# YAMAHA

**DIGITAL MIXING CONSOLE** *O2R96*

*Version 2*

# Owner's Manual

**Keep This Manual For Future Reference.**

EN

# Important Information

## Warnings

- Connect this unit's power cord only to an AC outlet of the type stated in this Owner's Manual or as marked on the unit. Failure to do so is a fire and electrical shock hazard.
- Be sure to connect to an appropriate outlet with a protective grounding connection. Improper grounding can result in electrical shock.
- Do not allow water to enter this unit or allow the unit to become wet. Fire or electrical shock may result.
- Do not place heavy objects, including this unit, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.
- Do not place a container with liquid or small metal objects on top of this unit. Liquid or metal objects inside this unit are a fire and electrical shock hazard.
- This unit is equipped with a dedicated ground connection to prevent electrical shock. Before connecting the power plug to an AC outlet, be sure to ground the unit. If the power cord has a three-pin plug, it will provide sufficient grounding so long as the AC outlet is grounded correctly.
- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- Do not remove the unit's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not modify the unit. Doing so is a fire and electrical shock hazard.
- If lightning begins to occur, turn off the power switch of the unit as soon as possible, and unplug the power cable plug from the electrical outlet.
- If there is a possibility of lightning, do not touch the power cable plug if it is still connected. Doing so may be an electrical shock hazard.
- Use only the included power cord for this unit. Using other types may be a fire and electrical shock hazard.
- The 02R96 has four rear-panel slots for installing mini-YGDAI cards. For technical reasons, certain card combinations are not supported. Before installing any cards, check the Yamaha web site to if your card is compatible. Installing cards that are not endorsed by Yamaha may cause electrical shock, fire, or damage to the unit.
- If the power cord is damaged (i.e., cut or a bare wire is exposed), ask your dealer for a replacement. Using the unit with a damaged power cord is a fire and electrical shock hazard.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the unit, turn it off immediately. Remove the power cord from the AC outlet. Consult your dealer for repair. Using the unit in this condition is a fire and electrical shock hazard.
- Should this unit be dropped or the cabinet be damaged, turn the power switch off, remove the power plug from the AC outlet, and contact your dealer. If you continue using the unit without heeding this instruction, fire or electrical shock may result.

## Cautions

- Keep this unit away from the following locations:
  — Locations exposed to oil splashes or steam, such as near cooking stoves, humidifiers, etc.
  — Unstable surfaces, such as a wobbly table or slope.
  — Locations exposed to excessive heat, such as inside a car with all the windows closed, or places that receive direct sunlight.
  — Locations subject to excessive humidity or dust accumulation.

- Hold the power cord plug when disconnecting it from an AC outlet. Never pull the cord. A damaged power cord is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- This unit has ventilation holes along the front underside and at the rear to prevent the internal temperature from rising too high. Do not block them. Blocked ventilation holes are a fire hazard. In particular, do not operate the unit while it's on its side, is upside down, or while it's covered with a cloth or dust sheet.
- If you are using the optional MB02R96 Peak Meter Bridge, do not hold only the MB02R96 when moving the 02R96. Otherwise, the meter brackets may be damaged, the main unit may malfunction, or you may be injured if the unit falls.
- This unit is heavy. Use two or more people to carry it.
- When you transport or move the 02R96 with the MB02R96 attached, do not permit impact or stress on the cable connector that connects the MB02R96 to the 02R96. Otherwise, malfunction may occur.
- To relocate the unit, turn the power switch off, remove the power plug from the AC outlet, and remove all connecting cables. Damaged cables may cause fire or electrical shock.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level. When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- If you know you will not use this unit for a long period of time, such as when going on vacation, remove the power plug from the AC outlet. Leaving it connected is a potential fire hazard.
- The inside of the unit should be cleaned periodically. Dust accumulation inside the unit may cause malfunction and is a potential fire hazard. Consult your dealer for information about cleaning.
- To prevent electrical shock when cleaning the unit, remove the power plug from the AC outlet.
- Do not apply oil, grease, or contact cleaner to the faders. Doing so may cause problems with electrical contact or fader motion.
- Do not use the headphones for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.

## Operating Notes

- XLR-type connectors are wired as follows: pin 1–ground, pin 2–hot (+), and pin 3–cold (−).
- Insert TRS phone jacks are wired as follows: sleeve–ground, tip–send, and ring–return.
- The performance of components with moving contacts, such switches, rotary controls, faders, and connectors, deteriorates over time. The rate of deterioration depends on the operating environment and is unavoidable. Consult your dealer about replacing defective components.
- Using a mobile telephone near this unit may induce noise. If noise occurs, use the telephone away from the unit.
- If the message "WARNING Low Battery!" appears when you turn on this unit, contact your dealer as soon as possible about replacing the internal data backup battery. The unit will still operate correctly, but data other than the presets will be lost.
- Before replacing the batteries, back up your data to a memory card, or another unit by using MIDI Bulk Dump.
- The digital circuits of this unit may induce a slight noise into nearby radios and TVs. If noise occurs, relocate the affected equipment.

- When connecting D-sub cables, be sure to tighten the screws on both sides of the connector securely. To disconnect the cable, loosen the screws completely, then remove the cable by holding the connector part. Do not remove the plug by pulling the cable while the screws are still attached. Otherwise, the connector may be damaged, leading to malfunction.
- When you change the wordclock settings on any device in your digital audio system, some devices may output noise, so turn down your power amps beforehand, otherwise your speakers may be damaged.

## Interference

The 02R96 uses high-frequency digital circuits that may cause interference on radio and television equipment located nearby. If interference is a problem, relocate the affected equipment. Using a mobile telephone near the unit may induce noise. In this case use the telephone away from the unit.

## 02R96 Exclusion of Certain Responsibility

Manufacturer, importer, or dealer shall not be liable for any incidental damages including personal injury or any other damages caused by improper use or operation of the 02R96.

## Trademarks

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## Copyright

## Yamaha Web Site

Further information about the 02R96, related products, and other Yamaha professional audio equipment is available on the Yamaha Professional Audio Web site at: <http://www.yamahaproaudio.com/>.

## Package Contents

- 02R96 Digital Mixing Console
- CD-ROM
- Power cord
- This manual
- Studio Manager Installation Guide

## Optional Extras

- MB02R96 Peak Meter Bridge
- SP02R96 Wooden Side Panels
- mini YGDAI I/O cards

## About this Owner's Manual

This *Owner's Manual* covers the 02R96 Digital Mixing Console.

All the information you need in order to operate the 02R96 Digital Mixing Console is contained in this manual. Use the table of contents to familiarize yourself with the manual's organization and to locate tasks and topics, and use the index to locate specific information. Before diving in, it's recommend that you read the "Operating Basics" chapter, starting on page 43.

Each chapter of this manual discusses a specific section or function of the 02R96. The Input and Output Channels are explained in the following chapters: "Input Channels," "Bus Outs," "Aux Sends," and "Stereo Out." Where possible, these chapters have been organized in order of signal flow, from input through to output.

Functions such as EQ and Delay are common to all channels. Rather than repeat the same information over and over, these functions are explained once in the "Common Channel Functions" chapter, which starts on page 107. The Input Channels, Bus Outs, Aux Sends, and Stereo Out chapters contain cross-references to the relevant sections of the "Common Channel Functions" chapter.

## Conventions Used in this Manual

The 02R96 features two types of button: physical buttons that you can press (e.g., ENTER and DISPLAY) and buttons that appear on the display pages. References to physical buttons are enclosed in square brackets, for example, "press the [ENTER] button." References to display page buttons are not emphasized, for example, "press the ENTER button."

Display pages can be selected by using the [DISPLAY] buttons or the Left Tab Scroll, Right Tab Scroll, and F1–4 buttons below the display. In order to simplify explanations, only the [DISPLAY] button method is mentioned in the procedures. See "Selecting Display Pages" on page 45 for details on all the ways in which pages can be selected.

## Installing the 02R96

The 02R96 should be placed on a strong and stable surface, somewhere that complies with the warnings and cautions listed in the previous sections.

## New Functions in 02R96 Version 2

The following functions have been added to the 02R96 as part of the upgrade of the firmware from version 1.2 to version 2.0.

### Control Surface

- Encoder mode now features an assignable function, ALT LAYER, which enables you to control the channel level for all 48 channels without switching between layers.  → page 50
- There are now 48 assignable Encoder mode parameters.  → page 52

### Input Channels

- Surround Pan supports 6.1 Surround.  → page 85
- You can change the bus assigned to each surround pan channel.  → page 87
- The Fader Group Master function enables you to control the overall level of the Fader group channels simultaneously while maintaining the relative level balance of each channel.  → page 80
- The Mute Group Master function enables you to mute all channels in a Mute group simultaneously.  → page 79
- The on/off status of the Follow Pan button is reflected in the pan and Surround Pan settings.  → page 82

## Aux Sends

- You can exclude channels from Aux Sends (Mix Minus). → page 104
- You can copy the channel fader positions to Aux Sends. → page 104
- You can set all Send levels to nominal simultaneously. → page 99
- If an Aux Send is set to pre-fader, you can set the Pre point before or after the [ON] button. → page 99

## Common Channel Functions

- Input and Output Channel Meter pages indicate the gain reduction being applied by the Gate and Compressor. → page 108
- You can select whether the Input Channel's Pan setting is used when the Input Channel Solo signal is set to Pre Fader. → page 121
- Raising the channel faders for soloed Channels from –∞ can unsolo the Channels. → page 121
- The AUX SELECT [AUX 1]–[AUX 8] buttons enable you to solo or unsolo Aux Sends. → page 121
- The Fader Group Master function enables you to control the overall level of the Fader group channels simultaneously while maintaining the relative level balance of each channel. → page 127
- The Mute Group Master function enables you to mute all channels in a Mute group simultaneously. → page 129

## Monitor

- The level of the Surround Monitor can be reset to 85dB SPL. → page 138
- A new parameter has been added to Base Management on the Surround Monitor Setup page. → page 140
- Surround Monitor is also available when Surround mode is set to Stereo.
- You can simultaneously select BUS and SLOT on the Surround Monitor page.
- You can select from Slot Channel 9 through Channel 16 as Surround Monitor signal sources.
- You can simultaneously select 2TRD, D2, D3, A1, or A2, and STEREO, ASSIGN1, or ASSIGN2 as Control Monitor signal sources.
- You can select the Talkback mic signal as the Studio Monitor source. → page 142

## Internal Effects and Plug-ins

- You can add optional Add-On Effects to the preset effects. → page 157

## Scene Memory

- You can globally apply the Fade Time setting to all scenes. → page 166
- You can globally apply the Recall Safe setting to all scenes. → page 167
- Any channel or parameter settings in the current scene can be copied and pasted into other scenes. → page 168
- You can select more parameters for the Recall Safe function. → page 167

## Automix

- You can insert the current mix parameters in a region specified in the Automix data. → page 180
- Touching the faders can punch parameter values in and out if the corresponding OVERWRITE button is set to on. → page 171
- A parameter related to timecode synchronization has been added. → page 234

## Remote Control

- The Joystick or the controls in the SELECTED CHANNEL section enable you to control Pro Tools Surround Pan settings.
- The USER DEFINED KEYS enable you to switch windows in the included Studio Manager application software.

## Other Functions

- A user-assignable layer enables you to assign Channels to Remote layer targets. → page 228
- You can also select General DAW (for DAW software that supports the Pro Tools protocol) or Cubase SX as the target for a Remote layer. → page 219
- Yamaha's proprietary Advanced DAW protocol has been added to Nuendo, Cubase SX, and General DAW. This enables you to control these devices using the 02R96's SELECTED CHANNEL section. (Controllable functions vary depending on the DAW software and version you are using.)
- You can now assign any of 174 functions to the USER DEFINED KEYS. → page 238
- You can assign the selected channels to a Fader or Mute group using the USER DEFINED KEYS. → page 238
- An Operation Lock function prevents unintentional edits and uses a password to restrict access to panel operation. → page 235
- The Oscillator can output sine wave signals with different frequencies to the L and R channels and odd and even buses. → page 234
- You can set the Auto Direct Out On check box so that if you change a channel's Direct Out destination, the channel Direct Out will automatically be enabled. → page 231
- You can set the Routing ST Pair Link check box so that the routing from paired Channels to the Stereo Bus is linked. → page 231

# Contents

# 1  Welcome

Thank you for choosing the Yamaha 02R96 Digital Mixing Console.

The 02R96 Digital Mixing Console offers 24-bit/96 kHz digital audio processing without compromise, comprehensive surround mixing and monitoring, including bass management, and hands-on control of popular DAW (Digital Audio Workstation) systems.

## Sonic Spec

- Linear 24-bit, 128-times oversampling A/D converters
- Linear 24-bit, 128-times oversampling D/A converters
- 20 Hz–40 kHz (0.5, –1.5 dB) frequency response at 96 kHz sampling rate
- 105 dB typical dynamic range (AD Input to Stereo Out)
- 32-bit internal signal processing (58-bit accumulator)

## Channel Architecture

- 56 Input Channels, with Direct Outs
- 8 Bus Outs, with to Stereo Out routing for subgrouping
- 8 Aux Sends
- Stereo Out
- Channels can be named for easy identification
- Channel library with 127 user memories

## I/O Architecture

- 16 analog mic inputs on balanced XLRs (plus 48 V phantom) 24 analog line inputs on balanced phone jacks
- 16 analog inserts
- 32 inputs, 32 outputs via four mini-YGDAI slots and optional I/O cards, which offer a variety of analog and digital I/O options, with support for all the popular digital audio interconnect formats, including AES/EBU, ADAT, Tascam TDIF-1, and mLAN.
- 8 assignable Omni outputs
- 1 AES/EBU, 2 Coaxial 2-track digital input, with sampling rate converters for connecting 44.1/48 kHz legacy digital audio equipment
- 1 AES/EBU, 2 Coaxial 2-track digital output
- 2 analog 2-track inputs
- XLR and phono connector stereo outputs
- Control room monitor outputs
- Dedicated studio monitor outputs
- Double channel digital I/O for use with legacy 44.1/48 kHz multitrack recorders
- Cascade ports for cascading up to four 02R96s (i.e., 224 Input Channels)

### I/O Patching

- Any available input port can be patched to the Input Channels, Insert Ins, or Effects inputs
- Direct Outs, Insert Outs, Bus Outs, Aux Sends, and the Stereo Out can be patched to any output port
- Input and output ports can be named for easy identification
- Patches can be stored in the Input and Output Patch libraries

### EQ

- 4-band parametric EQ on all Input and Output Channels
- EQ library with 40 presets, 160 user memories

### Groups & Pairs

- Horizontal and vertical pairing of Input Channels
- Horizontal pairing of Bus Outs, Aux Sends, and Surround Pan
- 8 Input Channel, 4 Output Channel Fader groups
- 8 Input Channel, 4 Output Channel Mute groups
- 4 Input Channel, 4 Output Channel EQ groups
- 4 Input Channel, 4 Output Channel Compressor groups

### Effects

- 4 internal effects processors
- Effects library with 61 presets, 67 user memories (presets 53–61 are used for optional Add-On Effects.)
- Optional Add-On Effect package includes effects that featuring new algorithms.
- Multichannel effects for surround sound processing
- Joystick control of early reflections and reverb with the Reverb 5.1 effect
- Optional Waves 56K effects plug-in cards
- User defined plug-ins for external effects control via MIDI, with Learn function

### Dynamics

- Gates on all 56 Input Channels
- Gate library with 4 presets, 124 user memories
- Compressors on all Input Channels and Out Channels (74 in total)
- Compressor library with 36 presets, 92 user memories

### Automation

- Dynamic automation of virtually all mix parameters, with 1/4-frame accuracy
- Automix library with 16 memories
- Snapshot style automation with 99 Scene memories, recallable via MIDI or Automix
- Individual fade time settings for all Input and Output faders
- Scene and library recalls
- Punch in/out entire channels with dedicated [AUTO] buttons, or individual parameters
- Editing fader moves with Fader Return, Fader Takeover, Absolute/Relative modes
- Offline event editing includes, erase, copy, move/merge, trim, duplicate, delete, and insert

### Surround Sound

- 3-1, 5.1 and 6.1 Surround modes
- Joystick control
- Bass management
- Monitor matrix
- Surround monitor speaker alignment functions
- Surround monitor library with 32 user memories

### Remote Control

- Control and manage your 02R96 from your Mac or PC by using the bundled Studio Manager software
- Remote Layers for external equipment control, including predefined targets for controlling DAW systems, and user defined targets for controlling MIDI equipment, with Learn function
- Comprehensive machine control via MMC, including transport, track arming, jog/shuttle, and built-in locator with eight Locate memories
- Assignable GPI (General Purpose Interface) port for external control and "Recording" light

### MIDI

- Standard MIDI ports, USB TO HOST port, or SERIAL TO HOST port
- USB, and SERIAL offer multiport operation
- Scene recall, mix parameter control, Bulk Dump, MTC and MIDI Clock for Automix synchronization, MMC for external machine control

### Control Surface

- 25 touch-sensitive 100-mm motorized faders (touch sense used to select channels or punch faders in/out during Automix recording)
- Use the faders to set channel levels or Aux Send levels
- Use the 24 Encoders to control Pan, Aux Send levels, or user assigned parameters
- Channels arranged into two Input Layers, Master Layer, and Remote Layer
- 320 x 240 dot LCD display with fluorescent backlight
- Complete hands-on control of all channel functions via the SELECTED CHANNEL section
- 2-digit Scene memory display
- 4 EQ displays for frequency, gain, and Q
- 16 user-definable buttons make light work of repetitive tasks

# 2 Control Surface & Rear Panel

## Control Surface



Labels around the control surface diagram:

- Monitor, Phones & Talkback Section (p. 34)
- MONITOR Section (p. 34)
- SCENE MEMORY (p. 31)
- MACHINE CONTROL (p. 32)
- Data Entry & Transport (p. 33)
- SELECTED CHANNEL Section (p. 26)
- STEREO (p. 30)
- LAYER (p. 30)
- USER DEFINED KEYS (p. 31)
- Channel strips (p. 20)
- Display Section (p. 25)
- AD Input Section (p. 20)
- DISPLAY ACCESS (p. 23)
- AUX SELECT (p. 21)
- ENCODER MODE (p. 22)
- FADER MODE (p. 22)
- EFFECTS/PLUG-INS (p. 24)
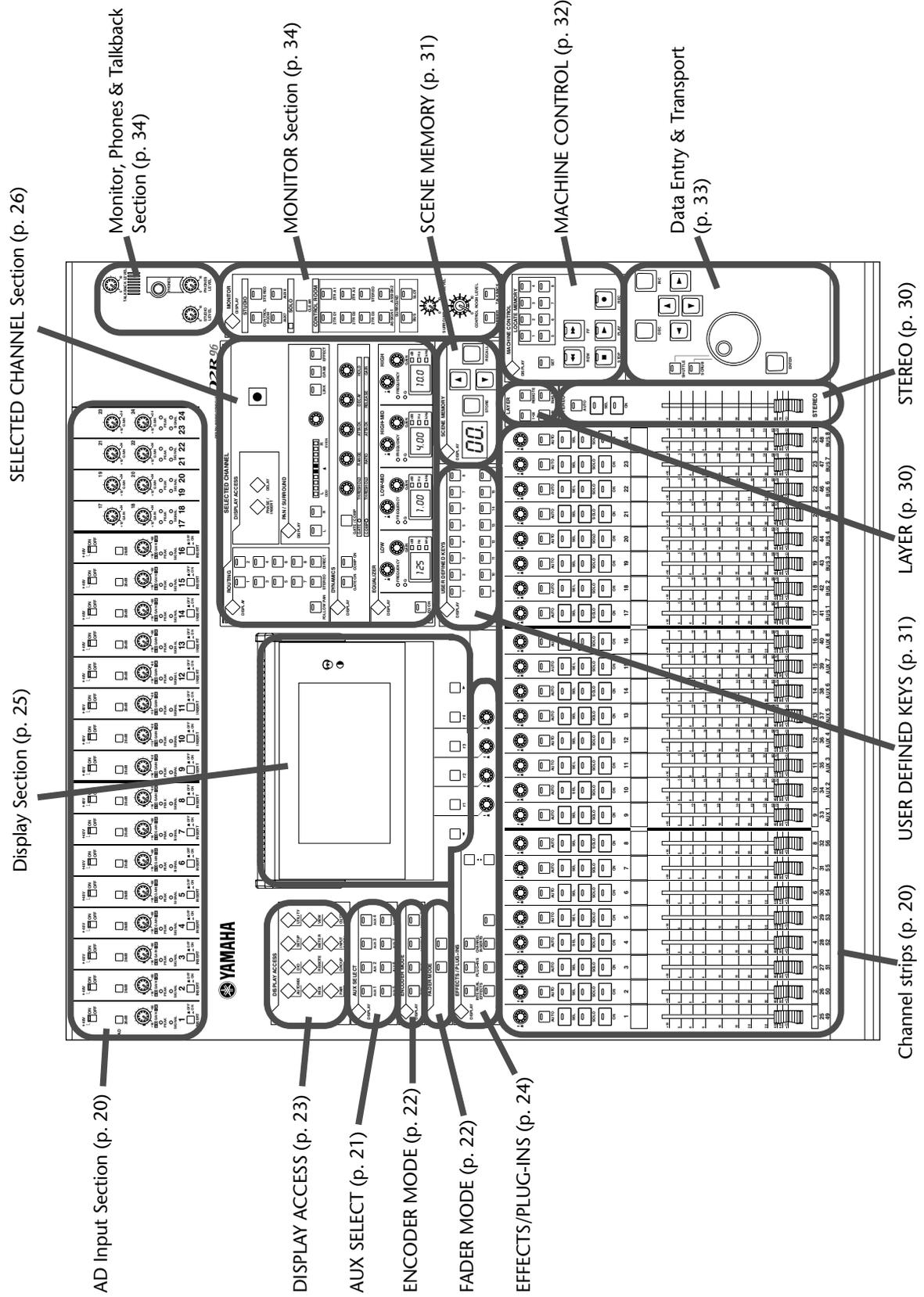
## AD Input Section

AD Input #1 is shown at the top; AD Inputs #17 and #18 below.
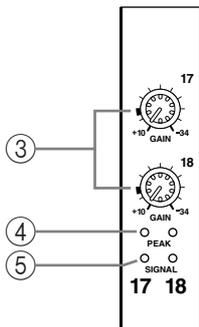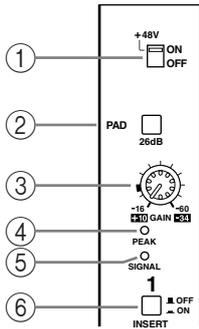
### ① +48V ON/OFF switches (AD 1–16)

These switches turn on and off the +48 V phantom power feed to each INPUT A (XLR-type connector). Phantom power is typically used to power condenser-type microphones or direct boxes. See "Phantom Power (AD 1–16)" on page 53 for more information.

### ② PAD switches (AD 1–16)

These switches turn on and off the 26 dB pad (attenuator) for each AD Input. See "Pad (AD 1–16)" on page 53 for more information.

### ③ GAIN controls

These controls adjust the gain of the AD Input Head Amps. They have an input sensitivity of –16 dB to –60 dB or +10 dB to –34 dB when Pad is on. AD Inputs 17 to 24 have an input sensitivity of +10 dB to –34 dB. See "Gain" on page 53 for more information.

### ④ PEAK indicators

These indicators light up when the input signal level is 3 dB below clipping. See "PEAK & SIGNAL Indicators" on page 53 for more information.

### ⑤ SIGNAL indicators

These indicators light up when the input signal level is 20 dB below nominal. See "PEAK & SIGNAL Indicators" on page 53 for more information.

### ⑥ INSERT ON/OFF switches (AD 1–16)

These switches are for turning on and off the AD Input inserts. See "AD Inserts (AD 1–16)" on page 54 for more information.

## Channel strips

Channel strip #1 is shown here.

The function of each channel strip depends on the currently selected Layer. See "Selecting Layers" on page 47 for more information.
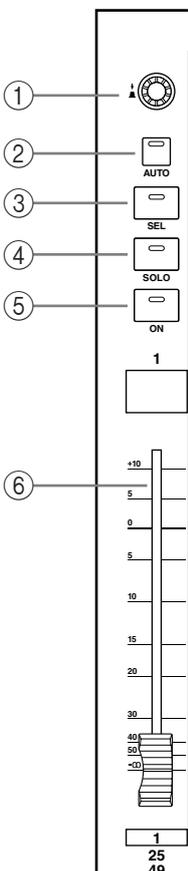
### ① Encoders

These controls are used to edit Input and Output Channel parameters. Their exact operation depends on the currently selected Encoder mode and Layer. There are two preset Encoder modes, Pan and Aux, and two assignable modes, with over 40 parameters to choose from. See "Selecting Encoder Modes" on page 50 for more information.

The Encoders feature push switches that are used to punch the parameter currently assigned to the Encoders in and out during Automix recording. See "Punching In & Out Individual Parameters" on page 183 for more information.

### ② AUTO buttons

These buttons are used to set Automix recording and playback for each channel. Their exact operation depends on the currently selected Layer. Their indicators light up orange in Record-Ready mode, red while recording, and green during playback. See "Channel Strip [AUTO] Buttons" on page 174 for more information.

### ③ SEL buttons

These buttons are used to select Input and Output Channels for editing with the SELECTED CHANNEL section. Their exact operation depends on the currently selected Layer. The [SEL] button indicator of the currently selected channel lights up. See "Selecting Channels" on page 48 for more information. The [SEL] buttons can also be used to pair channels, and to add and remove channels to and from the EQ, Comp, Fader, and Mute groups.

④ **SOLO buttons**

These buttons are used to solo Channels. The [SOLO] button indicators of channels that are soloed light up. See "Soloing Channels" on page 121 for more information.

⑤ **ON buttons**

These buttons are used to mute Input and Output Channels. Their exact operation depends on the currently selected Layer. The [ON] button indicators of channels that are on light up.

You can also use these buttons along with the AUX SELECT buttons to turn Aux Sends on and off (Mix Minus) (page 104).

⑥ **Channel faders**

These 100 mm touch-sensitive motorized faders are used to set the levels of Input Channels, Bus Outs, and Aux Sends. Their exact operation depends on the currently selected Fader mode and Layer. See "Selecting Fader Modes" on page 49 for more information. Faders can be grouped for simultaneous operation. See "Grouping Input Channel Faders" on page 79 and "Grouping Output Channel Faders" on page 126 for more information.

Faders can also be used to select Input and Output Channels. See "Auto Channel Select & Touch Sense Select" on page 49 for more information. They can also be used to punch channels in and out during Automix recording. See "Punching In & Out Individual Parameters" on page 183 for more information.
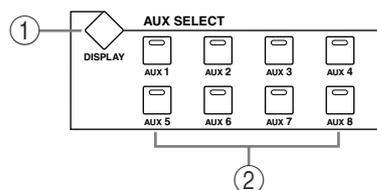
## AUX SELECT



① **AUX SELECT DISPLAY button**

This button is used to select the following pages: Aux Send, Aux Send Pan, and Input Channel Aux View. See "Aux Sends" on page 98 for more information.

② **AUX 1–8 buttons**

These buttons are used to select Aux Sends when sending Input Channel signals to Aux Sends. The button indicator of the currently selected Aux Send lights up. If the currently selected Aux Send is paired, the indicator of its partner flashes. See "Aux Sends" on page 98 for more information. These buttons can also be used to pair Aux Sends. See "Pairing Channels" on page 123 for more information.

Using these buttons along with the channel [ON] buttons enables you to turn Aux Sends on and off (Mix Minus) (page 104).

Using these buttons along with the LAYER buttons enables you to copy the corresponding channel levels to the Aux Send levels.

These buttons are also used to turn the Aux Out Solo function on and off when Aux/Solo Link is turned on (page 121).

## ENCODER MODE
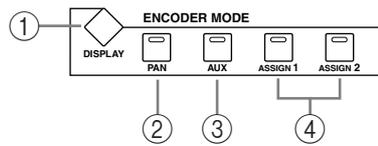


① **ENCODER MODE DISPLAY button**

This button is used to select the Encoder Mode Assign page. See "Selecting Encoder Modes" on page 50 for more information.

② **PAN button**

This button is used to select the Pan Encoder mode. Its indicator lights up when this mode is selected. In this mode, the Encoders function as Pan controls while an Input Channel Layer is selected. While the Master Layer is selected, Encoders 1–8 function as Input Channel 49–56 Pan controls, and Encoders 9–24 are inactive. See "Selecting Encoder Modes" on page 50 for more information.

③ **AUX button**

This button is used to select the Aux Encoder mode. Its indicator lights up when this mode is selected. In this mode, the Encoders function as Aux Send level controls when an Input Channel Layer is selected. While the Master Layer is selected, Encoders 1–8 function as Input Channel 49–56 Aux Send controls, and Encoders 9–24 are inactive. See "Selecting Encoder Modes" on page 50.

④ **ASSIGN 1 & 2 buttons**

These buttons are used to select the assignable Encoder modes. The button indicator for the currently selected mode lights up. When an assignable mode is selected, the function of the Encoders depends on the assigned parameter. Up to two parameters, from a list of over 40, can be assigned to these two buttons. See "Assigning Parameters to the ENCODER MODE Assign Buttons" on page 51 for more information.

## FADER MODE
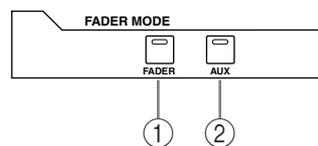


① **FADER button**

This button selects Fader mode, in which the faders control Input or Output Channel levels, depending on the currently selected Layer. Its indicator lights up when this mode is selected. See "Selecting Fader Modes" on page 49 for more information.

② **AUX button**

This button selects the Aux Fader mode, in which the faders control Aux Send levels. Its indicator lights up when this mode is selected. See "Selecting Fader Modes" on page 49 for more information.

## DISPLAY ACCESS
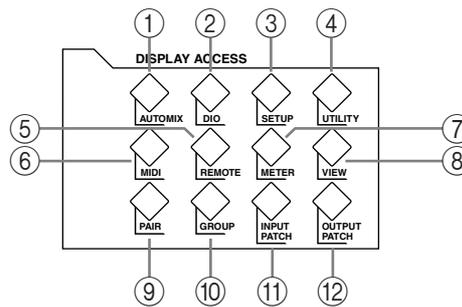


① **AUTOMIX button**

This button is used to select the following Automix pages: Automix Main, Automix Memory, Fader Edit, Event Copy, and Event Edit. See "Automix" on page 170 for more information.

② **DIO button**

This button is used to select the following pages: Word Clock Select, Dither, Cascade In, Cascade Out, Sampling Rate Converter, and Higher Sample Rate Data Transfer Format. See "Digital I/O & Cascading" on page 55 for more information.

③ **SETUP button**

This button is used to select the following pages: Preferences 1, Preferences 2, Preferences 3, MIDI/TO HOST Setup, GPI Setup, Input Port Name, Output Port Name, Time Reference, Time Signature, and Surround Bus Setup.

④ **UTILITY button**

This button is used to select the following pages: Oscillator, Channel Status Monitor, Battery Check, and Operation Lock.

⑤ **REMOTE button**

This button is used to select the Remote page. See "About the Remote Layer" on page 219 for more information.

⑥ **MIDI button**

This button is used to select the following pages: MIDI Setup, Program Change Assign Table, Control Change Assign Table, and Bulk Dump. See "MIDI" on page 190 for more information.

⑦ **METER button**

This button is used to select the following pages: Input Channel Meter, Master Meter, Effect 1-4 Input/Output Meter, Stereo Meter, and Metering Position. See "Metering" on page 107 for more information.

⑧ **VIEW button**

This button is used to select the following pages: Parameter View, Fader View, and Channel Library. See "Viewing Channel Parameter Settings" on page 129, "Viewing Channel Fader Settings" on page 130, and "Channel Library" on page 144 for more information.

⑨ **PAIR button**

This button is used to select the Input and Output Pair pages. See "Pairing Channels" on page 123 for more information.

⑩ **GROUP button**

This button is used to select the following pages: Input Channel Fader Group, Input Channel Mute Group, Output Fader Group, Output Mute Group, Input Equalizer Link, Output Equalizer Link, Input Comp Link, Output Comp Link, Input Fader Group Master, and Output Fader Group Master.

⑪ **INPUT PATCH button**

This button is used to select the following pages: Input Channel Patch, Input Channel Insert In Patch, Effect Input/Output Patch, Input Channel Name, and Input Patch Library. See "Input Patching" on page 66 for more information.

⑫ **OUTPUT PATCH button**

This button is used to select the following pages: Slot Output Patch, Omni Out Patch, Output Insert In Patch, Input Channel Direct Out Destination, 2TR Out Digital Patch, Output Channel Name, and Output Patch Library. See "Output Patching" on page 68 for more information.
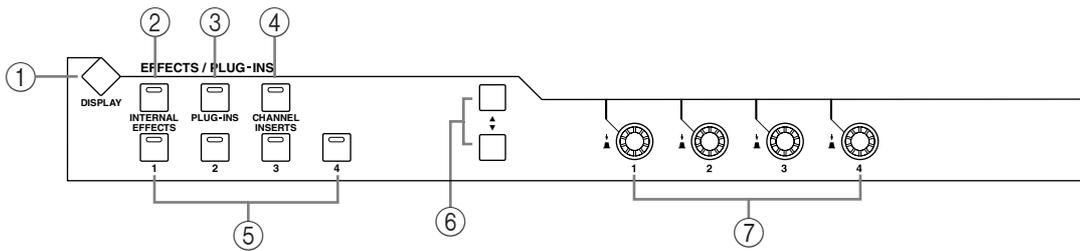
## EFFECTS/PLUG-INS



① **EFFECTS/PLUG-INS DISPLAY button**

This button is used to select the following pages: Effects Edit, Effects Library, Plug-In Setup, and Plug-In Edit. See "Internal Effects & Plug-Ins" on page 153 for more information.

② **INTERNAL EFFECTS button**

This button is used to select the internal effects processors in conjunction with the EFFECTS/PLUG-INS [1–4] buttons. Its indicator lights up when it's pressed. See "Editing Effects" on page 156 for more information.

③ **PLUG-INS button**

This button is used to select the Plug-Ins in conjunction with the EFFECTS/PLUG-INS [1–4] buttons. Its indicator lights up when it's pressed. See "Editing Plug-Ins" on page 160 for more information.

④ **CHANNEL INSERTS button**

If an internal effects processor or Y56K card effect is inserted in the currently selected channel, the relevant Effects Edit or Plug-In Edit page appears when this button is pressed, and its indicator lights up. In addition, the corresponding EFFECTS/PLUG-INS [1–4] button indicator flashes. If it's a Y56K that is inserted, the [PLUG-INS] button indicator also flashes. If it's an internal effects processor, the [INTERNAL EFFECTS] button indicator flashes. A warning message appears if there's nothing inserted in the currently selected channel. See "Editing Effects" on page 156 and "Editing Plug-Ins" on page 160 for more information.

⑤ **EFFECTS/PLUG-INS 1–4 buttons**

These buttons are used to select the internal effects processors and Plug-Ins in conjunction with the EFFECTS/PLUG-INS [INTERNAL EFFECTS] and [PLUG-INS] buttons. The button indicator of the currently selected internal effects processor or Plug-In lights up. While the EFFECTS/PLUG-INS [CHANNEL INSERTS] button indicator is lit, all of these buttons are inactive.

⑥ **Parameter Up/Down buttons**

These buttons are used to select the rows of internal effects processor and Plug-In parameters for editing with Parameter controls 1–4. The parameters in the currently selected row appear highlighted. Up to 16 parameters can be displayed at a time. If more are available, an up or down arrow is displayed. See "Editing Effects" on page 156 and "Editing Plug-Ins" on page 160 for more information.

⑦ **Parameter controls 1–4**

These are rotary controls and push switches. The rotary controls are used to edit the parameters of the currently selected internal effects processor or Plug-In. When the Effects Edit page is selected, they control the currently selected row of parameters, rows being selected by the Parameter Up/Down buttons. See "Editing Effects" on page 156 and "Editing Plug-Ins" on page 160 for more information.

The push switches are used to punch the Effects or Plug-In parameters currently being controlled by the rotary controls in and out during Automix recording. See "Punching In & Out Individual Parameters" on page 183 for more information.

## Display Section
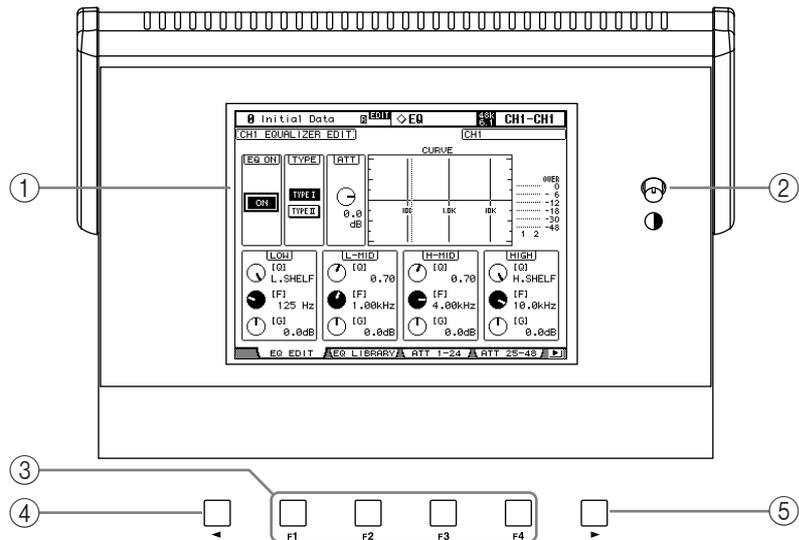


① **Display**

This 320 x 240 dot display with fluorescent backlight displays pages, information on the currently selected Scene and channel, the sampling rate, and more. See "About the Display" on page 44 for more information.

② **Contrast control**

This control is used to adjust the contrast of the display.

③ **F1–F4 buttons**

These buttons are used to select the pages whose tabs are currently visible. See "Selecting Display Pages" on page 45 for more information.

④ **Left Tab Scroll button**

This button, which is active only when the left Tab Scroll arrow is displayed, is used to display the tabs of pages available to the left of the currently selected page. See "Selecting Display Pages" on page 45 for more information.

⑤ **Right Tab Scroll button**

This button, which is active only when the right Tab Scroll arrow is displayed, is used to display the tabs of pages available to the right of the currently selected page. See "Selecting Display Pages" on page 45 for more information.

## SELECTED CHANNEL Section
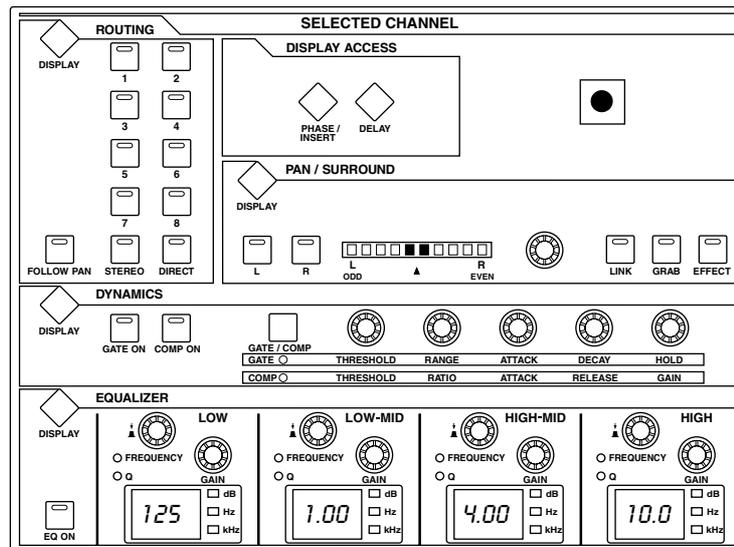


The subsections of the SELECTED CHANNEL section are explained below.

### ROUTING
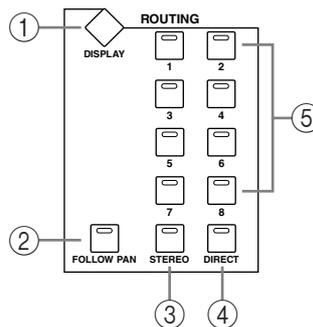


① **ROUTING DISPLAY button**

This button is used to select the following pages: Input Channel Routing, Bus to Stereo, and Bus to Stereo Library. See "Routing Input Channels" on page 82 and "Sending Bus Outs to the Stereo Out" on page 97 for more information.

② **FOLLOW PAN button**

This button determines whether or not the currently selected Input Channel's pan setting, and Surround pan setting are applied to the Bus Outs. Its indicator lights up when it's pressed. See "Routing Input Channels" on page 82 for more information.

③ **STEREO button**

This button is used to route the currently selected Input Channel to the Stereo Out. Its indicator lights up when it's pressed. See "Routing Input Channels" on page 82 for more information.

④ **DIRECT button**

This button is used to route the currently selected Input Channel to its Direct Out. Its indicator lights up when it's pressed. See "Routing Input Channels" on page 82 for more information.

⑤ **ROUTING 1–8 buttons**

These buttons are used to route the currently selected Input Channel to the Bus Outs. The button indicators of Bus Outs to which the Input Channel is routed light up. See "Routing Input Channels" on page 82 for more information.

### DISPLAY ACCESS
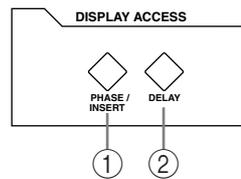
① **PHASE/INSERT button**

This button is used to select the Input Channel Phase and Insert pages. See "Reversing the Signal Phase" on page 73 and "Using Inserts" on page 115 for more information.

② **DELAY button**

This button is used to select the Delay pages. See "Delaying Channel Signals" on page 120 for more information.

### DYNAMICS
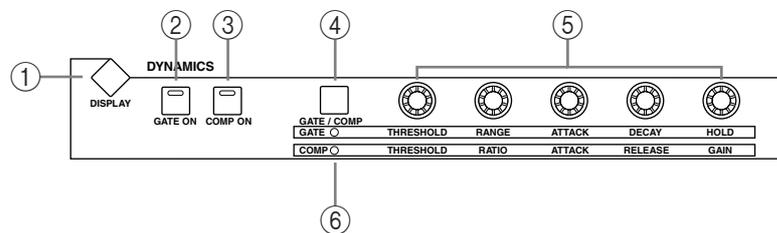
① **DYNAMICS DISPLAY button**

This button is used to select the following pages: Gate Edit, Gate Library, Comp Edit, and Comp Library. See "Gating Input Channels" on page 74 and "Compressing Channels" on page 116 for more information.

② **GATE ON button**

This button is used to turn the currently selected Input Channel's Gate on and off. Its indicator lights up when the Gate is on. See "Gating Input Channels" on page 74 for more information.

③ **COMP ON button**

This button is used to turn the currently selected channel's Compressor on and off. Its indicator lights up when the Compressor is on. See "Compressing Channels" on page 116 for more information.

④ **GATE/COMP button**

This button is used to set the rotary controls for either Gate or Compressor operation. When an Output Channel is selected, Compressor is selected automatically and cannot be changed. See "Gating Input Channels" on page 74 and "Compressing Channels" on page 116 for more information.

⑤ **THRESHOLD, RANGE, ATTACK, DECAY, HOLD (THRESHOLD, RATIO, ATTACK, RELEASE, GAIN) controls**

When the GATE/COMP button is set to GATE, these controls set the Threshold, Range, Attack, Decay, and Hold parameters of the currently selected Input Channel's Gate. When it's set to COMP, they set the Threshold, Ratio, Attack, Release, and Gain parameters of the currently selected channel's Compressor. See "Gating Input Channels" on page 74 and "Compressing Channels" on page 116 for more information.

⑥ **GATE/COMP indicators**

These indicators show whether the rotary controls are set to control a Gate or Compressor. The GATE indicator lights up when they're set to control a Gate; the COMP indicator, when they're set to control a Compressor. See "Gating Input Channels" on page 74 and "Compressing Channels" on page 116 for more information.

### PAN/SURROUND
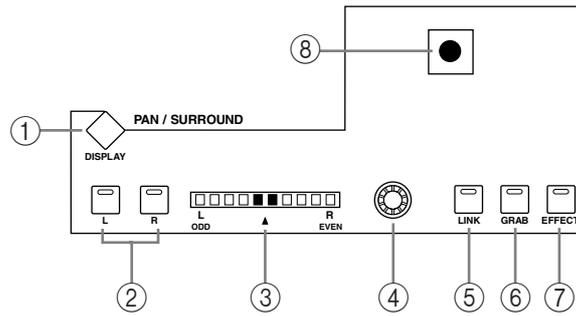


① **PAN/SURROUND DISPLAY button**

This button is used to select the Input Channel Pan pages, the Surround Mode page, and the Surround Edit pages. See "Panning Input Channels" on page 83 and "Using Surround Pan" on page 85.

② **L & R buttons**

These buttons can be used to select horizontally or vertically partnered Input or Output Channels. They can be used to select the left and right channels when the Stereo Out is selected. For Input Channels, in Individual Pan mode, the [L] button indicator lights up when an odd/left channel is selected; the [R] button indicator, when an even/right channel is selected. In Gang or Inverse Gang Pan mode, the button indicator of the other channel in the pair flashes while its partner is selected.

③ **PAN display**

This 10-segment display indicates the pan position of the currently selected Input Channel. When pan is set to center, the center two segments light up. When the Stereo Out is selected, it displays the balance.

④ **PAN control**

This rotary control is used to pan the currently selected Input Channel. When the Stereo Out is selected, it is used to set the balance. For Input Channels in Gang or Inverse Gang Pan mode, horizontally or vertically paired Input Channels are panned simultaneously. See "Panning Input Channels" on page 83 and "Balancing the Stereo Out" on page 94.

⑤ **LINK button**

This button, which is enabled only when a Surround mode other than Stereo is selected, is used to link the PAN control and the Joystick so that either control can be used for normal and surround panning. It's a global setting that applies to all Input Channels. Its indicator lights up when the PAN control and Joystick are linked. If the Joystick is set to control effects (i.e., the [EFFECT] button indicator is lit), this button is disabled. See "Panning Input Channels" on page 83 and "Using Surround Pan" on page 85 for more information.

⑥ **GRAB button**

This button is used to turn on and off Joystick control for the currently selected Input Channel. Its indicator lights up when Grab is on. When Grab is on, the Joystick can be used to control the currently selected Input Channel's surround pan position. When turned off, the Joystick does not control surround pan. In Stereo mode, it controls the currently-selected Input Channel's pan position. If the PAN control and the Joystick are linked (i.e., the [LINK] button indicator is lit), Grab is turned off if the PAN control is adjusted. If the Joystick is set to control effects (i.e., the [EFFECT] button indicator is lit), this button is disabled.

⑦ **EFFECT button**

This button is used to select the Joystick for parameter control of the Reverb 5.1 effect. Its indicator lights up when Reverb 5.1 effect control is on, and the Joystick cannot be used for surround panning. See "REVERB 5.1" on page 276 for more information.

⑧ **Joystick**
This control can be used for surround panning, normal panning, or parameter control of the Reverb 5.1 effect. When the [EFFECT] button indicator is lit, the Joystick controls the Reverb 5.1 effect. See "REVERB 5.1" on page 276 for more information. When the [EFFECT] button indicator is off and the [GRAB] button indicator is on, the Joystick controls surround panning of the currently selected Input Channel. When the [EFFECT] button and [GRAB] button indicators are both off, the Joystick can still be used for surround panning if the Auto Grab preference is on. See "Using Surround Pan" on page 85 for more information. When the [EFFECT] button indicator is off but the [GRAB] button and [LINK] button indicators are both on, the Joystick can be used for normal panning in unison with the PAN control. See "Panning Input Channels" on page 83 for more information.

**EQUALIZER**
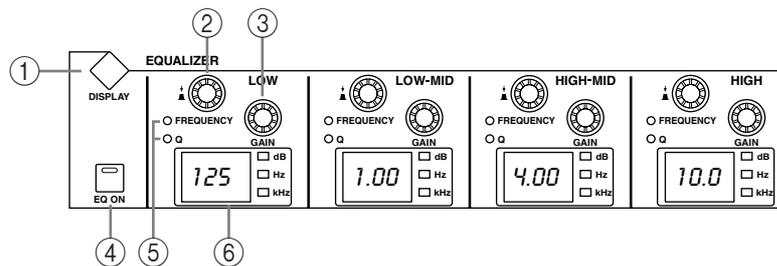


① **EQUALIZER DISPLAY button**
This button is used to select the following pages: Equalizer Edit, Equalizer Library, Input Channel Attenuator/Shifter, and Output Attenuator.

② **FREQUENCY/Q controls**
These are rotary controls and push switches. The push switches are used to select either frequency or Q. The current setting is shown by the FREQUENCY/Q indicators. The rotary controls are used to set the frequency or Q, as selected by the push switches. See "Using EQ" on page 111 for more information.

③ **EQ GAIN controls**
These controls are used to set the gain of each EQ band. See "Using EQ" on page 111 for more information.

④ **EQ ON button**
This button is used to turn the EQ of the currently selected channel on and off. Its indicator lights up when the EQ is on. See "Using EQ" on page 111 for more information.

⑤ **FREQUENCY/Q indicators**
These indicators show whether each FREQUENCY/Q control is set to control frequency or Q. The FREQUENCY indicator lights up when it's set to control frequency; the Q indicator, when it's set to control Q. See "Using EQ" on page 111 for more information.

⑥ **EQ displays**
Normally these displays show the frequency of each band. When the GAIN is adjusted, the gain value is displayed. When the Q is adjusted, the Q value is displayed. If the gain or Q is not adjusted for two seconds, the frequency value reappears. See "Using EQ" on page 111 for more information.

## LAYER
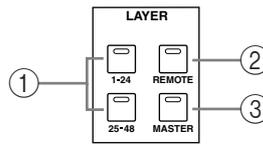


① **1–24 & 25–48 buttons**

These buttons select the Input Channel Layers, which determine which Input Channels are controlled by the channel strips. The LAYER button indicator for the currently selected Layer lights up. See "Selecting Layers" on page 47 for more information.

② **REMOTE button**

This button selects the Remote Layer, which can be used to control external devices, including DAWs. See "About the Remote Layer" on page 219 for more information. Its button indicator lights up when the Remote Layer is selected. See "Selecting Layers" on page 47 for more information.

③ **MASTER button**

This button selects the Master Layer, from which the channel strips control Input Channels 49–56, Bus Outs, and Aux Sends. Its indicator lights up when the Master Layer is selected. See "Selecting Layers" on page 47 for more information.
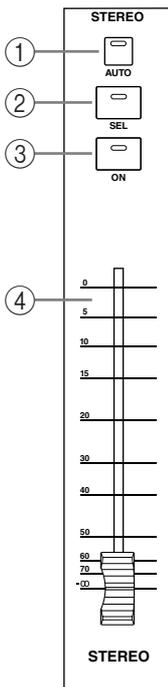
## STEREO



① **AUTO button**

This button is used exclusively to set Automix recording and playback for the Stereo Out. Its indicator lights up orange in Record-Ready mode, red while recording, and green during playback. See "Channel Strip [AUTO] Buttons" on page 174 for more information.

② **SEL button**

The Stereo Out [SEL] button is used exclusively to select the Stereo Out for editing with the SELECTED CHANNEL section. Its indicator lights up when the Stereo Out is selected. Each time it's pressed, the selection toggles between the Stereo Out's left and right channels. See "Selecting Channels" on page 48 for more information. It can also be used to add and remove the Stereo Out to and from EQ, Comp, Fader, and Mute groups.

③ **ON button**

This button is used exclusively to mute the Stereo Out. Its indicator lights up when the Stereo Out is on. See "Muting the Stereo Out (ON/OFF)" on page 93 for more information.

④ **Fader**

This 100 mm touch-sensitive motorized fader is used exclusively to adjust the level of the Stereo Out. See "Setting the Stereo Out Level" on page 93 for more information. It can be grouped with other Output Channel faders for simultaneous operation. See "Grouping Output Channel Faders" on page 126 for more information. It can also be used to select the Stereo Out, see "Auto Channel Select & Touch Sense Select" on page 49, or to punch the Stereo Out in and out during Automix recording. See "Punching In & Out Individual Parameters" on page 183 for more information.

## SCENE MEMORY
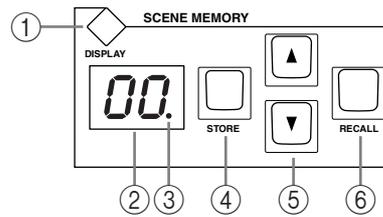
① **SCENE MEMORY DISPLAY button**
This button is used to select the following pages: Scene Memory, Input Channel Fade Time, Output Fade Time, Recall Safe, and Scene Memory Sort. See "Scene Memories" on page 162 for more information.

② **Scene memory display**
This displays the number of the currently selected Scene memory. See "Scene Memories" on page 162 for more information.

③ **Edit indicator**
This indicates that the current mix settings no longer match those of the Scene that was recalled last. See "Edit Buffer & Edit Indicator" on page 162 for more information.

④ **STORE button**
This button is used to store the current Scene to the selected Scene memory. See "Storing & Recalling Scenes with the SCENE MEMORY Buttons" on page 164.

⑤ **Scene Up/Down buttons**
These buttons are used to select Scene memories. Pressing the Scene Up [▲] button increments the selection; pressing the Scene Down [▼] button decrements the selection. Holding down a button causes the selection to increment/decrement continuously. See "Storing & Recalling Scenes with the SCENE MEMORY Buttons" on page 164.

⑥ **RECALL button**
This button is used to recall the selected Scene memory. See "Storing & Recalling Scenes with the SCENE MEMORY Buttons" on page 164.

## USER DEFINED KEYS
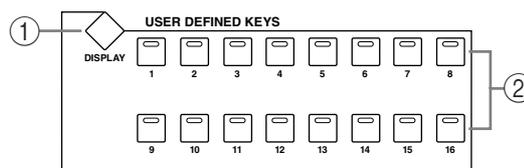
① **USER DEFINED KEYS DISPLAY button**
This button is used to select the User Defined Key Assign page. See "Using the User Defined Keys" on page 229 for more information.

② **USER DEFINED KEYS 1–16 buttons**
Up to 16 functions, from a list of over 172, can be assigned to these buttons. See "Using the User Defined Keys" on page 229 for more information. These buttons have specific functions when the DAW Remote Layer is selected. See "About the Remote Layer" on page 219 for more information.
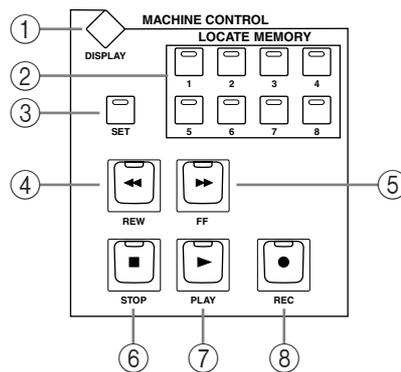
## MACHINE CONTROL



① **MACHINE CONTROL DISPLAY button**

This button is used to select the Locate Memory and Machine Configuration pages. See "Setting the Locate Memories" on page 224 and "Configuring Machines" on page 222 respectively for more information.

② **LOCATE MEMORY 1–8 buttons**

Pressing these buttons transmits Locate commands to the target machine (DAW, MMC) in order to locate the Locate memory points. Their indicators light up momentarily when they're pressed. See "Using the Locator" on page 224 for more information.

③ **SET button**

This button is used when specifying the eight Locate points. Its indicator lights up while it's pressed. See "Using the Locator" on page 224 for more information.

④ **REW button**

This button starts rewind on the target machine (DAW, MMC). Its indicator lights up while rewinding is in progress. See "Transport Buttons" on page 223.

⑤ **FF button**

This button starts fast forward on the target machine (DAW, MMC). Its indicator lights up while fast forwarding is in progress. See "Transport Buttons" on page 223.

⑥ **STOP button**

This button stops the target machine (DAW, MMC). Its indicator lights up momentarily when it's pressed. See "Transport Buttons" on page 223.

⑦ **PLAY button**

This button starts playback on the target machine (DAW, MMC). Its indicator lights up while playback is in progress. See "Transport Buttons" on page 223.

⑧ **REC button**

This button is used in conjunction with the [PLAY] button to start recording on the target machine (DAW, MMC). Its indicator lights up while recording is in progress. See "Transport Buttons" on page 223.

### Data Entry & Transport
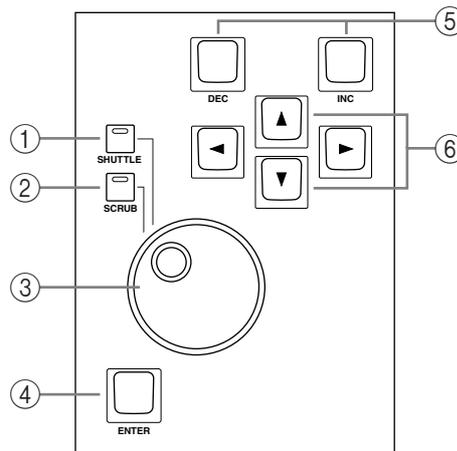


① **SHUTTLE button**

This button is used to set the Parameter wheel to Shuttle mode for machine control (DAW, MMC). Its indicator lights up when Shuttle mode is on. See "Using Shuttle & Scrub" on page 223 for more information.

② **SCRUB button**

This button is used to set the Parameter wheel to Scrub mode for machine control (DAW, MMC). Its indicator lights up when Scrub mode is on. See "Using Shuttle & Scrub" on page 223 for more information.

③ **Parameter wheel**

The Parameter wheel is used to edit parameter values, scroll through Scene and library lists, and to position the cursor when titling Scenes, Effects, and so on. Its detented action gives it a positive feel, allowing quick and accurate parameter editing. Turning it clockwise increases parameter values; turning it counterclockwise decreases them. Turning it fast allows quick parameter editing.

The Parameter wheel is also used with the Shuttle and Scroll functions. See "Using Shuttle & Scrub" on page 223 for more information.

④ **ENTER button**

This button is used to select and finalize parameter settings, to set on/off-type parameters, such as EQ ON/OFF, and to enter characters when titling Scenes, Effects, and so on. When a Pan control is selected on a Pan display page, pressing this button resets the pan position to center. For certain parameters, the [ENTER] button supports double clicking (i.e., two quick presses).

⑤ **DEC & INC buttons**

These buttons are used to adjust parameter values. Pressing the [INC] button increases the value of the currently selected parameter by one. Pressing the [DEC] decreases it. Pressing and holding either button causes the parameter value to change continuously.

These buttons can also be used to set on/off-type parameters, such as EQ ON/OFF. When such a parameter is selected, pressing the [DEC] button turns the function off, pressing the [INC] button turns it on.

These buttons can also used to scroll through Scene and library lists.

⑥ **Cursor buttons**

These buttons are used to move the cursor around the display pages, selecting parameters and options. The cursor appears as a flashing box, making it easy to see which parameter or option is currently selected. Holding down a cursor button moves the cursor continuously in the respective direction.

## Monitor, Phones & Talkback Section
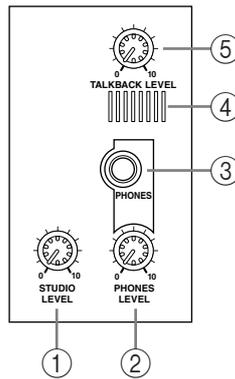
① **STUDIO LEVEL control**
This control is used to set the level of the STUDIO MONITOR OUT. See "Studio Monitoring" on page 137 for more information.

② **PHONES LEVEL control**
This control is used to set the level of the PHONES. See "Control Room Monitoring" on page 136 for more information.

③ **PHONES jack**
This stereo TRS phone jack outputs the Control room signal for monitoring via a pair of stereo headphones.

④ **Talkback mic**
This built-in microphone is used for talkback. See "Using Talkback" on page 142 for more information.

⑤ **TALKBACK LEVEL control**
This control is used to set the level of the built-in talkback microphone. See "Using Talkback" on page 142 for more information.
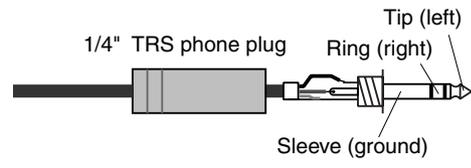
## MONITOR Section

The various subsections of the MONITOR section are explained below.

### STUDIO
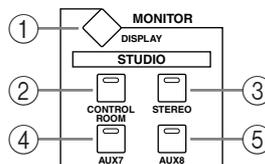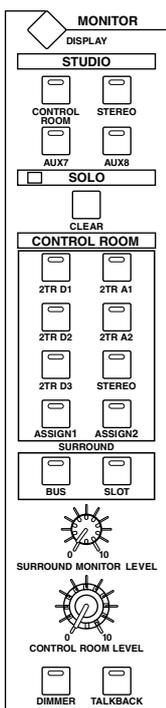
① **MONITOR DISPLAY button**
This button is used to select the following pages: Solo Setting, Control Room Setup, Talkback Setup, Surround Monitor, Surround Monitor Setup, Surround Monitor Patch, and Surround Monitor Library. See "Configuring Solo" on page 121, "Control Room Monitoring" on page 136 "Using Talkback" on page 142, and "Surround Monitoring" on page 138 respectively for more information.

② **CONTROL ROOM button**
This button selects the Control Room Monitor signal as the Studio Monitor signal source. Its indicator lights up when this source is selected. See "Studio Monitoring" on page 137 for more information.

③ **STEREO button**

This button selects the Stereo Out signal as the Studio Monitor signal source. Its indicator lights up when this source is selected. See "Studio Monitoring" on page 137 for more information.

④ **AUX 7 button**

This button selects Aux Send #7 as the Studio Monitor signal source. Its indicator lights up when this source is selected. See "Studio Monitoring" on page 137 for more information.

⑤ **AUX 8 button**

This button selects Aux Send #8 as the Studio Monitor signal source. Its indicator lights up when this source is selected. See "Studio Monitoring" on page 137 for more information.
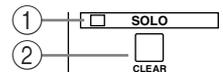
### SOLO

① **SOLO indicator**

This indicator flashes when one or more Channels are soloed, indicating that the Solo function is active. See "Soloing Channels" on page 121 for more information.

② **CLEAR button**

This button can be used to unsolo all soloed Channels. See "Soloing Channels" on page 121 for more information.

### CONTROL ROOM
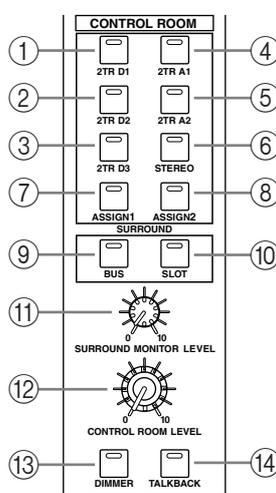
① **STEREO 2TR D1 button**

This button selects the 2TR IN DIGITAL AES/EBU 1 as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

② **STEREO 2TR D2 button**

This button selects the 2TR IN DIGITAL COAXIAL 2 as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

③ **STEREO 2TR D3 button**

This button selects the 2TR IN DIGITAL COAXIAL 3 as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

④ **STEREO 2TR A1 button**

This button selects the 2TR IN ANALOG 1 as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

⑤ **STEREO 2TR A2 button**

This button selects the 2TR IN ANALOG 2 as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

⑥ **STEREO button**

This button selects the Stereo Out as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Monitoring" on page 136 for more information.

⑦ **STEREO ASSIGN 1 button**

This button is used to select the assigned Output Channel as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Setup" on page 137 for more information.

⑧ **STEREO ASSIGN 2 button**

This button is used to select the assigned Output Channel as the Control Room Monitor signal source. Its indicator lights up when this source is selected. See "Control Room Setup" on page 137 for more information.

⑨ **SURROUND BUS button**

This button is used to select the Bus Outs as the Surround Monitor signal source. Its indicator lights up when this source is selected. See "Surround Monitoring" on page 138 for more information.

⑩ **SURROUND SLOT button**

This button is used to select the assigned Slot's Inputs as the Surround Monitor signal source. Its indicator lights up when this source is selected. See "Surround Monitoring" on page 138 for more information.

⑪ **SURROUND MONITOR LEVEL control**

This control is used to adjust the level of the Surround Monitor signals. See "Surround Monitoring" on page 138 for more information.

⑫ **CONTROL ROOM LEVEL control**

This control is used to adjust the level of the Control Room Monitor signal. See "Control Room Monitoring" on page 136 for more information.

⑬ **DIMMER button**

This button is used to dim the Control Room Monitor and Surround Monitor signals. Its indicator lights up when these signals are dimmed. See "Control Room Monitoring" on page 136 for more information.

⑭ **TALKBACK button**

This button is used to turn on the Talkback function, which distributes the Talkback mic signal to the Studio Monitor Outs, Slot Inputs and Omni Outputs specified on the Talkback Setup page. See "Using Talkback" on page 142 for more information.

