in a 9-pin female D-Sub connector near the mainframe connectors. On the reflective display the ESE or SMPTE cable termiantes in a AMP MOD IV connector (J4). Refer to page 2-7 for the pinout of this conenctor.

On an original display, terminate the facility-supplied ESE cable in a male 9-pin D-Sub, using pins 1 and 3. The clock's ESE signal input is balanced, so either a balanced or an unbalanced ESE signal can be used (connect the + signal to pin 1). See the drawing below for details.



END VIEW, MALE D-SUB
(ESE TIMECODE EXTENDER)

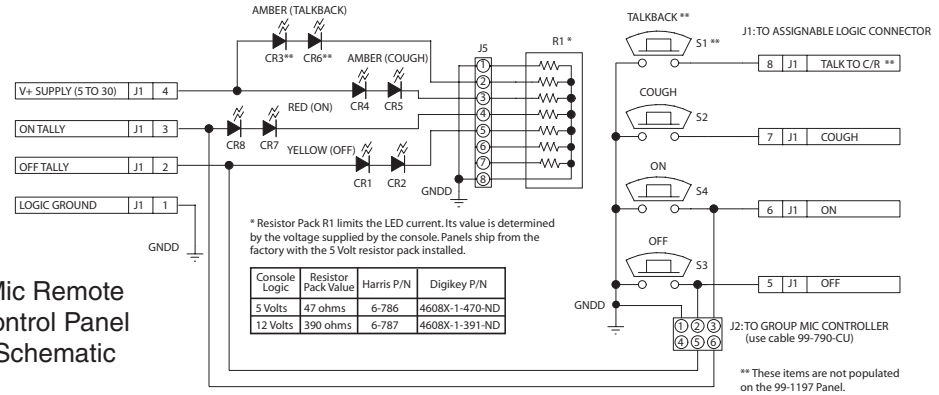
Logic Wiring

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 99-1197 AND 99-1198)

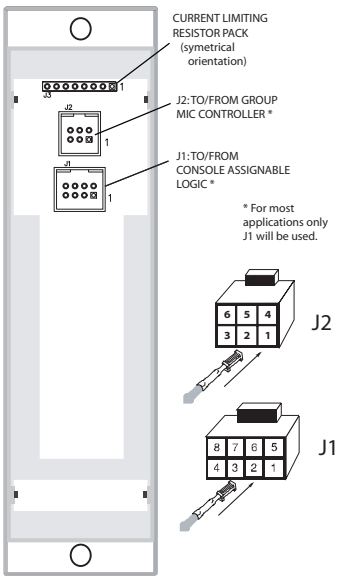
Mic Remote Control Panel Schematic



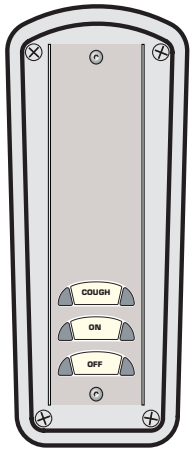
* Resistor Pack R1 limits the LED current. Its value is determined by the voltage supplied by the console. Panels ship from the factory with the 5 Volt resistor pack installed.

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

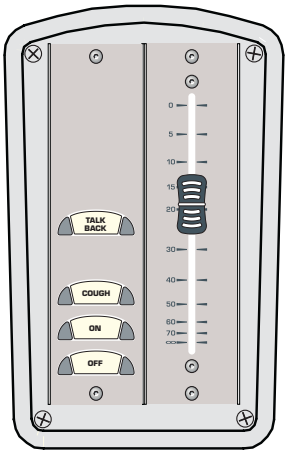
Mic Remote Control Panel Connections



Application Examples



99-1788-1 SINGLE CABINET PLATE with a 99-1197 GUEST MIC PANEL (ON/OFF/COUGH)



99-1788-2 DUAL CABINET PLATE with a 99-1198 GUEST MIC PANEL (ON/OFF/COUGH/TALKBACK) & 99-1191HEADPHONE FADER PANEL

90-1875, 1.6" Mic Remote Panel Cable (for 99-1197 and 99-1198)

RMXD ASSIGNABLE LOGIC CONNECTOR

SIGNAL	PIN
Logic Ground	1
Off Tally	5
On Tally	11
+5 VDC Supply	7
Off Switch (-)	3
On Switch (-)	9
Cough Switch (-)	8
Talk to C/R (-)	2
Tally Common	6
+5 VDC supply	12
Enable Logic Inputs (+)	4
+5 VDC Supply	10

BLK	
WHT	
RED	
GRN	
BRN	
BLU	
ORG	
YEL	

99-1197 or 99-1198 MIC CONTROL PANEL

PIN	SIGNAL
1	Logic GND
2	Off Tally
3	On Tally
4	Power Supply
5	Off Switch
6	On Switch
7	Cough Switch
8	Talkback Switch

PARTS LIST
Cable: Belden 9421 or equiv.
8-pin MOD IV Housing: 14-486 (Tyco-AMP 87631-4)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

VMCC, Sessions and Macros

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 RMX*digital* consoles. Sessions and macros are command files to route signals and to set up consoles for specific applications.

