RMXdigital

Radio Broadcast Console with DirectView Metering using 600-series or later code
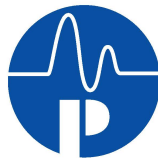

Operations & Technical Manual

12 Channel Console with Dual Meters: PRE99-1400D-12

20 Channel Console with Quad Meters: PRE99-1400Q-20

28 Channel Console with Quad Meters: PRE99-1400Q-28

PACIFIC RESEARCH & ENGINEERING

PR&E® RMX*digital*™ Broadcast Console with Direct View Metering Operations & Technical Manual, Revision B, March 2015

Warranty

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Revision	Date	Changes Made	Section	Pages	Editor
B	3/3/2015	Updated company name and logo. Corrected technical information as required.	All	All	RM
A.1	6/30/2013	Added product names and numbers to cover and updated company logo.	Cover	Cover	LD
		Corrected Figures 2-7 and 2-8.	2	2-8	
A	4/15/2013	Manual based on 75-53 RMXd Broadcast Console manual, with edits and additions made for console with Direct View metering.	All	All	LD
		Numbered figures and tables and added lists of Figures and Tables to Table of Contents.	All	All	

Table of Contents

Declaration of Conformity

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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: GatesAir (formerly PR&E, Harris, and Harris Broadcast)

Manufacturer's Shipping Address: 3200 Wismann Lane
Quincy, IL 62305
217 222 8200

Manufacturer's Mailing Address: 3200 Wismann Lane
Quincy, IL 62305
217 222 8200
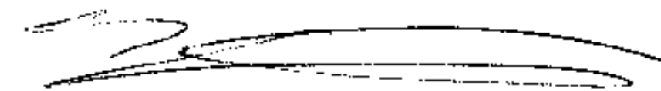
Equipment Description: Radio Mixing Console

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).

Mason, Ohio USA
Place
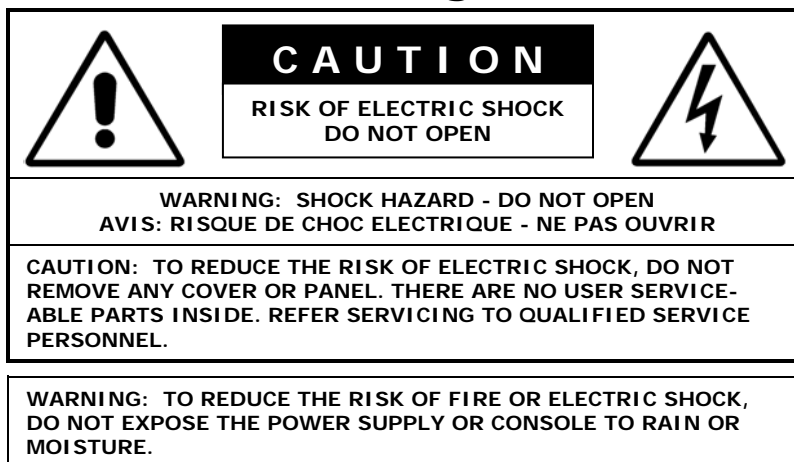
Signature

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 products 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.

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 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. Unplugging it prevents 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 these conditions:
    - When the AC cord or plug is damaged.
    - If liquid has been spilled or objects have fallen into the product.
    - If the product has been exposed to rain or water.
    - If the product has been dropped or damaged in any way.
    - When the product exhibits a distinct change in performance, which 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

CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**

**WARNING: SHOCK HAZARD - DO NOT OPEN
AVIS: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR**

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE ANY COVER OR PANEL. THERE ARE NO USER SERVICE-ABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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

The **Exclamation Point symbol**, within an equilateral triangle, alerts you 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 you to the presence of non-insulated 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. Operating this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, is required to take whatever measures are needed to correct the interference.

Chapter 1 - Introduction

Thanks for joining the growing ranks of broadcasters employing GatesAir products designed by PR&E. We endeavor to provide the finest quality products, systems, documentation, and after-sale support. To obtain the maximum benefit from the RMX*digital* console's capabilities, read through this section as well as Sections 2 thru 4 prior to actual product installation.

Your RMX*digital* console shipped with these components:

● **Mainframe** – with 12, 20, or 28 fader channel slots (Figure 1-1 shows an RMX*digital*-20)

● **DirectView Console Display** – with two or four meters, a clock, and an event timer

● **Dual Fader Panels** – installed in the mainframe, left to right, as ordered

● **Monitor Control Panel** – one standard, installed in the mainframe

● **KSU (Key Service Unit) Assembly** – one standard, installed in the mainframe

● **DSP (Digital Signal Processor) Card** – number installed per mainframe size:

  • one standard (RMX*d*-12 fader console)
  • two standard (RMX*d*-20 fader console)
  • three standard (RMX*d*-28 fader console)

● **Eight-Input Expansion Card** – optional cards, as ordered; total number installed can be up to the number of DSP cards installed in the mainframe

● **Single or Dual Width Blank Panels** – one single width panel standard, installed per mainframe, additional dual width panels installed, as ordered, to cover unpopulated channel slots

● **48 VDC Power Supply** – 2 RU, rack mount, one standard, redundant supply optional

● **Installation Kit** – one standard, with Amp MOD IV housings and contact receptacles for all audio and logic connections, plus a 4-pin Molex housing and female crimp pins for master clock/timer reset cable

Tool Kit – one standard, includes protective case, 1/16 inch hex driver, MOD IV crimp tool, and MOD IV receptacle contact removal tool

Figure 1-1. RMX*digital*-20 Console

Product Overview

The RMX*digital* (RMX*d*) console is a low-profile, digitally-controlled, routable audio console that sits in a countertop cutout. There are three mainframe sizes available to hold 12, 20, or 28 fader control strips. The rack-mount RMX*d*8-HL "headless mixer" is also available for special mixing applications. The RMX*d* console can operate in a fully standalone capacity or, for maximum flexibility and usability, it can be integrated into any VistaMax Audio Management System.

The console is designed for 24/7 operation. It has two DC power connections, with integral power coupler, for connecting a main and a redundant supply (PRE99-1205) for on-air studios. One power supply is included with each mainframe. All RMX*d* components—console, display, and power supply—are convection-cooled for completely silent operation.

An aluminum chassis holds the RMX*d* circuit board electronics 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 rear cover panel. The console display and cue speaker are attached to this cover panel, which is located immediately behind the dual fader and monitor control panels.

Each RMX*d* mainframe and the rack-mount RMX*d*8-HL come standard with a KSU assembly which has these connections:

- Four program and one send bus output – each with a dedicated analog and an AES digital output
- Analog control room outputs* – for powered monitor speakers and for the board operator and guest headphone amps
- Analog studio outputs* – for powered monitor speakers and for host and guest headphone amps
- Cue speaker plus line-level 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 or VistaMax destination
- Dedicated control room, studio, and cue/talk/external logic connectors, with three Assignable Logic I-O connectors*
- VistaMax Facet Link connectors – two RJ-45 connectors, standard; plus two optical MT-RJ connectors, optional
- Ethernet connector – bidirectional communications with the VistaMax LAN
- USB port – to connect programmable USB panels hosted by the console
- Serial Test Interface connection – 9-pin serial port for diagnostic and system maintenance

* **Note:** These connections are typically not used on the RMX*d*8-HL console.

Additional audio inputs and logic I-O can be added to the console by plugging in one or more optional 8-Input Expansion Cards into any DSP card. An Expansion card has eight stereo audio inputs (individually switch set for an analog or a digital input) which can also be individually configured for two discrete mono signals. The eight Assignable Logic I-O connectors on an Expansion card can be associated with any of the audio input signals on that same card. The audio inputs are independently routed to fader channels through session file settings. Sources can also be manually selected using channel strip source selectors. During console setup, using the VMCC app, audio inputs can be "bound" to a logic I-O connection for automatic channel logic control to/from peripheral devices or mic control panels.

8-Input Expansion cards can be added to any frame size:

- The RMXd-12 can have one card installed
- The RMXd-20 can have up to two cards installed
- The RMXd-28 can have up to three cards installed

VistaMax Control Center (VMCC)

The RMX*d* console is setup for daily use by first using the downloadable VistaMax Control Center® (VMCC) application to set the parameters for such "soft control" items as the signals assigned to the twenty-one monitor control panel source selectors; the KSU and 8-Input Expansion card Assignable logic configuration; and parameters for the audio inputs (mono vs. stereo, level trim/gain, phase reversal, etc.). All of these parameters are auto-loaded to the console by a VMCC-controlled console initialization file (INIT.MAC). Board operators can subsequently change the initial console settings, as required, by manually selecting different channel sources and changing control surface button assignments, or by taking a different session file—a pre-saved configuration file that reconfigures the entire console for different dayparts or functions.

Session Files

A new session file can be created using the console by following this process:

1. Take an existing session file (like the included `DAYPART.SES` session) to use as a template.

2. Select and take the desired input sources, if required, for each fader channel.

3. Change the channel strip button assignments (cue, mode, pan, bus assign), as required.

4. Press the **Session Save** button on the Monitor Control panel. This creates a new session file, with a suffix number added to the current session file name (e.g., `DAYPART 01.SES`). Note that this action never affects any existing session file nor can it ever overwrite any existing file.

5. Engineering would then use FTP Voyager, or other FTP client, to navigate to the console's SesFiles folder and rename the new session, as required, being sure to leave the `.SES` suffix at the end of the name. Only those file names with a `.SES` suffix will appear in the Session selector window.

A session file can also be created and/or edited using VMCC (when running on the admin computer) which will automatically update the file on the console when saved. As soon as this is done a board operator can then "dial up and take" the session file using the Monitor Control panel session selector and Take button.

For some facilities, a single customized session file may be sufficient to set up the console for all users, but it is more likely that multiple session files will need to be created in order to set the console for different dayparts or functions. For example, one console could serve split duty as a newsroom, feeding live audio to air during the day, and as a production room at night.

A session file can change any number of console settings. Therefore, once the session files have been created, edited, and saved back to the console, "dayparting" the console is as easy as selecting the desired session file and pressing the Take button. As an example, if the "morningzoo" session is currently loaded on an RMX*d*-12 console, and it has configured the console inputs with these settings:

- Five mic Inputs – each channel has the talent's name (or Guest) shown in the channel displays

- Three Telco channels – are set for two phone hybrid caller inputs plus an ISDN from a live remote

- Four line inputs – three are set for the automation system for sound FX, music beds, commercials, and so forth, with the forth for a traffic or weather service feed

To switch this same console for the midday daypart—which only needs one mic for the board operator/jock, who also takes requests, runs contests, and plays back most sources from the automation system, the new board operator would dial up and take their "midday" session, immediately reconfiguring the non-active channels on the console, which might result in these changes to the console from the morning zoo show:

- Input 1 is now the control room mic, with the jock's name shown in the channel display, if desired.

- The next four inputs are routed from the automation system for music, liners, and commercials.

- Input 6 is unchanged (it is the hybrid input) for those call-in music requests.

- The remaining Telco and input channels can be left alone or routed to silence, always remaining available for the board operator to dial up other sources as required.

To prevent any on-air signal interruptions, and to allow for seamless show transitions, any channels that are on-air (channels that are turned on when a session file is taken) will not immediately switch to the new settings. Instead, the on-air channels maintain their previous session file settings until turned off. Their On button(s) winks to indicate a new session has been taken but that channel is still using the previous session file settings. There is no time limit to how long a channel can be kept in this "pending" state. To move the channel to the next daypart settings, turn it off—it instantly updates to the new session settings.

Main Component Descriptions

This section discusses the RMX*digital* console components that a board operator sees:

● Dual Fader panels

● Monitor Control panel

● Console Display

Plus these "under cover" components:

● 48-Volt Power Supply

● KSU (Key Service Unit) card

● DSP (Digital Signal Processor) cards

● Optional 8-Input Expansion cards

Dual Fader Panels

Each Dual Fader panel (Figure 1-2) has two sets of channel controls. Each channel strip has these control functions:

● **Channel On** and **Channel Off** buttons

● **Cue On/Off** button

● Fader level control

● **Talkback** button, used to talk to callers or remotes *

● **FCN** (Function) button, used with Protected Destination signals *

● Input source selection (rotary control and **Take** button)

● Audio Mode control, with **Left**, **Right**, **Pan/Balance On/Off**, and pan pot

● **Auto F/B (Foldback) On/Off** button *

● **Bus Assignment** buttons (four program and one offline bus)

● **Send On/Off**, **Pre-Switch** & **Pre-fader Assignment**, and send level

Each 10-character display normally shows the input source name but alternate source names are shown when the yellow **Next** LED is lit while the source selector is used.

Each channel strip can control any type of audio source:

● Control room, studio, or External mic
● Line level input
● A routed signal from another device in the system
● A four-wire or Telco signal

Taking a session file initially routes the audio source for each fader. The input's source name (or an alias name) appears in the 10-character display above each fader. If no signal is routed to that fader SILENCE appears in the display.

The capacity to change the source, via the channel source selector and **Take** button, is a standard part of each channel strip. The physical audio source for each channel is "virtual" so 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*d* console. To simplify board operation, the available sources are typically limited on most channel strips by editing the session file using VMCC (or Windows Notepad).

* Controls are only active when a channel strip has a four-wire source (hybrid, ISDN, Comrex Access, etc.) routed to the channel using a Protected Destination macro

Figure 1-2. Dual Fader Panel

Monitor Control Panel

This standard panel is divided into three sections by graphic lines on the panel:

- Left section – **Session** (Figure 1-3)

- Middle section – **Control Room** (Figure 1-4)

- Right section – **Studio** (Figure 1-5)

Session Section

The **Session** section is the left third of the Monitor Control panel. The upper part of this section contains seven **Aux Meter** source selector buttons to display one of seven sources that can feed the Auxiliary Meter, which is the right-most meter in the Console Display. Here are the default source assignments for those buttons:

- Real Air (EXT)

- Send bus (SND)

- Telco record bus (TEL REC)

- Four program buses (PGM 1, PGM 2, PGM 3, PGM 4)

In the middle of the **Session** section are two 10-character displays. The top display shows the active session (**CURRENT**), while the bottom display shows alternate sessions (**NEXT**). Just below these two displays are the session controls to select, take, or save a session file:

- Rotary Session Selector – steps through all of the available session names, as shown in the **Next** display

- **Take** button – takes the **Next** session

- **Save** button – saves a new session

Below the session controls are the **Monitor Mode** buttons, which are covered in the *Control Room Section* subsection.

The bottom part of this section has five event **Timer Control** buttons that are used to manually or automatically control the Event Timer in the Console Display:

- **Auto Reset** – Allows the Event Timer to be reset by Channel On commands

- **Reset** – Resets the Event Timer to 00:00.0

- **Hold** – While held, freezes the Event Timer display, releasing returns to the elapsed time

- **Start** – Starts the Event Timer

- **Stop** – Stops the Event Timer

When the **Auto Reset** button is lit, the timer can be reset automatically when a channel is turned on. Session file entries determine which channels reset the timer.

Figure 1-3. Monitor Control Panel - Session Section

Control Room Section

The **Control Room** section, the center third of the Monitor Control panel, has monitor source selector buttons for the control room monitor and operator headphone outputs. You can select a source from among the seven buttons at the top of the center section, which typically have the same sources as set for the **Aux Meter**. The **Control Room** monitor source selector and **Take** button allows for up to 15 additional sources to be monitored. When you use the **Control Room** monitor source selector to select a source, the source name appears in the 10-character display, and all source selector buttons are turned off. Just above the monitor source name display are two level pots for setting the levels of the **Cue** speaker and the **Control Room Talkback** output.

The bottom of this section has independent **Control Room Monitor** and **Operator Head Phone** fader level controls. The selected source routes through the **Monitor Mode** controls in the **Session** section, near the top of the faders, which control whether all Control Room monitor outputs are:

- Stereo.
- Left only.
- Right only.
- Mono sum (left and right channels summed together).

The **AutoCue** button, also in the Session section of the Monitor Control panel, sets whether cue audio also goes to the board operator headphone output. When AutoCue is not lit, cue audio 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 operating modes, as set in VMCC. (This is done in the main RMX*d* console editing pane, near the bottom with a number of other check boxes.) When the VMCC option *Cue Headphone is Split* is checked, Split Cue mode is used. The monitor audio and the cue audio are separately summed to mono. Cue audio is switched into the left ear while the monitor audio sums into the right ear. When the option *Cue Headphone is Split* is not checked, Stereo Cue mode is used. In this mode the stereo cue audio replaces the monitor audio in the board operator headphones.

Figure 1-4. Monitor Control Panel — Control Room Section

Studio Section

The **Studio** Section is the right third of the Monitor Control panel. It has controls for a separate talk or voice studio. Select the monitor source for the studio, as for the control room: Press either a source selector button at the top of this section or use the monitor source selector and **Take** button to select an alternate source. The two volume pots above the **Studio** monitor source display control the level of the dedicated studio **Monitor** and **Talkback** outputs. This section also has two talkback buttons so that board operators can use their microphone to talk to the studio and/or to an external location.

Console Display

The Console Display (Figure 1-6 on page 1-7) sets just behind the operator control panels on a hinged rear cover. When the rear cover is closed, it conceals these components:

- KSU assembly
- DSP card(s)
- Eight-Input Expansion card(s)
- All of the console's audio, logic, and networking connections

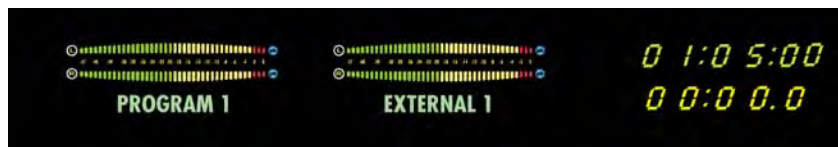**Figure 1-5. Monitor Control Panel — Studio Section**

Figure 1-6. RMX*d*-12 Console Display

The RMX*d*-12 console has two meters: the Main meter (left) always shows the **Program 1** bus; the Auxiliary Meter (right) shows sources set by using the Monitor Control panel Aux Meter source selector buttons. When Cue is active the Aux Meter shows the cue bus signal levels. RMX*d*-20 and -28 consoles have two additional meters dedicated that show the Program 1 and Program 2 bus levels. The right-hand two meters show the Program 3 bus levels and the Aux meter selection.

A time-of-day clock and an event timer are at the right end of each Console Display. The clock can be synchronized to an ESE and SMPTE master clock, or it can be operated autonomously. Three recessed buttons, adjacent to the clock and event timer, set the time when a master clock is not used. The event timer is manually controlled using the Monitor Control panel Event Timer buttons. When the Auto Reset button is lit the event timer can be automatically reset when pre-designated fader channels are turned on.

The display plugs into the KSU motherboard using a captive cable with two cables. These cables can be hot plugged (plugged in or unplugged while the console is powered and in use). A separate short 4-pin Molex pigtail cable hangs below the display so that an ESE or SMPTE master clock signal can be connected. This connector also has an event timer reset command output to auto-reset a studio-mounted event timer.

KSU Assembly

Each RMX*d* console, including the RMX*d*8-HL console, has one KSU assembly which has these features:

● Eight assignable audio inputs and eight assignable audio outputs
● Three Assignable Logic I-O connectors
● Dedicated logic connectors for
    • Control room
    • Studio
    • Cue/talk/external logic
● Eighteen dedicated analog and digital program and monitor outputs
● A VistaMax system LAN connector
● An RS-232 serial test connector
● Two "copper" RJ45 VistaMax Link connectors (Optical Facets are optional)
● One USB connector (for programmable control panels) on copper-only KSUs

The KSU assembly consists of these main elements:

● A 9G20 SBC (Single Board Computer)
● A VistaMax routing engine
● A DSP (Digital Signal Processor) for
    • Routing the eight assignable KSU inputs/outputs
    • Controlling the last four fader channels in the console
    • Summing the Program buses
    • Creating Telco (mix-minus) outputs
    • Creating and switching the monitor outputs

A KSU 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 the console and a VistaMax card frame exceeds 330 feet (100 meters), the maximum length supported by CAT6 cabling. The multi-mode fiber connection supports runs of up to 1.25 miles (2 km).

The KSU plugs into the console motherboard from the top of the chassis (Note: It CANNOT be hot-plugged). Two thumbscrews fasten it to the chassis. In normal usage, the KSU is hidden by the rear cover/Console Display. It is physically located behind the Monitor Control panel and the two adjacent Dual Fader panels, which are both hosted by the KSU.

DSP Cards

The number of DSP (Digital Signal Processor) cards installed in the mainframe depends on its size:

- RMX*d*-12 console has one DSP card
- RMX*d*-20 console has two DSP cards
- RMX*d*-28 console has three DSP cards

Each DSP card plugs into the console's motherboard from the top. The DSP cards, like the KSU assembly, CANNOT be hot-plugged. A silkscreen warning label to this effect is on each DSP card. The DSP card is fastened to the chassis using two thumbscrews. In normal operation it is hidden by the rear cover/Console Display. Each DSP card is located behind the four Dual Fader panels that it hosts.

Each DSP card can have an 8-Input Expansion card (optional) plugged into it. To indicate operational status, each DSP and 8-Input Expansion card has a "heartbeat" LED and an automation activity LED. The 8-Input Expansion cards, because they plug into the DSP card, can be hot-plugged, if required.

8-Input Expansion Cards

Each optional 8-Input Expansion card (PRE99-2665 – Figure 1-7) has eight 6-pin MOD IV audio connectors and eight 12-pin Assignable Logic connectors. The eight audio connections can have stereo or two mono signals connected to each connector. Each connector is independently set for an analog or digital audio input using the top panel **Audio Format Selection** multi-switches.

Each audio input is a VistaMax source that can be routed to any VistaMax destination, independently of how it is used on the console. The various audio inputs are typically routed to specific channels through session file settings but they can also be manually "dialed up" using the Dual Fader source selector and Take button. The assignable logic connections can be "bound" to any one of the audio inputs on the same 8-Input Expansion card. These "audio with logic" signals can then be routed to a channel or to any VistaMax destination.
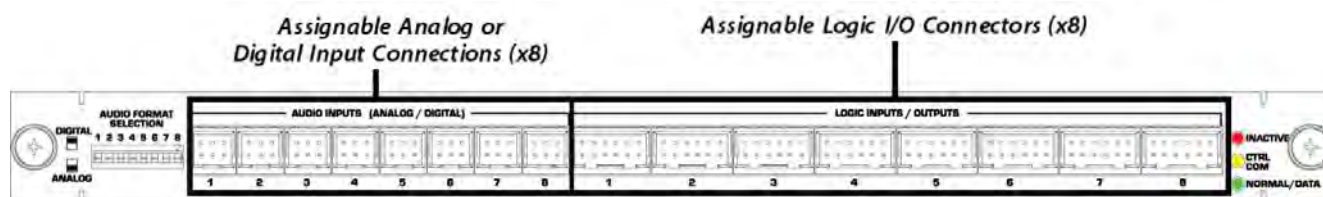
Figure 1-7. An 8-Input Expansion Card

On microphones, the Assignable logic can connect to a mic control panel that is then "bound" to that specific microphone input in VMCC to allow the talent, sitting at the mic in a studio, to be able to remotely turn their fader channel on/off using their mic control panel buttons. The console channel automatically controls the lighting of the mic panel's On and Off buttons, tracking the console channel status.

Another common use for logic is with automation systems. The audio for three or four channels of playback are "logically bound" to logic inputs so that the playback system can control the channel status while also allowing the board operator to manually start events by turning the playback fader channels on manually.

Power Supply

A separate rack mount +48 VDC power supply (PRE99-1205) comes standard with each console mainframe. The RMX*d*8-HL mixer has a built-in 48-volt supply. Both the RMX*d* mainframe and the RMX*d*8-HL mixer include an integral power coupler to add a redundant supply (optional). All supplies include an IEC input cord for USA outlets. Each supply operates from 90 to 240 VAC, on 50 Hz or 60 Hz AC systems.

Note that the console mainframe Installation Kit includes two keyed 48-volt power cables (for a main and a redundant supply). We recommend connecting and running both cables to the main power supply mounting location so that a redundant PRE99-1205 supply (optional) can easily be added in the future.

Specifications

Specifications measured on an RMX*d*-28 mainframe with 14 dual fader panels and 600 ohm loads on the analog outputs. 0 dBu = 0.775 volts RMS, regardless of circuit impedance, which equals 0 dBm into a 600 ohm circuit. Noise specs use a 22 kHz bandwidth. Add +1.7 dB of noise for a 30 kHz bandwidth. Total Harmonic Distortion (THD+N) measured at +18 dBu outs (swept signal with 22 kHz low pass filter).

FSD = Full Scale Digital, which is a signal level of 0 dBFS (digital) or +24 dBu (analog)

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*d*8-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
RMX*digital* mainframes: Height above countertop = 3.5" [90 mm] for main console meter
Depth below countertop = 9.75" [248 mm] at the rear of the frame
Front-to-back depth = 22" [559 mm]
Figure 2-1 (page 2-1) has a console side view with dimension details.

RMX*d*-12 = 27.4" [696 mm] wide
RMX*d*-20 = 40.2" [1021 mm] wide
RMX*d*-28 = 53.0" [1346 mm] wide

All dimensions = Height x Width x Depth:

RMXd8-HL (Rack mounted mixer):
    2 RU: 3.5" [89 mm] x 19" [483 mm] x 10" [254 mm]
48 Volt Power Supply (Rack mounted):
    2 RU: 3.5" [89 mm] x 19" [483 mm] x 10" [254 mm]

GatesAir reserves the right to change specifications without notice or obligation.

Warranty

The RMX*digital* console and the 48-volt power supply carry a standard manufacturer's warranty of **15 months** from the ***date of shipment*** of the device from GatesAir. To view or download the current GatesAir Standard Warranty Policy Statement, for either domestic or international locations, visit this GatesAir web page: http://www.gatesair.com/services/technical-support/warranties.aspx.

Chapter 2 – Installation

The RMX*digital* mainframe requires a cutout (Figures 2-1 and 2-2) in the furniture countertop. The console card cage, which extends below the rear cover, is normally concealed within the studio cabinetry but can also simply hang down below the countertop just above a cable tray. The console's overall height above the countertop is only 2 inches [50.8 millimeters] except for the console display, mounted to the rear cover, which extends about 3.5 inches [90 millimeters] above the countertop.
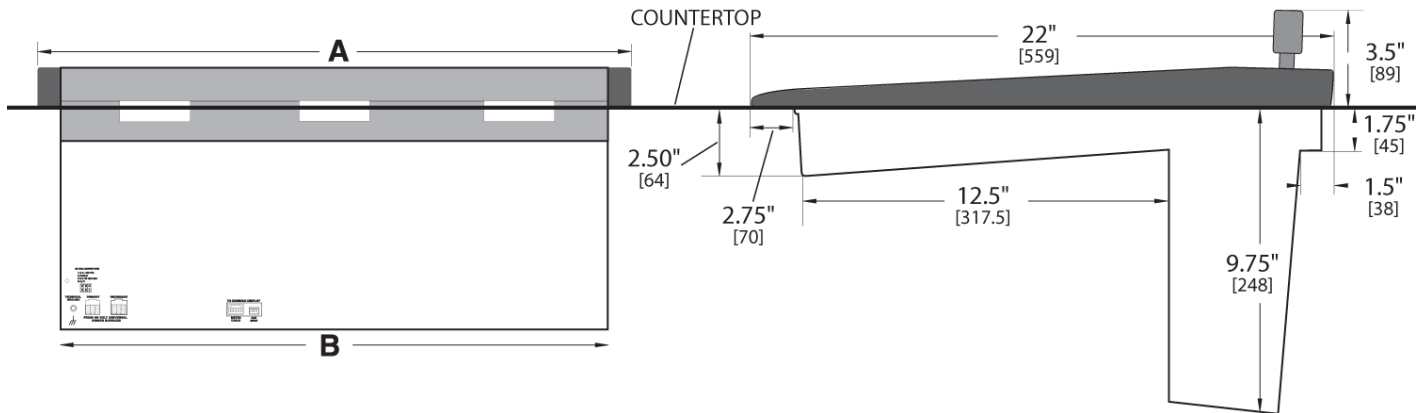
Figure 2-1. Back and Side Views of Console with Dimensions
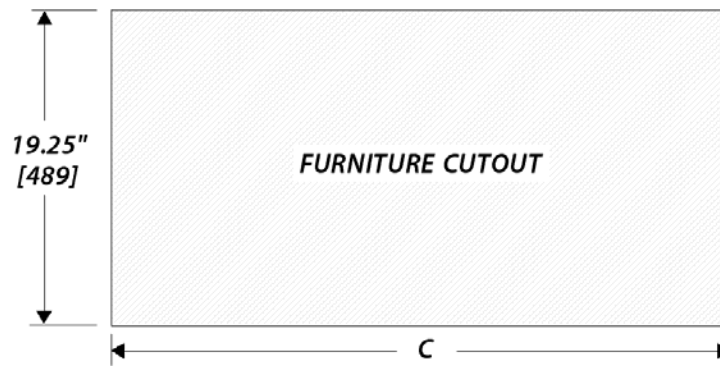
Figure 2-2. Furniture Cutout

Table 2-1 gives frame sizes and cutout dimensions.

Table 2-1. Dimension Table

Mainframe	A	B	C
RMX*d*-12	27.4" [696 mm]	26.1" [662 mm]	26.25" [668 mm]
RMX*d*-20	40.2" [1021 mm]	38.9" [987 mm]	39.25" [993 mm]
RMX*d*-28	53.0" [1346 mm]	51.7" [1312 mm]	52.0" [1320 mm]

All dimensional tolerances are: +¼" [6.4 mm], –0" [0.0 mm].

Typical setback from countertop edge to the front of the console: 6" [152 mm] to 12" [305 mm].

Your RMX*digital* console shipment contains these items:

● 12, 20, or 28 input slot standard mainframe, with
  • Integral Console Display
  • Monitor Control panel
  • KSU Assembly
  • DSP cards
  • Optional items, as ordered:
    ◦ Universal Dual Fader Panels
    ◦ Blank Panels
    ◦ 8-Input Expansion cards
● 2RU rack mount 48-volt power supply
● Installation and tool kits:
  • AMP MOD IV connector housings and receptacle contacts
  • Crimp and contact removal tools
  • Hex driver
  • Removable clear lenses
  • Clear insert sheet
● Two +48 VDC power cables (15 feet in length)

Console Installation

To facilitate console installation, logic wiring diagrams for specific peripheral equipment are available from GatesAir Technical Support: 217-222-8200 or tsupport@harris.com.

Note: When installing the console, 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*d* console and neighboring equipment. Route all audio cables to achieve the maximum practical distance from all AC power mains wiring.

Connect a Technical Ground wire to the console chassis (a threaded insert is provided on the rear chassis for this connection). This protects the console electronics from being adversely affected by board operator-induced ESD (electro-static discharges) into the control panels.

GatesAir recommends using antistatic flooring material in the control room and that the chair provided for the board operators is conductive to this flooring, either through its material or by incorporating a ground strap to dissipate static charges. See the GatesAir Application Note **AN07-10 ESD Protection for Radio Studios** for more procedures to protect electronics from ESD.

Frame Configuration

The board operators will use two types of control panels in the RMX*d* console:

● Dual Fader Panels
● Monitor Control Panel

Each Dual Fader panel is two input slots wide. The Monitor Control panel is three slots wide. Figure 2-3 on the next page shows the panels' physical positions. Most control panels can be positioned up to two slots from their standard slot designations (limited by the reach of their red power and signal connecting cable). Any combination of these accessory panels can be installed in lieu of one or more Dual Fader panels across the console:

● Single or Dual Width blank panels
● Single or Dual Width Divider Kits to hold multiple turret-size control panels, intercom panels, etc.
● Custom panels, like a Telos drop-in control panel

Contact your GatesAir sales representative for the available RMX*digital* options.
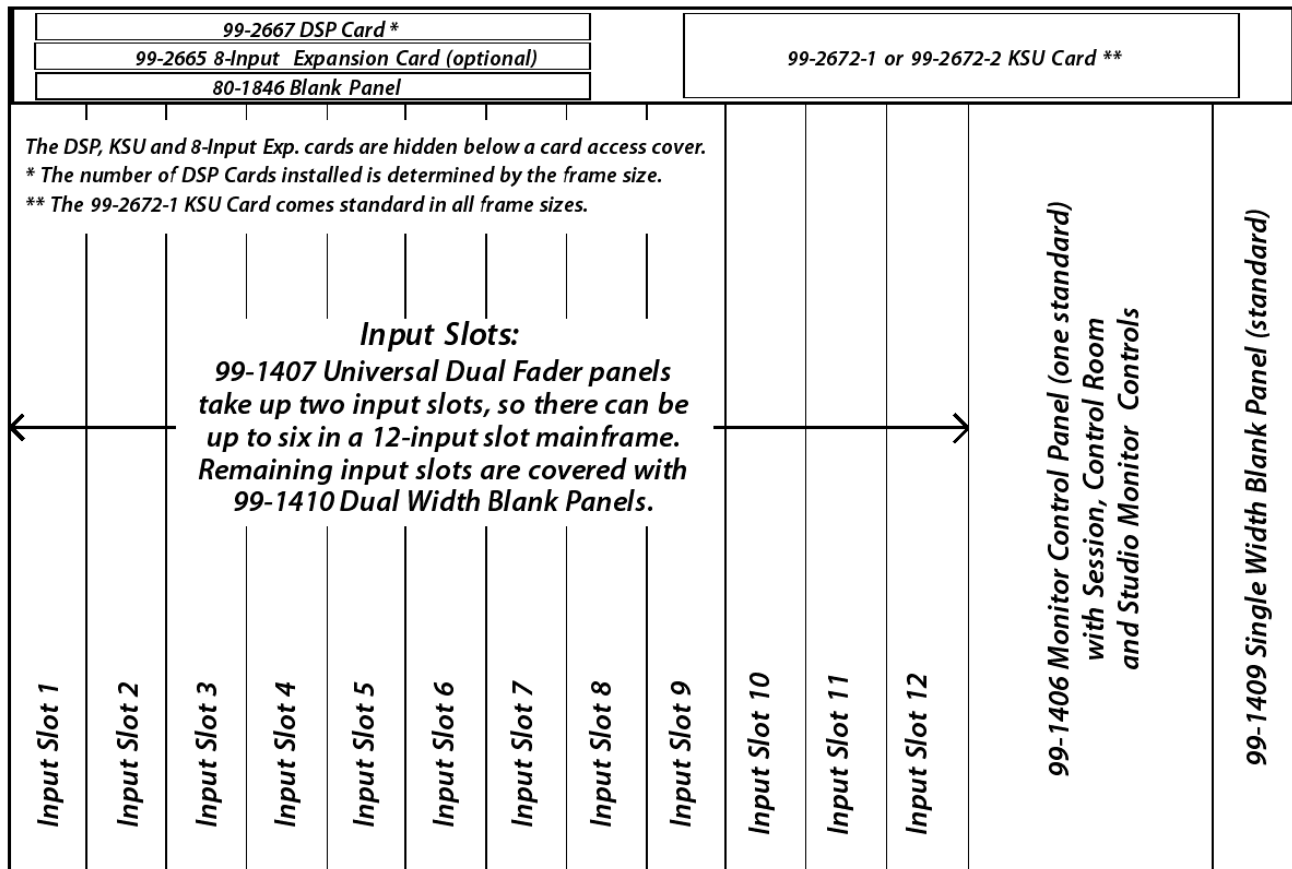
99-2667 DSP Card *	99-2672-1 or 99-2672-2 KSU Card **
99-2665 8-Input Expansion Card (optional)	
80-1846 Blank Panel	

The DSP, KSU and 8-Input Exp. cards are hidden below a card access cover.
* The number of DSP Cards installed is determined by the frame size.
** The 99-2672-1 KSU Card comes standard in all frame sizes.

Input Slots:
99-1407 Universal Dual Fader panels take up two input slots, so there can be up to six in a 12-input slot mainframe. Remaining input slots are covered with 99-1410 Dual Width Blank Panels.

Input Slot 1 | Input Slot 2 | Input Slot 3 | Input Slot 4 | Input Slot 5 | Input Slot 6 | Input Slot 7 | Input Slot 8 | Input Slot 9 | Input Slot 10 | Input Slot 11 | Input Slot 12

99-1406 Monitor Control Panel (one standard) with Session, Control Room and Studio Monitor Controls

99-1409 Single Width Blank Panel (standard)

Figure 2-3. RMX*d*-12 Frame Configuration

Notes: The number of input slots equals the console model number. (For example, the RMX*d*-20 console has 20 input slots.) All RMX*d* mainframes have one KSU card with a DSP to sum the various Program buses. It also hosts the last four input slots—the two right-most Dual Fader panels—in addition to hosting four special-purpose "phantom channels." Each DSP card controls eight input slots, connecting to four Dual Fader panels. Therefore, the RMX*d*-12 console has one DSP card; the RMX*d*-20 console has two DSP cards; and the RMX*d*-28 console has three DSP cards.

An RMX*d* Divider Kit allows standard six-inch GatesAir Studio Accessory Panels to be installed anywhere across the mainframe. Two kits are available: **PRE99-1411-1** is one input slot wide and can hold one or two single-width accessory panels; **PRE99-1411-2** is two input slots wide to hold up to four single-width panels, or two single-width and one dual-width panel. A Divider kit can be installed into any slot location. Dual Fader panels or the Monitor Control panel can be moved left or right one or two slots to accommodate installing a divider kit. Figure 1-1 (page 1-1) shows a console with two dual-width Divider kits installed at either end of the mainframe. These hold multiple single-width selector panels and a dual-width Intercom Audio Expansion panel. Blank accessory panels **PRE99-1714-3** (1.6" x 6") or **PRE99-1740-3** (3.2" x 6") cover unused accessory panel openings when using a divider kit.

Channel Configuration

Each Dual Fader panel's audio source and channel assignment settings are initially established by taking a session, a console configuration file that sets up the console for a specific daypart (such as a morning show, syndicated satellite show, or afternoon drive program) or for a specific room function (such as on-air studio, commercial production, or voice tracking). A session can perform these tasks:

- Route a specific audio source to each fader channel or just leave the existing source on the fader channel
- Route up to 64 sources to local and/or network destinations
- Assign or un-assign any channel strip button assignments on any fader channel
- Set the alternate sources that are available to be taken on any fader channel

- Lock out any channel strip buttons from being changed by the board operator
- Turn specific fader channels on or off when the session is taken
- Display an alias name for any source

Some users may find only one session file is needed to use the console, while others may want to set up two to dozens of sessions to configure the console for each different daypart or function.

Each Dual Fader channel is operated in one of two general modes:

- As a Universal channel, used for Mic/Line control channels
- As a Telco channel, used with four-wire devices

Most of the fader channels will be set as Universal channels, which is the default setting for the console as it ships from the factory. These channels can have any mic or line input signal routed to them, but the fader channel's operations are subtly affected by the selected source signal. For example, when a mic is the source its Room Code will be detected so that the correct monitor output is muted and a hot mic warning logic is triggered when that channel is turned on. But, when the source on that same fader is a peripheral device, such as a CD player, then turning that fader channel on does not mute any monitor outputs nor cause any warning logic to be triggered.

There are two types of Telco channels, each has a specific mix-minus output, with IFB on one channel and a clean feed on a second channel: Dedicated Telco channels and Virtual Telco channels. Up to six fader channels in the console can be uniquely identified, as Dedicated Telco 1 through Telco 6, by setting a rear panel switch (the procedure is outlined in the next subsection). These Telco fader channels are usually identified by lit Talkback buttons and by a "winking" bus assignment button, which indicates which bus is being fed to that Telco's mix-minus output.

Note: When the RMX*d* console is running 600-series or later operating code Telco functionality changed substantially from previous generation consoles in order to support the RMX*engine* (**PRE99-1538**), an optional 1RU device that links to Facet 1 on the KSU. The RMX*engine* creates a subtractive mix-minus signal for up to 24 fader channels in the console to allow for more than six mix-minuses to be active at any one time. Any DSP-hosted Universal fader channel can then become a Virtual Telco channel by using a Protected Destination Mix-Minus Extended macro (PDest MME) to route a source to the channel and to route the channel's extended mix-minus audio to a protected destination. The PDest macro lights the Talkback button to indicate it's now a Virtual Telco channel. When an RMX*engine* is connected to a console the DSP-hosted fader channels should be left set as Universal channels.

The last four faders in the console (adjacent to the monitor control panel) are hosted by the KSU. Any of these four channels can still be set as a dedicated Telco channel since these four channels are not included in the list of Virtual Telco channels addressed by the RMX*engine*.

An RMX*d* console running 600-series or later code, without an RMX*engine* connected, can still have any DSP-hosted fader channel set as one of the six Dedicated Telco channels. There is a slight difference in operation in that the Talkback button on a DSP-hosted Dedicated Telco channel does not automatically light up. It is only when a Protected Destination Mix-Minus (PDest MM) macro routes a Telco source to that fader channel that the Talkback button lights up. Then, when a non-protected destination signal is routed to that channel, the Talkback button turns off. Note that one bus assignment button will continue to wink to indicate that the fader is still set as one of the six possible Dedicated Telco faders.

Dual Fader Panel Rotary Switch Settings

There are two rotary switches on the back of each Dual Fader panel. The upper switch affects the left fader channel strip. The lower switch affects the right fader channel strip. When the rotary switch is set to 0, the default setting, that fader channel strip is set as a Universal channel. When the rotary switch is set to 1 up to 6, then that fader channel strip is set as a Dedicated Telco fader (known as Telco 1 through Telco 6).

The last rotary switch setting, 7, sets that fader to be the console's talk audio source when a control room mic is routed to the fader. Routing a different source (a line input, studio mic, or an external mic) to that fader will not set it as a talk audio source. Typically, the left-most fader in the console is dedicated for the board operator's mic. As such, its rotary switch is typically set to 7 so that only the board operator's mic is

used for talkback, when pressing the Talk to Studio, Talk to External, and/or any lit Telco channel Talkback buttons. If a producer also needs to talk back, and that producer's mic is set as a control room mic, then also set their fader channel to 7.

If complete flexibility is desired then multiple channels—any except Dedicated Telco channels—could be set to 7, although the background room noise goes up substantially if multiple control room mics are simultaneously feeding the talk bus.

The Dedicated Telco channels are typically grouped together next to the Monitor Control panel, although any fader can be set as a Dedicated Telco fader. For ease of configuration and system troubleshooting, it is also best to assign them in numeric order, from left to right across the console, so it's easy to identify which fader is Telco 1, Telco 2, and so on. The Talkback button lenses are removable so that a label and a clear lens can be used to label the dedicated Telco faders as Telco 1, Telco 2, and so on.

To set the Dual Fader Panel rotary switches, perform these steps:

1. Remove the Dual Fader panels that need to have their rotary switches changed from the default 0 settings. (See the *Control Panel Removal* subsection in Chapter 5 – Service for instructions on removing panels.) The console power can be left on while unplugging and reconnecting the Dual Fader panels.

2. Unplug the red cable from the panel. Adjacent to the cable connector are two rotary switches (Figure 2-4). The rotary switches are labeled 0 – 7 with an arrow indicating the selected number. The upper switch affects the left channel strip. The lower switch affects the right channel strip. When a channel strip is not a Telco channel or a possible CR talk source, the switch should be set to 0.
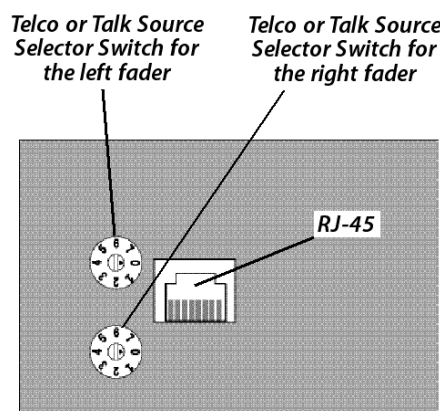

Figure 2-4. Dual Fader Panel, Bottom View

3. Change the rotary switch as required, with the switch position matching the Telco number, for Telco 1–6, in this manner:

    • Set to position 1 sets that channel strip as Telco 1
    • Set to position 2 sets that channel strip as Telco 2
      and continue all the way to Position 6 for Telco 6.

4. Change the rotary switch to position 7 to allow that channel strip's source to be the talk source when a control room mic is its source.

5. Once the Dual Fader panel's rotary switches are set, plug the red cable back into the RJ45 connector, and refasten the panel to the mainframe.

6. When any of the four KSU-hosted fader panels are set as Telco channels, their Talkback buttons will light up. When a DSP-hosted fader panel is set as a Telco channel the Talkback button will not light until a Protected Destination signal is routed to the channel. One bus assignment button will be winking to indicate it is set as a Dedicated Telco channel.

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

Note: Changing the rotary switches to add new Telco channels changes the console's card inventory. Therefore, adding a new Telco channel, after the RMX*d* console has been in use for a while, may cause the session files to no longer properly address all of the fader channels. To correct this issue,

take an existing session file then immediately press the Save Session button to create a new session with an updated Mapping section that also adds in the new Telco channel entries. This new session file can then be edited or renamed using FTP Voyager or the VMCC Session Editor.

Console Display

A low-profile Dual or Quad Meter console display (Figure 2-5) is mounted to the card access cover, centered behind the dual fader and monitor control panels.
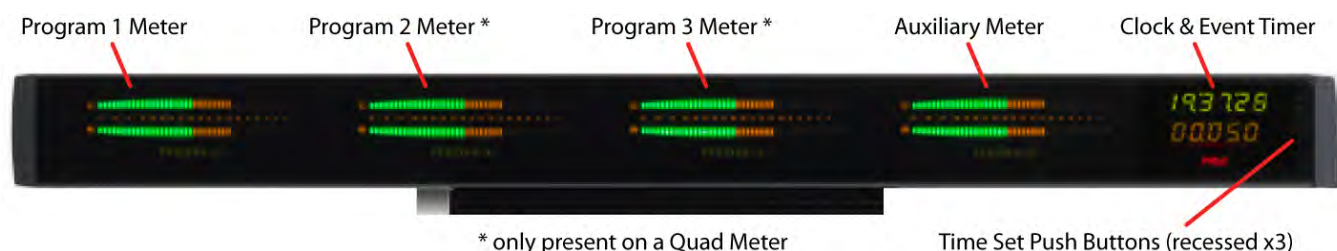

Figure 2-5. Console Display

The console display has three captive cables:

●   A ribbon cable carries power, the meter signals, meter names, and event timer control
●   A cue speaker cable carries the cue audio
●   An adapter cable allows easy connection of a master clock signal and/or studio-mounted event timer

All three cables are "hot-pluggable". The ribbon and cue speaker plug into keyed connectors on the back of the console mainframe. The adapter cable hangs below the card access cover so an ESE or SMPTE master clock signal and/or a timer reset cable (for a studio-mounted event timer) can be connected.

RMX*d*-12 consoles have a Dual Meter display with two horizontal stereo bar graph meters: Program 1 and Auxiliary. RMX*d*-20 and RMX*d*-28 consoles have Quad Meter displays, with four stereo bar graph meters: Program 1, Program 2, Program 3, and Auxiliary. Below each meter is a 10-character alphanumeric display to identify the signal. Each console display also has a time-of-day clock and a count-up event timer.

The leftmost meter is dedicated to display the Program 1 bus levels. On a quad meter, the two middle meters are dedicated to display the Program 2 and Program 3 bus levels. The rightmost meter (Auxiliary) is flexible, in that it can show the Program 4 bus levels or six other signals, as selected by the seven **Aux Meter** buttons on the Monitor Control panel. The meter also shows the Cue bus levels while cue is active.

Various parameters are set using multi-switches inside the console display. These switches control:

●   Meter display mode (average and peak levels or average level only)
●   Blue peak LED turn on level (-6, -4, -2, 0 dBFS)
●   Various clock and timer settings

To change any setting requires removing the rear cover of the console display.

The time-of-day clock runs in autonomous mode by default. Three recessed time-set buttons, on the front of the console display, slow the time to be set. The clock can display 12-hour time (default setting) or 24-hour time while run in autonomous mode.

The adapter cable, with a four-pin male Molex connector, hangs below the console display. Mating housing and female crimp terminals allow an ESE or SMPTE master clock signal to be connected to synchronize the clock time. See the *ESE Cable* subsection in Chapter 6 – Accessories for details on master clock connection. You can also synchronize a studio event timer to the console event timer using the same four-pin Molex connector.

The console event timer is controlled

●   Manually, through buttons on the Monitor Control panel
●   Automatically, through Channel On Timer reset commands, when the Auto Reset button is lit

Setting the Time

From the factory the clock is set to run in autonomous mode. A quartz crystal oscillator controls the clock timing. After applying power to the console, the clock time must be adjusted manually (Figure 2-6) to a time reference. Use a nonconductive tool, such as a wooden swab or a toothpick, to press the three recessed time-set switches to the right of the clock and event timer.

Figure 2-6. Manual Time Setting

● Press or press/hold the **Hours Adjust** button to change the hour display to the current hour.

● Press or press/hold the **Minutes Adjust** button to change the minutes to be slightly ahead of the time reference.

● Press/hold the **Hold Time Display** button to freeze the time. Release the button to synchronize the clock to the time reference.

Note: When ESE or SMPTE slave mode is selected, but the clock is not receiving a valid ESE or SMPTE signal, the clock reverts to its internal oscillator. Both clock colons rapidly flash to indicate that ESE or SMPTE time code is not being detected.

Setting the Console Display's Multi-Switches

Remove the rear cover from the console display (two black Phillips screws on a dual meter, three on a quad meter) to access the multi-switches that set the operating parameters for the meters, clock, and event timer. The RMX*d*-12 dual display has one circuit board (meter-clock-timer board). The RMX*d*-20 and RMX*d*-28 quad displays have two boards: the meter-clock-timer board and a two-meter expansion board.

Note: While these settings can be changed with console power applied, do not touch any components on the circuit boards, other than the multi-switches shown in this Chapter.

Clock Parameter Settings

The clock has four operating modes: autonomous 12-hour (default); autonomous 24-hour; ESE slave; SMPTE slave. The active mode is set using multi-switch DS4 on the meters-clock-timer board. Use these guidelines to set the clock:

● When the clock will not be synchronized to a master clock, and it should show 12-hour time, the standard USA display, no changes are required; leave all switches set OFF, the default setting.

● To display 24-hour or military time, in autonomous mode only, set switch 4 ON.

● To synchronize the clock to an ESE master clock, set switch 2 ON.

● To synchronize the clock to a SMPTE master clock, set switch 5 ON.

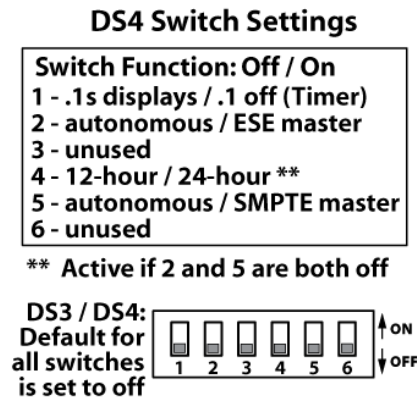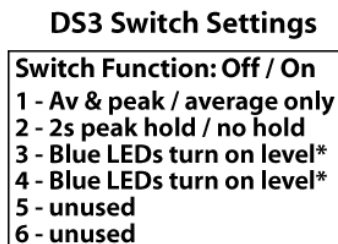Figure 2-7 on the next page summarizes the DS4 switch settings.

DS4 Switch Settings

Switch Function: Off / On
1 - .1s displays / .1 off (Timer)
2 - autonomous / ESE master
3 - unused
4 - 12-hour / 24-hour **
5 - autonomous / SMPTE master
6 - unused

** Active if 2 and 5 are both off

DS3 / DS4:
Default for
all switches
is set to off

Figure 2-7. Clock and Event Timer Switch Settings

Event Timer

The count-up event timer shows elapsed time in minutes, seconds, and tenths of a second. Its only setting is whether or not to show the tenths of a second digit (00:00.1) while the timer is running. The tenths of a second is always shown when the timer is stopped or is being held (the **Hold** button is depressed). To not show the digit while the event timer is running set multi-switch DS4, switch 1 ON.

Meter Displays

On a dual meter display, multi-switch DS3 (Figure 2-8), on the meter-clock-timer board, sets the parameters for the Program 1 and Auxiliary meters. On a quad meter display, the DS3 switches on the meter-clock-timer board affect the Program 3 and Auxiliary meters. The DS3 multi-switches on the two-meter expansion board affect the Program 1 and Program 2 meters. Typically, on a quad meter, the two DS3 switches would be set the same so all four meters use the same settings.

DS3 Switch Settings

Switch Function: Off / On
1 - Av & peak / average only
2 - 2s peak hold / no hold
3 - Blue LEDs turn on level*
4 - Blue LEDs turn on level*
5 - unused
6 - unused

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

Figure 2-8. Meter Switch Settings

Setting the meter parameters on the DS3 multi-switches:

● Switch 1 selects the meter display mode: average and peak levels (default, set OFF) or display average levels only (set ON).

● Switch 2 sets how the peaks LEDs are displayed. Set OFF (default) the peak LEDs are held for three seconds. When set ON the peak LEDs begin to decay immediately and are not held.

● Switches 3 & 4 set where the blue Peak LEDs turn on. Both set OFF (default) turn the blue LEDs on at −6 dBFS. Set 3 ON and 4 OFF to turn the blue LEDs on at -4 dBFS. Set 3 OFF and 4 ON to turn the blue LEDs on at -2 dBFS. Set both 3 and 4 ON to turn the blue LEDs on at 0 dBFS.

● Switches 5 and 6 are not active.

Power Supply

The 48-volt Power Supply (99-1205) requires 2 RU of rack space within the control room furniture, typically below and to the left or right of the console. The supply must be installed such that the keyed 15-foot DC supply cable (90-1858-1) is not under any tension when connected to the console. The cable connects the *primary* connector on the mainframe's rear panel to the 5-pin connector on the power supply (Figure 2-9). For on-air room operation, a second 99-1205 supply can be added as a redundant supply since the console has an integral power coupler. The second supply goes to the *redundant* connector using the second DC power cable supplied with the console mainframe.
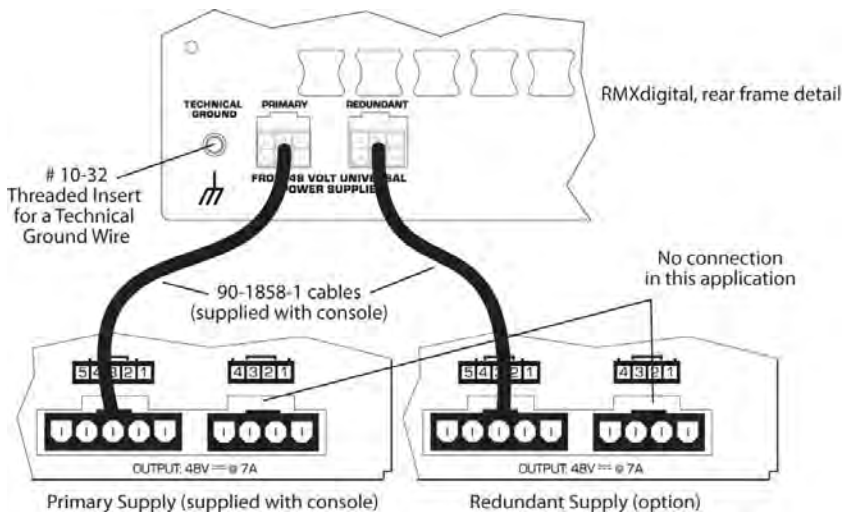
**Figure 2-9. 99-1205
Power Supply
Connection Detail**

⚠ **Note:** *DC Grounding* – Do not connect the audio or logic ground wiring to the chassis of the power supply.