# Rear Panel

AD Input Section (p. 38)
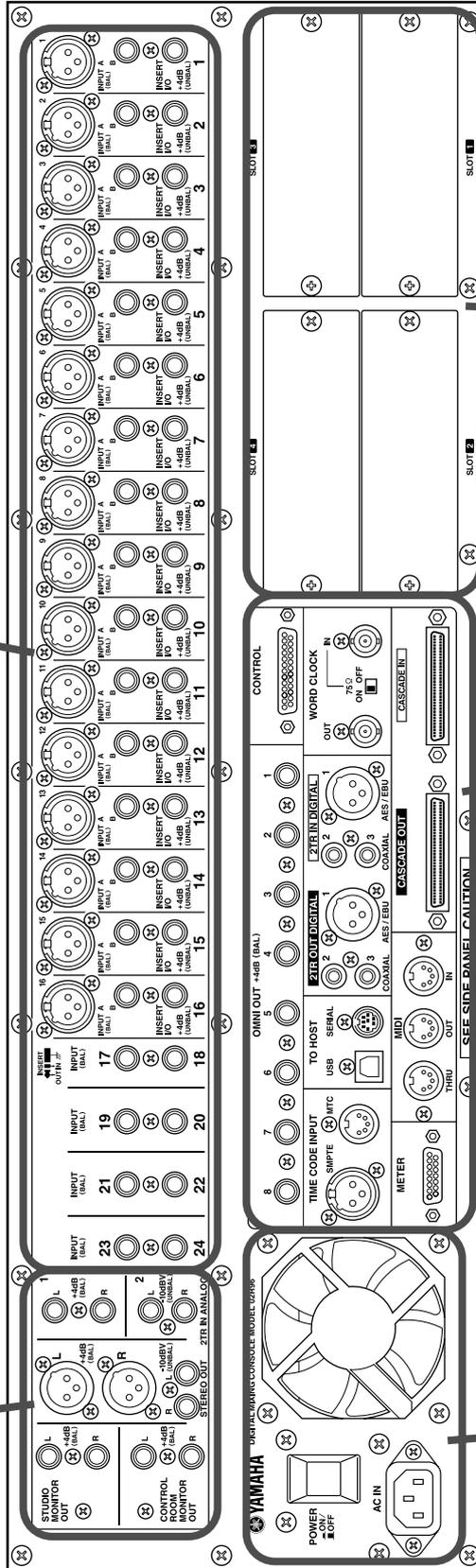
SLOT Section (p. 42)

OMNI OUTs, Digital I/O & Control Section (p. 40)

Analog Master I/O Section (p. 39)

Power Section (p. 42)

## AD Input Section

AD Input #1 is shown at the top; AD Inputs #17 and #18 below
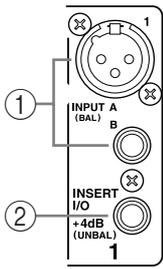
① **INPUT A & B (BAL) connectors**

AD Inputs 1 through 16 feature balanced XLR-3-31-type connectors and balanced 1/4-inch phone jacks, both with a nominal input range of –60 dB to +10 dB. Phantom powering (+48 V) is supplied to the XLR-type connectors, with individual ON/OFF switches on each input. The phone jacks, which can also be used with unbalanced phone plugs, have priority over the XLR-type connectors, so when a phone plug is inserted, the XLR-type connector is disconnected. AD Inputs 17–24 feature balanced 1/4-inch phone jacks. AD Inputs can be patched individually to the Input Channels or Insert Ins. See "AD Input Section" on page 53 for more information.
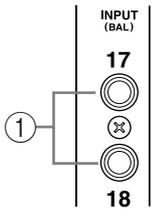
② **INSERT I/O +4dB (UNBAL) connectors (AD 1–16)**

These unbalanced 1/4-inch TRS phone jacks are used to insert external signal processors, etc., into AD Inputs 1 through 16. They are wired: sleeve–ground, ring–return, tip–send. The nominal signal level is +4 dB. Inserts can be turned on and off individually by using the INSERT ON/OFF switches. See "AD Input Section" on page 53 for more information.
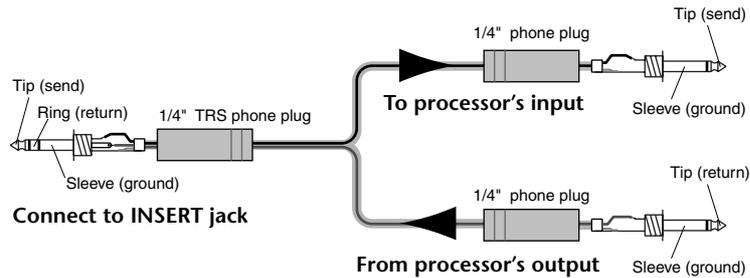
## Analog Master I/O Section
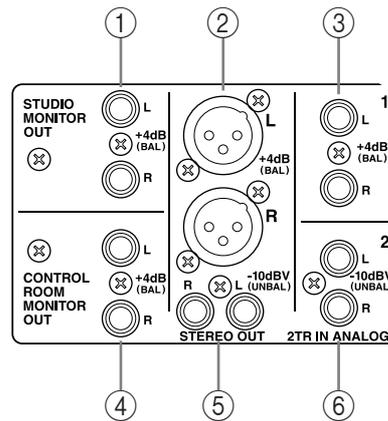


① **STUDIO MONITOR OUT +4 dB (BAL)**

These balanced 1/4-inch TRS phone jacks, nominal output level +4 dB, output the analog Studio Monitor signal for monitoring in the actual studio. The source, which is selected by using the STUDIO buttons in the MONITOR section, can be Aux Send #7, Aux Send #8, the Stereo Out, or Control Room. The output level is controlled by the STUDIO LEVEL control. See "Studio Monitoring" on page 137 for more information.
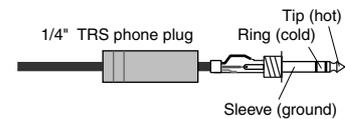
② **STEREO OUT +4 dB (BAL)**

These balanced XLR-3-32-type connectors, nominal output level +4 dB, output the analog Stereo Out signal and are typically connected the stereo inputs of a 2-track recorder. They are wired pin 1–ground, pin 2–hot (+), and pin 3–cold (–). See "Stereo Out Connectors" on page 92.
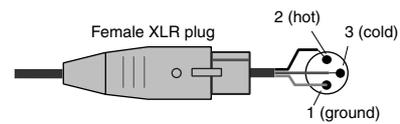
③ **2TR IN ANALOG 1 +4 dB (BAL)**

These balanced 1/4-inch TRS phone jacks, nominal input level +4 dB, are typically used to connect the analog stereo outputs of a 2-track recorder. Signals connected here can be monitored via the CONTROL ROOM MONITOR OUT by pressing the CONTROL ROOM [2TR A1] button. In addition, these inputs can be patched to Input Channels or Insert Ins. See "2TR Analog INs" on page 54.
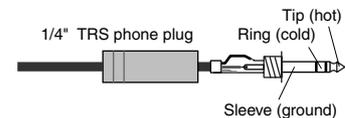
④ **CONTROL ROOM MONITOR OUT +4 dB (BAL)**

These balanced 1/4-inch TRS phone jacks, nominal output level +4 dB, output the analog Control Room Monitor signal and are typically used to feed the control room's main monitors. See "Control Room Monitoring" on page 136 for more information.
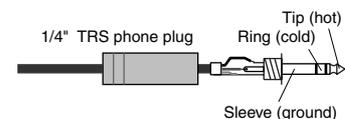
⑤ **STEREO OUT –10 dBV (UNBAL)**

These unbalanced phono connectors, nominal output level –10 dBV, output the analog Stereo Out signal and are typically connected to the stereo inputs of a 2-track recorder. See "Stereo Out Connectors" on page 92.
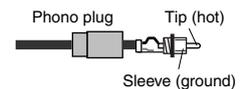
⑥ **2TR IN ANALOG 2 –10 dBV (UNBAL)**

These unbalanced phono connectors, nominal input level –10 dBV, are typically used to connect the analog stereo outputs of a 2-track recorder. Signals connected here can be monitored via the CONTROL ROOM MONITOR OUTs by pressing the CONTROL ROOM [2TR A2] button. In addition, these inputs can be patched to Input Channels or Insert Ins. See "2TR Analog INs" on page 54.
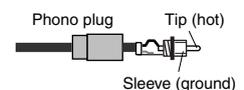
### OMNI OUTs, Digital I/O & Control Section
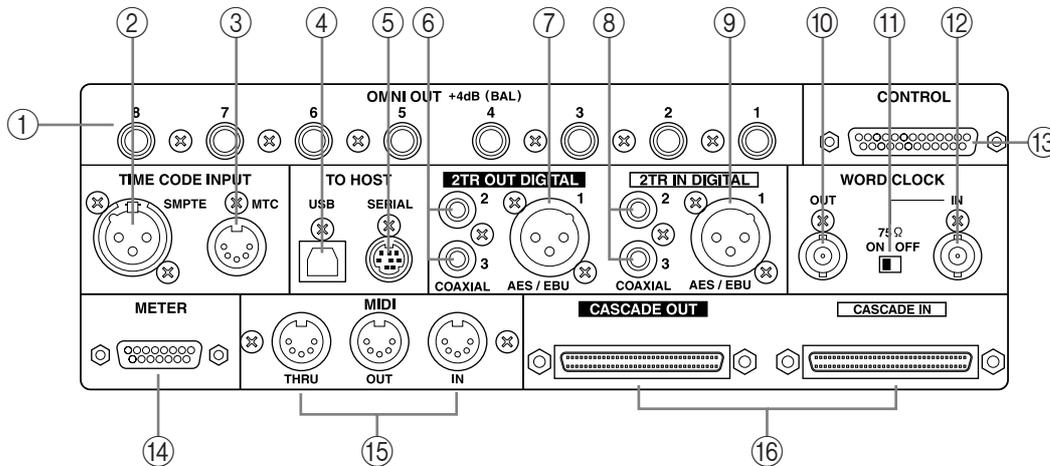


① **OMNI OUT +4dB (BAL)**
These balanced 1/4-inch TRS phone jacks, nominal output
level +4 dB, provide eight analog outputs that can be
patched to the following: Bus Outs, Aux Sends, the Stereo
Out, Insert Outs, Direct Outs, or Surround Monitor Chan-
nels. See "Omni Outs" on page 54.
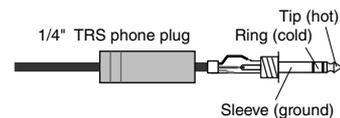


② **SMPTE TIME CODE INPUT connector**
This balanced XLR-3-31-type connector is used to input SMPTE timecode for synchroniz-
ing the Automix function. See "Selecting the Timecode Source & Frame Rate" on page 177.

③ **MTC TIME CODE INPUT connector**
This 5-pin DIN connector is used to input MTC for synchronizing the Automix function.
See "Selecting the Timecode Source & Frame Rate" on page 177.

④ **USB TO HOST port**
This USB port is for MIDI communication between the 02R96 and a host computer with a
USB port. See "MIDI I/O" on page 190 for more information.

⑤ **SERIAL TO HOST port**
This 8-pin mini DIN port is for MIDI communication between the 02R96 and a host com-
puter with a serial port. See "MIDI I/O" on page 190 for more information.

⑥ **2TR OUT DIGITAL COAXIAL 2 & 3**
These phono connectors output consumer format (IEC-60958) digital audio, and are typ-
ically connected to the digital stereo inputs of 2-track recorders. The following signals can
be patched to these outputs: Stereo Out, Bus Outs, Aux Sends, Direct Outs, Insert Outs, and
Control Room. Dither can be applied for digital audio transfer to lower-resolution systems.
See "2TR Digital Outs" on page 57 for more information.

⑦ **2TR OUT DIGITAL AES/EBU 1**
This XLR-3-32-type connector outputs AES/EBU format digital audio, and is typically con-
nected to the digital stereo input of a 2-track recorder. The following signals can be patched
to this output: Stereo Out, Bus Outs, Aux Sends, Direct Outs, Insert Outs, and Control
Room. Dither can be applied for digital audio transfer to lower-resolution systems. See
"2TR Digital Outs" on page 57 for more information.

⑧ **2TR IN DIGITAL COAXIAL 2 & 3**

These phono connectors accept consumer format (IEC-60958) digital audio, and are typically used to connect the digital stereo outputs of 2-track recorders. Signals connected here can be monitored via the CONTROL ROOM MONITOR OUT by pressing the CONTROL ROOM [2TR D2] or [2TR D3] button. In addition, these inputs can be patched to Input Channels or Insert Ins. Unsynchronized digital audio signals can be converted by the internal sampling rate converters. See "2TR Digital Ins" on page 58 for more information.

⑨ **2TR IN DIGITAL AES/EBU 1**

This XLR-3-31-type connector accepts AES/EBU format digital audio, and is typically used to connect the digital stereo output of a 2-track recorder. Signals connected here can be monitored via the CONTROL ROOM MONITOR OUT by pressing the CONTROL ROOM [2TR D1] button. In addition, this input can be patched to Input Channels or Insert Ins. Unsynchronized digital audio signals can be converted by the internal sampling rate converters. See "2TR Digital Ins" on page 58 for more information.

⑩ **WORD CLOCK OUT connector**

This BNC connector outputs a wordclock signal at the same clock rate as the 02R96. See "Wordclock Connections" on page 55 for more information.

⑪ **WORD CLOCK 75Ω ON/OFF termination switch**

This switch applies 75Ω termination to the WORD CLOCK IN. See "Terminating External Wordclocks" on page 57 for more information.

⑫ **WORD CLOCK IN connector**

This BNC connector is for connecting an external wordclock signal. See "Selecting the Wordclock Source" on page 56 for more information.

⑬ **CONTROL port**

This 25-pin D-sub connector provides access to the GPI (General Purpose Interface) through which external equipment can be triggered when specified 02R96 faders or USER DEFINE KEYS are operated. It can also be used to control a "RECORDING" light outside of a studio, to trigger the Solo function of an 02R Digital Recording Console, or to turn on Talkback from an external device. See "GPI (General Purpose Interface)" on page 225 for more information.

⑭ **METER port**

This 15-pin D-sub connector is for connecting the optional MB02R96 Peak Meter Bridge.

⑮ **MIDI IN, OUT & THRU ports**

These standard MIDI IN, OUT, and THRU ports are used to connect the 02R96 to other MIDI equipment. Supported MIDI messages include Program Changes for Scene recall, Control Changes and Parameter Changes for real-time parameter control, Bulk Dump for data storage, MIDI Clock, MTC, and MMC. See "MIDI I/O" on page 190 for more information.

⑯ **CASCADE IN & OUT ports**

These 64-pin connectors can be used to cascade up to four 02R96s to create a multiple-unit mixing system. The 02R96 can also be cascaded with an 02R Digital Recording Console. See "Cascading Consoles" on page 63 for more information.

## Power Section
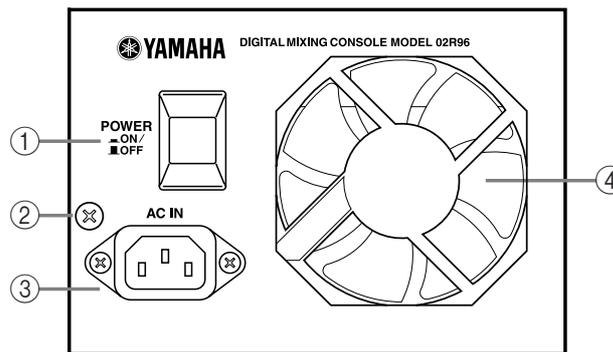


① **POWER ON/OFF switch**

This switch is used to turn on the power to the 02R96. See "Turning On & Off the 02R96" on page 43 for more information.

② **Grounding screw**

For electrical safety reasons, and correct operation of the touch-sensitive faders, it's important that the 02R96 is grounded properly. The supplied power cord has a three-pin plug, and if the ground terminal of the AC outlet is grounded, then the unit will be grounded sufficiently through the power cord. If the AC outlet does not provide a suitable ground, this screw must be connected to a suitable ground point. Grounding is also an effective method for eliminating hum, interference, and other noise.

③ **AC IN connector**

This connector is used to connect the 02R96 to an AC outlet via the supplied power cord. See "Connecting the Power Cord" on page 43 for more information.

④ **Cooling fan**

The cooling fan expels air out through this outlet. If the airflow is restricted, the 02R96 may overheat, so make sure this outlet is not blocked.

## SLOT Section
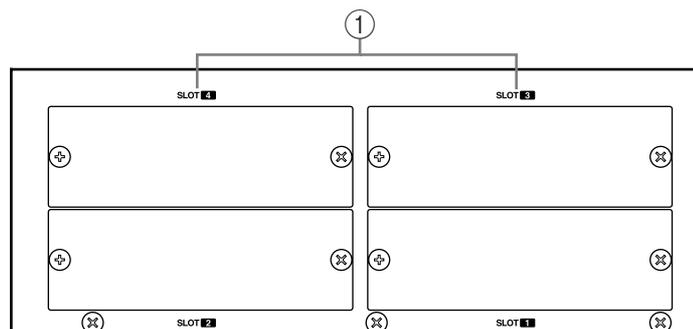


① **SLOT 1–4**

These four slots are for use with optional mini YGDAI cards, which offer a variety of analog and digital I/O options. See "Slot I/O" on page 59 for more information. Slot inputs can be patched to Input Channels or Insert Ins. See "Input Patching" on page 66 for more information. The following signals can be patched to the Slot Outputs: Bus Outs, Aux Sends, Stereo Out, Insert Outs, Direct Outs, and Surround Monitor Channels. See "Output Patching" on page 68 for more information.

# 3 Operating Basics

## Connecting the Power Cord

> *Warning: Turn off all equipment connected to the 02R96 before making any power connections.*

Connect the socket-end of the supplied power cord to the AC IN on the rear panel of the 02R96. Connect the plug-end to a suitable AC wall outlet, one that conforms to the power supply requirements stated on the 02R96's rear panel.
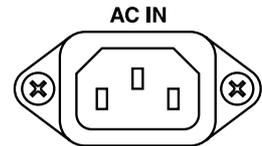
## Turning On & Off the 02R96

To prevent loud clicks and thumps in your speakers, turn on your audio equipment in the following order (reverse this order when turning off)—sound sources, multitrack and master recorders, 02R96, monitoring power amplifiers.
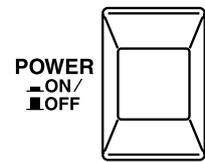
**1 To turn on the 02R96, press the [POWER] switch.**

The startup page appears for a while, and then the last selected display page appears.

**2 To turn off the 02R96, press the [POWER] switch again.**

## About the Display

All 02R96 mix parameters can be edited on the various display pages.
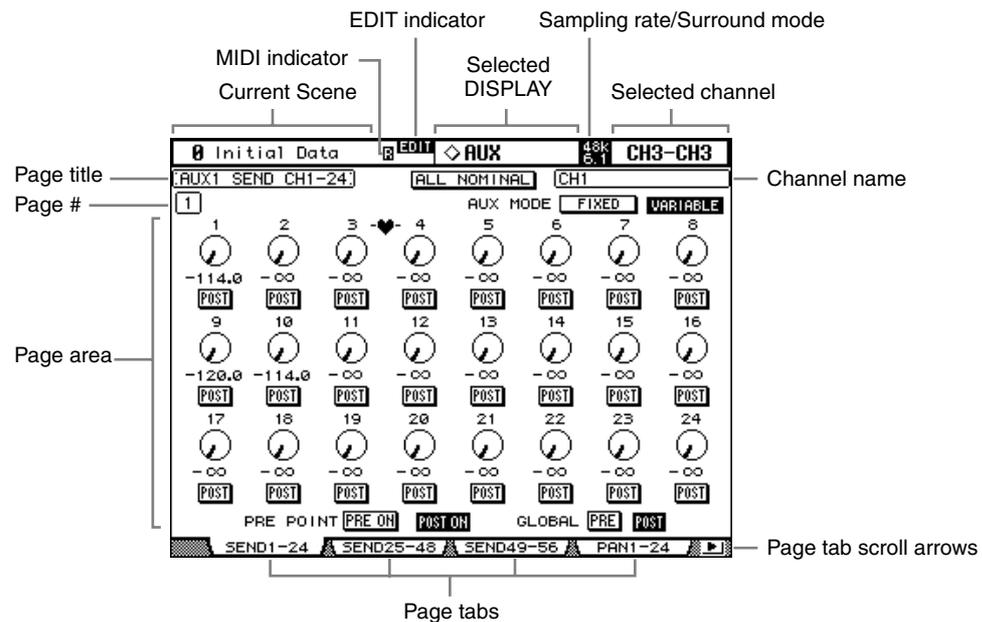


**Current Scene:** The number and title of the currently selected Scene memory are displayed here. See "Storing & Recalling Scenes with the SCENE MEMORY Buttons" on page 164 for more information. If the selected Scene is write-protected, a padlock icon appears. See "Using the Scene Memory Page" on page 165 for more information.

**MIDI indicator:** This indicator appears when the 02R96 is receiving MIDI data via the MIDI IN port, USB TO HOST port, or SERIAL TO HOST port.

**EDIT indicator:** This indicator appears when the current mix settings no longer match those of the Scene that was recalled last. It works in unison with the Edit indicator dot on the SCENE MEMORY display. See "Edit Buffer & Edit Indicator" on page 162 for more information.

**Selected DISPLAY:** This indicates the currently selected display page group, for example, AUX, EQ, or AUTOMIX. Display page groups are selected by using the [DISPLAY] buttons.

**Sampling rate/Surround mode:** This indicates the current sampling rate—44.1 kHz (44k), 48 kHz (48k), 88.2 kHz (88k), or 96 kHz (96k), and surround mode—6.1, 5.1, 3-1, and ST.

**Selected channel:** The Input or Output Channel currently selected by the [SEL] buttons is indicated here. See "Selecting Channels" on page 48. The first four characters are the Channel ID (e.g., CH1–CH56, BUS1–BUS8, AUX1–AUX8, ST-L, ST-R. The second four, are the channel's Short name. See "Naming Channels" on page 134. If the Channel ID preference is on, only the Channel ID is displayed. See "Channel ID" on page 232 for more information.

**Channel name:** Depending on the currently selected page, this is the Long name of either the currently selected channel or the channel selected by the cursor buttons. On some pages, the Aux Send pages, for example, it's possible to edit Aux Send levels without having to select each Input Channel. Instead, Input Channel Aux Sends can be selected by using the cursor buttons. In this case, the name displayed here is different to the name displayed in the upper-right corner of the display.

**Page title:** This is the title of the currently selected page.

**Page #:** Depending on the group of pages currently selected, page numbers are displayed here. For example, although you can view only one Input Channel 1–24 Aux Send page at a time, there are in fact eight Input Channel 1–24 Aux Send pages, one for each of the eight Aux Sends. Page numbers are also displayed when the Effects page group is selected.

**Page area:** This area of the display is where the various display pages appear.

**Page tabs:** These tabs are used when selecting pages. Up to four tabs are visible at a time. See "Selecting Display Pages" on page 45 for more information.

**Page tab scroll arrows:** These arrows indicate that there are more pages available. See "Selecting Display Pages" on page 45 for more information.

## Selecting Display Pages

◇
**DISPLAY**

Display pages are grouped by function, and each group of pages can be selected by using the following [DISPLAY] buttons: AUX SELECT, ENCODER MODE, EFFECTS/PLUG-INS, ROUTING, DYNAMICS, PAN/SURROUND, EQUAL-IZER, SCENE MEMORY, USER DEFINED KEYS, MACHINE CONTROL, MON-ITOR. Further page groups can be selected by using the DISPLAY ACCESS buttons.

- The next page in the group can be selected by pressing the [DISPLAY] button.

- Previous pages can be selected by pressing and holding down the [DISPLAY] button.

- The first page in the group can be selected by double-clicking the [DISPLAY] button.

- Pages whose tabs are currently displayed can be selected by using the F1–F4 buttons.

☐ F1   ☐ F2   ☐ F3   ☐ F4

◄| Tab Scroll arrows |►
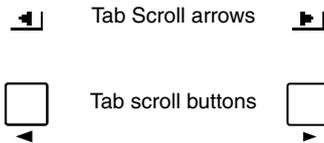
☐ Tab scroll buttons ☐
◄           ►

If there are more pages available than the four whose tabs are currently displayed, depending on whether they are located to the left or right, either the left or right Tab Scroll arrow appears. Pressing either the Left or Right Tab Scroll button displays the tabs of these pages, which can then be selected by using the F1–F4 buttons.

When parameters are divided among several pages, for example, the Input Channel Attenuators, which are divided among three pages, the page containing the parameter for the currently selected channel is selected automatically when channels on different Layers are selected. For example, if the Input Channel 1–24 Attenuator page is currently selected, and then you select, say, Input Channel #25 by using the LAYER [25–48] button and [SEL] button #1, the Input Channel 25–48 Attenuator page is selected automatically.

The currently selected page in a group, and the parameter selected on that page, are remembered when you select another group of pages, so when you return to that group, by pressing its [DISPLAY] button, that page is displayed with the same parameter selected.

The Auto Display preferences can be set so that certain pages appear automatically when a corresponding control is adjusted. For example, if the "Auto EQUALIZER Display" preference is on, the EQ page appears automatically when a SELECTED CHANNEL EQUAL-IZER control is operated. See page 230 for information on the Auto Display preferences.

## Display Parameter Boxes

Operation of the various buttons, rotary controls, and faders that appear on the display pages is straightforward. The only items that require a special mention are the parameter boxes, such as the INSERT POSITION, OUT, and IN parameter boxes shown here. Operation of these boxes consists of two steps. First you select a value, typically by using the Parameter wheel or INC/DEC buttons. Second you confirm your selection, while the value is flashing, by pressing the [ENTER] button. If you select another parameter while the value is still flashing, it remains unchanged.

```
┌─────────INSERT──────┐
│ ON/OFF   [OFF]      │
│ POSITION [PRE EQ]   │
│ OUT      [NONE]     │
│ IN       [NONE]     │
└─────────────────────┘
```
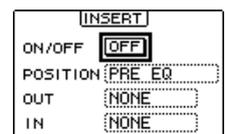
## Parameter Windows

When a rotary control in the SELECTED CHANNEL section is operated, if the corresponding parameter does not appear on the currently selected page, a parameter window like the one shown here is displayed while the control is adjusted. If the control is not adjusted for awhile, the window closes automatically. If the Auto Display preference for the adjusted parameter is on, the page containing that parameter appears instead of this parameter window.

## Confirmation Messages

For certain functions, the 02R96 prompts you for confirmation before executing them, as shown here. Press YES to execute the function, or press NO to cancel. If no action is taken for awhile, the confirmation window closes automatically and the function is not executed.
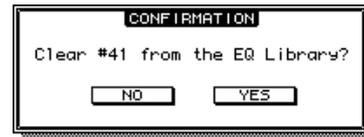
## Title Edit Window

The Title Edit window is used to enter titles for Scene and library memories, automixes, and so on. Depending on the item being titled, the number of characters that can be entered is either 4, 12, or 16. The following screen shots show the available characters. The one on the left shows uppercase characters and various punctuation marks. That on the right, lower-case characters and numbers.
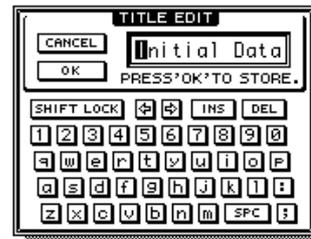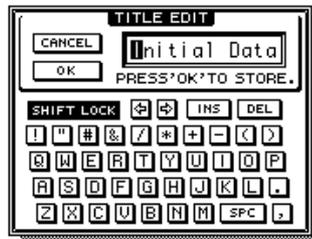
Use the cursor buttons to select characters, and the [ENTER] button to enter them into the title. The cursor moves to the right automatically as each character is entered. The Parameter wheel or the arrow buttons can be used to move the cursor within the title.

Use the SHIFT LOCK button to select uppercase and lowercase characters, and use the SPC button to enter a space. To insert a space at the cursor position and move subsequent characters to the right, press the INS button. To delete the character at the cursor position, press the DEL button.

When you've finished, press the OK button to enter the title, or press CANCEL to cancel title entry.

## Selecting Layers

Input and Output Channels are arranged into Layers, as illustrated below. There are four Layers altogether: two Input Channel Layers, a Master Layer (or Output Layer), and a Remote Layer.

Input Channels [1–24]
Input Channels [25–48]
Input Channels 49–56, Aux Sends, Bus Outs [MASTER]
[REMOTE]
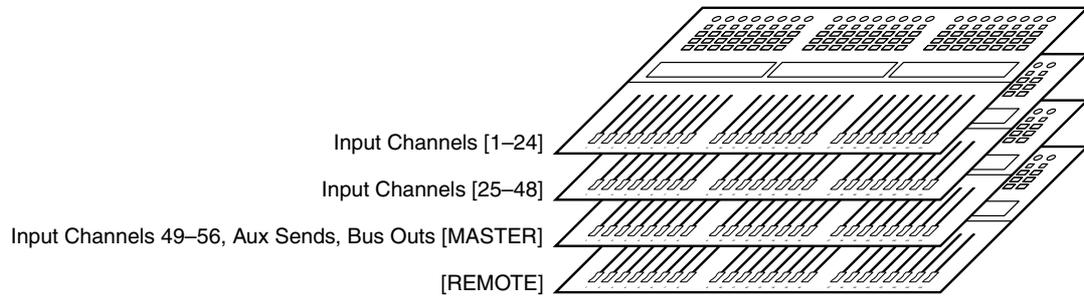
To select Input and Output Channels for editing with the channel strip controls, you use the LAYER buttons to select a Layer.

The LAYER button indicator for the currently selected Layer lights up.

The currently selected Layer determines the function of the channel strip Encoders, [AUTO] buttons, [SEL] buttons, [SOLO] buttons, [ON] buttons, and faders. For example, when Layer 1–24 is selected, [SEL] button #1 controls Input Channel #1. When Layer 25–48 is selected, it controls Input Channel #25. And when the Master Layer is selected, it controls Input Channel #49.

**LAYER**

| 1-24 | REMOTE |
| 25-48 | MASTER |
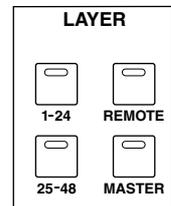
The following table shows which Input and Output Channels are controlled by the channel strips on each Layer.

| Layers | Channel Strips | | |
|---|---|---|---|
| | **1–8** | **9–16** | **17–24** |
| **1–24** | Input Channels 1–24 | | |
| **25–48** | Input Channels 25–48 | | |
| **MASTER** | Input Channels 49–56 | Aux Send masters 1–8 | Bus Out masters 1–8 |
| **REMOTE** | Operation depends on the selected target. See "About the Remote Layer" on page 219 for more information. | | |

The exact function of each channel strip fader and Encoder also depends on the currently selected Fader mode and Encoder mode respectively. See "Selecting Fader Modes" on page 49 and "Selecting Encoder Modes" on page 50 for more information.

## Selecting Channels

To select Input and Output Channels for editing with the SELECTED CHANNEL controls, you use the LAYER buttons to select a Layer, and the [SEL] buttons to select a channel on that Layer.

**1** **Select a Layer, as explained on page 47.**

**2** **Use the [SEL] buttons to select an Input or Output Channel.**

The [SEL] button indicator for the currently selected channel lights up. In addition, the Channel's ID and Short name appear in the upper right corner of the display (see page 44).

The exact channel selected by each [SEL] button depends on the currently selected Layer. For example, when Layer 1–24 is selected, [SEL] button #1 selects Input Channel #1. When Layer 25–48 is selected, it selects Input Channel #25. And when the Master Layer is selected, it selects Input Channel #49, as shown in the following table.

| Layer | [SEL] Button | | |
| --- | --- | --- | --- |
| | 1–8 | 9–16 | 17–24 |
| 1–24 | Input Channels 1–24 | | |
| 25–48 | Input Channels 25–48 | | |
| MASTER | Input Channels 49–56 | Aux Sends 1–8 | Bus Outs 1–8 |
| REMOTE | Operation depends on the selected target. See "About the Remote Layer" on page 219 for more information. | | |

For paired Input or Output channels, the channel whose [SEL] button you press is selected, and its indicator lights up. The [SEL] button indicator of the other channel flashes.

Vertical and horizontal Input and Output channel partners can also be selected by using the SELECTED CHANNEL PAN/SURROUND [L] and [R] buttons, which can also be used to select left and right channels when the Stereo Out is selected.

If the currently displayed page contains a relevant parameter, when a channel's [SEL] button is pressed, the cursor moves to that parameter automatically. If the currently displayed page contains no such parameter, the page that does contain such a parameter is selected automatically. For example, if a Delay page for the Output Channels is selected when an Input Channel [SEL] button is pressed, the Delay page showing the relevant Input Channel Delay parameter is selected automatically.

### Stereo Out [SEL] Button

The Stereo Out [SEL] button is used exclusively to select the Stereo Out for editing with the SELECTED CHANNEL controls. Its indicator lights up when the Stereo Out is selected. Each time it's pressed, the selection toggles between the Stereo Out's left and right channels. The SELECTED CHANNEL PAN/SURROUND [L] and [R] buttons can also be used to select the left and right channels.

If the currently displayed page contains a Stereo Out parameter, that parameter is selected automatically when the Stereo Out [SEL] button is pressed. If the currently selected page contain no such parameter, the page that does contain such a parameter is selected automatically. For example, if a Delay page for the Input Channels is currently selected when the Stereo Out [SEL] button is pressed, the Delay page showing the Stereo Out Delay parameter is selected automatically.

### Auto Channel Select & Touch Sense Select

While the Auto Channel Select preference is on (see page 230), channels can be selected by moving the corresponding fader or Encoder, or by turning on the corresponding [AUTO], [SOLO], or [ON] button. Note that you can use the [AUTO] buttons to select channels only during Automix recording or in Automix record ready mode.

While the Fader Touch Sense SELECT preference is on (see page 232), channels can be selected simply by touching the fader knobs.

## Selecting Fader Modes

The exact function of each fader depends on the selected Layer and Fader mode.

**1    Select a Layer, as explained on page 47.**

**2    Use the FADER MODE buttons to select a Fader mode.**

```
FADER MODE
  ┌──┐   ┌──┐
  │  │   │  │
  └──┘   └──┘
 FADER   AUX
```
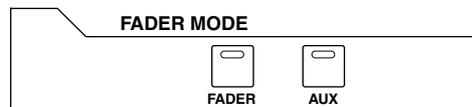
**[FADER]:** Channel faders control Input Channel levels or Output Channel master levels, depending on the selected Layer.

**[AUX]:** Channel faders control Aux Send levels, depending on the selected Layer.

The indicator of the currently selected FADER MODE button lights up.

The following table shows the channel fader functions for each Layer and Fader mode.

| Layer | Fader Mode | Fader | | |
|-------|------------|-------|---|---|
|       |            | **1–8** | **9–16** | **17–24** |
| **1–24** | Fader | Input Channels 1–24 level | | |
|          | Aux   | Input Channels 1–24 Aux Send level | | |
| **25–48** | Fader | Input Channels 25–48 level | | |
|           | Aux   | Input Channels 25–48 Aux Send level | | |
| **Master** | Fader | Input Channels 49–56 level | Aux Sends 1–8 master level | Bus Outs 1–8 master level |
|            | Aux   | Input Channels 49–56 Aux Send level | No operation: faders fixed at –∞ | |
| **Remote** | Fader | Operation depends on the selected target. See "About the Remote Layer" on page 219 for more information. | | |
|            | Aux   | | | |

## Selecting Encoder Modes

The exact function of each Encoder depends on the selected Layer and Encoder mode. There are two preset Encoder modes, Pan and Aux, and two assignable modes, for which you can choose from over 40 parameters.

**1 Select a Layer, as explained in page 47.**

**2 Use the ENCODER MODE buttons to select an Encoder mode.**
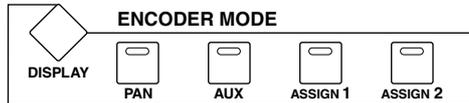


**[PAN]:** Encoders function as Pan controls.

**[AUX]:** Encoders control Aux Send levels, depending on the selected Layer.

**[ASSIGN 1/2]:** Encoders control the parameters assigned to the ASSIGN buttons. See "Assigning Parameters to the ENCODER MODE Assign Buttons" on page 51 for more information.

The indicator of the currently selected ENCODER MODE button lights up.

The following table shows the exact Encoder functions for each Layer and Encoder mode.

| Layer | Encoder Mode | Encoder | | |
|-------|------------|---------|---------|---------|
| | | **1–8** | **9–16** | **17–24** |
| **1–24** | Pan | Input Channels 1–24 pan | | |
| | Aux | Input Channels 1–24 Aux Send level | | |
| | Assign 1/2 | Input Channels 1–24 assigned parameter[1] | | |
| **25–48** | Pan | Input Channels 25–48 pan | | |
| | Aux | Input Channels 25–48 Aux Send level | | |
| | Assign 1/2 | Input Channels 25–48 assigned parameter[1] | | |
| **Master** | Pan | Input Channels 49–56 pan | No operation | |
| | Aux | Input Channels 49–56 Aux Send level | No operation | |
| | Assign 1/2 | Input Channels 49–56 assigned parameter | Aux Sends 1–8 assigned parameter | Bus Outs 1–8 assigned parameter |
| **Remote** | Pan | Operation depends on the selected target. See "About the Remote Layer" on page 219 for more information. | | |
| | Aux | | | |
| | Assign 1/2 | | | |

1. When Alt Layer is assigned, the Encoders enable you to control a parameter that is assigned to the corresponding channel fader in the partner layer. (A partner layer would be the layer of channels 25-48 if the layer of channels 1-24 is currently selected.)

# Assigning Parameters to the ENCODER MODE Assign Buttons

Up to two parameters can be assigned to the two ENCODER MODE ASSIGN buttons.

Initially, the following parameters are assigned to the ASSIGN buttons:

**[ASSIGN 1]:** Input Patch

**[ASSIGN 2]:** Direct Out

**1** **Use the ENCODER MODE [DISPLAY] button to select the Encoder Mode Assign page.**
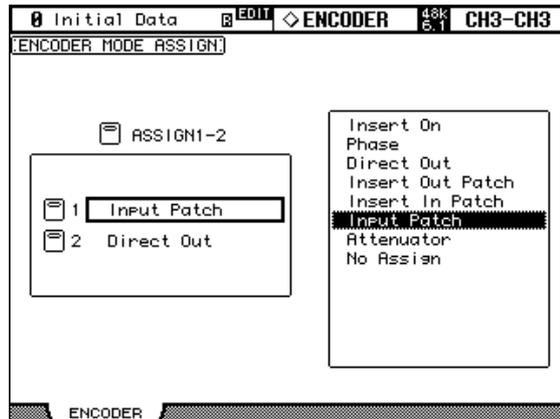


The names of the parameters currently assigned to each ASSIGN button are displayed in the left-hand box. The parameter currently assigned to the selected ASSIGN button appears highlighted in the right-hand box.

**2** **Press an ASSIGN button, or use the Up/Down cursor buttons, to select an ASSIGN button.**

**3** **Use the Parameter wheel, or the INC/DEC buttons to select a parameter.**

A parameter is selected when it appears inside the dotted box.

See the "Assignable Encoder Mode Parameter List" on page 52 for a complete list of assignable parameters.

**4** **Press the [ENTER] button to assign your choice.**

Once assigned, the selected parameter appears highlighted in the right-hand box.

When channels that do not feature the currently assigned parameter are selected, the Encoders are inactive. For example, if the assigned Encoder parameter is "Phase," and the Master Layer is selected, Encoders 9–24 are inactive, because the Aux Sends and Bus Outs do not feature Phase parameters.

## Assignable Encoder Mode Parameter List

| # | Parameter | Encoder Operation | Push Switch Operation |
|---|---|---|---|
| 1 | No Assign | — | — |
| 2 | Attenuator | Attenuator | — |
| 3 | Input Patch | Input Channel patch | Confirm or execute patch selection. |
| 4 | Insert In Patch | Insert In patch | Confirm or execute patch selection. |
| 5 | Insert Out Patch | Insert Out patch | Confirm or execute patch selection. |
| 6 | Direct Out | Direct Out patch | Confirm or execute patch selection. |
| 7 | Phase | Phase: normal/reverse | — |
| 8 | Insert On | Insert on/off | — |
| 9 | Aux pre/post | Aux pre/post | — |
| 10 | Delay On | Delay on/off | — |
| 11 | Delay Time | Delay Time | — |
| 12 | Delay FB.Gain | Delay FB.Gain | — |
| 13 | Delay Mix | Delay Mix | — |
| 14 | EQ On | EQ on/off | — |
| 15 | EQ Type | EQ Type | — |
| 16 | EQ Low Q | EQ Low Q | — |
| 17 | EQ Low F | EQ Low Frequency | — |
| 18 | EQ Low G | EQ Low Gain | — |
| 19 | EQ Low-Mid Q | EQ Low-Mid Q | — |
| 20 | EQ Low-Mid F | EQ Low-Mid Frequency | — |
| 21 | EQ Low-Mid G | EQ Low-Mid Gain | — |
| 22 | EQ High-Mid Q | EQ High-Mid Q | — |
| 23 | EQ High-Mid F | EQ High-Mid Frequency | — |
| 24 | EQ High-Mid G | EQ High-Mid Gain | — |
| 25 | EQ High Q | EQ High Q | — |
| 26 | EQ High F | EQ High Frequency | — |
| 27 | EQ High G | EQ High Gain | — |
| 28 | Gate On | Gate on/off | — |
| 29 | Gate Threshold | Gate Threshold | — |
| 30 | Gate Range | Gate Range | — |
| 31 | Gate Attack | Gate Attack | — |
| 32 | Gate Decay | Gate Decay | — |
| 33 | Gate Hold | Gate Hold | — |
| 34 | Comp On | Comp on/off | — |
| 35 | Comp Threshold | Comp Threshold | — |
| 36 | Comp Ratio | Comp Ratio | — |
| 37 | Comp Attack | Comp Attack | — |
| 38 | Comp Release | Comp Release | — |
| 39 | Comp Out Gain | Comp Out Gain | — |
| 40 | Comp Knee/Width | Comp Knee/Width | — |
| 41 | Surr L/R Pan | Surround L/R Pan | — |
| 42 | Surr F/R Pan | Surround F/R Pan | — |
| 43 | Surr Front DIV | Surround Front DIV | — |
| 44 | Surr Rear DIV | Surround Rear DIV | — |
| 45 | Surr. LFE Level | Surround LFE level | — |
| 46 | Surr. Pan Wheel | Surround Pan Wheel | — |
| 47 | Scene Fade Time | Scene Fade Time | — |
| 48 | Alt Layer | Alt Layer | — |

# 4  Analog I/O & the AD Input Section

## AD Input Section

The 02R96 features 24 AD Inputs for connecting microphone and line-level sources.

AD Inputs can be patched to Input Channels or Input Channel Insert Ins (see page 66). They can also be patched to Output Channel Insert Ins (see page 69).

### AD Input Connectors (AD 1–16)
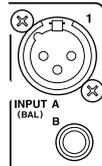
AD Inputs 1 through 16 feature balanced XLR-3-31-type connectors and balanced 1/4-inch phone jacks, both with a nominal input range of –60 dB to +10 dB. The phone jacks, which can also be used with unbalanced phone plugs, have priority over the XLR-type connectors, so when a phone plug is inserted, the XLR-type connector is disconnected.

### AD Input Connectors (AD 17–24)
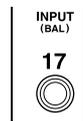
AD Inputs 17 through 24 feature balanced 1/4-inch phone jacks, with a nominal input range of –34 dB to +10 dB. They can also be used with unbalanced phone plugs.

### Phantom Power (AD 1–16)

AD Inputs 1 through 16 feature switchable +48 V phantom powering for use with condenser-type microphones and direct boxes. Phantom power is supplied to the balanced XLR-3-31-type connector, and can be switched individually for each AD Input.

### Pad (AD 1–16)

AD Inputs 1 through 16 feature pad switches, which attenuate input signals by 26 dB, allowing the Head Amps to work with high-level signals. Pad is typically used to attenuate "hot" signals from bass or snare drum microphones, or "hot" line-level signals.

### Gain
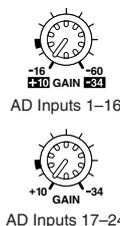
AD Inputs feature detented rotary gain controls with an input sensitivity of –16 dB to –60 dB, or +10 dB to –34 dB when the Pad is on (+10 dB to –34 dB for AD Inputs 17–24). The GAIN controls adjust the gain of the Head Amps, allowing you to optimize input signal levels for the best signal-to-noise performance. Ideally, the GAIN control should be set so that the signal level is relatively high, and it's okay for the PEAK indicator to light up occasionally. If the PEAK indicator lights up often, however, you should back off the GAIN control a little, otherwise, signal clipping may occur. If the GAIN is set too low, the signal-to-noise performance will suffer.

### PEAK & SIGNAL Indicators

These indicators are used in conjunction with the GAIN controls and PAD switches to optimize signal levels. The SIGNAL indicator lights up when the input signal level is 20 dB below the rated level. The PEAK indicator lights up when the input signal level is 3 dB below clipping.

### AD Inserts (AD 1–16)

AD Inputs 1 through 16 feature switchable analog inserts on 1/4-inch TRS phone jacks for the send and return signals. They are wired: sleeve–ground, ring–return, tip–send. The rated level for both connectors is +4 dB.

AD Input inserts can be turned on and off individually by using the INSERT ON/OFF switches, so you don't have to disconnect your external equipment in order to remove an insert.

## Stereo Out

See page 92 for information on the Stereo Out outputs.

## Control Room Monitor Out

See page 136 for information on the Control Room Monitor output.

## Studio Monitor Out

See page 137 for information on the Studio Monitor output.

## Omni Outs

The 02R96 features assignable Omni Outs on balanced 1/4-inch TRS phone jacks. Omni Outs can be patched to Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or Surround Monitor Channels (see page 69). In addition, Input Channel Direct Outs can be patched to the Omni Outs (see page 70).
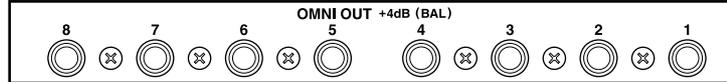
The maximum output level of each OMNI OUT can be set internally to either +4 dB (−10 dB operating level) or +18 dB (+4 dB operating level). Contact your dealer for further details.

## 2TR Analog INs

The 02R96 features two sets of 2-track analog inputs: 2TR IN ANALOG 1 +4 dB (BAL) uses balanced 1/4-inch TRS phone jacks. 2TR IN ANALOG 2 −10 dBV (UNBAL) uses unbalanced phono connectors. These inputs can be monitored via the Control Room monitors by pressing the CONTROL ROOM [2TR A1] and [2TR A2] buttons. They can be patched to Input Channels (see page 66), Input Channel Insert Ins (see page 67), or Output Channel Insert Ins (see page 69).
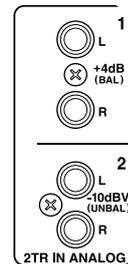
# 5  Digital I/O & Cascading

## Wordclocks

Unlike analog audio equipment, digital audio equipment must be synchronized when digital audio signals are transferred from one device to another, otherwise, signals may not be received correctly and audible noise, glitches, or clicks may occur. Synchronization is achieved using what's called a *wordclock*, which is a clock signal for synchronizing all the digital audio signals in a system. Note that wordclocks are not the same as SMPTE/EBU or MTC timecode, which is typically used to synchronize tape machines, MIDI sequencers, and so on. Wordclock synchronization refers to the synchronization of the digital audio processing circuits inside each digital audio device.

In a typical digital audio system, one device operates as the wordclock master, and the other devices operate as wordclock slaves, synchronizing to the wordclock master. Wordclock signals can be distributed via dedicated cables, typically BNC cables, or derived from digital audio connections, including AES/EBU, ADAT, and Tascam formats.

If you're connecting to the 02R96 using only analog inputs and outputs, no special wordclock settings are required, and the 02R96 can be set to use its own internally generated wordclock. If you're connecting other equipment digitally, however, you must decide which device to use as the wordclock master and which devices to use as slaves.

The 02R96 can be used as the wordclock master running at either 44.1 kHz, 48 kHz, 88.2 kHz, or 96 kHz, or slaved to an external wordclock source. External wordclock signals can be received via the Slot Inputs, 2TR Digital Inputs, the CASCADE IN port, or the dedicated BNC WORD CLOCK IN connector.

In a system where all devices share a common wordclock, it's important that all devices be turned on even if they're not being used. Turn on the wordclock master first, and then the slaves. When shutting down the system, turn off the slaves first, and then the master. Before use, make sure that the wordclock slaves are correctly locked to the wordclock master. Most devices have front panel indicators to indicate this. Refer to the relevant owner's manuals for more information.

### Wordclock Connections

The 02R96 features a BNC wordclock input and a BNC wordclock output. External wordclock signals can be connected to the WORD CLOCK IN connector, and terminated by using the 75Ω ON/OFF switch (see page 57). The WORD CLOCK OUT outputs a wordclock signal at the same clock rate as the 02R96.
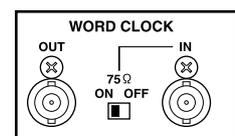
### Selecting the Wordclock Source

The wordclock source can be selected as follows.

> *Note: When you change the wordclock settings on any device in your digital audio system, some devices may output noise, so turn down your power amps beforehand, otherwise your speakers may be damaged.*

**1   Use the DISPLAY ACCESS [DIO] button to locate the Word Clock Select page.**
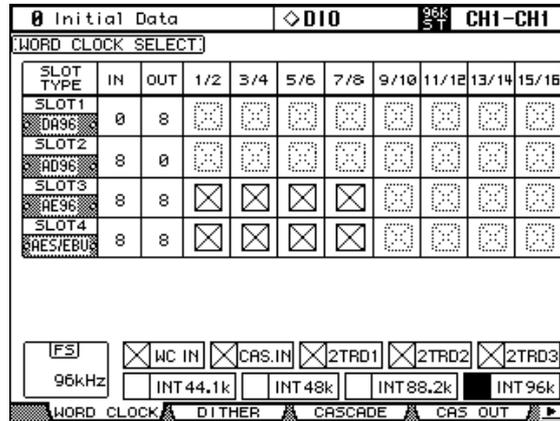


**2   Use the cursor buttons to select the sources, and press [ENTER] to set.**

The SLOT TYPE column displays the names of any installed I/O Cards. The IN and OUT columns indicate the number of inputs and outputs available for each installed I/O Card. The FS box in the lower-left corner displays the current wordclock status: 44.1kHz, 48kHz, 88.2kHz, 96kHz, or Unlock.

The following are possible wordclock sources:

**SLOT1–4 (1/2–15/16):** These buttons select the Slot Inputs as the wordclock source. Inputs are selected in pairs, the number of pairs depending on the type of I/O Card installed.

**WC IN:** This button selects the WORDCLOCK IN connector as the wordclock source.

**CAS. IN:** This button selects the CASCADE IN port as the wordclock source.

**2TRD1, 2TRD2, 2TRD3:** These buttons select the 2TR Digital Inputs as the wordclock source.

**INT44.1k, INT48k, INT88.2k, INT96k:** These buttons select the internal wordclock generator as the wordclock source.

The source select buttons have the following indications:

☐   A usable wordclock signal is present at this input.

⊠   No wordclock signal is present at this input.

◹   A wordclock signal is present, but it's out of sync with the current 02R96 clock.

■   This is the currently selected wordclock source.

⊠   This input was selected as the wordclock source, but no usable signal was received.

⬚   This cannot be selected as the wordclock source because a wordclock signal cannot be sourced from this input on this type of I/O Card, or no I/O Card is installed.

If an external wordclock source fails for some reason, the 02R96 automatically switches to its internal wordclock generator at the closest frequency.

### Terminating External Wordclocks

Wordclock signals distributed via BNC cables must be terminated correctly, otherwise, jitter and synchronization errors may result. Ideally, you should make a separate wordclock connection to each device and terminate it. The following examples show two ways in which wordclock signals can be distributed and how termination should be applied in each case. Normally the WORD CLOCK 75Ω ON/OFF switch should be set to ON. The OFF setting provides support for wordclock source devices with special specifications.

### Star Distribution

In this example a dedicated wordclock distribution box is used to supply wordclock signals to each device individually. Termination is applied at each device.
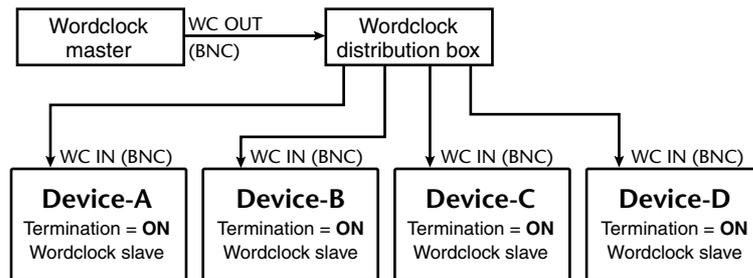


### Daisy Chain Distribution

In this example the wordclock signal is distributed in a "daisy-chain" fashion, with each device feeding the wordclock signal on to the next. This method of distribution is not recommended for larger systems.
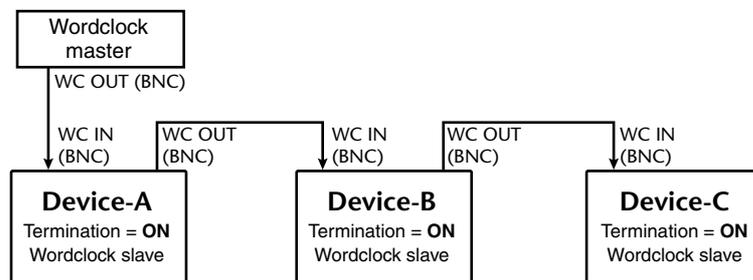


# 2TR Digital Outs

The 02R96 features three sets of 2-track digital outputs: 2TR OUT DIGITAL AES/EBU 1 uses an XLR-3-32-type connector and outputs AES/EBU format digital audio. 2TR OUT DIGITAL COAXIAL 2 and 3 use phono connectors and output consumer format (IEC-60958) digital audio. These outputs can be patched to the Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or the Control Room signal (see page 70). They can also be patched to Direct Outs (see page 70). Digital output signals can be dithered for transfer to lower-resolution systems (see page 62).
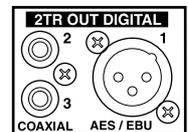
## 2TR Digital Ins

The 02R96 features three sets of 2-track digital inputs: 2TR IN DIGI-TAL AES/EBU 1 uses an XLR-3-31-type connector and accepts AES/EBU format digital audio. 2TR IN DIGITAL COAXIAL 2 and 3 use phono connectors and accept consumer format (IEC-60958) digital audio. These inputs can be monitored via the Control Room monitors by using the CONTROL ROOM [2TR D1], [2TR D2], and [2TR D3] buttons. They can be patched to Input Channels (see page 66), Input Channel Insert Ins (see page 67), or Output Channel Insert Ins (see page 69). Digital audio signals received at sampling rates other than the current 02R96 rate can be converted by the internal sampling rate converters (see page 58). You can monitor the Channel Status of digital signals present at these inputs on the Channel Status Monitor page (see page 62).
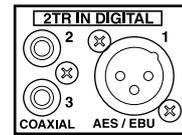
## 2TR In Sampling Rate Conversion

The 02R96's 2TR Digital Inputs feature sampling rate converters so you can easily connect your legacy 44.1/48 kHz digital audio equipment.

1  **Use the DISPLAY ACCESS [DIO] button to locate the Sampling Rate Converter page.**
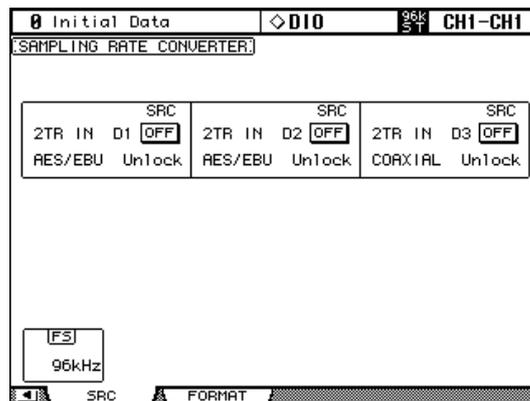


2  **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set them.**

The FS box in the lower-left corner displays the current wordclock status: 44.1kHz, 48kHz, 88.2kHz, 96kHz, or Unlock.

**2TR IN D1–3:** These buttons are used to turn on and off the sampling rate converter for each 2TR Digital Input. When on, the sampling rate of the received digital audio is converted to the 02R96's current sampling rate. The original sampling rate is displayed.

# Slot I/O

The 02R96 features four Slots for installing optional mini-YGDAI (Yamaha General Digital Audio Interface) I/O Cards, which offer various analog I/O options and digital I/O interfaces in all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam.

Slot Inputs can be assigned to Input Channels or Input Channel Insert Ins (see page 66), or to Output Channel Insert Ins (see page 69). Slot Outputs can be assigned to Bus Outs, Aux Sends, the Stereo Out, Insert Outs, or the Surround Monitor Channels (see page 68), or Direct Outs (see page 70).

Slot outputs can be dithered for digital audio transfer to lower-resolution systems (see page 62).

## Available Cards

The following mini-YGDAI I/O Cards are currently available. See the Yamaha Professional Audio Web site at the following URL for up-to-date news on I/O Cards: <http://www.yamahaproaudio.com/>.

| Card | Format | In | Out | Resolution/Sampling Rate | Connectors |
|---|---|---|---|---|---|
| MY8-AD | Analog in | 8 | — | 20-bit, 44.1/48 kHz | Phone jack (balanced) x8 |
| MY8-AD24[1] | | | | 24-bit, 44.1/48 kHz | |
| MY4-AD | | 4 | | | XLR-3-31 type (balanced) x4 |
| MY8-AD96 | | 8 | | 24-bit, 44.1/48/88.2/96 kHz | D-sub 25-pin |
| MY4-DA | Analog out | — | 4 | 20-bit, 44.1/48 kHz | XLR-3-32 type (balanced) x4 |
| MY8-DA96 | | | 8 | 24-bit, 44.1/48/88.2/96 kHz | D-sub 25-pin |
| MY8-ADDA96 | Analog in/out | 8 | 8 | | Euroblock x4 |
| MY8-AE[2] | AES/EBU I/O | 8 | 8 | 24-bit, 44.1/48 kHz | D-sub 25-pin |
| MY16-AE[2] | | 16 | 16 | | |
| MY8-AEB | | 8 | 8 | | BNC connector x8 |
| MY8-AE96 | | 8 | 8 | 24-bit, 44.1/48/88.2/96 kHz | D-sub 25-pin |
| MY8-AE96S[3] | | | | | |
| MY8-AT[2] | ADAT I/O | 8 | 8 | 24-bit, 44.1/48 kHz | Optical x2 |
| MY16-AT[2] | | 16 | 16 | | Optical x4 |
| MY8-TD[2] | Tascam | 8 | 8 | | D-sub 25-pin BNC wordclock output |
| MY16-TD[2] | | 16 | 16 | | D-sub 25-pin |
| MY8-mLAN[2] | IEEE1394 | 8 | 8 | | 6-pin 1394 connector x2 |
| MY16-mLAN[2] | | 16 | 16 | | |
| WAVES Y56K | ADAT | 8 | 8 | 24-bit, 44.1/48 kHz | Optical x2 |
| WAVES Y96K | | | | 24-bit, 44.1/48/88.2/96 kHz | |

1. This card is a substitution for a 20-bit MY8-AD card.
2. These cards support 24-bit/96 kHz in Double Channel mode. (Separate 96 kHz wordclock required.)
3. This card is identical to the MY8-AE96, except that it features a sampling rate converter.

## Installing I/O Cards

> ⚠ *For technical reasons, certain card combinations are not supported. Before installing any cards, check the Yamaha web site (see page 5) to see whether your card is compatible.*
> *http://www.yamahaproaudio.com/*
> *Also check the total number of cards that can be installed in the unit. Installing cards that are not endorsed by Yamaha may cause electrical shock, fire, or damage to the unit.*

This section explains how to install I/O Cards.

**1    Turn off the 02R96.**

**2    Undo the two fixing screws and remove the slot cover, as shown below.**
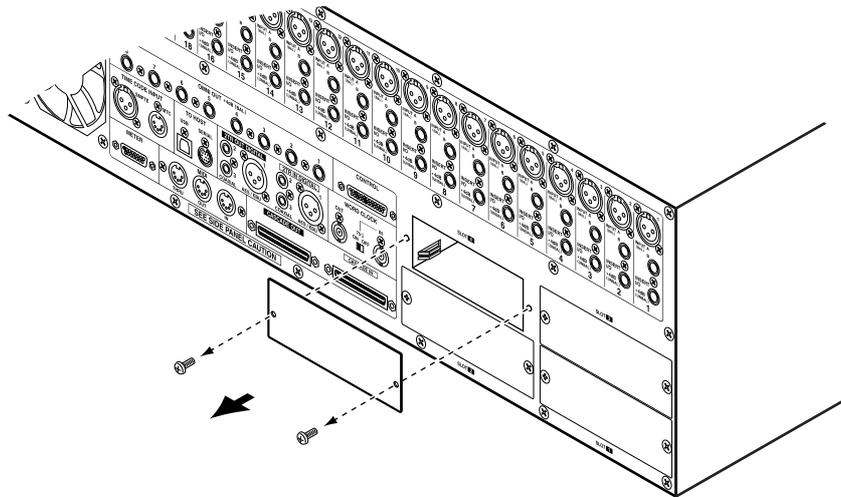


Keep the cover and fixing screws in a safe place for future use.

**3    Insert the card between the guide rails and slide it all the way into the slot, as shown below. You may have to push firmly to plug the card into the internal connector.**
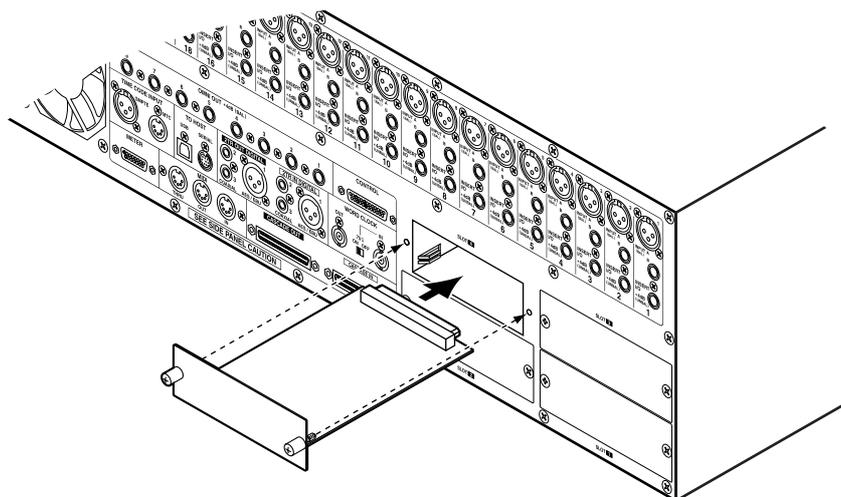


**4    Secure the card using the attached thumbscrews. Do not leave them loose, as the card will not be grounded correctly, which may cause the 02R96 to malfunction.**

You can check which I/O Cards are installed on the Word Clock Select page (see page 56).

### Setting the Transfer Format for Higher Sampling Rates

The data transfer format for the higher sampling rates can be set as follows.

**1    Use the DISPLAY ACCESS [DIO] button to locate the Higher Sample Rate Data Transfer Format page.**

```
┌─────────────────────────────────────────────────────┐
│ 0 Initial Data          ◇DIO        96k  CH1-CH1     │
│                                      ST              │
│ (HIGHER SAMPLE RATE DATA TRANSFER FORMAT)            │
│                                                       │
│ ┌──────┬────────┬────────┬─────────────────────────┐ │
│ │ SLOT │  IN    │  OUT   │          SRC            │ │
│ │ TYPE │        │        │ 1/2  │ 3/4 │ 5/6 │ 7/8  │ │
│ ├──────┼────────┼────────┼──────┼─────┼─────┼──────┤ │
│ │SLOT1 │ DOUBLE │ DOUBLE │      │     │     │      │ │
│ │adat  │CHANNEL │CHANNEL │  -   │  -  │  -  │  -   │ │
│ ├──────┼────────┼────────┼──────┼─────┼─────┼──────┤ │
│ │SLOT2 │ DOUBLE │ DOUBLE │ OFF  │ ON  │ ON  │ ON   │ │
│ │AES/EBU│ SPEED │CHANNEL │96kHz │44.1 │48kHz│88.2  │ │
│ │      │        │        │      │kHz  │     │kHz   │ │
│ ├──────┼────────┼────────┼──────┼─────┼─────┼──────┤ │
│ │SLOT3 │ DOUBLE │ DOUBLE │      │     │     │      │ │
│ │TDIF  │CHANNEL │CHANNEL │  -   │  -  │  -  │  -   │ │
│ ├──────┼────────┼────────┼──────┼─────┼─────┼──────┤ │
│ │SLOT4 │        │        │      │     │     │      │ │
│ │D/A   │   -    │   -    │  -   │  -  │  -  │  -   │ │
│ └──────┴────────┴────────┴──────┴─────┴─────┴──────┘ │
│                                                       │
│  ◄│     SRC        FORMAT                            │
└─────────────────────────────────────────────────────┘
```

**2    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set them.**

The SLOT TYPE column displays the names of any installed I/O Cards.

**IN/OUT:** These parameters are used to set the input and output data transfer format of I/O Cards when running at the higher sampling rates (i.e., 88.2 kHz or 96 kHz) to either Double Channel, Double Speed or Single. In Double Speed mode, digital audio data is received and transmitted at the current higher sampling rate (i.e., 88.2 kHz or 96 kHz). In Double Channel mode, digital audio data is received and transmitted at a sampling rate that is exactly half the current higher sampling rate and data is handled by two channels, thereby reducing the total number of inputs or outputs for an eight channel I/O Card to four. In Double Channel mode, the even-numbered channels are disabled. Double Channel mode allows you to record 96 kHz audio to legacy 44.1/48 kHz digital multitrack recorders. In Single mode, digital audio data is received and transmitted at a sampling rate that is exactly half the current higher sampling rate. This is useful for digital MTR recording and playback situations.