Chapter 4 covered console configuration, basic VMCC operations and standard commands for session and macro files. This appendix presents addition details on using VMCC, session files and macro files to set up and control signal routing in the RMX*digital* console. A VMCC errata section covers program use notes and applications.

The revision D release of the Harris # 99-5000 CD-ROM first introduced two major changes to the VistaMax operating system. The first is that all VistaMax devices (racks, BMX*digital* consoles, RMX*digital* consoles) can run using the same VistaMax Server code. The second is that two Harris-proprietary software programs: VistaMax Community Monitor (CM) and VistaMax Control Center (VMCC) were used to create, maintain and properly distribute configuration files to all VistaMax community devices. Previously, configuration files were created manually using a text-only editor like Notepad and were distributed to all the community members by hand. Now, only session and macro files are edited using Notepad.

VMCC FILE MAINTENANCE

The VMCC application (icon: ) not only simplifies device configuration, it also allows one-stop file maintenance for every VistaMax community member—any console, cardframe 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 a 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 and cardframes 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 falling 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 admin 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 broadcasts its IP address using multicast messaging, CM will show it in its status window.

To access such a "missing" device, change the admin 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 so the IP address can be corrected in the file. Reset the admin computer back to its previous fixed IP address (typically it is set to `192.168.100.11`).

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) so the corrected IP address is used. If the problem was caused by a typo, be sure to correct the IP address in VMCC and then redistribute the corrected files to the device to update the hash table.

VMCS (VistaMax Command Server)

Each VistaMax device can communicate with external servers using either TCP/IP or UDP commands. The communications format is set in the `nqx.ini` file in the VMCS_Port definition entry line: `VMCS_Port = 2002,U`

This entry line is already in the template file that creates each `nqx.ini` file. It sets that device to respond to, and to send out, UDP commands.

When a device requires TCP/IP to be used instead, then the `nqx.ini` file must be modified so that TCP/IP commands are used.

If only one device requires this setting (which is much slower than communicating using UDP commands), then instead of changing the template `nqx.ini` file, the `nqx.ini` file on the device can be changed by editing the `nqx.ini` file's VMCS_port entry line so it changes from this:

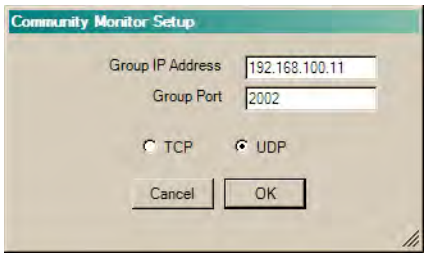
```
VMCS_Port = 2002,U ;UDP protocol
```

to this:

```
VMCS_Port = 2006,T ;TCP/IP protocol
```

Community Monitor includes an application called Command Client which can be used to manual load a session or macro file or take up to eight routes in one command line. The Command Client is accessed from the *Start* menu (under *Programs/Harris Corp/VistaMax* on the admin computer).

Select Options, then Setup to open up the setup pane, as shown below:

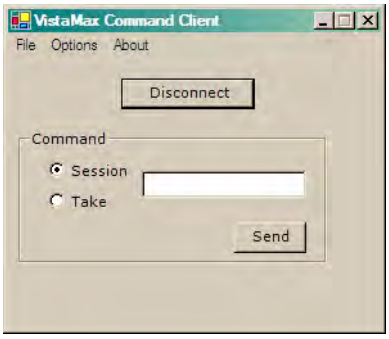


Default Command Client Setup Windows

Enter the IP address of the VistaMax device you want to communicate with (typically, this is the main VistaMax or Envoy cardframe). The Group Port entry should already be set to 2002 and UDP selected, then click OK to close the pane.

If the VistaMax device is set to use TCP/IP protocol (view the `nqx.ini` file if in doubt), then change the Group Port to 2006 and select TCP instead of UDP, then click OK to close the setup pane.

Click the Connect button in the Command Client window (shown at the top of the next page) to initialize communications with the VistaMax device. Once connected, the *Connect* button changes to a *Disconnect* button, activating the lower half of the window so a session or macro file name can be entered in the text box when the *Session* radio button is selected. To enter a session or macro,



Command Client Window

type the full name with suffix, then press *Send* to load the session or macro.

Click the *Take* radio button to route one or more signals. To enter routes, each route is listed in this form: [source, destination]. Up to eight routes can be entered. Each is separated by a comma:

`[161,241],[163,243],[165,245]`

Pressing *Send* then takes the routes, in order, on the VistaMax device. The entry example 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 two devices, then the signals must use the universal signal ID form that includes the device numbers (e.g., `[D10.225,d3.129]`).

