

NetWave™

Broadcast Console

8-input console: 99-1600-08
16-input console: 99-1600-16
24-input console: 99-1600-24



Operations & Technical Manual

PRE75-54

Revision B • 4/07



Broadcast Communications Division
www.broadcast.harris.com

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Declaration of Conformity

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 Corporation

Manufacturer's Address:

1493 Poinsettia Avenue, Suite 143
Vista, CA 92081
(760) 936-4010

Equipment Description:

Mixer Board

Equipment Class:

Professional Audio Equipment - Residential

Model Numbers:

NetWave

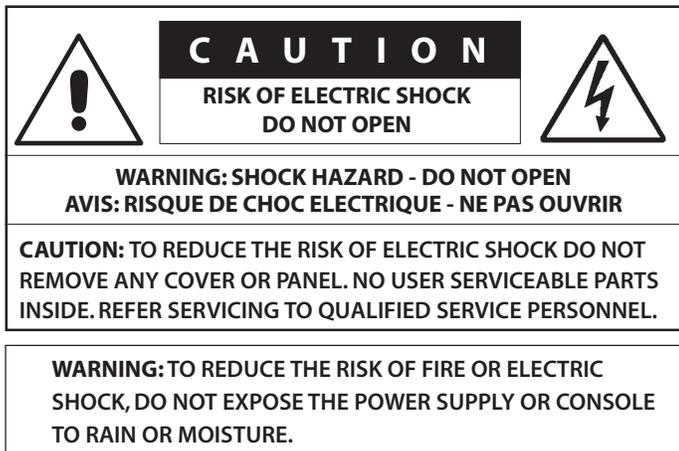
*I the undersigned, hereby declare that the equipment specified
above, conforms to the above Directive(s) and Standard(s).*

VISTA CA
Place: _____
Signature: _____
Full Name: THEODORE STAROS
Position: DIRECTOR PACIFIC DESIGN CENTER

Safety Instructions

- Read All Instructions.** Read all safety and operating instructions before operating the product.
- Retain All Instructions.** Retain all safety and operating instructions for future reference.
- Heed All Warnings.** You must adhere to all warnings on the product and those listed in the operating instructions.
- Follow All Instructions.** Follow all operating and product usage instructions.
- 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.
- Ventilation.** Slots and openings in the product are provided for ventilation. They ensure reliable operation of the product and keep it from overheating. Do not block or cover these openings during operation. Do not place this product into a rack unless proper ventilation is provided and the manufacturer's recommended installation procedures are followed.
- 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.
- Attachments.** Do not use any attachments not recommended by the product manufacturer as they may cause hazards.
- 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.
- 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.
- Power Cord Protection.** Power supply cords must be routed so that they are not likely to be walked on nor pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.
- Lightning.** For added protection for this product, unplug it from the AC wall outlet during a lightning storm or when it is left unattended and unused for long periods of time. This will prevent damage to the product due to lightning and power line surges.
- Overloading.** Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.
- 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.
- 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.
- 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.
- Servicing.** Refer all servicing to qualified servicing personnel.
- Damage Requiring Service.** Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following 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 does not operate normally (following operating instructions).
 - If the product has been dropped or damaged in any way.
 - When the product exhibits a distinct change in performance. This indicates a need for service.
- 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.
- 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.
- Cleaning.** Do not use liquid or aerosol cleaners. Use only a damp cloth for cleaning.

Hazard/Warning Label Identification



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



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

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

v

HARRIS CORPORATION

Revision B • 4/07

Introducing NetWave

1



NetWave-16 Console

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

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

NetWave consoles have these parts:

- **Main Frame:** with 8, 16 or 24 channel slots
- **Monitor & Output Card:** one per console
- **DSP & I/O Card:** one on 8-input frames; two on 16-input frames; three on 24-input frames
- **Monitor Control Panel:** one per console
- **Dual Fader Panel:** four on 8-input frames; six on 16-input frames; nine on 24-input frames
- **Reflective Display:** clock, timer and two meters are standard, an additional two meters can be added to the NetWave-16 and NetWave-24
- **Dual Width Blank Panel:** two standard on NetWave-16; three on NetWave-24 (used to cover unpopulated channel slots)
- **48-Volt Supply:** an in-line supply is standard on the NetWave-8 and NetWave-16; a rack-mount supply is standard on the NetWave-24 (optional on the other two frame sizes)
- **Installation Materials:** Installation kit; NetWave CD-ROM; NetWave Quick Guide
- **Toolkit (optional):** 76-1901 toolkit
- **Printed Manual (optional):** 75-54 NetWave Installation & Operation manual

Product Overview

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

Each NetWave is a stand-alone console but, for maximum flexibility and usability, can be **Linked** with a VistaMax system. Two Link Activation Kits (99-1425 or 99-1426) are available to activate the built-in VistaMax Link connector. The Link, a single CAT-5e or CAT-6 cable, connects the console to a VistaMax or Envoy Hub card facet to allow any system source (audio signals or audio signals with logic) to be routed to any NetWave channel and to the two External Monitor inputs.

The VistaMax Link also carries a number of NetWave signals to the VistaMax system including: one input from each channel (either the local analog or digital input can be chosen); each program bus output; the mix-minus outputs (each of which has a clean feed and an IFB feed); the two channel Telco record output; and the stereo cue bus. These signals can then be routed to any VistaMax system destination, as required.

To further enhance a Linked console, an optional Dual Fader panel upgrade, the Dual Router Kit (99-1424), is also available. This kit adds VistaMax source selection ability to both faders on any Dual Fader panel.

The Reflective Display, with two stereo bargraph meters (PGM 1 and auxiliary), a clock which can be slaved to an ESE or a SMPTE master clock and an Event Timer, is integrated into the frame behind the control panels. Quad meter display kits are available for the NetWave-16 (99-1990-16Q) and for the NetWave-24 (99-1990-24Q) to add dedicated Program 2 and Program 3 meters.

Two 48-volt power supplies are used with NetWave consoles: a rack mount supply (99-1205), which is the same one used with VistaMax and

Envoy card frames and RMXd and BMXd consoles, comes standard with the NetWave-24; an in-line supply (99-1206) comes standard with the NetWave-8 and 16 frame sizes (the 99-1205 supply is an option for these sizes).

An optional 90-1995 Power Coupler allows any NetWave console to be redundantly powered by coupling in a second, matching, 48-volt supply.

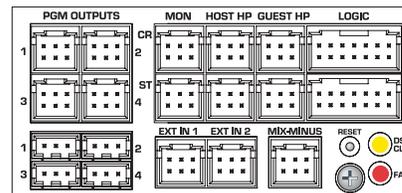
The NetWave is constructed using an all-aluminum chassis that fully contains all circuit board electronics for strength and RFI immunity. To ensure silent operation, there are no fans used in any NetWave component. The console, control panels, console display and power supplies are all convection cooled.

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

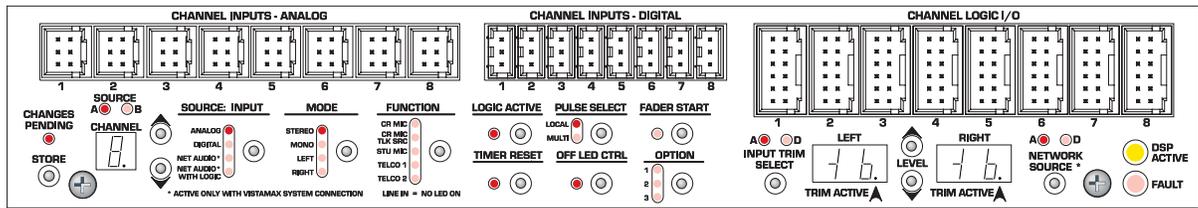
NETWAVE CONNECTIONS

• Monitor & Output Card:

- » Four stereo Program bus outputs (each 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



Monitor and Output Card Connections



DSP and I/O Card Connectors and Channel Setup Controls

- » Separate control room and studio logic connectors (warning interface output, logic I/O for dim and mute control, talk logic output)
- **DSP & I/O Cards:**
 - » Sixteen stereo/dual mono audio inputs (eight analog and eight digital) are assignable as the A or B sources for the eight channel fader control strips associated with that card
 - » Eight channel logic connectors are assignable to either the A or B source of the eight channel control strips associated with that card
- **Other Connections:**
 - » One 1/4" TRS jack for the board operator headphones, left side panel
 - » One RJ-45 VistaMax Link connector for a CAT-5e/CAT-6 cable (requires that an optional Link or Link Plus Activation Kit be installed)
 - » One keyed connector from the 48-volt power supply
 - » Four, eight or twelve internal RJ-45 sockets to supply power and signals to the Dual Fader panels
 - » Four, eight or twelve internal and rear panel LAN passthru RJ-45 sockets for standard CAT-5 cabling to connect the optional Dual Router Kits to the VistaMax LAN
 - » One ESE or SMPTE master clock input on the clock-timer board
 - » One Timer Reset output, for a studio event timer, on the clock-timer board

MAIN COMPONENT DESCRIPTIONS

NetWave board operators use three parts: the Dual Fader panels; the Monitor panel; and the Reflective Console Display. Each is covered in this section along with descriptions for the other parts making up the console: 48-volt power supplies, the Monitor & Output card, the DSP & I/O card, the VistaMax Link and the optional upgrade kits.

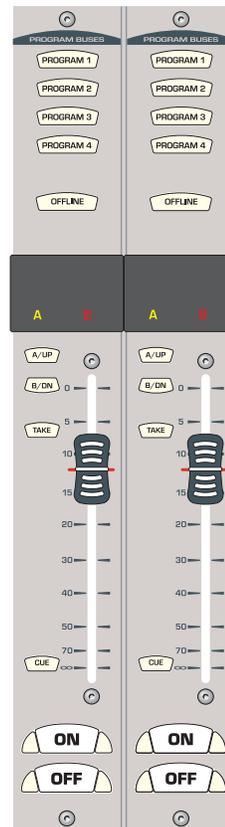
NetWave Dual Fader Panels

Each Dual Fader panel has two channel control strips. Each strip has the following features: separate channel on and off

buttons; a 100mm fader for channel level control; cue on/off button; A and B source selector buttons with a Take button; active source illuminated label; and five bus assignment buttons (four Program and one Offline).

Channel control is digital, so no audio ever travels through the Dual Fader panel. In fact, a Dual Fader panel can be swapped “hot” without affecting either channel’s audio performance.

Each Dual Fader panel plugs into a DSP & I/O card using a single red



Dual Fader Panel

CAT-5 cable. Since each DSP & I/O card carries eight audio channels, up to four Dual Fader panels are plugged into each DSP & I/O card.

Each Dual Fader channel control strip has two audio inputs and one logic I/O connector associated with it on the DSP & I/O card. Since each channel strip has two possible sources (A and B), which audio input is used for each source is assigned during console setup. In the standard, non-linked NetWave console the two possible inputs are the local analog input or the local digital input assigned to that channel on the DSP & I/O card. When the NetWave is linked to a VistaMax system, there are three selections per source: the local analog input, the local digital input, or a routed VistaMax source.

The operating parameters for each source, on each channel, are independently set during console setup through a common group of setup buttons and LEDs on each DSP & I/O card (shown in the illustration on the previous page). These controls set the parameters used when the A and the B source is selected. The parameters include: input type (is the input a control room mic, a studio mic, a line input or a Telco input?); whether logic is be associated with that input; whether the event timer is reset at channel on; whether fader start is active; etc. The parameter settings are stored in nonvolatile RAM.

The channel strip's A and B select buttons are used along with the Take button to choose the active source for that channel. When the A source is active, yellow LEDs backlight the A source label under a smoked polycarbonate window above the A button, and the A button is lit. When the B source is active, red LEDs backlight the B source label above the fader 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 (mic control panel, CD player, computer playback system, etc.) and that peripheral

can also control the channel. The logic I/O provides fully independent parallel logic functions that: outputs 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).

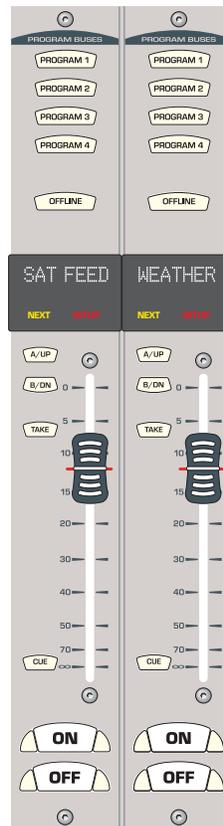
Dual Fader Panel Upgrades

There are two upgrade kits that add source selection ability to a Dual Fader panel: a Dual Selector kit, for stand-alone consoles, and a Dual Router kit, for Linked consoles.

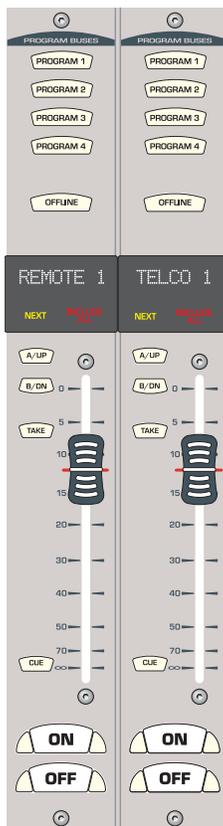
The **Dual Selector kit** (99-1428-1) uses a 16X2 Source Selector—a 1 RU box with sixteen inputs, individually set as an analog or a digital input, and two digital outputs that connect to the digital inputs for that Dual Fader panel. The UP/DN and TAKE buttons select which of the seventeen possible sources (the local analog input for that fader plus the sixteen common sources on the 16X2 selector) is active on that fader channel.

The **Dual Router Kit** (99-1424) adds this same type of signal selection ability to a Dual Fader panel in a Linked console. Of course, the number of signals that can be selected on the two faders is much larger since any source in a VistaMax system is a potential source for that fader.

The Dual Router kit, in effect, changes the A/B selector buttons on both channels of any



Dual Selector Panel



Dual Router Panel

displayed name switches to show a potential Next Source for that channel. The yellow Next label above the UP button lights while the Next Source name is displayed. Holding down, or repeatedly tapping the UP or DN button, steps alphanumerically through the list of potential Next Source names available on that channel.

Once the desired source name is shown, pressing the Take button selects that source—when the channel is off. New sources cannot be taken when the channel is on (the On button flashes three times to indicate the next source cannot be taken since the channel is on). A next source can be pre-selected and then taken once the channel is off.

On the Dual Router panel, which sources are seen when the UP and DN buttons are pressed is set using the VistaMax Control Center (VMCC) software, vers 1.1 or later. Each channel could be assigned anywhere from one source up to every

Dual Fader panel into being a VistaMax source selector. The UP/DN and TAKE buttons are used to select the active signal for each channel.

Dual Fader panels that have either the Dual Selector or the Dual Router kit installed are easily identified by the two 10-character signal name displays under the top half of the smoked polycarbonate lens above the fader.

This display normally shows the name of the current VistaMax source feeding that channel. But, when finding the next source, by pressing the UP or DN button, the displayed name switches to show a potential Next Source for that channel.

available source in the VistaMax system in its selection list. In regular use, the signal list is kept short to make it easy for board operators to easily find desired sources. If a board operator needs to selected a source that is not shown, pressing both the UP and DN buttons together turns on the Include All function, lighting up the red Include All label. Every source available to the console's parent device is now displayed. Pressing both UP and DN buttons together again turns off the Include All function.

The VMCC 1.1 (or later) software is included on the NetWave CD-ROM (99-5001) that comes with the console.

To network the NetWave with a VistaMax system, requires that all VistaMax devices be running build 445.10 under the 400-series code, or any version of 500-series code. The current operating system code build can be seen by viewing the `release.txt` file on the NetWave's parent cardframe or by using Community Monitor, another program included on the NetWave CD-ROM to view the code build.

```

Release.txt - Notepad
File Edit Format View Help
VistaMax Platform Version 4.20 [SJP]
CE.NET 4.2 + 2004 Q1 and Q2 QFES applied
#build 501.37 - built 07:05:2006 @ 09:19.32
Technology of Pacific Research & Engineering
Copyright 2003 - 2006 Harris Corp.

```

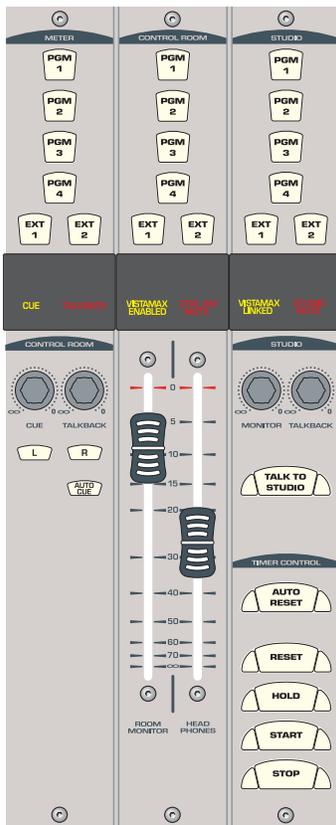
Operating System Code version and build, as shown in the `release.txt` file

Monitor Control Panel

This standard panel is divided into three sections separated by double graphic lines. From left to right the sections, divided by main function, are: Aux Meter control; Control Room (CR) control; and Studio control.

Aux Meter Section

The top of all three sections have exclusive action source selector buttons to select one monitor signal



Monitor Control Panel

from the PGM 1 thru 4 buses and the two External Monitor inputs. In the Aux Meter section, the buttons select which signal feeds the right-most meter in the Reflective Display, with the selected source name shown below the Aux Meter.

Note that the Aux Meter is typically set to alternately display the cue levels while cue is active (the cue label lights, cue is displayed below the meter and the cue level is shown).

Several CR controls are located below the meter selector buttons in this section of the panel. They are covered in the Control Room Section.

Control Room Section

The middle of the panel has the CR monitor source selector buttons and the two faders to adjust the level of the room monitor speakers and the operator headphone outputs.

Any one source can be selected, which feeds all control room monitor outputs. The active source button lights to indicate its selection.

A cue speaker, at the left end of the console display, is level controlled by the cue pot in the middle of the left-hand section. A yellow cue label lights while cue is active.

A talkback pot controls the level of incoming talkback that feeds the cue speaker, independently of the cue volume pot. A red Talk to CR label lights when a studio mic talks to the control room.

The signal mode for all CR and studio outputs is determined by the Monitor Mode buttons in the left-hand section (below the cue and talkback pots). 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 L and R are lit).

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

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

Studio Section

The right-hand section of the Monitor panel has the monitor source selection buttons and level controls for a separate talk or voice studio. One source can be selected from among the six buttons at the top of the center section. The selected source button lights to indicate its selection.

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 the monitor output.

This section of the Monitor Control panel also has a Talk to Studio button to allow the board operator to talk to the studio using the board operator mic. If desired, multiple control room mics can be assigned as talk sources to enable both a board op and a producer to talk to the studio without having to add a mic control panel.

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. Which channel sources reset the timer are set during installation using the DSP & I/O card setup controls.

Reflective Console Display

The integrated Reflective Console Display has two stereo bargraph meters, with the left one showing the PGM 1 output levels. The right-hand, or Aux Meter, shows a source selected using the Meter source controls on the Monitor panel. Two more stereo bargraph meters (for Program 2 and Program 3) can be added to the larger frame sizes by installing an optional Quad Meter kit.

A time of day clock and an event timer are also in the Console Display. The default operating mode for the clock is autonomous, meaning the clock runs independently and must be set by hand. The clock time remains current for about three days with the power off. After that, the time must again be set. The clock can alternately be slaved to a SMPTE, ESE TC-89 or ESE TC-90 master clock. In this mode, the time set buttons are not active.

The event timer is controlled by Monitor panel buttons, as well as reset commands from one or more channels when the Auto button is lit.

Monitor & Output Card

Each NetWave console has one Monitor & Output card with the user connections listed on page 1-2. The Monitor Control panel plugs into the Monitor & Output card, receiving power while sending control signals.

The card also supplies power and clock signals, and sends and receives bused audio signals, to the DSP & I/O cards via a short flat cable jumper.

There are two LEDs, to indicate operational status (DSP clock and Fail), and a console reset button located on the Monitor & Output card.

The Monitor & Output card is partly located below the Monitor Control panel and the Reflective Console Display. In normal operation the card connections are hidden by a cosmetic flip-open rear cover.

DSP & I/O Cards

Each DSP & I/O card (Digital Signal Processor plus Inputs and Outputs) has the setup controls, audio inputs and logic I/O connectors for eight console channels, on the four Dual Fader panels, that mount directly in front of each card. A DSP Active and a Fault LED indicate operational status on each card.

There is one DSP & I/O card on NetWave-8 consoles, two on NetWave-16 consoles and three on NetWave-24 consoles. In normal operation, the DSP & I/O cards are completely hidden from the operator by the Reflective display and a cosmetic flip-up cover.

Each DSP & I/O card has twelve RJ-45 connectors. Eight are internal connectors for the four Dual Fader panels (red CAT-5 cables, supplied with the frame, connect the panels); the other four internal RJ-45 connectors are for the optional Dual Selector or Dual Router kits (which have a blue CAT-5 cable). Customer-supplied CAT-5 cables connect the Dual Selector panel to the 16X2 selector or the Dual Router panel to the VistaMax

LAN, using the four rear panel RJ-45 passthru connectors.

Each DSP & I/O card has a common set of assignment buttons and indicator LEDs to assign the parameters for each A and B source on the eight channels associated with that DSP & I/O card. The setup parameters include: input selection (analog, digital or network); mode selection (stereo, L, R, or mono); signal function (mic, line, Telco); whether the logic I/O is active; input gain trims for both analog and digital inputs; network source assignment; and other logic settings.

Power Supply

Two power supplies can be used NetWave consoles. Each has a single 48-volt output on a keyed DC connector and uses a detachable IEC AC cord.

An in-line supply (99-1206) is standard on the NetWave-8 and -16 consoles. It has a captive six foot DC cable which allows the supply to sit below the console within the cabinetry. This supply is not recommended for use with the NetWave-24 console.

NetWave-24 consoles ship with a Universal 48-volt Supply (99-1205), which is also used by VistaMax card frames and RMX*d* and BMX*d* consoles. A fifteen foot detachable DC cable (90-1858-1) connects that supply to the console.

One supply comes standard with each console. A second matching redundant supply can be connected to a NetWave console by using the optional 90-1995 Power Coupler.

NOTE: When adding a 99-1205 supply for redundant powering, order a 99-1205-1 supply (it includes a 90-1858-1 fifteen-foot DC cable).

The 99-1205 supply has a recessed front panel on/off switch and a green LED to indicate the 48-volt output is good. The 99-1206 supply has a green LED on the top of its case to indicate its 48-

volt output is good but 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 connector is located next to the DC input connector on the rear panel. This connector links the NetWave console to a VistaMax or Envoy Hub card in order to network the console with a VistaMax system. A Link or Link Plus Activation Kit must be installed to use this Link connection.

Once activated, the Link sends up to 32 stereo signals (the four program buses, cue bus, Telco record output, mix-minus signals and one input from each channel) to a VistaMax network as source signals. Up to 26 stereo destinations (two routed External Monitor inputs and one input for each channel) are routed from the VistaMax system to the console.

Specifications

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

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

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

FSD (Full Scale Digital) = +24 dBu

Dimensions

All NetWave consoles: 3" [76] max height above countertop, except for console reflector, 6" [152]. Front-to-back depth is 21" [533].

NetWave-8 is 20" [508] wide
NetWave-16 is 32.4" [823] wide
NetWave-24 is 45.2" [1148] wide
99-1206 (in-line supply for NetWave-8 and -16):
2" [51] x 3.8" [97] x 9.5" [241]
99-1205 (rack mount supply for NetWave-24):
2 RU: 3.5" [89] x 19" [483] x 10" [254]
All dimensions: Height x Width x Depth.

Console Power Requirements

Measured at 120 VAC/60 Hz.

NetWave-8: 54 watts

NetWave-16: 99 watts

NetWave-24: 141 watts

Required Supply Voltage

NetWave-8: +48 VDC @ 1.2 amps

NetWave-16: +48 VDC @ 2 amps

NetWave-24: +48 VDC @ 3 amps

One power supply included. The NetWave-8 and NetWave-16 use a 99-1206 supply. The NetWave-24 uses a 99-1205 supply.

An optional Power Coupler (90-1995) is available for adding a matching redundant supply for on-air consoles.

Analog Line Inputs

Input Impedance: >60 k ohms, balanced

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

Input Headroom: 20 dB above nominal input

Analog Outputs

Output Source Impedance: <3 ohms, active balanced

Output Load Impedance: 1k ohms min.

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 trimmed by +/-15 dB

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

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

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

Internal Sample Rate: 48 kHz

Output Sample Rate: 48 kHz nominal (each can be set for 44.1 kHz)

Processing Resolution: 24-bit fixed with extended precision accumulators

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

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

Monitor Outputs

Output Source Impedance: <3 ohms, active balanced

Output Load Impedance: 1 k ohms min.

Output Level: +4 dBu nominal, +24 dBu max.

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

Crosstalk Isolation

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

Stereo Separation

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

Power Supply Ground

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

Power Supplies

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

AC input: detachable IEC power cord

DC output: Uses a keyed, latching connector on a captive cable on the 99-1206 supply or a detachable cable (90-1858-1) on the 99-1205 supply

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

Warranty

NetWave consoles carry a manufacturer's warranty which is subject to the following guidelines and limitations:

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

- B)** Equipment furnished by the Seller, but manufactured by another, shall be warranted only to the extent provided by the other manufacturer.
- C)** Thermal filament devices, such as fuses or lamps, are expressly excluded from this warranty.
- D)** The warranty period on equipment or parts repaired or replaced under warranty shall expire upon the expiration date of the original warranty.
- E)** This Warranty is void for equipment which has been subject to abuse, improper installation, improper operation, improper or omitted maintenance, alteration, accident, negligence (in use, storage, transportation or handling), operation not in accordance with Seller's operation and service instructions, or operation outside of the environmental conditions specified by Seller.
- F)** This Warranty is the only warranty made by Seller, and is in lieu of all other warranties, including merchantability and fitness for a particular purpose, whether expressed or implied, except as to title and to the expressed specifications contained in this manual. Seller's sole liability for any equipment failure or any breach of this Warranty is as set forth in subparagraph A) above; Seller shall not be liable or responsible for any business loss or interruption, or other consequential damages of any nature whatsoever, resulting from any equipment failure or breach of this warranty.

Installation

The NetWave console sits on the countertop on rubber feet. One cable access cutout is required below the frame so cabinet wiring can cleanly connect to the console connectors, which are hidden below a cosmetic 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 corner feet are provided to do this. Frame sizes and cutout dimensions are listed below.

Dimension Table

Frame Size	Width	Cable Access Dims.
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]

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 in order to fully open the connector cover when the console's rear is against a wall.

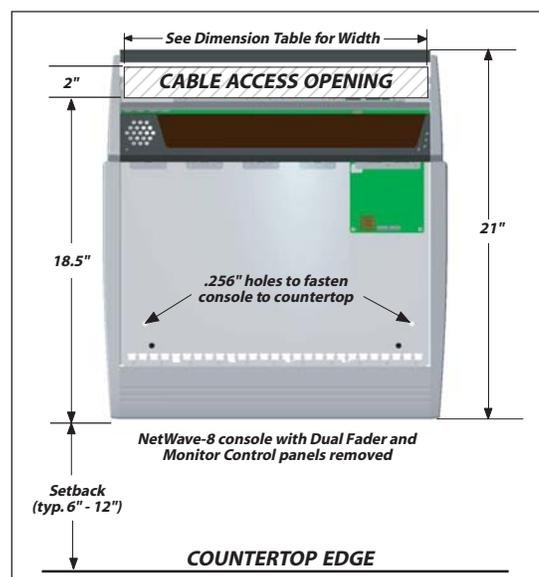
The console height above the countertop is 3" [76], except for the console display reflector, which is 8" [203] above the countertop.

Typical console setback from the countertop edge to the palm rest is between 6" [152] and 12" [305].

Millimeter dimensions listed in brackets. All dimensional tolerances are: ±1/4" [6.4].

