

NetWave Broadcast Console

NetWave

Installation & User Guide



8 Channel Console with Dual Metering: PRE99-1600D-08
16 Channel Console with Dual Metering: PRE99-1600D-16
16 Channel Console with Quad Metering: PRE99-1600Q-16
24 Channel Console with Dual Metering: PRE99-1600D-24
24 Channel Console with Quad Metering: PRE99-1600Q-24

75-60 NetWave Manual
Rev B April, 2014

® NetWave™ DirectView Broadcast Console
Operations & Technical Manual
Revision B, April 2014

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Revision	Date	Changes Made	Section	Pages	Editor
A	3/2013	Updated manual for direct view meter console. Reformatted manual and made minor grammatical and punctuation edits.	All	All	LD
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Declaration of Conformity

Application of Council Directive: 89/336/EEC

**Standards To Which
Conformity Is Declared:** EN55103-1: 1997 (Professional Audio)
EN55022 Class A
EN61000-3-2
EN61000-3-3
EN55103-2: 1997 (Professional Audio)
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

Manufacturer's Name: 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: Professional Audio Equipment - Residential

Model Numbers: NetWave

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

Harris Broadcast—Mason Ohio USA
Place


Signature

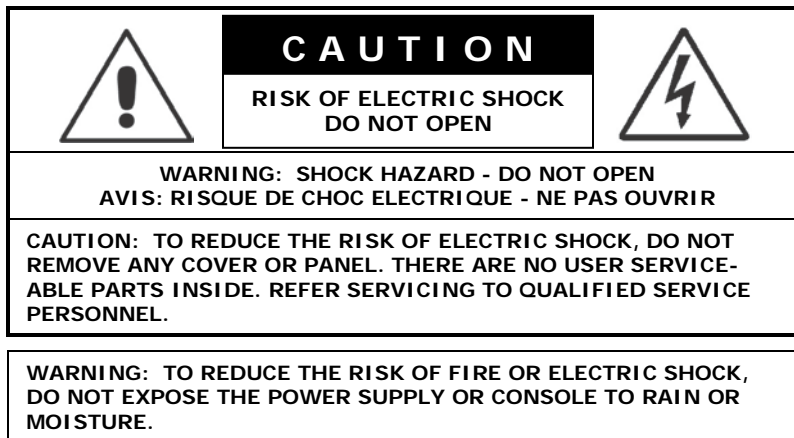
Theodore Staros
Full Name

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



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 uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

WARNING: This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device (pursuant to Subpart J of Part 15 FCC Rules), which are designed to provide reasonable protection against such interference when operated in a commercial environment. 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.

Section 1 - Introduction

Thanks for joining the growing ranks of broadcasters employing GatesAir products. We endeavor to provide the finest quality products, systems, documentation, and after-sale support. To obtain the maximum benefit from the NetWave's capabilities, read through this section and the sections on *Installation* and *Operation* prior to actual product installation.

NetWave consoles have these standard parts:

- **Main Frame:** with 8, 16 or 24 channel slots
- **Monitor & Output Card:** with monitor and program audio outputs and monitor logic, one per console
- **DSP Card:** with channel audio input and logic I-O connectors
 - One card on a NetWave-8 console
 - Two cards on a NetWave-16 console (Figure 1-1)
 - Three cards on a NetWave-24 console
- **Monitor Control Panel:** monitor source selection and level control, one panel per console
- **Dual Fader Panel:** input source selection, bus assignment, and level control
 - Four panels on a NetWave-8 console
 - Six panels on a NetWave-16 console
 - Nine panels on a NetWave-24 console
- **Console Display:**
 - Two bar graph stereo audio meters with clock and event timer, standard on Dual Meter consoles
 - Four audio meters with clock and event timer, standard on Quad Meter consoles
- **Dual Width Blank Panel:** (covers unpopulated channel slots)
 - Two on a NetWave-16 console
 - Three on a NetWave-24 console
- **48-Volt Supply:**
 - An in-line supply on the NetWave-8 and NetWave-16 consoles
 - A rack mount supply on the NetWave-24 console (optional on the other two frame sizes)
- **Installation Materials:**
 - Installation kit
 - NetWave Quick Guide
- **Toolkit (optional):** 76-1901 toolkit



Figure 1-1. NetWave-16 Console

Product Overview

The NetWave DirectView console is a low-profile, digitally-controlled, VistaMax-compatible audio console designed to sit on the countertop. Three frame sizes are available, with 8-, 16-, or 24-channel slots.

Each NetWave console is standalone but, for maximum flexibility and usability, can be *linked* with a VistaMax audio management system. Two Link Activation Upgrade Kits (PRE99-1425 or PRE99-1426) are available to

activate the built-in VistaMax Link connector. The Link, a single CAT5e or CAT6 crossover cable, connects the NetWave console to a VistaMax system Hub card *facet*. This connection allows any VistaMax system source (audio signals or audio with logic signals) to be routed to any NetWave channel and to either or both external monitor selectors. The VistaMax Link also carries a number of NetWave signals to the VistaMax system:

- One local audio input from each channel (either the analog or digital input can be chosen)
- All four stereo program buses
- All mix-minus outputs (with both a clean feed and an IFB feed)
- The two channel Telco record output
- The stereo cue bus

Any of these signals can be routed to any VistaMax system destination, as required by the application.

To further enhance a Linked console, a Dual Router Kit, PRE99-1424, Dual Fader panel upgrade is also available. This kit adds VistaMax source selection ability to both faders on any Dual Fader panel. Typically one or both of these kits are installed, depending on console size and application.

The NetWave DirectView console display has these parts:

- Two or four stereo bar graph meters (PGM 1 and Auxiliary; or PGM 1, PGM 2, PGM 3, and Auxiliary)
- A digital clock which can be slaved to an ESE or a SMPTE master clock
- A count-up event timer

The console display sits just behind the channel fader panels and fastens to the console chassis.

A single 48-volt DC output power supply is used to power the NetWave console:

- A rack mount supply (PRE99-1205), also used with VistaMax card frames and RMXd consoles, comes with the NetWave-24 console.
- An in-line supply (PRE99-1206) comes with the NetWave-8 and -16 consoles. (A PRE99-1205 supply is an option for these size consoles.)

An optional Power Coupler (PRE90-1995) allows any on-air NetWave console to be redundantly powered by coupling a second, matching, 48-volt DC supply to the console.

The NetWave console is constructed using an all-aluminum chassis that fully contains all circuit board electronics for strength and RFI immunity. To ensure silent operation, there are no fans used in any NetWave component. The console, control panels, console display, and power supplies are all convection cooled.

All end-user audio, logic, power, and network connections are made along the top rear section of the console chassis. Connector access is made via a removable flip-open cover which hides the cabling and connectors during normal operation.

NetWave Connections

- Monitor & Output Card (Figure 1-2):
 - Four stereo Program bus outputs – with separate analog and AES digital outputs
 - Three stereo analog control room outputs – for a room monitor amp and for separate host and guest headphone amps
 - Three stereo analog studio outputs – for a studio monitor amp and for separate host and guest headphone amps
 - Two stereo analog External Monitor inputs
 - Two mono analog Mix-Minus outputs with IFB
 - Separate control room and studio logic connectors – warning interface output, logic I-O for dim and mute control, talk logic output

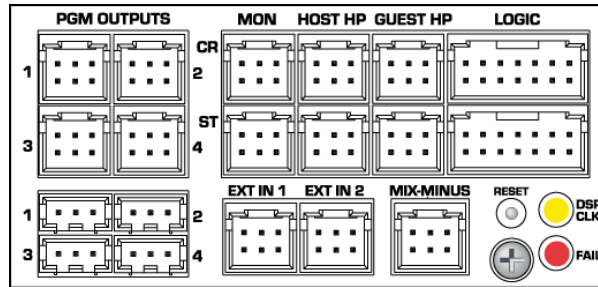


Figure 1-2. Monitor & Output Card Connections

- DSP Cards (Figure 1-3):
 - Sixteen stereo/dual mono audio inputs (eight analog and eight AES digital) – assignable as the A or B source for the eight fader control strips associated with each DSP card
 - Eight channel logic connectors – assignable to either the A or B source of the eight fader control strips associated with each DSP card to control external control panels or peripherals

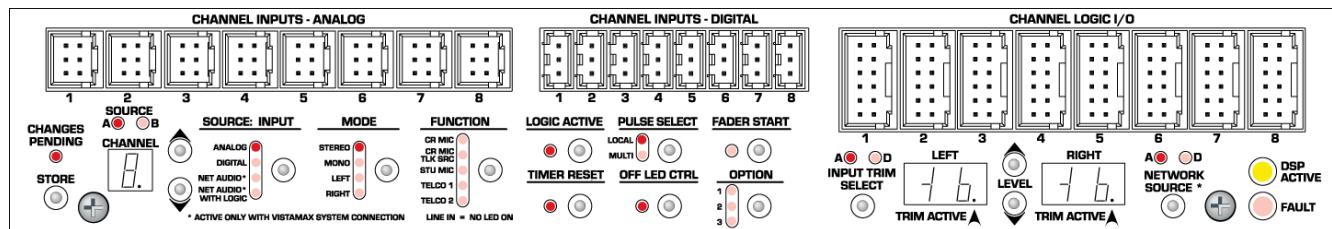


Figure 1-3. DSP Card Connectors and Channel Setup Controls

- Other Connections:
 - One 1/4" TRS jack for the board operator headphones – recessed left side panel
 - One RJ-45 VistaMax Link connector, next to DC power connector, for a CAT6 crossover cable – use requires installing an optional Link or Link+ Plus Activation Kit
 - One keyed 6-terminal Mini-Fit Jr. connector – for the 48-volt DC power supply
 - Eight, sixteen, or twenty-four internal RJ-45 jacks – to connect Dual Fader, Dual Selector, and Dual Router panels
 - Four, eight, or twelve rear panel RJ-45 jacks – to connect control signals to upgraded Dual Router or Dual Selector panels
 - One 4-pin Molex connector – for ESE or SMPTE master clock input and timer reset control

Main Component Descriptions

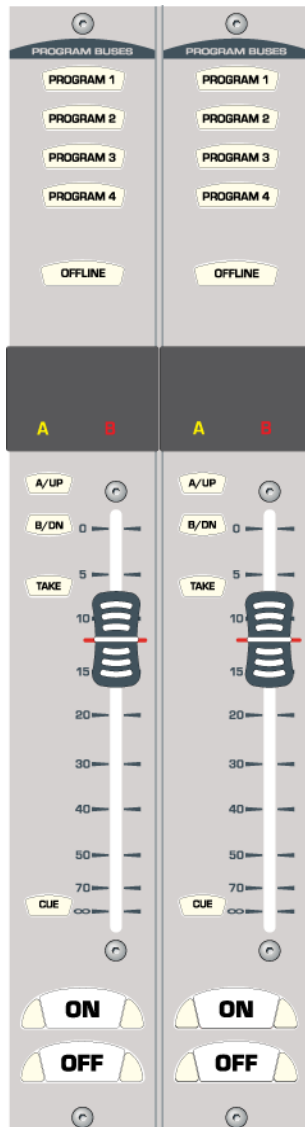
NetWave console board operators use these three parts:

- The Dual Fader (or upgraded Dual Router or Dual Selector) panels
- The Monitor Control panel
- The Console Display

This section discusses all three parts, along with descriptions for these other parts of the console:

- Power supplies, 48-volt DC
- Monitor & Output card, with monitor and program outputs
- DSP cards, with audio inputs and logic I/O
- VistaMax Link
- Optional upgrade kits

NetWave Dual Fader Panels



Each Dual Fader panel (Figure 1-4) has two fader channel control strips, each with these features:

- Separate Channel On and Channel Off illuminated buttons
- A 100 mm fader for channel level control
- Cue On/Off illuminated button
- A/Up and B/Down source selection buttons with Take button
- Active source illuminated label
- Five bus assignment buttons (four Program and one Offline)

All channel control is digital, so no audio actually travels through a Dual Fader panel. Thus, a Dual Fader panel can be “hot swapped” without affecting either channel’s audio performance.

Dual Fader panels plug into the DSP cards using one red cable per panel. Each DSP card handles eight audio channels and four Dual Fader panels.

A Dual Fader channel control strip has two audio inputs and one logic I-O connector on the DSP card. You use the channel setup buttons on the DSP card to assign which physical audio input is the A or B source. In a standalone console, the local analog and digital inputs for that channel are the only possible sources. When the NetWave console is linked to a VistaMax system, there are three selections available for the A or B source:

- The local analog input
- The local digital input
- A routed VistaMax source

The operating parameters for each source, on each channel, are independently set through a common group of setup buttons and LEDs on each DSP card (Figure 1-3). These controls set the parameters used by the A and the B sources. To set the parameters, you first need to know answers to these types of questions for each input signal:

- Is the signal analog, digital, or networked?
- What is the audio mode: stereo, mono sum, left-only, or right-only?
- What type of signal (function) is being connected: standard line input device, a CR mic, or a CR mic with talkback, a Studio Mic, or a Telco input?
- Is logic associated with the input? And should the Off button be controlled remotely?
- Should the event timer reset at Channel On?

Figure 1-4. Dual Fader Panel

After you enter all the parameters for each A and B source for each input on a DSP card, press the **Store** button to store all settings in nonvolatile memory on the DSP card.

Once you configure the input sources, use the channel strip’s **A** and **B** select buttons, along with the **Take** button, to choose the active source for each channel. When the A source is active, a yellow LED backlights the **A** source label, under a smoked polycarbonate window above the **A/UP** button, and the **A** button is lit. When the B source is active, a red LED backlights the **B** source label, and the **B** button is lit.

Setting a channel source to use the logic I-O means the channel can remotely control a peripheral device (such as a mic control panel, CD player, or computer playback system) and that peripheral can also control the channel function on, off, and cue. The logic I-O provides fully independent parallel logic functions that: output start and stop pulses to line devices (on and off tallies to mic panels); receives channel on, off, cue, and reset/ready commands from line devices (on, off, cough, and talkback commands from mic panels).

Dual Fader Panel Upgrades

There are two upgrade kits that add source selection ability to any Dual Fader panel:

- The **Dual Selector Kit** (PRE99-1428-1 – Figure 1-5) uses a 16x2 MicroRouter – a 1RU device with 16 inputs, individually set for either an analog or a digital input, and two digital outputs that go to the two digital inputs associated with that Dual Selector panel. The **A** and **B** buttons function as Up and Down buttons which, when used with the **TAKE** button, select which of the 17 possible sources—the local analog input for that fader plus the 16 common sources on the MicroRouter—is to be the active source on that fader channel.
- The **Dual Router Kit** (PRE99-1424 – Figure 1-6) adds the same type of signal selection ability to any Dual Fader panel in a VistaMax Linked console. Of course, the number of signals that can be selected on the two faders is much larger, since any source in the VistaMax system is a potential source for either fader. The Dual Router kit incorporates a VistaMax source selector into the upgraded panel using the **A/UP**, **B/DN**, and **TAKE** buttons on each fader channel to select and take a new source for that fader.

Dual Fader panels, with either the Dual Selector or the Dual Router upgrade, are easily identified by the two 10-character signal name displays under the top half of the smoked polycarbonate lens above the faders.

The displays normally show the name of the current source feeding that channel. But, when you press the **UP** or **DN** button, the displayed name switches to show a potential Next Source for that channel. The yellow **Next** label, above the **UP** button, lights to indicate a **Next Source** name is appearing. Hold down or repeatedly tap the **UP** or **DN** button for the list of available sources for that channel to appear one-by-one alphanumerically.



Figure 1-5. Dual Selector Panel



Figure 1-6. Dual Router Panel

When the desired source name appears and the channel is off, press the Take button to select that source. New sources cannot be selected when the channel is on. If you press the Take button while the channel is on, the On button flashes three times to indicate the next source has been pre-selected to be taken when the channel is turned off.

You use the VistaMax Control Center (VMCC) software, Version 1.1 or later to set which sources appear on each Dual Router panel when the **UP** and **DN** buttons are pressed. Each channel can have from one source up to every available source in the VistaMax system in its selection list. Keep the signal list fairly short so that board operators can easily find their desired sources. To select a source that is not normally shown, the board operator can press and hold the **UP** and **DN** buttons together for three seconds to turn on the Include All function. The red **Include All** label then lights up. The operator can now view every source available to the console. Likewise, to cancel the Include All function and turn off the red **Include All** label, press and hold the **UP** and **DN** buttons together once more. You can obtain VMCC from the GatesAir Customer Portal site or the GatesAir FTP site. Section 5 – “NetWave Servicing” gives details on accessing these sites.

To link the NetWave console into a VistaMax system, all VistaMax devices must be running 400-series code, build 445.10 or later, or any build of 500-series or 600-series code.

Monitor Control Panel

This standard panel (Figure 1-7) is divided into three sections separated by double graphic lines. These sections, listed from left to right and divided by main function, are

- Auxiliary Meter section
- Control Room (CR) section
- Studio section



Figure 1-7. Monitor Control Panel

Auxiliary Meter Section

The top portion of all three sections has exclusive action source selector buttons to select one monitor signal from between the PGM 1 thru 4 buses and the two External Monitor inputs. In the Meter section, the buttons select which signal feeds the right-most meter in the Console Display, with the selected source name shown below the Auxiliary Meter. The Auxiliary Meter is typically set to alternately show the cue levels while cue is active; the **Cue** label lights, and the cue level is shown in the Auxiliary Meter section with the name **Cue** below the meter.

Several CR controls are located below the meter selector buttons in this section of the panel. The Control Room Section covers these controls.

Control Room Section

The middle of the panel has the Control Room (CR) monitor source selector buttons and the two faders to adjust the level of the room monitor speakers (left fader) and the operator headphone outputs (right fader). Any one source can be selected, which feeds all control room monitor outputs. The active source selection button lights to indicate it is active.

A cue speaker, mounted within the console display, is level controlled by the Cue pot in the middle of the left-hand Auxiliary section of the panel. A yellow **Cue** label, just above the pot, lights while cue is active on any channel.

A Talkback pot controls the level of incoming talkback that feeds the cue speaker, independently of the Cue volume pot. A red **Talkback** label, just above the Talkback pot, lights when the control room is receiving talkback.

The **Monitor Mode** buttons, also in the left-hand section, below the cue and talkback pots, set the signal mode for all CR and studio outputs. The **L** and **R** buttons control whether the monitor outputs are stereo (neither button is lit), left only (L is lit), right only (R is lit), or a mono sum signal (both are lit).

Just below the R mode button is the **AutoCue** button. When this button is lit, the operator's headphone output automatically switches to feed the cue bus into the operator's headphones when cue is active. When unlit, cue activity does not affect the board operator's headphone audio.

AutoCue has two operating modes (set by multi-switch DS1, switch 3 on the Monitor & Output card). The default setting is Split Cue, where the cue audio goes to one ear and monitor audio is summed to the other ear. This is typically used when the console is in an on-air studio. The alternate mode is Stereo Cue, where stereo cue audio replaces the monitor audio source in the headphones. This setting is typically used in production rooms and other off-air applications.

Studio Section

The right-hand section of the Monitor Control panel has the monitor source selection buttons and level controls for a separate talk or voice studio. You can select a source from among the six buttons at the top of this section. The active source button lights when selected.

The two pots in this section control the output level of a dedicated studio monitor output (Monitor) and the amount of talk to studio audio (Talkback) that is fed to this monitor output.

The Studio Section also has a Talk to Studio button to allow the board operator to talk to the studio using the board operator mic. You can assign multiple control room mics to also be talk sources to enable both a board operator and a producer to talk to the studio while someone presses the Talk to Studio button.

Five event timer control buttons are at the bottom of this section. Start, Stop, Hold, and Reset manually control the event timer in the Console Display. When the Auto Reset button is lit, the timer can be reset automatically when a channel is turned on that has the Timer Reset option assigned. (The DSP card setup controls set which channel sources reset the timer.)

Console Display

The Console Display (Figure 1-8) has either two or four stereo bar graph meters:

- The left meter always shows the PGM 1 bus level.
- When four meters are present, the next two meters show the PGM 2 and PGM 3 bus levels, respectively.
- The right one, the Auxiliary Meter, shows a source selected using the Meter source buttons on the Monitor Control panel (PGM 1-4, EXTERNAL 1, EXTERNAL 2, and CUE).



Figure 1-8. Console Display

The Console Display includes a clock and event timer. The default operating mode for the clock is autonomous; the clock runs independently and must be set by hand. The clock time remains current for about three days with the console powered off. After that, the time must be set again. The clock can alternately be slaved to a SMPTE, ESE TC-89, or ESE TC-90 master clock. In the slave mode, the time set buttons are not active. The event timer is manually controlled by Monitor Control panel buttons and, when the Auto button is lit, by timer reset commands from one or more fader channels.

Monitor & Output Card

Each NetWave console has one Monitor & Output card (Figure 1-2) with the user connections listed previously. The Monitor Control panel plugs into the Monitor & Output card, receiving power while sending and receiving control signals. The card also connects to the DSP cards via a short, flat cable jumper to supply power and clock signals and to send and receive bused audio signals. The Monitor & Output card has two LEDs to indicate operational status (DSP clock and Fail) and a recessed console reset button.

This card is partly located below the Monitor Control panel and the Console Display. In normal operation, the card connections are hidden below the flip-open rear cover.

DSP Cards

Each Digital Signal Processor card (DSP card – Figure 1-3) has the setup controls, audio input connectors, and logic I-O connectors for eight console channels and for four Dual Fader panels that are mounted directly in front of that DSP card. A DSP Active and a Fault LED indicate the card's operational status.

There is one DSP card on a NetWave-8 console, two DSP cards on a NetWave-16 console, and three DSP cards on a NetWave-24 console. In normal operation, the DSP cards are completely hidden from the operator by the console display and the flip-open rear cover. All DSP cards are identical, except for the leftmost card, which has a bus termination resistor pack installed in a socket (RN1) on the card.

Each DSP card has 12 RJ-45 jacks:

- Eight jacks, labeled red or blue, are located below the Dual Fader panels. The red jacks connect up to four Dual Fader panels (using flat, red cables supplied with the frame). The blue jacks are only used to connect flat, blue cables supplied with Dual Router and Dual Selector upgrade kits.

- Four external RJ-45 jacks on the rear panel couple the optional Dual Selector or Dual Router panels to a 16x2 MicroRouter or to a VistaMax network switch port using customer-supplied CAT-5 cabling.

Each DSP card has a common set of assignment buttons and indicator LEDs to assign these parameters for each A and B source on the eight channels associated with that DSP card:

- Input selection (Analog, Digital, or Network)
- Mode selection (Stereo, Left, Right, or Mono Sum)
- Signal function (Line Input, CR Mic, CR Mic as a Talk Source, Studio Mic, or Telco Input)
- Whether the logic I-O is active
- Input gain trims for both analog and digital inputs
- Network source assignment
- Additional logic parameter settings

Power Supply

Two types of power supplies are used with NetWave consoles. Each type has a single 48-volt DC output on a keyed connector and uses a detachable IEC AC cord for 110 VAC/240 VAC, 50/60 Hz systems.

An in-line supply (PRE99-1206) is standard on the NetWave-8 and NetWave-16 consoles. It has a captive six foot DC cable to allow the supply to sit below the console within the cabinetry. This supply is not recommended for use on a NetWave-24 console.

NetWave-24 consoles ship with a rack mount Universal 48-volt DC Supply (PRE99-1205), which is also used on VistaMax card frames and RMX*digital* consoles. A 15-foot detachable DC cable (PRE90-1858-1) connects this supply to the console.

One supply comes standard with each console. A second matching redundant supply can be connected to a NetWave console by installing the optional PRE90-1995 Power Coupler.



Note: When adding a PRE99-1205 supply for redundant powering, order a PRE99-1205-1 supply, since it includes the PRE90-1858-1 15-foot DC cable).

The Universal 48-volt DC Supply has a recessed front panel on/off switch and a green LED to indicate the 48-volt output is good. The PRE99-1206 in-line supply has a green LED on the top of its case to indicate its 48-volt output is good. It does not have a power switch. Each supply is designed for continuous 24/7 operation and is fully regulated and protected against excessive current by internal fuses and electronic safeguards.

VistaMax Link

The RJ-45 VistaMax Link (Figure 1-9) connector, adjacent to the DC input connector on the rear panel, links the NetWave console to a VistaMax, Envoy, or VMConnect Hub card, using a crossover CAT5e or CAT6 cable. You must install a Link or Link Plus Activation Kit to use the Link connector.

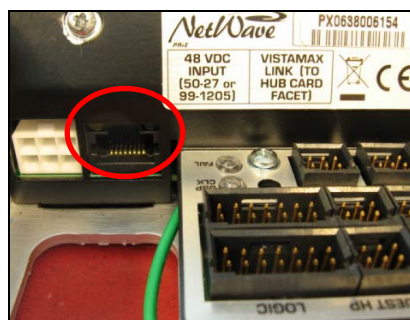


Figure 1-9. VistaMax Link

The Link connector outputs four stereo program buses, stereo cue bus, the two-channel Telco record output, up to six dual mix-minus signals, and one stereo source from each channel as VistaMax network source signals. The Link can also input a source signal from the VistaMax network to each fader channel and the two External Monitor inputs.

Specifications

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

General

Measured on a fully populated NetWave-24 with 100k Ω loads on the analog outputs.

0 dBu=0.775 volts RMS, regardless of circuit impedance (0 dBm into 600 Ω). Noise measured using a 20 kHz bandwidth. Add 1.7 dB for a 30 kHz bandwidth.

Total Harmonic Distortion (THD+N) measured with swept signal, at +18 dBu, with a 20 kHz low pass filter.

FSD (Full Scale Digital) = 0 dBFS (digital output), +24 dBu (analog output)

Dimensions

All NetWave console mainframes are 3" [76] maximum height above the countertop, except for the console display, which is 6" [152] high. The front-to-back depth of all mainframe sizes is 21" [533].

NetWave-8 is 20" [508] wide; NetWave-16 is 32.4" [823] wide; and NetWave-24 is 45.2" [1148] wide.

PRE99-1206 in-line supply for NetWave-8 and -16: 2" [51] x 3.8" [97] x 9.5" [241]

PRE99-1205 rack mount supply for NetWave-24 is 2 RU: 3.5" [89] x 19" [483] x 10" [254]

All dimensions - Height x Width x Depth, except as noted.

Power Supplies

Supply included with console: PRE99-1206 (NetWave-8 and NetWave-16) or PRE99-1205 (NetWave-24).

Optional Power Coupler (PRE90-1995) available for adding a matching redundant supply for on-air consoles

AC input voltage & frequency: 90-240 VAC, 50/60 Hz

AC input: detachable IEC power cord

DC output: a keyed, latching connector on a captive cable on the PRE99-1206 supply or a detachable cable (PRE90-1858-1) on the PRE99-1205 supply

Rack mount or in-line power supply: grounded through the AC input cord ground pin

Console Power Requirements

Measured at 120 VAC/60 Hz

NetWave-8: 54 watts; NetWave-16: 99 watts; and NetWave-24: 141 watts

Required Supply Voltage & Current

NetWave-8: +48 VDC @ 1.2 amps; NetWave-16: +48 VDC @ 2 amps; NetWave-24: +48 VDC @ 3 amps

Stereo Separation

Between Analog Program Outputs: >90 dB, 20 Hz to 20 kHz

Crosstalk Isolation

Program-to-Program bus: 85 dB, 20 Hz to 20 kHz

Frequency Response

Input to Program Output: +0.3 dB/-0.1 dB, from 20 Hz to 20 kHz

Dynamic Range

Analog Input to Analog Output: 106 dB referenced to FSD, 108 dB "A" weighted to FSD

Analog Input to Digital Output: 108 dB referenced to FSD, 110 dB "A" weighted to FSD

Digital Input to Analog Output: 108 dB referenced to FSD, 111 dB "A" weighted to FSD

Digital Input to Digital Output: 115 dB

Total Harmonic Distortion + Noise

Analog Input to Analog Output: <0.003%, 20 Hz to 20 kHz (<0.002% typical at 1k), +18 dBu input, +18 dBu output

Analog Input to Digital Output: <0.0009%, 20 Hz to 20 kHz, +18 dBu input, -6 dB FSD output

Digital Input to Analog Output: <0.003%, 20 Hz to 20 kHz (<0.002%, typical at 1 kHz), -6 dB FSD input, +18 dBu output

Digital Input to Digital Output: <0.0005%, 20 Hz to 20 kHz, -6 dB FSD input, -6 dB FSD output

Analog Line Inputs

Input Impedance: >60k Ω , balanced

Nominal Input Level: +4 dBu (each input can be independently trimmed by +/-15dB)

Input Headroom: 20 dB above nominal input

Analog Line Outputs

Output Source Impedance: <3 Ω , active balanced

Output Load Impedance: 1k Ω min.

Nominal Output Level: +4 dBu

Maximum Output Level: +24 dBu

CR & Studio Monitor Outputs

Output Source Impedance: <3 Ω , active balanced

Output Load Impedance: 1k Ω minimum

Nominal Output Level: +4 dBu

Maximum Output Level: +24 dBu

Digital Inputs and Outputs

Reference Level: 20 dB below FSD

Input Level: each input can be independently gain/trim set by +/-15 dB

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

AES-3 Input & Output Compliance: 24-bit sample rate conversion

Digital Reference: Crystal (internal) or VistaMax slave (external) at 48 kHz \pm 100 ppm

Output Sample Rate: 48 kHz nominal (individually switch set to 44.1 kHz)

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

Latency: <600 μ s, any input to monitor output

Warranty

Each NetWave console has a standard manufacturer's warranty of 15 months from the date of shipment of the equipment from GatesAir. To view or download the current GatesAir Standard Warranty Policy Statement for either domestic or international locations, go to:

<http://www.gatesair.com/services/technical-support/warranties.aspx>

Section 2 – Installation

The NetWave console sits on the countertop on multiple rubber pads. One cable access cutout should be cut below the mainframe so that wiring can cleanly connect to the console connectors, which are then hidden below a rear cover after installation. For security and stability, the console should be fastened to the countertop using two #8 or #10 screws or bolts (not supplied). Two .256" chassis holes behind the two front pads are supplied for this purpose (Figure 2-1).

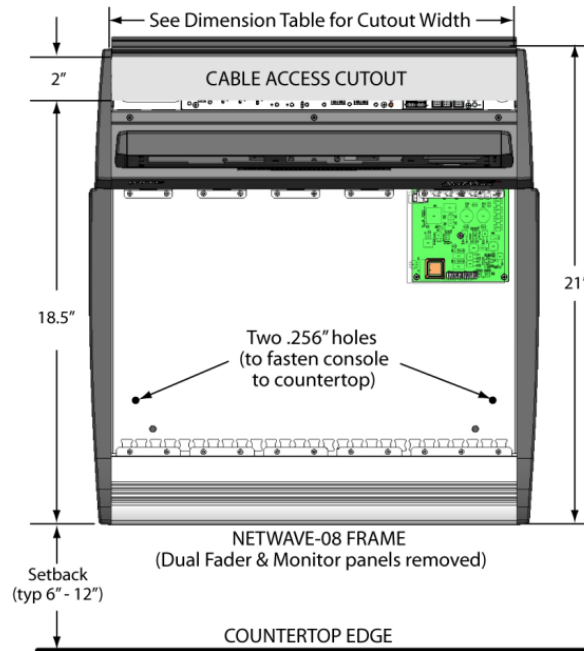


Figure 2-1. Cable Access Cutout & Console Mounting Holes

Table 2-1 gives frame sizes and cutout dimensions.

Table 2-1. Dimension Table

Frame Size	Width	Cable Access Dim
NetWave-8	20" [508]	2" x 17" [51 x 432]
NetWave-16	32.8" [833]	2" x 30" [51 x [762]
NetWave-24	45.6" [1158]	2" x 43" [51 x 1092]

Millimeter dimensions are listed in brackets. All dimensional tolerances are $\pm \frac{1}{4}$ " [6.4].

NetWave consoles are 21" [534] deep (from the front of the palm rest to the back tips of the side panels). Add .5" [13] additional clearance behind the console to fully open the connector cover when the console's rear is near a wall.

The overall control surface height is 3" [76] maximum. The console display's height is 5 $\frac{3}{4}$ " [146] above the countertop. Typical console setback, from the edge of the countertop to the console palm rest is typically between 6" [152] and 12" [305].

Your NetWave console shipment contains these items:

- NetWave mainframe, loaded with
 - DSP and Monitor & Output cards
 - The Monitor Control panel
 - Dual Fader panels
 - NetWave-8 console includes four panels
 - NetWave-16 console includes six panels plus two dual blank panels
 - NetWave-24 console includes nine panels plus three dual blank panels
- 48-volt DC power supply
 - PRE99-1206 in-line supply with the NetWave-8 and NetWave-16 consoles
 - PRE99-1205-1 rackmount supply and DC cable, shipped separately, with the NetWave-24 console

- Installation kit (MOD IV housings and receptacle contacts for all connectors, blank source name labels)
- Channel Setup Stylus Tool
- NetWave Quick Guide and other installation documentation

Console Installation



Note: Several video and PDF files are available on: console installation; installing optional items; setting up the console channels; and typical console operations. You can download these files from the GatesAir Customer Portal or the Harris FTP site. Section 5 – “NetWave Servicing” gives details on accessing these sites.

General Wiring Info

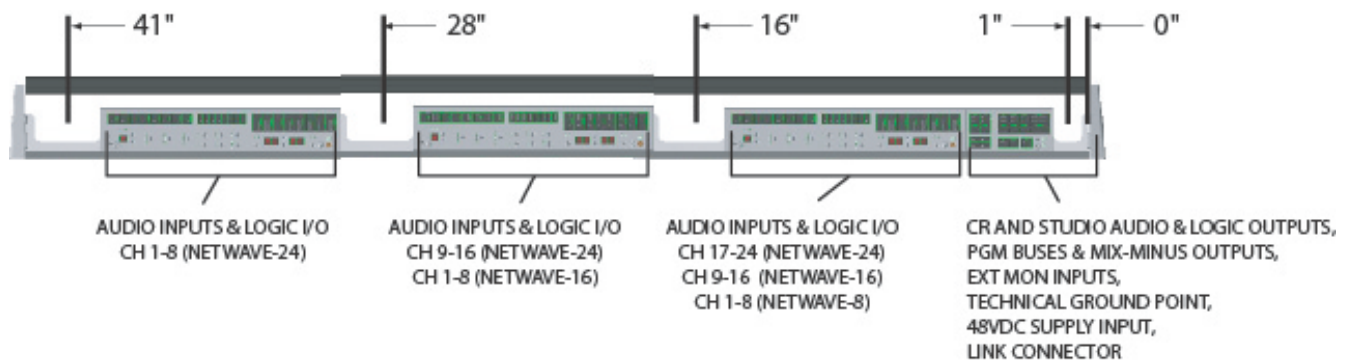
To facilitate console installation, create a wire list of all console interconnections to and from peripheral devices. Identify and create tags for each audio and logic cable. List these connections in a master facility wiring logbook to ease installation, future system wiring or equipment changes, and system troubleshooting.

The *Cabling & Wiring* subsection covers wire preparation and connector installation. Figure 2-34 shows block diagrams for all NetWave logic connector types. The *Connection Guides* subsection gives typical peripheral connections for the NetWave console (for example, microphone preamp, CD player, audio playback system, and linking the NetWave console with a VistaMax audio management system).

Audio cables to and from the NetWave console should always be run with the maximum practical distance from all AC power mains wiring. The console's 48-volt power cable carries only DC voltage so audio wiring can run parallel or even be tie wrapped to this cable without a problem.

The audio and logic wiring for each channel connects sequentially along the back of the console in groups of eight channels per DSP card. The chassis metal is cutaway between the DSP cards to facilitate getting the connectors and wiring up through the countertop cutout.

To ease installation, break out each group of cables, using Figure 2-2 dimensions as measured from the right end of the cutout (Figure 2-1). Cables are normally broken out and individually tie wrapped to the bottom of the countertop just behind the cable cutout. Leave a 6-to-8-inch service loop on each cable to ease installation and future wiring changes. This extra cabling hangs down into the cabinet (or the cable tray) after being connected.



**Figure 2-2. Console Connections with Access Points
(measured from right end of cable cutout)**

All monitor and program outputs, the CR & Studio logic cables, the 48-volt DC cable, the optional Link cable, and the technical ground wire all connect at the right rear corner of the console. (Note: All orientation references are made from the board operator's position standing in front of the console.) The chassis is cut out in this area to allow cables to come up from inside the cabinet or a cable tray.

The chassis is also recessed behind the four Pass Thru RJ-45 jacks on each DSP card for the cabling for Dual Router or Dual Selector panels.

In general, plug in audio and logic cables first. After plugging in each cable, fold its wires over the connector and drop the service loop wire into the gap between the connector and the flip-up rear cover. The technical ground wire, DC power cable, and any Link and LAN cables can then be connected. Again, leave all excess cable dropped down into the cabinet or into the cable tray.

Power Supply Placement

Two types of power supplies are used with NetWave consoles. Each power supply has a single 48-volt DC output cable with a keyed and locking connector. Each supply uses a detachable IEC AC input cable with a USA-type plug. The AC connector, or the IEC cord, must be changed for overseas operation. Both supplies can operate from 90 to 240 VAC on 50 or 60 Hz power.

- The PRE99-1206 in-line supply comes standard on NetWave-8 and NetWave-16 consoles. This supply has a captive six-foot DC cable, so it must be located near the right rear corner of the console. It is typically set on the cable tray or mounted within the cabinet. The supply can be tie-wrapped to a vertical wall to save space. This supply becomes warm under normal use. Since it uses free air space for ventilation, it must never be covered or closely enclosed.
- The PRE99-1205 Universal 48-volt Supply comes standard on the NetWave-24. It requires 2 RU of rack space within the console cabinetry, typically located below and to the left or right of the console. This supply is also used on VistaMax card frames and RMX*digital* consoles. A detachable 15-foot DC cable connects the supply to the NetWave console.