The IN and OUT parameters are only available when a higher sampling rate (i.e., 88.2 kHz or 96 kHz) is selected. When the sampling rate is 44.1 kHz or 48 kHz, all parameters on this page are unavailable. As are individual parameters for Slots with analog I/O Cards installed, or no I/O Card installed. When a digital I/O card that does not support 88.2/96 kHz is installed, such as the MY8-AE, MY8-AT, or MY8-TD, its IN and OUT formats cannot be set to Double Speed mode.

**SRC:** These parameters are used to turn on and off the sampling rate converter for each pair of Slot Inputs. When on, the sampling rate of the received digital audio is converted to the 02R96's current sampling rate. The original sampling rate is displayed. These parameters are available only when an I/O Card with onboard sampling rate converters is installed, such as the MY8-AE96S.

## Dithering Digital Outputs

For digital audio transfer to lower-resolution systems, the 2TR Digital Outputs and Slot Outputs can be dithered to 16-bit, 20-bit, or 24-bit.

**1** **Use the DISPLAY ACCESS [DIO] button to locate the Dither page.**
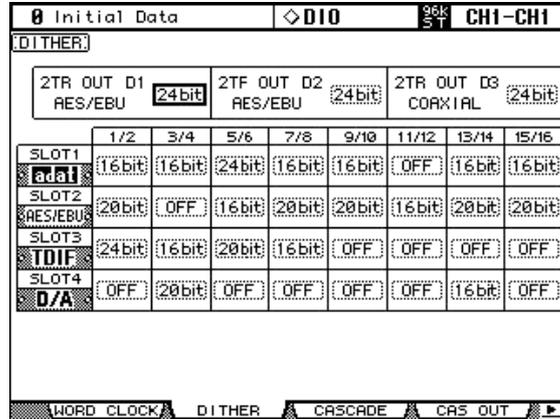


**2** **Use the cursor buttons to select the Dither parameters, and use the Parameter wheel or INC/DEC buttons to set them.**

The SLOT column displays the names of any installed I/O Cards.

You can copy the currently selected setting to all Dither parameters by double-clicking the [ENTER] button.

## Monitoring Digital Input Channel Status

You can monitor the Channel Status of digital audio signals connected to the 2TR Digital Inputs and Slot Inputs as follows.

**1** **Use the DISPLAY ACCESS [UTILITY] button to locate the Channel Status Monitor page.**
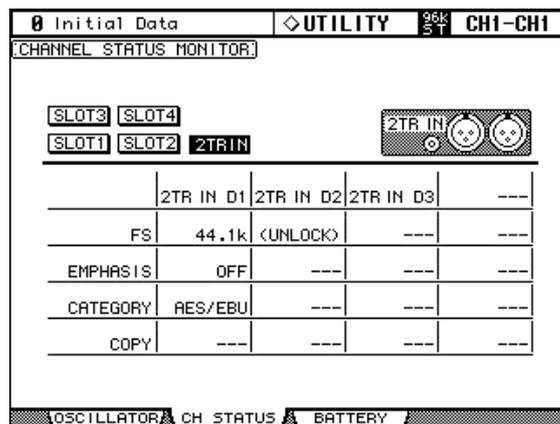


**2** **Use the cursor buttons to select the SLOT 1–4 and 2TR IN buttons, and the press [ENTER].**

Displayed Channel Status information includes sampling rate (FS), emphasis, category, and copy protection.

However, if a mini-YGDAI I/O card other than AES/EBU format is installed, Channel Status information will be grayed out.

3   **If you select the SLOT button for a slot that has an MY16-AE card installed, use the 01–08 and 09–16 buttons located in the lower-right corner of the screen to select a channel group you wish to display.**

`01-08`    `09-16`

# Cascading Consoles

Total four 02R96s or DM2000s can be cascaded, offering a maximum of 224 Input Channels. Several functions are linked between all cascaded consoles, including Solo, Scene Recall and Store, so that all consoles work just like one big console. A single Yamaha 02R Digital Recording Console can be included in the cascade system.

The CASCADE IN and CASCADE OUT ports are used to transmit and receive Cascade and control signals. Only use the optional dedicated Cascade cables for connecting.

```
 CASCADE OUT              CASCADE IN
 ◎ ▭▭▭▭▭ ◎    ◎ ▭▭▭▭▭ ◎
```
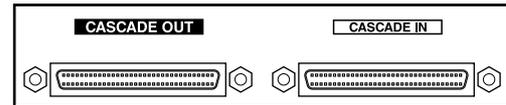
## Linked Functions

The following 02R96 functions are linked via the cascade ports:

·   AUX SELECT (Not linked with DM2000's Aux 9–12.)

·   Display page selection (Not linked with the DM2000.)

·   Solo function

·   FADER MODE

·   ENCODER MODE

·   Metering position setting

·   Peak Hold On/Off

·   Meter Fast Fall on/off

·   Scene Store, Recall, and Title Edit

When a Scene is recalled on the master console, that scene is recalled on all cascaded consoles.

·   The following Automix functions: Make New Automix, Store, Recall, Title Edit, Transport (AutoREC, REC, PLAY, STOP, ABORT).

·   The following Automix parameters: Automix Enable/Disable, Internal Start Time, Offset Time, Frame Rate, Overwrite (FADER, ON, PAN, SURR, AUX, AUX ON, EQ), Motor ON/OFF, Edit Out Mode OFF/RETURN/TAKEOVER, Return Time, Update To End On/Off, ABSOLUTE/RELATIVE Fader Edit Mode, Touch Sense Edit In On/Off, Touch Sense Edit Out On/Off, Touch Sense Edit Off/Touch/Latch.

Function and parameter linking can be turned on or off by using the Cascade COMM Link preference (see page 231). The Solo function is always linked regardless of this preference.

> *Note: When the Cascade COMM Link preference is on, do not make any MIDI connections between cascaded 02R96/DM2000s. If two 02R96/DM2000s are cascaded and connected via MIDI, and the Cascade COMM Link preference is on, when a store operation is performed on the master console, a loop will be created, causing both consoles to execute endless store operations.*

When the 02R96 is cascaded with a Yamaha DM2000 Digital Production Console, display page selection is not linked, and Matrix Send select actions, and Aux Send 9–12 select actions performed on the DM2000 are ignored by the 02R96.

## Cascade Hookup Examples

### Cascading Two 02R96s

Master: Off
Bi-directional: –

02R96 #1

CASCADE OUT
CASCADE IN

Master: On
Bi-directional: On

02R96 #2

CASCADE IN
CASCADE OUT

Final signals can be output by
the Slot Outputs or Omni Outs.

Final signals can be output by
the Slot Outputs or Omni Outs.
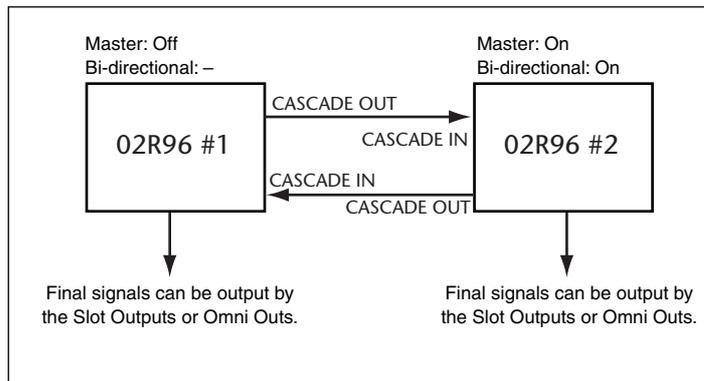
### Cascading Three or More 02R96s

Master: Off
Bi-directional: –

02R96 #1

CASCADE OUT
CASCADE IN

CASCADE IN

Master: Off
Bi-directional: –

02R96 #2/3

CASCADE OUT
CASCADE IN

Master: On
Bi-directional: On

02R96 #4

CASCADE OUT

Final signals can be output by
the Slot Outputs or Omni Outs.

Final signals can be output by
the Slot Outputs or Omni Outs.
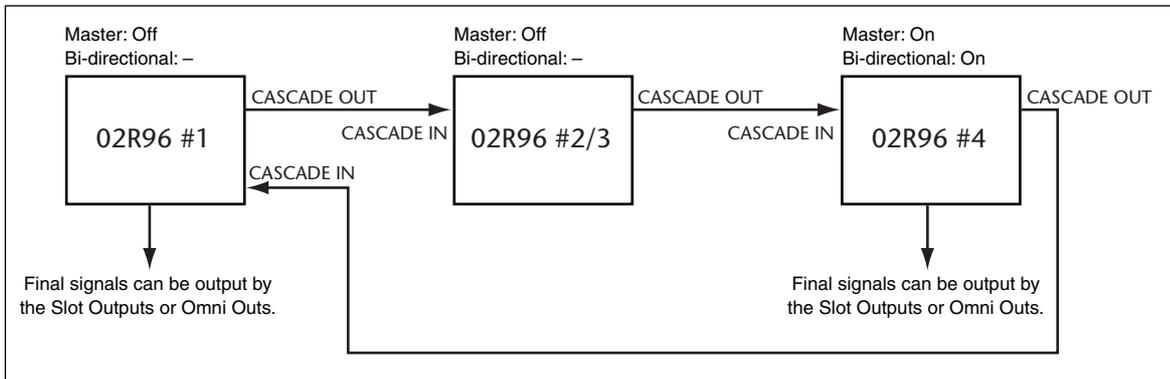
### Cascading an 02R Digital Recording Console

02R

CASCADE OUT
CASCADE IN

Master: Off
Bi-directional: –
Cascade In from: 02R

02R96 #1/2

CASCADE OUT
CASCADE IN

Master: On
Bi-directional: Off

02R96 #3

Final signals can be output by
the Slot Outputs or Omni Outs.
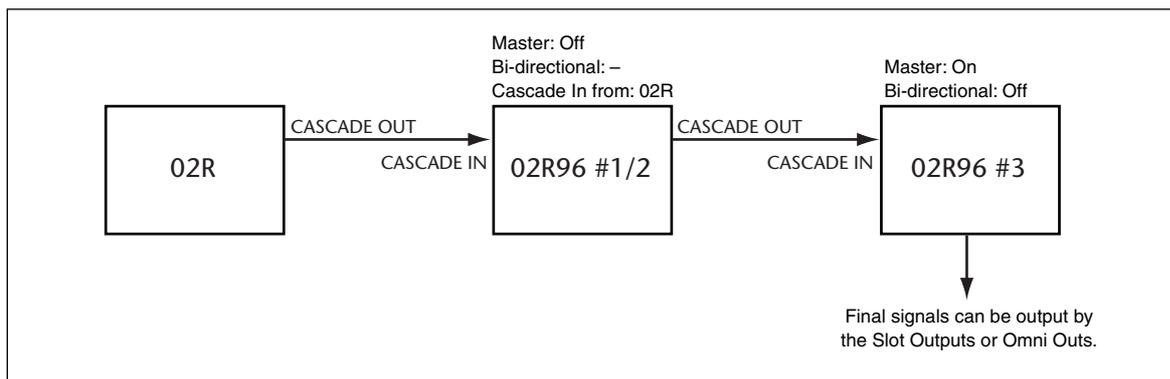
### Attenuating Cascade Inputs

Cascade Inputs can be attenuated, and the Cascade mode and Cascade source can be specified on the Cascade In page.

**1    Use the DISPLAY ACCESS [DIO] button to locate the Cascade In page.**
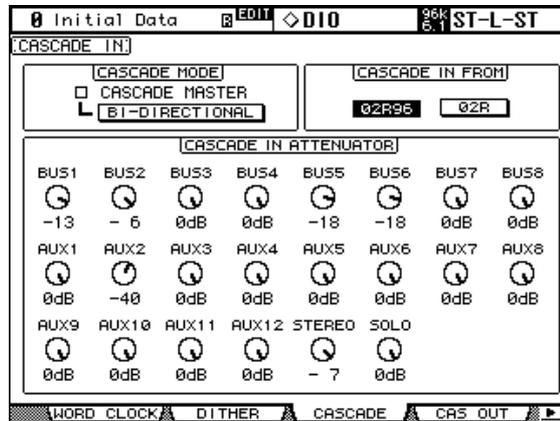
```
┌─────────────────────────────────────────────────────┐
│ 0 Initial Data    R EDIT ◇DIO      96k ST-L-ST       │
│ CASCADE IN                                           │
│   ┌──CASCADE MODE──┐    ┌──CASCADE IN FROM──┐         │
│   □ CASCADE MASTER                                   │
│   └ BI-DIRECTIONAL          02R96   02R              │
│                                                      │
│          ──CASCADE IN ATTENUATOR──                   │
│   BUS1  BUS2  BUS3  BUS4  BUS5  BUS6  BUS7  BUS8      │
│    ◔     ◔     ◔     ◔     ◔     ◔     ◔     ◔        │
│   -13   - 6   0dB   0dB   -18   -18   0dB   0dB       │
│   AUX1  AUX2  AUX3  AUX4  AUX5  AUX6  AUX7  AUX8      │
│    ◔     ◕     ◔     ◔     ◔     ◔     ◔     ◔        │
│   0dB   -40   0dB   0dB   0dB   0dB   0dB   0dB       │
│   AUX9 AUX10 AUX11 AUX12 STEREO SOLO                 │
│    ◔     ◔     ◔     ◔     ◔     ◔                    │
│   0dB   0dB   0dB   0dB   - 7   0dB                   │
│   WORD CLOCK   DITHER   CASCADE   CAS OUT   ►         │
└─────────────────────────────────────────────────────┘
```

**2    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set them.**

**CASCADE MODE:** When you want to output the same signals from two 02R96s, turn on the BI-DIRECTIONAL button. In this case, the Cascade connections are looped. Turn on the CASCADE MASTER option on the last 02R96 to make it the master console. When the BI-DIRECTIONAL button is off, the last 02R96 in the cascade is automatically configured as the master console and it output the final signals.

**CASCADE IN FROM:** This is used to specify the type of device connected to the CASCADE IN port, either 02R96 or 02R. When a 02R96 or DM2000 is connected to the CASCADE IN port, 02R96 is specified automatically.

**CASCADE IN ATTENUATOR:** These controls are used to attenuate Cascade Input signals. The AUX9–AUX12 controls attenuate the corresponding signals only when the 02R96 is cascaded between two Yamaha DM2000 Digital Production Consoles, they have no effect on the 02R96 itself. You can copy the currently selected setting to all Attenuator parameters by double-clicking the [ENTER] button.

### Turning On & Off Cascade Outputs

Individual Cascade Outputs can be turned on or off as follows.

**1    Use the DISPLAY ACCESS [DIO] button to locate the Cascade Out page.**

```
┌─────────────────────────────────────────────────────┐
│ 0 Initial Data    R EDIT ◇DIO      96k ST-L-ST       │
│ CASCADE OUT                                          │
│                                                      │
│          ──CASCADE OUT ON/OFF──                      │
│   BUS1  BUS2  BUS3  BUS4  BUS5  BUS6  BUS7  BUS8      │
│   OFF   OFF   ON    ON    OFF   OFF   OFF   OFF       │
│                                                      │
│   AUX1  AUX2  AUX3  AUX4  AUX5  AUX6  AUX7  AUX8      │
│   ON    ON    OFF   OFF   OFF   OFF   OFF   OFF       │
│                                                      │
│   AUX9 AUX10 AUX11 AUX12 STEREO SOLO                 │
│   OFF   OFF   OFF   OFF   OFF   OFF                   │
│                                                      │
│   WORD CLOCK   DITHER   CASCADE   CAS OUT   ►         │
└─────────────────────────────────────────────────────┘
```
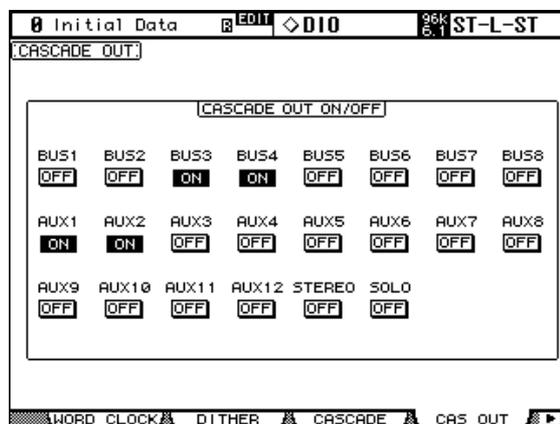
**2    Use the cursor buttons to select the ON/OFF buttons, and use the [ENTER] button to set them.**

# 6 Input & Output Patching

## Input Patching

Input and Output signals for the Input Channels, Input Channel Insert Ins, and internal effects processors are selected on the Input Patch pages, which are selected by using the DISPLAY ACCESS [INPUT PATCH] button. Use the cursor buttons to select the patch parameters, use the Parameter wheel or INC/DEC buttons to select a source, and press [ENTER] to set.

Patch parameters display Short Port names. The Long Port name of the currently selected patch parameter is displayed in the upper-right corner of each page.

Patching can also be done by using the Patch Select Window (see page 71). Input Channel Inputs, Insert Ins, and Insert Outs can also be patched by using the Encoders (see page 72).

See page 241 for a complete list of input patch sources. See page 244 for a list of initial input patches.

Input Patch settings can be stored in the Input Patch library, which contains 1 preset memory and 32 user memories. See "Input Patch Library" on page 145 for more information.

## Patching Input Channels

AD Inputs, Slot Inputs, internal effects processor outputs, Digital or Analog 2TR Inputs, Bus Outs, or Aux Sends can be patched to the Input Channel Inputs.

The Input Channel Patch parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Patch page is shown below. The layout of the other page is the same. When Vertical Input Channel pairing mode is selected, patch parameters for vertical partners are displayed, for example, CH1, CH25, CH2, CH26, and so on.
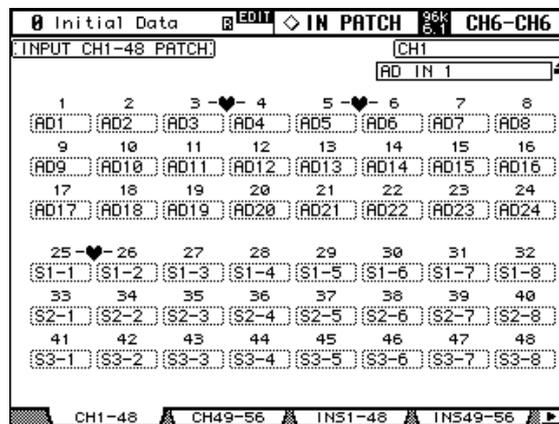


In addition to using the cursor buttons, Patch parameters can also be selected by using the LAYER and [SEL] buttons.

## Patching Input Channel Insert Ins

AD Inputs, Slot Inputs, internal effects processor outputs, Digital or Analog 2TR Inputs can be patched to the Input Channel Insert Ins.

The Input Channel Insert In Patch parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Insert In Patch page is shown below. The layout of the other page is the same. When Vertical Input Channel pairing mode is selected, patch parameters for vertical partners are displayed, for example, CH1, CH25, CH2, CH26, and so on.
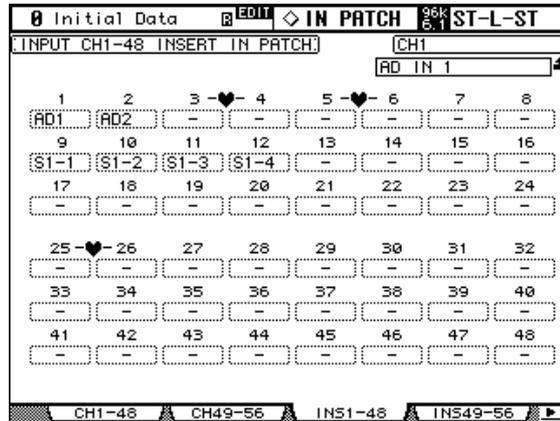


In addition to using the cursor buttons, Patch parameters can also be selected by using the LAYER and [SEL] buttons.

## Patching Effects Inputs and Outputs

Aux Sends, internal effects processor outputs (OUT1 and OUT2 only), or Output Channel Insert Outs can be patched to the internal effects processor inputs.

Input Channels, or Insert Ins can be patched to the internal effects processor outputs. Internal effects processor inputs can be also patched to the internal effects processor outputs (OUT1 and OUT2 only).
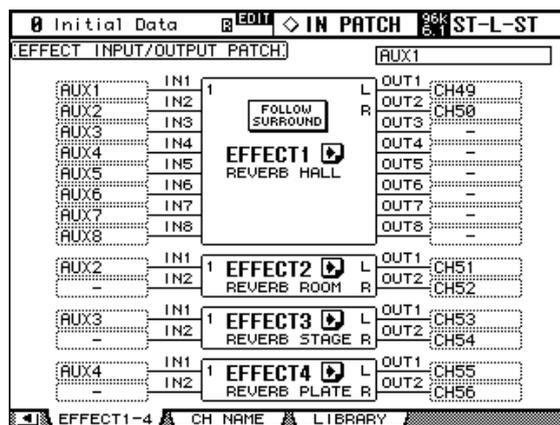


**FOLLOW SURROUND:** When surround effects are recalled to Effects processor 1, this button sorts the effect inputs and outputs displayed in the list in the order specified on the Surround Bus Setup page (see page 87). If the recalled surround effects are compatible with 5.1 Channel systems, the surround bus setting for 5.1 surround mode will be used.

▶: Press this button repeatedly until an Effect Edit (1–4) page for the effects processor you wish to edit appears.

## Output Patching

Signal sources for the Slot Outputs, Omni Outs, Output Channel Inserts Ins, Direct Outs, and 2TR Digital Outputs are selected on the Output Patch pages, which are selected by using the DISPLAY ACCESS [OUTPUT PATCH] button. Use the cursor buttons to select the patch parameters, use the Parameter wheel or INC/DEC buttons to select a source, and press [ENTER] to set.

Depending on the patch page, patch parameters display either Short Channel or Short Port names. The Long Channel or Port name of the currently selected patch parameter is displayed in the upper-right corner of each page.

Signal sources can also be selected by using the Patch Select Window (see page 71). Insert Ins, Insert Outs, and Direct Outs can also be patched by using the Encoders (see page 72).

See page 245 for a complete list of output patch sources. See page 249 for a list of initial output patches.

Output Patch settings can be stored in the Output Patch library, which contains 1 preset memory and 32 user memories. See "Output Patch Library" on page 145 for more information.

### Patching Slot Outputs

Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or Surround Monitor Channels can be patched to the Slot Outputs. Slot Outputs can be patched to Direct Outs on the Direct Out Destination pages (see page 70).

The Slot Output Patch parameters for the four Slots are arranged into two pages. The Slot 1–2 Output Patch page is shown below. The layout of the other page is the same.
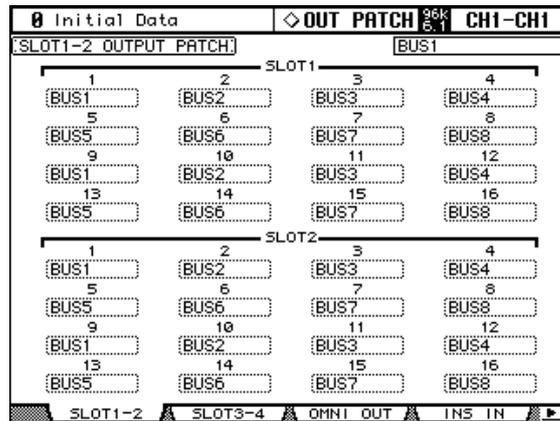


When a Slot Output is patched to a Direct Out (see page 70), and that Direct Out is assigned on an Input Channel Routing page, the Slot Output patch cannot be changed here. If the higher sampling rate (88.2 kHz/96 kHz) data format is set to Double Channel mode, the Slot's even channel patch is disabled and cannot be changed.

## Patching Omni Outs

Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or Surround Monitor Channels can be patched to the Omni Outs. Omni Outs can be patched to Direct Outs on the Direct Out Destination pages (see page 70).

```
 0 Initial Data          ◇ OUT PATCH 96k CH1-CH1
[OMNI OUT PATCH]                        [OMNI OUT  1]
                                        [AUX1              ]

        OMNI1      OMNI2      OMNI3      OMNI4
       [AUX1    ] [AUX2    ] [AUX3    ] [AUX4    ]


        OMNI5      OMNI6      OMNI7      OMNI8
       [AUX5    ] [AUX6    ] [AUX7    ] [AUX8    ]




    ▓ SLOT1-2 ▟ SLOT3-4 ▟ OMNI OUT ▟ INS IN  ▐▶▌
```
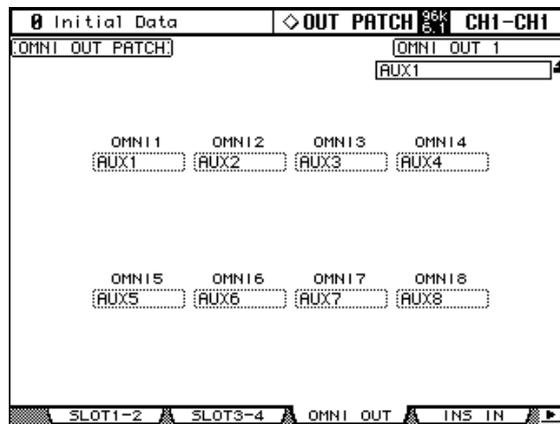
When an Omni Out is patched to a Direct out (see page 70), and that Direct Out is assigned on an Input Channel Routing page, the Omni Out patch cannot be changed here.

## Output Channel Inserts Ins

AD Inputs, Slot Inputs, internal effects processor outputs, or Digital or Analog 2TR Inputs can be patched to the Output Channel Insert Ins. The left and right channels of the Stereo Out can be patched individually.
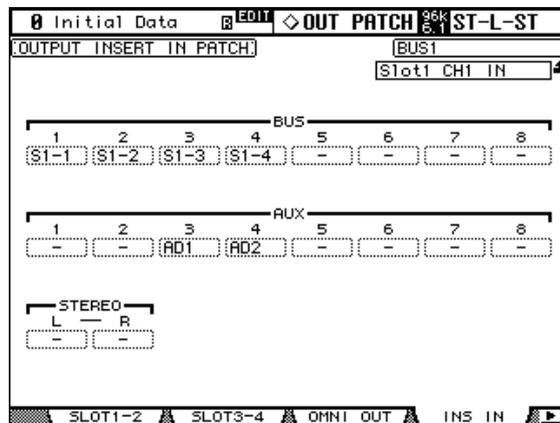
```
 0 Initial Data     ▣EDIT ◇ OUT PATCH 96k ST-L-ST
[OUTPUT INSERT IN PATCH]                [BUS1           ]
                                        [Slot1 CH1 IN  ]

       ┌──────────────BUS──────────────┐
        1      2      3      4    5     6     7     8
      [S1-1][S1-2][S1-3][S1-4][ - ][ - ][ - ][ - ]

       ┌──────────────AUX──────────────┐
        1      2      3      4    5     6     7     8
      [ - ][ - ][AD1][AD2][ - ][ - ][ - ][ - ]

       ┌──STEREO──┐
        L  ─  R
      [ - ][ - ]


    ▓ SLOT1-2 ▟ SLOT3-4 ▟ OMNI OUT ▟ INS IN  ▐▶▌
```

In addition to using the cursor buttons, Patch parameters can also be selected by using the [SEL] buttons.

## Patching Direct Outs

Direct Outs can be patched to the Slot Outputs, Omni Outs, or 2TR Digital Outputs.

The Direct Out Destination parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Direct Out Destination page is shown below. The layout of the other page is the same.
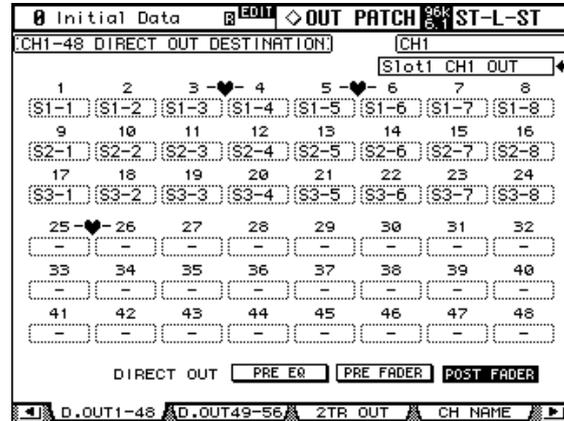


In addition to using the cursor buttons, Patch parameters can also be selected by using the LAYER and [SEL] buttons.

## Patching the 2TR Digital Outputs

Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or the Control Room signal can be patched to the 2TR Digital Outputs. 2TR Digital Outputs can be patched to Direct Outs on the Direct Out Destination pages (see page 70). The left and right channels of each Digital Output can be patched individually.
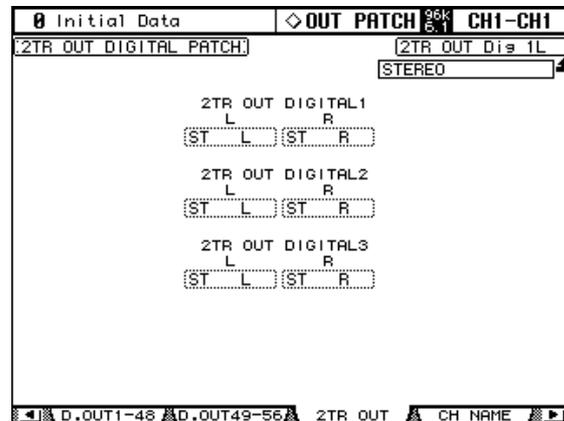


When a 2TR Digital Output is patched to a Direct out (see page 70), and that Direct Out is assigned on an Input Channel Routing page, the 2TR Digital Output patch cannot be changed here.

## Naming Input & Output Ports

You can specify Long and Short names for the Input and Output Ports as follows. These names appear on the Input and Output Patch pages.

See page 251 for a list of the initial Input Port names; page 252 for Output Port names.

**1    Use the DISPLAY ACCESS [SETUP] button to locate the Input Port or Output Port Name page.**
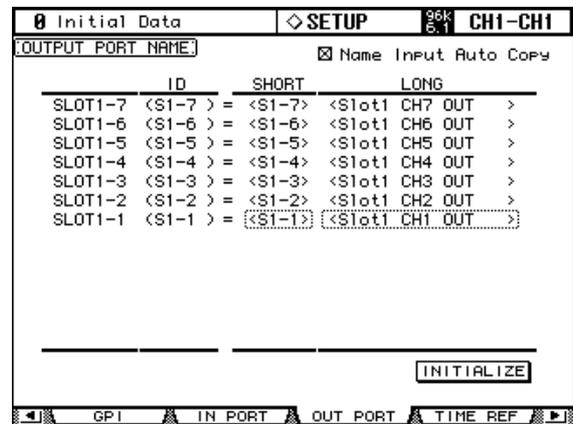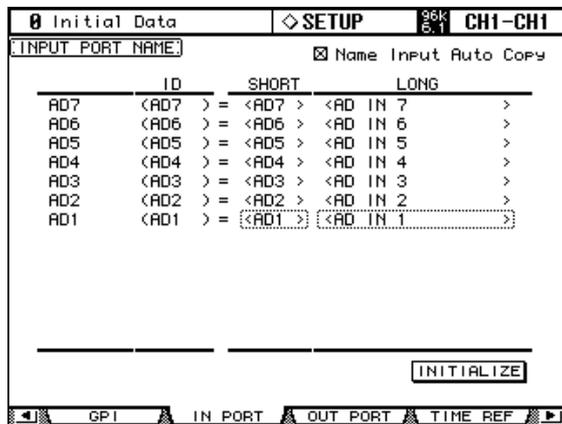


**2    Use the Parameter wheel or INC/DEC buttons to select the ports.**

**3    Use the cursor buttons to select the Long or Short name, and then press [ENTER].**

When the Title Edit window appears, edit the port name, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

When the Name Input Auto Copy option is on, the first four characters of a newly entered Long name are automatically copied to the Short name and vice versa.

You can reset all port names back to their initial values by pressing the INITIALIZE button.

## Patch Select Window

Input and Output patches can be made by using the Patch Select window, shown below, which appears when the [ENTER] button is pressed while a patch parameter is selected.
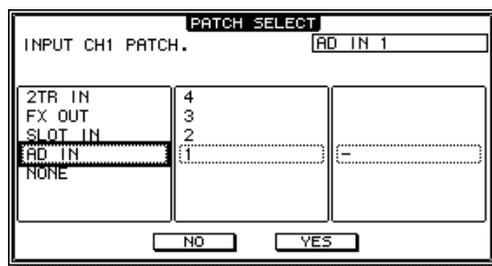


Available input and output sources and destinations are displayed in a hierarchical format in three panes. The existing source or destination is displayed in the upper-right corner of the window. Use the cursor buttons to move the cursor to the pane on the left, and use the Parameter wheel or INC/DEC buttons to select the top level item. Then move the cursor to the center pane, and select an item at the next level. Select an item in the right pane, if available, and then select the YES button and press [ENTER].

## Patching with the Encoders

The following patches can be made by using the Encoders: Input Channel Inputs, Insert Outs, Insert Ins, and Direct Outs.

1 **Assign one of the above parameters to an Encoder ASSIGN button, as explained on page 51.**

2 **Press the ASSIGN button to which you assigned the patch parameter.**

3 **Use the Encoders to select ports, and press the Encoder push switches to set them.**

The coresponding Patch page appears when an Encoder is operated. If you operate another Encoder, the selection is cancelled and the patch is left unchanged.

# 7  Input Channels

## Patching Input Channels

AD Inputs, Slot Inputs, internal effects processor outputs, Digital or Analog 2TR Inputs, Bus Outs, or Aux Sends can be patched to the Input Channel Inputs. See "Patching Input Channels" on page 66 for more information.

## Metering Input Channels

Input Channel signal levels can be metered on the Meter pages. See "Metering" on page 107 for more information.

## Reversing the Signal Phase

The signal phase of each Input Channel can be reversed as follows.

**1   Use the SELECTED CHANNEL DISPLAY ACCESS [PHASE/INSERT] button to select the Phase pages.**

The Phase parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Phase page is shown below. The layout of the other page is the same.
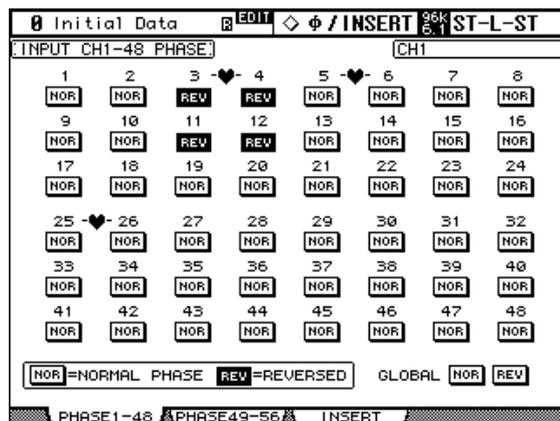


**2   Use the cursor buttons or Parameter wheel to select the NOR/REV buttons, and the [ENTER] button and INC/DEC buttons to set them.**

The NOR/REV buttons can also be selected by using the [SEL] buttons.

**GLOBAL NOR/REV:** These buttons allow you to set the phase of all Input Channels simultaneously.

# Gating Input Channels

Each Input Channel features a noise Gate for automatically shutting out unwanted noise. Gate settings can be stored in the Gate library, which contains 4 preset memories and 124 user memories. See "Gate Library" on page 148 for more information.

## Preset Gates & Types

The following table lists the preset Gates and types. See page 283 for detailed parameter information.

| # | Preset Name | Type | Description |
|---|-------------|------|-------------|
| 1 | **Gate** | GATE | Gate template |
| 2 | **Ducking** | DUCKING | Ducking template |
| 3 | **A. Dr. BD** | GATE | Gate preset for use with acoustic bass drums |
| 4 | **A. Dr. SN** | GATE | Gate preset for use with acoustic snare drums |

## Using the SELECTED CHANNEL DYNAMICS Controls

1   **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select Input Channels.**

2   **Use the [GATE ON] button to turn the currently selected Input Channel's Gate on or off.**
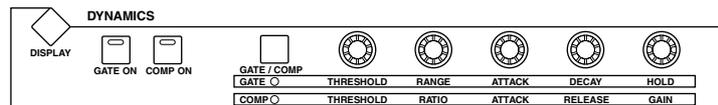


3   **Use the [GATE/COMP] button to set the DYNAMICS controls to GATE (GATE indicator lit), and use the THRESHOLD, RANGE, ATTACK, DECAY, and HOLD controls to set the Gate.**

## Gate Edit Page

Gate settings can be viewed and set on the Gate Edit page. If the Auto DYNAMICS Display preference is on, this page appears automatically when a gate control in the SELECTED CHANNEL DYNAMICS section is operated.

1   **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select Input Channels.**

2   **Use the SELECTED CHANNEL DYNAMICS [DISPLAY] button to locate the Gate Library page, and then recall a Gate preset that contains the gate type that you want.**

See "Gate Library" on page 148 for more information.

**3 Use the SELECTED CHANNEL DYNAMICS [DISPLAY] button to locate the Gate Edit page.**
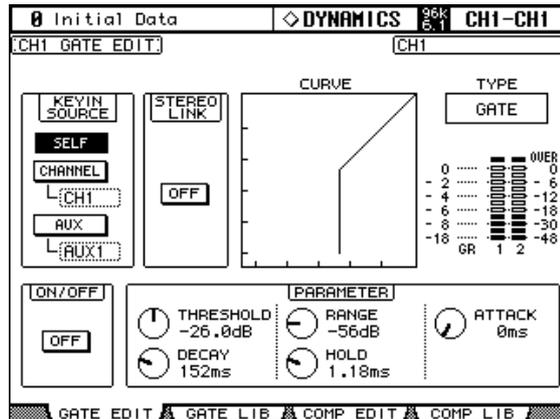


**4 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**KEYIN SOURCE:** This determines the trigger source for the currently selected Input Channel's Gate. Trigger sources include SELF (the Gate's own input signal), CHANNEL (another Input Channel), or AUX (an Aux Send from 1–8). Input Channel trigger sources are selectable in blocks of 12 channels. For example, if Input Channel #1 is currently selected, an Input Channel from 1–12 can be selected as the trigger source. However, if Input Channel #13 is currently selected, an Input Channel from 13–24 can be selected.

**STEREO LINK:** This allows you to pair Gates for stereo operation even when Input Channels are not paired. Input Channel Gates are paired either horizontally or vertically depending on the Pair mode setting for the currently selected Input Channel. See "Pairing Channels" on page 123 for more information on horizontal and vertical pairing. When Input Channels are paired, this parameter is turned on automatically and cannot be changed.

**CURVE:** This displays the gate curve (i.e., input level vs. output level).

**TYPE:** This is the gate type used by the currently selected Input Channel's Gate.

**Meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner. The GR meter indicates the amount of gain reduction being applied by the currently selected Input Channel's Gate.

**ON/OFF:** This turns the currently selected Input Channel's Gate on and off. It works in unison with the SELECTED CHANNEL DYNAMICS [GATE ON] button.

**PARAMETER:** These controls are used to set the Threshold, Range, Attack, Decay, and Hold parameters.

## Attenuating Input Channels

Input Channels signals can be attenuated pre-EQ. See "Attenuating Signals" on page 110 for more information.

## EQ'ing Input Channels

Each Input Channel features 4-band parametric EQ. See "Using EQ" on page 111 for more information.

## Grouping Input Channel EQs

Input Channel EQs can be grouped, allowing you to control the EQ of several Input Channels simultaneously. There are four Input Channel EQ groups: a, b, c, and d.

**1 Use the DISPLAY ACCESS [GROUP] button to locate the Input Equalizer Link page.**
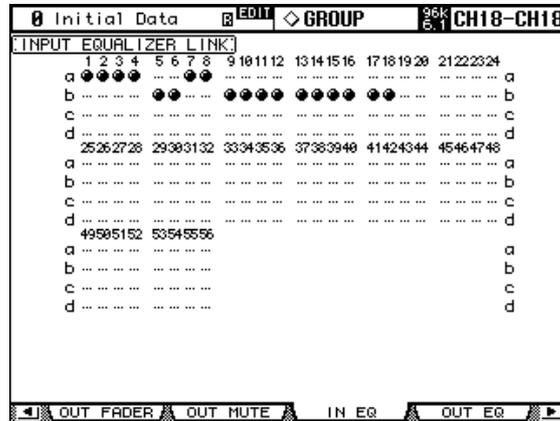


**2 Use the LAYER buttons to select the Layers.**

The corresponding group row is selected as each Layer is selected.

**3 Use the Up/Down cursor buttons to select EQ groups a–d.**

The selected group is highlighted by a flashing cursor box.

**4 Use the [SEL] buttons to add and remove Input Channels to and from the selected group.**

The EQ settings of the first Input Channel added to the group are applied to all subsequently added Input Channels.

When an Input Channel is added to a group, its [SEL] button indicator lights up.

## Input Channel Inserts

Internal effects processors and external signal processors can be patched into the Input Channels by using the Inserts. See "Using Inserts" on page 115 for more information.

## Compressing Input Channels

Each Input Channel features a Compressor. See "Compressing Channels" on page 116 for more information.

## Grouping Input Channel Compressors

Input Channel Compressors can be grouped, allowing you to control the compression of several Input Channels simultaneously by operating any Compressor control in the group. There are four Input Channel Compressor groups: i, j, k, and l.

**1** **Use the DISPLAY ACCESS [GROUP] button to locate the Input Comp Link page.**
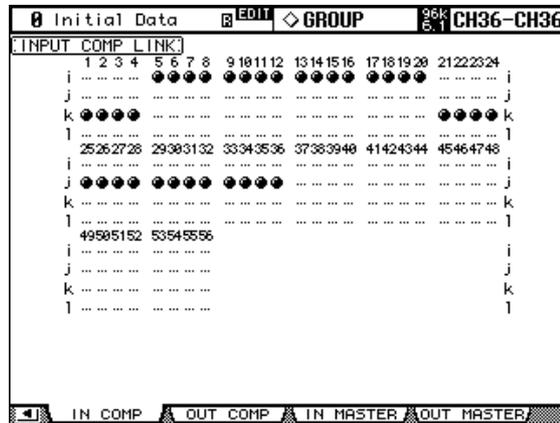


**2** **Use the LAYER buttons to select the Layers.**

The corresponding group row is selected as each Layer is selected.

**3** **Use the Up/Down cursor buttons to select Comp groups i–l.**

The selected group is highlighted by a flashing cursor box.

**4** **Use the [SEL] buttons to add and remove Input Channels to and from the selected group.**

The Compressor settings of the first Input Channel added to the group are applied to all subsequently added Input Channels.

When an Input Channel is added to a group, its [SEL] button indicator lights up.

## Delaying Input Channels

Each Input Channel features a Delay function. See "Delaying Channel Signals" on page 120 for more information.

## Muting Input Channels (ON/OFF)

Input Channels can be muted as follows.

**1** **Use the LAYER buttons to select the Layers.**

**2** **Use the [ON] buttons to mute the Input Channels.**

The [ON] button indicators of channels that are on are lit.

## Grouping Input Channel Mutes (ON/OFF)

Input Channel Mutes can be grouped, allowing you to mute several Input Channels simultaneously. There are eight Input Channel Mute groups: I, J, K, L, M, N, O, and P.

**1  Use the DISPLAY ACCESS [GROUP] button to locate the Input Channel Mute Group pages.**

The Mute group parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Mute Group page is shown below. The layout of the other page is the same.
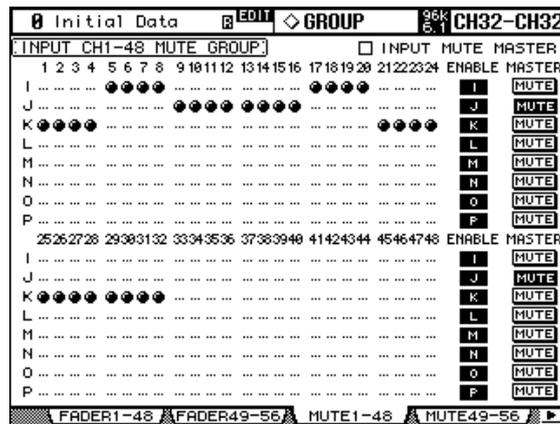


**2  Use the LAYER buttons to select the Layers.**

The corresponding Mute Group page and group row is selected as each Layer is selected.

**3  Use the Up/Down cursor buttons to select Mute groups I–P.**

The selected group is highlighted by a flashing cursor box.

**4  Use the [SEL] buttons to add and remove mutes to and from the selected group.**

When an Input Channel is added to a Mute group, its [SEL] button indicator lights up.

**ENABLE:** These buttons are used to enable and disable the groups.

**INPUT MUTE MASTER:** When this check box is checked, clicking a MASTER MUTE button mutes or unmutes all channels in the corresponding Mute group. When this check box is unchecked, the Input Channel [ON] button status links to the mute on/off status of the channels in the group.

**MASTER MUTE:** When the Input Mute Master check box is checked, use this button to mute or unmute all channels in the corresponding Mute group.

When the Input Mute Master check box is unchecked, pressing the Input Channel [ON] button mutes or unmutes the channels in the corresponding Mute group (Mute On channels turn off and Mute Off channels turn on).

## Input Channel Mute Master

The 02R96 features a Mute Master function that enables you to mute all channels in the Mute group using the MASTER button, much like a Mute group on an analog mixing console. When the Mute Group Master function is enabled, the channel [ON] button status does not link to the corresponding Mute group.

**1    Follow Steps 1–4 as described in the "Grouping Input Channel Mutes (ON/OFF)" section on the previous page, select the Input Mute Master check box, then press the [ENTER] button to check or uncheck the Input Mute Group Master check box.**

**2    When the Input Mute Master check box is checked, the MASTER MUTE button for each Mute group turns mute on or off for the channels in the corresponding Mute group.**

If the channels are muted by the Mute Master function, the corresponding channel [ON] button indicators flash. You can assign the MASTER MUTE button function to one of the USER DEFINED KEYS for convenient operation.

## Setting Input Channel Levels

Input Channel levels can be set as follows.

**1    Use the LAYER buttons to select the Layers.**

**2    Press the FADER MODE [FADER] button to select Fader mode.**

**3    Use the faders to set the Input Channel levels.**

Refer to the legend on the left side of the faders when setting Input Channel levels.

Fader positions can be viewed on the Fader View pages. See "Viewing Channel Fader Settings" on page 130 for more information.
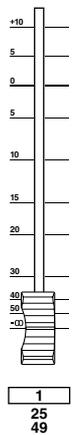
## Grouping Input Channel Faders

Input Channel faders can be grouped, allowing you to control the level of several Input Channels simultaneously. There are eight Input Channel Fader groups: A, B, C, D, E, F, G, and H.

**1    Use the DISPLAY ACCESS [GROUP] button to locate the Input Channel Fader Group pages.**

The Fader Group parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Fader Group page is shown below. The layout of the other page is the same.
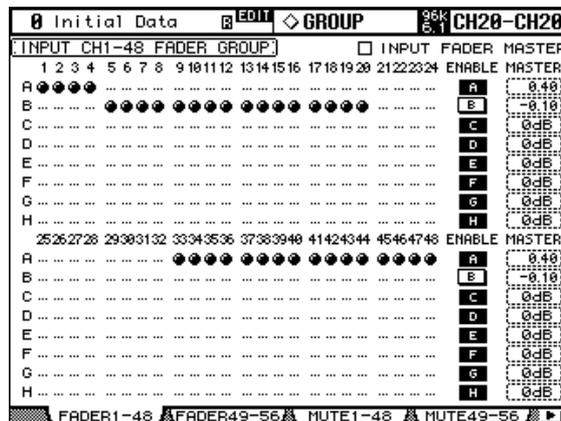
2 **Use the LAYER buttons to select the Layers.**

The corresponding Fader Group page and group row is selected as each Layer is selected.

3 **Use the Up/Down cursor buttons to select Fader groups A–H.**

The selected group is highlighted by a flashing cursor box.

4 **Use the [SEL] buttons to add and remove faders to and from the selected group.**

When an Input Channel is added to a group, its [SEL] button indicator lights up.

**ENABLE:** These buttons are used to enable and disable the groups.

**INPUT FADER MASTER:** When this check box is unchecked, the Input Channel fader positions link to the fader levels for the channels in the corresponding Fader group. When this check box is checked, you can set the master level for the corresponding Input Channel Fader group in the Master column. The resultant Input Channel level equals the corresponding Input Channel fader level plus the Group Master level. See "Group Master for Input Channel Faders" on page 80.

When the Input Fader Master check box is not checked, operating the channel faders will affect the input levels for the corresponding Fader group. Pressing and holding down the [SEL] button while operating the fader of an Input Channel will temporarily cancel the corresponding Fader group, which is convenient if you want to adjust the relative balance between channels.

Fader groups are active only in Fader mode (i.e., when the FADER MODE [FADER] button indicator is on). See "Selecting Fader Modes" on page 49 for more information.

## Group Master for Input Channel Faders

The 02R96 features a Fader Group Master function that enables you to control the level of all channels using the Group Master level while maintaining the relative balance between channels, much like a VCA group on an analog mixing console. While this function is enabled, channel fader operation does not affect channel levels in the corresponding Fader group.

1 **Follow Steps 1–4 as described in the "Grouping Input Channel Faders" section on the previous page, select the Input Fader Master check box, then press the [ENTER] button to check or uncheck the Input Fader Master check box.**

2 **When the Input Fader Master check box is checked, you can set channel levels of the Fader groups in the Master column.**

When the Master column is selected, repeatedly pressing the [ENTER] button turns the Input Fader group on and off.

You can also make these settings in the Input Fader Group Master page, as shown below.

**3    Use the DISPLAY ACCESS [GROUP] button to locate the Input Fader Group Master page.**

```
0 Initial Data    ⊠EDIT  ◇GROUP    96k  CH20-CH20
                                    6.1
[INPUT FADER GROUP MASTER]       ⊠ INPUT FADER MASTER
                                   [ALL NOMINAL]

     A     B     C     D     E     F     G     H
   [ON] [OFF] [ON]  [ON]  [ON]  [ON]  [ON]  [ON]




  -6.85  3.65   0.0   0.0   0.0   0.0   0.0   0.0
  ◀│   IN COMP  │ OUT COMP │ IN MASTER │OUT MASTER
```
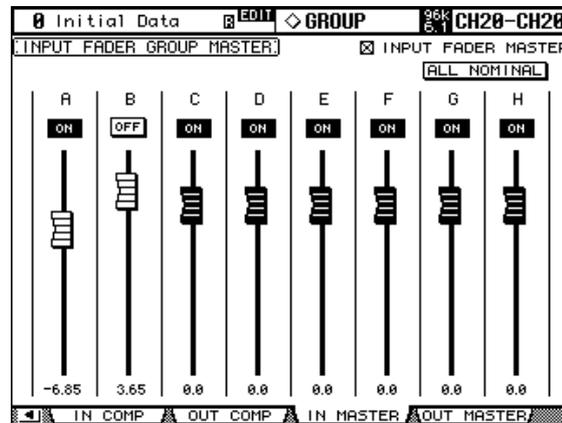
**4    Use the cursor buttons to select parameters, then use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set the parameters.**

**INPUT FADER MASTER:** When this check box is checked, you can set the master levels for the Input Fader groups. The resultant Input Channel level equals the corresponding Input Channel fader level plus the Group Master level.

**ALL NOMINAL:** This button resets the master levels for all Input Fader groups to nominal.

**ON/OFF:** This turns each Input Fader group on or off. This function works like a VCA mute on an analog mixing console.

**Faders:** These faders adjust the master levels of the Fader groups. Fader knobs are highlighted when faders are set to 0.0 dB. Press the [ENTER] button to set the currently-selected fader to 0.0 dB.

You can also control the parameters from the channel strips on the control surface as described below by using the User Assignable Layer of the Remote Layers. See page 228 for information on the User Assignable Layer.

**Encoders:** The Encoders are not available.

**[AUTO] buttons:** These buttons are used to control the Fader Group Master On/Off and the master level during Automix.

**[SEL] buttons:** These buttons move the cursor on the Input Fader Group Master page.

**[SOLO] buttons:** These buttons turn the Solo function of each Fader group on and off. You can monitor all the channels in each Fader group.

**Channel Faders:** The channel faders enable you to set the master level for each Fader group.

## Routing Input Channels

Each Input Channel can be routed to the Bus Outs, Stereo Out, or its own Direct Out.

### Using the SELECTED CHANNEL ROUTING Controls

**1    Use the LAYER buttons to select the Layers, and use the [SEL] buttons to select the Input Channels.**

**2    Use the [1–8], [STEREO], and [DIRECT] buttons to route the currently selected Input Channel.**
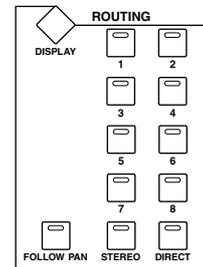
**[1–8]:** These buttons route the currently selected Input Channel to the Bus Outs.

**[STEREO]:** This button routes the currently selected Input Channel to the Stereo Out.

**DIRECT:** This button routes the currently selected Input Channel to its Direct Out.

**[FOLLOW PAN]:** This determines whether the Input Channel's Pan control setting is applied to the Bus Outs. When off, the levels of the signals fed to the odd and even Bus Outs is the same. When on, the levels of the signals fed to the odd and even Bus Outs follows the Pan control.

In Surround mode, when this button is turned off, the surround pan setting does not affect signals fed to the Bus Outs. You can enable the surround pan setting when the input source is monaural, and patch the surround sources or surround effects directly to the Surround Buses.

### Routing Pages

Input Channel routing settings can be viewed and set on the Routing pages. If the Auto ROUTING Display preference is on, these pages appear automatically when a button in the SELECTED CHANNEL ROUTING section is pressed. See "Auto ROUTING Display" on page 230.

**1    Use the SELECTED CHANNEL ROUTING [DISPLAY] button to select the Routing pages.**

The Routing parameters for the 56 Input Channels are divided among three pages. The Input Channel 1–24 Routing page is shown below. The layout of the other two pages is the same.
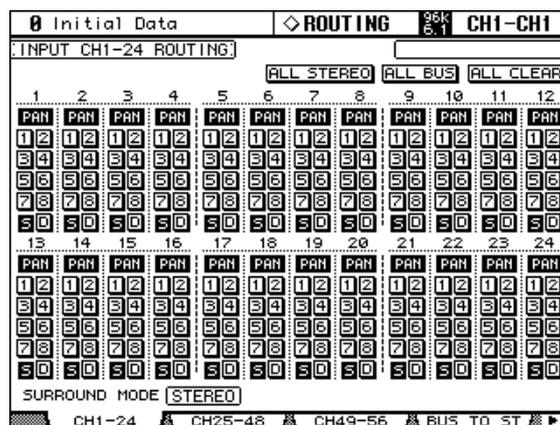


**2    Use the cursor buttons and Parameter wheel to select the parameters, and use the [ENTER] button or INC/DEC buttons to set them.**

Channels can also be selected by using the LAYER buttons and [SEL] buttons.

**ALL STEREO:** This button assigns all Input Channels that are currently displayed to the Stereo Out.

**ALL BUS:** This button assigns all Input Channels that are currently displayed to all Bus Outs

**ALL CLEAR:** This button clears all routing assignments that are currently displayed.

The currently selected Surround mode is displayed in the lower-left corner. When Stereo mode is selected, the Bus Out routing buttons display numbers from 1 through 8. When a Surround Pan mode is selected, they display abbreviations of the Surround Channel names, as shown in the following table. See "Using Surround Pan" on page 85 for more information.

| Surround Mode | Bus Outs | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Stereo | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 3-1 | L | R | C | S | 5 | 6 | 7 | 8 |
| 5.1 | L | R | Ls | Rs | C | E[1] | 7 | 8 |
| 6.1 | L | R | Ls | Rs | C | Bs | E | 8 |

1. Short for LFE (Low frequency Effects).

This table shows the default assignments. The actual assignments may vary depending on the settings on the Surround Bus Setup page. See "Assigning Surround Channels to Buses" on page 87 for more information.

# Panning Input Channels

Input Channels can be panned between the left and right channels of the Stereo Out.

### Using the Encoders

1   **Use the LAYER buttons to select the Layers.**

2   **Press the ENCODER MODE [PAN] button to select the Pan Encoder mode.**

3   **Use the Encoders to pan the input channels.**

### Using the SELECTED CHANNEL PAN/SURROUND Controls

1   **Use the LAYER buttons to select the Layers, and use the [SEL] buttons to select the Input Channels.**
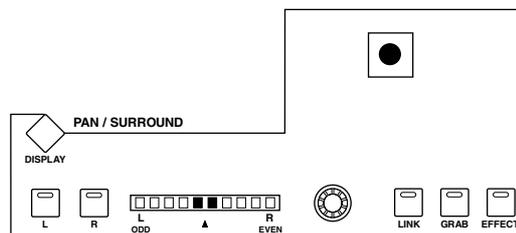


2   **Use the Pan control to pan the currently selected Input Channel.**

The pan display indicates the pan position of the currently selected Input Channel. When pan is set to center, the center two segments light up. You can use the [L] and [R] buttons to select horizontal or vertical Input Channel partners.

The [LINK] button, which is enabled only when a Surround mode other than Stereo is selected, is used to link the Pan control and the Joystick so that either control can be used for panning. This setting applies only to Input Channels that are currently selected. For this to work, the [EFFECT] button indicator must be off and the [GRAB] and [LINK] button indicators must be on.

## Pan Pages

Pan settings can be viewed and set on the Pan pages. If the Auto PAN/SURROUND Display preference is on, these pages appear automatically when a control in the SELECTED CHANNEL PAN/SURROUND section is operated.

1   **Use the SELECTED CHANNEL PAN/SURROUND [DISPLAY] button to select the Input Channel Pan pages.**

The Pan parameters for the 56 Input Channels are arranged into three pages. The Input Channel 1–24 Pan page is shown below. The layout of the other two pages is the same.
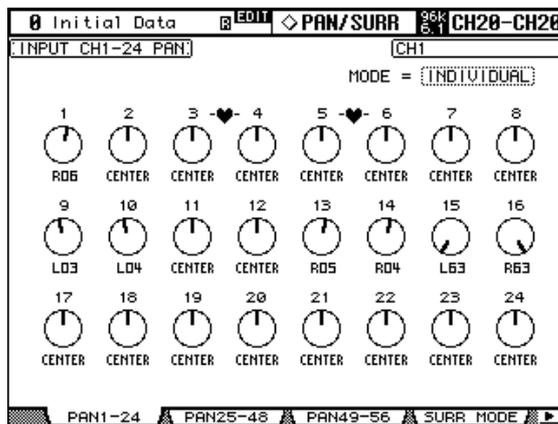


2   **Use the cursor buttons to select the Pan controls, and use the Parameter wheel and INC/DEC buttons to set them.**

Pan parameters can also be selected by using the LAYER buttons and [SEL] buttons.

The currently selected Pan control can be set to center by pressing [ENTER].

**MODE:** There are three Pan modes that determine how horizontally and vertically paired Input Channels are panned: Individual, Gang, and Inverse Gang. This is a global setting that applies to all paired Input Channels.

 In individual mode, paired Input Channel pan controls operate independently.
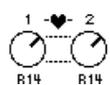
 In Gang mode, paired Input Channel pan controls operate in unison.

 In Inverse Gang mode, paired Input Channel pan controls operate in unison but move in opposite directions.

Aux Send Pan controls can be linked to Input Channel Pan controls so that operating an Input Channel Pan control also operates the corresponding Aux Send Pan control, and vice versa (see page 103). While linked, the Pan mode can be set on the Aux Pan page or the Input Channel Pan page.

*Note: While the PAN/SURROUND [LINK] button is turned on, the Pan mode is automatically set to Individual. When the Pan mode is switched from Gang mode to Inverse Gang mode, the [LINK] button is turned off.*

# Using Surround Pan

The 02R96 supports 3-1, 5.1 and 6.1 Surround modes. Surround pan is independent of normal panning. Normal panning determines how the Input Channel signal is panned between the left and right channels of the Stereo out. Whereas surround panning determines how the Input Channel signal is panned among the Surround channels (i.e., the Bus Outs).

If Input Channel Follow Pan is off, you can patch signals to the corresponding Bus Outs without being affected by the surround pan setting. This is useful when you want to assign the surround source or surround effect return to Bus Outs.

When the Nominal Pan preference is on (see page 231), signals will be at nominal level when panned hard left or hard right, and at +3 dB when the preference is turned off.

*Note: If you have saved a scene with the Follow Pan function turned off on a 02R96 that is older than Version 2.0, the surround setting may not be reproduced*

The following table shows how Surround channels are handled by the Bus Outs.

The table may vary depending on the settings on the Surround Bus Setup page (see page 87).

| Surround Mode | Bus Outs | | | | | | |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **3-1** | L | R | C | S | | | |
| | Front left | Front right | Center | Surround | — | — | — |
| **5.1** | L | R | Ls | Rs | C | LFE | |
| | Front left | Front right | Rear left | Rear right | Center | Subwoofer | — |
| **6.1** | L | R | Ls | Rs | C | Bs | LFE |
| | Front left | Front right | Rear left | Rear right | Center | Rear center | Subwoofer |

## Selecting Surround Pan Modes

The Surround mode can be selected as follows.

**1** **Use the SELECTED CHANNEL PAN/SURROUND [DISPLAY] button to select the Surround Mode page.**
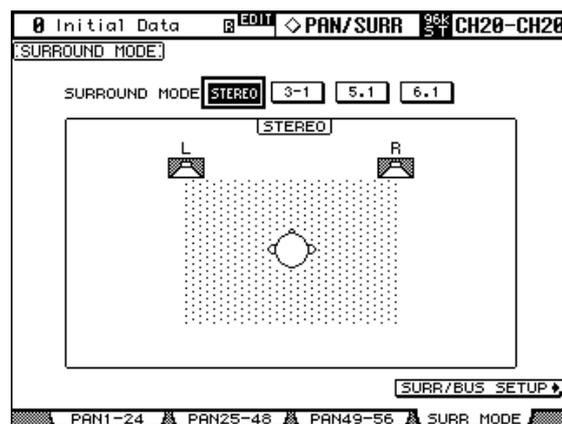
**2** **Use the cursor buttons to select the surround mode buttons, and press [ENTER] to activate the selected mode.**

The diagram on each page shows the typical sound image placement and the Surround channel to Bus Out configuration.

3-1 Surround
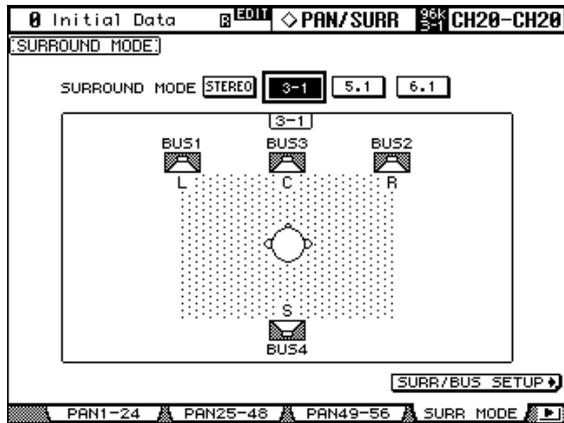


5.1 Surround
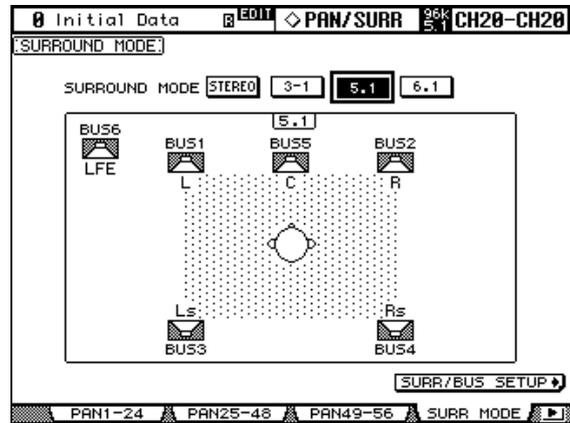


6.1 Surround
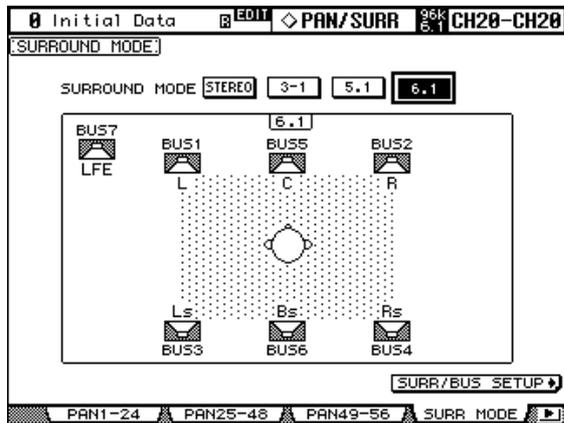


Select the SURR/BUS SETUP button, then press the [ENTER] button to display the Surround Bus Setup page, which enables you to change the Surround Channel to Bus Out assignment. See "Assigning Surround Channels to Buses" on page 87 for more information on the Surround Bus Setup page.