⚡ **Note:** *AC Grounding* – Do not defeat the power cord "U" safety ground in any way. Doing so can create a potentially dangerous condition to the operator.

Grounding and Shielding

Follow these grounding and cable shielding guidelines:

● Connect the broadcast facility's technical ground to the RMX*d* 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.

⚠ **Note:** *Grounding* – The Power Supply chassis connects to the AC mains safety or "U" ground wire.

Note: *Audio Ground Noise* – 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 wire way as an AC power line.

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 each connecting cable. List each connection in a master facility wiring logbook to facilitate:

● Wiring installation
● Any future system wiring changes
● Equipment updates
● System troubleshooting

The *Connection Quick Guides* in this Chapter give information on each audio and logic connection. Figure 2-24 shows block diagrams for all logic interface types.

Connector Access

All audio and logic connections are made using plug-in AMP MOD IV connectors. In normal operation, these connectors are concealed below the card access cover that extends across the console behind the user control panels. The console display mounts to the card access cover.

To access the connectors, open the card access cover by either lifting from the front or by pressing the top of the console display toward the console rear. The card access cover hinges open at the rear on two dowel pins attached to the side panels.

The card access cover and console display can be completely removed to facilitate wiring. Before removing the card access cover, unplug the console display cables—meter, cue speaker, and ESE/SMPTE adapter. Rotate the card access cover until it is vertical then lift straight up and off the two dowel pins.

To reinstall the card access cover, hold the cover in a vertical orientation and set it onto the two dowel pins. Route the meter cables out the access opening to the rear of the mainframe (the ESE/SMPTE adapter cable just hangs below the cover) then rotate the cover forward to close. Plug the meter and cue speaker cables back into the motherboard.

Required Cables and Wiring

These types of cable and wire are typically required:

● Balanced analog audio connections use two-conductor, stranded, insulated, and shielded cable using a separate shield drain wire (equivalent to Belden 8451, 9451 or 8761). Many facilities alternately use stranded UTP (unshielded twisted pair) cable (equivalent to Gepco IP222BA7) with good success.

● AES/EBU connections use 110 ohm two-conductor, stranded, insulated, foil-shield cable containing a separate shield drain wire (equivalent to Belden 1800A). In most cases stranded UTP (unshielded twisted pair) cable (equivalent to Gepco IP222BA7) will work fine for these signals as well.

● Logic control cables use 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. Cables with five or eight wires are the most often used for logic cables even though there may be twelve or fourteen pins on a logic connector, only a handful are typically connected for any given application. Stranded Category cable (CAT5 or CAT6), with its eight wires, can also be used for logic wiring. We do not recommend using solid Category cable for an audio or logic wiring application.

● One CAT6 crossover cable connects KSU Facet 0 to a VistaMax system Hub card Facet (only required for a networked installation).

● One CAT6 straight-thru cable connects the KSU Ethernet jack to a laptop computer (for a stand-alone installation) or to the VistaMax system LAN switch (in a networked installation).

Wire Preparation

All RMX*d* audio and logic wiring terminates in AMP MOD IV receptacle contacts at the console. You can use stranded wires of 22 to 26 AWG with insulation diameters of .040 to .060 inch with the AMP MOD IV receptacle contacts. To prepare audio wire, follow these steps:

1. Strip the cable insulation jacket and foil shield back a minimum of 1.5 inches [38.10 millimeters].

2. Remove the foil shield and sleeve the drain wire with 20 AWG Teflon sleeving. Leave 0.14 inch [3.57 millimeters] of the drain wire exposed.

3. Cover the cut end of the jacket with 0.75 inch [19.05 millimeters] of heat-shrink tubing (Figure 2-10). Shrink this tubing, centered on the jacket cut end, to hold the drain wire sleeving in place.
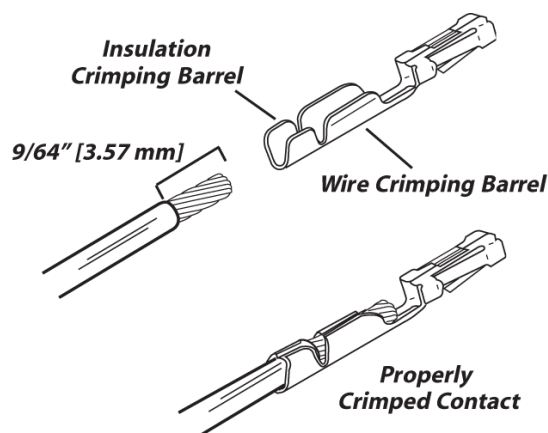

Figure 2-10. AMP MOD IV Contact Crimp Detail

4. Strip the signal wire insulation back 0.14 inch [3.57 millimeters].

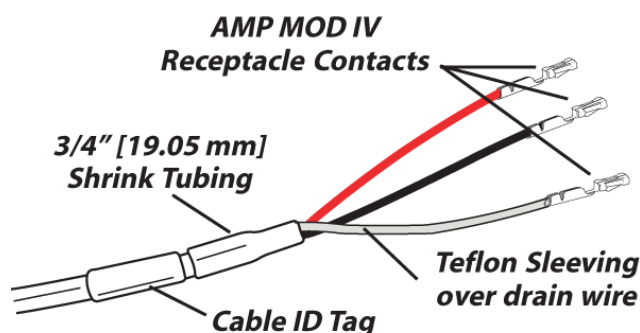5. Crimp the receptacle contact onto the wire and insulation (Figure 2-11).

Figure 2-11. Audio Wire Ready for Insertion into an AMP MOD IV Connector Housing

Note: ***Audio Cable Shielding*** – 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 foil shield.

Fabricate logic control cables and stranded UTP cables in a similar manner to the shielded audio wiring, just skip step 2 (and step 3 would be optional). On logic cables, stripping the jacket back an additional inch or two will make it a lot easier to insert the crimped contacts into the larger logic connector housings.

Crimp Tool Operation

Your console shipment included a ratcheting AMP crimp tool with contact holder (Figure 2-12).
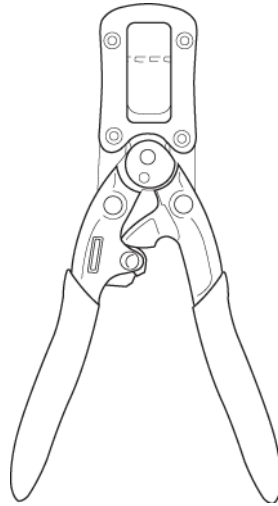

Figure 2-12. Ratcheting AMP Crimp Tool

This tool crimps both the insulation and wire barrels on the AMP MOD IV receptacle contact in one crimp. To use the ratcheting crimp tool, perform these steps:

1. Insert the receptacle contact into the contact holder with the barrel openings up. Typically the middle holder is used (for 20–24 AWG wire).

2. Flip the holder up so it magnetically latches to the crimp tool. The end of the insulation barrel should lie about 2 mm from the end of the die.

3. Close the tool one click so the anvil holds the contact in place (Figure 2-13).
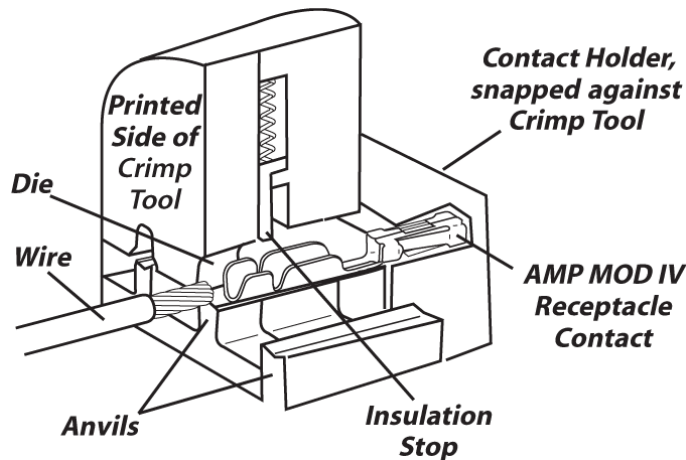
Figure 2-13. Crimp Tool – Cutaway View

4. Insert the prepped wire into the contact until the insulation hits the tool's wire stop.

5. 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.

Once the contact has been crimped, insert and lock the contact receptacle into the appropriate connector housing (Figure 2-14) using the audio pin assignment diagrams (Figure 2-15) and logic pin assignment diagrams (Figure 2-20).

Figure 2-14. Receptacle Contact Insertion & Removal Detail

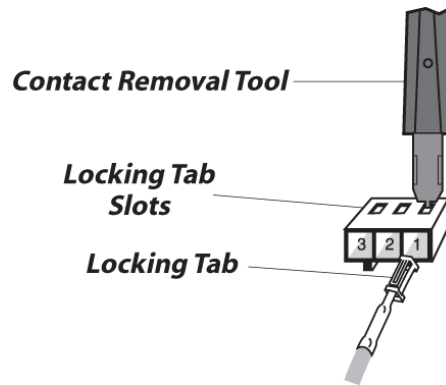Insert the receptacle contact into the MOD IV housing with its locking tab side toward the locking tab slots on the side of the connector housing. A slight click will be heard when the contact's locking tab springs up into the locking tab slot.

If a contact does not latch properly, it typically means the locking tab not open enough. The locking tab can be opened up using the 70-129 Contact Removal Tool included in the 76-1401 tool kit. This tool has two "ramps" on each edge of the tool. Push the ramp under a locking tab to open it up so that it will then properly latch into the locking tab slot.

The Contact Removal tool is also used to remove a latched contact from a MOD IV housing. Insert the tool's tip into the locking tab slot to press the locking tab down then lightly pull the wire to remove the contact from the housing.

Audio Connections

Balanced analog and digital audio wiring take advantage of the three-pins-per-row design of the AMP MOD IV housings. Digital signals use three-pin housings. Analog signals use six-pin housings (Figure 2-15). All audio wiring uses this orientation:

● The audio shields (an optional connection in most modern wiring) connect to pin 1 and pin 4.

● The audio low (-) wires connect to the middle pins (pin 2 and pin 5).

● The audio high (+) wires connect to pin 3 and pin 6.

Three-pin Digital Connector   **Six-pin Analog Connector**

Pin numbering, wire insertion end view, as oriented to plug into the KSU connectors

Figure 2-15. Audio Connectors

Analog Connections

There are no analog inter-stage patch points in the RMX*d* console. To use the console with a patch bay, connect line level analog outputs from the peripheral devices directly to the patch bay, and then normal these signals to the appropriate analog inputs. Likewise, you may route the RMX*d* console's analog outputs through a patch bay normalled to standard peripherals, such as analog on-air processing gear, recorders, or telephone hybrids.

Each analog input is designed for a balanced line level (+4 dBu) signal, but any individual input can be level trimmed, in the VistaMax Control Center (VMCC) application, by up to +/-15 dB to allow unbalanced -10 dBV

devices to be directly connected to the console. Analog inputs from mono sources, such as mic processors or hybrids, can connect two signals onto one six-pin connector to maximize input connector usage. VMCC settings identify the signals as two mono signals rather than one stereo linked signal. Note that all mics must be separately pre-amplified and/or processed before connecting to the console's inputs.

Typically, the only connection that requires a shielded connection are the console monitor outputs, which most often connect to powered monitor speakers. Using a UTP cable is not recommended for this application.

Tables 2-1 and 2-2 detail the terminal assignments for the six-pin MOD IV housing for one stereo connection and for two mono analog audio connections.

<div style="display:flex; justify-content:space-between;">

Table 2-1. Line Input or Output, Stereo Analog Audio Connections

PIN	SIGNAL NAME
1	Shield, Left Channel
2	Left Channel Low (-)
3	Left Channel High (+)
4	Shield, Right Channel
5	Right Channel Low (-)
6	Right Channel High (+)

Table 2-2. Line Input or Output, Two Mono Analog Connections

PIN	SIGNAL NAME
1	Shield, Signal 1
2	Signal 1 Low (-)
3	Signal 1 High (+)
4	Shield, Signal 2
5	Signal 2 Low (-)
6	Signal 2 High (+)

</div>

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 to the console's internal sample rate of 48 kHz. In most cases, digital inputs will also accept unbalanced S/PDIF signals. See the *Unbalanced Connections* subsection for S/PDIF connection details.

Each digital output is an AES-3 compatible signal. AES-3 outputs cannot connect directly to S/PDIF inputs but instead require a signal translation interface. Table 2-3 gives the AES/EBU digital pin assignments.

Table 2-3. AES/EBU Digital Inputs and Outputs

PIN	SIGNAL NAME
1	Shield, ties to chassis
2	AES Signal Low (-)
3	AES Signal High (+)

Unbalanced Connections

Although analog inputs and outputs are active and balanced, unbalanced consumer or "semipro" equipment can be directly connected to the console. For long cable runs we recommend connecting an unbalanced device through an IHF-PRO match box to keep the unbalanced cable lengths as short as possible. If a match box is not available, and the cable lengths are under twenty-five feet or so, an unbalanced device can be directly connected to an RMX*d* input following Figure 2-16 on page 2-15.
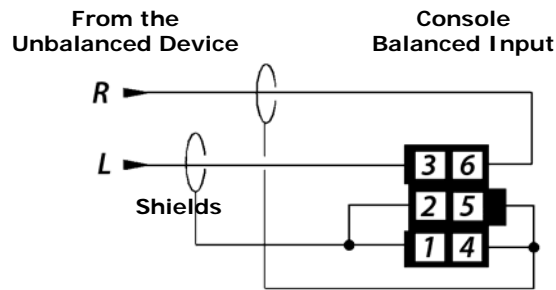
From the
Unbalanced Device

Console
Balanced Input

Figure 2-16. Unbalanced Stereo Device Connecting to an RMX*d* Analog Input

When an RMX*d* active balanced analog output must connect to an unbalanced device, 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 be left floating when connecting an RMX*d* output to an unbalanced input following Figure 2-17.
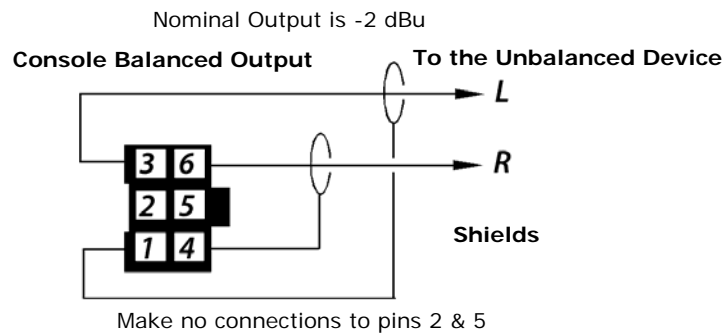
Nominal Output is -2 dBu

Console Balanced Output   **To the Unbalanced Device**

Make no connections to pins 2 & 5

Figure 2-17. RMX*d* Analog Output Connected to an Unbalanced Stereo Device

S/PDIF Signals

Devices with only an S/PDIF digital output can usually be connected directly to an RMX*d* input. With a long cable run a 249 ohm termination resistor may be needed to impedance match the 75 ohm S/PDIF cable impedance. Install the resistor on the AMP MOD IV connector at the console end, per Figure 2-18. For shorter cable lengths the termination resistor is typically not required.

From S/PDIF Device   **Console AES/EBU Input**

Signal

Shield

249 ohm resistor
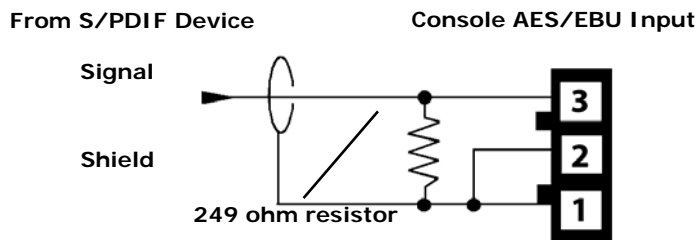
Figure 2-18. Connecting an S/PDIF Device to an RMX*digital* AES/EBU Input

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

Notes: You must use a signal conversion interface to connect an AES/EBU output to an S/PDIF input.

Some S/PDIF signals may not work with the RMX*d* console's inputs, even with the additional load resistor or a transformer, because of nonstandard levels or protocols in the S/PDIF product.

RMX*d* Sample Rate

The RMX*d* console uses the professional audio sample rate of 48 kHz for all internal audio mixing and routing. Each analog input goes through an analog-to-digital conversion to 48 kHz. Each digital input uses a sample rate converter, for sample rates from 25 to 50 kHz, which get converted to the console's internal 48 kHz sample rate.

Some console digital outputs are fixed at 48 kHz. Program 1, Program 2, Send, and KSU Outputs A and B can alternately be set for 44.1 kHz in the VMCC application. (See Chapter 4 for instructions on changing the sample rate output.)

When the RMX*digital* console is used in a stand-alone application the console cannot be locked to any external sample rate reference. When the console is networked with a VistaMax system it is 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. The VistaMax manual (75-52) gives details about this connection.

KSU Audio Inputs and Outputs

There are twenty dedicated, and eight routed, analog and digital outputs on the KSU card (Figure 2-19):

- Analog and digital bus outputs – **PGM 1**, **PGM 2**, **PGM 3**, **PGM 4**, and **Send**
- Analog monitor outputs for the control room and a studio
- Three Talkback audio-only outputs
- A mono cue output
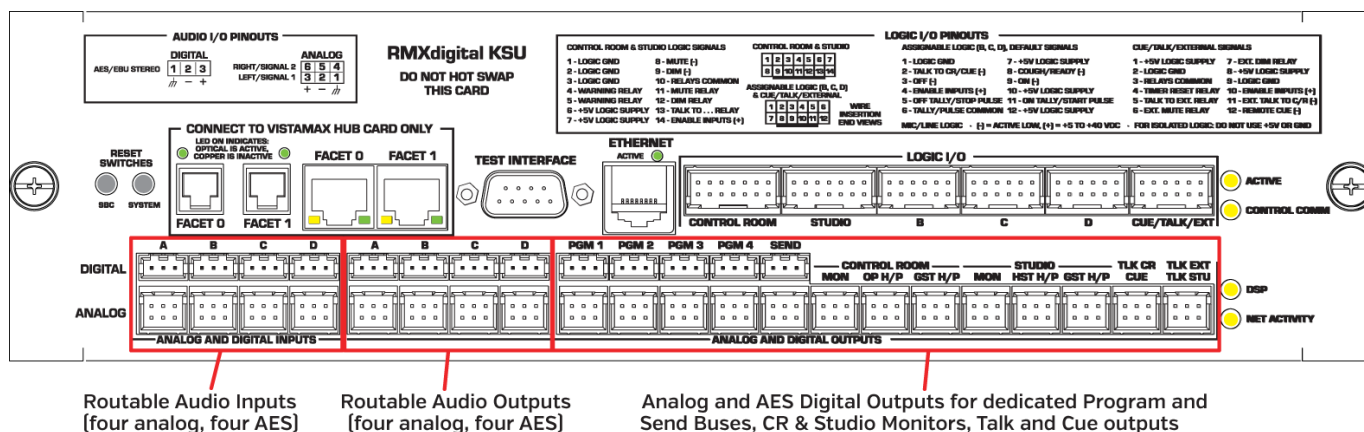- Eight routable outputs (four analog and four digital)

Figure 2-19. KSU Card Connections

There are also eight routable inputs (four analog and four digital) on the KSU. You can route these input signals to any console fader channel, by either session file commands or by using the Dual Fader panel source selectors to manually "dial them up." During console configuration, you can also set any of these inputs as available to be routed to any VistaMax device in the network.

The eight routable outputs can be routed to by a take command in the router command section of a session or by using any VistaMax system routing method (source selector, console setup macro file, VistaVue, VistaTouch, etc.). These routed outputs are often used to route signals that do not have dedicated outputs, like the mix-minus signals and the Telco record signals. Other uses for these routable outputs include feeding a World Feed Panel, an air skimmer, a program recorder, creating a mono PGM bus output, and doing voice track recording.

Even though each routable connector's default setting is stereo linked, any analog or digital input or output connector can be set in VMCC to function as two mono inputs or two mono outputs. Section 4 gives more information on assigning inputs and outputs as stereo versus separate mono signals.

Additional audio inputs are available on all frame sizes by adding optional 8-Input Expansion Cards. One 8-Input Expansion card can be added to each DSP Card. An 8-Input Expansion card has eight stereo audio inputs and eight logic I-O connections. Card multi-switches set each audio input for either an analog or a digital signal. Each of the eight logic I-O connectors can be associated with any one audio connection on the same card.

Logic Connections

Each RMX*d* console has these logic connections:

● Control Room Logic I-O
  • Warning light interface
  • External mute indicator
  • External monitor Dim control
  • Talkback control and indicator

● Studio Logic I-O
  • Warning light interface
  • External mute indicator
  • External monitor Dim control
  • Talkback control and indicator

● Cue/Talk/External Logic I-O
  • Remote cue logic command
  • Remote timer reset output
  • External location mute, dim, and talk commands
  • External talk to CR logic input

● Assignable Logic I-O
  • Three on the KSU card (standard)
  • Eight on each optional 8-Input Expansion card

Figure 2-20 (on page 2-19) has block diagrams and connector pin outs for the four types of logic interfaces. All logic inputs and outputs are fully opto-isolated through using opto-couplers on the inputs and solid state relays on the outputs. The inputs work with logic from +5 to +40 VDC. The outputs are solid-state "dry-contact" relays which can switch up to 60 volts, AC/DC.

The Control Room, Studio, and Cue/Talk/External logic connectors are dedicated to the functions shown in the block diagrams. There are no soft configurations for these connections.

The Assignable Logic I-O connectors have typical logic functions, as shown throughout this manual, but the logic inputs and outputs also have additional functions that can be substituted for the "typical" settings during console configuration using the VMCC app. These are used for special logic transfer functions, like routing a console-mounted control panel contact closure to a VistaMax logic card output.

Each Assignable Logic connector can be "bound" or associated with one audio input. On the KSU card, the three Assignable Logic I-O connectors, labeled B, C, and D, can be associated with any KSU audio input (analog or digital A, B, C, or D). For example, if audio input Digital A is from a CD player with logic, then the CD player's logic could connect to the B Logic I-O connector. In VMCC the KSU B Logic would be bound to the Digital A audio input. Likewise, any two of the other seven routable audio inputs could be associated with the C and D Logic connectors. This "binding" of the audio to the logic connections is set using VMCC, which is covered in Chapter 4 with further details in Appendix A.

Logic Interfaces

Figure 2-20 (page 2-19) shows the logic connector pin assignments as well as block diagrams for the four types of logic connections on the RMX*d* console:

- Control Room
- Studio
- Cue/Talk/External
- Assignable

The left side of each block diagram shows the logic inputs, the right side shows the logic outputs. Logic inputs with the (-) symbol are active low inputs isolated by opto-couplers. In order to function, the opto-couplers must be powered, by +5 to +40 VDC, through the Enable Logic Inputs (+) pin.

Logic outputs use isolated solid-state relay contacts with a common return connection to one pin. This relay common pin can be tied to ground, for low logic outputs, or to any logic voltage up to 60 volts AC/DC to supply high logic outputs. Relays can source or sink up to 350 mA. The CR and Studio warning relay outputs are the exception: they are also isolated dry contact relays but each has a dedicated pair of output pins.

+5 VDC supply and ground pins are available on each connector, but these pins should only connect to isolated remote control panels. When connected to a peripheral the ground and logic voltage should be sourced from the peripheral device in order to maintain isolated operation.

Control Room (CR) Logic

This 14-pin connector has two isolated relay contacts, pins 4 and 5, for a hot mic warning lamp interface. This output is activated when any fader channel, with a control room mic as its source, is assigned to a Program bus and is turned on. This action also mutes the Control Room Monitor audio output.

The three other logic outputs have a common return connection on pin 10:

- CR dim, pin 12, is activated while receiving Talk to CR.
- CR mute, pin 11, is activated when a CR mic channel is on.
- CR Talkback, pin 13, is activated when receiving a Talk to CR command.

You can use these outputs to control external speaker switching or for tally indicators.

The two logic inputs (active low logic) can remotely dim the Control Room monitors (on pin 9) or mute the CR monitors (on pin 8). To use these inputs, pin 14 must connect to +5 to +40 VDC. Remote Dim can be used to indicate the control room is receiving an intercom or phone call while mute can be used when calling out on an intercom or phone system.

Studio Logic

This 14-pin connector is identical to the CR logic connector except this connection is for a talk studio, announce booth, or other separate voice room associated with the control room. The two isolated relay "dry contact pins" (4 and 5) connect to a hot mic warning interface. They are activated whenever any fader channel, with a studio mic as its source, is assigned to a Program bus and turned on. This action also mutes the Studio Monitor audio output.

These three logic outputs have a common return connection on pin 10:

- Studio dim, pin 12, is activated while receiving Talk to Studio.
- Studio mute, pin 11, is activated when a Studio mic channel is on.
- Studio talkback, pin 13, is activated when receiving a Talk to Studio command.

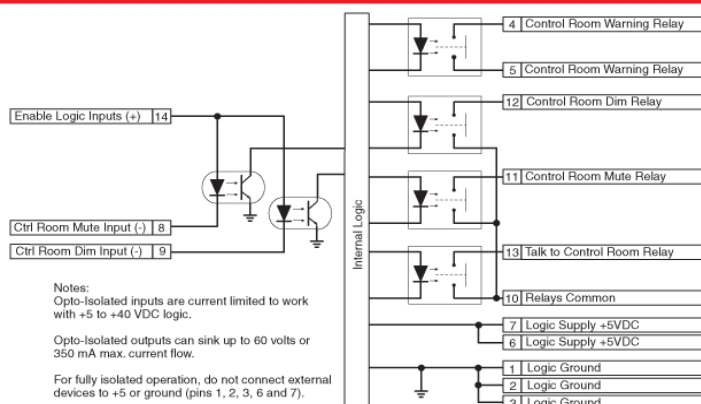You can use these outputs to control external speaker switching or for tally indicators.

The two logic inputs (active low logic) can remotely dim the Studio monitors (on pin 9) or mute the Studio monitors (on pin 8). To use these inputs, pin 14 must connect to +5 to +40 VDC. Remote Dim can be used to indicate the studio is receiving an intercom or phone call while mute can be used when calling out on an intercom or phone system.

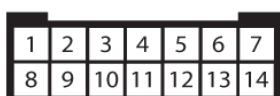## Control Room Logic Interface - Connector Pin Outs and Block Diagram

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 (+)

Enable Logic Inputs (+) 14
Ctrl Room Mute Input (-) 8
Ctrl Room Dim Input (-) 9

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).

Internal Logic

4 Control Room Warning Relay
5 Control Room Warning Relay
12 Control Room Dim Relay
11 Control Room Mute Relay
13 Talk to Control Room Relay
10 Relays Common
7 Logic Supply +5VDC
6 Logic Supply +5VDC
1 Logic Ground
2 Logic Ground
3 Logic Ground

Studio Logic Interface - Connector Pin Outs 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 (+)

Enable Logic Inputs (+) 14
Studio Mute Input (-) 8
Studio Dim Input (-) 9

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).

Internal Logic

4 Studio Warning Relay
5 Studio Warning Relay
12 Studio Dim Relay
11 Studio Mute Relay
13 Talk to Studio Relay
10 Relays Common
7 Logic Supply +5VDC
6 Logic Supply +5VDC
1 Logic Ground
2 Logic Ground
3 Logic Ground
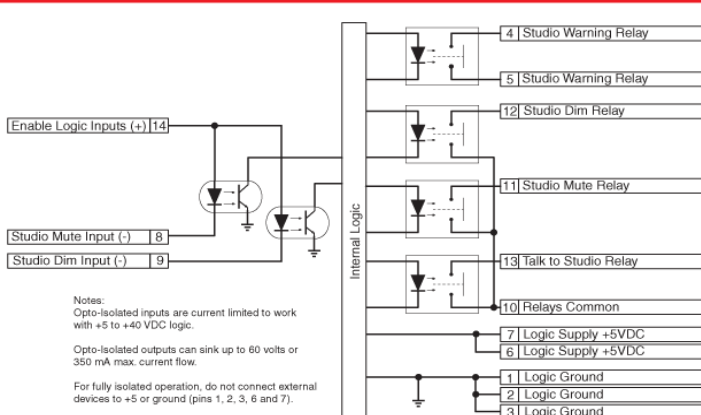
Cue / Talk / External Logic Interface - Connector Pin Outs and Block Diagram
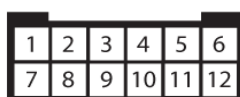
Wire insertion end view

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 (-)

Enable Logic Inputs (+) 10
Ext Cue On Input (-) 12
Ext Talk to CR Input (-) 11

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).

Internal Logic

4 External Timer Reset
7 External Dim Relay
6 External Mute Relay
5 Talk to External Relay
3 Relays Common
1 Logic Supply +5VDC
8 Logic Supply +5VDC
2 Logic Ground
9 Logic Ground
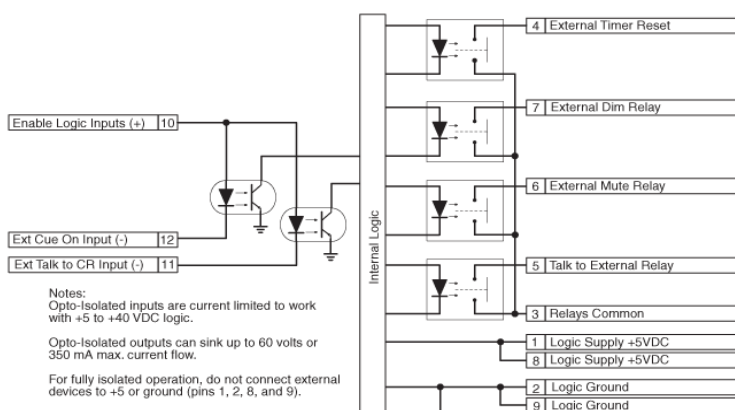
Assignable Logic Interface - Connector Pin Outs and Block Diagram

DEFAULT SIGNAL ASSIGNMENTS
(MIC LOGIC / LINE LOGIC

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

Enable Logic Inputs (+) 4
On (-) 9
Off (-) 3
MIC: Cough (-) / LINE: Ready (-) 8
MIC: Talk To C/R (-) / LINE: Cue (-) 2

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).

Internal Logic

11 MIC: On Tally Relay / LINE: Start Pulse Relay
5 MIC: Off Tally Relay / LINE: Stop Pulse Relay
6 Tally & Pulse Common
7 Logic Supply +5VDC
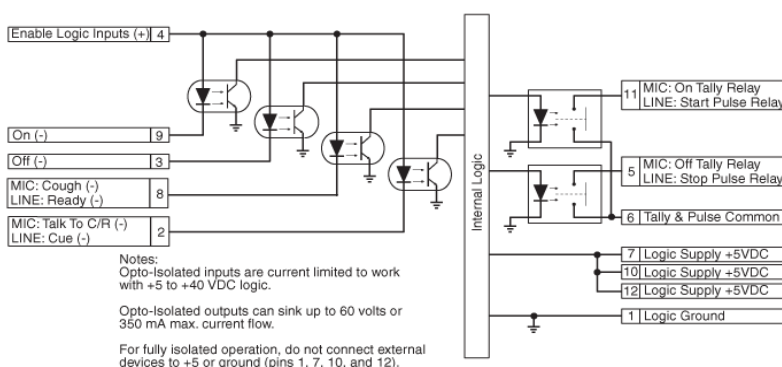10 Logic Supply +5VDC
12 Logic Supply +5VDC
1 Logic Ground

Figure 2-20. Logic Interfaces - Connector Signal Assignments and Block Diagrams

Cue / Talk / External Logic

This 12-pin connector has a two active low logic inputs for remote cue (on pin 12) and External Talk to CR (on pin 11). To use these inputs, pin 10 must connect to +5 to +40 VDC.

Four logic outputs (dry-contact relays) have a common return connection on pin 3:

- External Dim, pin 7, is activated while External Talk to CR or Talk to External is active.
- External Mute, pin 6, is activated when an External mic channel is assigned to a PGM bus and is on.
- Talk To External, pin 5, is activated whenever Talk to External is active.
- An Event Timer reset, on pin 4, can auto-reset an external location event timer.

Assignable Logic

There are three of these 12-pin connectors on the KSU card (labeled B, C, and D). Additional Assignable Logic connectors can be found on the optional 8-Input Expansion Cards. The Assignable Logic I-O connectors are typically associated with audio on the same card and connect to either remote mic control panels using Mic logic or to a peripheral device using Line logic. The INIT.MAC file (created by VMCC) is where the Assignable logic to audio binding and remote logic functions are defined.

Mic logic is used whenever the audio source that's "bound" to the logic connector mutes the control room, the studio, or the external location, as set in the VMCC app's Room Code setting for the audio source. A mic remote control panel controls the channel on/off status while the tally outputs from the channel control the on/off button tallies in sync with the channel strip.

Line logic is used with peripheral devices like CD players and automation systems. Pin 2 can be set as a remote cue switch input which, when held low by an automation system or by a studio or producer Cue switch, routes the audio input to the cue bus. Pin 8 is the ready logic input. Ready allows a peripheral device to both turn off the channel audio and to subsequently control the channel off button illumination to indicate source status: ready (lit solid); not ready (no light); the event has already played (blinking).

With line logic, pins 11 and 5 are typically set as start/stop command outputs to start or stop/pause the peripheral device when the channel is turned on/off. Each output generates a single 220 msec contact closure between the common relay contact (pin 6) and pin 11 (Start Pulse) or pin 5 (Stop Pulse). In VMCC, they can alternately be set to output a pulse for every button press or output a sustained contact closure.

Microphone Logic

Microphone logic has three main functions:

- To mute the monitor speakers in the room with the hot mic.
- To command a hot mic warning light to turn on.
- To activate mic logic functions like talkback and cough.

The RMX*d* console has separate logic and audio connections to three "rooms": Control Room (the room the console is in); Studio (a separate talk studio associated with that control room); an External location (for a producer, news announcer, sports anchor, or other location with a microphone connected to that console). Each of these rooms is assigned a Room Code number, in the main console edit pane in VMCC (shown in Figure 4-13 on page 4-17). Even though every room in a facility can be assigned a unique Room Code number, since numbers from 1 – 127 can be used, in most applications each console is set to use the same set of Room Codes: 1 for Control Room, 2 for Studio, and 3 for External.

Once the console's three Room Code numbers are assigned, each microphone input on the console must then be set to one of these three room codes in order to identify it as a Control Room mic, a Studio mic, or an External location mic. The mic's Room Code entry is entered in the audio details edit pane (shown in Figure 4-20, page 4-24). Every audio input is set to the default Room Code of 0, which indicates there is no muting or warning light logic control associated with that audio input. The console and mic Room Code numbers are all defined in the INIT.MAC file.

Mic Connections

Microphones must be pre-amplified to line level for connection to an RMX*d* audio input. Typically, mics are routed through a mic processor to pre-amplify, equalize, and compress or limit the audio. The mic processor output, either analog or digital, connects to a console input. The Room Code number assigned to that mic input in the VMCC app tells the console it is a microphone input and whether it is in the Control Room, a Studio, or an External location.

When there is a mic control panel associated with the mic, the mic control panel is wired to an Assignable Logic connector and that logic connector is then "bound to", or associated with, that mic's audio input connector in the VMCC app. This means that, regardless of which channel strip the mic is dialed up on, the logic signals from the mic panel are routed with the audio to the channel strip controls and the mic channel logic controls are routed back to the logic connector.

When the console is part of a VistaMax audio management system, the mic audio and remote panel logic could be assigned to, or come from, a completely different console or a VistaMax frame. This assignment 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.

Mic Logic To/From the RMX*d* Console

Two mic control panels are available for the RMX*d* console:

- PRE99-1197 Guest Mic Control Panel – with three controls: On; Off; and Cough
- PRE99-1198 Host Mic Control Panel – with four controls: On; Off; Cough; and Talkback

A mic panel plugs into an RMX*d* Assignable Logic I-O connector. That connector is then logically "bound" to the mic's audio input. Note that the "bound" audio and logic connectors must be physically located on the same 8-Input Expansion card or on the KSU. You cannot bind a logic connector on the KSU with a logic connector on an 8-Input Expansion card (or vice versa).

Figure 2-21 shows the wiring diagram for the interconnect wiring. Since eight wires are used, Category cabling could alternately be employed to connect the control panel to the Assignable Logic connector.
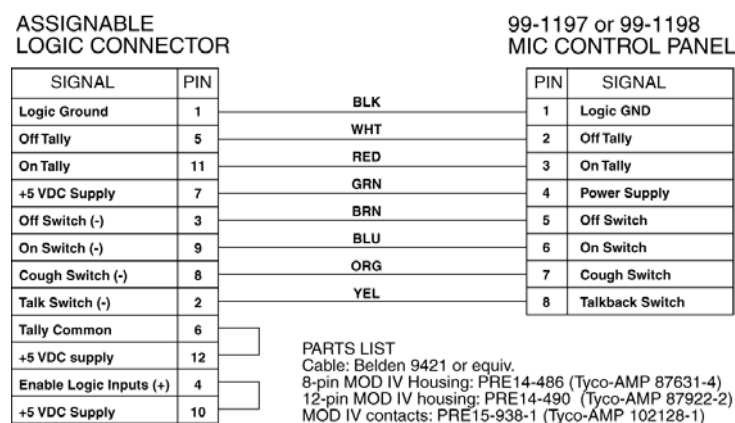

Figure 2-21. Mic Control Panel to Assignable Logic Connector Wiring

The On, Off, Cough, Talkback switches (pins 5 – 8 on the panel) connect to the four Switch inputs (pins 2, 3, 8, and 9 on the console). To enable these external inputs, jumper pin 4 to pin 10.

The On and Off switches have controlled LEDs which connect to the Tally outputs (pins 5 and 11 on the console). The Tally relay common (pin 6) is jumpered to +5 (pin 12) to light the LEDs. The other two switches (Cough and Talkback) are lit by connecting +5 VDC (pin 7) to the panel's supply input (pin 4). The switches and LEDs have a common connection via the Logic Ground (pin 1 on both connectors).

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 end of the Cough and Talkback LEDs or lamps are tied together to +5 volts.

Each switch is tied to its logic counterpart: the On switch goes to the On (-) input; the Off switch goes to Off (-) input; and so forth. The on/off lamps are tied to their Tally outputs: On lamp to On Tally; Off lamp to Off Tally. 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.

Note: The RMX*d* On Tally output can connect to a M!ka mic arm with hot mic indicators if an outboard +12 to +24 VDC power supply is used. Connect the power supply's + lead to Tally Common (pin 6) on each mic channel. Connect each channel's On Tally output (pin 11) to the "yellow" wire in the M!ka mic arm. The supply ground is then commoned to the "black" wire from each M!ka mic arm.

Assignable Logic I-O and Peripherals

Start and stop commands are typically used to control peripheral devices. You can set these commands to output a single 220 msec pulse, multiple pulses (additional pulses with each button press regardless of whether a channel state change occurred), or set them for sustained logic. The Drive Code logic output setting, in VMCC, sets whether the two logic outputs are set to output Start/Stop Pulses or On/Off Tallies. The audio source details page in VMCC is where the Start and Start Pulse output options can be set (Local State Change, Local or Remote Change, Local Actuation, Local or Remote Actuation)

In the *Basic Peripheral Device Logic Connection Example*, active low logic is used. Tally & Pulse Common connect to the logic ground on the peripheral device, labeled Command Common on the Denon CD player in the example. In the *Complex Logic Connection Example*, active high logic is used; 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 logic connections.

Peripheral devices typically control the channel off command by using the Ready logic input. The Ready logic performs both an audio reset, which turns the channel off, then controls the Off LED lighting when Ready control is check marked (in the audio source details page in VMCC). Otherwise, the Off LEDs turn on automatically at channel off.

Additional Logic Connections

The Console Display has two cables that plug into two motherboard connectors (accessed through rear cover openings). These cables carry the cue speaker audio, the timer control signals, digital bar graph meter signals, and meter legend display data. A separate cable, with a male 4-pin Molex connector, hangs below the Console Display (above the DSP cards and KSU) to connect an ESE or SMPTE master clock signal and/or the auto-reset logic to a studio Event Timer. Figure 2-22 details these connections. Figure 2-23 shows the location of the two rear connectors.
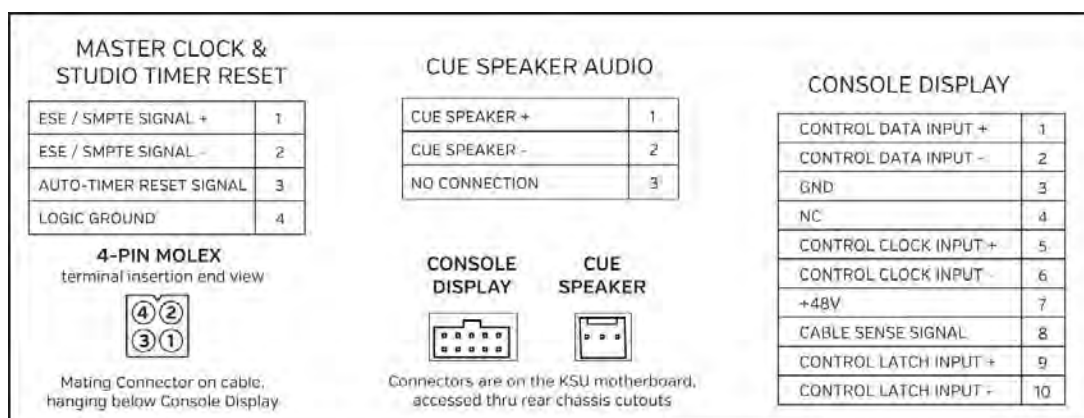

Figure 2-22. Console Display Connections

Connection Quick Guides

The following subsections have multiple Quick Guides that cover the connections for each RMX*d* card or component, along with audio and logic connector pin assignments and connection signal descriptions for

● Frame and Console Display
● KSU card
● Eight-Input Expansion card
● VistaMax connections

Refer back to page 2-19 (Figure 2-20) for console logic connection block diagrams.

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 GatesAir Accessory Panels. Connecting logic ground to a non-isolated device may result in a ground loop between the console and the peripheral device.

Frame and Console Display Connections Quick Guide

Figure 2-23 shows RMX*d* console and display connections. All connections should be made before connecting the power supplies and applying power to the console.

Rack mount the 48-volt power supply below and to the left or right of the console frame such that the supplied 15-foot DC power cable can connect between the rear of the supply and the rear of the console frame without being under tension. A redundant power supply can be rack mounted immediately above or below the main supply. If possible, plug the redundant supply into a different AC circuit as the main supply. The previous *Power Supply* and *Grounding and Shielding* subsections give power supply and technical ground wire connection details.

The *VistaMax Connections Quick Guide*, which appears later in this Chapter, details the VistaMax connection. The *KSU Card Connections Quick Guide* and the *8-Input Expansion Card Quick Guide*, which also appear later in this Chapter, detail the audio and logic connections.

Figure 2-23. RMX*d* Console Connections
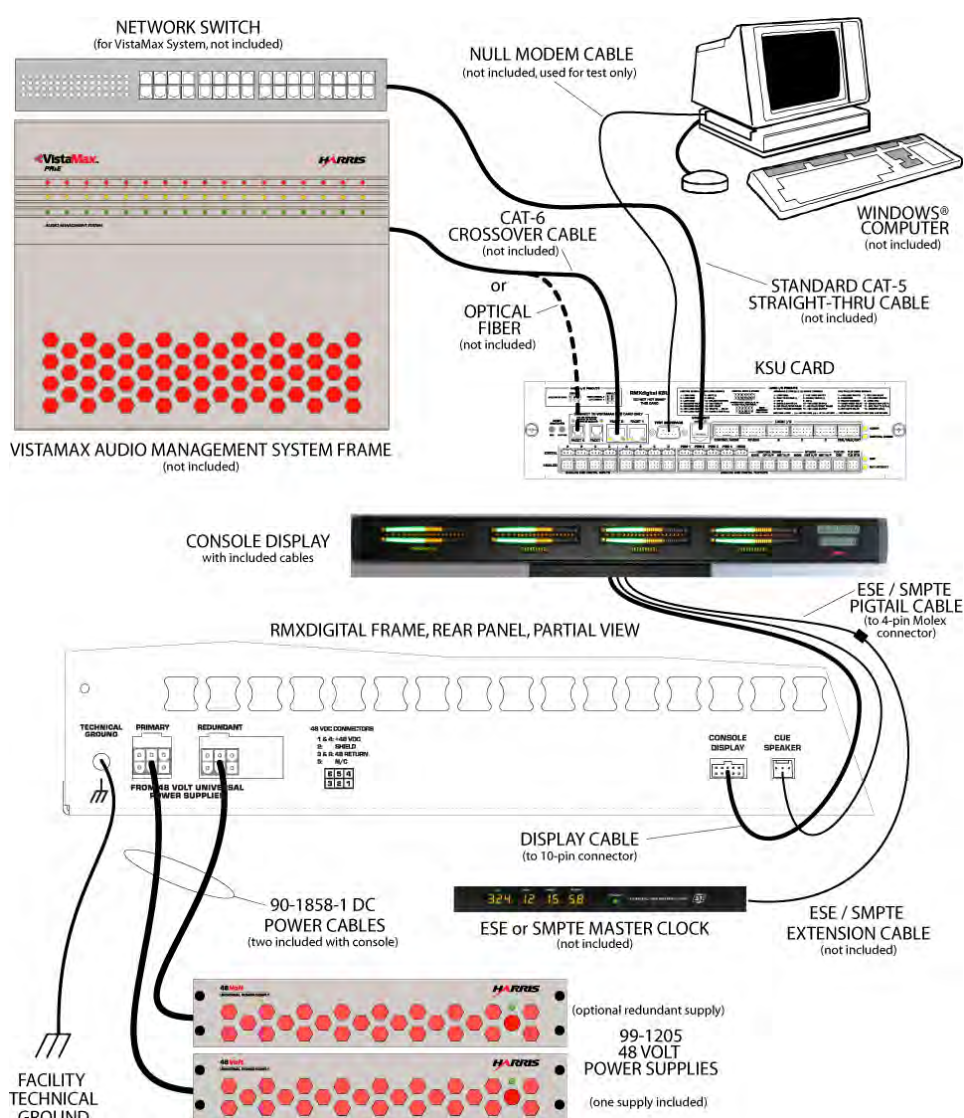
KSU Card Connections Quick Guide

The KSU card has the most user connections. There are two KSU cards available:

● The standard "Copper" card (99-2672-1) does not have optical Facet connectors. Instead, there is a USB pass-thru adapter located in lieu of the optical connections.

● The optional "Optical" card (99-2672-2) has two optical Facet connections in addition to the two standard copper Facet connections (shown in Figure 2-24)
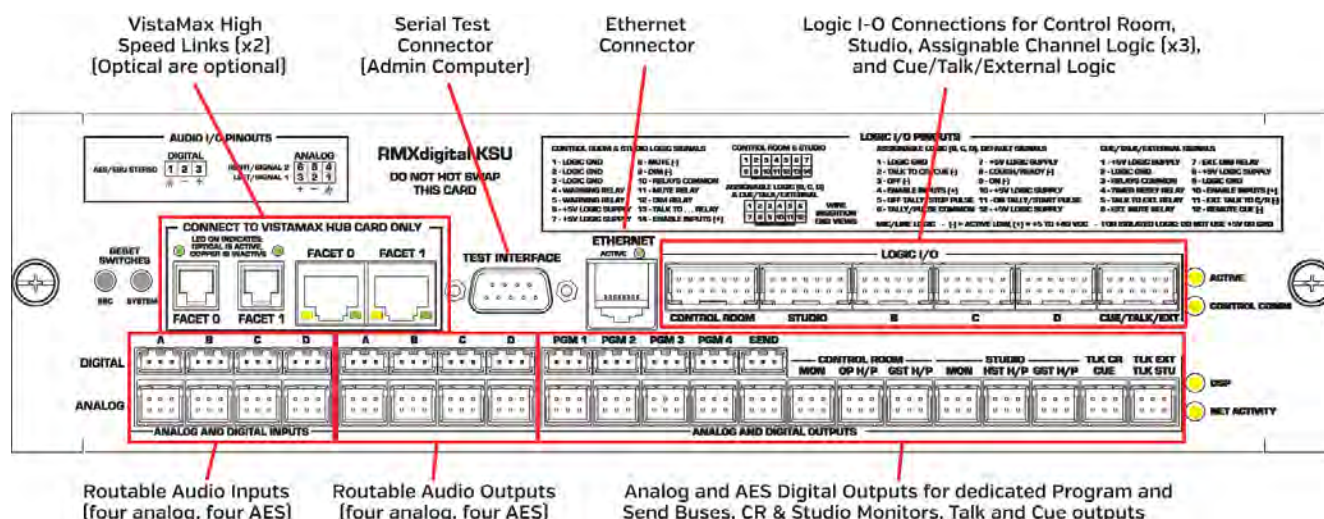

Figure 2-24. KSU Card Connections

Audio Inputs and Outputs

● **Analog** – You can use each routable six-pin analog connection (**A**, **B**, **C**, **D**) 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 in VMCC so unbalanced -10 dBV connections. The *Audio Connections* subsection and Figure 2-15 details the analog connector pin assignment and signals.

● **Digital** – Three-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 sample rate of 48 kHz. The AES outputs are also 48 kHz but the **A, B, PGM 1**, **PGM 2**, and **Send** outputs can be switched to 44.1 kHz sample rate outputs in VMCC. AES inputs can usually accept S/PDIF signals. (See the *Unbalanced Connections* subsection for details.) The *Audio Connections* subsection and Figure 2-15 details the digital connector pin assignment and signals.

Logic I-O

● **Control Room and Studio** – The two 14-pin connectors offer separate logic control of the control room and studio logic. Table 2-4 and Figure 2-25 detail these signals on the next page.

● **B, C, D** – These are the same Assignable Logic I-O connections as found on a DSP card. Each can be associated with one of the KSU audio inputs (analog or digital **A**, **B**, **C**, or **D**) in VMCC to assign the input and the logic settings. Figure 2-26 (page 2-26) and Table 2-5 (page 2-27) give signal details.

● **Cue/Talk/Ext** – This 12-pin connector has a remote cue logic input, talkback logic control, and control logic for an external location. Table 2-6 and Figure 2-27 give signal details on page 2-28.

Table 2-4. Control Room and Studio Logic I-O Signal Definitions

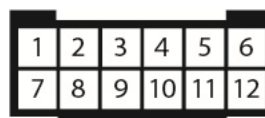| PIN	SIGNAL NAME	FUNCTION DESCRIPTION
14	Logic Inputs Enable (+)	The External Mute and External Dim control inputs are enabled by connecting this pin to +V (+5 to +40 VDC), typically from the controlling device. When isolated contact closures trigger the control inputs, can be jumpered to pin 7 (+5 Volts).
8	Mute (-)	When pulled low, and pin 14 is tied to +VDC, mutes the monitor speaker output and triggers the Room Mute Relay output.
9	Dim (-)	When pulled low, and pin 14 is tied to +VDC, triggers the Room Dim Relay output and dims the monitor speaker output by 18 dB.
10	Relays Common	The Common (C) relay contact output for the Dim, Talk, and Mute Relays. For active low relay outputs, jumper to logic ground on the controlled device or to pin 3 on isolated indicators. For active high relay outputs, jumper this pin to the +V on the controlled device or to pin 6 or 7 for isolated indicators using +5 volts.
11	Mute Relay	Normally Open (NO) dry contact. Connects to Relays Common (pin 10) while the console mute logic is active. Typically used to drive a mute indicator or to mute the talk back or cue speakers. See voltage and current switching note.
12	Dim Relay	Normally Open (NO) dry contact. Connects to Relays Common (pin 10) while the console dim logic is active. Typically used to drive a dim indicator or to dim talkback or cue speakers. See voltage and current switching note.
13	Talk Relay	Normally Open (NO) dry contact. Connects to Relays Common (pin 10) while the console is receiving talkback. Typically used to drive a Talk Active indicator or to control an incoming talk speaker switch. See voltage and current switching note.
4, 5	Warning Relay	Isolated N.O. dry contact relay for controlling a warning lamp interface (such as the Henry Superelay) while a room mute command is received. See voltage and current switching note.
6, 7	+5 Volt Supply	Logic voltage output source. Can deliver up to 300 mA of current to isolated devices. Pins are paralleled for convenience.
1, 2, 3	Logic Ground	Console logic ground. Connect to isolated devices only.

Note: To maintain isolated operation, Ground and/or +VDC connections should be from the peripheral device. Only connect the +5 Volt Supply and Logic Ground to remote button / indicator panels. Each relay output can sink or source up to 60 volts, AC or DC, at 350 mA.