Either supply must be installed such that the keyed 48-volt supply cable is not under any tension when routed through the cabinet to the NetWave power connector. The 48-volt cable locks into a keyed power connector on the right rear corner of the NetWave chassis, as viewed from the board operator position.

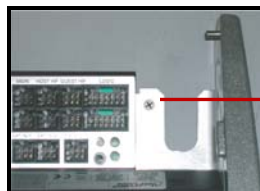
If you use the optional PRE90-1995 Power Coupler (optional) to add a redundant power supply for on-air consoles, the main and redundant power supplies plug into a Y-cable, which then plugs into the console. The Power Coupler Y-cable typically hangs down through the cutout so that the cable is below the countertop.



Note: Do not defeat the IEC power cord “U” safety ground in any way, as this action may create a potentially dangerous condition to the operator.

Grounding and Shielding

You should terminate a technical ground wire for the console in a crimped ring tongue terminal suitable for a #8 stud which connects to the NetWave chassis using a #8 screw in a threaded insert (Figure 2-3).



Tie a 14-16 AWG ground wire to this threaded insert using a ring tongue fastener and a #8 screw.

Figure 2-3. Technical Ground Connection Point, NetWave Chassis (right rear view)

When all system components share a common ground potential, using isolated ground AC outlets tied individually back to the main technical ground, the audio cable shields can connect at the console and peripheral ends, or you can use unshielded balanced wiring to simplify installation.

If isolated ground AC outlets are not used throughout, connect the cable shields at the console end only. Do not connect the shields 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 Noises – Buzz pickup is generally electrostatic, such as capacitive coupling between an audio line and an AC power line. To avoid audio ground noises, do not route audio wires in the same wireway as an AC power line.



Note: Strong electromagnetic fields from peripheral equipment using switching power supplies may impair NetWave performance, so keep these products as far away as practical from the console’s location.

Countertop Preparation

Follow the [Table 2-1](#) dimensions to mark and router the cable access opening through the countertop and substrate. Always radius the corners to prevent laminate cracks.



Note: If the console is set against a wall, leave a .5" [13] gap between the side panel ends and the wall so that you can open the rear connector cover fully.

Center the console over the cable access cutout so that the rear connector cover, when closed, covers the cutout. You can fasten the console to the countertop for security or stability. To do so, you must remove the leftmost Dual Fader panel and the Monitor Control Panel to access the two chassis holes. (Figure 2-1 shows the two hole locations.)

Control Panel Removal Procedure

Control panels fasten to the chassis using four, or six, M3x6 silver hex screws. Each panel plugs into a DSP or the Monitor & Output card using one-foot red cables. To remove a control panel perform these steps:

1. Remove the panel’s hex screws (four on the Dual Fader panels, six on the Monitor Control panel – Figure 2-4) using a 2 mm or 5/64" hex driver (a GatesAir PRE70-57 hex driver is supplied in the optional PRE76-1901 NetWave toolkit).



Figure 2-4. M3x6 Module Hex Screws

2. To access a panel’s red control cable, move the two faders to full off and lightly squeeze the two fader knobs together as you lift the panel up and slightly out of the chassis (Figure 2-5 on page 2-5).



Figure 2-5. Use of Faders to Lift Panel

3. Turn the module over, just above the slot, to access the red control cable (Figure 2-6).



Figure 2-6. Red Cable on Dual Fader or Monitor Control Panel

4. Unplug the red control cable from J5 on a Dual Fader panel or from J4 on the Monitor Control panel.
5. On a Dual Router or a Dual Selector panel, also unplug the blue cable from J3.



Note: This is a good time to install a Link activation kit since the Monitor Control panel is already out of the console. This is also a good time to make changes to the console's setup switches. (The *Monitor & Output Card Settings* subsection gives switch setting details.)

6. Before marking the holes to fasten the console to the countertop, verify that the console is set parallel to the countertop edge and that it completely covers the cable cutout.
7. Mark the two holes, and then move the console to drill pilot holes for screws or clear-thru holes for bolts. On laminate countertops, the hole through the laminate must be larger than the screw or bolt threads to prevent future laminate cracking.
8. Use #8 or #10 screws or bolts to fasten the console to the countertop substrate. Do not deform the chassis, or unbalance the rubber feet, by applying excessive torque on the screws or bolts.
9. Reinstall the panels in the mainframe, using the reverse order of their removal.

Console Option Installation

NetWave consoles normally ship from the factory in a standard configuration. Any console option ordered (Dual Selector upgrade, Link or Link Plus Activation kit, Dual Router upgrade, 4X-A2D converter, or additional Dual Fader panels) are typically packaged and shipped separately from the console. Any of these options can be added during console installation, or at a future date, as most options can be added with minimal interruption to operations. Link or Link Plus Activation kit installation does require that the console be powered down before the kit is installed but Dual Fader panels and Dual Selector or Dual Router upgrade kits can be installed while the console is powered up and is even on-air.

Link and Link Plus Activation Kits

A Link Activation kit (Figure 2-7) is required to activate the VistaMax Link connector on the NetWave console. The Link Activation kits convert a NetWave console from a non-networked standalone console into a networked console, making it ready to connect to a VistaMax Audio Management System.

The NetWave console's RJ-45 Link jack (Figure 2-8) is adjacent to the keyed DC power connector on the rear panel. This jack connects the console to any available VistaMax Hub card facet using a cross-over CAT5e or CAT6 cable (customer supplied). The maximum length of this Link cable is 330 feet [100 meters].



Figure 2-7. Link Activation Kit



Figure 2-8. RJ-45 Link Jack

Link or Link Plus activation adds these capabilities to the NetWave console:

- A routed VistaMax source signal can be set as either the A or B source on any fader channel.
- A routed VistaMax signal can be used in lieu of the local Ext In 1 and/or Ext In 2 monitor input.
- All console buses (four programs, two mix-minuses, Telco record, and stereo cue) plus one local audio input from each channel (either the analog or the digital input) are network sources, making them available for routing to any VistaMax destination.
- Link Plus Activation adds four network-only Telco mix-minus signals. On a NetWave-24 console, these four new mix-minus signals replace the local network sources from audio inputs 21 – 24.

To install either activation kit, you must power off the console and remove the Monitor Control panel.



Note: Discharge possible static charges before performing this procedure or handling any PROM.

Activation Kit Installation

1. Power down the console.
2. Perform the [Control Panel Removal Procedure](#) to remove the Monitor Control panel.
3. Use the PLCC Extraction Tool (Figure 2-9), which is included in the Activation kit, to remove PROM U64 (Figure 2-10) from the front left corner of the Monitor & Output card:
 - a. Place the two tool tips into the open corners of the PROM.
 - b. Squeeze the tool handles to "pop" the PROM out of the socket.



Figure 2-9. PLCC Extraction Tool

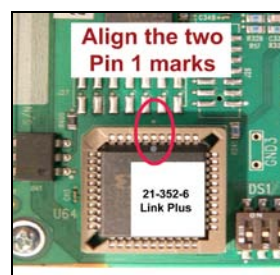


Figure 2-10. PROM U64

4. Place the Link PROM (21-352-4) or Link Plus PROM (21-352-6) into the U64 socket, aligning the Pin 1 mark on the PROM to the circuit board mark. Firmly press on the PROM to fully seat it into the socket.
5. Replace the Monitor Control panel (plug in the red flat cable and fasten the panel to the chassis).
6. Power up the console and verify the VistaMax Enabled label (Figure 2-11) is lit on the Monitor Control panel. The VistaMax Linked label, located next to the VistaMax Enabled label, will light up once a Link cable is connected from the NetWave's Link jack to a Facet jack on a VistaMax system Hub card.



Figure 2-11. VistaMax Enabled Label on Monitor Control Panel

Dual Router Upgrade Kit

A Dual Router upgrade kit adds a VistaMax source selector to both channels of any Dual Fader panel, turning it into a Dual Router panel. You must install a Link or Link Plus Activation kit to use a Dual Router panel.

Any Dual Fader panel can have a Dual Router kit installed but, for most applications, only one to three Dual Fader upgrade kits are installed in the console to add VistaMax source selection to two, four, or six fader channels. The remaining fader channels can also have a VistaMax source as their A or B input source, but there is no local selection control over the routed VistaMax source to these channels.

A Dual Router kit includes these parts:

- Two 10-character displays
- Two Next/Include All labels
- A plug-in processor card
- A blue flat cable
- An installation instruction sheet

Dual Router Kit Installation

1. Perform the [Control Panel Removal Procedure](#) to remove the Dual Fader panel.
2. Remove the two dark gray lenses from the front of the Dual Fader panel by unsnapping each lens, starting from the sides of the Dual Fader panel.
3. Remove and discard the black foam material covering the two display sockets.
4. Insert the two 10-character displays (Figure 2-12) into the two sockets. Orient the parts with their contact row (and part number side) toward the rubber silos that hold the A/B labels.



Figure 2-12. 10-Character Display Orientation

5. Lift the two A/B labels out of the rubber label silos and insert the two Next/Include All labels in their places. Note that rubber cement may have been used to glue the A/B labels to the silos.
6. Snap the dark gray lenses back onto the panel. Verify that the Next/Include All labels remain in the silos.

7. Perform these steps to secure the processor card:
 - a. Discharge static electricity before removing the processor card from its antistatic bag.
 - b. Firmly insert the processor card into the keyed connector at about a 45 degree angle.
 - c. Press down on the top of the card to lock it into the two card latches.
 - d. The card's bag has a label with its MAC address. On this label, write the console name and the names of the two channels this TINI controls. This information is needed during software configuration.
8. Plug the blue cable included with the kit into J3 on the Dual Router panel.
9. Hold the panel above its slot in the frame and plug the blue cable into the blue RJ-45 LAN Pass Thru jack, noting the jack's letter. (The same lettered jack on the rear panel is used to connect the Dual Router panel to the VistaMax LAN.)
10. Plug the red flat cable back into J5.
11. Set the panel onto the chassis mounting tabs, arranging the red and blue cables so they do not press against the processor card or get pinched by the panel's sides.
12. Refasten the panel to the chassis.
13. Connect a straight-thru CAT6 cable from the rear panel LAN Pass Thru jack, using the same letter jack as noted in Step 9) to a VistaMax LAN switch port.
14. Use VistaMax Control Center (VMCC) to configure the new Dual Router panel with the information written on the card's antistatic bag label.

Dual Selector Kit

A Dual Selector kit integrates source selection for a GatesAir 16x2 MicroRouter (a 1 RU device with 16 analog or digital inputs independently routed to two digital outputs). The Dual Selector kit adds two 10-character displays to the two faders so that the board operators can select, by name, up to 17 sources (the 16 selector inputs and the local analog input on that fader). You can install a Dual Selector kit into any NetWave Dual Fader panel to turn it into a Dual Selector panel.

A Dual Selector kit includes these parts:

- Two 10-character displays
- Two Next/Setup labels
- A plug-in Selector Interface card
- A blue flat cable
- An installation instruction sheet

Dual Selector Kit Installation

1. Perform the [Control Panel Removal Procedure](#) to remove the Dual Fader panel.
2. Remove the two dark gray lenses from the front of the Dual Fader panel by unsnapping each lens starting from the sides of the Dual Fader panel.
3. Remove and discard the black foam material covering the two display sockets.
4. Insert the two 10-character displays (Figure 2-12) into the two sockets. Orient the parts with their contact row (and part number side) toward the rubber silos that hold the A/B labels.
5. Pry out the two A/B labels from the rubber label silos and insert the two Next/Setup labels in their place. On some panels, rubber cement may be holding the A/B labels in place.
6. Snap the dark gray lenses back onto the panel. Verify that the Next/Setup All labels remain in the silos.

7. Perform these steps to secure the Interface card:
 - a. Discharge static electricity before removing the Interface card.
 - b. Firmly insert the Interface card into its connector at about a 45 degree angle.
 - c. Press down on the top of the card to lock it into the two card latches.
8. Plug the blue cable included with the kit into J3 on the Dual Selector panel.
9. Hold the panel above its slot in the frame and plug the blue cable into the blue RJ-45 LAN Pass Thru jack, noting the jack's letter. (The same lettered jack on the rear panel is used to connect the 16x2MicroRouter.)
10. Plug the red cable back into J5.
11. Set the panel onto the chassis mounting tabs, arranging the red and blue cables so they do not press against the Interface card or get pinched by the panel's sides.
12. Refasten the panel to the chassis.
13. Connect a straight-thru CAT6 cable from the rear panel LAN Pass Thru jack, using the same letter jack as noted in Step 9) to the MicroRouter's Dual Selector RJ-45 jack.
14. Perform these steps to change the source names that appear on the Dual Selector panel:
 - a. On the *left fader channel*, press and hold the **Offline** and **Take** buttons for about three seconds to put the Dual Selector panel into Setup mode.
 - b. Use the *left fader* **UP** and **DN** buttons to step through the 18 source names (the 16 inputs on the MicroRouter and the two local analog inputs on these two fader channels).
 - c. The first letter in each displayed source name begins blinking. Use the *right fader* **UP** and **DN** buttons to change the character for this letter.
 - d. Press the *right fader* **Take** button to accept the new character. The next letter begins blinking. When you press the Take button while the 10th (or right-most) letter is blinking, the cursor wraps back around to the first letter.
 - e. To clear the entire name, press and hold the left fader Take button. When an input is not connected, clear its name and leave it blank so that the input does not appear as a possible source when the board operator selects a new source.
15. To exit Setup mode, press and hold the left fader **Offline** and **Take** buttons for three seconds. The Setup labels are no longer lit, indicating the panel has returned to Operation mode.

4X-A2D Quad Converter

PRE99-1430, a 4X-A2D Quad Converter (Figure 2-13) converts four balanced or unbalanced analog inputs into four AES-3 digital outputs. The converter is used in facilities with more analog peripherals than console inputs. It allows four analog peripherals to connect to four NetWave digital inputs or any other AES input.



Figure 2-13. 4X-A2D Quad Analog-Digital Converter

Two pre-wire packages are also available with the 4X-A2D converter:

- PRE99-1430-1 includes four 3-foot MOD IV to MOD IV cables (to jumper the 4X-A2D digital outputs to four NetWave digital inputs) to the 4X-A2D converter and connector kit.
- PRE99-1430-2 includes nine eight 20-foot pigtail cables so that the converter can be placed almost anywhere within the studio. Four cables are 6-pin MOD IV to pigtails to connect analog devices. The other five cables are 3-pin MOD IV to pigtails to connect to the NetWave console and to a digital reference signal.

Dual Fader Panels

The NetWave-8 console comes fully populated with four Dual Fader panels. The NetWave-16 console comes with six Dual Fader panels and two Dual Blank panels. The NetWave-24 console comes with six Dual Fader panels and three Dual Blank panels. You can replace any Dual Blank panel with a Dual Fader, a Dual Selector, or a Dual Router panel. You can also upgrade any Dual Fader panel to be a Dual Router or a Dual Selector panel by installing an upgrade kit. Each panel type is fastened using four hex head screws.

Dual Fader Panel Installation in Place of a Dual Blank Panel

1. Using a 2 mm or 5/64" hex driver, remove the four screws fastening the Dual Blank panel to the chassis.
2. Lift the panel out of the console.
3. Cut the tie wrap on the red flat cable folded below the Dual Blank panel.
4. Plug this red cable into J5 on the fader panel.
5. For a Dual Router or Dual Selector panel, connect its blue CAT-5 cable to the LAN passthru jack.
6. Fasten the panel to the chassis using the screws removed in Step 1.

Console Display

A DirectView Console Display with two meters (Figure 2-14) comes standard on all console sizes. An optional Quad Meter upgrade, available on the NW-16 and NW-24 consoles, adds two additional meters (Figure 1-1). Every display includes a digital clock and a count-up event timer (to the right of the meters) and a cue speaker (mounted behind a mesh screen just below the meters). The DirectView Console Display is fastened to the top of the console frame, just behind the control panels.



Figure 2-14. Dual Meter Console Display

The Dual Meter Display has two horizontal stereo bar graph meters. Alphanumeric displays below each meter identify the displayed signal (PROGRAM 1, PROGRAM 2, and so forth). The meters provide simultaneous level monitoring of the Program 1 bus (left-hand meter) and a second bus or system signal on the right-hand meter (called the Auxiliary Meter). The source for the Auxiliary meter is set by the Aux Meter select buttons on the Monitor Control panel. The Aux Meter can alternately display the cue bus levels when cue is active on any fader channel.

A Quad Meter Display allows the levels of all four Program buses to be displayed simultaneously. The left three meters display Program 1, Program 2, and Program 3 respectively. The right-most meter (Aux) functions the same as on a Dual Meter Display.

Various meter, clock, and event timer parameters are set using multi-switches (inside the Console Display) on the meter-clock-timer board (in the Dual and Quad Meters) and on the two-meter board (in the Quad Meter only). The rest of this section discusses accessing and setting these switches.

Here are the display parameters and settings (factory default settings listed first):

- Meter Display Mode (average plus peak display; average-only display)
- Blue Over LEDs turn-on level (-6 dBFS; -4 dBFS; -2 dBFS; 0 dBFS)
- Peak Signal Hold (2-second hold; no peak hold)
- Clock Mode (autonomous; slaved to an ESE or SMPTE master clock input signal)
- Autonomous Time Display Mode (12-hour; 24-hour)
- Master Clock (autonomous; ESE; SMPTE)
- Event Timer (always displays .1 second; does not display .1 second while running)

Clock Setting

When used autonomously (the factory setting), a quartz crystal oscillator controls clock timing. After you apply power to the console, you must manually set the clock to the current time using the three recessed buttons near the clock display (Figure 2-15).

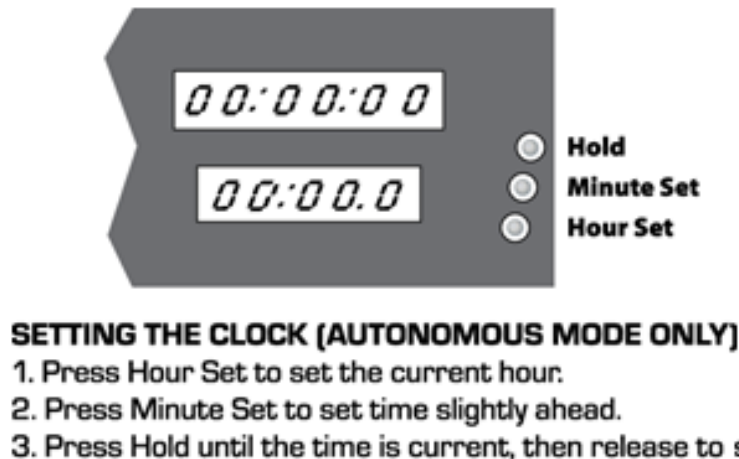


Figure 2-15. Clock Setting Procedure

The three recessed buttons have these functions:

- The Hour Set button (at the bottom) adjusts the hours display.
- The Minute Set button (in the middle) adjusts the minutes display.
- The Hold button (at the top) freezes the clock time so that it can be manually synchronized to a local time reference. Set the time slightly ahead of the reference time and then press **Hold**. Release **Hold** when the time display matches the reference time.



Note: When the clock is slaved to an ESE or SMPTE master clock, and the master clock signal is not present, the clock reverts to its internal oscillator and both display colons blink to indicate the selected ESE or SMPTE time code is not being detected or is not valid.

The clock maintains accurate time for about three days with the console powered off. After this period, the time needs to be reset when autonomous mode is being used.

Console Display Setup Switches

To access the console display setup switches, remove the DirectView display's rear cover. On a Dual Meter, the rear cover is fastened to the console by two black #1 Phillips screws. On a Quad Meter, the rear cover is fastened by three #1 Phillips screws. Remove and retain these screws, and then pull off the display's rear cover.

A Dual Meter has one circuit board (Figure 2-16) which is used to set the two meters. A Quad Meter has a second board, called the two-meter board. It also has a setup switch labeled DS3 (but turned 90° on the board) with the same functions as in Figure 2-16. It affects the Program 1 and Program 2 meters in a Quad Meter while the meter-clock-time board's DS3 switches affect the Program 3 and Auxiliary meters. Typically, both DS3 multi-switches are set to the same positions on the two boards.

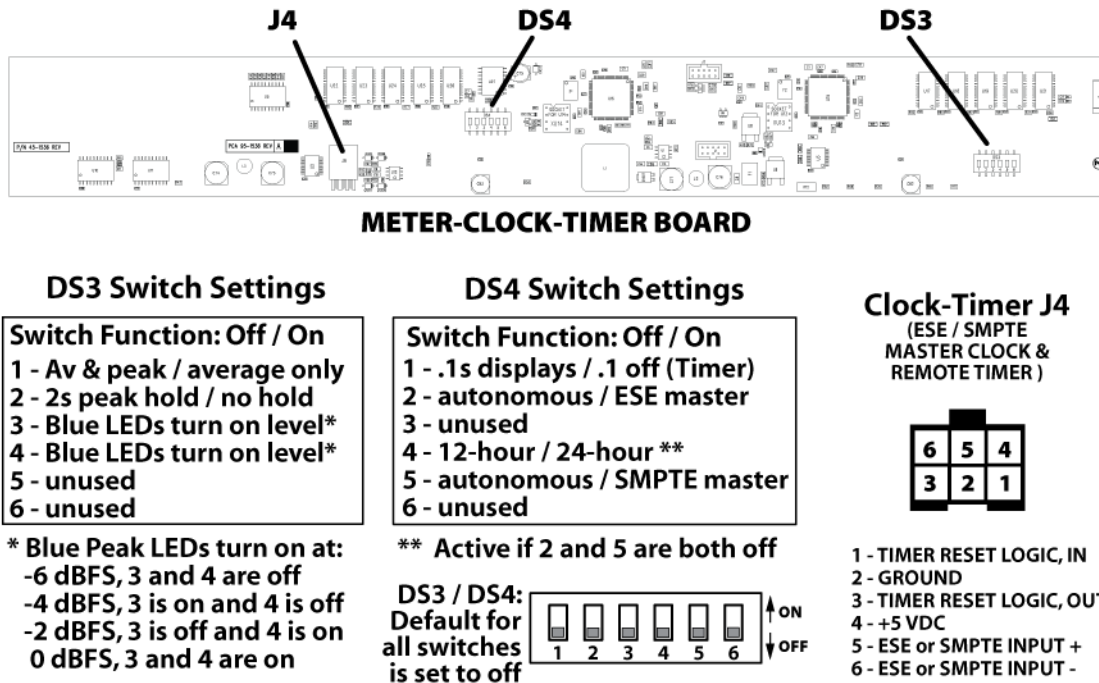


Figure 2-16. Console Display PCA Setup Switches and Connections



Note: For safety, touch the metal chassis to dissipate static *before* changing any switch or connecting an ESE, SMPTE, or remote timer cable. Do *not* touch any components on the meter-clock-timer or two-meter boards other than the setup switches and connector J4.

Clock Settings

Clock parameters are set using multi-switch DS4, located near the center of the meter-clock-timer board. The default setting is OFF for all switches. (Unused switches 3 and 6 should always be set OFF.)

In autonomous mode (switches 2 and 5 both set OFF), the time can appear in 12-hour format (switch 4 set to OFF) or 24-hour format (switch 4 set to ON). The switch 4 setting is ignored when a master clock signal is connected to the clock and either switch 2 or switch 5 is set ON.

When an ESE TC-89 or TC-90 master clock is used, set switch 2 to ON. The ESE signal type is auto-detected. When a SMPTE master clock is used, set switch 5 to ON. If both switches 2 and 5 are set ON, an ESE signal takes priority.

Master Clock Connection

An adapter cable brings the Master Clock and Timer Reset pins (Figure 2-17) from J4 on the meter-clock-timer board to a square four-pin Molex connector mounted on the rear connector panel. The NetWave installation kit includes Molex crimp pins and the mating 4-pin housing.

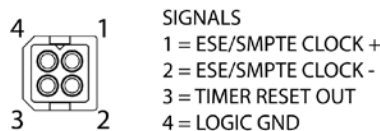


Figure 2-17. Master Clock & Timer Reset Connections

The ESE or SMPTE master clock connection is polarity sensitive—even though either a balanced or an unbalanced signal may be connected. The center conductor, or the + (high) signal, has to connect to pin 1 and the shield (or - (low) signal) has to connect to pin 2. No shield connection is required for a balanced signal. To reset a studio event timer, connect its timer reset command input to pin 3 (timer reset out) and connect the logic ground to pin 4.

Event Timer Settings

The event timer displays time in minutes, seconds, and tenths of seconds. The only timer setting (DS4, switch 1) sets whether the tenths of seconds digit is displayed while the event timer is running.

When set OFF (the factory default) the tenths are always displayed. When DS1-1 is set ON, the tenths of seconds are not displayed while the timer is running, but are displayed while the timer is stopped or is being held.

Meter Display Settings

On a Dual Meter display, the Program 1 and Auxiliary meter parameters are set using multi-switch DS3 (Figure 2-16) on the meter-clock-timer board. On a Quad Meter display, DS3 on the meter-clock-timer board affects the Program 3 and Auxiliary meters. The two-meter board (with its DS3 switch mounted in a vertical orientation) affects the first two meters (Program 1 and Program 2). Typically the DS3 switch settings on both boards are set to the same settings. The DS3 factory setting is all switches are set OFF.

- To show the average meter levels only (turning off the peak display), set switch 1 to ON.
- To have the Peak LEDs decay immediately, set switch 2 to ON.
- To change the level at which the Blue Peak LEDs turn on
 - Set switch 3 and 4 to off to turn on the Blue LEDs at -6 dBFS (default setting).
 - Set switch 3 on and switch 4 off to turn on the Blue LEDs at -4 dBFS.
 - Set switch 3 off and switch 4 on to turn on the Blue LEDs at -2 dBFS.
 - Set switch 3 on and switch 4 on to turn on the Blue LEDs at 0 dBFS.
- Leave switches 5 and 6 set to OFF.

Monitor & Output Board Settings

The Monitor & Output board has two multi-switches to set various console parameters. The factory default setting for most switches is OFF. To access the two multi-switches (Figure 2-18) on the Monitor & Output board, you must remove the Monitor Control panel from the chassis per the [Control Panel Removal Procedure](#).

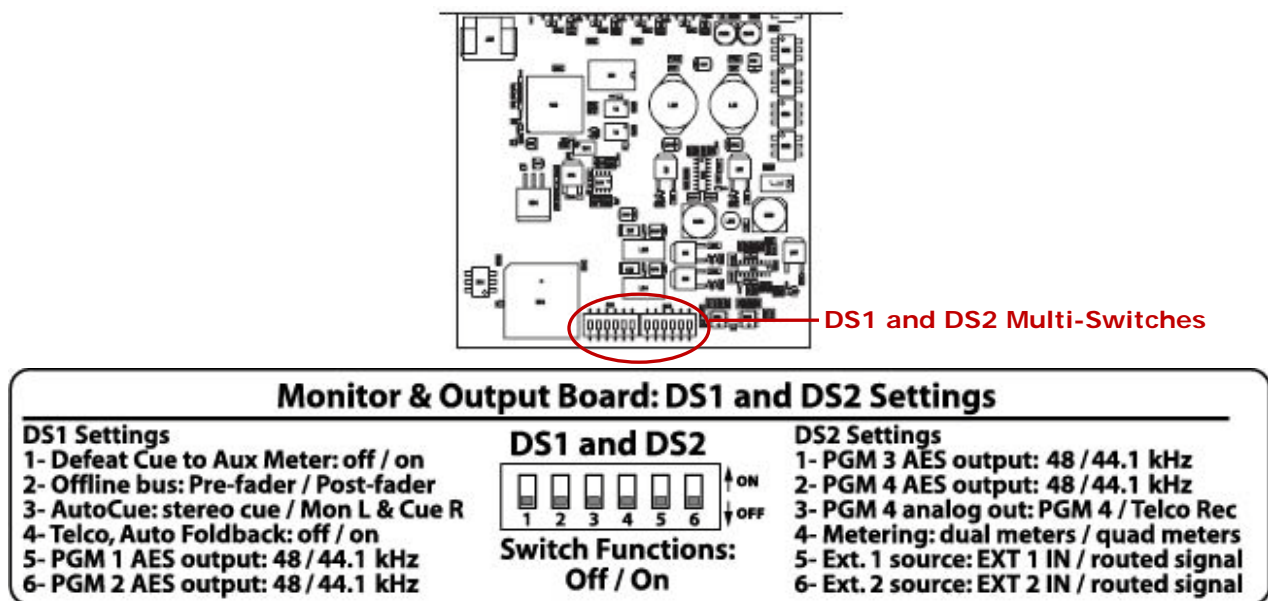


Figure 2-18. Multi-Switch Settings on Monitor & Output Board

DS1 and DS2 Settings

Multi-switches DS1 and DS2 are at the front edge of the Monitor & Output board, hidden below the Monitor Control panel in normal use. Here is an overview of the switch functions:

- DS1, switch 1 affects the Aux meter display. When set OFF, cue level is displayed in the Aux meter while cue is active. When set ON, the Aux meter does not display the cue level.
- DS1, switch 2 affects the Offline bus signals to the remotes and callers. When set OFF, the Offline audio is derived pre-fader. When set ON, the Offline signals are derived post-fader.
- DS1, switch 3 affects the operator headphone output when AutoCue is active. When set OFF, cue is fed to the headphones in stereo (typically used for production rooms). When set ON, a split feed (monitor to one ear, cue to the other) is sent to the headphones (typically used for on-air consoles).
- DS1, switch 4 affects how all Telco channels function. When set OFF, the mix-minus source (the winking bus assignment button) is not affected by the Telco channel status. When set to ON, the Auto Foldback function is activated. The mix-minus audio automatically switches between Offline, when the Telco channel is off, and the lowest selected program bus, when the Telco channel is on. If Offline is not lit on a Telco channel, no mix-minus audio is heard while that channel is off, except for talkback from the board operator mic to that Telco.
- The next four switches (DS1, switches 5 and 6 and DS2, switches 1 and 2) set the sample rate output for the Program 1, Program 2, Program 3, and Program 4 digital outputs. When set OFF, the sample rate is 48 kHz. When set ON, the sample rate is 44.1 kHz.
- DS2, switch 3 selects what audio is output on the console's Program 4 analog connector. When set OFF, Program 4 is heard. When set ON, the Telco Record audio is heard instead. This setting does not affect the digital Program 4 output or the Program 4 VistaMax system signal.
- DS2, switch 4 is only set ON if a Quad Meter is installed. For a Dual Meter, the switch must be set OFF.
- DS2, switch 5 and DS2, switch 6 set which source goes to the External 1 and External 2 monitor selectors. When set to OFF, the local EXT 1 and EXT 2 audio input is used. When set to ON, the signal comes from the VistaMax system. The ON setting should only be used when a Link or Link Plus Activation kit is installed.

NetWave Configuration

Figure 2-19 shows the location of the NetWave console's main components within the chassis:

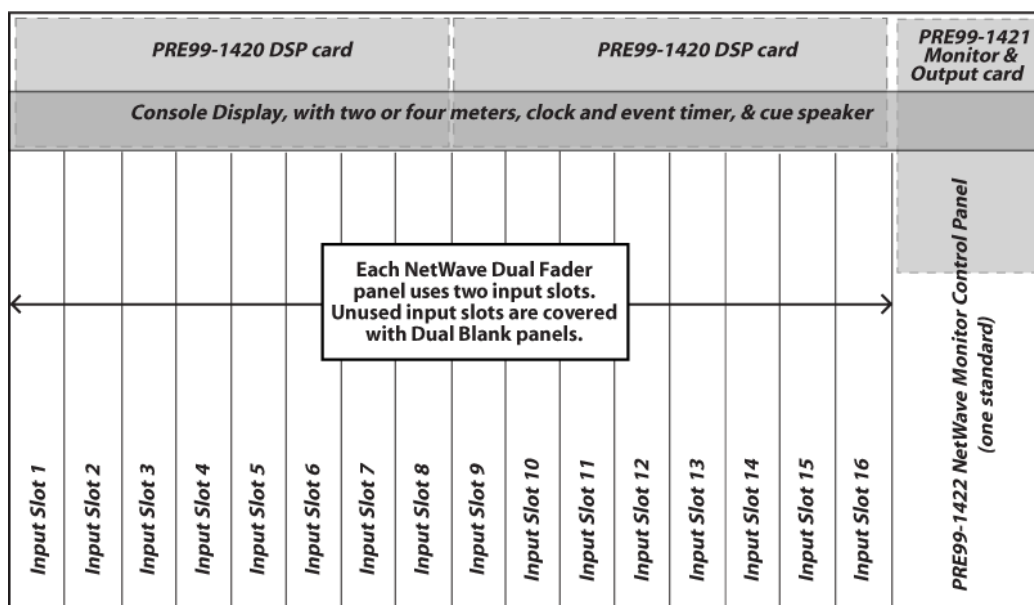


Figure 2-19. NetWave-16 Frame Configuration

Notes: The console model number (NetWave-8, -16, or -24) indicates the number of fader input slots available in the chassis. One Monitor & Output card, one DSP card, and one Monitor Control panel (three input slots wide) are standard on all frame sizes. The NetWave-8 console adds four Dual Fader panels, standard. The NetWave-16 console adds a second DSP card, six Dual Fader panels, and two Dual Blank panels, standard. The NetWave-24 console adds two more DSP cards, nine Dual Fader panels, and three Dual Blank panels, standard.

Here is a list of user-installed NetWave console options:

- PRE99-1423 Dual Fader Panel
- PRE99-1424 Dual Router Upgrade Kit
- PRE 99-1425 Link Activation Upgrade Kit
- PRE 99-1426 Link Plus Activation Upgrade Kit
- PRE 99-1428-2 Dual Selector Upgrade Kit with 16x2 MicroRouter
- PRE 90-2125 Dual Blank Panel

Each slot, or control panel frame position, is 1.6" wide. The Monitor Control panel is three slots wide. All other panels are two slots wide. There are 16 input slots on a NetWave-16 console, so you can install up to eight of any combination of these panel types:

- Dual Fader
- Dual Selector
- Dual Router
- Dual Blank

The NetWave-16 console, as shipped from the factory, includes six Dual Fader panels installed in slots 1-12 and two Dual Blank panels installed in slots 13-16. You can install additional Dual Fader panels (PRE99-1423) into slots 13-16 at the time of initial installation or any time afterwards. If purchased with the console, they are separately boxed and are installed in place of the Dual Blank panels. You can also install additional Dual Fader panels into the NetWave-24 console, which ships with nine Dual Faders in slots 1-18 and three Dual Blank panels in slots 19-24.

Dual Faders & DSP Cards

Four Dual Fader, Dual Router, or Dual Selector panels connect to each DSP card (Figure 2-20). Each panel connects to a specific RJ-45 jack labeled by its channel assignments, such as Fader Panel 7 & 8, identifying the two channels that are serviced, with 48-volt DC power and control signals, by each jack. Each RJ-45 jack has a one-foot red, flat cable plugged into it. A NetWave-8 frame has four cables, a NetWave-16 has eight cables, and a a NetWave-24 frame has 12 cables. On blank panels, these cables are tie-wrapped below the blank panels.

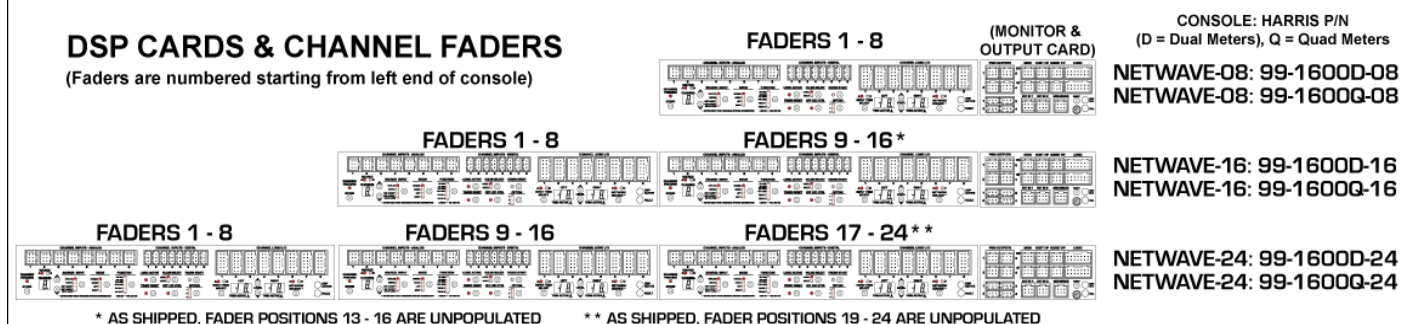


Figure 2-20. DSP Card Fader Connections

The optional Dual Router and Dual Selector kits add a second cable (blue flat) that connects the Dual Router kit's Processor card to the VistaMax LAN or the Dual Selector's Interface card to a 16x2 MicroRouter. Thus, there are two RJ-45 jacks located on the chassis below each panel's rear mounting bracket. A color-coded chassis label identifies the function of each jack. (The red jack is for the red power and control cable, and the blue jack is for the optional Dual Router or Dual Selector blue cable.)

Audio Inputs and Logic I-O Connections

Each DSP card has eight analog inputs, eight digital inputs, and eight Channel Logic I-O connectors (Figure 2-21). Each DSP card also has a group of Channel Setup buttons and accompanying LED indicators. These buttons are used to set up each A and B source on each fader channel by

- Selecting which physical input (analog or digital) is assigned as the A or B channel source.
- Setting the input mode (stereo, left-only, right-only, mono sum).
- Setting that input's function (line, CR mic, CR mic talk source, Studio mic, Telco input).
- Setting whether the logic I-O is active.
- Setting several other input and channel control parameters.