VMCC OPERATIONS ERRATA

The VMCC program first released with the 500-series operating code is version 2.0, build 2092. 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).

RMXd Input Card Identification

Unlike BMX*digital* consoles, RMX*digital* inputs do not have an "uninstalled" option in VMCC. This is because even channels without a Dual Fader panel installed are still available, just like the four phantom channels (channels 29-32) that are present in each RMX*digital* KSU.

When viewing the RMX*d* console cards in the Explorer pane, each input card starts with the card ID number assigned to that card. It is only on the RMX*d*-28 that these numbers correspond to their physical positions on the console. On the other frame sizes, card ID numbers will not necessarily correspond to their physical position in the frame.

Signal Naming Conventions

RMX*d* consoles can show 10-character names in their source name displays. The names shown are either the In Room Name or the Community Name along with other identifiers.

Which naming convention is used is assigned by the Tier Naming Convention, which is set for each device in the community in the device edit pane, just above the Source Include List.

Tier 1 naming is the default setting for consoles while Tier 2 is the default for cardframes (note: most users use Tier 2 for consoles and Tier 1 on cardframes!). There are three Tier Naming Conventions: 1, 2 and 3:

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 Sign[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

In Tier 1 naming, the In Room Name is displayed for all community members. This means the local, group and system publish files created by VMCC for a device set to use Tier 1 are identical. This convention is most often used on Envoy

and VistaMax cardframes since these signals are shared throughout the community. If the convention is used on consoles, however, each common console signal name (PGM 1, PGM 2, and so on) must be given a unique name (PGM 1-AIR or PROD-PGM 1, etc.) for each console so that the signals can be properly selected. To get around having to uniquely name all of these common signals, Tier 2 naming is typically used on consoles.

On devices using Tier 1 Convention naming, the Call Sign, Community Name, Discipline Prefix, Discipline Sort Character and Name Radix are not used so they can be left at their default settings.

On devices using Tier 2 Convention naming, the Call Sign entry (up to four characters), Name Radix character (one character) and Community Name entries (up to four characters) are used to create the signal names shown on the other devices in the community.

NOTE: When only Tier 1 and Tier 2 naming are used in a community, the Call Sign entry will typically be used to identify the console by room (e.g., Air, Prod, Img, News, etc.) rather than by the actual station Call Sign. In the examples on the previous page, this means the Group and System names for Tier 2 would display as PROD.MD1 rather than XYZ.MD1 which better identifies the signal as Minidisk player 1 in Production.

When multiple station groups are networked in one VistaMax community, Tier 3 naming can be used throughout the community to better differentiate signal names between fellow group members (those assigned the same Call Sign) and all of the other devices in the community (those assigned different Call Signs).

In Tier 3 naming, the device publish file that the fellow group members receive (those with the same Call Sign) is the Group Publish file. These signal names consist of the Discipline Sort Character, the Discipline Prefix and the Community Name (e.g., -PROD.MD1). The devices in the other Call Sign groups then receive the System Publish file, whose names consist of: the Call Sign, the first character of the Discipline Prefix name and the Community Name (e.g., XYZP.MD1).

Setting RMXd Signal Include Lists

Which of the sources listed in the various publish files are actually available to a particular console is assigned in the main Source Include list in the device editing pane. This sets which sources display on each channel strip and which sources are available for the Real Air, Synthetic Air, External Cue and Talk to CR inputs. The meter and monitor selectors have their own include lists.

The `routers.ini` file's [SrcInclude] listing is a sum of the sources in the main Source include list, the Meter include list and the two Monitor include lists. Thus a signal removed from the main include list—but which remains in the meter or monitor include list, will still show up in the `routers.ini` source list. Note, that if additional signals are included on any edge devices hosted by the device, they are also summed into the `routers.ini` source include list.

The [DstInclude] list in `routers.ini` is equal to the Main Destination Include list entries plus any destinations assigned to edge devices hosted by that VistaMax device.

RMXd Monitor/ Meter Key Definitions

The RMX*d* console editing pane allows the twenty-one source selection buttons for the Monitor, Meter and Studio 1 keys to be individually defined. Most keys have default sources assigned: the top row of switches are assigned to the Real Air source (the button label is EXT), the next row is assigned to Send and the bottom four buttons (PGM 1 thru PGM 4) are assigned to program bus 1 thru 4. The TEL REC and TEL MON buttons are not assigned by default since both of these signals are routed signals. To assign these signals

to the buttons, those two signals must first be added to the various include lists. This is covered in the next section on Telco settings.

Telco Channels

A maximum of six channels can be defined as RMX*d* Telco channels by setting the fader channels' rotary switches to be a unique Telco number (from 1 to 6). When an RMX*d* console is Inspected by VMCC, the fader channels defined as Telco channels are captured by the program. However, the VMCC program does not assign nor use the Telco number, and hence will allow any fader channel to be manually set as a Telco channel. In no case, though, should more than six channels be designated as Telco channels in VMCC.