Figure 2-20 (page 2-19) gives a simplified circuit block diagram.
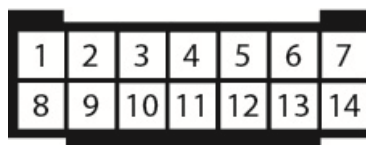
MOD IV terminal numbers, from wire insertion
end view, oriented as plugged into the KSU

Figure 2-25. Control Room and Studio Logic 14-Pin Logic Connector Housing

MOD IV terminal numbers, from wire insertion end view, oriented as plugged into the KSU

Figure 2-26. Assignable Logic I-O 12-Pin Logic Connector Housing

Table 2-5. Assignable Logic I-O Default Definitions

PIN	SIGNAL NAME (Logic Type)	FUNCTION DESCRIPTION
11	Start Pulse (Line)	Normally Open (N.O.) relay contact (common contact on pin 6). The actual logic function is set by the logic settings in VMCC. Typically outputs one momentary 220 msec contact closure when the channel is turned On from Off (alternately can be set to output a 220 msec contact closure each time the On button is pressed or can output a maintained contact closure while the channel is on). Typically connects to the Remote On logic input on a peripheral device.
11	On Tally (Mic)	Connects to Tally Common (pin 6) while the channel is On. The output is a N.O. dry contact type that is typically used to drive a mic control panel On button LED.
5	Stop Pulse (Line)	Follows the logic setting for the Start Pulse. This command is initiated by pressing the channel strip Off button. Typically connects to a Remote Stop, Off, or Pause logic input on a peripheral device.
5	Off Tally (Mic)	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 a mic control panel Off button LED.
6	Pulse Common (Line)	The Common (C) relay contact for the Start and Stop Pulse contacts. For active high logic outputs, connect this pin to the +V supply voltage on the peripheral device. For active low outputs, connect this pin to ground on the peripheral.
6	Tally Common (Mic)	The Common (C) relay contact output for the On and Off Tallies. When used with GatesAir mic control panels, jumper this pin to pin 12 (+5 volts) to supply voltage to the mic panel switch LEDs. **Note:** M!ka Mic Arm "Hot Mic" LEDs require +12 volts. A separate +12 VDC supply would need to connect to this pin to drive the LEDs
4	Enable Logic Inputs (+) (Mic or Line)	To enable the control inputs On, Off, Cough / Ready, and Talk to ... / Cue, tie this pin to +V. With isolated devices like mic control panels, jumper to pin 10 (+5 volts) to enable the inputs. On peripheral devices connect to the peripheral device's + voltage output (from +5 to +40 VDC is OK).
9	On (-) (Mic or Line)	When pulled low, turns the channel on, turning on the On Tally output for mic logic or generating a Start Pulse for Line logic.
3	Off (-) (Mic or Line)	When pulled low, turns the channel off turning on the Off Tally output for mic logic or generating a Stop Pulse for Line logic.
8	Cough (-) (Mic)	When pulled low, while the channel is on, turns off the channel On lamp and mutes the channel audio on all assigned buses. No effect if the channel is off.
8	Ready (-) (Line)	The Ready logic can both turn off a channel and subsequently control lighting of the Off button. Ready is assigned in VMCC and is an audio input signal option. When a channel is On, Ready logic turns the channel Off, without causing a Stop Pulse to be generated. The Ready logic then controls the Off button lighting to indicate device status. Typically, no Off LED indicates the peripheral is not ready; a steady Off LED indicates the device is ready; a flashing Off LED indicates the device has played or is not yet cued up.
2	Talk to ... (-) (Mic)	When pulled low, routes that mic's audio (pre-fader/pre-switch) to the assigned talkback bus (control room, studio, or external). This is a momentary connection that is only active while held low by pressing the Talkback button.
2	Cue (-) (Line)	When pulled and held low, the line input's audio (pre-fader/pre-switch) goes to the cue bus.
10, 12	+5 Volt Supply	Connect to isolated control panels only. Jumper pin 10 to pin 4 to Enable the Logic inputs. Jumper pin 12 to pin 6 to supply a Tally voltage (+5 volts at 300 mA). The two pins are simply paralleled for convenience.
1	Logic Ground	Connect to isolated control panels only.

Note: To maintain isolated operation, Ground and/or +VDC connections should be from the peripheral device.
Only connect the +5 Volt Supply and Logic Ground to remote button / indicator panels.
Each relay output can sink or source up to 60 volts, AC or DC, at 350 mA.

Figure 2-20 (page 2-19) gives a simplified circuit block diagram of the Assignable Logic Connection.

Table 2-6. Cue/Talk/External Logic I-O Signal Definitions

PIN	SIGNAL NAME	FUNCTION DESCRIPTION
3	Relays Common	The Common (C) relay contact output for the Talk, Dim, Mute, and Timer Reset relays. For an active low output, jumper this pin to logic ground. For an active high output, jumper this pin to + V on a peripheral (or +5 volts supply on isolated indicator panels). For isolated operation, the ground and/or +V supply must be supplied by the peripheral device. When used with remote panels, jumper to pin 9 for active low logic or to pin 1 or 8 for active high logic.
4	External Timer Reset	A single momentary closure to Relays Common (pin 3) occurs whenever a channel, set for Timer Reset, is turned on. This connection is typically used to reset an event timer at a producer or call screener position.
6	External Mute Reset	While External Mute is active, this pin connects to Relays Common (pin 3). Output is a N.O. dry contact. Typically used to drive a hot mic indicator or to mute speakers at the external position (for a call screener, producer, etc.).
7	External Dim Relay	Connects to Relays Common (pin 3) while an External Dim is active. Output is a N.O. dry contact type typically used to drive a Dim indicator or to dim the external position's talk and cue speakers.
5	Talk to External Relay	Connects to Relays Common (pin 3) while a Talk to External command is active from the control room or studio. Output is a N.O. dry contact type that can drive a Talk to External indicator or switch talk audio into a talk speaker.
10	Enable Logic Inputs (+)	To enable the Talk to CR and External Cue control inputs from a remote panel, jumper this pin to pin 1 or pin 8 (+ 5 supply). When tied to a peripheral device that would activate cue, connect to the peripheral device's +V output.
12	External Cue (-)	While held low, routes the External Cue Audio Source to the cue bus.
11	External Talk to CR (-)	While held low, routes the External Talk to CR Audio to the talk to CR bus.
1, 8	+5 Volt Supply	Can deliver +5 VDC at 300 mA to LEDs in isolated control panels and to Enable the Logic Inputs. The two pins are paralleled for convenience.
2, 9	Logic Ground	Use only with isolated control panels. Can also jumper to Relays Common (pin 3) to supply low logic for the relay outputs.

Note: To maintain isolated operation, Ground and/or +VDC connections should be from the peripheral device.
Only connect the +5 Volt Supply and Logic Ground to remote button / indicator panels.
Each relay output can sink or source up to 60 volts, AC or DC, at 350 mA.

Figure 2-20 (page 2-19) gives a simplified circuit block diagram of the Cue/Talk/External logic connection.
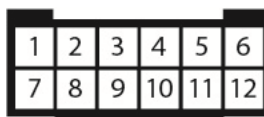
MOD IV terminal numbers, from wire insertion end
view, oriented as plugged into the KSU

Figure 2-27. Cue/Talk/Ext Logic 12-Pin Logic Connector Housing

Communications Connections

- **Ethernet** – This RJ45 connector ties the console to a restricted-access LAN for console setup, software maintenance, and VistaMax network communications. Do *not* connect the Ethernet connector to the facility's general computer LAN. Use a straight-thru CAT6 cable to connect to the VistaMax network switch. For initial setup, a cross-over cable may be required to directly connect to a laptop computer.

- **Test Interface** – This nine-pin serial I-O interface port can be connected to the serial port on a laptop or the admin computer using a null modem cable. Tera Term or other comm port program can then be run to monitor RMX*d* activity. This is a troubleshooting connection only.

- **Facet 0, Facet 1** – Two RJ-45 "copper" connectors (standard) and two MT-RJ optical connectors (optional) carry the VistaMax High Speed Link signals to/from a VistaMax Hub card. Each copper Facet uses a CAT6 crossover cable. The optional optical connectors take precedence over the matching copper connector when connected to an active optical connection on a VistaMax Hub card. Facet 0 typically connects to a Hub card facet while Facet 1 is available to connect to an RMX*engine* (optional).

- **USB Connector** – Allows one or more Programmable Control panels (PRE99-1532, PRE99-1533, PRE99-1534, or PRE99-1535) to be hosted by the RMX*d* console. When multiple Programmable Control panels will be hosted by the console a powered USB Hub would plug into this jack.

Eight-Input Expansion Card Connections Quick Guide

An optional 8-Input Expansion card (Figure 2-28) is available to add eight audio inputs and eight Assignable Logic I-O connections to any DSP Card. One Expansion card can be added to each DSP card in the console.

The eight six-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 three-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 six-pin connector with either one stereo pair or two separate mono signals on the connector. The six-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 the same 8-Input Expansion card. Figure 2-26 (page 2-26) and Table 2-5 (page 2-27) gave details on the Assignable Logic I-O signals.
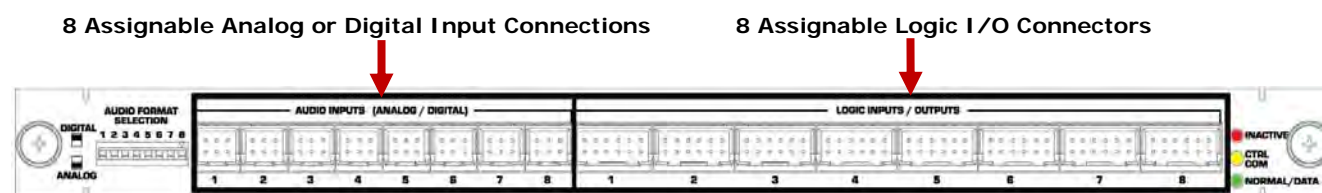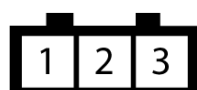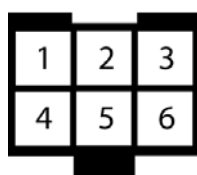
8 Assignable Analog or Digital Input Connections   **8 Assignable Logic I/O Connectors**

**Figure 2-28. Eight-Input Expansion Card Connections**

Audio Inputs 1-8

Analog Inputs – Set the matching, numbered, **Audio Format Selector** switch toward the board operator to set the input for analog audio. One stereo or two mono line level signals can connect to each six-pin AMP MOD IV connector. Each input can be trimmed by up to -16 dB in the VMCC app and, for unbalanced -10 dBV connections, up to +15.5 dB of gain can be added, often eliminating the need for a match box. **Note:** These connectors are reversed compared to the analog connectors on the KSU. (The left input signal is on the rear row of pins.)

Digital Inputs – Set the matching, numbered, **Audio Format Selector** switch toward the back of the console to set an input for digital audio. Use a three-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.) The *Unbalanced Connections* section on page 2-16 covers connecting an S/PDIF signal. **Note:** These digital connections are in the same orientation as the digital connections on the KSU card.

Assignable Logic I-O
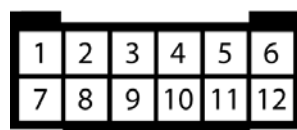
Logic Inputs/Outputs – A peripheral or a mic control panel can connect to each 12-pin connector. Table 2-5 (page 2-27) details the logic connections. Figure 2-20 (page 2-19) gives a block diagram of the Assignable Logic I-O interface. Each Assignable Logic connection can be bound to any one audio input on the same card. Chapter 4 gives additional setup and application information.

VistaMax System Connections Quick Guide

The KSU card has two facet connections (Facet 0 and Facet 1) to Link the console into a VistaMax Audio Management System. Either connector can be used to Link the console to a facet on a VistaMax Hub card, but in normal practice Facet 0 is connected to a Hub card and Facet 1 is reserved for use with the optional RMX*engine* (a 1RU device that creates subtractive mix-minus signals on any DSP-hosted fader channel using Protected Destination macros.

Each facet carries 64 audio channels, and any associated logic, bi-directionally to a VistaMax Hub card. When using a CAT6 Link cable up to 100 meters (330 feet) of cable can be used. To go beyond this distance, you must use the optional optical connections, which allow a console to connect to a VistaMax optical Hub card that is located anywhere up to 2 km away from the console.

The RJ45 Ethernet connector ties the console to the VistaMax network switch (Figure 2-29) using a straight-thru CAT6 cable. This connection is for communications and control within the VistaMax system. No audio flows over this connection.

Each console and card frame connected to the network switch is assigned a unique TCP/IP address during installation. Since each RMX*d* console has a default IP address of 192.168.100.22 assigned at the factory, this address **must be changed** prior to connecting the console to the VistaMax LAN. Chapter 4 – "RMX*digital* Server" gives details on changing this address.
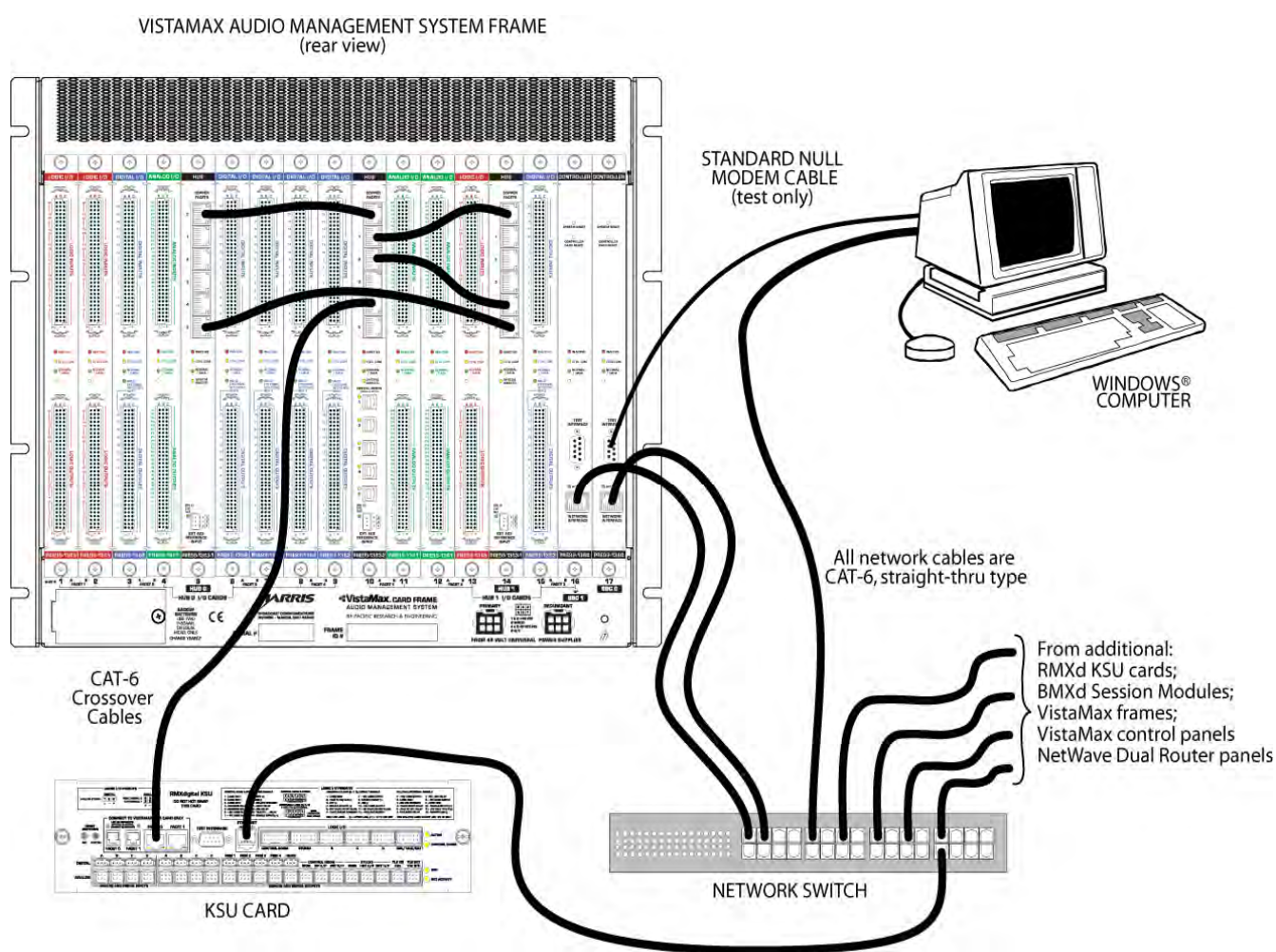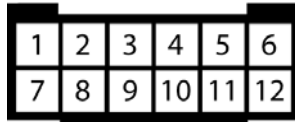

Figure 2-29. VistaMax Connections

Mic Remote Control Connection Example

This page shows how a mic remote control panel connects to an Assignable Logic connector.

Table 2-8. Mic Remote Control Assignable Logic I-O Connector Signals

Wire insertion end view

Pin		Function
#	Signal	
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 font indicates connections used in this example.

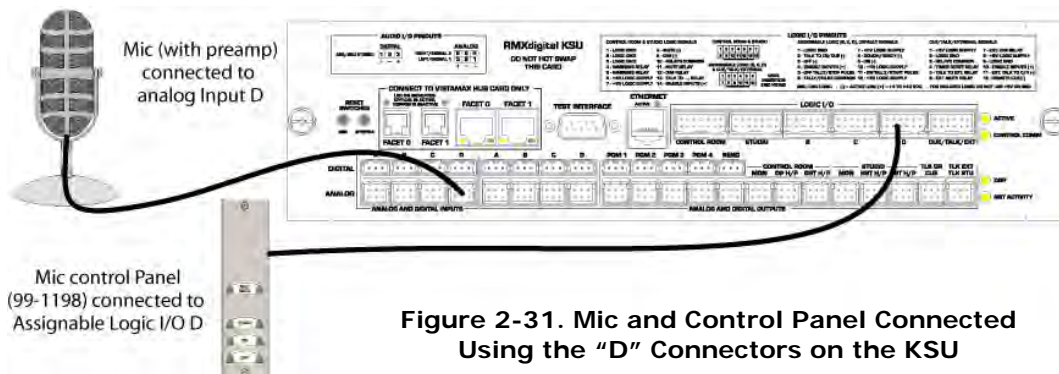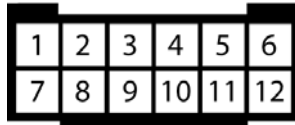**Figure 2-30. Mic and Control Panel Logic Cable Connections**

Figure 2-31. Mic and Control Panel Connected Using the "D" Connectors on the KSU

Basic Peripheral Device Logic Connection Example

This page shows how a basic peripheral device, like a CD player, connects to the Assignable Logic connector.

Table 2-9. Basic Peripheral Device Assignable Logic I-O Connector Signals

Wire insertion end view

Pin		Function
#	Signal	
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 font indicates connections used in this example.

ASSIGNABLE
LOGIC CONNECTOR

SIGNAL	PIN
Pulse Common	6
Enable Logic Inputs (+)	4
Stop Pulse	5
Start Pulse	11
Ready (-)	8

DENON DN-SERIES
CD PLAYER LOGIC

PIN	SIGNAL
23	**Switch Common**
22	**Tally Common**
3	**Pause N.O.**
2	**Play N.O.**
16	**Standby/Cue Tally**
15	**Pause Tally**

BRN
BLK
GRN
RED
WHT

CR1
CR2
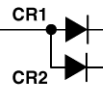
PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
25-pin DSub: 15-854 (DB-25P)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

Figure 2-32. Basic Peripheral Logic Cable Connections

Complex Logic Connection Example

This page shows how a peripheral device with complex logic functions, like an automation system, connects to the Assignable Logic. For most peripheral device connections, the logic ground and +5 volt supply connections should not used. However, in this example, the automation system connections are isolated as well. Chapter 4 and Appendix A give details on binding the logic to the peripheral's audio inputs and the channel strip session file settings for peripherals.

Table 2-10. Complex Peripheral Device Assignable Logic I-O Connector Signals

Pin		Function
#	Signal	
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

Wire insertion end view

Pin layout:
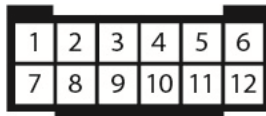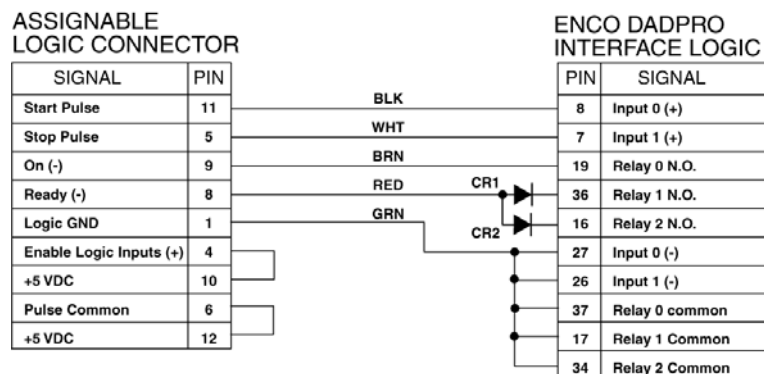| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |

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

ASSIGNABLE LOGIC CONNECTOR

SIGNAL	PIN
Start Pulse	11
Stop Pulse	5
On (-)	9
Ready (-)	8
Logic GND	1
Enable Logic Inputs (+)	4
+5 VDC	10
Pulse Common	6
+5 VDC	12

ENCO DADPRO INTERFACE LOGIC

PIN	SIGNAL
8	Input 0 (+)
7	Input 1 (+)
19	Relay 0 N.O.
36	Relay 1 N.O.
16	Relay 2 N.O.
27	Input 0 (-)
26	Input 1 (-)
37	Relay 0 common
17	Relay 1 Common
34	Relay 2 Common

BLK, WHT, BRN, RED, GRN
CR1, CR2

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)

Figure 2-33. Complex Peripheral Logic Cable Connections

Button Cap Lenses

Button caps on the RMX*d* console are labeled, from the factory, with laser-etched function names. Laser etching ensures the button cap labels withstand millions of button pushes without appreciable wear.

The channel off, channel Talkback, Talk to Studio, Talk to External, and the twenty-one monitor selector buttons all have removable lenses for field installation of custom labels, using two sizes of clear lenses:

● Large –Channel Off buttons (Dual Faders) and the two Talk buttons on the Monitor Control panel
● Small – The Talkback buttons (Dual Faders) and monitor select buttons on the Monitor Control panel

The 76-1403 lens kit is for the Monitor Control panel. It has twenty-one small and two large clear lenses. A 76-1404 lens kit comes with each Dual Fader Panel. It has two large and two small lenses. One 76-1403 lens kit and one 76-1404 kit for each Dual Fader panel is included with the console order. When an additional Dual Fader panel is purchase, a 76-1404 lens kit is included. These lens kits should be retained for future use if custom labels are not added during installation.

Printing Custom Button Labels

The console shipment includes one PRE80-1961 die-cut label sheet with twenty-eight small and sixteen large clear label inserts for buttons with removable button caps. A clear button cap is then used on the button. The die-cut label sheet can be printed using either a laser or an inkjet printer. Additional die-cut label sheets can be ordered from the GatesAir parts department.

A Microsoft® Word template file, which aligns with the die-cut sheet, can be used to create custom labels for the removable lens buttons. The file (71-1961rB Button Template.dot, shown in Figure 2-34) can be downloaded from the GatesAir Customer Portal or from the GatesAir studio products FTP site. (Chapter 5 *Parts and Repair Services* gives access info for these two sites.)

To create custom labels, open up the 71-1961 file, using Word or a compatible editor, and follow the steps listed in the sidebar on the document.

Note that Figure 2-34 is not to scale. The 71-1961rB Button Template.dot file must be downloaded to ensure you are using a full-size document.

Once you are done printing close the 71-1961 file WITHOUT SAVING so that it can be re-edited in the future to print additional labels as required.

Lens Replacement

To remove a button cap lens:

1. Use your thumbnail, under the top edge of the removable lens, to flip the lens up and off the button.

2. Place the printed clear label insert into the button cap.

3. Snap a clear lens onto the button cap.

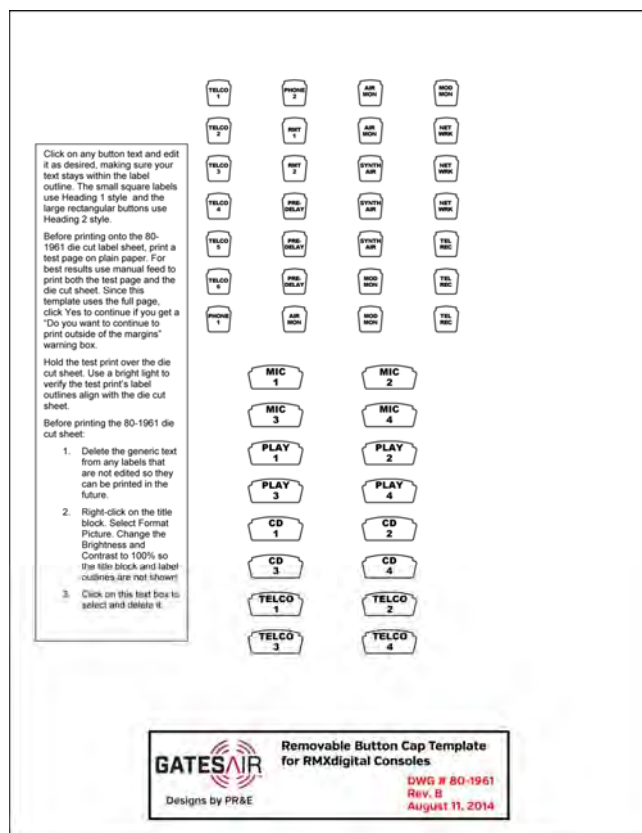Retain the original factory-etched lenses for possible future reuse.

Figure 2-34. Word Doc to Edit and Print Labels for Buttons with Removable Lenses

Chapter 3 – Operation

The RMX*d* console with DirectView metering (Figure 3-1) consists of these main parts:

● A **mainframe chassis** that can hold up to 6, 10, or 14 Dual Fader panels—depending upon frame size ordered, along with one single-width blank panel installed at the right end of the frame
● One **Monitor Control panel**, installed next to the blank panel, at the right end of the frame
● Multiple **Dual Fader panels**, as ordered
● One **Console Display** with
   • Two (RMX*d*-12) or four (RMX*d*-20 & RMX*d*-28) stereo bar graph meters
   • Clock
   • Event timer
● One rack mount **power supply** and two DC power cables

Figure 3-1. RMX*d*-20 Console, shown with various optional panels installed

Console Component Parts

Board Operator Control Panels

Board operators use two types of control panels:

● Monitor Control panel
● Dual Fader panels

Monitor Control Panel

The Monitor Control panel (a standard console part) is always installed near the right side of the mainframe. Its functions are divided into three columns (left to right) of these controls and displays:

● Session Selection/Event Timer Control/Auxiliary Meter Source Selection
● Control Room Monitor control
● Studio Monitor control

The board operator can set the audio sources and channel strip button settings—including bus assignments for every fader channel strip—by selecting and taking a session file (a console configuration file previously created by engineering or operations) using the Session selector in the left column of the Monitor Control panel. The monitor source for the control room, studio, and Aux meter can be selected using the various monitor source selection buttons. The middle and right sections of the Monitor Control panel have separate level controls for the control room monitors, board operator headphones, cue, and studio monitors.

See the *Monitor Control Panel Quick Guide* subsection (page 3-5) for complete information.

Dual Fader Panels

The Dual Fader panels control the audio inputs. Each Dual Fader panel has two separate channel strips to independently control two audio signals. The channel strip settings are typically preset using session file settings but, once a session file is taken, the board operator can use the channel Source Selectors and Take buttons to manually change audio sources, depending again, on session file settings. Some channels may have dedicated sources (like automation system inputs and mic inputs) so they only have one source available (besides SILENCE, which is always available). The bus assignment buttons allow each channel source to be assigned to any combination of buses, as required by the application.

Each channel typically has its own list of available audio input signals, which can come from a local connection on the console or, when the console is networked with a VistaMax system, from any of these other sources:

- Other RMX*d*, BMX*d*, NetWave, or Oasis consoles
- Inputs on VistaMax, Envoy, or VMConnect card frame I-O cards
- VM signal interface inputs

See the *Dual Fader Panel Quick Guide* subsection (page 3-3) for complete information.

Console Display

The RMX*d* console display mounts on the rear cover, which extends across the mainframe just behind the control panels. The RMX*d*-12 console display has these parts:

- Two signal level meters showing the Program 1 bus and a selectable auxiliary source
- A digital clock
- An event timer

The RMX*d*-20 and RMX*d*-28 console displays have four signal level meters to show

- Program 1
- Program 2
- Program 3
- A selectable auxiliary source

See the *Console Display Quick Guide* subsection (page 3-9) for complete information.

Power Supply

The RMX*d* power supply is designed specifically for 24/7 operation and should not be turned off. Doing so causes complete signal interruption on the console. If necessary, press the recessed power switch on the supply's front panel to turn the power supply off or on. If the power supply is turned off, wait a minimum of 30 seconds before turning the supply back on. This not only allows all filter caps to fully discharge but, if the console is networked in a VistaMax system, it allows time for the other networked devices to properly detect the console has left the VistaMax community so they can "close out their connections" with the console.

Note: It takes about ninety seconds for the console to boot up and become available after the power supply is turned on. In most cases a default session file will automatically load at the end of the power-up sequence.

Quick Guides

The following subsections present quick guides for these RMX*d* components:

- Dual Fader Panels
- Monitor Control Panel
- Console Display

Dual Fader Panel Quick Guide

Each panel has two identical channel strips for independent control of two audio signals (shown in Figures 3-2 and 3-3). The initial audio source for each channel strip is typically set by taking a session file. A board operator can then change channel sources by using the channels' **Source Selector** and **Take** button or by taking a different session file.
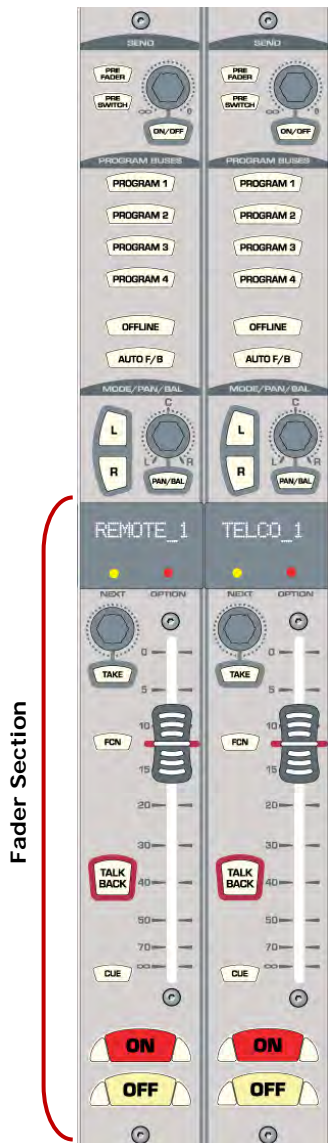

Figure 3-2. Dual Fader Panel – Fader Section

Fader Section Controls

Input Name Display – A 10-character display shows each channel's source name. When the **Source Selector** is actively being used, the yellow **Next** LED lights to indicate an alternate source name is being displayed.

Source Selector – A stepped rotary encoder, just below the yellow Next LED, is used to scroll alphanumerically through alternate channel sources. The sources shown may be limited by session file settings. Thus, only the assigned source may be shown, such as Host Mic, and Silence, which is always available.

Take – Pressing **Take,** while the **Next** LED is lit and the channel is *off*, selects the displayed alternate input source. If **Take** is pressed while the **Next** LED is lit but the channel is *on* then the On button blinks several times. This indicates the next source is now "pending", waiting until the channel is subsequently turned off before it is taken and applied to that fader channel.

FCN (Function) – Active only with 600-series or later system code. It indicates the status of a Protected Destination (PDest), which is a shared four-wire device like a hybrid, two-way, or ISDN. When a PDest is available and is taken on a channel, the **FCN** button is unlit. If the PDest is in use by another Telco fader in the network the **FCN** button winks slowly to indicate the destination is in use. The PDest user's **FCN** button winks rapidly to indicate someone else wants the PDest. Pressing the rapidly winking button releases the PDest. The **FCN** button lights to indicate you can request the same PDest back by pressing the lit **FCN** button.

Fader – The 100 mm channel level control has dB indications to show relative attenuation from 0 dB to infinity. The faders should normally be set close to the red line (-12 dB), which is unity gain through the channel. A nominal +4 dBu analog input signal should then appear on the signal meters as a -20 dBFS signal, which is equivalent to the old 0 VU mark on analog VU meters.

Talkback – This button is only active (lit) on dedicated Telco fader channels (set during console installation) hosted by the KSU (the last four fader channels). Up to six faders can be set as dedicated Telco channels. When the console has an RMX*engine* any DSP-hosted channel can have a PDest or four-wire source routed to it, which will light the Talkback button while the PDest source is active. When **Talkback** is lit, pressing the button sends the control room talk mic, pre-switch and pre-fader, to that Telco channel's IFB (mix-minus output with talk).

Cue – When this control is lit, the input audio, pre-fader, pre-switch, is sent to the cue output. On CR mic channels, the **Cue** button is momentary and the input audio only goes to the Aux meter and the operator headphones, when the **AutoCue** button is lit. With all other inputs, pressing the cue button toggles **Cue** on and off. When on, the audio goes to the Cue speaker, the Aux meter, and the operator headphones, when the **AutoCue** button is lit.

On – Press this button to turn the channel on. The button lights, and the audio feeds the selected buses. Logic control commands may also be initiated, depending upon session file logic settings for the active source.

Off – Press this button to turn the channel off, removing 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 active source. The button may not light when pressed, since some inputs may be set to indicate peripheral device status.

Send Bus Controls

On/Off – When this button is lit, the input audio goes to the send bus through the send volume control and the **Pre Fader** and **Pre Switch** controls. When it is unlit, no audio on this channel goes to the send bus.

Rotary Volume – This control sets the level of the audio going to the send bus.

Pre Fader – When unlit, the audio level going to the send bus is also controlled by the channel fader. When this button is lit, the audio going to the send bus is not affected by the channel fader.

Pre Switch – When unlit, the audio to the send bus follows the channel on or off status. When lit, the audio going to the send bus is not affected by the channel **On** or **Off** buttons.

Program and Offline Bus Assignment

Program 1, 2, 3, 4 – When lit, the channel audio, post fader and post switch, go to that Program bus. When unlit, the channel audio does not go to that bus. Any combination of the four Program buses can be assigned.

Offline – When lit, the channel audio goes to the Offline bus. When unlit, the channel audio does not go to the Offline bus. The Offline feed is pre-switch and can be set pre- or post-fader (a console configuration file setting). The Offline bus is only used as a base mix source for Telco channel mix-minus outputs.

Auto F/B (Automatic Foldback) – Active only on Telco channels. When lit, the Telco mix-minus audio toggles between the Offline bus (when that Telco channel is off) and a Program bus (when that Telco channel is on). When unlit, the mix-minus base mix is not affected by the Telco channel's status. The *Telco Foldback Mix* subsection gives more operational details.

Channel Mode and Pan/Balance Controls

L and **R** – These buttons control the channel's 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 applied to both left and right bus outputs.

Pan/Bal – When unlit, the pan/balance control position does not affect the audio. When lit, the **Rotary Pan/Balance** control affects the left/right audio levels.

Rotary Pan/Balance – When the **Pan/Bal** button is lit, this control affects how the audio input is placed in aural space. On a stereo signal, it functions as a stereo balance control. On a mono signal (the **L**, **R**, or both are lit) it is a pan control.
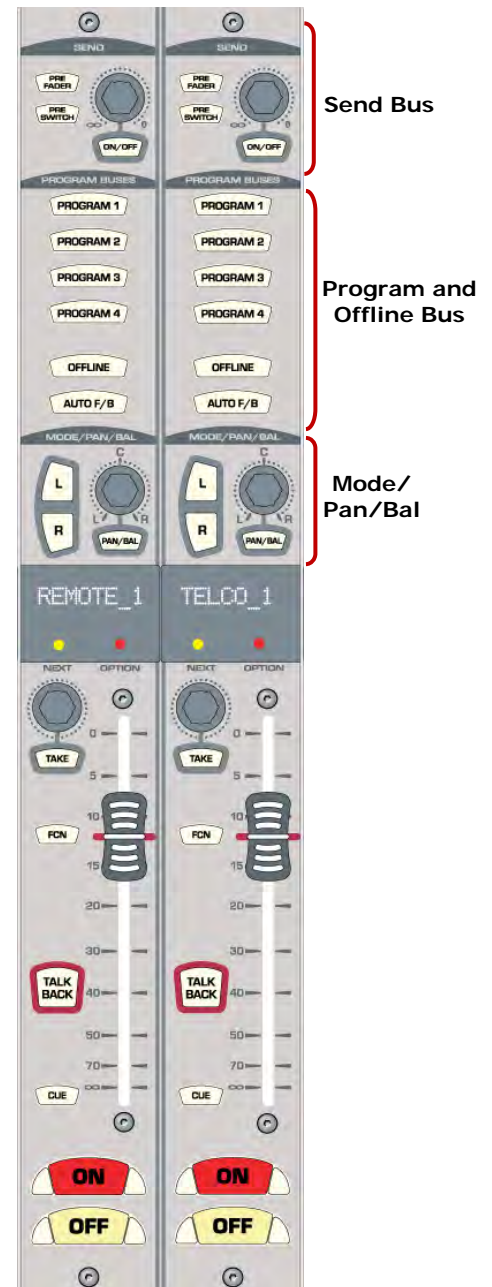

Figure 3-3. Dual Fader Panel – Send, Program Bus, and Mode/Pan/Bal Controls

Monitor Control Panel Quick Guide

This panel (Figure 3-4) is divided into three columns by function:

● **Left Column** – Has the seven auxiliary meter source selection buttons, the session file controls, the monitor mode buttons, and the event timer control buttons.

● **Center Column** – Has the control room monitoring controls: seven monitor source selection buttons and monitor source selector controls; faders for the control room monitors and operator headphone levels; cue and talkback rotary level controls

● **Right Column** – Has the studio monitoring controls: seven monitor source selection buttons and monitor source selector controls; rotary levels controls for the studio speakers and talkback; talk buttons so the board operator can talk to the studio and the external location
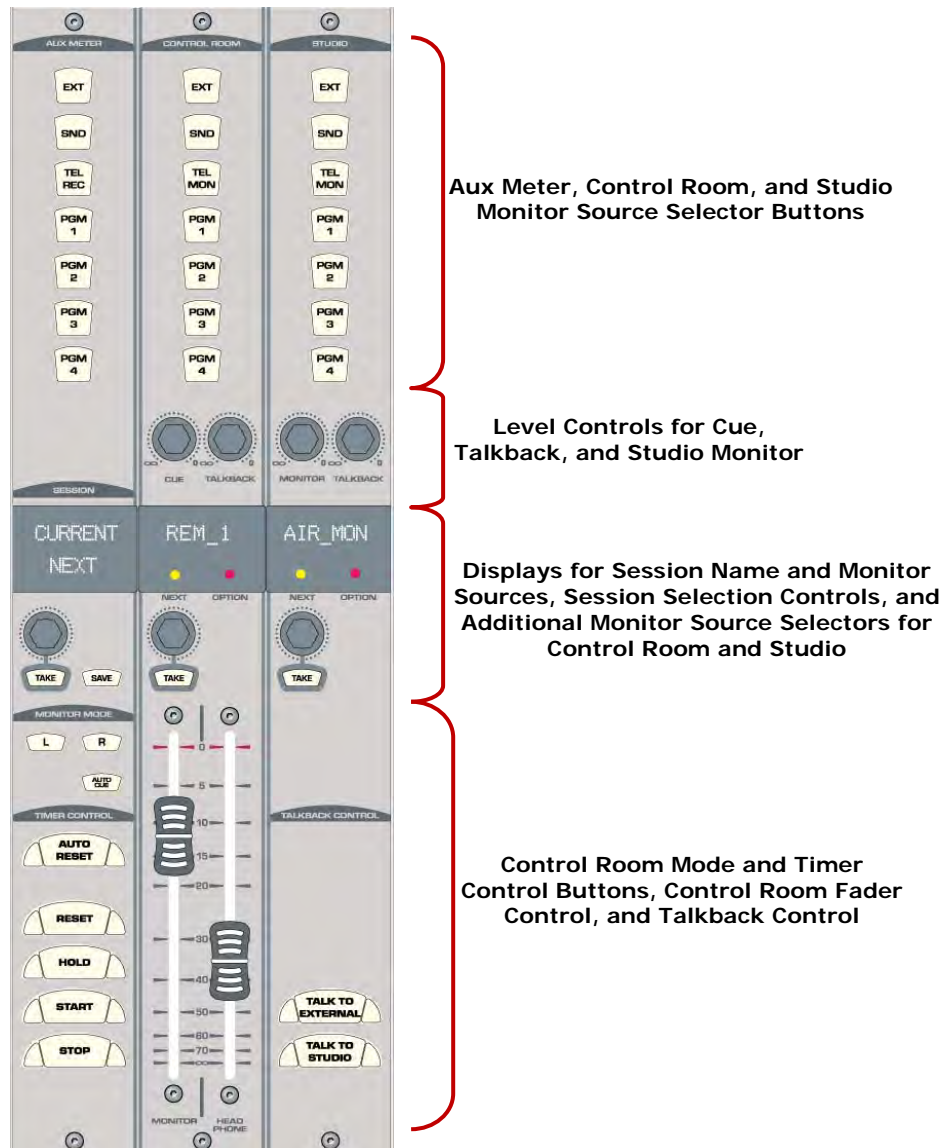

Figure 3-4. Monitor Control Panel

The next subsections cover each column's functions.

Monitor Control Panel Quick Guide – Left Column Controls

Figure 3-5 shows the left column controls on a Monitor Control Panel.

Aux Meter

These buttons have removable lenses so they can be custom labeled. The actual audio signal assigned to each button is set during console configuration. Only one button can be selected at a time. These are the default signals and labels:

EXT – When lit, routes an External input (such as an off-air tuner) to the Aux meter.

SND – When lit, routes the Send bus to the Aux meter.

TEL REC – When lit, routes the Telco Record bus to the Aux meter.

PGM 1-4 – When any one of these buttons is lit, routes that Program bus to the Aux meter.

Session

The board operator uses these controls to take or save a session file.

Session Name Display – The top line (CURRENT) shows the name of the session loaded into the console memory. The bottom line (NEXT) shows a name of other sessions, as selected using the **Session Selector** control.

Session Selector – Turn this rotary encoder to alphanumerically display previously saved sessions in the bottom line of the **Session Name Display**.

Take – Pressing this button takes, or loads into the console memory, the session shown in the bottom line of the display. The CURRENT and NEXT names will then be identical until the **Session Selector** is again used.

Save – Pressing this button saves a new session using the current settings of the Dual Fader panels' buttons, input sources, and the section settings in the console memory, loaded from the last session or macro that was taken. The new session name is the CURRENT session name and a numeric suffix (e.g., CURRENT_01).

Note: Pressing **Save** always creates a new session never affecting any existing sessions.

Monitor Mode

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

Auto Cue – When this button is lit, it allows Cue to interrupt the operator headphone output by the routing method set during console configuration. When the button is unlit, Cue does not interrupt the operator's headphone output.

Timer Control

This section controls the count up Event Timer in the Console Display.

Auto Reset – When lit, allows the event timer to be reset when a channel—with the timer reset function enabled in the session—is turned On. The timer resets to 00:00.0 and starts counting up. When unlit, the event timer ignores any channel timer reset commands.

Reset – Pressing this button resets the timer to 00:00.0 and starts counting up. Pressing **Reset** and **Stop** together stops and resets the timer to 00:00.0.

Hold – Press and hold this button to freeze the event timer's display to show elapsed time. The event timer continues to run. Releasing **Hold** returns the display to the current run time.

Start – Pressing this button starts counting up from the displayed time.

Stop – Pressing this button stops the timer with the elapsed time displayed. Pressing **Reset** and **Stop** together stops and resets the timer to 00:00.0.

Figure 3-5. Left Column - Monitor Control Panel

Monitor Control Panel – Center Column Controls

Figure 3-6 shows the center column controls on a Monitor Control Panel.

Control Room

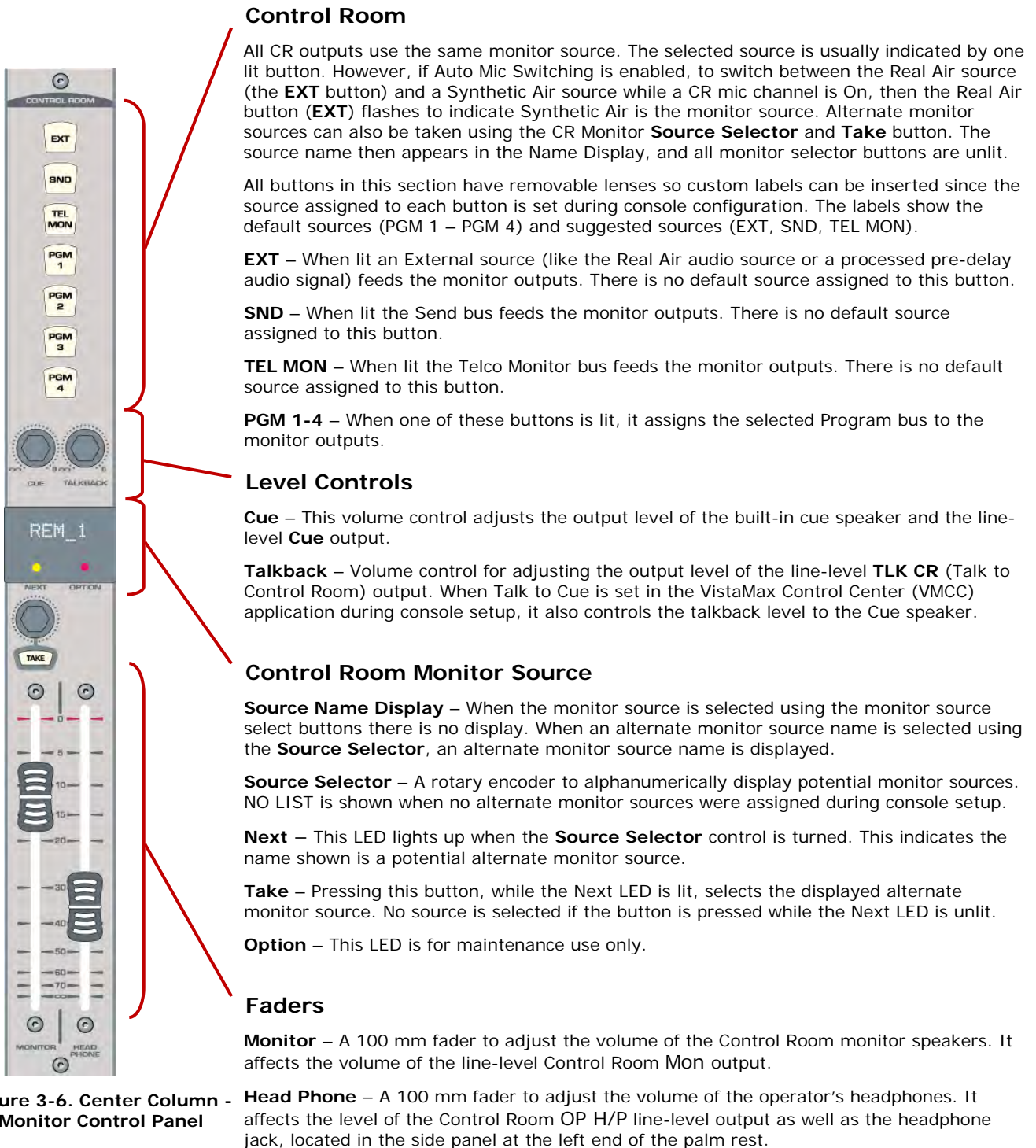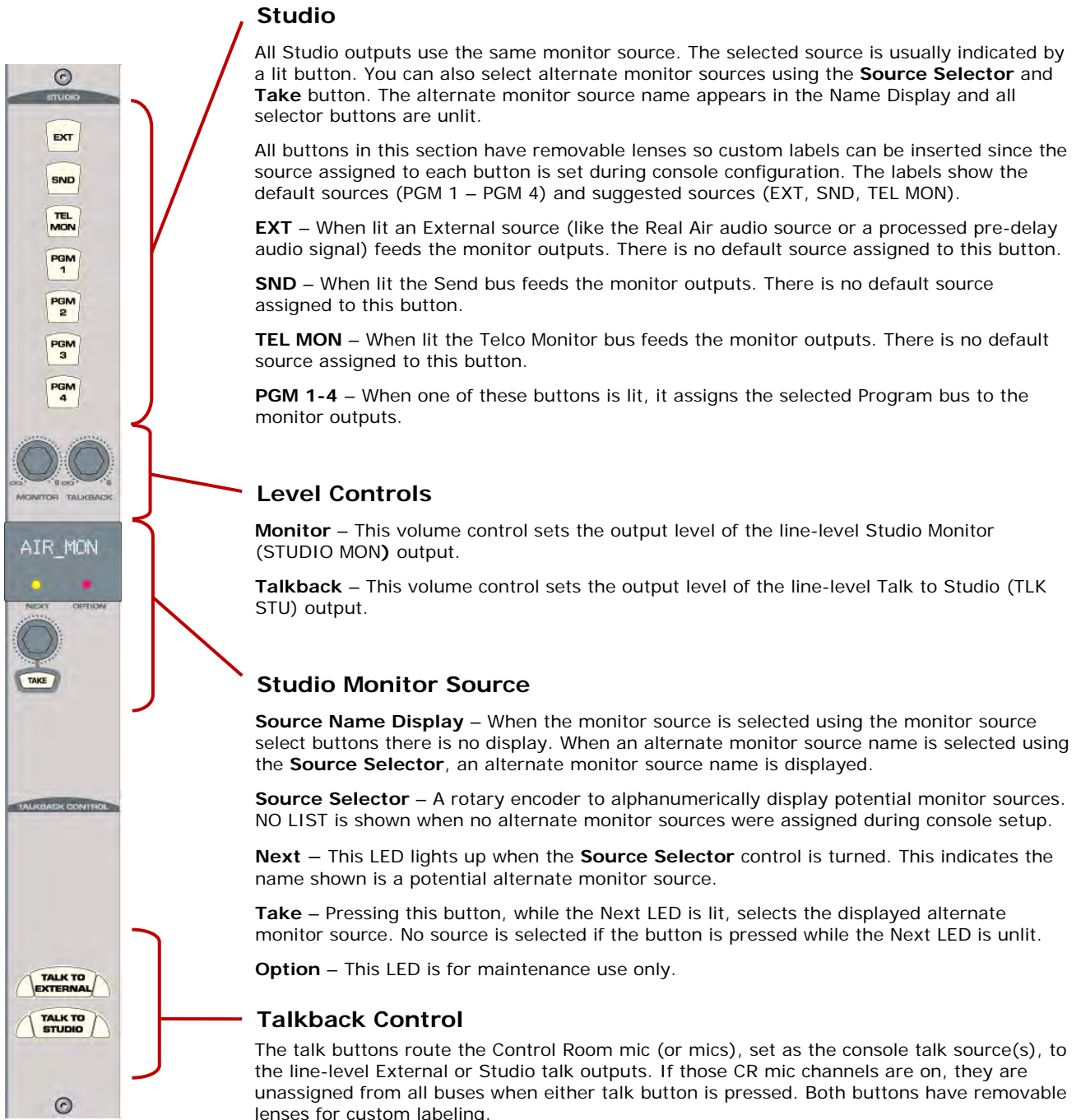All CR outputs use the same monitor source. The selected source is usually indicated by one lit button. However, if Auto Mic Switching is enabled, to switch between the Real Air source (the **EXT** button) and a Synthetic Air source while a CR mic channel is On, then the Real Air button (**EXT**) flashes to indicate Synthetic Air is the monitor source. Alternate monitor sources can also be taken using the CR Monitor **Source Selector** and **Take** button. The source name then appears in the Name Display, and all monitor selector buttons are unlit.

All buttons in this section have removable lenses so custom labels can be inserted since the source assigned to each button is set during console configuration. The labels show the default sources (PGM 1 – PGM 4) and suggested sources (EXT, SND, TEL MON).

EXT – When lit an External source (like the Real Air audio source or a processed pre-delay audio signal) feeds the monitor outputs. There is no default source assigned to this button.

SND – When lit the Send bus feeds the monitor outputs. There is no default source assigned to this button.

TEL MON – When lit the Telco Monitor bus feeds the monitor outputs. There is no default source assigned to this button.

PGM 1-4 – When one of these buttons is lit, it assigns the selected Program bus to the monitor outputs.

Level Controls

Cue – This volume control adjusts the output level of the built-in cue speaker and the line-level **Cue** output.

Talkback – Volume control for adjusting the output level of the line-level **TLK CR** (Talk to Control Room) output. When Talk to Cue is set in the VistaMax Control Center (VMCC) application during console setup, it also controls the talkback level to the Cue speaker.

Control Room Monitor Source

Source Name Display – When the monitor source is selected using the monitor source select buttons there is no display. When an alternate monitor source name is selected using the **Source Selector**, an alternate monitor source name is displayed.

Source Selector – A rotary encoder to alphanumerically display potential monitor sources. NO LIST is shown when no alternate monitor sources were assigned during console setup.

Next – This LED lights up when the **Source Selector** control is turned. This indicates the name shown is a potential alternate monitor source.

Take – Pressing this button, while the Next LED is lit, selects the displayed alternate monitor source. No source is selected if the button is pressed while the Next LED is unlit.

Option – This LED is for maintenance use only.

Faders

Monitor – A 100 mm fader to adjust the volume of the Control Room monitor speakers. It affects the volume of the line-level Control Room Mon output.

Figure 3-6. Center Column - Monitor Control Panel

Head Phone – A 100 mm fader to adjust the volume of the operator's headphones. It affects the level of the Control Room OP H/P line-level output as well as the headphone jack, located in the side panel at the left end of the palm rest.

Monitor Control Panel – Right Column Controls

Figure 3-7 shows the right column controls on a Monitor Control Panel.

Studio

All Studio outputs use the same monitor source. The selected source is usually indicated by a lit button. You can also select alternate monitor sources using the **Source Selector** and **Take** button. The alternate monitor source name appears in the Name Display and all selector buttons are unlit.

All buttons in this section have removable lenses so custom labels can be inserted since the source assigned to each button is set during console configuration. The labels show the default sources (PGM 1 – PGM 4) and suggested sources (EXT, SND, TEL MON).

EXT – When lit an External source (like the Real Air audio source or a processed pre-delay audio signal) feeds the monitor outputs. There is no default source assigned to this button.

SND – When lit the Send bus feeds the monitor outputs. There is no default source assigned to this button.

TEL MON – When lit the Telco Monitor bus feeds the monitor outputs. There is no default source assigned to this button.

PGM 1-4 – When one of these buttons is lit, it assigns the selected Program bus to the monitor outputs.

Level Controls

Monitor – This volume control sets the output level of the line-level Studio Monitor (STUDIO MON**)** output.

Talkback – This volume control sets the output level of the line-level Talk to Studio (TLK STU) output.

Studio Monitor Source

Source Name Display – When the monitor source is selected using the monitor source select buttons there is no display. When an alternate monitor source name is selected using the **Source Selector**, an alternate monitor source name is displayed.

Source Selector – A rotary encoder to alphanumerically display potential monitor sources. NO LIST is shown when no alternate monitor sources were assigned during console setup.

Next – This LED lights up when the **Source Selector** control is turned. This indicates the name shown is a potential alternate monitor source.

Take – Pressing this button, while the Next LED is lit, selects the displayed alternate monitor source. No source is selected if the button is pressed while the Next LED is unlit.

Option – This LED is for maintenance use only.

Talkback Control

The talk buttons route the Control Room mic (or mics), set as the console talk source(s), to the line-level External or Studio talk outputs. If those CR mic channels are on, they are unassigned from all buses when either talk button is pressed. Both buttons have removable lenses for custom labeling.

Figure 3-7. Right Column - Monitor Control Panel

Talk to External – While pressed, routes the Control Room talk mic(s), pre-switch and pre-fader, to the **TLK TO EXT** output. Also triggers the **TLK TO EXT** logic.

Talk to Studio – While pressed, routes the Control Room talk mic(s), pre-switch and pre-fader, to the **TLK TO STU** output. Also triggers the **TLK TO STU** logic.