The NetWave console shipment contains:

- NetWave main frame, loaded with DSP & I/O and Monitor & Output cards; a Monitor Control panel; Dual Fader panels (NetWave-8 has four; NetWave-16 has six plus two dual blanks; NetWave-24 has nine plus three dual blanks)
- 48-volt DC power supply (99-1206 in-line power supply with NetWave-8 and NetWave-16; 99-1205 rackmount supply and DC cable are shipped separately on the NetWave-24)
- Installation kit (MOD IV housings and receptacle contacts, blank source name labels)
- Channel Setup Stylus Tool
- Reflector for the Console Display
- Laminated NetWave Quick Guide
- NetWave CD-ROM



Cable Access Cutout & Console Mounting holes

Console Installation



The 99-5001 NetWave CD-ROM has several video and PDF files on console installation; on installing optional items; on setting up the console channels; and on typical console operations.

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.

Pages 2-20 to 2-24 cover wire preparation and connector installation. Page 2-26 has block diagrams for the various NetWave logic connectors. Pages 2-30 to 2-33 show typical peripheral connections for a mic, a CD player, a computer playback system and linking to a VistaMax system.

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

The channel audio and logic wiring connects sequentially along the back of the console in eight channel groups. The chassis metal is cutaway between the DSP & I/O cards to facilitate getting

the connectors and wiring up through the countertop.

To ease installation, break out each group of cables, using the dimensions shown below as measured from the right end of the cutout. Cabling is normally broken out and tie wrapped to the bottom of the countertop just behind the cable cutout. Leave a six to eight 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.

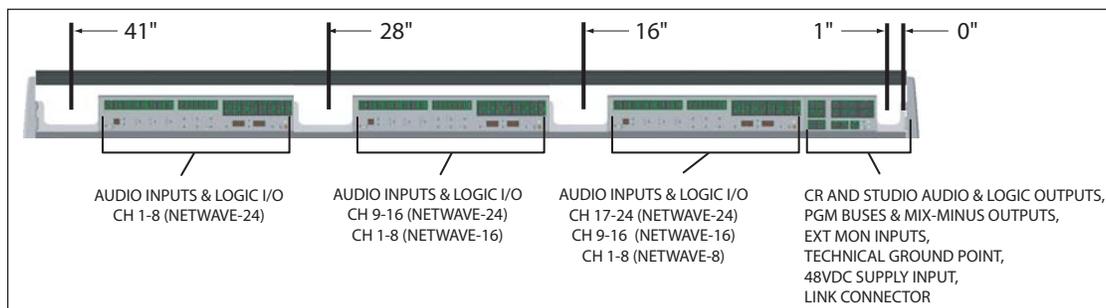
The monitor and program outputs connect at the right rear corner of the console along with the 48-volt supply, the optional Link cable and the technical ground wire. The chassis is also cutout in this area to ease installation.

Plug in all audio and logic cables first. Then route the excess cabling (i.e., service loops) into the cabinet by folding the audio and logic wires over their connectors and arranging the cables to go into the gap between the connectors and the flip-up connector cover such that the cover sits down onto the chassis behind the console display.

The technical ground wire, DC cable and any Link and LAN cables can then be connected.

POWER SUPPLY PLACEMENT

Two types of power supplies are used with NetWave consoles. Each has a single 48-volt DC output using a keyed and locking connector. Each uses an IEC AC input cable which is shipped with a USA-type plug. The AC connector, or the IEC



Console Connections with Access Points (measured from the right end of the cable cutout)

cord, will have to be changed for overseas operation. Both supplies operate from 90 to 240 VAC on 50 or 60 Hz power.

The 99-1206 in-line supply comes standard on the NetWave-8 and NetWave-16 consoles. It 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 wire tray or within the cabinet (it can be tie wrapped to a vertical wall to save space). This supply will get warm under normal use as it uses free air space for ventilation, so it must never be covered or enclosed.

The 99-1205 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. It is the same supply used with VistaMax cardframes and consoles. A detachable 15-foot DC cable (90-1858-1) connects this 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. The 48-volt cable locks into a keyed power connector on the right rear corner of the NetWave chassis.

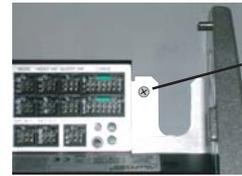
A 90-1995 Power Coupler (optional) is available to add a redundant power supply for on-air consoles. The main and redundant power supplies plug into its special Y-cable, which then plugs into the console. It hangs below the countertop.



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

GROUNDING AND SHIELDING

A technical ground wire for the console can be terminated in a crimped ring tongue terminal suitable for a #8 stud. The ground wire connects to



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

Technical Ground Connection Point, NetWave Chassis, right rear view

the NetWave chassis using a #8 screw in a threaded insert, shown above.

When all system components share a common ground potential (by using isolated ground AC outlets tied individually back to the main technical ground), the audio cable shields can be connected at both the console and the peripheral ends.

If isolated ground AC outlets are not used, connect the cable shields at the console end only. Do not connect the shields on the peripheral device end. Ensure the peripheral devices connect to a clean ground through their power cords or through separate ground wires to the facility’s technical ground.



GROUNDING NOTE: The Power Supply chassis connects to the AC mains safety or “U” ground wire.



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



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 dimensions listed on page 2-1 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 in order to flip-up the connector cover.

Center the console over the cable access cutout so that the rear connector cover, when closed, covers the cutout.

For security or stability the console can be fastened to the countertop. To do this, the leftmost Dual Fader panel and the Monitor Control Panel must be removed to access the two chassis holes (see page 2-1 for hole locations).

Removing Control Panels

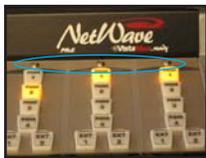
Control panels are fastened to the chassis using M3x6 silver hex screws. The panels plug into the DSP & I/O boards using one-foot red CAT-5 cables.

To remove a control panel:

1. Remove the panel's hex screws using a 2 mm hex driver (Harris 70-57, supplied in the optional 76-1901 NetWave/SMXdigital toolkit).

Panel screws, top

Panel screws, bottom



M3x6 Panel Screws (two on Dual Faders, three on the Monitor Control panel)

2. Move the panel's faders to full off and lightly squeeze the two fader knobs together to lift up the panel to remove it by hand.



WARNING: Lift the panel up just enough to clear the console surface.



Lightly squeeze the fader knobs together to lift a control panel out of the chassis



Unplug the red cable from the panel (Note: some panels also have a blue cable)

3. Unplug the red cable (J5 on Dual Fader panels, J4 on the Monitor Control panel).

On a Dual Router or a Dual Selector panel, unplug the blue flat cable from J3.

NOTE: If a Link activation kit is being installed, this is a good time to do it since the Monitor Control panel is already out of the console. Also, make

any changes to the Monitor & Output card setup switches at this time (see page 2-12).

Before marking the holes to fasten the console to the countertop, make sure the console is set parallel to the countertop edge and is covering the cable cutout. Mark, then move the console, to drill pilot holes for screws or clear holes for bolts. On laminate countertops it is important that the hole through the laminate is larger than the screw or bolt threads to prevent future laminate cracks.

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.

Reinstall the panels in the frame, using the reverse order of their removal.

INSTALLING CONSOLE OPTIONS

All NetWave consoles ship from the factory in a standard configuration. Any console option ordered (Dual Selector kit, Link or Link Plus Activation kit, Dual Router kit, Quad Meter package, 4X-A2D converter, or additional Dual Fader pan-

els) are packaged separately. These can be added during console installation or at any future date.

Dual Fader panels and panel kits (Dual Selectors, Dual Routers) can be installed while the console is powered and even on-air. Installing a Link or Link Plus Activation kit or a Quad Meter package requires that the console be powered off during installation.

Link and Link Plus Activation Kits



A Link Activation Kit activates the VistaMax Link Connector

Link activation kits change a NetWave, from a non-networked stand-alone console, into a networked or **Linked console** ready for connection to a VistaMax system.

The NetWave's RJ-45 Link connector, located next to the keyed DC power connector on the rear panel, connects the console to any available Hub card facet on a VistaMax or Envoy card-frame. Connection is through CAT-5e or CAT-6 cable (customer supplied). Total length allowed is 330 feet [100 meters].



The RJ-45 Link Connector on the back panel

Link or Link Plus activation adds the following capabilities to a NetWave console:

- A routed network signal can be set as the A or B source on any channel
- A routed network signal can be used instead of the local Ext In 1 or Ext In 2 input

- The console buses (four programs, two mix-minuses and stereo cue) plus one local input (analog or digital) from each channel are network sources, available for routing to any VistaMax destination
- Link Plus Activation adds the ability to have six Telco channels (the four new Telco mix-minus signals are network-only signals that replace the input signals normally available on channels 21 - 24)

To install either activation kit, the console must be powered off and the Monitor Control panel must be removed. An installation video and a PDF of the installation instruction sheet are included on the 99-5001 CD-ROM.



NOTE: Discharge possible static charges before following this procedure and before handling any PROM.

Activation Kit Installation

1. Power down the console.
2. Remove the Monitor Control panel, per the instructions on page 2-4.
3. Use the 70-134 PLCC removal tool (included in the Activation kit) to remove PROM U64 from the Monitor & Output card. Place the two tool tips into the open corners of the 21-352-3 PROM and then squeeze the tool handles to "pop" the PROM out of the socket.



PLCC Extraction Tool



PROM U64, front left portion of the Monitor & Output board

4. Place the Link PROM (21-352-4) or Link Plus PROM (21-352-6) into the U64 socket, aligning the pin 1 marks on the PROM and socket. Firmly press on the PROM to fully seat it into its socket.
5. Replace the Monitor Control panel (plug in the red cable and fasten the panel to the frame).
6. Power up the console and verify that the *VistaMax Enabled* label is now lit on the Monitor Control panel.



The VistaMax Enabled Label lights on the Monitor Control Panel when the Link is Activated

Dual Router Kit

A Dual Router kit adds VistaMax source selection capability to both channels on a Dual Fader panel. A Link Activation kit must be installed in order to use a Dual Router kit.

Any Dual Fader panel can have a Dual Router kit installed but, for most applications, between

one and three Dual Fader panels will be installed into the console. This results in two, four or six channels with the ability to select their own VistaMax source. The remaining channels can have a VistaMax source set as their A or B input, but they do not have control over their VistaMax source.

A Dual Router kit includes two 10-character displays; two *Next/Include All* labels; a plug-in TINI card; a blue flat CAT-5 cable; and an installation instruction sheet.

Dual Router Kit Installation

1. Remove the Dual Fader panel following the panel removal instructions on page 2-4.
2. Remove the two display lenses from the front of the Dual Fader panel by unsnapping each lens starting from the side of the Dual Fader panel.
3. Remove and discard the black light block material covering the two IC sockets.
4. Insert the two 10-character displays into the two DIP sockets. Orient the parts with their contact row toward the label silos (the part number side faces the rubber label silos).



10-Character Display Orientation

5. Pry out the two A / B labels from the rubber label silos and insert the two *Next / Include All* labels in their places. Note that on some panels the A / B labels may be glued in place.
6. Snap the display lenses back onto the panel. Verify the two labels remain held by the silos.
7. Discharge static electricity before removing the TINI card. Firmly insert the TINI into its connector at a 45 degree angle, then press it down to lock it in place. The TINI's bag has a label with its MAC address. Write the console name

and the two channels this TINI controls in the space provided on the label as this will be needed during software configuration.

8. Plug in the *blue* flat cable from the kit into J3.
9. Hold the panel above its slot and plug the *blue* cable into the LAN Passthru jack, noting the jack's letter (the corresponding lettered jack on the rear panel will then connect the Dual Router panel to the VistaMax LAN). Plug the *red* cable back into J5.
10. Set the panel onto the chassis tabs, making sure the CAT-5 cables are not being pinched by the panel's sides. Refasten it to the chassis.
11. Connect a straight-thru CAT-5 cable from the matching rear panel LAN Passthru jack (the same letter jack as used in step 9) to the VistaMax LAN switch.
12. Use VMCC to set up the new Dual Router panel. The information written on the TINI's antistatic bag label is used during this step.

Dual Selector Kit

A Dual Selector kit integrates source selection for a Harris 16X2 Source Selector (a 1 RU selector with sixteen analog or digital inputs independently switched to two digital outputs) in a Net-Wave Dual Fader panel.

The kit adds two 10-character displays to the two faders, just like the Dual Router kit, to allow the board operator to select between seventeen sources (the sixteen selector inputs and the local analog input on that fader). Any Dual Fader panel can have a Dual Selector kit installed.

A Dual Selector kit includes two 10-character displays; two *Next / Setup* labels; a plug-in Selector Interface card; a blue flat CAT-5 cable; and an installation instruction sheet.

Dual Selector Kit Installation

1. Remove the Dual Fader panel following the panel removal instructions on page 2-4.

2. Remove the two display lenses from the front of the Dual Fader panel by unsnapping each lens starting from the side of the Dual Fader panel.
3. Remove and discard the black light block material covering the two IC sockets.
4. Insert the two 10-character displays into the two DIP sockets. Orient the parts with their bottom contact row toward the label silos. The part number will also face the label silos.
5. Pry out the two *A / B* labels from the rubber label silos and insert the two *Next / Setup* labels in their place. Note that on some panels the *A/B* labels are glued in place.
6. Snap the display lenses back onto the panel. Verify the two labels are still in their silos.
7. Discharge static electricity before removing the Interface card. Firmly insert the Interface card into its connector at a 45 degree angle, then press it down to lock it in place.
8. Plug in the *blue* flat cable from the kit into J3.
9. Hold the panel above its slot and plug the *blue* cable into the LAN Passthru jack, noting the jack's letter (the corresponding lettered jack on the rear panel will connect the 16X2 Source Selector. Plug the *red* cable back into J5.
10. Set the panel onto the chassis tabs, making sure the CAT-5 cables are not being pinched by the panel's sides. Refasten it to the chassis.
11. Connect a straight-thru CAT-5 cable from the matching rear panel LAN Passthru jack (the same letter jack as used in step 9) to the 16X2 Source Selector panel.
12. Press and hold the left fader's **Offline** and **Take** buttons to put the panel into *Dual Selector Setup mode*. Use the left fader's **UP** and **DN** buttons to step through the eighteen possible sources (sixteen from the 16X2, the local analog input for the left fader and the local analog input for the right fader). Use the right fader's **UP** and **DN** buttons to change the char-

acter in the active letter (which is blinking). Press the right fader **Take** button to move to the next letter to the right (it will wrap back around to the first letter).

Press and hold the left fader **Take** button to clear the name. If an input is not used, clear its name and leave it blank so it does not show up when the operator selects a new source.

To exit *Setup mode*, press and hold the left fader **Offline** and **Take** buttons for three seconds. The Setup labels will be unlit.

4X-A2D Quad Converter

A 4X-A2D converts four balanced or unbalanced analog inputs into four AES-3 digital outputs to allow facilities with more analog peripherals than console inputs to use those analog peripherals on the NetWave's digital inputs.

The 4X-A2D is available in two packages: 99-1430-1 includes four 3-foot MOD IV cables, to jumper the 4X-A2D outputs to the console's digital inputs, plus connector housings and terminals to make up custom input cables; 99-1430-2 includes input and output pigtail cables (each 20 foot long) with MOD IV connectors installed so that the 4X-A2D can be placed almost anywhere in a studio to interface analog peripherals to the digital inputs on the NetWave.

Dual Fader Panels

The NetWave-16 has two dual blank panels installed while the NetWave-24 has three dual blank panels installed. Any of the can be replaced by a Dual Fader, a Dual Selector, or a Dual Router panel. Under each dual blank panel is a red CAT-5 cable to connect the Dual Fader panel.

Dual Fader Panel Installation

1. Remove the Dual Blank panel following the panel removal instructions on page 2-4.

2. Cut the tie-wrap on the red CAT-5 cable and then plug that cable into J5 on the panel.
3. If it is a Dual Router or Dual Selector panel, connect the blue CAT-5 cable to the LAN passthru jack.
4. Fasten the panel to the chassis using the screws removed in step 1.

Quad Meter Package

The optional Quad Meter Package replaces the standard console display with a four meter display in a NetWave-16 or NetWave-24 console. The package includes a new console display housing and a new meter board. The console's original meter and clock-timer boards are moved to this new display.

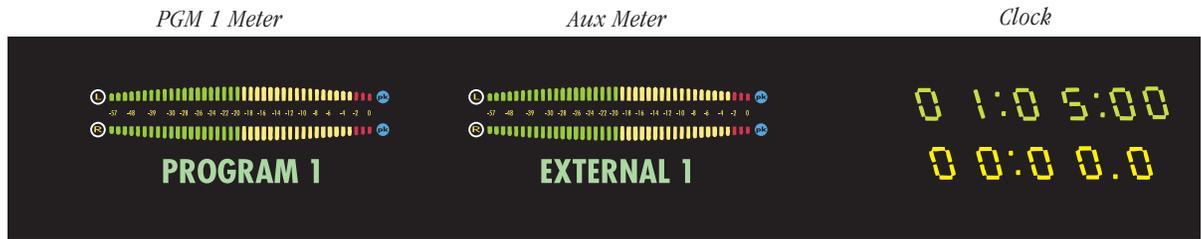
The Quad Meter Package features dedicated bargraph displays for PGM 1, PGM 2 and PGM 3, with the fourth meter (AUX) being used to display PGM 4 or an external monitor input.

Because the Quad Meter Package requires extensive frame disassembly the console power must be turned off during installation. For installation instructions, refer to the installation guide that comes with the package.

REFLECTIVE CONSOLE DISPLAY

The reflector can be inserted into its slot behind the console display at this time—if the best access to the console connectors is from the rear of the console. If the best access is from the front of the console, it is best to wait until the wiring is completed before permanently installing the reflector.

The reflector is shipped with protective paper stuck to both sides. This paper must be removed before installing the reflector.

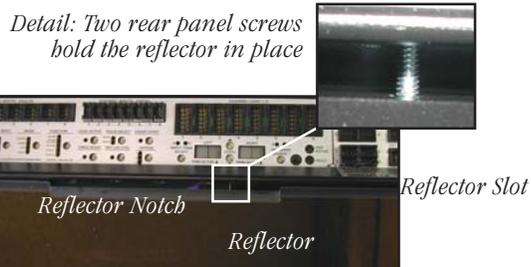


Board Operator View of the Standard Reflective Display, with two meters, clock and timer



NOTE: Always handle the reflector by its edges to prevent scratches and fingerprints. When the reflector is removed, place it on a lint-free cloth to prevent scratching the reflective surface. Use a lint-free cloth dampened with either diluted dish soap or alcohol, or a damp chamois, to clean the surface.

Two 4-40 screws, on the rear of the display assembly, firmly hold the reflector in place after it is installed into its slot. These screws are shipped installed and must be removed before the reflector can be inserted into its slot.



Installing the Reflector into the Console Display Slot

Insert the reflector, with its notched edge behind the clock and timer, into the slot. The reflector is designed to sit at a 22° angle toward the board op. This is assured by the two mounting screws. They should be installed once all console connections are finished and the console is ready for daily use. Before this time the reflector can sit in the slot without the screws for easy removal.

The standard Console Display has two horizontal stereo bargraph meters. Alphanumeric displays below each meter identify the signal displayed (PROGRAM 1, PROGRAM 2, etc.). The standard meters provide simultaneous level monitoring of the Program 1 bus on the left-hand meter and another bus or system signal on the right-hand Auxiliary Meter, as selected by the Aux Meter buttons on the Monitor Control panel.

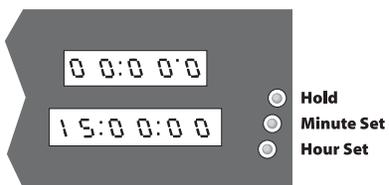
A Quad Meter Package adds two more meters (so all four Program buses can be displayed simultaneously), but the Aux meter functions the same as in the standard meter configuration.

Various meter, clock and timer parameters are set using switches on the meter (DS3) and clock-timer circuit boards (DS1). The procedure to change the switch settings is detailed in the following sections. In summary, here are the various display parameters that can be changed, with their factory default setting listed first:

- Meter Display Mode (average plus peak display; average-only display)
- Blue Over LED turn-on level (-6 dBFS; -4 dBFS; -2 dBFS; 0 dBFS)
- Peak Signal Hold (2 sec 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 (display .1 sec; do not display .1 secs while running)

Setting The Clock

When used autonomously (the factory default setting), a quartz crystal oscillator controls clock timing. After applying power to the console, the clock must be manually set to the current time using the three recessed buttons adjacent to the clock display (shown below). Use the NetWave Stylus tool or other blunt-tipped nonconductive object (wooden swab, toothpick, etc.) to press the recessed buttons.



SETTING THE CLOCK (AUTONOMOUS MODE ONLY)

1. Press Hour Set to set the current hour.
2. Press Minute Set to set time slightly ahead.
3. Press Hold until the time is current, then release to start clock.

- The Hour Set button (closest one to the board operator) adjusts the hours
- The Minute Set button (middle) adjusts the minutes
- The Hold button freezes the clock so it can be manually synchronized to a local time reference. Set the time slightly ahead of the reference time then press Hold. Release Hold when the time display matches the reference time.



NOTE: When the clock is set for an ESE or SMPTE master clock, and the selected format signal is not present, the clock runs off its internal oscillator. Both display colons blink to indicate the selected ESE or SMPTE timecode is not present or is not valid.

The clock retains its time for about three days while powered off. After this, the time will have to be reset again when autonomous mode is used.

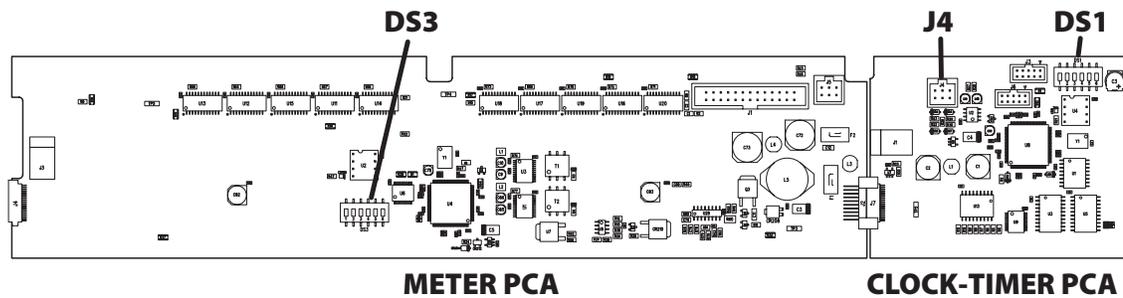
Removing the Console Display

The console display must be removed from the mainframe to change display settings; to connect a master clock or remote timer reset cable; or to install a Quad Meter Package upgrade.

Each of these activities require accessing the meter and clock-timer printed circuit assemblies (PCAs) on the bottom of the console display. The console should be powered off when removing and reinstalling the display assembly. Two padded surfaces are required for this procedure.

To remove the console display:

1. Flip-up the rear connector cover to access the two rear corner 4-40 screws that hold the reflector in place. Remove these screws.
2. Lift the reflector out of its slot. Place it on a padded surface to protect its mirrored surface.
3. Remove the console display cosmetic cover screws (two or four black 4-40 Phillips screws). Remove the cover by lifting it straight up.
4. Set the smoked display window (which was sandwiched between the display cover and the main display subassembly) off to the side.
5. Remove the display subassembly's mounting screws (multiple 4-40 silver Phillips screws located just above the control panels).
6. To protect the control panels and the display subassembly, lay some padded material over the top half of the control panels. Lift the display subassembly up just enough to clear the frame, then flip it forward and lay it facedown onto the padded material. The display subassembly connects to the Monitor & Output board using two cables. Do not strain these cables while removing the subassembly and placing it onto the control panels.
7. Use the illustration on the next page to identify the switches and connectors on the clock-timer and meter PCAs.



**Meter Boards
DS3 Switch Settings**

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

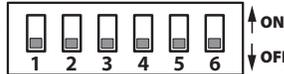
* Blue Peak LEDs turn on at:
 -6 dBFS, 3 and 4 are off
 -4 dBFS, 3 is on and 4 is off
 -2 dBFS, 3 is off and 4 is on
 0 dBFS, 3 and 4 are on

**Clock-Timer Board
DS1 Switch Settings**

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

** Active if 2 and 5 are both off

DS1 / DS3:
 Default for
 all switches
 is set to off



**Clock-Timer J4
(ESE / SMPTE
MASTER CLOCK &
REMOTE TIMER)**



- 1 - TIMER RESET LOGIC, IN
- 2 - GROUND
- 3 - TIMER RESET LOGIC, OUT
- 4 - +5 VDC
- 5 - ESE or SMPTE INPUT +
- 6 - ESE or SMPTE INPUT -

**Console Display PCA Setup Switches and Connections
(orientation shown while set onto the control panels)**



SAFETY NOTE: Touch the metal chassis to dissipate static before adjusting the switches or plugging in an ESE, SMPTE or remote timer cable. Do not touch any components on the PCAs other than the switches or connectors.

Reinstall the console display in reverse order. Use care to not pinch any cables between metal parts. Align the smoked display window holes with the clock set holes. The cosmetic cover holds the display window in place.

Clock Settings

Clock parameters are set using multi-switch DS1, located near the upper right corner of the clock-timer PCA. The default settings are all switches set to off.

When used autonomously, the clock time can display 12-hour or 24-hour time. Set DS1-4 to on

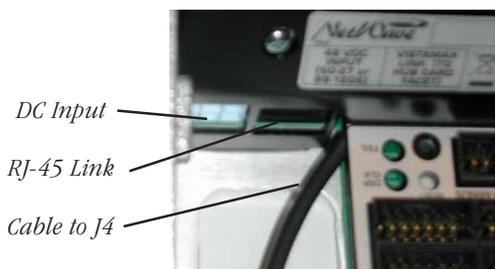
to display 24-hour time. This setting is ignored when a master clock signal is used.

When an ESE TC-89 or TC-90 master clock is used, set DS1-2 to on. The ESE signal type is auto-detected. When a SMPTE master clock is used, set DS1-5 to on. If both DS1-2 and DS1-5 are set on, the ESE signal takes priority.

ESE, SMPTE & Remote Timer Reset

An ESE or SMPTE master clock signal connects to J4, pins 5 and 6. The signal is polarity sensitive, but can be either a balanced or an unbalanced signal. Connect the center conductor or the + (high) signal to pin 5 and the shield or - (low) signal to pin 6. No shield connection is required for a balanced signal.

J4, pins 2 and 3 can be used to reset a studio event timer. Pin 3 is the timer reset output (pulse low on timer reset). Pin 2 is ground.



DC Input
RJ-45 Link
Cable to J4

J4 (ESE/SMPTE, studio event timer reset) Cable



NOTE: Route the J4 wiring through the chassis (next to the RJ-45 Link connector) **before** terminating it into a 6-pin MOD IV housing. Leave sufficient wire to reach J4 even when the display is in its service position (set upside down on the control panels).

Event Timer Settings

The event timer displays time in minutes, seconds and tenths of seconds. The only timer setting (DS1-1) 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 Settings

The PGM 1 and Aux meter parameters are set using multi-switch DS3 (shown on page 2-11). The Quad Meter Package adds a second meter board. The left-hand board's DS3 settings affect the first pair of meters (PGM 1 and PGM 2) and the right-hand meter board's DS3 settings affect the PGM 3 and Aux meters. Typically the two meter boards would be set to the same settings. The DS3 factory settings are all switches set to off.

To turn off the peak displays and to show only the average meter levels, set DS3-1 to on.

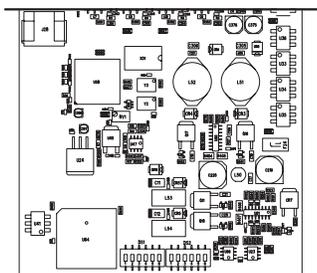
To have the Peak indicators decay immediately, switch DS3-2 to on.

To change the level where the Blue LEDs turn on: set DS3-3 and DS3-4 to off to turn on the Blue LEDs at -6 dBFS; set DS3-3 on and DS3-4 off to turn on the Blue LEDs at -4 dBFS; set DS3-3 and DS3-4 on to turn on the Blue LEDs at -2 dBFS.

DS3-5 and DS3-6 must be left set to off for NetWave consoles.