## Assigning Surround Channels to Buses

You can modify the Surround Channel to Bus assignment.

**1    Use the DISPLAY ACCESS [SETUP] button to locate the Surround Bus Setup page.**
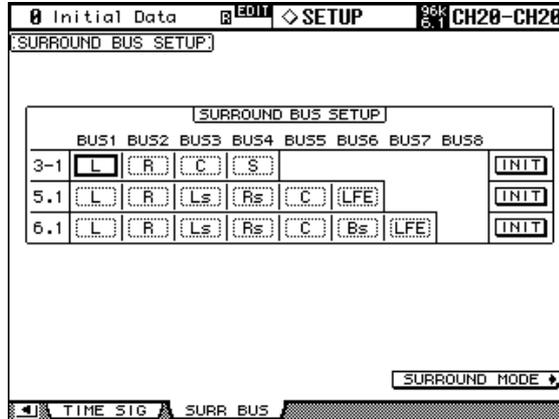


**2    Use the cursor buttons to select the bus for which you want to change the surround channel assignment, then use the Parameter wheel or INC/DEC buttons to select a surround channel.**

**INIT:** These buttons reset the channel assignment to the default setting.

### Using the Joystick

**1    Use the LAYER buttons to select the Layers, and use the [SEL] buttons to select the Input Channels.**
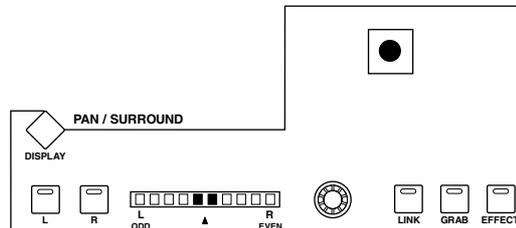


**2    Press the [GRAB] button to grab the current Joystick position, and then use the Joystick to set the surround pan.**

This is used to turn on and off Joystick surround pan control for the currently selected Input Channel. While Grab is on, the Joystick can be used to set the surround pan position of the currently selected Input Channel. If the Joystick is set to control effects (i.e., the [EFFECT] button indicator is lit), the [GRAB] button is disabled.

### Selected Channel Surround Edit Page

Surround pan settings can be viewed and set on the Input Channel Surround Edit page. If the Auto PAN/SURROUND Display preference is on, and a Surround Pan mode other than Stereo is selected, this page appears automatically when a PAN/SURROUND control other than the [EFFECT] button is operated. See "Auto PAN/SURROUND Display" on page 230.

1 **Use the SELECTED CHANNEL PAN/SURROUND [DISPLAY] button to select the Surround Edit page.**
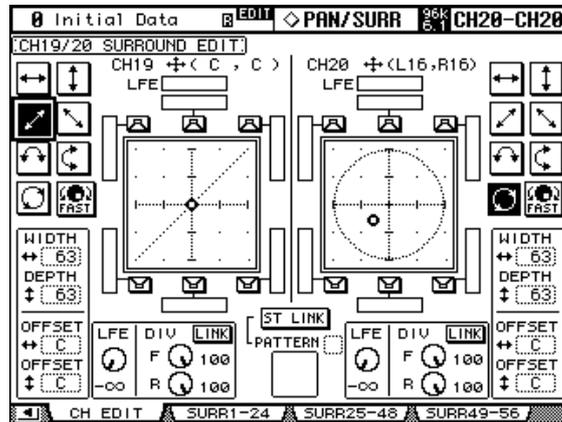


2 **Use the LAYER buttons to select the Layers, and use the [SEL] buttons to select the Input Channels.**

The Surround Edit page displays surround pan parameters for the currently selected Input Channel and its horizontal or vertical partner. The current surround pan position of each Input Channel is indicated by a small circle. It's also indicated numerically next to each Input Channel number, for example, "CH1 (L9, R10)."

The graph of the currently selected Input Channel displays a small square, which indicates the current position of the Joystick. If the Auto Grab preference is on (see page 231), when the Joystick is moved to the current surround pan position, the Joystick kicks in as surround pan control and the small square disappears.

The number of speaker icons and meters around the surround graph depends on the currently selected Surround mode. The meters indicate Bus Out signal levels.

You can move the surround pan directly to one of the speaker icons, including the box icons without speakers, by selecting its icon, and then pressing [ENTER].

3 **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**Patterns:** These buttons are used to select the seven patterns that determine how the surround pan moves by the Parameter wheel and INC/DEC buttons.

**FAST:** This sets the speed of surround pan control when using the Parameter wheel and INC/DEC buttons.

**WIDTH:** This sets the left-to-right width of the selected pattern.

**DEPTH:** This sets the front-to-rear depth of the selected pattern.

**WIDTH OFFSET:** This can be used to offset the left-to-right direction of the selected pattern.

**DEPTH OFFSET:** This can be used to offset the front-to-rear direction of the selected pattern.

**LFE:** This sets the level of the LFE (Low Frequency Effects) Channel (5.1 and 6.1 mode only).

**DIV (divergence):** This determines how the Center signal is fed to the Left, Right, and Center channels. When set to 0, the Center signal is fed only to the Left and Right channels (i.e., Phantom Center). When set to 50, the Center signal is fed equally to the Left, Right, and Center channels. When set to 100, it's fed to only the Center channel (i.e., Real Center) (3-1 and 5.1 mode only).

**DIV F/R:** The F parameter control determines how the Front Center signal is fed to the Left and Right channels. The R parameter control determines how the rear surround signal is fed to the Left and Right surround channels (only for 6.1 surround).

**DIV LINK:** When DIV LINK is on, the F and R parameter controls are set to the same value and linked to each other (only for 6.1 Surround).

**ST LINK:** This can be used to link the surround pan parameters of the currently selected Input Channel and its horizontal or vertical partner regardless of whether they are paired.

**PATTERN:** When Input Channels are linked, the eight patterns selectable here determine how the linked surround pan moves by the Parameter wheel and INC/DEC buttons.

## Input Channel Surround Pages

Surround pan positions can be viewed and set on the Surround pages.

**1    Use the SELECTED CHANNEL PAN/SURROUND [DISPLAY] button to select the Input Channel Surround pages.**

The Surround parameters for the 56 Input Channels are arranged into three pages. The Input Channel 1–24 Surround page is shown below. The layout of the other two pages is the same.
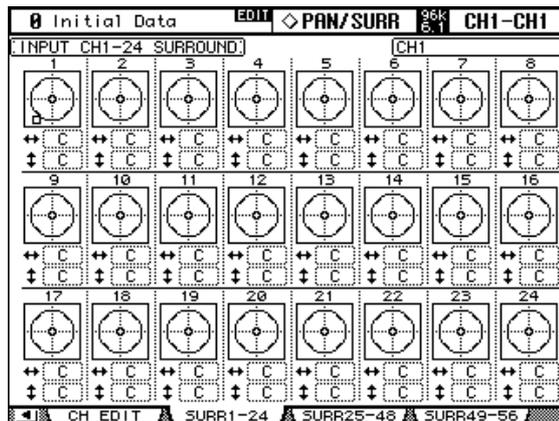


**2    Use the cursor buttons to select the Surround parameters, and use the Parameter wheel and INC/DEC buttons to set them.**

Input Channels can also be selected by using the LAYER buttons and [SEL] buttons. The graph for the currently selected Input Channel displays a small square, which indicates the current position of the Joystick.

**L/R:** These parameters are used to set the left/right surround position. While selected, they can quickly be set to center by pressing [ENTER].

**F/R:** These parameters are used to set the front/rear surround position. While selected, they can quickly be set to center by pressing [ENTER].

You can jump to the more detailed Surround Edit page by pressing [ENTER] while an Input Channel's surround graph is selected.

## Sending Input Channels to Aux Sends

Input Channel signals can be sent to Aux Sends 1–8. See "Setting Aux Send Levels" on page 99 and "Pre-Fader or Post-Fader Aux Sends" on page 98.

## Soloing Input Channels

Input Channels can be soloed. See page 121 for more information.

## Direct Outs

Each Input Channel features a Direct Out, which can be patched to the Slot Outputs, Omni Outs, or the 2TR Digital Outputs. Direct Out signals can be sourced pre-EQ, pre-fader, or post-fader. See "Patching Direct Outs" on page 70 and "Routing Input Channels" on page 82 for more information.

## Pairing Input Channels

Horizontal or vertical Input Channel partners can be paired for stereo operation. See "Pairing Channels" on page 123 for more information.

## Viewing Input Channel Settings

Parameter and fader settings for each Input Channel can be viewed on the View pages. See "Viewing Channel Parameter Settings" on page 129 and "Viewing Channel Fader Settings" on page 130 for more information.

## Naming Input Channels

Input Channels can be named for easy identification. See "Naming Channels" on page 134 for more information.

## Using the MS Stereo Microphone

The MS system is a type of stereo recording that uses two microphones: mono-directional M (Middle) and bi-directional S (Side) microphones. An M microphone picks up main signals, and an S microphone picks up directional signals. These two signals are decoded by calculating a sum (M plus S) and a difference (M minus S), and are recorded to L and R channels.

An MS microphone is usually a stereo microphone that features both M and S functions. To use an MS microphone, do the following:

**1    Connect the L connector of an MS microphone to an odd channel input jack, and the R connector to an even channel input jack.**

Signals from the MS microphone are input from the L and R connectors. To use an MS microphone with the 02R96, connect the L connector to the input jack of an odd Input Channel, and connect the R connector to the input jack of the partner channel.

**MS microphone**

R connector          L connector
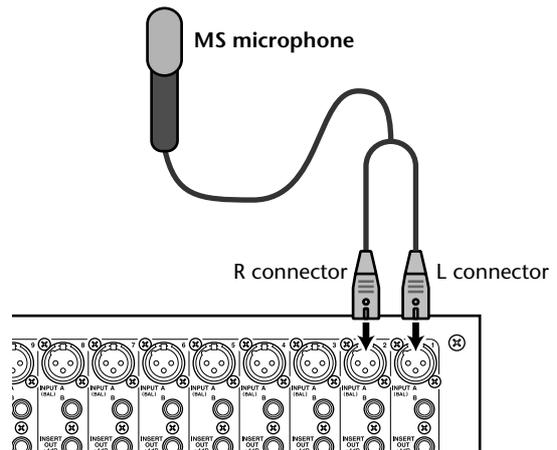


**2    Use the DISPLAY ACCESS [PAIR] button to locate the Pair pages.**

**3    Turn on the MS button for the channels to which the MS microphone is connected.**

The two channels are automatically paired and MS Decoding is turned on. With MS Decoding turned on, the faders and Encoders (Pan parameters) function as follows:

- **Odd-channel faders**.................M level (Controls the volume level.)
- **Odd-channel Encoders**...........ML/MR balance
- **Even-channel faders**................S level (Controls the left and right directional spread.)
- **Even-channel Encoders** ..........SL/SR balance

**4    Use the faders and Encoders to adjust the MS microphone level and balance.**

When the signals are routed to paired Buses or the Stereo Bus, a sum of signals (ML plus SL) is sent to the odd-numbered Bus, and a difference of signals (ML minus SL) is sent to the even-numbered Bus.

# 8 Stereo Out

## Stereo Out Connectors

The Stereo Out is output by the STEREO OUT +4 dB (BAL) balanced
XLR-3-32-type connectors and the STEREO OUT –10 dBV (UNBAL)
unbalanced phono connectors.
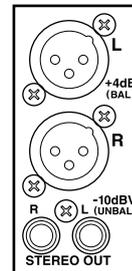
## Patching the Stereo Out to Outputs

The left and right channels of the Stereo Out can be patched to the Slot Outputs, Omni
Outs, or the 2TR Digital Outputs. See "Output Patching" on page 68 for more information.

## Routing Input Channels to the Stereo Out

Input Channels can be routed and panned to the Stereo Out. See "Routing Input Channels"
on page 82 for more information.

## Sending Bus Outs to the Stereo Out

Bus Out signals can be sent to the Stereo Out. See "Sending Bus Outs to the Stereo Out" on
page 97 for more information.

## Metering the Stereo Out

Stereo Out signal levels can be metered on the Meter pages. See "Metering" on page 107 for
more information.

## Monitoring the Stereo Out

The Stereo Out can be monitored via the CONTROL ROOM MONITOR OUTs and the
PHONES (see page 136) or the STUDIO MONITOR OUT (see page 137).

## Attenuating the Stereo Out

Stereo Out signals can be attenuated pre-EQ. See "Attenuating Signals" on page 110 for
more information.

## EQ'ing the Stereo Out

The Stereo Out features 4-band parametric EQ. See "Using EQ" on page 111 for more infor-
mation.

## Grouping Master EQs

The Stereo Out EQ can be grouped with the EQs of other Output Channels. See "Grouping
Output Channel EQs" on page 114 for more information.

## Stereo Out Inserts

Internal effects processors and external signal processors can be patched into the Stereo Out by using the Inserts. See "Using Inserts" on page 115 for more information.

## Compressing the Stereo Out

Signal dynamics can be controlled by using the Stereo Out Compressor. See "Compressing Channels" on page 116 for more information.

## Grouping Master Compressors

The Stereo Out Compressor can be grouped with the Compressors of other Output Channels. See "Grouping Output Channel Compressors" on page 119 for more information.

## Muting the Stereo Out (ON/OFF)

The Stereo Out can be muted by using the STEREO [ON] button, which is used exclusively for this task and is not affected by the Layers. Its indicator lights up when the Stereo Out is on.

## Grouping Master Mutes (ON/OFF)

The Stereo Out Mute can be grouped with the Mutes of other Output Channels. See "Grouping Output Channel Mutes (ON/OFF)" on page 128 for more information.

## Setting the Stereo Out Level

The Stereo Out level is set by using the STEREO fader, which is used exclusively for this task and is not affected by the Layers or Fader modes.
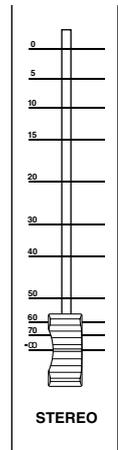
## Grouping Master Faders

The Stereo Out fader can be grouped with the faders of other Output Channels. See "Grouping Output Channel Faders" on page 126 for more information.

## Balancing the Stereo Out

The left and right channels of the Stereo Out can be balanced as follows.

1   **Press the STEREO [SEL] button to select the Stereo Out.**
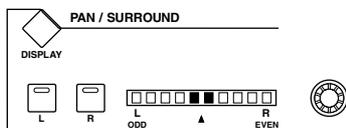


2   **Use the Pan control to set the balance.**

The pan display indicates the balance. When the balance is set to center, the center two segments light up.

The Stereo Out balance can also be set on the Stereo Fader View page. See "Viewing Channel Fader Settings" on page 130 for more information.

## Delaying the Stereo Out

The left and right channels of the Stereo Out can be delayed independently by using the Stereo Out Delay. See "Delaying Channel Signals" on page 120 for more information.

## Viewing Stereo Out Settings

Parameter and fader settings for the Stereo Out can be viewed and set on the View pages. See "Viewing Channel Parameter Settings" on page 129 and "Viewing Channel Fader Settings" on page 130 for more information.

## Naming the Stereo Out

The Stereo Out can be named for easy identification. See "Naming Channels" on page 134 for more information.

# 9 Bus Outs

## Patching Bus Outs to Outputs

Bus Outs can be patched to the Slot Outputs, Omni Outs, or the 2TR Digital Outputs. See "Output Patching" on page 68 for more information.

## Routing Input Channels to Bus Outs

Input Channels can be routed to the Bus Outs. See "Routing Input Channels" on page 82 for more information.

## Metering Bus Outs

Bus Out signal levels can be metered on the Meter pages. See "Metering" on page 107 for more information.

## Monitoring Bus Outs

Bus Outs can be assigned to the CONTROL ROOM [ASSIGN 1] or [ASSIGN 2] button for monitoring. See "Control Room Monitoring" on page 136 for more information.

## Attenuating Bus Outs

Bus Out signals can be attenuated pre-EQ. See "Attenuating Signals" on page 110 for more information.

## EQ'ing Bus Outs

Each Bus Out features 4-band parametric EQ. See "Using EQ" on page 111 for more information.

## Grouping Master EQs

Bus Out EQs can be grouped with the EQs of other Output Channels. See "Grouping Output Channel EQs" on page 114 for more information.

## Bus Out Inserts

Internal effects processors and external signal processors can be patched into the Bus Outs by using the Inserts. See "Using Inserts" on page 115 for more information.

## Compressing Bus Outs

Signal dynamics can be controlled by using the Bus Out Compressors. See "Compressing Channels" on page 116 for more information.

## Grouping Master Compressors

Bus Out Compressors can be grouped with the Compressors of other Output Channels. See "Grouping Output Channel Compressors" on page 119 for more information.

## Muting Bus Outs (ON/OFF)

Bus Outs can be muted by using the channel strip [ON] buttons.

1    **Press the LAYER [MASTER] button to select the Master Layer.**

2    **Use channel strip [ON] buttons 17–24 to mute the Bus Outs.**

The [ON] button indicators of Bus Outs that are on light up.

## Grouping Master Mutes (ON/OFF)

Bus Out Mutes can be grouped with the Mutes of other Output Channels. See "Grouping Output Channel Mutes (ON/OFF)" on page 128 for more information.

## Setting Bus Out Levels

Bus Out levels can be set as follows.

1    **Press the LAYER [MASTER] button to select the Master Layer.**

2    **Press the FADER MODE [FADER] button to select Fader mode.**

3    **Use faders 17–24 to set the Bus Out levels.**

Refer to the legend on the right side of the faders when setting Bus Out levels.
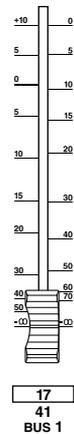
## Grouping Master Faders

Bus Out faders can be grouped with the faders of other Output Channels. See "Grouping Output Channel Faders" on page 126 for more information.

## Delaying Bus Outs

Each Bus Out features a Delay function. See "Delaying Channel Signals" on page 120 for more information.

## Soloing Bus Outs

Bus Outs can be soloed. See page 121 for more information.

## Pairing Bus Outs

Bus Outs can be paired for stereo operation. See "Pairing Channels" on page 123 for more information.

## Sending Bus Outs to the Stereo Out

Bus Outs can be routed to the Stereo Out buses as follows. Bus Out to Stereo Out settings can be stored in the Bus to Stereo library, which contains 1 preset memory and 32 user memories. See "Bus to Stereo Library" on page 147 for more information.

**1    Use the SELECTED CHANNEL ROUTING [DISPLAY] button to locate the Bus to Stereo page.**
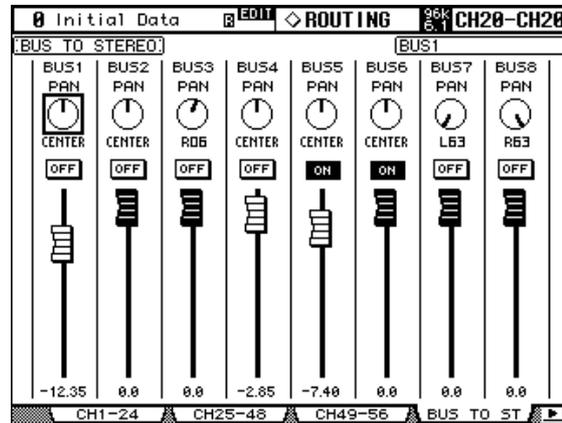


**2    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**PAN:** These controls are used to pan the Bus Out signals between the left and right Stereo Out buses. The currently selected Pan control can be set to center by pressing [ENTER].

**ON/OFF:** These buttons are used to turn on and off the Bus Out to Stereo Out routing.

**Faders:** These faders are used to set the Bus Out to Stereo Out levels. Fader knobs appear highlighted when faders are set to 0.0 dB.

Press the [ENTER] button to set the currently-selected fader to 0.0 dB. You can copy the currently-selected fader position to other faders by double-clicking the [ENTER] button.

## Viewing Bus Out Settings

Parameter and fader settings for each Bus Out can be viewed and set on the View pages. See "Viewing Channel Parameter Settings" on page 129 and "Viewing Channel Fader Settings" on page 130 for more information.

## Naming Bus Outs

Bus Outs can be named for easy identification. See "Naming Channels" on page 134 for more information.

# 10 Aux Sends

## Patching Aux Send Masters to Outputs

Aux Send Masters can be patched to the Slot Outputs, Omni Outs, or the 2TR Digital Outputs. See "Output Patching" on page 68 for more information.

## Setting the Aux Send Mode

Aux Sends have two operating modes—Variable and Fixed—which can be set individually for each of the eight Aux Sends. In Variable mode, Aux Send levels are variable and the signal source point can be either pre-fader or post-fader. In Fixed mode, Aux Send levels are fixed at nominal and the signal source point is fixed to post-fader.

1   **Use the AUX SELECT [DISPLAY] button to select the Aux Send pages.**

The Aux Send parameters for the 56 Input Channels are divided among three pages. The Input Channel 1–24 Aux Send page is shown below: Variable mode on the left, Fixed mode on the right. The layout of the other two pages is the same.
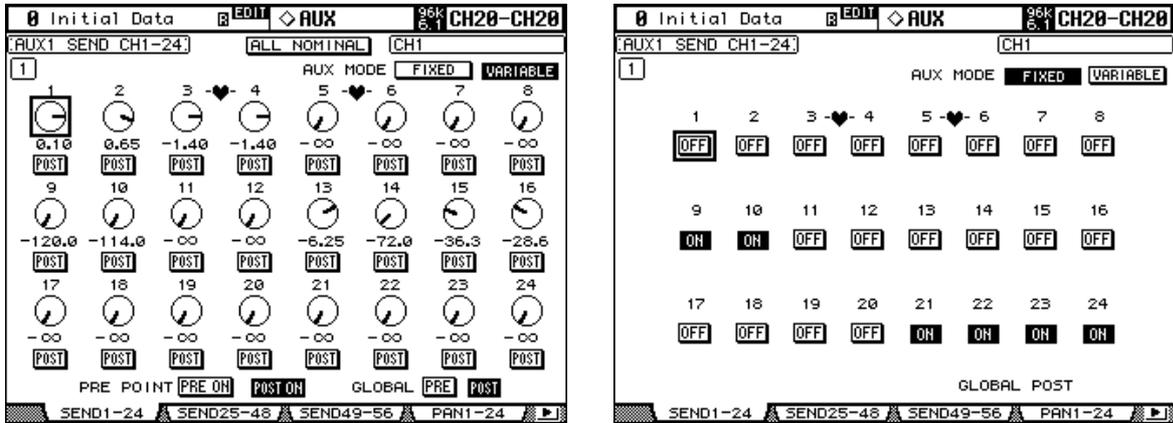


On the Fixed mode page, "GLOBAL POST" is displayed in the lower-right corner, indicating that the Aux Send Pre/Post parameter is fixed at Post.

2   **Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select Aux Sends 1–8.**

3   **Use the cursor buttons to select the FIXED and VARIABLE buttons, and press [ENTER] to select a mode.**

When the Aux mode is changed, the parameters of the selected Aux Send are set as follows.

| Parameters | Change from Variable to Fixed | Change from Fixed to Variable |
|---|---|---|
| Level | All set to nominal | All set to –∞ |
| Pre/Post | All set to Post | |
| On/Off | All turned off | All turned on |

## Pre-Fader or Post-Fader Aux Sends

Aux Sends can be configured individually as either pre-fader or post-fader on the Aux Send pages (see page 99) or the Aux View pages (see page 102). If Aux Sends are configured as pre-fader, you can position the send points before or after the [ON] buttons.

## Setting Aux Send Levels

Aux Send levels can be set by using the faders or Encoders.

### Using the Faders

**1** **Use the LAYER buttons to select the Layers.**

**2** **Press the FADER MODE [AUX] button to select the Aux Fader mode.**

**3** **Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select Aux Sends 1–8.**

**4** **Use the faders to set the Aux Send levels.**

Refer to the legend on the left side of the faders when setting Aux Send levels.
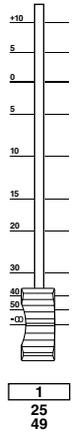
### Using the Encoders

**1** **Use the LAYER buttons to select the Layers.**

**2** **Press the ENCODER MODE [AUX] button to select the Aux Encoder mode.**

**3** **Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select Aux Sends 1–8.**

**4** **Use the Encoders to set the Aux Send levels.**

## Aux Send Pages

You can view and set the Aux Send parameters of all Input Channels on the Aux Send pages. Operation of the Aux Send pages in Variable and Fixed mode is explained separately.

### Variable Mode

**1** **Use the AUX SELECT [DISPLAY] button to select the Aux Send pages.**

The Aux Send parameters for the 56 Input Channels are divided among three pages. The Input Channel 1–24 Aux Send page in Variable mode is shown below. The layout of the other two pages is the same.
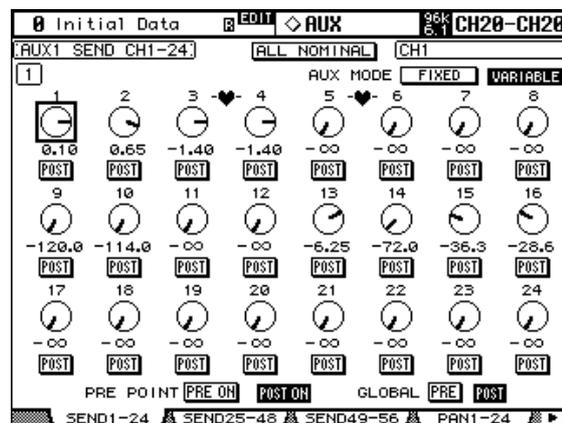


**2** **Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select Aux Sends 1–8.**

**3** **Use the cursor buttons to select the Input Channel Aux Send controls.**

Input Channels can also be selected by using the LAYER buttons and [SEL] buttons.

**4 To turn Aux Sends on and off, select the rotary controls, and press [ENTER].**

The rotary controls of Aux Sends that are turned off, appear gray, and "OFF" appears in place of the level value. Aux Send levels can still be changed even when they're off.

**5 To set Aux Send levels, select the rotary controls, and use the Parameter wheel or INC/DEC buttons.**

To set Aux Send levels for all Input Channels to nominal, select the ALL NOMINAL button.

**6 To set the Pre Fader and Post Fader parameters, select the PRE/POST buttons, and use the [ENTER] button or INC/DEC buttons.**

**7 To set all Input Channels for the selected Aux Send to pre-fader or post-fader simultaneously, select the GLOBAL PRE or POST button, and then press [ENTER].**

The PRE or POST button is highlighted, and remains highlighted as long as all Input Channel pre or post settings remain unchanged, so you can quickly see if all Input Channels are set to either pre-fader or post-fader.

**8 If you selected pre-fader, turn on the PRE ON button or POST ON button to set the Pre point before or after each channel's [ON] button.**

### Fixed Mode

See page 98 for information on how to select Fixed Aux mode.

**1 Use the AUX SELECT [DISPLAY] button to select the Aux Send pages.**

The Input Channel 1–24 Aux Send page in Fixed mode is shown below. The layout of the other two Aux Send pages in Fixed mode is the same.
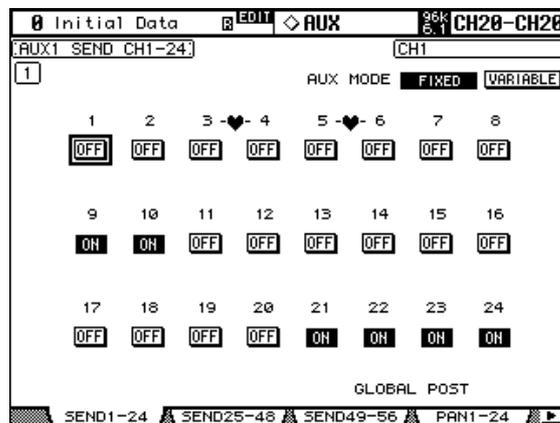


**2 Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select Aux Sends 1–8.**

**3 Use the cursor buttons or Parameter wheel to select the Aux Send buttons.**

Input Channels can also be selected by using the LAYER buttons and [SEL] buttons.

**4 Use the [ENTER] button or INC/DEC buttons to turn Aux Sends on and off.**

If the Fader mode is set to Aux, the faders provide a visual indication of the On/Off status of each Input Channel for the currently selected Aux Send. For Aux Sends that are on, faders move to the nominal position. Aux Sends that are off, they move to the –∞ position. On/Off settings cannot be changed by using the faders.

# Viewing Aux Send Settings

You can view and set settings of all Aux Sends on the Aux View pages. Level and Pre/Post parameters are displayed separately.

## Level Parameters

In Level mode, the Aux View pages display Aux Send Level and On/Off parameters. Fixed mode Aux Sends can be turned on and off only.

**1**    **Use the AUX SELECT [DISPLAY] button to select the Aux View pages.**

**2**    **Select the DISPLAY LEVEL button, and press [ENTER].**

The Aux View parameters for the 56 Input Channels are divided among three pages. The Input Channel 1–24 Aux View page is shown below in Level mode. The layout of the other two pages is the same.
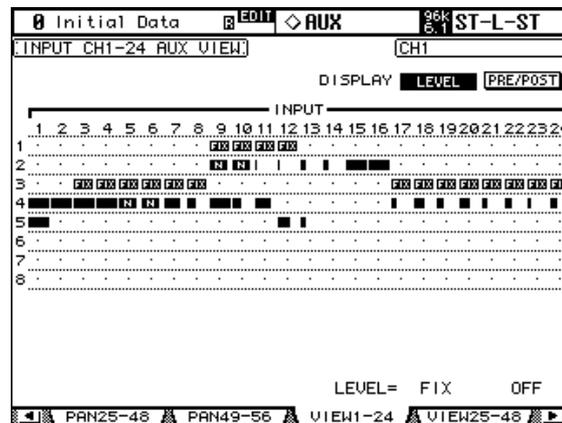


**3**    **Use the cursor buttons to select the Input Channel Aux Sends.**

Input Channels can also be selected by using the Input Channel Layer buttons and [SEL] buttons. Aux Sends can also be selected by using the AUX SELECT [AUX 1]–[AUX 8] buttons.

**4**    **Use the Parameter wheel or INC/DEC buttons to set the Aux Send levels.**

**5**    **Use the [ENTER] button to turn on and off the selected Aux Send.**

The various Aux View page indicators are as follows:

·    Send level set to –∞, or Fixed mode Aux Send set to off.

▮    Send level bar.

▢    Send set to off.

Ⓝ    Send level set to nominal.

Ⓝ    Send off, level set to nominal.

Ⓕ    Fixed mode Aux Send set to on.

In Variable Aux mode, the Level and On/Off parameter values for the selected Aux Send are displayed in the lower-right corner of the page, for example, "LEVEL: –2.0 dB   ON/OFF: ON."

In Fixed Aux mode, the On/Off parameter values for the selected Aux Send are displayed in the lower-right corner of the page, for example, "LEVEL: FIXED   ON/OFF: ON."

### Pre/Post Parameters

In Pre/Post mode, the Aux View pages display Aux Send Pre/Post parameters. Fixed mode Aux Sends can be turned on and off only.

**1** **Use the AUX SELECT [DISPLAY] button to select the Aux View pages.**

**2** **Select the DISPLAY PRE/POST button, and press [ENTER].**

The Input Channel 1–24 Aux View page is shown below in Pre/Post mode. The layout of the other two Aux View pages in Pre/Post mode is the same.
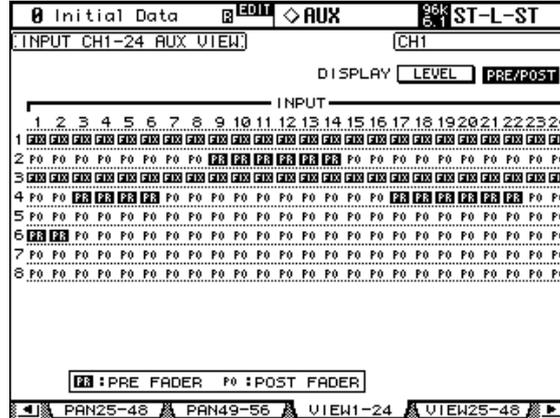


**3** **Use the cursor buttons or Parameter wheel to select the Input Channel Aux Sends.**

Input Channels can also be selected by using the LAYER buttons and [SEL] buttons. Aux Sends can also be selected by using the AUX SELECT [AUX 1]–[AUX 8] buttons.

**4** **Use the [ENTER] button or INC/DEC buttons to set the selected Aux Send to either pre-fader or post-fader.**

The various Aux View page indicators are as follows:

**PR**    Aux Send configured pre-fader.

**PO**    Aux Send configured post-fader.

**FIX**    Fixed mode Aux Send.

Fixed mode Aux Sends can be turned on and off by using the [ENTER] or INC/DEC buttons.

## Panning Aux Sends

When Aux Sends are paired, Aux Sends can be panned between the paired Aux buses. See "Pairing Channels" on page 123 for more information. If the selected Aux Send is not paired, the message "AUX*x*–*x* are not paired" appears.

If the currently selected pair of Aux Send Masters is set to Follow Surround on the Output Pair page, Aux Sends follow the Input Channel Surround Pan settings and cannot be set here, in which case the message "Now AUX*x*-*x* PAN Following Surround" appears. See "Pairing Aux Sends" on page 106 for more information.

**1    Use the AUX SELECT [DISPLAY] button to select the Aux Pan pages.**

The Aux Pan parameters for the 56 Input Channels are divided among three pages. The Input Channel 1–24 Aux Pan page is shown below. The layout of the other two pages is the same.
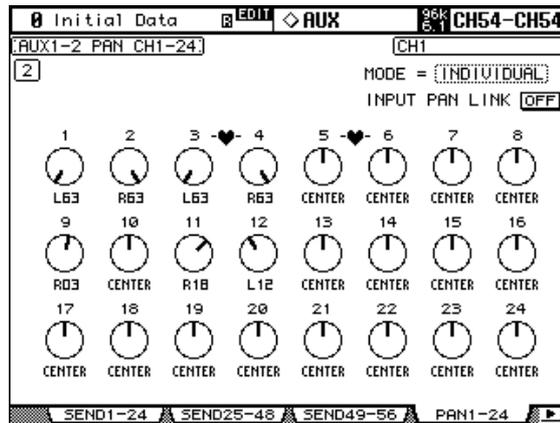


**2    Use the AUX SELECT [AUX 1]–[AUX 8] buttons to select the Aux Sends 1–8.**

**3    Use the cursor buttons to select Input Channel Aux Send pan controls, and use the Parameter wheel or INC/DEC buttons to set them.**

Input Channels can also be selected by using the LAYER buttons and [SEL] buttons.

The currently selected Pan control can be set to center by pressing [ENTER].

**MODE:** There are three Pan modes that determine how paired Aux Sends are panned: Individual, Gang, and Inverse Gang. This is an individual setting that applies to each send in a pair of Aux Sends.

 In individual mode, Aux Send pan controls operate independently.
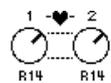
 In Gang mode, the Aux Send pan controls of paired Input Channels operate in unison.

 In Inverse Gang mode, the Aux Send pan controls of paired Input Channels operate in unison but move in opposite directions.

**INPUT PAN LINK:** This is used to link Aux Send Pan controls to Input Channel Pan controls so that operating an Input Channel Pan control also operates the corresponding Aux Send Pan control, and vice versa. This can be set individually for each pair of Aux Send Masters. When a link is established, the pan positions and Pan mode of the Input Channels are copied to the Aux Sends. While linked, the Pan mode can be set from either the Aux Pan page or the Input Channel Pan page (see page 84). The Pan mode setting for Aux Sends is linked to the Pan mode setting for Input Channels.

## Excluding Certain Channels from Aux Sends (Mix Minus)

You can quickly exclude certain channel signals from Aux Sends by using the controls on the top panel. This operation is called "Mix Minus."

For example, when Aux Sends are being used as monitors for the musicians or a narrator, you can turn off the audio signals of the musicians or narrator, excluding them from the monitor sound.

**1 Press and hold down the AUX SELECT [AUX 1]–[AUX 8] buttons of the desired Aux Sends.**

The [ON] button indicators in the channel strip remain lit while you hold down the button. This means that signals routed from channels with a lit [ON] button indicator to the Aux Send are turned on.

*Note: If you release the AUX SELECT button before you proceed to Step 2, you will be unable to complete the Mix Minus operation.*

**2 Press the [ON] buttons of the Input Channels you wish to exclude from the Aux Send. You can select multiple channels.**

The selected channels' [ON] button indicators turn off, and signals routed from those channels to the corresponding Aux Send are turned off. "MIX MINUS FOR AUX * " appears at the bottom of the screen. (The asterisk represents an Aux number.)
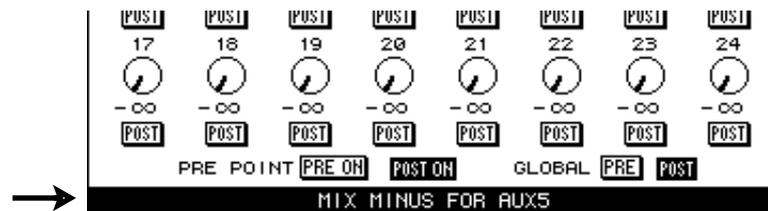


*Tip: At this time, the Send Level controls on the Aux Send page are grayed out.*

**3 To reset the setting, while pressing and holding down the AUX SELECT [AUX 1]–[AUX 8] buttons you pressed in Step 1, press the [ON] buttons you pressed in Step 2.**

The corresponding [ON] button indicators light up.

## Copying Channel Fader Positions to Aux Sends

While Aux Sends are in Variable mode, you can copy all Input Channel fader positions on one layer to the corresponding Aux Sends.

This is convenient when you wish to send to the musicians monitor signals that have the same balance setting as the Stereo Out signals.

**1 Locate the copy source layer button from the Input Channel Layer buttons, then press and hold down the button.**

*Note: If you release the button in the LAYER section before you proceed to Step 2, you will be unable to complete the Copy operation.*

**2 Press one of the AUX SELECT [AUX 1]–[AUX 8] buttons to select the desired Aux Send copy destination.**

The confirmation message appears.
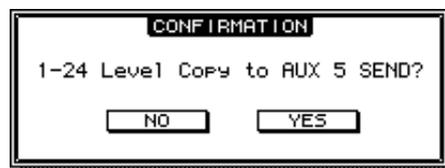
3 **To execute the Copy operation, move the cursor to the [YES] button, then press [ENTER].**

To cancel the Copy operation, move the cursor to the [NO] button, then press [ENTER].

*Tip: If the copy destination Input Channel has been paired with a vertical partner in another Layer, the fader position will be copied to the partner's Aux Send.*

## Metering Aux Send Masters

Aux Send Master levels can be metered on the Meter pages. See "Metering" on page 107 for more information.

## Monitoring Aux Send Masters

Aux Send Masters can be assigned to the CONTROL ROOM [ASSIGN 1] or [ASSIGN 2] button for monitoring. See "Control Room Monitoring" on page 136 for more information. Aux 7 and Aux 8 can be monitored via the STUDIO MONITOR OUT (see page 137).

## Attenuating Aux Send Masters

Aux Send Master signals can be attenuated pre-EQ. See "Attenuating Signals" on page 110 for more information.

## EQ'ing Aux Send Masters

Each Aux Send Master features 4-band parametric EQ. See "Using EQ" on page 111 for more information.

## Grouping Master EQs

Aux Send Master EQs can be grouped with the EQs of other Output Channels. See "Grouping Output Channel EQs" on page 114 for more information.

## Aux Send Master Inserts

Internal effects processors and external signal processors can be patched into the Aux Send Masters by using the Inserts. See "Using Inserts" on page 115 for more information.

## Compressing Aux Send Masters

Signal dynamics can be controlled by using the Aux Send Master Compressors. See "Compressing Channels" on page 116 for more information.

## Grouping Master Compressors

Aux Send Master Compressors can be grouped with the Compressors of other Output Channels. See "Grouping Output Channel Compressors" on page 119 for more information.

## Muting Aux Send Masters (ON/OFF)

Aux Send Masters can be muted as follows.

1 **Press the LAYER [MASTER] button to select the Master Layer.**

2 **Use channel strip [ON] buttons 9–16 to mute the Aux Send Masters.**

The [ON] button indicators of Aux Send Masters that are on light up.

## Grouping Master Mutes (ON/OFF)

Aux Send Master Mutes can be grouped with the Mutes of other Output Channels. See "Grouping Output Channel Mutes (ON/OFF)" on page 128 for more information.

## Settings Aux Send Master Levels

Aux Send Master levels can be set as follows.

**1    Press the LAYER [MASTER] button to select the Master Layer.**

**2    Press the FADER MODE [FADER] button to select the Fader mode.**

**3    Use faders 9–16 to set the Aux Send Master levels.**

Refer to the legend on the right side of the faders when setting Aux Send Master levels.
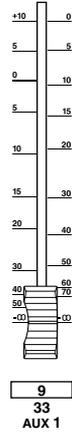
## Grouping Master Faders

Aux Send Master faders can be grouped with the faders of other Output Channels. See "Grouping Output Channel Faders" on page 126 for more information.

## Delaying Aux Send Masters

Each Aux Send Master features a Delay function. See "Delaying Channel Signals" on page 120 for more information.

## Soloing Aux Sends

Aux Sends can be soloed. See page 121 for more information.

## Pairing Aux Sends

Aux Sends can be paired for stereo operation. See "Pairing Channels" on page 123 for more information.

## Viewing Aux Send Master Settings

Parameter and fader settings for each Aux Send Master can be viewed and set on the View pages. See "Viewing Channel Parameter Settings" on page 129 and "Viewing Channel Fader Settings" on page 130 for more information.

## Naming Aux Send Masters

Aux Send Masters can be named for easy identification. See "Naming Channels" on page 134 for more information.

# 11 Common Channel Functions

## Metering

Input Channels, Bus Outs, Aux Sends, the Stereo Out, and the effects processors can be metered on the various Meter pages, which are located by using the DISPLAY ACCESS [METER] button.

Input and Output Channel Meter pages also display fader positions numerically. The Peak Hold function, which applies to all level meters, can be turned on or off on any of the Meter pages.

### Setting the Metering Position

Input and Output Channels can be metered pre-EQ, pre-fader, or post-fader. This setting, which can be set independently for the Input and Output Channels, can be set on the Metering Position page shown below, or any of the Input and Output Channel Meter pages.
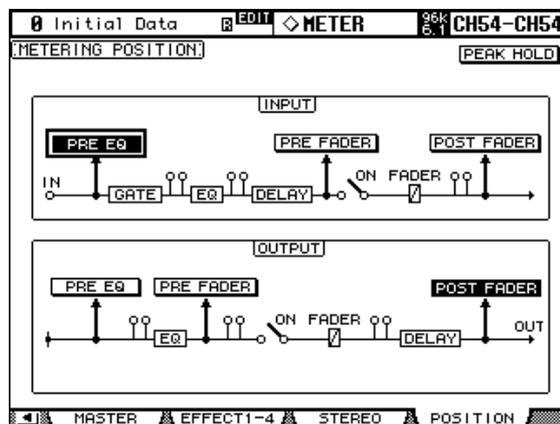


**PRE EQ:** Channels are metered pre-EQ.

**PRE FADER:** Channels are metered pre-fader.

**POST FADER:** Channels are metered post-fader.

## Metering Input Channels

There are two types of Input Channel Meter page: 24-channel and 48-channel.

There are three 24-channel Meter pages. The Input Channel 1–24 Meter page is shown below. The layout of the other two pages is the same. These pages feature two level meters for each Input Channel. When Input Channels are vertically paired, both meters operate. When Input Channels are horizontally paired, only the left-hand meter operates.
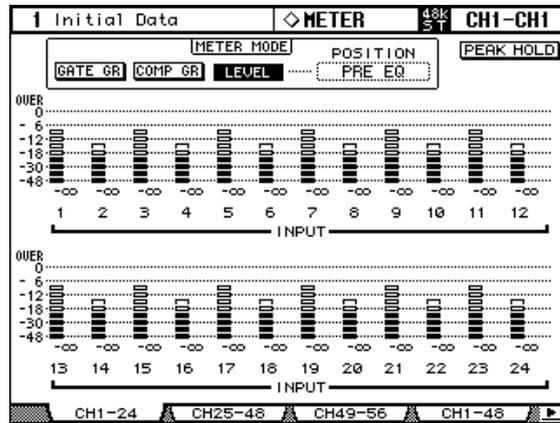


**GATE GR:** The meters indicate the gain reduction being applied by the Gate.

**COMP GR:** The meters indicate the gain reduction being applied by the Compressor.

There are two 48-channel Meter pages. The Input Channel 1–48 Meter page is shown below. The layout of the other page is the same.
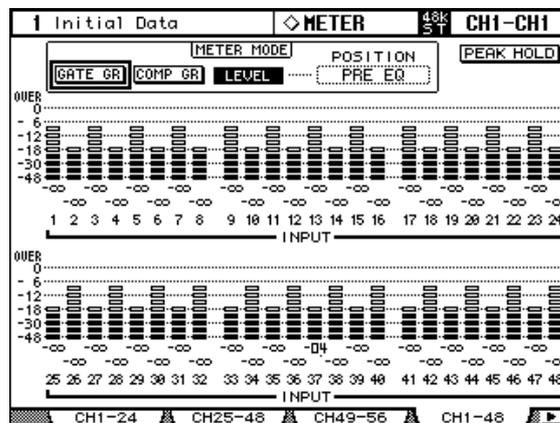
### Metering Output Channels

Bus Outs, Aux Sends, and the Stereo Out can all be metered on the Master Meter page.
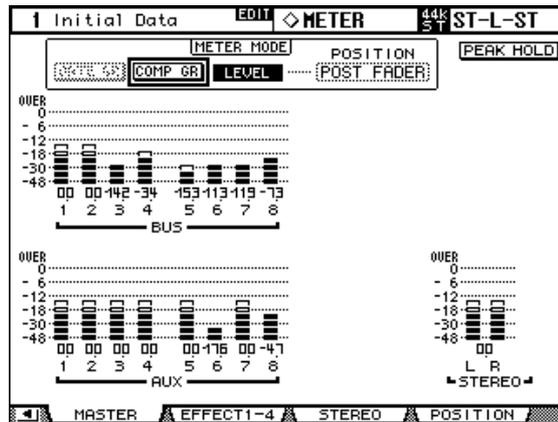


### Metering Effects

Effects inputs and outputs are metered on the Effect 1–4 page. There are eight input and output meters for effect #1, and 2 input and output meters for effects 2 through 4.
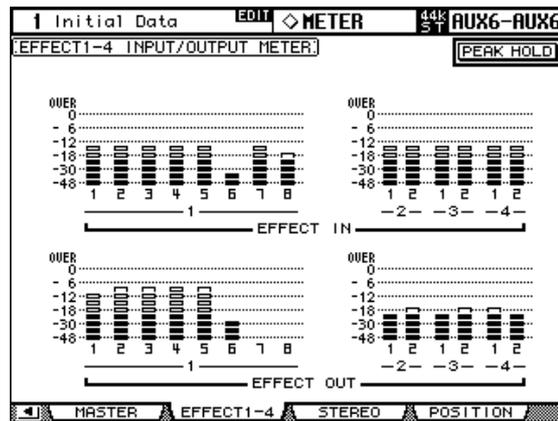


### Metering the Stereo out

The Stereo Out can be metered on the Stereo Meter page. Peak signal levels for the left and right channels are displayed numerically.
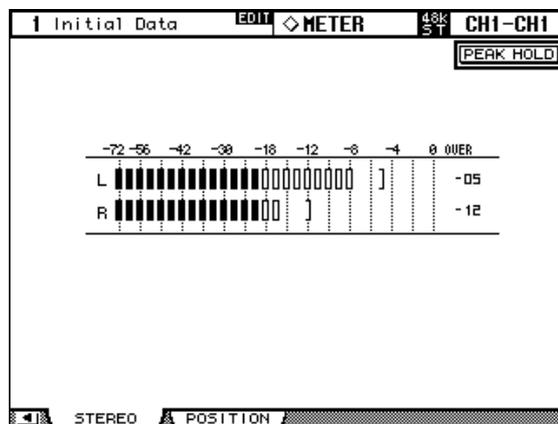
## Attenuating Signals

Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature pre-EQ attenuation, which is useful for attenuating "hot" signals before EQ'ing.

**1 Use the EQUALIZER [DISPLAY] button to select the Attenuator pages.**

The Attenuator parameters for the 56 Input Channels are arranged into three pages. The Input Channel 1–24 Attenuator/Shifter page is shown below. The layout of the other two pages is the same.
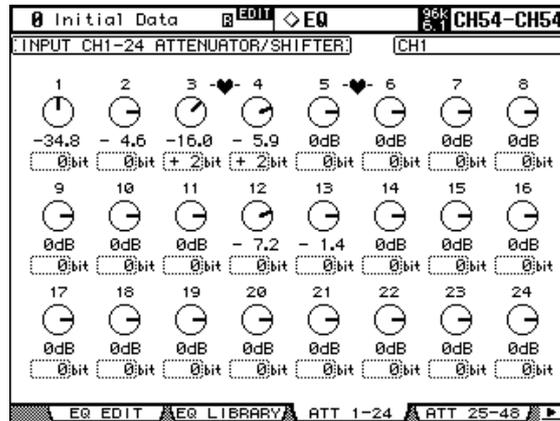


The attenuator parameters for the Output Channels appear on the Output Attenuator page.
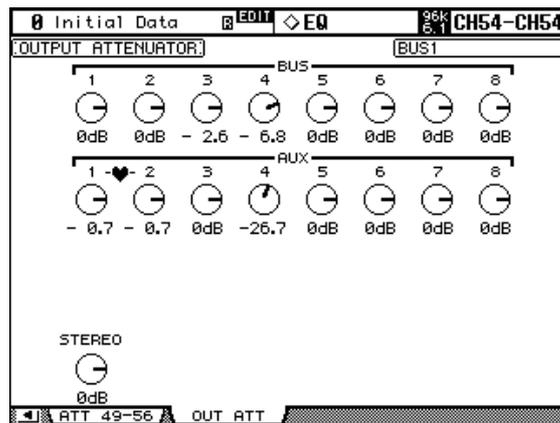


**2 Use the cursor buttons to select the channels, and use the Parameter wheel or INC/DEC buttons to set the amount of attenuation.**

Input and Output Channels can also be selected by using the LAYER and [SEL] buttons.

You can copy the currently selected Input or Output Channel attenuation setting to all Input or Output Channels respectively by double-clicking the [ENTER] button.

For Input Channels, you can also set the amount of attenuation in bits from +2 bits to –24 bits. Use the cursor buttons to select the bit shift parameters, and use the Parameter wheel or INC/DEC buttons to set them. The rotary attenuators and the bit shift parameters can be set independently.

You can set the attenuator parameters for individual Input and Output Channels on the Input Attenuator and Output Attenuator pages, regardless of paired channels. The changes made on the Attenuator pages, along with the level balance between channels, will be reflected in the settings in the SELECTED CHANNEL section, in the EQUALIZER [ATT] controls, and on the EQ Edit page.

# Using EQ

Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature 4-band parametric EQ. The LOW-MID and HIGH-MID bands are peaking type. The LOW and HIGH bands can be set to shelving, peaking, or HPF and LPF respectively. EQ settings can be stored in the EQ library, which contains 40 preset memories and 160 user memories. See "EQ Library" on page 150 for more information.

## Preset EQs

The following table lists the preset EQs. See page 282 for detailed parameter information.

| # | Preset Name | Description |
|---|---|---|
| 1 | Bass Drum 1 | Emphasizes the low range of a bass drum and the attack created by the beater. |
| 2 | Bass Drum 2 | Creates a peak around 80 Hz, producing a tight, stiff sound. |
| 3 | Snare Drum 1 | Emphasizes "snappy" and rimshot sounds. |
| 4 | Snare Drum 2 | Emphasizes various ranges for that classic rock snare drum sound. |
| 5 | Tom-tom 1 | Emphasizes the attack of tom-toms, and creates a long, "leathery" decay. |
| 6 | Cymbal | Emphasizes the attack of crash cymbals, extending the "sparkling" decay. |
| 7 | High Hat | Use on a tight high-hat, emphasizing the mid to high range. |
| 8 | Percussion | Emphasizes attack and adds clarity to the high-range of instruments, such as shakers, cabasas, and congas. |
| 9 | E. Bass 1 | Produces a tight electric bass sound by cutting very low frequencies. |
| 10 | E. Bass 2 | Unlike preset 9, this preset emphasizes the low range of an electric bass. |
| 11 | Syn. Bass 1 | Use on a synth bass with emphasized low range. |
| 12 | Syn. Bass 2 | Emphasizes the attack that is peculiar to synth bass. |
| 13 | Piano 1 | Makes pianos sound brighter. |
| 14 | Piano 2 | Used in conjunction with a compressor, this preset emphasizes the attack and low range of pianos. |
| 15 | E. G. Clean | Use for line-level recording of an electric or semi-acoustic guitar to get a slightly harder sound. |
| 16 | E. G. Crunch 1 | Adjusts the tonal quality of a slightly distorted guitar sound. |
| 17 | E. G. Crunch 2 | A variation on preset 16. |
| 18 | E. G. Dist. 1 | Makes a heavily distorted guitar sound clearer. |
| 19 | E. G. Dist. 2 | A variation on preset 18. |
| 20 | A. G. Stroke 1 | Emphasizes the bright tones of acoustic guitars. |
| 21 | A. G. Stroke 2 | A variation on preset 20. You can also use it with gutsy guitar sounds. |
| 22 | A. G. Arpeg. 1 | Ideal for arpeggio playing on acoustic guitars. |
| 23 | A. G. Arpeg. 2 | A variation on preset 22. |
| 24 | Brass Sec. | Use with trumpets, trombones, or saxes. When used with a single instrument, try adjusting the HIGH or HIGH-MID frequency. |
| 25 | Male Vocal 1 | An EQ template for male vocals. Try adjusting the HIGH or HIGH-MID parameters according to the voice quality. |
| 26 | Male Vocal 2 | A variation on preset 25. |
| 27 | Female Vo. 1 | An EQ template for female vocals. Try adjusting the HIGH or HIGH-MID parameters according to the voice quality. |
| 28 | Female Vo. 2 | A variation on preset 27. |
| 29 | Chorus&Harmo | An EQ template for brightening choruses. |
| 30 | Total EQ 1 | Use on a stereo mix during mixdown. Sounds even better when used with a compressor. |
| 31 | Total EQ 2 | A variation on preset 30. |
| 32 | Total EQ 3 | A variation on preset 30. Can also be used with paired Input or Output Channels. |

| # | Preset Name | Description |
|---|---|---|
| 33 | **Bass Drum 3** | A variation on preset 1, with low and mid range reduced. |
| 34 | **Snare Drum 3** | A variation on preset 3, creating a thicker sound. |
| 35 | **Tom-tom 2** | A variation on preset 5, emphasizing the mid and high ranges. |
| 36 | **Piano 3** | A variation on preset 13. |
| 37 | **Piano Low** | Emphasizes the low range of pianos recorded in stereo. |
| 38 | **Piano High** | Emphasizes the high range of pianos recorded in stereo. |
| 39 | **Fine-EQ Cass** | Add clarity when recording to or from cassette tape. |
| 40 | **Narrator** | Ideal for recording narration. |

## Using the SELECTED CHANNEL EQUALIZER Controls

1  **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**
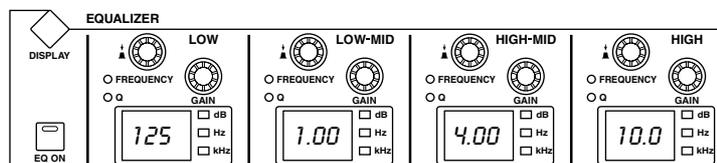


2  **Use the [EQ ON] button to turn the EQ on or off.**

3  **Use the GAIN controls to set the gain of each band.**

When a GAIN control is adjusted, the gain in dB is displayed on the corresponding EQ display. If the GAIN control is not adjusted for two seconds, the EQ display returns to displaying the frequency.

4  **To set the frequency, press a FREQUENCY/Q control so that the FREQUENCY indicator lights up, and use the FREQUENCY/Q control to set the frequency.**

The frequency is displayed by the corresponding EQ display.

5  **To set the Q, press a FREQUENCY/Q control so that the Q indicator lights up, and use the FREQUENCY/Q control to set the Q.**

The Q value is displayed by the corresponding EQ display. If the Q control is not adjusted for two seconds, the EQ display returns to displaying the frequency.

To reset an individual gain control, hold down the corresponding FREQUENCY/Q control. To reset all gain controls, press the LOW and HIGH FREQUENCY/Q controls.

The EQ parameter ranges are as follows.

| Parameter | LOW | LOW-MID | HIGH-MID | HIGH |
|---|---|---|---|---|
| **Gain** | –18.0 dB to +18.0 dB (0.1 dB steps)[1] | | | |
| **Frequency** | 21.2 Hz to 20.0 kHz (120 steps per 1/12 octave) | | | |
| **Q** | HPF, 10.0 to 0.10 (41 steps), L.SHELF | 10.0 to 0.10 (41 steps) | | LPF, 10.0 to 0.10 (41 steps), H.SHELF |

1. The LOW and HIGH GAIN controls function as filter on/off controls when Q is set to HPF or LPF respectively.

The initial EQ parameter settings are as follows.

| Parameter | LOW | LOW-MID | HIGH-MID | HIGH |
|---|---|---|---|---|
| **Gain** | 0 dB | | | |
| **Frequency** | 125 Hz | 1.00 kHz | 4.00 kHz | 10.0 kHz |
| **Q** | L.SHELF | 0.70 | | H.SHELF |

## EQ Edit Pages

EQ parameters can also be set on the EQ Edit page. If the Auto EQUALIZER Display preference is on, this page appears automatically when a control in the SELECTED CHANNEL EQUALIZER section is operated. See "Auto EQUALIZER Display" on page 230.

**1    Use the EQUALIZER [DISPLAY] button to select the EQ Edit page.**
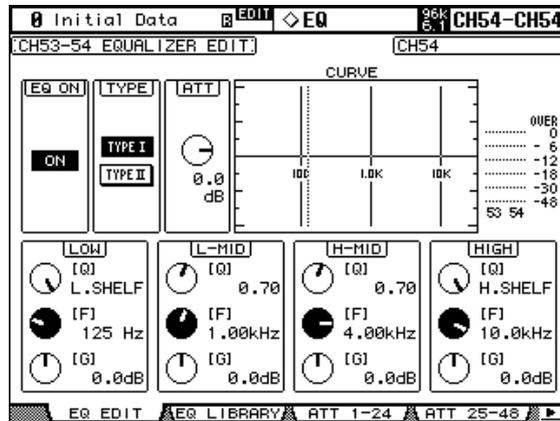
```
0 Initial Data     R EDIT  ◇EQ       96k  CH54-CH54
CH53-54 EQUALIZER EDIT               CH54
                              CURVE
 EQ ON  TYPE  ATT
                                               OVER
                                                  0
          TYPE I                                - 6
   ON                                          -12
          TYPE II      0.0                      -18
                       dB    100   1.0K   10K   -30
                                               -48
                                             53 54
   LOW          L-MID         H-MID          HIGH
   [Q]           [Q]           [Q]           [Q]
   L.SHELF            0.70           0.70     H.SHELF
   [F]           [F]           [F]           [F]
   125 Hz        1.00kHz       4.00kHz       10.0kHz
   [G]           [G]           [G]           [G]
   0.0dB         0.0dB         0.0dB         0.0dB
    EQ EDIT   EQ LIBRARY  ATT 1-24  ATT 25-48  ►
```

**2    Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

**3    Use the cursor buttons to select the parameters, and use the Parameter wheel and INC/DEC buttons to set them.**

**EQ ON:** This turns the EQ on and off. While this page is selected, the [ENTER] button can be used to turn the EQ on and off so long as any parameter other than TYPE is selected.

**TYPE:** This selects the type of EQ: TYPE I (the EQ type used on legacy Yamaha digital mixing consoles) or TYPE II (a newly developed algorithm).

**ATT:** This can be used to attenuate signals pre-EQ. It's the same Attenuator parameter that appears on the Attenuator pages. See "Attenuating Signals" on page 110 for more information.

**CURVE:** This displays the EQ curve of the currently selected Input Channel.

**Level meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner.

**LOW, L-MID, H-MID, HIGH:** These are the Q, Frequency (F), and Gain (G) parameters for the four bands. The parameter (F or Q) you selected using the FREQUENCY/Q control is highlighted.

## Grouping Output Channel EQs

The Bus Out, Aux Send, and Stereo Out EQs can be grouped, allowing you to control the EQ of several Output Channels simultaneously. There are four Output Channel EQ groups: e, f, g, and h.

**1  Use the DISPLAY ACCESS [GROUP] button to locate the Output Equalizer Link page.**
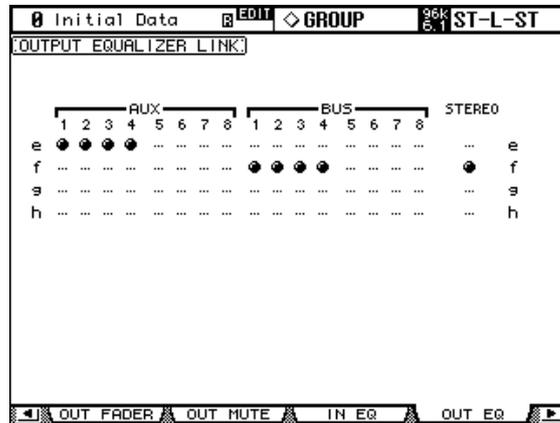


**2  Press the LAYER [MASTER] button.**

**3  Use the Up/Down cursor buttons to select EQ groups e–h.**

The selected group is highlighted by a flashing cursor box.

**4  Use the [SEL] buttons to add and remove Output Channels to and from the selected group.**

The EQ settings of the first Output Channel added to the group are applied to all subsequently added Output Channels.

When an Output Channel is added to a group, its [SEL] button indicator lights up.

## Using Inserts

Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature assignable Inserts.

**1    Use the SELECTED CHANNEL DISPLAY ACCESS [PHASE/INSERT] button to select the Insert page.**

The Insert page for Input Channels is shown below.
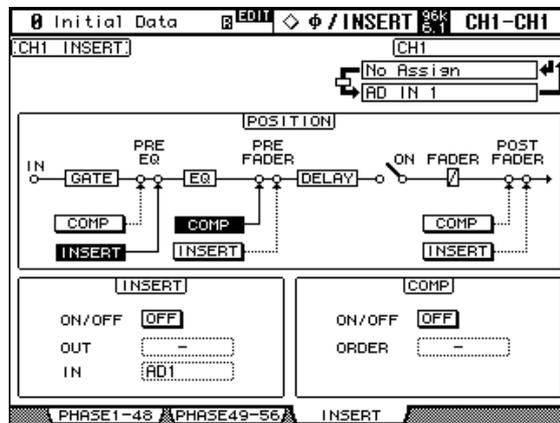


The Insert page for Bus Outs, Aux Sends, and the Stereo out is shown below.
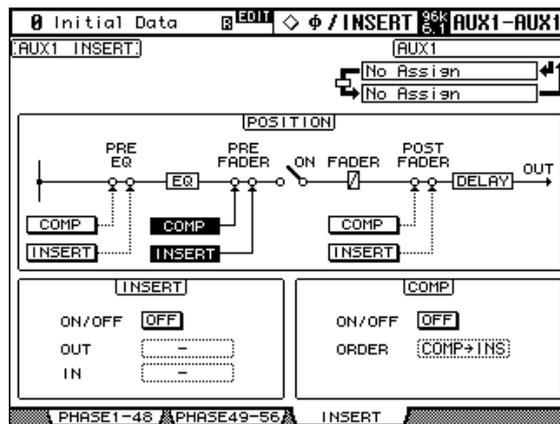


**2    Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

**3    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**POSITION:** This determines the position of the Insert and Compressor within the channel, and can be set to pre-EQ, pre-fader, or post-fader. Click the desired [COMP] and [INSERT] buttons in the POSITION block diagram to select the Compressor and Insert positions.

**INSERT ON/OFF:** This turns the currently selected channel's Insert on and off.

**INSERT OUT:** This selects the destination for the Insert Out, which can be a Slot Output, Omni Out, 2TR Digital Output, or the input to an internal effects processor. See page 241 and page 245 for Input and Output patch parameter lists. The Port ID of the currently selected destination is displayed below the currently selected channel's Long name in the upper-right corner of the page. The destination port can also be selected by using the Patch Select window (see page 71), which is accessed by pressing [ENTER] while this parameter is selected. Insert Outs can also be patched on the Output Patch pages. See "Output Patching" on page 68 for more information.

**INSERT IN:** This selects the source for the Insert In, which can be an AD Input, Slot Input, 2TR Digital or Analog Input, or the output of an internal effects processor. See page 241 for a list of Input Channel Insert In sources; page 245 for a list of Output Channel Insert In sources. The Port ID of the currently selected source is displayed below the currently selected channel's Long name in the upper-right corner of the page. The source port can also be selected by using the Patch Select window (see page 71), which is accessed by pressing [ENTER] while this parameter is selected. Insert Ins can also be patched on the Input Channel Insert In Patch pages. See "Patching Input Channel Insert Ins" on page 67 for more information.

**COMP ON/OFF:** This turns the currently selected channel's Compressor on and off. It works in unison with the SELECTED CHANNEL DYNAMICS [COMP ON] button, and the ON/OFF button on the Comp Edit page. See "Compressing Channels" on page 116 for more information.