Console Display Quick Guide

The RMX*d*-12 console display (Figure 3-8) has two signal meters. The RMX*d*-20 and RMX*d*-28 console displays have four signal meters. All displays have a clock and event timer.
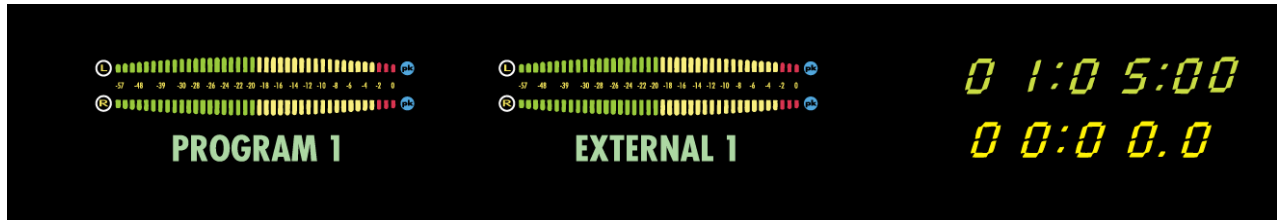
Figure 3-8. Two-Meter Console Display

The RMX*d* console displays include these parts

- Bar graph meters – The *Bar Graph Meters* subsection details the bar graph indications.

- Digital clock – The clock displays time in HR:MN:SEC (hours:minutes:seconds) in either 12-hour or 24-hour time. The *Time Setting* subsection (Chapter 2) details setting the clock.

- Event timer - The event timer displays time in MN:SEC:TS (minutes:seconds.tenths of seconds). The previous *Monitor Control Panel Quick Guide - Left Column Controls* subsection details the timer controls.

Bar Graph Meters

The left-most meter provides a level display for the **Program 1** bus. The right-most Auxiliary meter shows a selected source set by the Aux Meter buttons on the Monitor Control panel (*Monitor Control Panel Quick Guide – Left Column Controls* subsection). However, while cue is active, the meter shows the cue bus levels. Alphanumeric displays below each meter identify the displayed source by name (for example, **Cue**, **Program 1**, **Send**, and **External**). On the RMX*d*-20 and RMX*d*-28 quad meter displays, the middle meters show the **Program 2** and **Program 3** buses, respectively.

Figure 3-9 identifies the parts found on each bar graph meter. Each bar or segment, from 0 down to -30, represent a 1 dB level change. From -30 down to -57, each bar represents a 3 dB difference in level. The center of the meter (-20 dBFS) is equivalent to 0 VU on a mechanical "analog" VU meter. With a properly set up console, a tone with a level of -20 dBFS will have a +4 dBu analog output and a -20 dBFS digital output.
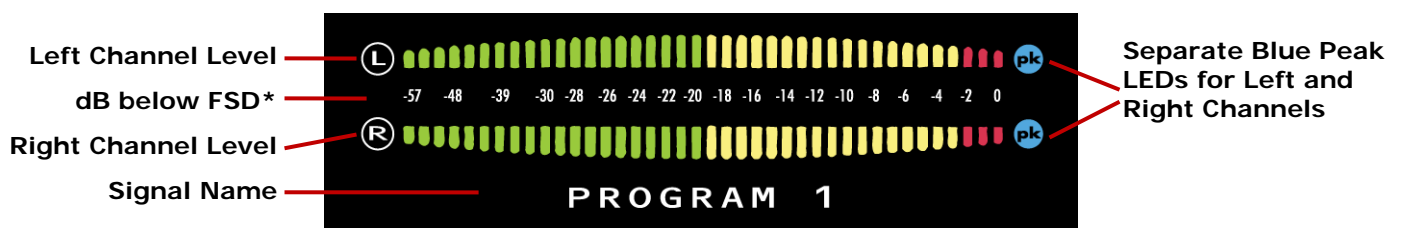
*FSD – Full Scale Digital, 0 on the meters, the maximum console output level
Compared to an analog VU meter, 0 VU is equivalent to the -20 dBFS.*
Figure 3-9. RMX*digital* Bar Graph Meter

The segments up to -20 are green to indicate they are safe levels (below analog 0 VU), while the segments from -20 to -3 are yellow indicating where the peak level indicators should be. The 0, -1, and -2 segments are red to indicate the signal is dangerously close to clipping. To prevent digital distortion on the program and monitor outputs, the red bars should rarely, if ever, light up—especially the 0 bar. A red bar lighting indicates the signal is at, or very close to the digital clipping point.

The meter's default setting displays two different signal levels:

- Average Signal level: a solid moving bar graph that typically extends to the -20 to -14 dBFS range.

- Instantaneous Peak Level: a single lit bar, typically 6 to 10 dB higher than the average bar graph, which should be in the -12 to -3 dBFS range.

The meters can alternately be set to display only the average signal level. There is also a setting for whether or not the peak LEDs are held (default setting holds the peak for about three seconds).

The two blue Peak LEDs alert the operator to hot signals nearing the digital clipping point. The Peak LEDs can be set to turn on when the peak signal level hits 0, -2, -4, or -6 dBFS (default setting is -6 dBFS).

RMX*d* Applications

The RMX*d* console is suitable for use in an on-air studio, a production room, a newsroom, or a voicing studio; the console can be installed as a standalone console or as a "device" in a VistaMax audio management system. Because of the RMX*d*'s flexibility and compact design, some features require knowledge beyond the typical console operation of select a bus, run the fader up, and turn the channel on. This section presents an overview of some of the common board operations.

VistaMax Integration

When the RMX*d* console is linked with 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 network signals that are physically connected to remotely located VistaMax frames, typically located in the terminal or rack room, or other networked consoles located elsewhere in the facility.

To a board operator, a VistaMax audio management system has just two components:

- Sources
- Destinations

A source is simply an audio input signal, whether from a satellite receiver, a Telco hybrid, a remote traffic feed, a processed mic, an automation system, or a Program bus from another console.

Each of these audio input sources can be routed to any number of these type of destinations:

- An output on any VistaMax I-O card
- A channel on the RMXdigital console
- A KSU card routable output

Each channel strip in the RMX*d* console is a destination. No channel is directly associated with any particular input on the console, allowing any channel complete access to every source on the console and in the entire VistaMax system. However, to simplify board operator source selection, each channel strip typically has a "channel specific include list" set by the session that limits the sources shown on each fader to just those deemed most valuable to that fader channel. This limited access means some channels may only have one source, typically the case with microphone and automation system channels. Each session on the console could use the same include list for each channel or each session could have different include lists for each fader channel, it all depends upon the application.

A board operator accesses networked VistaMax signals in the same way as for a local input source:

1. Rotate the Source Selector control. The **Next** LED lights to indicate the display is now showing alternate source names in the 10-character display.

2. While the **Next** LED is lit, press **Take**. If the channel is off, the **Next** LED turns off and the new source is routed to the channel (as the source is routed, brackets appear around the source name, the source is ready when the brackets are removed). If the channel is on, the on button winks several times to indicate that the new source is now pending (it will be taken only after the channel is turned off). If the **Next** LED goes out before pressing **Take**, the display reverts to show the current source name and no source change is performed.

Since each channel shares one display for the current source name and the next source name, as soon as the Source Selector knob is touched the **Next** LED lights to indicate the display is now showing alternate source names, in alphanumeric order. This same type control is also used to select session files and select alternate monitor sources for the control room and studio. Rack-mount VistaMax Source Selector panels may also be used to choose sources to feed to in-room recording devices in similar fashion.

Routing a console signal to any VistaMax location requires only that the source name be "published," a setup function that simply lists the sources that each destination device 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.

Telco/4-Wire Device Operation

In the RMX*digital* the term "Telco" is used to generically refer to any type or model of remote send and receive device, like a telephone hybrid, a satellite transceiver, an ISDN, a two-way radio, or a codec. "4-wire device" is another name often used to generically refer to these type devices.

The 600-series operating system code, used with all DirectView RMX*digital* consoles, introduced many new features but two in particular affect how Telco devices and Telco channels operate:

- Protected Destinations (PD). This new construct was created so that destinations, connected to shared four-wire devices, could be protected from having their mix-minus return routes changed by other system users. A new macro, called a PDest or Protected Destination macro, sets up the protected destination. A PDest macro not only routes a four-wire device to the Telco fader and routes the mix-minus for that Telco fader back to the four-wire device, it also flags that destination so that it will be protected. And, if the console is using an RMX*engine*, the PDest can also change a regular mic/line channel into a "virtual Telco" channel.

  The system monitors each protected destination. When a new route request is made to a protected destination the system asks the current PD owner to release that destination (by blinking the FCN button on the PDest fader channel). The current PD owner can release the PD by pressing the FCN button. The system then routes the new signal to the PD and a new "owner" now has that destination. Complete operational details are covered in later subsections.

- The RMX*engine*. An optional 1RU processor, which plugs into Facet 1 on the KSU, was created to allow for more than six concurrent mix-minus signals on the RMX*d* console. It creates a subtractive mix-minus signal for every DSP-hosted fader in the console, allowing any of those fader channels to become a "Virtual Telco" channel when using a PDest macro.

Dedicated Telco Channels

When an RMX*engine* is not used with the RMX*d* console, any six fader channels in the console can be set as dedicated Telco channels by changing the channel's rotary switch setting on the back of the dual fader panel. The rotary switch setting identifies up to six channels as being uniquely-numbered dedicated Telco faders (Telco 1 – Telco 6), each with its own dedicated mix-minus output. The actual number of dedicated Telco channels that need to be assigned depends upon the console's application: some users may only need one Telco channel for phone callers, while most users have two Telco channels for callers and remotes, while others need more than six Telco channels—which is where the RMX*engine* comes in…

When the console has an RMX*engine* connected to it, because of the new features that it adds, no DSP-hosted fader channel should be set as a dedicated Telco channel since the RMX*engine* can turn any DSP-hosted fader channel into a "virtual Telco" channel. Only the KSU-hosted faders (the four faders nearest the monitor control panel) would be set as dedicated Telco faders with an RMX*engine*.

Even though, without an RMX*engine* connected, any DSP-hosted or KSU-hosted fader channel can be set as one of up to six dedicated Telco channels, there are differences in how a KSU-hosted vs. DSP-hosted dedicated Telco channel operates. The most apparent difference is that the Talkback buttons light up on the KSU-hosted fader channels but the DSP-hosted dedicated Telco channels will not have a lit Talkback button until a PDest macro is taken on that channel.

Dedicated Telco channels have two buttons: **Auto F/B** (Automatic Foldback) and **Talkback** (Talk to Caller) which are not active on non-Telco channels. In addition, the bus assignment buttons serve a dual purpose, to assign the Telco channel audio to one or more buses and to indicate (by winking) which bus is the "base mix" for the mix-minus or foldback signal for that four-wire device.

Telco Foldback Mix

There are two mono Foldback (or mix-minus) signals associated with each Telco channel, regardless of whether it is a dedicated Telco channel or a Virtual Telco channel:

- An IFB (Interruptible Foldback) signal
- A "clean feed"

The six Foldback or Mix-Minus buses are typically identified as MM 1 (mix-minus 1) thru MM 6 (mix-minus 6). The IFB feed (the odd signal numbers or "left" channels) is normally used with four-wire devices with only one return channel. The Telco Foldback signal with talk (IFB) allows the board operator to talk individually to any caller or remote by using the Telco channel's Talkback button.

The clean feed (the even signal numbers or "right" channel) is typically only used with ISDNs and other codecs having dual return channels.

The bus used to feed these two Foldback outputs is indicated by a 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. When that button is lit, the Telco channel's state (On or Off) automatically switches the Foldback source between the offline bus while the channel is off, and the lowest active PGM bus when the channel is on. When **Auto F/B** is unlit, the mix-minus is always fed by whichever bus is winking, regardless of the Telco channel status.

All program bus Foldback feeds are derived post-switch and post-fader. The Offline bus Foldback feed is pre-switch and is normally set pre-fader, but it can be derived post-fader, depending upon a configuration setting made when the console was installed.

Auto Foldback On

When the **Auto F/B** button is lit (Figure 3-10), 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.

Foldback Source with **Auto F/B** lit and channel **On**

Foldback Source with **Auto F/B** lit and channel **Off**
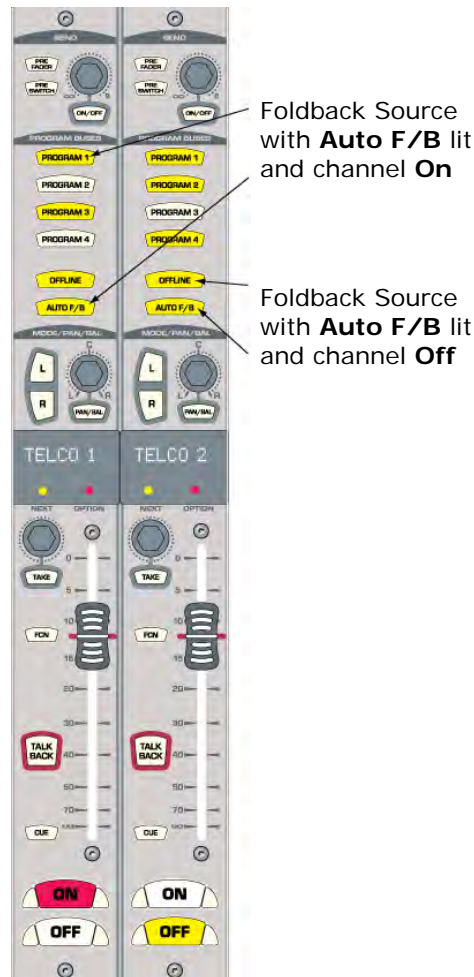
Figure 3-10. Telco Auto On Foldback Settings

The Foldback mix uses this bus priority:

- **Channel On** – **Program 1** is the Foldback mix source. If it is not assigned (unlit), the source is selected in this order: **Program 2**, **Program 3**, **Program 4**, and **Offline**.

- **Channel Off** – The **Offline** bus is the Foldback mix bus. If it is not assigned (unlit), there is no foldback audio except talkback.

Auto Foldback On is the most common setting for call-in contests, remotes, or interviews where the caller/remote 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 board operator through their CR mic on the **Offline** bus. The board operator 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 waiting to go on-air, the caller must listen to something like a "contest rules and regulations" recording, it is best to only assign the recording playback channel and the caller to **Offline**. The board operator presses the **Talkback** button to talk to the caller or can momentarily assign the operator's mic to **Offline** to talk to the caller without pressing **Talkback**.

When the caller goes live on-air (the Telco channel is On), the Foldback automatically switches to **Program 1** (assuming the air feed is the **Program 1** bus) so that the caller hears everything else going out on-air, except the caller's own voice.

Auto Foldback Off

When the **Auto F/B** button is unlit (Figure 3-11), the Telco channel has a different bus priority order for selecting the Foldback feed.

Foldback
Source
when **Auto
F/B** is not

Channel status
does not change
Foldback Source
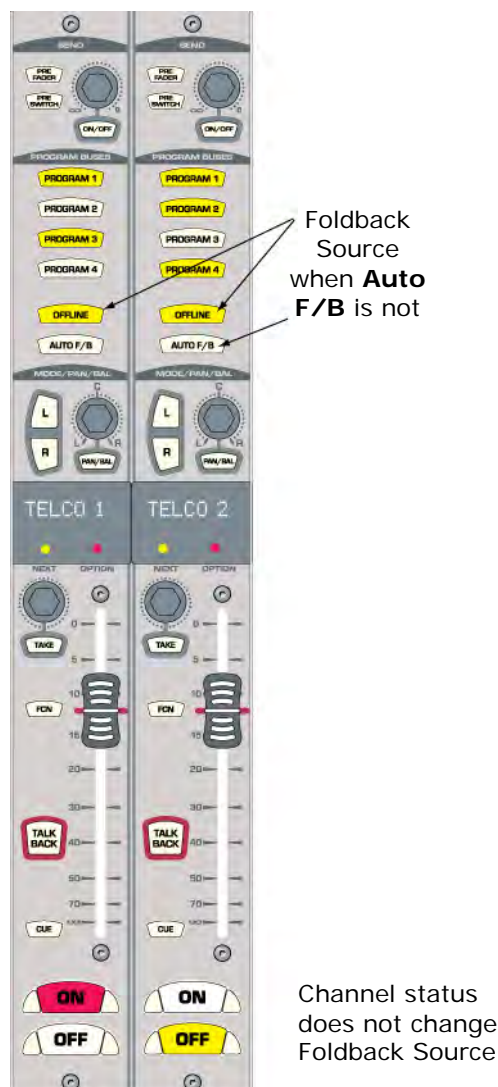
Figure 3-11. Telco Auto Off Foldback Settings

Whether the Channel is *on* or *off*, the primary Foldback source is **Offline**. If it is not assigned, the program buses are selected in order: **Program 1**, **Program 2**, **Program 3**, or **Program 4**.

Auto Foldback Off is the most common setting for recording callers for later broadcast or for a live remote where the clean mix-minus feed is used as a "broadcast" feed to the remote site.

In a remote broadcast, when the remote talent channel goes between being off-air and on-air, the Foldback mix should not change. In this case, select only **Program 1** on the Telco channel. The **Program 1** Foldback is always 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; it is the Foldback feed, regardless of the program bus assignments and whether the channel is On or Off. The board operator would use the **Talkback** button to talk to the remote talent on the IFB mix-minus.

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®. Which Telco channels being recorded is set in the "[TelcoRecord]" section of the session file. Each Telco channel is listed in this section. When a channel setting is set for "=1" that Telco channel is set as a To Record Telco—that Telco channel is recorded to the caller output. If the channel setting is "=0" that Telco channel is not included in the caller record output but may be included in the talent output, depending on which bus it is assigned to.

In the session file section example, Telco 1 (Channel_81) and Telco 4 (Channel_84) are summed together to go to the caller output, since they are both set at =1. Telco 2 (Channel_82) and Telco_3 (Channel_83) are not recorded on the caller output, since their settings are =0.

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

The caller output contains all the Telco channels that are assigned as =1 in the session file. The talent output is the base mix—either one program bus or the Offline bus—plus any Telco channel that is assigned as =0 in the [TelcoRecord] section of the session file. Typically, just the talent mic channel is assigned to the bus for the base mix, but any channels assigned to that bus are 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 for all Telco channels or only set one Telco channel to =1 in the [TelcoRecord] section.

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

- AUTO F/B is Off for all Telco channels that are being recorded (Telcos that are =1 in the [TelcoRecord] section):

  - The base mix source is **Offline**. If it is not assigned, the program buses are used in order:
    ◦ **Program 1**
    ◦ **Program 2**
    ◦ **Program 3**
    ◦ **Program 4**
  - If **Offline** is the base mix source, it does not matter whether the channels are On or Off; all To Record Telco channels are recorded (Figure 3-12).
  - If a program bus is the base mix source, the To Record Telco channel must be On to record the caller. If a To Record Telco channel is Off, that caller is *not* being recorded.

Base Mix Source
(feeds the right
channel of the
Telco Record
Output)

Channel On/Off
status does not
affect the Telco
Record Outputs

Figure 3-12. Recording Functions with Auto F/B Off for All To Record Telcos

- AUTO F/B is on at least one To Record Telco (Figure 3-13):

  - 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 the Telcos with **Auto F/B** lit are **On**, **Program 1** is the primary base mix. If Program 1 is not assigned, the order is
    ◦ **Program 2**
    ◦ **Program 3**
    ◦ **Program 4**
    ◦ **Offline**
  - When any To Record Telco channel is turned Off, with **Auto F/B** lit, **Offline** is the base mix source. If **Offline** is not assigned, no callers are recorded. Table 3-1 summarizes the record output.
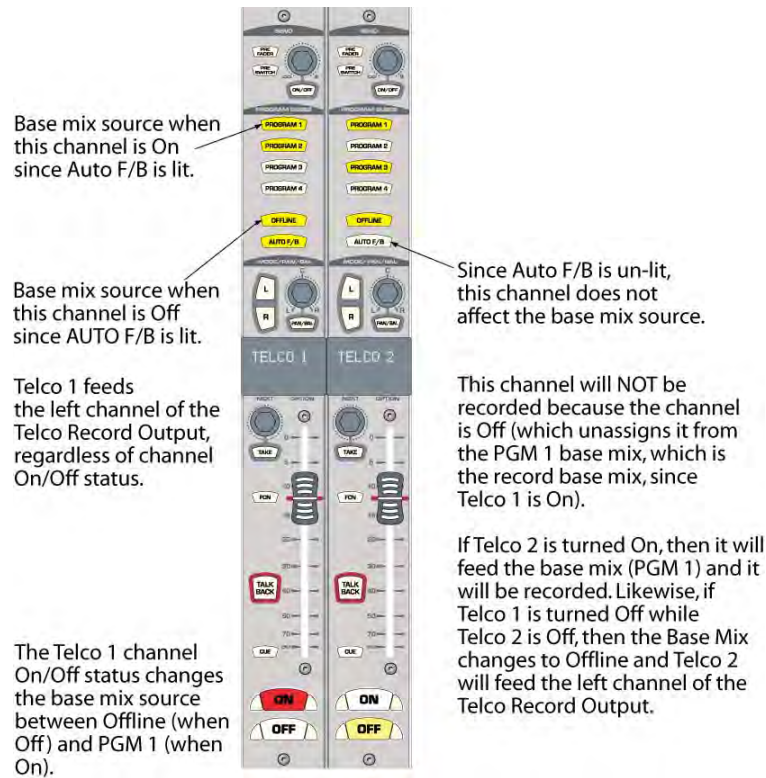
Figure 3.13. Recording Functions with Auto F/B On for Any To Record Telco Channel

The Record Summary (Table 3-1) lists which signals get recorded.

Table 3-1. Telco Record Output Summary

Channel	Description
Left	All Telco channels assigned *To Record* by the session file.
Right	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. The bus may be assigned to a monitor select button so that it can easily be monitored, as this is the other method to verify that the correct Telco channels and talent signals are being recorded.

Chapter 4 – RMX*digital* Server Setup

The RMX*d* server physically consists of a single-board computer (SBC) with an integral Flash Disk to store:

- The console's operating system
- VMCC-created console configuration and setup files
- User-created session and macro files

The SBC is part of the KSU card assembly. The RMX*d* Server stores these file types:

- Sessions (`.ses` suffix)
- Macros (`.mac` suffix)
- Console setup (`.ini` suffix)
- Console configuration (`.cfg` suffix)
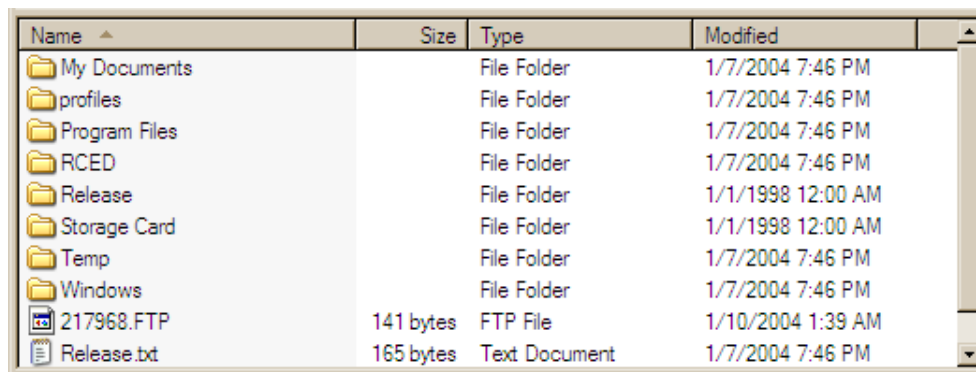
The RMX*d* Server also functions as an FTP (File Transfer Protocol) server, allowing files to be transferred between a networked Windows® XP Pro, 7 Pro, or 8 Pro computer—running FTP Voyager or other FTP application—and the RMX*d* console. The networked computer is generically referred to as the "admin computer" in this manual. The admin computer is usually installed in the terminal or rack room near the VistaMax card frames, but it can be a desktop computer in the engineering office or even a laptop computer, especially if the RMX*d* console is used in a standalone configuration.

All `.ini` and `.cfg` files on the RMX*d* Server are maintained using the VistaMax Control Center (VMCC) application—a GatesAir editor application that can be downloaded from the GatesAir Customer Portal or the GatesAir Studio products FTP site. (The *Parts and Repair Services* subsection in Chapter 5 gives details on accessing these sites.) This chapter and Appendix A give information on using VMCC.

Because RMX*d* uses the same operating system as VistaMax card frames, only one admin computer running VMCC is required to maintain all of the VistaMax devices networked together on the VistaMax LAN.

RMX*d* File Structure

The RMX*d* console's setup and configuration files must be properly saved into specific folders to ensure proper operation. All of the files that VMCC creates and distributes to each device are automatically saved into the proper locations in the **Storage Card** folder. Figure 4-1 shows the folders and files that appear on the single board computer's (SBC's) flash disk as viewed in FTP Voyager. The Storage Card is the only folder that is user-controlled. All other folders and files are recreated each time the SBC boots up.

Figure 4-1. Files and Folders on the RMX*d* Server

Any FTP application (even Internet Explorer) can be used to view, upload, or download files in the **Storage Card** folder. However, FTP Voyager, a dedicated FTP file management application, is recommended. (It can be downloaded from the GatesAir file download sites.) The default factory IP address assigned to each RMX*d* console is 192.168.100.22. The recommended IP address for the admin computer is 192.168.100.11. With these settings, enter the console's IP address into the FTP Site address field in FTP Voyager to view the files on a new console.

The **Storage Card** folder contains:

● A **Data** folder

● The `nqx.ini` file, which VMCC maintains

● A `provisioned.hash` file (written by VMCC after it distributes updated configuration files)

● An **RCED** folder with an rced.jar file (config file for 9G20-based edge devices hosted by the console)

The **Data** folder contains these folders:

● **SesFiles** – Used to store all the session and macro files, including the `init.mac` file which VMCC maintains

● **SysFiles** – Used to store the remaining console configuration and setup files:

- routers.ini
- inventory.txt
- local_publish.cfg
- edgedevice.ini
- serverid.txt
- `Dxx_publish.cfg` – When the console is networked with a VistaMax system, there is one device publish file from every other device in the VistaMax community (RMX*d* and BMX*d* consoles and VistaMax system card frames)

● **Ref** – Config files used by the older x86-based SBCs

RMX*d* Server Files Overview

This subsection describes the configuration and other types of files found on the RMX*d* server. It is presented as background information on how the console functions since in most applications the operating system or the VMCC app create and maintain these files. They should not be manually edited.

The configuration files that VMCC creates can be viewed in the VMCC **Provisioning** window (Figure 4-2).
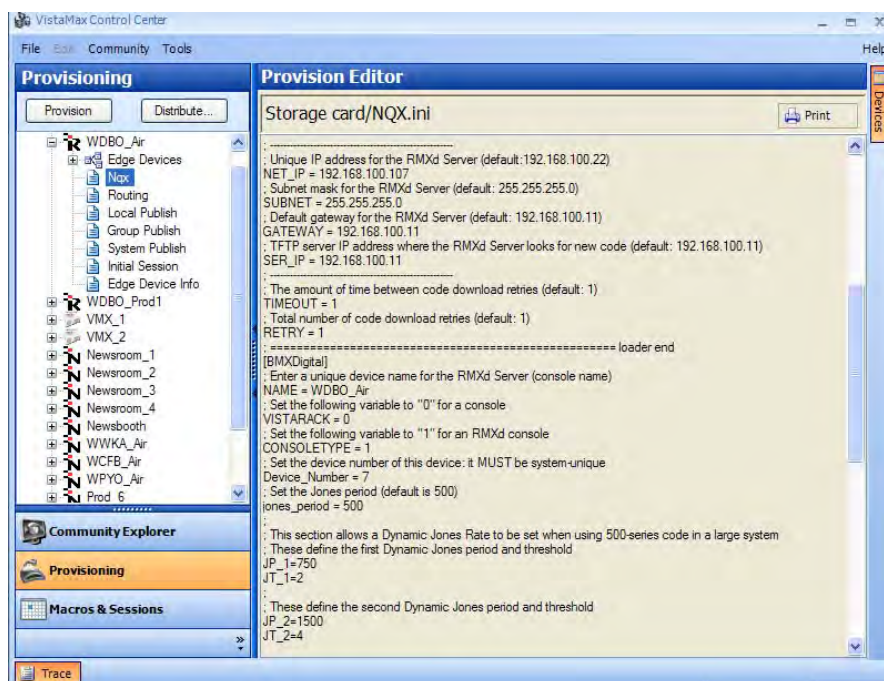
Figure 4-2. VMCC Provisioning Window with Server Files

Click the **Provision** button to create updated configuration files. Then click the **+** button next to the RMX*d* console name to show the list of configuration files that VMCC created. To view a file, click on its name:

● **Nqx**
● **Routing**
● **Local Publish**
● **Group Publish**
● **System Publish**
● **Initial Session**
● **Edge Device Info**

The file name highlights and the file is shown in the **Provision Editor** pane.

`Release.txt` File

This text file (Figure 4-3)—stored at the top level of the flash drive—lists the operating system version, build number, and build date. You can compare this information to the operating system builds available for download from the GatesAir PR&E file download sites to ensure you have the latest build. (Chapter 5 − *Service* gives details on accessing these sites.)
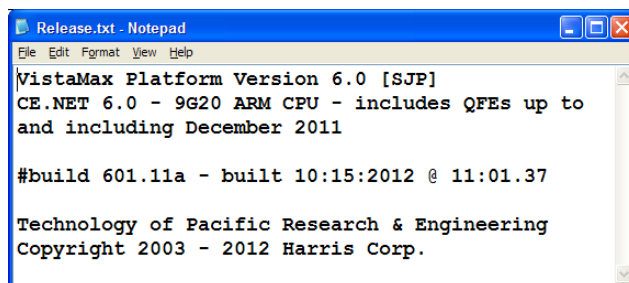
Figure 4-3. Release.txt File

Nqx.ini File

This essential setup file is stored in the **Storage Card** folder. The file is maintained by VMCC and should not be manually edited. It is the first configuration file read as the SBC (single board computer) starts up, and since it is only read during SBC startup when it is changed the console must be restarted in order to read the new settings. Click on the console's name in the **Community Explorer** pane to view and edit these settings in the console's **Device Editor** pane (shown in Figure 4-13):

- **Device Name** – Uniquely identifies the VistaMax device using up to 10 alphanumeric characters (such as AIR_STUDIO, NEWSROOM, or PROD_1). Use an underscore character (_) to separate words since spaces and other special characters are not allowed. The Device Name sets the NAME= parameter.

- **Device Number** – A unique number from 1 to 63 to identify the RMXd console to the VistaMax system. The number entered is typically related to the console's IP address. For example, if the console's IP address is 192.168.100.113, the Device Number would be 13. This number sets the Device_number= parameter.

- **Device Address** – A unique fixed IP address for the console, typically 192.168.100.xxx. The first three octets are identical for all devices in the system. The last octet uniquely identifies the device. Table 4-1 (page 4-21) lists recommended IP addressing. This entry sets the NET_IP= parameter.

- **Subnet Mask** – The default subnet mask (255.255.255.0) is typically not changed. Check with a network administrator before making any changes to the subnet mask.

- **Gateway Address** – This IP address is set to the admin computer's IP address (default = 192.168.100.11). Check with a network administrator before making any changes to this address.

When the nqx.ini entries are changed and VMCC is used to provision and distribute the updated files, the SBC must reset to read and incorporate the changes (Figure 4-17). After you distribute the updated settings to a new console, changing them from the default settings, used the Community Monitor (CM) application's **Status View**, which shows all devices in the VistaMax community, to verify that the new device name, device number, and IP address are all using the desired settings.

Provisioned.hash File

This file is also in the Storage Card folder. It is created and maintained by VMCC. It has a checksum for each of the configuration files that VMCC creates. During VMCC file distribution, when Normal Download is selected in the Distribute Provision Files window and Next is clicked, VMCC downloads the provisioned.hash file from each device in the system and reads it so it can determine which files need to be downloaded and what action each device needs to take to incorporate the updated files. If this file is not present, VMCC will automatically download all of the config files for that device, forcing the SBC to reset in order to read the nqx.ini. This action is equivalent to selecting Force Download in the Distribute Provision Files window.

SesFiles Folder

The SesFiles folder (Figure 4-4) holds the user-created session and macro files and the `init.mac` file, which is a special console initialization macro file created and maintained by VMCC.
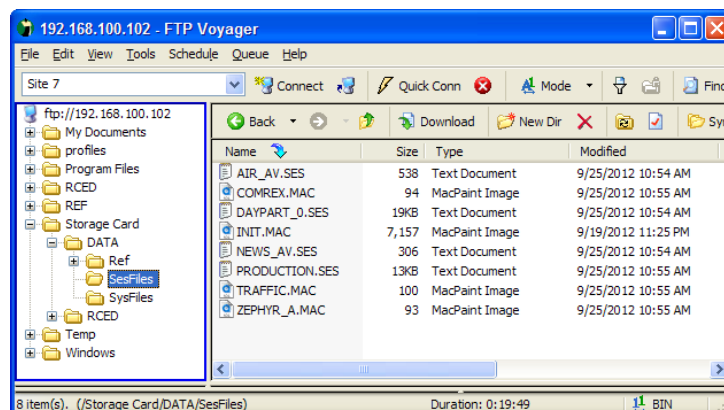
Figure 4-4. FTP Voyager - SesFiles Folder Session (.ses) and Macro (.mac) Files

Session and Macro Files

Session files (such as `daypart_0.ses`) set up the console's fader channels for particular "dayparts," such as
● Morning drive
● Midday
● Afternoon drive
● Overnights

Session files can alternately set up the console's fader channels for specific applications, such as
● Voice tracking
● Commercial production
● Newsroom
● Backup on-air studio

To easily create a new session file on the console, perform these steps:
1. Take an existing session file.
2. Change the channel sources and channel button assignments, as required, for the new daypart or application. **Note:** Only take signal sources on the fader channels. Do not take a macro since that will replace the session file entries with the macro file entries in the SBC memory. Thus, when **Save** is pressed, the session file will not contain the original session file settings. If a macro needs to be taken on a channel, the new session file must be manually edited to add the macro number to the channel's take command.
3. Press **Save** on the Monitor Control panel to create a new session file, with the original session file entries plus the updated fader channel settings, to a new session file in the SesFiles folder. The system automatically adds a suffix (e.g., if `daypart_0.ses` was taken, the new session file would be `daypart_01.ses`). The original session file can never be overwritten from the console.

To load or "take" a new session file, perform these steps:
1. Turn the Monitor Control panel's rotary Session Selector to display the desired session file in the lower 10-character display. All `.ses` session files, in the SesFiles folder, are displayed alphanumerically minus the `.ses` suffix.
2. When the desired session file name is displayed, press **Take** to load that session into the console's memory. The new session name moves to the top display indicating it is now the active session.

Taking a session reconfigures all of the channel's settings, except for any channels that are on-air. Channels that are On when a session is taken go into "pending" status; their red On buttons wink to indicate they are

still using the previous session file settings. When a pending channel is subsequently turned Off, it instantly updates to the new session settings. This safeguard prevents accidental on-air signal interruptions when a session file is taken and allows a new session to be "pre-loaded" during a stop set, assuring the console is ready for the new application or daypart as soon as the stop set ends. Since these settings stay pending and do not update until the channel is turned Off, you can maintain the current channel selections for these pending channels as long as required.

Macro files are text files like sessions which are also saved in the SesFiles folder. However, macro files have the `.mac` suffix and do not appear in the Session Selector display list. Macro files perform specific functions, such as routing a four-wire device to a Telco fader and routing that fader's mix-minus signal back to the four-wire device. Macro files are typically included on Telco fader channels to take four-wire devices. You can also load macros with FTP commands in one of these ways:

● Manually using FTP Voyager

● Automatically by using the VistaTouch Task Scheduler program

● Using an admin macro created in VMCC v2.2 or later and running on a Windows 7 admin computer

You can also use the Session Selector to take a macro if you first change the `.mac` file suffix to `.ses`.

Init.mac File

VMCC maintains this special macro file in the SesFiles folder. It loads automatically each time the SBC restarts and when a VMCC distribution changes configuration settings on the console. You can load this file manually with an FTP command or other method. The file sets up the console's programmable logic settings, including binding the logic I-O to a specific audio source. The file also specifies what sources are set for each of the 21 meter and monitor selector buttons on the Monitor Control Panel. And, the file contains room mute code assignments for audio inputs and various other assignments for audio input configuration settings, such as input trim and phase reversal.

● Default routes.

● Default logic settings and logic I-O bindings to audio sources.

● Monitor and meter selection button assignments.

● Mute codes.

● Various audio input settings.

Editing this file manually is not recommended, as the next VMCC distribution might upload a new `init.mac` file, overwriting any customer edits you made.

SysFiles Folder

The SysFiles folder (Figure 4-5) holds the remaining console configuration and initialization files. It also has a number of files maintained by the RMX*d* server, including route persistence files (`PF_xx.bin`) that allow audio and logic routes to be automatically reestablished if power is lost and then restored.
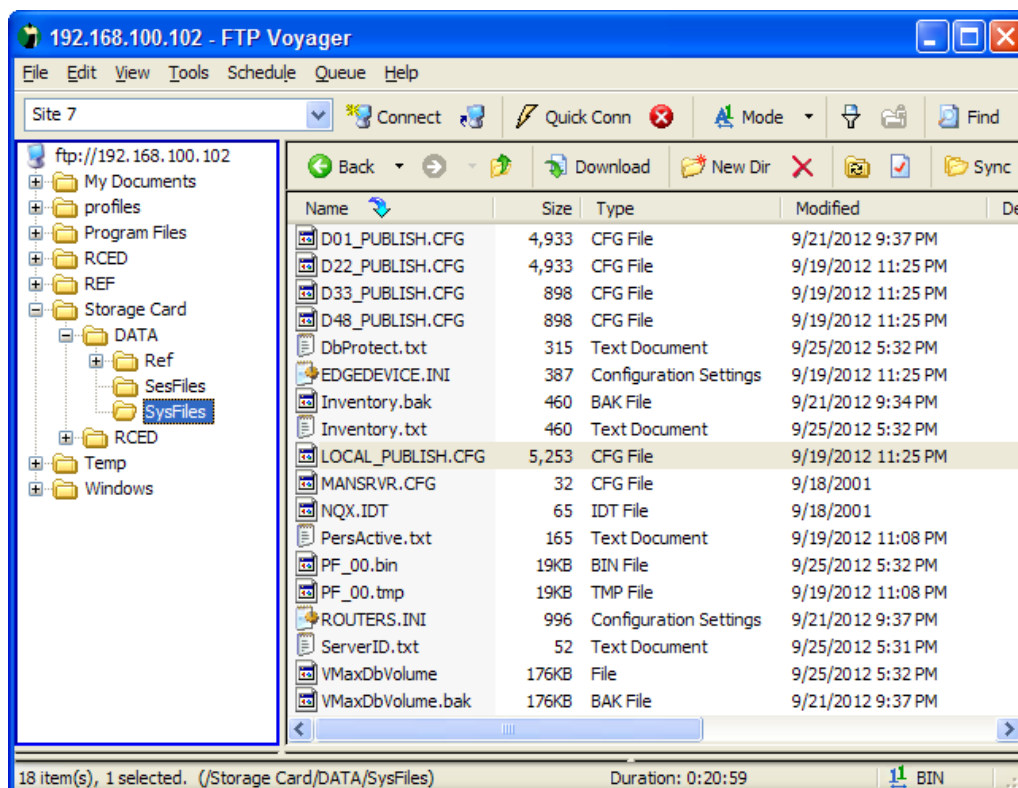
Figure 4-5. SysFiles Folder Contents

The next subsections cover these user files in the SysFiles folder:

- `Serverid.txt`

- `Inventory.txt`

- `Routers.ini`

- `Edgedevice.ini`

- `Local_publish.cfg`

- `Dx_publish.cfg`

Serverid.txt File

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 "`123-456-789`" is the Server ID for that particular SBC. You would give this number to a GatesAir tech support representative to receive a License Code which you enter into VMCC to unlock optional extended features on a specific console. However, the text file is unused at this time.

Intentory.txt File

This text file (Figure 4-6) lists the console's physical inventory of cards and panels. Most of the Map entries relate to the status of the Dual Fader channels, which are set as either a normal line input (the rotary switch is set to 0 or 7) or as a Telco channel (the rotary switch is set to 1-6). The example shows the file for an RMXd-20 console with faders 9 and 10 set as Telco 1 (51) and Telco 2 (52).
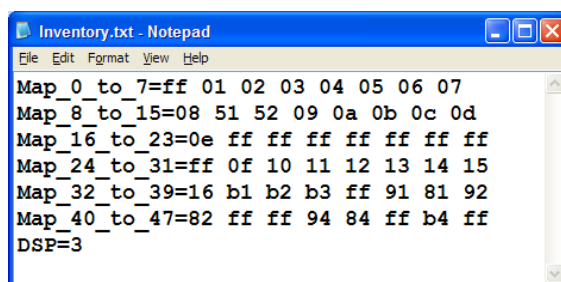
Figure 4-6. `Inventory.txt` File

The operating system automatically updates this file whenever the SBC is restarted or an 8-Input Expansion card or a Dual Fader panel is hot-plugged. To verify that your changes are properly detected, you can delete the file before making the changes; a new file is written which incorporates the changes.

The [Mapping] section of a session file is compared to the inventory when a session file is taken. If all fader positions match, all channels are updated with the new session settings. If any faders do not match—which might be caused by adding or removing Telco channels—those faders are not updated by the session file. The [Mapping] section in the session file does not include the DSP−x entry line but is otherwise identical to the inventory.txt file.

Each DSP card handles eight fader channels, so each row in the inventory file has eight entries. The Map_0 entry is always ff, so Map_1 to Map_8 show the eight fader channels hosted by DSP card 1, found on all console sizes. Map_9 to Map_16 show the settings for the next eight fader channels on DSP card 2, on RMXd-20 and RMXd-28 consoles. Map_17 to Map_24 show the next eight fader channels on DSP card 3, only present on an RMXd-28 console. Therefore, in this file example for an RMXd-20 console, Map_17 to Map_24 show ff, indicating there is no DSP 3 card in the console.

Map_25 to Map_32 show the eight fader channels on the KSU DSP (four physical fader channels and four "phantom" fader channels). Map_33 to Map_47 show:

- The Monitor Control panel (b1, b2, b3).

- The audio and logic connections on the 8-Input Expansion cards (as 91 and 81 for DSP 1, 92 and 82 for DSP 2, 93 and 83 for DSP 3, and 94 and 84 for the KSU DSP).

- The SBC (b4).

The last entry line (DSP=3) indicates the number of DSP cards specified by the nqx.ini file. The KSU card, which includes DSP, counts as a DSP card.

The fader channels are listed in hexadecimal numbers (01 to 09 and then 0a up to 2c). The six possible dedicated Telco faders are identified as hex 51 to 56 in the inventory.txt file. These hexadecimal numbers are equal to the decimal numbers used to identify the fader channels in session files. Therefore hex 51 identifies Telco 1 in the inventory, while [Router_81] identifies Telco 1 in a session file (hex 51 = decimal 81).

Routers.ini File

This file, also maintained in VMCC, sets which sources and destinations from each device in the community are available for routing on a console or selector panel. There are three sections to the file:

- [Routers] − Router definitions

- [SrcInclude] − Source include list

- `[DstInclude]` – Destination include list

Here is an example:

```
[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
```

Section headers such as `[Routers]`, `[SrcInclude]`, and `[DstInclude]` are used universally in `.ini`, `.mac`, `.ses`, and `.cfg` files to identify sections. The `[Routers]` section sets the type of router networked with the console. The `[SrcInclude]` (Source Include) section lists the source signals that can be shown on the fader channels' source selectors. In the example, only signals 225-231 on device 3 and signals 173-233 and 257-291 on device 11 could be shown in the source selectors.

The `[DstInclude]` (Destination Include) section lists the destinations available to selector panels served by the console. In the example, the only destinations 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 many sources from one device are listed, there might be multiple `Include_x=` statement lines for the device; entry lines are limited to 80 characters per line after the = sign.

Edgedevice.ini File

This file, also maintained in VMCC, configures the edge devices—console, turret, or rackmount source or source/destination selector panels—that the RMX*d* Server hosts. This example is an `edgedevice.ini` file for a single VM-SSD selector panel:

```
;========================================================================
[00-60-35-01-E8-F1]              ; SS_1_Dst
;========================================================================
EXEFile=rced/rced.tini             ;Location of tini executable
FTPServerIP=192.168.100.22         ;IP address of vistamax rack
DeviceIP=192.168.100.101           ;IP address of this edge device
DeviceMask=255.255.255.0           ;Device mask
GatewayIP=192.168.100.11           ;Gateway
LogServerEnable=0
ServerName=RMXd_28                 ;This parameter sets the name of the edge
device server
DeviceName=SS_1_Dst                ;The name of this device
VMServerIP=192.168.100.22:4001     ;IP address of vistamax rack:port#
;
Destination_1=D22.243
;
Include_1_1_1=D22.273-279
;
;Button Assignments =============
Button_1_1=D22.273    ; CD PLAYER
Button_1_2=D22.275    ; ZEPHYR 1
Button_1_3=D22.277    ; REPLAY
```

Although selector panels are typically served by a VistaMax frame, they can be served by a console, as in this example. Typically, selector panels are only served by a VistaMax frame when the controlled destination (or destinations) is on the console's KSU routable outputs. As shown, a selector panel—the VM-SS panel, in this case—is configured to control the source going to signal 243, the KSU B analog output. Each destination controlled by a selector panel has its own include signal list, identified by the `Include_1_1_1` entry. You enter all these settings into the VMCC application using signal names rather than numbers. VMCC translates the entries into the signal numbers this file example shows.

`Local_publish.cfg` File

This file, created and maintained by VMCC, lists all the console's sources and destinations by signal number. The file performs these functions:

● Defines the signal name, using the In Room Name entry

● Sets whether the signal name:

  • Is mono or part of a linked signal, for stereo or multi-channel audio signals
  • Has return logic associated with it
  • Is hidden

This example shows part of a `local_publish.cfg` file:

```
;AudioSrc Card#: 39
src=273,CD PLAYER,274,273
src=274,{274
src=275,ZEPHYR 1,276
src=276,{276
src=277,REPLAY,278
src=278,{278
src=279,VOX PRO,280
src=280,{280
```

Each line identifies one signal as either a source (`src=`) or a destination (`dst=`) followed by its local signal number, its In Room Name entry and, if it is "stereo linked," a comma and then the next signal number.

The right channel of a stereo signal is hidden, indicated by a left curly bracket (`{`), in front of the right channel name. That signal cannot be selected or seen by any VistaMax community device. On stereo signals, the right channel is hidden by default, resulting in the board operator only seeing the names in the Source Selector list:

● CD PLAYER

● ZEPHYR 1

● REPLAY

● VOX PRO

`Dx_publish.cfg` File

For each VistaMax device to have a local list of the source and destination names on other devices, VMCC also creates two *device publish* files when it creates the Local Publish file. These two files are called

● Group Publish.

● System Publish.

Which of these files is actually sent to the other devices depends on the console's Tier Naming Convention settings and the Call Sign settings on the other devices.

When the console is set for Tier 1 Naming Convention, all three publish files are identical. However, consoles are typically set for Tier 2 Naming Convention so that the common signals (such as PGM 1 and PGM 2) don not have to be renamed on each console. With the Tier 2 Convention selected, the local console still shows the full 10-character In Room Name, but all other devices detect the console's Community Name instead,

preceded by its Call Sign entry (which is XYZ in the example). The Group and System Publish files are therefore identical on a Tier 2 console. This example is part of a device Group and System Publish file when Tier 2 naming convention is used and the Call Sign on that console is set to XYZ:

```
;AudioSrc Card#: 39
src=273,XYZ.CD,274
src=274,{XYZ.274
src=275,XYZ.ISDN,276
src=276,{XYZ.276
src=277,XYZ.PLAY,278
src=278,{XYZ.278
src=279,XYZ.VPRO,280
src=280,{XYZ.280
```

When a console is set for Tier 3 naming convention, the Local Publish, Group Publish and System Publish files are all different from one another. The Group Publish file now shows names using

● The Discipline Sort Character (in the example, an underscore _ character).

● The Discipline Prefix (in this example AIR).

● The four-character Community Name (CD, ISDN, PLAY, VPRO).

The Group Publish file is sent to any other console that has the Call Sign of XYZ. Typically these other consoles have unique Discipline Prefix entries to identify each console, such as

● AIR.

● PROD.

● NEWS.

● SPTS.

● TRFC.

This example shows a Group Publish file with Tier 3 Naming Convention:

```
;AudioSrc Card#: 39
src=273,_AIR.CD,274
src=274,{_AIR.274
src=275,_AIR.ISDN,276
src=276,{_AIR.276
src=277,_AIR.PLAY,278
src=278,{_AIR.278
src=279,_AIR.VPRO,280
src=280,{_AIR.280
```

The System Publish file shows names using:

● the Call Sign entry (XYZ in the example)

● the first letter of the Discipline Prefix (A for AIR in the example)

● the four-character Community Name (at the end).

The System Publish file is sent to all devices that have anything other than XYZ entered as their Call Sign. This file distribution allows multiple stations to use one VistaMax community and still be able to share sources, as required, without having to come up with unique names to identify the sources coming from rooms in another station. In this case, XYZA would quickly identify these signals as being from the XYZ air studio. This example shows a System Publish file with Tier 3 Naming Convention:

```
;AudioSrc Card#: 39
src=273,XYZA.CD,274
src=274,{XYZA.274
src=275,XYZA.ISDN,276
```

```
src=276,{XYZA.276
src=277,XYZA.PLAY,278
src=278,{XYZA.278
src=279,XYZA.VPRO,280
src=280,{XYZA.280
```

RMX*d* Server Configuration

You must install several software applications on the admin computer to configure the RMX*d* server for use. You can download these applications, along with the other GatesAir PR&E PDF documents this manual refers to, from either the GatesAir Customer Portal site or the GatesAir PR&E FTP site. Each application has a `readme.txt` file or other installation file covering application installation and setup. The *Parts and Repair Services* subsection in Chapter 5 gives details on accessing these sites.

NetManager & Community Monitor

NetManager has four services and four servers that run in the background on the admin computer. Starting these services and servers automatically starts the Community Monitor (CM) application, previously available as a standalone program. The NetManager icon is , and the CM icon is .

NetManager/CM listens to communications on the VistaMax LAN sent from each VistaMax community member. The CM Status window shows these types of system parameters for each community member:

- IP address

- Device name

- MAC address

The CM Status Logger window shows a running log of system activity. The NetManager Quick Guide (GatesAir document 71-2012) gives more details on using NetManager and Community Monitor. Because CM maintains a text file (`Community Monitor.txt`) on the admin computer, which VMCC uses during the Inspect Community process, NetManager and Community Monitor should be running prior to using the Inspect Community function in VMCC to have the most accurate and up-to-date community member information.

VistaMax Control Center

The VistaMax Control Center (VMCC) software application allows you to edit and maintain the settings of these RMX*d* server setup files so that the console fits into a particular VistaMax community:

- `nqx.ini`

- `init.mac`

- `edgedevice.ini`

- `routers.ini`

- `local_publish.cfg`

- `device_publish.cfg`

The VMCC icon is . This application not only sets up and maintains files for RMX*d* consoles but also for all VistaMax community members:

- Other RMX*d*, BMX*digital*, Oasis, and NetWave consoles

● VistaMax card frames

● Signal interfaces

● Edge devices

VMCC also automatically updates each interdependent file when any change is made, automatically deciding how each community member reacts to the new files. Here are some examples:

● When you select a console-wide setting (such as changing a device name, device number, or the IP address) the nqx.ini file is changed. The SBC must restart (just as a computer restarts) to read the updated `nqx.ini` file.

● If you change a signal name or other parameter or include a new signal on a device, VMCC performs an Init Router procedure so that the SBC reads the updated publish and router include files.

● When selector panel or intercom panel settings are changed, VMCC performs an *Init RCED* (Remote Control Edge Device) procedure, forcing the edge devices to restart so that they can read their updated settings.

VMCC allows for staggered file distribution so that any one console or frame can be updated separately from the other devices in the community. Other subsections in this section cover VMCC in more detail.

Appendix A gives additional details on using VMCC to accomplish various system setup tasks. The appendix gives examples of system design and console setup commands, with additional session file and macro file information beyond what is covered in this section.

VistaVue & VistaTouch

The VistaTouch and VistaVue workflow applications help end users and engineering personnel route signals and take macros and session files. The NetManager application includes one license to run either of these workflow applications. To run both applications at the same time, or to run multiple copies of either application on any computer at your facility, requires a GatesAir Route Data Server (RDS) License Key to be plugged into a USB port on the admin computer. These license keys are available:

● Five concurrent users (PRE99-1442-1).

● Ten concurrent users (PRE99-1442-2).

● Twenty concurrent users (PRE99-1442-3).

● An unlimited number of users (PRE99-1442-4).

VistaVue is an X-Y grid application that allows signals to be taken by "double-clicking" the grid. The view of the system signals can be filtered to show specific destinations, such as only one of these destinations:

● The logger outputs

● The Internet streams

● Four-wire devices

● The on-air studio

● A production room

● A newsroom

VistaVue uses controlled access with your existing network login credentials. Therefore, different users can log onto any workstation and be granted access to their own User Scope settings, allowing them to route signals to only those destinations assigned to them. This application also has a "minimized presentation" that emulates a Source-Destination selector. The GatesAir PR&E document 71-2009 VistaVue Quick Guide gives additional details.

VistaTouch is a "hot button" application designed for non-technical users to quickly route signals to a workstation or mixer for either monitoring or recording. This application can have from two to 64 hot buttons

with each button having its own JPEG photo or graphic, or even a live webcam, to make it easy to identify the button's function. The GatesAir document 71-2007 VistaTouch Quick Guide gives additional details.

FTP Voyager

This is the recommended FTP file transfer application to use on a VistaMax admin computer. FTP Voyager transfers session and macro files between a console and the admin computer, where VMCC can edit them or you can edit them with Notepad. Then you can use FTP Voyager to upload the files back to the console or frame. You can also use this application to download files from the GatesAir FTP site.

3CDaemon

This program is a TFTP server that is only used to upload new operating system code to a VistaMax device. Each time a console or a card frame starts up, it sends out a TFTP request asking for updated code. If 3CDaemon is running, and it receives this request, it uploads the new operating system code to that device.

Configuration Prerequisites

These items are required before the RMX*d* Server can be configured, whether as a standalone console or as a member of a VistaMax system:

- A admin computer running Windows® XP Pro or Windows® 7 Pro (32-bit) with one Ethernet port assigned to a fixed IP address of 192.168.100.11

- A CAT6 cable for either direct connection between the computer and the console – Newer computers auto-configure the connection, so a straight-thru cable can be used; older computers require a crossover cable for a direct connection.

- A fixed IP address that can be assigned to the RMX*d* Server, if it is being added to an existing VistaMax system

- An installed and powered RMX*d* console

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

There are the two methods of connecting an admin computer to the RMX*d* Server:

- Direct connection – Connect a CAT6 cable between the KSU card's Ethernet connector and the Ethernet port assigned to IP 192.168.100.11 on the admin computer.