MONITOR & OUTPUT BOARD SETTINGS

The Monitor & Output board has two multi-switches to assign various parameters to the Monitor & Output board and its outputs. The factory default setting for all switches is off. The Monitor Control panel must be removed (see page 2-4) to access the two multi-switches.



Exposed portion of the Monitor & Output board, below the Monitor Control panel

Monitor & Output Board: DS1 and DS2 Settings		
DS1 Settings	DS1 and DS2	DS2 Settings
1- Defeat Cue to Aux Meter: off / on	1- PGM 3 AES output: 44.1 / 48 kHz	1- PGM 3 AES output: 44.1 / 48 kHz
2- Offline bus: Pre-fader / Post-fader	2- PGM 4 AES output: 44.1 / 48 kHz	2- PGM 4 AES output: 44.1 / 48 kHz
3- Auto Cue: stereo cue / Mon L & Cue R	3- PGM 4 analog out: PGM 4 / Telco Rec	3- PGM 4 analog out: PGM 4 / Telco Rec
4- Telco, Auto Foldback: off / on	4- Metering: dual meters / quad meters	4- Metering: dual meters / quad meters
5- PGM 1 AES output: 44.1 / 48 kHz	5- Ext. 1 source: EXT 1 IN / routed signal	5- Ext. 1 source: EXT 1 IN / routed signal
6- PGM 2 AES output: 44.1 / 48 kHz	6- Ext. 2 source: EXT 2 IN / routed signal	6- Ext. 2 source: EXT 2 IN / routed signal
	Switch Functions:	
	Off / On	

Monitor & Output Board, Multi-Switch Settings

DS1 and DS2 Settings

Multi-switches DS1 and DS2 are at the front edge of the Monitor & Output board, hidden below the Monitor panel in normal use.

DS1-1 affects the Aux meter display. When set off, cue level is displayed while cue is active. When set on, the Aux meter does not display cue.

DS1-2 affects the Offline bus signals. When set off, Offline signals are pre-fader. When set on, the Offline signals are post-fader.

DS1-3 affects the operator headphone output when AutoCue is active. When set off, cue is fed to the headphones in stereo (typically used for pro-

duction 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).

DS1-4 affects Telco channel operation. When set off, the mix-minus source (the winking bus assignment button) is not affected by turning the Telco channel on or off. When set to on, the Auto Foldback function is activated. The mix-minus output 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 to that Telco.

The next four switches (DS1-5, DS1-6, DS2-1 and DS2-2) set the sample rate outputs for the PGM 1, PGM 2, PGM 3 and PGM 4 digital outputs. When set off, the sample rate is 44.1 kHz. When set on, the sample rate is 48 kHz.

DS2-3 selects what is output on the local PGM 4 analog connector. When set off, PGM 4 is output. When set on, Telco Record is output instead. This setting does not affect the digital PGM 4 output or the PGM 4 VistaMax system signal.

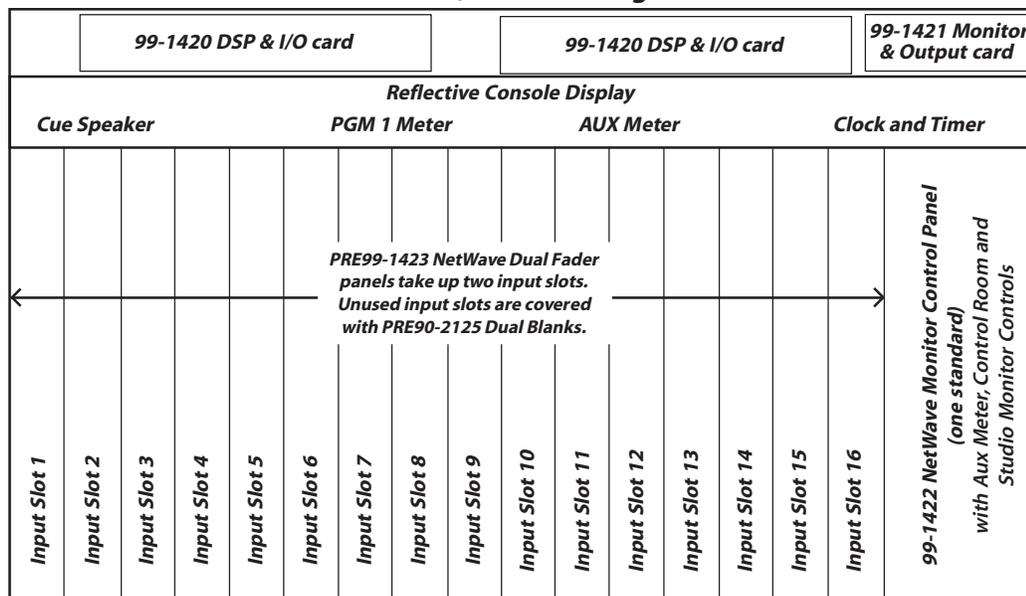
DS2-4 is only set on if a Quad Meter Package is installed. For the standard two meter display it must be set off.

DS2-5 and DS2-6 set which source feeds the External 1 and 2 monitor selectors. When set to off, the local external audio input is used. When set to on, the signal is routed from a VistaMax system. The on setting should only be used when a Link or Link Plus Activation kit is installed.

NETWAVE CONTROL PANELS

The NetWave's main components are identified in the illustration, below. There are five types of control panels (Dual Fader, Dual Selector, Dual

NetWave-16, Frame Configuration

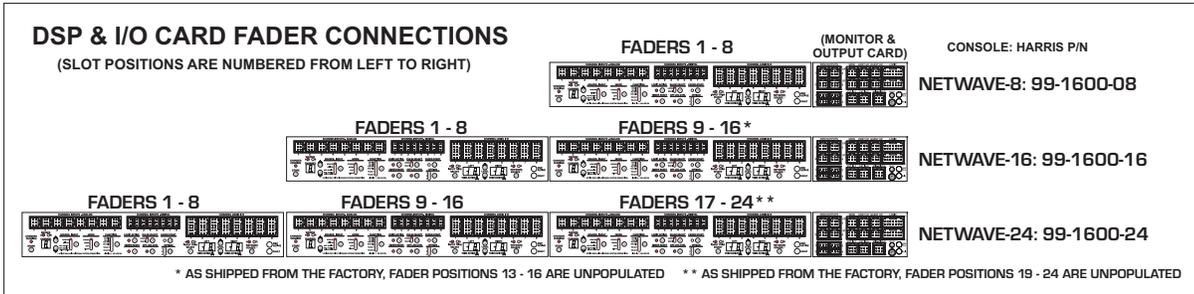


NOTES: The console model number (NetWave-8, -16, -24) indicates the number of input slots. One Monitor & Output card and one Monitor Control panel is standard. Each DSP & I/O card has DSP, audio inputs and logic I/O for eight input channels (NetWave-8 has one DSP, NetWave-16 has two DSP, and NetWave-24 has three DSP cards).

Dual Blank panels (90-2125) cover unused slots.

User-installed NetWave console options:

- 99-1423 Dual Fader Panel
- 99-1424 Dual Router Kit
- 99-1425 Link Activation Kit
- 99-1426 Link Plus Activation Kit
- 99-1428-1 Dual Selector Kit with 16X2 source selector
- 99-1990-16Q Quad Meter Package for NetWave-16
- 99-1990-24Q Quad Meter Package for NetWave-24



Router, Monitor Control and Dual Blank); there are two types of cards (Monitor & Output and DSP & I/O); and two display PCAs (Dual Meter and Clock-Timer).

Each slot, or control panel frame position, is 1.6" wide. The Monitor panel consumes three slots. All other panels use two slots. There are sixteen input slots on a NetWave-16, as shown on the previous page, so up to eight Dual Fader, Dual Selector, Dual Router or Dual Blank panels can be installed. The NetWave-16, as shipped from the factory, includes six Dual Fader panels installed into slots 1-12. Slots 13-16 are covered by two Dual Blank panels.

Additional Dual Fader panels (99-1423) can be installed into slots 13-16 at time of installation or any time afterwards. If purchased with the console, they will be separately boxed and are installed in place of the Dual Blank panels.

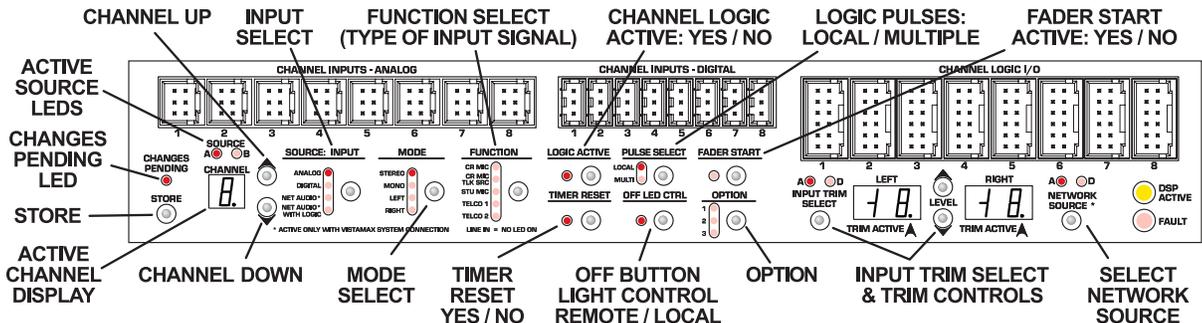
This also holds true for the NetWave-24, which ships with nine Dual Faders (in slots 1-18) and three Dual Blank panels in slots 19-24.

DUAL FADERS AND DSP & I/O CARDS

Four Dual Fader, Dual Router or Dual Selector panels connect to each DSP & I/O card, as illustrated above. Each connects to an RJ-45 jack labeled by their channel assignments (e.g., Fader Panel 7 & 8). These identify which two channels are serviced by that jack. The panels get power and control signals from these jacks using one foot red CAT-5 cables. A NetWave-8 frame has four cables, a NetWave-16 has eight and a NetWave-24 frame has twelve cables.

The optional Dual Router and Dual Selector kits add a second blue CAT-5 cable to connect the Dual Router kit's TINI card to the VistaMax LAN or the Dual Selector's Interface card to a 16X2 Source Selector. Because of space constraints, special flat CAT-5 cables are used.

The Dual Fader and passthru RJ-45 jacks are located below each panel's rear mounting bracket. A chassis label identifies each jack as to its use.



DSP & I/O Card Setup Controls

Audio Inputs and Logic I/O

Each DSP & I/O card has eight analog inputs, eight digital inputs and eight Channel Logic I/O connectors, as shown on page 2-14. Which physical input (analog or digital) is assigned to the A and B channel sources; its mode (stereo, left, right, mono); its function (line, CR mic, Studio mic, Telco); whether the logic I/O is active for the A or the B source; and several other parameters, are all assigned through a common group of *Channel Setup* buttons and LEDs on each DSP & I/O card. These controls are covered in the next section (Setup Controls).

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) refers to 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 the illustration at the top of the previous page.

Channel strip refers to the set of physical channel controls. There are two channel strips per Dual Fader, Dual Selector or Dual Router panel.

Source refers to the two operator selected channel sources (A, B) available on each Dual Fader channel strip, and to the multiple sources available on Dual Selector and Dual Router panels.

Local Inputs or I/O refers to the physical audio and logic connections on each DSP & I/O card.

Channel refers to a channel strip on a Dual Fader, Dual Selector or Dual Router panel.

Setup Controls

DSP & I/O cards have a common group of setup controls, shown on the previous page, to separately assign the A and B source parameters for the eight fader channels plugged into that DSP & I/O card.

A Setup Stylus Tool (70-160), included with the console, is used to press the recessed buttons. Any blunt-tipped nonconductive object (wooden swab, toothpick, etc.) could also be used.

The Setup Controls are typically not used until after the console is wired since parameter changes take effect immediately, which means the active signal and level can be confirmed using the console display and monitor outputs.

The active channel and source on the setup controls is identified both by the Active Channel Display and Lit A or B LED and on the fader panel by a blinking A / B indicator. This allows an input source (analog, digital or network) to be monitored on the active channel to ensure the correct signal is selected and that the levels and logic settings are correct.

DSP & I/O Card Modes

DSP & I/O cards have four modes of operation:

Sleep Mode: Used for normal console operations. No displays or LEDs are lit (except for active Option LEDs) and only certain buttons are active.

The card returns to *Sleep Mode* automatically five minutes after the last button press. The card also returns to *Sleep Mode* after pressing **Store** in *Parameter Set 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. Parameters for each channel source can be viewed and then changed as required (the Changes Pending

LED blinks to indicate at least one change has been made). Note that parameter changes take effect immediately.

Once all channel sources are configured as desired, press **Store** to save all parameters to nonvolatile memory and return the card to *Sleep Mode*. If no changes are made, pressing **Store** simply returns the panel to *Sleep Mode*. Changed parameters are also stored when the panel times out and returns to *Sleep Mode*.

Parameter Copy Mode: An alternate setup mode entered from any other mode by pressing **Option + Channel Up** (⊕). If the Changes Pending LED is blinking, those changes are stored before activating this mode. The mode is identified by a period in the Active Channel Display.

Current parameter settings are not recalled when the channel source is changed. Instead, one group of parameters is assigned, which can then be stored to sources like mics, computer playback systems and CD players—inputs which use the same, or very similar, parameter settings.

Once the required parameters are assigned, select the first channel source to use these settings, then press **Store**. Select additional channel sources and press **Store** to update each channel source's settings.

Press **Option + Channel Up** (⊕) to exit this mode 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*.

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 parameters are stored to nonvola-

tile memory before entering this mode. The Active Channel Number Display blinks to indicate the mode is active.

All controls on the eight fader channels are locked out, with all Program buttons assigned, all channels set to the A source and all faders set to nominal. One group of parameter settings is applied to all channels. The **Channel Up** and **Channel Down** buttons step through the channels, turning On the active channel (all other channels are turned off).

To exit this mode, press **Option + Channel Down** (⊖) to return to *Parameter Set Mode*. Press **Store** to exit to *Sleep Mode*.

More details on this and other test modes are covered in Chapter 5 Servicing NetWave.

Set-Up Control Summary

The setup controls (shown on page 2-14) are used to view, set and store the parameters for each A and B source on each channel. These controls are normally used in *Parameter Set Mode*, where the active parameter settings for each channel and source are shown as the channel up and down buttons are pressed to step through the channels.

The Channel Display shows which channel (1 to 8) and source (the A or B source LED is lit) is active. That channel strip's A or B label also flashes to indicate it's the active channel. On Dual Router panels, both source LEDs light since those channels have only one source (net audio). The parameters for the active channel source are displayed using the parameter LEDs and trim displays.

In *Parameter Set Mode*, changing any parameter causes the Changes Pending LED to blink. After the parameters are changed on all channels, the updated parameter settings can be stored to nonvolatile memory by pressing **Store**. The changes are also automatically saved to nonvolatile memory when the panel automatically returns to *Sleep Mode* after timing out.



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.

A summary of the functions for each setup button, LED and display follows.

Store—This is a multifunction button: from *Sleep Mode* it puts the controls into *Parameter Set Mode*; in *Parameter Set Mode* it stores all channel sources to non-volatile memory and returns the controls to *Sleep Mode* if the Pending Changes LED is blinking (if it is not blinking, then it just returns the controls to *Sleep Mode*); in *Parameter Copy Mode* it stores the parameters to the active channel source.



Changes Pending LED—This LED blinks to indicate at least one parameter has been changed in the dynamic memory but has not yet been saved to nonvolatile memory. Pressing **Store** in *Parameter Set Mode* turns off the LED and returns the card to *Sleep Mode*.



In *Parameter Copy Mode*, pressing **Store** turns the LED off to show the parameter changes were stored on that channel source.

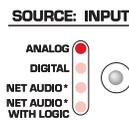
Channel Up & Channel Down Buttons—In *Parameter Set Mode* these two buttons step through the eight channel's A and B sources showing each one's parameters. In *Parameter Copy Mode*, the two buttons also step through the channel sources, but the parameters are not recalled since this mode allows one set of parameters to be set and then stored, as required, to multiple sources.



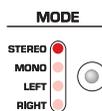
Active Channel & Source Indicators—The active channel number is shown in the 7-segment Channel display and the active source is indicated by the lit A or B LED. Press **Channel Up** or **Channel Down** LED. Press **Channel Up** or **Channel Down** to step sequentially through the channels and sources. The channels wrap around (Channel Up from source 8B goes to source 1A and vice versa). A decimal point is lit if *Parameter Copy Mode* is active. Both A and B LEDs light on Dual Router panels.



Input Select—Sets the audio input for the active channel source. The two Net Audio selections are only available when the console's *VistaMax Enabled* label is lit on the Monitor panel indicating the NetWave is networked with a VistaMax system.

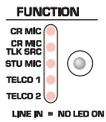


Input Mode—Sets how the selected audio input feeds the channel strip. *Stereo* is the default setting, which is used with stereo sources like CD players. *Mono* is typically used for news or mono AM broadcast applications. It sums a stereo input to a mono signal that is then applied to both the left and right channels.



The *Left* and *Right* selections allow two mono sources to connect on one input connector. One typical application is to allow one or more guest mics in a control room and one or more guest mics in a studio to share the same channels. The control room guest mic preamps typically connect to the *Left* inputs and are set as the A sources, while the studio guest mic preamps connect to the *Right* inputs and are set as the B sources. When the channel sources are A, the control room guest mics are active. When channel sources are B, the studio guest mics are active.

Input Function—Defines the type of signal connected to the selected input. The setting may affect the monitor outputs, mix-minus outputs and various Logic I/O signals.



With no LEDs lit, the signal is defined as a line input device (e.g., CD player, MD player, computer playback system, Shortcut, Instant Replay, etc.). The channel does not mute any monitor output when turned on.

When CR MIC is lit, the signal is defined as a control room mic. When the channel is turned on, the CR Monitor output mutes and the control room warning command is activated.

When CR MIC TLK SRC is lit, the signal is also defined as a control room mic, with the same muting and logic features as the CR MIC selection. But, additionally, this signal is identified as the talk mic source for console talkback. Multiple mics can be set as control room talk sources, but typically only the board operator mic and possibly a producer mic are set to this function. Other control room mics can talk to the studio using a mic control panel with a talkback button.

When STU MIC is lit, the signal is defined 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, then that mic position can talk to the control room.

When TELCO 1 or TELCO 2 is lit, or if both LEDs are blinking, it indicates the input signal requires a mix-minus return signal from the console. Use these settings with Telco hybrids, ISDN connections, satellite transceivers and other two-way devices. Only one console channel source can be set as Telco 1 or Telco 2 (with Link Plus Activation, six channel sources can be set as Telcos 1-6. To indicate the four added Telco sources, both Telco LEDs blink three, four, five or six times, with a slight pause, to indicate Telco 3, 4, 5 and 6).

Logic Active—Sets whether the channel logic I/O connector is active for the A or B source. When lit, the channel's logic I/O connector is active for that source. When unlit, the logic connector is not active for that source. Do not set Logic Active on both A and B sources as this may result in incorrect logic behaviors.



Timer Reset—When lit, indicates a timer reset command will be generated at channel on. When unlit, no timer reset command is issued for that source.



The Auto button must be lit on the Monitor panel in order for these timer reset commands to reach the Event Timer.

Start/Stop Pulse Generation—Affects how start and stop pulses are generated when the source Function is a Line or Telco device. This button is locked out when the special operating mode *Tally Output* (Option 2) is active.



There are four conditions: both LEDs off; Local on and Multi off; Local off and Multi on; and both Local and Multi LEDs on.

With both LEDs off, the default setting, one start or one stop pulse is generated whenever the channel on/off state is changed by pressing the **Channel On/Off** or when receiving remote logic on and off commands.

When the Local LED is on and the Multi LED is off, a start or stop pulse is only generated when the channel status is changed by pressing **Channel On** or **Channel Off**. The channel can still be turned on and off remotely, but no start or stop pulse will be generated by this action.

With Multi on and Local off, a start pulse is generated every time **Channel On** is pressed or a start command is received. Likewise, a stop pulse is generated every time **Channel Off** is pressed or

a channel off command is received. No channel state change is required to generate additional start or stop pulses.

With both Multi and Local on, a start pulse is generated every time **Channel On** is pressed and a stop pulse is generated every time **Channel Off** is pressed. Remote channel on/off commands do not generate any pulses.

Off Button Lighting—When unlit (the standard **OFF LED CTRL** setting), the Off button lights up  whenever the channel is off. When lit, the remote logic command Ready controls the lighting of the channel Off button.

Typically, this setting is lit for CD players and other peripheral devices that can control a channel's Off button light to indicate play status. If the peripheral is not ready (e.g., no CD loaded), the channel off button is not lit. When the peripheral is ready (e.g., a CD is loaded and cued), then the off button is lit. After the peripheral finishes (e.g., the CD track has played) the off button winks to indicate the event has completed.

Fader Start—When unlit (the standard setting), **FADER START** the channel fader position has no effect on the channel on/off status.  When lit, moving the fader turns the channel on as the fader is moved up from full off. The channel is turned off when the fader is returned to full off. The channel on and off buttons and the remote channel on and off commands are not affected by the fader start setting.

Option—Always pressed in combination with **OPTION** other setup buttons to place the DSP & I/O card into a special operation, set up or test mode. The three Option LEDs indicate the status of special operating modes. Pressing **Option + Off LED Ctrl** toggles whether *Program Button Pro-*



tect Mode is active. When active (Option LED 1 is lit), Program assignment buttons must be “double-clicked,” or pressed twice quickly, to change the assignment button status on the eight channel strips plugged into this DSP & I/O card.

Pressing **Option + Logic Active** toggles whether *Tally Output Mode* is active. When active (Option LED 2 is lit), all eight Logic I/O connectors on this DSP & I/O card use tally logic (On / Off Tallies), regardless of type of device, and **Pulse Select** is disabled. When the Option 2 LED is off, the output logic for line and Telco devices are start and stop pulses and **Pulse Select** works normally.

The other **Option** button functions are: **Option + Store**, which resets all channel strips and their parameters to factory default conditions; **Option + Channel Up**, sets the DSP & I/O card into *Parameter Copy Mode* so one group of parameters can be quickly assigned to multiple channels; **Option + Input Trim Select**, used to display the PROM revision for that card in the trim displays. The left display shows “r” while the right display shows the number of the PROM revision (e.g., 9=rev I, 10=rev J, 11=rev K, and so on).

Input Trim Controls—The left and right channel  for every local analog and digital input can be independently trimmed, in one dB steps, by up to +/-15 dB.

Use the **Input Trim Select** button to select which input— analog (A) or digital (D), is active and which signal—left or right, is selected for trimming. The active channel is identified by the lit A or D LED and by the lit Trim Active decimal point in the Trim display.

Press **Level Up**  or **Level Down**  to raise or lower that signal in 1 dB steps. If the active source's channel is turned on and assigned to a bus, the console meters can be used to verify the level since level changes take place immediately.

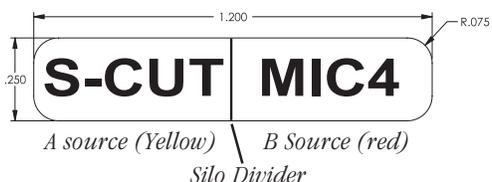
Network Source—This function is only active when the console’s VistaMax Link is active. One input from each channel—either analog (A) or digital (D), is set as a VistaMax source. The selected input signal is sent to the VistaMax system over the Link cable. These signals are available to be selected like any other VistaMax source signal. These settings do not affect any local uses of the selected signals.



Refer to the NetWave Quick Guide and to pages 2-30 to 2-32 for the parameter settings used by several common peripherals.

Channel Source Labels

Dual Fader panels have an A / B source label on each fader channel. One blank source label (80-2132), for each slot in the console, is included in the console installation kit so that custom source labels can be created. A Brother P-Touch® label maker can be used (1/4" clear with black lettering tape is recommended) to print up to five characters per source name when Size 1 font is used.



Custom Source Name Label

To replace the source name label, 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). Remove the A / B label from the rubber silo. Some A / B labels may be glued into the silo. Use an Exacto knife to cut the glue and remove the labels.

Insert the custom label in its place. Make sure the labels are firmly held in the ledge around the top of each silo before snapping the display lens back onto the panel.

Cabling and 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, the cover can be completely removed by lifting it straight up when closed, or it can be flipped 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 AND WIRE

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

- Analog audio connections use two-conductor, stranded, insulated, shielded cable using a separate shield drain wire (equivalent to Belden 8451, 9451 or 8761)
- AES/EBU connections use 110 ohm two-conductor, stranded, insulated, foil-shield cable containing a separate shield drain wire (equivalent to Belden 1800B)
- Logic control uses stranded, 22 AWG, multiple-conductor, non-shielded, jacketed cable (equivalent to Belden 9423, 8457 or 9421).

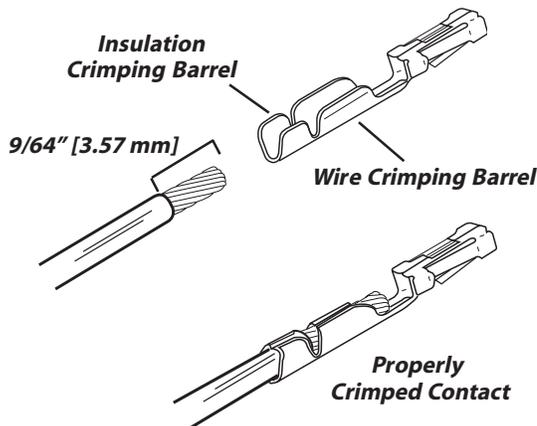
The number of conductors required is determined by the application. Typically, cables with five or eight wires are most often used for constructing logic cables since, even though there are twelve or fourteen pins on the logic

connectors, only a handful are typically connected for any given application.

- Crossover CAT-5e/CAT-6 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 Source Selector

WIRE PREPARATION

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

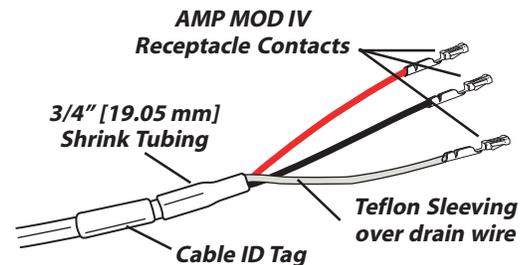


AMP MOD IV Receptacle Contacts

Follow these steps for audio wire preparation:

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

- 4 Strip each signal wire insulation back 9/64" [3.57 mm].
- 5 Crimp the receptacle contact onto the wire and insulation.



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

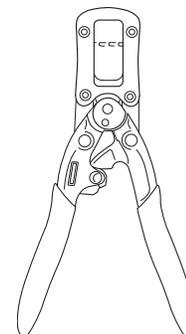


Audio Cable Shielding Note: To follow recommended grounding procedures, the drain wires must be sleeved with Teflon sleeving and heat shrink tubing must cover all cable jacket cut ends to insulate the shield wiring.

Logic control cables are fabricated in a similar manner to the audio wiring. Strip the jacket insulation back 1½" [38.10 mm], sleeve the cut end with 3/4" [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 (70-126) is included with each RMXd or BMXd console and with each VistaMax card frame.



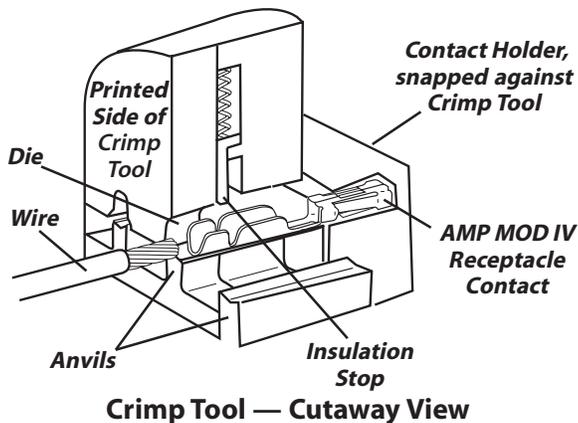
AMP MOD IV Contact Crimp Tool

If a tool is not already on-premises, one is included in the optional 76-1901 NetWave/SMXd Tool Kit.

The MOD IV tool crimps both the insulation and the wire barrels on the MOD IV receptacle contact in one crimp.