The third CR and Studio monitor selector button (TEL MON) does not have a default assignment in VMCC since the default source (Telco Monitor bus) must be routed. To assign this signal to the button, Telco Mon (signal 175) must be added to the Monitor and Studio 1 Include lists. The signal can then be set as the Switch 3 source in the CR Monitor/Studio 1 Keys entry boxes.

The TEL REC signal (Telco Record, signal 173) must also be included on the Meter Include List so it can be assigned to meter switch 3. It is recommended that the TEL REC signal also be included in the Monitor and Studio 1 Include lists so that the board operator and talent can easily monitor the Telco record signals. The non-assigned signals in the CR Monitor and Studio 1 include lists are "dialed-up" by the operator using the two monitor source selectors.

Extra Logic Input Selections

VMCC has a list of logic commands that can be assigned to remote mic control panel buttons. Included in this list are several signals that are only available on the BMX*digital* console. The signals that should not be selected on RMX*digital* include: Talk to Studio 1 Co-Host, Talk to Studio 2, Talk to Studio 2 Host and Talk to Studio 2 Co-Host. Setting a button to these logic command does not cause problems, but they will not do anything on an RMX*digital* since it does not have any method to use these specific logic commands.

Duplicate Community Names

VMCC allows multiple files to be saved with the same name since each one has a unique creation date. To avoid confusion, especially if there are multiple VMCC users, assign a unique name for each new community after it's first created.

Editing Card Complement on a Device

When editing the card complement on any device, you must wait for the processing to complete or else program errors could be introduced. Processing is complete once the community text blinks.

Edge Device Parent Reassignment

Each edge device has an assigned "parent" which is the community member with that edge device's setup information in its `edgedevice.ini` file.

If an existing edge device is assigned to a new parent in VMCC, the updated `edgedevice.ini` file will have to be provisioned and distributed to all of the affected consoles and cardframes 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 Initialize RCED command issued by VMCC after the new parent file is distributed. To ensure the edge device is using the correct file, power cycle that edge device to force it to retrieve its setup information from its 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 then properly nest under their parent.

Inspection and Merge Devices Issues

Matching the Actual Community to an Existing VMCC-created Community

Inspecting the actual devices, with the intent to populate the null MAC addresses of a matching VMCC-created community, brings up a *Merge Devices* pane after inspection has completed. This pane shows a list of all devices which match in both IP address and physical card configuration to those in the already existing VMCC-created community.

There is no distinction in this pane between devices that match completely and devices that only need their MAC address populated in VMCC. Clicking *Accept* will populate the MAC addresses in those community members that matched. Even though it appears no action is required (the pane shows that all the devices match), if *Cancel* is clicked, the MAC addresses are not filled in.

Merging a "Real Device" with a VMCC-Entered Device

Inspecting a community, with the intent to merge an inspected real facility device with a VMCC-entered device, only works if the inspected device and the existing VMCC device match exactly in regards to framesize and the types of cards installed and the card slot positions.

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 are listed in the Inspect window. Make note of the differences, click *Cancel* and update the VMCC device accordingly. Then, inspect the community again. Once the inspected device matches the VMCC device, VMCC will merge the inspected device attributes 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. Always scroll down through the device list looking for devices with changes.

Merge Devices with 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.

GENERAL SESSION/MACRO FILE INFO

The **SBC** uses a memory-resident database to maintain the file commands (the sections and their entries) from the last session file loaded or macro file taken on that console. To the **SBC database**, handling a session or a macro file uses the same procedure: clear the memory-resident database cleared to make room for the new file, then load the files contents.

Since clearing the database doesn't affect the control panel/hardware settings (the channels' source and button status is maintained by the hardware fader modules), the operation of the con-

sole is not affected. However, all of the static sections that were loaded when the previous session or macro file was taken are erased, which includes the following session file sections: [Mapping], [fader_start], [fix_fader], [fix_pan], [local_cough], [Timer_Reset],[routercommand_1].

After the database is cleared, the new session or macro file sections and entries are loaded into the database and the commands are executed. For a macro file, the commands are simply run without regard to whether or not they match the console or cardframe hardware, the console config, etc. For session files, the [Mapping] section is used to verify each command matches the console's hardware configuration before the command is executed to prevent incorrect routing, etc.

Pressing the console's *Save Session* button, or using the Save_Ses FTP literal command, causes the SBC to first take a "snapshot" of the current channel settings from the control panels/hardware, writing (or overwriting) those values (all of the button sections and current routed sources for each channel and the [Mapping] section data) into the database. Thus, at the end of this process, but before the database is written to the new session file, the database holds the current status of the console's buttons (bus, mode, PS, PF, Pan/Bal assignments, etc.) PLUS whatever previous static command sections were last loaded (e.g., [fader_start],[local_cough],[fix_fader], [Timer_Reset],[fix_pan],[routercommand_1],). The new .ses file is then written.