- Indirect connection through a network switch or hub

  1. Connect a CAT6 cable patch from the KSU card's Ethernet connector to an open port on the network switch.

  2. Connect a CAT6 cable patch from the Ethernet port on the admin computer to another open port on the network switch.

  Note: A network hub can 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 does not conflict with an existing network address. The default address assigned at the factory is 192.168.100.22.

Initial Configuration Process

This process requires these criteria:

- Both NetManager and VMCC are installed on the admin computer.

- The RMX*d* console is installed, powered up, and using the factory IP setting of 192.168.100.22.

- The admin computer and the RMX*d* console are networked together.

Here are the procedures in this process:
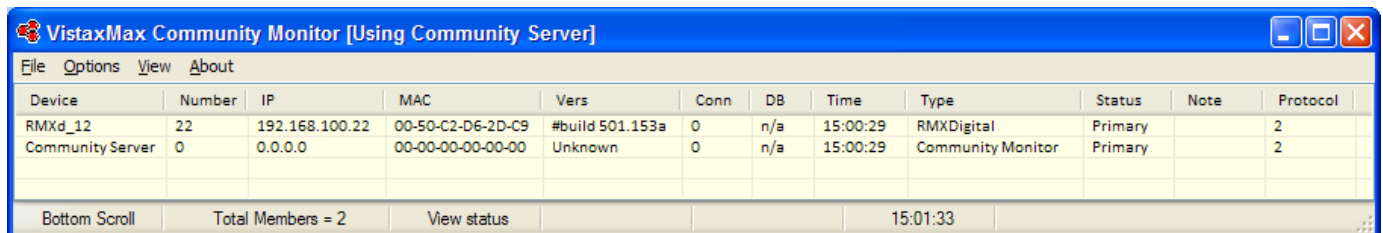
1. Assure the CM display lists the RMX*d* console.

2. Set the network interface in VMCC.

3. Inspect the VistaMax Community.

4. Edit the RMX*d* console settings.

5. Provision the configuration files.

6. Distribute the provisioned files.

The next subsections give steps on and/or information for these configuration procedures.

Note: Appendix A gives additional details on using VMCC to accomplish various system setup tasks. The appendix gives examples of system design and console setup commands, with additional session file and macro file information beyond what is covered in this section.

Assure CM Lists the RMX*d* Console

1. Click the [icon] desktop icon on the admin computer to start the NetManager application.

2. In NetManager, click **Start All Services**. The **Community Monitor** opens.

3. In **Community Monitor**, click **View** | **Status** (Figure 4-7). The new RMX*d* console should appear in the status window with an IP address of 192.168.100.22.

Device	Number	IP	MAC	Vers	Conn	DB	Time	Type	Status	Note	Protocol
RMXd_12	22	192.168.100.22	00-50-C2-D6-2D-C9	#build 501.153a	0	n/a	15:00:29	RMXDigital	Primary		2
Community Server	0	0.0.0.0	00-00-00-00-00-00	Unknown	0	n/a	15:00:29	Community Monitor	Primary		2

Figure 4-7. Community Monitor Status Window

4. If the console does not appear, check the IP address of the admin computer's Ethernet port, which should be 192.168.100.11.

5. If this IP address is incorrect, perform these steps:

   a. Stop all services in NetManager.
   b. Close NetManager.
   c. Change the admin computer to the 192.168.100.11 fixed IP address.
   d. Reopen NetManager.
   e. Click **Start All Services**.
   f. Assure the **Community Monitor** display lists the new console, indicating the admin computer is properly communicating with the console.

Set Network Interface in VMCC

The first time you click [icon] to start the VistaMax Control Center (VMCC), you need to select the network interface to connect to the VistaMax switch or to the console. Perform these steps:

1. Click **Tools** | **Options** (Figure 4-8). The **Options** dialog box appears.
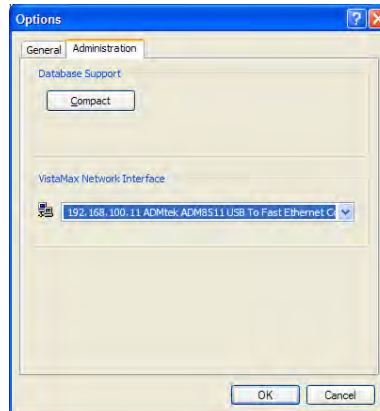
Figure 4-8. Network Interface Selection in VMCC

2. Click the **Administration** tab.

3. At the **VistaMax Network Interface** the drop-down list, click **192.168.100.11**.

4. Click **OK**.

Inspect the VistaMax Community

Now, inspect the VistaMax community. Perform these steps:

1. To create a new community, click **Community** | **New Community** on the VMCC menu bar (Figure 4-9).
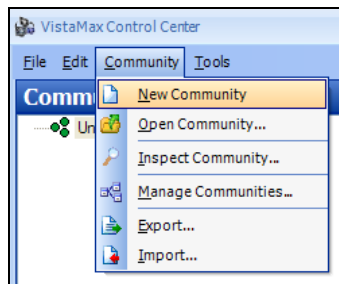
Figure 4-9. Community Menu on VMCC Menu Bar

2. On the VMCC menu bar, click **Community** | **Inspect Community**. The **Community Inspection** window appears (Figure 4-10) to show all the VistaMax devices detected—which in this case should be only the new RMX*d* console.
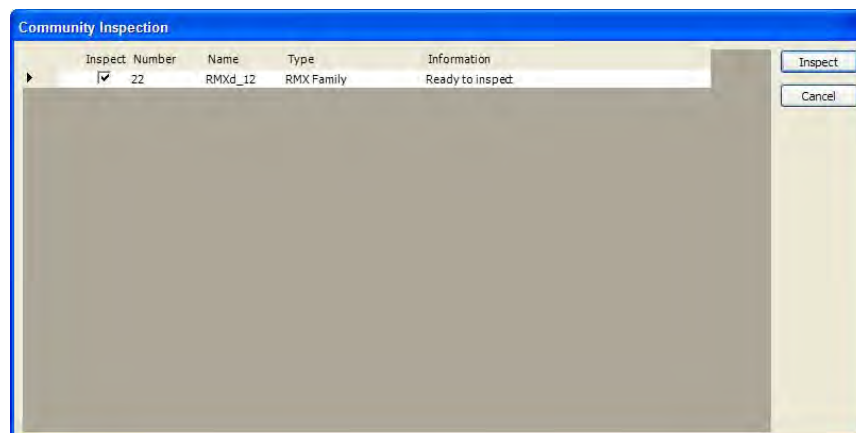
Figure 4-10. Community Inspection Window

3. Verify that the **Inspect** check box is selected for the RMX*d* console. (If there is no check mark in the check box, click the check box to select it.)

4. Click the **Inspect** button. The information line shows "done" when the inspection is completed (Figure 4-11).
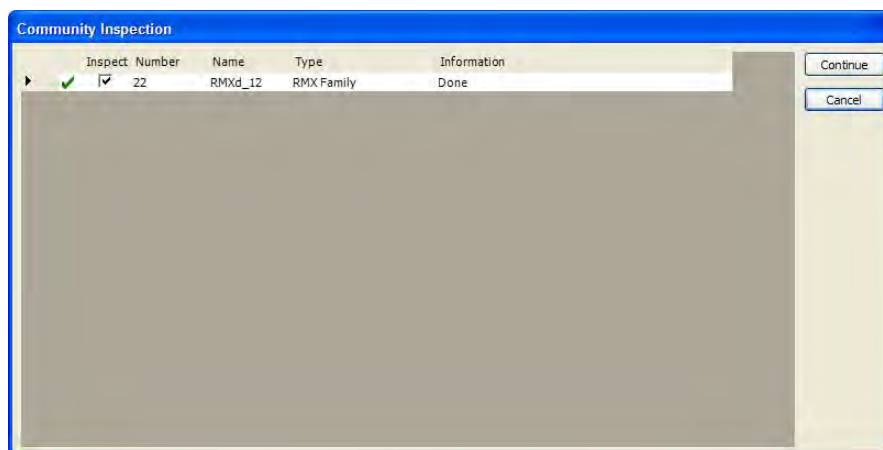
Figure 4-11. Community Inspection Completed

5. Click **Continue** to view the inspection results on the Merge Devices window (Figure 4-12). With a new console, there are no slot conflicts or critical issues.
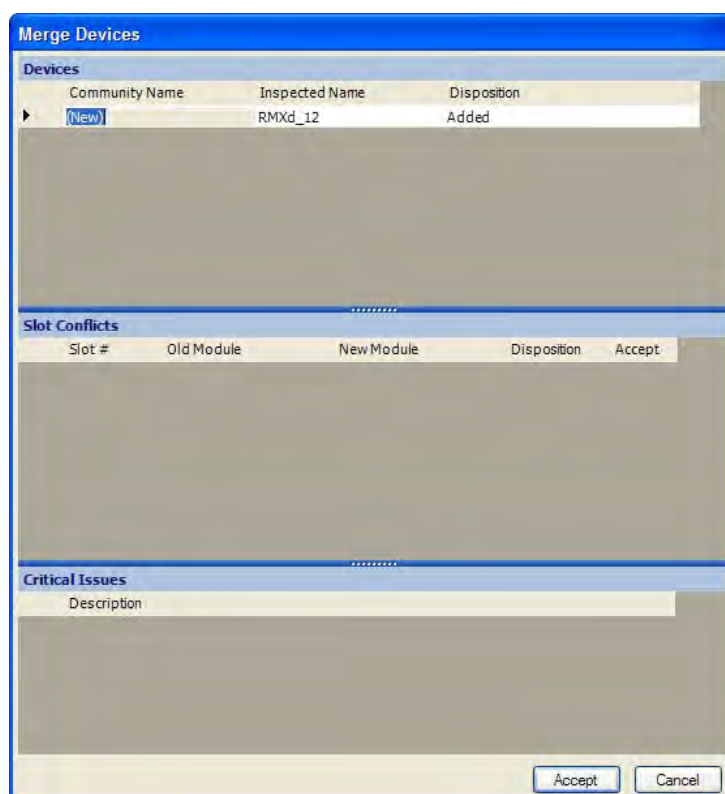
Figure 4-12. Community Inspection Results

6. Click **Accept**.

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

Edit the RMX*d* Console Settings

Familiarize yourself with the VMCC window (Figure 4-13), as you use it to set and check device parameters.
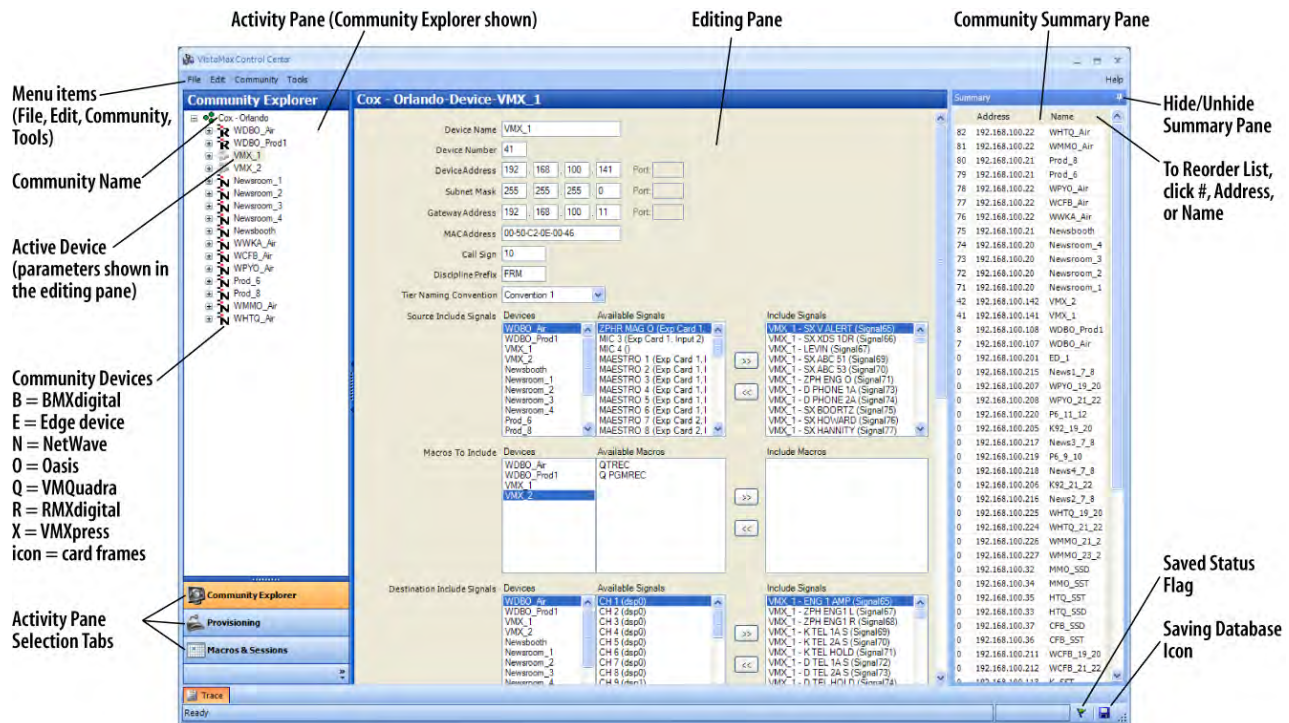
Figure 4-13. VMCC User Interface Features

Community Explorer Pane

The **Community Explorer** pane lists devices in the community. The pane uses a tree structure to expand and collapse items. Click the **+** button next to a console name to expand the tree, showing individual panels and cards and a **Signal Summary**. Click the **-** button to collapse the tree, hiding its items.

Editing Pane

The editing pane, in the middle of the VMCC window, shows parameters for the community or device selected on the **Community Explorer** pane. Click a community or device on the list to select it and show parameters on the editing pane, such as:

● Unique device name

● Unique device number

● Unique IP address

● Parameters affecting how the device interacts with other consoles and frames in the community.

The Configuration Notes and Tips subsection gives details on setting device parameters.

When you select the community name, at the top of the Community Explorer pane, the community parameters appear in the editing pane. Normally, only the **Community Name** is edited. The **Administrator Address** is the admin computer IP address, which has been set as 192.168.100.11. The **Multicast Address** (234.5.6.7, port 5100) and other settings should remain at their default settings.

Summary Pane

The **Summary** pane, on the right of the VMCC window, lists the community members by

- IP address.
- Device number.
- Device name.

To open this pane, click the **Devices** icon on the upper right of the edit pane. To keep the pane open, click ⊞ at the upper right. To hide the pane, click ⊞ again. When you have "pinned" the pane open with this icon, you can click and hold the pane's title bar to undock the pane and drag it to another location on the admin computer Desktop. You can double-click the pane's title bar to dock it to the VMCC window.

Provision Configuration Files

After you make any needed edits to the console parameters, you need to "provision the files"—that is, to use the new entries to create new console configuration files. Perform these steps:

1. Click **Provisioning** on the left navigation pane, below the **Community Explorer** pane. The **Provisioning** window appears (Figure 4-14).
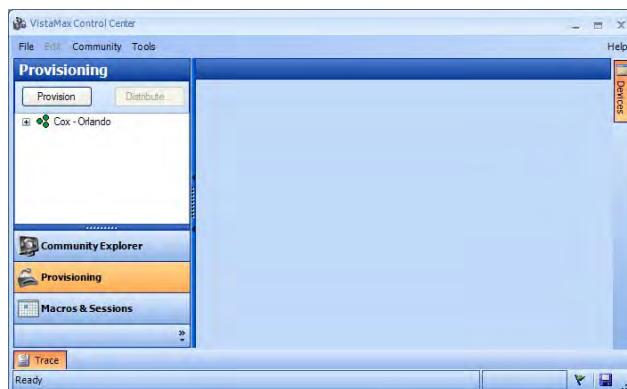
Figure 4-14. Provisioning Window

2. Click **Provision** to create new setup and configuration files using the parameters entered in the editing panes.

Note: The **Distribute** button is not available (or "enabled") until you click the Provision button. The next subsection, *Distribute Provisioned Files*, covers this procedure.

When you provision the files, the **Provisioning** pane lists the newly provisioned files, using a tree structure similar to the **Community Explorer** list. Click the **+** button next to the console name to view the setup files VMCC created. Click a file name to display the file contents in the **Provision Editor** pane (Figure 4-15).
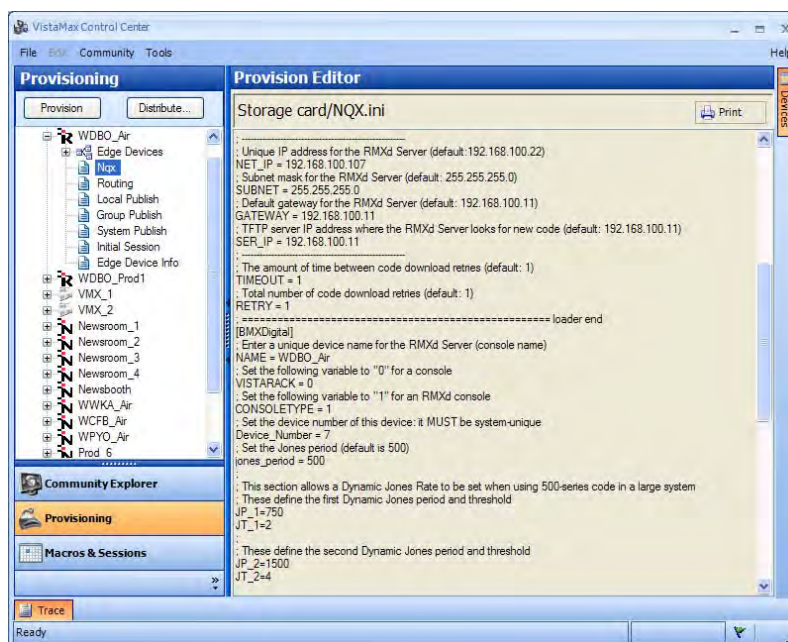
Figure 4-15. Provisioning Window with Provision Editor Open

Even though you can manually edit files in the **Provision Editor**, you *should not* normally do so; the manual edits are overwritten the next time you click the **Provision** button to create new setup files.

Distribute Provisioned Files

The final procedure is to distribute (download) the newly provisioned files to the console and to other community members. Perform these steps:

1. Click **Distribute**. The **Distribute Provision Files – Mode** dialog box appears (Figure 4-16).
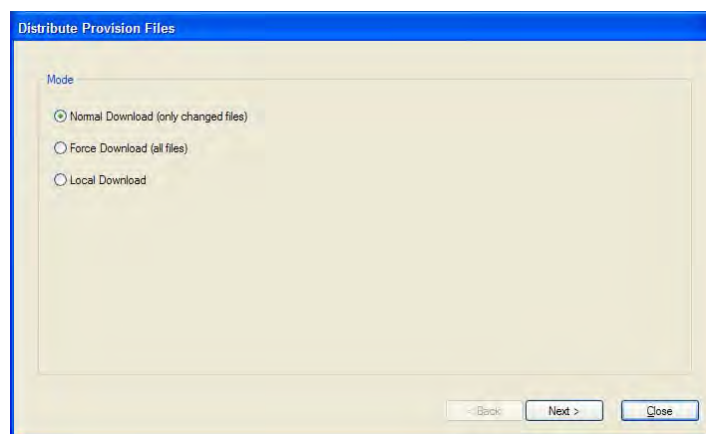
Figure 4-16. Distribute Provision Files – Mode Dialog Box

2. Click an option button:

    • **Normal Download** – Default selection, only distributes the files that were changed
    • **Force Download** – Distributes all console files, replacing every configuration file
    • **Local Download** - Distributes files to the admin computer's hard drive (default location = **My Documents** folder) to create a backup of all of the configuration files.

3. Click **Next**.

4. If you selected **Local Download**, a save dialog box opens that defaults to the **My Documents** folder.

a. Navigate to a different folder if desired.
b. Click **Save**.

5. If you selected **Normal Download** or **Force Download**, a second **Distribute Provision Files** dialog box appears (Figure 4-17) so that you can **Select Device Specific Distribution**.
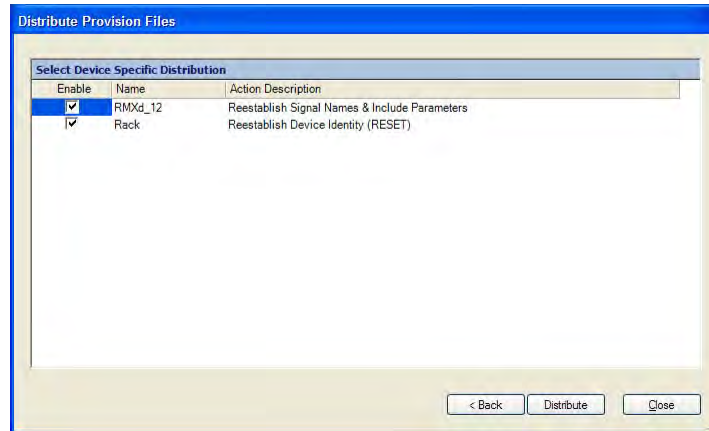
Figure 4-17. Distribute Provision Files — Select Device Specific Dialog Box

Note: VMCC reads each device's `provisioned.hash` file to identify which files have changed and what action must be taken by each device after the files are distributed. The **Action Description** shows the action performed on the device when you click **Distribute**. When the `nqx.ini` file has changed, the device's SBC needs to restart, as the **Action Description** indicates for the **Rack** device in the example. When the publish files or signal include lists have changed, an init router is performed, as the **Action Description** indicates for the **RMXd_12** device in the example. If changes are made to a selector panel or intercom, an Init RCED is performed to restart all edge devices hosted on that device so that they read the updated information.

6. Click to select or clear the **Enable** box next to each device to send files to that device. One or more devices must be enabled to distribute files.

7. To distribute the provisioned files to the enabled devices, click **Distribute**.

Once you create a community in VMCC, open the existing community (click Community | Open Community) and then perform procedures 3 through 6 in the *Initial Configuration Process* and follow the *Console Configuration Notes & Tips* to add each new console, frame, or edge device. Appendix A gives additional information on using VMCC.

Console Configuration Notes & Tips

If a console is not networked with a VistaMax system, the console can continue to use the factory default IP address of 192.168.100.22. In such a case, a network switch is not required; the admin computer can be directly connected to the console using a CAT6 cable whenever any files require editing.

With multiple RMX*d*, BMX*digital*, NetWave, Oasis, VistaMax rack frames, signal interfaces, and edge devices networked together, it is essential that you keep a list of all devices on the VistaMax LAN so that non-conflicting IP addresses can be assigned and set on each device before connecting them to the network switch. Sequentially list the network devices (consoles, card frames, edge devices, switches, and computers), assigning a unique IP address and, for the RMX*d* and BMX*d* consoles and VistaMax card frames, assigning unique device names and device numbers (from 1 to 63).

VistaMax communities can be set to use any Class-C network addressing scheme. However, as the VistaMax devices are typically segregated from the facility LAN anyway, it is easiest to leave the devices on the default 192.168.100.xxx subnet. The admin computer should have two network interface connections (NICs), both set for fixed IP addresses. One NIC is set for the VistaMax LAN, to communicate directly with the VistaMax devices, while the other NIC is used to interface any facility computer that is running the Workflow software

apps so that they can control routes and take macro files. Table 4-1 shows a suggested addressing scheme for assigning devices in easy-to-remember blocks of IP addresses.

Table 4-1. Suggested IP Addressing for a VistaMax LAN Using a 192.168.100.xxx Subset

Networked Device	IP Address
Network switches	192.168.100.1 up to .10
Default TFTP server (admin 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 (RMXd or BMXd)	192.168.100.101 up to .150 **
VistaMax Edge Devices	192.168.100.200 up to .299

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

** The device number for frames and consoles is typically related to the last octet in the IP address. For example, a console set as device 1 would be set for .101, a console set as device 2 would be set to .102, a frame assigned as .41 would be device 41, a frame assigned to .42 would be device 42, and so on.

Note: Major network communication problems 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 knowledgeable network administrator.

Before the admin computer can access the RMX*d* server, its IP address must be changed to be within the local subnet mask assigned to the RMX*d* server. The default IP address for a console, as shipped from the factory, is 192.168.100.22 with a subnet mask of 255.255.255.0.

Note: If the console's IP address has been changed and is not known, the device still appears in the Community Monitor's Status window; the device information is sent using Multicast messaging.

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

Console Signal Setup

When you have edited the RMX*d* console settings in VMCC and distributed the changes, the console can now be safely networked with other VistaMax devices in the community. However, the console is not "ready for air" just yet, as your board operators would need to dial up signals with names such as `IN 1-EXP1` or `IN 3-EXP2`, the type of default names assigned to the console inputs.

Most of the names and common parameters are edited in the VMCC **Signal Summary** pane (Figure 4-18), but other settings require your using the tree structure to open the audio and logic cards. Click a card's **+** button and then click the **Sources** or **Destinations +** button to view and edit settings for specific signals.
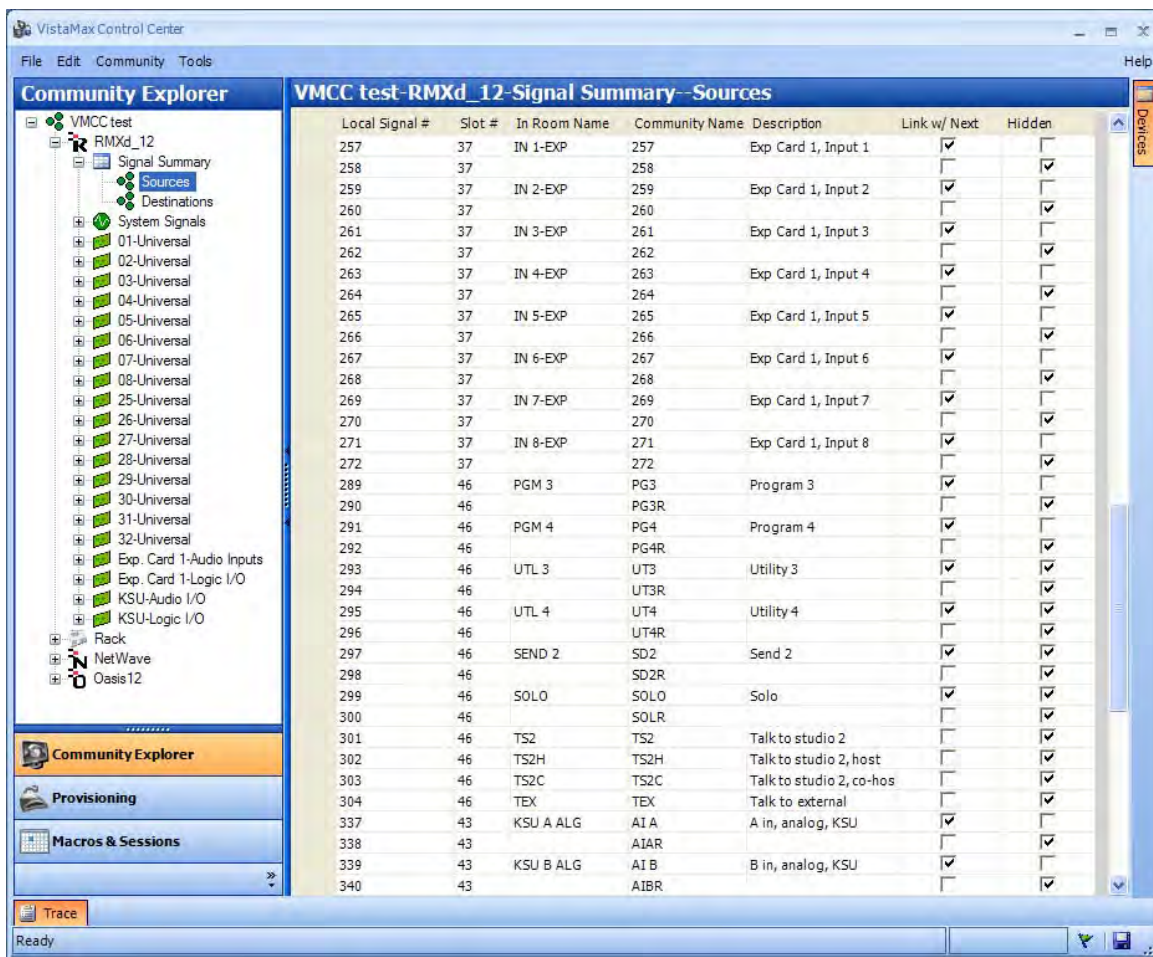
Figure 4-18. VMCC Signal Summary Pane

Here's a summary of the various signal parameters that need to be edited or checked to prepare the console for daily use, regardless of whether it is standalone or networked in a VistaMax community:

● Each input signal has an **In Room Name** the board operator sees displayed on the fader channels. Change this name of up to 10 characters to identify the input signal—such as HOST MIC, CD 1, A/V 1, or VOXPRO). The default names—such as IN 1-EXP1 or IN 3-EXP2—only identify the console's physical input. When the console uses Tier Naming Convention 2 or 3, the four-character **Community Name** has a default setting of a signal number. Therefore, you need to edit this name, also. You can add a signal **Description** for each input signal to better identify it in VMCC. You can also add information such as the punch block number and circuit or the source for an audio input and the destination for an audio output.

● Verify signal mode (whether stereo or mono) needs to be verified for each input and output. All user inputs and outputs default to stereo with the odd-numbered signals being linked to the next even-numbered signal. However, you can change any individual signal to be two unrelated mono signals by clearing the **Link w/Next** check box.

● Various signals may need to be hidden (so they are not seen by other community members) or may need to be unhidden. The right channel of a stereo signal is always hidden, but other unused inputs and non-connected outputs should also be hidden until they are physically connected. This is done by a checkmark in the **Hidden** column.

● You need to assign a Mute Code to the Control Room, Studio, and an External location for the console. Most locations use the numbers 1, 2, and 3, but you can assign any number from 1 to 127 to each room to uniquely identify the location. You then assign the appropriate Mute Code to each microphone input,

in the **Audio Inputs** detail edit pane (Figure 4-19), so that the Control Room, Studio, or an External location automatically mutes and triggers warning logic while that mic is active.
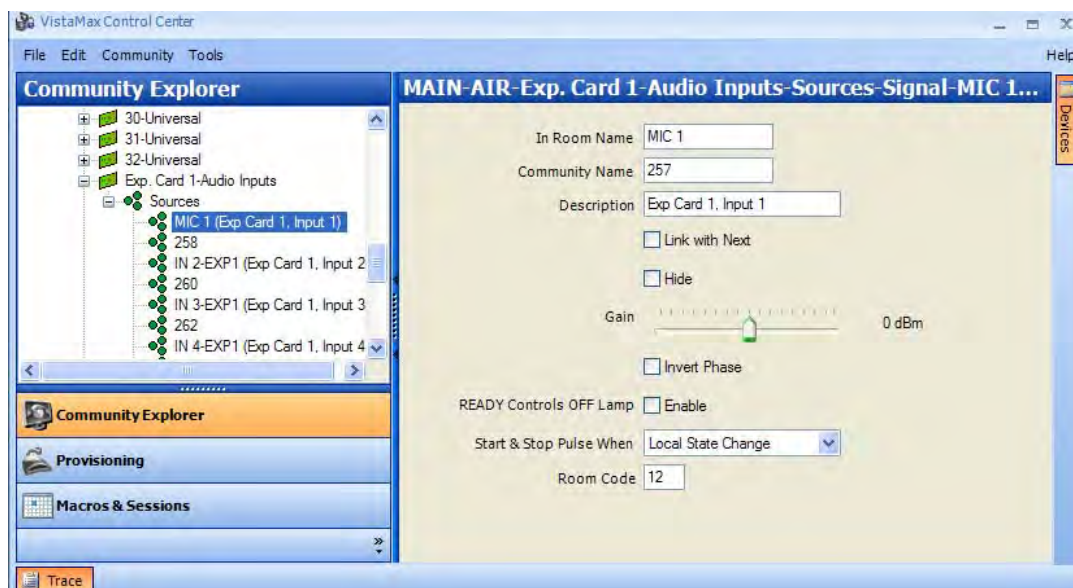
Figure 4-19. VMCC Room Code Assignments

● Associate an audio input to a specific logic I-O connector for logic control from a mic remote panel or a peripheral device when the audio signal is routed to a fader channel.

● Set any input gain trims. (You can set each input for up to +15.5 dB or -16 dB of gain/trim in .5 dB steps.)

● Set whether the signal phase gets inverted.

● Set whether the signal is added to various Include Lists.

You make the most common settings on the **Signal Summary** pane (Figure 4-18). To access this pane, perform these steps:

1. In the **Community Explorer** pane, click **+** next to the console to open its tree.

2. Click **+** next to **Signal Summary**.

3. Click either **Sources** (the input signals) or **Destinations** (the console output signals).

The **Signal Summary** pane allows you to quickly edit the signal names. The **In Room Name**, shown on the channel displays, can have up to 10 characters. The **Community Name**, shown on other devices when Tier Naming Convention 2 or 3 is used on the console, can have up to four characters.

This pane also allows you to set each signal as a mono signal or as part of a stereo or a surround signal. When you select a **Link w/Next** check box in the signal row, that signal is linked to the following signal. You would normally link an odd number signal (the left channel) with the following even number signal (the right channel). Since the right channel of a stereo signal is hidden, the **Hidden** check box for that signal is normally selected. When a signal is part of a discrete 5.1 surround signal, there are six signals "linked together" with five **Link w/Next** check boxes in a row selected and five **Hidden** checkboxes selected (Figure 4-14).
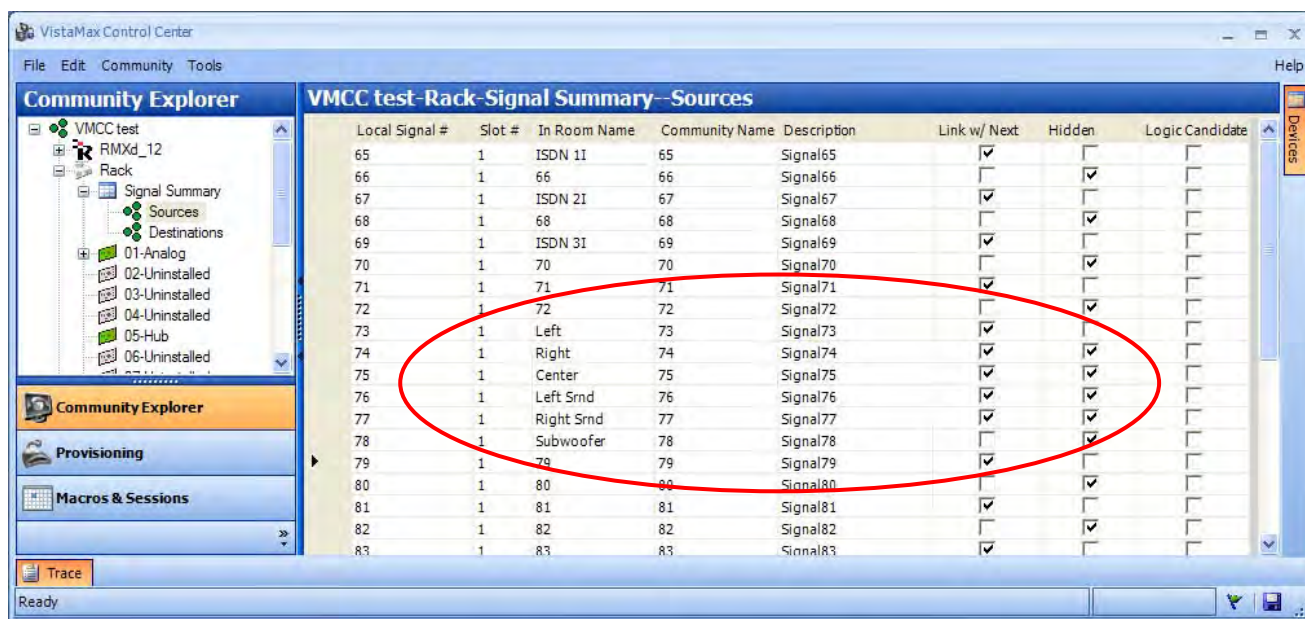
Figure 4-19. Signal Summary Pane with Settings for a 5.1 Discrete Surround Signal

Additional signal settings are available in the signal detail pane. To open this pane, perform these steps:

1. Click **+** next to a specific card name to expand that card.

2. Click **+** next to **Sources** or **Destinations**.

3. Click a signal name.

Figure 4-20 shows the signal detail pane for the first input on the first Audio Expansion car, **Exp. Card 1-Audio Inputs**. The **Gain** and **Invert Phase** settings are edited individually for the left and right inputs of a stereo signal. The other settings—**Ready Controls Off Lamp** enable, **Start & Stop Pulse**, and **Room Code**—only need to be set on the left channel of a stereo pair.
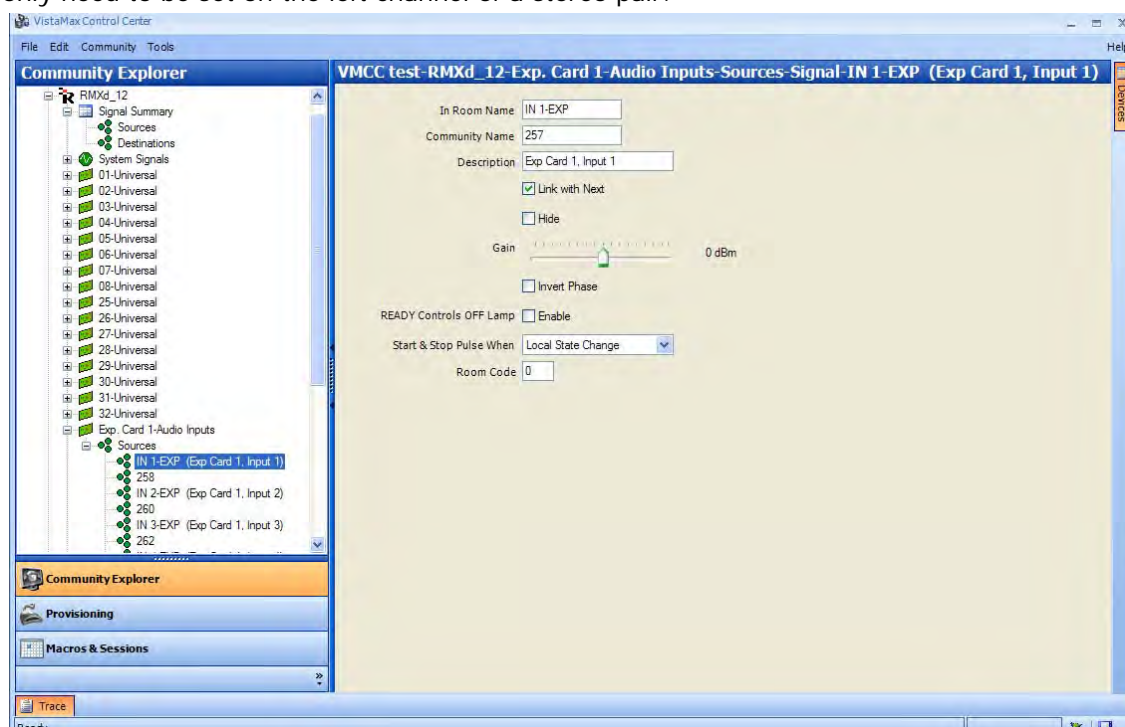
Figure 4-20. VMCC Signal Detail Pane

Signal Summary Pane Parameters

The next subsections cover parameters that can be edited in the **Signal Summary** pane (Figures 4-18 and 4-19).

In Room Name, Community Name, & Description

The **In Room Name** appears in the channel strip source selectors. It can have up to 10 alphanumeric characters, including spaces and some special characters.

The **Community Name**, four characters long, is used to identify a signal on other community members' console channels or edge device source selectors. This name follows the Call Sign prefix (set on the console pane) and the Name Radix (set on the community pane).

The **Description** simply helps to identify the signal. It only appears in VMCC.

To enter the signal names and definitions, click the **In Room Name**, **Community Name**, or **Description** and edit the entry as required. If you enter too many characters or if an illegal character, a red exclamation point and an error warning box appear, indicating an error that needs to be corrected (Figure 4-21).
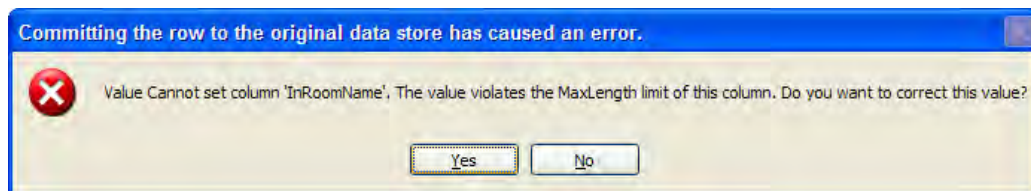
Figure 4-21. VMCC Name Length Error Message

Signal Format: Stereo or Mono

All six-pin AMP MOD IV audio connectors on the RMX*d* carry two signals. By default, each connector is set as a stereo connection; the left signal is assigned an odd signal number, and the right signal is assigned the next even signal number. These assignments ensure the two signals are treated as one source or destination for proper phase, timing, and routing.

This stereo relationship is set by the **Link w/Next** check box. When you select the check box on the signal row, that signal is stereo linked with the next signal. You would typically put the link on the odd-numbered signal so that a stereo signal is on one connector.

To change a stereo signal into a pair of mono signals, click the **Link w/Next** check box to clear it. The two signals are now treated as separate mono signals. To use the former right channel, clear the **Hidden** check box for that signal. When a mono signal is routed to a channel fader, it automatically appears on both the left and right outputs of the channel strip.

Hidden Signals

Each console has a number of signals that are hidden. These include each stereo signal's right channel (hidden so only the left channel's name appears in source selectors) and all of the internal console-only signals like the mix-minus primitive and talkback signals.

If the signal's **Hidden** check box is selected, that signal is hidden. It cannot be added to any signal **Include List**. To change a signal's **Hidden** status, click the check box to select or clear it.

You can select or clear check boxes for an entire console quickly by clicking a column entry to select it and then using the keyboard space bar to select or clear that check box. Press the UP or DOWN ARROW key to quickly move through the list, pressing the space bar as needed to select or clear the check boxes.

Signal Detail Pane Parameters

The next subsections cover parameters that can be edited in the signal detail pane (Figure 4-20).

Input Gain and Trim

The nominal signal level for each input is +4 dBu for analog signals and -20 dBFS for digital signals. Individual input gain/trim controls allow the input signal to be raised by up to +16 dB, to compensate for an unbalanced analog input or a low digital signal level, or to be trimmed by up to -15.5 dB, to compensate for hotter-than-normal input signals. Gain and trim are set independently for each channel of a stereo pair.

The **Gain** amount appears on the right of the slider. It is set at **0 dBm** by default and changes when you move the slider. The gain or trim can be set in .5 dB increments. Click and drag the **Gain** slider to the left for trim or to the right for gain. You can also click the **Gain** slider and press the UP or DOWN ARROW key to adjust the gain in .5 dB steps. Clicking to the left or right of the **Gain** slider adjusts the gain or trim in 2 dB steps.

Invert Phase

When a signal's **Invert** check box is selected, the phase of the signal inverts. The phase invert is set independently for each channel of a stereo pair.

Ready Controls Off Lamp

This setting is only active when the audio signal is bound to logic. When the **Enable** box is selected, the signal is coming from a peripheral device, such as a CD player or a automation system that has a Ready command which can be used to indicate play status. Thus, when the signal is routed to a fader, the off lamp may be

● Off − to indicate the source is not ready.

● Lit − to indicate the source is ready to play.

● Blinking − to indicate the source is paused or that it has completed playing the track or segment.

Only the **Enable** box for the left channel of a stereo pair needs to be selected.

Start/Stop Pulse

This setting is only active when the audio signal is bound to logic. The setting affects the outgoing start and stop commands when the signal is routed to a fader. Here are explanations for the setting selections available on the drop-down list:

Local State Change − The normal setting; causes one pulse to be sent out when the board operator presses the channel On or Off buttons to change the channel's state from Off to On or from On to Off. One start pulse is output when the channel is changed from Off to On, and one stop pulse is output when the channel is changed from On to Off.

Local or Remote Change − Performs the same logic functions—one pulse with each state change—but pulses are also generated when a remote logic on or off command is received.

Local Actuation − Causes a start or stop pulse to be output every time the channel On or Off button is pressed, regardless of whether the channel state is changed.

Local or Remote Actuation − Allows for multiple start or stop pulse outputs by pressing the On and Off buttons or by using remote logic on and off commands.

Room Code

Use this setting with microphone inputs to associate each input to a specific room. This association helps to properly mute the monitor outputs and to trigger hot mic warning signs.

You can assign three **Mute Room Codes** on the main console edit pane. You can assign a numeric code, from 1 to 127, to each room. Each room can be assigned its own room code but, in standard practice, every console is simply set to use these codes:

- **Room Code 1** for the **Mute Control Room Code**

- **Room Code 2** for **Mute Studio Room Code**

- **Room Code 3** for **Mute External Room Code**

Once you have assigned the **Room Code** numbers, you must set the appropriate **Room Code** on each preamplified microphone input. Then, when the mic is routed to a fader channel, its **Room Code** tells the console which monitor output to mute and which warning command output to trigger while the mic channel is On and assigned to a bus. The **Mute Room Codes** subsection gives more information.

Main Console Edit Pane

The next subsections cover parameters that can be edited in the main console edit pane (Figure 4-22). Click the console name to access this pane. The edit pane shows the main console entries. Use the vertical scroll bar to move up or down on the pane and view all the entries.
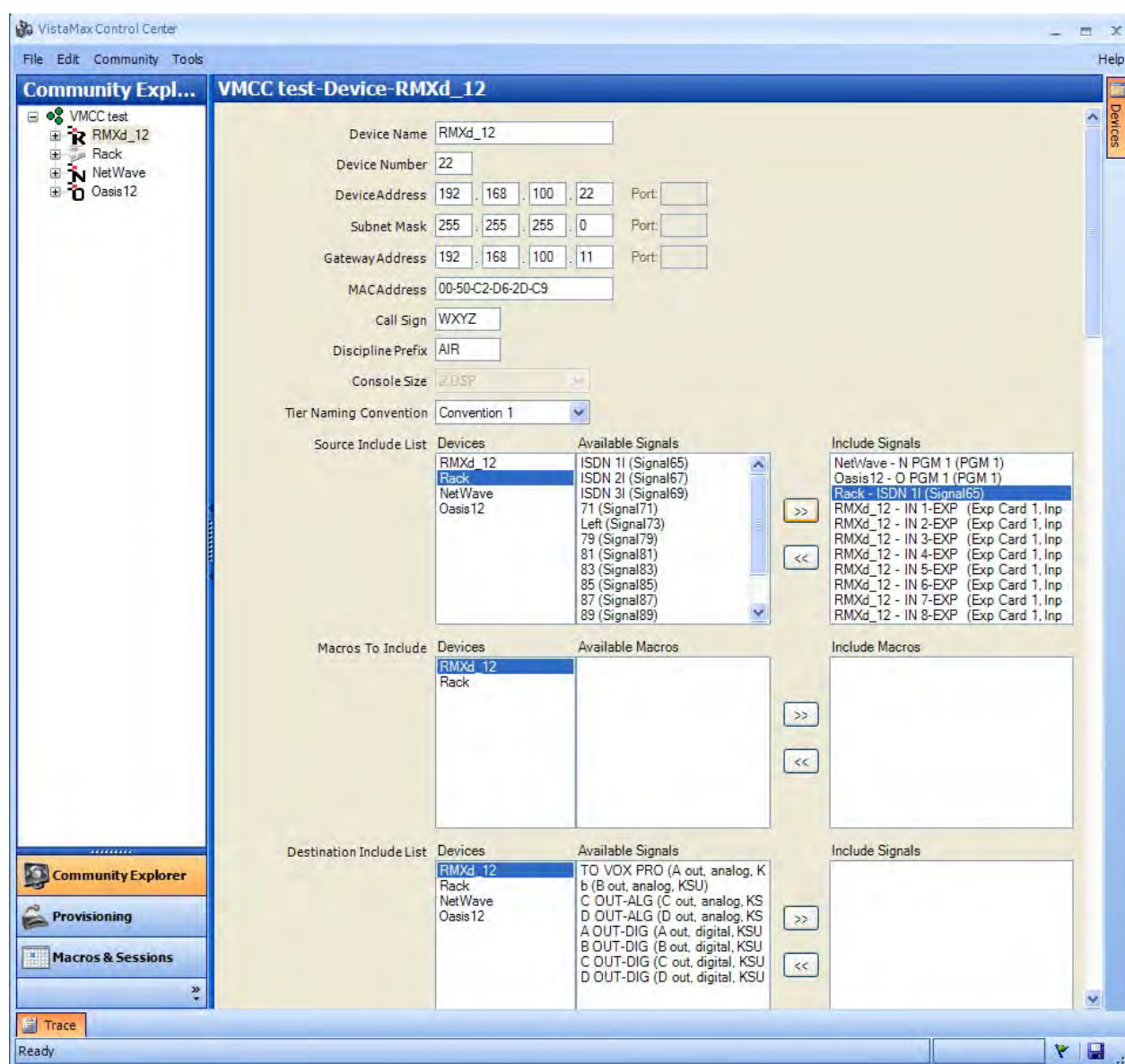
Figure 4-22. VMCC Main Console Edit Pane – Top of Pane

Device Include Lists

A device include list is the master signal source or destination list for a console or card frame. This list only shows signals that *do not* have their **Hidden** check box selected on the **Signal Summary** pane (Figure 4-18). The **Source Include List** sets which signals are available for routing to channel faders or programmable outputs on the console. The **Destination Include List** is typically left blank on a console; unless it is hosting a source/destination selector panel, the console does not have any destination selection device.

To create a **Source** or **Destination Include Signals** list, perform these steps:

1. Select a device in the **Devices** list (such as **Rack** in Figure 4-22). All unhidden sources on that device appear in the **Available Signals** list.

2. In the **Available Signals** list, click desired signals to select them:
    *   To select multiple signals, hold Ctrl while clicking the signals.
    *   To select sequential signals on the list, hold Shift while clicking the first and last signal in the sequence.

3. Click ⟩⟩ to add these signals to the **Include Signals** list.

4. Repeat these steps to add signals for other devices.

5. To remove a signal from the **Include Signals** list, perform these steps:
    a. Click the signal name on the list.
    b. Click ⟨⟨ .

Use this procedure to create the **Include Macros** list as well.

Monitor/Meter Include Lists & Sources

The Monitor Control panel has three columns with seven buttons on each column. The first column selects the Aux Meter source, the middle column selects the Control Room monitor source, and right column selects the Studio monitor source. The Control Room and the Studio monitor also have source selectors that allow you to monitor up to 15 additional sources.

You can assign each monitor select button to a console bus or to a routed signal. You can set up to 15 routed signals for each **Monitor** and **Meter Include List** (Figure 4-23). You can alternately assign any routed signal to a select button. You can call up the signals not assigned to a monitor button using the CR and Studio monitor source selector controls.
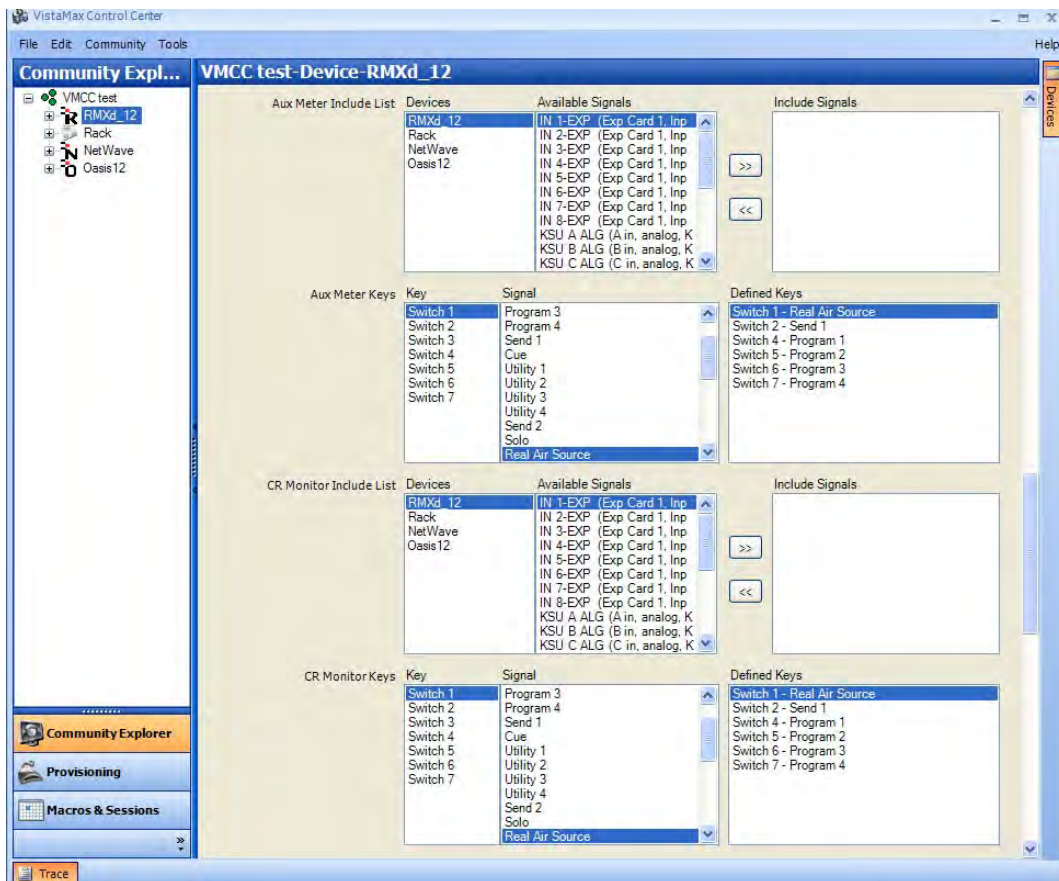
Figure 4-23. VMCC Main Console Edit Pane − Meter & Monitor Include Lists

Some buttons have default sources assigned (such as PGM 1 thru PGM 4), but you can reassign any button as needed. Set the **Monitor** and **Meter Include Lists** as the console **Include Lists** by selected a device, selecting the signals to be assigned to the device, and clicking the [>>] button to add them to the list. There can only be 15 signals in an **Include Signals** list. To remove any sources from the **Include Signals** list, select the signals and click the [<<] button.