To use the ratcheting crimp tool:

1. Insert the contact into the contact holder with the barrel openings up. Typically, the middle holder is used (20 - 24 AWG wire). Flip the holder up so 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, as shown in the cutaway view, below).



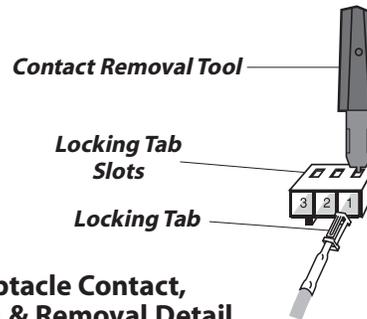
2. Insert the prepped wire into the contact until the insulation hits the tool's stop. Hold the wire in place while squeezing the tool handles to crimp the contact onto the wire and insulation. The tool handles automatically release and spring open after the crimp cycle is complete.

After all contacts on a cable are crimped, insert and lock the contact into the appropriate connector housing following the pinout diagrams found on this page (for audio) and 2-26 (for logic).

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.

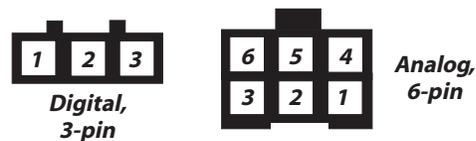
To remove a contact from a housing, the 70-129 Contact Removal Tool (also included in the optional 76-1901 tool kit) is required. Insert the tool tip into the locking tab slot and press the locking tab down while lightly pulling on the wire to remove the contact from the housing.



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 Connectors



Pin numbers, wire insertion end view

Audio wiring has this orientation:

- 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.

Analog Connections

NetWave does not have interstage 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 normalled to standard peripherals such as analog on-air processing gear, recorders, telephone hybrids, etc.

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 directly connect to the console. Note that microphones must be separately preamplified and processed before being connected to the console.

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

Pin Signal Description

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

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

Pin Signal Description

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) compatible signals with sample rates between 25 to 50 kHz. Each digital input goes is sample rate converted to the console's internal sample rate of 48 kHz. The inputs will work with most S/PDIF signals (see the S/PDIF Signals section on the next page).

Each digital output is an AES-3 compatible signal. AES-3 outputs cannot connect directly to an

S/PDIF input. To do this requires a signal translation interface.

AES/EBU Digital Inputs & Outputs

Pin Signal Description

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

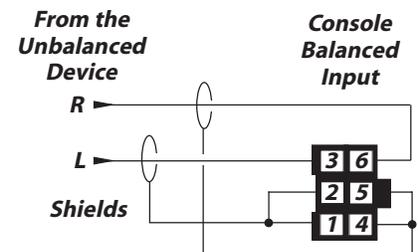
UNBALANCED CONNECTIONS

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

If a match box is not available, an unbalanced analog device can be directly connected to a NetWave input following this wiring:

Connecting an Unbalanced Stereo Device to a NetWave Analog Input

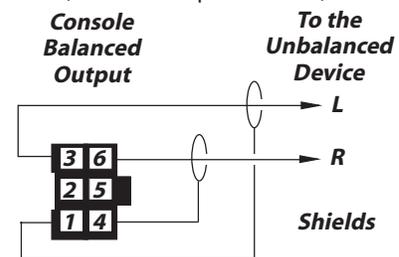
(Nominal Input is -10 dBu)



When an unbalanced device must be connected to a NetWave balanced analog output, and an IHF-PRO match box is not available, use the following illustration. Do not tie the low (-) and shield pins

Connecting an Unbalanced Device to a NetWave Analog Output

(Nominal Output is -2 dBu)

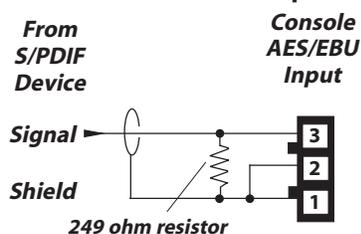


together to “unbalance” the signal. The low output pin must always be left floating when unbalancing a NetWave output.

S/PDIF Signals

Most S/PDIF digital outputs can also connect to a NetWave’s digital inputs by connecting both pin 1 and 2 to the shield. Unshielded twisted pair signal cable can be used for short runs (below 50 feet). When a longer cable run is used, or if 75 ohm coax cable is used, add a 249 ohm resistor to properly load the S/PDIF cable. Install the resistor on the MOD IV housing per the following illustration.

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



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

Note 1: A signal conversion interface must be used to connect AES/EBU outputs to S/PDIF inputs.

Note 2: Some S/PDIF signals will not work with the NetWave’s inputs, even with the additional load resistor or a transformer, because of low output level or nonstandard protocol.

NETWAVE SAMPLE RATE

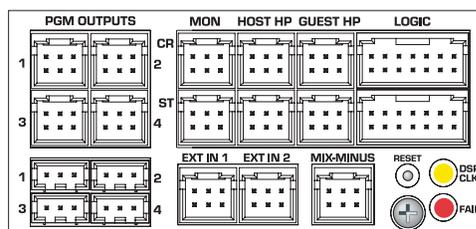
NetWave uses the professional audio sample rate of 48 kHz for all its internal audio mixing and routing. Each digital input has an integral sample rate converter to convert incoming sample rates from 25 to 50 kHz to the console’s internal 48 kHz sample rate.

The console’s digital outputs are normally sample rate converted to 44.1 kHz, but each can be set for 48 kHz output through settings on the multi-switches on the Monitor & Output board (see page 2-12 for the switch settings).

When the console is used in a stand-alone application, the console cannot be locked to an external sample rate reference. If this is required, the NetWave must be networked with a VistaMax system (the NetWave is automatically synchronized to the VistaMax system’s master clock, which can be externally referenced). Refer to a VistaMax (75-52) or Envoy (75-55) manual for details.

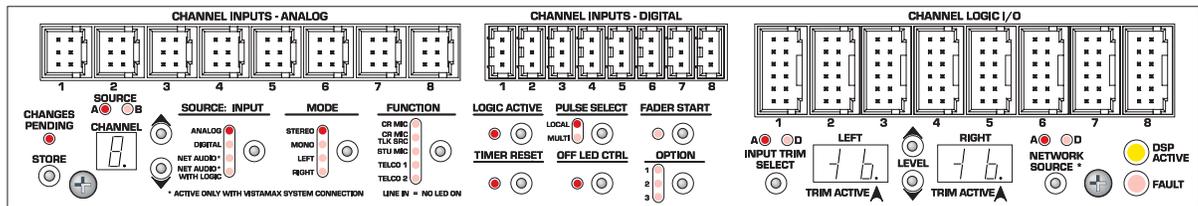
AUDIO CONNECTIONS

There are eighteen dedicated analog and digital inputs and outputs on the Monitor & Output card (shown below). Connections include separate analog and digital outputs for four Program buses (PGM 4 can alternately be set as a local Telco Record output), analog inputs for two External Monitor signals, two analog mono mix-minus outputs, three analog monitor outputs for the control room (monitor, host headphone and guest headphone) and three monitor outputs for a studio (monitor host headphone and guest headphone).



Monitor & Output Card Connections

Each DSP & I/O card (shown at the top of the next page) has eight analog and eight digital inputs that are assigned as sources using the DSP & I/O setup controls. When the VistaMax Link is activated, one input (either analog or digital) from each channel is set as a VistaMax source that can



DSP & I/O Card Connections

be routed to any other VistaMax community member. Likewise, each channel source can be set to use a routed signal from the VistaMax system as its input. See Chapter 4, Linking NetWave, for additional details.

Any analog or digital input connector can be set to function as two mono inputs rather than as a combined stereo signal through the Mode setup control.

LOGIC CONNECTORS

The NetWave console has the following logic connections:

- Channel Logic I/O (eight 12-pin MOD IV connectors on each DSP & I/O card)
- Control Room Logic (14-pin MOD IV on the Monitor & Output card) for warning light, external mute, dim, and talkback control
- Studio Logic (14-pin MOD IV on the Monitor & Output card) for warning light, external mute, dim, and talkback control
- Remote timer reset output and ESE or SMPTE master clock input on the clock-timer circuit board in the Console Display assembly

Page 2-26 has block diagrams and pinouts 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 INTERFACE

Logic connector pinouts and block diagrams for the Control Room, Studio, Channel Logic and Timer logic are shown on page 2-26.

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

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

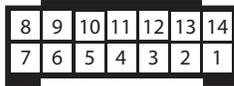
Several +5 volt supply and ground pins are available on each connector, but these should only be used to power isolated accessory panels. Grounds and logic voltages should always be sourced from the peripheral device in order to maintain fully isolated operation.

Control Room Logic

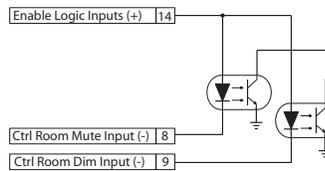
This 14-pin connector has two isolated relay contacts (pins 4 and 5) for controlling a warning lamp interface like the Harris WL-2 or Henry Superelay. It is activated whenever any channel with a Control Room mic as its source is turned

(cont. page 2-27)

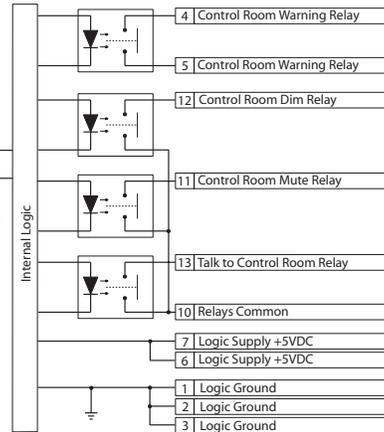
Control Room Logic Interface, Connector Pinout and Block Diagram



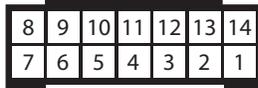
- Wire insertion end view
- | | |
|--------------------------|------------------------------|
| 1 - LOGIC GND | 8 - MUTE C/R (-) |
| 2 - LOGIC GND | 9 - DIM C/R (-) |
| 3 - LOGIC GND | 10 - RELAYS COMMON |
| 4 - WARNING RELAY | 11 - MUTE RELAY |
| 5 - WARNING RELAY | 12 - DIM RELAY |
| 6 - +5 VOLT LOGIC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



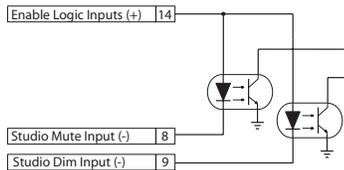
Notes:
Opto-isolated inputs are current limited to work with +5 to +40 VDC logic.
Opto-isolated outputs can sink up to 60 volts or 350 mA max. current flow.
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 2, 3, 6 and 7).



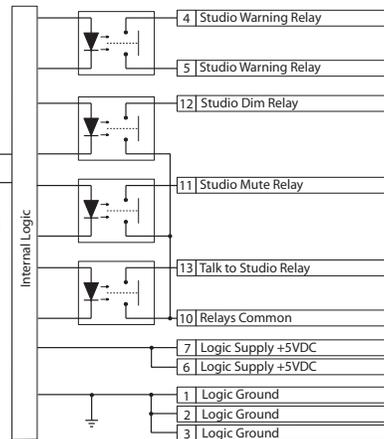
Studio Logic Interface, Connector Pinout and Block Diagram



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



Notes:
Opto-isolated inputs are current limited to work with +5 to +40 VDC logic.
Opto-isolated outputs can sink up to 60 volts or 350 mA max. current flow.
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 2, 3, 6 and 7).

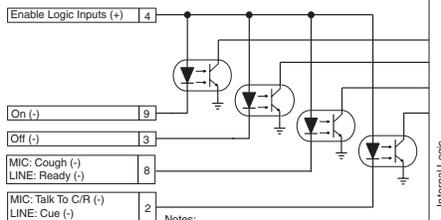


Channel Logic Interface, Connector Pinout and Block Diagram

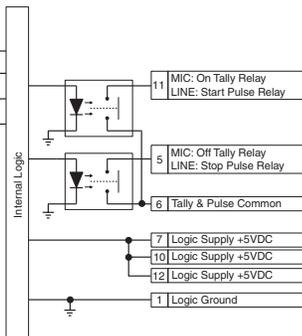


Wire insertion end view

- | | |
|-----------------------------|-----------------------------|
| 1 - LOGIC GROUND | 8 - COUGH / READY CTRL (-) |
| 2 - TALK TO CR / CUE (-) | 9 - CHANNEL ON (-) |
| 3 - CHANNEL OFF (-) | 10 - +5 VOLT LOGIC SUPPLY |
| 4 - ENABLE LOGIC INPUTS (+) | 11 - ON TALLY / START PULSE |
| 5 - OFF TALLY / STOP PULSE | 12 - +5 VOLT LOGIC SUPPLY |
| 6 - TALLY / PULSE COMMON | |
| 7 - +5 VOLT LOGIC SUPPLY | |



Notes:
Opto-isolated inputs are current limited to work with +5 to +40 VDC logic.
Opto-isolated outputs can sink up to 60 volts or 350 mA max. current flow.
For fully isolated operation, do not connect external devices to +5 or ground (pins 1, 7, 10, and 12).



Clock-Timer Interface, Connector Pinout and signals



Wire insertion end view

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

NetWave Logic Connections on the Monitor & Output Card, DSP & I/O Cards and Clock/Timer Circuit Board

On. This action also mutes the Control Room Monitor audio output.

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

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

Studio Logic

This 14-pin connector has the same connections as the control room connector, except they're for a talk studio or voice room. There are two isolated relay contacts (pins 4 and 5) for controlling a warning lamp interface like the Harris WL-2 or Henry Superelay. It is activated when any channel with a studio mic as its source is turned On.

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

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

Channel Logic

There are eight 12-pin Channel Logic connectors on each DSP & I/O 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

type of logic used (Mic or Line) is determined by the setting of the Function parameter. Mic logic is used when CR MIC, CR MIC TLK SRC or STU MIC is selected. All other Function settings use Line logic.



Note: *Tally Output mode* uses Tally commands (On / Off Tallies instead of Start / Stop pulses) for line logic. This mode is active when the Option 2 LED is lit on the DSP & I/O card.

The Channel Logic I/O connector is assigned to either the A or B channel source by pressing the **Logic Active** setup button while the channel source is active. When the Logic Active LED is lit, the logic connector is active. When the Logic Active LED is off, the logic is not used on 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; and 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 it is the Function parameter setting that 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. 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 Harris mic control panels that compliment the NetWave console's look and feel: a three-button panel without talkback control (99-1197, with On, Off and Cough buttons); and a four button panel with talkback (99-1198, with On, Off, Cough and Talkback buttons). A typical mic panel logic connection is shown below.

ASSIGNABLE LOGIC CONNECTOR			99-1197 or 99-1198 MIC CONTROL PANEL	
SIGNAL	PIN		PIN	SIGNAL
Logic Ground	1	BLK	1	Logic GND
Off Tally	5	WHT	2	Off Tally
On Tally	11	RED	3	On Tally
+5VDC Supply	7	GRN	4	Power Supply
Off Switch (-)	3	BRN	5	Off Switch
On Switch (-)	9	BLU	6	On Switch
Cough Switch (-)	8	ORG	7	Cough Switch
Talk Switch (-)	2	YEL	8	Talkback Switch
Tally Common	6			
+5VDC supply	12			
Enable Logic Inputs (+)	4			
+5VDC Supply	10			

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

90-1875 Cable for Mic Control

To activate a mic panel: the Function parameter must be set to CR MIC, CR MIC TLK SRC or STU MIC to set the source as a microphone; and Logic Active must be on (the Logic Active LED is lit); a logic cable must connect from the Channel logic I/O to the mic remote panel.

The panel can be used to turn the channel on and off; to receive channel on and off tallies; and to activate the cough, and talk to the control room on four-button panels. Turning the channel on mutes the room monitor output; turns on the room warning light logic; and lights the On button on the mic panel.

A wiring diagram for a mic panel cable (Harris cable # 90-1875) is shown above. The panel's switches (On, Off, Cough, Talkback) connect to the four remote inputs on pins 2, 3, 8 and 9. Pin 4 is jumpered to pin 10 to enable the external inputs.

The switch LEDs connect to pins 5, 7 and 11 (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 +5VDC.

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

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

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

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 blinking (With Link Plus activation, up to six channel sources can be set as Telcos. With only two Telco LEDs, if either is lit solid it indicates that Telco 1 or Telco 2 is selected. When both Telco LEDs blink, it indicates that Telco 3 - 6 is active. The number of blinks indicate which Link Plus Telco is selected: three blinks is Telco 3, four blinks is Telco 4, five blinks is Telco 5 and six blinks is Telco 6).

When the Logic Active LED is lit and the Function is line or Telco, the logic functions of pins 2, 5, 8 and 11 change.

Pin 2 changes to be a cue switch input that can be triggered by a computer playback system or by a remote studio or producer cue switch to put the channel audio into cue.

Pin 8 changes to be a ready logic input. This command is used by peripheral devices to automatically turn off the channel at the end of some event. When **Off LED Ctrl** is also lit, the ready command not only turns the channel off, it also controls the channel's Off button illumination to

indicate that the peripheral is not ready (no Off button light); is cued and ready to play (Off button is lit solid); or that the event has been completed (Off button flashes).

Pins 11 and 5 change to become start and stop pulse outputs to automatically start or stop/pause a peripheral device when the channel is turned on and off. These generate 220 msec contact closures between pin 6 and pin 11 for a start pulse and pin 6 and pin 5 to generate a stop/pause pulse. Whether a single or multiple pulse is output depends upon the setting of **Pulse Select**.



Note: When the *Tally Output Mode* is active (**Option 2** LED is lit), the line logic outputs on pins 11 and 5 are On and Off Tallies instead of start and stop pulses. The **Pulse Select** function is also inactive in this mode. To activate or turn off this mode, press **Option + Logic Active**.

Channel Logic I/O and Peripherals

In the basic peripheral logic connection example on page 2-30, active low logic is used, thus Tally & Pulse Common is connected to the logic ground on the peripheral device (labeled Command Common on the Denon CD player in the example).

In the complex logic example shown on page 2-31, active high logic is used, thus Tally & Pulse Common connects to +5 VDC.



Note: This voltage is more typically supplied directly by the peripheral device in order to prevent ground loops, but in this example the peripheral 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 it can be reset by the console's timer reset logic.

This connector also has an external timer reset input, that is typically not used in this application. A momentary low on pin 1 will reset the Event Timer.

This connector also has the input for a master clock signal on pins 5 and 6. This connection is covered on page 2-11.

CONNECTION GUIDES

Pages 2-30 to 2-33 show the typical connections and parameter settings for: a mic with a mic remote panel; a CD player with remote logic; a computer playback system; and the connections to a VistaMax audio management system.

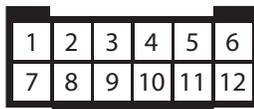


Note: To isolate the NetWave console from peripheral devices, use only the isolated control logic connections. The +5 VDC and logic ground connections are referenced to the console's power supply and ground. These should only be connected to isolated devices like mic control panels or other Harris Accessory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

MIC REMOTE CONTROL CONNECTION EXAMPLE

This example shows a mic control panel connection to a Channel Logic I/O connector.

CHANNEL LOGIC I/O CONNECTOR SIGNAL TABLE

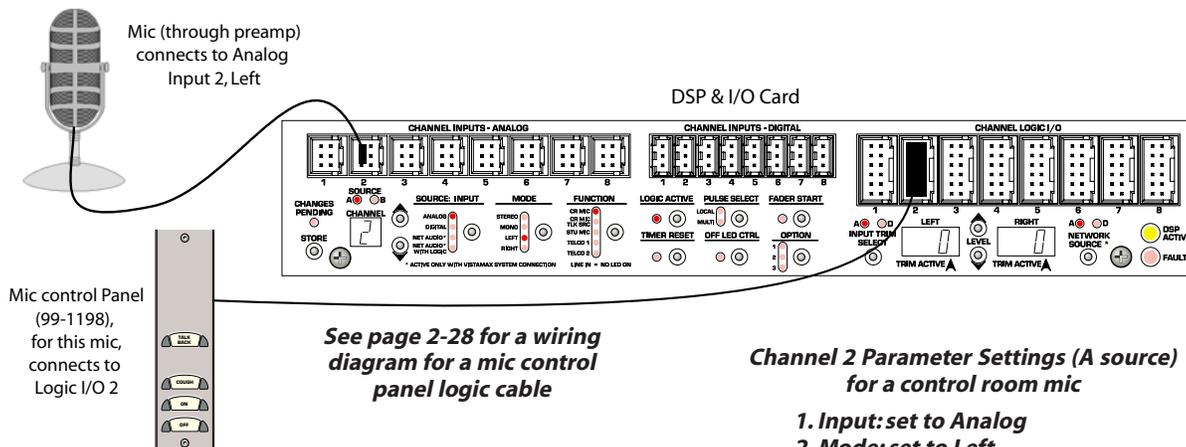


(wire insertion end view)

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

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

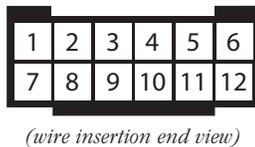
EXAMPLE OF A MIC & MIC CONTROL PANEL CONNECTED TO CHANNEL 2



BASIC PERIPHERAL DEVICE LOGIC CONNECTION EXAMPLE

This example shows a peripheral device (with basic logic functions like the CD player shown below) connected to an Channel Logic I/O connector.

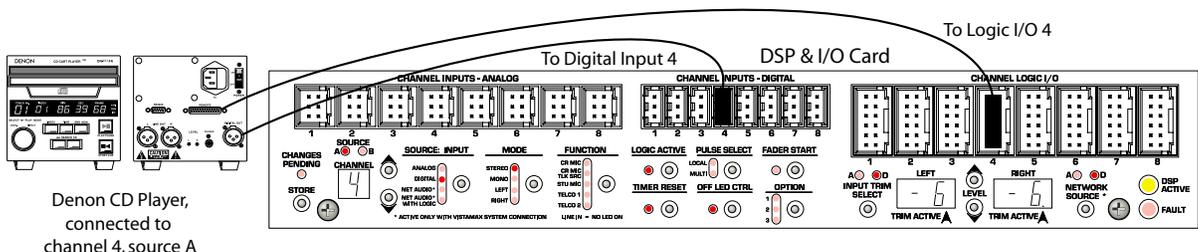
CHANNEL LOGIC I/O CONNECTOR SIGNAL TABLE



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

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

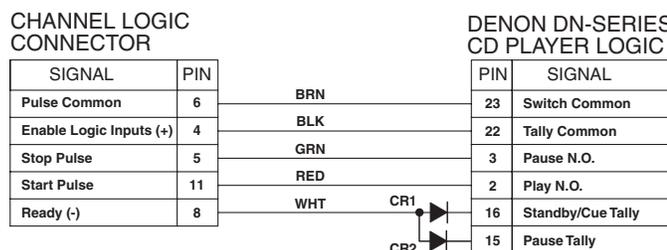
EXAMPLE OF CD PLAYER CONNECTED TO INPUT 4



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)

TYPICAL DENON CD PLAYER LOGIC WIRING

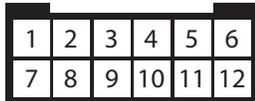


PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
25-pin DSub: 15-854 (DB-25P)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

COMPLEX LOGIC CONNECTION EXAMPLE

This example shows a 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.

CHANNEL LOGIC I/O CONNECTOR SIGNAL TABLE

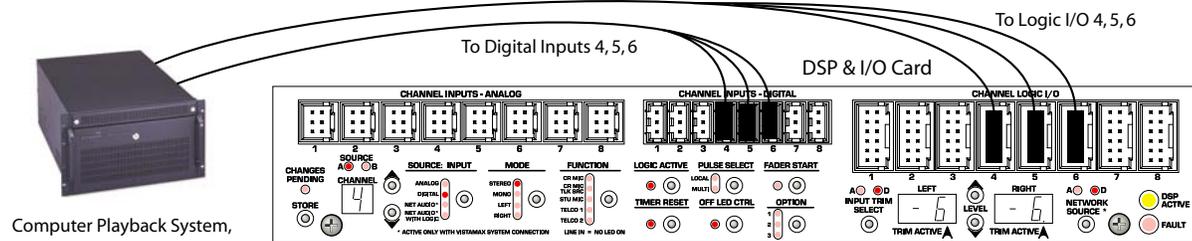


(wire insertion end view)

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

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

EXAMPLE OF A COMPUTER PLAYBACK SYSTEM CONNECTED TO CHANNELS 4, 5 AND 6

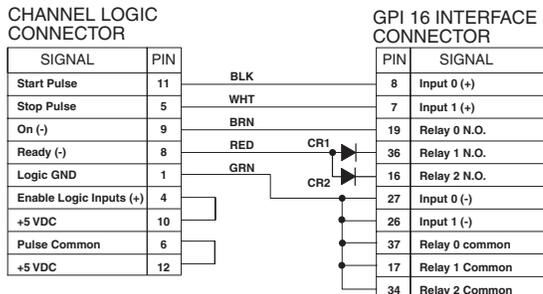


Computer Playback System, three channels connected to channels 4, 5, 6, all source A

Channels 4, 5 and 6 Parameter Settings (A sources)

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 as VistaMax sources)

TYPICAL COMPUTER PLAYBACK SYSTEM LOGIC WIRING USING A GENERAL PURPOSE I/O CARD

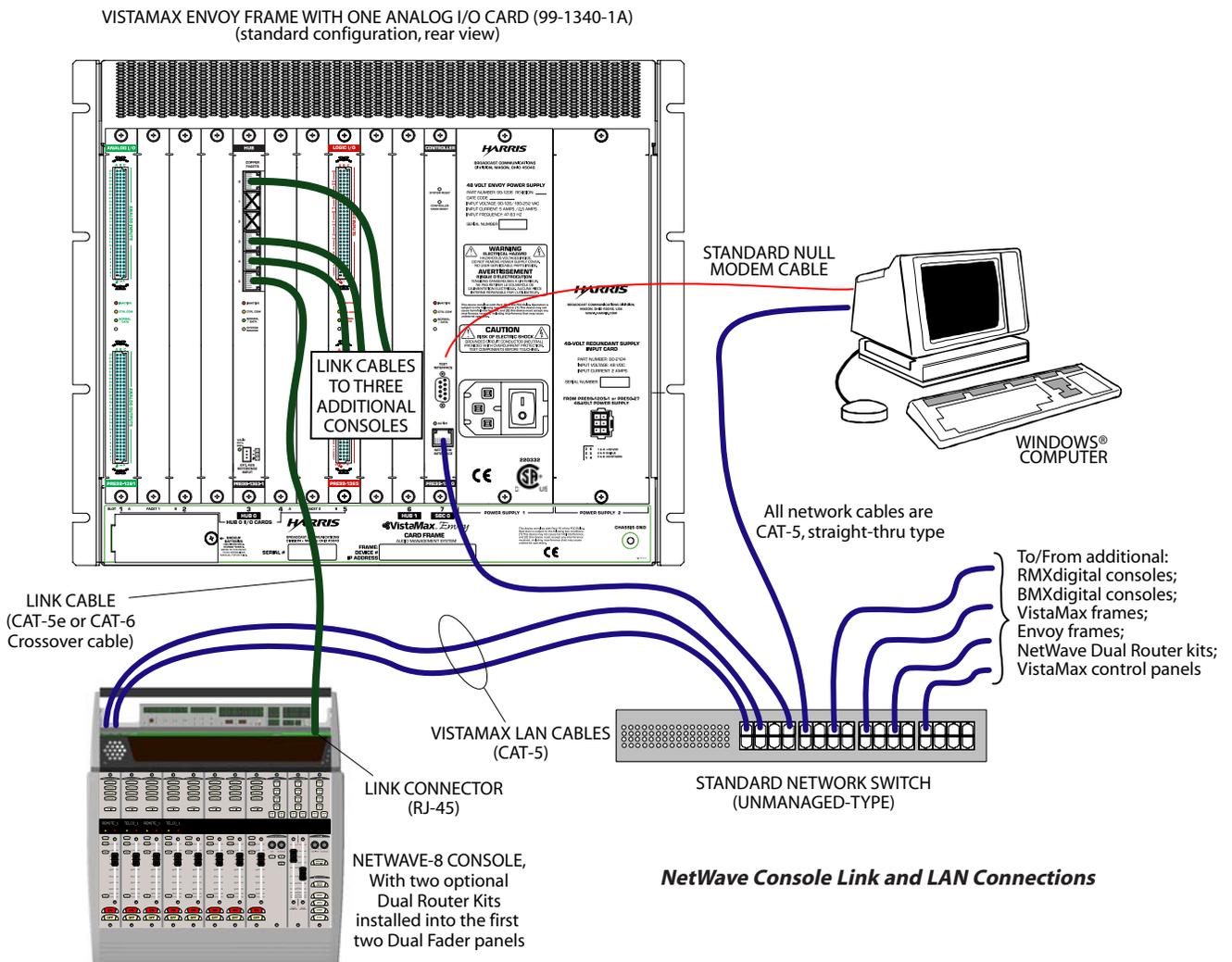


PARTS LIST
Cable: 19-119 (Belden 8445 or equiv.)
Diodes: 11-7 (1N4001 or equiv.)
37-pin DSub: 15-885 (DC 110963-4)
DSub crimp pins: 15-884 (DB-37P)
12-pin MOD IV housing: 14-490 (Tyco-AMP 87922-2)
MOD IV contacts: 15-938-1 (Tyco-AMP 102128-1)

VISTAMAX NETWORK CONNECTIONS

When the VistaMax Link is activated (optional feature), the NetWave'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 or Envoy card frame using a *Link cable*. A Link cable is a CAT-5e or CAT-6 crossover cable up to 300 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.