**COMP ORDER:** If the Insert and Compressor are set to the same position in the channel (i.e., INSERT POSITION and COMP POSITION are the same), you can use this parameter to set the order of the Insert and Compressor to either Comp->Ins or Ins->Comp.

When a Y56K card effect, or an internal effects processor is inserted in the currently selected channel, when the EFFECTS/PLUG-INS [CHANNEL INSERTS] button is pressed, the corresponding EFFECTS/PLUG-INS [1–4] button indicator flashes, and the corresponding Effects, or Plug-In edit page appears. If it's a Y56K card that's inserted, the [PLUG-INS] button indicator also flashes. If it's an internal effects processor, the [INTERNAL EFFECTS] button indicator also flashes. This applies only to effects that are inserted into channels. If there's nothing inserted in the currently selected channel, a message appears.

# Compressing Channels

Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature a Compressor. Settings can be stored in the Comp library, which contains 36 preset memories and 92 user memories. See "Comp Library" on page 149 for more information.

## Preset Comps & Types

The following table lists the preset Comps and types. See page 284 for detailed parameter information.

| # | Preset Name | Type | Description |
|---|---|---|---|
| 1 | **Comp** | COMP | Compressor intended to reduce the overall volume level. Use it on the stereo output during mixdown, or with paired Input or Output Channels. |
| 2 | **Expand** | EXPAND | Expander template. |
| 3 | **Compander (H)** | COMPAND-H | Hard-kneed compressor template. |
| 4 | **Compander (S)** | COMPAND-S | Soft-kneed compressor template. |
| 5 | **A. Dr. BD** | COMP | Compressor for use with acoustic bass drum. |
| 6 | **A. Dr. BD** | COMPAND-H | Hard-kneed compander for use with acoustic bass drum. |
| 7 | **A. Dr. SN** | COMP | Compressor for use with acoustic snare drum. |
| 8 | **A. Dr. SN** | EXPAND | Expander for use with acoustic snare drum. |
| 9 | **A. Dr. SN** | COMPAND-S | Soft-kneed compander for use with acoustic snare drum. |
| 10 | **A. Dr. Tom** | EXPAND | Expander for use with acoustic tom toms, which automatically reduces the volume when the tom toms are not played, improving mic separation. |
| 11 | **A. Dr. OverTop** | COMPAND-S | Soft-kneed compander for emphasizing the attack and ambience of cymbals recorded with overhead mics. It automatically reduces the volume when the cymbals are not played, improving mic separation. |
| 12 | **E. B. Finger** | COMP | Compressor for leveling the attack and volume of a finger-picked electric bass guitar. |

| # | Preset Name | Type | Description |
|---|---|---|---|
| 13 | E. B. Slap | COMP | Compressor for leveling the attack and volume of a slapped electric bass guitar. |
| 14 | Syn. Bass | COMP | Compressor for controlling or emphasizing the level of a synth bass. |
| 15 | Piano1 | COMP | Compressor for brightening the tonal color of a piano. |
| 16 | Piano2 | COMP | A variation on preset 15, using a deep threshold to change the overall attack and level. |
| 17 | E. Guitar | COMP | Compressor for electric guitar "cutting" or arpeggio-style backing. The sound color can be varied by playing different styles. |
| 18 | A. Guitar | COMP | Compressor for acoustic guitar "stroke" or arpeggio-style backing. |
| 19 | Strings1 | COMP | Compressor for use with strings. |
| 20 | Strings2 | COMP | A variation on preset 19, intended for violas or cellos. |
| 21 | Strings3 | COMP | A variation on preset 20, intended for string instruments with a very low range, such as cellos or contrabass. |
| 22 | BrassSection | COMP | Compressor for brass sounds with a fast and strong attack. |
| 23 | Syn. Pad | COMP | Compressor for synth pad, intended to prevent diffusion of the sound. |
| 24 | SamplingPerc | COMPAND-S | Compressor for making sampled percussion sound like real acoustic percussion. |
| 25 | Sampling BD | COMP | A variation on preset 24, intended for sampled bass drum sounds. |
| 26 | Sampling SN | COMP | A variation on preset 25, intended for sampled snare drum sounds. |
| 27 | Hip Comp | COMPAND-S | A variation on preset 26, intended for sampled loops and phrases. |
| 28 | Solo Vocal1 | COMP | Compressor for use with main vocals. |
| 29 | Solo Vocal2 | COMP | A variation on preset 28. |
| 30 | Chorus | COMP | A variation on preset 28, intended for choruses. |
| 31 | Click Erase | EXPAND | Expander for removing a click track that may bleed through from a musicians headphones. |
| 32 | Announcer | COMPAND-H | Hard-kneed compander for reducing the level of the music when an announcer speaks. |
| 33 | Limiter1 | COMPAND-S | A soft-kneed compander with a slow release. |
| 34 | Limiter2 | COMP | A "peak-stop" compressor. |
| 35 | Total Comp1 | COMP | Compressor for reducing the overall volume level. Use it on the stereo output during mixdown, or with paired Input or Output Channels. |
| 36 | Total Comp2 | COMP | A variation on preset 35, but with more compression. |

### Using the SELECTED CHANNEL DYNAMICS Controls

**1** **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

**2** **Use the SELECTED CHANNEL DYNAMICS [COMP ON] button to turn the currently selected channel's Compressor on or off.**
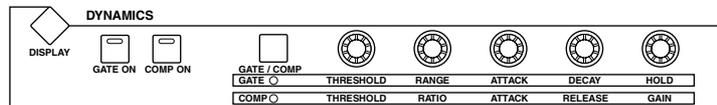


**3** **Use the SELECTED CHANNEL DYNAMICS [GATE/COMP] button to set the DYNAMICS controls to COMP (COMP indicator lit), and use the THRESHOLD, RATIO, ATTACK, RELEASE, and GAIN controls to set the Compressor.**

While an output Channel is selected, the [GATE/COMP] button is fixed at COMP.

### Comp Edit Page

Compressor settings can be viewed and set on the Comp Edit page. If the Auto DYNAMICS Display preference is on, this page appears automatically when a Compressor control in the SELECTED CHANNEL DYNAMICS section is operated. See "Auto DYNAMICS Display" on page 230.

**1** **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

**2** **Use the SELECTED CHANNEL DYNAMICS [DISPLAY] button to locate the Comp Library page, and recall a preset Compressor that contains the comp type that you want.**

See "Comp Library" on page 149 for more information.

**3** **Use the SELECTED CHANNEL DYNAMICS [DISPLAY] button to locate the Comp Edit page.**
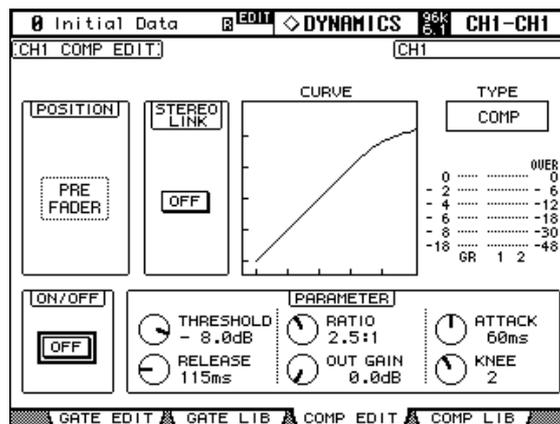


**4** **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**POSITION:** This determines the position of the Compressor within the channel, and can be set to pre-EQ, pre-fader, or post-fader. It works in unison with the COMP POSITION parameter on the Insert page. See "Using Inserts" on page 115 for more information.

**STEREO LINK:** This allows you to pair Comps for stereo operation even when channels are not paired. Input Channel Comps are paired either horizontally or vertically depending on the Pair mode setting for the currently selected Input Channel. See "Pairing Channels"

on page 123 for more information on horizontal and vertical pairing. When channels are paired, this parameter is turned on automatically and cannot be changed.

**CURVE:** This displays the Compressor curve (i.e., input level vs. output level).

**TYPE:** This is the comp type used by the currently selected channel's Compressor.

**Meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner. The GR meter indicates the amount of gain reduction being applied by the currently selected channel's Compressor.

**ON/OFF:** This turns the currently selected channel's Compressor on and off. It works in unison with the SELECTED CHANNEL DYNAMICS [COMP ON] button.

**PARAMETER:** These controls are used to set the Threshold, Ratio, Attack, Release, Out Gain, and Knee (Width) parameters.

## Grouping Output Channel Compressors

The Bus Out, Aux Send, and Stereo Out Compressors can be grouped, allowing you to control the compression of several Output Channels simultaneously. There are four Output Channel Compressor groups: m, n, o, and p.

**1   Use the DISPLAY ACCESS [GROUP] button to locate the Output Comp Link page.**
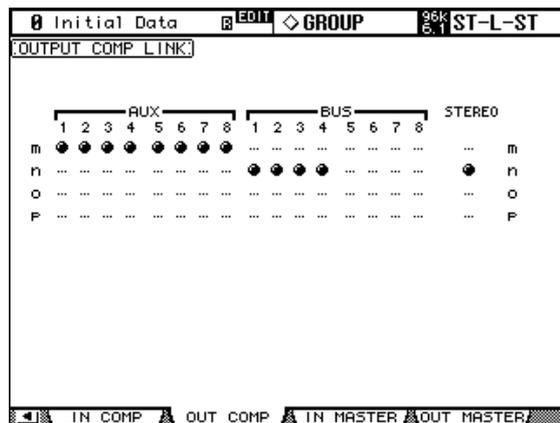


**2   Press the LAYER [MASTER] button.**

**3   Use the Up/Down cursor buttons to select Comp groups m–p.**

The selected group is highlighted by a flashing cursor box.

**4   Use the [SEL] buttons to add and remove Output Channels to and from the selected group.**

The Compressor settings of the first Output Channel added to the group are applied to all subsequently added Output Channels.

When an Output Channel is added to a group, its [SEL] button indicator lights up.

## Delaying Channel Signals

Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature independent Delay functions. Input Channel Delays feature feedback, with independent Mix and Gain parameters.

**1  Use the SELECTED CHANNEL DISPLAY ACCESS [DELAY] button to select the Delay pages.**

The Delay parameters for the 56 Input Channels are arranged into three pages. The Input Channel 1–24 Delay page is shown below. The layout of the other two pages is the same.
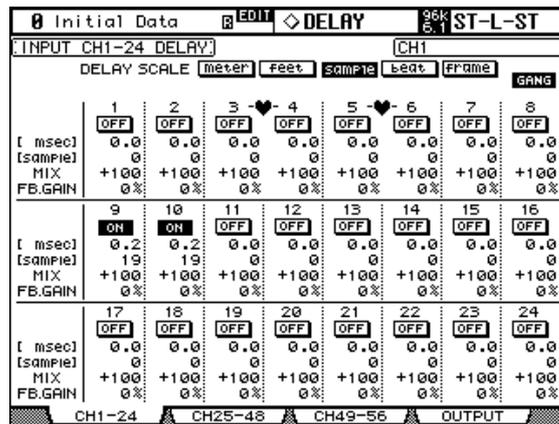


The Delay parameters for the Bus Outs, Aux Sends, and the Stereo Out appear on the Output Delay page.
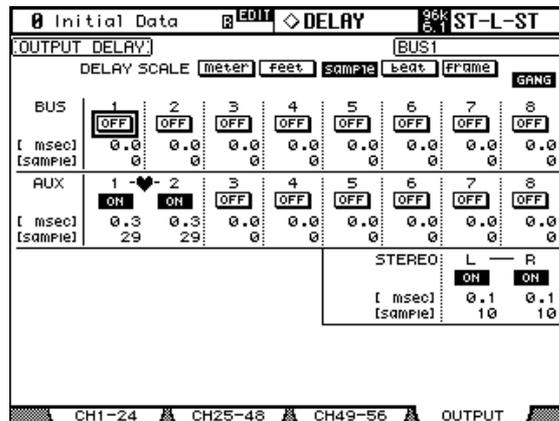


**2  Use the cursor buttons to select the Delay parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

Input and Output Channels can also be selected by using the LAYER and [SEL] buttons.

**DELAY SCALE:** These buttons determine the units of the delay value shown below the msec value. Units can be set to meters, feet, samples, beats, or timecode frames.

**GANG:** When this option is turned on, the delay time for paired channels can be set simultaneously. Ganging is relative, so any delay time difference between the two channels is maintained when this is turned on.

**ON/OFF:** These buttons turn the individual Delay functions on and off. The [ENTER] button can be used to turn a Delay on and off regardless of which parameter is selected.

**msec:** This sets the delay time in milliseconds. The delay time can also be set by using the parameter below, which is the delay time in the units selected by the DELAY SCALE buttons. You can copy the currently selected Input or Output Channel delay setting to all Input or Output Channels respectively by double-clicking the [ENTER] button.

**MIX:** This parameter, available only on the Input Channel Delay pages, sets the mix of dry and wet signals.

**FB.GAIN:** This parameter, available only on the Input Channel Delay pages, sets the amount of feedback.

## Soloing Channels

Input Channels, Bus Outs, and Aux Sends can be soloed as follows.

**1** **Use the LAYER buttons to select the Input Channel Layers if you want to solo Input Channels, or select the Master Layer if you want to solo Output Channels.**

Input and Output Channels cannot be soloed simultaneously. Soled Input Channels will be unsoled when an Output Channel is soloed, and vice versa.

**2** **Use the [SOLO] buttons to solo the channels on the selected Layer.**

The [SOLO] button indicators of channels that are soloed light up.

The SOLO indicator in the MONITOR section flashes when the Solo function is active. You can unsolo all soloed channels by pressing the SOLO [CLEAR] button.
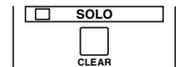
### Configuring Solo

The Solo function is configured on the Solo Setup page. If the Auto SOLO Display preference is on, this page appears automatically when a channel is soloed. See "Auto SOLO Display" on page 230.

**1** **Use the MONITOR [DISPLAY] button to locate the Solo Setup page.**
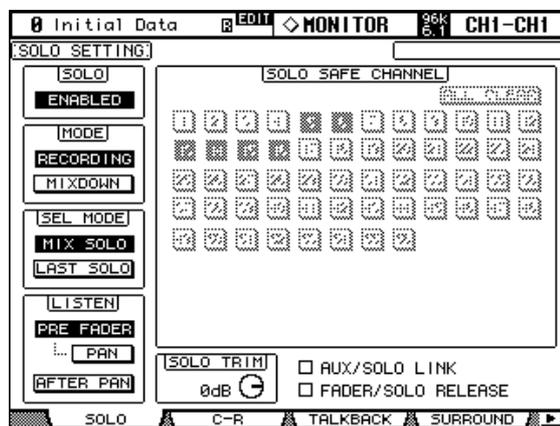


**2** **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**SOLO:** This is used to enable and disable the Solo function.

**STATUS:** This determines the Solo mode: Recording or Mixdown. It affects only Input Channels.

In Recording Solo mode, soloed Input Channel signals are fed to the Solo bus and output via the Control Room Outputs. Other buses are unaffected by this mode. If the Listen parameter is set to AFTER PAN, the signal source for Input Channels that are off, is pre fader.

In Mixdown Solo mode, soloed Input Channel signals are fed to the Stereo bus and output via the Stereo Out and Control Room Outputs. Unsoloed Input Channels are muted and their [ON] button indicators flash (unless they are Solo Safe enabled). Only Input Channels that are routed to the Stereo Out can be soloed in this mode. Input Channels that are off are temporarily turned on when they are soloed.

**SEL MODE:** This determines the Solo Select mode: Mix Solo or Last Solo. In Mix Solo mode, any number of channels can be soloed simultaneously. In Last Solo mode, only one channel can be soloed at a time.

**LISTEN:** This determines the source of the Input Channel Solo signal: Pre Fader or After Pan. It does not affect Mixdown Solo mode. Output Channels are fixed at After Pan. If you select Pre Fader, turning on the PAN button below it enables you to solo the channel with the Pan setting still applied.

**SOLO TRIM:** This is used to trim the level of the Solo signal. This parameter does not affect Mixdown Solo mode.

**SOLO SAFE CHANNEL:** For Mixdown Solo mode, Input Channels can be configured individually so that they are not muted when other Input Channels are soloed. Use the [SEL] buttons, cursor buttons, or Parameter wheel to select the SOLO SAFE CHANNEL buttons. Use the [ENTER] or INC/DEC buttons to set Solo Safe for each Input Channel. These settings do not affect Recording Solo mode. You can clear all Solo Safe settings by selecting the ALL CLEAR button and pressing [ENTER].

**AUX/SOLO LINK:** When this check box is checked, you can solo or unsolo the Aux Sends using the AUX SELECT [AUX 1]–[AUX 8] buttons without changing the Master layer. This is convenient when you want to solo or unsolo Aux Outs while controlling the Aux Sends from the Input Channels. Press the AUX SELECT key for the AUX send that you want to solo, making it light. Then press that key once again to solo only the selected AUX send. When Aux Sends are soloed, the corresponding AUX SELECT button indicators flash.

**FADER/SOLO RELEASE:** When you check this check box, raising the channel faders of soloed Channels from –∞ will unsolo the Channels. If the channel fader position is higher than –∞, you cannot solo the corresponding channel.

This function is disabled in Mixdown Solo mode and for the Output Channels.

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*Note: When the AUX/SOLO LINK or FADER/SOLO RELEASE check box is checked, the solo setting is cancelled.*

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# Pairing Channels

Input Channels, Bus Outs, and Aux Sends can be paired for stereo operation. Input Channels can be paired either horizontally, that is, adjacent odd-even channels on the same Layer (e.g., 1-2, 3-4, 5-6, etc) or vertically, that is, counterpart channels on adjacent Layers (e.g., 1-25, 2-26, 49-73, 50-74, etc). Bus Outs and Aux Sends can be paired only horizontally.

## Pairing Channels by Using the [SEL] Buttons

Only horizontal pairing can be set by using the [SEL] buttons.

**1** **Use the LAYER buttons to select the Layer containing the channels that you want to pair.**

**2** **While holding down the [SEL] button of the first channel, press the [SEL] button of the second channel.**

The settings of the first channel are copied to the second channel and the channels are paired. The [SEL] button indicator of the currently selected channel lights up, while the [SEL] button indicator of the other channel flashes.

To cancel a pair, while holding down the [SEL] button of the first channel, press the [SEL] button of the second channel.

The following channel parameters are copied, and controlled together, when channels are paired: Fader, On/Off, Insert On/Off, Aux On/Off, Aux Send Mode, Aux Send Level, Aux Pre/Post, Aux Pre Point, Gate parameters, Compressor parameters, EQ parameters, Fader group, Mute group, EQ group, Comp group, Solo, Solo Safe, [AUTO] button, Fade Time, Recall Safe, Bus to Stereo On/Off, Bus to Stereo Level.

The following channel parameters are not copied, or controlled together, when channels are paired: Input Patch, Insert Patch, Output Patch, Comp Position, Phase, Delay On/Off, Delay Time, Delay Feedback, Delay Mix, Routing, Pan, Follow Pan, Surround Pan, Bus to Stereo Pan, Aux Send Pan, Balance.

When channels are paired, the Attenuator value is copied, but the changes made in the Attenuator page are not reflected in the pair partner. However, if you change the values in the EQ Edit page, Parameter view page, or on the control surface, the changes will be reflected in the pair partner while maintaining the relative level difference.

When Aux Send Mode is set to Fixed, Aux Send On/Off is not controlled together.

Check the Routing ST Pair Link check box to link the routing from the paired channels to the Stereo Bus. See "Setting Preferences" on page 230 for more information.

## Pairing Channels by Using the Pair Pages

Both horizontal and vertical pairing can be set on the Pair pages.

**1 Use the DISPLAY ACCESS [PAIR] button to locate the Pair pages.**

The Pair parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Pair page is shown below. The layout of the other page is the same.
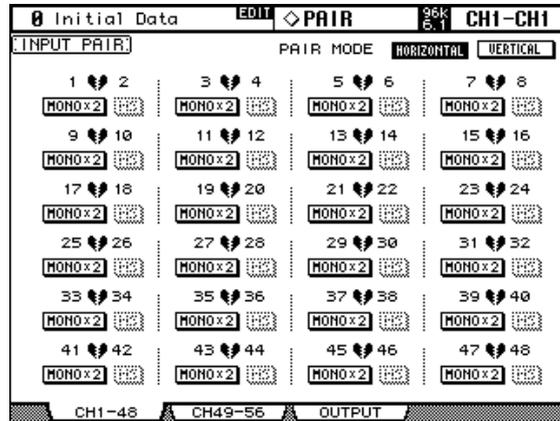


**2 To set the pair mode, select the PAIR MODE HORIZONTAL or VERTICAL buttons, and press [ENTER].**

The Pair mode can be set independently for Input Channels 1–48 and Input Channels 49–56. The Input Channel 1–48 Pair page in Vertical mode is shown below.
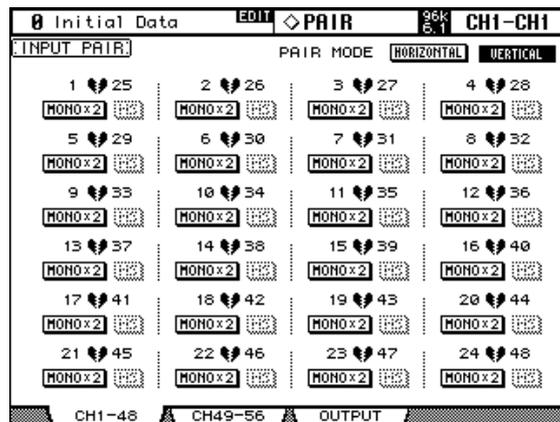


Pair parameters for the Bus Outs and Aux Sends appear on the Output Pair page.
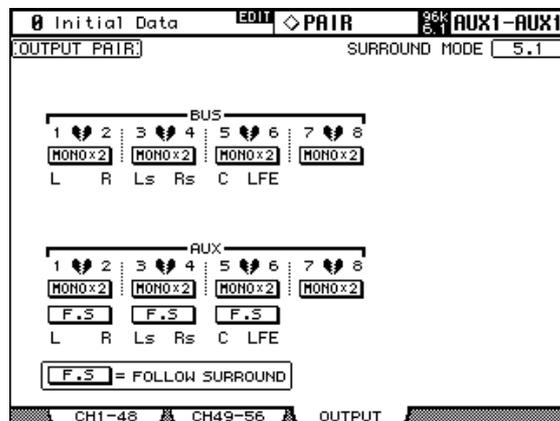
**3** **Use the cursor buttons or Parameter wheel to select the channel pair buttons, and press [ENTER] to make or break pairs.**

Input and Output Channels can also be selected by using the LAYER and [SEL] buttons.

A dialog box appears with options for copying the settings of the first channel to the second channel, the second channel to the first channel, and for resetting both channels to their initial settings. Choose the option required, and then press [ENTER].

On other display pages, paired channels have a heart icon, or a dash between their channel numbers.

When Input Channels are paired, MS Decoding can be used to decode signals from microphones arranged as MS pairs. MS Decoding is set on the Input Channel Pair pages. This can be turned on and off for each pair of channels by using the MS buttons.

The Output Pair page displays the currently selected Surround mode (i.e., Stereo, 3-1, 5.1, or 6.1), which can be set on the Surround Mode page (see page 85). When a Surround mode other than Stereo is selected, the names of the Surround channels are shown below the Bus Out and Aux Send pair buttons, as shown in the following table.

| Surround Mode | Bus Out/Aux Send | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 3-1 | L | R | C | S | — | — | — | — |
| 5.1 | L | R | Ls | Rs | C | LFE | — | — |
| 6.1 | L | R | Ls | Rs | C | Bs | LFE | — |

This table shows the default assignment. The assignment may vary depending on the settings in the Surround Bus Setup page (see page 87).

When a Surround mode other than Stereo is selected, Aux Sends can be set to follow the same Input Channel Surround Pan that applies to the Bus Outs, which is useful for feeding Surround channel signals to external effects processors. This is turned on and off by using the F.S buttons that appear below the Aux Send Pair buttons. When a pair of Aux Sends are set to follow Surround Pan, their Aux Send Pair button is unavailable, and their Aux Pan parameters (see page 103) are unavailable.

## Grouping Output Channel Faders

The Bus Out, Aux Send, and Stereo Out faders can be grouped, allowing you to control the level of several Output Channels simultaneously. There are four Output Channel Fader groups: Q, R, S, and T.

**1**  **Use the DISPLAY ACCESS [GROUP] button to locate the Output Fader Group page.**
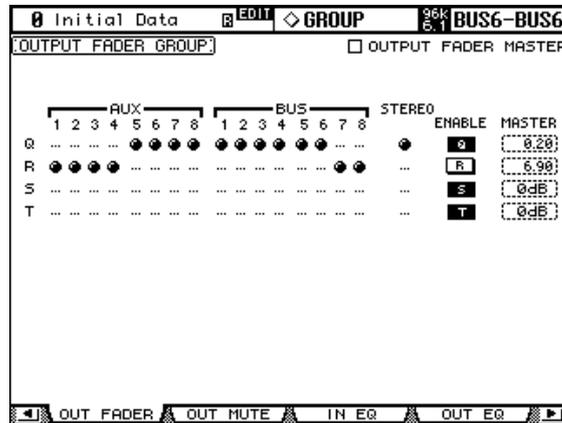


**2**  **Press the LAYER [MASTER] button.**

**3**  **Use the Up/Down cursor buttons to select Fader groups Q–T.**

The selected group is highlighted by a flashing cursor box.

**4**  **Use the [SEL] buttons to add and remove Output Channel faders to and from the selected group.**

When an Output Channel is added to a group, its [SEL] button indicator lights up.

**ENABLE:** These buttons are used to enable and disable the groups.

**OUTPUT FADER MASTER:** When this check box is not checked, the Output Channel fader positions determine the fader levels in the Output Channel Fader groups. When this check box is checked, you can set the master level for the corresponding Output Channel Fader group in the Master column. The resultant Output Channel level equals the corresponding Output Channel fader level plus the Group master level. See "Group Master for the Output Channel Faders" on page 127 for more information.

When the Output Fader Master check box is not checked, operating the channel faders will affect the Output Channel levels in the corresponding Fader group. Pressing and holding down the [SEL] button while operating the fader of an Output Channel will temporarily cancel the corresponding Fader group, which is convenient if you want to adjust the relative balance between channels.

When the Output Fader Master check box is not checked, fader groups are active only in Fader mode. See "Selecting Fader Modes" on page 49 for more information.

# Group Master for the Output Channel Faders

The 02R96 also features a Fader Group Master function that enables you to control the level of all channels using the Group Master level while maintaining the balance between the channels, much like a VCA Group on an analog mixing console. While this function is enabled, channel fader operation will not affect the channel levels of the corresponding Fader group.

**1** **Follow Steps 1–4 as described in the "Grouping Output Channel Faders" section on the previous page, select the Output Fader Master check box, then press the [ENTER] button to check or uncheck the Output Fader Master check box.**

**2** **When the Output Fader Master check box is checked, you can set the channel levels of the Fader groups in the Master column.**

When the Master column is selected, repeatedly pressing the [ENTER] button turns the Output Fader Group on and off.

You can also make these settings in the Output Fader Group Master page, as shown below.

**3** **Use the DISPLAY ACCESS [GROUP] button to locate the Output Fader Group Master page.**
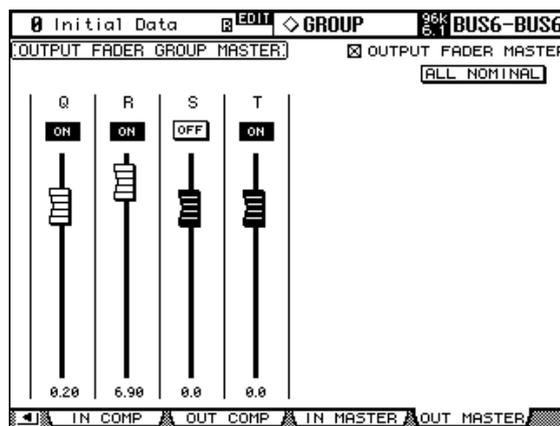


**4** **Use the cursor buttons to select the parameters, then use the Parameter wheel, INC/DEC buttons or [ENTER] button to set them.**

**OUTPUT FADER MASTER:** When this check box is checked, you can set the master levels for the Output Fader groups. The resultant Output Channel level equals the corresponding Output Channel fader level plus the Group master level.

**ALL NOMINAL:** This button resets the master levels for all Output Fader groups to nominal.

**ON/OFF:** This turns each Output Fader group on or off, like a VCA mute on an analog mixing console.

**Faders:** These faders adjust the master levels of the Fader groups. Fader knobs appear highlighted when faders are set to 0.0 dB. Press the [ENTER] button to set the currently-selected fader to 0.0 dB.

You can also control the Fader Master function from the channel strips on the control surface as described below by using the User Assignable Layer of the Remote Layers. See page 228 for information on the User Assignable Layer.

**Encoders:** The Encoders are not available.

**[AUTO] buttons:** These buttons are used to control the Fader Group Master On/Off and the master level during Automix.

**[SEL] buttons:** These buttons move the cursor on the Output Fader Group Master page.

**[SOLO] buttons:** These buttons turn the Solo function of each Fader group on and off, enabling you to monitor every channel in each Fader group.

**Channel Faders:** The Channel Faders enable you to set the master level for each Fader group.

## Grouping Output Channel Mutes (ON/OFF)

The Bus Out, Aux Send, and Stereo Out mutes can be grouped, allowing you to mute several Output Channels simultaneously. There are four Output Channel Mute groups: U, V, W, and X.

1   **Use the DISPLAY ACCESS [GROUP] button to locate the Output Mute Group page.**
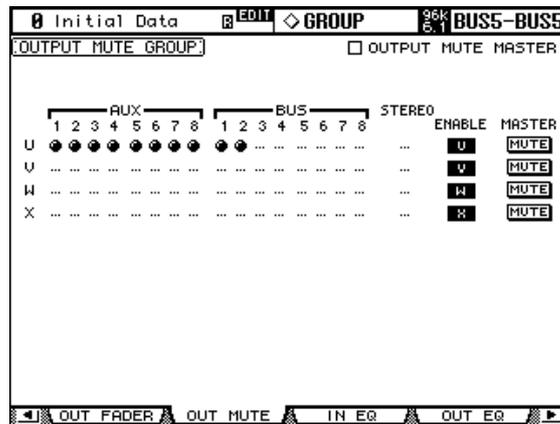


2   **Press the LAYER [MASTER] button.**

3   **Use the Up/Down cursor buttons to select Mute groups U–X.**

The selected group is highlighted by a flashing cursor box.

4   **Use the [SEL] buttons to add and remove Output Channels to and from the selected group.**

When an Output Channel is added to a Mute group, its [SEL] button indicator lights up.

**ENABLE:** These buttons are used to enable and disable the groups.

**OUTPUT MUTE MASTER:** When this check box is checked, pressing the MASTER MUTE button turns mute on or off for all channels in the corresponding Mute group. When this check box is unchecked, the Output Channel [ON] button status mutes or unmutes the channels in the group.

**MASTER MUTE:** When the Output Mute Master check box is checked, use this button to mute or unmute all channels in the corresponding Mute group.

When the Output Mute Master check box is unchecked, pressing the Output Channel [ON] button mutes or unmutes the channel in the corresponding Mute group (Mute On channels are turned off and Mute Off channels are turned on).

## Output Channel Mute Master

The 02R96 features a Mute Group Master function that enables you to mute all channels in the Mute group using the MASTER button, much like a Mute group on an analog mixing console. When this function is enabled, the channel [ON] buttons do not control the channels in the group collectively.

**1    Follow Steps 1–4 described in the "Grouping Output Channel Mutes (ON/OFF)" section on the previous page, select the Output Mute Master check box, then press the [ENTER] button to check or uncheck the Output Mute Master check box.**

**2    When the Output Mute Master check box is checked, the MASTER MUTE button in each group mutes or unmutes the channels in the corresponding group.**

If the channels are muted by the Mute Master function, the corresponding channel [ON] button indicators flash. You can assign the MASTER MUTE button function to one of the USER DEFINED KEYS for convenient operation.

## Viewing Channel Parameter Settings

The parameter setting of the currently selected Input Channel, Bus Out, Aux Send, or the Stereo Out can be viewed and set on the Parameter View pages.

**1    Use the DISPLAY ACCESS [VIEW] button to select the Parameter View page.**

**2    Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

**3    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] buttons to set them.**

### Input Channels

This is the Parameter View page for the Input Channels.
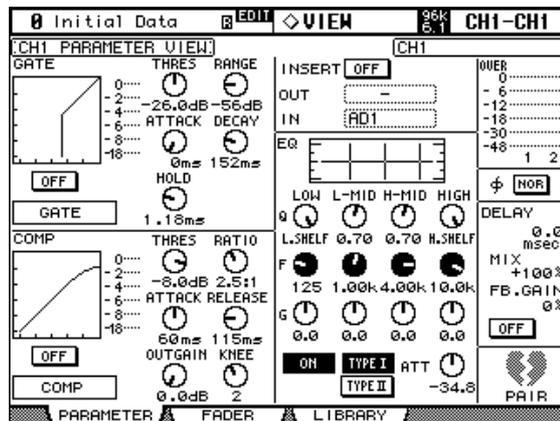


**GATE:** The following Gate parameters for the currently selected Input Channel can be set: Gate On/Off, Threshold, Range, Attack, Decay, and Hold. The GR meter indicates the amount of gain reduction being applied by the Gate. Also displayed are the gate curve and gate type. See "Gating Input Channels" on page 74 for more information.

**COMP:** The following Compressor parameters for the currently selected channel can be set: Comp On/Off, Threshold, Ratio, Attack, Release, Gain, and Knee. The GR meter indicates the amount of gain reduction being applied by the Compressor. Also displayed are the comp curve and comp type. See "Compressing Channels" on page 116 for more information.

**INSERT:** The currently selected channel's Insert can be turned on and off and patched. See "Using Inserts" on page 115 for more information.

**EQ:** The currently selected channel's EQ and Attenuator can be set. Also displayed is the EQ curve of the currently selected Input Channel. See "Using EQ" on page 111 for more information.

**Meters:** These meters indicate the levels of the currently selected channel and its horizontal or vertical partner.

**Phase:** The signal phase of the currently selected Input Channel can be reversed. See "Reversing the Signal Phase" on page 73 for more information.

**DELAY:** The currently selected channel's Delay function can be set. See "Delaying Channel Signals" on page 120 for more information.

**PAIR:** This heart icon indicates whether or not channels are paired. See "Pairing Channels" on page 123 for more information.

## Output Channels

This is the Parameter View page for the Bus Outs, Aux Sends, and the Stereo Out. Parameters are the same as for the Input Channel Parameter View page, minus the GATE and Phase sections and the DELAY MIX and FB GAIN parameters. The parameter settings of the left and right channels of the Stereo Out can be viewed individually. Use the [SEL] buttons to toggle between the left and right channels.
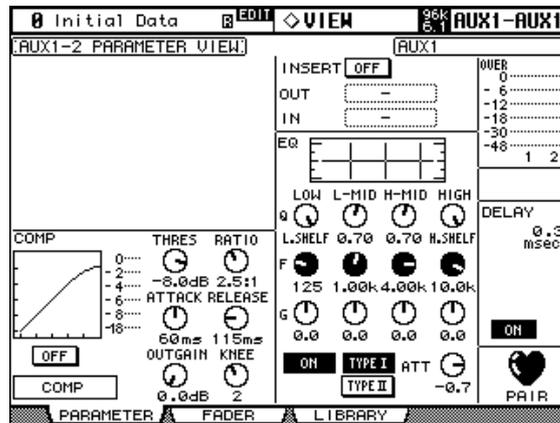


## Viewing Channel Fader Settings

The fader-related settings of the currently selected Input Channel, Bus Out, Aux Send, or the Stereo Out can be viewed and set on the Fader View pages.

1   **Use the DISPLAY ACCESS [VIEW] button to select the Fader View page.**

2   **Use the LAYER buttons to select Layers, and use the [SEL] buttons to select channels.**

3   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] buttons to set them.**

Pan and Balance controls can be set to center by pressing [ENTER] while they're selected.

## Input Channels

This is the Fader View page for the Input Channels.
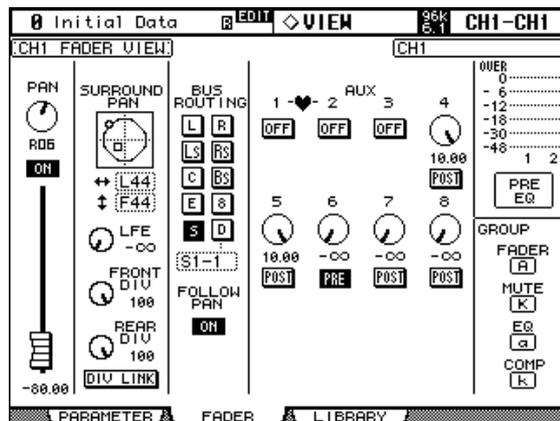


**PAN:** This is the currently selected Input Channel's Pan parameter. Select this parameter using the cursor buttons, then press the [ENTER] button to set the Pan parameter to Center. See "Panning Input Channels" on page 83 for more information.

**ON/OFF:** This is the On/Off parameter of the currently selected Input Channel. See "Muting Input Channels (ON/OFF)" on page 77 for more information.

**Fader:** This indicates the fader position of the currently selected Input Channel. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See "Setting Input Channel Levels" on page 79 for more information.

**SURROUND PAN:** The Surround pan parameters for the currently selected Input Channel are displayed only when a Surround mode other than Stereo is selected. See "Using Surround Pan" on page 85 for more information.

**BUS ROUTING:** This section contains Routing and Follow Pan buttons for the currently selected Input Channel. See "Routing Input Channels" on page 82 for more information. The Direct Out output patch can also be set. See "Patching Direct Outs" on page 70 for more information.

**AUX:** These are the currently selected Input Channel's Aux Send Level, On/Off, and Pre/Post parameters. While a rotary control is selected, the Aux Send can be turned on and off by pressing [ENTER]. See "Aux Sends" on page 98 for more information.

**Meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner. The metering position is displayed below them.

**GROUP:** These buttons indicate which Fader, Mute, EQ, or Comp group, if any, the currently selected Input Channel is in.

## Bus Outs

This is the Fader View page for the Bus Outs.
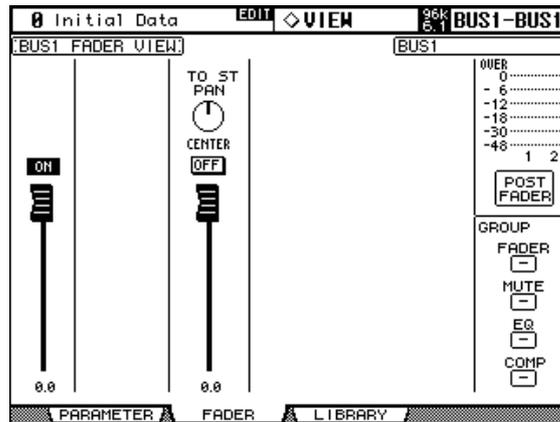


**ON/OFF:** This is the On/Off parameter of the currently selected Bus Out. See "Muting Bus Outs (ON/OFF)" on page 96 for more information.

**Fader:** This indicates the fader position of the currently selected Bus Out. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See "Setting Bus Out Levels" on page 96 for more information.

**TO ST PAN, ON/OFF & Fader:** These are the Bus Out to Stereo Out Pan, On/Off, and Fader parameters for the currently selected Bus Out. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See "Sending Bus Outs to the Stereo Out" on page 97 for more information.

**Meters:** These meters indicate the levels of the currently selected Bus Out and its partner. The metering position is displayed below them.

**GROUP:** These buttons indicate which Fader, Mute, EQ, or Comp group, if any, the currently selected Bus Out is in.

## Aux Sends

Below is the Fader View page for the Aux Sends.
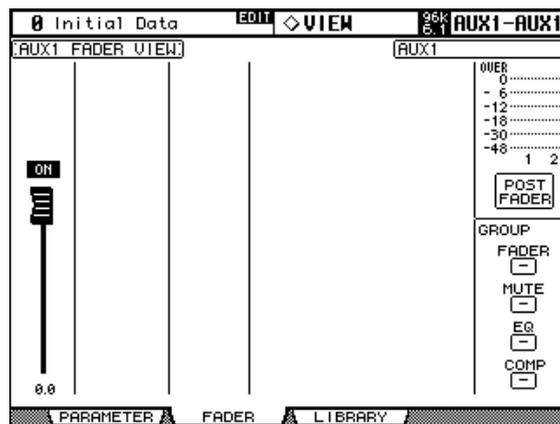


**ON/OFF:** This is the On/Off parameter of the currently selected Aux Send. See "Aux Send Pages" on page 99 for more information.

**Fader:** This indicates the fader position of the currently selected Aux Send. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See "Settings Aux Send Master Levels" on page 106.

**Meters:** These meters indicate the levels of the currently selected Aux Send and its partner. The metering position is displayed below them.

**GROUP:** These buttons indicate which Fader, Mute, EQ, or Comp group, if any, the currently selected Aux Send is in.

## Stereo Out

Below is the Fader View page for the Stereo Out. The settings of the left and right channels of the Stereo Out can be viewed individually. Use the STEREO [SEL] button to toggle between the left and right channels**.**
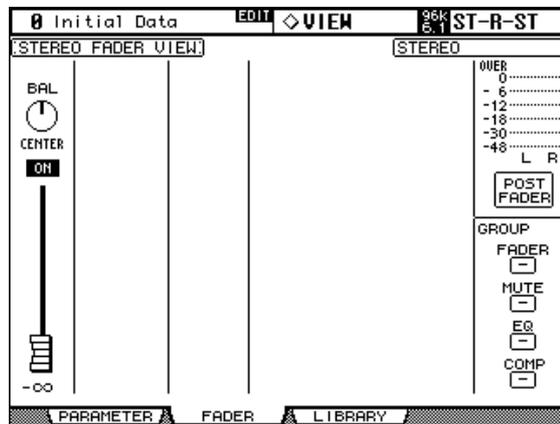


**BAL:** This is the Balance parameter for the Stereo Out. Select this parameter using the cursor buttons, then press the [ENTER] button to set the parameter to Center. See "Balancing the Stereo Out" on page 94 for more information.

**ON/OFF:** This is the On/Off parameter of the Stereo Out. See "Muting the Stereo Out (ON/OFF)" on page 93 for more information.

**Fader:** This indicates the fader position of the Stereo Out. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See "Setting the Stereo Out Level" on page 93 for more information.

**Meters:** These meters indicate the levels of the Stereo Out. The metering position is displayed below them.

**GROUP:** These buttons indicate which Fader, Mute, EQ, or Comp group, if any, the Stereo Out is in.

# Naming Channels

You can specify Long and Short names for the Input Channels, Bus Outs, Aux Sends, and the Stereo Out as follows.

See page 250 for a list of initial Input Channel names; page 250 for Output Channel names.

## Input Channels

1   **Use the DISPLAY ACCESS [INPUT PATCH] button to locate the Input Channel Name page.**
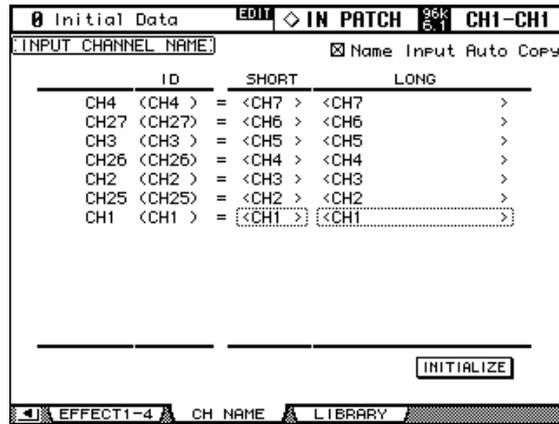


2   **Use the Parameter wheel, INC/DEC buttons, or the LAYER and [SEL] buttons to select the Input Channels.**

When Vertical Input Channel pairing mode is selected, Input Channels are listed in order of vertical partners, for example, CH1, CH25, CH2, CH26, and so on.

3   **Use the cursor buttons to select the Input Channel's Long or Short name, and then press [ENTER].**

When the Title Edit window appears, edit the Input Channel name, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

You can reset all Input Channel names back to their initial values by pressing the INITIAL-IZE button.

If the Name Input Auto Copy check box in the upper right corner is checked, the first four characters of the name entered in the LONG column are automatically copied to the SHORT column. Also, a name entered in the SHORT column is automatically copied to the LONG column.

## Output Channels

**1    Use the DISPLAY ACCESS [OUTPUT PATCH] button to locate the Output Channel Name page**

```
0 Initial Data      EDIT ◇OUT PATCH 96k CH1-CH1
[OUTPUT CHANNEL NAME]           ⊠Name Input Auto Copy
              ID        SHORT       LONG
     AUX7 <AUX7>  =  <AUX7>   <AUX7            >
     AUX6 <AUX6>  =  <AUX6>   <AUX6            >
     AUX5 <AUX5>  =  <AUX5>   <AUX5            >
     AUX4 <AUX4>  =  <AUX4>   <AUX4            >
     AUX3 <AUX3>  =  <AUX3>   <AUX3            >
     AUX2 <AUX2>  =  <AUX2>   <AUX2            >
     AUX1 <AUX1>  =  <AUX1>   <AUX1            >

                                      INITIALIZE
  ◀ D.OUT1-48  D.OUT49-56   2TR OUT    CH NAME  ▶
```
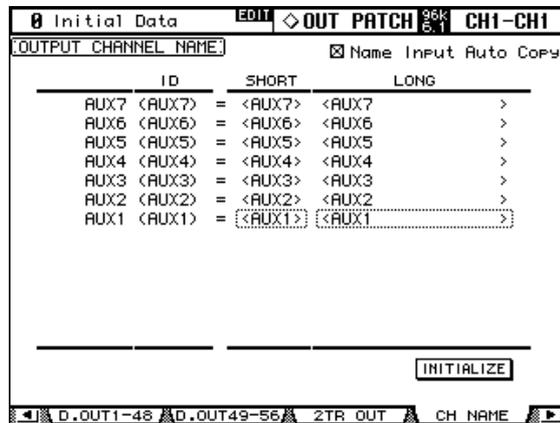
**2    Use the Parameter wheel, INC/DEC buttons, or the Master Layer and [SEL] buttons to select the Output Channels.**

**3    Use the cursor buttons to select the Output Channel's Long or Short name, and then press [ENTER].**

When the Title Edit window appears, edit the Output Channel name, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

You can reset all Output Channel names back to their initial values by pressing the INITIALIZE button.

If the Name Input Auto Copy check box in the upper right corner is checked, the first four characters of the name entered in the LONG column are automatically copied to the SHORT column. Also, a name entered in the SHORT column is automatically copied to the LONG column.

# 12 Monitoring & Talkback

## Control Room Monitoring

The CONTROL ROOM MONITOR OUT uses balanced 1/4-inch phone jacks, nominal level +4 dB. Typically it's used to feed the control room's main monitors.
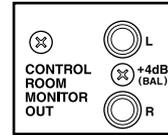
The Control Room Monitor signal source is selected by using the CONTROL ROOM buttons.

**[2TR D1]:** Selects the 2TR IN DIGITAL AES/EBU 1.

**[2TR D2]:** Selects the 2TR IN DIGITAL COAXIAL 2.

**[2TR D3]:** Selects the 2TR IN DIGITAL COAXIAL 3.

**[2TR A1]:** Selects the 2TR IN ANALOG 1.

**[2TR A2]:** Selects the 2TR IN ANALOG 2.

**[STEREO]:** Selects the Stereo Out.

**[ASSIGN 1]:** Selects the Output Channel assigned to this button on the Control Room Setup page. See "Control Room Setup" on page 137.

**[ASSIGN 2]:** Selects the Output Channel assigned to this button on the Control Room Setup page. See "Control Room Setup" on page 137.
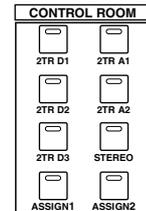
The level of the Control Room Monitor signal can be set by using the CONTROL ROOM LEVEL control. The [DIMMER] button activates the Dimmer function, which dims the Control Room Monitor and Surround Monitor signals by the amount specified on the Control Room Setup page (page 137). The Dimmer function is activated automatically when the Talkback or Oscillator function is active.
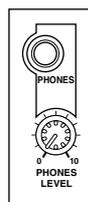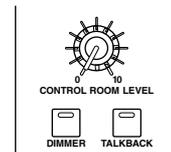
The Control Room Monitor signal is also fed to the PHONES jack, the level of which is set by using the PHONES LEVEL control.

### Control Room Setup

Control room monitoring is configured on the Control Room Setup page.

**1    Use the MONITOR [DISPLAY] button to locate the Control Room Setup page.**
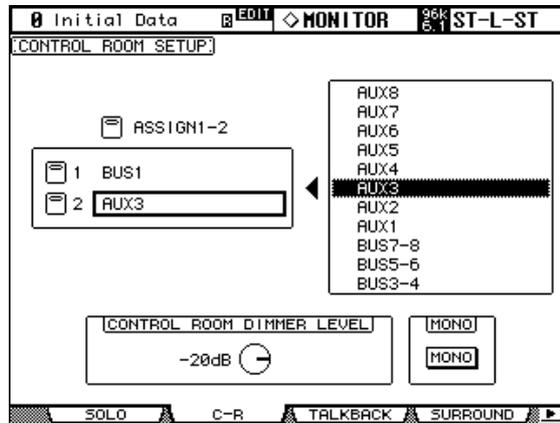


**2    Use the cursor buttons to select the ASSIGN buttons in the left-hand box, and use the Parameter wheel to select an Output Channel in the right-hand box.**

Bus Outs or Aux Sends can be assigned to the [ASSIGN 1] and [ASSIGN 2] buttons.

**3    Press [ENTER] to assign the selected Output Channel.**

Once assigned, the selected Output Channel appears highlighted in the right-hand box.

The other parameters on this page are as follows.

**CONTROL ROOM DIMMER LEVEL:** This determines the amount of attenuation applied to the Control Room Monitor and Surround Monitor signals by the Dimmer function. Use the cursor buttons to select it, and use the Parameter wheel or INC/DEC buttons to set it from.

**MONO:** This button is be used to switch the Control Room Monitor signal into mono.

## Studio Monitoring

The STUDIO MONITOR OUT uses balanced 1/4-inch phone jacks, nominal level +4 dB. Typically it's used to feed monitoring systems in the actual studio.
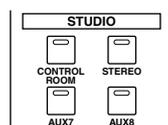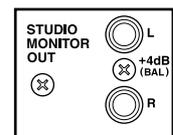


The Studio Monitor signal source is selected by using the STUDIO buttons.

**[CONTROL ROOM]:** Selects the Control Room Monitor.

**[STEREO]:** Selects the Stereo Out.

**[AUX 7]:** Selects Aux Send #7.

**[AUX 8]:** Selects Aux Send #8.

The level of the Studio Monitor signal can be set by using the STUDIO LEVEL control.

## Surround Monitoring

The 02R96 features comprehensive surround monitoring functions, including a pink noise generator for speaker setup, Bass Management, and down mixing.

The Surround Monitor signal source is selected by using the SUR-ROUND buttons. The [BUS] button selects the Bus Outs as the source. The [SLOT] button selects the Inputs of the Slots specified on the Surround Monitor page as the source. Surround mixes from up to four multitrack recorders can be monitored by patching Slot Inputs to Surround Monitor Channels (see page 141) and selecting with the [SLOT] button. The level of the Surround Monitor can be set by using the SURROUND MONITOR LEVEL control.
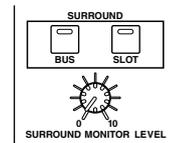
Surround monitor speakers can be aligned by using the individual Attenuator and Delay parameters on each Surround Monitor Channel. In addition to the standard Ls and Rs speakers, the 02R96 supports Ls2 and Rs2 speakers, with independent Attenuator and Delay parameters, for a more diffused surround monitoring environment. See "Configuring Surround Monitoring" on page 139 for more information.

Surround Monitor Channels can be patched to Slot Outputs or Omni Outputs. See "Output Patching" on page 68 for more information.

Surround Monitor settings can be stored in the Surround Monitor library, which contains 1 preset memory and 32 user memories. See "Surround Monitor Library" on page 152 for more information.

General surround monitoring is performed on the Surround Monitor page.

1   **Use the MONITOR [DISPLAY] button to locate the Surround Monitor page.**
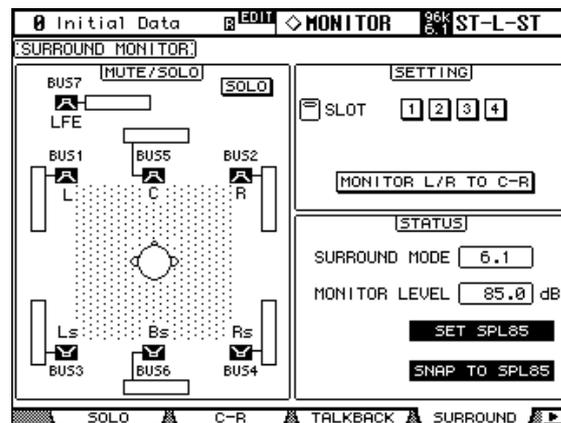


2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

The number of speaker icons and meters shown on the Surround Monitor page depends on the currently selected Surround mode. The meters indicate Bus Out signal levels.

**MUTE/SOLO:** These parameters are used to mute and solo Surround Channels. A Surround Channel is on when its speaker icon is highlighted. Speaker icons can be selected by using the cursor buttons. When SOLO is on, Surround Channels can be soloed by selecting speaker icons and pressing [ENTER].

**SETTING:** These buttons are used to select which Slot's Inputs are monitored when the SURROUND [SLOT] button is pressed. Up to four Slots can be assigned, and the signals from each Slot are mixed. Individual Slot Inputs can be patched to Surround Monitor Channels on the Surround Monitor Patch page (see page 141).

When the MONITOR L/R to C-R button is on, the Left and Right Surround Monitor Channels are fed to the Control Room Monitors. This is useful when you want to use the same speakers for Left and Right Surround Monitors and Control Room Monitors.

**STATUS:** SURROUND MODE indicates the currently selected Surround mode, which is set on the Surround Mode page (see page 85). MONITOR LEVEL indicates the volume setting of the SURROUND MONITOR LEVEL control, which can be calibrated to 85 dB SPL, the cinema standard for setting up Surround Channel Monitor speakers. To do this, output pink noise from the built-in Oscillator (see page 139), set the SURROUND MONITOR LEVEL control and the level controls on the Surround Monitor speaker amps so that the total output is 85 dB SPL, then press the SET SPL85 button. The MONITOR LEVEL indication will then display the volume setting relative to 85 dB SPL. Press the SET SPL85 button again to return to the normal volume indication. Press the SNAP TO SPL85 button to reset the SURROUND MONITOR LEVEL control to 85 dB SPL.

## Configuring Surround Monitoring

Surround monitoring, including speaker setup, monitor matrix, Bass Management, and monitor alignment, is configured on the Surround Monitor Setup page.

**1 Use the MONITOR [DISPLAY] button to locate the Surround Monitor Setup page.**
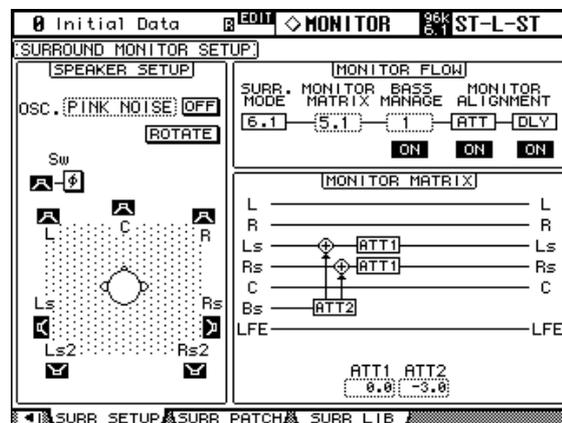


**2 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**SPEAKER SETUP:** These parameters are for setting the volume balance of the surround monitor speakers. Select the OSC (Oscillator) parameter and choose from PINK NOISE, 500-2K (pink noise through a 500 Hz to 2 kHz BPF), 1K (1 kHz sinewave), or 50 Hz (50 Hz sinewave). Use the ON/OFF button to turn the Oscillator on and off. When on, the Oscillator outputs a signal at –20 dB to the Surround Channels whose icons are highlighted. You can turn on and off Oscillator output for speakers individually. Speaker icons can be selected by using the cursor buttons or the Bus Out [SEL] buttons on the Master Layer. The signal phase of the LFE Channel can be reversed by using the SW Phase button. When ROTATE is on, the Oscillator signal is output by each speaker in turn in a clockwise direction (3 second signal, 2 second pause).

**SURR. MODE:** This indicates the currently selected Surround mode, which is set on the Surround Mode page (see page 85).

**MONITOR MATRIX:** This is used to select the Surround Monitor Matrix. In 6.1 Surround mode, you can select 6.1, 5.1, 3-1, or ST. In 5.1 Surround mode, you can select 5.1, 3-1, or ST. In 3-1 Surround mode, you can select 3-1 or ST.

When a down mix Monitor Matrix is selected, you can attenuate signals by using the ATT parameters.

You can use the Surround Monitor settings in Stereo mode, but Monitor Matrix is fixed to ST.

The following screen shows an example in 6.1 Surround mode and 3-1 Monitor Matrix mode.
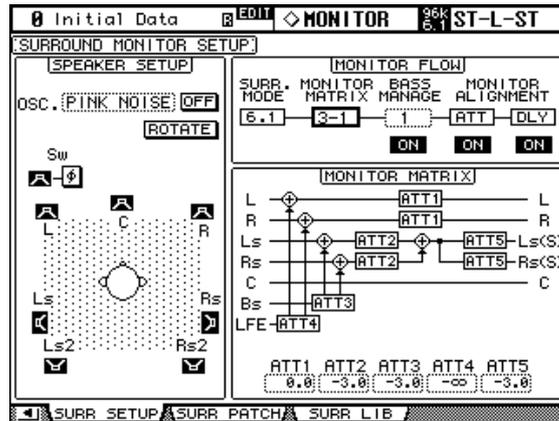


**BASS MANAGEMENT:** You can set the filter and attenuator settings for each Surround Monitor Channel using five preset Bass Management modes.
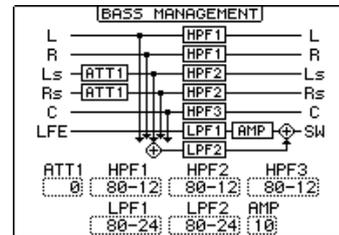


The following presets are available:

| | Presets | Parameters | | | | |
|---|---|---|---|---|---|---|
| No. | Title | HPF 1, 2, 3 | LPF1 | LPF2 | ATT 1 & 2 | AMP |
| 1 | DVD Mix w/BS | 80–12 | 80–24 | 80–24 | 0 | 10 |
| 2 | DVD Author w/BS | 80–12 | 120–42 | 80–24 | 0 | 10 |
| 3 | Film Mix w/BS | 80–12 | 80–24 | 80–24 | –3 | 10 |
| 4 | Film Author w/BS | 80–12 | 120–42 | 80–24 | –3 | 10 |
| 5 | Bypass | THRU | THRU | MUTE | 0 | 0 |

ATT1: Adjusts the level difference between LR and LsRs.
ATT2: Adjusts the level difference between C and Bs.
AMP: Corrects the LFE channel level.
HPF1–3: Cut the low range so that the speakers' supporting frequency ranges will not interfere with the subwoofer signals.
HPF1–2: Cut the high range so that the subwoofer's supporting frequency ranges will not interfere with other speakers' signals.

*Tip: If you select 3-1 Monitor Matrix mode, use Presets 1 or 2 to establish an appropriate monitoring environment.*

You can set the Bass Management parameters in the following ranges:

| Parameters | Range |
|------------|-------|
| HPF 1, 2, 3 | THRU, 80-12, 80-12L, 80-24, 80-24L |
| LPF1 | THRU, 80-24, 80-24L, 120-42 |
| LPF2 | THRU, 80-24, 80-24L, MUTE |
| ATT 1 & 2 | 0 to –12 dB (1 dB steps) |
| AMP | 0 to +12 dB (1 dB steps) |

The HPF 1, 2, 3, and LPF 1 & 2 values indicate a cut-off frequency and a filter response. For example, "80-12" means a cutoff frequency of 80 Hz and a filter response of –12 dB/octave. "L" means Linkwitz filter. Other filters are Butterworth.

### MONITOR ALIGNMENT ATT & DLY ON/OFF:

These buttons are used to turn on and off the Monitor Alignment Attenuator and Delay parameters of all Surround speakers. The MONITOR ALIGNMENT diagram and Surround Channel Attenuator and Delay parameters, which are displayed when either of these buttons are selected, allow you to align the surround monitor speakers by attenuating and delaying Surround Channels as necessary. The Attenuator parameters can be set –∞, –12 dB to +12 dB in 0.1 dB steps. The Delay parameters can be set from 0 to 30 msec in 0.02 msec steps.
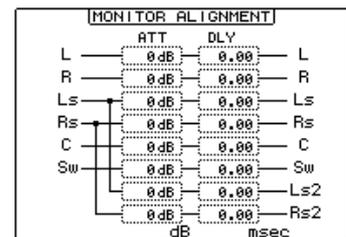


## Patching Slot Inputs to Surround Channels

Individual Slot Inputs can be patched to Surround Monitor Channels as follows.

**1  Use the MONITOR [DISPLAY] button to locate the Surround Monitor Patch page.**
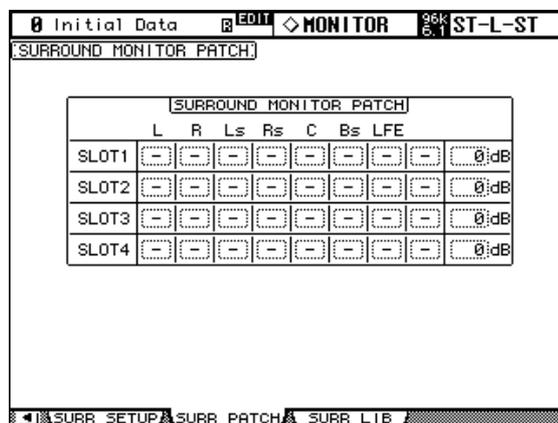


**2  Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**SLOT/CH:** This patching matrix is used to patch Inputs 1–16 from each of the four Slots to the Surround Monitor Channels. Each Slot Input can be patched to only one Surround Monitor Channel.

**LEVEL:** These parameters are used to set the monitor level of each Slot.

## Using Talkback

The Talkback function distributes the Talkback mic signal to the Studio Monitor Outs and any Slot or Omni Outputs specified on the Talkback Setup page.

The TALKBACK LEVEL control sets the level of the built-in talkback microphone.

The [TALKBACK] button has two modes of operation: If it's pressed once (i.e., for less than 300 ms), the Talkback function is turned on and remains on when the button is released. This is Latched mode (this mode can be disabled on the Talkback Setup page). If it's pressed and held for longer, the Talkback function is turned on, but turns off when the button is released. This is Unlatched mode. The [TALKBACK] button indicator flashes while the Talkback function is active.

### Talkback Setup

1   **Use the MONITOR [DISPLAY] button to locate the Talkback Setup page.**
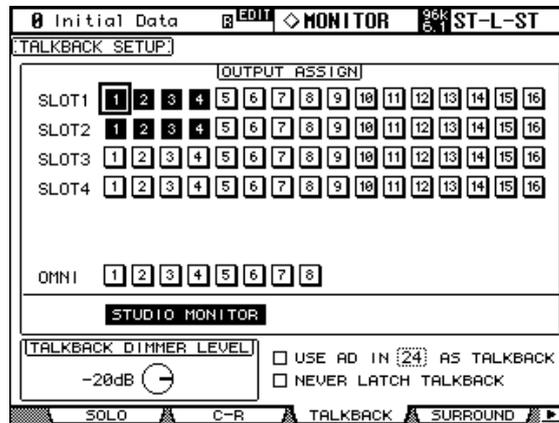


2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**OUTPUT ASSIGN:** These buttons are used to assign the Talkback mic signal to Slot and Omni Outputs.

**STUDIO MONITOR:** This allows you to select the Talkback mic signal as the Studio Monitor source.

**TALKBACK DIMMER LEVEL:** When the Talkback function is active, this determines the amount of attenuation applied to sound sources assigned to the Studio Monitors and selected for Talkback.

**USE AD IN *x* AS TALKBACK:** This allows you to select an AD Input as the Talkback signal source. Use the check box to turn this option on and off, and use the number parameter to specify the number of the AD Input. The signal from the specified AD Input is mixed with the Talkback mic signal. Turn down the TALKBACK LEVEL if you do not want to use the Talkback mic.

**NEVER LATCH TALKBACK:** This options allows you to disable latching for the Talkback function.

# 13  Libraries

## About the Libraries

The 02R96 features 10 libraries for storing Automix, Effects, Channel, Input Patch, Output Patch, Bus to Stereo, Gate, Comp, EQ, and Surround Monitor data.

Library data can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

## General Library Operation

Since most library functions are the same for each library, rather than explain them several times, they're explained only here for conciseness.