Mute Room Codes

Each console has three monitor outputs you can mute to prevent "hot mics" from feeding back through the in-room monitor speakers and the cue speaker (Figure 4-24):

● Control Room

● Studio

● External
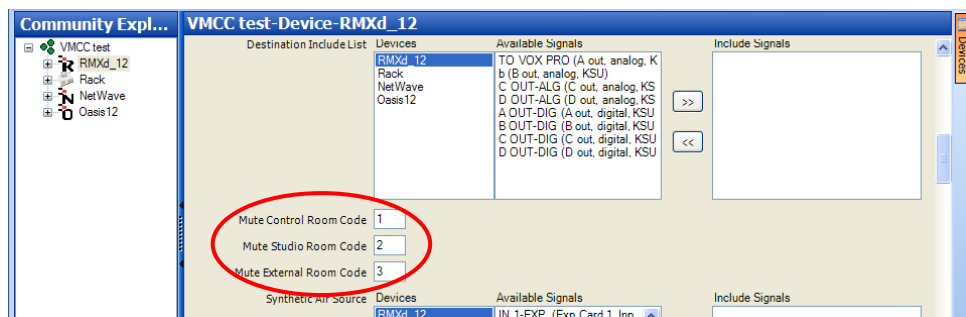
Figure 4-24. VMCC Main Console Edit Pane − Mute Room Codes

A valid room code is any number from 1 to 127. Each room can be assigned its own room code but, in standard practice, every console is simply set to use these codes:

- **Room Code 1** for the **Mute Control Room Code**

- **Room Code 2** for **Mute Studio Room Code**

- **Room Code 3** for **Mute External Room Code**

Once you have assigned the **Room Code** numbers, you must set the appropriate **Room Code** on each preamplified microphone input. Then, when the mic is routed to a fader channel, its **Room Code** tells the console which monitor output to mute and which warning command output to trigger while the mic channel is On and assigned to a bus.

Synthetic Air and Real Air Sources

Typically, you only set the **Synthetic Air Source** and **Real Air Source** for on-air consoles, to compensate for several seconds worth of profanity or for the HD Radio delays that might occur between the console and the off-air monitor signal (Figure 4-25). Assigning sources to these two signals tells the Control Room Monitor logic to automatically switch between an off-air signal (the **Real Air Source**, used when no mic channel is On), and a non-delayed signal (the **Synthetic Air Source**, used whenever any control room mic channel is On). You can simply set the **Synthetic Air Source** to the PGM 1 bus. However, it is more often the output of a backup air processor that simulates the processed sound of the Real Air signal without any delay.
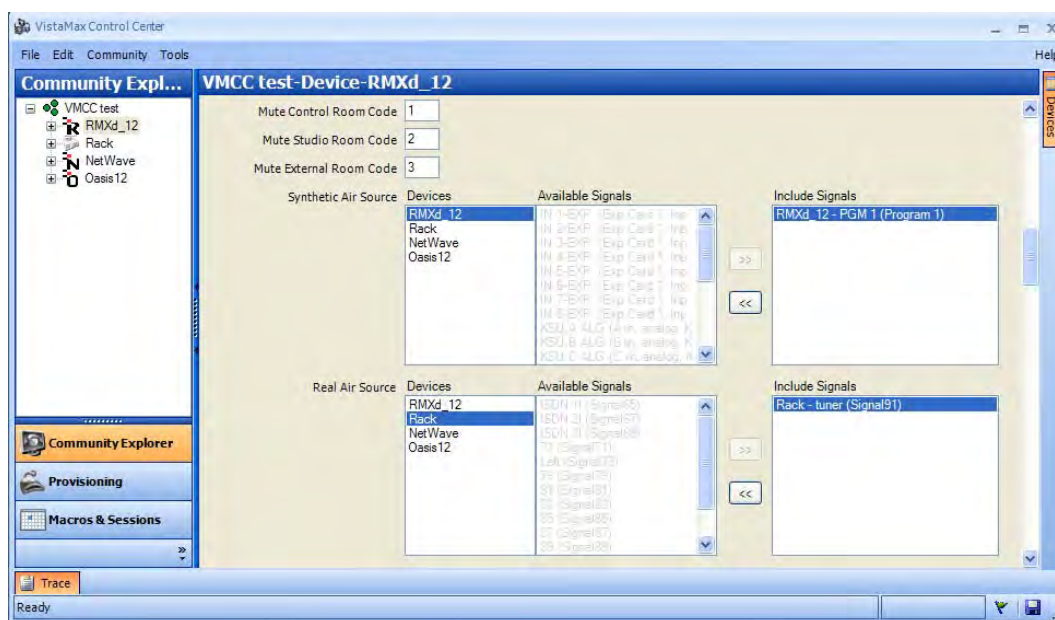
Figure 4-25. VMCC Main Console Edit Pane – Synthetic Air and Real Air Sources

If you do not set a source in the **Synthetic Air Source Include Signals** list, automatic signal switching does not occur. If you do not set a signal for either **Real Air Source** or **Synthetic Air Source**, both sources default to PGM 1. To use automatic monitor switching, you must set the **Real Air Source** as active for the Control Room Monitor source; it is the default signal assigned to the top button on the monitor selection buttons.

External Cue & External Talk to C/R Audio Sources

Use these two signal settings to assign two console or system inputs as the sources for an External Cue input and an External Talk to Control Room input (Figure 4-26). 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 through Phantom channel 3 to the Talk to CR bus. The External Cue signal is automatically routed through Phantom channel 4 to the Cue bus. You can then control these phantom

channels by logic commands on the Ext Cue and Ext Talk to CR inputs on the Cue/Talk/Ext logic connector. The *Cue/Talk/External Logic* subsection in Chapter 2 gives more information.
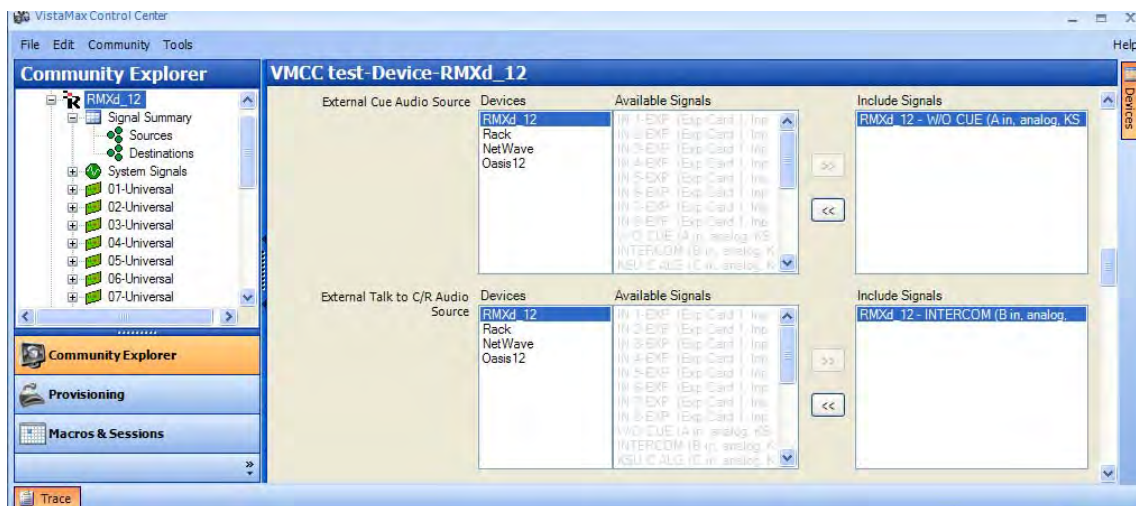

Figure 4-26. VMCC Main Console Edit Pane – External Cue and External Talk to C/R Audio Sources

Console Operational Parameters and Output Sample Rate

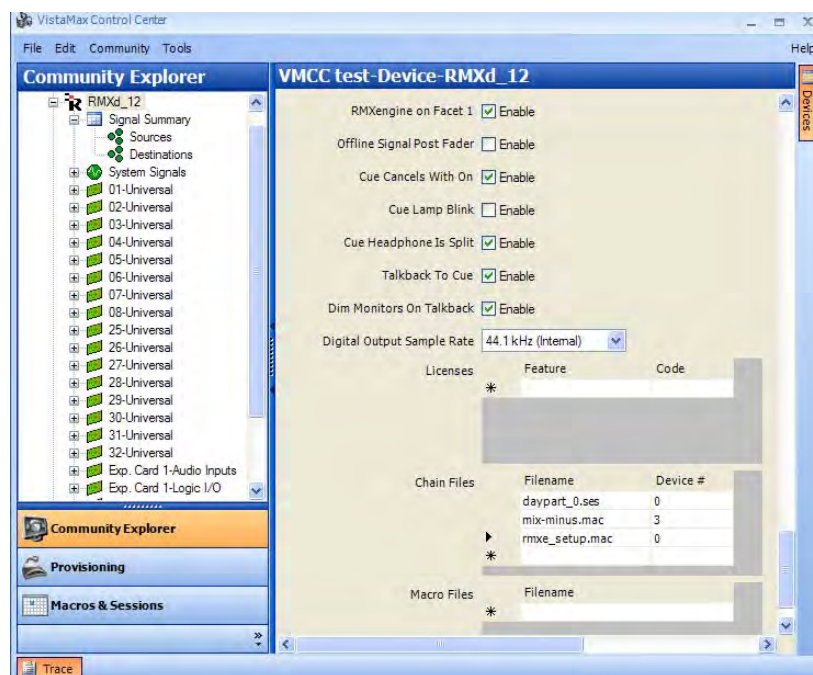There are a number of console-wide operational functions that you can set on or off by selecting or clearing the specific **Enable** check boxes (Figure 4-27).

Figure 4-27. VMCC Main Console Edit Pane – Operational Parameters and Output Sample Rate

You only enable (select the **Enable** check box) the **RMXengine on Facet 1** function when an RMX*engine* is plugged into Facet 1 on the console. Selecting this **Enable** check box adds all of the signals going to and coming from the RMX*engine* to the console's **Signal Summary** list. The RMX*engine* is a 1RU device used to extend RMX*d* functionality by creating a subtractive mix-minus for every DSP fader channel, for on-the-fly mix-minus creation, and adding five new Telco Record outputs, for Protected Destination Telcos using PGM 1 – 4 and Offline). It also allows for Dual Console Operation where two RMX*d* consoles, each with an RMX*engine*, can have their Program buses summed together to create four composite Program outputs. The GatesAir customer document 71-1538 RMX*engine* Quick Guide gives additional details.

Offline Signal Post Fader controls how the channel audio is sent to the offline bus. With the default setting of *not* enabled (the **Enable** check box cleared), the offline bus audio is both pre-switch and pre-fader. When you select the **Enable** check box, the offline bus is still pre-switch, but you can adjust the audio level with the channel faders.

Cue Cancels With On affects the cue functionality. With the default setting of enabled (the **Enable** check box selected), the cue button is automatically turned off—if active—when that channel is turned on. When you clear the **Enable** check box, the cue is not affected by changing the channel's state.

Cue Lamp Blink sets whether the cue buttons are lit solid—the default setting of not enabled—or the buttons blink while active—the **Enable** check box selected.

Cue Headphone Is Split affects how the audio is fed to the Control Room Host headphone audio output. With the default setting of enabled (the **Enable** check box selected) and the AutoCue button is lit, when cue is active on any fader channel, the headphone audio is split and summed; one side of the headphone receives the monitor source audio and the other side receives cue. When you clear the **Enable** check box, cue is fed in stereo to the headphones, cutting off the monitor signal. The enabled Split Cue setting is typically used for on-air studios, while the Stereo Cue (the **Enable** check box cleared) setting is typically used for production rooms.

Talkback To Cue sets whether the incoming "talk to control room" audio is also fed to the cue speaker. With the default setting of enabled (the **Enable** check box selected), all Talk to CR audio goes to the dedicated Talk CR output *and* to the cue speaker. When you clear the **Enable** check box, talkback only goes to the dedicated Talk CR output. The Talkback level control on the Monitor Control Panel controls the talkback level for both settings.

Dim Monitors On Talkback controls whether the control room and studio monitors dim by 12 dB while Talk to CR or Talk to Studio is active. The default setting of enabled (the **Enable** check box selected) causes the monitors to dim. When you clear the **Enable** check box, the monitors do not dim.

Use the **Digital Output Sample Rate** list to set the sample rate for the five digital outputs with adjustable sample rates:

● The first two KSU outputs (A and B)

● The first two program outputs (PGM 1 and PGM 2)

● The Send output

These can all be set for either 48 kHz (the default setting) or for 44.1 kHz output. The remaining digital outputs (KSU outputs C and D, and PGM 3 and PGM 4) use a fixed 48 kHz sample rate.

Licenses

This section of the main console edit pane is not used for the RMX*d* console.

Chain and Macro Files

In these sections, you can enter multiple session and/or macro file names using the name and suffix, such as:

● `daypart_0.ses`

● `mix-minus.mac`

The specified files automatically load every time the `init.mac` file runs. This file runs when you restart the single board computer (SBC), when you distribute changes to the console from VMCC, or when you manually run the file using an FTP command.

Typically, you would use the session file specified to set up the console for its standard operating function, such as an on-air studio, a production room, or a voice tracking studio. For some applications, you may need to load a session or macro file from another device, as the `mix-minus.mac` in Figure 4-27. In the **Device #** column, you can enter a device number for each session or macro file. To specify the session or macro file is stored on the local console, use a **Device #** of "0" (as for the `daypart_0.ses` session file in Figure 4-27. The `rmxe_setup.mac` macro file in Figure 4-27 is a standard macro file that routes the DSP fader's

audio and logic signals, the four PGM buses, and various other signals needed to create a subtractive mix-minus for every DSP fader channel to the RMX*engine*.

Session Files

Session files are text-only files with an `.ses` suffix. When you press **Save** on the Monitor Control panel, the system saves the current fader channel settings and source selections to a new session file in the SesFiles folder on the RMX*d* Server (`storage card/DATA/SesFiles`). Both the GatesAir PR&E application note AN07-01 *Creating and Editing Session and Macro Files* and application note AN07-02 *A Guide to Session and Macro Files* give additional details on session and macro files.

There is no limit to the number of session files you can save in the SesFiles folder on a console. However, as every session saved to the SesFiles folder is listed in alphanumeric order on the Session Selector, only active session files should be kept in this folder. Use FTP Voyager on the admin computer to periodically open the SesFiles folder and delete old and unused session files. You could keep older sessions and any engineering test sessions inside a folder created in the SesFiles folder, since the board operator could not see any session files in this folder. When a board operator needs one of these hidden files, move it into the SesFiles folder; the file immediately appears as an available session in the session selector.

You can create a new session by first taking another session file that you want to use as the basis for the new session. Then, set the fader channel assignment buttons and source selections to reflect the new console function (for example, setting up for a morning show, unattended operation, or live remote). You then press **Save** on the Monitor Control panel to save the channel fader button settings and source selections into a new session, along with any routes and channel-specific includes list from the session file that was loaded.

Note: When you press the session **Save** button and it rapidly blinks several times, the button is locked out. To unlock the session **Save** button, press/hold the bottom two Aux Meter selector buttons (default labels for these two buttons: PGM 3 and PGM 4) for three seconds to unlock the button. Press/hold the same two Aux Meter selector buttons for three seconds, until the **Save** button rapidly flashes several times, to relock the session **Save** button and prevent accidental session saves.

Each time you press the **Save** button, all of the current fader channel button settings and selected sources are saved to the new session file. The filename is the previously loaded session name with a numbered suffix. Since session names are limited to 10 alphanumeric characters, the original session name is truncated to eight characters when needed to add the two-number suffix (as in `undefine01.ses`). Use FTP Voyager to view the SesFiles folder and rename the session file name.

Session File Editing

Once you file a session, use FTP Voyager on the admin computer to download and edit the `.ses` file as required. Use a text-only editor like Windows® Notepad to add or update any session settings, such as changing the default channel source or adding button lockout information. You can also use this same computer to perform other session management duties, such as renaming or deleting session files.

In VMCC, version 2.2, there is a built-in RMX*d* console session. Click the **Macros & Sessions** tab to open the editor window. Click the **RMX*d* Session Editor** option button to access the editor (Figure 4-28).
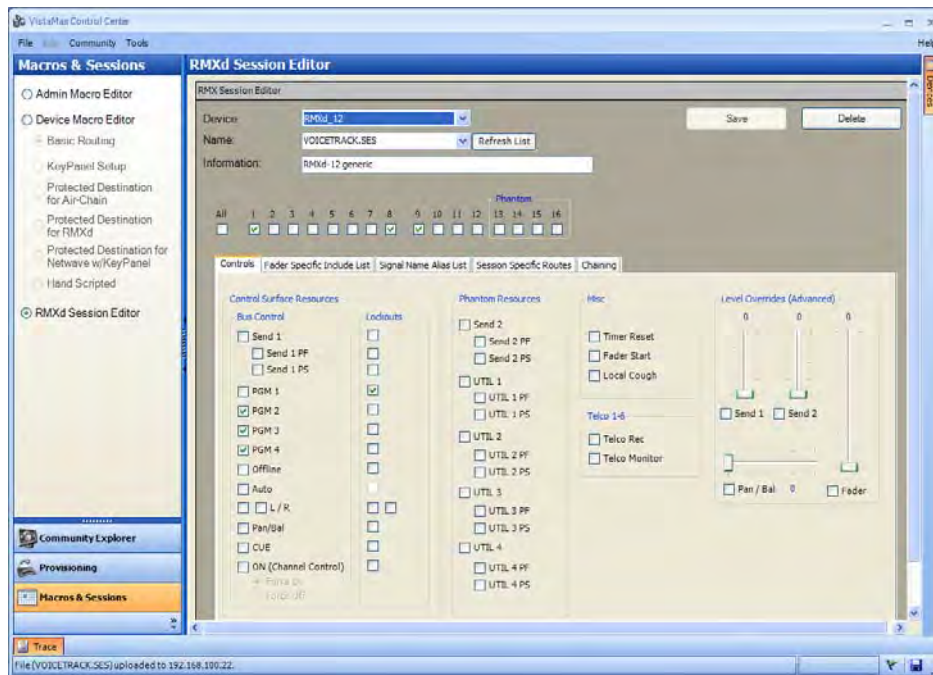
Figure 4-28. RMX*d* Session Editor

Template Session Creation

To simplify creating new sessions, you should create a session file with the most common settings used on the console, including channel source selections and button lockouts. You can then use this session file as a template to create new sessions. Perform these steps:

1. Press **Take** to take the template session.

2. Adjust the settings.

3. Press **Save** to create a new session file.

4. Using the admin computer, rename the session file.

The next sections cover these aspects of template session creation:

● Recalling and loading sessions

● Saving sessions

● Downloading sessions on a LAN-connected computer

● Editing downloaded sessions

● Uploading the sessions back to the RMX*d* Server for operator use

Session Recall and Loading

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.
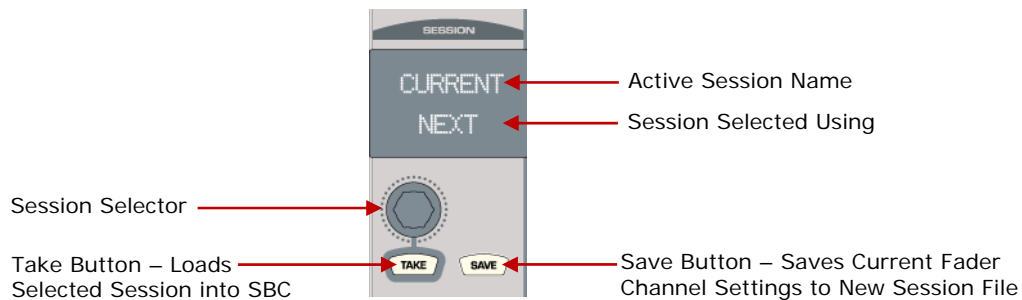
Figure 4-29. Monitor Control Panel — Session File Controls

Rotate the **Session** selector clockwise (to the right) to move up through the list alphanumerically. Rotate it counterclockwise (to the left) to move down through the list. When the desired session name 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 `daypart_0.ses` session file, which ships with *each* RMX*d* console, perform these steps:

1. Use the **Session** selector to find and display **DAYPART_0** in the bottom line of the session display.

2. Press **Take** to load the session.

Note: When you use the **Take** button to load a session, any channels that are currently On are not affected by the new session file settings. Instead, the On button begins to wink for any channel that is On, indicating that channel has changes that are "pending." Then, when a pending fader channel is turned Off, the button assignment settings and source selection from the new session file load onto the channel.

Session Saving

To save a session template, perform these steps:

1. Load the `daypart_0.ses` session as directed in the previous subsection.

2. Change bus assignments and channel source selections as required on the fader channels.

    Note: Session files save all fader channel button settings and the source selections on each fader, but rotary knob and linear fader settings are *not saved* as part of the session file. Also, monitor source selection and other Monitor Control panel settings are not saved as part of the session file.

3. Press **Save** to save the channel settings. A new session file, `daypart_01.ses`, is now saved to the RMX*d* Server. This file becomes the template session file for this console.

    Note: When you press the Save button, the new session is given a name based on the name of the session that was last loaded, followed by a suffix (01, 02, 03, and so forth).

The newly created template session, `daypart_01.ses`, now contains the standard console surface settings. To add lockout information or to rename this file, you can download it from the RMX*d* Server to an admin computer for manual editing, or you can open it in VMCC, version 2.2 or later and edit it in the RMX*d* Session Editor.

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

Session Downloading

Before downloading the new template session to the admin computer, create a Session Files folder on the admin computer to save files in while editing and to use as a backup for the files on the RMX*d* Server. To download a session from the RMX*d* Server to the admin computer, perform these steps:

1. Start FTP Voyager. The **FTP Site Profile Manager** window appears (Figure 4-30).
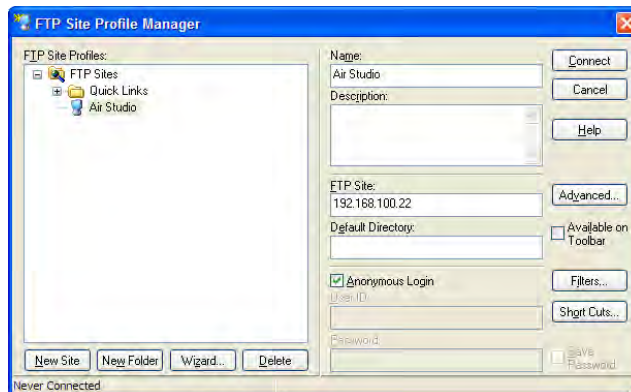

Figure 4-30. FTP Voyager – FTP Site Profile Manager Window

2. Click the console name.

3. Click **Connect**. FTP Voyager connects to the console, and the console's file tree appears (Figure 4-31).

4. If the admin computer has never connected to the console before, perform these steps to add a new device:

    a. Click **New Site**.
    b. At **Name**, type the console's name (such as **Air Studio** in Figure 4-30).
    c. At **FTP Site**, type the console's IP address.
    d. Click **Connect**.
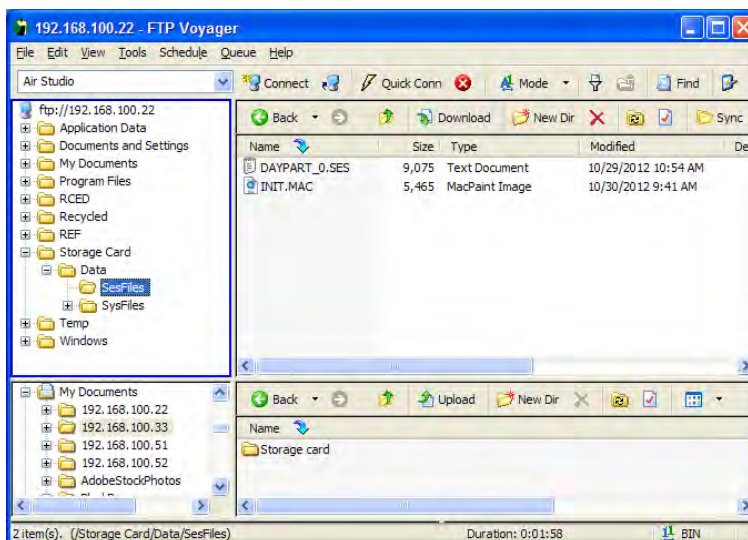
Figure 4-31. FTP Voyager – RMX*d* SesFiles Folder – File View

5. On the left pane, click **Storage Card** | **Data** | **SesFiles** to view the macro and session files.

6. Copy the `daypart_01.ses` session template file you just saved into the Session Files folder on the admin computer.

To create a shortcut to open the SesFiles folder directly in FTP Voyager, perform these steps:

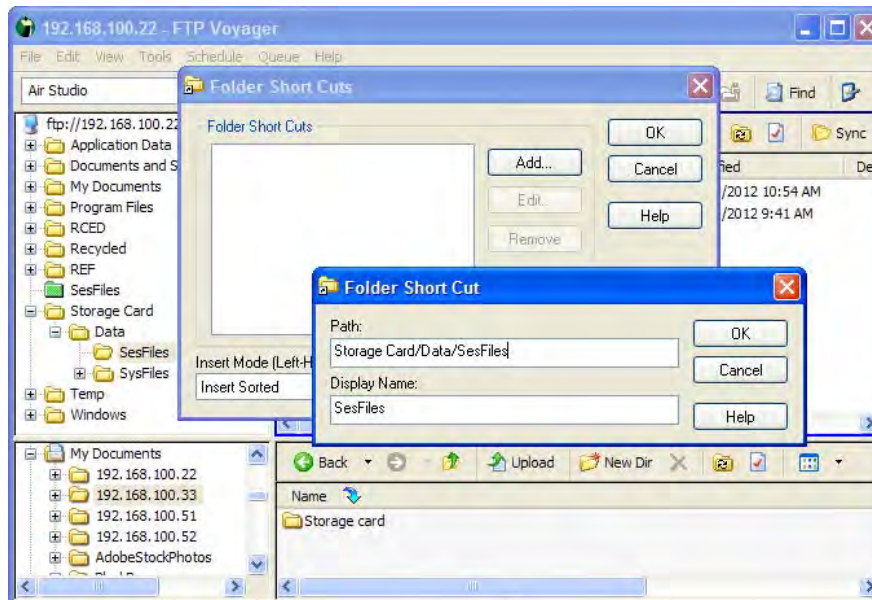1. Click **Tools** | **Folder Shortcuts** to open the **Folder Short Cuts** dialog box (Figure 4-26).

Figure 4-32. FTP Voyager Short Cut to SesFiles Folder

2. Click **Add**. The **Folder Short Cut** dialog box appears.

3. At **Path**, type "Storage Card/Data/SesFiles" (the **SesFiles** path name).

4. Click **OK** to set the short cut path. The dialog box closes.

5. On the **Folder Short Cuts** dialog box, click **OK** to accept the new shortcut. The dialog box closes and a green **SesFiles** folder appears in the file tree.

6. Click the folder once to open it.

Session File Editing

After downloading the `daypart_01.ses` file, perform these steps:

1. Open the local copy of `daypart_01.ses` in Notepad® or another text file editor.

2. Edit the file as required.

   Notes: Add any channel button lockouts—which prevents the operator from changing one or more channel buttons—as well as any other changes required.

   The *Session and Macro Files* subsection gives more information on editing session files.

3. Use **Save As** to save the file with a different, more descriptive name, such as `template.ses`. This filename, without the `.ses` extension, appears in the session display when you rotate the Monitor Control panel's Session selector.

   Notes: Session names can have up to 10 alphanumeric characters, as well as spaces and underlines, but cannot use special characters. You can use both upper and lower case letters to name the file, but file names appear in upper case letters in the session display. The file name must have an `.ses` extension to be recognized as a session file.

   You can also rename the file after you have saved it. In either Windows® Explorer on the admin computer or in the RMX*d* Server's FTP site, with FTP Voyager, right-click the file and click **Rename**. Alternately, you can click the file, pause, and click it again.

After editing and renaming the file, use the steps in the next subsection to upload it to the RMX*d* Server.

Session Uploading

To use an edited session file, you must upload it to the RMX*d* Server's FTP site. To use the newly created template file, referred to as `template.ses` previously, as the basis for creating session files, you need to upload it the SesFiles folder on the RMX*d* Server's FTP site. Perform these steps:

1. Open the RMX*d* Server's FTP site.

2. Navigate to the SesFiles folder.

3. Copy the `template.ses` file from the admin computer to the SesFiles folder.

4. To load the file into the RMX*d* console, perform these steps:

    a. Turn the Monitor Control panel's Session selector until **TEMPLATE** appears in the **Session** display.
    b. Press **Take**.

5. Confirm that all of the settings and input sources are set correctly before using the file as a template for creating other sessions.

Session and Macro Files

All session and macro files are text-only files which consist of sections, entries, or comments. You can find a full description of all session and macro file sections and variables in the GatesAir Application Notes AN07-01 and AN07-02. Here are the most common sections used in session and macro files:

● Fader Channel

● General File Information

● Button Assignment

● Channel Button Lockout

● Console Mapping

● Router Command

The next subsections discuss these numbering systems and common session and macro file sections.

Fader Channel ID and Signal ID Numbers

There are two numbering systems used to identify specific fader channels or audio inputs and outputs in a VistaMax system:

● Channel IDs

● Signal IDs

RMX*d* components—channel strips, monitor control sections, audio inputs, audio outputs, and logic I-O ports—are assigned unique ID numbers to specifically identify every local signal. These assignments are based on their physical position in the mainframe or by the card or panel that they reside on.

The Dual Fader channel strips are numbered from the left end of the frame (beginning with number 01) to the right. The maximum amount of channel strip numbers is 32 because there are four "phantom" channels on each the KSU; 28 channel strips can be installed on an RMX*d*-28 plus the four phantom channels.

Any channel strip that is set as a Telco fader is numbered separately from the sequential channel strip numbers. You can assign up to six Telco channels (Telco 1 − 6) using a rotary switch setting on the rear of the Dual Fader panels. The channel ID numbers for the six Telco fader channels are 81 to 86. The *Dual Fader Panel Rotary Switch Settings* subsection in Chapter 2 gives information on setting a Dual Fader channel as a Telco channel.

Table 4-2 gives information for RMX*d* channel ID numbers.

Table 4-2. RMX*d* Channel ID Numbers

Type	Channel #	Assignment Method
Fader channels	1 to 32*	Red CAT6 cables, as connected, left to right
Monitor Control	33 to 35	Last red CAT6 cable, right end of console
Audio I-O	37, 39, 41, 43	8-Input Expansion card inputs and KSU inputs and outputs
Logic I-O	38, 40, 42, 44	8-Input Expansion card logic I-O and KSU logic I-O
Telco Channels	81 to 86	As defined by the rotary switch settings on the dual faders

*   A maximum of 28 channel strips are supported, plus four KSU phantom channels numbered 29, 30, 31 and 32.

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. Therefore, when you use a channel ID to identify a network signal, the channel ID number must be preceded by "D*x*." where x is the device number of the console or frame where that signal resides. Here is an example of how channel ID numbers appear on a networked console:

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

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

General File Information

The information section typically starts a session file. It has the header `[Information]` followed by a Description entry line, as in this example:

```
[Information]
Description=rmxd-12 generic
```

The description entry (in this example, `rmxd-12 generic`) can be manually edited to describe why the session file was created (such as `sets the console to prerecord network feeds`). To change the description, edit the entry line that begins with `Description=`. You can change everything to the right of the equal sign, up to a limit of 80 characters. If more than 80 characters are needed, create a new line in the file, and add a comment line starting with a semicolon (;). Any text proceeded by a semicolon is a comment. You can add up to 32 comment lines to any session file to clarify its purpose or use.

Button Assignment Setting

Each type of fader channel button (PGM 1, PGM 2, OFFLINE, PAN, and so forth) has a section in the session file where you can preset the button state for each fader channel to turn On or Off when the session file is taken. The default settings in the `daypart_01.ses` file for all buttons is =0, which sets each button state to Off.

Although the On/Off settings can be manually edited by changing each =0 setting to =1, it is generally far easier to simply set the fader channel buttons to their desired states of On or Off on the dual fader panels and then use the Monitor Control panel Save button to save all of the button states at one time to a new session file. You can then edit this session file as a template to create session files for daily use.

However, there are a few sections that need to be manually edited or edited using the RMXd Session Editor in VMCC version 2.2 or later. These sections do not have control surface buttons and include

● [On]

● [fix_fader]

● [TelcoRecord]

● [TelcoMonitor]

The next subsections discuss these manually edited sections. The AN07-01 Application Note on *Session and Macro Files* lists the remaining special purpose sections. You can download this application note from the GatesAir Customer Portal or the GatesAir PR&E FTP site. (The *Parts and Repair Services* subsection in Chapter 5 gives details on accessing these sites.)

[On]

Normally, there is no [On] section in a session file, as this section allows a session to immediately turn channels On or Off when the session is taken, whether or not those channels are on-air. Thus, any [On] section entry overrides the normal method of changing sessions where any channel that is on-air goes into pending. When the [On] section is used channels are forced on or off immediately when the session is taken. An On section looks like this:

```
[On]
Channel_1=1
Channel_2=0
Channel_4=1
```

In this example, when the session file is taken, channels 1 and 4 are immediately turned On with the new session file settings, while channel 2 is immediately turned Off—even if that channel was on-air. No other channels are affected by this section.

You might use the [On] section to set up a console for unattended operation. You could then schedule the session to be taken by VistaTouch at a specific time to turn On specific channels and turn Off all other channels.

[Fix_Fader]

When you use the [On] section to force a channel On, as for unattended console operation, you typically add another section [fix_fader] to the session file. This section can override the fader position, ignoring its setting, and instead set the channel to a fixed level. Then, adjusting the fader no longer controls the level on the affected channels.

The entry value is any hexidecimal value from 00 (equal to a fader set to full off) to FF (equal to the fader set to full on). Setting the entry to equal B5 sets the channel to unity gain (the same level as setting the fader to the -12 mark). Use these guidelines:

● To set the "fader" 3 dB below unity gain, set the entry to A0.

● To lower the level by 6 dB from nominal, set the entry to 8E.

● To lower the level by 10 dB, set the entry to 7C.

● If you need extra gain, use these settings:

   • Set the entry to C9 to add 3 dB of gain.
   • Set the entry to DA to add 6 dB of gain.
   • Set the entry to F2 to add 10 dB of gain.

In this example, channel 1 is set for unity gain whereas channel 4 is set to add 3 dB of gain above nominal.

```
[fix_fader]
Channel_1=B5
Channel_4=C9
```

[TelcoRecord] and [TelcoMonitor]

You can use these two sections to assign each Telco channel to the Telco Monitor bus and/or the Telco Record bus. To assign the Telco channel, edit the default setting =0 (Off) to =1 (On) to set that Telco channel as active on that bus:

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

```
[TelcoMonitor]
Channel_81=1
Channel_82=1
Channel_83=1
Channel_84=1
```

These sections set Telco channel 1 (ID # 81) so that it feeds both the Telco Record output and the Telco Monitor bus. The other Telco channels do not feed the record output but do feed the Telco Monitor output.

Session File Section Summary

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

● [Cue] – Sets whether cue is On or Off for each channel.

● [Send_1] – Sets whether that channel is assigned to the send bus.

● [Prog_1, Prog_2, Prog_3, Prog_4] – Sets whether that channel is assigned to any of the four Program buses.

● [Offline_1] – Sets whether that channel is assigned to the Offline bus.

● [Send_1_PF] – Sets whether that channel goes to the Send bus pre-fader (=1) or post-fader (=0).

● [Send_1_PS] – Sets whether the channel's send is pre-switch (=1) or post-switch (=0).

● [PanBalance] – Sets whether the channel's pan/balance control is in circuit (=1) or out of circuit (=0).

● [TelcoAuto] – Sets whether the Auto Foldback feature is On or Off for each Telco channel. When set On, that channel's Auto F/B button lights.

● [TelcoRecord] – Sets whether that Telco channel feeds the Telco Record bus.

● [TelcoMonitor] – Sets whether that Telco channel feeds the Telco Monitor bus.

● [Mode] – Sets the channel's mode of operation. This section has four possible variables:
   • For a stereo signal (=0)
   • To use the left channel only (=1)
   • To use the right channel only (=2)
   • To do a mono sum of the left and right signals (=3)

- `[local_cough]` – Sets whether the channel's On button also functions as a cough button when a microphone is routed to that channel. The `=1` setting mutes the mic audio from the PGM buses while the On button is pressed. When set to `=0`, the On button does not function as a cough button.

- `[timer_reset]` – When set to `=1` and the timer's Auto button is lit, that channel resets the event timer to 00.00.0 when that channel is turned On. If the Auto button is not lit or the entry is `=0`, there is no timer reset at channel On.

- `[fader_start]` – When set to `=1`, the channel is automatically turned On when the fader is moved up from full Off. The channel turns Off when the fader is moved back to full Off. `=0` (or no section entry) means fader movement does not affect the channel 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 16 line entries in the section using this format: `port_event_j=k` where `j` is the port number (from 1 to 16) and k is 0 for a null event or 1 to cause a contact closure.

Channel Lockout

A `[ChannelLockout_x]` section allows any fader channel button to be locked out to prevent the board operator changing it. Channel lockouts are often set for unattended console operation so that, if something is accidentally set on the console, no buttons are changed. Channel lockouts are also set for special console setups such as safe voice tracking on an on-air console. In that case, a session would un-assign the board operator microphone and certain automationchannels from the air PGM bus and then lock out those assignment buttons so that they could not be turned On, accidentally feeding audio to the on-air signal during voice tracking.

In VMCC version 2.2, the RMX*d* Session Editor has a check box for each control button (Figure 4-33). You can easily set one channel fader up to all channel faders by using these check boxes to select which buttons to lock out.
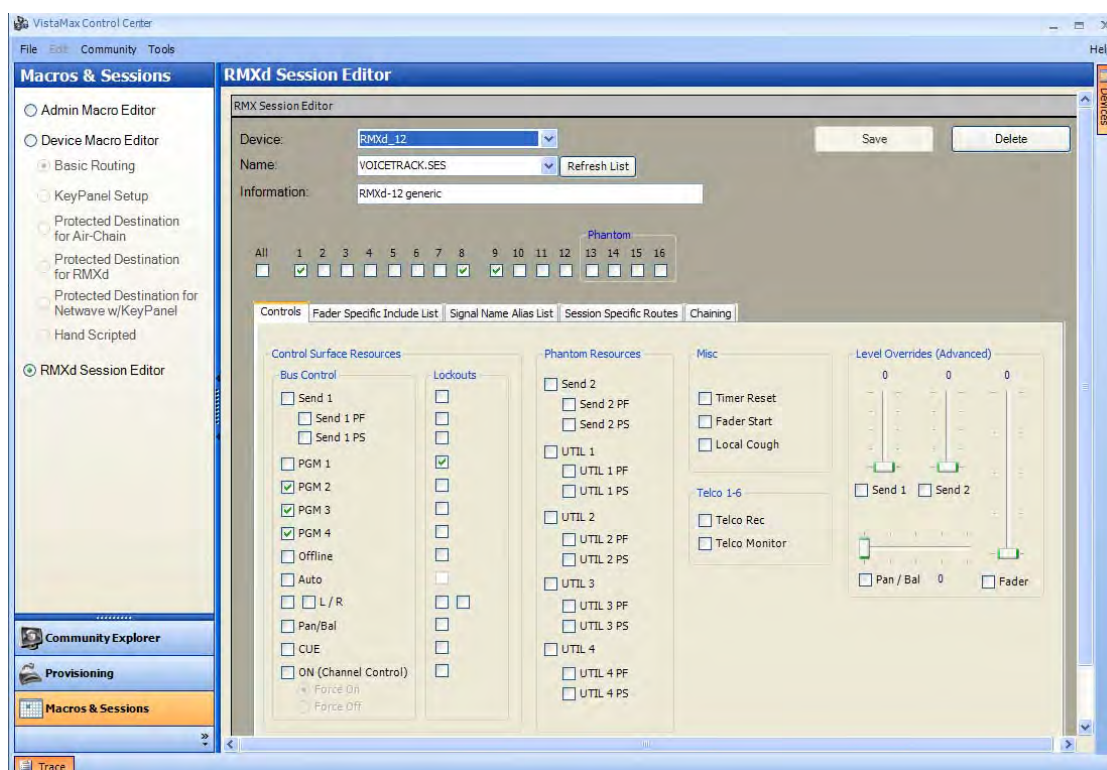

Figure 4-33. RMX*d* Session Editor – Fader Channel Buttons for Lockout

A channel lockout section begins with the `[ChannelLockout_x]` header. This example shows locking out the four PGM buttons on the Telco 6 fader channel:

```
[ChannelLockout_86]
Send1_On=0
Send1_PF=0
Send1_PS=0
Program1=1
Program2=1
Program3=1
Program4=1
Offline1=0
Cue=0
ModeLeft=0
ModeRight=0
On=0
PanBalance=0
```

To set a channel lockout, perform these steps:

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, you should keep all of the channel lockout sections 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.

   Note: The channel ID number table (Table 4-2) shows 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.

   Note: Each button is locked separately. To allow the operator to change the button, leave the setting for the button as `0`. To lock out that particular button, change the setting to `1`.

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

Console Mapping

The mapping section `[Mapping]` lists the RMX*d* channels in a table, as they were detected at the time the session was saved. The RMX*d* Server automatically rewrites the section at each save, so you should not edit it. This section must match the current `inventory.txt` file that is saved in the SysFiles folder. If a channel position does not match, that channel is not changed when you take the session file. The position might not match if a new Telco channel is added and an old session is taken.

The table entries are in hexadecimal:

- `Map_0` is a reserved position listed as `FF` 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` is always `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.

Router Command Assignment

Each console is assigned a unique device number as set by the `nqx.ini` file when you power up the console. Though typically left at `device=1` for non-networked consoles, when multiple RMX*d* consoles and VistaMax frames are networked together, you must assign a unique device number, from 1 to 63, to each device to distinctly identify its signals to the other networked devices.

[RouterCommand_1]

There can be only one `[RouterCommand_1]` section in a session file. It can have up to 63 'Take commands' to route sources to destinations. If you need to make more than 63 routes, the macro or session would be chained to load another file, which can have its own `[RouterCommand_1]` section with another 63 routes possible. Here is a typical `[Router Command_1]` section:

```
[RouterCommand_1]
take_1=169,193        ; CBS 41 > DRRSW IN1
take_2=185,195        ; PROD 1 > DRRSW IN2
take_3=5617,197       ; NEWS PGM 1 > DRRSW IN3
take_4=191,199        ; MT PRESS > DRRSW IN4
take_5=D1.225,D41.201    ; AIR PGM 1 > DRRSW IN5
take_6=D1.289,D41.203    ; AIR PGM 3 > DRRSW IN6
```

Each Take command (`take_x=source,destination`) must be listed in numerical order and be on separate entry lines. You can identify signals on the same device as where the macro or session file is saved by their local signal number (such as `take_1=169,193`). When a signal goes to or comes from another device, its local signal number must be preceded by its device number (`take_6=D1.289,D41.203`) to identify that the signal is on another device. Signal 5617 identifies a signal from a NetWave console. The other three digital signals identify signals on VistaMax I-O cards. D1 identifies signals coming from an RMXdigital console, while D41 identifies signals going to another card frame.

Routes are continuously maintained until another session or macro file is loaded that changes the routing, or until you select a new source on a channel strip in one of these ways:

- Using a FTP take command

- Using VistaVue to take a new source

- "Dialing up" a new source on a hardware selector panel

A "persistence file" saved in the SysFiles folder of the SBC maintains the routes even if the console or card frame is turned off or loses power. This file is periodically updated as you take routes in the system. Previous examples have shown one source being routed to one destination, but any one source could be routed to multiple destinations by adding separate Take command lines from that same source to the other destinations.

Include Lists

You can only select a source on a fader channel source selector if that source was added to the console's Source Include List, stored in the console's `routers.ini` file. The Source Include list, with the `[srcinclude]` header, is created and maintained using VMCC. This list contains every signal that might be required to be routed on a console.

The Source Include list could contain every signal from every device in the VistaMax community, maybe several hundred sources, making it very difficult for the board operator to find the desired source. To limit the total number of sources shown on any channel's source selector, each channel can have a channel-specific source list set by the session file. This source list should include only those sources required for a particular daypart or application. In many applications, most of the faders should only include one or two sources, such as those channels used for microphones and automation systems. Telco channels should only have four-wire devices listed on them or, more often, four-wire macros. A handful of channels are typically left with all or most console signals listed.

Once a channel has been assigned a channel-specific include list, that list is 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 needs this command: `include_1=all`.

Here is an example of the channel-specific include lists for four channels set as Telcos. 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, 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 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 (such as `[Router_81]`). You must list each include line in numeric order, where x equals 1 in the first line, then 2, 3, and so on. Typically, you would list all the sources for one device on a single line, but you could divide them into separate entry lines to improve legibility 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 from which the Telco 1 and Telco 2 channels can select sources: `D1` (device 1) and `D2` (device 2).

Channel ID numbers identify the available sources as they identify the section headings. Table 4-2 lists the channel number assignments.

INIT.MAC

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 used to override the default console settings for a particular daypart or application. The `init.mac` file is maintained and edited using VMCC, so you would not manually edit any of these entries in the `init.mac` file:

- [room_code_mute] This entry assigns a room code number to the three console monitor outputs: control room, studio, and external. There is also a definition for Studio 2, but that definition is not used in RMX*d*.

- [room_code_card_x] This entry assigns a room code to a console input, identifying a microphone input by its room location. The code is used to control which monitor output mutes, and which warning command or tally is output, when the fader channel assigned to the code is turned On.

- [system_properties] This section sets various global properties for the console. When the entries are set to =1: the cue is cancelled with channel On; the cue button LEDs blink when active; and the offline signal source is post-fader. The meter average only property is not used in RMX*d*.

    ```
    [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.
    - 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 similar to those in the [monitor_selection] section.

- [studio1_selection] This section has the include list and the seven button definitions for the studio monitor buttons. The entries are similar to those in the [monitor_selection] section.

- [on_out_port_card_x] This section sets the relationship of the output logic for each Assignable logic connector on the KSU (card_4), the three possible 8-Input Expansion cards (card_1, card_2, card_3), and the time slots the logic signals use.

    There can be up to 16 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.

- The a is the port number. It is 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.
- The 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 a stop pulse.
- The c defines which time slots are used by the logic commands. Typically the odd numbered time slots, starting with slot 1, are used in order. VMCC automatically assigns this entry as the ports are defined.

- [port_config_card_x] This section defines the logic outputs 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 are very useful: 1, which defines the output as closed, and 2, which defines it as an open command.

  There could be up to 16 line entries (for an 8-Input Expansion card) under this heading. The entries port_config_h=i define each port.

  - The h is the port number, from 1 to 16, which is set for one of the four types of logic functions.
  - The i is the logic function:
    ◦   0 is a pulsed close command.
    ◦   1 is a sustained close.
    ◦   2 is a sustained open.
    ◦   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 16 line entries under this heading. The entries on_out_ts_d_i=e,f,g define each port.

  - The d is the port number (from 1 to 16),
  - The 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)
  - The logic function is assigned to the input timeslot g (from 1 to 16).

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

Software Updates

GatesAir may periodically issue software revisions for the RMX*d* Server at no charge and may offer new feature enhancements may for a nominal fee. In either case, the operating system for the RMX*d* console (also used on VistaMax card frames) is a single binary file named nk_9G20.bin (for 9G20 SBCs) or nk.bin (for older x86 SBCs). This file is inside a folder that is named with the version number of the release, like 501.136 or 601.11a. The "a" suffix identifies the file as being for a 9G20 SBC. If there is no suffix, the file is for an x86 SBC. All of the folders are zipped so after downloading they must be unzipped before use.

To identify the current version of code running on your console, open the **View Status** window in **Community Monitor**. The operating system version is shown in the **Vers** column for each device (Figure 4-34).

Figure 4-34. Community Monitor — Version of Code on RMX*d* Console

You can download the current release for both the x86 and 9G20 code, and selected past releases, from the GatesAir Customer Portal or the GatesAir FTP site: `ftp://ftp.pre.com`. (The *Parts and Repair Services* subsection in Section 5 gives details on accessing these sites.) To update your RMX*d* console requires using a TFTP Server program such as 3CDaemon, which you can also download from the Customer Portal or GatesAir FTP site.

TFTP Server

Trivial File Transfer Protocol (TFTP) Servers transfer and update software for routers, switchers, hubs, and other networked devices, such as the RMX*d* Server. The RMX*d* console uses the same code as the VistaMax card frames. Therefore, before installing 3CDaemon, you need to download the updated VistaMax code to your admin computer and unzip its folder to the desktop or to a GatesAir Software folder. The folder is named with the code version (such as `601.11a`). To install and configure the TFTP Server, perform these steps:

1. Download the TFTP Server (3CDaemon) to the admin computer.

2. Unzip the folder.

3. Open the `read_me_first.txt` file that accompanies the software.

4. Follow the installation instructions on the file.

5. Start 3CDaemon (Figure 4-35).
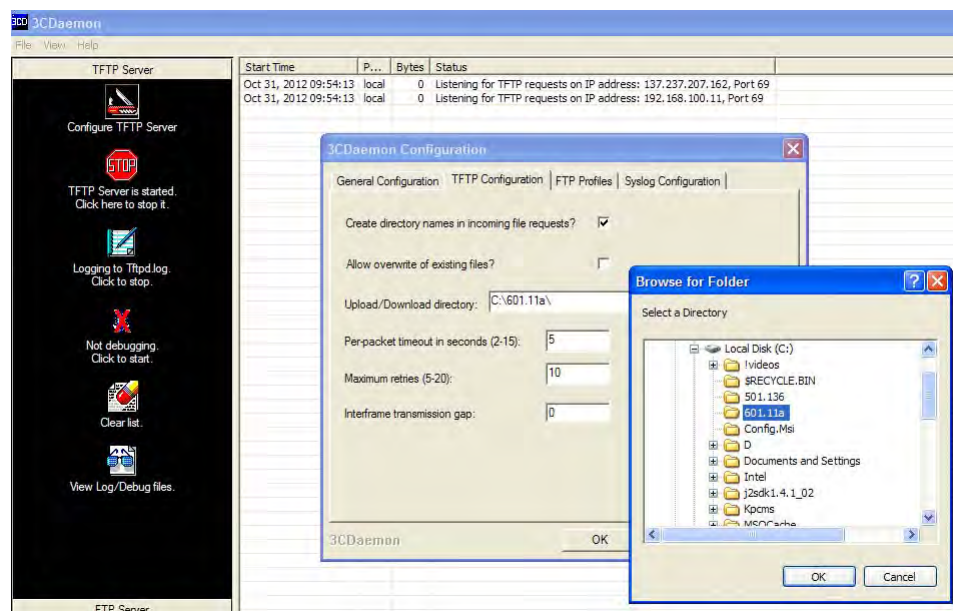
Figure 4-35. 3CDaemon Configuration for New Code Upload to an RMX*d* Console

6. Click the **TFTP Server** tab.

7. Click **Configure TFTP Server**. The **3CDaemon Configuration** dialog box appears.

8. In the dialog box, click **Upload/Download Directory**. A **Browse for Folder** dialog box appears.

9. Navigate to the folder containing the new RMX*d* code version (such as `601.11a`).

10. Click **OK**.

11. Click **Yes** to save changes.

12. Click **OK**.

Software Update Setup

Once you have set the TFTP Server to point to the folder holding the new operating system code, the update is performed automatically once the RMX*d* SBC is restarted. It is best to take the RMX*d* off-air during this procedure. Monitor sources may be momentarily interrupted during the update process, and the board operator cannot take any new session files or sources at this time. To set up the RMX*d* system for an automatic update, perform these steps:

1. Verify that the TFTP Server is pointing to the folder containing the updated system software.

2. Make sure the TFTP Server is properly communicating with the RMX*d* Server. This message appears when the TFTP Server is talking to the VistaMax community: "Listening for TFTP requests on IP address: 192.1.68.100.11, Port 69."

3. Press the **SBC Reset** button on the RMX*d* KSU card.

   The TFTP Server begins uploading the new code to the RMX*d* Server in about five to 10 seconds, and it takes about 30 seconds to upload the code. A status message appears in the 3CDaemon log window (Figure 4-36) showing the upload progress and notifying when the upload is done.
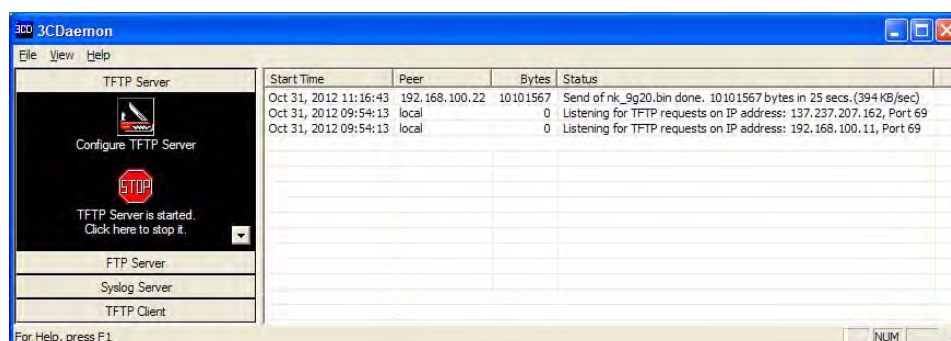
Figure 4-36. New Code Uploaded into an RMX*d* Server

   Note: The RMX*d* Server then verifies that the code was properly uploaded. If it has uploaded successfully, a message appears as in Figure 4-36: "Send of nk_9g20.cin done." The SBC then restarts using the new code. If the code has not uploaded properly, the SBC continues to use its existing code.

4. When the code has completed uploading, close the TFTP Server.

5. After the RMX*d* console has restarted, use the **Community Monitor** View Status window to verify the RMX*d* console is using the new code (Figure 4-34).

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Chapter 5 - Service

Your RMX*d* console is designed to give many years of trouble-free operation. If it does require service, please read through this section, which provides information on servicing your RMX*d* console and on the spare and replacement parts that are available.

Parts and Repair Services

only a few parts on the RMX*d* console are field replaceable. Tables 5-1 through 5-4 give part lists and numbers part numbers. Assemblies are field replaceable but are generally not field-serviceable. For servicing, you need to return assemblies to GatesAir Technical Services Department.

RMX*d* technical information—such as this manual, selected schematics, software, and PROM revision information—is available from the GatesAir Customer Support Portal (http://ecustomer.broadcast.harris.com/) or the FTP support site (ftp://ftp.pre.com – username: customer; password: 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 GatesAir Technical Services Department. To expedite the ordering process and ensure the correct parts are ordered, have the GatesAir part numbers available when ordering. Tables 5-1 through 5-4 give part lists. Panels, cards, and assemblies may have lead times exceeding two weeks, so order accordingly.

Panels, cards, and assemblies returned to GatesAir for service, exchange, or credit must have an RA (Return Authorization) tracking number 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, go to the GatesAir Services and Support page (http://harrisbroadcast.com/servicesandsupport) for contact information or call the GatesAir parts department at 217.221.7500. You can also purchase spare fader panels, main circuit boards, and other assemblies through a sales representative. To expedite the ordering process and ensure the correct parts are ordered, have the GatesAir part numbers available when ordering. Tables 5-1 through 5-4 list the available parts. Control panels, circuit boards, and assemblies may have long lead times, so order accordingly.