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 cardframes, consoles, admin computer and 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. Refer to Chapter 4, and to the VistaMax (75-52) or Envoy (75-55) manuals, for additional details on Link cables, Dual Router panel LAN cables, and for setup and configuration details.



Using NetWave

This chapter covers user operation of the NetWave console.

Console Overview

The NetWave console consists of: a mainframe holding multiple Dual Fader panels and one Monitor Control panel; an integrated Reflective Console Display with two stereo bargraph meters, a clock and event timer; and an in-line or rack mount power supply.

DUAL FADER PANELS

NetWave audio inputs are assigned to one or more buses, level controlled using a 100 mm fader, and switched on/off using channel strip controls on Dual Fader panels. Each Dual Fader panel has two channel strips. Each channel strip has two input sources (A and B).

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 (as shown on the previous page). NetWave-24 consoles ship with nine Dual Fader panels, but can have up to twelve installed.

Dual Fader panels can also be upgraded to add additional input source selection abilities. Upgraded Dual Fader panels can be identified by their two 10-character displays. These show the name of the active or a possible next source for each channel. Each upgraded panel also changes the A and B button functions to be UP and DN (down) selectors used to step through possible next source names.

A *Dual Selector* upgrade adds source selection control for a rackmount 16X2 Source Selector. This gives each channel on that panel the ability to choose between seventeen named sources (sixteen on the 16X2 Source Selector 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.

When the NetWave console is Linked to a VistaMax system (the VistaMax Enabled and Vis-



NetWave-16 Console (with two optional Dual Fader panels)

taMax Linked labels are lit on the Monitor Control panel) Dual Fader panels can be upgraded to *Dual Router* panels. Again, the A / B buttons change to become UP / DN buttons to select a new VistaMax source for each of the channels. Dual Router channels have **Next / Include All** labels in place of the standard A / B name labels.

Quick Guides to using the NetWave Dual Fader, Dual Selector and Dual Router panels are on pages 3-3, 3-4 and 3-5.

MONITOR CONTROL PANEL

This standard panel is installed at the right end of the mainframe. It has monitor source selectors and level controls for the control room, and one studio or voice booth, and selector buttons to assign which signal feeds the Auxiliary meter.

A Quick Guide to using the Monitor Control panel is on pages 3-6 to 3-9.

REFLECTIVE CONSOLE DISPLAY

The NetWave's standard display has two horizontal bargraph signal level meters showing Program 1 on the left meter and a selected source on the right, Auxiliary (AUX) meter. There is also a time of day clock and an event timer.

NetWave-16 and NetWave-24 consoles can be upgraded to four meters, to display Program 1, Program 2, Program 3 and the Auxiliary signal.

A Quick Guide to using the Reflective Console Display is on page 3-10.

POWER SUPPLY

NetWave power supplies are designed specifically for 24/7 operation. The console should not be powered off since doing so will cause complete signal interruption.

NetWave-8 and NetWave-16 consoles have an in-line power supply that is typically set within the cabinetry. It does not have a switch so it must be unplugged from its AC outlet to turn it off. Net-

Wave-24 consoles include a rack mount supply with a recessed power switch on the front panel to turn it on and off.

Wait at least fifteen seconds after turning off either supply before reapplying power.

VISTAMAX INTEGRATION

Networking a NetWave console with a VistaMax system means that an almost unlimited number of audio and audio-with-logic signals can be routed to any channel on the console and to the two External monitor inputs, depending upon how the console is configured.

VistaMax Source Selection

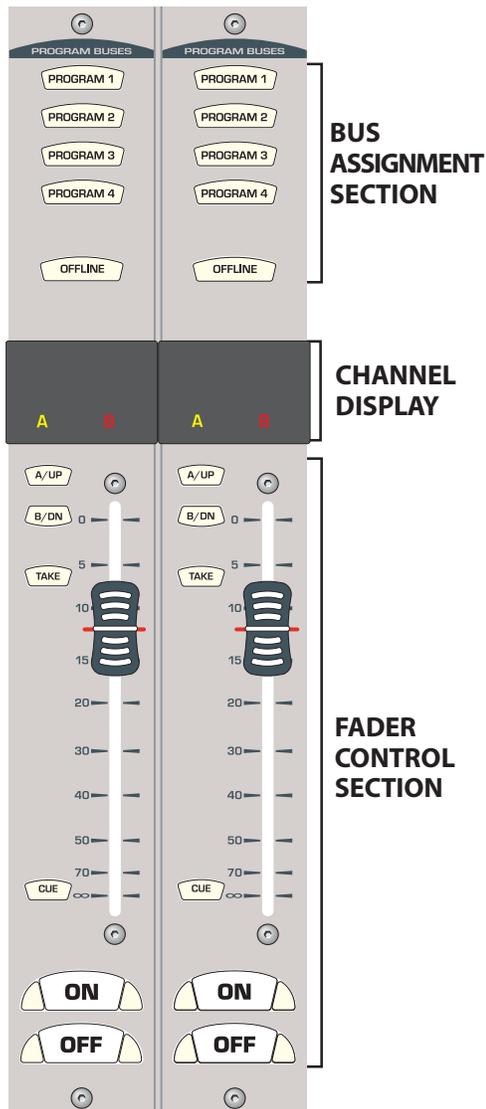
On Dual Fader panel channels, when a network source is set as its A or B source, the VistaMax source routed to that channel can't be changed on the panel. It can only be changed by using a VistaMax Source Selector panel or by running a session or macro file on the console's parent device (this is typically done by engineering or programming). Typically, these routed channel sources are rarely changed since Dual Fader panels do not have a way to display the source name on the channel (except by changing the A / B label with a custom source name label. This also holds true for a routed External Monitor signal. Hence, routed signals on Dual Fader channels and on the external monitors typically do not get changed very often unless there is a VistaMax Source Selector panel in the room dedicated to do this.

However, any Dual Fader panel can be upgraded to be a Dual Router panel, which does have access to changing its source and does have a 10-character display to show the routed source name. Using this type of panel is covered on page 3-5.

For a more complete description of the VistaMax Audio Management System, refer to the VistaMax (75-52) or Envoy (75-55) manuals.

DUAL FADER PANEL

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



BUS ASSIGNMENT SECTION

PROGRAM 1, 2, 3, 4 — When lit, routes the channel audio, post fader and post switch, to any combination of the four Program buses.

OFFLINE — When lit, routes the channel audio, pre-switch and typically pre-fader (it can be set for post-fader), to the Offline bus.

Note: Telco channels will have one assignment button either winking or blinking. This indicates the bus assigned to the Telco mix-minus and that Telco's record status. See page 3-12 for Telco operation specifics.

FADER CONTROL SECTION

A and B — 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 will blink), then press TAKE while it is blinking.

TAKE — Switches the input source (A to B or B to A) when pressed while blinking. If the channel is on, it will force the channel off before changing the source.

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

CUE — When lit, routes pre-fader, pre-switch audio 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, it toggles cue on and off. Cue feeds the cue speaker and, when AutoCue is lit on the Monitor panel, also feeds the operator headphones. Cue levels are also typically displayed on the Aux meter while active.

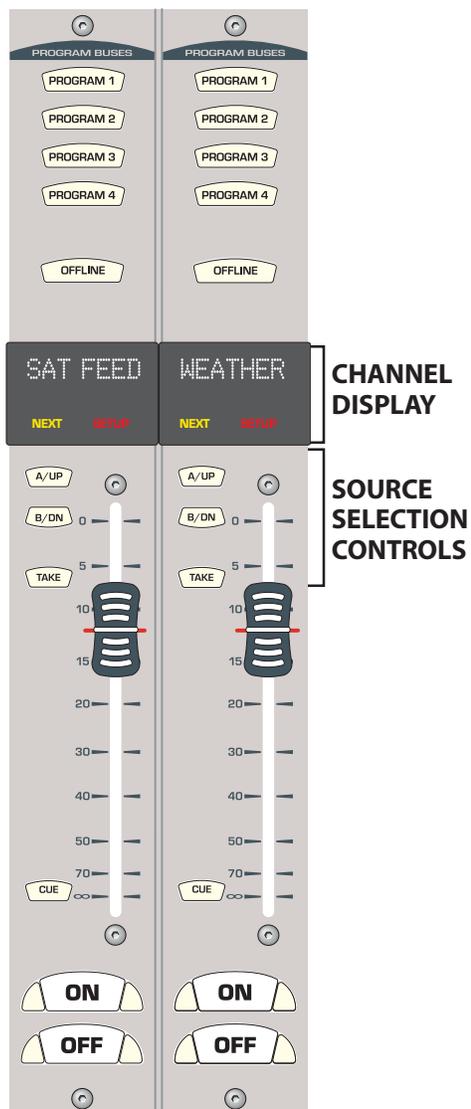
ON — Press to turn the channel on. The button lights, routing the audio to the selected buses. Logic control commands may also be initiated, depending upon the logic settings for that source.

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 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

Dual Selector panels are recognized by their changed channel display: they have two 10-character Source Name displays and two **Next** and **Setup** labels. These panels can select between the sixteen sources available on a 16X2 Source Selector (called common sources, available to both channels) and the local input on each channel. Most panel functions are identical to the Dual Fader panel, so only those functions that differ are covered here.



CHANNEL DISPLAY

Source Name Display — The two ten-character displays have two functions, depending upon whether the **Next** label 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, the Next label turns off about three seconds after the last UP or DN button press. The name returns to showing 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 will turn off and the panel will return to Normal mode.

SOURCE SELECTION CONTROLS

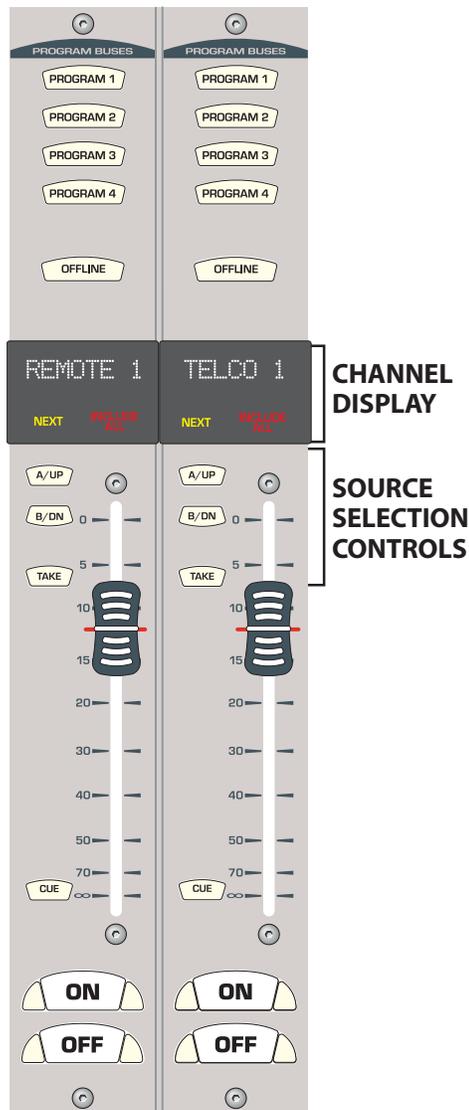
UP and DN — Pressing either button lights the **Next** label. This changes the Source Name Display to show the names of potential next sources while the **Next** label is lit. Press UP to step through the names in forward alphanumeric order. Press DN (down) to step through the names in reverse order. Pressing and holding either button rapidly steps 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 TAKE is pressed while the channel is on, the On button blinks rapidly to indicate the take command is locked out. After the channel is turned off, TAKE can be pressed to take the previously selected next source.

DUAL ROUTER PANEL

Dual Router panels are recognized by their changed channel display: they have two 10-character Source Name displays and two **Next** and **Include All** labels. These panels are only available on consoles that are Linked with a VistaMax system. Most panel functions are identical to the Dual Fader panel, so only those functions that differ are covered here.



CHANNEL DISPLAY

Source Name Display — The ten-character displays have two functions, depending upon whether the **Next** label is lit. When **Next** is not lit, the display shows the name of the network source routed to 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 name returns to showing the active routed network source name.

Include All — Press the UP and DN buttons together to activate the Include All function, which allows every source name available to the console to be displayed (typically each channel only has small list of source names, in a channel-specific include list, to make selecting a next source easier). To return to the channel-specific include list, press the UP and DN buttons together again to turn off **Include All**.

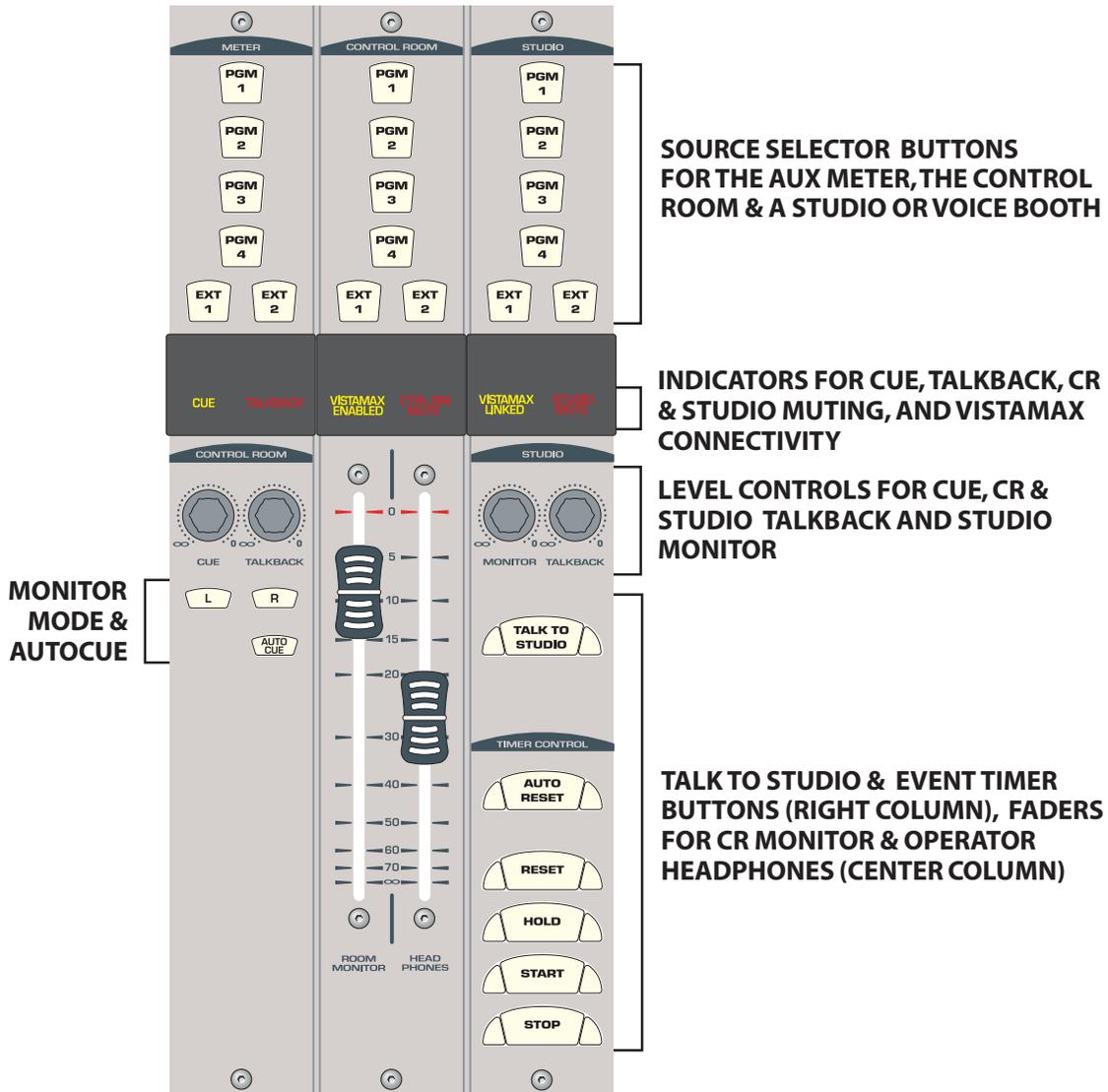
SOURCE SELECTION CONTROLS

UP and DN — Pressing either button lights the **Next** label. This changes the Source Name Display to show the names of potential next sources while the **Next** label 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. Pressing and holding either button rapidly steps through the list. The Source Name Display returns to show the active source name about three seconds after the last button press. Pressing both UP and DN together toggles the Include All function on (**Include All** is lit) or off (**Include All** is not lit).

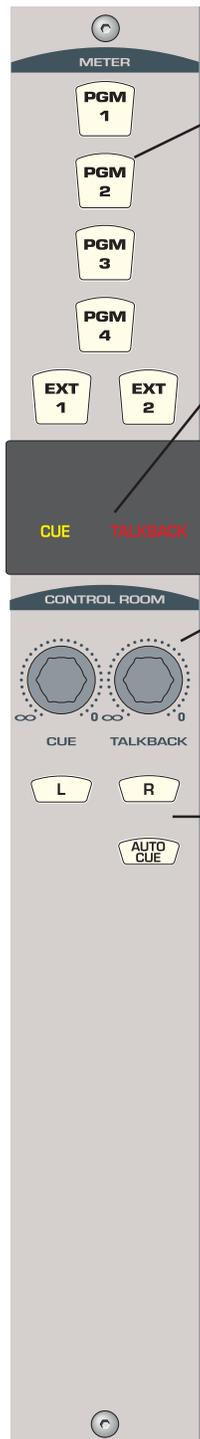
TAKE — When **Next** is lit, and the channel is off, pressing TAKE selects the displayed next source as the new source for the channel. To prevent on-air signal interruptions, the current source cannot be changed while the channel is on. If the TAKE button is pressed while the channel is on, the On button blinks rapidly to indicate the take command is locked out. After the channel is turned off, TAKE can be pressed to take the previously selected next source.

MONITOR CONTROL PANEL

This panel is divided into three columns by function: the left column has the aux meter source selectors; the center column has the control room monitor controls (source selectors and level controls for the control room speakers and operator headphones); the right column has the studio monitor controls (source selectors and level controls for studio speakers). Each column's functions are separately detailed over the next three pages.



MONITOR CONTROL PANEL, LEFT COLUMN CONTROLS



METER

These buttons select which signal feeds the right-hand Aux meter. Only one button can be selected at a time.

PGM 1-4 — *When lit, sends that Program bus to the Aux meter.*

EXT 1, EXT 2 — *When lit, assigns that External input to the Aux meter.*

DISPLAYS

Cue — *When lit, indicates that cue is active on one or more channels and is being fed to the cue speaker. Cue typically also overrides the Aux meter selection so the cue level can be seen (this feature can be defeated during console setup).*

Talkback — *When lit, indicates the control room is receiving talkback from the studio. The control room monitors dim by 12 dB while receiving talkback. Talkback goes to the operator headphones and is switched to the cue speaker through the Talkback level control.*

LEVEL CONTROLS

Cue — *Adjusts the cue output level to the built-in mono cue speaker. This level does not affect the routed stereo cue signal or the AutoCue signal in the operator's headphones.*

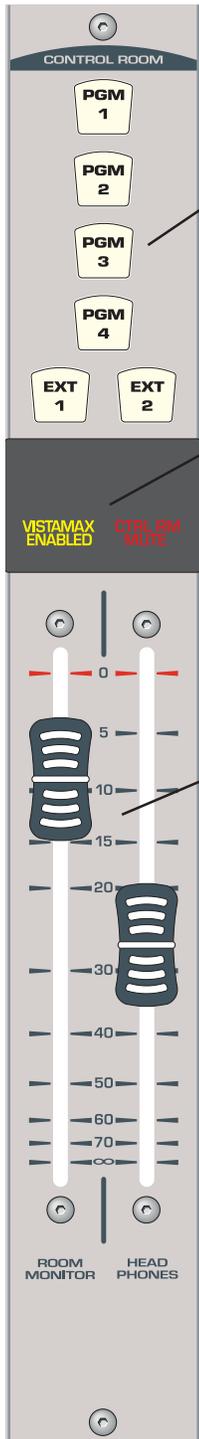
Talkback — *Adjusts the level of talkback to the control room that is fed to the cue speaker. When talkback is received, cue audio is cut off and talkback is sent to the cue speaker through this control.*

MONITOR MODE SELECTIONS

L & R — *When both buttons are unlit, all monitor and headphone outputs are stereo. With only L (left) lit, the left channel on the selected monitor source feeds both the left and right monitor outputs. With only R (right) lit, the right channel on the selected monitor source feeds both the left and right monitor outputs. With both L and R lit, the left and right outputs are a mono sum of the left and right channels on the selected monitor source.*

AUTOCUE — *When unlit, cue does not affect the operator headphone output. When lit, and cue is active, the operator headphone output switches to listen to the cue signal using one of two modes: stereo cue, where cue replaces the monitor signal; or split cue, where cue is summed to feed one ear while monitor is summed to feed the other ear. The mode is set during console setup. Typically production rooms use stereo cue while on-air studios use split cue.*

MONITOR CONTROL PANEL, CENTER COLUMN CONTROLS



CONTROL ROOM MONITOR SOURCE

All control room outputs use the same selected monitor source. The selected source is indicated by the lit button. Only one button can be selected at a time.

PGM 1-4 — When lit, routes the selected Program bus to the control room outputs.

EXT 1, EXT 2 — When lit, routes the selected External signal to the control room outputs.

DISPLAYS

VistaMax Enabled — When lit, indicates the console is ready to be networked with a VistaMax Audio Management System. If it is not lit, the console is a stand-alone console with no networking capability.

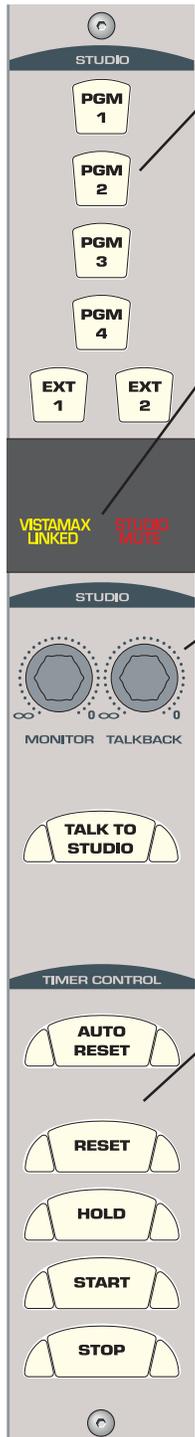
Control Room Mute — When lit, indicates the room monitor output and control room warning logic are active due to one or more channels, that have a control room mic as their input, are on and assigned to a program bus. When unlit, no channel that has a control room mic as its source is turned on.

FADERS

Room Monitor — 100mm fader for adjusting the volume of the control room monitor output. It affects the level of the control room (CR MON) output.

Headphones — 100mm fader for adjusting the output volume of the board operator headphone jack (1/4" TRS) in the console's left side panel.

MONITOR CONTROL PANEL, RIGHT COLUMN CONTROLS



STUDIO MONITOR SOURCE

All studio outputs use the same monitor source. The selected source is indicated by the lit button. Only one button can be selected at a time.

PGM 1-4 — When lit, routes the selected Program bus to the studio outputs.

EXT 1, EXT 2 — When lit, routes the selected External signal to the studio outputs.

DISPLAYS

VistaMax Linked — When lit, indicates the console is properly connected and communicating with a VistaMax Audio Management System. If it is not lit, the console is not connected to a VistaMax system and has no networking capability.

Studio Mute — When lit, indicates the room monitor output and studio warning logic are active due to one or more channels, that have a studio mic as their input, being turned on and assigned to a program bus. When unlit, no studio mic is turned on.

STUDIO CONTROLS

Monitor — Adjusts the output level of the studio monitor (ST MON) output.

Talkback — Adjusts the amount of talkback to the studio that feeds the studio monitor output. Set the talkback control to full off if talkback should not feed the studio speakers.

Talk to Studio — While pressed, routes the control room talk mics, pre-switch and pre-fader, to the studio host output and to the room monitor output through the Talkback control. Talk mics are inputs defined as CR MIC TLK SRC (control room mic talk source) and that are active (i.e., if the talk mic is the B input, then the B source has to be selected on the channel. If the A source is active, then that mic's audio will not feed the talk output).

EVENT TIMER CONTROLS

Auto Reset — When lit, allows the event timer to be reset when a channel, that has timer reset enabled, is turned on. This resets the timer to 00:00.0 and starts counting upward. When unlit, the event timer does not receive reset commands from the channels.

Reset — Resets the event timer to 00:00.0 and starts counting up. Press Reset and Stop together to reset and stop the timer at 00:00.0.

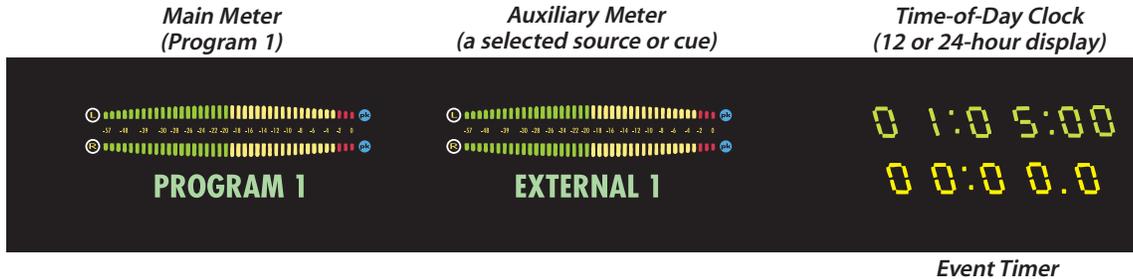
Hold — Press and hold the button to freeze the event timer display to show the elapsed run time when the button was pressed. The event timer continues to count during this time. Releasing the button returns the event timer display to show the current run time.

Start — Starts the event timer counting up from the displayed time.

Stop — Stops the event timer and displays the elapsed time. Press Start to continue counting up from the displayed time. Press Reset and Stop together to reset the timer to 00:00.0.

REFLECTIVE CONSOLE DISPLAY

The standard console display has two bargraph meters, a clock and an event timer. Two additional meters, which show Program 2 and Program 3, may be added to the NetWave-16 and NetWave-24 consoles.



NetWave's Reflective Display

CLOCK

The clock displays time in hours: minutes: seconds in either 12- or 24-hour time. See page 2-8 for information on setting the clock.

EVENT TIMER

The event timer displays time in minutes: seconds: tenths of seconds. Page 3-9 shows the event timer controls on the Monitor Control panel.

BARGRAPH METERS

The left-hand meter provides level display for Program 1. When the optional Quad Meter kit is installed, the two middle meters display Program 2 and Program 3.