**1  Locate the various library pages as explained in the following sections.**

The Input Patch Library page shown below is used here for explanation purposes.
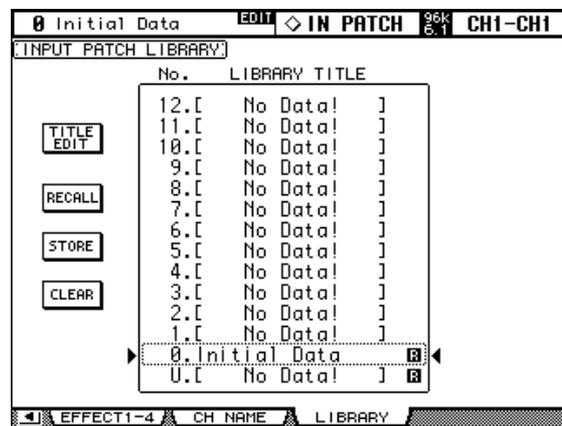


**2  Use the Parameter wheel or INC/DEC buttons to select the memories.**

A memory is selected when it appears inside the dotted box.

**3  Use the cursor buttons to select the following page buttons.**

**TITLE EDIT:** To edit the title of the selected memory, select this and press [ENTER]. When the Title Edit window appears, edit the title, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

**RECALL:** To recall the contents of the selected memory, select this and press [ENTER]. If the Recall Confirmation preference is on, a confirmation window appears before the contents are recalled.

**STORE:** To store settings to the selected memory, select this and press [ENTER]. When the Title Edit window appears, enter a title, and press OK. See "Title Edit Window" on page 46 for more information. You can stop the Title Edit window from appearing by turning off the Store Confirmation preference on page 230.

**CLEAR:** To delete the contents and title of the selected memory, select this and press [ENTER]. A confirmation window appears before the memory is cleared.

Read-only preset memories have an "R" icon next to their name. You cannot store, clear, or edit the title of these memories. Empty memories have the title "No Data!" Memory #0 is a read-only memory that you can recall to reset settings to their initial values.

Memory #U is a special read-only memory that allows you to undo and redo memory recall and store operations. After recalling a memory, you can revert to the previously recalled memory by recalling memory #U. After storing a memory, you can revert it to its previous contents by recalling memory #U. You can redo either of these undo operations by recalling memory #U again.

## Channel Library

Input Channel, Bus Out, Aux Send, and Stereo Out channel settings can be stored in the Channel library, which contains 2 preset memories and 127 user memories. Preset memories are read-only. User memories enable you to store custom settings.

**1    Use the DISPLAY ACCESS [VIEW] button to select the Channel Library page.**
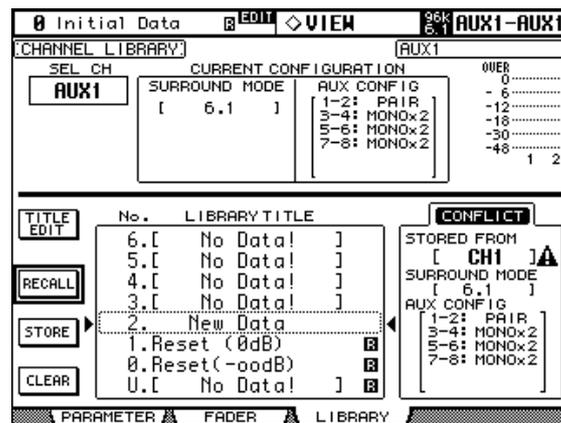


**2    Use the LAYER buttons to select Layers, and the [SEL] buttons to select channels.**

When storing, the settings of the currently selected channel are stored to the selected memory. When recalling, the settings in the selected memory are applied to the currently selected channel.

Only memories whose contents correspond to the currently selected channel can be recalled. For example, you can recall Input Channel settings to Input Channels, but not to Aux Sends. When the selected memory and currently selected channel don't correspond, a warning triangle and the word "CONFLICT" appear in the STORED FROM box.

Preset memory #0, "Reset(–∞dB)," resets all parameters of the currently selected channel to their initial values and sets the channel level to –∞ dB. Preset memory #1, "Reset (0dB)," also resets all parameters, but sets the channel level to 0 dB (i.e., nominal).

**SEL CH:** This indicates the currently selected channel.

**CURRENT CONFIGURATION:** If the currently selected channel is an Input Channel, Surround mode and Aux configuration information is displayed here.

**Level meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner.

**STORED FROM:** This indicates the channel whose settings were originally stored in the selected memory. If the currently selected channel is an Input channel, Pan mode and Aux pairing information is also displayed.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Input Patch Library

Input Patch settings can be stored in the Input Patch library, which contains 1 preset memory and 32 user memories. The preset memory is read-only. User memories enable you to store custom settings. See page 66 for information on Input Patch settings.

**1**   **Use the DISPLAY ACCESS [INPUT PATCH] button to select the Input Patch Library page.**

```
 0 Initial Data      EDIT ◇IN PATCH 96k  CH1-CH1
                                      6.1
(INPUT PATCH LIBRARY)
                  No.   LIBRARY TITLE
                  12.[  No Data!   ]
                  11.[  No Data!   ]
  TITLE           10.[  No Data!   ]
  EDIT             9.[  No Data!   ]
                   8.[  No Data!   ]
                   7.[  No Data!   ]
  RECALL           6.[  No Data!   ]
                   5.[  No Data!   ]
  STORE            4.[  No Data!   ]
                   3.[  No Data!   ]
                   2.[  No Data!   ]
  CLEAR            1.[  No Data!   ]
                ▶ 0.Initial Data    R ◀
                   U.[  No Data!   ] R
  ◀ EFFECT1-4 ╱ CH NAME ╱ LIBRARY
```
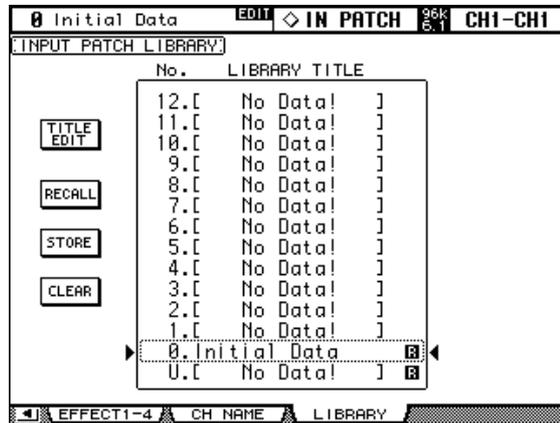
When storing, the current Input Patch settings are stored to the selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Output Patch Library

Output Patch settings can be stored in the Output Patch library, which contains 1 preset memory and 32 user memories. The preset memory is read-only. User memories enable you to store custom settings. See page 68 for information on Output Patch settings.

**1**   **Use the DISPLAY ACCESS [OUTPUT PATCH] button to select the Output Patch Library page.**

```
 0 Initial Data      EDIT ◇OUT PATCH 96k  CH1-CH1
                                       6.1
(OUTPUT PATCH LIBRARY)
                  No.   LIBRARY TITLE
                  12.[  No Data!   ]
                  11.[  No Data!   ]
  TITLE           10.[  No Data!   ]
  EDIT             9.[  No Data!   ]
                   8.[  No Data!   ]
                   7.[  No Data!   ]
  RECALL           6.[  No Data!   ]
                   5.[  No Data!   ]
  STORE            4.[  No Data!   ]
                   3.[  No Data!   ]
                   2.[  No Data!   ]
  CLEAR            1.[  No Data!   ]
                ▶ 0.Initial Data    R ◀
                   U.[  No Data!   ] R
  ◀ LIBRARY
```
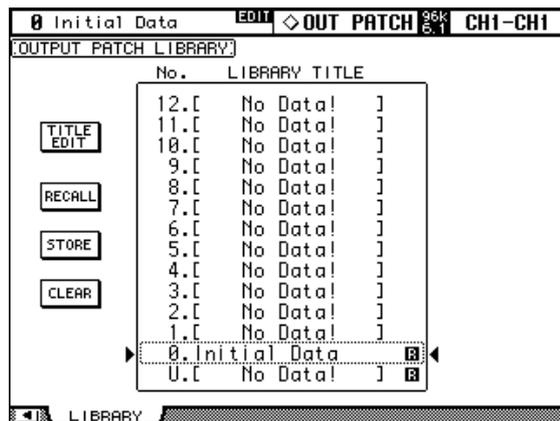
When storing, the current Output Patch settings are stored to the selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Effects Library

Effects settings can be stored in the Effects library, which contains 61 preset memories and 67 user memories. Preset memories are read-only. User memories enable you to store custom settings. See page 153 for information on using the Effects.

**1** **Use the EFFECTS/PLUG-INS [DISPLAY] button to select the Effect Library page.**
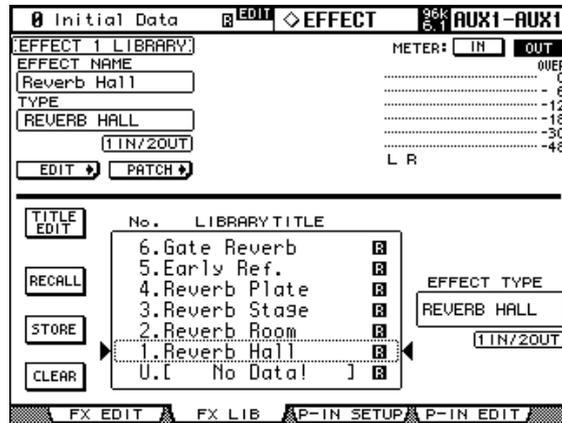


**2** **Press the EFFECTS/PLUG-INS [INTERNAL EFFECTS] button, and use the EFFECTS/PLUG-INS [1–4] buttons to select the internal effects processors.**

When storing, the settings of the currently selected internal effects processor, indicated in the upper-left corner, are stored to the selected memory.

**EFFECT NAME:** This is the name of the previously recalled Effects memory.

**TYPE:** This is the effects type used in the previously recalled Effects memory. Its I/O configuration is shown below this.

**EDIT:** Pressing this button, then the [ENTER] button, displays the Effects Edit page, which enables you to adjust the Effects parameters. See "Editing Effects" on page 156 for more information.

**PATCH:** Pressing this button, then the [ENTER] button, displays the Effects Input Patch page, which enables you to patch internal Effects processor inputs and outputs. See "Patching Effects Inputs and Outputs" on page 67 for more information.

**Level meters:** These meters indicate the input and output levels of the currently selected Effects processor. Use the IN and OUT buttons to switch between input level and output level. There are eight meters for Effects processors #1, and two meters for Effects processors #2 through #4.

**EFFECT TYPE:** This is the effects type in the selected memory. Its I/O configuration is shown below this.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Bus to Stereo Library

Bus to Stereo settings can be stored in the Bus to Stereo library, which contains 1 preset memory and 32 user memories. The preset memory is read-only. User memories enable you to store custom settings. See page 97 for information on Bus to Stereo routing.

**1    Use the ROUTING [DISPLAY] button to select the Bus to Stereo Library page.**

```
0 Initial Data      EDIT ◇ROUTING  96k  CH1-CH1
                                   48

 BUS TO STEREO LIBRARY
              No.   LIBRARY TITLE
             12.[  No Data!    ]        CURRENT
             11.[  No Data!    ]     CONFIGURATION
 TITLE       10.[  No Data!    ]     BUS
 EDIT         9.[  No Data!    ]     1-2: MONOx2
              8.[  No Data!    ]     3-4: MONOx2
 RECALL       7.[  No Data!    ]     5-6: MONOx2
              6.[  No Data!    ]     7-8: MONOx2
 STORE        5.[  No Data!    ]       LIBRARY
              4.[  No Data!    ]     CONFIGURATION
 CLEAR        3.[  No Data!    ]
              2.[  No Data!    ]     BUS
              1.[  No Data!    ]     1-2: MONOx2
          ▶  0. Initial Data   R ◀   3-4: MONOx2
             U.[  No Data!    ] R     5-6: MONOx2
                                     7-8: MONOx2
 ◀  LIBRARY
```

When storing, the current Bus Out to Stereo Out settings are stored to the selected memory.

**CURRENT CONFIGURATION:** Bus Out pairing information for the current configuration is displayed here.

**LIBRARY CONFIGURATION:** Bus Out pairing information for the configuration stored in the currently selected memory is displayed here.

If the Bus Out pairing configuration does not match the current configuration, the word "CONFLICT" will appear in the LIBRARY CONFIGURATION box. In this case, if you recall such a memory, the 02R96 will apply the current Bus Out pairing configuration and related parameter settings to the recalled memory settings.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

# Gate Library

Input Channel Gate settings can be stored in the Gate library, which contains 4 preset memories and 124 user memories. Preset memories are read-only. User memories enable you to store custom settings. See page 74 for information on gating Input Channels.

1 **Use the DYNAMICS [DISPLAY] button to select the Gate Library page.**
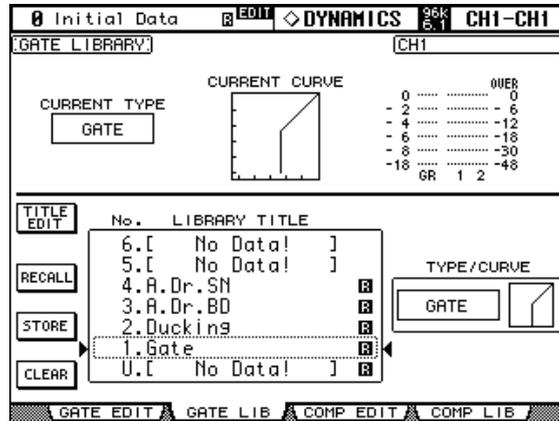


2 **Use the LAYER buttons to select the Layers, and the [SEL] buttons to select Input Channels.**

When storing, the Gate settings of the currently selected Input Channel, indicated in the upper-right corner, are stored to the selected memory. When recalling, the Gate settings in the selected memory are applied to the currently selected Input Channel.

**CURRENT TYPE:** This indicates the current Gate type of the currently selected channel.

**CURRENT CURVE:** This is the Gate curve of the currently selected channel.

**GR meters:** These meters indicate the amount of gain reduction being applied by the Gate, and the levels of the currently selected channel and its adjacent channel. If Pair mode for the currently selected channel is set to Vertical, the level of its counterpart on the adjacent Layer is displayed.

**TYPE/CURVE:** The type (Gate or Ducking) and curve of the currently selected memory is displayed to the right of the memory list.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Comp Library

Comp settings can be stored in the Comp library, which contains 36 preset memories and 92 user memories. Preset memories are read-only. User memories enable you to store custom settings. See page 116 for information on the Comps.

**1    Use the DYNAMICS [DISPLAY] button to select the Comp Library page.**
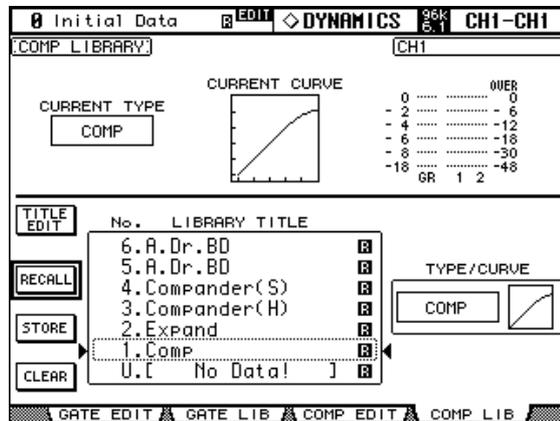
```
┌─────────────────────────────────────────────────────┐
│ 0 Initial Data    EDIT ◇DYNAMICS 96k CH1-CH1         │
│ COMP LIBRARY              CH1                          │
│                  CURRENT CURVE         OVER           │
│                                    0 ┈┈┈┈┈   0        │
│  CURRENT TYPE                    - 2 ┈┈┈┈┈ - 6        │
│  ┌──────┐                        - 4 ┈┈┈┈┈ -12        │
│  │ COMP │                        - 6 ┈┈┈┈┈ -18        │
│  └──────┘                        - 8 ┈┈┈┈┈ -30        │
│                                  -18 ┈┈┈┈┈ -48        │
│                                     GR  1 2           │
│ ┌─────┐ No.  LIBRARY TITLE                            │
│ │TITLE│                                               │
│ │EDIT │ 6.A.Dr.BD           R                         │
│ └─────┘ 5.A.Dr.BD           R         TYPE/CURVE      │
│ ┌─────┐ 4.Compander(S)      R                         │
│ │RECALL│ 3.Compander(H)     R      ┌──────┐┌────┐     │
│ └─────┘ 2.Expand            R      │ COMP ││    │     │
│ ┌─────┐ 1.Comp              R ◄    └──────┘└────┘     │
│ │STORE│ U.[   No Data!   ]  R                         │
│ └─────┘                                               │
│ ┌─────┐                                               │
│ │CLEAR│                                               │
│ └─────┘                                               │
│   GATE EDIT  GATE LIB  COMP EDIT  COMP LIB            │
└─────────────────────────────────────────────────────┘
```

**2    Use the LAYER buttons to select Layers, and the [SEL] buttons to select channels.**

When storing, the Comp settings of the currently selected channel, indicated in the upper-right corner, are stored to the selected memory. When recalling, the Comp settings in the selected memory are applied to the currently selected channel.

**CURRENT TYPE:** This indicates the current Comp type of the currently selected channel.

**CURRENT CURVE:** This is the Comp curve of the currently selected channel.

**GR meters:** These meters indicate the amount of gain reduction being applied by the Comp, and the levels of the currently selected channel and its adjacent channel. If Pair mode for the currently selected channel is set to Vertical, the level of its counterpart on the adjacent Layer is displayed.

**TYPE/CURVE:** The type (Comp, Expand, Comp Hard, Comp Soft) and curve of the currently selected memory is displayed to the right of the memory list.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## EQ Library

Input Channel, Bus Out, Aux Send, and Stereo Out EQ settings can be stored in the EQ library, which contains 40 preset memories and 160 user memories. Preset memories are read-only. User memories enable you to store custom settings. See page 111 for information on EQ'ing.

1   **Use the EQUALIZER [DISPLAY] button to select the EQ Library page.**
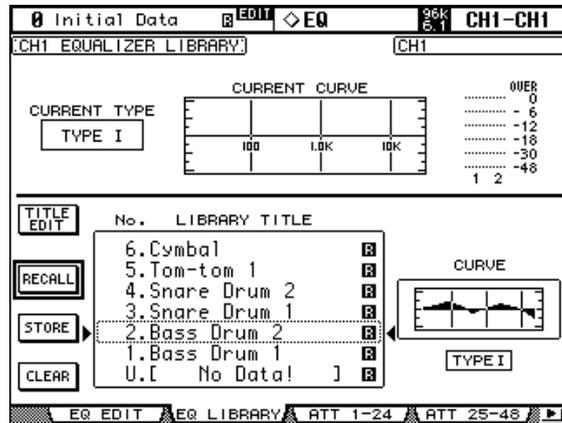


2   **Use the LAYER buttons to select Layers, and the [SEL] buttons to select channels.**

When storing, the EQ settings of the currently selected channel, indicated in the upper-left and right corners, are stored to the selected memory. When recalling, the EQ settings in the selected memory are applied to the currently selected channel.

**CURRENT TYPE:** This indicates the current EQ type (TYPE I or TYPE II) for the currently selected channel.

**CURRENT CURVE:** This is the EQ curve of the currently selected channel.

**Level meters:** These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner.

**CURVE:** This displays the EQ curve in the currently selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Automix Library

Up to 16 Automixes can be stored in the Automix library. See page 170 for information on using Automix.

**1  Use the DISPLAY ACCESS [AUTOMIX] button to select the Automix Memory page.**
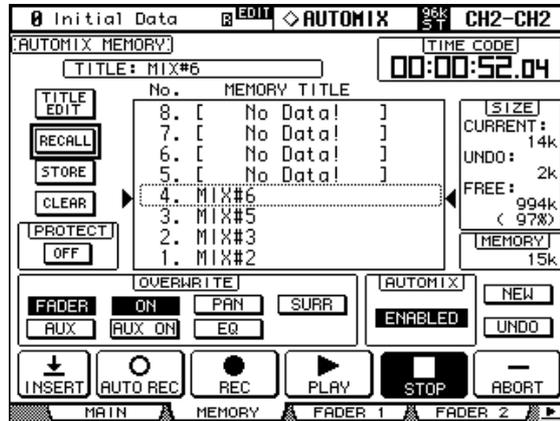


When storing, the current Automix is stored to the selected memory.

**TITLE:** This is the title of the current Automix.

**CURRENT:** This is the size of the current Automix.

**UNDO:** This is the size of the Automix data in the current Undo buffer.

**FREE:** This is the amount of free memory for storing the current Automix.

**MEMORY:** This is the size of the selected Automix memory.

**PROTECT:** To protect the contents of the selected memory, select this and press [ENTER]. A padlock icon appears next to the titles of memories that are write-protected. Automixes cannot be stored to write-protected memories.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

## Surround Monitor Library

Surround Monitor settings can be stored in the Surround Monitor library, which contains 1 preset memory and 32 user memories. The preset memory is read-only. User memories enable you to store custom settings. See page 138 for information on Surround Monitoring.

**1    Use the MONITOR [DISPLAY] button to select the Surround Monitor Library page.**
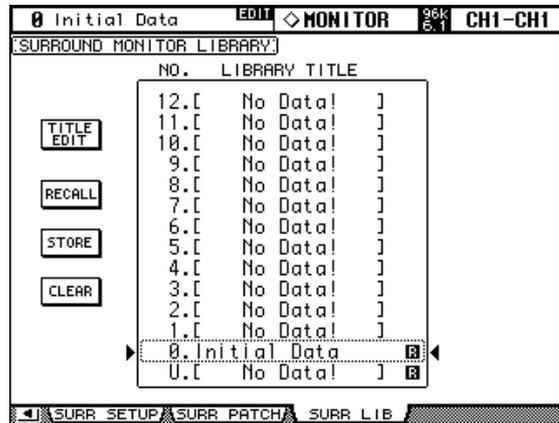


When storing, the current Surround Monitor settings are stored to the selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 143.

# 14  Internal Effects & Plug-Ins

## About the Effects

The 02R96 features four internal multi-effects processors, offering a whole host of effects types, including reverbs, delays, modulation-based effects, combination effects, and multi-channel effects designed especially for use with surround sound.

Effects processors 2–4 feature assignable stereo inputs and outputs. Processor #1, which is intended for use with the multichannel surround effects, features eight assignable inputs and outputs. Processor inputs and outputs can be patched to various sources, including the inputs and outputs of other effects processors, allowing you to chain processors together in series. (The only outputs available for patching in series are effects processor outputs OUT1 and OUT2.)

The input and output signal levels of the currently selected Effects processor can be metered on the Effects Edit page and the Effects Library page. The input and output signal levels of all effects processors can be metered on the Meter pages. See "Metering" on page 107 for more information.

Effects settings can be stored in the Effects library, which contains 61 preset memories and 67 user memories. See "Effects Library" on page 146 for more information.

## Patching Effects Processors

Effects processor inputs can be fed from the Aux Sends, Input and Output Channel Insert Outs, or the outputs of another effects processor. See "Patching Effects Inputs and Outputs" on page 67 for more information.

Effects processor outputs can be patched to the Input Channels, Input and Output Channel Insert Ins, or the inputs of another effects processor. See "Output Patching" on page 68 for more information.

## Preset Effects & Types

The following tables list the preset effects and types. See page 259 for detailed parameter information.

### Reverbs

| # | Preset Name | Type | Description |
|---|-------------|------|-------------|
| 1 | **Reverb Hall** | REVERB HALL | Concert hall reverberation simulation with gate |
| 2 | **Reverb Room** | REVERB ROOM | Room reverberation simulation with gate |
| 3 | **Reverb Stage** | REVERB STAGE | Reverb designed for vocals, with gate |
| 4 | **Reverb Plate** | REVERB PLATE | Plate reverb simulation with gate |
| 5 | **Early Ref.** | EARLY REF. | Early reflections without the subsequent reverb |
| 6 | **Gate Reverb** | GATE REVERB | Gated early reflections |
| 7 | **Reverse Gate** | REVERSE GATE | Gated reverse early reflections |

### Delays

| # | Preset Name | Type | Description |
|---|-------------|------|-------------|
| 8 | **Mono Delay** | MONO DELAY | Simple mono delay |
| 9 | **Stereo Delay** | STEREO DELAY | Simple stereo delay |
| 10 | **Mod.delay** | MOD.DELAY | Simple repeat delay with modulation |
| 11 | **Delay LCR** | DELAY LCR | 3-tap (left, center, right) delay |
| 12 | Echo | ECHO | Stereo delay with crossed left/right feedback |

## Modulation-based Effects

| # | Preset Name | Type | Description |
|---|---|---|---|
| 13 | **Chorus** | CHORUS | Chorus |
| 14 | **Flange** | FLANGE | Flanger |
| 15 | **Symphonic** | SYMPHONIC | Proprietary Yamaha effect that produces a richer and more complex modulation than normal chorus |
| 16 | **Phaser** | PHASER | 16-stage stereo phase shifter |
| 17 | **Auto Pan** | AUTO PAN | Auto-panner |
| 18 | **Tremolo** | TREMOLO | Tremolo |
| 19 | **HQ.Pitch** | HQ.PITCH | Mono pitch shifter, producing stable results |
| 20 | **Dual Pitch** | DUAL PITCH | Stereo pitch shifter |
| 21 | **Rotary** | ROTARY | Rotary speaker simulation |
| 22 | **Ring Mod.** | RING MOD. | Ring modulator |
| 23 | **Mod.Filter** | MOD.FILTER | Modulated filter |

## Guitar Effects

| # | Preset Name | Type | Description |
|---|---|---|---|
| 24 | **Distortion** | DISTORTION | Distortion |
| 25 | **Amp Simulate** | AMP SIMULATE | Guitar amp simulation |

## Dynamic Effects

| # | Preset Name | Type | Description |
|---|---|---|---|
| 26 | **Dyna.Filter** | DYNA.FILTER | Dynamically controlled filter |
| 27 | **Dyna.Flange** | DYNA.FLANGE | Dynamically controlled flanger |
| 28 | **Dyna.Phaser** | DYNA.PHASER | Dynamically controlled phase shifter |

## Combination Effects

| # | Preset Name | Type | Description |
|---|---|---|---|
| 29 | **Rev+Chorus** | REV+CHORUS | Reverb and chorus in parallel |
| 30 | **Rev->Chorus** | REV->CHORUS | Reverb and chorus in series |
| 31 | **Rev+Flange** | REV+FLANGE | Reverb and flanger in parallel |
| 32 | **Rev->Flange** | REV->FLANGE | Reverb and flanger in series |
| 33 | **Rev+Sympho.** | REV+SYMPHO. | Reverb and symphonic in parallel |
| 34 | **Rev->Sympho.** | REV->SYMPHO. | Reverb and symphonic in series |
| 35 | **Rev->Pan** | REV->PAN | Reverb and auto-pan in series |
| 36 | **Delay+ER.** | DELAY+ER. | Delay and early reflections in parallel |
| 37 | **Delay->ER.** | DELAY->ER. | Delay and early reflections in series |
| 38 | **Delay+Rev** | DELAY+REV | Delay and reverb in parallel |
| 39 | **Delay->Rev** | DELAY->REV | Delay and reverb in series |
| 40 | **Dist->Delay** | DIST->DELAY | Distortion and delay in series |

## Others

| # | Preset Name | Type | Description |
|---|---|---|---|
| 41 | **Multi.Filter** | MULTI.FILTER | 3-band parallel filter (24 dB/octave) |
| 42 | **Freeze** | FREEZE | Simple sampler |
| 43 | **Stereo Reverb** | ST REVERB | Stereo reverb |
| 44[1] | **Reverb 5.1** | REVERB 5.1[2] | 6-channel reverb for 5.1 surround |
| 45[1] | **Octa Reverb** | OCTA REVERB[2] | 8-channel reverb for 7.1 surround |
| 46[1] | **Auto Pan 5.1** | AUTO PAN 5.1 | 6-channel auto pan for 5.1 surround |
| 47[1] | **Chorus 5.1** | CHORUS 5.1 | 6-channel chorus for 5.1 surround |
| 48[1] | **Flange 5.1** | FLANGE 5.1 | 6-channel flanger for 5.1 surround |
| 49[1] | **Sympho. 5.1** | SYMPHO. 5.1 | 6-channel symphonic effect for 5.1 surround |
| 50 | **M. Band Dyna.** | M. BAND DYNA. | Multi-band dynamics processor |
| 51[1] | **Comp 5.1** | COMP 5.1[2] | Multi-band compressor for 5.1 surround |
| 52[1] | **Compand 5.1** | COMPAND 5.1[2] | Multi-band compander for 5.1 surround |
| 53[3] | **Comp276** | — | — |
| 54[3] | **Comp276S** | — | — |
| 55[3] | **Comp260** | — | — |
| 56[3] | **Comp260S** | — | — |
| 57[3] | **Equalizer601** | — | — |
| 58[3] | **OpenDeck** | — | — |
| 59[3] | **REV-X Hall** | — | — |
| 60[3] | **REV-X Room** | — | — |
| 61[3] | **REV-X Plate** | — | — |

1. These effects can be recalled only to effects processor #1.
2. Since these effects types require four DSPs, the total number of effects processors is reduced by three when one of these types is used. For example, if REVERB 5.1 is used with effects processor #1, processors 2–4 are unavailable.
3. Preset numbers are reserved for Add-On Effects. Effects that are not installed appear in gray and are unavailable for use. See "Adding Optional Add-On Effects" on page 157 for more information on Add-On Effects.

## Editing Effects

The internal effects processors can be edited as follows.

**1   Press the EFFECTS/PLUG INS [INTERNAL EFFECTS] button.**

**2   Use the EFFECTS/PLUG INS [1–4] buttons to select the internal effects processors.**

**3   Use the EFFECTS/PLUG INS [DISPLAY] button to locate the Effects Library page, and recall a preset effects memory that contains the effects type that you want.**

See "Effects Library" on page 146 for more information.

**4   Use the EFFECTS/PLUG INS [DISPLAY] button to locate the Effects Edit page.**
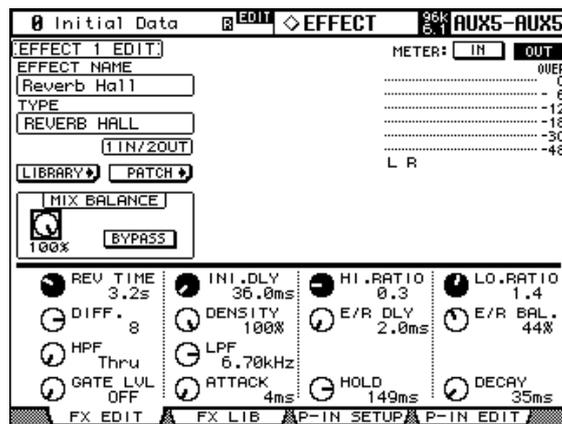


The available effects parameters depends on the effects type currently selected. See page 153 for detailed parameter information.

**5   Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set them.**

**EFFECT NAME:** This is the name of the currently-recalled Effects memory.

**TYPE:** This is the effects type used in the currently-recalled Effects memory. Its I/O configuration is shown below this.

**LIBRARY:** Select the LIBRARY button, then press [ENTER] to display the Library page for the selected effects processor. See "Effects Library" on page 146 for more information.

**PATCH:** Select the PATCH button, then press [ENTER] to display the Effects Input/Output Patch page, which enables you to patch internal Effects processor inputs and outputs. See "Patching Effects Inputs and Outputs" on page 67 for more information.

**MIX BALANCE:** This is used to set the balance between the wet and dry signals. When set to 0%, only the dry signal is heard. When set to 100%, only the wet signal is heard.

**BYPASS:** This button is used to bypass the currently selected effects processor.

**TEMPO:** The TEMPO section displays TEMPO parameters for delay and modulation-based effects. These TEMPO parameters calculate and set the delay time for delay effects, or the modulation frequency for modulation effects, relative to the specified tempo and note duration. Use these parameters along with the SYNC and NOTE parameters.

When you turn on the SYNC parameter, the 02R96 recalculates the delay time or modulation frequency based on the TEMPO parameter value (tempo) and the NOTE parameter value (note). For example, if the TEMPO parameter is set to 120BPM and the NOTE parameter is set to an eighth note, turning on the SYNC parameter sets the delay time to 250msec and the modulation frequency to 0.25Hz.

> *Tip:*
> * *If you turn on the SYNC parameter and edit the TEMPO or NOTE parameter, the 02R96 recalculates the delay time or modulation frequency.*
> * *If you turn on the SYNC parameter and edit the delay time or modulation frequency, the NOTE parameter value changes based on the TEMPO parameter setting.*
> * *See "Effects and tempo synchronization" on page 281 for more information on the tempo sync parameters.*

**Level meters:** The Level meters indicate the input and output levels of the currently selected Effects processor. Select the IN or OUT button to display input or output levels respectively. There are eight output meters for Effects processors 1, and two output meters for Effects processors 2 through 4.

Effects parameters can also be adjusted by using Parameter controls 1–4. Use the Parameter Up/Down buttons to select the rows of parameters. The parameters in the currently selected row appear highlighted. Up to 16 parameters can be displayed at a time, and if more are available, an up or down arrow is displayed.
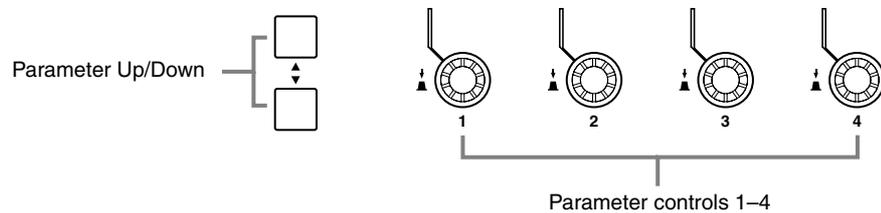


When a Y56K card effect, or an internal effects processor is inserted in the currently selected channel, when the EFFECTS/PLUG-INS [CHANNEL INSERTS] button is pressed, the corresponding EFFECTS/PLUG-INS [1–4] button indicator flashes, and the corresponding Effects, or Plug-In edit page appears. If it's a Y56K card that's inserted, the [PLUG-INS] button indicator also flashes. If it's an internal effects processor, the [INTERNAL EFFECTS] button indicator also flashes. This applies only to effects that are inserted into channels. If there's nothing inserted in the currently selected channel, a message appears.

## Adding Optional Add-On Effects

Installing an optional Add-On Effect package enables you to expand the internal Effects processors. You can use installed Add-On Effects as preset effects #53 and up. Edited settings can be stored in user memories #68 and up. Refer to the installation guide included in your Add-On Effect package for information on installing the effects.
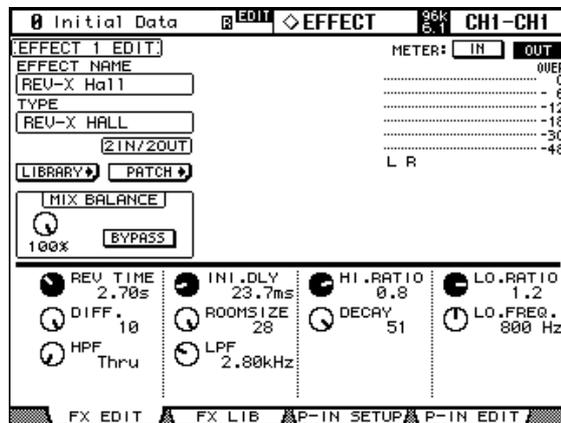
As of January 2004, the following Add-On Effect packages are available:

- AE011 Channel Strip Package
- AE021 Master Strip Package
- AE031 Reverb Package

Additional packages will be released in the future. Visit the Yamaha web site for the latest information:

http://www.yamahaproaudio.com/

## About Plug-Ins

There are two types of Plug-Ins: Waves Plug-Ins and User Defined Plug-Ins. Waves Plug-Ins are available on Y56K cards, which need to be installed in the 02R96's mini YGDAI Slots (Slots 3 and 4 only). See your Yamaha dealer for details. User Defined Plug-Ins can be used to control up to 32 user definable parameters via MIDI Control Change or Parameter Change messages on an external MIDI device, such as an external effects processor. Plug-In parameters can be controlled by using the four Parameter controls below the display. Plug-In parameter settings are stored in Scenes, for snapshot-style automation.

When installing Y56K cards, mini YGDAI Slots 3 and 4 correspond to Plug-Ins 3 and 4, so if you install, for example, a Y56K card in Slot #4, it's automatically configured as Plug-In #4. 02R96 signals are patched through to the Y56K card's effect chains just like any other signal is patched through to a Slot Input or Output. Slot Outputs (i.e., effect chain inputs) can be fed from the Bus Outs, Aux Sends, Stereo Out, or the Input and Output Channel Insert Outs. Slot Inputs (i.e., effect chain outputs) can be fed to the Input Channels, or the Input and Output Channel Insert Ins. See "Input & Output Patching" on page 66.

Settings for Y56K cards are stored in memory on the card when you store a Scene, and recalled automatically during Scene recall. Please note, however, that these settings cannot be stored in 02R96 Scenes. Therefore, the cards do not support Scene memory global paste, sort, sort, and other scene related functions.

*Note: Y56K cards use Scenes #1–#96. If you store or recall Scenes #97 and up, the Y56K card settings will not reflect the Scenes. (A warning message will appear.)*

# Configuring Plug-Ins

Plug-Ins can be configured as follows.

If you've installed a Y56K card into one of the Slots, the 02R96 configures itself automatically and no further configuration settings are required.

**1    Press the EFFECTS/PLUG INS [PLUG-INS] button.**

**2    Use the EFFECTS/PLUG INS [DISPLAY] button to locate the Plug-In Setup page.**



**3    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TARGET:** These are used to assign a target to each of the four Plug-Ins. Parameters for the specified target appear on the Plug-In Edit page when that Plug-In is selected by using the EFFECTS PLUG-INS [1–4] buttons. In addition to using the cursor buttons, Plug-Ins can also be selected on this page by using the EFFECTS PLUG-INS [1–4] buttons.

**TITLE:** If a Y56K card is installed, its name is displayed here. If the target is set to USER DEFINED, the specified title of the bank currently selected on the Plug-In Edit page is displayed.

**PORT:** If a Y56K card is installed, its Slot number is displayed here. If the target is set to USER DEFINED, you can specify the Plug-Ins MIDI port as MIDI, SERIAL 1–8, USB 1–8, or SLOT1 1–8. Plug-In MIDI Ports can also be set on the MIDI/To Host Setup page. See "MIDI I/O" on page 190 for more information.

## Editing Plug-Ins

Plug-Ins can be edited as follows. The settings of Waves Plug-Ins and User Defined Plug-In banks can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

If you've installed a Y56K card into one of the Slots, display pages especially for the Waves card are displayed when the corresponding Plug-In is selected. See the Waves documentation for more information. The following explanation applies only to User Defined Plug-Ins.

**1    Press the EFFECTS/PLUG INS [PLUG-INS] button.**

**2    Use the EFFECTS/PLUG INS [1–4] buttons to select the Plug-Ins.**

**3    Use the EFFECTS/PLUG INS [DISPLAY] button to locate the Plug-In Edit page.**
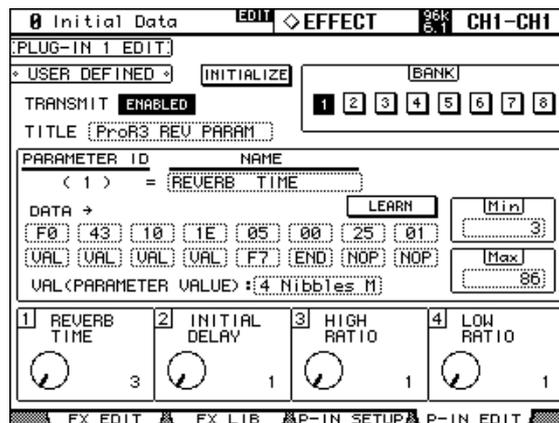


**4    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TRANSMIT:** This enables and disables MIDI data transmission for the currently selected Plug-In.

**INITIALIZE:** This initializes the settings of the currently selected bank.

**BANK:** These buttons are used to select the parameter banks of the currently selected Plug-In. Up to four parameter settings can be stored in each bank, making a total of 32 parameters per Plug-In.

**TITLE:** This is used to enter a title (up to 16 characters long) for each bank. To enter a title for the currently selected bank, select this and press [ENTER]. When the Title Edit window appears, enter a title, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

**PARAMETER ID/NAME:** This is used to select the four rotary controls at the bottom of the Plug-In Edit page for editing, and to enter a name (up to 16 characters long) for each control. Use the Parameter wheel or INC/DEC buttons to select a Parameter ID from 1–4, and then press [ENTER]. When the Title Edit window appears, enter a title, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

**DATA:** This is used to specify the MIDI message (up to 16 bytes) to be transmitted when each parameter control is adjusted. Use the PARAMETER ID/NAME parameter to select a Parameter ID from 1–4, and then edit as necessary. Data values can be set in hex from 00 to FF. The VAL setting is the value of the parameter control. The END setting specifies the end of the data. NOP means no data is transmitted.

**LEARN:** This button is used to turn on and off the Learn function, which can be used to learn what MIDI messages are transmitted by external MIDI devices when their controls or parameters are adjusted. When on, received MIDI messages are displayed by the DATA parameter. Only the first 16 bytes of data, starting with a Status bit, are displayed.

**MIN/MAX:** These parameters determine the minimum and maximum values of the MIDI data transmitted when each parameter control is adjusted. Use the PARAMETER ID/NAME parameter to select a Parameter ID from 1–4, and then edit as necessary.

**VAL:** This is used to select the format for converting parameter control values to the DATA parameter's VAL setting. It applies to the currently selected bank. The available options are listed in the following table.

| VAL | Description | VAL count |
|---|---|---|
| **One byte** | Transmit the lower 7 bits of the parameter value as 1 word | Up to one VAL |
| **MSB/LSB** | Transmit the lower 14 bits of the parameter value in 7-bit units starting from the upper byte | Up to two VAL's |
| **LSB/MSB** | Transmit the lower 14 bits of the parameter value in 7-bit units starting from the lower byte | Up to two VAL's |
| **2 Nibbles M** | Transmit the lower 8 bits of the parameter value in 4-bit units, consecutively from the highest data | Up to two VAL's |
| **3 Nibbles M** | Transmit the lower 12 bits of the parameter value in 4-bit units, consecutively from the highest data | Up to three VAL's |
| **4 Nibbles M** | Transmit the parameter value in 16 bit units, consecutively from the highest data | Up to four VAL's |
| **2 Nibbles L** | Transmit the lower 8 bits of the parameter value in 4-bit units, consecutively from the lowest data | Up to two VAL's |
| **3 Nibbles L** | Transmit the lower 12 bits of the parameter value in 4-bit units, consecutively from the lowest data | Up to three VAL's |
| **4 Nibbles L** | Transmit the parameter value in 16-bit units, consecutively from the lowest data | Up to four VAL's |

When the controls at the bottom of the Plug-In Edit page are operated, the specified MIDI data, along with the value of the parameter control, is transmitted.

Plug-In parameters can also be adjusted by using Parameter controls 1–4, which correspond to the four parameters shown at the bottom of the Plug-In Edit page.
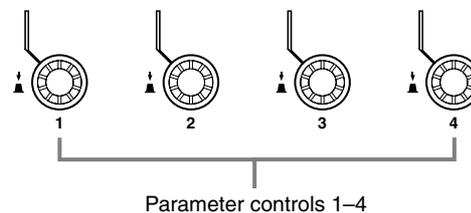


Parameter controls 1–4

When a Y56K card effect, or an internal effects processor is inserted in the currently selected channel, when the EFFECTS/PLUG-INS [CHANNEL INSERTS] button is pressed, the corresponding EFFECTS/PLUG-INS [1–4] button indicator flashes, and the corresponding Effects, or Plug-In edit page appears. If it's a Y56K card that's inserted, the [PLUG-INS] button indicator also flashes. If it's an internal effects processor, the [INTERNAL EFFECTS] button indicator also flashes. This applies only to effects that are inserted into channels. If there's nothing inserted in the currently selected channel, a message appears.

The parameter settings, and the target and bank for each Plug-In are stored in Scenes. When a Scene is recalled, if the Plug-In's Target is the same as when the Scene was stored, the parameters are set accordingly and the corresponding MIDI data is transmitted (so long as the REMOTE parameter is set to ENABLED). If the Target is not the same, the parameters are set accordingly but no MIDI data is transmitted.

# 15 Scene Memories

## About Scene Memories

Scene memories allow you to store a snapshot of virtually every 02R96 mix setting in a Scene. There are 99 Scene memories, and they can be titled for easy identification. Scenes can be linked to Input and Output Patch library memories, so that input and output patches are recalled along with Scenes. A fade time of up to 30 seconds can be set individually for each Input and Output Channel fader. Recall Safe can be used to exclude individual Input and Output Channels and certain parameters from Scene recalls. Stored Scenes can be sorted as necessary.

Scenes can be stored and recalled by using the SCENE MEMORY [STORE] and [RECALL] buttons, or by using the Scene Memory page. Scenes can be assigned MIDI Program Change numbers and recalled remotely. See "Assigning Scenes to Program Changes" on page 193 for more information. When a Scene is recalled on the 02R96, the Program Change number assigned to that Scene is transmitted, which can be used to recall programs, effects, etc., on other MIDI equipment. In addition, manual Scene recalls can be recorded on-the-fly in an Automix. When that Automix is replayed, the Scenes are recalled automatically. See "Automix" on page 170 for more information.

Scene memories can be stored to external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

### What's Stored in a Scene?

The following items are stored in Scenes: Input and Output Channel settings, Effects settings, Group and Pair settings, Fade Time settings, and Scene title.

### Edit Buffer & Edit Indicator

The Edit Buffer is where the current mix settings (i.e., the current Scene) are stored. When a Scene is stored, the mix settings in the Edit Buffer are written to the selected Scene memory. When a Scene is recalled, the contents of the selected Scene memory are copied to the Edit Buffer, making them the current mix settings.

When a parameter is adjusted after a Scene has been recalled, the Edit indicators—the dot on the SCENE MEMORY display and "EDIT" on the display—appear, indicating that the current mix settings (i.e., those in the Edit Buffer) no longer match those of the Scene that was recalled last, as illustrated below.



Scene #2 has just been recalled, so the contents of the Edit Buffer match those of Scene #2 and the Edit indicators are off.

A parameter has been adjusted since Scene #2 was recalled, so the Edit indicators appear, indicating that the contents of the Edit Buffer no longer match those of Scene #2.

The contents of the Edit Buffer are retained while the 02R96 is turned off.

### Scene Memories #0 & #U

Scene memory #0 is a special read-only memory that contains the initial settings of all mix parameters. It can be recalled, but not stored. When you want to reset all mix parameters to their initial, or default values, recall Scene memory #0. Input Channel faders are set to either –∞dB or nominal, depending on the Initial Data Nominal preference (see page 231).

Scene memory #U is a special read-only memory that allows you to undo and redo Scene memory recall and store operations. After recalling a Scene memory, you can revert to the previously recalled Scene memory by recalling Scene memory #U. After storing a Scene memory, you can revert it to its previous contents by recalling Scene memory #U. You can redo either of these undo operations by recalling Scene memory #U again.

## Auto Scene Memory Update

Normally, when a Scene is recalled and then edited, that Scene must be stored again in order to save the edits. If the Scene MEM Auto Update preference on page 231 is on, however, those edits are stored automatically in a Shadow memory. There's one Shadow memory for each Original Scene memory. The contents of the Original and Shadow memories can be recalled alternately, which is useful for doing A/B comparisons.

When a Scene is recalled, the current mix settings are automatically stored in the Shadow memory of the Scene memory that was recalled last. When you return to that Scene, you can recall the Shadow or Original memory alternately.

While the Scene MEM Auto Update preference is on, Shadow memories, not Original memories are recalled initially. To recall an Original memory, recall its Shadow memory first, and while the Edit indicators are both off, recall again. This time the Original memory is recalled.

When recalling Original and Shadow memories, you can easily tell which is currently active by the Edit indicators, which are off when an Original memory is active, and on when a Shadow memory is active. Note that when a Scene is stored, the contents of the Original and Shadow memories will be the same and the Edit indicators will be off regardless of which memory is active.

When recalling Scenes in an Automix, only the Original memories can be recalled. When recalling Scenes via MIDI Program Change messages, Original and Shadow memories can be recalled, and operation is the same as for recalling Scenes by using the 02R96's SCENE MEMORY buttons or the Scene Memory page.

# Storing & Recalling Scenes with the SCENE MEMORY Buttons

As each Scene memory is selected, its number flashes on the SCENE MEMORY display, and its number and title flash in the Scene memory section of the display. These stop flashing when the selected Scene memory is either stored or recalled. Empty Scene memories have the title "No Data!" and cannot be recalled. You cannot store to Scene memories that are write-protected.

*Warning: When storing Scenes, make sure that there are no settings in the Edit Buffer that you do not want to store. Perhaps some settings have been adjusted accidentally, or by someone else. If you are not sure of the Edit Buffer's exact contents, recall the last Scene, make the adjustments that you really want, and then store the Scene. You may want to store the current Scene to an unused Scene memory just in case.*

## Storing Scenes

**1    Use the SCENE MEMORY Up [▲] and Down [▼] buttons to select the Scene memories.**

**2    Press the [STORE] button.**

The Title Edit window appears. This window can be disabled by the Store Confirmation preference on page 230.

**3    Enter a title.**

See "Title Edit Window" on page 46 for more information.

**4    Press OK on the Title Edit window.**

The current Scene is stored to the selected Scene memory.

You can undo Scene stores, reverting to the previous mix settings, by recalling Scene memory #U ("Ud" on the SCENE MEMORY display).

## Recalling Scenes

**1    Use the SCENE MEMORY Up [▲] and Down [▼] buttons to select the Scene memories.**

**2    Press the [RECALL] button.**

The contents of the selected Scene memory are recalled and all mix parameters are set accordingly. If the Recall Confirmation preference is on, a confirmation window appears before a Scene is recalled.

You can undo Scene recalls, reverting to the previous mix settings, by recalling Scene memory #U ("Ud" on the SCENE MEMORY display).

# Using the Scene Memory Page

On the Scene Memory page you can store, recall, write-protect, delete, and edit the titles of Scenes.

**1    Use the SCENE MEMORY [DISPLAY] button to locate the Scene Memory page.**

```
 0 Initial Data         ◇SCENE   96k  CH1-CH1
                                   0,1
[SCENE MEMORY]              Free:100%  PATCH LINK
                   No.      TITLE      INPUT OUTPUT
                12.[ No Data!         ]   ┌─┐ ┌─┐
                11.[ No Data!         ]   │─│ │─│
 ┌─────┐       10.[ No Data!         ]   │─│ │─│
 │TITLE│        9.[ No Data!         ]   │─│ │─│
 │EDIT │        8.[ No Data!         ]   │─│ │─│
 └─────┘        7.[ No Data!         ]   │─│ │─│
                6.[ No Data!         ]   │─│ │─│
 ┌─────┐        5.[ No Data!         ]   │─│ │─│
 │RECALL│       4.[ No Data!         ]   │─│ │─│
 └─────┘        3.[ No Data!         ]   │─│ │─│
                2.[ No Data!         ]   │─│ │─│
 ┌─────┐        1.[ No Data!         ]   │─│ │─│
 │STORE│        0.Initial Data      🔒   │─│ │─│
 └─────┘        U.[ No Data!        ]🔒   │─│ │─│
 ┌─────┐
 │CLEAR│
 └─────┘
 PROTECT
 ┌─────┐
 │ OFF │
 └─────┘
      SCENE    FADE1-48   FADE49-56   OUT FADE  ▶
```
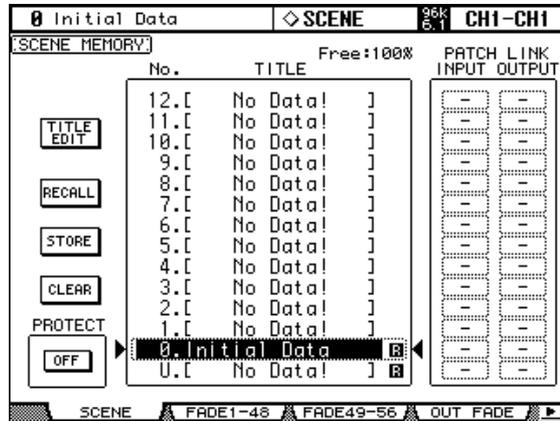
**2    Use the Parameter wheel or INC/DEC buttons to select the Scene memories.**

A Scene memory is selected when it appears inside the dotted box.

**3    Use the cursor buttons to select the following buttons.**

**TITLE EDIT:** To edit the title of the selected Scene memory, select this and press [ENTER]. When the Title Edit window appears, edit the title, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

**RECALL:** To recall the contents of the selected Scene memory, select this and press [ENTER]. The contents of the selected Scene memory are recalled, all parameters are set accordingly, the Scene memory's number and title stop flashing, and the Edit indicators go off. If the Recall Confirmation preference is on, a confirmation window appears before a Scene is recalled.

**STORE:** To store the current Scene to the selected Scene memory, select this and press [ENTER]. When the Title Edit window appears, enter a title, and press OK. See "Title Edit Window" on page 46 for more information. When a Scene is stored, the Scene memory's number and title stop flashing, and the Edit indicators go off. You can stop the Title Edit window from appearing by turning off the Store Confirmation preference on page 230. The "Free: 100%" value indicates the amount of free memory available for storing Scenes.

**CLEAR:** To delete the contents and title of the selected Scene memory, select this, press [ENTER], and the press YES when the confirmation window appears.

**PROTECT:** To protect the contents of the selected Scene memory, select this and press [ENTER]. A padlock icon appears next to the titles of Scene memories that are write-protected. Scenes cannot be stored to write-protected Scene memories. While the PROTECT button is selected, the selected Scene memory can be protected and unprotected by using the INC/DEC buttons.

**PATCH LINK:** This indicates the Input/Output Patch library number that is linked to each scene. When you store a scene, the number of the input/output patch that was most recently recalled or stored will automatically be linked with that scene. When you recall that scene, this library number will also be automatically recalled. You can also move the cursor to the parameter boxes and change the library numbers.

## Fading Scenes

Fade times can be specified for individual Input Channels, Bus Outs, Aux Sends, Stereo Out, and the Group Master. The fade time determines the time it takes the Input and Output Channel faders to move to their new positions when a Scene is recalled. Fade time settings can be specified for each Scene individually.

**1   Use the SCENE MEMORY [DISPLAY] button to locate a Fade Time page.**

The Fade Time parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Fade time page is shown below. The layout of the other page is the same.



The Fade Time parameters for the Output Channels appear on the Output Fade Time page.



**2   Use the cursor buttons or [SEL] buttons to select the individual Fade Time parameters, and use the Parameter wheel or INC/DEC buttons to set them.**

You can copy the currently selected Input or Output Channel Fade Time setting to all Input or Output Channels respectively by double-clicking the [ENTER] button. If the Input or Output Group Master is selected, you can copy the setting to all Input or Output Channel Group Master channels.

The Long name of the channel whose Fade Time parameter is currently selected appears in the upper-right corner of the page. When a channel is selected by using the [SEL] buttons, its Long name also appears in the upper-right corner of the display.

The Fade Time can be set from 0 to 30 seconds in 0.1 second steps.

You can reset all Input Channel Fade Time parameters to zero by selecting the ALL INPUT CLEAR buttons, then pressing the [ENTER] button. You can reset all Output Channel Fade Time parameters to zero by selecting the [ALL CLEAR] buttons, then pressing the [ENTER] button.

Global Fade Time: When this check box is checked, a Scene is recalled using the Fade Time that is applied globally to all Scenes. (The Fade Time setting stored in the recalled Scene is temporarily ignored.)

## Recalling Scenes Safely

When a Scene is recalled, all mix parameters are set accordingly. In some situations, you may want to retain the settings of certain parameters on certain channels, and this can be achieved by using the Recall Safe function. Recall Safe can be set individually for Input/Output Channels, Group Master, Internal Effect Processor, and the Remote Layer, etc.

**1    Use the SCENE MEMORY [DISPLAY] button to locate the Recall Safe page.**
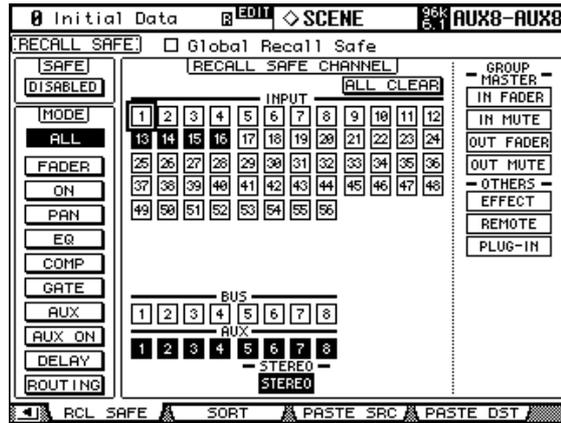


**2    Select the SAFE ENABLED/DISABLED button, and use the [ENTER] button or the INC/DEC buttons to enable or disable the Recall Safe function.**

**3    Use the cursor buttons, [SEL] buttons, or Parameter wheel to select channels, and use the [ENTER] button or the INC/DEC buttons to set them as Safe channels.**

When a channel is Safe, its number appears highlighted.

**GROUP MASTER/OTHERS:** Recall Safe can be set individually not only for Input/Output Channels, but also Group Master, Internal Effect Processors, User Defined Remote Layer, and Plug-ins.

**4    Use the cursor buttons or Parameter wheel to select the MODE parameters, and the [ENTER] button to set them.**

The MODE buttons determine which Safe channel parameters are unaffected by Scene recalls. ALL (all parameters. This option is mutually exclusive with the following options), FADER (faders), ON (On/Off parameters), PAN (Pan parameters), EQ (EQ parameters), COMP (Comp parameters), GATE (Gate parameters), AUX (Aux Send levels), AUX ON (Aux Send On/Off parameters), DELAY (Delay parameters), ROUTING (Routing parameters).

**GLOBAL RECALL SAFE:** When this check box is checked, a Scene is recalled using the settings that are applied globally to all Scenes. The settings stored in the recalled Scene are temporarily ignored.

Recall Safe settings are stored in Scene memories.

## Sorting Scenes

Scene can be sorted by using the Scene Memory Sort function.

**1 Use the SCENE MEMORY [DISPLAY] button to locate the Scene Memory Sort page.**
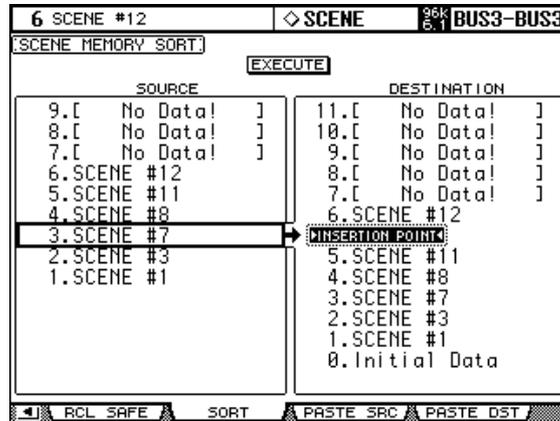


**2 Use the cursor button to the select the SOURCE list, and use the Parameter wheel or the INC/DEC buttons to select the Scene memory you want to move.**

**3 Use the cursor button to the select the DESTINATION list, and use the Parameter wheel or the INC/DEC buttons to select the position to which you want to move the source Scene memory.**

**4 Press [ENTER] to move the source Scene memory to the specified destination.**

The [ENTER] button executes the Sort function regardless of its position.

## Copying and Pasting a Scene (Global Paste)

Any channel or parameter settings for the current scene can be copied and pasted into other scenes. This function is useful when you want to apply edited parameter settings in the current scene to other scenes.

**1 Use the SCENE MEMORY [DISPLAY] button to locate the Global Paste Source CH Select page.**
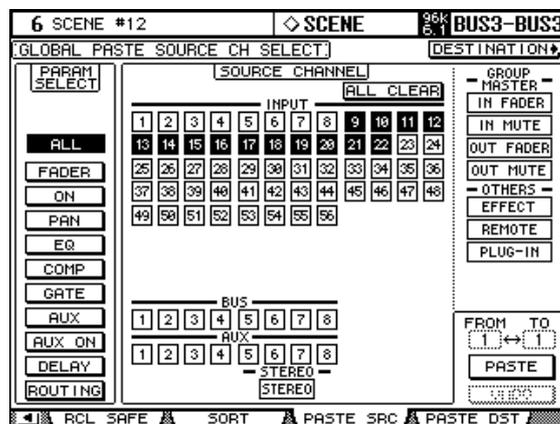
**2**  **Use the cursor buttons, [SEL] buttons, or Parameter wheel to select the channel category, then use the [ENTER] button or the INC/DEC buttons to select the copy source channel.**

The number of the source channel is highlighted.

**GROUP MASTER/OTHERS:** You can select as the copy source each Group Master, internal Effects processos, User Defined Remote layer, or user Defined plug-in, as well as each channel.

**3**  **Use the cursor buttons or Parameter wheel to select the copy source parameter, then press the [ENTER] button.**

**4**  **Use the cursor buttons or Parameter wheel to select the destination channels, then press the [ENTER] button.**

**5**  **Use the SCENE MEMORY [DISPLAY] button to locate the Global Paste Destination Scene page.**

```
6 SCENE #12          ◇SCENE      BUS3-BUS3
[GLOBAL PASTE DESTINATION SCENE]        ◄ SOURCE
       No.     TITLE                    TO
      14.[   No Data!  ]                 4
      13.[   No Data!  ]
      12.[   No Data!  ]
      11.[   No Data!  ]
      10.[   No Data!  ]
       9.[   No Data!  ]
 PASTE  8.[   No Data!  ]
        7.[   No Data!  ]
 UNDO   6.SCENE #12
        5.SCENE #11
        4.SCENE #8
        3.SCENE #7
      ► 2.SCENE #3                     ◄ FROM
        1.SCENE #1                       2
 ◄ RCL SAFE   SORT   PASTE SRC  PASTE DST
```
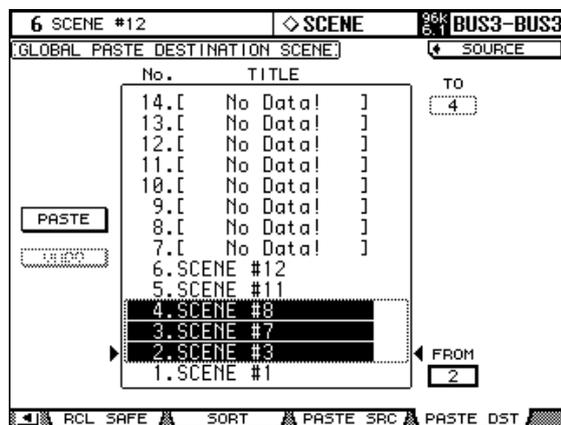
**6**  **Use the Parameter wheel or INC/DEC buttons to select the destination scene(s).**

Scenes specified between FROM and TO (inclusive) become the paste destination. You can paste up to 10 scenes at a time.

**7**  **Use the cursor buttons to select the PASTE button, then use the [ENTER] button to paste the settings.**

You cannot paste the settings to write-protected scenes.

**UNDO:** This button restores the settings used prior to the paste operation. However, if the settings in the scene are changed after the paste operation (such as by saving, clearing, or sorting the scene, or receiving scene data via MIDI Bulk Dump), the UNDO function is disabled.

# 16  Automix

## About Automix

The 02R96's Automix function allows dynamic automation of virtually all mix parameters, including Levels, Mutes, Pan, Surround Pan, Aux Sends, Aux Send Mutes, EQ, effects, and Plug-Ins. You can specify which of these parameters will be recorded, and punch channels in and out of recording on-the-fly. User Defined Remote Layer operations, and scene and library recall operations can also be automated, combining snap shot and dynamic mix automation. Events are recorded in real time and can be edited either offline, with 1/4 frame accuracy, or by rerecording with punch in/out. Automix can be synchronized to an external timecode source or to the internal timecode generator.

Up to 16 Automixes can be stored in the Automix library. See "Automix Library" on page 151 for more information. They can also be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

## What's Recorded in an Automix?

The following parameters can be recorded in an Automix.

| Parameter | Input Channels | Bus Out Masters | Aux Send Masters | Stereo Out |
|---|---|---|---|---|
| Channel Levels (faders) | O | O | O | O |
| Channel Mutes (ON/OFF) | O | O | O | O |
| Pan | O | — | — | — |
| Surround Pan | O | — | — | — |
| EQ (F, Q, G, On/Off) | O | O | O | O |
| Aux Send 1–8 levels | O | — | — | — |
| Aux Send 1–8 mutes | O | — | — | — |
| Feder Group Master (Level, On/Off) | | — | | |
| Scene recalls | | — | | |
| EQ, Gate, Comp, Effects, Channel library recalls | | — | | |
| Effect parameters (certain parameters) | | — | | |
| User Defined Plug-Ins (parameters 1–4) | | — | | |
| User Defined Remote Layers (faders, [ON], Encoders) | | — | | |

## Automix Main Page

This section explains the Automix Main page.