To request an RA to return a part for service, contact the Pacific Design Center office:

> GatesAir, Pacific Design Center
> Technical Services Department
> 1493 Poinsettia Ave, Suite 143
> Vista, CA 92081 USA
> Service Phone: 760.936.4029
> Fax: 760.936.4001
> E-mail: presupport@harris.com
> www.broadcast.harris.com

Serviced assemblies within the USA are shipped FOB Vista, CA using FedEx two-day service, unless otherwise specified. FedEx overnight or next morning delivery is also available for most items. You can charge services can be charged to AmEx, VISA, Mastercard, or parts can be shipped COD if you do not have an account with GatesAir. Contact a sales representative for account information.

Spare and Replacement Parts

Table 5-1. Serviceable Assemblies and Replacement Parts

	PR&E #	Description or Use		PR&E #	Description or Use
Serviceable Assemblies	95-1536	Meter-Clock-Timer PCA (used in both Dual and Quad displays)	**Replacement Parts (continued)**	21-349-1	PROM, DSP card
	95-1537	Quad Meter PCA (Quad console display only)		21-352-1	KSU DSP PROM (U55)
	95-2670-1	Left motherboard PCA (for DSP)		21-352-2	KSU Net PROM (U60)
	95-2670-2	Middle motherboard PCA (for DSP)		21-353-1	PROM, 8-Input Expansion card
	95-2680	Right motherboard PCA (for KSU)		23-132	Cue speaker
	99-1205	48 Volt Power Supply (2 RU)		32-725	Knob, rotary control, for Monitor Control panel and Send pots
	99-1406	Monitor Control Panel		32-726	Fader knob (silver, standard)
	99-1407	Dual Fader Panel		32-727	Fader knob (red)
	99-2665	8-Input Expansion Card		32-728	Fader knob (green)
	99-2667	DSP Card		32-729	Fader knob (blue)
	99-2672-1	KSU Card (no optical connectors)		32-730	Fader knob (yellow)
	95-2672-1	KSU, main PCA		32-735	Knob, Dual Fader Source Selector (6 mm)
	95-2675	KSU, analog connector PCA		38-88	Screws, silver hex head, control panels
	95-2677	KSU, digital connector PCA		76-1403	Monitor Control panel, removable lens kit
	99-1804	9G20 SBC (single board computer)		76-1404	Dual Fader panel, removable lens kit
	99-2672-2	KSU Card (with optical connectors)		80-1752	Display Lens (covers 10-character display and LEDs on control panels)
	95-2672-2	KSU, main PCA		80-1846	Card cage slot blank panel
	95-2675	KSU, analog connector PCA		80-1961	Clear Insert Sheet (for printing removable lens labels)
	95-2677	KSU, digital connector PCA		90-1858-1	15-foot DC cable (power supply to console)
	99-1804	9G20 SBC (single board computer)		90-1713-2	Fader and cable assy
Replaceable Parts	12-93	10-character display		90-1872-2	RMXd-12 H/P jack assy (17-122 jack and cable)
	17-122	Headphone jack		90-1872-3	RMXd-20 H/P jack assy (17-122 jack and cable)
	19-327	Flex cable, 30-conductor (KSU card)		90-1872-4	RMXd-28 H/P jack assy (17-122 jack and cable)
	19-335	18" Red CAT-5 cable (panel power & signal cables)		99-1411-1	One slot wide divider kit (to add two turret panels)
	19-336	36" Black CAT-5 cable (DSP & I-O card to KSU cables)		99-1411-2	Two slots wide divider kit (to add four turret panels)
	21-226-6	PROM, Monitor Control panel		99-1409	14.25" blank panel, one slot wide
	21-226-7	PROM, Dual Fader panel		99-1410	14.25" blank panel, two slots wide

Installation Kits

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

Table 5-2. 76-1400 Installation Kit Parts

PR&E #	Description	Qty
14-482	Three-pin AMP MOD IV housing	13
14-484	Six-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

Table 5-3. 76-1401 Tool Kit Parts

PR&E #	Description	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

*   One per installed panel

Table 5-4. 76-2665 Eight-Input Expansion Card Kit

PR&E #	Description
14-482	3-pin AMP MOD IV housing
14-484	6-pin AMP MOD IV housing
14-490	12-pin AMP MOD IV housing
15-938-1	AMP MOD IV contact receptacles
38-88	4-40 x 1/4" buttonhead screws

Console Troubleshooting

There are diagnostic test modes built into each Dual Fader panel and the Monitor Control panel. The Control Test Mode allows you to test each button, fader, pot, or rotary encoder to verify correct operation.

A Logic States Test mode is also available on the Monitor Control panel so that you can display the state of the CR, Studio, and External logic functions. There is a full-page overlay in the *Logic States Test Mode* subsection that can be printed out to go over the monitor selector buttons.

Control Test Mode

To enter the Control Test mode on a Dual Fader panel, perform these steps:

1. Remove the panel.

2. Unplug the red cable to remove power.

3. Plug the cable back in.

4. Press and release either Off button within three seconds of applying power.

5. To exit the Control Test mode, press either channel's On and Off buttons together.

To enter Control Test mode on the Monitor Control panel, perform these steps:

1. Unplug its red cable.

2. Plug the cable back in.

3. Press and release the Timer Start button within three seconds of applying power.

4. To exit Control Test mode, press the Timer Reset and Start buttons together.

When Control Test mode is active, the source name display should look like Figure 5-1.
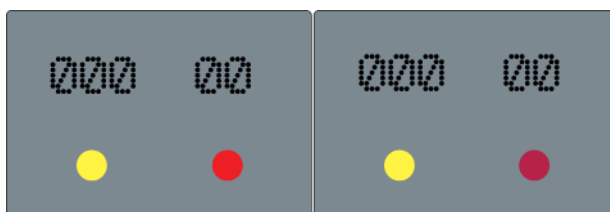

Figure 5-1. Dual Fader Panel, Fader Test

Move each rotary control and fader and observe their encoder pulse output count in hexadecimal numbers, which is shown in the channel source name display. The lit yellow or red LED under each source display identifies which control is being moved. Press the button to test its operation in this mode. The button LEDs toggle on and off with each press of each button.

Logic States Test Mode

You would use this test mode in conjunction with the Logic State Overlay, the full-page overlay on the next page. You can enter and exit the test mode during normal console operation. Use this mode to display the Control Room, Studio, and External logic command states. To enter or exit the test mode, press the Talk to Studio, Talk to External, and Studio Take buttons together. You can only enter or exit the mode while the Studio Next LED is Off.

This mode does not affect source selection button operation, so you can select new monitor or meter sources while in this test mode. However, the buttons do not show any change, as the button LEDs are now displaying the logic states for the various console logic signals (shown on the Logic State Overlay). Lit LEDs indicate true or On conditions, while unlit LEDs indicate false or Off conditions. The Studio Monitor button for PGM 4 (lower right selector button) is lit to indicate this mode is active.

This test mode is useful for verifying that

● The mic inputs are assigned to the correct room.

● External devices such as mic remote panels, intercom panels, and warning interfaces are properly set up and properly wired.

● External commands are reaching the console.

The Logic State Overlay on the next page should be printed full-size so that it fits over the RMX*d* selector buttons.

|		
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

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.

Studio Selector
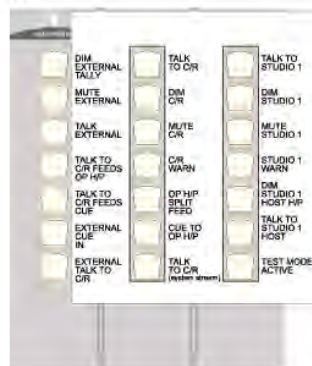
Control Panel Servicing

Operator control panels consist of individual plastic buttons, with laser etched labels, that are held in place by a metal faceplate. The buttons press against a rubber sheet which has conductive plastic contacts on the opposite side. These contacts are pressed down against a switchboard PCA to make the switch contact. The switchboard PCA is attached to the metal faceplate, sandwiching the contact sheet and buttons together.

Control panels can be field-serviced (to clean after a spill), but they have limited field-replaceable parts. Most components are surface mounted. Only these components are field-replaceable:

● Faders

● Rotary encoders

● Pots

● PROMs

Table 5-1 shows all available replaceable parts:

● The 10-character display and lens

● The rotary and fader knobs

● The faders

You can remove or install Dual Fader panels while the console is powered up (turned on), and even on-air, without causing any audio interruption or noises in the program audio. A replacement panel assumes the removed panel's button settings when plugged in. However, all fader and pot levels change to the new panel's control settings. Therefore, you should turn off all bus assignments prior to unplugging a Dual Fader panel.

Removal

To remove a Dual Fader or Monitor Control panel from the frame, perform these steps:

1. Using the included hex tool (70-90), remove the top and bottom silver hex screws (38-307A). There are two screws on the top and two on the bottom of each Dual Fader panel. There are three screws on the top and three on the bottom of the Monitor Control panel.

2. Move the fader to the bottom of its travel.

3. Carefully lift the panel up from the top edge to reach the red cable on the bottom of the panel.

4. Unplug the red cable from the bottom of the panel.

⚠ **Note:** If you need to replace one of the assemblies, contact GatesAir Technical Service Department for service or replacement parts.

Installation

To install a control panel into the frame, perform these steps:

1. Remove any blank panels covering the slots where the control panel is to be installed.

2. Hold the panel near its slot so that the red cable can be plugged into the panel's RJ-45 jack.

3. Plug the short red cable into the panel's RJ-45 jack.

4. Set the panel into the frame. (Some panels may have guide pins which go into the top rail.) The panel should sit level on the top and bottom rails. It may be necessary to adjust or coil the cable(s) so they do not get pinched by the panel's sides.

5. Fasten the panel to the frame using the 38-88 silver hex screws removed previously.

Fader Servicing

There are no replaceable or re-buildable parts on the RMX*d* fader assembly. The faders are long-life, conductive plastic, single-element faders. Fader service consists of cleaning and lubricating.

If coffee, a soft drink, or other sugared liquid has leaked into a fader, remove the fader from the panel and clean it as soon as possible. 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.

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.

Removal

To remove and reinstall a fader, perform these steps:

1. Remove the control panel with the problem fader from the frame.
2. Unscrew the four screws on each side of the rear cover of the control panel.
3. Remove the rear cover from the control panel.
4. Unplug the problem fader.
5. Pull off the fader knob.
6. Using a 70-90 tool, remove the two fader hex screws.
7. Remove the fader from the control panel.
8. Remove the snap-on fader cover that is held in place by plastic end tabs.
9. Clean the fader using a dry cotton swab or one dampened only with distilled water.

Cleaning

Note: Do not use any soap or other chemical to clean the fader.

To clean the fader and cover, perform these steps:

1. Remove the fader's plastic cover.
2. Hold the fader under hot running water while moving the fader slider back and forth to dislodge any sugars.
3. Hold the cover under hot running water as well.
4. If the fader rails are noticeably dirty, use a dry cotton swab or Chemwipe to wipe them.
5. Thoroughly dry the fader rails and conductive plastic using dry cotton swabs and taking care not to touch the fader fingers.
6. Use the steps in the next procedure to re-lubricate the glide rail.

Lubrication

1. Move the fader slider to the middle of its travel.
2. Place one drop of Dow Corning 510 lubricant or an equivalent non-migrating lubricant on *the top rail only* on either side of the fader slider bushings.

   Note: Only the top rail, the one on which the fader slider bushings glide, requires lubricant.

3. Move the slider through its full travel to distribute the lubricant.

4. Wipe off any excess lubricant.

Console Display Service

Two meters, the clock, and the event timer are located on the meter-clock-timer PCA in a Dual Console Display. On a Quad Console Display, there is a second dual-meter board that plugs into the meter-clock-timer board. You remove the console display's plastic rear cover to access these PCAs for service. A Dual meter has two black Phillips screws. The Quad meter has three cover screws.

Console Display and Cover Removal

If desired, you can remove the entire console display and rear card cage cover from the console by unplugging the display and cue speaker cables. These cables plug into the KSU motherboard, at the rear lower section of the console, near the power connections. These cables are hot pluggable, so you can unplug them and plug them back in while the console is being used.

To remove the console display and rear cover, perform these steps:

1. Open up the rear cover.

2. Unplug any ESE/SMPTE master clock cable from the short adapter cable that extends below the display.

3. With the cover held vertically, lift it up and off the roll pins mounted into each side panel.

4. Make sure the display and cue cable connectors do not catch as you remove the cover and display from the console.

To reinstall the display, set the rear cover onto the roll pins and then rotate the cover forward.

Clock Troubleshooting

The clock's blinking colons indicate the clock is set to slave mode but the ESE or SMPTE timecode signal is not being received. If you are not using an ESE or SMPTE master clock, the meter-clock-timer board multi-switch DS1 switches 2 and 5 must be set to Off for autonomous mode. The *Console Display Multi-Switch Settings* subsection in Chapter 2 gives information on the meter-clock-timer PCA and DS1 multi-switch settings.

To use an ESE or a SMPTE master clock, connect either a balanced or an unbalanced signal to the four-pin Molex connector. The + or signal connects to pin 1 with the – or GND connection on pin 2. Note the signal polarity for a balanced signal; if the polarity is reversed, the clock cannot detect the time code. Also, make sure the terminals are properly locked into the Molex housing. Otherwise, intermittent operation could result.

Event Timer Troubleshooting

If the event timer is not working properly, use these guidelines to troubleshoot:

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

● If the tenths of seconds display is not working properly, check the setting of switch 1 on the multi-switch DS1 of the meter-clock-timer PCA. When set to Off, the default setting, the .1 seconds display is always shown. When set to On, the .1 seconds do not display while the event timer is running. The *Event Timer* subsection in Chapter 2 gives additional timer information.

● If the timer is not auto-resetting as expected when a channel is turned On, verify that the Auto reset button is lit on the Monitor Control panel and that the [timer_reset] section of the currently loaded session file section is properly configured. Any channel that, when turned On, should reset the timer needs to be set as =1 in the [timer_reset] section, as the example below shows for channels 4 – 6.

When channels set as =0 (channels 1 – 3 in the example) are turned On, they do not reset the timer. Chapter 4 – "RMX*digital* Server Setup" gives more information about session file settings.

Auto Timer Reset Section in a Session File Example:

`[timer_reset]`

`Channel_1=0`

`Channel_2=0`

In this example, when channels 1 - 3 have an entry of =0. Therefore, when these channels are turned on, they do not reset the timer.

`Channel_3=0`

`Channel_4=1`

`Channel_5=1`

Channels 4 - 6 have an entry of =1 and therefore do reset the timer, as long as the Auto Reset button is lit on the Monitor Control Panel.

`Channel_6=1`

Meter Troubleshooting

The dual meter PCA, on a Quad Meter, plugs into the meter-clock-timer PCA. A cable connects the meter assembly to the KSU motherboard, the lower rear panel. This cable can be hot-plugged. If the meters are not working properly, unplug the cable, wait about ten seconds, then plug the cable back in. If the meters for PGM 1 and PGM 2 (on a Quad display) are not working properly, but the PGM 3 and Aux meters are working, the dual meter PCA is defective. Verify that the DS4 multi-switches are set the same for both PCAs. The *Meters* subsection in Chapter 2 covers settings.

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.

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

Power Supply Connections

Only one connection is required from the supply's 5-pin connector. The 90-1858-1 cable is the interconnection cable from the power supply to the console frame. Table 5-5 gives pin assignments for this cable, and Figure 5-2 shows the DC power supply connectors and their pin locations.

Table 5-5. 90-1858-1 Cable Color Codes and Pinouts

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

The *Power Supply* subsection in Chapter 2 gives interconnection details.
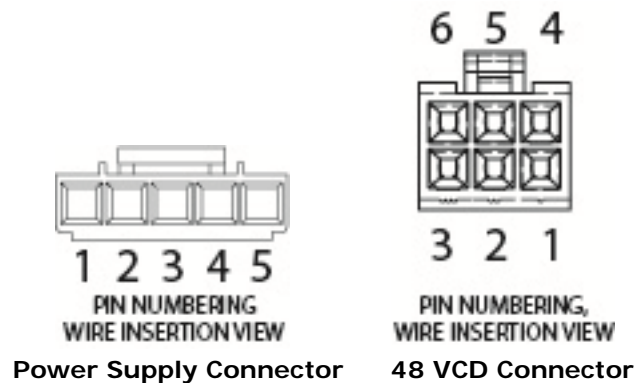
Figure 5-2. DC Power Cable Connectors

Frame Component Cabling

The +48 volt main power supply, and optional redundant power supply, connect to J18 and J19 on the KSU motherboard, on the right, lower rear of the chassis. Figure 5-7, in the *Motherboard Service Information* subsection later in this section, shows the three types of motherboards and their connections. The +48 volts from the J18 and J19 connectors are coupled through a dual Schottky diode, CR1, on the KSU motherboard. Its output is the +48 volt source for the entire console.

This +48 volts goes to all motherboards to supply voltage to the KSU, the DSP cards, the 8-Input Expansion cards, and to pin 6 on each RJ-45 connector with a red cable (J13 - J15 on the KSU MB and J1 - J4 on the DSP MBs). Pin 3 of these RJ-45 connectors is the 48 volt return. Each red cable goes through a round access hole up to the control panel section of the frame (Figure 5-3). There are seven red cables in the RMX*d*-12 console, eleven in the RMX*d*-20 console, and fifteen in the RMX*d*-28 console.
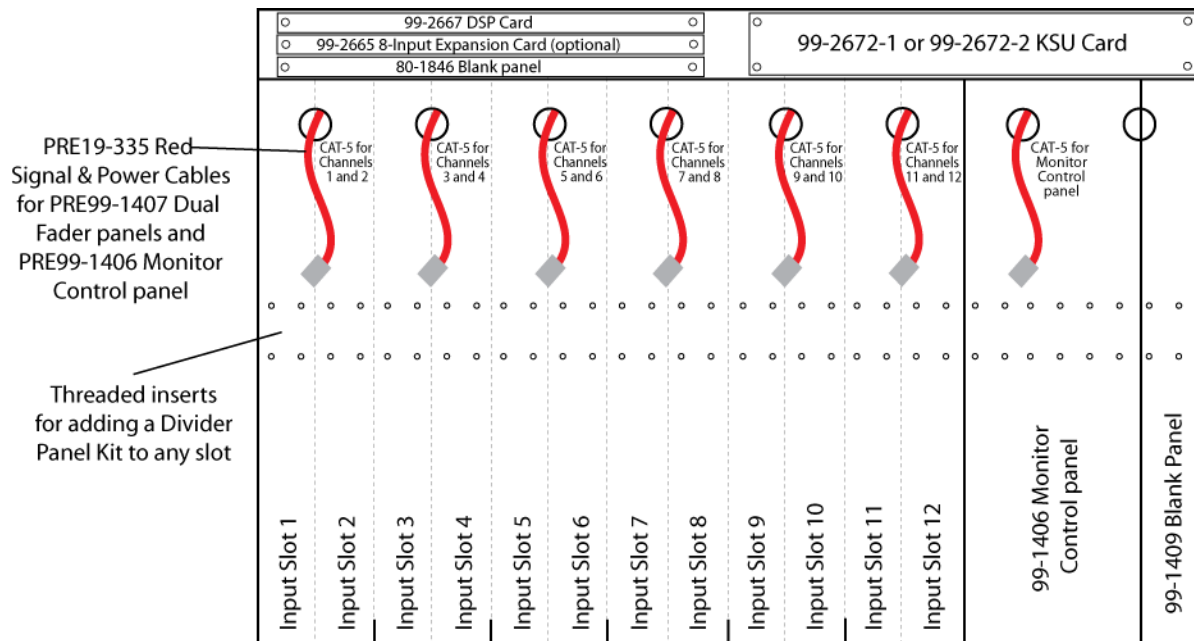
Figure 5-3. RMX*d* Frame Components

The last red cable, closest to the right end of the frame, plugs into the Monitor Control panel. The other red cables in the frame plug into Dual Fader panels.

The red 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, plugging into the first Dual Fader panel. The next

cable is for channel strips 3 and 4—the next Dual Fader panel—and so on, up to the last one used for the Monitor Control panel.

The red cables are 18" long, allowing any panel to be moved a few slots left or right of its standard position to install blank panels or Divider Kits. These kits are used to add GatesAir turret control panels into the frame.

Each DSP card handles signals for eight fader channels or four Dual Fader panels. There are two channels strips on each panel. The last four channels, the two Dual Fader panels closest to the Monitor Control panel, are controlled by DSP on the KSU card. The KSU DSP also handles the summing of all buses and monitor outputs. In addition, the KSU card also contains the network interface to tie the console into a VistaMax Audio management system for both communications via the Ethernet jack and for audio via the Facet 0 and/or Facet 1 jacks.

KSU Card Service

Figure 5-4 shows the LEDs and connectors on the KSU card.
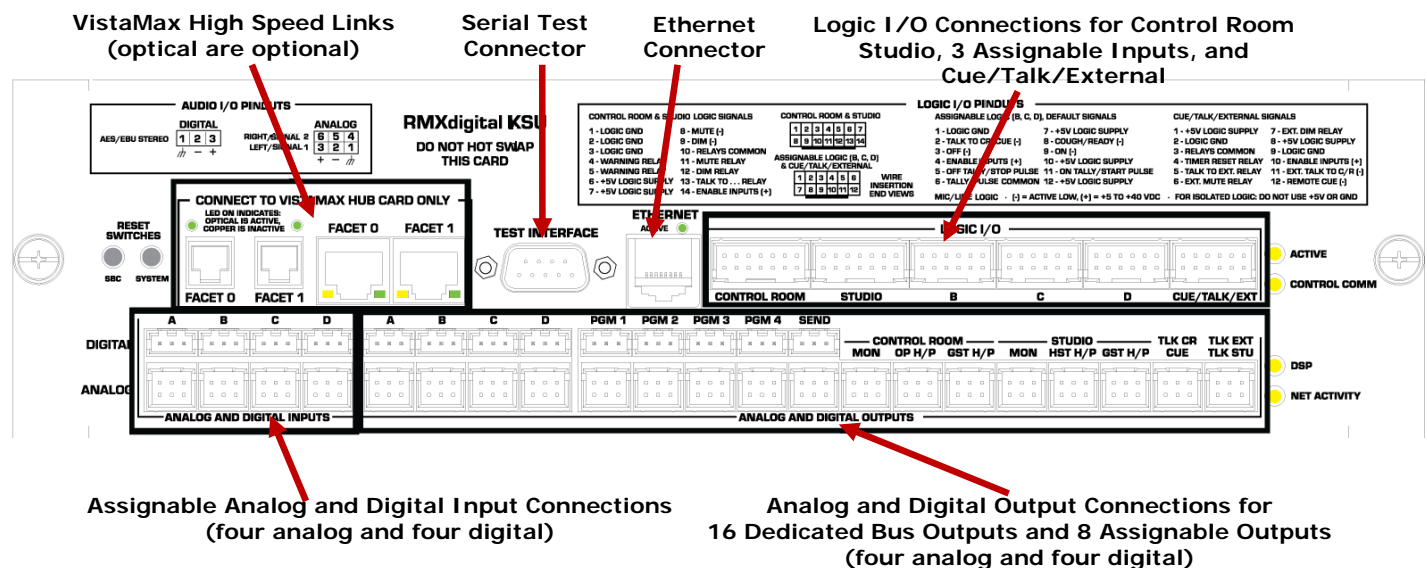
Figure 5-4. LEDs and Connectors on the KSU Card

There are four yellow LEDs near the right end of the KSU card to indicate its operational status:

● **Active** LED – When lit solid, this LED indicates normal operation. It is not lit while the system is starting or if a KSU card problem is encountered.

● **Control Comm** (Communications) LED – This LED blinks to indicate proper communications between the SBC (single board computer) and all of the DSP cards in the console.

● **DSP** LED – This LED blinks with a "heartbeat rhythm" to indicate the KSU DSP is active. The leftmost DSP card's DSP LED flashes twice as fast as this LED to indicate that it is the master DSP card.

● **Net Activity** LED – This LED also blinks to indicate the KSU card's internal routing network is properly working.

These are other indicators on the KSU card:

● The Active LED on the Ethernet connector, which lights up to indicate a good connection when a CAT6 cable is connected to an active port on a computer or on a network switch

● The Facet LEDs, which must also be lit solid to indicate a good connection

There are two KSU reset switches near the left end of the panel. Unless instructed by technical support, *never* press the System Reset button, as it resets all cards in the console, removing all audio going to all

outputs. This reset is equivalent to powering the console off. When you press the System Reset button, you must then press the SBC Reset button to restart the SBC, reestablishing normal routing within the console.

If the Session selector displays "Automation Inactive" for an extended time, it indicates the KSU card has lost communications with the SBC (single board computer). In this case, pressing the SBC Reset button restarts the SBC on the KSU card. The "Automation Inactive" message remains for about 45 seconds as the SBC restarts, but the message should not be seen at any other time. Pressing the SBC reset button has minimal effect on console operation and should not interrupt the audio going to the program or routed outputs. But, while the console's SBC restarts, no new routes can be made, no new sessions can be taken or saved, and routed monitor inputs such as pre-delay or off-air can be cut off. Therefore, it is best to switch the monitors to monitor PGM 1 while the SBC is being reset.

Resetting the SBC reloads the console's operating system code. Also, when the console is part of a VistaMax system, resetting the SBC reestablishes the Ethernet and Link connections with the VistaMax network. Depending upon the size of the VistaMax system and how many publish files must be read, it could take more than 90 seconds for the SBC to complete restarting. Once a session file name appears in the Session selector, the console is ready for normal usage again.

The Test Interface connector on the KSU card connects the console to the serial port of a setup computer for troubleshooting SBC issues where the SBC does not complete starting up. Use HyperTerminal or other serial port monitoring program to view the serial communications from the console during start-up, including data such as the console's IP address and network name.

Note: The KSU card cannot be plugged in or unplugged while the console is powered up.

DSP Card Service

Figure 5-5 shows the LEDs and connectors on the DSP card.
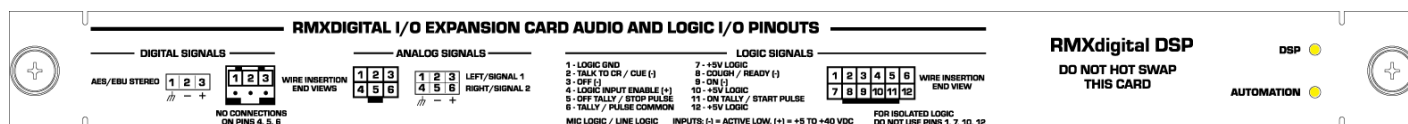
Figure 5-5. LEDs and Connectors on the DSP Card

There are two yellow LEDs to indicate DSP card operational status:

● **DSP** LED – This LED blinks with a "heartbeat rhythm" to indicate the DSP is active. The leftmost DSP card's LED blinks twice as fast as the DSP LEDs on the other DSP cards to indicate it is the master DSP card.

● **Automation** LED – This LED slowly blinks to indicate the card is properly communicating with the SBC on the KSU card.

Note: The DSP cards cannot be plugged in or unplugged while the console is powered up.

Eight-Input Expansion Card Service

Figure 5-6 shows the LEDs and connectors on the 8-Input Expansion card.
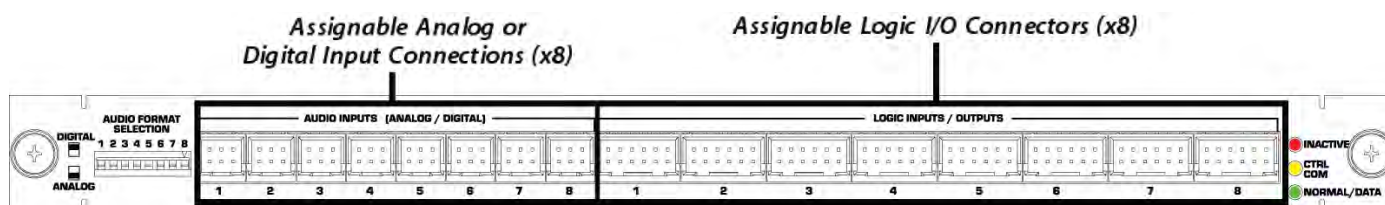

Figure 5-6. LEDs and Connectors on the 8-Input Expansion Card

There are three LEDs to indicate the 8-Input Expansion card 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) – This LED blinks to indicate system communications.

- **Normal/Data** LED (green) – This LED slowly blinks to indicate audio and/or logic signals are being routed on the card.

Note: The 8-Input Expansion card can be plugged in or unplugged while the console is powered up, but any signals connected to this card are turned off when it unplugged.

Motherboard Service

There are three types of motherboards—two DSP and one KSU (Figure 5-7). They plug directly into one another and are fastened to the bottom of the card cage. Which card types are installed depend upon frame size, as the Motherboard Orientation section of the figure shows. The motherboards are accessed from the front side of the card cage by removing the lower front cover panel (or two panels on an RMX*d*-28 console). The panel hooks at the top and is fastened along the bottom using Phillips screws.
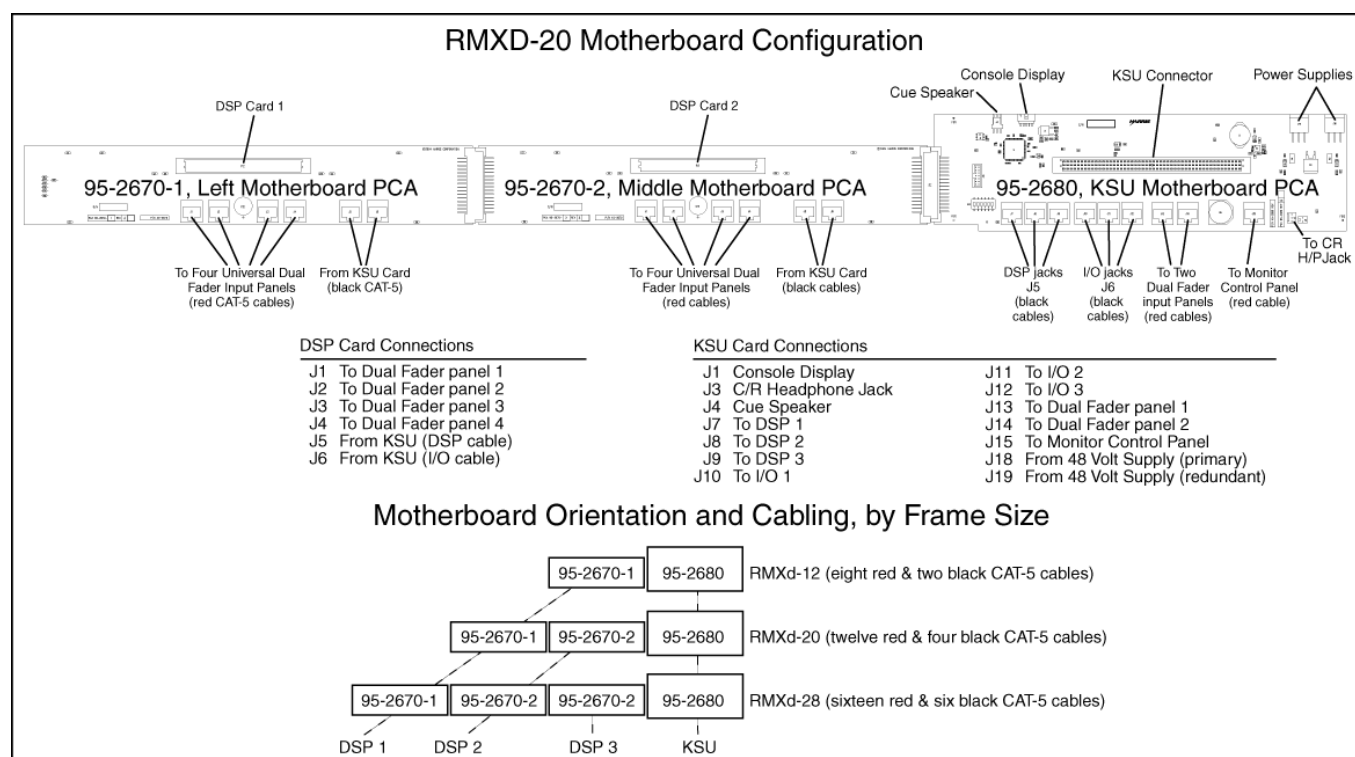
Figure 5-7. RMX*d*-20 Motherboards

The DSP and 8-Input Expansion card signals connect to the KSU using black CAT6 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 CAT6 cables carry +48 volts and data to/from the Dual Fader panels and the Monitor Control panel. Figure 5-3 shows their frame orientations.

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Chapter 6 – Accessories

GatesAir offers a number of accessories and services to complement your RMX*d* console. Available products include

- VistaMax Audio Management System to integrate multiple RMXdigital, NetWave, Oasis, and BMXdigital consoles into a facility-wide network.

- Host and guest mic control panels and headphone panels.

- Peripheral control panels.

- A host turret with space for eight turret control panels.

- A 3 x 6 headphone distribution amp with jack-only.

- Guest level control/jack cabinet-mount panels.

GatesAir services range from supplying logic wiring for common peripheral devices to complete system wiring design and installation packages.

Furniture and Cabinetry

GatesAir offers a full line of standard and custom furniture and cabinetry specifically designed to house the RMX*d* console with studio peripheral equipment. Complete turnkey studio design and implementation services are also available. Contact your GatesAir 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*d* 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.

- Peripheral control panels.

There are two types of cabinet skirt-mounted headphone panels:

- Jack-only

- 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 (Figure 6-1).

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)

Figure 6-1. Cabinet Plates

To install more than one or two Accessory panels in a studio use the PRE99-1450-08 Host Turret. It has eight 1.6" turret panel slots. The PRE99-1450-08CT includes an integral Clock and Event Timer (Figure 6-2). This figure also shows how the host turret is typically populated.
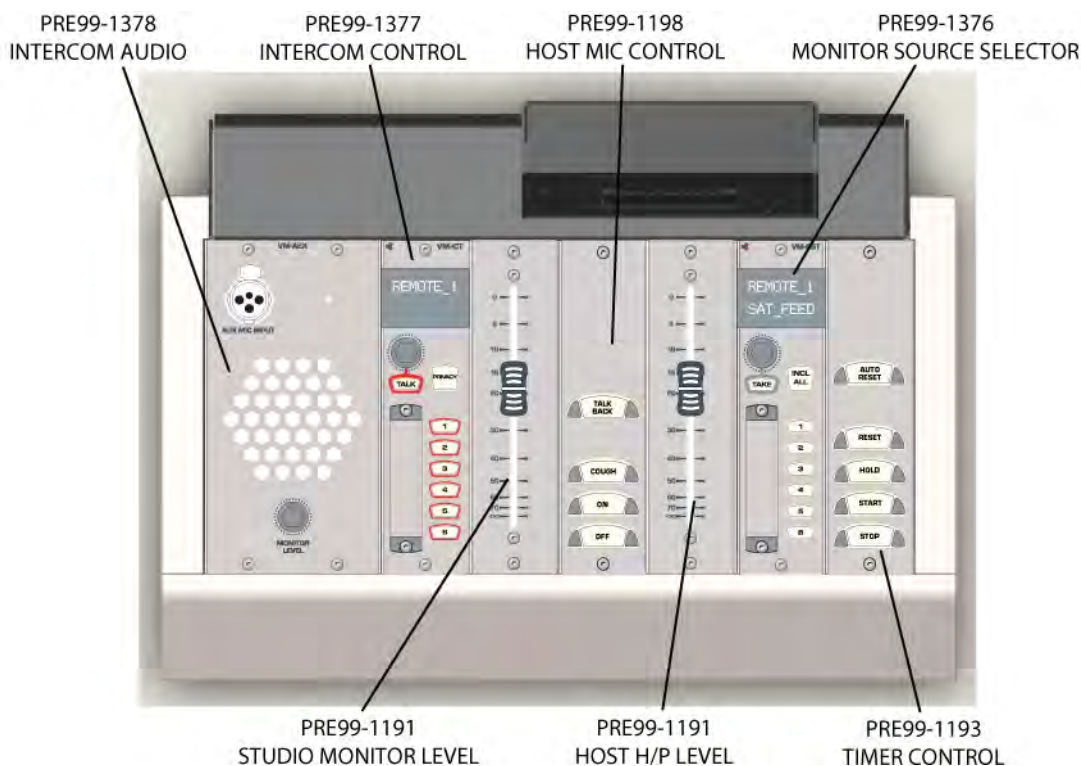

PRE99-1378
INTERCOM AUDIO

PRE99-1377
INTERCOM CONTROL

PRE99-1198
HOST MIC CONTROL

PRE99-1376
MONITOR SOURCE SELECTOR

PRE99-1191
STUDIO MONITOR LEVEL

PRE99-1191
HOST H/P LEVEL

PRE99-1193
TIMER CONTROL

Figure 6-2. PRE99-1450-08CT Host Turret

Mic Remote Control Panels

Three mic remote control panels are available for the RMX*d* console. A basic mic panel is the 99-1197 with On, Off, and Cough buttons (Figure 6-1). The 99-1198 (the Host Turret example in Figure 6-2) adds a Talkback button to the On/Off/Cough buttons. Figure 6-3 shows pin assignments for the mic panel logic cable.
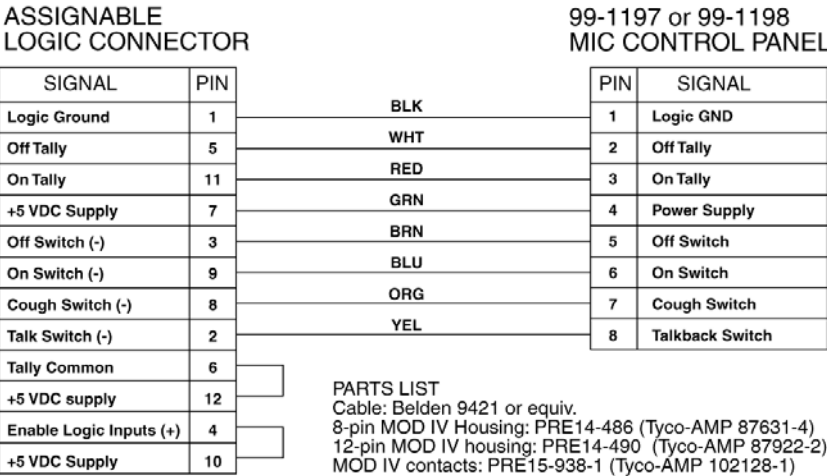
Figure 6-3. Mic Panel Logic Cable

Figure 6-4 shows a simplified wiring schematic for these panels.
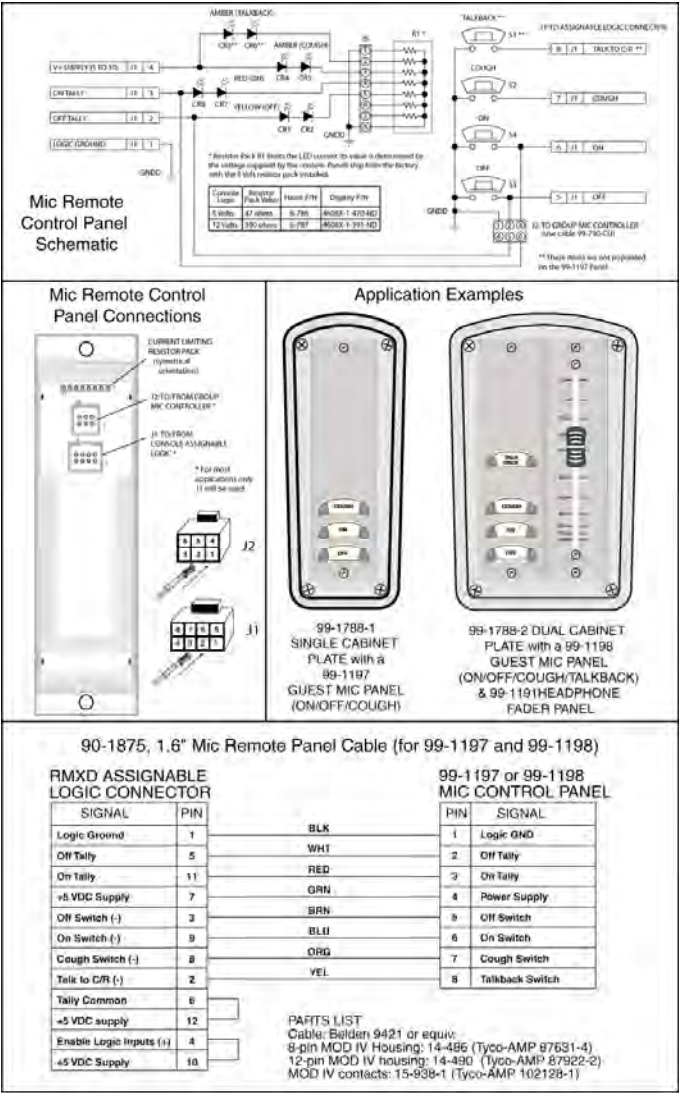
Figure 6-4. Mic Panel Wiring Schematic

RMX*d* Divider Kit

Mounting an accessory panel into the RMX*d* mainframe requires that a Divider Kit 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.

The *Frame Configuration* subsection in Chapter 2 gives more information on divider kits.

Headphone Distribution Amp

The PRE99-1215 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 you use the PRE99-1214-series headphone panels. Headphone panels are available with and without a volume control pot. Those without a pot are designed to use the headphone fader panel (the 99-1788-2 dual position cabinet plate in Figure 6-1). You can use existing headphone control panels, which use a pot to directly control the audio to the headphones, with the 99-1215 Headphone Amplifier.

ESE/SMPTE Master Clock

To connect an ESE or SMPTE master clock, use an ESE timecode adapter cable, terminated in a 4-pin Molex connector which hangs below the console display. Figure 6-5 shows the pin assignments for this connector. The mating connector and crimp pins are included with the console.

SIGNALS
1 = ESE/SMPTE CLOCK +
2 = ESE/SMPTE CLOCK -
3 = TIMER RESET OUT
4 = LOGIC GND
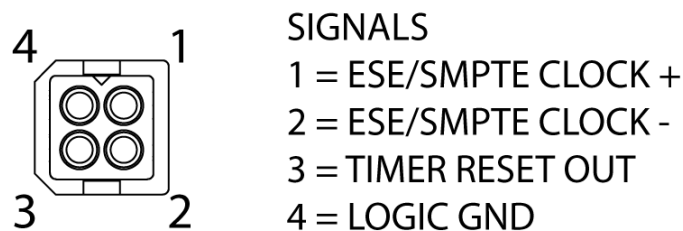
Figure 6-5. Console Display PCAs with J4 Connector

Logic Wiring

To assist in logic cable design and construction, GatesAir Technical Services Department can supply logic wiring diagrams for many popular peripheral devices. To assist in installation, GatesAir also offers pre-made peripheral logic cables for many popular devices. For availability and pricing, contact a sales representative.

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Appendix A – VMCC, Sessions, & Macros

The VistaMax Control Center (VMCC) is the software application that station engineers use to create and maintain the configuration files used by all VistaMax community devices—including RMX*d* consoles. Session and macro files are text-only command files used to route signals and to set up the RMX*d* console for:

- Specific applications, such as

    - An on-air studio.
    - Voice tracking studio.
    - Commercial production.

- Specific dayparts, such as

    - A morning show.
    - A news broadcast.
    - A sports broadcast.
    - Overnight unattended operation.
    - Weekend board operation.

Chapter 4 covers the basics on console configuration and VMCC operations as well as the standard commands used in session and macro files. This appendix presents additional details on using the VMCC application and on customizing session and macro files to set up and control signal routing in a networked RMX*d* console. A VMCC errata subsection covers application usage notes and other applications.

VMCC File Maintenance

The VMCC app (icon:) not only simplifies console configuration but also handles configuration file maintenance for every VistaMax community member—be it an edge device panel (such as source selectors or intercoms), a networked console (RMX*d*, BMX*d*, NetWave, or Oasis), a VM signal interface (VMXpress or VMQuadra), or a VistaMax card frame (VistaMax, Envoy, or VMConnect).

The VMCC app is also used to Provision (create updated config files) and to then selectively Distribute the setup and config files to each community device. When this is done the app saves a PROVISIONED.HASH file in each device's Storage Card folder. VMCC subsequently reads this file when a Normal Distribution is selected at the next distribution to identify which files differ in the newly provisioned files. This process assures that only changed files are downloaded. VMCC then directs each selected device to perform an operation—depending upon which files were downloaded—in order to read the new settings in the downloaded files.

For example, if only the INIT.MAC file needs to be downloaded, then only that file is re-run by the operating system; but if signal names or signal include lists are changed, then an "init router" command is issued to cause all the publish files (saved in the SysFiles folder) to be re-read, followed by reading of the ROUTERS.INI file and finally the INIT.MAC. When an edge device is added, or one is changed, the host device for that edge device must do an "init rced" which reinitializes the hosting of its remote control edge devices. This process involves closing communications with all of its edge devices before running the EDGEDEVICE.INI file. The edge devices then automatically reconnect using the new settings.

If a hash file is not found—as is the case the first time VMCC downloads files—or when the NQX.INI file is changed, VMCC must restart the SBC (Single Board Computer) on that device since the NQX.INI file is only read when the SBC in the RMX*d* console's KSU card is rebooted.

NetManager and Community Monitor

The Community Monitor (CM) app (icon:) works closely with the NetManager (NM) app (icon:). As such, CM typically automatically starts up as the four servers and services in NM are started. CM is a valuable tool for not only setting up and maintaining a VistaMax system but also for troubleshooting and analyzing VistaMax system operations. This application also shows all VistaMax devices connected to the network—even those with IP addresses falling outside the network's assigned subnet.

IP Addressing Problems

IP addressing problems can occur if a new console is added to a system that is not using the default IP addressing scheme (Table 4-1). A factory-fresh console has an IP address of 192.168.100.22 but, if the system is set for another subnet (such as 137.237.207.xxx), the admin computer will not be able to communicate with the new console. Also, the console and admin computer cannot communicate if the IP address entered into VMCC had a typo and files were distributed to the console. When the Controller Card restarts after file distribution, not only would FTP Voyager no longer be able to communicate with the console, but no other community devices would be able to communicate with it, either. However, every community device broadcasts its IP address using multicast messaging, so CM would still list the console in its status window with the assigned IP address.

To access such a "missing" device, perform these steps:

1. Change the admin computer's fixed IP address so that it falls within the missing device's subnet, as listed in the CM status display (in CM select View > Status).

2. Use FTP Voyager to:

    a. View the device's storage card.
    b. Open up the `NQX.INI` file.
    c. Manual edit the IP address.
    d. Upload the edited file back to the Storage Card folder on the device.

3. Change the admin computer IP back to its previous fixed IP address (default = 192.168.100.11).

4. Restart that device's SBC in one of these ways:

    •   On a card frame, press the Controller Card reset button.
    •   On an RMX*d* KSU card, press the SBC reset button.

    The SBC now restarts using the correct IP address.

5. If the problem was caused by a typo, perform these steps:

    a. Correct the IP address in VMCC.
    b. Redistribute the corrected files to the device to update the provisioned hash table.

VistaMax Command Server

External servers can communicate with a VistaMax system using TCP/IP or UDP commands. The communications format is set in the `NQX.INI` file in the VistaMax Command Server (VMCS) Port definition entry line: `VMCS_Port = 2002,U` . This entry line is included in a template file that creates each `NQX.INI` file. It sets the device to respond to and to send out UDP commands. When a device requires TCP/IP to be used instead, you must modify the `NQX.INI` file so that TCP/IP commands are used.

If only one device requires this setting—which is much slower than communicating using UDP commands—instead of changing the template `NQX.INI` file, you can edit the VMCS port entry line in the `NQX.INI` file on the device:

Standard entry, for UDP protocol – `VMCS_Port = 2002,U ;UDP protocol`

Edited entry, for TCP/IP protocol – `VMCS_Port = 2006,T ;TCP/IP protocol`

Command Client

The Command Client application, included with NetManager, can be used to manually load a session or macro file or to take up to eight routes in one command line.

Access the Command Client application from the admin computer **Start** menu under **All Programs** > **Harris Corp** > **VistaMax VMCS Client Application** > **VMCS Client Application**. The default open window is shown in Figure A-1.
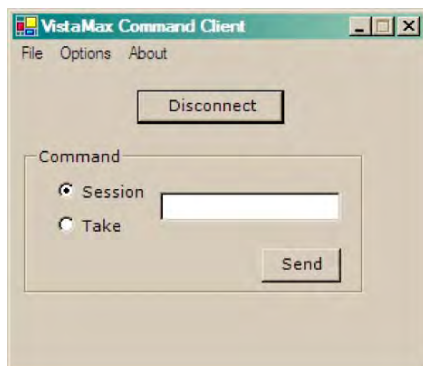
Figure A-1. VistaMax Command Client Window

1. Click **Options** > **Setup** to pop up the **Community Monitor Setup** dialog box (Figure A-2).
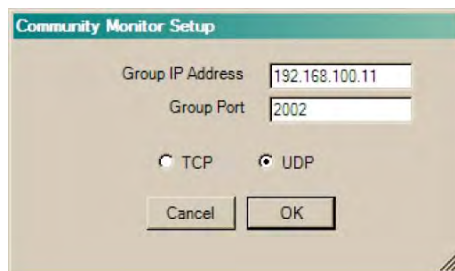
Figure A-2. Community Monitor Setup Dialog Box

2. In the **Group IP Address** type in the IP Address of the VistaMax device you want to communicate with (typically, the main VistaMax system card frame). Note: the default setting is 192.168.100.11, which is the default admin computer address, so this entry must be edited.

3. For most VistaMax devices, the Group Port (2002) and UDP selection are used. Click **OK** to accept the settings and close the dialog box. If the VistaMax device is set to use TCP/IP protocol instead (view the NQX.INI file if in doubt), perform these steps:

    a. Change the **Group Port** to **2006**.
    b. Click the **TCP** option to select it.
    c. Click **OK**. The dialog box closes.

4. On the Command Client window (Figure A-1), click **Connect** to initialize communications with that VistaMax device. Once connected, **Connect** changes to **Disconnect** and the Command section of the window is now active.

5. To take a session or macro file, perform these steps:

    a. Click the **Session** radio button.
    b. In the text box, enter the full file name of the session or macro file, including the suffix (e.g., daypart_0.ses or macro.mac) that you want to take. If the macro or session file is on another device you can take it by adding a comma and the device number. For example, to load ISDN.MAC on Device 41, type in ISDN.MAC,41 into the entry box.
    c. Click **Send** to load the session or macro file.

6. To route one or more signals individually, perform these steps:

   a. Click the **Take** radio button.

   b. In the text box, type each route in this format: `[source,destination]`. You can type up to eight routes, separated by commas, such as:

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

   c. Click **Send** to take the routes on the VistaMax device(s).

   > **Note:** The example routes the first three mix-minus signals (161, 163, and 165) to the first three analog outputs (241, 243, 245) on an RMX*d* console's KSU card. When routes are made between two devices, the signals must use the universal signal ID form that includes their device numbers, such as `[D10.225,d3.129]` which routes PGM 1 from Device 10 to the first fader on Device 3.

VMCC Operations Errata

As of this manual update, the current VMCC program is Version 2.2, build 50. The operational tips and function warnings in this subsection apply to this build. The latest VMCC release build, and the GatesAir customer document 71-2011 VMCC 2.2 Quick Guide.pdf, can be downloaded from either the GatesAir Customer Portal site or the GatesAir FTP site (see page 5-1 for access details).

RMX*d* Channel Identification

When viewing the expanded RMX*d* console in the VMCC Community Explorer pane, each fader channel appears with a name that begins with a channel number. Channel numbers from 01 to 08 correspond to the fader channels hosted by the left-most DSP card. Channel numbers from 09 to 16 correspond to the second DSP card on RMX*d*-20 and RMX*d*-28 consoles, while channel numbers from 17 to 24 correspond to the right-most or third DSP card on the RMX*d*-28. On every size console the KSU channels are identified as 25 to 32.

Unlike BMX*digital* consoles, RMX*d* fader channels do not have an "uninstalled" option in the Community Explorer pane. Right-clicking on a channel in VMCC results in only two choices: Universal or Telco. For many applications it is best to leave all faders set as Universal. This is especially important on consoles running 600-series VistaMax system code with an RMX*engine* (RMX*e*) connected to Facet 1. The RMX*e* is a separate rack-mount device that creates a subtractive mix-minus for every DSP fader channel in the console. It uses Protected Destination macros to create Telco channels on the fly; to route the Telco device to the channel; and to route that channel's subtractive mix-minus back to the Telco device.

When an RMX*e* is not being used, but the console is running 600-series VistaMax code, then we recommend that only the four KSU channel faders (channel numbers 25 to 28) be set as one to four Telco channels (by setting the rotary switches on the rear of the dual fader panels to positions 1 – 4, see page 2-5 for more information). Even though the channel faders hosted by DSP cards can be still be set as Telco channels, their Talkback buttons do not constantly light up, which is the indicator that it is a Telco fader, until a Protected Destination source is routed to that channel. This can lead to operator confusion since those faders will still have a bus assignment button "winking" (to indicate the mix-minus bus) all of the time.

Any fader channel slot without a physical Dual Fader panel installed, due to a blank panel, a Telos control panel, or a custom control panel being installed into those two channel slots, are still available for use just like the four "phantom channels" that are included on the RMX*d* KSU (channels numbered 29 – 32 in the Community Explorer). Thus, any of these "phantom faders" can be used to create a mono-sum of any signal in the system; to function as an effects return; to create a CR or Studio microphone sub-mix; or to accomplish other signal mixing using fixed levels. The phantom faders can then be assigned to feed any Program or Utility bus, just as with normal physical fader channels, by settings in the session files.

RMX*digital* Broadcast Console with Direct View Metering Manual
Revision B   Appendix A –VMCC, Sessions, & Macros

Signal Naming Conventions

RMX*d* console channels have 10-character source name displays to show either the **In Room Name** or the **Community Name** of each source. Which name is show is controlled by the VMCC Tier Naming Convention setting for each device. The Tier Naming Convention for each device in the community is set in the device edit pane, just above the Source Include List.

Tier 2 naming is the most common setting for RMX*d* consoles, while Tier 1 is the standard convention used with card frames. Figure A-3 compares all three Tier Naming Conventions, showing which names appear on the local console versus other group or system devices.

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

Figure A-3. Tier 1, 2, and 3 Naming Conventions

In Tier 1 naming, all community members display the In Room Name, with up to 10 characters. Therefore, the local, group, and system publish files VMCC creates for a device set to use Tier 1 are all identical. This convention is most often used on VistaMax, Envoy, and VMConnect card frames, as these signals are typically shared throughout the community. When using this convention on RMX*d* consoles, however, you must give each common console signal (PGM 1, PGM 2, MM-1, MM-2, and so on) a unique name (such as PGM 1-AIR or PROD-PGM 1) on each console to avoid duplicate signal names in the system. To get around having to rename every common signal, Tier 2 naming is typically used on RMX*d* consoles so that the In Room Names for the common signals like PGM 1 do not need to be edited.