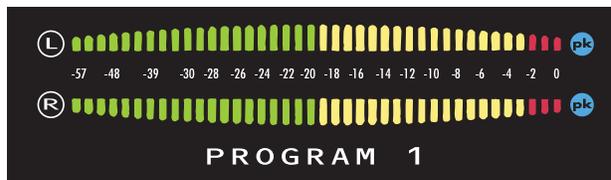
The right-hand meter (Auxiliary) provides level display for a source selected by the Aux Meter buttons on the Monitor Control panel (see page 3-7). The Aux meter typically shows the cue bus level while cue is active (whether this feature is active is set during console configuration).

An alphanumeric display below each meter identifies the displayed signal by name (PROGRAM 1, EXTERNAL 1, CUE, etc.).

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

From -20 to -3 the LEDs are yellow. Signal levels should always peak in this area. The 0, -1, and -2 bars are red to indicate the signal is dangerously close to clipping. To prevent digital distortion on the outputs, the red bars should rarely, if ever, light up—especially the 0 bar since this indicates the signal is at, or is attempting to go beyond, Full Scale Digital (the absolute maximum digital signal possible).

Left Channel Level
dB below FSD*
Right Channel Level



Separate Blue Peak Indicators for Left and Right Channels

Signal name

RMXdigital Bargraph Meter

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

The meters can be set to display the average signal level only (a solid moving bargraph indicates the average signal level) or both average and peak signals (a solid bargraph is the average level with a single bar, typically 6 to 10 dB higher than the average bargraph, being the peak level of the signal).

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

NetWave Applications

The NetWave console is a very flexible on-air, production, newsroom or voicing studio console that may be installed as a stand-alone 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.

Here's an overview of some of these advanced operational features.

STAND ALONE OPERATION

When the NetWave 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 channel label (A / B or, if custom labels are made, the name of the input). Blank

labels are supplied as part of the installation kit, so source name labels can be made to use in place of the A / B labels to identify each input.

To change the active source, press the unlit source button (A or B). The Take button will flash. Pressing the Take button, while it is flashing, changes the source. If Take is not pressed within three seconds, the Take button deactivates and the source change is cancelled. When the source is changed while the channel is On, the channel is forced off and then the source is changed.

One source for each channel can have logic control associated with it. There are two types of NetWave logic control: mic control, which ties to control panels associated with studio or control room microphones; and peripheral device control, for equipment like computer playback systems, phone editors, CD players or MD players.

For a microphone, the mic panel can turn the channel on and off remotely. Each panel also has a Cough button to momentarily mute the audio without turning the channel off. Mic panels for hosts and co-hosts may also feature a fourth button (Talkback) that is used to talk to the control room from a studio mic, or talk to the studio from a control room mic. The board operator can talk to the studio using his/her 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 or a spot. The peripheral may alternately cause the channel to turn on when an event starts. It may also turn the channel off when the event ends for semi- or automatic operation. The peripheral may also control the Off button lighting for the channel to indicate the peripheral's status (no Off light indicates the peripheral is not ready, a steady Off light indicates the peripheral is ready, and a blinking Off light indicates the event has completed).

The Monitor Control panel is where a bus or external signal is selected as the monitor signal for the board operator headphones and control room monitor speakers. A separate monitor source can be selected for the studio headphone and monitor outputs. In most on-air applications, the air monitor signal is assigned to one of the two external monitor inputs (EXT 1, EXT 2). The other external input typically is from a synthetic air signal to simulate the air signal processing, but without any delay. Alternately, one of the program buses may be monitored for a non-delayed signal.

Two channel sources (or 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 following sections.

TELCO / CODEC OPERATION

Each stand-alone or Link Activated NetWave console can have two channel sources set as Telco 1 and Telco 2. Consoles with Link Plus Activation can have up to six channels designated as Telcos.

Typically, Telco inputs come from telephone callers or from live remotes (in the NetWave “Telco” refers to any type of two-way device, including telephone hybrids, satellite transceivers, ISDN codecs and two-way radios).

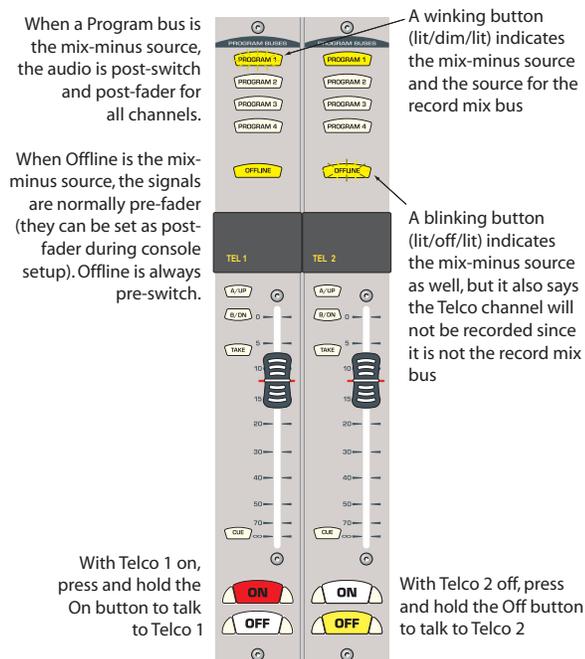
Each Telco device has a Caller, or From Network, output that connects to the Telco channel input. A NetWave *mix-minus* output, specifically for that Telco device, goes from the console back to the Send, or To Network, input on the Telco device.

The console’s two local Telco outputs (Mix-Minus) can also be called foldback or IFB (Interruptible Fold Back) outputs since the board operator can talk to either output. No matter which bus is assigned to these outputs, the audio is always minus the Telco audio (hence the term mix-minus). On earlier analog consoles, this mix-mi-

nus output would be manually created by the board operator through bus assignments, but on the NetWave 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 have dual-channel mix-minus outputs that go to the VistaMax system. 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 or Envoy I/O card. 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.



Telco Channel Features

The Telco channel sources should have been identified by custom labels during installation (in lieu of the standard A / B labels). But, if not, Telco channels have one distinctive feature: one bus assignment button will be winking (or blinking) because, on the two Telco channels, 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 signal. In addition, the buttons also identify whether or not that Telco channel is being sent to the Telco Record output. It's a bit complicated but, the following sections should clear things up.

THE TELCO MIX-MINUS OUTPUTS

The mix-minus outputs are always a main bus (PGM 1, PGM 2, PGM 3, PGM 4 or Offline) assigned on that Telco channel. Every channel assigned to the mix-minus bus (including the other Telco channels) appears in that mix-minus output, but it is always minus its own Telco input.

Which bus is the mix-minus signal is identified by a *winking* or *blinking* bus assignment button for each Telco channel. A winking button (the button is on, dims, then is full on again) indicates two things: first, that it's the mix-minus bus, and second, that it's feeding the Telco Record output.

A blinking button (where the button is lit, then goes off, then is lit again) also indicates the mix-minus bus, but it means that Telco channel is not assigned to the Telco Record bus and so will not be recorded.

How is the winking/blinking bus assignment button determined? In part, by whether or not the Auto Foldback mode is active on the console. With Auto Foldback off, which is the default setting, the Offline bus has priority, followed by PGM 1, PGM 2, PGM 3, then PGM 4. This means that whenever the Offline bus is selected on a Telco channel, it will be winking and the mix-minus output for that Telco will be the Offline bus. Also, when Auto

Foldback is not active, the Telco channel's on/off status does not affect the mix-minus bus selection—if Offline is active it's the mix-minus bus.

When the console has Auto Foldback active, Offline goes to the mix-minus output whenever the Telco channel is off. Turning the Telco channel on automatically switches that mix-minus signal to the lowest number program bus assigned on the Telco channel. Turning the channel off, returns the mix-minus to the Offline bus.

Note that the mix-minus output can differ in level substantially when changing between the Offline bus and one of the Program buses. This is because the offline bus is pre-switch and typically pre-fader (although it can be set to be post-fader during console setup), whereas the Program buses are always post-switch and post-fader.

Telco Operation with Auto Foldback Active

When the console is set up with Auto Foldback active, each Telco channel's foldback mix automatically toggles between an assigned program bus while the channel is on and the Offline bus while the channel is off.

When the Channel is On: PGM 1 is the foldback mix source. If it's not assigned, then the source is selected in this order; PGM 2, PGM 3, PGM 4, then Offline.

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

Setting Auto Foldback active is most often used for call-in contests or interviews where a caller will go live to air. 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 can hear the talent/board operator thru their mic feeding the Offline bus.

The talent can hear the caller by assigning the Telco channel to cue. In this setup, the caller can hear the talent mic all the time, unless it is unassigned from the Offline bus.

If, while the caller is waiting to go on-air, they must listen to something like a “contest rules and regulations” recording, then it is best to only assign the recording playback channel and the caller to Offline. The talent can then press the caller’s 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 then goes live on-air (the Telco channel is on), the foldback automatically switches to PGM 1 (assuming the air feed is the Program 1 bus) so that the caller hears everything else going out on-air minus their own voice.

Auto Foldback Off (default operation)

When Auto Foldback is off, the Telco channel has a different bus priority order for selecting the foldback feed.

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

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

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

TELCO RECORD OUTPUT

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

The console does not have a dedicated local Telco Record output, but the Program 4 analog output can alternately be assigned as the Telco Record output. Linked consoles have the stereo Telco Record output as one of their network signals.

TELCO RECORD OUTPUT SUMMARY

LEFT CHANNEL	All Telco channels assigned to the record mix bus
RIGHT CHANNEL	All non-Telco channels assigned to the record mix bus
NOT RECORDED	Any channel NOT assigned to the record mix bus

The Record Summary, above, lists which signals get recorded. But, since the Telco record mix bus is affected by whether Auto Foldback is active or not, here is a more detailed explanation of how the Telco Record output is affected by the Auto Foldback mode setting.

Auto Foldback is off (default setting):

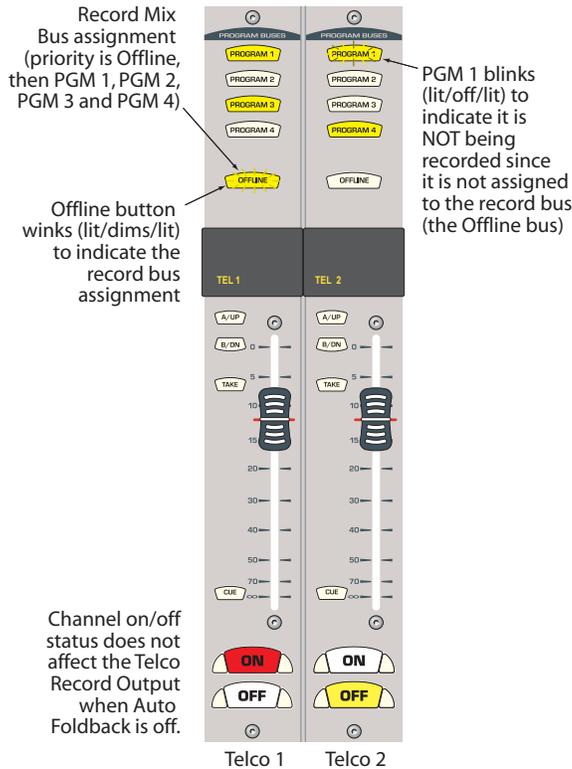
The record mix bus priority is Offline, then PGM 1, PGM 2, PGM 3, PGM 4.

When Offline is the record mix source, it doesn’t matter whether the channels are on or off. If a non-Telco channel is assigned to the Offline bus, then it will be in the right channel of the Telco Record output.

All Telco channels assigned to the Offline bus get mixed together on 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, then only those channels (including the Telco channels) that are turned on and assigned to the record mix bus will be recorded.

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



Auto Foldback is active:

In this mode, the record mix source follows the on/off state of all of the Telco channels. When all Telco channels are on, then PGM 1 is the primary record mix (if it is not assigned, then PGM 2, PGM 3, PGM 4 or Offline is used in that order). When all Telco channels are off, then 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.

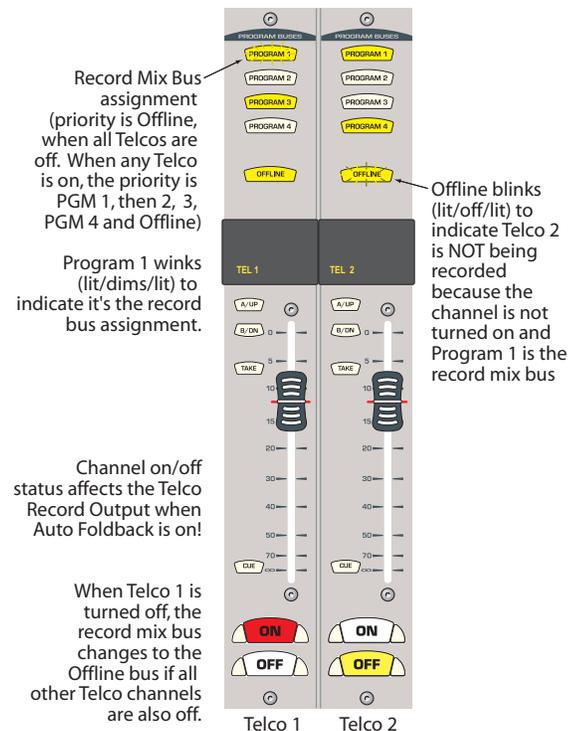
LINK PLUS ACTIVATION

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 Telcos in the console will complicate how the Telco record bus output is used, especially if Auto Foldback is active, since all Telco channels must be On in order to use a PGM bus as the Telco Record source.

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



Linking NetWave

This chapter covers setup, configuration and use of linked NetWave consoles within VistaMax audio management systems. Two Monitor panel labels (*VistaMax Enabled* and *VistaMax Linked*) light up when the NetWave is properly linked with a VistaMax system. If the two labels are not lit, the information in this chapter does not apply to that NetWave since it is not a linked console.

Linked NetWave Consoles

The first step to link a NetWave console with a VistaMax system is to install a Link Activation kit (99-1425 Link Activation or 99-1426 Link Plus Activation). When the console is powered back up after the kit is installed the Monitor Control panel's *VistaMax Enabled* label lights to indicate the kit was properly installed.

The second step is to physically link the NetWave to a VistaMax or Envoy cardframe, which



RJ-45 Link Connector on the rear panel

is then that NetWave's **parent device**. This means that it controls the signal routing to and from that console. Connect the console's rear panel Link jack to an available Hub card facet using a CAT-5e/CAT-6 crossover cable. Cable runs up to 300 feet [100M] are supported. Once connected, a second Monitor panel label, *VistaMax Linked*, lights to indicate a good connection has been established.

Once both labels are lit, the next step is to configure the NetWave console signals using VistaMax Control Center (VMCC). This involves naming the NetWave's audio sources; selecting which of these signals should be added to community member include lists; and configuring any Dual Router panels that were installed in the console.

The VistaMax system must be running 500-series (build 501.70 or later) operating system code; the VistaMax Control Center (VMCC) setup software must be version 2, build 2092 or later; and Community Monitor (CM) must be version 3.85 or later.

If the VistaMax system is new, all of these should be correct, but when the NetWave is being added to an existing VistaMax system, the system devices may be running older software. The current versions for each of these programs (as of the ship date of the console) was supplied with the console on the 99-5001 NetWave CD-ROM.

Even newer versions of each program may be available on the Harris PR&E FTP site (<ftp.pre.com>). See the Service chapter (page 5-1) for information about logging into this site.

VistaMax Community Monitor [IP 234.5.6.7] [Port 5100] [Interface 192.168.100.11]													
File Options View About													
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-05-5f	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		

Bottom Scroll Total Members = 5 View status 11:38:52

Community Monitor Status Window, with a NetWave console connected to VMX_51

VERIFYING SOFTWARE VERSIONS

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

VistaMax devices running the last released version of 400-series code (build 445.10 or later) can be used with NetWave, but to take full advantage of the NetWave’s linked features, the code should be upgraded to 500-series. In addition, 400-series code systems should upgrade Community Monitor and VMCC as well since these are required to use the 500-series code.

To view the Community Monitor version, click the menu bar item *About*. For 500-series code, version 3.85 or later is required. To view the VMCC version, click on *Help* then *About VMCC*. Version 2 (build 2092 or later) must be used with 500-series code.

A customer document: [71-2002_500-series_code_update.pdf](#), is included on the 99-5001 CD-ROM. It has information on migrating from 400-series to 500-series operating system code. It is best to contact Harris studio products tech support for assistance before performing an operating system software upgrade.

LINKED NETWAVE FEATURES

NetWave consoles, 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 chan-

nel source on any channel to be set to use this destination (in lieu of using the local analog and digital input) as its input. Thus, any VistaMax signal (even one with logic) can be set as the input on any channel.

- One local signal (the analog or 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, independent of how it is used on the console.
- The two External Monitors (Ext 1 and Ext 2) are assigned specific VistaMax destinations so that air monitors or other signals can be routed to the console. Either, or both, of these inputs can be set to use their routed signal in lieu 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 outputs are also VistaMax sources, plus the routed signals are dual-channel: one channel is a clean mix-minus feed, the second is an IFB signal (the same signal used on the local

mix-minus outputs). With Link Plus Activation, there can be up to six Telco channels. Subsequently, there are six dual channel mix-minus signals going to the VistaMax system.

To activate these various new features, the NetWave console, through its parent VistaMax or Envoy card frame, is set up using VMCC.

Linked NetWave Setup

This chapter assumes the reader has a working knowledge of VistaMax terms and procedures and that a VistaMax community has already been set up and is working properly. Refer to the VistaMax (75-52) or Envoy (75-55) manuals for general VistaMax system information and VMCC software usage. This chapter builds upon those manuals, presenting specific information for setting up NetWave consoles for use in an existing VistaMax system running 500-series code.

To set up a newly linked NetWave console, the correct versions of Community Monitor (CM) and the VistaMax Control Center (VMCC) must be installed (as listed on page 4-2) and running on the VistaMax system's setup computer; the NetWave console's *VistaMax Linked* and *VistaMax Enabled* labels must be lit; and the setup computer, the NetWave's parent device, and any Dual Router TINI cards installed into the NetWave, must be networked together on the VistaMax LAN.

1 Community Monitor (CM)

Normally CM is already running on the setup computer with its miniature icon in the taskbar tray. If not, click the desktop icon () to start the program. Right-click on the

tray icon and select *Show Monitor Display*. Click on the menu item *View*, then select *Status* to view a list of the VistaMax community members. An example of the Status display, with a NetWave console connected, is shown at the top of page 4-2. A "MAC address" is used to identify the frame size of the NetWave since the NetWave does not have a true MAC address.

With the new NetWave console and its TINI cards shown in the CM display, the network is properly communicating with the new console. If the console does not appear in the display, check that the LAN and Link cables are connected properly and that the setup computer is running the CM software (version 3.85 or later) that is compatible with 500-series VistaMax code. Earlier versions did not support NetWave consoles and Envoy card frames.

2 VMCC

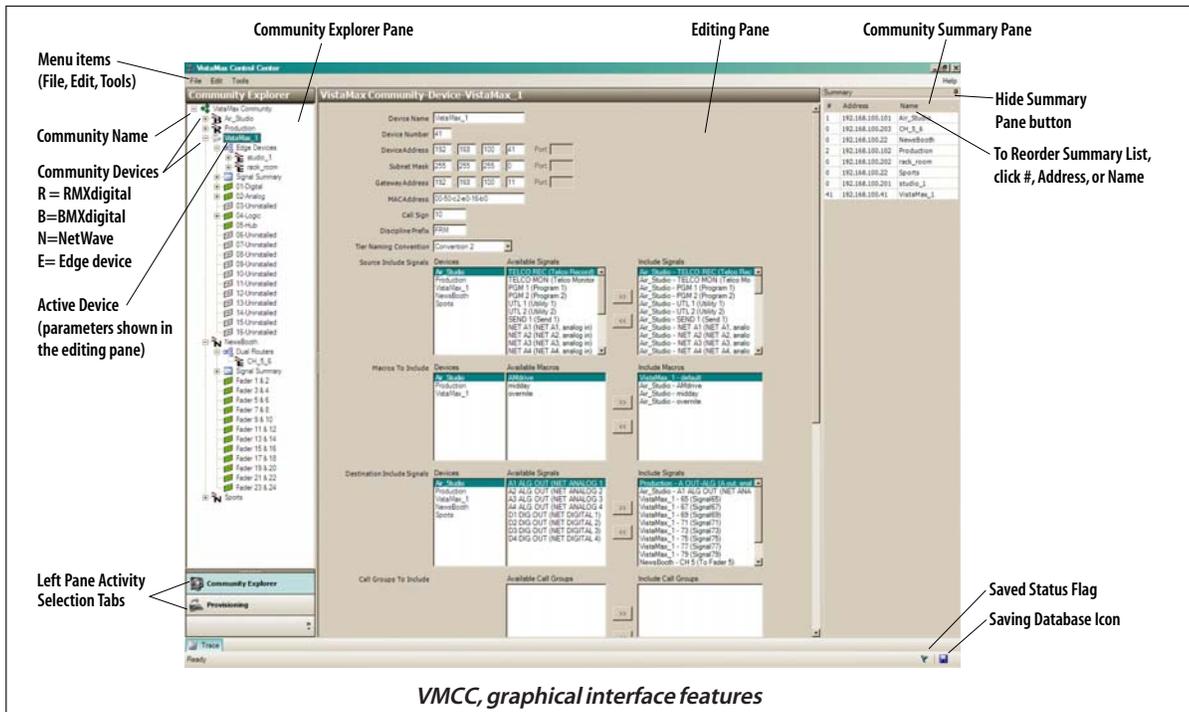
It is assumed VMCC has already been used to setup the other members of the VistaMax community and that it is now being used to add a new NetWave console to the existing community—and that community is active in VMCC. The VMCC program's main graphical interface features are identified on the following page.

Refer to the VistaMax or Envoy manual on using VMCC to set up a VistaMax community before continuing with these instructions.

Click the VMCC *File* menu item, then select *Inspect Community*. A community inspection

Inspect	Number	Name	Type	Information
<input checked="" type="checkbox"/>	22	BMX_22	BMX Family	Ready to inspect
<input checked="" type="checkbox"/>	51	VMX_51	VistaMax Rack	Ready to inspect
<input checked="" type="checkbox"/>	52	VMX_52	VistaMax Rack	Ready to inspect
<input checked="" type="checkbox"/>	0	00-60-35-01-04-40	1/1 Dest Source Selector	Ready to inspect
<input checked="" type="checkbox"/>	0	00-60-35-01-05-e4	1/1 Dest Source Selector	Ready to inspect
<input checked="" type="checkbox"/>	0	NetWave	VPC Family	Ready to inspect

VMCC Inspection Window



VMCC, graphical interface features

window opens to show all the VistaMax devices detected, including the new NetWave consoles, any Dual Router TINI cards, and the other existing VistaMax devices (consoles, card frames and edge devices) in the community.

The other community members don't need to be reinspected, so uncheck them (double-click on their **Inspect** check boxes to remove the checkmark). The only devices that should remain checked are the NetWave console and any TINI cards installed as part of the Dual Router kit upgrades.

TINI cards show up in the list with their MAC address shown in the **Name** column (as shown on the previous page) and their **Type** is set as *1/1 Dest Source Selector*. If necessary, widen the **Name** column to show the full MAC address (point the mouse next to the **Type** heading and click/hold on the left-right arrow symbol that pops up, drag right to open up the **Name** column width).



Note: When the TINI card was installed as part of the Dual Router upgrade, the console name and which two fader channels that TINI controls should have been written on the label on the TINI's antistatic bag. This can be used to verify each TINI card's assignments during configuration.

Click *Inspect* to inspect the NetWave and Dual Router panels. The information line shows **Done** when the inspection completes. Click *Continue* to move to the window showing the inspection results. With a new console there will be no slot conflicts or critical issues, so click *Accept*.

After a few seconds (depending upon how large the community is) the console will appear 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.

3 Edit the Device Settings

After an inspection, the new console should be selected (if it's not, click once on the console name in the Community Explorer pane to highlight its name). The right side editing pane shows the device settings for the new console, as shown below.



NetWave Parameter Setup Pane in VMCC

Give the console a unique name since each size frame uses the same default name (i.e., NetWave_24). Enter a console name (up to 10 alphanumeric characters can be used with one or more underlines, spaces are not allowed) in the Console Name entry box.

Verify that the parent device information (Name, e.g., Vista Rack; Hub card, e.g., Slot 5 (Hub 0); and Facet, e.g., Facet 5) is correctly entered since this defines the source and destination signal numbers assigned to that NetWave console. If these are incorrectly defined, the console will not receive the correct signals and signals from the console will not route correctly.

4 Name and Define the Console Signals

Once the device settings are edited, the signal names and modes can be defined for the two types of console signals: sources and destinations. To access the signal name entry panes, click the + button next to the NetWave console name in the Explorer pane to open the console tree. Click the Signal Summary + button, then highlight *Sources* to bring up the following VMCC display:



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

NetWave Source Name Entry Pane in VMCC

Each Signal Summary pane (Sources and Destinations) allows the default In Room Name, Community Name, and Description to be edited, and each Link w/Next and Hidden column checkbox to be checked or unchecked, as required, for each source and destination.

By default, all sources and destinations are linked stereo signals with the right channel hidden. To change a signal, like a mic input, to mono, uncheck the Link w/Next column box for the left channel of the signal. If the right channel input will also be used, then uncheck its Hidden column box.

The Sources pane shows the signals from the NetWave that the VistaMax system sees. These include one input from each channel (which input is used, analog or digital, is defined by the DSP & I/O card channel setup buttons) along with the various program, cue and Telco signals.

The In Room Names are what appear in VistaMax selector panels and Dual Router panels throughout the system when Tier Naming Convention 1 is used. The In Room Name can be up to 10 alphanumeric characters long. Spaces, dashes, underlines, forward and back slashes, and periods are allowed in these names. On stereo signals, only the left name is used. Typically, the Description column and the names for the various bus signal names are left at their default settings.

Note that duplicate names are allowed, so use care to create unique names in order to prevent signal selection confusion that duplicate names could cause.

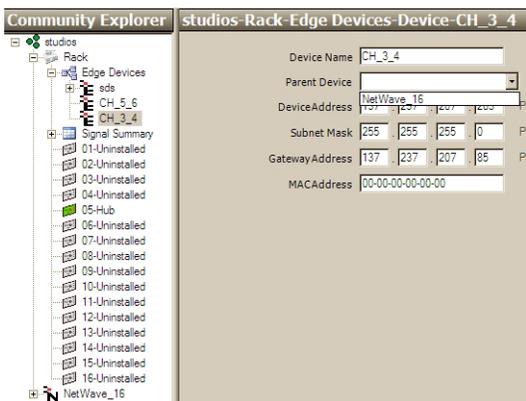
Community Names are only used when Tier Naming Convention 2 or 3 is used. The Community Name is limited to four characters since up to six characters are used up by the Tier 2 and Tier 3 name prefixes. These naming conventions are typically only used when multiple stations are networked together in large VistaMax systems. When Tier 1 is used, the Community Names are not used and can be left at their defaults. For additional information on Tier Naming Conventions, refer to the VistaMax or Envoy manual.

The Destination pane shows the signals coming from the VistaMax system going to the channels and to the external monitor selectors. Their In Room Names are only used during setup and on Source-Destination selector panels, so these are normally left at their default settings.

5 Setup Dual Router TINI Cards

If one or more Dual Router kits were installed, then they need to be setup at this time. When the community was inspected, the Dual Router TINI cards were listed in the Explorer pane as SSD_1_1 (a dual source selector that controls two destinations).

Each TINI must now be: given a unique name (typically identifying the two Dual Fader channels it controls, e.g., CH_3_4);



Setting the TINI's Parent Device in VMCC

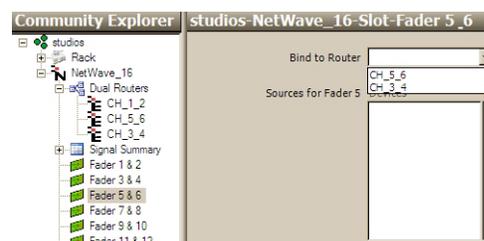
assigned to a Parent Device (the same parent as the NetWave console) and; given a unique device IP address. This information should have been written on the TINI card's antistatic package label when the TINI was installed into the Dual Fader panel.