Here is a summary of common definitions used for various NetWave signals and control panel terms that are used throughout this manual:

- **Channel slot** (1 to 8, 1 to 16, or 1 to 24) – The left-to-right frame positions, as viewed by a board operator, where Dual Fader, Dual Selector, Dual Router, or Dual Blank panels are installed. Slots are equivalent to the Fader numbers shown in Figure 2-20.
- **Channel strip** – The set of physical channel controls associated with a fader. There are two channel strips per Dual Fader, Dual Selector, or Dual Router panel.
- **Source** – The two operator-selected channel sources (A, B) available on each Dual Fader channel strip or the multiple sources available on Dual Selector and Dual Router panels.
- **Local Inputs, Outputs, or Logic I-O** – The physical audio and logic connections on each DSP card and Monitor & Output card.
- **Fader Channel** – One half of a Dual Fader, Dual Selector, or Dual Router panel. Each panel has a left channel fader and a right channel fader.
- **Buttons** – The group of Channel Setup buttons on each DSP card.

Setup Controls

Each DSP card has a common group of setup controls (Figure 2-21), to separately assign the A and B source parameters, for the eight fader channels plugged into that DSP card. Each DSP card is identical.

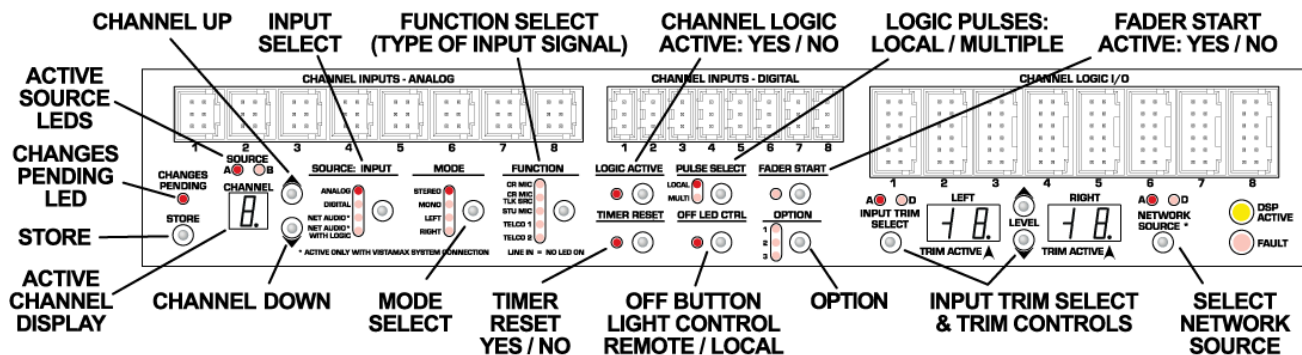




Figure 2-21. DSP Card Setup Controls

A Setup Stylus Tool (PRE70-160), included with the console, is used to press the recessed Channel Setup buttons. Some advanced setup commands require pressing two buttons (such as **Option** and another button) simultaneously. If two NetWave Setup tools are not available, you can use any blunt-tipped nonconductive object (wooden swab, toothpick, pencil, pen, and so forth).

Note: Bold print in the following sections identify setup buttons or displays on the DSP cards.

The Channel Setup Controls are typically not used until after the console is fully wired. Because parameter changes take effect immediately, the active signal and its level and logic settings can be confirmed by using the console fader assignments, logic connections, console meters, and monitor outputs.

Press **Channel Up** , **Channel Down** , or **Store** to turn on the DSP setup buttons and LEDs. The Active Channel Display number (1 – 8) along with a lit **Source A** and/or **B** LED on the DSP card identify the active channel and source. A corresponding blinking **A** and/or **B** LED on a fader panel identifies the active fader channel.

DSP Card Operational Modes

The Channel Setup Controls on each DSP card have four modes of operation:

- **Sleep Mode** – Used during normal console operations. No displays or LEDs are lit, except when a console optional feature is active, then the corresponding **Option** LED(s) will be lit. The **Channel Up**, **Channel Down**, and **Store** buttons are the only active buttons.

Setup controls automatically return to *Sleep Mode* five minutes after the last button press. Pressing the **Store** button, while in *Parameter Set Mode*, saves the parameters and also returns that DSP card to *Sleep Mode*.

- **Parameter Set Mode** – Used to view, edit, and store the channel source parameters.

From *Sleep Mode*, press **Store**, **Channel Up**, or **Channel Down** to enter this mode. You can view parameters for each channel source and change them as needed. (A **Changes Pending** LED blinks to indicate that one or more changes have been made.)

Note: Parameter changes take effect immediately so use caution when making changes on an active console.

Once all channel parameters are changed as required, press **Store** to save the new settings to nonvolatile memory. The DSP card returns to *Sleep Mode*. If you have not made any changes, pressing **Store** simply returns the panel to *Sleep Mode*. The DSP card also times out five minutes after the last button press. Any changed parameters will automatically be stored when the DSP card times out before returning to *Sleep Mode*.

- **Parameter Copy Mode** – An alternate setup mode that can be entered from any other mode by pressing **Option + Channel Up**. If the **Changes Pending** LED is blinking when this is done, the changes are stored before this mode is activated. *Parameter Copy Mode* is identified by a period in the Active Channel Display.

In this mode, parameter settings are not recalled as the channel source is changed. Instead, you can set up one group of parameters for a specific type of input device, such as a studio microphone, and then copy and paste these settings to any number of channel sources. This process simplifies setting up devices with the same settings, such as control room mics, studio mics, computer playback channels, and general audio players (such as CD, MD, handheld recorders, and so forth).

After pressing **Option + Channel Up**, set the required parameters for the device (such as a Studio Mic with logic). Once you set the parameters, select the first channel source to use these settings, and press **Store**. Select additional channel sources that use these same settings, pressing **Store** each time to update each channel source's settings.

Press **Option + Channel Up** to exit *Parameter Copy Mode* and return to *Parameter Set Mode*. If no further changes are required, press **Store** to save the new settings to nonvolatile memory and return the card to *Sleep Mode*.

- **DSP Test Mode** – Used to test and confirm connections during installation. Press **Option + Channel Down** to enter this mode from any other mode. If the **Changes Pending** LED is blinking, the current parameters are stored to nonvolatile memory before entering this mode. The Active Channel Display number blinks to indicate the *DSP Test Mode* is active.

While this mode is active, the fader panel controls on the eight channels on the DSP card are locked out. All Program buttons are assigned, all channels are set for the **A Source**, and the channel fader level is set to nominal. The same set of parameters is applied to all channels. Press **Channel Up** or **Channel Down** to step through the channels. This turns one channel On and turns all other channels Off so that the audio inputs can be confirmed or tested.

To exit this mode, press **Option + Channel Down** to return to *Parameter Set Mode*. Press **Store** to exit to *Sleep Mode*. Chapter 5 – NetWave Servicing gives additional details on the *DSP Test Mode* and the other modes available to test control panels.

Setup Control Summary

The DSP card setup controls (Figure 2-21, page 2-16) are used to view, set, and store the parameters for each **A** and **B Source** on each fader channel. These controls are normally used in *Parameter Set Mode*, where the active parameter settings for each of the eight channels and their A and B sources are shown as **Channel Up** or **Channel Down** is pressed to step through the fader channels hosted by that DSP card.

The **Channel Display** identifies which channel (**1** to **8**) and which source (the **A** or **B** source LED is lit) is active. The current parameters for the active channel source appear on the parameter LEDs and trim displays. That channel strip's **A** or **B** label also blinks to indicate it is the active channel source. Both source LEDs will light on Dual Router panels since a Dual Router only has one source: network audio.

In *Parameter Set Mode*, changing any parameter causes the **Changes Pending** LED to blink. After you change the parameters on all channels, pressing **Store** saves the updated parameter settings to nonvolatile memory. The changes are also automatically saved to nonvolatile memory when the panel automatically returns to *Sleep Mode* after timing out from five minutes of no button activity.

Note: Changes to parameter settings *immediately* affect the active channel so that the input selection, mode selection, function settings, logic settings, and level trim settings can be actively monitored during parameter setup. Use caution when changing parameters on consoles that are on-air.

Here is a summary of the functions for each DSP card setup button, LED, and display:

- **STORE** — This button is multifunctional:
 - From *Sleep Mode*, press this button to wake up the DSP card to *Parameter Set Mode*.
 - In *Parameter Set Mode*, press this button to store all channel sources to nonvolatile memory and return the controls to *Sleep Mode* when the **Changes Pending** LED is blinking. If that LED is not blinking, pressing **Store** just returns the DSP card to *Sleep Mode*.
 - In *Parameter Copy Mode*, pressing this button stores the parameters to the active channel source.
- **CHANGES PENDING** — This LED blinks when at least one parameter has been changed in the dynamic memory but has not yet been saved to nonvolatile memory.
 - In *Parameter Set Mode*, pressing **Store** turns off this LED, saves the parameters, and returns the DSP card to *Sleep Mode*.
 - In *Parameter Copy Mode*, pressing **Store** saves the current parameter settings to that channel and turns off the LED. Changing the channel source turns the LED on again.
- **CHANNEL UP** & **CHANNEL DOWN** — In *Parameter Set Mode*, pressing these buttons steps through the eight channels' A and B sources to show the current parameter settings. In *Parameter Copy Mode*, the two buttons also step through the channel sources, but the parameters are not recalled since this mode allows one set of parameters to be set and then stored, as required, to multiple sources. Press **Channel Up + Option** to enter or exit *Parameter Copy Mode*. Press **Channel Down + Option** to enter or exit *DSP Test Mode*.



- **CHANNEL & SOURCE** — The 7-segment **Channel** display shows the active channel number. The lit **A** and/or **B** LED indicates the active source. Press **Channel Up** or **Channel Down** to step sequentially through the channels (**1** to **8**) and their sources (**A** and/or **B**). The channel numbers wrap around; for example, pressing **Channel Up** at **Source 8B** goes to **Source 1A**, and vice versa.

The decimal point is lit when *Parameter Copy Mode* is active. The 7-segment display blinks when *DSP Test Mode* is active. Both the **A** and **B** LEDs light up on Dual Router and Dual Selector panels, since those fader channels only have one source.



- **SOURCE: INPUT** — This button selects which audio input feeds the active channel source.

- **Analog** — The channel's local analog input is the source
- **Digital** — The channel's local digital input is the source
- **Net Audio** — A routed audio signal, with no logic control, is the source
- **Net Audio with Logic** — A routed source, with logic control of the channel, is the source.

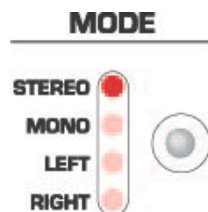
SOURCE: INPUT



Note: The two Net Audio selections are only available when the console's VistaMax Enabled and Linked labels are both lit on the Monitor Control panel, indicating the NetWave console is networked with a VistaMax system.

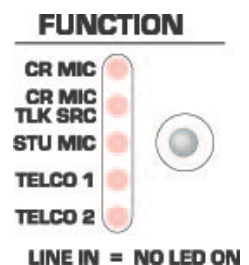
- **MODE** — Press this button to select how the audio input is fed to the active fader channel. The default setting is stereo.

- **Stereo** — Use this setting with stereo sources like CD players.
- **Mono** — Use this setting to sum the left and right inputs to a mono signal that then feeds both the left and right channels of the fader. This setting is typically used on a call recorder, where the caller is recorded on one channel and the talent is recorded on the other channel, and for news or mono AM broadcast applications, where all audio coming into the console is set for mono sum.
- **Left & Right** — These two settings allow two mono sources to “share” one stereo input connector. One typical application is to connect two mics: a guest mic in the control room and a guest mic in a studio. The control room guest mic preamp would typically connect to the **Left** input and be set as the **A Source**, while the studio guest mic preamp would connect to the **Right** input and be set as the **B Source**. When the channel source is **A**, the control room guest mic is active. When the channel source is **B**, the studio guest mic is active.



- **FUNCTION** — This button sets what type of signal is connected to the channel source. This setting directly affects monitor output muting; the console mix-minus outputs; and the channel, control room, and studio Logic I-O signals.

- **LINE IN** — When no **Function** LED is lit, the signal is defined as a line input device (such as a CD player, MD player, computer playback system, Shortcut, Instant Replay, World Feed Panel input, and so forth). With this type of **Function**, the channel does not mute any monitor output when turned on.
- **CR MIC** — This setting defines the audio signal as being a control room mic. When the channel is turned on, the CR Monitor output mutes and the control room warning command is activated.
- **CR MIC TLK SRC** (Talk Source) — This setting also defines the signal as a control room mic, with the same muting and logic features as the **CR MIC** setting. But, the **CR MIC TLK SRC** setting further defines the audio input as the source feeding the console talkback to the studio and to callers/remotes. Multiple CR mics can be set as **CR MIC TLK SRC**, but this setting is typically limited to the board operator mic and a producer mic.



- **STU MIC** – This setting defines the audio input as a studio mic. When the channel is turned on, the studio monitor output mutes, and the studio warning command is activated. If a Mic Control Panel with Talkback button is used, that mic position can talk back to the control room.
- **TELCO 1** or **TELCO 2** – These settings identify the input signal as a “four-wire device” which means there is an associated mix-minus output signal from the console to will connect back to the four-wire device. Some typical four-wire devices are telephone hybrids, ISDNs, Comrex Vectors, Comrex Accesses, and two-way radios. Only one console input can be set as **Telco 1** or **Telco 2**.

With Link Plus Activation, up to six console inputs can be set as Telco inputs. The four added Telco sources are identified by both Telco LEDs blinking three, four, five, or six times, with a slight pause, to indicate the **Telco 3 – 6** inputs. You can only set one console input as **Telco 3 – 6**.

- **LOGIC ACTIVE** — Press the button to turn the **Logic Active** LED on or off. When the LED is on, the channel's logic I-O connector is active when the selected source is active on the fader channel. When the LED is unlit, the logic connector is not associated with the active source. Do not set **Logic Active** On on both the **A** and **B** sources, as it may result in incorrect logic behavior.

LOGIC ACTIVE



- **TIMER RESET** — Press the button to turn the Timer Reset function on (the LED is lit) or off (the LED is not lit). When the LED is lit the channel source sends a timer reset command to the Event Timer each time the channel is turned on. When the LED is unlit, no timer reset command is issued for that source. The Event Timer's Auto button, on the Monitor Control panel, must also be lit for the channel timer reset commands to reach the Event Timer.

TIMER RESET



- **PULSE SELECT** — This setting affects how start and stop pulses are generated by Line and Telco devices. This button is locked out when the special operating mode *Tally Output* (Option 2) is active.

PULSE SELECT



- Both LEDs off – In this default setting, one start and one stop pulse is generated whenever the channel's On/Off state changes, which occurs when you press the channel On and Off buttons or when it receives remote logic on and off commands.
- **Local** On and **Multi** Off – A start or stop pulse is only generated when the channel status is changed by pressing the fader channel's On and Off buttons. No start or stop pulse is generated when the channel is remotely controlled.
- **Local** Off and **Multi** On – A start pulse is generated each time you press the fader channel's On button or the channel receives a start command. Likewise, a stop pulse is generated each time you press the channel Off button or the channel receives a channel off command. No channel state change is required to generate additional start or stop pulses.
- Both **Local** and **Multi** LEDs On – A start pulse is generated each time you press the fader channel On button, and a stop pulse is generated every time you press the fader channel Off button. Remote channel on/off commands do not generate any pulses.

- **OFF LED CTRL** (Control) —When the LED is unlit—the standard setting—the fader channel Off button is lit while the channel is off. When this LED is lit, the channel Off button lighting is controlled by the remote logic command *Ready*. This setting is typically lit for CD players and other peripheral devices that can control the channel off button LED to indicate device status.

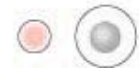
OFF LED CTRL



If the peripheral is not ready (for example, if no CD is loaded), the channel Off button is unlit. When the peripheral is ready (for example, a CD is loaded and a track is cued), the channel Off button is lit solid. After the peripheral finishes (for example, the CD track has played), the channel Off button winks to indicate the event has completed.

- **FADER START** — When the LED is unlit (the standard setting), the channel fader position has no effect on the channel On/Off status. When the LED is lit, moving the fader up from full off turns the channel on. Moving the fader back to full Off turns the channel off. The channel On and Off buttons and remote channel on and off commands are not affected by the fader start setting.

FADER START



- **OPTION** — This button is used *in combination with* other setup buttons to place the DSP card into special operational, setup, or test modes. The three **Option** LEDs indicate which special operating modes are active on that DSP card. Since each DSP card is set separately, **Option** settings may differ between the DSP cards.



- **Option + Off LED Ctrl** – Press this button combination to enter or exit the *Program Button Protect Mode*. When this setting is active (the **Option 1** LED is lit), operators must “double-click” Program assignment buttons (press it twice quickly) to change that button’s status on the eight faders on the DSP card.
 - **Option + Logic Active** – Press this button combination to enter or exit *Tally Output Mode*. When this setting is active (the **Option 2** LED is lit), all eight Logic I-O connectors on the DSP card use tally logic (sustained on and off tallies), regardless of the device type, and the **Pulse Select** button is disabled. When this setting is inactive (the **Option 2** LED is unlit), the output logic for Line and Telco devices are start and stop pulses and the **Pulse Select** button works normally.
 - **Option + Store** – Press this button combination to reset all eight channels, and their **A** and **B Source** parameters, back to their factory default settings.
 - **Option + Channel Up** – Press this button combination to enter or exit *Parameter Copy Mode*, which allows one set of parameters to be assigned (like a control room or studio microphone) and then quickly saved to setup multiple channel sources to the same parameter settings.
 - **Option + Channel Down** – Press this button combination to enter or exit the DSP Test Mode to check the inputs on the DSP card.
 - **Option + Input Trim Select** – Press and hold this button combination to show the PROM revision for that DSP card in the two trim displays. The left display shows “r” and the right display shows the number of the PROM revision (e.g., 9=rev I, 10=rev J, or 11=rev K, and so on).
- **INPUT TRIM SELECT & LEVEL** — The three buttons allow independent trim or boost of the left and/or right inputs of the local analog and local digital inputs, in steps of 1 dB, up to +/-15 dB.



- **Left and Right** – These displays show the current gain or trim setting for the input source indicated above the **Input Trim Select** button. When **A** is lit, the Analog input level trim settings appear in the **Left** and **Right** displays. When **D** is lit, the Digital input level trim settings are shown. A lit **Trim Active** decimal point indicates which audio channel (**Left** or **Right**) can be adjusted using the **Level** controls. The **Input Trim Select** button steps through the four input channels (analog left, analog right, digital left, digital right), changing the **Trim Active** decimal point and the **A** and **D** LEDs accordingly.
 - **Level Up** or **Level Down** – Press these buttons to raise or lower the active channel (the **Trim Active** decimal point is lit on that channel) in 1 dB steps. When the active source is assigned to the fader channel, and cue is active and the console Aux meter is set to show the cue bus levels, you can use the Aux meter to adjust the incoming level since level adjustments take place immediately.

- **NETWORK SOURCE** — This function is only active if the console's VistaMax Link is active. One audio input from each channel — **A** (the local analog) or **D** (the local digital) — can be assigned as a VistaMax source. The selected input signal is sent to the VistaMax system over the Link cable. The network source signals are then available to be routed, like any other VistaMax source signal, to destinations on other devices in the VistaMax community. This setting does not affect using the same sources locally within the console.
- **DSP ACTIVE & FAULT** — Chapter 5, NetWave Servicing, covers the **DSP Active** and **Fault** LEDs in the *DSP Card Status* subsection.

The *NetWave Quick Guide* and the previous *Dual Faders & DSP Cards* subsection of this manual present the parameter settings used by several common peripherals.



Channel Source Labels

Dual Fader panels have an A/B source label installed in each fader channel. The yellow source label lights up when the A Source is active. The red label lights when the B Source is active. The console installation kit includes one blank source label (PRE80-2132) per fader channel so that you can create custom source labels (Figure 2-22). Use a Brother P-Touch® label maker (1/4" clear with black lettering tape is recommended) to print up to five characters per source name when using Size 1 font.

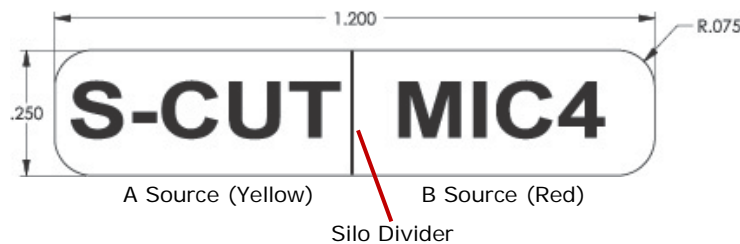


Figure 2-22. Custom Source Name Label

To change the A/B source name label, perform these steps:

1. Pry up on the smoked polycarbonate display lens from the outside. (Each lens has two snap tabs along the top and bottom that hold it in the panel.)
2. Remove the A/B label from the rubber silo. The A/B labels may be glued to the silo using rubber cement. Use an Exacto knife to trim the glue and remove the A/B label.
3. Insert the custom label into the rubber silo ledge. Make sure the label is firmly held in the ledge around the top of each silo before snapping the display lens back onto the panel.

Cabling & Wiring

All user connections are made on plug-in connectors along the rear of the console. The connectors are hidden in normal operation by a rear flip-up cover that extends across the console. To access the connectors, you can completely remove the cover by lifting it straight up when closed, or you can flip it open by either lifting it from the front edge or by pressing in on the vertical section at the back. The cover sits on two roll pins that extend from the side panels. It flips open toward the rear.



Note: The cover is typically removed during installation to ease connector access. To prevent scratches, set the painted cover on a padded surface.

Required Cables & Wires

These types of wire and cable are recommended for use with NetWave consoles:

- Analog audio connections can use Unshielded Twisted Pair (UTP) cables (Gepco IR222BA7 or similar) for most balanced connections. Shielded cable with a separate shield drain wire (Belden 8451 or 9451 or similar) should be used for connecting powered monitor speakers.
- AES/EBU connections use 110 Ω two-conductor, stranded, insulated, foil-shield cable containing a separate shield drain wire (equivalent to Belden 1800B), although UTP cable also works for most connections.
- Logic control uses stranded, 22 AWG, multiple-conductor, non-shielded, jacketed cable (equivalent to Belden 9423, 8457 or 9421).

The number of conductors required is determined by the application. Typically, cables with five or eight wires are most often used for constructing logic cables since, even though there are 12 or 14 pins on the logic connectors, only a handful are typically connected for any given application.

- Crossover CAT6 cable to connect the VistaMax Link connector to a VistaMax frame
- Straight-thru CAT-5 cables to connect Dual Router kits to a VistaMax system LAN switch or a Dual Selector to a 16x2 MicroRouter

Wire Preparation

All NetWave audio and logic wiring terminates in AMP MOD IV receptacle contacts (Figure 2-23). Stranded wires of 22 to 26 AWG, with insulation diameters of .040 to .060 inch, can be used with the MOD IV receptacle contacts.

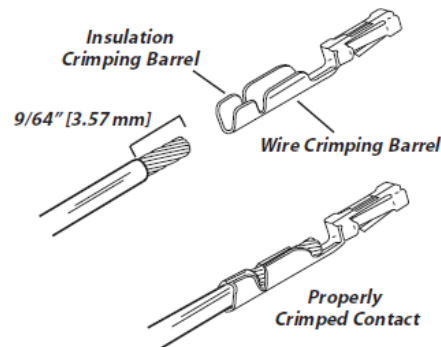


Figure 2-23. AMP MOD IV Receptacle Contacts

To prepare shielded audio wire, perform these steps:

1. Strip the cable insulation jacket and foil shield back 1½" [38.10 mm].
2. Remove the foil shield and sleeve the drain wire with 20 AWG Teflon sleeving. Leave 9/64" [3.57 mm] of the drain wire exposed.
3. Cover the cut end of the jacket with 3/4" [19.05 mm] of heat-shrink tubing. Shrink this tubing, centered on the jacket cut end, to hold the drain wire sleeving in place.
4. Strip each signal wire insulation back 9/64" [3.57 mm].
5. Crimp the receptacle contact onto the wire and insulation (Figure 2-24).

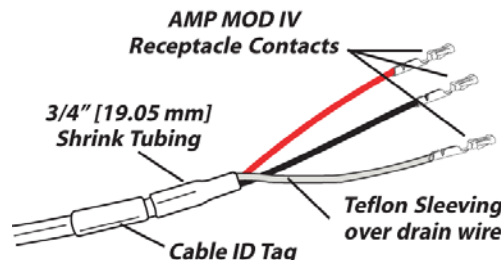


Figure 2-24. Audio Wire Prepped for AMP MOD IV Connectors



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

Fabricate Logic control cables and UTP audio wires in a similar manner to the shielded audio wiring. Strip the jacket insulation back 1½" [38.10 mm], sleeve the cut end with ¾" [19.05 mm] of shrink tubing and strip the insulation from each wire 9/64" [3.57 mm].

Crimp Tool Operation

A ratcheting AMP crimp tool with contact holder (PRE70-126 – Figure 2-25) is included with each RMXd or BMXd console and with each VistaMax card frame. A ratcheting crimp tool is also included in the optional PRE76-1901 NetWave Tool Kit. The MOD IV tool crimps both the insulation and the wire barrels on the MOD IV receptacle contact in one crimp.

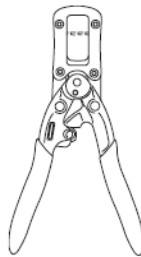


Figure 2-25. AMP MOD IV Receptacle Contact Crimp Tool

To use the ratcheting crimp tool, perform these steps:

1. Insert the 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 that it magnetically latches against the crimp tool. The end of the insulation barrel should be about 2 mm from the end of the die. Close the tool handles one click, only until the anvil holds the contact in place (Figure 2-26).

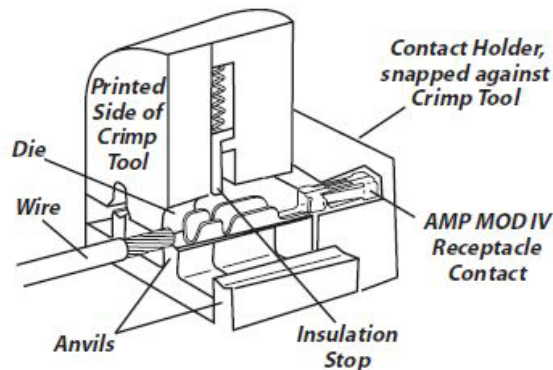


Figure 2-26. Crimp Tool – Cutaway View

3. Insert the prepped wire into the contact until the insulation hits the tool's stop.
4. Hold the wire in place while squeezing the tool handles to crimp the contact onto the wire and insulation. The tool handles automatically release and spring open after the crimp cycle is complete.
5. After all contacts on a cable are crimped, insert and lock the contact into the appropriate connector housing according to the audio (Figure 2-28) and logic (Figure 2-34) pin assignment diagrams.
6. Insert the receptacle contact into the housing with its locking tab side toward the locking tab slots on the connector housing. A slight click can be heard when the contact's locking tab springs up into the locking tab slot.

To remove a contact from its housing, use the PRE70-129 Contact Removal Tool (Figure 2-27), also included in the optional PRE76-1901 tool kit. Insert the tool tip into the locking tab slot and press the locking tab down while lightly pulling on the wire to remove the contact from the housing.

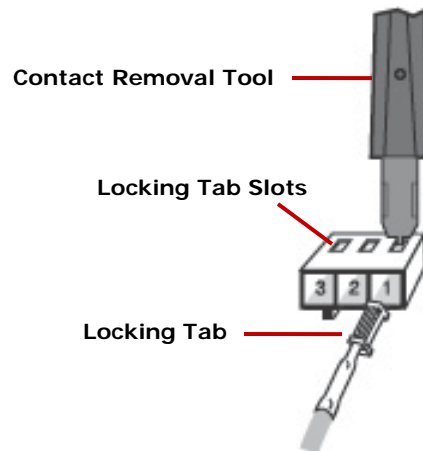
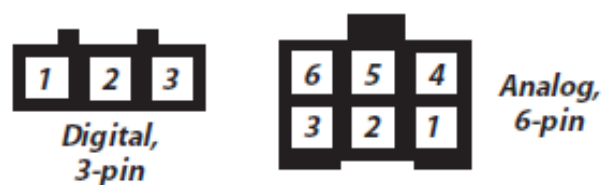


Figure 2-27. Receptacle Contact, Insertion & Removal Detail

Audio Connections

Analog and digital audio connections take advantage of the three-pins per row design of the MOD IV housings. Three-pin housings are used for digital connections and six-pin housings are used for analog connections. Audio wiring has this orientation (Figure 2-28):

- Shields connect to pins 1 and 4.
- The audio low (-) wires, typically black, connect to the middle pins (pins 2 and 5).
- The audio high (+) wires, typically red, connect to pins 3 and 6.
- When inputs come from mono sources like mic preamps, two separate signals may connect to each 6-pin connector to maximize connector usage.



Pin numbers, wire insertion end view

Figure 2-28. Audio Connectors

Analog Connections

The NetWave console does not have inter-stage patch points so, to use the console with a patch bay, connect line level outputs from peripheral devices directly to the patch bay. Normal these signals to the appropriate NetWave inputs. NetWave outputs may be routed through a patch bay normalised to standard peripherals such as analog on-air processing gear, recorders, or telephone hybrids.

Each analog input is designed for standard professional +4 dBu balanced output equipment. Each input can be level trimmed, by up to +/-15 dB, so that unbalanced -10 dBv prosumer devices can also directly connect to the console. Microphones must be separately pre-amplified and processed before being connected to the console. Tables 2-2 and 2-3 give the signal descriptions for the stereo analog audio connections and two mono analog connections, respectively.

Table 2-2. Stereo Analog Audio Connections: Line Input/Output – 6-Pin Housing

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

Table 2-3. Two Mono Analog Connections: Line Input/Output – 6-Pin Connector

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

Digital Connections

Three-pin digital inputs are designed for AES-3 (AES/EBU) digital audio signals using sample rates between 25 and 50 kHz. Each transformer-coupled AES-3 input goes through a sample rate converter to change the incoming sample rate to the console's internal sample rate of 48 kHz so that no external sample or word clock is required. The AES-3 inputs also work with most S/PDIF signals. (The *S/PDIF Signals* subsection gives details.)

Each transformer-coupled digital output is a balanced AES-3 digital audio signal at either 48 kHz or 44.1 kHz sample rates. The AES-3 outputs cannot connect directly to an S/PDIF digital input. A signal translation interface is required. Table 2-4 gives the signal descriptions for AES/EBU digital inputs and outputs.

Table 2-4. AES/EBU Digital Inputs & Outputs

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

Unbalanced Connections

Although all analog inputs and outputs are active and balanced, unbalanced consumer or “semipro” equipment can be connected to the console. For best results, connect an unbalanced device through an IHF-PRO match box and keep the unbalanced cable lengths as short as possible. If a match box is not available, you can directly connect an unbalanced analog device to a NetWave input using the Figure 2-29 wiring example on the following page.

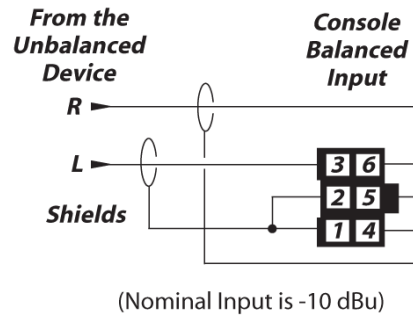


Figure 2-29. Unbalanced Stereo Device Connecting to NetWave Analog Input

If an IHF-PRO match box is not available, you can directly connect an unbalanced analog device to a NetWave balanced analog output using the wiring shown in Figure 2-30.

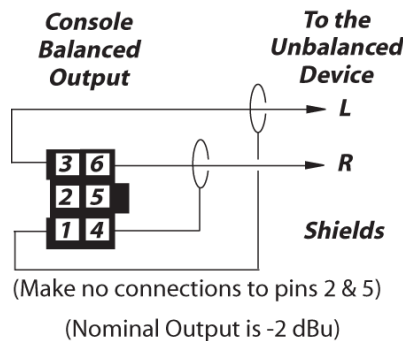


Figure 2-30. Unbalanced Device Connecting to NetWave Analog Output

Do not tie the low (-) and shield pins together to “unbalance” the signal. The low output pin must always be left floating when unbalancing a NetWave output.

S/PDIF Signals

Most S/PDIF digital outputs can also connect to a NetWave console’s digital inputs by connecting both pin 1 and 2 to the shield. You can use unshielded twisted pair signal cable for short runs (below 50 feet). When you use a longer cable run, or a 75 Ω coax cable, add a 249 Ω resistor to properly load the S/PDIF cable. Install the resistor right onto the MOD IV housing as shown in Figure 2-31.

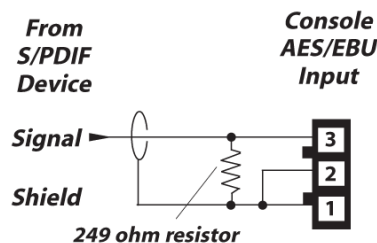


Figure 2-31. S/PDIF Device Connecting to NetWave AES/EBU Input

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

Notes: A signal conversion interface must be used to connect AES/EBU outputs to S/PDIF inputs.

Some S/PDIF signals do not work with the NetWave console’s inputs, even with the additional load resistor or a transformer, because of low output level or nonstandard protocol.

NetWave Sample Rate

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

You can set the console's digital outputs for either 48 kHz or 44.1 kHz output through the multi-switch settings on the Monitor & Output board (Figure 2-18).

When used in a standalone application, the console cannot be locked to an external sample rate reference. If the console needs to be locked, it must be networked with a VistaMax system. The NetWave console is automatically synchronized to the VistaMax system's master clock, which can be externally referenced. Both the VistaMax (PRE75-52) and Envoy (PRE75-55) manuals give details on this application.

Audio Connections

There are 18 dedicated analog and digital inputs and outputs on the Monitor & Output card (Figure 2-32). Connections include

- Separate analog and digital outputs for four Program buses.
(Analog PGM 4 can alternately be set as a local Telco Record output.)
- Analog inputs for two External Monitor signals.
- Two analog mono mix-minus with IFB outputs.
- Three analog monitor outputs for the control room (monitor, host headphone, and guest headphone).
- Three monitor outputs for a studio (monitor, host headphone, and guest headphone).

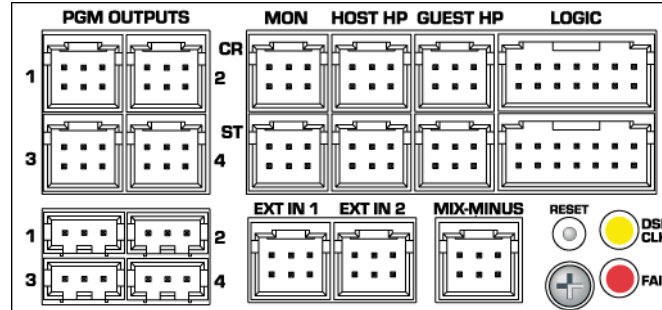


Figure 2-32. Monitor & Output Card Connections

Each DSP card (Figure 2-33) has eight analog and eight digital inputs that are assigned as sources using the DSP setup controls. (Figure 2-21 shows DSP card callouts with additional button and LED details.) When the VistaMax Link is activated, one input (either analog or digital) from each channel is set as a VistaMax source that can be routed to other VistaMax community members. Likewise, each channel source can be set to use a routed signal from the VistaMax system as its input. Section 4 – “Linked NetWave Consoles” gives additional details.

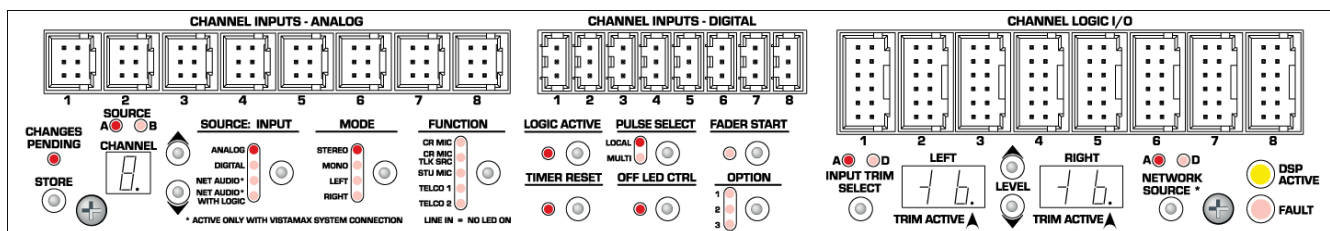


Figure 2-33. DSP Card Connections

Any analog or digital input connector can be set to function as two mono inputs rather than as a combined stereo signal by changing its **Mode** setting.

Logic Connections

The NetWave Console has four types of logic connections:

- Channel Logic I-O (eight 12-pin MOD IV connectors on each DSP card – Figure 2-33)
- Control Room Logic (one 14-pin MOD IV connector on the Monitor & Output card – Figure 2-32) for room warning light, external mute, dim, and talkback control
- Studio Logic (one 14-pin MOD IV connector on the Monitor & Output card – Figure 2-32) for room warning light, external mute, dim, and talkback control
- Remote timer reset output and ESE or SMPTE master clock input (Figure 2-17) on a Molex connector on the console rear panel (from the meter-clock-timer board's J4 connector in the Console Display)

Figure 2-34 shows block diagrams and pin assignments for the four types of NetWave logic interface connectors. All logic inputs are fully isolated by opto-couplers and accept logic commands that use +5 to +40 volt logic. All logic outputs are solid-state "dry-contact relays" that can switch control signals of up to 60 volts, AC or DC. They cannot directly control warning lamps using 120 VAC. A warning lamp interface must be used to connect the warning lamp.