Control File Formatting

VistaMax setup and configuration files are text-only files that share these common formatting rules: all command text is held within sections; each section begins with a [Section Name] header can be up to 32 characters); each KeyValue uses a separate line within the section with a corresponding Entry Value (there is a 1,000 character limit, which may be further limited by constraints imposed by a particular section); any text proceeded by a semicolon (;) is a comment line which can have up to 80 characters.

Config (.cfg) and setup (.ini) files are created and maintained through VMCC, so the following information is most applicable to session and macro files which are edited using Notepad.

Here's how a typical section and its entries appear in VistaMax files:

```
[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 can be added, as long as each comment begins with a semicolon (;).

Each section can have up to 64 entry lines. Each entry line is composed of a KeyValue followed by = (equal sign) and an 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 a ;).

The format of the Entry Value is also Section Name specific, and it may have multiple components, each separated by a comma.

When an Entry Value refers to a specific signal in the VistaMax system it can be identified in three ways: by its unique global number (*e.g., 65697*); by its local number (*e.g., 161*), which is the same number on all devices of the same type; or, when the signal is referring to a signal on another device, by using its universal number (*e.g., d1.161*),

which is the device number followed by a period and the local signal number. Each of the example numbers reference the Mix-Minus 1 signal on the console set as device 1.

The following command shows the use of local signal 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 signal 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 signal 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 type of console and cardframe.

Section Headings

Most session file section headings define the button states for the channel strip controls. 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 detailed in chapter 4.

[Telco Record] and [Telco Monitor]

These two Telco section headings get automatically created when a session file is saved on a console with Telco channels assigned. They must then be manually edited since RMX*digital* has no control surface buttons to set their conditions. These set which Telco channels (labeled as Channel 81 - 86) feed the Telco record bus and/or the Telco monitor bus.

To have a Telco input feed the record or monitor bus when the session file is loaded, the Entry Value is set for `=1`. In the following example, Telco 1 (e.g., Channel_81) is the only Telco that appears in the Telco Record output. Telco 2 (e.g., Channel_82) is the only Telco going to the Telco monitor output.

```
[TelcoRecord]
Channel_81=1
Channel_82=0
Channel_83=0
Channel_84=0
Channel_85=0
Channel_86=0

[TelcoMonitor]
Channel_81=0
Channel_82=1
Channel_83=0
Channel_84=0
Channel_85=0
Channel_86=0
```

[chain]

This section can specify that one or multiple other session or macro files be automatically loaded, on any console or cardframe, when the session is taken. It is most often used in macros, but it can be used in sessions as well. The chain command entry looks like this:

```
[chain]
call_1=remote_1.mac,9
call_2=remote_2.mac
```

The first entry line loads a macro on a different device. In this case device 9, as defined by the `,9`, has a `remote_1.mac` file in its `sesfiles` folder. The second line loads a macro that's on the same device (the `remote_2.mac` file is in the local `sesfiles` folder).

[RouterCommand_1]

This section can specify up to sixty-three routes to be taken when the session or macro file is taken. Typical usage was shown in the examples under signal numbering on the previous page. Each `Take_x` KeyValue, numbered sequentially starting from 1, defines one route. Each EntryValue then defines the source and the destination. 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 with a `.mac` suffix. They are created using a text-only editor like Notepad®. Macro files use the same commands as session files, and are saved into the *sesfiles* folder on the SBC. They typically have only a few sections in them since a macro is created to perform a specific task and so typically does not address console channel button settings.

The most common macro application is to performing return routing for two-way devices, like ISDNs and Telco hybrids. These devices require a mix-minus signal—which is specific to which fader the two-way device appears on, to be routed from the appropriate mix-minus bus to the two-way device. To do this, multiple macro files are created to control the two-way routing. These macros are what the operators actually select on the Telco channels in the console. One macro is created for each two-way device and for each fader channel that device is available on.

Each of these types of macros has two routes: one routes that Telco device to the fader; the second routes the mix-minus for that fader channel to the Telco device. Here's a couple examples where the Telco hybrid connects to the KSU A Analog input (from network signal) and the A Analog output (send to network signal).