Once this information is entered into VMCC, right click on the TINI's name in the Explorer pane to pop up the *Convert to Dual Router* selection box to define the device as a Dual Router panel. The TINI's icon will automatically move under the parent device and be selected (if not, expand the parent device, then click on the Dual Router TINI to open up the device pane).

The Parent Device selection box will again be empty, so click the down arrow to select the NetWave console that panel is installed in (e.g., NetWave_16). Assign each of the Dual Router TINI cards in like manner.

Once all TINIs are redefined as Dual Router panels, in order to have them now appear under their own consoles (instead of under the consoles' parent devices) may require that the VMCC community be reopened. Select *File*, then *Open Community* and select the community's name.

The TINI cards appear under the NetWave consoles in the *Dual Routers* branch. The TINI cards can now be "bound" to the two Dual Fader channels that each TINI controls. First, click on a Fader to open up its Binding Pane, then click on the down arrow in the *Bind to*



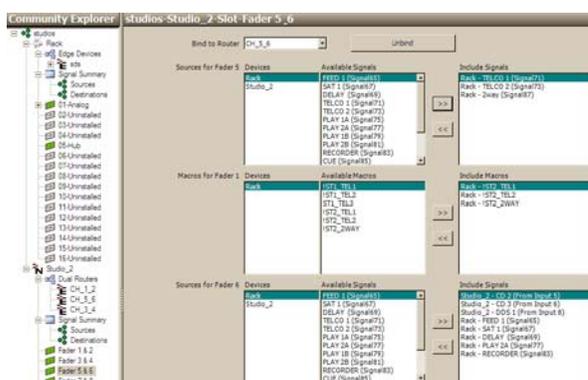
Binding the TINI cards to a Dual Fader Panel

are available to be bound to those two channels. In the above example, only TINIs CH_3_4 and CH_5_6 can be selected since CH_1_2 has already been bound to Faders 1 & 2. Since *Faders 5 & 6* are selected, highlighting CH_5_6 selects that TINI to bind to those two channels.

6 Setup the Dual Router Parameters

Once a TINI is bound to a pair of channels, the Sources and Macros entry boxes are populated with the VistaMax devices and the sources that are available to the NetWave console's parent device.

From these lists of signals, only sources and macros that will be typically needed for each channel should be selected and then included by clicking the double right arrow button (>>). Note that Dual Router channels can always view the complete list of sources available to the console by using the channel's Include All function, so it is best to keep the Include list short so that board operators don't have to search through a long list to find a desired signal.



Setting the Sources Available for each Dual Router

In the example, above, for Faders 5 & 6, channel 5 includes three macros, which show up in the list along with the signals (hence the ! at the beginning of their names to dif-

ferentiate them from signals). Macros are special setup files that run on the console's parent device.

NetWave macros are typically used to set up Telco channel routing when multiple Telco devices are shared between studios. In this case, the macro file includes a route command for the Telco device's *From Network* output to channel 5 and a route command to route the mix-minus output for that Telco channel to the *To Network* input on the Telco device.

7 Provision Files

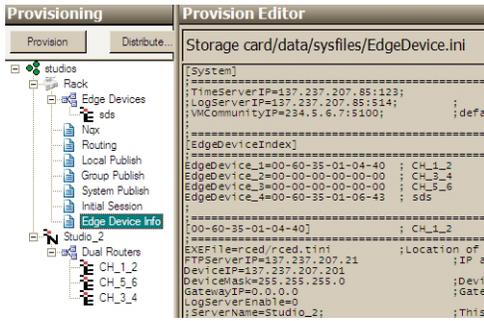
Once the NetWave signals are defined and the TINI cards are associated with channels and the channel include lists are created, these new settings must be used to create new configuration files by **Provisioning** new files.

Click the *Provisioning* tab at the bottom of the Community Explorer pane to switch to the Provisioning window. There are only two buttons at the top of the left pane: *Provision* and *Distribute...* Click the *Provision* button to create new setup and configuration files (using the parameters entered in the editing pane) for the NetWave console.

Provisioning modifies the console's parent device configuration files to add in the new information that was just entered in the Community Explorer window. The files can be double checked in the right pane by selecting one of the files to view (click the + button next to a community member's name to drop down a list of the setup files VMCC created).

Even though the NetWave console will also be shown in the list, no files are actually sent to the console since all of its configuration data is stored on the parent device.

Highlight a file name, like Edge Device Info (shown at the top of the next page) to



Viewing Provisioned Files

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

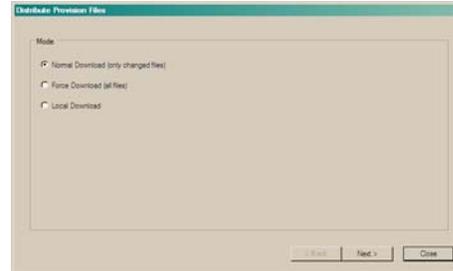
7 File Distribution

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

Click a radio button to select the distribution method, then click the *Next* button. If Local Download is selected, a save dialog box opens to the *My Documents* folder. If necessary, change folders, then click *Save*.

When Normal or Force Download is selected, VMCC opens a Device Specific Distribution window while checking that it can communicate with the various community devices. This window also lists the action that will be taken after the files are distributed. To send the files, the device must be enabled (double-

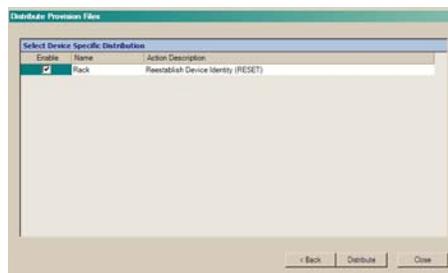
click on the Enable boxes to add or remove the check mark).



File Distribution Selection window in VMCC

Click *Distribute* to download the provisioned files to the enabled devices. When Force Download was selected in the previous screen, as shown above, then each device will “Reestablish Device Identity (RESET).” Normally, when a NetWave is added, only the publish files are changed, so an initialize router will be performed. This is less intrusive than the Reset command, and should cause minimal signal disruption.

The edgedevice.ini file will also have changed if any TINI Dual Routers were added. This causes an init RCED (initialize Remote Control Edge Devices) command to be performed which causes each edge device served by the parent device to be reset. This means existing source selector panels cannot be used for about three to five minutes while the panels restart and reread the updated *edgedevice.ini* file information.



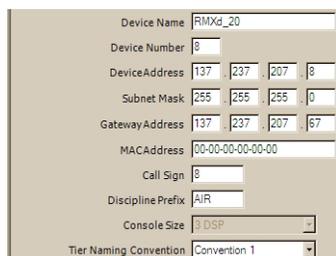
Device-Specific Distribution List Window

SIGNAL SETUP DETAILS

This section presents additional details about the NetWave signals and their VMCC settings, as previously outlined in the step-by-step instructions.

In Room & Community Names, Description

The In Room Name is always displayed on Source Selectors and Dual Routers that are hosted on the console's parent device. Each of these names can be up to ten alphanumeric characters long. This name is also used in other rooms when they are using Tier 1 naming conventions. See the VistaMax or Envoy manuals for more details on Tier naming.



The screenshot shows a configuration form with the following fields and values:

- Device Name: RMXd_20
- Device Number: 8
- Device Address: 137 . 237 . 207 . 8
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway Address: 137 . 237 . 207 . 67
- MAC Address: 00-00-00-00-00-00
- Call Sign: 8
- Discipline Prefix: AIR
- Console Size: 3 DSP
- Tier Naming Convention: Convention 1

Tier Naming Convention is set on each VistaMax device

The Community Name is displayed on devices hosted by devices using Tier 2 or Tier 3 naming conventions. The name is limited to four characters since it follows a three character Call Group prefix (which is set in the console's parent device main pane) and a Name Radix divider (set in the community pane).

The Description column is simply used to identify the signal in other VMCC screens. It is not used by the VistaMax system.

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

Signal Format (Stereo or Mono)

All NetWave AMP MOD IV audio connectors (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, being 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.

This stereo relationship is set by a checkmark in the *Link w/Next* column, which sets the signal as being **stereo linked** with the next signal. Typically, this is done on an odd-numbered signal with the next even numbered signal to ensure the two signals are on one connector.

To change a stereo signal into two mono signals, remove the checkmark in the *Link w/Next* column by double-clicking on it. The two signals will now be treated as two separate mono signals. When a mono signal is routed to a NetWave channel strip, it automatically appears on both the left and right channels.

Hidden Signals

On stereo signals, the right channel is *Hidden* so that only the one name (the left channel's) appears in source selector lists. A Hidden signal is one with a checkmark in the *Hidden* column. This means it is not available to be added to any signal include list.

To change the *Hidden* status, double-click on the checkmark to remove it, or double-click in the empty box to add a checkmark.

A quick way to set the checkmarks for an entire console is to click once to highlight a column entry and then use the keyboard space bar to check or uncheck that check box. Use the keyboard up and down arrow keys to quickly step through the list, pressing the spacebar as required to toggle the check box status.

Included Signal Lists

Only those signals without checkmarks in the *Hidden* column can be added to any include list. An Include List defines a group of signal sources or destinations. Include lists are used in the routers.ini file, the edgedevice.ini file, the init.mac file and in macro files. The source include list sets which signals are available for routing (i.e., in the edgedevice.ini file they set which ones are shown in the Dual Router and source selector displays). The destination include list, in the routers.ini file, sets which destinations can have signals routed to them.

To edit the NetWave console's signal list, highlight its parent device's name, then highlight the NetWave console's name in the Source Include Signals list. All of the unhidden source names appear in this list. Using standard Windows selection techniques, select the desired signals, then click the double right arrow key (>>) to add these signals to the parent device's Include Signals list. This makes the selected signals available to be routed to any VistaMax destination.

Repeat this procedure for the Destination Include List. Typically only the channels with Dual Router panels are included in this list.

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

Macro Files

Macro files are text files with the suffix .mac. Macro files created for the NetWave console are stored in the SesFiles folder on the VistaMax Server (storage card/DATA/SesFiles) assigned as the parent device for that console.

Macros can be created on the setup computer, or another computer, using a text-only editor like Windows® Notepad, and then transferred using

FTP Voyager (or other FTP program) to the VistaMax server.



Note: Macros can cause multiple audio and logic routes to occur when they are taken. They could also cause session or macro files to be loaded on any device in the system. Needless to say, macros are very powerful, causing signal routing changes to take place that may affect other users in the VistaMax system, so they should always be used with caution.

NETWAVE SIGNAL NUMBERS

Macro files use signal numbers to define sources and destinations. Thus, an understanding of how signals are identified in the NetWave console is essential. The *netwave_signal_numbers.pdf* file on the 99-5001 CD-ROM lists every possible NetWave source and destination signal number in a spreadsheet. A signal has one of 96 possible signal numbers, corresponding to which Hub card facet the Link cable is plugged into and which card frame slot the Hub card is in.

The examples that follow all show one NetWave console plugged into the card frame defined as device 40. The console's Link cable is plugged into facet 4 of Hub card 0.

The first page of the *netwave_signal_numbers.pdf* file shows the NetWave console's sources for Hub 0, facet 4, as being signal 257 (the console input set as Source 1, left channel) to signal 320 (cue, right channel).

Pages 4 - 6 of the PDF file show the destination numbers for NetWave consoles. Sources and destinations use the same number set, thus, for Hub 0, facet 4, destination 257 is the left-most Dual Fader channel (channel 1) while signal 308 (the last destination on a NetWave-24 console) is the right channel of External Monitor 2.

These signal numbers are used by VMCC to generate the setup files, and are shown in the **Local Signal #** column on the source and destination signal panes. The Device Number is listed on the main pane for each VistaMax device (NetWave consoles do not have separate device numbers, they use their parent's device number).

DUAL ROUTER SOURCES

For a source to appear on a Dual Router panel, that source signal number must be listed in the parent device's `routers.ini` file, as shown below:

```
[SrcInclude]
Include_1_1=D40.65,95,257,259,261,263-287
Include_1_2=D40.M1-6
```

The above example shows the sources and macros on a cardframe (device 40), which has one NetWave console connected to Hub 0, facet 4. Since this list might also include every source from every device in the VistaMax system, a more manageable list of sources, specific for each channel, is derived from this all-inclusive `routers.ini` file list. This include list is saved in the `edgedevice.ini` file, which is also stored on the parent device.

The `edgedevice.ini` file has a separate include list for each Dual Router channel that limits the number of sources one has to search through to find a useful source for each channel. This example was generated by the settings in the illustration on page 4-7:

```
Include_1_1_1=D40.71,73,87
Include_1_1_2=D40.M4-6
Include_2_1_1=D40.65-69,77,83,265,267,271
```

Since each Dual Router panel controls two channels, there are two sets of include lists shown above. The left channel has two entry lines (`Include_1_1_1=` and `Include_1_1_2=`) which separately list sources and macros. The right channel on the Dual Router panel uses the

`Include_2_1_1=` entry line to define the sources available to that channel.

The `routers.ini` and `edgedevice.ini` entries are automatically generated by VMCC, during provisioning, following the signals and macros that were included on the parent device's main pane and set in the Sources and Macros include pane for each Dual Router channel.

SECTION HEADERS

Macro files consist of sections, which are defined by a section header followed by one or more entry lines. The section header defines an action while the entry lines define what occurs. The most common macro section header used on a NetWave is `[RouterCommand_1]`. Here is an example of its use to route two signals between a cardframe and a NetWave console:

```
[RouterCommand_1]
take_1=D40.71,D40.265
take_2=D40.315,D40.93
```

The Router Command section defines routes. There can be only one Router Command section in a macro, but it can define up to 64 routes, from `take_1` to `take_64`, in numeric order.

For info on using other macro section headers, refer to the VistaMax or Envoy manual.

MACRO FILE ENTRY LINES

In the Router Command section, each route is defined by an entry line. Each entry line (`take_x=source,destination`) must be listed in numeric order and must be on a separate line. The sources and destination signals are identified by device number, a period and their local signal number (e.g., `D40.71`).

Comments can be added to macro entry lines to clarify what the entry line is for and help others understand the purpose of the macro:

```
[RouterCommand_1]
take_1=D40.71,D40.265;Hybrid C to CH5
take_2=D40.315,D40.93;MM1 to Hybrid C
```

Here, the comment lines clarify the two routes between Hybrid C and a NetWave console. This type of route is the most common usage for a macro on a NetWave console. The first line defines Take 1, which routes source signal 71 (an I/O card input on device D40, a VistaMax card frame that is the parent device for the NetWave) to destination signal 265. Signal 265, per the VMCC Signal Summary, is the channel 5 input for a NetWave console in Hub 0, facet 4.

Take 2 defines a route to send the mix-minus output of Telco 1 (console source signal 315) to destination signal 93 on device 40.

When this macro is taken, the signal from the Telco device (input 71 on a card frame) is routed to channel 5 (this channel 5 source was defined as Telco 1 during console setup). The Telco 1 mix-minus signal is then routed to the Telco device connected to output 93 on the card frame.

Each route in a Router Command section is taken, in order, when the macro file is loaded or taken. Macros can be loaded by using a command line interface on the setup computer or by taking the macro, just as if it were a source, on a Dual Router or a Source Selector panel.

Routes taken by a macro file are continuously maintained until another macro file is loaded that changes the source-to-destination routing or when a new source is selected on a Dual Router or a Source Selector panel for the destination. Routes are held, even if the console or its parent device loses power, by a “persistence file” that is constantly being updated as routes are taken.

Multiple Routes

The macro examples shown so far route one source to one destination, but any one source can be routed to multiple destinations by sim-

ply adding additional Take command lines.

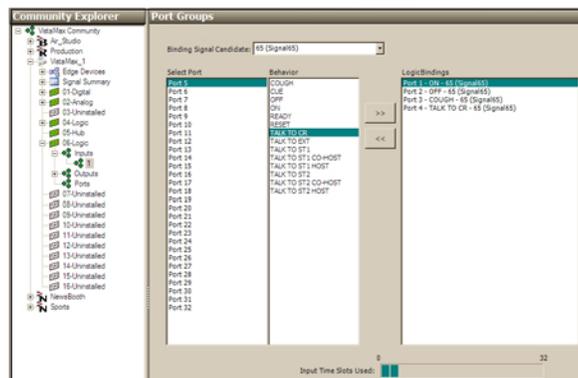
However, the converse does not apply: only one signal can be routed to a destination. Routing a second signal to a destination removes the first route’s signal, replacing it with the signal defined in the second route.

NetWave Logic Routing

When the channel’s signal source is set as Net Audio with Logic, the routed audio signal from the VistaMax system has logic commands embedded in the audio signal header to control the channel. The commands available to control a NetWave channel are: channel on/off, cue on, cough, ready, talk to CR and talk to Studio. Any other logic commands assigned in VMCC are ignored by NetWave channels.

Conversely, each NetWave channel sends logic commands to the VistaMax system using the header of that channel’s VistaMax source signal—even when that signal is not the active source for the channel. Typically, the only commands used are the channel on and channel off commands. They can be used to trigger VistaMax logic I/O card outputs to send out either Tally or pulse commands.

To do this, the logic signals are routed from the channel to a Logic I/O card using route commands. A typical example is shown on the next page:



VMCC, Showing Studio Mic Input Logic Assignments

```
[RouterCommand_1]  
take_1=D40.257,D40.130  
take_2=D40.259,D40.131
```

This shows the first two channels of a NetWave (connected to device 40, Hub 0, Facet 4) being routed to the first two timeslots of a logic card in slot 4 of an Envoy card frame (set as device 40). Here the NetWave channel audio is only used as a carrier, since it is the logic commands in the header that trigger the logic card outputs. What commands are output were set in the Logic Outputs pane of VMCC.

The VistaMax or Envoy manuals have additional information on VistaMax logic usage.



4 Linking the NetWave

Servicing NetWave

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 (see page 5-2 for part number listing). Assemblies are field-replaceable, but are not field-serviceable. All assemblies, or their circuit boards, must be returned to Harris for board-level repair.

NetWave technical information (selected schematics, PROM revision information, wiring diagrams, etc.) are available at this Internet support site: <ftp://ftp.pre.com>.

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

PARTS ORDERING AND REPAIR INFORMATION

Spare fader panels, main circuit boards and other assemblies can be purchased through a sales representative, the Harris parts department or through the Harris Technical Services Department. To expedite the ordering process and to ensure

the correct parts are ordered, have the Harris part numbers available when ordering. For a list of parts, see page 5-2. Control panels, circuit boards and assemblies may have long lead times, so order accordingly.

Control panels, circuit boards and assemblies returned to Harris 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, visit the Harris Broadcast Communications Division service website (www.broadcast.harris.com/support/fieldservice.asp), the Harris Premiere site (<https://premier.harris.com/broadcast/>) or call the Harris BCD parts department at 217.221.7500.

To request an RA to return a part for service, contact the Pacific Design Center office:

**Harris, Pacific Design Center
Technical Services Department
1493 Poinsettia Ave, Suite 143
Vista, CA 92081 USA**

**Service Phone: 760.936.4029
Fax: 760.936.4001
E-mail: presupport@harris.com**

www.broadcast.harris.com

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

SPARE AND REPLACEMENT PARTS

Main component locations are shown on page 5-8

Serviceable Assemblies

Harris #	Description or Use
90-1990-08	Standard Display Assembly, NetWave-8
90-1990-16	Standard Display Assembly, NetWave-16
90-1990-24	Standard Display Assembly, NetWave-24
90-2129	Dual Stereo Bargraph Meter PCA
90-2130	Clock & Event Timer PCA
99-1205	Rack mount 48-volt supply (2 RU)
99-1206	In-line 48-volt supply
99-1420	DSP & I/O card
99-1421	Monitor & Output card
99-1422	Monitor Control Panel
99-1423	Dual Fader Panel

Replacement Parts

Harris #	Description or Use
12-93	10-character display (Dual Selector or Dual Router)
17-122	Headphone jack (without wiring)
19-64	Flex Cable, 50-conductor (between DSP & I/O cards)
19-338	12" red CAT-5 cable (panel power & comm.)
21-226-10	PROM, Monitor Control panel
21-226-11	PROM, Dual Fader panel
21-226-12	PROM, dual meter PCA
21-226-13	PROM, clock-timer PCA
21-352-3	PROM, non-linked, Output & Monitor card
21-352-4	PROM, Link Activation, Output & Monitor card
21-352-5	PROM, DSP & I/O card
21-352-6	PROM, Link Plus Activation, Output & Monitor card
23-200	Cue speaker
30-13	IEC line cord (USA style plug)
32-725	Rotary control knob
32-726	Fader knob (silver, standard)
32-727	Fader knob (red)
32-728	Fader knob (green)
32-729	Fader knob (blue)
32-730	Fader knob (yellow)
38-307A	M3x6 chrome hex screw (panel and fader screws)
50-27	In-Line Power Supply (without IEC cord)
70-160	Set-Up Stylus Tool
75-54	NetWave Manual (printed version)
80-1752	Lens (two per Dual Fader panel)
80-1981-08	Palmrest (NetWave-8)
80-1981-16	Palmrest (NetWave-16)
80-1981-24	Palmrest (NetWave-24)
80-1982-1	Left side panel
80-1982-2	Right side panel
80-1983-08	Display window (NetWave-8)
80-1983-16	Display window (NetWave-16)
80-1983-24	Display window (NetWave-24)

Replacement Parts (cont.)

Harris #	Description or Use
80-1984-08	Reflector (NetWave-8)
80-1984-16	Reflector (NetWave-16)
80-1984-24	Reflector (NetWave-24)
80-1993-08	Connector access cover (NetWave-8)
80-1993-16	Connector access cover (NetWave-16)
80-1993-24	Connector access cover (NetWave-24)
90-1858-1	15-foot DC cable (99-1205 power supply to console)
90-1997	Cue Speaker assy (23-200 speaker and cable)
90-1872-1	H/P jack assy (17-122 jack and cable), NetWave-8
90-1872-2	H/P jack assy (17-122 jack and cable), NetWave-16
90-1872-3	H/P jack assy (17-122 jack and cable), NetWave-24
90-1998-1	Serial Console display cable (NetWave-8 & -16)
90-1998-2	Serial Console display cable (NetWave-24)
90-2125	Blank Panel, two slots wide
95-1044	Fader Assembly (Dual Fader and Monitor panels)

INSTALLATION KITS

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

76-1900-xx Installation Kit Parts

Harris #	Description	Qty for: -08	-16	-24
14-482	3-pin AMP MOD IV housing	12	20	28
14-484	6-pin AMP MOD IV housing	21	29	37
14-490	12-pin AMP MOD IV housing	8	16	24
14-492	14-pin AMP MOD IV housing	2	2	2
15-938-1	AMP MOD IV contact receptacles	286	454	622
80-2132	blank display lens	8	16	24

76-1901 Tool Kit (optional)

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

OPTIONAL UPGRADE KITS

These kits can be installed at the time of console installation or any time thereafter.

Harris #	Description or Use
99-1424	Dual Router upgrade (requires a Link Activation kit)
99-1425	Link Activation Kit
99-1426	Link Plus Activation Kit (for up to six Telcos)
99-1428-1	Dual Selector kit with 16X2 Source Selector
99-1990-16Q	Quad Meter Package for a NetWave-16
99-1990-24Q	Quad Meter Package for a NetWave-24

Control Panel Service

There is a diagnostic test mode built into each Dual Fader and Monitor Control panel that allows each button, fader and rotary pot to be individually tested to verify correct panel 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.

CONTROL TEST MODE

To enter the Control Test mode on a Dual Fader panel, within three seconds of applying power to the panel, 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 a Monitor panel, within three seconds of applying power, press and release the Timer **Start** button. To exit the Control Test mode, press the Timer **Start** and **Stop** buttons together.

When the Control Test mode is active, pressing any button alternately lights and turns off the LEDs in that button.

The bus select button LEDs (on Dual Faders) or the monitor select button LEDs (on the Monitor Control panel) display the binary output from one active fader or rotary pot (indicated by the lit yellow or red label above that fader or pot). With the control at full off, most or all of the LEDs are off. When the control is at full on, most or all of the LEDs are on). In between these points the LEDs cycle through a binary count. If all LEDs turn off anywhere in the middle of travel, it indicates a defective pot or fader element.

PANEL CONSTRUCTION

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

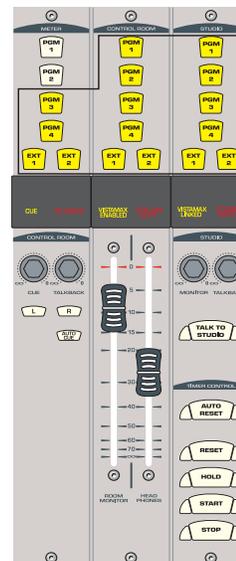
Dual Fader Panel, Fader Test



These LEDs display the fader output in binary code. Typically, all are on when the fader is at full on, and all are off when the fader is at full off.

The red LED above the fader (B or INC ALL) lights to indicate the which fader is being tested.

Monitor Panel, Fader Test



These LEDs display the binary output from the fader or pot under test. Typically, all light up when the fader/pot is at full on, and all are off when the fader/pot is at full off.

The label directly above the fader or pot lights to indicate which fader or pot is being moved.

Control panels are not a field-serviceable assembly, but they do have a limited number of field-replaceable parts. All replaceable parts (10-character display and lens, rotary and fader knobs, fader) are listed on page 5-2.

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 only

thing that may change are the fader levels, since these assume the new panel's settings. A replacement panel's faders/pots must be set the same settings as the panel being replaced when it is replaced while the console is on-air. Generally, it's best to turn off both channels prior to unplugging a Dual Fader panel.

Before removing the Monitor panel, it is recommended that the monitor speaker power amplifiers be turned off and headphones be unplugged.

REMOVING CONTROL PANELS

To remove a control panel from the frame:

- 1** Use a 2mm hex tool (70-57 or equivalent) to 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 fader to the bottom of its travel and lightly squeeze the fader knobs together to lift the panel up enough to unplug the red cable from the bottom of the panel. On Dual Router panels, a second *blue* cable will have to be unplugged as well.



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

Installing Control Panels

To install a control panel into the frame:

- 1** Remove the blank panel covering the slots where the control panel is to be installed.
- 2** Hold the panel so that the *red* cable can be plugged into J5 on the panel. On Dual Router panels, plug in the *blue* cable into J3.
- 3** 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.

- 4** Fasten the panel to the frame using the 38-307A silver hex screws removed previously.

FADERS

There are no replaceable nor 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, soft drink or other sugared liquid has gotten 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 it is reinstalled.

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, then the fader must be replaced as the design does not allow disassembly or relubrication.

Fader Removal and Reinstallation:

- 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 (70-57 tool).
- 3** Press down on the fader slider, or pull on the fader assembly from below, to unplug the problem fader from the control panel board.
- 4** Plug the replacement fader into the fader connector using pins 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 and the clock-timer boards are located on the under side of the Console Display, which is a subassembly that is fastened to the main frame behind the control panels.

Removing the Console Display

The console display must be removed from the frame to change display settings, to connect a master clock or a remote timer reset cable, or to install the Quad Meter Package.

Each of these activities require accessing the meter and clock-timer boards. The console should be powered off while removing and reinstalling the display assembly. Two padded surfaces (shop towels, etc.) are required for this procedure.

To remove the console display:

1. Flip-up the rear connector cover to access the two 4-40 Philips screws holding the reflector in place. Remove these screws (rear corners of the console display cover).
2. Lift the reflector out of its slot, by its edges only. Set it onto a padded surface to protect its mirrored surface.
3. Remove the console display cover screws (either two or four 4-40 Phillips screws, top along the rear). Remove the console display cover by lifting it straight up.
4. A smoked display window was sandwiched between the display cover and the main display subassembly. Set this off to the side.
5. Remove all of the console display subassembly mounting screws (4-40 Phillips) along the front of the subassembly. These sit just above the control panels. Use care when removing the screws.
6. To protect the control panels and console display subassembly, lay padded material over the top half of the control panels. Lift the console display subassembly up enough

to clear the frame, then rotate it forward laying it facedown on the padded material.

The console display subassembly is connected to the Monitor & Output board using two cables. Do not strain these cables while removing the subassembly and placing it on the control panels.



SAFETY NOTE: Touch the metal chassis to dissipate static before adjusting the multi-switches or plugging in a cable to J4. Do not touch any components on the boards other than the multi-switches or connectors.