Logic Interfaces

Figure 2-34 shows these logic interfaces, along with connectors, pin-outs, and a block diagram for each interface:

- Control Room
- Studio
- Channel Logic
- Timer Logic

The block diagrams show the logic inputs on the left and the logic outputs on the right. The logic inputs, noted by the (-) symbol, are active low. They are isolated by opto-couplers which are typically activated by connecting their Enable Logic Inputs pin to +5 to +40 V.

Most logic outputs are isolated solid-state relay contacts that are commoned together through the relay common pin, which is typically tied to ground (to generate logic low outputs) or to a logic voltage of up to 60 V at 350 mA (to generate logic high outputs). The exceptions to the relay common method are two warning relay outputs, which are isolated solid-state dry contacts.

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

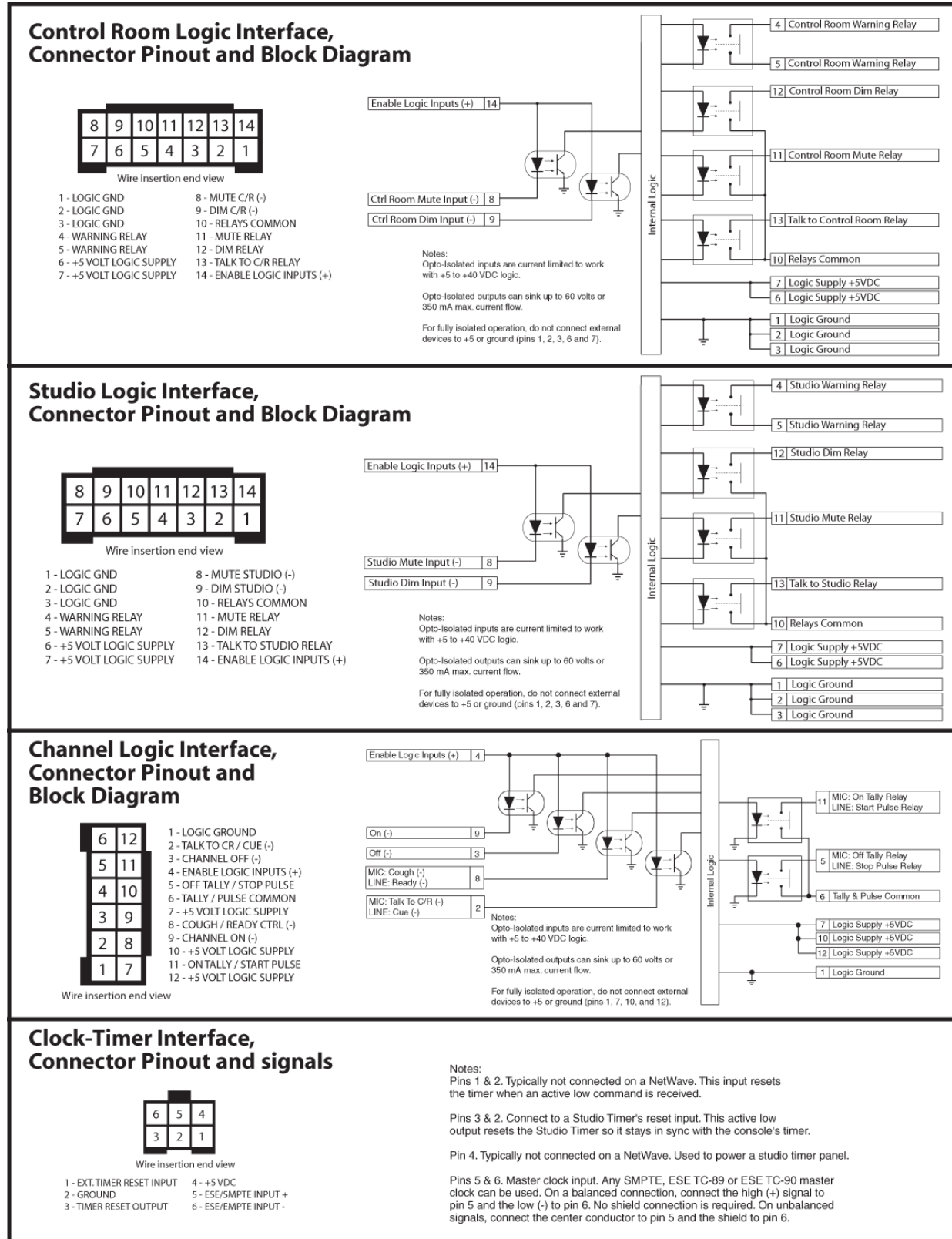


Figure 2-34. Summary of NetWave Logic Connectors

Control Room Logic

This 14-pin connector has two isolated relay contacts (on pins 4 and 5) which are used to control a warning lamp interface like the GatesAir WL-2 or Henry Superelay. The warning relay is activated whenever any channel with a Control Room mic as its source is turned on and assigned to a Program bus. This action also mutes the Control Room Monitor audio output.

These are the other three logic outputs, which are all commoned together on pin 10:

- CR dim on pin 12 (active when receiving talkback)
- CR mute on pin 11 (active when a CR mic is hot)
- Talkback on pin 13 (active when Talk to CR is being received)

You can use these outputs to control external speaker switching circuitry, for tally indicators, or to trigger an air skimmer or other recording device.

There are two external logic inputs you can use to remotely dim the monitors (pin 9) or to mute the monitors (pin 8). To use these inputs, you must tie pin 14 high (+5 to +40 VDC). The logic inputs are triggered by being pulled low.

Studio Logic

This 14-pin connector has the same connections as the control room, except they are for a talk studio or voice booth. There are two isolated relay contacts (pins 4 and 5) for controlling a warning lamp interface like the GatesAir WL-2 or Henry Superelay. The connector is activated when any channel with a studio mic as its source is turned on and assigned to a Program bus. This action also mutes the Studio Monitor audio output.

These are the other three logic outputs, which are all commoned together on pin 10:

- Studio dim on pin 12, active when receiving talkback
- Studio mute on pin 11, active when a Studio mic is hot
- Studio talkback on pin 13, active when Talk to Studio is being received

You can use these outputs to control external speaker switching circuitry, for tally indicators, or to trigger an air skimmer or other recording device.

There are two external logic inputs you can use to remotely dim the monitors (pin 9) or to mute the monitors (pin 8). To use these inputs, you must tie pin 14 high (+5 to +40 VDC). The logic inputs are triggered by being pulled low.

Channel Logic

There are eight 12-pin Channel Logic connectors on each DSP card. They typically connect remote mic control panels (using Mic logic with On and Off Tallies) or peripheral devices (using Line logic with Start and Stop Pulses). The **Function** parameter setting determines the type of logic used (Mic or Line). Mic logic is used when one of these parameters is selected:

- CR MIC
- CR MIC TLK SRC
- STU MIC

All other **Function** settings use Line logic.



Note: The *Tally Output Mode* sends Tally commands (on/off tallies instead of start/stop pulses) for Line logic on all eight DSP card logic connections on that DSP card. This mode is active when the **Option 2** LED is lit on any DSP card.

To assign the **Channel Logic I-O** connector to either the A or B channel source, press the **Logic Active** setup button while the channel source is active. (The channel number and the **A** or **B Source** LED are lit on the DSP card.) When the **Logic Active** LED is lit, the logic connector is active with that source. When the **Logic Active** LED is unlit, the logic is not used with that source.

Microphone Logic

Microphone logic has three main functions:

- Mute the monitor speakers in the room with a “hot” mic
- Command a room warning light
- Activate mic logic functions like remote on/off, talkback, and momentary cough

The warning commands come from the control room or studio logic connectors, but the **Function** parameter setting tells the monitor logic that the input is a mic and where that mic is located (control room or studio).

Mic Connections

Microphones must be preamplified to line level before being connected to a NetWave audio input. Typically, mics are routed through a mic processor to preamplify, equalize and compress, or limit their audio levels. A mic processor can connect to either an analog or a digital input, as either can be set as a mic input.

Mic Logic To/From a NetWave

There are two GatesAir mic control panels that compliment the NetWave console’s look and feel:

- A three-button panel without talkback control (PRE99-1197, with On, Off and Cough buttons)
- A four button panel with talkback (PRE99-1198, with On, Off, Cough and Talkback buttons).

Figure 2-35 shows a typical mic control panel wiring diagram. The panel’s three or four switches (On, Off, Cough, and Talkback) connect to the four remote Logic inputs on pins 2, 3, 8, and 9. Pin 4 is jumpered to pin 10 to enable the external inputs.

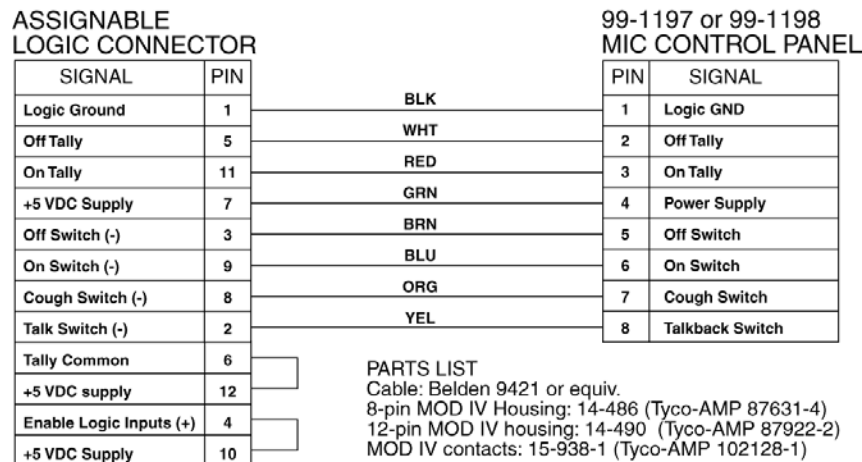


Figure 2-35. Cable from a NetWave Logic Connector to a Mic Control Panel

The switch LEDs connect to pins 5, 7, and 11 (pin 1 supplies ground). The On Tally output (pin 11) drives the On switch LEDs and the Off Tally (pin 5) drives the Off switch LEDs. The Cough and Talkback LEDs connect directly to +5 VDC.

To make a custom mic panel, use SPST (single pole, single throw) momentary contact switches with LED indicators. Tie one side of each switch and lamp to Logic Common (pin 1). Tie the other side of the Cough and Talkback lamps together to +5 V.

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

To activate a mic panel

- Set the **Function** parameter to CR MIC, CR MIC TLK SRC, or STU MIC to set the source as a microphone.
- Enable the **Logic** parameter (the **Logic Active** LED is lit).
- A logic cable must physically connect from the **Channel Logic I-O** to the mic panel.

You can use the mic control panel to

- Turn the channel on and off.
- Receive channel on and off tallies.
- Activate the cough feature (momentarily mutes the audio from the Program buses)
- Talk to the Control Room or Talk to the Studio. (On four-button panels only.)

Turning the channel on mutes the room monitor output, turns on the room warning light logic, and lights the On button on the mic control panel.

Line Logic

Line logic is used when the source's **Function** LEDs are all off (signifying a line input device) or when the **Telco 1** LED or **Telco 2** LED is lit or when both Telco LEDs blink. Blinking Telco LEDs indicate the console has Link Plus activation, allowing four sources to be set as Telco 3, 4, 5, and 6. The number of blinks indicates which Link Plus Telco is set on that channel: three blinks for Telco 3, four blinks for Telco 4, five blinks for Telco 5, and six blinks for Telco 6. A slight pause separates each set of blinks.

When the **Logic Active** LED is lit and the **Function** is line or any Telco, the logic functions for pins 2, 5, 8, and 11 differ from those used with mic logic. Pin 2 is a remote cue switch input that can be triggered by a computer playback system or by a remote studio or producer cue switch. Pin 2 puts the channel's audio onto the cue bus. This feature can also be used on a fader slot covered by a blank panel, since this function does not require a fader panel to be present. This feature allows a dedicated cue audio input (or even a talkback audio source) to connect to the console without consuming a fader channel, if there are blank panels on the console.

Pin 8 is the Ready command used by peripheral devices to both turn off the channel at the end of an event and, when **Off LED Ctrl** is lit, to control the channel's off button illumination, which can indicate one of these scenarios:

- The peripheral device is not ready (the off button is unlit).
- The peripheral device is cued and ready to play (the off button is lit solid).
- The event has played or has ended (the off button flashes).

Pins 11 and 5 output start and stop pulses (220 msec contact closures) so that a peripheral device can be started or stopped as the channel is turned on and off. The Start Pulse is output on pin 11, and the Stop Pulse is output on pin 5. Pin 5 is the relay common for these two momentary contact closure outputs. The **Pulse Select** setting affects the behavior of the pulses and sets whether a single pulse or multiple pulses are output when you press the channel on and off buttons.



Note: When the *Tally Output Mode* is active (**Option 2** LED is lit), the logic outputs on pins 11 and 5 are On Tally and Off Tally instead of Start Pulse and Stop Pulse, and the **Pulse Select** function is not active. To toggle in and out of *Tally Output Mode*, press **Option + Logic Active**. When this mode is active, it affects all eight channels on that DSP card.

Channel Logic I-O and Peripherals

In the basic peripheral logic connection example (Table 2-6 and Figure 2-37 on page 2-36), active low logic is used, thus Tally & Pulse Common is connected to the logic ground on the peripheral device (labeled Command Common on the Denon CD player in the example). In the complex logic example (Table 2-7 and Figure 2-39 on page 2-37) active high logic is used, thus Tally & Pulse Common connects to +5 VDC.



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

Peripheral devices can turn off the channel through the Ready logic input. This input performs not only an audio reset to turn off the channel, but it can also control the Off button LEDs when the Off LED parameter is active on that channel. Otherwise, the Off LEDs turn on automatically at channel Off.

Clock-Timer Interface

An external event timer reset command is on the Clock-Timer PCA (J4, pin 3). It connects to a studio or external location Event Timer so that it can be reset by the console's timer reset logic.

This connector has an external timer reset input that is typically not used in this application. A momentary low on pin 1 resets the Event Timer. This connector also has the input for a master clock signal on pins 5 and 6. The *ESE*, *SMPTE*, and *Remote Timer Reset* subsection covers this connection.

Connection Guides

This subsection gives examples of these typical connections and parameter settings:

- A mic with a mic remote panel
- A CD player with remote logic
- A computer playback system
- The connections to a VistaMax audio management system



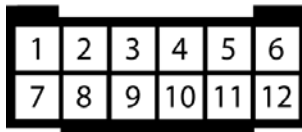
Note: To isolate the NetWave console from peripheral devices, use only the isolated control logic connections. The +5 VDC and logic ground connections are referenced to the console's power supply and ground. These should only be connected to isolated devices like mic control panels or other GatesAir Accessory Panels. Connecting these to non-isolated devices may result in a ground loop between the console and peripheral.

Mic Remote Control Connection Example

Table 2-5 and Figure 2-36 show a mic control panel connection to a Channel Logic I-O connector.

Table 2-5. Channel Logic I-O Connector Signals – Mic Control Panel Example

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



Wire insertion end view

Notes: +VDC is any voltage from +5 to +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA maximum.
Bold type indicates connections used in this example.

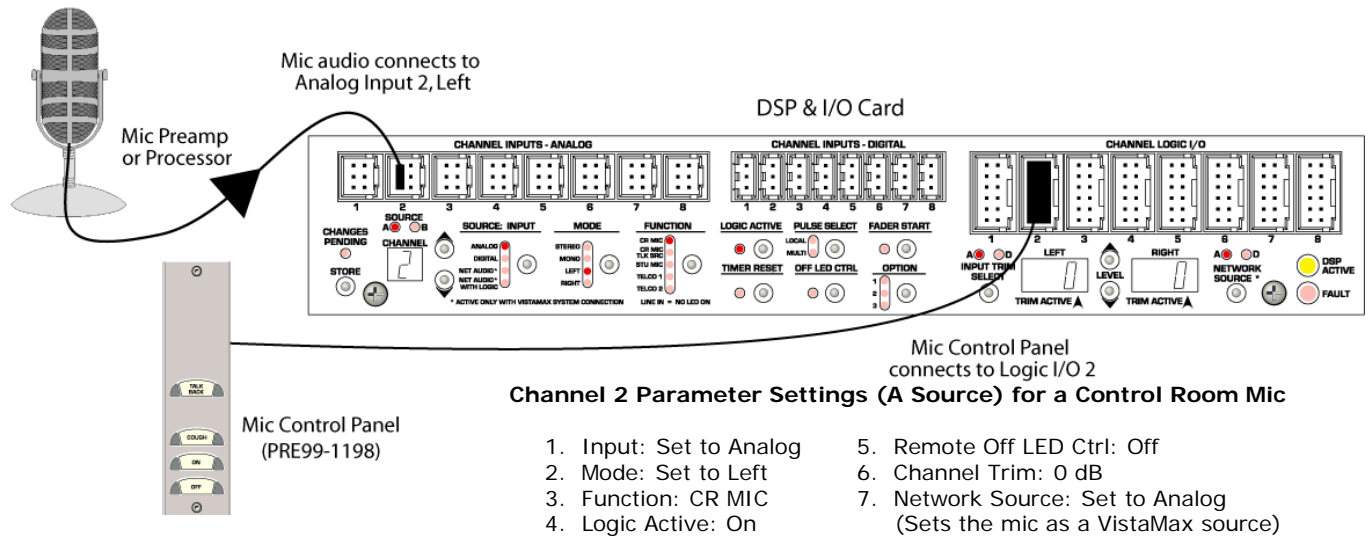


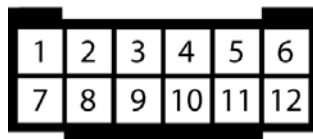
Figure 2-36. Example of Mic & Mic Control Panel Connected to Channel 2

Figure 2-35 (page 2-32) shows the wiring diagram for the logic cable used to connect a mic control panel to a NetWave channel logic connector.

Basic Peripheral Device Logic Connection Example

Table 2-6 and Figures 2-37 and 2-38 show a peripheral device (with basic logic functions like the CD player shown) connected to a Channel Logic I-O connector.

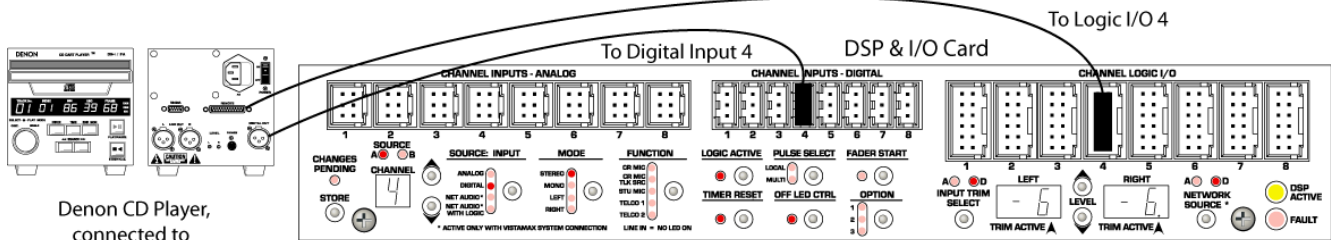
Table 2-6. Channel Logic I-O Connector Signals – Peripheral Device Example



Wire insertion end view

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

Notes: +VDC is any voltage from +5 to +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA maximum.
Bold type indicates connections used in this example.



Denon CD Player,
connected to
channel 4, source A

Channel 4 Parameter Settings (A Source) for a Peripheral Device Using Line Logic

1. Input: Set to Digital
2. Mode: Set to Stereo
3. Function: LINE (no LEDs lit)
4. Logic Active: On
5. Timer Reset: On
6. Remote Off LED Ctrl: On
(for Ready control of Off LED)
7. Input Trim: -6 dB on both channels
8. Network Source: Set to Digital
(Sets the CD player as a VistaMax source)

Figure 2-37. CD Player Connected to Input 4

CHANNEL 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



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)

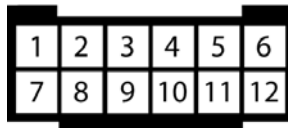
Figure 2-38. Typical Denon CD Player Logic Wiring

Complex Logic Connection Example

Table 2-7 and Figures 2-39 and 2-40 show a device with more complex logic functions like that typically found in a computer playback system. On most peripheral devices, the logic ground and +5 Volt supply connections are not used. But, in this example, the playback system logic I-O connections are also isolated.

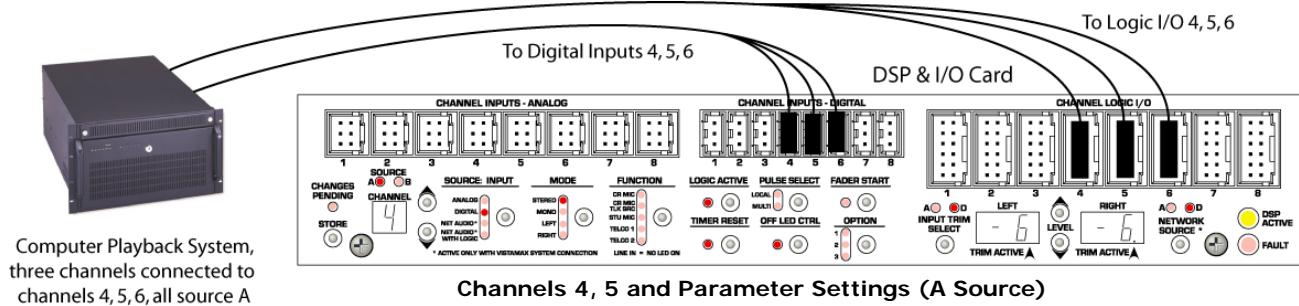
Table 2-7. Channel Logic I-O Connector Signals – Complex Logic Connection Example

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



Wire insertion end view

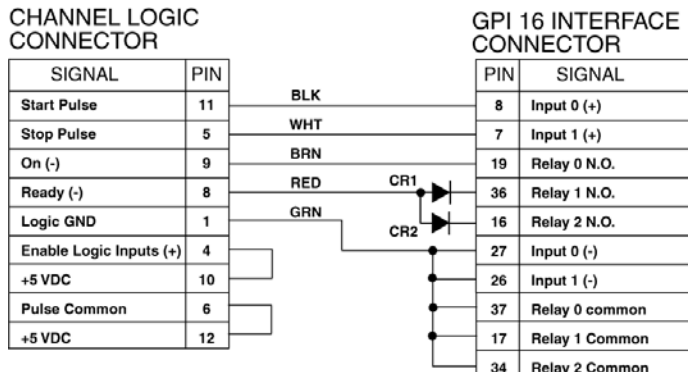
Notes: +VDC is any voltage from +5 to +40 VDC.
Outputs can switch voltages up to +60 VDC at 350 mA maximum.
Bold type indicates connections used in this example.



Channels 4, 5 and Parameter Settings (A Source)

1. Input: Set to Digital
2. Mode: Set to Stereo
3. Function: LINE (no LEDs lit)
4. Logic Active: On
5. Timer Reset: On
6. Remote Off LED Ctrl: On (for Ready control of Off LED)
7. Input Trim: -6 dB on both channels
8. Network Source: Set to Digital (Sets these inputs to VistaMax source)

Figure 2-39. Computer Playback System Connected to Channels 4, 5, and 6



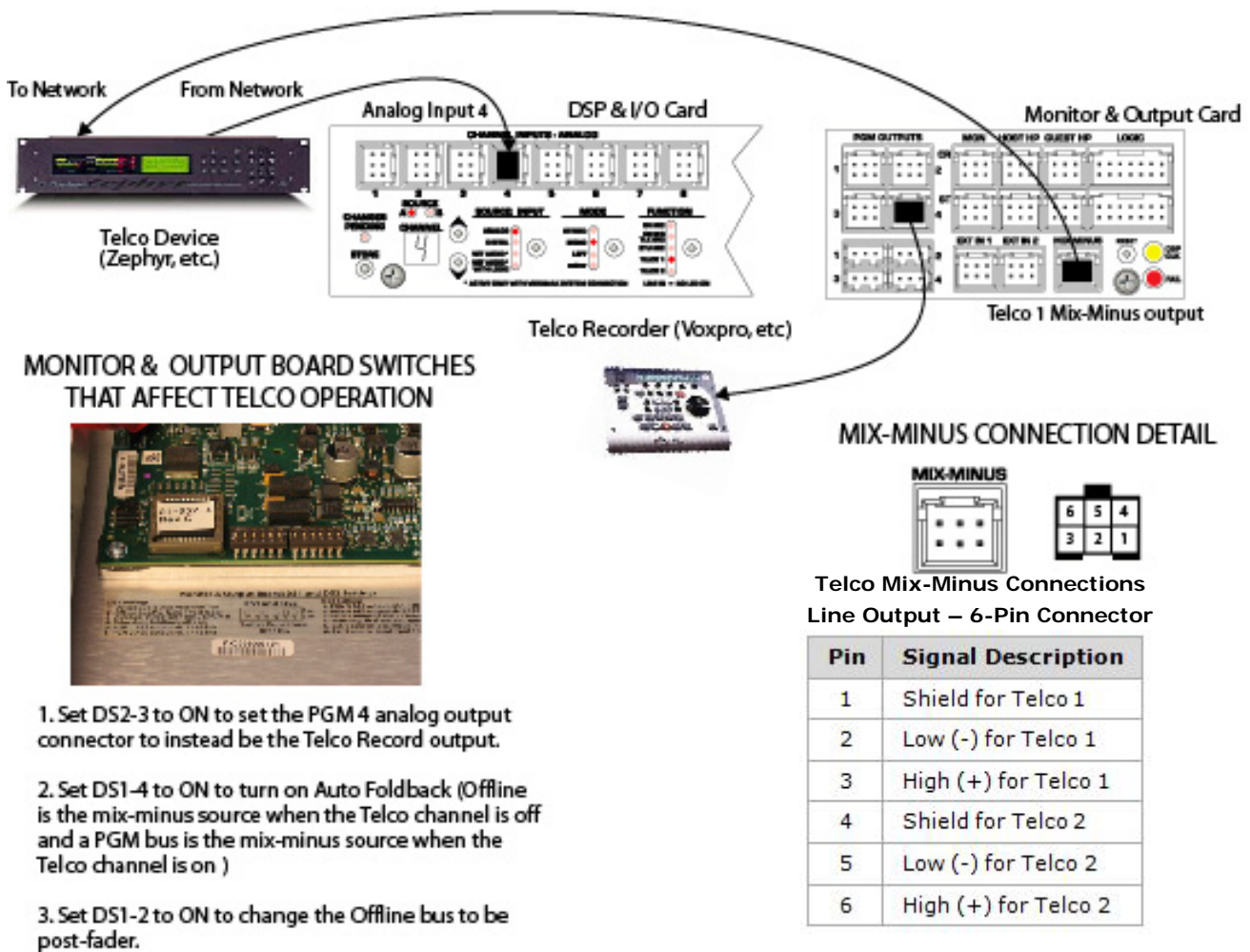
PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
37-pin DSub: 15-885 (DC 110963-4)
DSub crimp pins: 15-884 (DB-37P)
12-pin MOD IV housing: PRE14-490 (Tyco-AMP 87922-2)
MOD IV contacts: PRE15-938-1 (Tyco-AMP 102128-1)

Figure 2-40. Typical Computer Playback System Logic Wiring Using General Purpose I-O Card

Four-Wire Device Connection Example

Figure 2-41 shows a four-wire device (such as a Telco hybrid, ISDN, or two-way device) connected to the NetWave console. Typically these devices have a mono *From Network* signal that connects to a console input and a mono *To Network* signal that connects from a mix-minus output. All NetWave consoles can have two channel sources defined as a four-wire or Telco device and identified as Telco 1 and Telco 2. To make setup and troubleshooting easier, assign the Telco 1 input physically to the left of the Telco 2 channel source.

With Link Plus Activation, you can set up to six channel sources on a NetWave console as Telco inputs. The additional four mix-minus signals (Telco 3 - 6) are only available as sources in the VistaMax system. The mix-minus outputs for Telco 1 and Telco 2 can be taken from the console's Mix-Minus 1 and 2 outputs, or they can be a routed source on the VistaMax system.



Channel Settings for ISDN Unit Connected to Channel 4 (A Source)

- Input: Set to Analog
- Mode: Set to Mono
- Function: Telco 1 LED lit
- Logic Active: Off
- Timer Reset: Off
- Remote Off LED Ctrl: Off (for Ready control of Off LED)
- Input Trim: 0 dB on both channels
- Network Source: Set to Analog (Sets this input as VistaMax source)

Figure 2-41. Four-Wire Device Connection Summary

VistaMax Network Connections

When the VistaMax Link is activated (optional feature), the NetWave console's RJ-45 VistaMax Link connection, located next to the DC power connector, connects the console to any available Hub Card facet on a VistaMax, Envoy, or VMConnect card frame using a Link cable (Figure 2-42). A Link cable is a CAT6 crossover cable of up to 330 feet [100 meters] in length. It carries 64 stereo audio signals bi-directionally between the NetWave console and the Hub card facet. Sources from the VistaMax system may also have logic signals associated with the audio to control the console channels. The console channel on and off logic can also control associated logic outputs on the VistaMax system.

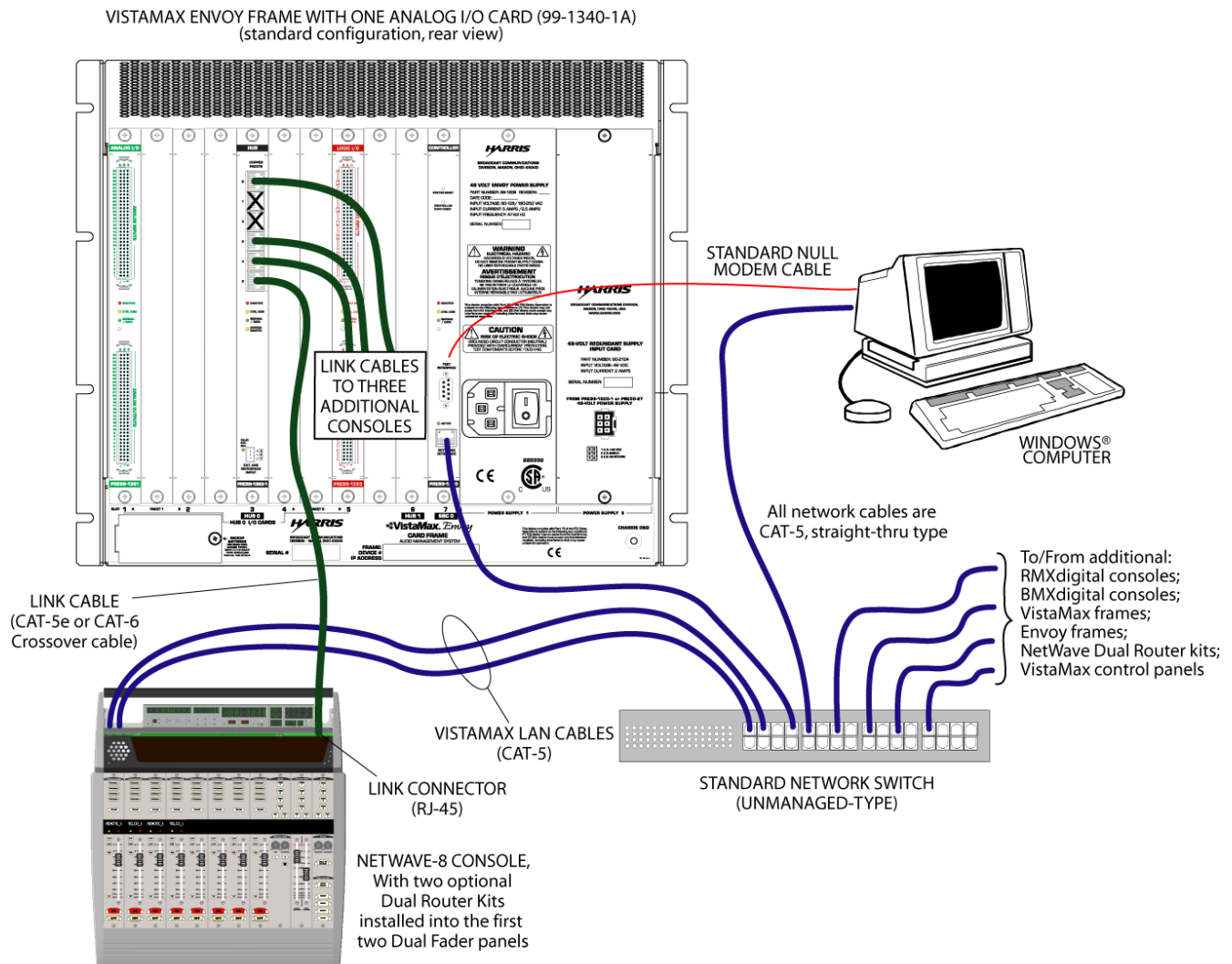


Figure 2-42. NetWave Console Link and LAN Connections

The RJ-45 LAN connectors on the rear panel tie Dual Router panels (optional feature) individually to the VistaMax LAN. These can be directly connected to the main network switch (where all of the card frames, the consoles, the admin computer, and the VistaMax edge device panels connect). When several Dual Router panels are installed, they can connect to a small network hub or switch which, in turn, connects to the main network switch. Section 4 – “Linked NetWave Consoles” and the VistaMax (75-52), Envoy (75-55), or VM Device (75-57) manuals give additional details on Link cables and Dual Router panel LAN cables, as well as setup and configuration details.

Section 3 – Operation

The NetWave console (Figure 3-1) consists of these parts:

- Mainframe holding multiple Dual Fader panels and one Monitor Control panel
- Integrated DirectView Console Display with
 - Two or four stereo bar graph meters
 - Clock
 - Event timer
- In-line or rackmount power supply



Figure 3-1. NetWave Console

Console Parts

Dual Fader Panels

NetWave fader channel controls allow you to

- Select a source (A or B) as the audio for that channel.
- Assign the channel to one or more buses.
- Control the level using a 100 mm fader.
- Switch the bus audio to the assigned buses using On and Off buttons.

Each Dual Fader panel has two channel control strips.

NetWave-8 consoles ship with four Dual Fader panels installed. NetWave-16 consoles ship with six Dual Fader panels but can have eight panels installed (Figure 3-1). NetWave-24 consoles ship with nine Dual Fader panels but can have up to 12 installed. This section contains quick guides on the Dual Fader panel and these possible upgrades: Dual Selector and Dual Router.

Monitor Control Panel

This standard panel is installed at the right end of the mainframe and has these features:

- Monitor source selectors and level controls for the control room and one studio or voice booth
- Selector buttons to assign which signal feeds the Auxiliary meter.

This section contains a quick guide on the Monitor Control Panel.

Console Display

The Console Display has two or four horizontal bar graph signal level meters. On a two-meter display, the left meter shows Program 1 and the right, or Auxiliary (AUX) meter, shows a source selected using the Aux Meter controls on the Monitor Control panel. On a four-meter display, the middle two meters show Program 2 and Program 3, respectively. A digital clock and an event timer are at the far right end of the Console Display. This section contains a quick guide for using the Console Display.

Power Supply

NetWave power supplies are designed specifically for 24/7 operation. The console should not be powered off, as that would cause complete signal interruption.

NetWave-8 and NetWave-16 consoles have an in-line power supply that is typically set within the cabinetry. This type power supply does not have a switch, so it must be unplugged from its AC outlet to turn it off. NetWave-24 consoles include a rackmount supply with a recessed power switch on the front panel to turn it on and off. Always wait at least 15 seconds after turning off either supply before reapplying power.

VistaMax Integration and Source Selection

When a NetWave console is linked with a VistaMax system, there is an almost unlimited number of audio and/or audio-with-logic signals that can be routed to any fader channel on the console and/or to the two External monitor inputs. On channels with a standard Dual Fader panel, when a network source is set as the A or B source, the VistaMax source routed to that channel cannot be changed on the Dual Fader panel but must be changed by one of these methods:

- Using a VistaMax Source Selector panel
- Using a VistaTouch or VistaVue software control panel
- Taking a setup file, called a "session" or "macro" file, on a VistaMax device to route a signal to the fader.

Since all these methods are typically done by an engineer or programmer, most routed signals to Dual Fader panels or to the external monitors are dedicated signals that are rarely, if ever, changed.

However, you can upgrade any Dual Fader panel to a Dual Router panel, which does have the controls to change its source, along with a 10-character display to show the name of the routed source. The *Dual Router Panel Quick Guide* subsection gives more details. The VistaMax, Envoy, and VMConnect user guides give a more complete description of the VistaMax Audio Management System.

Quick Guides

This subsection has quick guides for these NetWave panels or components:

- Dual Fader
- Dual Selector
- Dual Router
- Monitor Control
- Console Display

Dual Fader Panel Quick Guide

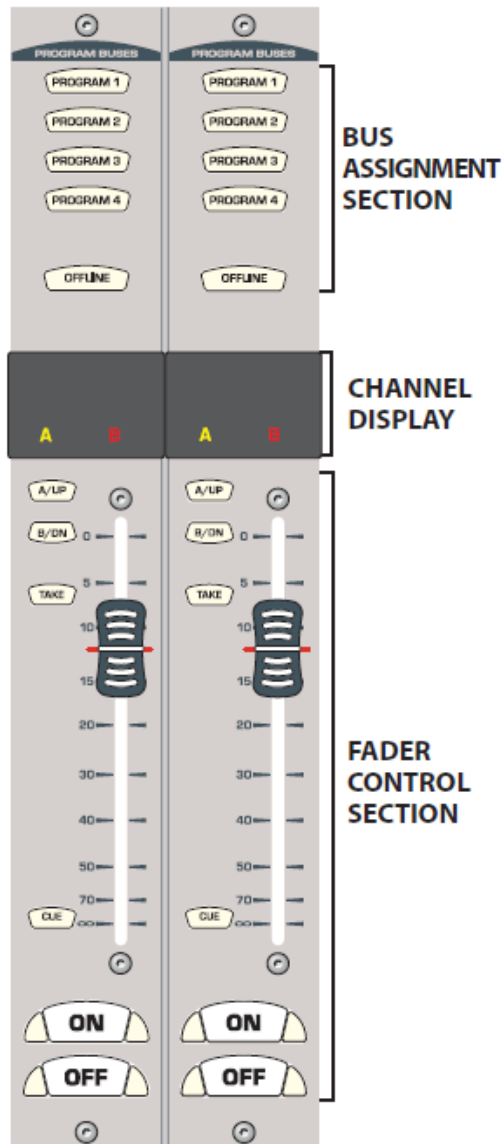


Figure 3-2. Dual Fader Panel

Each Dual Fader panel (Figure 3-2) has two channel strips for independent control of two audio signals. Each channel typically has two sources (**A** and **B**) that are board-operator selected. The **A** and **B** labels are normally replaced by custom labels to identify the input signal by name. The **A** and **B** labels light up to indicate which source is active on that fader channel.