```
[RouterCommand_1]
take_1=337,151; Hybrid In > Fader 12
take_2=161,241; MM-1 > KSU Analog A
```

The previous macro is selected on fader 12. If this Telco hybrid will also be available on fader 13, then this macro would be included on fader 13:

```
[RouterCommand_1]
take_1=337,153; Hybrid In > Fader 13
take_2=163,241; MM-2 > KSU Analog A
```

Macros can also perform complex audio and logic switching functions. One typical use is to switch the air chain between the main air studio and an emergency backup studio. In this example, device 2 is the production room 1 console which will be switched into the air chain, taking over from the main air studio. This macro switches the PGM 1 feed from the product room to the air chain through the Sage Endec delay and a BTI switcher. The logic commands are used to switch "air control indicators" in each studio and to switch control between a delay dump control panel in each room:

```
[RouterCommand_1]
take_1=d2.225,135; P1 PGM1 to Delay
take_2=135,71; Delay to Sage
take_3=71,81; Sage to BTI ana switch
take_4=71,137; Sage to BTI dig switch

[port_event_card_4]
port_event_30=1; Momentary Closure

[port_config_card_4]
port_config_15=2; P1 on-air latch
port_config_16=0; P2 unlatched on-air
port_config_17=0; Air delay panel off
port_config_18=2; P1 1 delay panel ON
port_config_19=0; P2 delay panel off
port_config_21=0; Air in delay off
port_config_22=2; P1 in delay ON
port_config_23=0; P2 in delay off
```

Macros are loaded by: an operator using a fader source selector that has macros included in its signal list; through a chain command in a session or other macro file: UDP commands from a digital playback system networked with the VistaMax system; using a manual file load FTP command; using Task Scheduler to load macros by date/time.

Macro files are stored in the SesFiles folder along with session files, however, 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, under 500-series code, the macro can be included as a "source" when using VMCC to set up the console, and are then selected on a fader channel just like signals. When the operator presses *Take* on the fader channel the macro is taken.

In 400-series code, macros must be exclusively assigned on a fader channel—no audio signals could be displayed along with the macros. This limitation is removed in the 500-series operating system code, which allows intermixed signals and macros on any fader channel or edge device.

Here is how a standard router definition ([Router_4]) and one set exclusively for loading macros ([Router_5]) appear in the session file:

```
[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) with a take command to route a signal to the fader channel when the session file is taken.

Router 5 is set to display only four macros in its source list using the 400-series code format, which can also be used in 500-series code. Macros 1, 2 and 3 are on the local device. Macro 4 (bayonne) is loaded on device 6. Here is the session file command syntax for assigning macros to a router channel:

```
[Router_x]
Macro_n=Filename,d
```

x is the channel ID of the router channel.

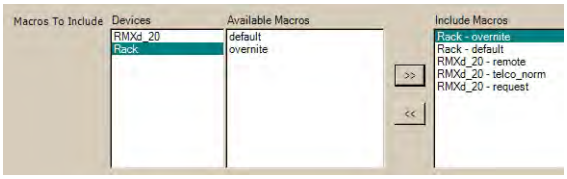
n sequentially numbers the macro entries, starting from 1. Up to 63 macros could be assigned to any one router channel.

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 runs on that device. No entry says the macro is on the local device.

Alternately, in 500-series code, macros can be added to the included signals list in the *routers.ini* file by entering the macro file names into VMCC at the device level:

Adding Macro File Names into VMCC is Done at the Device Level in 500-Series Code



Macro Files are Also Included at the Device Level

Once the macro files are included at the device level, the *routers.ini* and the various publish files are updated by distributing new files to the system devices. Macros are then handled as if they are signals with a special prefix (`M1`, `M2`, `M3`, and so on). The macro numbers to macro files are identified at the top of the *local_publish.cfg* file:

```
;macros
mac=1,remote
mac=2,telco_norm
mac=3,request
```

Here is a typical 500-series channel-specific include list with both signals and macros in the list. In the example, the three macros shown in the publish file example are included:

```
Include_1_1=D23.65-135,M1-3
```

When the operator dials through the available sources, the macro names (remote, telco_norm, request) appear in the list alphanumerically along with the other signal sources included.

Fader Channel Macro Usage

When taking macros, the same rules apply as for signals: if the channel is Off, taking a macro causes it to execute immediately. While the channel is On, taking any macro—local or remote, will show brackets around the name because the macro is pending. It is then executed as soon as the channel is turned Off.

Macros listed on a fader channel using the 400-series format causes the console automation to check the local *sesfiles* folder to verify that the macro file is actually present. If the macro file is not found, the name is surrounded by arrows: `> Macro name <` when dialed up on a fader channel. If this macro is subsequently taken, the name is surrounded by square brackets, `[ Macro name ]` to indicate the macro is pending since it was not found.

Note that this function only checks the local device. When macro files from other devices are listed it is assumed they execute as requested since there is no indication the macro file did not load as requested.

PHANTOM CHANNELS & BUSES

Each RMX*digital* includes four "phantom channels"—special-purpose input channels within the KSU DSP, that can be used just like any other input channel, albeit without any physical controls. Any input slot covered by a blank panel (e.g., no Dual Fader panel is installed in that slot) means there are two more phantom channels available for each blank panel in the console.