**1    Use the DISPLAY ACCESS [AUTOMIX] button to locate the Automix Main page.**
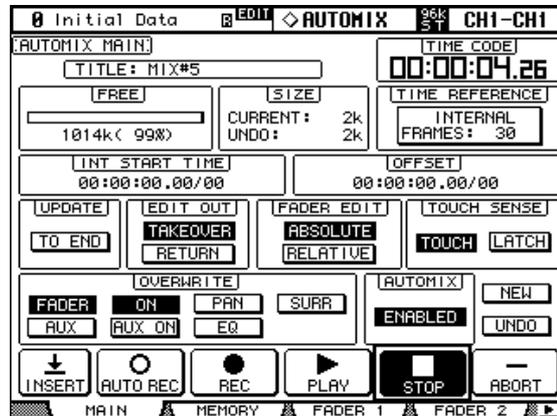


**2    Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TITLE:** This is the title of the current Automix.

**TIME CODE:** This counter displays the current timecode position.

**FREE:** The amount of free Automix memory remaining is displayed here in kilobytes, percent, and graphically by a bargraph.

**SIZE:** The size of the current Automix and the size of any Automix data in the undo buffer are displayed here in kilobytes.

**TIME REFERENCE:** This section displays the current timecode source and frame rate. If you select this item and then press the [ENTER] button, you can jump directly to the Time Reference page (see page 177).

**INT START TIME:** This parameter is used to set the start time of the internal timecode generator in hours, minutes, seconds, frames, and subframes. Press the [ENTER] button to reset the currently selected digits to "00." The internal timecode generator is selected on the Time Reference page (see page 177).

**OFFSET:** This parameter can be used to specify an offset relative to the external timecode source in hours, minutes, seconds, frames, and subframes. Specify a "+" value to move events forward relative to the incoming timecode. Specify a "–" value to move events backwards relative to the incoming timecode. Press the [ENTER] button to reset the currently selected digits to "00." If the Timecode Display Relative preference is turned on (see page 233), the indicated timecode is offset.

**UPDATE:** This button determines the fate of events that exist beyond the point at which rerecording is stopped. When TO END is on, all events that exist beyond the point at which rerecording is stopped for parameters that have been edited during the current pass are erased. This function is useful when you want parameters to remain the same right through to the end of the Automix. Events are erased only when the current pass is actually stopped, not when a punch out occurs. When TO END is off, existing events are left as they are.

When TO END is on, the way in which Fader events are processed depends on the currently selected Fader Edit mode and Edit Out mode. In the following table, the Fader Edit mode is set to Absolute. If the Fader Edit mode is set to Relative, and the Edit Out mode is set to either Takeover or Off, the fader will remain at a position relative to the position at which recording is stopped.

| | Return | Takeover or Off |
|---|---|---|
| **TO END is OFF** | At the point at which recording is stopped, the fader returns to the position specified by the existing fader data, at the speed specified by the Time parameter on the Fader Edit pages. | At the point at which recording is stopped, the fader remains at the same position until the next Fader event in the existing data occurs. |
| **TO END is ON** | At the point at which recording is stopped, the fader returns to the position specified by the existing fader data, at the speed specified by the Time parameter, and all subsequent events are erased so that the fader remains at that position right through to the end of the Automix. | At the point at which recording is stopped, all subsequent events are erased so that the fader remains at that position right through to the end of the Automix. |

**EDIT OUT:** These buttons are used to set the Edit Out mode: Off, Takeover, or Return. The Edit Out mode determines how rerecorded fader moves align with existing fader data at the punch out point. Fader data includes Input Channel levels, Bus Out master levels, Aux Send master levels, the Stereo Out level, User Defined Remote Layer faders, and Group master levels. The Edit Out modes are explained in the following table. The Return Time is specified on the Fader Edit page (see page 176).

| Off | Return | Takeover |
|---|---|---|
| At the punch out point, the fader remains at the same position until the next Fader event in the existing data occurs. | At the punch out point, the fader returns to the position specified by the existing fader data, at the speed specified by the Time parameter on the Fader Edit pages. | At the punch out point, recording continues until the fader position intersects the existing fader data. If you are still touching the fader knob at the actual punch out point, the fader is disabled until you release it.<br><br>In this example, punch out was performed by pressing the [AUTO] button, and the fader was moved manually between the punch out and actual punch out points. |

**FADER EDIT:** These buttons are used to set the Fader Edit mode: Absolute or Relative. The Fader Edit mode determines how fader moves are rerecorded. It has no effect during the first recording pass. In Absolute mode, fader moves are rerecorded as absolute values and existing fader data is erased. In Relative mode, fader moves are rerecorded relative to the existing fader data.

Fader data includes Input Channel levels, Bus Out master levels, Aux Send master levels, Stereo Out level, User Defined Remote Layer faders, and Group master levels.

The following table explains Fader Edit mode operation (TO END: off. Edit Out: off)

| Absolute | Relative |
|---|---|
| Fader edits are recorded as absolute values and existing fader data between the punch in and out points is erased. | Fader edits are rerecorded relative to the existing fader data. |



**TOUCH SENSE:** When the TOUCH button is selected, the Touch Sense function enables you to touch the faders to punch parameter values in and out. The corresponding parameters' OVERWRITE button must be set to on. When the LATCH button is selected, only punch in operations are available (the punch out function is disabled).

**OVERWRITE:** These buttons determine which parameters can be recorded on the first pass, and rerecorded (i.e., overwritten) on subsequent passes. They can be set while recording is in progress. Parameters for which the corresponding OVERWRITE button is not set, cannot be edited while recording is in progress.

| Parameter button | Description |
|---|---|
| **FADER** | Channel faders (Inputs Channels, Bus Out masters, Aux Send masters, the Stereo Out, Group master levels, and User Defined Layer faders) |
| **ON** | Channel Mutes (ON/OFF), User Defined Layer [ON] buttons, and Group master ON |
| **PAN** | Input Channel Pan, User Defined Layer Encoders |
| **SURR** | Input Channel Surround pan, LFE level, DIV parameter, and RDIV parameter |
| **AUX** | Aux Send 1–8 levels |
| **AUX ON** | Aux Send 1–8 mutes |
| **EQ** | EQ (F, Q, G, On/Off) |

Scene and library recalls, and internal effects processors and Plug-Ins parameters can be recorded regardless of the OVERWRITE settings.

**AUTOMIX:** This button is used to enable and disable the Automix function. It works in unison with the AUTOMIX [ENABLE] button.

**NEW:** This button is used to create a new Automix. When a new Automix is created, a Scene recall event to recall the current Scene (i.e., the last Scene recalled) is automatically inserted at the start of the Automix. You can edit this event so that another Scene is recalled. This initial Scene is important because it sets all the mix parameters how you'd like them at the beginning of the Automix. Without it, mix parameters would remain the same as when Automix playback was stopped.

**UNDO:** This button is used to undo various Automix operations. During each recording pass, when a new Automix is created, when an Automix is recalled, when an offline edit is performed, or when the Undo function is used, the current Automix data is copied to the Undo buffer, from which it can be retrieved by pressing UNDO while Automix is stopped.

The Undo buffer is cleared when the 02R96 is turned off. If you want to save the contents of the Undo buffer, perform the undo, and then store the Automix (see page 151).

**INSERT:** The INSERT button inserts the current Scene into the current Automix data. This is useful when you want to quickly swap out a specified range of the Automix data, such as a line of dialog. See "Inserting Mix Parameters into Automix" on page 180 for more information.

**AUTO REC:** This button works the same as the REC button except that it remains on when Automix recording is stopped. It appears highlighted while Auto Record mode is on.

**REC:** This button is used to engage Record-Ready mode, in which Automix recording starts automatically as soon as the specified timecode source starts. Unlike the AUTO REC button, however, it's turned off when recording is stopped. It flashes in Record-Ready mode, and is highlighted during recording. This button can also be used to engage Automix recording during playback. To do this, while the PLAY button is highlighted (i.e., during playback), press the REC button (it flashes in Record-Ready mode). Then press the PLAY button to start recording.

**PLAY:** This button is used to start Automix recording and playback when the timecode source is set to internal. When an external timecode source is selected, while the external timecode is being received, recording and playback are started, and this button is turned on automatically. If Automix is stopped by pressing the STOP or ABORT button, recording or playback can be restarted by pressing this button so long as timecode is still being received. This button can also be used in conjunction with the REC button to punch in recording during Automix playback.

**STOP:** This button is used to stop Automix playback and recording. It appears highlighted while Automix is stopped.

**ABORT:** This button is used to abort the current recording and inserting without updating the existing Automix data.

## Channel Strip [AUTO] Buttons

The channel strip [AUTO] buttons are used to arm channels in Record-Ready mode, and to punch channels in and out during recording.

The [AUTO] button indicators operate as follows:

- Off: Automix playback disabled
- Green: Automix stopped or playing
- Orange: Record-Ready mode
- Red: Recording (even for individual parameters, see page 183)
- Flashing red: Takeover in progress
- Flashing green: indicates that a fader is inactive, for example, when you continue touching a fader after actual punch out has occurred when using the Takeover Edit Out mode.

## Automix Memory Page

Automixes can be stored and recalled on the Automix Memory page. The lower half of this page is identical to the Automix Main page.

**1   Use the DISPLAY ACCESS [AUTOMIX] button to locate the Automix Memory page.**
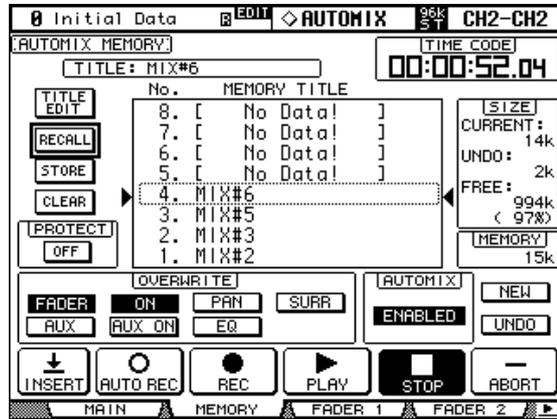


**2   Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

The Automix library functions are explained in "Automix Library" on page 151. The remaining items are the same as on the Main page and are explained on page 171.

## Fader Edit Pages

During playback, fader positions are displayed graphically as black bars on the Fader Edit page, of which there are three. The Fader Edit 1 page displays Faders positions for Input Channel 1 through 56, the Bus Outs, and Stereo Out. The Fader Edit 2 page displays faders positions for Input Channel 1 through 56, the Bus Outs, and Aux Sends. The Fader Edit 3 page displays fader positions for the Input Group Master Levels and Output Group Master Levels. When the Fader mode is set to Fader, Input and Output Channel levels are displayed. When it's set to Aux mode, Aux Send levels are displayed.

During rerecording, arrows are displayed next to each fader bar. A downward arrow indicates that the current fader position is higher than that specified by the existing fader data. An upward arrow indicates that the current fader position is lower than that specified by the existing fader data.



**1   Use the DISPLAY ACCESS [AUTOMIX] button to locate the Fader Edit pages.**

The Fader Edit 1 page is shown here.
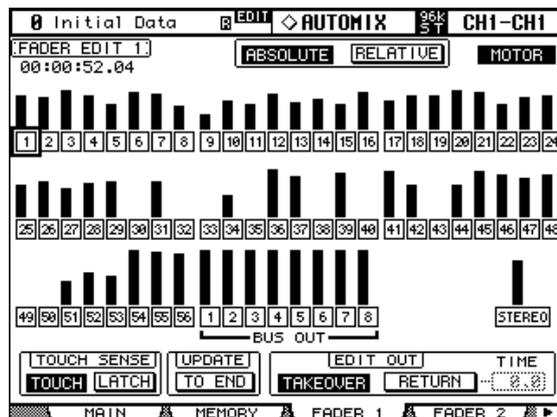
**2 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

The counter in the upper-left corner displays the current timecode position.

**Edit Safe buttons:** The numbered buttons below each fader bar are Channel Safe buttons, which can be used to prohibit automix recording on certain channels. A channel is set to safe when its button appears highlighted.

You can make all channels safe by selecting one "non-safe" button and double-clicking the [ENTER] button. A confirmation message appears.

You can cancel all safe channels by selecting one "safe" button and double-clicking the [ENTER] button. A confirmation message appears.

During recording, events cannot be recorded, or rerecorded on safe channels, although existing events are played back and faders, Encoders, [ON] buttons, and so on can still be used, which is useful for rehearsing mix moves. Channel safe settings cannot be changed during recording.

**ABSOLUTE & RELATIVE:** These buttons are the same as those on the Main and Memory pages. See "Automix Main Page" on page 171 for more information.

**MOTOR:** This button is used to turn the fader motors are on and off for Automix playback. The button appears highlighted when the motors are on. The motors cannot be turned off during recording, and are automatically turned on when recording starts.

**TOUCH SENSE:** This button is the same as the TOUCH SENSE button on the Automix Main page (see page 173).

**UPDATE:** This button is the same as that on the Main and Memory pages. See "Automix Main Page" on page 171 for more information.

**EDIT OUT:** The TAKEOVER and RETURN buttons are the same as those on the Main and Memory pages. See "Automix Main Page" on page 171 for more information. The TIME parameter determines the time it takes faders to return to levels specified by the existing Automix data when the Edit Out mode is set to Return. It can be set from 0.0 to 30.0 seconds in 0.1 second steps.

## Selecting the Timecode Source & Frame Rate

The timecode source and frame rate for Automix can be set as follows.

**1   Use the DISPLAY ACCESS [SETUP] button to select the Time Reference page.**
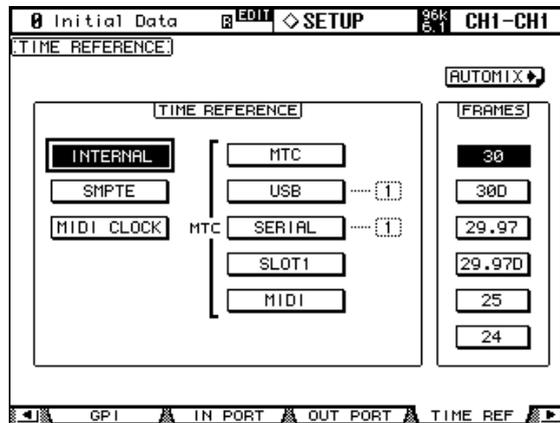
```
0 Initial Data   R EDIT ◇SETUP   96k  CH1-CH1
                                  8.1
(TIME REFERENCE)
                                       AUTOMIX ►

          [TIME REFERENCE]              [FRAMES]

    ┌─────────────┐  ┌──────────┐      ┌────────┐
    │  INTERNAL   │  │   MTC    │      │   30   │
    └─────────────┘  └──────────┘      └────────┘
    ┌─────────────┐  ┌──────────┐      ┌────────┐
    │   SMPTE     │  │   USB    │┄┄[1] │  30D   │
    └─────────────┘  └──────────┘      └────────┘
    ┌─────────────┐  ┌──────────┐      ┌────────┐
    │ MIDI CLOCK  │MTC│  SERIAL  │┄┄[1] │ 29.97  │
    └─────────────┘  └──────────┘      └────────┘
                     ┌──────────┐      ┌────────┐
                     │  SLOT1   │      │ 29.97D │
                     └──────────┘      └────────┘
                     ┌──────────┐      ┌────────┐
                     │   MIDI   │      │   25   │
                     └──────────┘      └────────┘
                                       ┌────────┐
                                       │   24   │
                                       └────────┘

    ◄█    GPI    █  IN PORT █ OUT PORT █ TIME REF █►█
```

**2   Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TIME REFERENCE:** The following timecode sources can be selected.

| Source | Description |
|---|---|
| **INTERNAL** | Internally generated timecode |
| **SMPTE** | SMPTE timecode received via the SMPTE TIME CODE INPUT |
| **MIDI CLOCK** | MIDI Clock received via the MIDI IN port |
| **MTC** | MTC received via the MTC TIME CODE INPUT |
| **USB** | MTC received via the USB TO HOST port |
| **SERIAL** | MTC received via the SERIAL TO HOST port |
| **SLOT1** | MTC received via Slot #1 (for use with an optional mLAN I/O Card installed in Slot #1) |
| **MIDI** | MTC received via the MIDI IN port |

For the USB and SERIAL sources, you must specify a port from 1–8.

**FRAMES:** The frame rate can be set to: 30, 30D, 29.97, 29.97D, 25, or 24. An Automix will playback correctly even if the frame rate is different to that which was used when the Automix was originally recorded.

The MIDI CLOCK source supports Song position Pointers, F8 TIMING CLOCK (timing info), FA START (starts Automix from beginning), FB CONTINUE (starts Automix from current position), and FC STOP (stops Automix).

## Creating a Time Signature Map

When using the MIDI CLOCK timecode source, you'll also need to specify the initial time signature and any time signature changes that follow.

**1   Use the DISPLAY ACCESS [SETUP] button to select the Time Signature page.**

```
0 Initial Data   🗓EDIT ◇SETUP   96k CH1-CH1
                                 5.1
[TIME SIGNATURE]

 MEAS  TIME   MEAS  TIME   MEAS  TIME   MEAS  TIME
    1  4/4
    8  3/4
    9  4/4
   48  4/4
   49  3/4
   50  4/4




 ◀▮  TIME SIG  ▮  SURR BUS
```

**2   Use the cursor buttons to select the parameters, and use the Parameter wheel or INC/DEC buttons to specify the measure and time signature.**

To insert a time signature change, use the cursor buttons to select the next available entry, and press [ENTER], or turn the Parameter wheel.

To delete a time signature change, select it, and then press [ENTER]. The initial time signature entry at measure #1 cannot be deleted.

## Recording an Automix

This section provides a general procedure for Automix recording.

**1   Connect a timecode source.**

**2   Select the timecode source and frame rate.**

See "Selecting the Timecode Source & Frame Rate" on page 177 for more information.

**3   Use the DISPLAY ACCESS [AUTOMIX] button to locate the Automix Main page.**

**4   On the Automix Main page, use the ENABLED/DISABLED button to enable the Automix function.**

**5   On the Automix Main page, use the OVERWRITE buttons to select which parameters you want to record.**

The corresponding OVERWRITE buttons pages appear highlighted.

**6   On the Automix Main page, press the REC button.**

The REC button flashes.

Alternatively, you could press the AUTO REC button so that Automix recording starts automatically when timecode is received. The main difference between REC and AUTO REC is that the AUTO REC functions remains on when recording is stopped, whereas REC must be pressed each and every time you want to start recording. Initially however, REC may be the safer option.

**7   Use the [AUTO] buttons to arm channels for Automix recording.**

The [AUTO] button indicators of armed channels light up orange.

**8   Start the timecode source.**

The REC and PLAY buttons appear highlighted.

**9   Adjust the faders and other controls as necessary.**

Use the SELECTED CHANNEL section to edit the currently selected channel. Channels are selected automatically when the [AUTO] buttons are pressed. You can punch channels out of recording by using the [AUTO] buttons.

**10  To stop Automix recording, stop the timecode source, or press the STOP button on the Automix Main or Memory page.**

When the Mix Update Confirmation preference is on (see page 233), a confirmation message appears asking if you want to update the existing Automix data (i.e., keep the edits just recorded).

## Inserting Mix Parameters into Automix

You can insert the static mix parameter settings into the range specified by the IN and OUT parameters in the current Automix data. This is useful when you want to quickly insert static EQ settings into a specified range of the Automix data.

**Before Insert**                                          **After Insert**
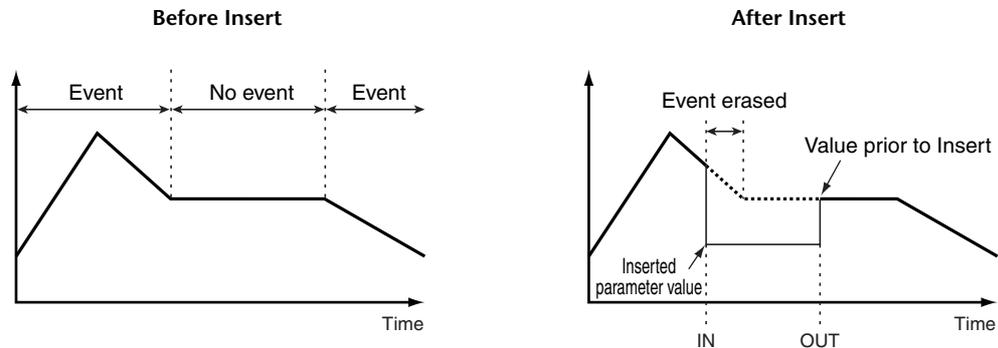


1   **Follow Steps 1–4 as described in the "Recording an Automix" section on the previous page, then press the DISPLAY ACCESS [AUTOMIX] button to display the Automix Main page.**
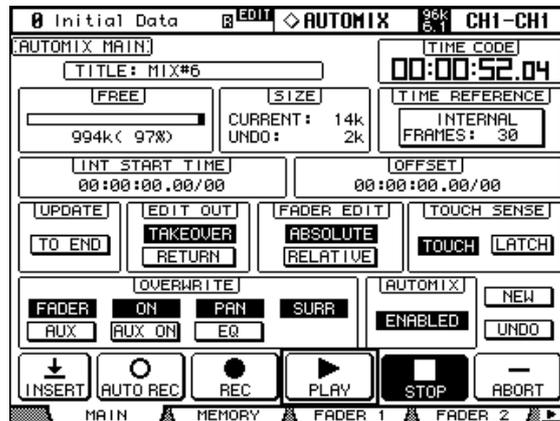


2   **Use the cursor buttons to select the INSERT button, then press [ENTER].**

A confirmation message appears.
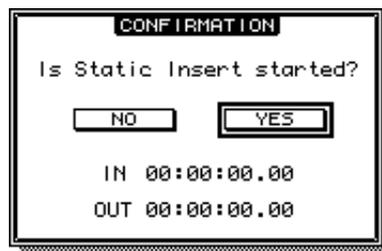


3   **Use the IN and OUT parameters to specify the region to be inserted.**

The default IN and OUT parameter values use the Locate memories specified by the Insert Time Link preference (see page 234). If you change the Locate points for the corresponding Locate memories while the confirmation message is displayed, the IN and OUT parameter values will be updated accordingly.

If MIDI clock is selected as a timecode source, these parameters indicate the position in bar:beats:clocks and use the IN and OUT parameter values in the TIME SETTING section on the Event Job page. In this case, the Insert Time Link preference is disabled.

**4    Use the cursor buttons to select YES, then press [ENTER].**

The 02R96 enters Insert mode, and the INSERT button is highlighted.

The fader positions, mute function and other parameters are updated to the settings specified for the time value of the IN parameter.
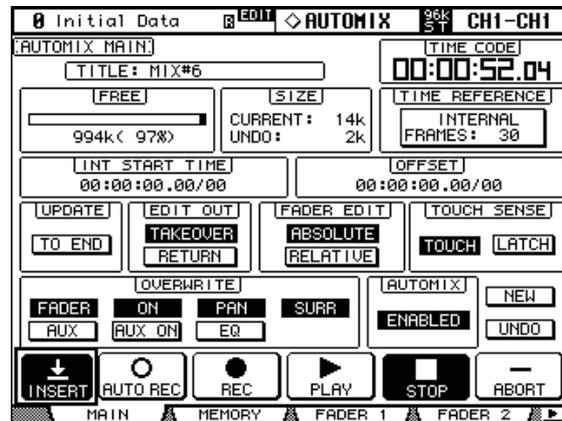


**5    Select the parameter you wish to insert using the AUTOMIX OVERWRITE buttons.**

To select effect or plug-in parameters, locate the Effect Edit or Plug-in Edit page, then move the cursor to the desired parameter and press [ENTER].

**6    Select the insert destination channel by pressing the corresponding [AUTO] button.**

The selected [AUTO] button indicator lights up red.

**7    Edit a parameter you wish to insert.**

**8    Use the cursor buttons to select the INSERT button, then press [ENTER].**

A confirmation message appears.
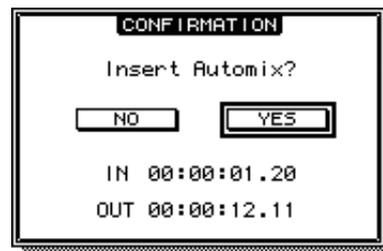


**9    Use the cursor buttons to select YES, then press [ENTER] to insert the data.**

Once the data is inserted, Insert mode is cancelled and the INSERT button is unhighlighted.

## Rerecording Events

Events can be rerecorded as many times as you like. Remember, however, that unlike the first pass, on subsequent passes existing events for the currently punched in parameter are overwritten, so use the OVERWRITE buttons and [AUTO] buttons with care. Instead of using the [AUTO] buttons to punch in an entire channel, you can reduce the risk of overwriting important data by punching in and out individual parameters (see page 183). Use the Update To End option to determine how existing events are handled when rerecording is stopped (see page 171). Use the Edit Out (see page 172) and Fader Edit (see page 173) options to determine how Fader events are rerecorded.

## Parameter Recording

The following table summarizes parameter recording operation for each parameter. Parameter adjustments made on the respective display pages are also recorded.

| Parameter | Channel | OVER-WRITE | Operation | Pair/Group |
|---|---|---|---|---|
| **Channel Levels (faders)** | Input | FADER | Set Layer to input, Fader mode to Fader, use faders | Faders of paired channels and grouped faders are recorded together |
| | Bus Out, Aux Send | | Set Layer to Master, Fader mode to Fader, use faders | |
| | Stereo Out | | Use Stereo Out fader | |
| | Group Master levels | | Use faders assigned to Group Master in the User Assignable Layer. | |
| **Channel Mutes (ON/OFF)** | Input | ON | Set Layer to input, use [ON] buttons | [ON] buttons of paired channels and grouped mutes are recorded together |
| | Bus Out, Aux Send | | Set Layer to Master, use [ON] buttons | |
| | Stereo Out | | Use Stereo Out [ON] button | |
| | Group Master On/Off | | Use [ON] buttons assigned to Group Master in the User Assignable Layer. | |
| **Pan** | Input | PAN | Set Layer to input, Encoder mode to Pan, use Encoders. | If Pan mode is Gang or Inverse-Gang, paired channels are recorded together. |
| **Surround Pan** | Input | SURR | Use Joystick (If a surround parameter is assigned to the Encoders, also use Encoders) | If ST LINK button on Surround Edit page is on, adjacent channels are recorded together. |
| **EQ (F, Q, G, On/Off)** | Input, Bus Out, Aux Send, Stereo Out | EQ | Use SELECTED CHANNEL EQUALIZER section (If EQ parameter assigned to an Encoder, also use Encoders) | EQ of paired channels, and grouped EQs recorded together |
| **Aux send 1–8 levels** | Input | AUX | If Fader mode is Aux, use faders. If Encoder mode is Aux, use Encoders (also use Aux Send or Aux view pages) | Aux send levels of paired channels recorded together. (If the selected Aux Send is paired, the send level to both Aux Sends is recorded.) |
| **Aux send 1–8 mutes** | Input | AUX ON | Use Aux Send or Aux view pages | Aux send mutes of paired channels recorded together (If the selected Aux Send is paired, mutes for both Aux Sends recorded.) |
| **Scene recalls** | — | — | Use SCENE MEMORY section or Scene Memory page | — |
| **Library recalls** | EQ, Gate, Comp, Effects, Channel | — | Use corresponding library page | — |
| **Effect parameters (certain parameters)** | Effects processors 1–4 | — | Use Parameter controls 1–4 (push to punch in/out). Select the desired parameter on the Effect Edit page, then press [ENTER] | — |
| **User Defined Plug-Ins (parameters 1–4)** | Plug-Ins 1–4 | — | Use Parameter controls 1–4 (push to punch in/out). Select the desired parameter on the Plug-in Edit page, then press [ENTER] | — |
| **User Defined Remote Layers** | Faders | FADER | Select User Defined Remote Layer, use faders | — |
| | [ON] buttons | ON | Select User Defined Remote Layer, use [ON] buttons | — |
| | Encoders | PAN | Select User Defined Remote Layer, use Encoder | — |

## Punching In & Out Individual Parameters

During Automix rerecording, channels can be punched in and out by pressing the channel strip [AUTO] buttons. Individual parameters can be punched in and out as follows.

| Parameter | Channel | OVER-WRITE | Operation | Punch In | Punch Out |
|---|---|---|---|---|---|
| **Channel Levels (faders)** | Input | FADER | Set Layer to input, Fader mode to Fader | Touch fader knob and adjust[1] | Release fader knob[2] |
| | Bus Out, Aux Send | | Set Layer to Master, Fader mode to fader | | |
| | Stereo Out | | Stereo Out fader | | |
| | Group Master faders | | Set the Fader mode to Fader; Set the Group Master in the User Assignable Layer. | | |
| **Pan** | Input | PAN | Set Layer to input, Encoder mode to Pan. | Press Encoder and adjust | Press Encoder |
| **Surround Pan** | Input | SURR | Select Input Layer and assign Surround LFE Level or Surround Pan Wheel to the Encoders | Press Encoder and adjust | Press Encoder |
| **EQ (F, Q, G)** | All channels | EQ | Turn on Auto EQ Edit In preference (see page 233). Use SELECTED CHANNEL EQUALIZER section (If EQ parameter assigned to an Encoder, also use Encoders) | Adjust control | Press [AUTO] button |
| **EQ On/Off** | | | | Press EQ [ON] button | Press [AUTO] button |
| **Aux send 1–8 levels** | Input | AUX | Set Layer to input, Fader mode to Aux | Touch fader knob and adjust[1] | Release fader knob[2] |
| | | | Set Layer to input, Encoder mode to Aux | Press Encoder and adjust | Press Encoder |
| **Effect parameters (certain parameters)** | Effects processors 1–4 | — | Select internal effects processors | Push Parameter 1–4 control, or select the parameters on the Effect Edit page, then press [ENTER] | Push Parameter 1–4 control, or select the parameters on the Effect Edit page, then press [ENTER] |
| **User Defined Plug-Ins (parameters 1–4)** | Plug-Ins 1–4 | — | Select Plug-Ins | Push Parameter 1–4 control. Select the desired parameter on the Plug-in Edit page, then press [ENTER] | Push Parameter 1–4 control Select the desired parameter on the Plug-in Edit page, then press [ENTER] |
| **User Defined Remote Layers** | Faders | FADER | Select User Defined Remote Layer | Touch fader knob and adjust[1] | Release fader knob[2] |
| | Encoders | PAN | Select User Defined Remote Layer | Press Encoder and adjust | Press Encoder |

1. TOUCH SENSE on Fader Edit page must be TOUCH or LATCH.
2. TOUCH SENSE on Fader Edit page must be TOUCH.

If during Automix recording you punch in an individual parameter by using the controls listed in the above table, even if some OVERWRITE buttons are on, only the existing data of that particular parameter will be overwritten. Likewise, when you punch out an individual parameter by using the controls listed above, only that particular parameter will be punched out.

If during Automix recording you press an [AUTO] button to punch in a channel, the existing data of all parameters for which the corresponding OVERWRITE buttons are on will be overwritten. When you press the [AUTO] button to punch out of recording, all of those parameters will be punched out.

When faders are grouped with the Fader Group Master function turned off, if the OVER-WRITE FADER button is on, pressing an [AUTO] button, or touching the fader knob of any fader in the group (if TOUCH SENSE on the Fader Edit page is on) puts all the corresponding channels into Record mode and all the [AUTO] button indicators light up red. The same applies to Mute (OVERWRITE ON button) and EQ (OVERWRITE EQ button) groups.

## Playing Back an Automix

So long as the Automix function is enabled, the Automix function will chase the incoming timecode and play and stop the current Automix accordingly. Playback stops automatically when the end of the Automix data is reached. Playback can be stopped manually by pressing the STOP or ABORT button on the Automix Main or Memory page. Playback will stop automatically if no timecode is received for a while, for example, if the timecode source is disconnected or turned off.

If the timecode source is set to internal, use the PLAY button on the Automix Main or Memory page to start Automix playback, and the STOP button to stop it.

You can disable Automix playback on individual channels by using the channel strip [AUTO] buttons. During playback, the [AUTO] button indicators appear green. When Automix playback for an individual channel is disabled, its [AUTO] button indicator goes out.

During playback, faders move in accordance with recorded Fader events (so long as the corresponding Layer and Fader mode is selected). Fader movement can be disabled by turning off the fader motors (see page 175). Fader events can be viewed on the Fader Edit pages (see page 175).

Other events are displayed by the display pages and button indicators. Recorded events of the currently selected channel are displayed by the SELECTED CHANNEL section controls and displays.

> *Warning: If the effects type is different to that which was used when the effects parameter edits were recorded, the parameter edits will not be played back. However, they are not deleted. When you rerecord effects parameter edits, it's recommended that you delete the existing effects events offline. See "Editing Events Offline" on page 185 for more information.*

# Editing Events Offline

Automix events can be edited offline on the Event Job and Event Edit pages. Offline editing can be performed only while the Automix function is stopped.

## Event Job Page

On the Event Job page, specified events on specified channels between specified in and out points can be erased, copied, moved/merged, or trimmed.

**1    Use the DISPLAY ACCESS [AUTOMIX] button to locate the Event Job page.**
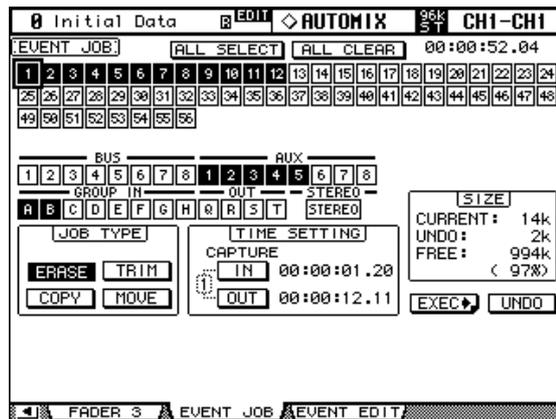


**2    Use the cursor buttons to select the channels to edit, then press [ENTER] to set them.**

You can select multiple Input Channels, Bus Outs, Aux Outs, Stereo Out, and the Fader Group Master. When you select a channel, its button is highlighted. (You can select multiple channels.)

**ALL SELECT:** The ALL SELECT button selects all channels.

**ALL CLEAR:** The ALL CLEAR button de-selects all channels.

**3    Use the cursor buttons to select the IN and OUT parameters, then use the Parameter wheel, INC/DEC buttons or [ENTER] button to specify the edit range.**

**TIME SETTING:** The IN and OUT parameters are used to specify the region of Automix data to be erased, copied, moved/merged, or trimmed. The IN and OUT points can be set on-the-fly by pressing the [ENTER] button while the IN or OUT button is selected. The captured timecode values can be edited by using the Parameter wheel or the INC/DEC buttons. Press the [ENTER] button to reset the currently selected digits to "00." Up to eight IN and OUT timecode values can be captured and stored in the eight Capture memories. Use the cursor buttons to select the Capture memory number, and use the Parameter wheel or the INC/DEC buttons to select the Capture memories.

**4    Use the cursor buttons to select a Job, then press [ENTER].**

The following Jobs are available. Certain Jobs feature an additional parameter below the TIME SETTING section.

**ERASE:** The ERASE button erases specified Automix data.

**COPY:** The COPY button copies specified Automix data. This Job features a SOURCE section and COPY TO section (below the TIME SETTING section).
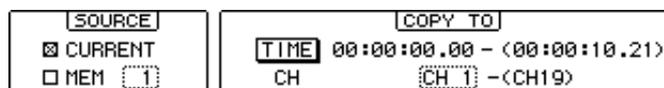
The SOURCE section enables you to select the copy source Automix. You can select CURRENT (the current Automix) or MEM (any Automix from 1 to 16).

The TIME parameter determines the point to which the specified data is copied. The number in parentheses on the right indicates the end point of the copy destination. You can set the TIME parameter on-the-fly by selecting the TIME button, then pressing [ENTER]. You can edit the captured timecode value using the Parameter wheel or INC/DEC buttons. Press [ENTER] to reset the currently-selected digit to "00."

The CH parameter specifies the channel to which the specified data will be copied. The number of destination channels depends on the specified number of copy source channels. For example, if Input Channels 1 though 8 are specified as the source, then the number of destination channels will be eight (8). Destination channels are contiguous and only the first channel in the range can be specified. The number in parentheses on the right indicates the last channel in the copy destination.

You cannot copy from Input Channels to Output Channels. Also, even within Output Channels, you cannot copy between Aux and Bus channels.

**TRIM:** The TRIM button trims the specified Automix data. This Job includes a TRIM EDIT section below the TIME SETTING section.

```
           ┌─TRIM EDIT─┐
 IN:  ┌ 0.0 ┐SEC   LEVEL: ┌ 0.0 ┐dB
 OUT: └ 0.0 ┘SEC
```

The IN parameter determines the amount of time required for the faders to achieve the specified trim amount. The OUT parameter determines the amount of time required for the faders to return to the previous levels. The LEVEL parameter specifies the fader trim amount in the range of –96 dB to +96 dB.
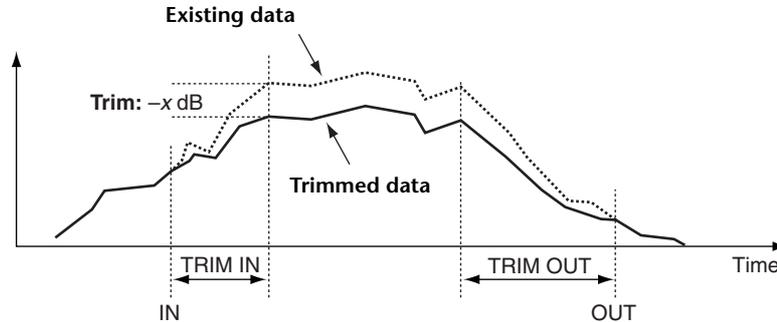
**MOVE/MERGE:** This Job features a SOURCE section and a MOVE TO (MERGE TO) section below the TIME SETTING section. The function of this button changes depending on the SOURCE section setting. If you select CURRENT (current Automix) in the SOURCE section, this button becomes the MOVE button, which enables you to move the specified range of Automix data to another position. If you select MEM (Automix memories 1–16) in the SOURCE section, this button becomes the MERGE button, which enables you to merge the specified range of Automix data with other Automix data.

```
┌──[SOURCE]──┐  ┌─────────[MOVE TO]─────────┐
│ ⊠ CURRENT  │  │ [TIME] 00:00:00.00 - (00:00:10.21) │
│ □ MEM  [ 1]│  │ CH        [CH 1] -(CH19)            │
└────────────┘  └───────────────────────────┘
```
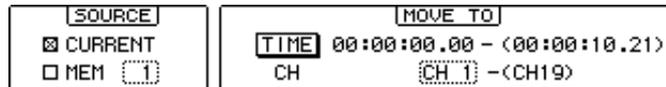
The SOURCE section enables you to select the move/merge source Automix. You can select CURRENT (the current Automix) or MEM (any Automix from 1 to 16).

The TIME parameter determines the point to which the specified data is moved or merged. The number in parentheses on the right indicates the end point of the move/merge destination. You can set the TIME parameter on-the-fly by selecting the TIME button, then pressing [ENTER]. You can edit the captured timecode value using the Parameter wheel or the INC/DEC buttons. Press the [ENTER] button to reset the currently-selected digit to "00."

The CH parameter specifies the channel to which the specified data will be moved or merged. The number of destination channels depends on the number of move/merge source channels specified. For example, if Input Channels 1 though 8 are specified as the source, then the number of destination channels will be eight (8). Destination channels are contiguous and only the first channel in the range can be specified. The number in parentheses on the right indicates the last channel of the move/merge destination.

You cannot move or merge from Input Channels to Output Channels. Also, even within Output Channels, you cannot move or merge between Aux and Bus channels.

**5   Use the cursor buttons to select the EXEC button, then press [ENTER].**

The PARAMETERS window appears, which enables you to select the parameters to be edited, and to perform the selected Job.

```
┌───────────────────────────────────────────────┐
│ 0 Initial Data  R[EDIT] ◇AUTOMIX [96k] CH1-CH1│
│ [EVENT JOB]              [ EXEC ][BACK▶]       │
│         ┌───── COPY PARAMETERS ─────┐          │
│         [FADER] [ ON ] [ PAN ] [SURR] [ EQ ]   │
│                                                │
│ LIB     [ CH ] [GATE] [COMP] [ EQ ] │[SCENE]   │
│ FX LIB  [1][2][3][4]                           │
│                                                │
│ AUX     [1][2][3][4][5][6][7][8]               │
│ ON      [1][2][3][4][5][6][7][8]               │
│                                                │
│ REMOTE  [1]                                    │
│                                                │
│ EFFECT  [1][2][3][4]                           │
│ PLUG-IN [1][2][3][4]                           │
│                                                │
│ [◀] FADER 3 │ EVENT JOB │EVENT EDIT            │
└───────────────────────────────────────────────┘
```
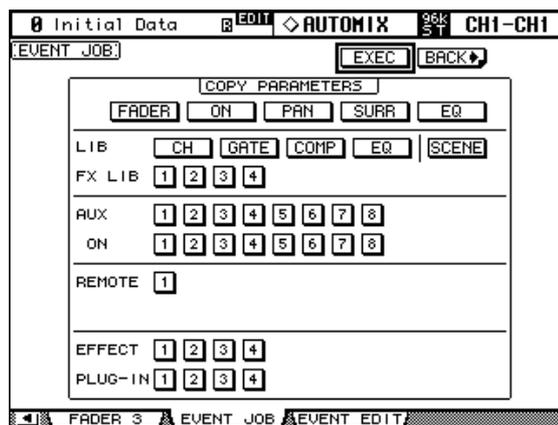
When you select a parameter, its button is highlighted. You can specify multiple parameters.

Double-clicking a non-highlighted parameter button will display a message confirming that you wish to highlight all parameter buttons. Double-clicking a highlighted parameter button will display a message that you wish to unhighlight all parameter buttons.

These buttons correspond to the following parameters:

| Button | | Events |
|---|---|---|
| FADER | | Channel Fader events (Inputs Channels, Bus Out masters, Aux Send masters, Group master levels, and the Stereo Out) |
| ON | | Channel Mute events, Group master ON |
| PAN | | Input Channel pan events |
| SURR | | Input Channel surround pan, LFE level, DIV parameter events, and RDIV parameter events |
| EQ | | Channel EQ events |
| LIB | CH | Channel library recall events |
| | GATE | Gate library recall events |
| | COMP | Comp library recall events |
| | EQ | EQ library recall events |
| | SCENE | Scene recall events |
| FX LIB | 1–4 | Effects library recall events of each internal effects processor |
| AUX | 1–8 | Level events of each Aux Send |
| ON | 1–8 | Mute events of each Aux Send |
| REMOTE | 1 | User Defined Remote Layer events |
| EFFECT | 1–4 | Parameter events for each internal effects processor |
| PLUG-IN | 1–4 | Parameter events for each Plug-In |

6   **Use the cursor buttons to select the EXEC button, then press [ENTER].**

When the confirmation message appears, select YES to execute the Job.

**BACK:** Select this button to return to the previous page without executing the Job.

## Event Edit Page

On the Event Edit page, you can edit, duplicate, delete, and insert new events.

1   **Use the DISPLAY ACCESS [AUTOMIX] button to locate the Event Edit page.**
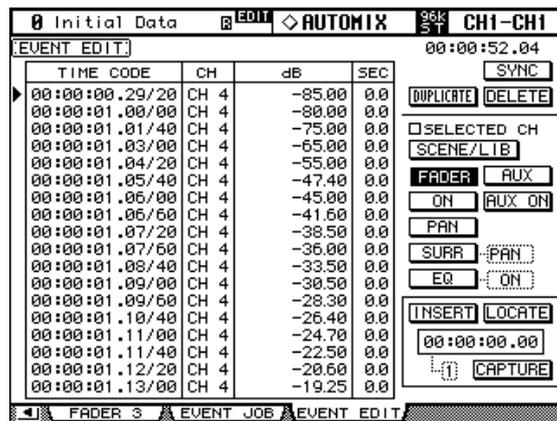


2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**Event list:** Automix events are listed in chronological order. The type of events listed depends on the Event select buttons. Use the cursor buttons to select event parameters. While the cursor is on the SYNC, DUPLICATE, DELETE, SELECTED CH, or Event select buttons, you can use the Parameter wheel or the INC/DEC buttons to scroll the list. While the cursor is inside the event list, you can use these controls to edit event parameters. The triangular cursor at the left side of the list indicates the currently selected event. When an event's timecode value is edited, the list is resorted automatically.

**SYNC button:** This button is used to synchronize the list to the current timecode position. When pressed, events closest to the current timecode position are displayed. This function can be used during Automix playback.

**DUPLICATE button:** This button is used to duplicate events. Use the Parameter wheel to select an event, select the DUPLICATE button, and then press [ENTER]. A duplicate event is inserted below the currently selected event. If there are no events in the list, you can use this button to insert a new event of the type specified by the Event select buttons.

**DELETE button:** This button is used to delete events. Use the Parameter wheel to select an event, select the DELETE button, and then press [ENTER].

**SELECTED CH:** When this option is on, only events of the currently selected channel are displayed. All Scene recall and effects library recall events are displayed regardless of this option. For paired channels, only events of the currently selected channel are displayed.

**Event select buttons:** These buttons are used to select the type of events to be displayed in the event list.

| Button | Events Listed | List Format |
|--------|---------------|-------------|
| SCENE/LIB | Library and Scene recall events | TIME CODE, CH, SCENE/LIB |
| FADER | Channel faders (Inputs Channels, Bus Out masters, Aux Send masters, Group master levels, and the Stereo Out) | TIME CODE, CH, dB, SEC |
| ON | Channel Mutes (ON/OFF) | TIME CODE, CH, ON/OFF |
| PAN | Pan | TIME CODE, CH, L-C-R |
| SURR-PAN | Surround pan | TIME CODE, CH, SURR |
| SURR-LFE | Surround LFE | TIME CODE, CH, dB |
| SURR-DIV | Surround DIV | TIME CODE, CH, DIV |
| SURR-RDIV | Surround RDIV | TIME CODE, CH, DIV |
| EQ-ON | EQ ON/OFF | TIME CODE, CH, ON/OFF |
| EQ-FREQ | EQ Frequency | TIME CODE, CH, BAND/Hz |
| EQ-Q | EQ Q | TIME CODE, CH, BAND/Q |
| EQ-GAIN | EQ Gain | TIME CODE, CH, BAND/dB |
| AUX | Aux Send 1–8 levels | TIME CODE, CH, AUX, dB |
| AUX ON | Aux Send 1–8 mutes | TIME CODE, CH, AUX, ON/OFF |

**INSERT button:** This button is used to insert new events. Use the Event select buttons to select the type of event that you want to insert. Use the Captured timecode counter to specify the point at which you want to insert the new event. Select the INSERT button, and then press [ENTER].

**LOCATE button:** This button is used to locate events at the Capture memory display position.

**Capture memory display:** This displays the captured timecode position. The captured timecode values can be edited by using the Parameter wheel or the INC/DEC buttons. Press the [ENTER] button to reset the currently selected digits to "00."

**CAPTURE button:** This button is used to capture the current timecode position. Up to eight timecode values can be captured and stored in the eight Capture memories. Use the cursor buttons to select the Capture memory number, and use the Parameter wheel or the INC/DEC buttons to select the Capture memories. Capture memories can be selected even while the CAPTURE, LOCATE, or INSERT button is selected.

If the Auto Inc TC capture preference is on (see page 233), Capture memories increment automatically each time a timecode position is captured.

If the Link Capture & Locate Memory preference is on (see page 233), the eight Capture memories are linked to the eight Locate memories so that, for example, edits made to Capture memory #1 are reflected on Locate memory #1, and vice versa.

# 17 MIDI

## MIDI & the 02R96

The 02R96 supports the following MIDI messages:

- Program Changes for recalling Scenes (see page 193)
- Control Changes for real-time parameter control (see page 194)
- System Exclusive Parameter Changes for real-time parameter control (see page 194)
- MIDI Note On/Off for Freeze effect etc. (see page 275)
- Bulk Dump for transmitting Scene, library, and setup data (see page 195)
- MTC and MIDI Clock for Automix synchronization (see page 177)
- MMC for external machine control (see page 222)
- User Defined Plug-Ins transmit user-specified MIDI data when Parameter controls 1–4 are operated (see page 158)
- User Defined Remote Layer transmits user-specified MIDI data when the channel strip faders, Encoders, and [ON] buttons are operated (see page 219)
- Predefined Remote Layers for controlling popular DAWs (Digital Audio Workstations), including Pro Tools (see page 196)

## MIDI I/O

The 02R96 features four types of interface for transmitting and receiving MIDI data:

- Standard MIDI ports
- TO HOST USB port
- TO HOST SERIAL port
- SLOT1 (for use with an optional mLAN I/O Card installed in Slot #1)
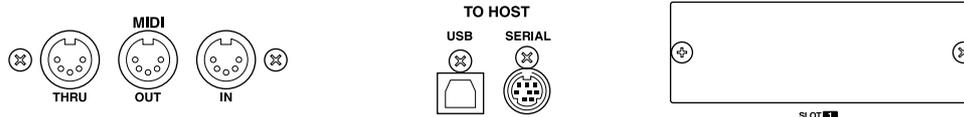
TO HOST SERIAL and TO HOST USB are multiport interfaces, with eight ports each.

When the 02R96 receives MIDI data via any of these interfaces, the MIDI indicator appears on the display (see page 44).

If you are connecting a Windows computer to the TO HOST USB or TO HOST SERIAL port, you must install and use the YAMAHA CBX Driver for Windows and the YAMAHA USB Driver for Windows, which are included on the supplied CD-ROM.

If you plan to connect a Macintosh computer to the TO HOST USB port, you must install and use the YAMAHA USB Driver for Macintosh, or the YAMAHA USB Driver for MacOS X. If you are using MacOS 8.6–9.2.2, you must install OMS 2.3.3 in the Macintosh.

If you plan to connect a Macintosh computer running MacOS 8.6–9.2.2 to the TO HOST SERIAL port on the 02R96, you must install OMS 2.3.3 in the Macintosh.

## MIDI Port Setup

MIDI ports are configured as follows.

**1** **Use the DISPLAY ACCESS [SETUP] button to locate the MIDI/TO HOST Setup page.**
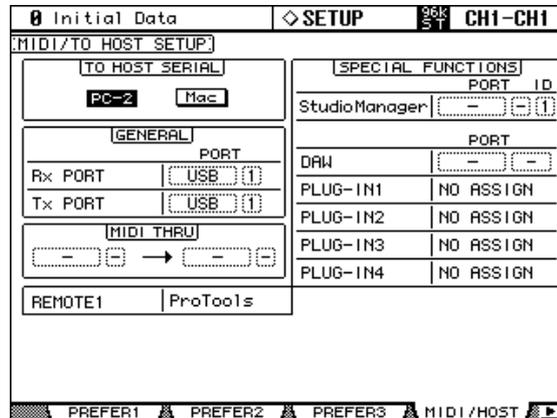


**2** **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TO HOST SERIAL:** These buttons are used to configure the TO HOST SERIAL port for use with either a Mac or PC.

*Caution: When a PC is connected to the TO HOST SERIAL port, do not set this to Mac because your PC may crash.*

**GENERAL:** These parameters are used to select ports for general MIDI data transmission and reception, including Program Changes for recalling Scenes, Control Changes for real-time parameter control, and Note On/Off for use with the Freeze effect. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1.

**MIDI THRU:** These parameters allow you to route the incoming MIDI data from one port through to another port. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1.

**REMOTE1:** This parameter is used to select a port for the Remote Layer. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1. If Pro Tools is selected as the target for a Remote Layer, "Pro Tools" is displayed here and no settings can be made.

**Studio Manager:** These parameters are used to select a port for use with the Studio Manager software and to assign the 02R96 an ID from 1 to 8. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1. See the Studio Manager documentation for more information.

**DAW:** These parameters are used to select ports for use with DAWs. Since four ports are required to control DAWs, ports are selected in groups of four, as follows: 1–4, 2–5, 3–6, 4–7, 5–8. Available ports include: SERIAL, USB, and SLOT1.

**PLUG-IN1–4:** These parameters are used to select ports for use with the Plug-Ins. If a Waves Plug-In card is installed in a Slot, the number of that Slot is displayed and no settings can be made. If the Plug-In target is set to USER DEFINED, you can select a port from MIDI, SERIAL 1–8, USB 1–8, or SLOT1. Ports for User Defined Plug-Ins can also be set on the Plug-In Setup page (see page 159).

*Note: Some functions cannot share ports. If you try to assign a port that's already assigned to such a function, the message "Change Port?" appears. If you select YES, the port will be assigned to the selected function and the previously assigned function will be set to "NO ASSIGN."*

## MIDI Channel Setup

MIDI Channels for reception and transmission are specified as follows.

1   **Use the DISPLAY ACCESS [MIDI] button to locate the MIDI Setup page.**

```
0 Initial Data    B   ◇MIDI      BUS3-BUS3
[MIDI SETUP]

                      Tx      Rx     OMNI    ECHO

          CHANNEL    [ 1 ]   [ 1 ]    -       -

          PROGRAM    [OFF]   [ ON]   [OFF]   [OFF]
          CHANGE

          CONTROL    [OFF]   [OFF]    -      [OFF]
          CHANGE

          PARAMETER  [OFF]   [ ON]    -      [OFF]
          CHANGE

          BULK         -     [ ON]    -       -

          OTHER        -       -      -      [OFF]
          COMMANDS

          Fader Resolution:  [HIGH]  [LOW]

          SETUP    PGM ASGN    CTL ASGN    BULK
```
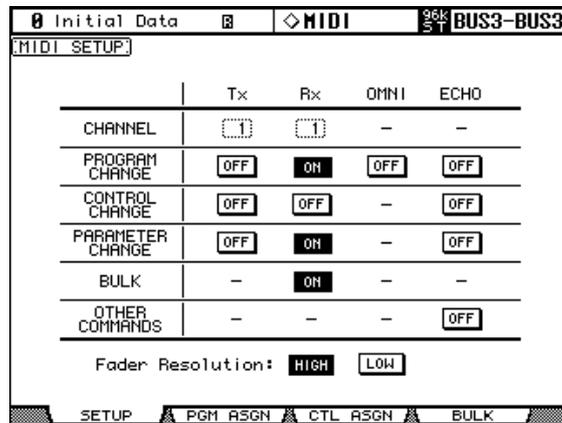
2   **Use the cursor buttons or Parameter wheel to select the parameters, and use the INC/DEC buttons or [ENTER] button to set them.**

Select MIDI channels for transmission and reception in the CHANNEL row, and turn the transmission and reception of each MIDI message on or off using the buttons in the parameter rows from PROGRAM CHANGE to OTHER COMMANDS.

### CHANNEL

This parameter row enables you to specify MIDI Channels for MIDI message transmission and reception. The following parameters are available in this row:

**Tx:** This parameter box specifies a MIDI Transmit Channel.

**Rx:** This parameter box specifies a MIDI Receive Channel.

### PROGRAM CHANGE

This parameter row enables or disables transmission and reception of Program Changes.

**Tx ON/OFF:** Transmission of Program Change messages is enabled or disabled.

**Rx ON/OFF:** Reception of Program Change messages is enabled or disabled.

**OMNI ON/OFF:** When this button is turned on, Program Changes on all MIDI Channels are received regardless of the CHANNEL row settings.

**ECHO ON/OFF:** This button determines whether Program Change messages received at the MIDI IN port are echoed through to the MIDI OUT port.

### CONTROL CHANGE

This parameter row enables or disables transmission and reception of Control Changes.

**Tx ON/OFF:** Transmission of Control Change messages is enabled or disabled.

**Rx ON/OFF:** Reception of Control Change messages is enabled or disabled.

**ECHO ON/OFF:** This button determines whether Control Change messages received at the MIDI IN port are echoed through to the MIDI OUT port.

### PARAMETER CHANGE

This parameter row enables or disables transmission and reception of Parameter Changes.

**Tx ON/OFF:** Transmission of Parameter Change messages is enabled or disabled.

**Rx ON/OFF:** Reception of Parameter Change messages is enabled or disabled.

**ECHO ON/OFF:** This button determines whether Parameter Change messages received at the MIDI IN port are echoed through to the MIDI OUT port.

### BULK

This parameter row enables or disables reception of Bulk Dump data.

**Rx ON/OFF:** Reception of Bulk Dump data is enabled or disabled.

### OTHER COMMANDS

**ECHO ON/OFF:** This button determines whether other MIDI messages received at the MIDI IN port are echoed through to the MIDI OUT port.

### Fader Resolution

**HIGH/LOW:** This parameter specifies the resolution of the value output when you operate the 02R96's faders. To transfer fader value data between two cascaded 02R96s, or to record the 02R96 operation to or play it back from a sequencer, select the HIGH button. When the LOW button is selected, the fader resolution switches to 256 steps.

## Assigning Scenes to Program Changes

02R96 Scenes can be assigned to MIDI Program Changes for remote recall. When a Scene is recalled on the 02R96, the assigned Program Change number is transmitted. If that Scene is assigned to more than one Program Change, the lowest Program Change is transmitted. Likewise, when a Program Change message is received, the assigned Scene is recalled. You must set the MIDI Setup parameters in order to transmit and receive Program Change messages (see page 192).

Initially, Scenes 1 through 99 are assigned sequentially to Program Changes 1 through 99. Scene #0 is assigned to Program Changes #100. A Scene to Program Change assignment table, listing initial assignments and with space to note user assignments, is provided on page 302. This table can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

1    **Use the DISPLAY ACCESS [MIDI] button to locate the Program Change Assign Table page.**



2    **Use the cursor buttons to select the PGM CHG. column, and use the Parameter wheel or INC/DEC buttons to select the Program Changes.**

3    **Use the cursor buttons to select the SCENE No/TITLE column, and use the Parameter wheel or INC/DEC buttons to select Scenes.**

You can initialize the Scene to Program Change assignment table by selecting the INITIALIZE button, and then pressing [ENTER].

## Assigning Parameters to Control Changes

02R96 parameters can be assigned to MIDI Control Changes for real-time control. When a parameter is adjusted on the 02R96, the assigned Control Change message is transmitted. Likewise, when a Control Change message is received, the assigned 02R96 parameter is set. You must set the MIDI Setup parameters in order to transmit and receive Control Change messages (see page 192).

A Parameter to Control Change assignment table, listing the initial assignments, is provided on page 303. This table can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

1   **Use the DISPLAY ACCESS [MIDI] button to locate the Control Change Assign Table page.**

```
6 SCENE #6              ◇MIDI    48k ST-L-ST
                                 ST
[CONTROL CHANGE ASSIGN TABLE]  MODE  TABLE   NRPN

   No.(CH)     PARAMETER
   12 ( 1) =  FADER H    CHANNEL    INPUT12
   11 ( 1) =  FADER H    CHANNEL    INPUT11
   10 ( 1) =  FADER H    CHANNEL    INPUT10
    9 ( 1) =  FADER H    CHANNEL    INPUT 9
    8 ( 1) =  FADER H    CHANNEL    INPUT 8
    7 ( 1) =  FADER H    CHANNEL    INPUT 7
    6 ( 1) =  FADER H    CHANNEL    INPUT 6
    5 ( 1) =  FADER H    CHANNEL    INPUT 5
    4 ( 1) =  FADER H    CHANNEL    INPUT 4
    3 ( 1) =  FADER H    CHANNEL    INPUT 3
    2 ( 1) =  FADER H    CHANNEL    INPUT 2
    1 ( 1) =  FADER H    CHANNEL    INPUT 1
    0 ( 1) =  NO ASSIGN

                                  INITIALIZE

    SETUP    PGM ASGN   CTL ASGN    BULK
```

2   **Use the cursor buttons to select the MODE TABLE button, and press [ENTER].**

In TABLE mode, when 02R96 parameters are adjusted, MIDI Control Change messages are transmitted in accordance with the assignments on this page. In NRPN mode, when 02R96 parameters are adjusted, predefined NRPNs (Non Registered Parameter Number) are transmitted.

3   **Use the cursor buttons to select the No. (CH) column, and use the Parameter wheel or INC/DEC buttons to select the Control Changes.**

4   **Use the cursor buttons to select the three PARAMETER columns, and use the Parameter wheel or INC/DEC buttons to select the parameters.**

Parameters with more than 128 steps require two or more Control Change messages for MIDI transmission and reception. Certain Delay parameters and the faders are divided into L and H parameters. Delay Time parameters are divided into LOW, MID, and HIGH parameters. For accurate transmission, all parameters (e.g., both L and H for faders) must be assigned to individual Control Changes.

You can initialize the Parameter to Control Change assignment table by selecting the INITIALIZE button, and then pressing [ENTER].

## Controlling Parameters by Using Parameter Changes

02R96 parameters can be controlled in real time by using Parameter Change messages, which are System Exclusive messages. When a parameter is adjusted on the 02R96, a Parameter Change message is transmitted. Likewise, when a Parameter Change message is received, a 02R96 parameter is adjusted. See "MIDI Data Format" on page 319 for detailed information. You must set the MIDI Setup parameters in order to transmit and receive Parameter Change messages (see page 192).

## Using Bulk Dump

02R96 data can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump.

**1    Use the DISPLAY ACCESS [MIDI] button to locate the Bulk Dump page.**
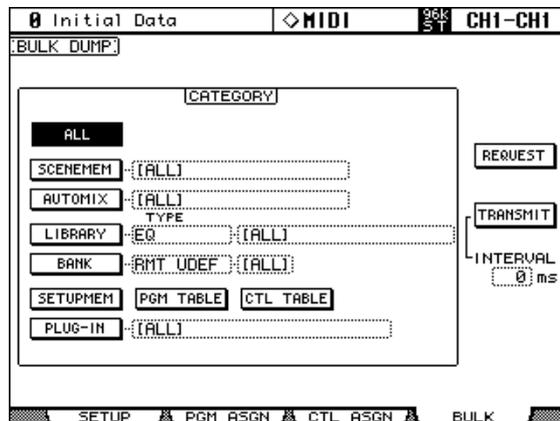


**2    To transmit data, use the CATEGORY parameters to select the type of data you want to transmit, select the TRANSMIT button, and then press [ENTER].**

The INTERVAL parameter sets the interval between data packets during transmission.

The CATEGORY parameters can be set as follows:

**ALL:** All data.

**SCENE MEM:** ALL Scenes, individual Scenes, or current (i.e., the Edit buffer).

**AUTOMIX:** ALL Automixes, individual Automixes, or the current Automix.

**LIBRARY:** The following libraries: EQ, Gate, Comp, Channel, Effects, Bus to Stereo, Input Patch, Output Patch, Surround Monitor. For each library you can specify ALL user memories, individual user memories, and for the Bus to Stereo, Input Patch, Output Patch, Surround Monitor libraries you can also specify the current settings.

**BANK:** User Defined Remote Layer banks (RMT UDEF), User Defined Plug-Ins banks (PLUG UDEF), User Defined Keys banks (KEYS UDEF), or the USER ASSIGNABLE LAYER banks (USR LAYER). For each item you can specify ALL or individual banks.

**SETUP MEM:** 02R96 setup data (i.e., system settings).

**PGM TABLE:** Scene to MIDI Program Change table. See "Assigning Scenes to Program Changes" on page 193.

**CTL TABLE:** Parameter to MIDI Control Change table. See "Assigning Parameters to Control Changes" on page 194.

**PLUG-IN:** The settings of any installed Y56K cards. You can specify ALL Slots or Slot 3 or 4.

**3    You can also transmit 02R96 data via a MIDI cable. To receive data, use the CATEGORY parameters to select the type of data you want to receive, select the REQUEST button, then press [ENTER].**

# 18  Pro Tools Remote Layer

The 02R96 features a Remote Layer target especially designed for controlling Pro Tools.

If an optional MB02R96 Peak Meter Bridge is installed, Pro Tools channel levels are displayed on its meters.

## Configuring Windows Computers

**1    Connect your PC.**

The 02R96 can be connected to your Windows PC by connecting the TO HOST SERIAL port to a suitable RS232 serial port on your PC, or by connecting the TO HOST USB port to a USB port on your PC. If you use the TO HOST SERIAL port, make sure that the TO HOST SERIAL parameter on the MIDI/TO HOST Setup page is set to PC-2 (see page 191).

**2    Install the necessary drivers.**

Once your PC is connected, you'll need to install the TO HOST SERIAL or TO HOST USB drivers included on the 02R96 CD-ROM.

## Configuring Macintosh Computers (MacOS 8.6 to 9.2.2)

**1    Connect your Mac.**

The 02R96 can be connected to your Mac by connecting the TO HOST SERIAL port to either the Printer or Modem port on your Mac, or by connecting the TO HOST USB port to a USB port on your Mac. If you use the TO HOST SERIAL port, make sure that the TO HOST SERIAL parameter on the MIDI/TO HOST Setup page is set to Mac (see page 191).

**2    Install OMS.**

The 02R96 communicates with Pro Tools via OMS (Open Music System) software. If you already have OMS installed on your Mac, there's no need to install it again and you can move on to the next section. If you don't already have OMS installed, it's included on the 02R96 CD-ROM. Refer to the OMS documentation included on the 02R96 CD-ROM for more information on installing.

**3    Install Yamaha USB MIDI driver 1.04 or later.**

If you are using the TO HOST USB port, you must also install the Yamaha USB MIDI driver included on the 02R96 CD-ROM. See the included documentation for more information.