Bus Assignment Section

Program 1,2,3,4 – When any combination of buttons is lit, the channel is turned on, and the fader is potted up (typically to the red line indication), the source audio is applied to the lit Program buses.

Offline – When lit, routes the source audio, the pre-on/off switch, and typically pre-fader to the Offline bus, a special bus used only for callers and remotes.

Note: When a Telco source is assigned to a fader, one assignment button winks, indicating that bus is assigned to be the Telco mix-minus base mix and to go to the Telco's record bus. The *Telco/Codec Operation* subsection gives details.

Fader Control Section

A/UP and **B/DN** – The lit button indicates the active source, along with the lit **A** or **B** label in the Channel Display. To change the source, press the unlit source button (**TAKE** blinks), and then press **Take** while it is blinking.

Take – Switches the input source (**A** to **B** or **B** to **A**) when pressed while blinking. If pressed while the channel is on, **Take** forces the channel off and changes the source.

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

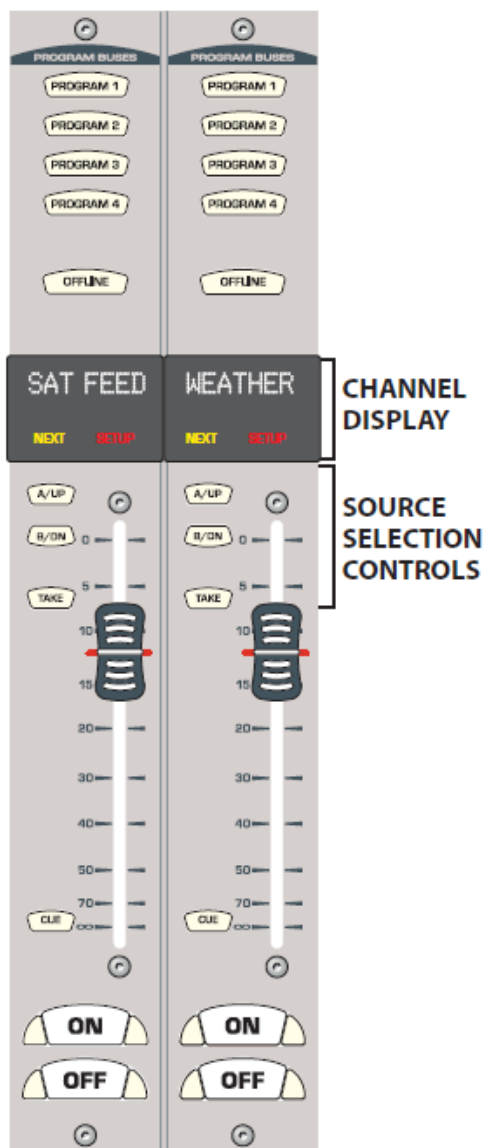
Cue – When lit, routes the source audio, pre-fader, and pre-switch to the cue speaker without affecting the on-air signal. On CR MIC channels, the cue button is momentary and the signal only feeds the Aux meter. On line inputs, cue toggles on and off. Cue feeds the cue speaker and, when AutoCue is lit on the Monitor panel, also feeds the operator headphones. Cue levels also typically appear on the Aux meter while active.

On – Press to turn the channel on. The button lights, sending the audio to the selected Program buses. Logic control commands may also be initiated, depending upon the logic settings for that source.

Off – Press to turn the channel off and remove the audio from all selected buses (except for Offline, if selected). The button may not light on peripheral devices when the source is set to respond to ready commands to indicate its status. Logic control commands may also be initiated, depending upon the logic settings for that source.

Talkback – On Telco channels, pressing the lit **On** or **Off** button routes the CR talk mics to that Telco's mix-minus IFB output. The lit button blinks rapidly while talk is active, as do the talk mic channel buttons. If a CR talk mic channel is on, it is muted from all buses while talking.

Dual Selector Panel Quick Guide



A Dual Selector panel (Figure 3-3) is an upgraded Dual Fader panel with built-in source selection control for a 16x2 MicroRouter. This upgrade gives each channel on the panel the ability to choose between 17 named sources (16 on the 16x2 MicroRouter and the local analog input for that channel strip). Dual Selector channels have **Next/Setup** labels in place of the standard **A/B** name labels.

You can recognize Dual Selector panels by their channel display:

- Two 10-character Source Name displays
- Two **Next** and **Setup** labels

Each channel strip can select between the 16 sources available from the 16x2 MicroRouter (called common sources, available to both channels) and its own local analog input. Most panel functions are identical to the Dual Fader panel, so this subsection covers only those functions that differ.

Channel Display

Source Name Display – The ten-character displays have two functions, depending upon whether **Next** is lit. When **Next** is not lit, the display shows the name of the active source for that channel. Pressing the **UP** or **DN** button causes **Next** to light and changes the display to show the name of a potential next source for that channel.

Next – When lit, indicates the source selector buttons (**UP** and **DN**) are actively being used to find the next source for the channel. **Next** is turned off when **Take** is pressed. If **Take** is not pressed, **Next** turns off about three seconds after the last **UP** or **DN** button press. The displayed name then returns to show the active source name.

Setup – Should not be lit under normal operation. When lit it indicates the panel is in **Setup** mode, which is only used to assign, or edit, the source names.

To exit **Setup** mode, press and hold the left channel **Offline** and **Take** buttons together for three seconds. The **Setup** labels turn off, and the panel returns to **Normal** mode.

Figure 3-3. Dual Selector Panel

Source Selection Controls

UP and DN – Pressing either button lights **Next**, changing the Source Name Display to show the names of potential next sources while **Next** is lit. Press the **UP** button to step through the names in forward alphanumeric order. Press the **DN** (down) button to step through the names in reverse order. Press and hold either button to rapidly step through the list. The Source Name Display returns to show the active source name about three seconds after the last **UP** or **DN** button press.

Take – When **Next** is lit, and the channel is off, pressing **Take** selects the displayed next source as the new source for that channel. To prevent on-air signal interruptions, the current source cannot be changed while a channel is on. If you press **Take** while the channel is on, the **ON** button blinks rapidly to indicate the **Take** command is locked out and the source is "preset." When you subsequently turn off the channel, pressing **Take** instantly takes the preset source.

Dual Router Panel Quick Guide

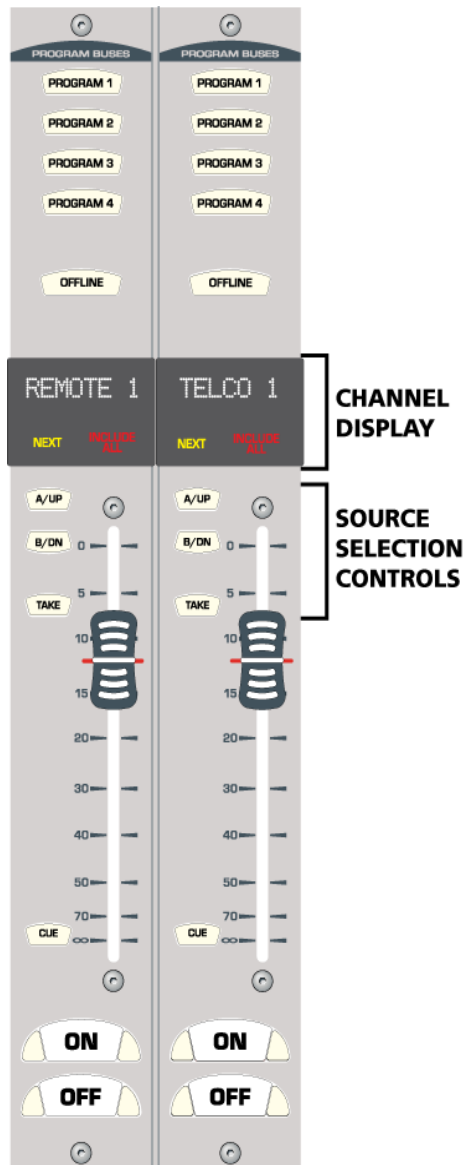


Figure 3-4. Dual Router Panel

When the NetWave console is linked to a VistaMax system, the VistaMax Enabled and VistaMax Linked labels are lit on the Monitor Control panel. In this case, one or more Dual Fader panels are typically upgraded to Dual Router panels (Figure 3-4). Use the **A/UP**, **B/DN**, and **Take** buttons to select and route a new VistaMax source for each display. Dual Router panels are easily recognized by their channel display:

- Ten-character Source Name display on each channel strip
- Two **Next** and **Include All** labels instead of **A/B** name labels

Since most panels are identical to the Dual Fader panel, this subsection covers only those functions that differ.

Channel Display

Source Name — Each ten-character display can show different names, depending upon whether **Next** is lit. When **Next** is unlit, the display shows the name of the current network source routed to that fader channel. Pressing the **UP** or **DN** button causes **Next** to light and the display switches to show the names of potential new sources for the channel, in alphanumeric order.

Next — When lit, indicates the source selector buttons (**UP** and **DN**) are actively being used to find a new source for the channel. **Next** is turned off when **Take** is pressed. If **Take** is not pressed, **Next** turns off about three seconds after the last **UP** or **DN** button press. In either case, the Source Name returns to show the current routed network source name.

Include All — Each fader channel is assigned a list of source names which can be taken on that fader channel. This list is usually kept short to make it easy to select a new source. The list can be expanded to show all the source names available to the console by pressing and holding the **UP** and **DN** buttons together until **Include All** lights (about three seconds). While **Include All** is lit, the list of new source names is expanded to show all names available to the console. Press and hold **UP** and **DN** together again for three seconds to turn off **Include All** and return to the channel-specific include list.

Source Selection Controls

UP and **DN** — Pressing either button lights **Next**, changing the Source Name Display to show the names of potential next sources while **Next** is lit. Press the **UP** button to step through the names in forward alphanumeric order. Press the **DN** (down) button to step through the names in reverse order. Press and hold either button rapidly to step through the list. The Source Name Display returns to show the active source name about three seconds after the last button press. Press and hold the **UP** and **DN** buttons together to toggle the **Include All** function on (**Include All** is lit) or off (**Include All** is not lit).

Take — When **Next** is lit, and the channel is off, pressing **Take** selects the displayed next source as the new source for the channel. To prevent on-air signal interruptions, the current source cannot be changed while the channel is On. If you press **Take** while the channel is on, the **ON** button blinks rapidly to indicate the **Take** command is locked out and the source is "preset." When you subsequently turn off the channel, pressing **Take** instantly takes the preset source.

Monitor Control Panel Quick Guide

This panel (Figure 3-5) is divided into three columns by function:

- **Left Column Controls** – Contains the aux meter source selectors
- **Center Column** – Contains the control room monitor controls (source selectors and level controls for the control room speakers and operator headphones)
- **Right Column** – Contains the studio monitor controls (source selectors and level controls for studio speakers)

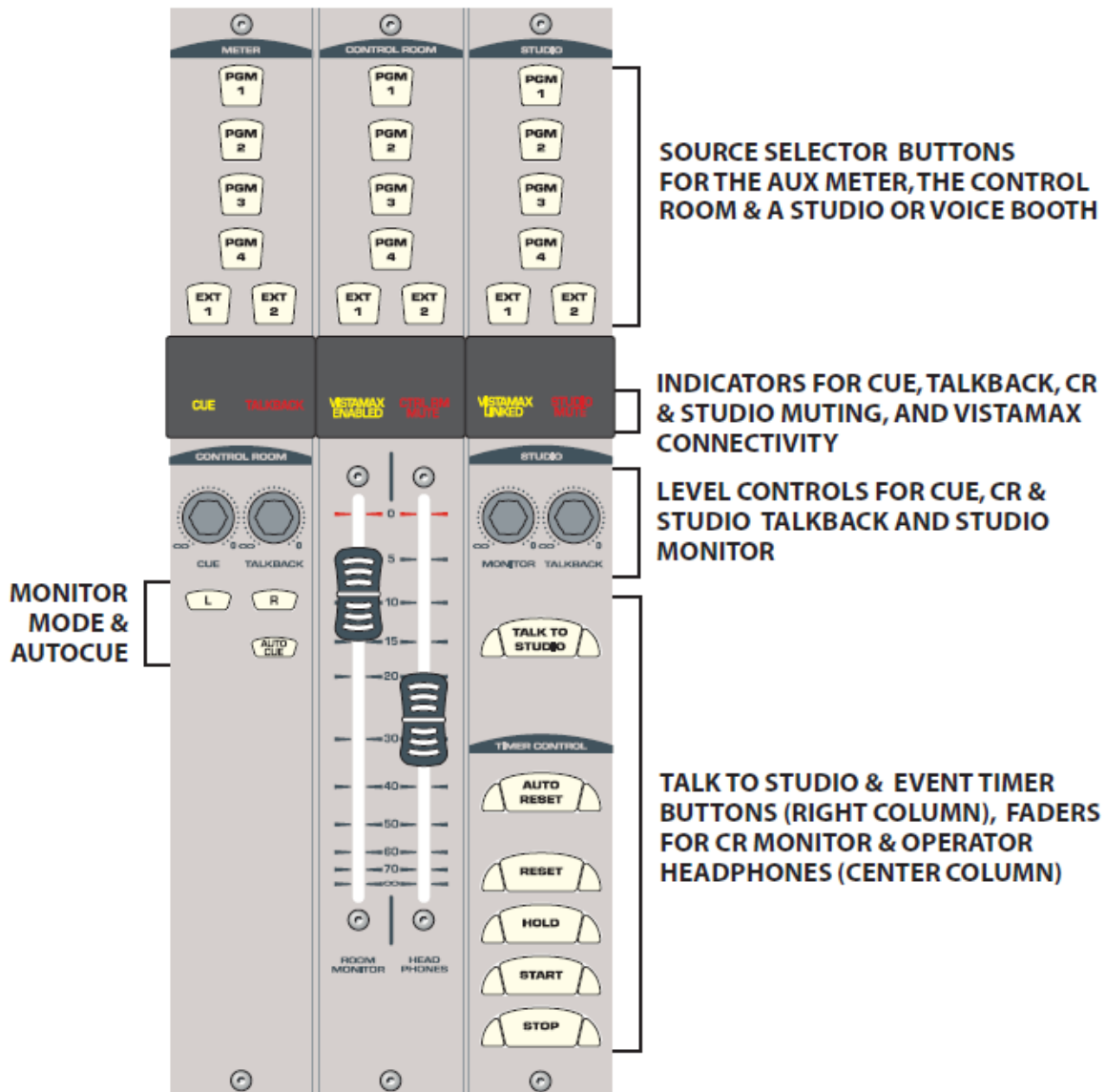


Figure 3-5. Monitor Control Panel

Monitor Control Panel – Left Column Controls

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

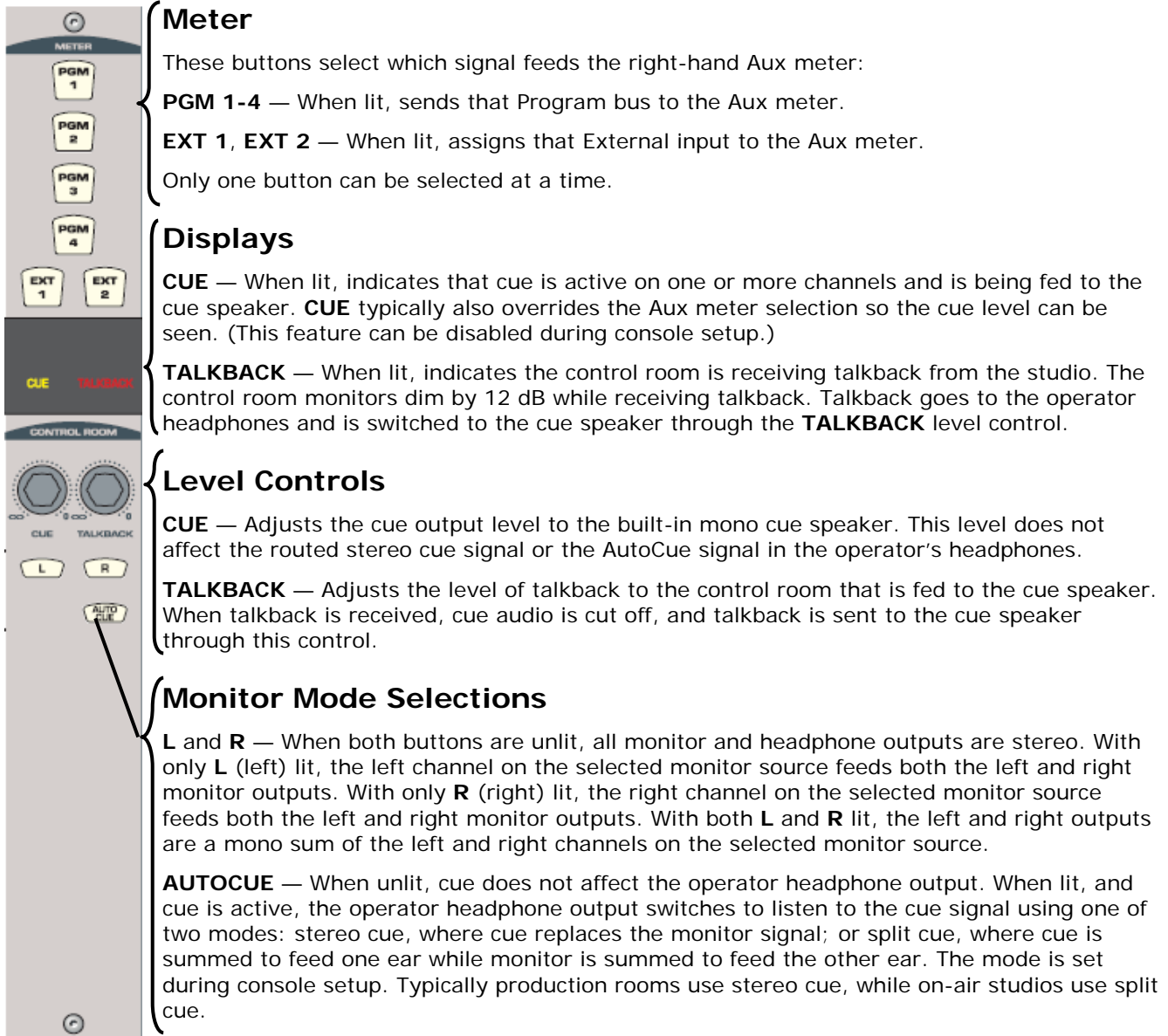


Figure 3-6. Left Column -
Monitor Control Panel

Monitor Control Panel – Center Column Controls

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

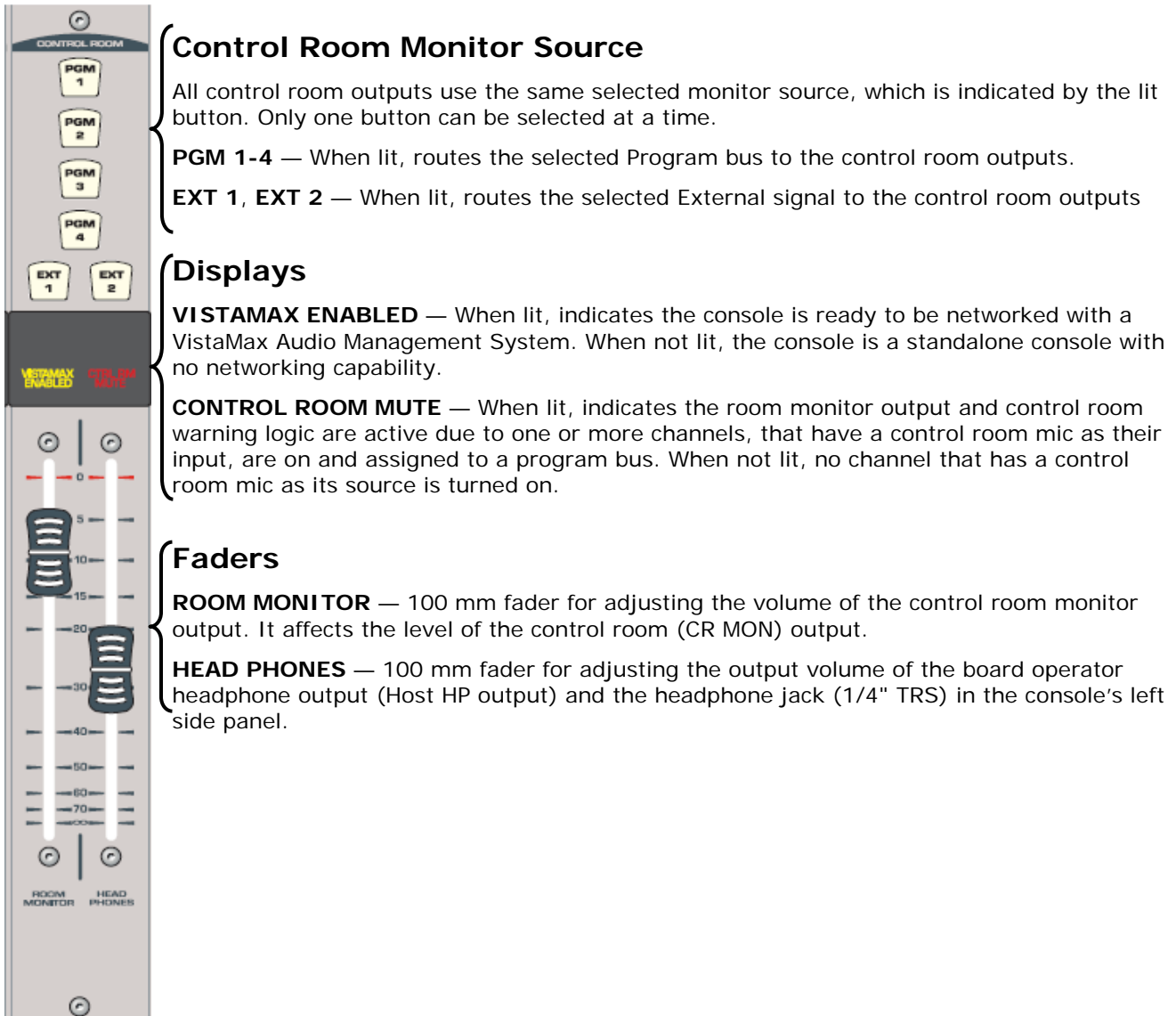
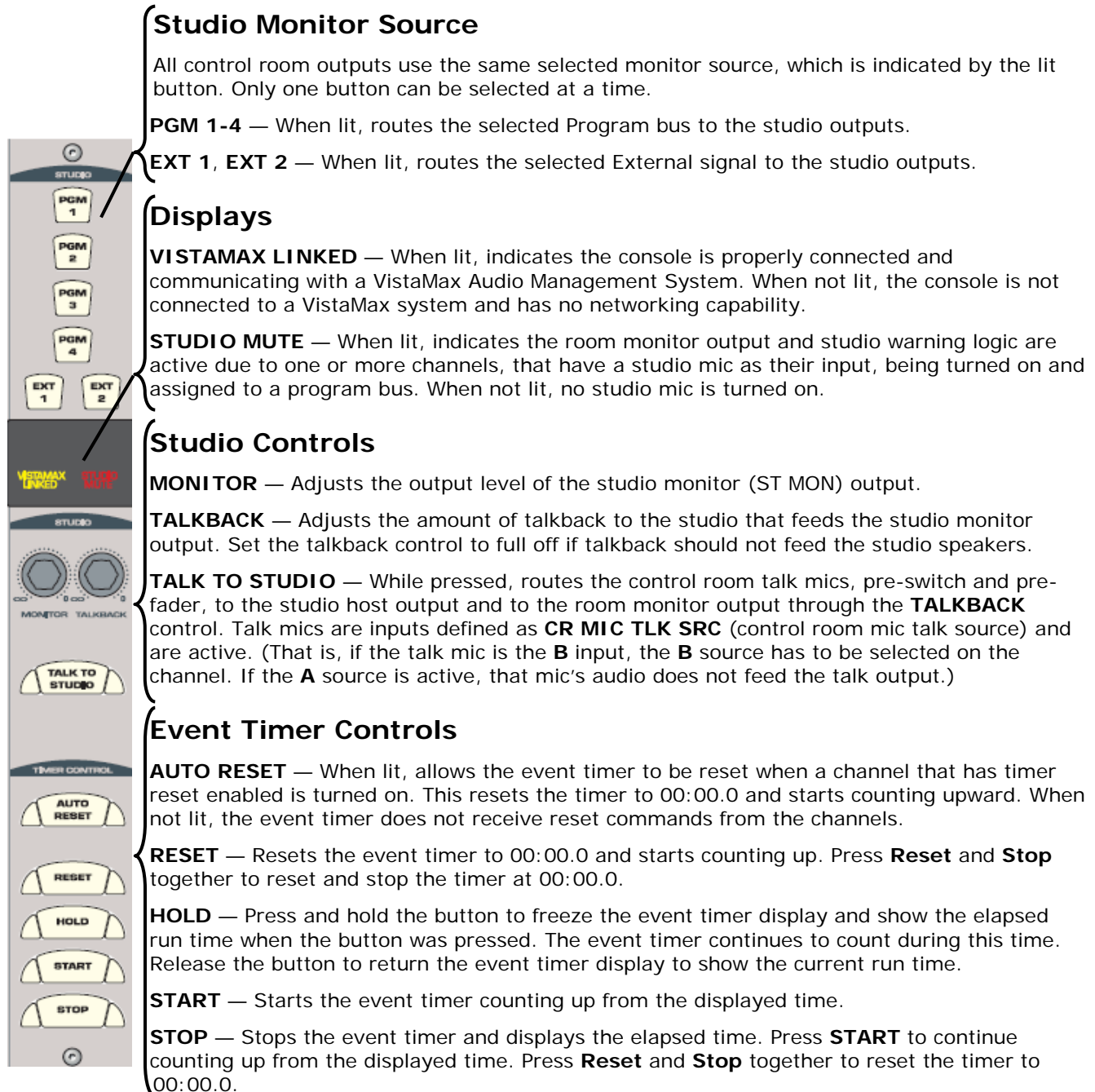


Figure 3-7. Center Column -
Monitor Control Panel

Monitor Control Panel – Right Column Controls

Figure 3-8 shows the right column controls on a Monitor Control Panel.



**Figure 3-8. Right Column -
Monitor Control Panel**

Console Display Quick Guide

The standard console display has these parts:

- Program bus levels using two or four bar graph meters
- Digital Clock
- Event Timer

Figure 3-9 shows a dual meter display. A quad meter adds two meters, **Program 2** and **Program 3** levels, in between the **Program 1** meter and the Auxiliary meter. You can order the NetWave-16 and NetWave-24 consoles with either a dual or a quad meter display. The NetWave-8 console is only available with a dual display.

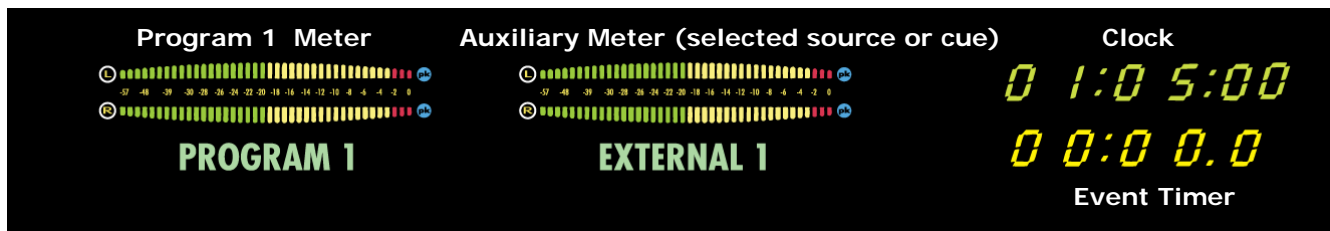


Figure 3-9. NetWave Dual Meter Display

Bar Graph Meters

A 10-character alphanumeric display below each meter identifies the displayed signal by name (**Program 1**, **External 1**, **Cue**, and so forth). The left meter shows the **Program 1** bus on both a Dual and Quad meter. On a Quad Meter, the two middle meters show the **Program 2** and **Program 3** buses. The right meter (Auxiliary) shows the levels of the source selected using the Aux Meter buttons on the Monitor Control panel (Figure 3-6). Note that the Auxiliary meter can also automatically show levels of the cue bus whenever cue is active (a feature set or disabled using a Monitor & Output board setup switch).

Figure 3-10 shows a detailed view of a bar graph meter. The meter is calibrated in dBFS (decibels Below Full Scale Digital) with the far right end of the meter showing 0 dBFS, the maximum output level of the console. In analog terms, 0 dBFS is equivalent to an analog output level of +24 dBu. Thus, the -20 dBFS bar (the last green LED segment in the middle of the meter) is equivalent to a 0 VU setting on a mechanical VU meter. A -20 dBFS signal on the meter results in a +4 dBu analog program output.

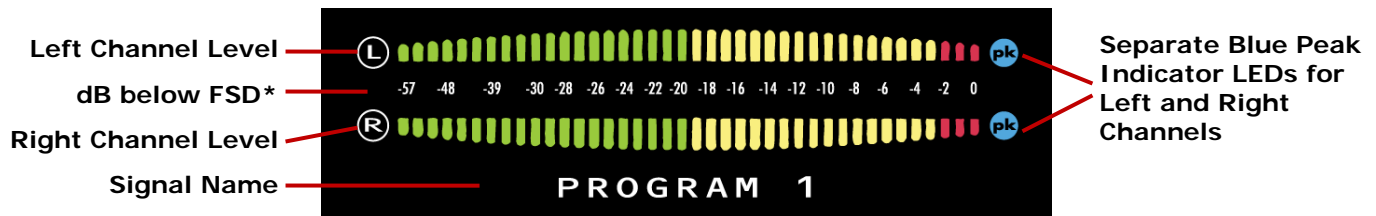


Figure 3-10. RMXdigital Bar Graph Meter

The bars from 0 to -30 dBFS represent a 1 dB level change between bars. From -30 to -57, each bar represents a 3 dB difference in level. Bars are green from -57 up to -20 (equivalent to a 0 VU level on a mechanical VU meter). From -19 to -3 the bars are yellow. Peak signal levels should always fall within this range. The 0, -1, and -2 bars are red to indicate the signal is dangerously close to digital clipping.

To prevent digital distortion on the outputs, the red bars should rarely, if ever, light up—especially the 0 bar—as it indicates the signal is at, or is attempting to go beyond, Full Scale Digital (the absolute maximum digital signal possible).

The NetWave meters, by default, display levels using *Peak & Average Mode* where a solid bar graph shows the Average level, with a single lit bar, typically 6 to 10 dB higher than the top of the Average bar graph, showing the peak level of the signal. The meters can alternately be set to the *Average-only Mode* where a

solid bar graph shows the Average level without any peak bar indication. A display board setup switch sets the mode of operation.

The two blue **pk** (peak) LEDs light up in either meter mode to indicate when the signal is too high. During installation, the display board setup switches also set the level where the blue **pk** LEDs turn on (0, -2, -4, or -6 dBFS) and the meter display mode (peak hold, where the highest peak bar stays lit for about 3 seconds; or non-peak hold, where the peak more accurately follows the signal).

Clock

The clock displays time in hours, minutes, and seconds (HR:MN:SC) in either 12- or 24-hour time. Figure 2-15 (on page 2-11) shows how to set the clock when it is not synchronized to a SMPTE or ESE master clock.

Event Timer

The event timer displays time in minutes, seconds, and tenths of seconds (MN:SC:TN). Figure 3-8 (on page 3-9) shows the event timer controls on the Monitor Control panel.

NetWave Applications

The NetWave console is a very flexible on-air, production, newsroom, or voice tracking studio console that may be installed as a standalone console or as a Linked console integrated into a VistaMax Audio Management System.

Because of its flexibility and its compact design, some features, especially when the console is Linked, require knowledge beyond the basic console operations of selecting which bus to assign a channel to, running up its fader, turning the channel on and making sure the signal does not hit the red LEDs on the meters. This section gives an overview of some of these advanced operational features.

Standalone Operation

When the NetWave console is not networked with a VistaMax system, there are two sources normally available to each channel: **A** and **B**. These are local sources connected directly to the console.

The active source is identified by the lit source selector button and lit channel label (**A/B** or, when custom labels are made, the source name). The console's installation kit contains blank labels, so you can make source name labels to use in place of the **A/B** labels.

To change the active source, press the unlit source button (**A** or **B**). The **Take** button flashes. Pressing the **Take** button, while it is flashing, changes the source. If you do not press **Take** within three seconds, the button deactivates and the source change is cancelled. If you press **Take** while the channel is on, the channel is forced off and the source is changed.

One source per channel can have logic control associated with it. There are two types of NetWave logic control:

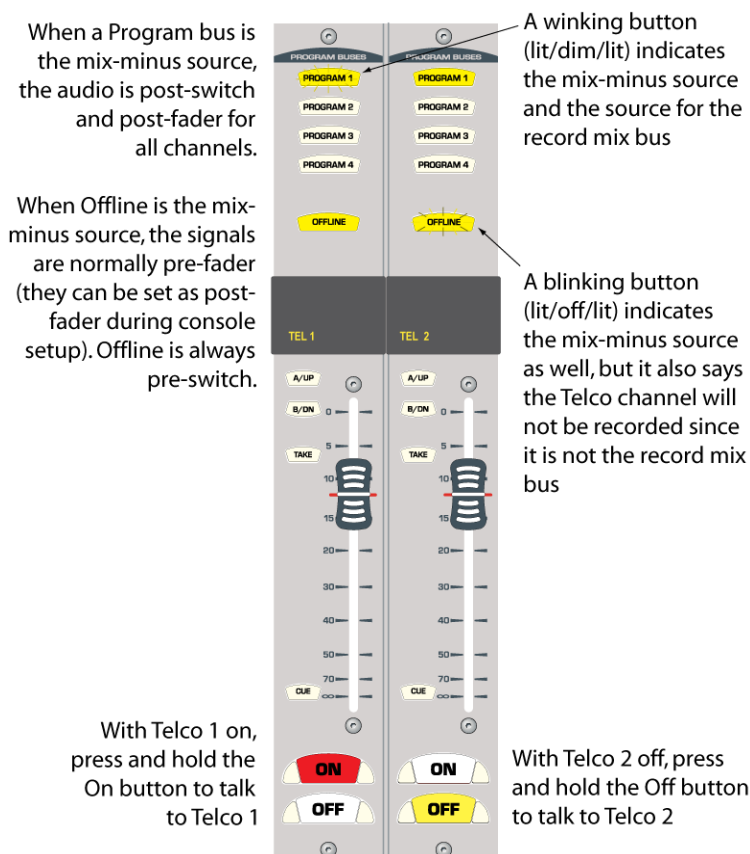
- Mic control – For GatesAir mic control panels associated with a studio or a control room microphone
- Peripheral device control – For equipment like computer playback systems, phone editors, CD players, and MD players

For a microphone, the mic control panel can remotely turn the channel on and off. Each panel also has a **Cough** button to momentarily mute the audio without turning the channel off. A host mic panel has a fourth button (**Talkback**) that is used to allow talking from a separate studio to the control room. A producer in the control room could use the same host panel to allow talking to the studio from the control room. The board operator can also talk to the studio using his/her own mic by pressing the **Talk to Studio** button on the Monitor Control panel.

For peripheral devices, the channel **On** button typically causes the peripheral to start playing an event, like a song, sounder, liner, or spot. The peripheral can alternately cause the channel to turn on when an event

Two channel sources (or a total of six sources with the optional Link Plus Activation kit) may be assigned as Telco inputs. These are special channel sources, with added functionality, that are covered in more detail in the next sections.

Standalone and Link Activated NetWave consoles can have up to two channel sources set as the **Telco 1** and **Telco 2** channels (Figure 3-11). Consoles with Link Plus Activation can have up to six channels designated as Telco channels 1 through 6.



Typically, Telco channel inputs come from telephone callers or from live remotes. In regards to the NetWave console, "Telco" refers to any type of four-wire, two-way device, such as these examples:

- Telephone hybrid
- Satellite transceiver
- ISDN or other telephone codec

- Two-way radio

Each Telco device has a Caller or From Network output that connects to a Telco channel input. A NetWave mix-minus output, specifically controlled by the settings on that Telco channel, goes from the console back to the Send or To Network input on the Telco device.

The console's two local Telco outputs (called "Mix-Minus") are also known as "fold back" or "IFB" (Interruptible Fold Back) outputs, since the board operator can independently talk to either output. No matter which bus is assigned to these mix-minus outputs, the audio is always minus the incoming Telco audio. On earlier analog consoles, this mix-minus output would be manually created by the board operator through bus assignments. But on the NetWave console, the mix-minus output is always correctly derived by the console, regardless of which bus is selected on the Telco channels.