On devices using Tier 1 Convention naming (typically card frames), you do not need to edit these entries since they are not used in Tier 1 naming:

● Call Sign – set in the device edit pane

● Discipline Prefix – set in the device edit pane

● Community Name – set in the Signal Summary panes

On devices using Tier 2 Convention naming (typically RMX*d* consoles), you must edit these names to uniquely identify that console's signal names on the other devices in the community:

● Call Sign – set in the device edit pane; identifies the console

● Name Radix – set in the Community edit pane; separates the console name from the Community name

● Community Name – set in the Signal Summary panes; identifies the signal

Note: When you only use Tier 1 and Tier 2 naming in a community, the Call Sign entry typically identifies the console by room function (such as AIR, PROD, IMG, NEWS) rather than by the actual station Call Sign. Figure A-3 shows the Group and System names for Tier 2 as PROD.MD1 rather than XYZ.MD1, which better identifies the signal as the Minidisk player 1 in Production.

GatesAir   A-5   Radio Studio Products

When multiple station groups are networked together in one VistaMax community, use Tier 3 naming throughout the community to differentiate signal names between fellow group members—those with the identical Call Sign—and all of the other devices in the community—those with 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 (such as -PROD.MD1) consist of these elements:

● The Discipline Sort Character – set in the Community edit pane; identifies the signal as a group member

● The Discipline Prefix – set in the device edit pane; identifies the room

● The Community Name – set in the Signal Summary pane; identifies the signal

Any device with a different Call Sign then receives the System Publish file, whose names (such as XYZP.MD1) consist of these elements:

● The Call Sign – set in the device edit pane; identifies this as another group's signal

● The first character of the Discipline Prefix name – set in the device edit pane; identifies the room

● The Community Name – set in the Signal Summary panes; identifies the signal

RMX*d* Signal Include List Setting

The main Source Include list, on the device editing pane, assigns those sources which might be routed to the console. The sources in this list are available on every RMX*d* channel, until you add channel-specific include lists to the console's session files in order to only show those signals needed by each fader.

The [SrcInclude] list, in the ROUTERS.INI file, is a sum of all the sources listed in the main Source include list, plus the Aux 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 appear in the ROUTERS.INI source list. 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 the ROUTERS.INI file is equal to the Main Destination Include list entries plus any destinations assigned to edge devices hosted by that VistaMax device.

Note: VMCC maintains the ROUTERS.INI file, so it should never be manually edited.

RMX*d* Monitor/Meter Key Definitions

The RMX*d* console device edit pane allows the twenty-one monitor source selection buttons (Aux Meter, CR Monitor, and Studio Monitor) 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 two rows are typically assigned to the Send bus (labeled SEND) and to Telco Record (TEL REC)

● The bottom four buttons (PGM 1 thru PGM 4) are assigned to internal Program buses 1 thru 4

The Real Air Source (EXT) and the TEL REC buttons are typically not pre-assigned to any signal since both are routed signals. To assign these two signals to the buttons, you must first add those signals to the Aux Meter, CR Monitor, and Studio Monitor Include lists and then assign them to each button. The *Telco Channels* subsection covers adding these signals.

Telco Channels

You can define a maximum of six fader channels as dedicated RMX*d* Telco channels by setting the Dual Fader channels' rotary switches to unique Telco numbers (1 to 6). When the VMCC application inspects an RMX*d* console, the application captures the fader channels defined as Telco channels. The VMCC application does not assign nor use the Telco number and therefore allows you to manually set any fader channel as a Telco channel. In no case, however, should you designate more than six channels as Telco channels in VMCC.

When using 600-series VistaMax code on the RMX*d* console and using an RMX*engine*, you do not have to assign any Telco channels since any DSP-hosted channel can be set as a "temporary Telco channel" by taking a Protected Destination macro. The GatesAir customer document 71-1538 RMX*engine* Quick Guide gives details on this application.

The third CR and Studio monitor selector button (TEL REC) does not have a default assignment in VMCC, since the default source (Telco Record bus) must be routed. To assign this signal to the button, you must add Telco Rec (signal 173) to the Aux Meter, CR Monitor, and Studio Monitor Include lists. You can then set that signal as the Switch 3 source in the Aux Meter, CR Monitor, and Studio Monitor Keys entry boxes. You must also have one or more Telco channels set to feed the Telco Record bus in the session file section [TelcoRecord]. Those Telco channels set as =1 feed the Telco Record bus. Telco channels set as =0 do not. Here is what this session file section looks like when Telco 1 and 2 are set to feed the Telco Record bus:

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

Extra Logic Commands

VMCC has a long list of logic commands that can be assigned to logic inputs and logic outputs. Some of these commands, called standard input logic commands using active low logic, are universally used by remote mic control panel buttons and peripheral equipment:

- On – turns the fader channel On using a momentary low logic pulse

- Off – turns the fader channel Off using a momentary low logic pulse

- Cue – turns on the channel cue function using a sustained low logic

- Cough – mutes the audio from the program buses while held low

- Ready – can turn off the channel and then control the Off button LEDs using sustained or pulsed logic

- Reset – turns the fader channel Off without generating an Off Pulse

- Talk to CR - activates talkback to the control room host, cue, and talkback outputs

- Talk to Ext - activates talkback to the external studio output

- Talk to ST1 – activates talkback to the studio monitor and studio host outputs

- Talk to ST1 Host – triggers talkback to the studio host output only

There are also several input signals that should not be set on the RMX*d* console, as they are only active on BMX*digital* consoles:

- Talk to Studio 1 Co-Host

- Talk to Studio 2

- Talk to Studio 2 Host

- Talk to Studio 2 Co-Host

Setting these signals to a remote button on an RMX*d* console does not cause problems. However, there is no effect, as the RMX*d* console does not have any method to use these specific logic commands.

On the logic output side, there are five standard command outputs:

- Cough Tally – only used for "special logic" applications; Cough button lights to indicate logic is active on a mic control panel

- Off Tally – controls the Off button illumination on a mic control panel

- On Tally – controls the On button illumination on a mic control panel

- Start Pulse – channel On button momentary logic closure

● Stop Pulse – channel Off button momentary logic closure

In addition to these standard commands, used to control a fader channel from the logic inputs and control a remote panel or peripheral by the fader channel on the logic outputs, there are also multiple commands available to provide direct logic control between any logic input and any logic output in the VistaMax system. These "special-case usage" logic commands are identified by an asterisk (*) in the VMCC application.

An example of special logic usage would be the need for a contact closure on a VistaMax Logic I-O card to trigger a skimmer or logger whenever a console mic is on. Instead of running a pair of wires from the air studio, you can set any assignable input logic on the console to one of these special-case logic commands, such as Cough Tally (*).

That logic input is then physically connected it to the CR mute logic output on the CR logic connector (so that the logic input is triggered when any CR mic is on). On the VistaMax Logic I-O card, you set the logic port connected to the skimmer as a Cough Tally. A system route, typically set in a [RouterCommand_1] section in the console's session file, is then made from that logic input to the VistaMax logic output.

Duplicate Community Names

VMCC allows you to save multiple communities 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 is first created. Note that for most installations there should only be one community in the VMCC application.

Edge Devices

Each edge device has an assigned "parent" who is the community member with that edge device's setup information in its EDGEDEVICE.INI file. If you change an existing edge device to use a new parent in the VMCC application, you'll need to provision and distribute the updated EDGEDEVICE.INI files to all of the affected consoles and card frames to effect the parent change on the edge device.

When there are dozens of edge devices in a community, the affected edge devices may not "hear" the Initialize RCED command that VMCC issues after distributing files to change its parent device. In this case the edge device would not completely reconnect since it's still trying to connect to its previous parent device. Power cycling that edge device will delete the old parent from its memory and cause it to start back up using BootP which will cause its new parent to then send out its setup information.

Even when the **Nest edge devices** option is checked in the **VMCC Options** window (**Tools** > **Options**), there are cases where the edge device does not automatically nest under its parent in the **Community Explorer** pane. The edge device positions only get updated in one of these cases:

● When a new device gets added to the community

● When the community is reopened (**Community** > **Open Community**)

● When the **Nest edge devices** option is cycled

To cycle the **Nest edge devices** option, perform these steps:

1. On the VMCC menu bar, click **Tools** > **Options** (A-4). The **Options** window then opens (Figure A-5).

**Figure A-4. VMCC Menu Bar
     with Tools Menu**

Figure A-5. VMCC Options Window

2. Clear the **Nest edge devices** check box.

3. Click **OK**. The **Options** window closes.

4. Click **Tools** > **Options** again to reopen the **Options** window.

5. Select the **Nest edge devices** check box.

6. Click **OK**. The edge devices will then be properly nested under their parent.
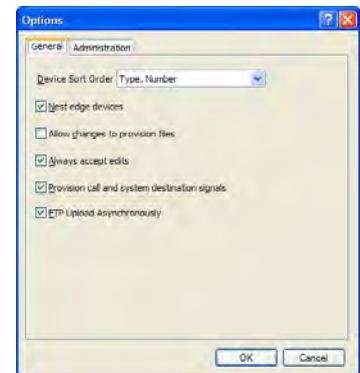
Inspection and Merge Device Issues

Here are guidelines for handling some issues you might encounter when inspecting and merging devices in VMCC.

Matching the Actual Community to an Existing VMCC-created Community

When you inspect community devices, with the intent to populate the null MAC addresses of a matching VMCC-created community, a **Merge Devices** pane appears after inspection has completed (Figure A-6).
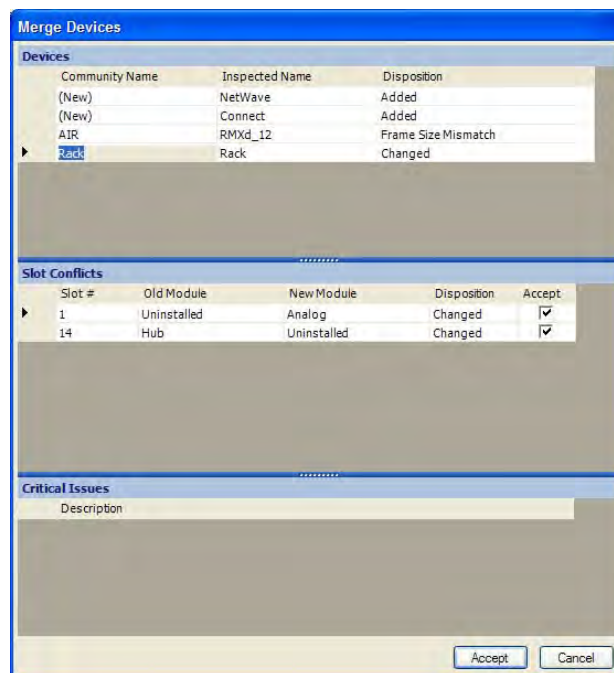
Figure A-6. VMCC – Merge Devices Pane

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. When you click **Accept**, the MAC addresses populate in those community members that matched. Even though it appears that no action is required (that is, the window shows that all the devices match), the MAC addresses are not populated until you click **Accept**. They *do not populate* if you click **Cancel**. Be sure to click **Accept** to populate the MAC addresses.

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

When inspecting a community with the intent to merge an inspected real facility device with a VMCC-entered device, note that the inspected device and the existing VMCC device must match exactly in regards to

- Frame size.

- Types of cards installed.

- 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 Merge Devices window lists differences between the VMCC device and the inspected device. To correct the devices for merging, perform these steps:

1. Note the differences.

2. Click **Cancel**.

3. Update the VMCC device accordingly.

4. Inspect the community again. Once the inspected device matches the VMCC device, VMCC merges the inspected device attributes into the existing VMCC device.

Using Merge Devices List

In the **Merge Devices** window (Figure A-6), if there is a changed device near the bottom of a long device list, there is no immediate indicator that decisions are required. Always scroll down through the device list to look for devices that require changes.

Merging Devices with Multiple Changes

If there are multiple devices with changes in the **Merge Devices** window, contiguous selections of changed devices display only the list of "Critical Issues" specific to the first changed device selected. Selecting a device with no changes causes the next changed device selected to display correctly.

General Session/Macro File Info

The console's SBC uses a memory-resident database to maintain the session file commands from the last session file or the last macro loaded into memory. Because the SBC uses the same procedure, whether to load a session file or a macro file taken on a channel (or a macro that has a .SES suffix so it appears in the session selector), the SBC must first clear the memory-resident database, to make room for the new file, before it can load the new file's contents.

Clearing this database does not affect the control panel/hardware settings, because the channels' source and button status is maintained by the fader modules. Therefore, general console operation is not affected. However, all of the static sections loaded into the memory that are not maintained on the channels get erased, including these important session file sections:

- `[Mapping]`

- `[fader_start]`

- `[fix_fader]`

- `[fix_pan]`

- `[local_cough]`

- `[Timer_Reset]`

- `[routercommand_1]`

This means that if a macro file gets loaded into memory from a channel (most Telco channels use macros) then its commands are now the only thing in the SBC memory—not the last session file that was loaded, even though the last session file name still appears in the session selector. If one was to then press the console's **Save Session** button (or use the `Save_Ses` FTP literal command) a new session file will be created, but this new session file will be missing all of the sections listed above. Thus the new session file will have the macro entries, the "snapshot" of the current channel settings from the control panels/hardware (all of the channel button sections and the current routed sources for each channel) and a new `[Mapping]` section (obtained from the SBC's inventory.txt file).

To ensure a new session file has all of the typical session file settings, always take a session file then make changes to the channels as required, then immediately save that session. In this way the memory will still hold the current status of the console's buttons (bus assign, mode, PS, PF, Pan/Bal assignments, etc.) *as well as* whatever previous static command sections were last loaded, such as these sections:

- `[fader_start]`

- `[local_cough]`

- `[fix_fader]`

- `[Timer_Reset]`

- `[fix_pan]`

- `[routercommand_1]`

The SBC then writes new .ses file.

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 header like: `[Section Name]` which can have up to 32 characters.

- Each section has one or more entries with each entry (called a Key Value) using 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.

Configuration (`.cfg`) and setup (`.ini`) files are created and maintained through VMCC, so this information is most applicable to session and macro files which you can edit in a text-only editor like Notepad®. With the release of VMCC 2.2, there is also a session and macro editor built into the VMCC application. The GatesAir customer document 71-2011 VMCC 2.2 Quick Guide.pdf gives details on using these editors in VMCC.

Here is how a typical section and its entry lines appear in the files:

```
[Section Name]
;Section comment
KeyValue=EntryValue        ;Entry line comment
```

The `[Section Name]` defines what the section entry values set up. The name is specific and must be entered using exact characters. After 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 Entry Value 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 EntryValue format is also section name specific, and it may have multiple components, separated by commas.

EntryValues which refer to VistaMax system signals can be identified using any of three ways:

- The signal's unique global number (such as *65697*)

- The signal's local number (such as *161*) – used to refer to a local source or destination signal number

- The signal's universal number (such as *D1.161*) – used to identify signals on other devices (such as D1) using the device and their local signal number (161), separated by a period

Each of the following examples reference the Mix-Minus 1 source signal, on an RMX*d* console set as device 1. Each entry creates two routes, from mix-minus 1 and 2, to the KSU A1 and A2 outputs.

Using local signal numbers:

```
[RouterCommand_1]
take_1=161,241   ;MM-1 > KSU A1
take_2=163,243   ;MM-2 > KSU A2
```

Using universal signal numbers:

```
[RouterCommand_1]
take_1=d1.161,d1.241    ;MM-1 > KSU A1
take_2=d1.163,d1.243    ;MM-2 > KSU A2
```

Using global signal numbers:

```
[RouterCommand_1]
take_1=65697,65777  ;MM-1 > KSU A1
take_2=65699,65779  ;MM-2 > KSU A2
```

You can use a GatesAir-created Excel spreadsheet (Global console signal ID calculator.xls) to calculate the global numbers for any device number for each console or rack. (Download the file from the GatesAir Customer Portal or the GatesAir FTP site, the *Parts and Repair Services* subsection in Chapter 5 gives details on accessing these sites.)

Most systems use local signal numbers (such as D1.161) since they are much easier to use and to identify which signal is being routed. The VMCC Signal Summaries contain all of the local signal numbers. The RMXd Signal IDs.pdf file, which can be downloaded from the GatesAir support site, also contains local signal numbers.

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, and so forth. Under each heading is an entry for each channel strip in the console. Chapter 4 gives details for these heading types.

[Telco Record] and [Telco Monitor]

These two Telco section headings are automatically created when a session file is saved on a console with at least one Dual Fader channel set as a Dedicated Telco channel. You must manually edit these entries since the RMX*d* console has no control surface buttons to set their conditions, as on the BMX*digital* console. These section headings set which Telco channels, labeled as Channels 81 – 86, feed the Telco record bus and/or Telco monitor bus.

To have a Telco channel feed the record or monitor bus when the session file is loaded, set the EntryValue to =1. In the following example, Telco 1 (`Channel_81`) is the only Telco channel that appears in the Telco Record output, and Telco 2 (`Channel_82`) is the only Telco channel going to the Telco monitor output.

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

[TelcoMonitor]
Channel_81=0
Channel_82=1
Channel_83=0
```

[chain]

This section can specify that one or multiple other session or macro files be automatically loaded onto any console or card frame when the session is taken. You would use this section more often in macros, but you can use it 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, defined by the `,9` which has the `remote_1.mac` file in its `SesFiles` folder. The second line loads a macro on the same device; the `remote_2.mac` file is in the local `SesFiles` folder.

[RouterCommand_1]

This section can specify up to 64 routes to be taken when you take the session or macro file. The previous examples in the Control File Formatting subsection show typical usage of this section. Each `Take_x` KeyValue—numbered sequentially starting from 1—defines one route. Each EntryValue then defines the source and the destination. In the `take_1=161,241` KeyValue, signal `161` is the source, and signal `241` is the destination.

Macro Files

Macro files are text-only command files with a `.mac` suffix which you create in VMCC 2.2 or in a text-only editor like Notepad®. Macro files use the same commands as session files, and you save them in the `sesfiles` folder on the SBC. Typically, these files only have a few sections in them. A macro is created to perform a specific task and typically does not address console channel button settings.

One of the most common macro applications is to simplify routing "four-wire" devices, such as Comrex Access, Telos Zephyr, and Telco hybrids. Four-wire 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 back to the two-way device. To easily route four-wire devices, create a macro file for each four-wire device and then add the macro names to the console in VMCC. You can then add the macros to the Include list for the console so that they can be selected on the Telco channels in the console.

Each four-wire macro has two routes:

- The first routes that four-wire device to a console fader.

- The second routes the mix-minus for that fader channel back to the four-wire device.

Here is an example of a Telco hybrid connected to the KSU A Analog input (from network signal) and the A Analog output (send to network signal). This macro uses two variables: `fader` and `mm`. The operating system knows which device and which fader the macro is taken on. This type of macro can only be taken on RMX*d* fader channels. It is not valid when taken by any other method; the `fader` and `mm` variables are not valid unless the macro is taken on an RMX*d* fader channel.

```
[RouterCommand_1]
take_1=337,fader; Hybrid In > Fader
take_2=mm,241; fader mix-minus > KSU Analog A
```

You can also use general-purpose macros to perform complex audio and logic switching functions. You could schedule these macros or manually take them on hardware selector panels or in VistaTouch, an on-screen hot button application to take macros.

One typical macro use is to switch the air chain between a main air studio and a secondary or backup studio. In this example, device 2 is the production room 1 console (P1) which is switched to the air chain, taking over from the main air studio. This macro switches the PGM 1 feed from the production room to the air chain through a Sage Endec delay and a BTI switcher, which is listed in the `[RouterCommand_1]` section. You would use the logic commands, listed in the `[port_event_card_4]` and `[port_config_card_4]` sections, 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 analog switch
take_4=71,137; Sage to BTI digital 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
```

Macro files are loaded by any of these methods:

- An operator uses a fader source selector which has a macro included in its signal list

- Through a chain command run in a session or another macro file

- UDP commands from an automation system networked with the VistaMax system

- Using a manual file load FTP command

- Using the VMCC or VistaTouch Task Scheduler to load macros by date/time

- Using VistaTouch

Macro files are saved in the `SesFiles` folder along with session files. However, as these files do not have a `.ses` suffix, they do not appear in the Session selector. You must manually add the macro names to the console, in VMCC, at the bottom of the console's main edit pane (Figure A-7). The macro names are then available to be included on the console (Figure A-8) by adding them to the console include list.
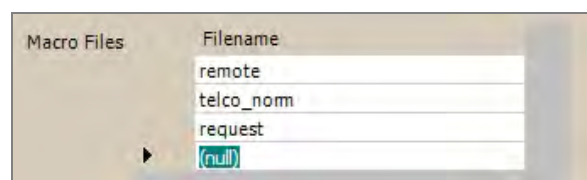
Figure A-7. 500-Series or 600-Series Code Macro File Name Addition at the Device Level
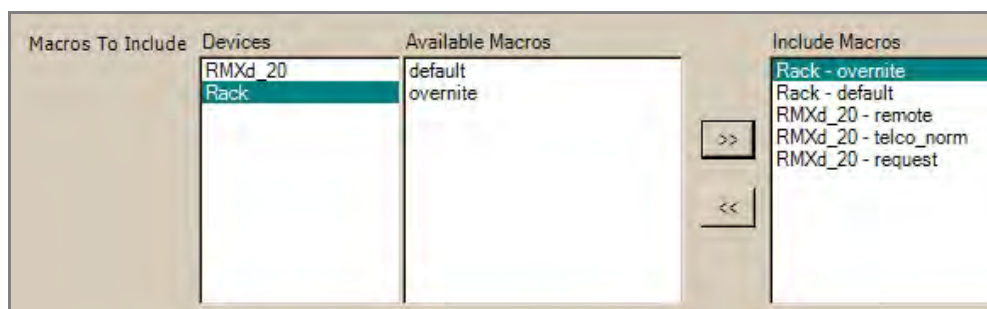
Figure A-8. Macro Files Included at the Device Level

Once you include the macro files at the console level, the `routers.ini` and the various publish files are updated when you distribute new files to the system devices. Macros are then handled as if they were signals but with a special prefix (M1, M2, M3, and so on). The macro numbers to macro file names 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. The three macros shown in the publish file example are included in this example:

```
[Router_81]
Take=0
Include_1 = 65-135
Include_2 = 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 included signal source names.

When taking macros, the same rules apply as for sources:

● If the channel is Off, taking a macro causes it to execute immediately.

● If the channel is On, taking any macro—local or remote—causes the name to appear with brackets around it, indicating the macro is pending. The macro is then executed when the channel is turned Off.

Note: If a macro is taken on a fader channel and the macro does not include a route to that fader channel, then the macro name continues to appear in brackets `[telco_norm]` since no source was routed to that fader channel, which would update the name display.

Phantom Channels & Buses

Each RMX*d* console includes four "phantom channels," special-purpose input channels within the KSU DSP, which can be used as any other input channel, albeit without any physical controls. Any input slot covered by a blank panel (for example, 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*d* console also includes several "phantom buses" which 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, always included in each session file, and what each header 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, you must route them to a VistaMax destination. For example, to use the Utility 1 bus, you can route it to the KSU digital output D by adding this route entry:

```
[RouterCommand_1]
take_1=229,255;UTL 1 > KSU digital D
```

If you set the Pre-Fader and/or Pre-Switch entries to `=1`, 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, 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. You can download a PDF file (fix_fader_entry_table.pdf) that lists the hex value versus fader position and channel gain. Download this file from the GatesAir Customer Portal or the GatesAir PR&E FTP site. (The *Parts and Repair Services* subsection in Chapter 5 gives details on accessing these sites.)

Phantom Channels and Pending Mode

There is no pre-switch setting on Program buses. Therefore, when you need to assign a phantom channel to a Program bus, you must use the session section [On] to specifically turn the phantom channel On (`Channel_xx=1`) or Off (`Channel_xx=0`). If you do not include this entry in every session file, the phantom channel could be put into pending mode, as any other channel that is On when a session file is taken. That is, the "On button" winks and the new session information is not loaded into that channel until it is turned Off. However, as 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—other than turning the console off and then power it back on—is to run a session file that has this section:

```
[force_off]
channel_13=1
channel_14=0
channel_15=0
channel_16=0
```

A session file with this section can force a phantom channel Off to remove it from a pending state. If used improperly, this section in a session file could affect on-air audio and thus should only be used in a special session file. To avoid this situation, when using phantom channels, you should assign them to a send or utility bus where the pre-switch setting can be set true (such as `[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 destinations for the External Talk to C/R and the External Cue signals. If you use these two signals with the phantom channels, you would define the source inputs on the console edit pane in VMCC. 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 three possible Control Room talk destinations: Talk to CR output, Cue speaker, and Operator headphones. 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. Cue is muted when a C/R mic channel is On. If the AutoCue button is lit, Cue also feeds the operator headphones.

500-Series Code Features

The 500-Series code adds several new features, including the ability to include macro names with signal source names on both edge devices and fader channel source selectors. The next subsections discuss other 500-Series features. These features carry over to the 600-series code as well.

Intercom Call Groups

The Intercom call groups feature in the 500-series code 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. However, while each hot key had previously only been assignable to one intercom panel, 500-series code allows one hot key to be assigned to a call group. Therefore, you can use VMCC to page or call multiple intercom stations simultaneously. You create Intercom call groups and assign members to a call group at the device level of the VistaMax or Envoy card frame that holds the Hub with Intercom card (Figure A-9).
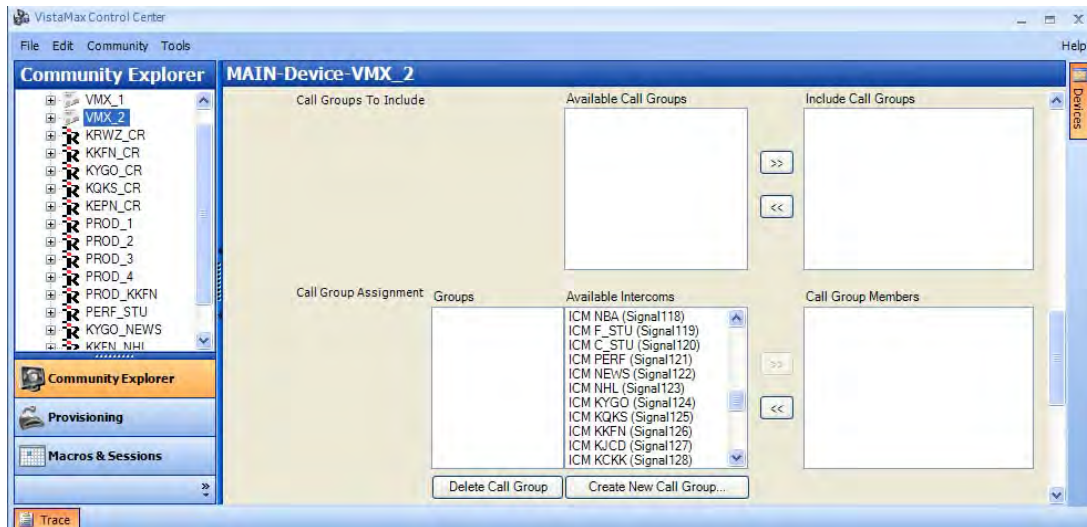
Figure A-9. VMCC Call Groups – Setting Call Group Assignments

Perform these steps:

1. Click **Create New Call Group**. An **Add New Group Name** dialog box appears.

2. Type a group name of up to 10 characters.

3. Click **Add**. The dialog box closes, and the new group name appears in the **Groups** column.

4. Click the names of the **Available Intercoms** to include in the selected group (Figure A-10) in one of these ways:

   • To select consecutive items, perform these steps:
      a. Click the first item on the list.
      b. Press and hold the Shift key.
      c. Click the last item on the list.
      d. Release the Shift key.

   • To select nonconsecutive items, perform these steps:
      a. Click an item.
      b. Press and hold the Ctrl key.
      c. Click all other items to be selected.
      d. Release the Ctrl key.
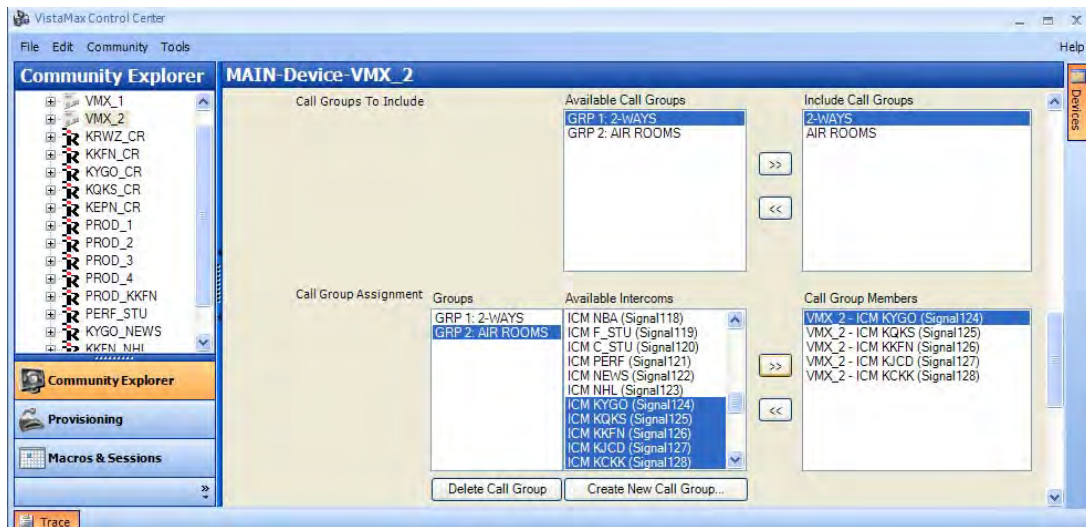
Figure A-10. VMCC Call Groups — Setting Call Group Members

5. Click [>>]. The names appear in the **Call Group Members** list.

Once you form the call groups, add them to the **Include Call Groups** list for the intercom parent device (Figure A-11).
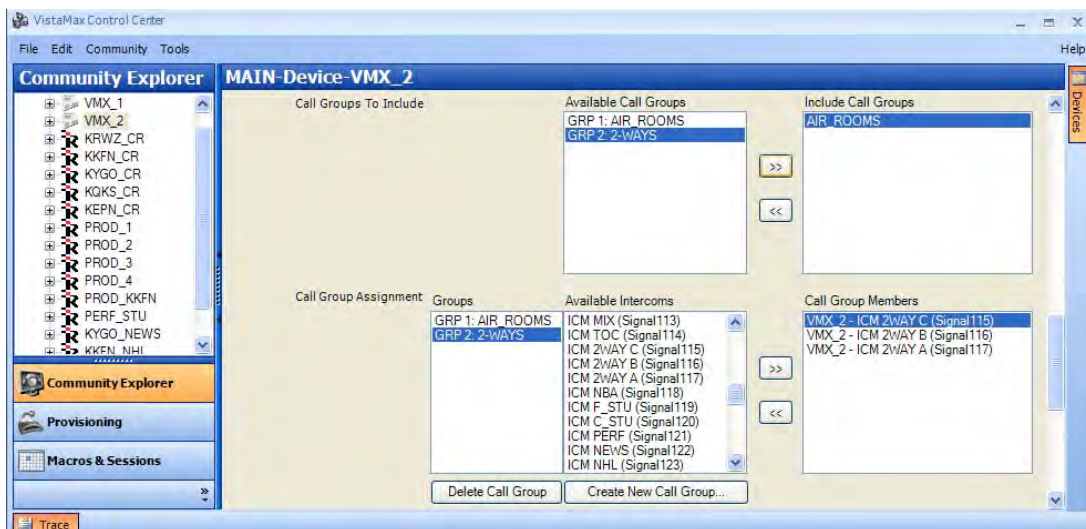

Figure A-11. VMCC Call Groups to Include - Adding Call Groups

You can then include the **Call Groups** at the intercom level and assign the groups to hot keys on each intercom panel (Figure A-12).
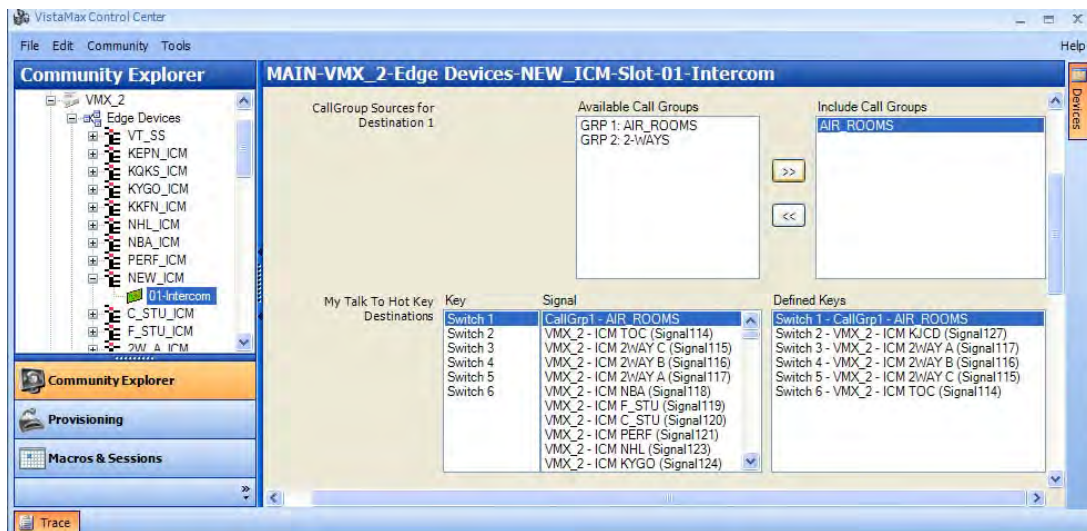
Figure A-12. VMCC Call Group Sources – Including Call Groups & Adding to Intercom Hot Keys

Assignable Logic Configuration

The 500-series code also introduced a logic routing feature, Automatic Return Routing. You can set this feature on any audio signal with logic to automatically route the channel logic commands (channel on/off tallies or start/stop pulses) back to the logic connector when the signal is taken on a fader channel. This feature both simplifies session file creation and allows sources with logic to maintain correct return logic routing regardless of which fader channel they are taken on.

Assignable Logic connectors are on 8-Input Expansion cards and the KSU card. You configure these connectors on the VMCC **Community Explorer** pane under each device's Logic I-O icon (Figure A-13). The KSU card has three assignable I-O connectors (labeled Inputs 2 – 4 in VMCC) while each Expansion Card has eight connectors (labeled Inputs 1 - 8).
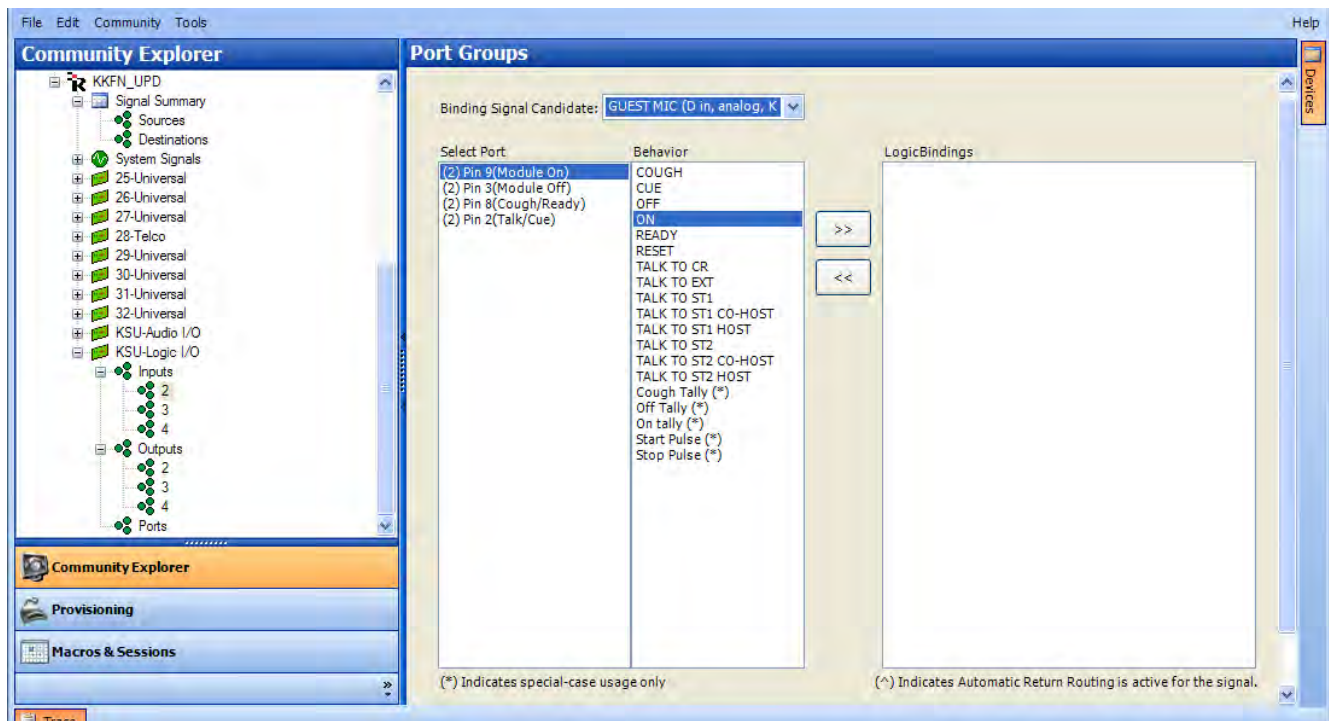
Figure A-13. VMCC Port Groups – Assignable Input Logic Connector Settings

You first need to associate each assignable logic connector with an audio input signal, called the **Binding Signal Candidate**. Figures A-13, A-14, and A-16 show **Guest Mic** as the **Binding Signal Candidate** because there is a microphone control panel associated with that mic that is physically plugged into logic connector 2 (Input 2) on the KSU card. Figures A-15 and A-17 show a automation system signal **Prophet** as the **Binding Signal Candidate** on KSU logic connector 3 (Input 3) just to show the different logic commands (**Ready** versus **Cough** and **Cue** versus **Talk**, and **On/Off Tally** versus **Start/Stop Pulse**) that are used by peripheral devices.

To configure the four input logic ports on any assignable connector, perform these steps.

1. In the VMCC **Community Explorer** pane, click **+** next to the device tree to open it. (In Figure A-10, the device is **KKFN_UPD**.)

2. Click **+** to next to the Logic I-O card tree (such as **KSU-Logic I-O**) to open it.

3. Click **+** next to the **Inputs** tree to open it.

4. Click on an **Input** number (such as **2**) to open that logic connector in the **Port Groups** edit pane.

5. In the drop-down list, click the **Binding Signal Candidate** from the list of available audio signals (such as, **Guest Mic**).

6. At **Select Port**, perform these steps:

   a. Click a logic input signal (such as **(2) Pin 9 (Module On)**).
   b. Click the desired **Behavior** (such as **On**) to bind to that logic input setting.
   c. Click [>>] to assign the behavior and move the port setting to the **Logic Bindings** pane.

7. Repeat steps 5 and 6 for the other logic input signals.

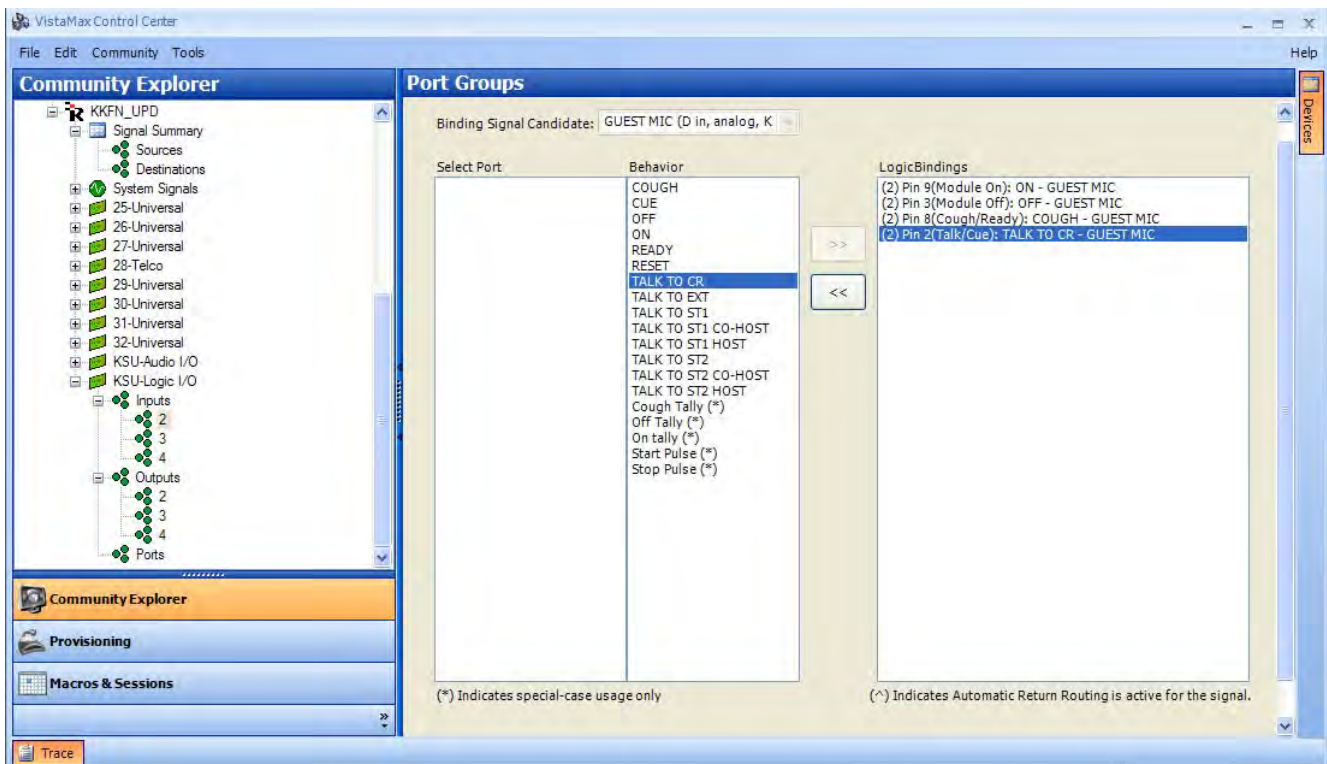Figure A-14 shows the normal logic input settings for a mic control panel.

Figure A-14. VMCC Port Groups – Normal Logic Input Settings for Mic Control Panel

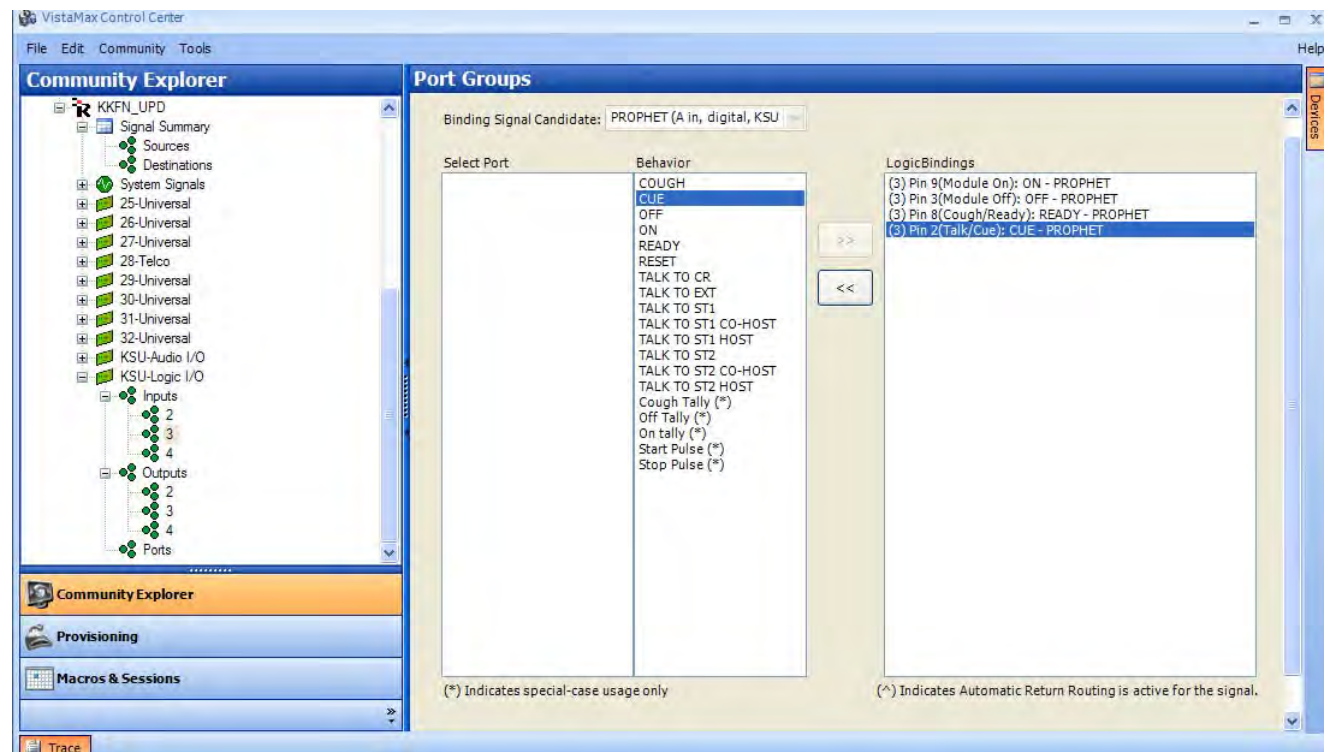Figure A-15 shows the normal settings for automation system.

Figure A-15. VMCC Port Groups – Normal Logic Input Settings for Automation System

After assigning the input logic, you can assign the output logic. To assign the two output logic commands to the two output ports on the logic connector, perform these steps:

1. In the VMCC **Community Explorer** pane, click **+** next to the **Outputs** tree to open it.

2. Click an **Output** number (such as **2**) to open that logic connector in the **Port Groups** edit pane (Figure A-16).
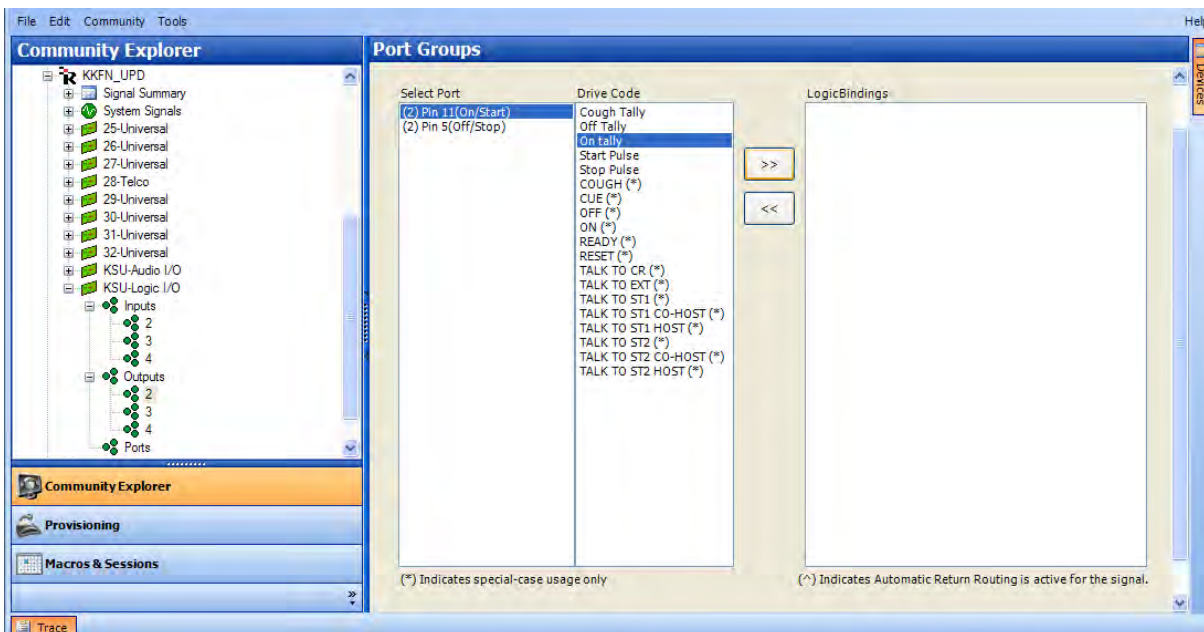
Figure A-16. VMCC Port Groups – Assignable Output Logic Connector Settings

3. At **Select Port**, perform these steps:

   a. Click a logic output signal (such as **Pin 11 (On/Start)**).
   b. Click the **Drive Code** to bind to that logic setting.

   c. Click [>>] to assign the **Drive Code** and move the port setting to the **Logic Bindings** pane.

4. At **Select Port**, perform these steps:

   a. Click the second logic output signal (such as **Pin 5 (Off/Stop)**).
   b. Click the **Drive Code** to bind to that logic setting.

   c. Click [>>] to assign the **Drive Code** and move the port setting to the **Logic Bindings** pane.

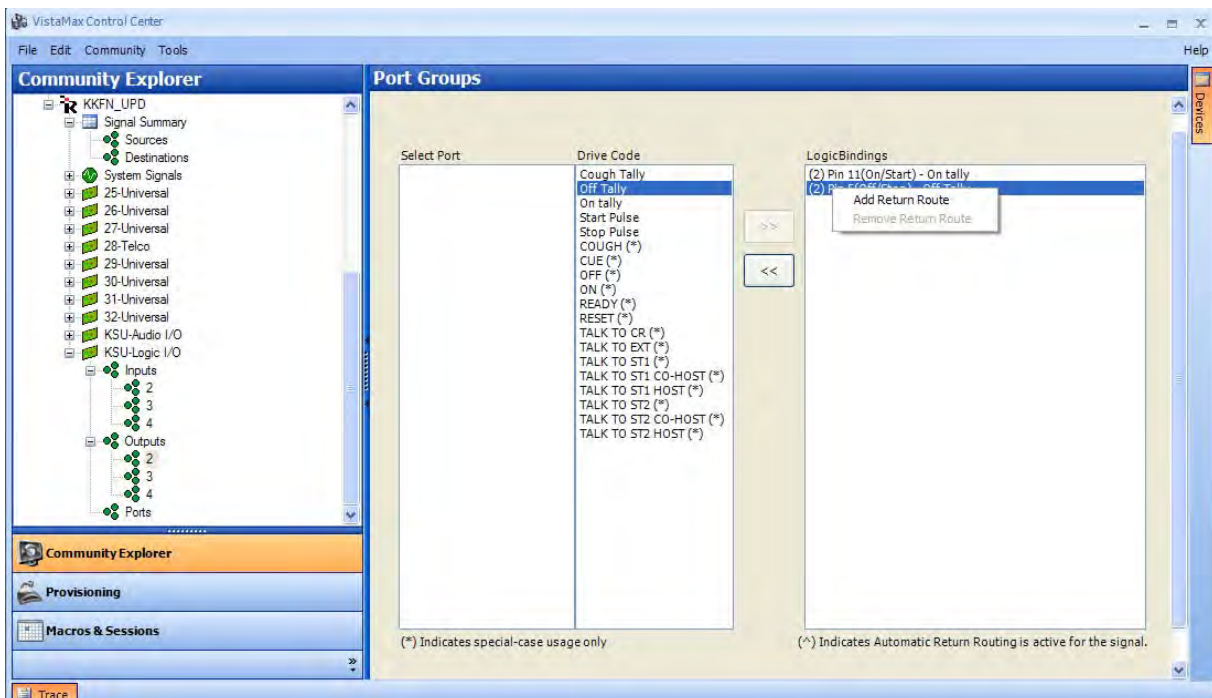5. Right-click in the **Logic Bindings** column to access the menu (Figure A-17).

Figure A-17. VMCC Port Groups – Logic Bindings Right-Click Menu

6. Click **Add Return Route**. VMCC adds a carat symbol (^) to the **Logic Bindings** (Figure A-18) to indicate that Automatic Return Routing is active for that signal.
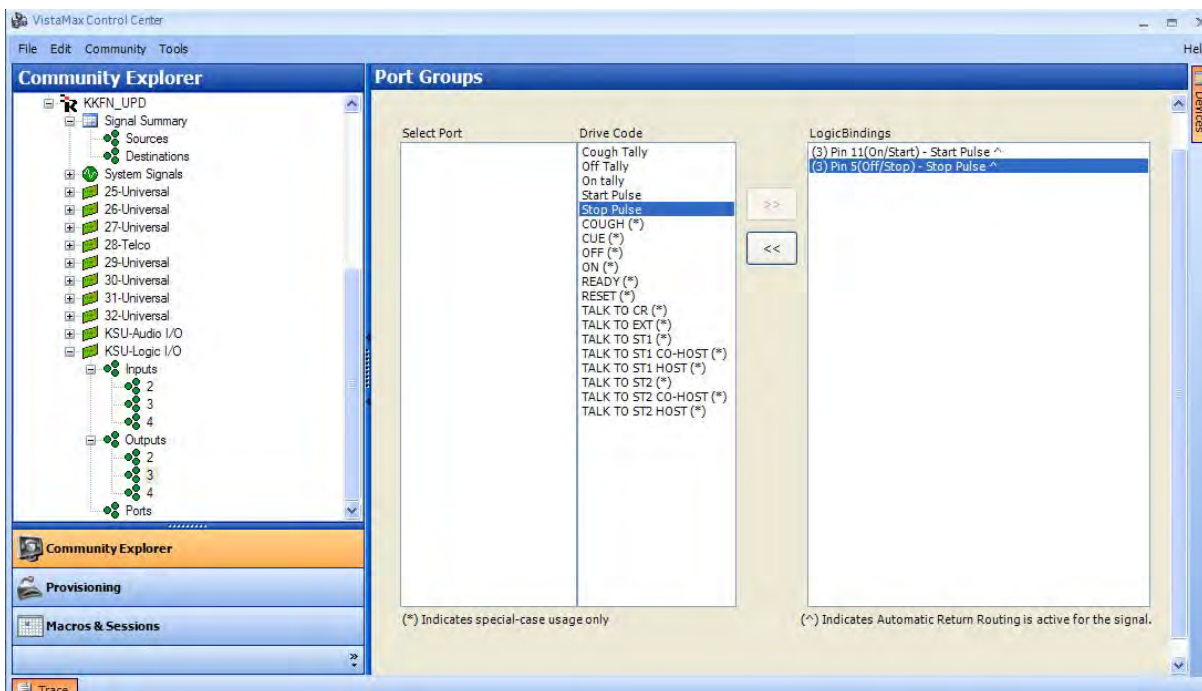
Figure A-18. VMCC Port Groups – Automatic Return Route Selected

Now, when a mic or peripheral with Automatic Return Routing is taken on any fader channel, the fader channel logic commands are automatically routed back to the logic output. This action occurs even if the mic or peripheral is taken on another console. Shared signals should probably not have Automatic Return Routing assigned, as someone working on another console could take that source and steal the return logic control away from the original channel fader. Also, dedicated signals such as automation channels, which are dedicated to one room, should not have Automatic Return Routing assigned to ensure that their return logic cannot accidentally be routed from another fader channel. In each of these examples, you must continue to use the logic route commands in the session files to route these signals' return logic.