Each RMX*digital* also includes several "phantom buses" that can have any channel assigned to them—including the phantom channels, from a session or macro file. To use these phantom buses, edit the session file by changing the channel entry under the appropriate phantom bus header from the default setting of `Channel_xx=0` to `Channel_xx=1`. This setting assigns the channel to that bus. These bus signals are included in the standard source signal list in VMCC. Here are the phantom bus headers—which are always included in each session file, and what each controls:

- `[Solo]` Assigns the channel to the solo bus (since the signal is taken post switch and post fader, this command is not very useful on phantom channels).
- `[Send_2]` Assigns the channel to the Send 2 bus.
- `[Utl_1, Utl_2, Utl_3, Utl_4]` Assigns the channel to one or more Utility buses.
- `[Send_2_PF, Utl_1_PF, Utl_2_PF, Utl_3_PF, Utl_4_PF]` Sets the channel to feed a bus pre-fader. This setting does nothing if the channel is not assigned to the same bus.
- `[Send_1_PS, Utl_1_PS, Utl_2_PS, Utl_3_PS, Utl_4_PS]` Sets the channel to feed a bus pre-switch. This setting does nothing if the channel is not assigned to the same bus.

To use the phantom buses, they must be routed to a VistaMax destination. For example, if the Utility 1 bus is being used, it can be routed to the KSU digital output D by adding this route entry:

```
[RouterCommand_1]
take_1=229,255;UTL 1 > KSU digital D
```

If the Pre-Fader and/or Pre-Switch entries are set to `=1`, then that channel's signal is immediately applied, at unity gain, to the bus when the

session file is taken. If the signal level must be set to a level other than unity gain, then do not use pre-fader, but instead enter a fader level setting for the channel by adding a `[fix_fader]` section to the session file.

A Fix Fader entry of `Channel_xx=B5` is the same as setting the fader to nominal (-12) or assigning the channel under the pre-fader header. Hex numbers from 00 (fader off) to FF (fader max) are valid. A PDF file (*fix_fader_entry_table.pdf*) is included on the 99-5000 CD-ROM that lists the hex value versus fader position and channel gain.

Phantom Channels and Pending Mode

When a phantom channel must be assigned to a Program bus, since there is no pre-switch setting on these buses, the session section `[On]` must be used to specifically turn the phantom channel on (`Channel_xx=1`) or off (`Channel_xx=0`). If this entry is not included in every session file, then the phantom channel could be put into pending mode, just like any other channel that is On when a session file is taken—the "On button" winks and the new session information is not loaded into that channel until it is turned off. But, since phantom channels do not have physical buttons, there is no way to identify when a phantom channel is stuck in Pending Mode other than the signal remains fed to that PGM bus.

If a phantom channel does get into pending mode, the only way to turn it off (short of power cycling the console!) is to run a session file that has this section:

```
[force_off]
channel_13=1
channel_14=0
channel_15=0
channel_16=0
```

which forces the first phantom channel off to remove it from a pending state. Needless to say, this could affect on-air audio if used improperly and thus should only be used in a special session file.

To avoid this situation, when using phantom channels it is best to assign them to a send or utility bus where the pre-switch setting can be set true (e.g. [Send_1_PS] or [Utl_1_PS] set to `=1`).

External Cue and External Talk to C/R

The last two KSU phantom channels, Phantom 3 (destination 221) and Phantom 4 (destination signal 223) are typically used as the destinations for the External Talk to C/R and the External Cue signals. If these two signals are used with the phantom channels, then the source inputs are defined in VMCC (console edit pane). No other routing or assignments are required.

To activate the External Talk to C/R signal, pull pin 11 on the Cue/Talk/Ext connector low (with pin 10 on the connector jumpered to +VDC). The External Talk input is routed to the Control Room talk destinations (Talk to CR output, Cue speaker and Operator headphones are the three possible destinations) while the pin is held low.

To activate the External Cue signal, pull pin 12 on the Cue/Talk/Ext connector low (with pin 10 on the connector jumpered to +VDC). The External Cue input is routed to the Cue speaker (and the Cue output) and to the auxiliary meter, which displays the Cue level. Note that Cue is muted when a C/R mic channel is On. Cue will also feed the operator headphones if the AutoCue button is lit.

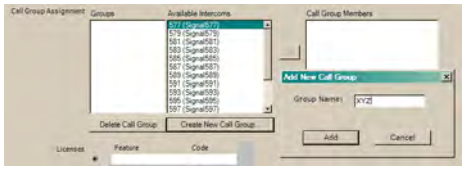
500-SERIES CODE FEATURES

The 500-series code has added several new features, including the ability to include macro names with signal sources names on both edge devices and fader channel source selectors, as previously outlined.

Intercom Call Groups

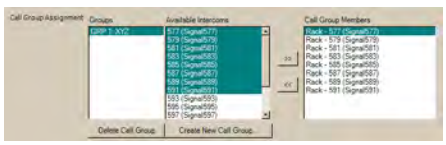
Another major new feature in 500-series code is Intercom call groups. This feature allows multiple intercom stations to be called using a single hot key. As in 400-series code, you can press multiple hot keys to call multiple stations, but each hot key had previously only been assignable to one intercom panel. Now, with 500-series code, one hot key can be assigned to a call group, which means that multiple intercom stations can be paged or called simultaneously through using VMCC.