The board operator can talk to either mix-minus output by pressing and holding that Telco channel's active On or Off button. The button blinks rapidly while pressed to indicate talkback is active.

Linked NetWave consoles also have dual-channel mix-minus signals that can be routed to any VistaMax destination or output. One channel is the same IFB mix-minus output as available on the console, while the second is a clean feed mix-minus output. To use this dual mix-minus output, the console must be linked to a VistaMax system and the Telco device's Send or To Network input must be connected to a VistaMax system output. This type of connection is most often used with dual channel ISDN remotes where the IFB output goes to the talent headphones at the remote while the clean feed goes to a PA system at the remote broadcast site.

The Telco channel sources should be identified by custom labels during installation, in lieu of the standard **A/B** labels. If they do not have custom labels, Telco channels have one distinctive feature: one bus assignment button winks or blinks because, on each Telco channel, the bus assignment buttons are multipurpose; they not only assign the Telco channel to one or more buses, they also set which bus is used to create the mix-minus return signal. In addition, the buttons also identify whether or not that Telco channel is being sent to the Telco Record output. It is a bit complicated, but the next sections should help clarify using Telco channels.

The Telco Mix-Minus Outputs

The mix-minus audio output for each Telco channel is derived from one **Program** or the **Offline** bus. Which bus feeds the mix-minus output is identified on each Telco channel by one winking or blinking bus assignment button. A winking button (lit, dimmed, lit) indicates three things:

- The Telco input is assigned to that bus.
- The mix-minus output is derived from that same bus.
- That bus is also feeding the Telco Record output so that the caller or remote can be recorded.

A blinking button (lit, off, lit) indicates the same three things except that Telco channel is *not* feeding the Telco Record output so that caller or remote will not be recorded.

The button that winks or blinks is also determined, in part, by whether the Auto Foldback console feature is set on or off. This feature is set during console setup. When Auto Foldback is off, which is the console's default setting, the **Offline** bus always has priority. This means that if the **Offline** button is lit on a Telco channel, it winks and the mix-minus output for that Telco channel, and for the Telco Record output, is the **Offline** bus. To send a PGM bus to the mix-minus output, the **Offline** button must be turned off. Then the PGM button blinks, since the **Offline** bus is feeding Telco Record. When Auto Foldback is off, the Telco channel on/off status does not affect which bus is going to the mix-minus output or to the Telco Record output. Use this mode to record callers rather than have them go live to air.

If callers or remotes go live to air, Auto Foldback should be set on. In this mode, when the Telco channel is off, **Offline** is automatically fed to the mix-minus output. When the Telco channel is turned on, the mix-minus output automatically switches to the lowest number **Program** bus assigned on that Telco channel. Turning the channel off automatically switches the mix-minus back to the **Offline** bus.

Telco Operation with Auto Foldback On

When the console is set up with Auto Foldback set on, each Telco channel's mix-minus automatically toggles between the lowest assigned program bus while the channel is on, and the **Offline** bus while the channel is off. Here is a summary:

- **Telco Channel On: Program 1** is the mix-minus source. If it is not assigned, the source is selected in this order: **Program 2, Program 3, Program 4**, and **Offline**.
- **Telco Channel Off:** The **Offline** bus is the mix-minus source. If it is not assigned (unlit), there is no mix-minus audio—except for talkback—going to the mix-minus output.

Setting Auto Foldback on is typically used for live interviews and live remotes that do not need a clean return feed. Typically, only the talent or board operator's mic channel and the caller's Telco channel are assigned to **Offline**. While the Telco channel is off, the caller/remote can hear the talent/board operator through his/her mic on the **Offline** bus. The talent hears the caller/remote by assigning the Telco channel to cue. In this setup, the caller/remote can hear the talent mic all the time, unless it is unassigned from the **Offline** bus.

If while a caller is waiting to go on-air, he/she 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 talent can then press the caller's Off button to talk to the caller, or they could momentarily assign their mic to **Offline** to talk to the caller without pressing Telco talkback.

When the caller/remote goes live to air (the Telco channel is turned on), the caller/remote mix-minus audio 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, minus his/her own voice.

Auto Foldback Off (Default Setting)

When Auto Foldback is set off, the mix-minus audio is not affected by the Telco channel **On** or **Off** status; the mix-minus audio is always **Offline** unless it is not assigned, then the mix-minus audio is from the lowest assigned program bus, in this order: **Program 1, Program 2, Program 3, Program 4**.

Auto Foldback Off is typically used to record callers or interviews for later broadcast and for live remotes where a "broadcast" or clean feed going back to the remote site is required. Thus, the mix-minus audio should never change. In this case, assign the Telco channel only to the air bus (typically **Program 1**) so that it is always sent back to the remote, regardless of whether the Telco channel is **On** or **Off**. If there are two audio feeds to the remote, as with an ISDN remote, the IFB feed would go to the talent's headphones and the second mix-minus or clean feed would go to the audience. If a special remote broadcast mix is required, construct it using **Offline** and then it will remain the mix-minus audio, regardless of the program bus assignments and whether the channel is **On** or **Off**.

Telco Record Output

A two-channel Telco Record output, with the caller on the left channel and the talent (any mic/line channels assigned to the mix-minus bus) on the right channel, is available for use with phone call editors like VoxPro®.

The console does not have a dedicated local Telco Record output, but the **Program 4** analog output can be switched (using a console setup switch) to be a local Telco Record output. Linked consoles have the stereo Telco Record output as one of their network signals.

A Record Summary (Table 3-1) lists which signals get recorded on the Telco record output.

Table 3-1. Telco Record Output Summary

Channel	Description
Left	All Telco channels assigned to the record mix bus
Right	All non-Telco channels assigned to the record mix bus
Not recorded	Any channel <i>not</i> assigned to the record mix bus

Since the Telco record mix bus is affected by whether Auto Foldback is active or not, Figures 3-12 and 3-13, along with the discussions with each illustration, explain in detail how the Telco Record output is affected by the Auto Foldback mode setting.

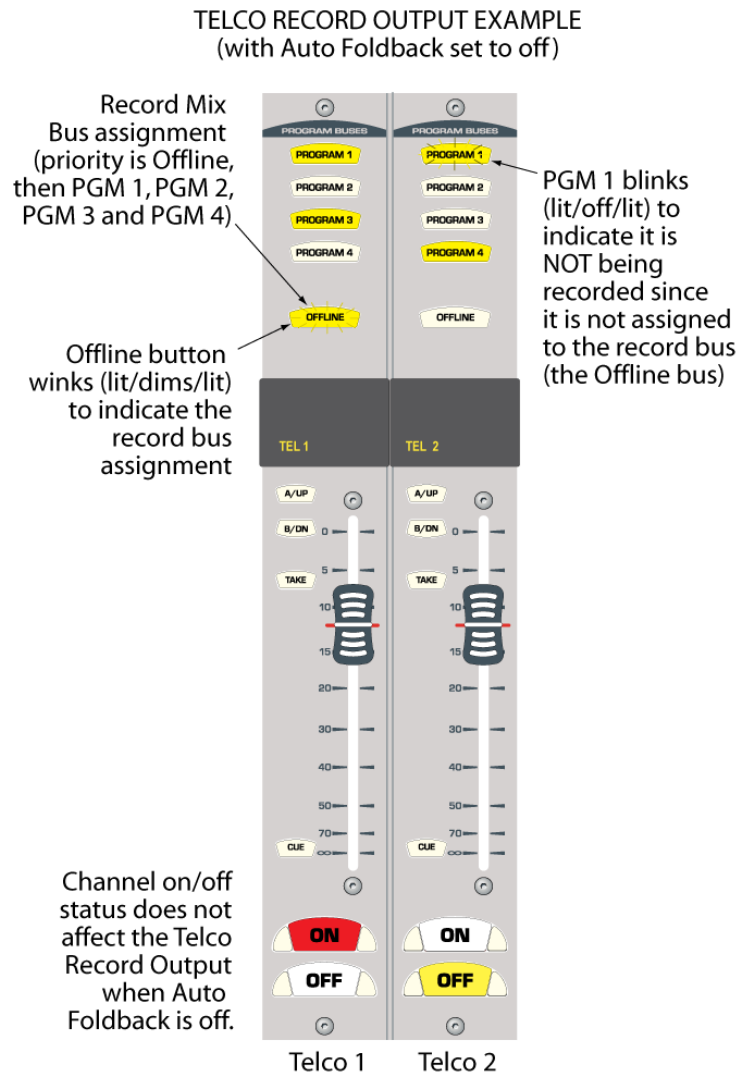


Figure 3-12. Telco Record Output – Auto Foldback Off

Auto Foldback Off (default):

- The record mix bus priority is **Offline**, **Program 1**, **Program 2**, **Program 3**, **Program 4**.
- When **Offline** is the record mix source, it does not matter whether the channels are on or off. If a non-Telco channel is assigned to the **Offline** bus, it will be in the right channel of the Telco Record output.
- All Telco channels assigned to the **Offline** bus get mixed together to the left channel of the Telco Record output. Any that are not assigned to the **Offline** bus are not recorded.
- When a program bus is the record mix source, only those channels (including the Telco channels) that are turned on and assigned to the record mix bus are recorded.

TELCO RECORD OUTPUT EXAMPLE (with Auto Foldback set to on)

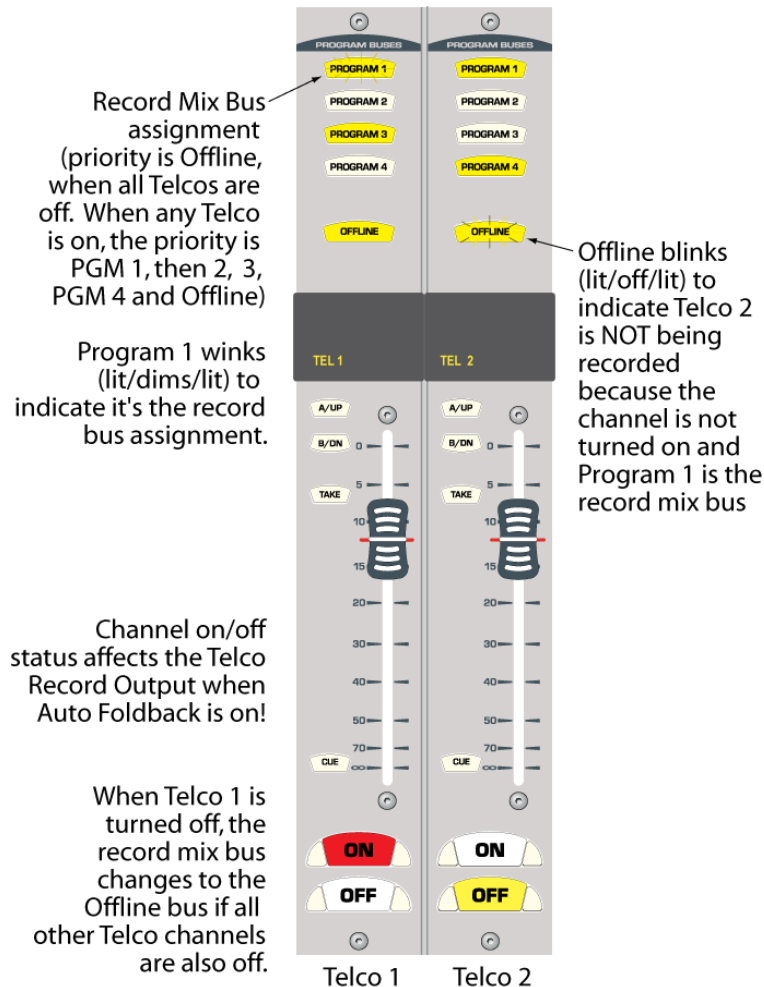


Figure 3-13. Telco Record Output – Auto Foldback On

Auto Foldback On:

The record mix source follows the on/off state of all of the Telco channels. When all Telco channels are on, **Program 1** is the primary record mix. (If it is not assigned, **Program 2**, **Program 3**, **Program 4** or **Offline** is used in that order). When all Telco channels are off, **Offline** is the record mix source.

Note: Offline feeds are always pre-switch. They are normally set as pre-fader but may be changed during console setup to be post-fader.

Link Plus Activation

When the console is linked to a VistaMax system using Link Plus, up to six channel sources can be set as Telco channels. Each Telco has its own mix-minus and subsequently can be individually talked to using the channel's **On** or **Off** buttons.

Because the console only has two local mix-minus outputs, the four additional mix-minus outputs are routed signals that go through the VistaMax system. To a board operator, this is not an issue since this routing is done transparently and follows the same rules as outlined previously (mix-minus routing is performed automatically following the bus assignments and whether Auto Foldback is on or off).

Having six Telco faders complicates how the Telco record bus output is used, especially if Auto Foldback is active, since all Telco channels must be On to use a Program bus as the Telco Record source.

Section 4 - Linked NetWave Consoles

This section covers specific features of linked NetWave consoles, which are NetWave consoles connected to a VistaMax Audio Management System:

- Linking the NetWave console
- Setup
- Configuration
- Use

Two monitor control panel labels (**VistaMax Enabled** and **VistaMax Linked**) light up when the NetWave console is properly linked with a VistaMax system. If the two labels are not lit, the NetWave is not properly linked to a VistaMax system Hub card facet. Setup, configuration, and use information in this section only applies to NetWave consoles that are properly linked with a VistaMax system.

NetWave Linking

To link a NetWave console to a VistaMax system, follow this process:

1. Install a Link Activation kit (PRE99-1425 Link Activation or PRE99-1426 Link Plus Activation). When the console is powered back up after the kit is installed, the monitor control panel's **VistaMax Enabled** label is lit to indicate the kit was properly installed.
2. Physically link the NetWave to an available facet on a Hub card in a VistaMax, Envoy, or VMConnect card frame. That device is the NetWave console's "parent" in the VistaMax system, controlling the signal routing to and from that console. To link the console, connect the rear panel RJ-45 VistaMax Link jack (next to the power connector – Figure 4-1) to an available Hub card facet using a CAT5e or CAT6 **crossover** cable. Cable runs of up to 300 feet [100M] are supported. When the VistaMax Link jack is connected to the Hub card, a second monitor control panel label, **VistaMax Linked**, lights to indicate that a good connection has been established with the Hub card.



Figure 4-1. RJ-45 VistaMax Link Connector on Rear Panel

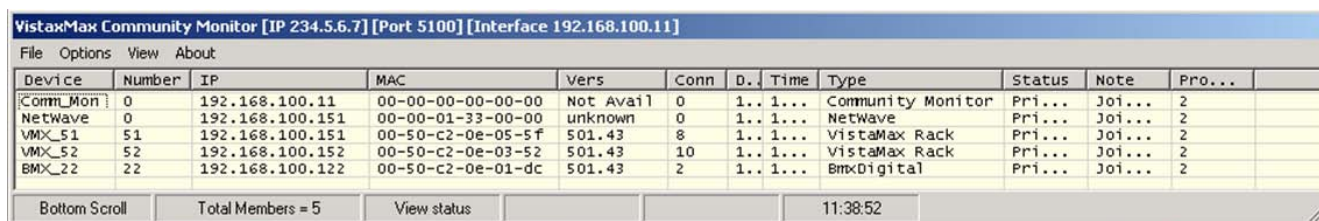
3. With both labels lit, you can configure the NetWave console signals using VistaMax Control Center (VMCC), which involves
 - a. Naming the NetWave's audio sources.
 - b. Selecting which of these signals should be added to community member include lists.
 - c. Configuring any Dual Router panels that are installed in the console.

The VistaMax system devices must be running 500-series (build 501.70 or later) operating system code; the VistaMax Control Center (VMCC) setup software must be Version 2.0, build 2092, or later; and Community Monitor (CM) must be Version 3.100 or be running any version of the combined NetManager/Community Monitor.

If the VistaMax system is new, all these steps should be correct. But, when the NetWave console is being added to an existing VistaMax system, the system devices may be running older operating system code. The current version for each of these programs can be downloaded from the GatesAir Customer Portal site or from the GatesAir FTP site. Section 5 – "Service" gives more information about accessing these sites.

Operating System Version Verification

To identify which version of operating code is running on the VistaMax system devices, open **Community Monitor** (Figure 4-2), on the admin computer, and select **View | Status**. The **Vers** column in this window lists the code version running on each device in the system.



Device	Number	IP	MAC	Vers	Conn	D.	Time	Type	Status	Note	Pro...
Comm_Mon	0	192.168.100.11	00-00-00-00-00-00	Not Avail	0	1..	1...	Community Monitor	Pri...	Joi...	2
NetWave	0	192.168.100.151	00-00-01-33-00-00	unknown	0	1..	1...	NetWave	Pri...	Joi...	2
VMX_51	51	192.168.100.151	00-50-c2-0e-05-f	501.43	8	1..	1...	VistaMax Rack	Pri...	Joi...	2
VMX_52	52	192.168.100.152	00-50-c2-0e-03-52	501.43	10	1..	1...	VistaMax Rack	Pri...	Joi...	2
BMX_22	22	192.168.100.122	00-50-c2-0e-01-dc	501.43	2	1..	1...	BmxDigital	Pri...	Joi...	2

Figure 4-2. Community Monitor Status Window, NetWave Console Connected to VMX_51

VistaMax devices running 400-series code, build 445.10 or later, can be used with the NetWave console. However, to take full advantage of the NetWave's linked features the code should be upgraded to either 500-series or 600-series code.

To view the **Community Monitor** version, click the **About** menu bar item. The last standalone build of **Community Monitor** is Version 3.100. All newer versions are included as part of the GatesAir NetManager application. To view the VMCC version, click **Help**, and then click **About VMCC**. Version 2.0, build 2092 or later, is required to support NetWave consoles.

A customer document (71-2002_500-series_code_update.pdf) gives information on migrating from 400-series to 500-series operating system code. It can be downloaded from GatesAir Customer Portal site or from the GatesAir FTP site. (Section 5 – “Service” gives more information about accessing these sites.) Contact GatesAir studio products tech support for assistance before performing an operating system code upgrade.

Linked NetWave Features

NetWave consoles, when linked to a VistaMax system, have these upgraded features:

- Each NetWave channel is assigned a specific VistaMax destination on its parent device. This allows either the A or B channel source on any channel to be set to use a VistaMax source (instead of using the local analog and digital input) as the A or B input. Thus, any VistaMax signal (even one with logic) can be set as the input on any channel on a linked NetWave console.
- One local signal (the analog or the digital input) from each channel is a VistaMax source—regardless of whether that local input is even used on the console. These signals can be routed to any VistaMax system destination, if desired, independent of whether the signal is being used on the console.
- The two Monitor inputs (Ext 1 and Ext 2) also have specific VistaMax destinations assigned to them so that air monitors or other signals can be routed to the inputs. Either, or both, of these inputs can be set to use a routed signal instead of their local input connection (Ext In 1 and Ext In 2).
- The four program buses are VistaMax sources that can be routed to any VistaMax destination.
- The cue bus, in stereo, is a VistaMax source that can be routed to any VistaMax destination.
- The Telco Record output is a VistaMax source that can be routed to any VistaMax destination.
- The two Telco mix-minus signals, in addition to having local outputs, are also VistaMax sources. A plus is that the routed signals are dual-channel: one channel is a clean mix-minus feed, while the second is an IFB signal (the same signal used on the local mix-minus outputs). With Link Plus Activation, up to six channels can be set as Telco channels. Subsequently, with Link Plus, there are six dual channel mix-minus signals available to the VistaMax system. (Only Telco 1 and Telco 2 have local mix-minus outputs.)

The VistaMax Control Center (VMCC) setup software is used to set up the NetWave console to use the new linked console features.

Linked NetWave Setup

This section assumes

- You have a working knowledge of VistaMax terms and procedures.
- The VistaMax community has already been set up and is working properly.
The VistaMax (75-52), Envoy (75-55), or VM Family of Devices (75-57) manuals give general VistaMax system information and VMCC software usage. Additional information on using VMCC can be found in GatesAir Application Notes, available for downloading from the GatesAir Customer Portal site or from the GatesAir FTP site. This section builds upon that information, presenting specific details for setting up NetWave consoles to use in an existing VistaMax system.

Before setting up a newly linked NetWave console, these criteria must exist:

- Compatible versions of Community Monitor (CM) and the VistaMax Control Center (VMCC) must be installed (as listed in the previous *Operating System Version Verification* subsection) and running on the VistaMax system's admin computer.
- The NetWave console's **VistaMax Linked** and **VistaMax Enabled** labels must be lit.
- The admin computer, the NetWave's parent device (VistaMax, Envoy, or VMConnect card frame), and any Dual Router upgrade kits, must be networked together on the VistaMax LAN.

To set up a linked NetWave console, ensure that CM is running and that the NetWave console appears in the CM Status View. Then follow this process:

1. [Set up the new NetWave console as a member of the VistaMax community.](#)
2. [Edit the NetWave console settings.](#)
3. [Name and define the console signals.](#)
4. [Set up Dual Router processor cards.](#)
5. [Set Dual Router channel sources.](#)
6. [Provision the configuration files.](#)
7. [Distribute the provisioned files.](#)

The next subsections give detailed procedures for this process.

Set Up a NetWave Console using VMCC

It is assumed that you have already used VistaMax Control Center (VMCC) to set up the other members of the VistaMax community and that you are now using VMCC to add a new NetWave console to the existing community that appears in VMCC. Figure 4-3, on page 4-4, identifies the VMCC program's main graphical interface features.

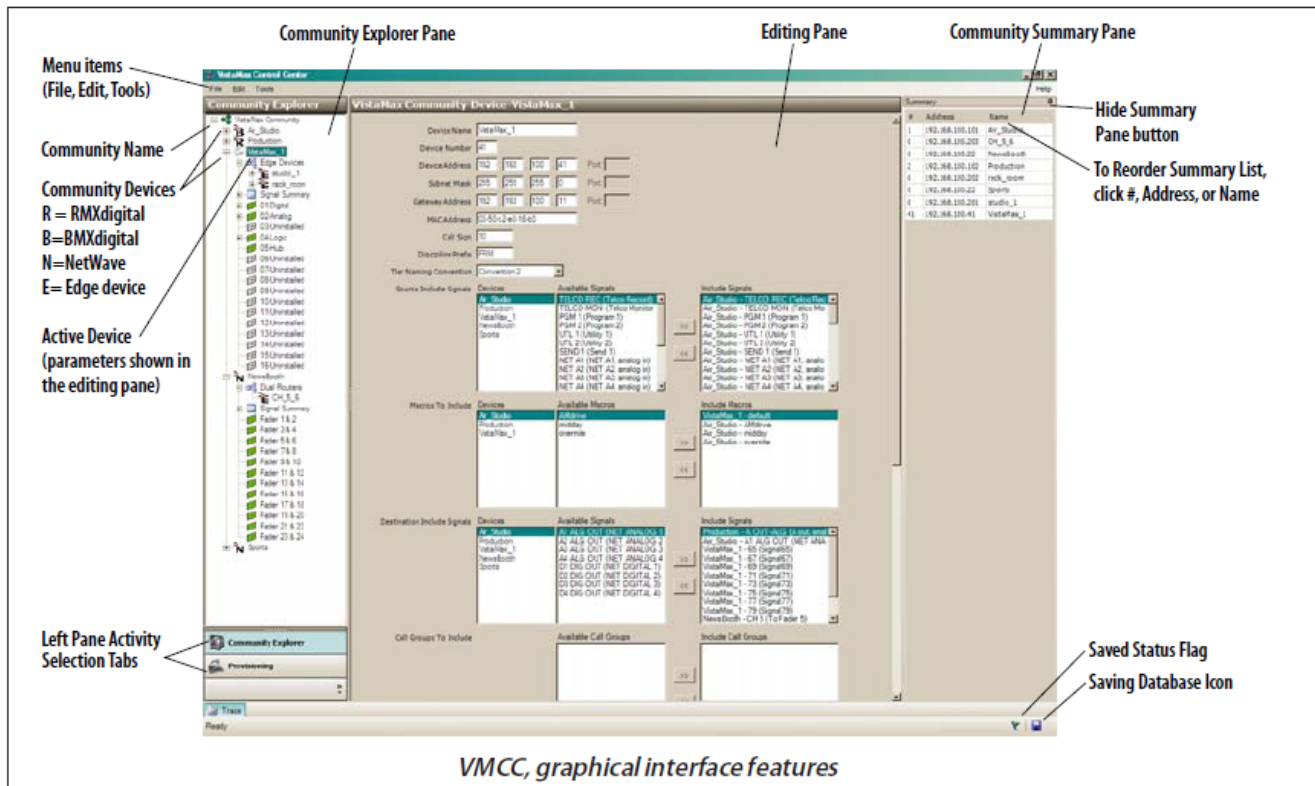


Figure 4-3. VMCC Graphical Interface Features

Review the VistaMax or Envoy manual discussion on using VMCC to set up a VistaMax community before performing these steps:

1. Click the VMCC **File** menu item (in VMCC 2.1 or earlier versions) or the **Community** menu item (in VMCC 2.2 or later versions).
2. Select **Inspect Community**. A community inspection window (Figure 4-4) opens to show all the VistaMax devices detected, including the new NetWave console, any Dual Router processor cards, and the other existing VistaMax devices (consoles, card frames, and other edge devices) in the community.

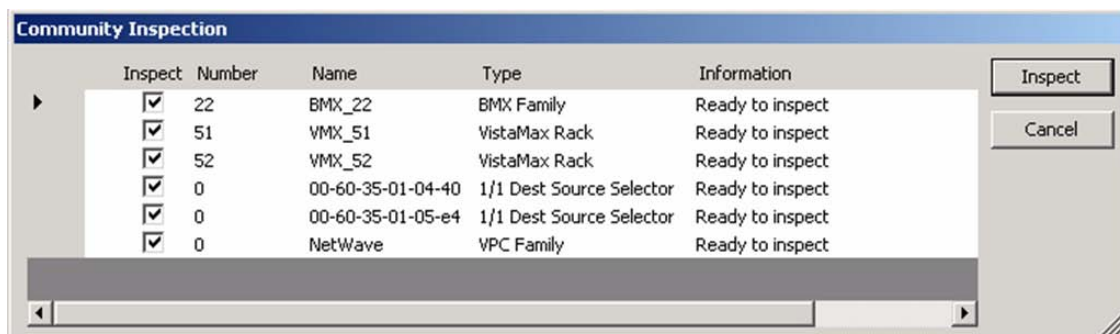


Figure 4-4. VMCC Inspection Window

3. The other community members do not need to be re-inspected, so click to clear those **Inspect** check boxes. (Click a check box to select or clear it.) The only **Inspect** check boxes that should be selected are for the NetWave console and any processor cards installed as part of the Dual Router kit upgrades.

4. Dual Router processor cards show up in the list with their MAC address as their **Name** (Figure 4-4). Their **Type** is shown as **1/1 Dest Source Selector**. If necessary, perform these steps to widen the **Name** column to show the full MAC address:

- a. Point next to the **Type** heading.
- b. Click the left/right arrow symbol that pops up and drag it to the right.



Note: When the processor card is installed as part of a Dual Router upgrade, the console name and the two fader channels that the card controls should be written on the label on the TINI's antistatic bag. Use this information to verify each processor card's assignments during configuration.

5. Click **Inspect** to inspect the **NetWave** and **Dual Router** panels. The information line shows **Done** when the inspection completes.
6. Click **Continue** to move to the window showing the inspection results.
7. With a new console, there are no slot conflicts or critical issues, so click **Accept**. After a few seconds (depending upon how large the community is) the console name appears as a new community member in the **Community Explorer** pane, along the left side of the VMCC window. This pane shows each device in the VistaMax community.

Edit the Device Settings

1. If the new console name is not selected in the **Community Explorer** pane, click once on its name to select it. The editing pane shows the current device settings for the NetWave console (Figure 4-5).



Figure 4-5. NetWave Parameter Setup Pane

2. Create a unique name for the console (such as "PROD_1"), since each size frame has the same default name. The **Device Name** can have up to 10 alphanumeric characters. Spaces are not allowed, so use an underscore to separate words (as in "PROD_1").
3. Verify that the parent device information is correctly entered, since this information sets the source and destination signal numbers assigned to that NetWave console.
 - **Parent Device**
 - **VMX Hub Slot #**
 - **VMX Hub Facet #**

If needed, click the down arrow to show available **Parent Devices**, **Hub Slot #**, and **Hub Facet #**. If the information is incorrect, the console will not receive the correct audio signals and audio signals from the NetWave console will not route correctly. When the console is inspected using VMCC, this information should be set correctly.

- If a Link Plus Activation PROM was installed, select the **Link Plus Activation Enable** check box, which adds four dual mix-minus signals to the source list for the console. On NetWave-24 consoles, these four mix-minus signals replace the audio sources normally available from channels 21 – 24.
- Assign a unique **Device Number** (from 65 up to 256 are valid numbers) to the console. The NetManager and VistaVue software use the **Device Number** to identify the NetWave signals as being on a “separate device” even though the NetWave console is treated as just another I-O card by its parent device.

Name and Define the Console Signals

Once the NetWave device settings are edited the signal names and modes for the two types of console signals: Sources and Destinations, can be edited.

- In the **Community Explorer** pane, click the + button next to the NetWave console name to show the Signal Summary and fader channel selectors. Click the + button next to **Signal Summary** to view the Sources and Destinations selectors. Click on **Sources** (it highlights the name) to show the **Sources Signal Summary** in the edit pane.

Local Signal #	Slot #	In Room Name	Community Name	Description	Link w/ Next	Hidden
321	1	IN 1	I1	From Input 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
322	1	IN 1 R	I1R	From Input 1 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
323	2	IN 2	I2	From Input 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
324	2	IN 2 R	I2R	From Input 2 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
325	3	IN 3	I3	From Input 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
326	3	IN 3 R	I3R	From Input 3 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
327	4	IN 4	I4	From Input 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
328	4	IN 4 R	I4R	From Input 4 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
329	5	IN 5	I5	From Input 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
330	5	IN 5 R	I5R	From Input 5 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 4-6. NetWave Source Name Entry Pane

- In this pane, the default Source settings for each signal's **In Room Name**, **Community Name**, **Description**, **Link w/Next**, and **Hidden** columns can be edited as required. (More information for each of these settings follows this procedure.)
- By default, all sources and destinations are set as linked stereo signals with the right audio channel hidden. To change from a stereo to a mono signal, as for a microphone input, clear the **Link w/Next** check box on the left channel of the source signal.
- To also use the right channel input, clear the **Hidden** check box.

The **Sources** pane (Figure 4-6) lists one input from each NetWave channel, the four program buses, the stereo cue bus, and the Telco mix-minus and Telco Record signals. (The actual input audio—analogue or digital, is defined by the **Network Source** selections on each DSP card.)

The **In Room Names** appear on VistaMax selector panels and in Dual Router panels throughout the system, when Tier Naming Convention 1 (a VMCC device setting) is used by the console's parent device. The **In Room Name** can have up to 10 alphanumeric characters (including spaces, dashes, underlines, forward and back slashes, and periods). On stereo signals only the left name needs to be edited; the right channel can remain at its default name (such as PGM 3 R) since it is Hidden in normal usage. Typically, the **Description** column settings remain at the default but can be edited to identify the channel source (such as “Input 24 analog from CD player”). Duplicate In Room and Community names are allowed, so be careful to create unique names, preventing signal selection confusion from having duplicate source names in the system.

The **Community Name** column names are only used when Tier Naming Convention 2 or 3 is used by the NetWave's parent device. The **Community Name** is limited to four characters, since up to six characters are used up by the Tier 2 and Tier 3 name prefixes. Typically, these naming conventions are only used when multiple stations are networked together in large VistaMax systems. When Tier 1 is used

on the NetWave's parent device, the **Community Names** are not used and can be left at their defaults. The VistaMax, Envoy, and VM Device manuals give additional information on Tier Naming Conventions.

5. In the **Community Explorer** pane, click on **Destinations** (the name highlights) to show the routed channel inputs and External 1 and 2 monitor inputs.

Note: These signals are usually left at their defaults. However, if you use a Source-Destination selector panel to manually route signals to these destinations, every NetWave console has the same set of names, causing duplicate names to appear in the selector. In that case, the **Destinations** will need to have unique names.

6. If required, edit the **Destinations' In Room Names** as you did for the **Sources**, using up to 10 alphanumeric characters to uniquely identify each destination (e.g., PROD1 EXT1, VT CH1, NEWS CH15).

Setting Up Dual Routers


If one or more Dual Router upgrade kits have been installed, you would now set them up in VMCC. When the community was inspected, the Dual Router upgrade processor gets listed in the **Community Explorer** pane (Figure 4-7) by an  icon, which identifies it as an "edge device". Its name is its MAC address. The type of edge device is a SSD_1_1, which is a dual source selector that controls two destinations.




Figure 4-7. New Dual Router Panel Setup

To set up each Dual Router processor, perform these steps:

1. In the **Community Explorer** pane, click on the edge device name to show its settings in the edit pane.
2. Type a **Device Name**, of up to 10 alphanumeric characters in place of the MAC address. Use a descriptive name, like Z_AIR_1314, to identify which NetWave that Dual Router panel is installed in and the two faders it controls. Spaces are not allowed so use underscores to separate words and numbers.
3. Click to select a **Parent Device** (this is the NetWave console's parent device) from the drop-down list.
4. At **Device Address**, edit the last octet of the IP address to get a unique IP address. (Typically, IP addresses from ".201" up are used for source selector panels and Dual Router panels).

Note: The **Subnet Mask** and **Gateway Address** usually remain at their default settings. The exception is when a 9G20 processor is used in the Dual Router in place of the older TINI card. In this case, set the **Gateway Address** to the admin computer's IP address (Figure 4-7).

5. If needed, type the admin computer's IP address at **Gateway Address**.

6. In the **Community Explorer** pane, right-click on the new Dual Router panel's name. The **Convert to Dual Router** option box appears (Figure 4-7).
7. Click **Convert to Dual Router** to identify the edge device as a Dual Router. The  icon moves below the parent device and the edge device settings remain in the edit pane.
8. If the edge device settings no longer appear in the edit pane, perform these steps:
 - a. In the **Community Explorer** pane, click + next to the parent device name to expand the parent device.
 - b. Click + next to the Edge Devices.
 - c. Click the Dual Router panel name to show its settings in the edit pane.
9. Click the Drop Down button next to the **Parent Device** entry in the edit pane and select the NetWave console that this Dual Router panel is installed in.

After you define all of the Dual Router panels, reopen the VMCC community will force the Dual Routers to appear under their own consoles instead of under the consoles' parent devices. To do this:

1. In VMCC 2.2, click **Community | Open Community**, or click **File | Open Community** in earlier versions of VMCC.
2. Click your community's name to reopen the community. In the **Community Explorer** pane, each Dual Router panel now appears under its parent device (such as PROD_1).
3. To confirm a panel is ready to be "bound" to the Dual Fader channel slots where each panel is physically installed (Figure 4-8), perform these steps:
 - a. Click + next to the NetWave console name.
 - b. Click + next to **Dual Routers**. Any Dual Router panel that appears in the **Community Explorer** pane is ready to be "bound." In Figure 4-8, the Dual Router is in the middle of the console (Fader 13 & 14).

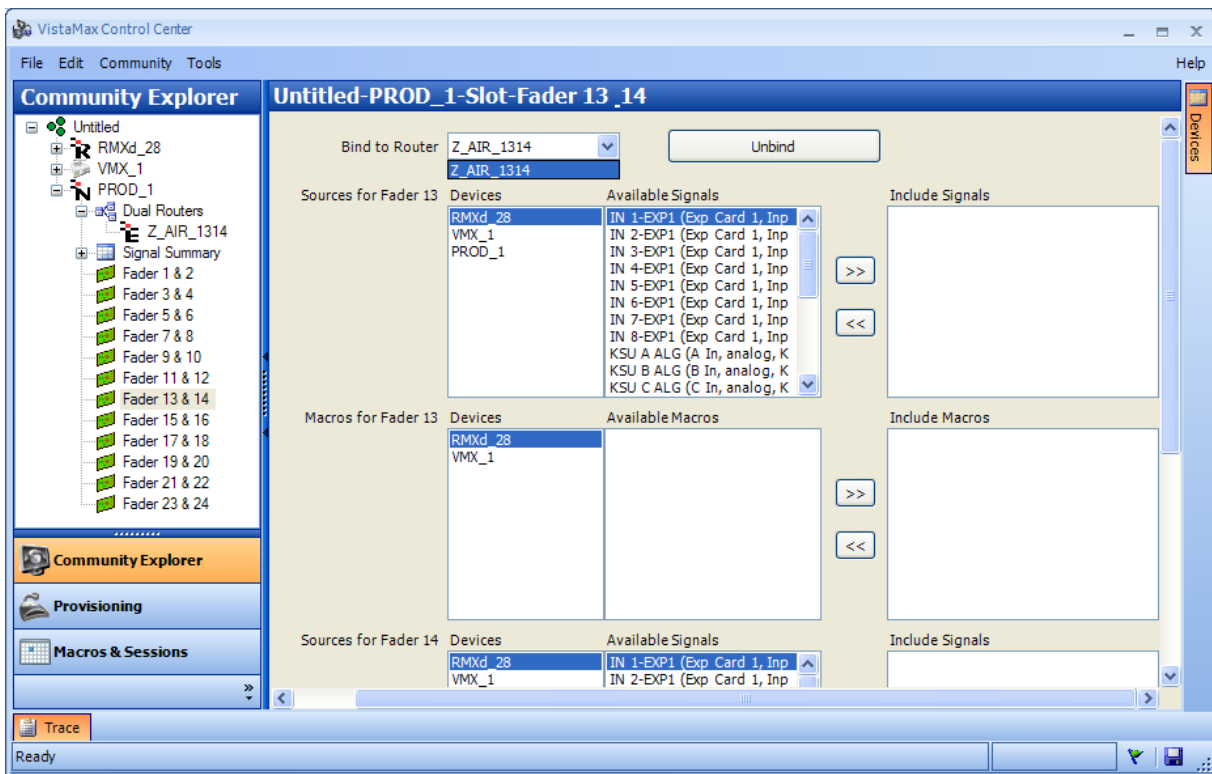


Figure 4-8. Dual Routers Binding to Dual Fader Slots

4. In the **Community Explorer** pane, click the appropriate **Fader** name (Fader 13 & 14 in Figure 4-8) to view its settings in the edit pane.
5. There may be more than one Dual Router panel, so select the proper Dual Router panel name (Z_AIR_1314 in this example) from the **Bind to Router** drop-down list in the edit pane.