Reinstall the console display in reverse order, making sure not to pinch any cables between metal parts. Align the smoked display window holes with the clock set holes. The console display cover holds the window in place.

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 J4 on the clock-timer board. If the clock is supposed to be autonomous, verify that DS1-2 and DS1-5 are both set off. See page 2-10 and 2-11 for information on the clock and DS1 switch settings.

Even though the ESE/SMPTE input on the clock is balanced, polarity of the incoming signal is important. If reversed, the master clock signal will not be detected. The + or hot lead must connect to J4, pin 5 and the - or shield lead must connect to J4, pin 6. If a balanced cable is used, 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. DS1-1 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 (LED is lit) on those channel sources that should be resetting the event timer.

METER TROUBLESHOOTING

Each meter is coupled through the clock-timer board for power and signals. There is a flat cable that connects the clock-timer (J6) to the Monitor & Output board (J23). If neither meter is working, shut down the console and remove the Console Display assembly and check that the meter and clock-timer boards are firmly connected and that both boards are securely fastened to the display assembly.

Check that the flat cable is properly plugged in at each end. Also check that the switches on multi-switch DS3 on the meter board are fully set to their on or off positions. The default settings for NetWave is all switches set to their off positions.

48-Volt Supplies

Periodically check that the vent openings on the 99-1205 rack mount 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 rack mount or on the top of the in-line power supply, indicates that its 48-volt DC output is good.



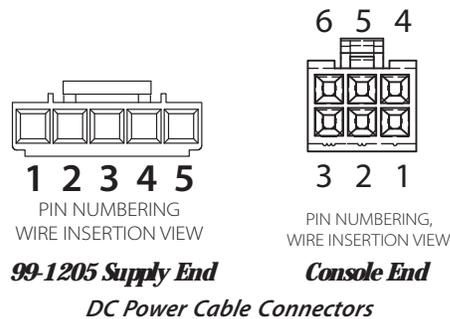
CAUTION: To reduce the risk of electric shock, do not disassemble the power supply. Refer servicing to qualified service personnel.

POWER SUPPLY CONNECTIONS

The in-line supply (99-1206) has a captive DC output cable, while the rack mount supply (99-1205) has a detachable DC cable. Both use the pinouts shown below for the 90-1858-1 cable, which is the interconnection cable that goes from the 99-1205 supply to the NetWave console.

90-1858-1 Cable Color Code/Pinout

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



Product Description

The +48 volts from a 99-1205 or a 99-1206 power supply plugs into J21 on the Monitor & Output card. When a redundant supply is used, a 90-1995 Redundant Coupler couples the two power supplies into the NetWave through a pair of low-voltage drop Schottky diodes.

48 volts is fed to the DSP boards, along with the various system bus signals, via 50-conductor flex cables. These tie the Monitor & Output card and the DSP & I/O cards together in series. The last DSP & I/O card (the DSP & I/O card farthest from the Monitor & Output card) has a 100 ohm resistor pack plugged into RN1 to terminate these bus signals.

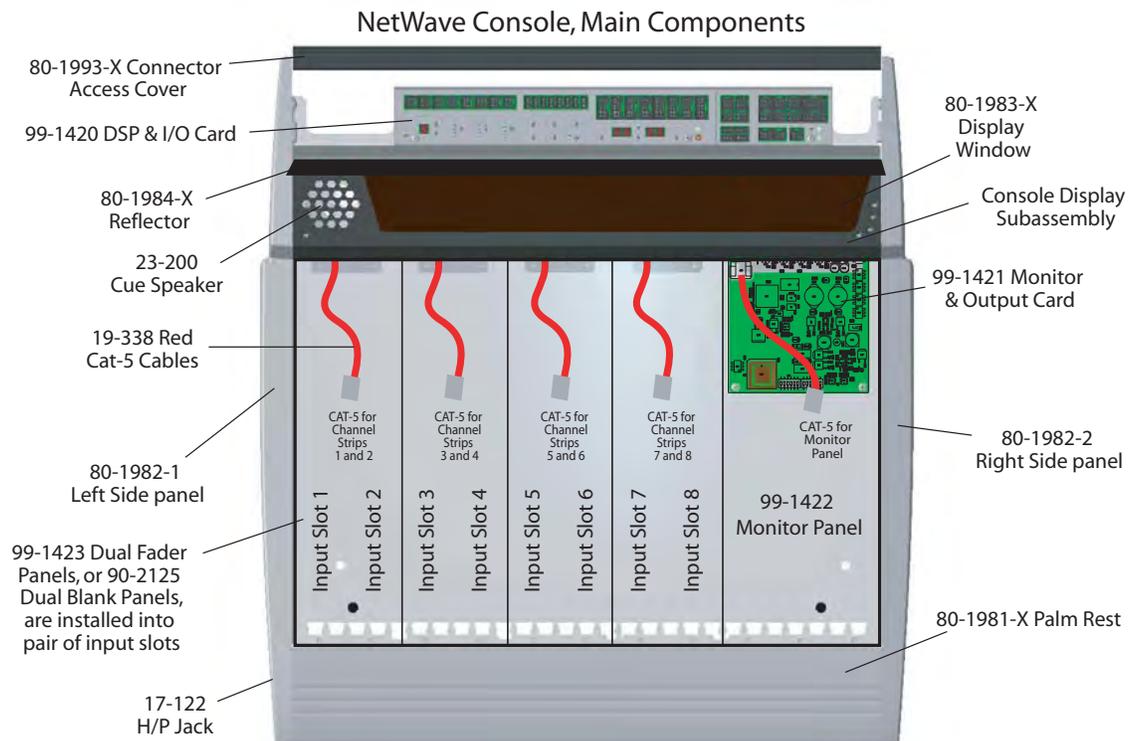
The +48 volts is routed to each control panel using pins 4 and 5 of RJ-45 jacks. Pin 7 is the 48 volt return. A balanced clock is on pins 1 and 2. Pins 3 and 6 are the bidirectional data lines. Pin 8 is used to sense that the panel is present.

Each card and panel has a DC-to-DC converter to convert the +48 VDC into other DC voltages required by the panels and cards. These include ± 17 VDC for analog circuits, +5 VDC for digital circuits and +3.3 VDC for FPGA circuits.

The Monitor Control panel uses a 12" red cable to plug into J28 on the Monitor & Output card for power and signals. Each Dual Fader panel position has a red cable plugged into a labeled jack on a DSP & I/O card. Each position in the frame has a red cable supplied with the frame.

Each DSP & I/O card handles signals from eight inputs. Channel control is done using the eight control strips, on the four Dual Fader panels plugged into that DSP & I/O card.

The Monitor & Output card also has DSP to sum the various system buses and then create 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



NOTE: Part numbers with an X suffix have three variations: use -08 for NetWave-8 parts, use -16 for NetWave-16 parts and -24 for NetWave-24 parts.

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 six Telco channels to the console.

MONITOR & OUTPUT CARD STATUS

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

- FAIL is off 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 & I/O cards.

The **Reset** button can be pressed to reset the console if unexpected operation occurs. This is equivalent to power cycling the console.

The Link connector has two LEDs (green and yellow) to indicate a good connection to a Hub card facet on a VistaMax or Envoy card frame. In addition, the Monitor Control panel label *VistaMax Linked* lights when a CAT-5 cable is properly connected to a Hub card, using a crossover CAT-5e cable.

DSP CARD STATUS

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

- DSP ACTIVE blinks with a “heartbeat rhythm” to indicate the DSP is active. The left-most DSP & I/O card’s LED will flash twice as fast as the LEDs on the other DSP & I/O cards to indicate it is the master DSP card.
- FAULT is off when the system is operating normally. If it is on, it indicates abnormal operation on that DSP & I/O card.

Service Setup Test Modes

The DSP & I/O card setup controls have three service modes available to help with service and maintenance of the NetWave console.

The first service mode is **Data Path Test**. It allows one set of parameters to be assigned to all eight channels on a DSP & I/O card. It is entered by pressing **Option + Channel Down** in any setup mode. If the Changes Pending LED was blinking, the 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 & I/O 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 out to *Parameter Set Mode*, then press **Store** to return the card to *Sleep Mode*.

The second service mode is **DSP & I/O User Interface Test**. It is used to verify that the LEDs, displays and switches on the DSP & I/O 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 & I/O 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*.

The third service mode is **Factory Reset**. It resets the 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 the 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.

NetWave Accessories

Harris offers a number of accessories and services to complement the NetWave console. Products range from the Envoy cardframe (which can network multiple NetWave consoles together into a facility-wide network), to the 16X2 Source Selector and Dual Selector kit (which adds sixteen source selection to any Dual Fader panel), to the 4X-A2D (four-way A/D converter to use analog signals on digital inputs), to various studio mic control panels, peripheral control panels, headphone jack and level control panels (which integrate with the Harris 3x6 headphone distribution amp). Harris services range from supplying logic wiring diagrams for common peripheral devices to complete system wiring design and installation packages.

Furniture and Cabinetry

Harris offers a full line of standard and custom furniture and cabinetry specifically designed to integrate the NetWave console with studio peripheral

equipment. Complete turnkey studio design and implementation services are also available.

Contact your Harris sales representative for additional information.

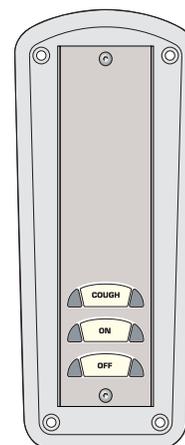
Accessory Panels

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

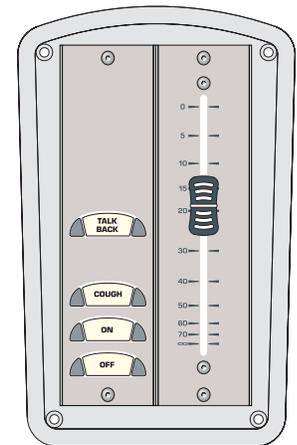
There are two types of cabinet skirt-mounted headphone panels (jack-only and jack with rotary level control). Custom-designed switch and indicator panels are also available.

The 99-1788-1 Single Cabinet Plate (shown below) allows any single 1.6" x 6" panel to mount in a countertop. The 99-1788-2 Dual Cabinet Plate

CABINET PLATE APPLICATION EXAMPLES

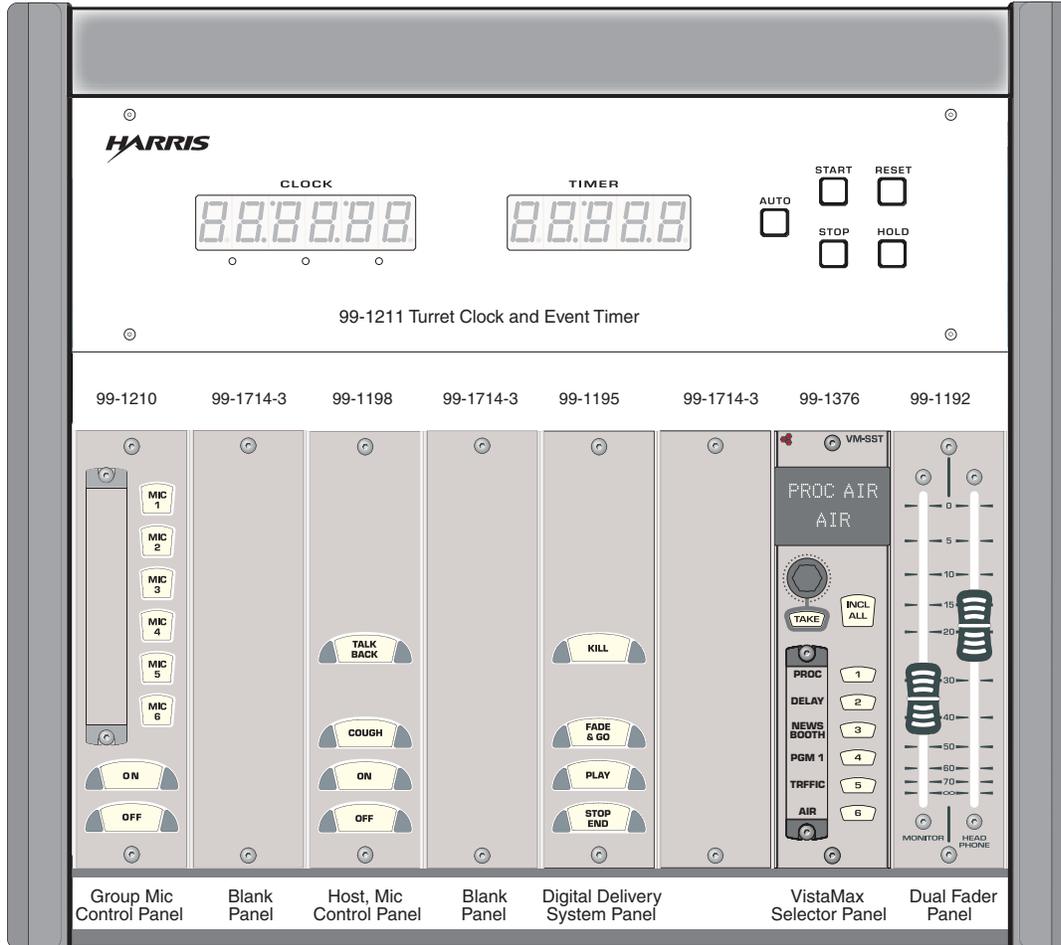


99-1788-1 SINGLE POSITION CABINET PLATE (SHOWN WITH A 99-1197)



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

99-1213 STUDIO CONTROL TURRET, APPLICATION EXAMPLE



allows two 1.6" panels or a 3.2" double-width panel to mount into a countertop.

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

MIC REMOTE CONTROL PANELS

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

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

HOST TURRET

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

Some of the most commonly used Accessory panels, as shown in the Host Turret example above, are the Group Mic panel (99-1210) with On/Off control for up to six microphones; a host mic con-

control panel with talkback button (99-1198); an automation panel to control a news actuality machine or a digital delivery system; a VistaMax source selector (99-1376) to control the monitor source for the studio; and a Dual Fader panel (99-1192) for host control of the studio speakers and host headphone levels. Three, four, five and six button automation control panels are available to remotely control tape machines, news actuality servers, digital delivery systems, delay units, etc.

Headphone Distribution Amp

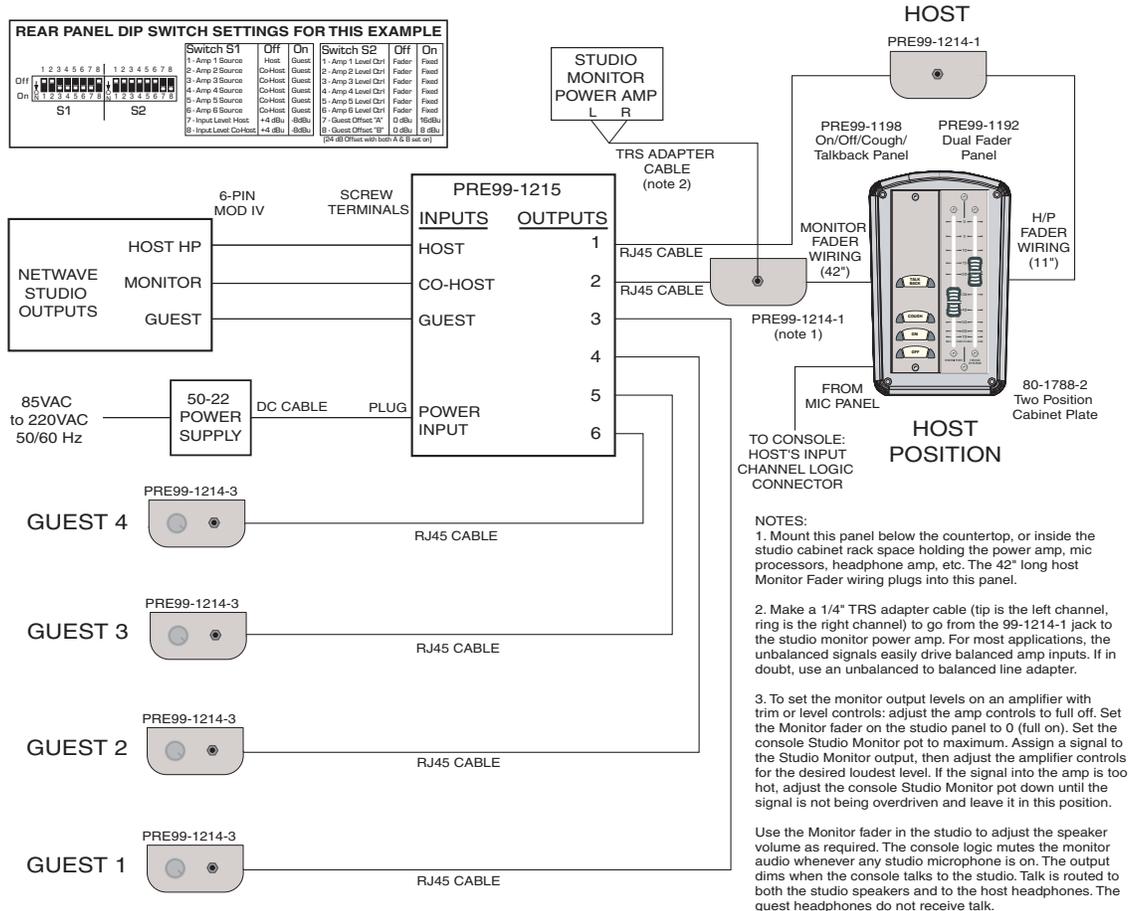
The 99-1215 Harris Headphone amp, originally designed for the BMX*digital* console, can be repurposed to not only create a headphone amp

system for the studio, but to also give studio speaker level control to the studio host position.

The 99-1215 has six outputs (typically for one host and five guests, but in this application for one host, four guests and one studio monitor amplifier) that connect to Harris 99-1214-x headphone panels using CAT-5 cables.

The following illustration shows how to use the 99-1215 headphone system with the NetWave. The three inputs (Host, Co-Host and Guest) connect to the NetWave console studio outputs: Host HP, Monitor and Guest HP. By properly setting the two rear panel switches (S1 and S2) per the illustration, the headphone amp outputs are assigned as: Host (#1), studio monitor (#2), and up to four Guests (outputs #3 to #6).

USING A 99-1215 HEADPHONE AMPLIFIER WITH A NETWAVE CONSOLE, INCLUDING USING IT FOR MONITOR SPEAKER LEVEL BY THE HOST



The Dual Fader panel (99-1192), used to control both the host's headphone level and the studio monitors level, can mount in a Studio Control Turret or in a Harris cabinet plate. When the NetWave is part of a VistaMax system, a Two-Position cable plate (80-1788-2) can be used to also hold a 99-1376 VistaMax Source Selector to allow the host to select the studio monitor source.

The studio monitor amplifier connects using a 99-1214-1 headphone panel TRS jack. The output level is controlled by the Monitor fader on the Dual Fader panel.

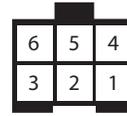
The guests plug their headphones into the 99-1214-3 headphone panels which have a volume pot on the panel next to the TRS jack.

ESE/SMPTE Master Clock

As shipped from the factory, the NetWave clock is autonomous, running off an internal timebase. The clock can be synchronized to an ESE TC-89, ESE TC-90 or SMPTE master timecode signal. To do this requires that the console display be removed from the chassis so that a facility-supplied ESE or SMPTE timecode cable can be plugged into J4 on the Clock-Timer board.

In addition, DS1 switch settings must be set to activate the timecode input. To use ESE timecode,

Clock-Timer PCA connector J4 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/EMPTPE 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.

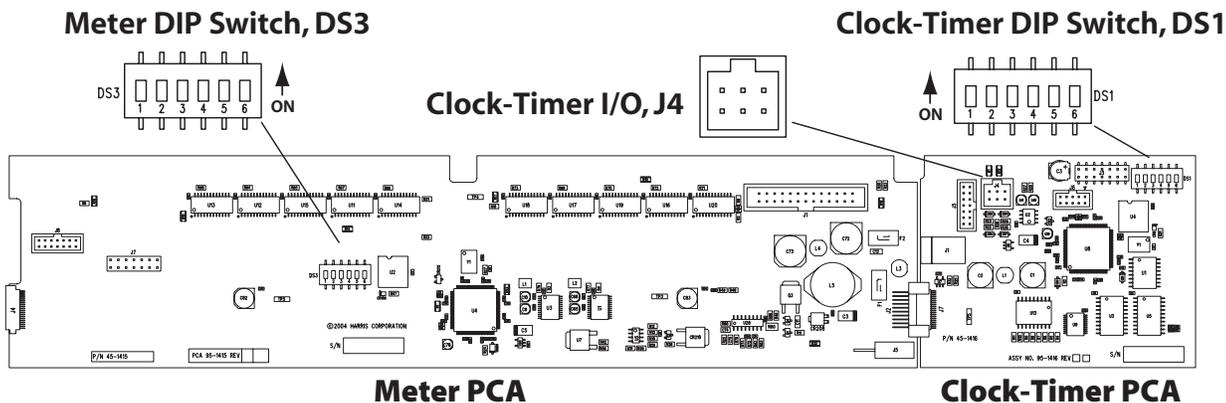
Pin 4. Typically not connected on a NetWave. Used to power a studio timer panel.

Pins 5 & 6. Master clock input. Any SMPTE, ESE TC-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.

DS1-2 must be set to On. Either TC-89 or TC-90 timecode can be used. The clock autodetects which version is being received.

If SMPTE timecode is used, set DS1-5 to on and make sure DS1-2 is set to off. If both DS1-2 and DS1-5 are set on, then the clock is set for ESE timecode.

The clock's ESE/SMPTE signal input is balanced, so either a balanced or an unbalanced signal can be used. See the above drawing for connection details.



Console Display PCAs, showing J4, used for connecting an ESE or SMPTE master clock signal

Quad Meter Kit

The standard NetWave console display has two stereo bargraph meters to simultaneously display PGM 1 and another bus or external signal selected by the Meter selector buttons on the Monitor Panel.

On the NetWave-16 and NetWave-24 consoles, two additional meters, in a Quad meter kit, can be added to simultaneously display PGM 1, PGM 2, PGM 3 and the Monitor Panel selected source.

The 99-1990-16Q kit is for the NetWave-16 and 99-1990-24Q kit is for the NetWave-24. Quad Meter Kit.

Quad A/D Converter

The 4X-A2D (99-1430) can be used to convert four analog signals into digital signals in order to use the digital inputs on the NetWave with analog signals. The box, roughly the size of two decks of cards, can be mounted below the furniture near the console.

The 4X-A2D is available in two kits: 99-1430-1, which includes short patch cables to plug directly into the NetWave digital inputs and connectors to make up custom input cables; and 99-1430-2, which includes 20-foot input and output cables (terminated in the MOD IV connectors that the 4X-A2D uses) so that the 4X-A2D can be placed between the console and its source, or used with other peripherals.

Dual Selector Kit

A Dual Selector Kit expands the number of inputs available to stand-alone (non-Linked) NetWave consoles. A Dual Selector Kit (99-1428-1) can be installed into any Dual Fader panel to control source selection on a 16X2 Selector, a one RU box with sixteen inputs (each individually set

for an analog or a digital input) and two digital outputs. The two outputs connect to the two digital inputs controlled by the Dual Selector panel.

Each fader on the Dual Selector can choose between the sixteen selector inputs and its own local analog input.

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 and from the console and an Envoy or VistaMax.

The Link Activation kit is 99-1425. The Link Plus Activation kit, which also adds the ability to have six Telco channels, is 99-1426.

Dual Router Kit

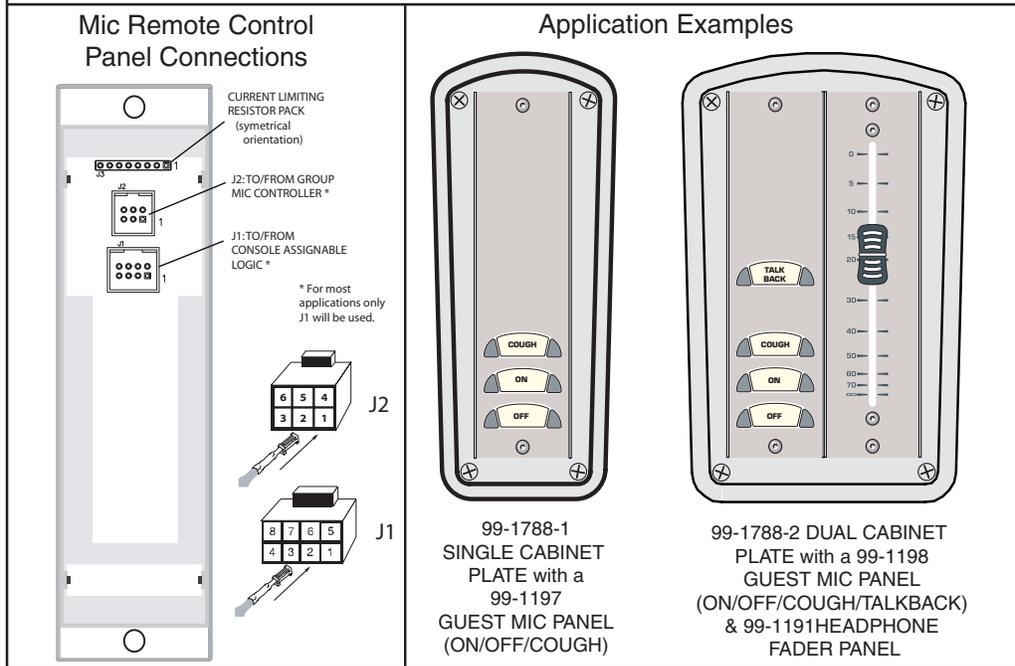
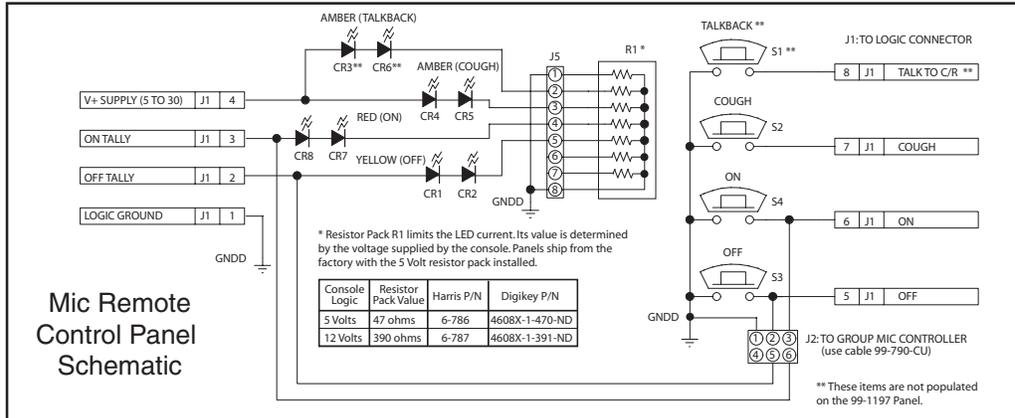
On NetWave consoles with a Link Activation kit installed, any Dual Fader panel can have a Dual Router kit (99-1424) to effectively add a dual VistaMax source selector to those two fader channels. If desired, multiple Dual Router kits can be installed in a console for maximum signal source selection flexibility.

NetWave Toolkit

The optional NetWave Tool Kit (76-1901) 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 Harris-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 BMX*digital* and RMX*digital* consoles and VistaMax cardframes.

MIC REMOTE CONTROL PANEL INFORMATION (FOR 99-1197 AND 99-1198)



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

NETWAVE CHANNEL LOGIC CONNECTOR		99-1197 or 99-1198 MIC CONTROL PANEL	
SIGNAL	PIN	PIN	SIGNAL
Logic Ground	1	1	Logic GND
Off Tally	5	2	Off Tally
On Tally	11	3	On Tally
+5 VDC Supply	7	4	Power Supply
Off Switch (-)	3	5	Off Switch
On Switch (-)	9	6	On Switch
Cough Switch (-)	8	7	Cough Switch
Talk to C/R (-)	2	8	Talkback Switch
Tally Common	6		
+5 VDC supply	12		
Enable Logic Inputs (+)	4		
+5 VDC Supply	10		

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

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