Creating Intercom call groups is done at the top level of the VistaMax or Envoy cardframe that holds the Hub with Intercom card:



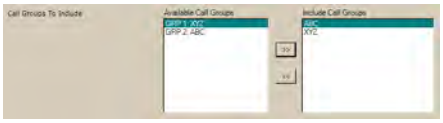
Creating a Call Group is Done at theDevice Level

Click *Create New Call Group...* to open up a dialog box to enter a group name of up to ten characters, then click *Add*. The new group name then appears in the *Groups* column so intercom panels can be added to create the group. Highlight the names of the intercom panels to include in the highlighted call group, then click the >> (double right arrow) so the names appear in the *Call Group Members* list at the right side.



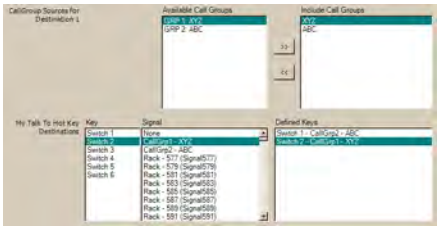
Assigning Members to a Call Group is also Done at the Device Level

Once the call groups are formed, they are added to the include list for the intercom parent device:



Including Call Groups at the device level

The Call Groups are then available to be assigned to hot keys on each intercom panel:

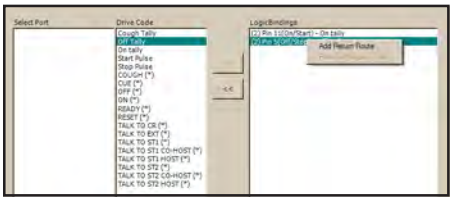


Including Call Groups at the Intercom level, and Assigning a Call Groups to a Hot Key

Automatic Reverse Logic Routing

This feature is used to command an automatic logic return route from a fader to the peripheral device when the peripheral is routed to a fader.

Reverse routing is assigned to each peripheral device after the output logic bindings are set. Right clicking in the Logic Bindings pane pops up the Add Return Route selection box. Select **Add Return Route**. Now, when that peripheral is selected on a fader channel, the fader channel logic commands are automatically routed back to the peripheral's logic output—no matter which device has that logic connection.



Adding Automatic Logic Return Routing

In 400-series code, return logic routes were manually created by using a macro file to route the signal with logic to a channel and to then route the logic from the fader channel back to the peripheral device.

This could be problematic if the console was dayparted and one daypart had a CD player on fader 15 while other dayparts had an Instant Replay and a VoxPro routed to the same fader. The problem was that the return logic route would not be affected when the source routed to the fader channel was changed. Thus even though the CD player was routed to the channel, the return logic would remain tied to the previous peripheral. This same problem would occur when multiple logic controlled devices are selected on a single fader channel.

To solve this issue, macros, instead of source signals, are selected by the operator. Each macro routes the desired signal to the fader, releases the logic route going to the other devices with logic available to that fader, and routes the logic to the selected peripheral. Here's a typical macro for routing return logic, required for 400-series code:

```
[RouterCommand_1]
Take_1=277,157 ;CD 2 to fader 15
Take_2=157,277 ;return logic to CD 2
Take_3=-1,339 ;cancel logic-VoxPro
Take_4=-1,343 ;cancel logic-InstRply
```

This macro routes CD 2 to fader 15 and routes the channel 15 logic to the CD player, while also routing silence (the `-1` source) to the VoxPro and Instant Relay to ensure the channel 15 logic no longer controls those devices. Similar macros would be created for the VoxPro and Instant Replay to remove the logic from the other devices.

When 500-series code is sued, this same process can be used, but in most cases it is far simpler to assign return routing on most signals since the net result is that signal source selection with logic control is much easier than it ever has been in the past since macro files do not have to created to handle the return logic routing.

There are still some signals where using return logic routing may not be desirable. That's because automatic return logic routing is made each time that signal is routed to a fader. Thus, someone on another console might dial up that source and steal logic control away, removing control from the original fader. If this occurs, simply retake the signal to move return logic control back to the previous channel.

Because of this, there may be some signals (like digital playback channels that are dedicated to one room) that should not have the reverse logic routing feature selected to ensure that the logic cannot be accidentally routed from another fader channel.

Index

Page numbers listed as chapter-page.

Page numbers listed as chapter-page.

C (CONT.)

D

E

F

G

H

I

K

L

Page numbers listed as chapter-page.

L (CONT.)

M

N

O

P

Q

R

Page numbers listed as chapter-page.

S

S (CONT.)

T

U

V

W