Setting Up Dual Router Channel Sources

Once a Dual Router is assigned to a pair of fader channels (by clicking **Bind**), **Sources** and/or **Macros** can be assigned to each of the faders using the **Devices**, **Available Signals/Macros**, and **Include Signals/Macros** lists for each fader (Figure 4-9).

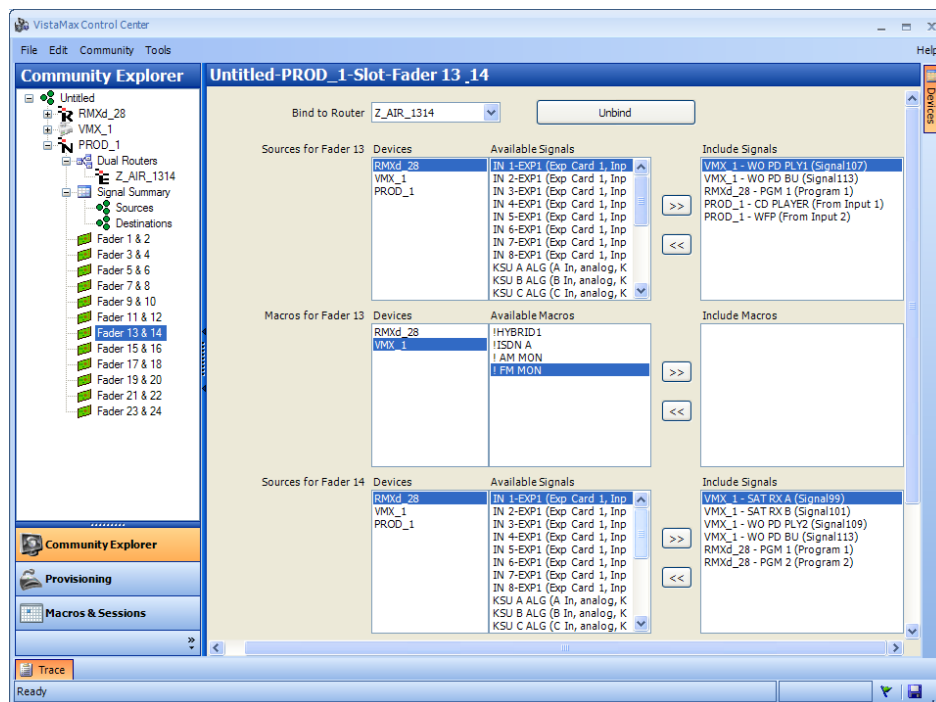


Figure 4-9. Dual Router Channel Source Setting

1. In the **Sources** section for the left fader (odd #), click on a VistaMax Device name in the **Devices** list.
2. In the **Available Signals** list, double-click on one signal to add it to the **Include Signals** list, or use standard Windows selection methods to select multiple signals:
 - When signals are adjacent to each other, click the first signal on the list and then hold down the SHIFT key while clicking on the last signal.
 - When signals are not adjacent to each other, click on one signal, then hold down the CTRL key while clicking on additional signals.
3. Click the **>>** button to add the selected signals to the **Include Signals** list. Only regularly used sources and macros should be included on each fader.

Notes: Any NetWave Dual Router fader can show a complete list of sources and macros available to the console by using the Include All function. Therefore, the **Include Signals** lists should be kept short (ideally below 20 names) both for best performance and so board operators can easily select sources. In Figure 4-9, five **Include Signals** sources are listed for **Fader 13**, and six sources are listed for **Fader 14**.

You can also include a “macro” on any Dual Router channel. A macro is a special setup file that typically runs on the NetWave parent device. A macro can take multiple system routes, as well as take other actions, when taken on a console fader. In Figure 4-9, the macro names begin with an exclamation point (!) to differentiate them from source names. NetWave console macro files are typically used to route Telco or four-wire signals, which have both an incoming audio signal as well as an outgoing audio signal (called the mix-minus). By taking a macro, you can route the Telco device to the fader channel while a second route takes the mix-minus signal for that fader and sends it back to the Telco device.

4. In the **Macros** section for the first fader, use Steps 1-3 to
 - a. Select a **Device**.
 - b. Select from among the **Available Macros**.
 - c. Add the selected macros to the **Include Macros** list.
5. Repeat these steps for the second fader.

Provision the Configuration Files

Once the NetWave signals are named, and any Dual Router faders are set up, the system configuration files (on the NetWave’s Parent Device) must be updated by **Provisioning** new configuration files:

1. At the bottom of the **Community Explorer** pane, click the **Provisioning** tab (Figure 4-9) to view the **Provisioning** window (Figure 4-10). There are only two buttons at the top of the provisioning pane: **Provision** and **Distribute**.

Note: If you have made any changes to VMCC since the last **Provisioning**, the **Distribute** button is disabled.

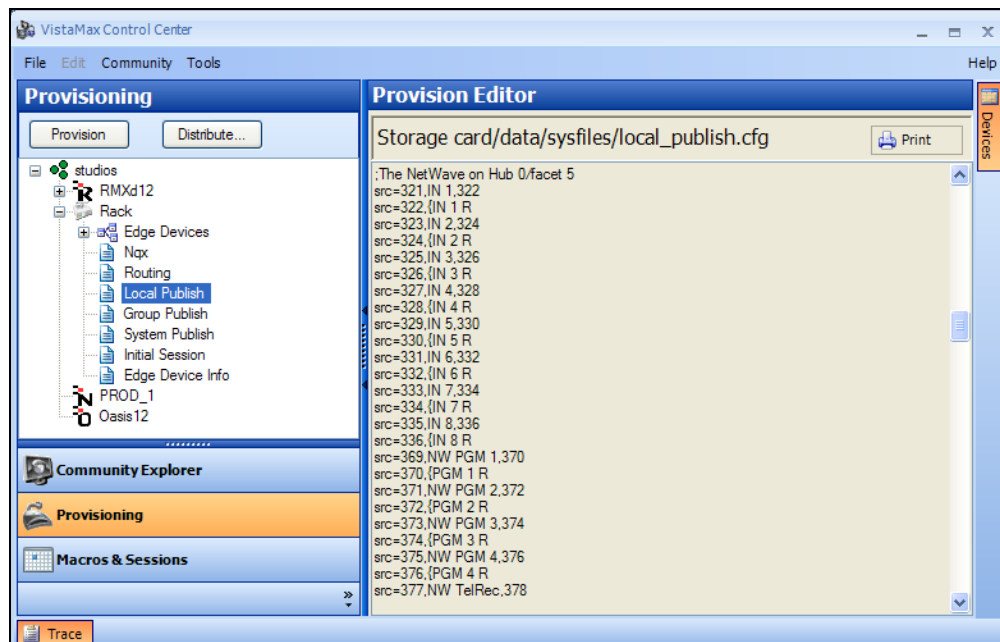


Figure 4-10. Provisioning and Provision Editor Panes

2. Click **Provision** to create new configuration files using the parameters entered in the edit pane for the NetWave console and its Dual Router panels. This action modifies the console’s parent device configuration files, that VMCC uses, to add the new information just entered in the **Community Explorer** edit panes.

3. To review any configuration file in the **Provision Editor** pane:

- a. Click **+** next to the parent device name in the left pane.
- b. Click on the file name (such as **Local Publish** in Figure 4-10) to view that file in the **Provision Editor** pane to check for typos or other editing mistakes.

Note: Even though you can edit the file in the **Provision Editor** pane, it is not recommended; any changes you make here will get overwritten at the next **Provisioning**.

Distribute the Files

After new files are provisioned, the final step is to distribute the new files to the community devices:

1. In the left pane of the **Provisioning** window, click **Distribute**. A **Distribute** dialog box appears (Figure 4-11) with these three options:
 - **Normal Download (only changed files)** – Sends only the changed configuration files to the VistaMax devices. This default option is most commonly used.
 - **Forced Download (all files)** – Sends every configuration file to the VistaMax devices, replacing all existing configuration files and causing the selected devices to automatically reset.
 - **Local Download** - Saves the provisioned files to the admin computer's hard drive (the default location is the **My Documents** folder) for a system backup. Each device's files get saved in separate folders, labeled by the device's IP address.

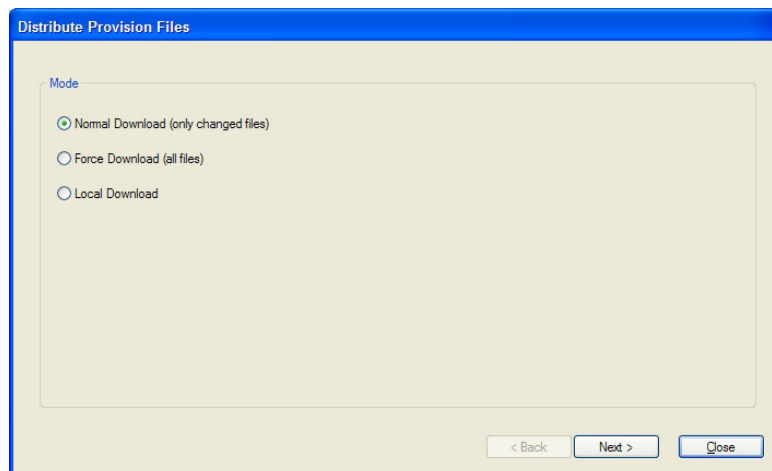


Figure 4-11. Distribute Provision Files Window

2. Click an option button to select the distribution method.
3. Click **Next**.
4. If you select **Local Download**, a **Save** dialog box appears with the **My Documents** folder as the default location. You can change the folder location, if needed, and then click **Save**.
5. If you select **Normal** or **Force Download**, the **Select Device Specific Distribution** dialog box appears (Figure 4-12 on page 4-12) while VMCC checks that it can communicate with the various community devices. This dialog box shows the action taken after the files are distributed. To send the files to any device, the **Enable** check box must be selected. (Click to select or clear the check box.)

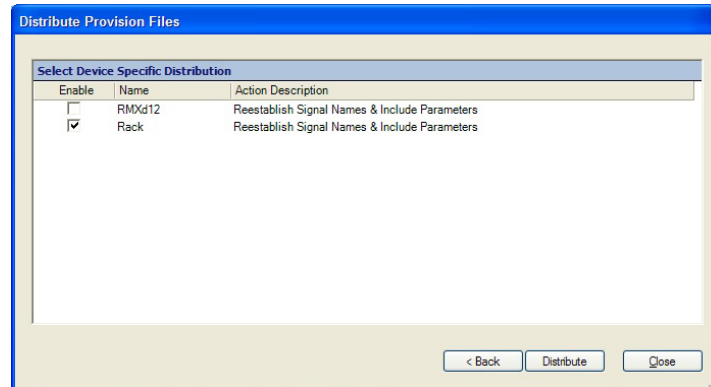


Figure 4-12. Distribute Provision Files - Device-Specific Distribution List

- Click **Distribute** to download the provisioned files to the enabled devices. If **Force Download** was selected in Step 1, each enabled device will reset after the files are distributed (**Reestablish Device Identity (RESET)**). Typically, when a NetWave console is added to a community, the **Normal Download** method is selected Step 1 which means that only files changed by adding the NetWave and/or Dual Router panels will be sent to the enabled devices which means that either **Reinitialize Router** (when a new Dual Router panel is added) or **Reestablish Signal Names & Include Parameters** (when a NetWave console is added or signal settings are edited) will occur. Both actions are much less intrusive than **Reset**, which forces the SBC in the device to restart.

Adding a Dual Router panel changes the edgedevice.ini file, which means the NetWave's parent device has to do an init RCED (reinitialize Remote Control Edge Devices), causing all edge devices (source selector panels, intercom panels, and dual routers) served by that parent device to momentarily go off-line. Therefore, existing edge devices cannot be used for roughly two to six minutes (depending upon the size of the system and how many panels are connected to that device) as each panel restarts and waits its turn to read the updated edgedevice.ini file information.

Signal Setup Details

This section presents additional details about the NetWave signals and their VMCC settings.

In Room and Community Name and Description

The **In Room Name** is always displayed on Source Selectors and Dual Routers hosted on the console's parent device (Figure 4-13).

Local Signal #	Slot #	In Room Name	Community Name	Description	Link w/ Next	Hidden
39	20	IN 20	I20	From Input 20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
40	20	IN 20 R	I20R	From Input 20 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41	21	IN 21	I21	From Input 21	<input checked="" type="checkbox"/>	<input type="checkbox"/>
42	21	IN 21 R	I21R	From Input 21 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43	22	IN 22	I22	From Input 22	<input checked="" type="checkbox"/>	<input type="checkbox"/>
44	22	IN 22 R	I22R	From Input 22 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45	23	IN 23	I23	From Input 23	<input checked="" type="checkbox"/>	<input type="checkbox"/>
46	23	IN 23 R	I23R	From Input 23 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47	24	IN 24	I24	From Input 24	<input checked="" type="checkbox"/>	<input type="checkbox"/>
48	24	IN 24 R	I24R	From Input 24 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
49	63	PGM 1	PG1	PGM 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
50	63	PGM 1 R	PG1R	PGM 1 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
51	63	PGM 2	PG2	PGM 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
52	63	PGM 2 R	PG2R	PGM 2 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
53	63	PGM 3	PG3	PGM 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
54	63	PGM 3 R	PG3R	PGM 3 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>
55	63	PGM 4	PG4	PGM 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
56	63	PGM 4 R	PG4R	PGM 4 R	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 4-13. NetWave Signal Source Name Entry Pane

Each name can have up to 10 alphanumeric characters. This name is also used in other rooms when the parent device is using Tier 1 naming conventions. Figure 4-14 shows where the **Tier Naming Convention** is set. The VistaMax and Envoy manuals give more details on Tier naming.

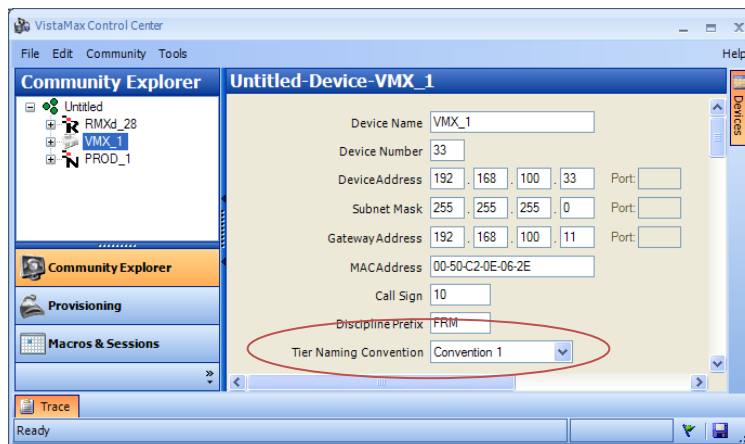


Figure 4-14. Tier Naming Convention Set on a VistaMax Device

With **Convention 1**, the up-to-ten-character **In Room Name** appears on all devices. But, when the parent device is set for **Convention 2** or **Convention 3** naming, the **In Room Name** only appears on devices hosted by that device. All other devices display the **Community Name** instead. This name is limited to four characters, since the **Call Sign** or **Discipline Prefix** (three character names set in the device's main edit pane) and the In Room Prefix, Discipline Sort Character, and Name Radix divider (all set in the VMCC Community edit pane) use the other six characters.

The **Description** column (Figure 4-13) only identifies the signal in VMCC. The VistaMax system does not use this column, so most entries can be left to their default settings. On the NetWave input signals, it can be used to identify whether each source signal is from the analog or the digital input.

To edit signal names and definitions, click **In Room Name**, **Community Name**, or **Description** and edit as required. Click a column heading name to re-sort the list by the data in that column (A – Z). Click the heading name a second time to reverse the order (Z – A). The normal viewing order is by **Local Signal #** from the lowest signal number on up.

If you enter too many characters or an illegal character, a red exclamation point and a pop-up error box appear. You need to correct the error or else the system discards your entry.

Signal Format (Stereo or Dual Mono)

All NetWave AMP MOD IV audio connectors (both analog and digital) carry two signals. By default, each connector is defined as a stereo connection with the left, or first signal, assigned an odd signal number and the right, or second signal, assigned the next even signal number. Stereo linking ensures the two signals are treated as one source or destination for proper phase, timing, and signal routing.

When the **Link w/Next** check box is selected (Figure 4-13 on page 4-12), this stereo relationship is set, which means that signal is stereo-linked with the next signal. In the NetWave console, the odd signal number indicates the left channel, and the next even number signal is the right channel on the same connector, which has its **Hidden** box checked.

To change a stereo signal into two mono signals, click the **Link w/Next** check box to clear it. If the second signal will be used, clear the check mark for **Hidden** for that signal, otherwise that signal will not be available in the system. The two signals on that connector will now be treated as two separate mono signals. When a mono signal is routed to a NetWave channel strip, it automatically goes to both the left and right channels of that fader.

Hidden Signals

On stereo signals, the right channel **Hidden** check box (Figure 4-13 on page 4-12) is always selected so that only the left channel name appears in source selector lists. Any signal can have the **Hidden** check box selected, meaning that signal is not available to be added to any signal include list. This is also typically used on inputs and outputs that are not wired.

To change the **Hidden** status for a signal, click the check box to add a check or click on the check to clear it. A quick way to select the column check boxes for an entire console is to click once, to select a column entry, and then use the keyboard space bar to select or clear that check box. Use the keyboard up and down arrow keys to quickly step through the list, pressing the spacebar as required to select or clear each check box.

Included Signal Lists

There are separate **Include Signals** lists for Sources, Macros, and Destinations. The **Available Signals** lists only show those signals in which the **Hidden** check boxes are *cleared* (no checkmarks). The [Macro Files](#) subsection covers how to have macros appear in the **Available Macros** list.

The [Set Dual Router Channel Sources](#) subsection discusses the list of sources included on each Dual Router panel fader. The other important include list is the device **Include Signals** list for each device in the VistaMax system. The signals from each NetWave console (the analog or digital channel inputs, the four PGM buses, the cue, the mix-minus signals, and the Telco Record signals) can be made available to any device by including the desired signals on that device in VMCC. Perform these steps to include the desired signals:

1. In the **Community Explorer** (Figure 4-15) click on a Device name (like MC) to show the overall device parameters in the edit pane.

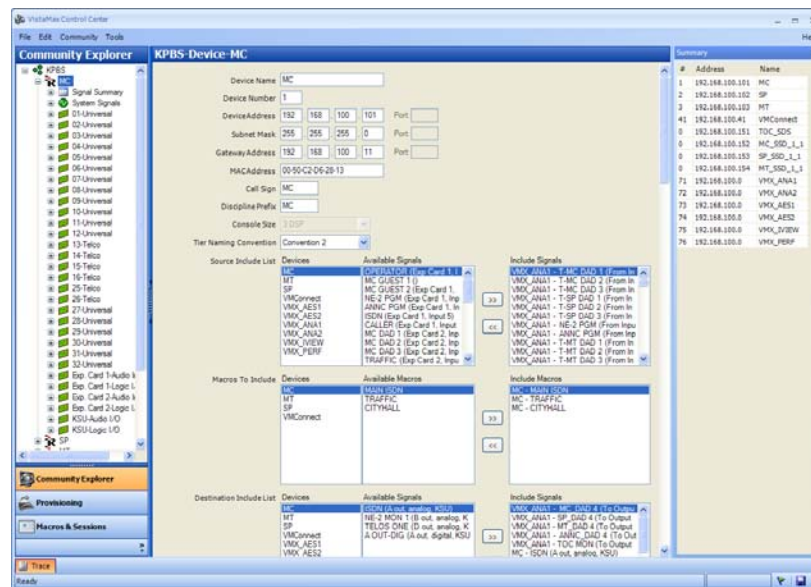



Figure 4-15. Source Include Signals

2. In the **Source Include List** section, under **Devices**, select the NetWave console's name. All the unhidden source names appear in the **Available Signals** list.
3. In the **Available Signals** list, select one or more signals to include from that device, using standard Windows selection techniques.
4. Click the  button to add the selected signals to the **Include Signals** list.
5. Repeat Steps 2, 3, and 4 to include signals from each VistaMax device.

6. Provision and distribute the changes to the community. After the changes are distributed, the selected NetWave signals are available for routing to any VistaMax destination that has included the signals as sources.

This same procedure can be followed to set the Destination Include List. However, only the NetWave host device typically needs to set any Destination Include lists. Also, the only signals included are those fader channels, and the external input, that are set to use a networked source, since their sources are most often set using a Source-Destination selector panel or by routes in a system setup macro file.

To remove any sources from an **Include Signals** list, select the signals and click .

Macro Files

Macro files can also be included on both devices and Dual Router panels. Use the **Macros to Include** entry boxes to include these files (Figure 4-15 on page 4-14). A macro file is a small text file with the suffix .mac. You can “take” or run a macro file by any of these methods:

- Include the file on a Dual Router panel and “dial up” and Take the macro
- Include the file on a source selector panel and “dial up” and Take the macro
- Schedule the macro file to be automatically taken by time in VMCC 2.2 or in VistaTouch
- Use the on-screen app VistaTouch to manual take a Macro assigned to a hot key
- “Chain” the macro file to be taken when another system setup file is taken

Macro files created for use on the NetWave console are stored on its parent device, in the SesFiles folder on its VistaMax Server (storage card/Data/SesFiles). Macro files can be hand crafted using a text-only editor (Windows® Notepad) and then transferred to the VistaMax server using FTP Voyager or other FTP program, or they can be created and edited using VMCC 2.2, which includes a **Macros & Sessions** tab in the **Community Explorer** pane. Click this tab to open the **Macros & Sessions** window where macros and other files can be created and edited (Figure 4-16).

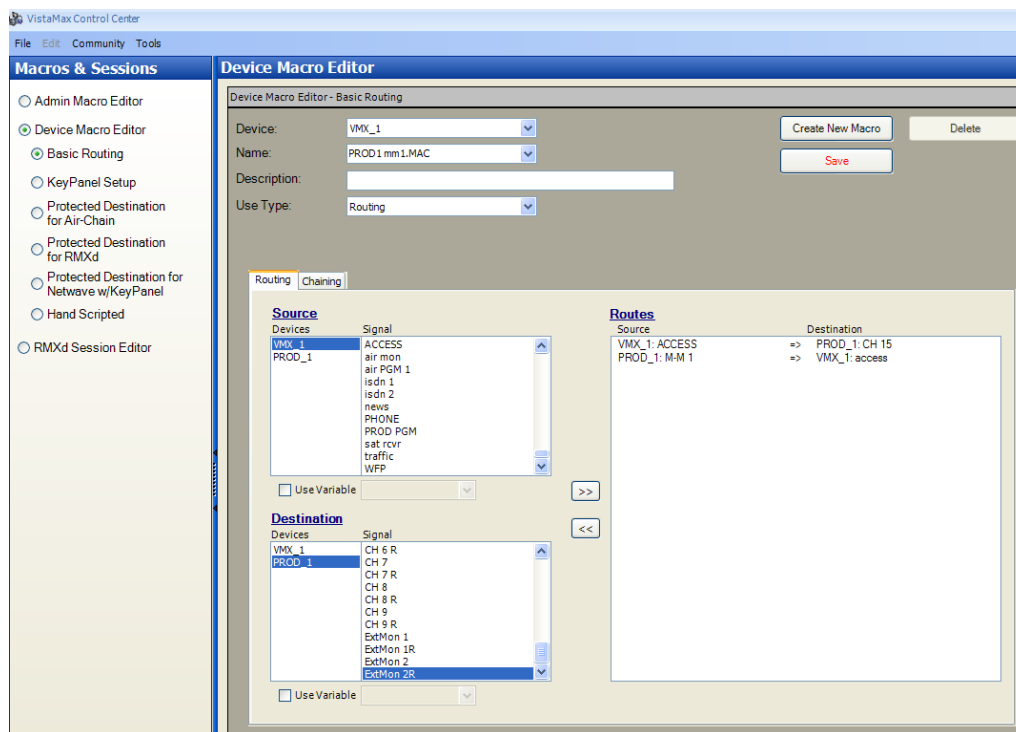


Figure 4-16. Device Macro Editor

To create or edit a macro, perform these steps:

1. In the **Macros & Sessions** pane, click the **Device Macro Editor** option.
2. Click the **Basic Routing** option.
3. In the **Device Macro Editor** pane, click to select the NetWave's parent **Device** from the drop-down list. Any macros that are already on the parent device are listed in the **Name** drop-down list.
4. Click **Create New Macro**. Macros are most often used with Telco devices to route the Telco device to a NetWave Telco channel and to also route that channel's mix-minus signal to the Telco device.



Note: Macros can cause multiple audio and logic routes to occur when they are taken. They can also cause session or macro files to be loaded on any device in the system. Macros can be very powerful, causing signal routing changes to take place that may affect other users in the VistaMax system, so be careful when editing them and using them for the first time.

Once you create macros in VMCC 2.2, or manually create them and upload them to the NetWave parent device, you then must add the new macro names to VMCC (at the top level of the parent device) in order for the macros to be available. The names entered there then appear as **Available Macros** (Figure 4-15) under the NetWave's parent device. You can then select and include the macros, as desired, on any Dual Router fader.

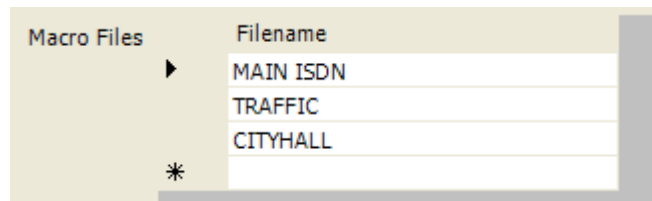


Figure 4-17. Adding Macro File Names to a VistaMax Device

One caveat with taking macros on NetWave Dual Router panels is that, if the macro taken does not route a signal to that fader channel, the channel display shows the macro name in brackets after you click **Take**. Normally an audio signal is routed to that fader, and this is not an issue. But, if you want to be able to change sources routed to the External Monitor using a macro, be sure to route SILENCE to that fader as well. Otherwise, it appears as if the route did not complete, as the name is left in brackets (such as "[AM MOD MON]").

Section 5 - NetWave Servicing

The NetWave console is designed to yield many years of continuous trouble-free operation. If a console does require service, please read through this chapter for service information and available spare or replacement parts.

Parts and Repair Services

There are only a handful of field-replaceable parts on the NetWave console (Tables 5-1 through 5-4). Assemblies are generally field-replaceable, not field-serviceable. All assemblies, or their circuit boards, should be returned to a GatesAir Service Center for board-level repair.

Additional technical information (such as panel quick guides, schematics, software and firmware revision information, wiring diagrams, application notes, and service bulletins) are available for downloading from the GatesAir Customer Care site http://support.gatesair.com/ecustomer_enus/ and from the GatesAir Digital Studio Products FTP site (IP address: 64.106.177.206, using port 21027). To use the GatesAir FTP site, log-on with the User ID "customer" using the password "pacific". Most technical documentation and schematics are published in PDF, so Acrobat Reader 6.0 or later is required.

Parts Ordering and Repair Information

Spare fader panels, main circuit boards, and other assemblies can be purchased through your GatesAir sales representative, the GatesAir parts department, or through the GatesAir Technical Services Department. To expedite the ordering process and to ensure the correct parts are ordered, have the GatesAir part numbers available when ordering. Tables 5-1 through 5-4 give part lists. Control panels, circuit boards, and assemblies may have long lead times, so order accordingly.

Control panels, circuit boards, and assemblies returned to GatesAir for service, exchange, or credit must have an RA (Return Authorization) tracking number issued prior to their return. This number is assigned by the Technical Services Department. Items received without an RA number written on the shipping label side of the packaging may be refused or subject to additional handling fees.

To order assemblies, call the GatesAir Parts Department at 217.221.7500 or visit the GatesAir Customer Service website: <http://www.gatesair.com/services/technical-support/repair.aspx>

To request an RMA, to return a module or a circuit board for service, call 217.221.7164; fax an RMA request to 217.221.7084; or request one through email: tsupport@gatesair.com.

Serviced assemblies within the USA are shipped FOB Quincy, IL using FedEx two-day service, unless otherwise specified. FedEx overnight and next morning delivery are also available for most items.

Spare and Replacement Parts

Table 5-1. Serviceable Assemblies and Replacement Parts

	PRE #	Description or Use		PRE #	Description or Use
Serviceable Assemblies	PRE90-2148	Meter-Clock-Timer PCA	Replacement Parts (continued)	PRE32-727	Fader knob (red)
	PRE90-2149	Dual Bar Graph Meter PCA (Quad Meters)		PRE32-728	Fader knob (green)
	PRE99-1205	2RU Rack Mount Universal 48-volt supply		PRE32-729	Fader knob (blue)
	PRE99-1206	In-line 48-volt supply (NW-08, NW-16)		PRE32-730	Fader knob (yellow)
	PRE99-1420	DSP & Inputs card		80-1981-08	Palm rest (NetWave-8) *
	PRE99-1421	Monitor & Output card		80-1981-16	Palm rest (NetWave-16) *
	PRE99-1422	Monitor Control Panel		80-1981-24	Palm rest (NetWave-24) *
	PRE99-1423	Dual Fader Panel		9506000748	Left side panel *
Replacement Parts	PRE12-93	10-character display		9506000749	Right side panel *
	PRE17-22	Headphone jack (without wiring)		9506001081	Connector access cover (NetWave-8) *
	PRE19-64	Flex Cable, 50-conductor		9506001082	Connector access cover (NetWave-16) *
	PRE90-2131-1	12" red flat cable (panel power/signal)		9506001083	Connector access cover (NetWave-24) *
	PRE21-226-10	PROM, Monitor Control panel		PRE90-1858-1	15-foot DC cable (for 99-1205 power supply)
	PRE21-226-11	PROM, Dual Fader panel		PRE90-1872-1	H/P jack cable assy, NetWave-8 *
	PRE21-352-3	PROM, non-linked, Output & Monitor card		PRE90-1872-2	H/P jack cable assy, NetWave-16 & -24 *
	PRE21-352-5	PROM, DSP card		PRE-2125	Blank Panel, two slots wide
	7220153000	Cue speaker		PRE95-1044	Fader Assy. (Dual Faders & Monitor panel)
	PRE30-13	IEC line cord (USA style plug)			

* Parts only available while console is in current production

See Figure 5-5 on page 5-8 for the main component locations.

Installation Kits

Console size-specific installation kits are shipped with each new console.

Table 5-2. PRE76-1900-08, 016, -24 Installation Kit Parts

PRE #	Description	Quantity		
		8	16	24
PRE14-482	3-pin AMP MOD IV housing	12	20	28
PRE14-484	6-pin AMP MOD IV housing	21	29	37
PRE14-490	12-pin AMP MOD IV housing	8	16	24
PRE14-492	14-pin AMP MOD IV housing	2	2	2
PRE15-938-1	AMP MOD IV contact receptacles	286	454	622
80-2132	blank display lens	8	16	24

Table 5-3. 76-1901 Tool Kit Parts (optional)

PRE #	Description	Qty
70-57	2mm Hex driver	1
PRE70-126	AMP MOD IV crimp tool	1
PRE70-129	AMP MOD IV pin extractor tool	1
88-175	Tool Pouch	1

Optional Upgrade Kits

You can install these kits when you install the console or any time after that.

Table 5-4. Upgrade Kits (optional)

PRE #	Description
PRE99-1424	Dual Router upgrade (requires a Link Activation kit)
PRE99-1425	Link Activation Kit
PRE99-1426	Link Plus Activation Kit (for up to six Telco sources)
PRE99-1428-1	Dual Selector kit with 16x2 Source Selector

Control Panel Service

There is a diagnostic test mode built into each Dual Fader panel and into the Monitor Control panel that allows each button, fader, and rotary pot to be individually tested to verify correct operation. It can only be accessed when the panel is first powered by either power cycling the console or by individually unplugging the panel's red cable.



Note: If the red flat cable is not properly latched into the RJ-45 connector, a panel can go into Control Test mode during normal use because of intermittent operation. After testing, always confirm that the cable is latched before re-installing the panel.

Control Test Mode

To enter the *Control Test* mode on a Dual Fader panel, remove the panel from the console and unplug its red flat cable. Within three seconds of plugging the cable back in, press and release the **Left Channel Off** button. To exit the *Control Test* mode, press the **Right Channel On** and **Off** buttons together.

To enter *Control Test* mode on the Monitor Control panel, remove the panel from the console and unplug its red flat cable. Within three seconds of plugging the cable back in, press and release the **Timer Start** and **Stop** buttons together. To exit the *Control Test* mode, press the **Timer Start** and **Stop** buttons together.

While the *Control Test* mode is active, pressing any button alternately turns on or turns off the LED in that button.

The PGM and Offline bus select button LEDs on the Dual Fader panels (Figure 5-1) or the monitor select button LEDs on the Monitor Control panel (Figure 5-2) display the binary output of the active fader or rotary pot (indicated by the lit yellow or red label above that fader or pot). With the control set to full off, most or all LEDs are off. When the control is set to full on, most or all LEDs are on. In between these points, the LEDs cycle through, showing a binary count. All LEDs turning off anywhere in the middle of travel indicates a defective pot or fader element.

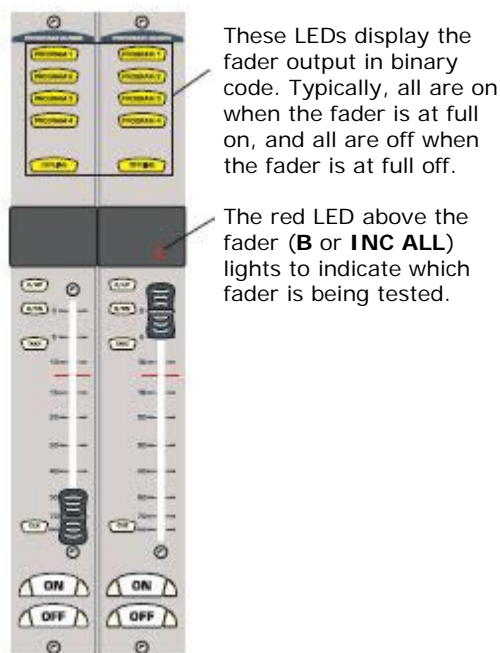


Figure 5-1. Dual Fader Panel, Fader Test

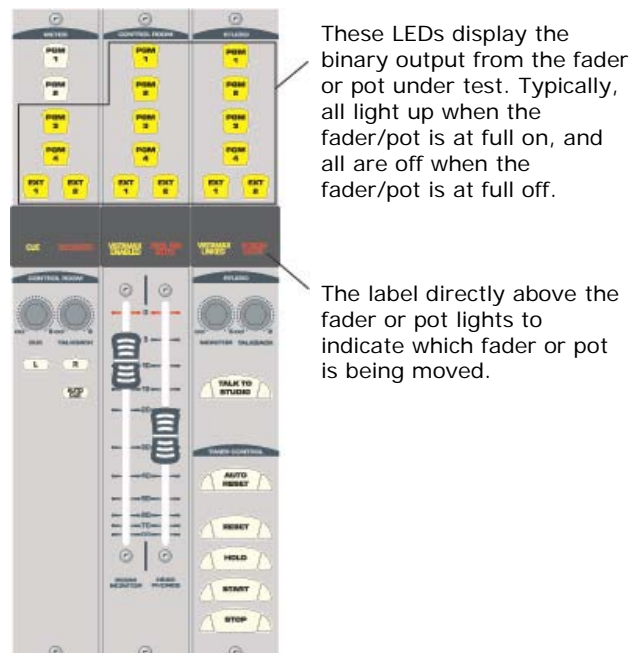


Figure 5-2. Monitor Panel, Fader Test

Panel Construction

Each control panel consists of separate plastic buttons sitting on a conductive plastic contact sheet. The switchboard PCA is fastened to the metal faceplate, with a plastic inlay, to hold the contact sheet and buttons in place.

Control panels are not a readily field-serviceable assembly, but they can be disassembled, with care, to be cleaned in case of a spill into the panel. Table 5-1 lists all available replaceable parts (10-character display and lens, rotary and fader knobs, and fader).

Control panels can be removed or installed while the console is powered, and on-air, without causing any audio interruption or noises in the program audio. The new panel assumes the removed panel's button settings when plugged in. The fader setting controls the levels. If the faders on the replacement panel are not set to the same position as the removed panel, the level may change when the new panel's fader settings are detected as the panel powers up. To prevent abrupt level changes if you replace a panel while the console is on-air, you must set the replacement panel's faders/pots to the same settings as the removed panel.

Generally, it is best to turn off both channels prior to unplugging the Dual Fader panel. Before you remove the Monitor Control panel, you should turn off the monitor speaker power amplifiers and unplug the headphones.

Control Panel Removal and Installation

Removal

To remove a control panel from the frame, perform these steps:

1. Using a 2mm hex tool (70-57 or equivalent), remove the four or six silver hex screws (38-307A). There are two screws top and bottom on each Dual Fader panel. There are three screws, top and bottom, on the Monitor panel.
2. Move the faders to the bottom of their travel.

3. Lightly squeeze the fader knobs together to lift the panel up enough to reach the red cable on the bottom of the panel.
4. Unplug the red flat cable from either the panel or from the DSP card (Dual Fader panels) or Monitor & Output (Monitor Control panel).
5. On Dual Router or Dual Selector panels, also unplug the blue flat cable.



Note: If you need to replace one of the assemblies, contact GatesAir Technical Service Department for service or replacement parts.

Installation

To install a fader control panel into the frame, perform these steps:

1. Using a 2mm hex tool (70-57 or equivalent), remove the four hex screws of the blank panel covering the slots where the control panel is to be installed.
2. Remove the blank panel.
3. Hold the panel so that the red flat cable can be plugged into J5 on the panel.
4. On Dual Router or Dual Selector panels, plug in the blue flat cable into J3.
5. Lower the panel into the frame so that it sits 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.
6. Fasten the panel to the frame using the hex screws removed in Step 1.

Fader Removal and Reinstallation

There are no replaceable or rebuildable parts on NetWave fader assemblies. The faders are long-life, conductive plastic, single-element faders used to control a DC voltage. No audio passes through any fader or pot on the NetWave console.

If coffee, a soft drink, or other sugared liquid has spilled into a fader, remove the fader from the panel as soon as possible. Hold the fader under hot running water while moving the fader slider back and forth to dislodge any sugars. Do not use any soap or other chemical to clean the fader. Dry the fader using a hair dryer or heat shrink gun set on a low-heat setting. The fader must be completely dry before reinstallation.

If the fader movement is rough, either the lubricant on the glide rails has evaporated or foreign material has gotten into the fader. If running the fader under hot running water does not help, the fader must be replaced; the design does not allow for disassembly or relubrication.

To remove and reinstall a fader:

1. Remove the control panel with the problem fader from the frame.
2. Remove the fader knob and the two front panel fader hex screws using the 70-57 tool.
3. To unplug the problem fader from the control panel board, unplug the fader assembly from the contact board. It plugs into a 6-pin header using terminals 4, 5, and 6.
4. Plug the replacement fader into the fader connector using terminals 4, 5, and 6.
5. Fasten the fader to the front panel using the screws removed in Step 2. Snap the fader knob onto the fader slider.
6. Move the fader through its full travel to ensure it does not bind or scrape along the control panel slider cutout.

Console Display Service

The meter-clock-timer board and, on the Quad Display only, the two-meter board are located inside the Console Display subassembly, which is fastened to the chassis just behind the operator control panels. The circuit board settings can be changed, or the circuit boards exchanged, by removing the rear cover from the subassembly. These boards plug into the Monitor & Output board using a single small ribbon cable, which can be “hot plugged” if required.

Console Display Removal

The console's display subassembly only has to be removed from the chassis if the cue speaker needs to be changed or if a DSP card or the Monitor & Output card needs to be exchanged. You should power off the console before removing and reinstalling the display subassembly.

To remove the display subassembly, perform these steps:

1. Open the rear cover panel to reveal the rear chassis and the back of the display subassembly.
2. If a master clock cable is plugged into the 4-pin Molex connector on the rear chassis, unplug the cable.
3. The Molex connector must be released from the chassis, since it is on a cable coming from the meter-clock-timer board. To do this, press on its two mounting tabs while pushing the connector in through the chassis, releasing it from being held in the chassis opening.
4. There are multiple Philips screws (3, 5, or 7, depending upon console size) that fasten the rear of the display subassembly to the chassis. Remove and retain these screws.
5. The multiple Phillips screws (Figure 5-3) that fasten the front of the display subassembly to the chassis go through small tabs that extend below the operator control panels. To access these screws, which must be removed, you must remove several control panels:
 - On all console sizes, remove the Monitor Control panel and the first (left-most) dual fader panel.
 - On a NetWave-8, also remove the third dual fader panel.
 - On a NetWave-16, also remove the fourth and seventh dual fader panels.
 - On a NetWave-24, also remove the fourth, seventh, and tenth dual fader panels.



Figure 5-3. Front Mounting Tab and Screw for DirectView Display

6. Lift up the display subassembly so that the front tabs clear the chassis.
7. Unplug the two captive display cables from the Monitor & Output card. The cue speaker cable is plugged into J25, and the display cable is plugged into J23.

Reinstall the console display in reverse order, except in regards to the Molex connector for the master clock cable. Latch this connector into the rear chassis opening first. Then plug the two display cables back into keyed connectors J23 and J25 on the Monitor & Output card. Be sure not to pinch any of these cables between the subassembly and the chassis while reinstalling the display. Also, do not put any strain on these cables while removing or reinstalling the display subassembly.

Clock Troubleshooting

If the clock's colons are blinking, it indicates the clock has lost its ESE or SMPTE master time code signal. This signal plugs into a Molex connector on the rear chassis, which goes to J4 on the clock-timer board. If the clock is supposed to be running in autonomous mode, verify that DS4 switch 2 and DS4 switch 5 are both set off. The *Setting the Clock* subsection in Section 2 gives information on the clock and DS4 switch settings.

Even though the ESE/SMPTE master clock input is balanced, the polarity of the incoming signal is important. If it is reversed, the master clock signal is not detected. The + or hot lead must connect to pin 1 of the Molex connector and the - or shield lead must connect to pin 2. If you use a balanced cable, no shield connection is required.

Event Timer Troubleshooting

If the tenths of seconds display is not functioning as expected, check the multi-switch setting on the clock-timer circuit board. DS4 switch 1 sets whether the tenths of seconds are displayed while the event timer is running. The tenths of seconds are always displayed while the event time is in Hold or Stop modes.

If the event timer does not auto-reset as expected, make sure the Auto button is lit on the Monitor Control panel and that the channel setup parameter Timer Reset is active (its LED is lit) on those channel sources that should be resetting the event timer.

Meter Troubleshooting

The meter-clock-timer cable (plugged into J6) goes to the Monitor & Output board, plugging into J23. If the display is unlit, it is most likely a cabling issue. Try these guidelines:

1. Remove the rear cover of the display and unplug the cable from J6, then plug the cable back in. This cable can be "hot plugged" so that the meter can be checked without powering down the console.
2. If the display is still unlit, try power cycling the console to reset the Monitor & Output card.
3. If the display is still unlit, remove the display subassembly and check the other end of the cable (plugged into J23 on the Monitor & Output board).

Also check that multi-switch DS3, on both the meter-clock-timer and two-meter boards in a Quad Meter, are all set fully to their ON or OFF positions. The default setting is all DS3 switches set to OFF.

48-Volt Supplies

Periodically check that the vent openings on the 99-1205 rackmount supply are not blocked and that there is no dust buildup on the top cover openings. On the 99-1206 in-line supply, periodically check that it is not covered up by any materials like cable bundles, papers, insulation, etc. It relies on a free air flow around it to keep it cool.

A green LED, on the front of the rackmount or on the top of the in-line power supply, indicates that its 48-volt DC 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

The in-line supply (99-1206) has a captive DC output cable, while the rackmount supply (99-1205) has a detachable DC cable. Both use the pin-outs (Table 5-5 and Figure 5-4) for the 90-1858-1 cable, which is the interconnection cable that goes from the 99-1205 supply to the NetWave console.

Table 5-5. 90-1858-1 DC Cable Color Codes and Pin-outs

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	Return Black	6
5	+48 V Return	Return Green	3
-	-	No connection	5

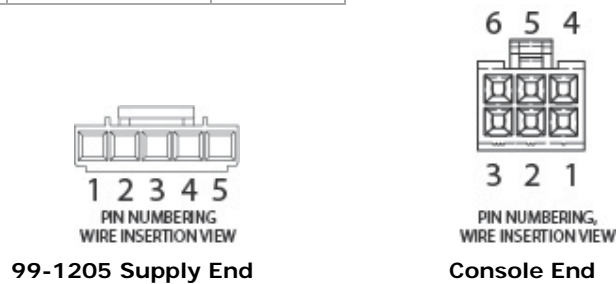


Figure 5-4. DC Power Cable Connectors

Product Description

Use this discussion, with Figure 5-5, for details on the NetWave console main component locations and functions. +48 volts, from a 99-1205 or 99-1206 power supply, plugs into J21 on the 99-1421 Monitor & Output card. When a redundant supply is used, a 90-1995 Redundant Coupler couples the two power supplies into the NetWave console through a pair of low-voltage drop Schottky diodes.

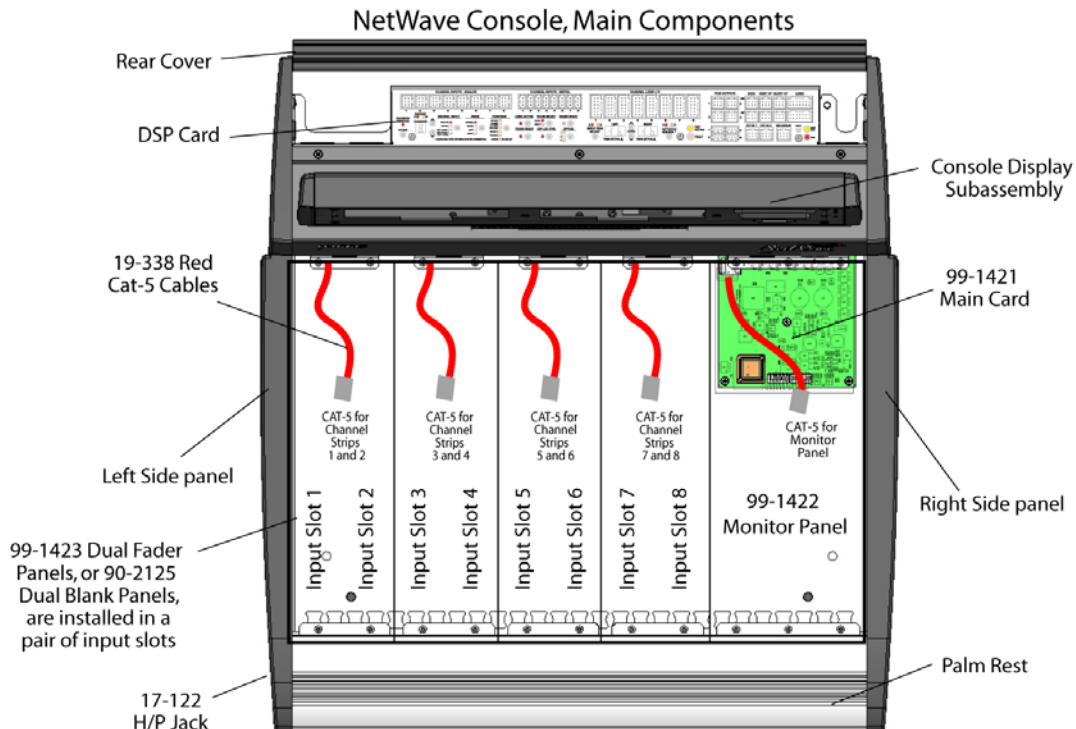


Figure 5-5. NetWave Console Main Components

Along with the system bus signals, +48 VDC is fed to each DSP card via a 50-conductor flex cable. A flex cable ties the Monitor & Output card to the adjacent DSP card and ties the additional DSP cards together in series. All DSP cards are identical, except for the DSP card farthest from the Monitor & Output card, which has a 100 Ω resistor pack plugged into socket RN1 to terminate the various buses.

+48 VDC goes to each Dual Fader panel on pins 4 and 5 of the “red” RJ-45 connectors on the chassis. The Monitor Control panel uses the same pins for power on an RJ-45 on the Monitor and Output board. Pin 7 is the 48 volt return. A balanced clock signal is on pins 1 and 2. Pins 3 and 6 are the bidirectional data lines. Pin 8 is used to sense that a panel is present which allows the panels to be hot-plugged or unplugged.

Each card and panel has DC-to-DC converters that convert the +48 VDC into the DC voltages required on each panel or card. These include ± 17 VDC for analog circuitry, +5 VDC for digital circuitry, and +3.3 VDC for the FPGAs (Field Programmable Gate Arrays).

The Monitor Control panel uses a 12" red flat cable, plugging into J28 on the Monitor & Output card, for power and signals. Each Dual Fader panel position has a red flat cable plugged into a “red labeled” jack on a DSP card. A red flat cable is supplied for each slot in the frame.

Each DSP card handles signals from sixteen inputs (eight analog and eight digital). Channel control is done using the eight control strips, on the four Dual Fader panels, plugged into that DSP card.

The Monitor & Output card also has DSP to sum the various system buses creating the physical outputs from the console. The Monitor & Output card also serves as the network interface for the VistaMax system by controlling the VistaMax Link connector. This Link is not active until one of the Link Activation kits is installed. The 99-1425 Link Activation kit activates the Link. The 99-1426 Link Plus Activation kit both activates the Link and adds support for four more Telco channels in the console.

Monitor & Output Card Status

Two LEDs near the right end of this card indicate operational status:

- **FAIL** is unlit when the system is operating normally. If it is on, it indicates abnormal operation.
- **DSP CLK** blinks with a “heartbeat rhythm” to indicate the on-board DSP is active and communicating with the other DSP cards.

Press the **Reset** button, to reset the console, if unexpected operation occurs or if the console stops responding to button presses. This reset is equivalent to power cycling the console. When you press this button all channels are turned off and all audio through the console is cut off while the console restarts.

The **Link** connector has two integral LEDs (green and yellow). These must be both lit solid to indicate a good connection to a Hub card facet on a VistaMax system Hub card. In addition, the Monitor Control panel label **VistaMax Linked** lights when a crossover CAT6 cable is properly connected to a Hub card.

DSP Card Status

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

- **DSP ACTIVE** blinks with a “heartbeat rhythm” to indicate that DSP is active. The left-most DSP card’s LED will flash twice as fast as the LEDs on other DSP cards to indicate it is the master DSP card.
- **FAULT** is unlit when the system is operating normally. If this LED is on, it indicates abnormal operation on that DSP card. Press the **Reset** button, on the Monitor & Output card, to restart the console and clear this condition. If this does not clear the fault, then power down the console for 30 seconds and then repower it. If the fault condition remains contact GatesAir technical support.

Service Setup Test Modes

The DSP card setup controls have three service modes available to help with service and maintenance of the NetWave console:

- **Data Path Test** – This mode allows one set of parameters to be temporarily assigned to all eight channels on a DSP card. It is entered by pressing **Option** + **Channel Down** in any setup mode. If the **Changes Pending** LED was blinking, any changes are stored before this mode is entered.

The **Active Channel** display number blinks and all A and B labels on the eight channels on that DSP card blink to indicate the mode is active. All eight channels are assigned to all Program buses and the active channel is turned on to a nominal output level (faders are bypassed in this mode). Press **Option** + **Channel Down** to exit to **Parameter Set Mode**, then press **Store** to return the card to **Sleep Mode**.

- **DSP & I-O User Interface Test** – This mode is used to verify that the LEDs, displays and switches on the DSP card are working properly. It is entered by pressing **Option** + **Fader Start** while in the Data Path Test Mode.

All of the setup LEDs and displays on the DSP card are turned on so their operation can be verified. Press each switch to verify the LEDs and displays turn off while the switch is held. To exit this mode, press **Option** + **Fader Start** to exit to **Parameter Set Mode**, then press **Store** to return the card to **Sleep Mode**.

- **Factory Reset** – This mode resets the stored channel parameters and channel strip controls to their factory defaults. To do this, press **Option** + **Store** in any mode. The stored parameters for all channel A and B sources are erased and replaced with their factory default settings (Analog; Stereo; Line; trims set to 0; all other buttons off; all network sources Analog). All channel strip controls are unassigned and set to the A source.

Section 6 – NetWave Accessories

GatesAir offers a number of accessories and services to complement the NetWave console. Here are some products that are compatible with the NetWave console:

- VistaMax, Envoy, and VMConnect card frames. Used to network the NetWave console and other GatesAir consoles together into a facility-wide audio and logic control network.
- 16x2 MicroRouter and Dual Selector. Adds sixteen additional analog or digital sources to the two fader channels on any Dual Fader panel in stand-alone NetWave consoles.
- 4X-A2D converter. A four-way A-D converter to allow four analog peripherals to plug into four digital inputs on any NetWave console that needs additional local analog inputs.
- Host and guest mic control panels and matching Cabinet Plates (for mounting one or two control panels in the countertop). Allows hosts and/or guests control over their fader channel.
- Various illuminated peripheral control panels suitable for turret or cabinet plate mounting
- 3x6 Headphone Distribution System. Headphone amplification system for up to six headphone panels with separate inputs for a Host, Co-Hosts, and Guests. One CAT5 cable connects to cabinet-mounted headphone jack panels (with or without local volume control).

GatesAir services range from supplying logic wiring diagrams for common peripheral devices and system installation advice, to various pre-wire kits (with MOD IV connectors on one end to pigtails on the other end) with wire labels and enough male and female XLR connectors to wire up all inputs and outputs on a console, to complete system wiring design and installation packages. Contact your GatesAir sales representative for additional information.

Furniture and System Design

GatesAir offers a full line of standard, knock-down style cabinets and custom furniture specifically designed to integrate the NetWave console with studio peripheral equipment. Complete turnkey studio design, wiring, and installation services are also available. Contact your GatesAir sales representative for additional information.

Accessory Panels

Several accessory panels are available to maintain the console's look and feel throughout the control room and studio. Each panel is 6" long and either 1.6" or 3.2" wide. Single width panels (1.6" x 6" panels) include host and guest mic control panels, a fader panel for host headphone or studio monitor level control, and a six-button peripheral control panel (each button/LED is separately controlled so one panel could control a delay system, turn on cue on a console channel, start/stop playback on a remote device, unlock studio doors, etc.). Dual width panels (3.2" x 6") include the VistaMax Intercom Audio Expansion Panel.

Accessory panels can be installed in a GatesAir Host Turret or in a GatesAir Cabinet Plate, which is a countertop bezel. Cabinet Plates (Figure 6-1) are available in two sizes: for one single width panel (PRE99-1788-1); or for two single or one dual width panel (PRE99-1788-2).

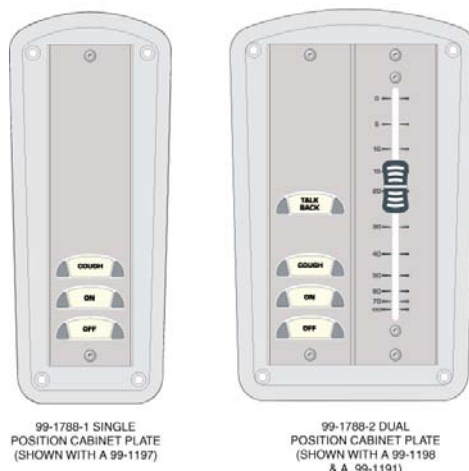


Figure 6-1. Cabinet Plate Application Examples

Host Turret

To install more than one or two accessory panels in a control room or studio, the GatesAir Host Turret should be used. It has eight 1.6" accessory panel slots and is available with or without a Clock and Event Timer.

Figure 6-2 shows a Host Turret (PRE99-1450CT) with a clock-timer display and timer control panel. A Low-Profile Host Turret (PRE99-1450), without a clock and timer, is also available. Each host turret can hold eight 1.6" panels, four 3.2" panels, or any combination thereof. Each Host Turret requires a countertop cutout of 13" [330] x 5.6" [142].

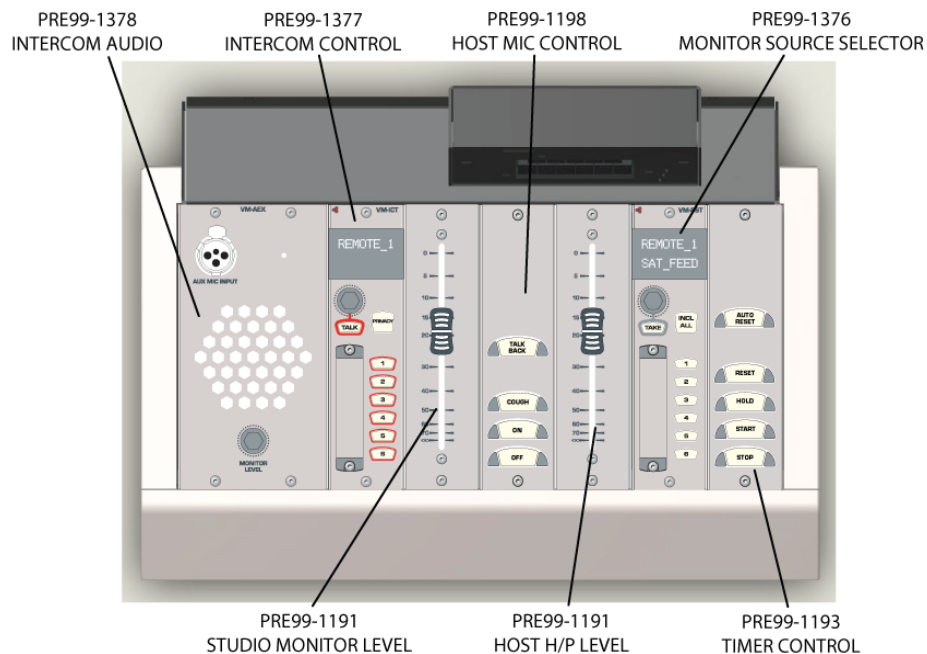


Figure 6-2. Host Turret with Clock-Timer Display, Application Example

Figure 6-2 shows a typical application for the host turret where the NetWave console is networked with a VistaMax audio management system using a VistaMax Intercom system, as shown by the two Intercom Audio Expander and Control panels at the left end of the turret. The middle panels three panels have the host's mic control panel, with a talk to control room button and two fader panels to control the studio monitor speaker level and the host's H/P level. The last panel on the right is the timer control panel for the event timer in the clock-timer display. Next to that panel is a monitor source selector for the studio so that the host can dial up their own monitor source.

In addition to these panels, GatesAir offers various fixed legend and active LCD programmable button panels that are compatible with the host turret. These panels can control:

- Profanity delays.
- News actuality servers.
- Digital delivery systems.
- Mix-minus signal routing.
- Switching of the air chain.

Mic Remote Control Panels

Two GatesAir mic control panels (each 6" x 1.6" in size) are compatible with the NetWave console. The Guest Mic panel (PRE99-1197) has three illuminated buttons: **On**, **Off**, and **Cough**. It is normally mounted on the countertop in a single cabinet plate (Figure 6-1 on page6-1). A Host Mic Panel (PRE99-1198) has four

illuminated buttons: **On**, **Off**, **Cough**, and **Talkback**. It is typically mounted along with a host H/P level control in a dual width cabinet plate (Figure 6-1 on page 6-1).

Figures 6-3 through 6-5 show a mic panel schematic along with wiring and other connection information.

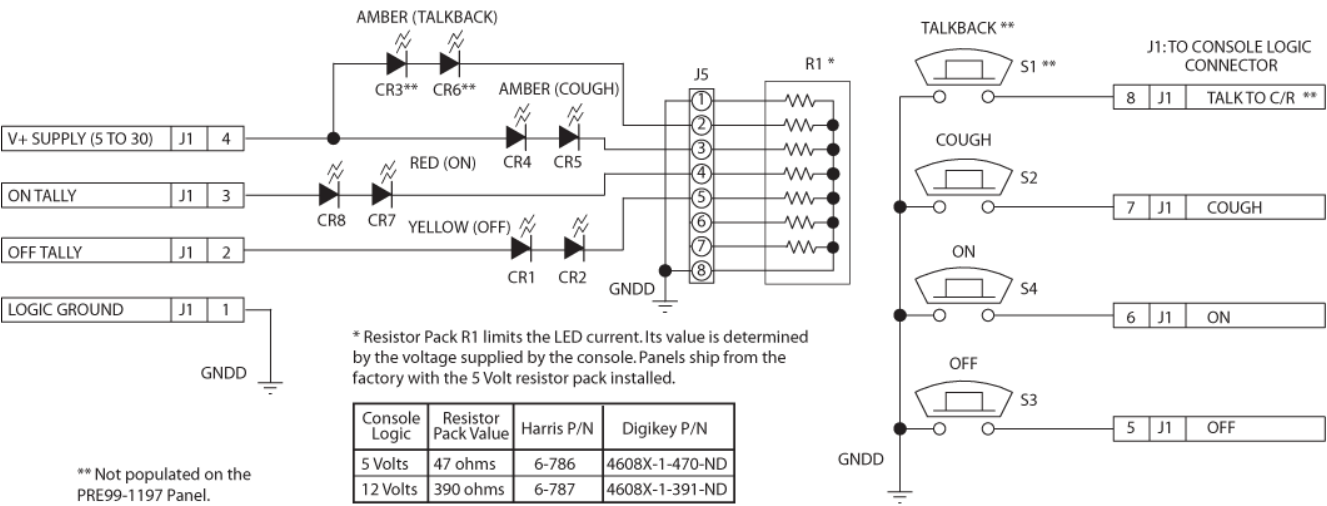


Figure 6-3. Mic Control Panel Simplified Schematic

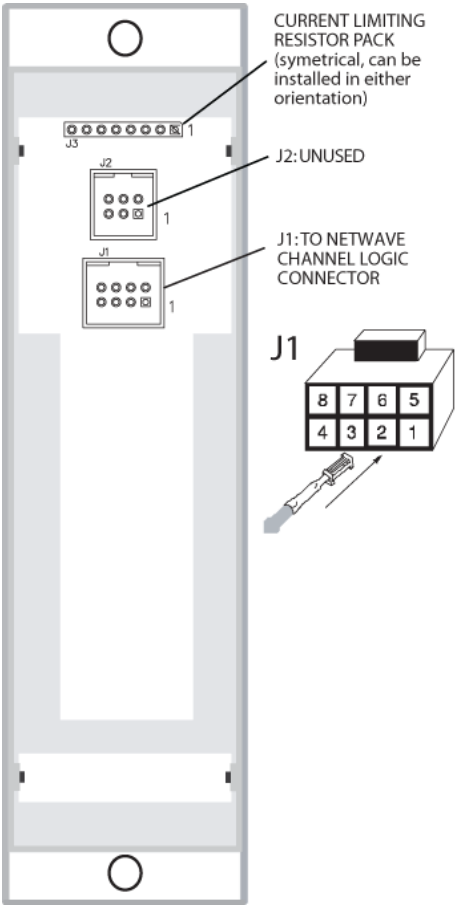


Figure 6-4. Mic Control Panel Connections

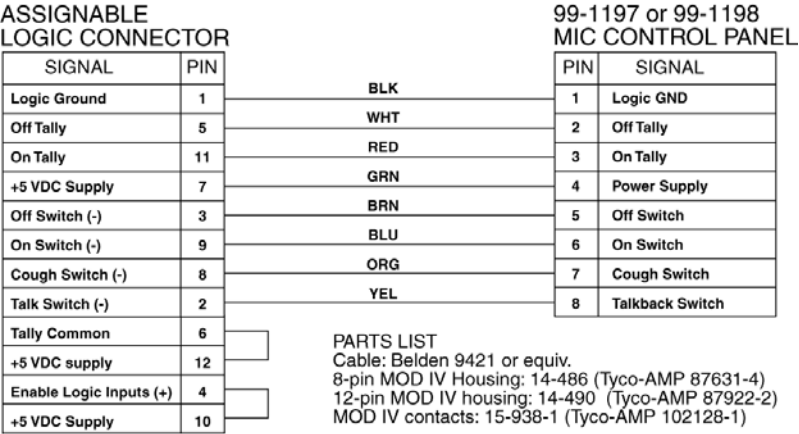


Figure 6-5. Mic Control Panel Cable Diagram

3x6 Headphone Distribution Amp

The GatesAir 3x6 Headphone (H/P) amp (PRE99-1215), originally designed for the BMX*digital* console, can also be used with NetWave console to create a H/P system for a talk studio with up to five guest positions and a host position, which can control the studio speakers' level. The H/P amp has six outputs, typically set for one host and five guests. But, in this example application, it is set for one host, four guests, and a "co-host" position that is used as a separate feed for the studio monitor speakers. Each 3x6 H/P amp output is an RJ-45 connector that uses standard CAT-5 cabling to connect the cabinet-mounted GatesAir H/P panels. The CAT-5 cable carries stereo audio and the level control signal for that output's H/P amp.

Figure 6-6 shows how the 3x6 H/P Amp can be used with the NetWave. The three inputs on the H/P amp are: Host, Co-Host, and Guest. These connect to the NetWave console's studio outputs: Host H/P, Monitor, and Guest H/P, respectively. Setting the switches as shown gives these results:

- The Studio Host H/P audio goes to output 1, which goes to the Host's H/P jack panel.
- The Studio Monitor audio goes to output 2, which goes to the Studio monitor speaker jack panel.
- The Studio Guest H/P audio goes to outputs 3-6, which go to four Guest H/P panels with level pots.

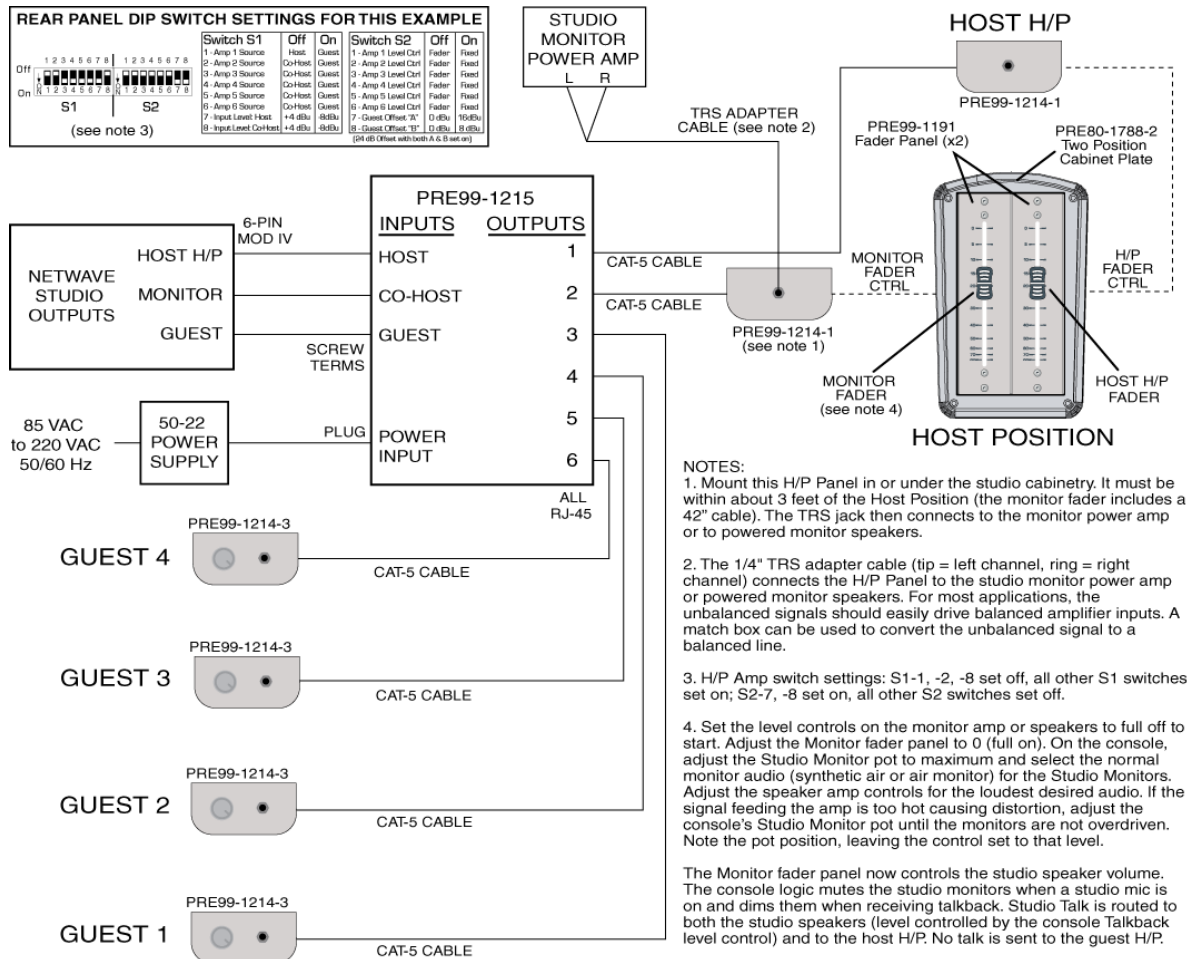


Figure 6-6. PRE99-1215 Headphone Amplifier with NetWave Console

Mount two Fader panels (PRE99-1191) in a Dual Cabinet Plate as shown or in a Host turret to give the host control over both his/her headphone level and the level of the studio monitor speakers. The studio speakers/amplifier connects to a PRE99-1214-1 headphone panel's TRS jack, allowing the output level to be

controlled by the Monitor fader panel. Guests plug their headphones into PRE99-1214-3 H/P jack panels with volume pot so they can control their own levels.

ESE/SMPTE Master Clock

When shipped from the factory, the NetWave clock is set for autonomous operation running off an internal time base. In this condition, the clock time must be set using the three recessed buttons next to the clock in the console display. For many installations, the console clock is synchronized with an ESE TC-89, ESE TC-90, or SMPTE master time code signal. A four-pin Molex connector (Figure 6-7), mounted on the console's rear panel, connects the time code signal to the console. The Molex connector is internally connected to J4 on the meter-clock-timer board in the console display.

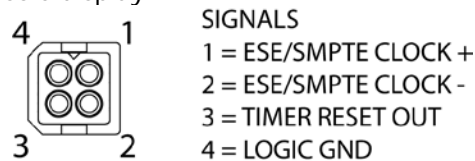


Figure 6-7. Rear Panel ESE/SMPTE and Timer Reset Connector

When a master clock signal is connected, you must set the multi-switch DS4, on the meter-clock-timer board in the console display, to use the type of master clock signal being received. Setting the DS4 requires removing the rear cover of the console display (held in place by two or three #1 Phillips screws). With an ESE master clock set DS4 switch 2 to ON. The circuit auto-detects which version, TC-89 or TC-90, is being received.

With a SMPTE master clock connected, set DS4 switch 5 to ON, and leave switch 2 set to OFF. If both switches 2 and 5 are set to ON the clock defaults to detect ESE time code.

Even though the ESE/SMPTE signal input is balanced, an unbalanced signal can also be connected. The signal polarity must be connected with the + signal connected to pin 1 and ground, or the – signal, connected to pin 2. Figure 6-8 shows connection details.



Wire insertion end view

- | | |
|----------------------------|-----------------------|
| 1 - EXT. TIMER RESET INPUT | 4 - +5 VDC |
| 2 - GROUND | 5 - ESE/SMPTE INPUT + |
| 3 - TIMER RESET OUTPUT | 6 - ESE/EMPTE INPUT - |

Notes:

Pins 1 & 2. Typically not connected on a NetWave. This input resets the timer when an active low command is received.

Pins 3 & 2. Connect to a Studio Timer's reset input. This active low output resets the Studio Timer so it stays in sync with the console's timer.

Pin 4. Typically not connected on a NetWave. Used to power a studio timer panel.

Pins 5 & 6. Master clock input. Any SMPTE, ESETC-89 or ESE TC-90 master clock can be used. On a balanced connection, connect the high (+) signal to pin 5 and the low (-) to pin 6. No shield connection is required. On unbalanced signals, connect the center conductor to pin 5 and the shield to pin 6.

Figure 6-8. Clock-Timer PCA Connector J4 Details

Quad A/D Converter

The GatesAir 4X-A2D (PRE99-1430) can be used to convert four analog signals into four digital signals to connect four analog signals to the NetWave digital inputs. The 4X-A2D converter, roughly the size of two decks of cards, is typically mounted below the furniture near the console.

The 4X-A2D converter is also available with two wiring kits:

- PRE99-1430-1 – Includes four three-foot-long MOD IV patch cables to connect the 4X-A2D outputs directly to NetWave digital inputs. Also includes the MOD IV terminals and housings to make up the audio input cables.
- PRE99-1430-2 – Includes eight twenty-foot pigtail cables terminated with the three-pin and six-pin MOD IV connectors used on the 4X-A2D. Allows the 4X-A2D to be conveniently placed between the console and the four analog sources. Also allows the 4X-A2D to alternately feed other digital devices if required.

Dual Selector Kit

The Dual Selector Kit expands the number of audio inputs available to a standalone (non-Linked) NetWave console. The Dual Selector Kit (PRE99-1428-1) converts any Dual Fader panel into two source selectors for the GatesAir 16x2 MicroRouter, a 1RU box with 16 inputs individually set for an analog or a digital input. It has two digital outputs that connect to the digital inputs on the two fader channels controlled by the Dual Selector panel. Each fader channel on the Dual Selector panel can then choose between the 16 selector inputs and the fader's own local analog input. This choice is made by name, since the upgrade kit adds a 10-character signal name display to each fader.

Link Activation Kits

To integrate a NetWave console into a VistaMax audio management system requires that a Link Activation kit be installed. Each kit activates the VistaMax Link connection on the rear panel of the console allowing signals to be routed to/from the console to an Envoy, VistaMax, or VMConnect card frame. The Link Activation kit product number is PRE99-1425. The Link Plus Activation kit, which also adds the ability to have six Telco channels, is product number PRE99-1426.

Dual Router Kit

On NetWave consoles with a Link or Link Plus Activation kit installed, any Dual Fader panel can be upgraded using a Dual Router upgrade kit (PRE99-1424). This kit adds two 10-character displays and VistaMax source selection to a Dual Fader panel. If desired, you can have multiple Dual Router kits installed for maximum signal source selection flexibility.

NetWave Toolkit

An optional NetWave Tool Kit (PRE76-1901) contains a ratcheting AMP MOD IV crimp tool, an AMP MOD IV extraction tool, and a 2mm hex driver (for fader and panel hex screws). A GatesAir logo pouch is also included to hold the tools. Only one toolkit is required per facility, regardless of the number of consoles. All of these tools, except for the 2mm hex driver, are included with RMX*digital* consoles and VistaMax card frames.



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