## Configuring Macintosh Computer (MacOS X)

**1    Connect the 02R96 TO HOST USB port to a USB port on your Mac.**

**2    Install the Yamaha USB MIDI Driver for MacOS X on the computer.**

## Configuring the 02R96

**1    Use the DISPLAY ACCESS [SETUP] button to locate the MIDI/TO HOST Setup page, and use the DAW parameter to specify the port to which Pro Tools is connected.**

See "MIDI Port Setup" on page 191 for more information.

**2    Use the DISPLAY ACCESS [REMOTE] button to locate the Remote page, and set the target to Pro Tools.**

See "Assigning a Target to the Remote Layer" on page 219 for more information.

**3    Use the LAYER [REMOTE] button to select the Remote Layer.**

When the Pro Tools Remote Layer is selected, the 02R96's control surface controls Pro Tools, not the 02R96. In order to control the 02R96, you need to select an Input Channel Layer or the Master Layer. Audio mixing on the other Layers and Automix continues while the Pro Tools Layer is selected.

## Configuring Pro Tools

Pro Tools needs to be configured as follows. For more information, see your Pro Tools documentation.

**1    Launch Pro Tools.**

**2    If you are using MacOS 8.6 - 9.2.2, choose OMS Studio Setup from the Setups menu, and configure OMS as necessary.**

This screen shot shows the Yamaha USB MIDI driver with eight ports. An OMS-compatible device profile for the 02R96 is included on the 02R96 CD-ROM. See the included documentation for more information.
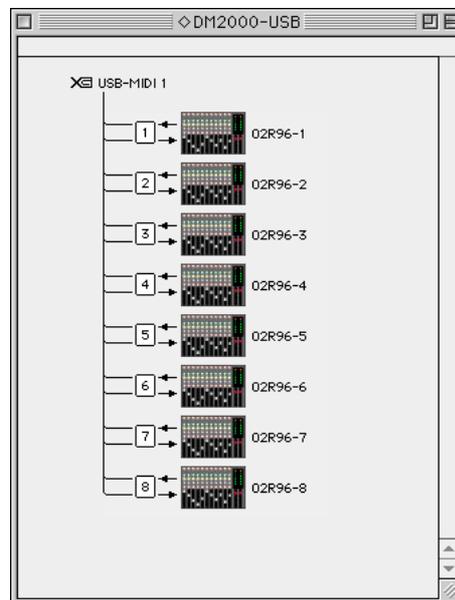


**3    Choose Peripherals from the Setups menu.**

**4 When the Peripherals window appears, click the MIDI Controllers button.**
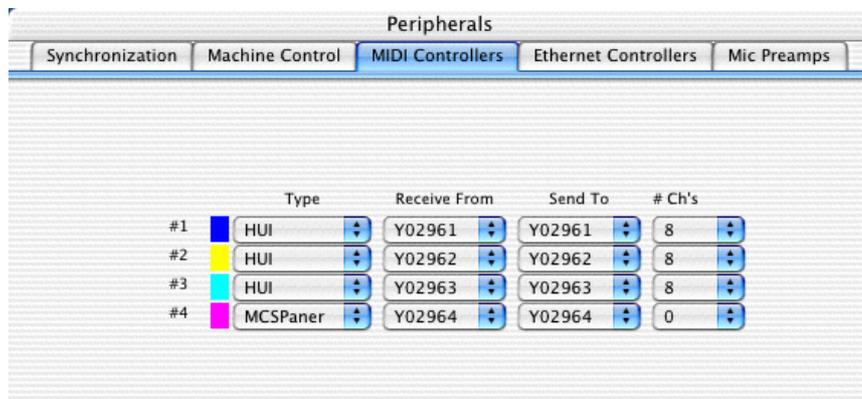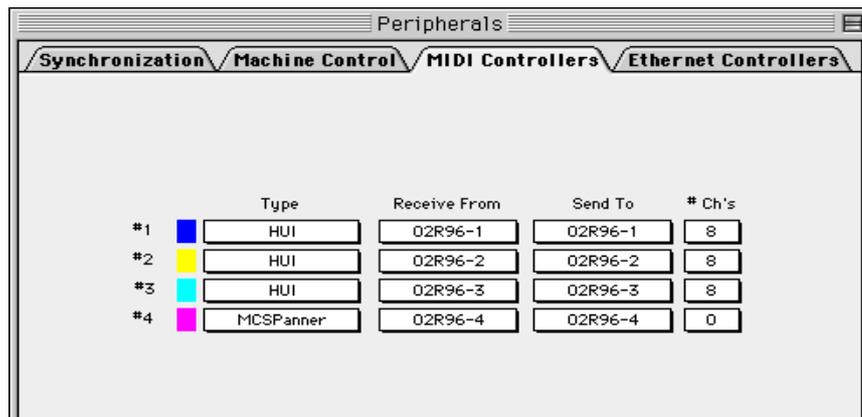




**5 Select HUI as the Type of controller for #1–#3, and select MCS PANNER for #4 to enable use of the Joystick.**

**6 Select the Receive From and Send To ports, and then click OK.**

The 02R96 can emulate up to three typical 8-channel Pro Tools MIDI controllers. A single MIDI port is required for every eight channels. So, you must configure MIDI Controller #1 to use channels 1 through 8, MIDI Controller #2 to use channels 9 through 16, and MIDI Controller #3 to use channels 17 through 24.

# Control Surface Operation with the Pro Tools Remote Layer

This section explains the operation of the 02R96 control surface when the Pro Tools Remote Layer is selected. 02R96 buttons and controls are referred to by the names printed on the 02R96 with the name of the corresponding Pro Tools function in parenthesis. For example, "Press the AUX SELECT [AUX 1] (SEND A) button."

## Display

This is the Pro Tools Remote Layer page, the various sections of which are explained below.

```
┌──────────────────────────────────────────────────┐
│ 0 Initial Data    ⓡEDIT ◇REMOTE   96k  CH1-CH1   │
│                                    ST             │
│ REMOTE1    TARGET    ProTools                      │
│                                                    │
│          COUNTER              CURSOR MODE          │
│  □ TIME CODE                  NAVIGATION           │
│  □ FEET                       SELECT ASSIGN        │
│  ☒ BEATS  □□□ I.I.□□□          Pan                 │
│               INSERT ASSIGN/EDIT                   │
│  ASSIGN  COMPARE  BYPASS         INSERT            │
│                                                    │
│  Insert 1-4    Audio 1                             │
│  no insert no insert no insert no insert           │
│                                                    │
│    ⌐↓ SEL   ⌐↓ SEL   ⌐↓ SEL   ⌐↓ SEL              │
│     ◯        ◯        ◯        ◯                   │
│     □        □        □        □                   │
│ ▒▒ REMOTE  INSERT  (CHANNEL) (METER) ▒▒           │
└──────────────────────────────────────────────────┘
```
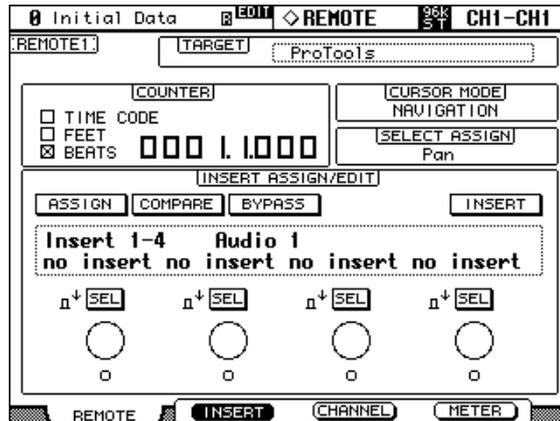
### F2 (INSERT), F3 (CHANNEL), F4 (METER) buttons
These buttons are used to select the following display modes:

- [F2]—Insert Assign/Edit Display mode (see page 200)
- [F3]—Channel Display mode (see page 200)
- [F4]—Meter Display mode (see page 201)

### TARGET
This parameter cannot be changed here. To change the target for this Layer, you must first select another Layer, and then press the DISPLAY ACCESS [REMOTE] button. See "Assigning a Target to the Remote Layer" on page 219 for more information.

### COUNTER
This counter works in unison with the timecode counter in Pro Tools. The display format is specified in Pro Tools. The three check boxes indicate the currently selected format, as follows:

```
        COUNTER
□ TIME CODE
□ FEET        I.I.□□□
☒ BEATS
```
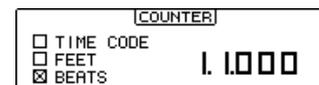
**TIME CODE:** Pro Tools timecode format set to "Time Code."

**FEET:** Pro Tools timecode format set to "Feet:Frames."

**BEATS:** Pro Tools timecode format set to "Bars:Beats."

When the Pro Tools timecode format is set to "Minutes:Seconds" or "Samples," no check boxes are selected.

### CURSOR MODE
The currently selected Cursor mode is displayed here: NAVIGATION, ZOOM, or SELECT. Cursor modes are selected by using the [INC] (CURSOR MODE) button.

```
CURSOR MODE
  SELECT
```
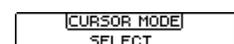
### SELECT ASSIGN
This indicates the current function of the Encoders. For example, Pan (PanR), SndA, SndB, SndC, SndD, or SndE.

```
SELECT ASSIGN
    ASGN
```
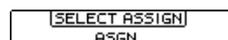
### INSERT ASSIGN/EDIT Display Mode

Press the [F2] button to select this mode.
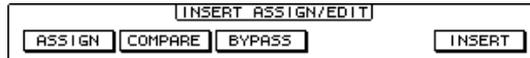


**ASSIGN:** This indicator flashes when the EFFECTS/PLUG-INS [1] (ASSIGN) button is pressed. See "Assigning Inserts/Plug-ins" on page 212 for more information.

**COMPARE:** This indicator appears highlighted when the EFFECTS/PLUG-INS [2] (COMPARE) button is pressed. See "Editing Plug-ins" on page 213 for more information.

**BYPASS:** This indicator appears highlighted when the EFFECTS/PLUG-INS [3] (BYPASS) button is pressed. See "Editing Plug-ins" on page 213 and "Bypassing Plug-ins" on page 214 for more information.

**INSERT:** This indicator appears highlighted when the EFFECTS/PLUG-INS [4] (INSERT/ASSIGN) button is pressed. See "Editing Plug-ins" on page 213 for more information.

### INSERT/PARAM Display
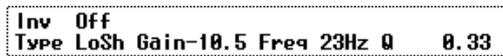


This section displays mainly insert and plug-in-related information, although other messages are also displayed here.

### Encoder Display
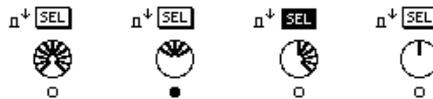


This section displays information about the Parameter controls 1–4. The SEL indicators show the on/off status of the Parameter control push-switches. The rotary control indicators show the positions of the Parameter controls. The "O" symbol below each Parameter control shows the automation status for each Parameter control.

### Channel Display Mode

Press the [F3] button to select this display mode.
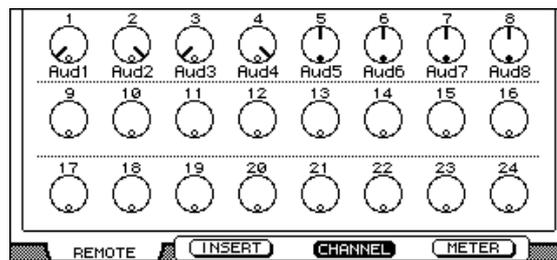


In this display mode, controls for the parameters currently assigned to the Encoders are displayed (e.g., pan or aux send). When displaying panpots, the small circles inside the Encoder icons are highlighted when pan is at center. The name of each channel is displayed below the Encoder icons. Automation mode settings, aux send destinations, and aux send pre/post settings can also be displayed here. See "Viewing the Automation Mode" on page 216, "Viewing Send Destinations" on page 210, and "Configuring Sends as Pre or Post" on page 210 respectively for more information.

## Meter Display Mode

Press the [F4] button to select this display mode.
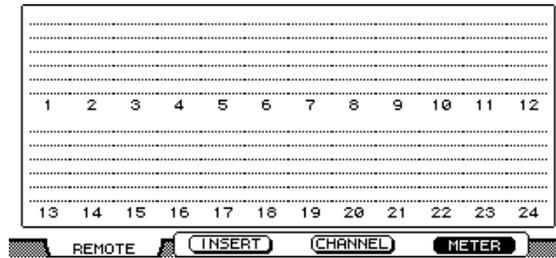


In this display mode, stereo meters for each channel are displayed. The name of each channel is displayed below the meters. Automation mode settings, aux send destinations, and aux send pre/post settings can also be displayed here. See "Viewing the Automation Mode" on page 216, "Viewing Send Destinations" on page 210, and "Configuring Sends as Pre or Post" on page 210 respectively for more information.

## Channel Strips

02R96 channel strips correspond to Pro Tools channels from left to right, with the leftmost Pro Tools channel being handled by 02R96 channel strip #1. You can change the order of channel strips by dragging the channel select buttons in Pro Tools, in which case the 02R96 automatically reorders its channel strips. By using the USER DEFINED KEYS, Pro Tools channels can be scrolled in banks of 24 (see page 206).

### Encoders & Push-Switches

The Encoders are used to set pan and send levels. The Encoder push-switches are used to reset send levels and panpots and to set sends to pre or post fader. Their exact operation depends on the currently selected Encoder mode, as shown in the following table.

| Encoder Mode | Encoder | Push-switches |
|---|---|---|
| **[PAN]** | Pan (see page 209) | Reset pan (see page 214) |
| **[SEND LEVEL]** | Send levels (see page 210) | Send pre/post (see page 210)<br>Reset send levels (see page 214) |

### [AUTO] buttons

These buttons are used in conjunction with USER DEFINED KEYS [3–8] to set the Automation mode of each channel. See "Setting the Automation Mode" on page 216 for more information.

### [SEL] buttons

These buttons are used to select channels (see page 209) and to select inserts (see page 213).

### [SOLO] buttons

These buttons are used to solo channels. See "Soloing Channels" on page 210 for more information.

### [ON] buttons

These buttons are used to mute channels. See "Muting Channels" on page 209 for more information.

### Faders

The faders are used to set channel levels (see page 209), or to set send levels in Flip mode (see page 211).
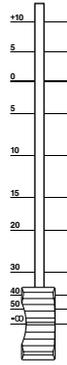
### AUX SELECT Section
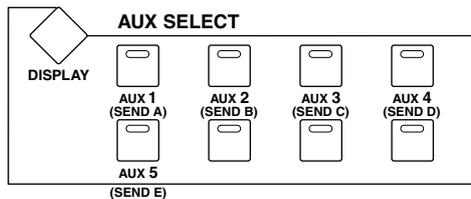
AUX SELECT [AUX 1]–[AUX 5] buttons are used to select sends A–E. The button indicator of the currently selected send lights up.

### ENCODER MODE Section
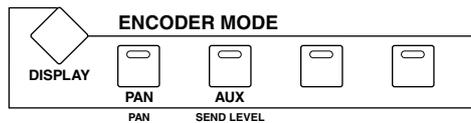
#### [PAN] (PAN) button

When this button is pressed, the Encoders work as channel panpots. Its indicator lights up when it's pressed. See "Panning Channels" on page 209 for more information.

#### [AUX] (SEND LEVEL) button

When this button is pressed, the Encoders work as send level controls. Its indicator lights up when it's pressed, and send A is selected automatically. If the Encoders are currently set to control pan, its indicator lights automatically when one of the AUX SELECT [AUX 1]–[AUX 5] (SEND A–E) buttons is pressed.

### FADER MODE Section
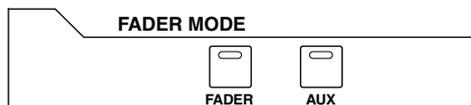
#### [FADER] & [AUX] buttons

These buttons are used to select Flip mode, in which faders, Encoders, and [ON] buttons can be used to control sends. See "Flip Mode" on page 211 for more information.

## EFFECTS/PLUG-INS Section
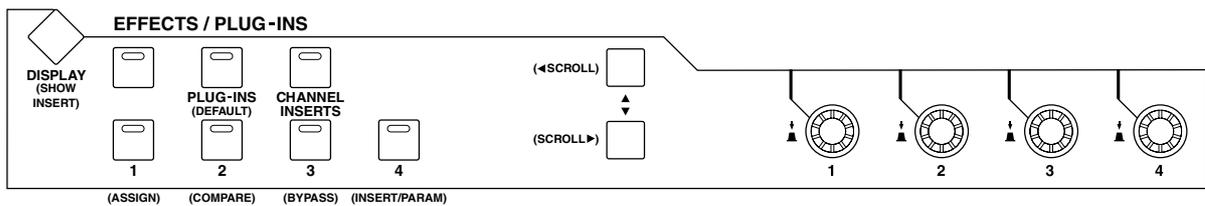


### [DISPLAY] (SHOW INSERT) button
This button is used to open and close plug-in windows.

### [PLUG-INS] (DEFAULT) button
This button is used in conjunction with other controls to reset faders, panpots, and sends to their default values. See "Resetting Faders, Sends, & Panpots" on page 214 for more information.

### [CHANNEL INSERTS]
This button determines the operation of the [SEL] buttons. When its indicator is off (Channel Select mode), [SEL] buttons select channels (see page 209). When its indicator is on (Insert Select mode), they select inserts/plug-ins (see page 213).

### [1] (ASSIGN) button
This button is used in conjunction with other controls to assign inserts/plug-ins to channels. See "Assigning Inserts/Plug-ins" on page 212 for more information.

### [2] (COMPARE) button
This button is used to compare plug-in edits before and after. See "Editing Plug-ins" on page 213 for more information.

### [3] (BYPASS) button
This button is used to bypass plug-ins. See "Editing Plug-ins" on page 213 and "Bypassing Plug-ins" on page 214 for more information.

### [4] (INSERT/PARAM) button
This button is used in conjunction with other controls when editing plug-ins. See "Editing Plug-ins" on page 213 for more information.

### Parameter Up (◄ SCROLL) & Parameter Down (SCROLL ►) buttons
These buttons are used to scroll parameters when assigning inserts and editing plug-ins. See "Assigning Inserts/Plug-ins" on page 212 and "Editing Plug-ins" on page 213 for more information.

### SELECTED CHANNEL Section

#### ■ ROUTING
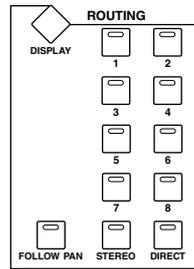


#### [1] button
Selects the previous track to be controlled by the Joystick.

#### [2] button
Selects the next track to be controlled by the Joystick.

#### [3] button
Functions the same as the [OPTION] key on a computer keyboard.

#### [4] button
Switches between L and R of the selected track. The [4] button indicator lights up when the R channel is selected.

#### [5] button
Selects Main, or Send (in this order) for the selected track.

#### [6] button
Switches the mode of the knob controls for the panner. The [6] button indicator lights up or turns off.

#### [7] button
Selects Send, or Main (in this order) for the selected track.

#### [8] button
Mutes or unmutes the selected track. The [8] button indicator lights up while the track is muted.

#### [DIRECT] button
Functions the same as the [SHIFT] key on the computer keyboard.

### ■ DYNAMICS
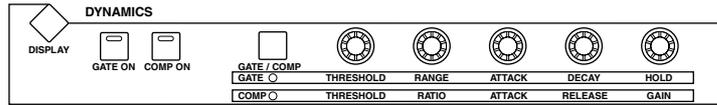


### [THRESHOLD] control

If the ROUTING [6] button indicator is off, the [THRESHOLD] control adjusts the front position. If the ROUTING [6] button indicator is lit, the control adjusts the front divergence.

### [RANGE/RATIO] control

If the ROUTING [6] button indicator is off, the [RANGE/RATIO] control adjusts the rear position. If the ROUTING [6] button indicator is lit, the control adjusts the rear divergence.

### [ATTACK] control

If the ROUTING [6] button indicator is off, the [ATTACK] control adjusts the F/R (front/rear) position. If the ROUTING [6] button indicator is lit, the control adjusts the F/R (front/rear) divergence.

### [DECAY/RELEASE] control

If the ROUTING [6] button indicator is off, the [DECAY/RELEASE] control adjusts the LFE level. If the ROUTING [6] button indicator is lit, this control adjusts the center percentage.

### [HOLD/GAIN] control

Adjusts the channel volume.

### ■ PAN/SURROUND
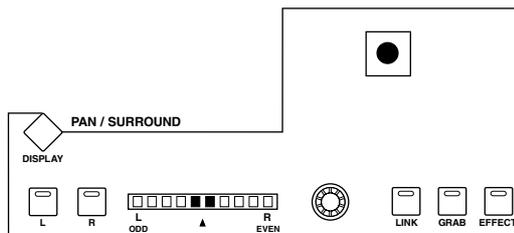


### [GRAB] button

Press this button, turning on the button indicator, then operate the Joystick to quickly set the pan position.

### Joystick

Operating the Joystick while the [GRAB] button indicator is turned on enables you to quickly set the pan position.

### USER DEFINED KEYS Section
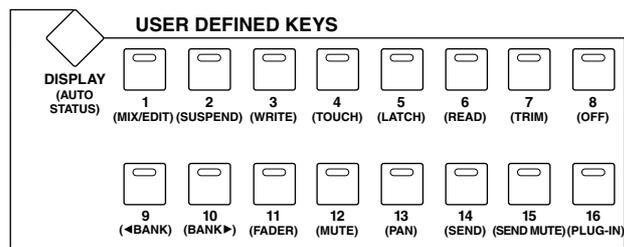


### [DISPLAY] (AUTO STATUS) button

This button is used to display the Automation mode settings of all channels. See "Viewing the Automation Mode" on page 216 for more information.

### [1] (MIX/EDIT)

This button is used to toggle between the Mix and Edit windows.

### [2] (SUSPEND) button

This button is used to temporarily suspend all automation recording and playback. Its indicator flashes while automation is suspended.

### [3] (WRITE), [4] (TOUCH), [5] (LATCH), [6] (READ), [7] (TRIM), [8] (OFF) buttons

These buttons are used in conjunction with the channel strip [AUTO] buttons to set the Automation mode of each channel strip. See "Setting the Automation Mode" on page 216 for more information.

### [9] (◀ BANK) & [10] (BANK ▶) buttons

These buttons are used to swap channel banks 24 channels at a time.

### [11] (FADER), [12] (MUTE), [13] (PAN), [14] (SEND), [15] (SEND MUTE), [16] (PLUG-IN) buttons

These buttons are used to select parameters for automation recording and playback. See "Arming Parameters for Automation" on page 217 for more information.

## MACHINE CONTROL Section
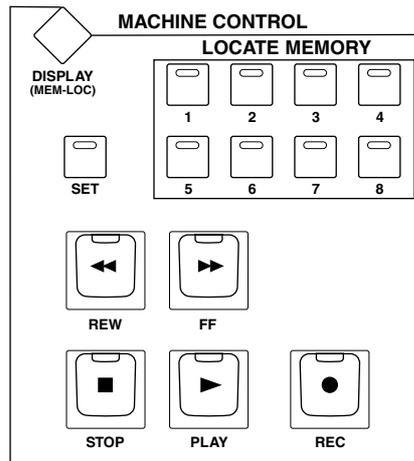


### [DISPLAY] (MEM-LOC) button
This button is used to open and close the Memory Locations window.

### LOCATE MEMORY [1–8] buttons
These buttons perform the same transport-related functions as the 1–8 number keys on a Macintosh keyboard. If you set the Numeric keypad Mode in Pro Tools to "Classic" (Setups menu, Preferences), these buttons can be used to directly locate markers 1–8.

### [REW] button
This button rewinds from the current cursor position (it's non-latching).

### [FF] button
This button fast forwards from the current cursor position (it's non-latching).

### [STOP] button
This button stops playback and recording.

### [PLAY] button
This button starts playback from the current cursor position.

### [REC] button
This button arms Pro Tools for recording ([REC] button indicator flashing), recording is started by pressing the [PLAY] button ([REC] button indicator lit continuously).

The MACHINE CONTROL section enables you to control Pro Tools only while the DAW CONTROL option is turned on either on the Locate Memory page (see page 224) or on the Machine Configuration page (see page 222), regardless of which layer is currently selected.

## Data Entry Section
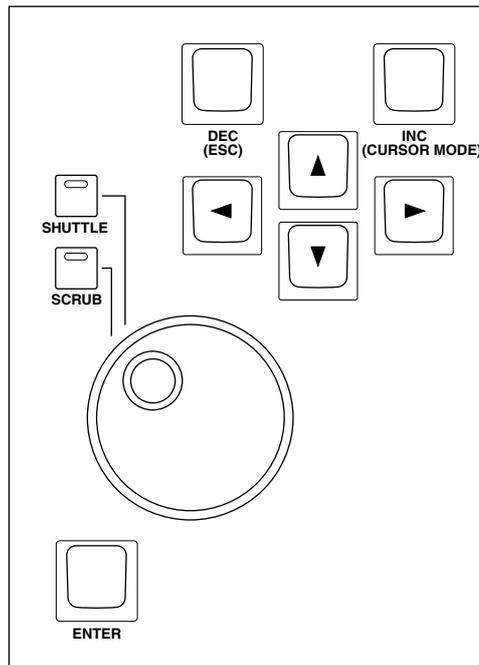


### Parameter Wheel

The Parameter wheel is used for shuttling and scrubbing (see page 215). It's also used for making fine adjustments to the selected region (see page 215).

### [SHUTTLE] & [SCRUB] buttons

These buttons are used to select the Shuttle and Scrub modes. See "Scrub & Shuttle" on page 215 for more information. These buttons are mutually exclusive with the [QUICK PUNCH] and [LOOP] buttons. Also, the cursor in the window on the computer monitor disappears.

### [ENTER] button

This button works the same as the Enter key on your computer keyboard. Pressing it opens the New Memory Location dialog box. While a dialog box is open, pressing it performs the same action as clicking the OK button.

### [DEC] (ESC) button

For the most part, this button works the same as the Esc key on your computer keyboard. While a dialog box is open, pressing it performs the same action as clicking the Cancel button.

### [INC] (CURSOR MODE) button

This button is used to select the following cursor modes: Navigation (see page 214), Zoom (see page 215), and Select (see page 215).

### Cursor buttons

These buttons can be used to navigate the Edit window (see page 214), zoom waveforms (see page 215), and to make fine adjustments to the selected region (see page 215). Their exact operation depends on the currently selected cursor mode.

## Selecting Channels

Channels can be selected as follows.

(Make sure the EFFECTS/PLUG-INS [CHANNEL INSERTS] button indicator is not lit before proceeding.)

**1 Use the [SEL] buttons to select channels.**

The [SEL] button indicators of selected channels light up.

**2 To select multiple channels in each eight-channel block (e.g., 1–8, 9–16, or 17–24), while holding down one [SEL] button, use the [SEL] buttons of the other channels in the same block to add and remove channels.**

## Setting Channel Levels

Channel levels can be set as follows.

(Make sure the FADER MODE [FADER] and [AUX] button indicators are not flashing before proceeding.)

**1 Use the faders to set channels levels.**

Faders in a mix group are controlled together.

## Muting Channels

Channels can be muted as follows.

**1 Use the [ON] buttons to mute channels.**

The [ON] button indicators of muted channels go out.

**2 Press the [ON] buttons again to unmute channels.**

The [ON] button indicators of unmuted channels are lit.

Grouped channels are muted together.

## Panning Channels

Channels can be panned as follows.

**1 Press the ENCODER MODE [PAN] (PAN) button.**

Its indicator lights up.

**2 Use the Encoders to pan the channels.**

Pan positions are displayed in Channel Display mode. See "Channel Display Mode" on page 200 for more information.

For stereo aux input channels (i.e., channels with two panpots), use the ENCODER MODE [PAN] (PAN) button to toggle between the left and right panpots, and pan with the Encoder. When the left panpot is active, the ENCODER MODE [PAN] (PAN) button indicator is lit continuously and the SELECT ASSIGN section of the display shows "Pan." When the right panpot is active, the ENCODER MODE [PAN] (PAN) button indicator flashes and the SELECT ASSIGN section of the display shows "PanR."

## Soloing Channels

Channels can be soloed as follows.

**1   Use the [SOLO] buttons to solo channels.**

The [SOLO] button indicators of soloed channels light up and the [ON] button indicators of unsoloed channels flash.

**2   Press the [SOLO] buttons again to unsolo channels.**

Grouped channels are soloed together.

## Viewing Send Destinations

Send destinations can be viewed in Channel Display mode [F3] or Meter Display mode [F4] (see page 200) by pressing the holding the AUX SELECT [AUX 1]–[AUX 5] (SEND A–E) buttons.

## Configuring Sends as Pre or Post

Sends can be configured as either pre or post as follows.

(Make sure the ENCODER MODE [PAN] (PAN) button indicator is not lit before proceeding.)

**1   Use the AUX SELECT [AUX 1]–[AUX 5] (SEND A–E) buttons to select the sends.**

The ENCODER MODE [AUX] (SEND LEVEL) button indicator lights up, as does the button indicator of the selected send.

**2   Use the Encoder push-switches to toggle between pre and post.**

Sends can also be set as pre or post fader by using the Encoder push-switches in Flip mode. See "Flip Mode" on page 211 for more information.

Send pre/post status can be viewed in Channel Display mode [F3] or Meter Display mode [F4] (see page 200) by pressing the holding the Encoder push-switches.

## Setting Send Levels

Send levels can be set as follows.

**1   Use the AUX SELECT [AUX 1]–[AUX 5] (SEND A–E) buttons to select the sends.**

The ENCODER MODE [AUX] (SEND LEVEL) button indicator lights up, as does the button indicator of the selected send.

The levels for the selected send are displayed in Channel Display mode. See "Channel Display Mode" on page 200 for more information.

**2   Use the Encoders to set the send levels.**

Send levels can also be set by using the faders in Flip mode. See "Flip Mode" on page 211 for more information.

## Muting Sends

Sends can be muted by using the [ON] buttons in Flip mode. See "Flip Mode" on page 211 for more information.

## Panning Sends

Only sends assigned to stereo destinations can be panned. Sends can be panned by using the Encoders in Flip mode. See "Flip Mode" on page 211 for more information.

# Flip Mode

In Flip mode, the faders, Encoders, and [ON] buttons can be used to control sends, as shown in the following table.

| Control | Normal mode | Flip mode |
|---|---|---|
| Fader | Channel level | Send level |
| Encoder | Channel pan/send level | Send pan |
| Encoder push-switches | Encoder mode is Pan, inactive<br>Encoder mode is Send level, Send pre/post | Send pre/post |
| [ON] button | Channel mute | Send mute |

**1   Press the FADER MODE [FADER] or [AUX] button.**

The FADER MODE [FADER] and [AUX] button indicators flash alternately, and both the ENCODER MODE [PAN] (PAN) and [AUX] (SEND LEVEL) button indicators light up. The SELECT ASSIGN section of the display shows "FLIP."

**2   Use the AUX SELECT [AUX 1]–[AUX 5] (SEND A–E) buttons to select the sends.**

The button indicator of the selected send lights up.

**3   Use the faders, Encoders, and [ON] buttons to control the currently selected send.**

For stereo aux input channels (i.e., channels with two send panpots), use the ENCODER MODE [PAN] (PAN) button to toggle between the left and right panpots, and pan with the Encoder. When the left panpot is active, the ENCODER MODE [PAN] (PAN) button indicator is lit continuously. When the right panpot is active, the ENCODER MODE [PAN] (PAN) button indicator flashes.

## Assigning Inserts/Plug-ins

Inserts can be assigned to channels as follows. The Pro Tools transport must be stopped in order to make these assignments.

**1    Press the EFFECTS PLUG-INS [CHANNEL INSERTS] button.**

Its indicator lights up and the [SEL] buttons are set to Insert Select mode.

**2    Use the [SEL] buttons to select channels for insert assignment.**

The name of the selected channel appears in the INSERT/PARAM section of the display. The border of the corresponding channel name in the Pro Tools Mix window is highlighted red.

**3    Press the EFFECTS/PLUG-INS [1] (ASSIGN) button.**

Its indicator flashes, as does the ASSIGN indicator on the display.

**4    Use Parameter controls 1–4 to select inserts/plug-ins.**

The names of the inserts/plug-ins appear on the display in abbreviated form. When you select an insert/plug-in other than the current, the corresponding SEL button flashes on the display.

**5    To confirm your selection, press the relevant Parameter control's push-switch.**

The SEL button stops flashing.

While the EFFECTS/PLUG-INS [1] (ASSIGN) button indicator is still flashing, you can assign more inserts/plug-ins to the same channel. To set insert #5, press the Parameter Down (SCROLL >) button. Press the Parameter Up (< SCROLL) button to view inserts 1–4 again.

To assign inserts/plug-ins to other channels, use the [SEL] buttons to select them. You'll need to press the EFFECTS/PLUG-INS [1] (ASSIGN) button each time you select another channel.

You can cancel this function by pressing the [DEC] (ESC) button.

## Editing Plug-ins

Plug-ins can be edited as follows.

**1**   **Press the EFFECTS PLUG-INS [CHANNEL INSERTS] button.**

Its indicator lights up and the [SEL] buttons are set to Insert Select mode.

**2**   **Use the [SEL] buttons to select the channel whose plug-in you want to edit.**

That channel's [SEL] button indicator lights up, and the border of the corresponding chan-
nel name in the Pro Tools Mix window is highlighted red. The names of the Plug-ins
inserted in the channel are displayed in the INSERT ASSIGN/EDIT section of the display.

**3**   **Use the Parameter control 1–4 push-switches to select the plug-in that you
want to edit.**

Plug-in Edit mode is set and the plug-in's parameters are displayed in the INSERT
ASSIGN/EDIT section of the display. The EFFECTS/PLUG-INS [4] (INSERT/PARAM)
button indicator lights up and the PARAM indicator on the display appears highlighted.

**4**   **Use Parameter controls 1–4 and their push-switches to edit the displayed
parameters.**

Parameters displayed on the top row can be edited by using the push-switches. Parameters
displayed on the bottom row can be edited by using the Parameter controls.

**5**   **Use the Parameter Down (SCROLL >) button and Parameter Up (< SCROLL)
button to select the parameter pages.**

When a parameter page is first selected, the number of the current parameter page and the
total number of parameter pages is displayed momentarily. For example, "1/2" indicates
that the first page of two is currently selected. While "3/4" indicates that the third page of
four is currently selected. The title of the plug-in is also displayed.

While editing a plug-in you can bypass it by pressing the EFFECTS/PLUG-INS [3]
(BYPASS) button. In which case, the BYPASS indicator on the display appears highlighted.

As soon as you begin editing a plug-in, the COMPARE indicator on the display appears
highlighted. You can compare your edits with the original settings by pressing the
EFFECTS/PLUG-INS [2] (COMPARE) button. The COMPARE indicator on the display
appears highlighted while the original settings are active, and unhighlighted while your
edits are active.

**6**   **To edit another plug-in, press the EFFECTS/PLUG-INS [4] (INSERT/PARAM)
button (its indicator goes out), use the [SEL] buttons to select the channel
(same as step #2), and use the Parameter control 1–4 push-switches to select
the plug-in (same as step #3).**

## Bypassing Plug-ins

Plug-ins can be bypassed as follows.

(Make sure the EFFECTS/PLUG-INS [4] (INSERT/PARAM) button indicator is not lit before proceeding.)

**1    Press the EFFECTS PLUG-INS [CHANNEL INSERTS] button.**

Its indicator lights up and the [SEL] buttons are set to Insert Select mode.

**2    Use the [SEL] buttons to select plug-ins.**

**3    While holding down the EFFECTS/PLUG-INS [3] (BYPASS) button, use Parameter control 1–4 push switches to bypass the plug-ins.**

To bypass plug-in #5, press the Parameter Down (SCROLL >) button, and then perform step 3. Press the Parameter Up (< SCROLL) button to view plug-ins 1–4 again.

The titles of bypassed plug-ins are displayed in uppercase characters. For example, the title of the plug in "D-Verb" appears as "d-verb" when it's not bypassed, and appears as "D-VERB" when it is bypassed.

## Resetting Faders, Sends, & Panpots

Faders, panpots, and sends can be reset to their default values as follows. For faders and send controls, this is "0." For panpots, it's center.

Make sure that the EFFECTS PLUG-INS [CHANNEL INSERTS] button indicator is off before proceeding with these shortcuts.

| To do this... | Do this! |
| --- | --- |
| Reset a channel fader | EFFECTS PLUG-INS [PLUG-INS]+[SEL] |
| Reset a channel panpot | [PAN], EFFECTS PLUG-INS [PLUG-INS]+[ENCODER push] |
| Reset a channel send level | AUX SELECT [AUX 1]–[AUX 5], EFFECTS PLUG-INS [PLUG-INS]+[ENCODER push] |

While the EFFECTS PLUG-INS [PLUG-INS] (DEFAULT) button is being pressed, its indicator flashes and "DFLT" appears in the SELECT ASSIGN section of the display.

Grouped channels are reset together.

## Navigating the Edit Window

The cursor buttons can be used to navigate the Edit window as follows.

**1    Use the [INC] (CURSOR MODE) button to select Navigation cursor mode.**

The CURSOR MODE section of the display shows "NAVIGATION."

**2    To move the edit cursor to the previous region boundary, or to the previous marker, press the Left cursor button.**

**3    To move the edit cursor to the next region boundary, or to the next marker, press the Right cursor button.**

**4    To select the track above, press the Up cursor button.**

**5    To select the track below, press the Down cursor button.**

## Zooming

The cursor buttons can be used to zoom the Edit window as follows.

**1    Use the [INC] (CURSOR MODE) button to select Zoom cursor mode.**

The CURSOR MODE section of the display shows "ZOOM."

In Zoom cursor mode, the cursor buttons work as follows:

· Left cursor button: Zoom out horizontally.

· Right cursor button: Zoom in horizontally.

· Up cursor button: Zoom in vertically.

· Down cursor button: Zoom out vertically.

## Making Fine Adjustments to the Selected Region

The cursor buttons can be used in conjunction with the Parameter wheel to make fine adjustments to the selected region.

**1    Use the [INC] (CURSOR MODE) button to select Select cursor mode.**

The CURSOR MODE section of the display shows "SELECT."

**2    While holding down the left cursor button, turn the Parameter wheel to make fine adjustments to the in point of the selected region.**

**3    While holding down the right cursor button, turn the Parameter wheel to make fine adjustments to the out point of the selected region.**

**4    To select the track above, press the Up cursor button.**

**5    To select the track below, press the Down cursor button.**

**6    To move the cursor to the in point of the selected region, double-click the Left cursor button.**

**7    To move the cursor to the out point of the selected region, double-click the Right cursor button.**

## Scrub & Shuttle

The Parameter wheel can be used to scrub and shuttle as follows.

**1    Make sure that Pro Tools is stopped.**

**2    Press the [SCRUB] button if you want to scrub, press the [SHUTTLE] button if you want to shuttle.**

The corresponding button indicator lights up. The [REW] and [FF] button indicators also light up, and the cursor mode is set to Navigation (the CURSOR MODE section of the display shows "NAVIGATION").

**3    Turn the Parameter wheel clockwise to scrub/shuttle forwards. Turn it counterclockwise to scrub/shuttle backwards.**

Scrub/shuttle starts at the in point of the selected region. If no region is selected, the edit cursor position is used. Note that if the Edit Insertion Follows Scrub/Shuttle preference is turned on in Pro Tools (Setups menu, Preferences command, Operation page), the currently selected region will be cancelled when the [SCRUB] or [SHUTTLE] button is pressed.

Press the left cursor button to move to the in point. Press the right cursor button, to move to the out point.

You can toggle between scrub and shuttle by pressing the [SCRUB] and [SHUTTLE] buttons, in which case scrub or shuttle continues from the current position.

4   **To stop scrub/shuttle, press the [SCRUB] or [SHUTTLE] button again, or press the [STOP] button.**

If you press the [REW], [FF], or [PLAY] button, scrub/shuttle operation is stopped before rewind, fast forward, or playback commences.

While scrub/ shuttle is active, only the following Pro Tools/02R96 controls can be used: [SCRUB] and [SHUTTLE] buttons, Parameter wheel, transport buttons, faders, [ON] buttons, and [SOLO] buttons. The current position can be stored as a marker by pressing the [ENTER] button.

The scrub resolution depends on the current zoom setting, the more zoomed in you are, the higher the resolution.

## Automation

### Viewing the Automation Mode

The Automation mode setting of each channel can be viewed as follows.

1   **Press either the [F3] or [F4] button.**

Channel Display mode or Meter Display mode is selected.

2   **Press and hold a channel's [AUTO] button.**

The channel's Automation mode is displayed while the [AUTO] button is pressed.

| Pro Tools | Display | [AUTO] Button Indicators |
|---|---|---|
| **Auto write** | Wrt | Flashing red (Record Ready) Red (Recording) |
| **Auto touch** | Tch | |
| **Auto latch** | Ltch | |
| **Auto read** | Read | Green |
| **Auto off** | Off | Off |

For MIDI tracks, "—" appears on the display.

The Automation mode settings of all channels can be viewed as follows.

3   **Press and hold the USER DEFINED [DISPLAY] (AUTO STATUS) button.**

The Automation modes of all channels are displayed while the USER DEFINED [DISPLAY] (AUTO STATUS) button is pressed.

### Setting the Automation Mode

The Automation mode can be set as follows.

1   **While holding down a channel's [AUTO] button, press the USER DEFINED [3] (WRITE), [4] (TOUCH), [5] (LATCH), [6] (READ), [7] (TRIM), or [8] (OFF) button.**

If Channel Display mode or Meter Display mode is currently selected, the channel's Automation mode is displayed while the [AUTO] button is pressed.

Grouped channels are set together.

### Trim Mode

Trim mode can be set as follows.

**1  While holding down a channel's [AUTO] button, press the USER DEFINED KEYS [7] (TRIM) button.**

If channel Display mode [F3] or Meter Display mode [F4] is currently selected, the channel's Automation mode is displayed while its [AUTO] button is pressed.

| Pro Tools | Display | [AUTO] Button Indicators |
|---|---|---|
| **Auto trim/write** | TWrt | Flashing red/orange (Record Ready) Orange (Recording) |
| **Auto trim/touch** | TTch | |
| **Auto trim/latch** | TLch | |
| **Auto trim/read** | TRd | Flashing green/orange |

You can display the Automation mode settings of all channels by pressing and holding the USER DEFINED KEYS [DISPLAY] (AUTO STATUS) button.

Grouped channels are set together.

### Arming Parameters for Automation

Parameters can be selected for automation recording as follows.

**1  Use the following USER DEFINED KEYS to arm parameters.**

| USER DEFINED KEYS | Pro Tools |
|---|---|
| [11] (FADER) | Volume |
| [12] (MUTE) | Mute |
| [13] (PAN) | Pan |
| [14] (SEND) | Send level |
| [15] (SEND MUTE) | Send mute |
| [16] (PLUG-IN) | Plug-in |

The button indicators for armed parameters light up.

## Panner

### Selecting a Track

Use the SELECTED CHANNEL ROUTING buttons to manipulate the following track operations.

| To do this... | Use these buttons: |
|---|---|
| Selecting the previous track | ROUTING [1] button |
| Selecting the next track | ROUTING [2] button |
| Selecting the top track | ROUTING [3] + [1] buttons |
| Selecting the last track | ROUTING [3] + [2] buttons |
| Selecting the main output of the selected track | ROUTING [3] + [5] buttons |
| Selecting Send 5 of the selected track | ROUTING [3] + [7] buttons |
| Selecting the output/send of the selected track | ROUTING [5] + [7] buttons |

### Stereo Track Link

You can control the panner for the L and R channels of stereo tracks simultaneously or individually, depending on the stereo link status.

To cancel the stereo panner link, press and hold down the [Control] key on the keyboard and move the Joystick.

## Panner Operation via the Joystick

**1    Select the track you wish to pan.**

**2    Press the [GRAB] button, turning on the [GRAB] button indicator.**

**3    While the [GRAB] button indicator is lit, operate the Joystick.**

If you move the Joystick for direct panning while the [GRAB] button indicator is lit, the pan position is specified as an absolute value, which may cause the pan position to jump drastically.

You can also restrict the trajectory direction of the Joystick. To limit movement to the L and R directions, press and hold down the [DIRECT] button and move the Joystick. To limit movement to the up and down (front and rear) directions, select 3 Knob mode in the Pro Tools Panner window.

## Panner Operation via Knob Controls

You can control the following parameters using the DYNAMICS controls.

| Controls | ROUTING [6] indicator is off | ROUTING [6] indicator is on |
|---|---|---|
| **THRESHOLD** | Front position | Front divergence |
| **RANGE/RATIO** | Rear position | Rear divergence |
| **ATTACK** | F/R position | F/R divergence |
| **DECAY/RELEASE** | LFE level | Center percentage |
| **HOLD/GAIN** | Channel volume ||

**1    Select the track and output, if desired.**

**2    Press the ROUTING [6] button to select the knob control mode that is appropriate for the parameter you wish to control.**

**3    Use the appropriate control to adjust the parameter.**

Pressing and holding down the [Command] key on the keyboard and rotating the controls reduces the change in the parameter values.

# 19  Remote Control

## About the Remote Layer

The 02R96's Remote Layer allows you to control external MIDI equipment directly from the 02R96. The type of device to be controlled (i.e., the target) can be specified for each Remote Layer. There are six types of target: User Defined, Pro Tools, Nuendo, Cubase SX, General DAW, and User Assignable Layer. User Defined targets allow you to specify the MIDI data that will be transmitted when the 24 channel strip faders, Encoders, and [ON] buttons are operated. These settings are stored in Scenes, for snapshot-style automation. The Pro Tools, Nuendo, Cubase SX, and General DAW targets have been especially designed to control Pro Tools, Nuendo, Cubase SX, and other DAW software that uses the Pro Tools protocol.

The User Assignable Layer target enables you to combine 02R96 channels to create a custom layer. See page 228 for more information on the User Assignable Layer.

### Assigning a Target to the Remote Layer

Targets are assigned to the Remote Layer as follows.

**1    Use the DISPLAY ACCESS [REMOTE] button to locate the Remote 1–4 pages.**
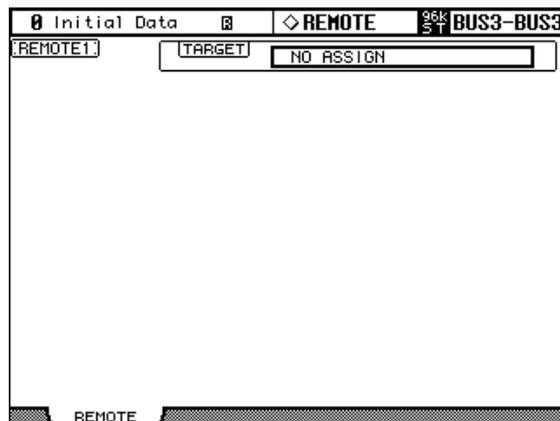


**2    Use the cursor buttons to select the TARGET parameter, use the Parameter wheel or INC/DEC buttons to select a target, and then press [ENTER].**

**TARGET:** This can be set to NO ASSIGN, USER DEFINED, Pro Tools, Nuendo, Cubase SX, General DAW, or User Assignable Layer. See page 220 for more information on the User Defined target. See page 196 for more information on the Pro Tools target. See page 228 for more information on the User Assignable Layer.

To conrol Nuendo or Cubase SX remotely, make the following settings in addition to the TARGET parameter.

**3    Select the desired port for the DAW parameter on the MIDI/To Host Setup page (see page 191).**

**4    Select an appropriate device in the Device menu of Nuendo or Cubase SX and specify the 02R96 as a controller.**

For more information on the necessary settings, refer to the Owner's Manual that came with Nuendo or Cubase SX.

### Configuring the User Defined Remote Layer

The User Defined Remote Layer can be configured as follows.

1   **Use the DISPLAY ACCESS [REMOTE] button to locate the Remote page.**
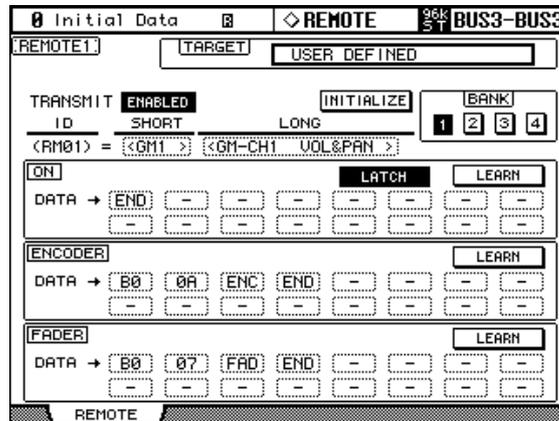


2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**TARGET:** This is used to select the target (only the User Defined target is explained in this section).

**TRANSMIT:** This enables and disables MIDI data transmission for the Remote Layer.

**INITIALIZE:** This initializes the settings of the currently selected bank.

**BANK:** These buttons are used to select banks 1, 2, 3, and 4. Each bank can contain MIDI settings for the 24 faders, Encoders, and [ON] buttons. Banks can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195). See "User Defined Remote Layer Initial Bank Settings" on page 255 for a list of initial bank settings.

**ID/SHORT/LONG:** On the Remote Layer, channel strips 1–24 are identified by the fixed IDs RM01–RM24. You can enter a Short and Long name for each Remote channel strip. To enter a name, use the cursor buttons to select the SHORT or LONG name, use the [SEL] buttons, Parameter wheel, or INC/DEC buttons to select the channel strips, and then press [ENTER]. When the Title Edit window appears, enter a name, and press OK when you've finished. See "Title Edit Window" on page 46 for more information.

**ON:** These parameters are used to specify the MIDI message (up to 16 bytes) to be transmitted when an [ON] button is pressed. Use the [SEL] buttons to select the channel strips, and then edit as necessary. When a value from 00 to FF is specified, that value is transmitted when an [ON] button is pressed. For the SW setting, data value 7F is transmitted when an [ON] button is turned on, and data value 00 is transmitted when an [ON] button is turned off. The END setting specifies the end of the data. "–" means no data is transmitted.

**UNLATCH/LATCH:** This parameter determines the operation of the [ON] buttons: Latching or Non-latching. When set to UNLATCH, an ON value is transmitted when an buttons is pressed, and an OFF value is transmitted when it's released. When set to LATCH, an ON value is transmitted when the button is pressed and that value is maintained when the button is released. The next time you press that button, the OFF value is transmitted.

**LEARN:** This button is used to turn on and off the Learn function, which can be used to learn what MIDI messages are being transmitted by external MIDI devices when their controls or parameters are adjusted. When on, received MIDI messages are displayed in the DATA area. Only the first 16 bytes of data, starting with a Status bit, are displayed.

**ENCODER:** These parameters are used to specify the MIDI message (up to 16 bytes) to be transmitted when an Encoder is operated. Use the [SEL] buttons to select the channel strips, and then edit as necessary. When a value from 00 to FF is specified, that value is transmitted

when an Encoder is adjusted. For the ENC setting, the Encoder's current value from 0–127 is transmitted when it's adjusted. The END setting specifies the end of the data. "–" means no data is transmitted.

**LEARN:** This works the same as the [ON] button Learn function above, except the received MIDI messages are displayed in the ENCODER DATA area. Only one Learn function can be used at a time.

**FADER:** These parameters are used to specify the MIDI message (up to 16 bytes) to be transmitted when a fader is operated. Use the [SEL] buttons to select the channel strips, and then edit as necessary. When a value from 00 to FF is specified, that value is transmitted when a fader is adjusted. For the FAD setting, a fader's current value from 0–127 is transmitted when it's adjusted. The END setting specifies the end of the data. "–" means no data is transmitted.

**LEARN:** This works the same as the [ON] button Learn function above, except the received MIDI messages are displayed in the FADER DATA area. Only one Learn function can be used at a time.

### Using the User Defined Remote Layer

Once configured, the User Defined Remote Layer can be used as follows.

**1    Use the LAYER [REMOTE] button to select the User Defined Remote Layer.**
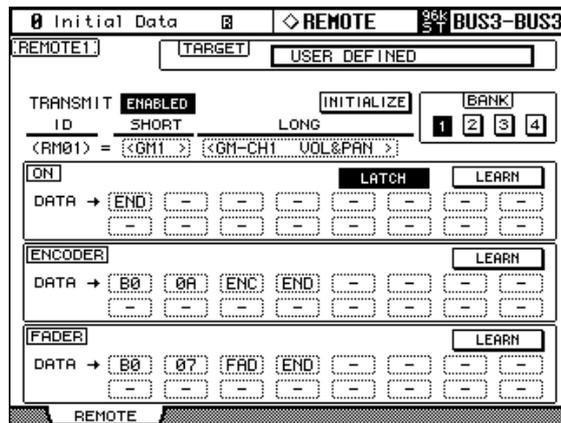


While the User Defined Remote Layer is selected, operating the channel strip faders, Encoders, and [ON] buttons causes the specified MIDI data to be transmitted.

When the User Defined Remote Layer is selected, the Remote page appears. Since this is the same page as that selected by the DISPLAY ACCESS [REMOTE] button, the User Defined Remote Layer can be configured here as well, even the target can be changed.

The settings of the channel strip faders, Encoders, and [ON] buttons, and the current target and bank setting for the Remote Layer are stored in Scenes. When a Scene is recalled, if the Remote Layer's target is the same as when the Scene was stored, the faders, Encoders, and [ON] buttons are set accordingly and the corresponding MIDI data is transmitted (so long as the TRANSMIT parameter is set to ENABLED). If the target is not the same, the faders, Encoders, and [ON] buttons are set accordingly, but no MIDI data is transmitted.

# About Machine Control

The 02R96 can control the transport and locate functions of up to eight external recording machines that support MMC (MIDI Machine Control).

Machines that support MMC can be controlled by connecting them to the 02R96's MIDI, SERIAL, USB, or SLOT1 (with optional mLAN I/O Card installed in Slot #1).

MMC support varies from machine to machine. Some machines may not operate exactly as explained in this section.

## Configuring Machines

Up to eight machines can be configured as follows.

1   **Use the MACHINE CONTROL [DISPLAY] button to locate the Machine Configuration page.**



2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**MACHINE CONTROL/DAW CONTROL:** When the MACHINE CONTROL option is on, the MACHINE CONTROL section controls external MMC machines, regardless of the layer selection. When the DAW CONTROL option is on, the MACHINE CONTROL section controls DAWs, regardless of the layer selection.

**TYPE:** This is used to specify the type of machine: MMC or NONE.

**PORT:** When the machine TYPE is MMC, use this parameter to specify the port for MMC communications. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1.

**DEVICE ID:** When the machine TYPE is MMC, use this parameter to specify the device ID from 1 to 127 or ALL. The target machine must be set to the same ID. The same ID cannot be assigned to more than one SERIAL, USB, or SLOT1 port.

**TRANSPORT CONTROL:** This parameter determines which machine is controlled by the 02R96's transport buttons. Only one machine can be controlled at a time.

## Transport Buttons

The 02R96's transport can be used to control external machines. The machine that is to be controlled can be selected on the Machine Configuration page (see page 222).
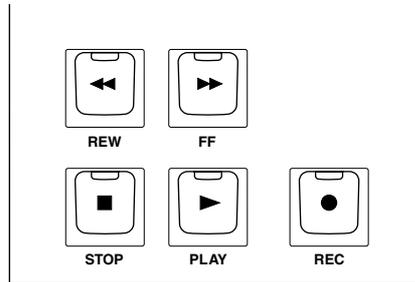
### [REW] button
This button starts rewind on the external machines.

### [FF] button
This button starts fast forward on the external machines.

### [STOP] button
This button stops the external machines.

### [PLAY] button
This button starts playback on the external machines. It's also used to punch out of recording.

### [REC] button
This button is used in conjunction with the [PLAY] button to start recording on the external machines.

## Using Shuttle & Scrub

The Parameter wheel can be used to shuttle and scrub the external machines.
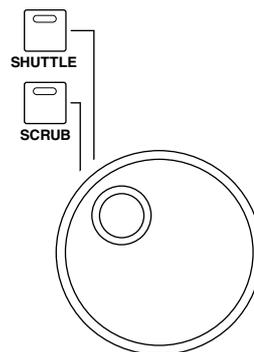
When the [SHUTTLE] button indicator is lit, the Parameter wheel can be used to shuttle. When the [SCRUB] button indicator is lit, the Parameter wheel can be used to scrub. Turn the Parameter wheel clockwise to shuttle/scrub forwards. Turn it counterclockwise to shuttle/scrub backwards.

## Using the Locator
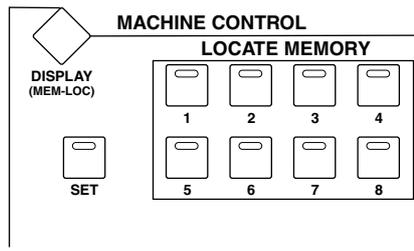


### LOCATE MEMORY [1–8] buttons

These buttons are used to set and to locate to the eight Locate memories. Locate memories can be set on the Locate Memory page (see page 224). To set a locate memory on-the-fly, while holding down the [SET] button, press a LOCATE MEMORY [1–8] button. The 02R96 must be receiving timecode in order to do this. Once set, the stored position can be located by pressing the corresponding button. If the button is pressed while the machine is stopped, the stored position is located. If the button is pressed while the machine is playing, the stored position is located and then playback continues from that position.

### [SET] button

This button is used in conjunction with the LOCATE MEMORY [1–8], [IN], [OUT], and [RETURN TO ZERO] buttons to set the locate points.

## Setting the Locate Memories

The locate points can be set as follows.

1   **Use the MACHINE CONTROL [DISPLAY] button to locate the Locate Memory page.**
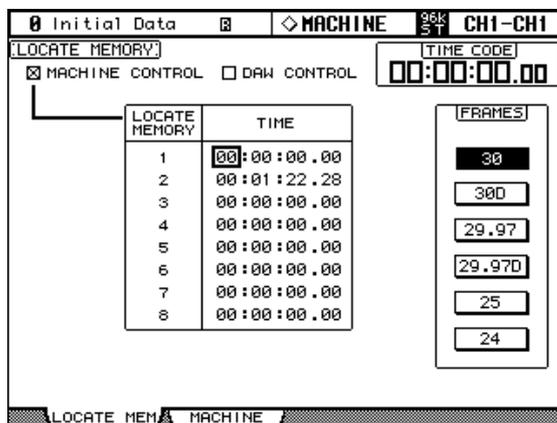


2   **Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.**

**MACHINE CONTROL/DAW CONTROL:** When the MACHINE CONTROL option is on, the MACHINE CONTROL section controls external MMC machines, regardless of the layer selection. When the DAW CONTROL option is on, the MACHINE CONTROL section controls DAWs, regardless of the layer selection.

**LOCATE MEMORY 1–8:** These time values determine the points that will be located when the LOCATe MEMORY [1–8] buttons are pressed. They can only be set while the MACHINE CONTROL option is on. Locate points can be specified in hours, minutes, seconds, and frames, the frame range being dependent on the frame rate setting on the Time Reference page (see page 177).

**FRAMES:** This parameter selects the timecode frame rate.

# GPI (General Purpose Interface)

The 02R96's CONTROL port (25-pin D-sub connector) provides a GPI (General Purpose Interface). You can configure the GPI so that it will output 8-channel trigger signals when you operate the faders or User Defined Keys, or receive 2-channel trigger signals to control 02R96 parameters.

```
CONTROL
```
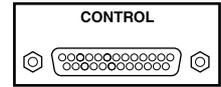
You can assign any function to these trigger signals. In this way, for example, you can control a "RECORDING" warning light outside a studio from the 02R96, or you can control the 02R96's Talkback function or Dimmer function using an outside switch.

See page 300 for more information on pin assignment.

This is an example of the external circuit that operates GPI. In this example, a trigger signal causes the LEDs to light up when the [⊔] button is selected as the trigger signal polarity in the OUTPUT section. A trigger signal causes the LEDs to turn off when the [⊓] button is selected as the trigger signal polarity.
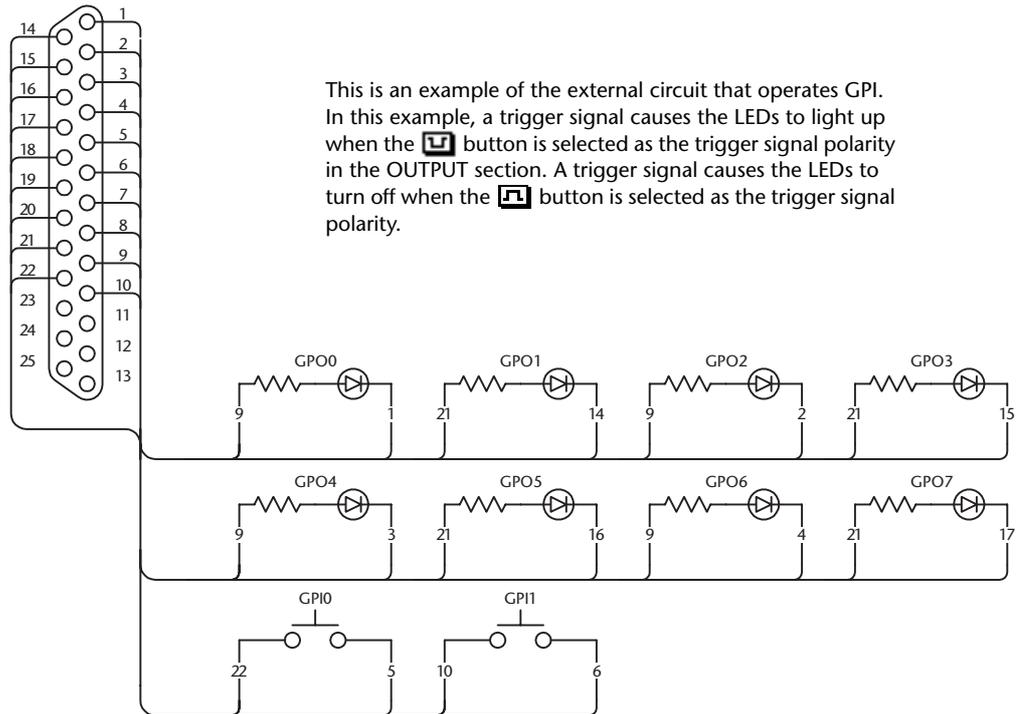
1    **Use the DISPLAY ACCESS [SETUP] button to select the GPI Setup page.**
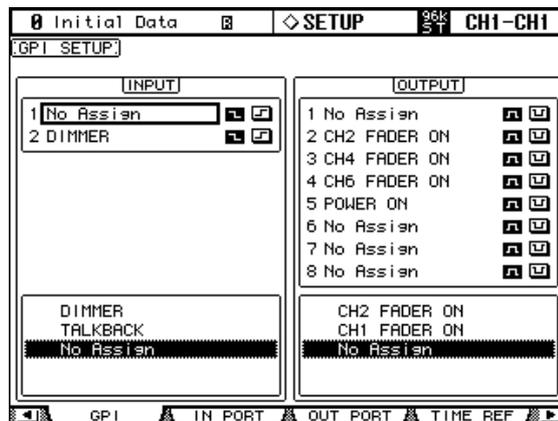
2    **To assign functions to incoming trigger signals, use the cursor buttons to select INPUT 1 or 2.**

3    **Use the Parameter wheel or INC/DEC buttons to select a parameter, then press [ENTER].**

**4 Select one of two buttons located to the right of trigger signal parameters INPUT 1 & 2 to specify how the incoming trigger signals will be detected.**

⊐⌐**:** When the switch is grounded (Low), the trigger signal is active and the selected parameter changes.

⊏⌐**:** When the GPI Input goes High (open), the trigger signal is active and the selected parameter changes.

You can execute functions assigned to the MONITOR section buttons and User Defined Keys, and turn channels on and off. See "GPI Trigger Source & Target List" on page 253 for a complete list of assignable functions.

> *Note: "xxx UNLATCH" means that the assigned function is enabled only while the incoming trigger signal is active. For example, if CH1 ON is selected, the channel on/off status changes each time the trigger signal is detected. If CH1 ON UNLATCH is selected, Channel 1 turns on only while the trigger signal is active.*

**Trigger =** ⊐⌐

Input signals from the CONTROL connector

Executes the function.      Executes the function.

**Trigger =** ⊏⌐

Input signals from the CONTROL connector

Executes the function.      Executes the function.
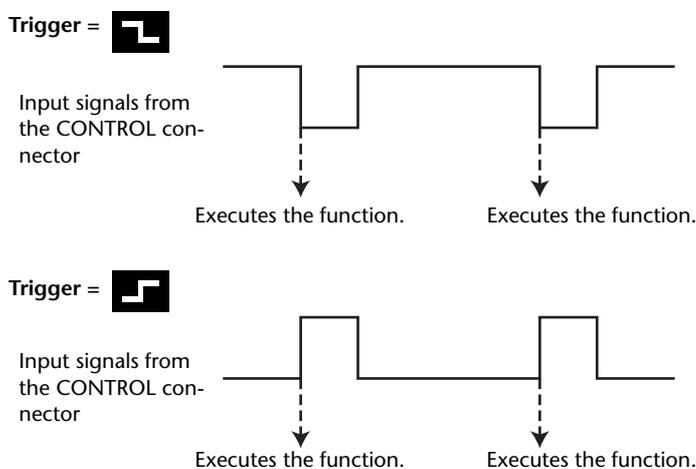
At this point, when the 02R96 receives the trigger signal at the CONTROL connector, the selected parameter changes.

> *Tip: Refer to the page 253 for a complete list of assignable parameters.*

**TALKBACK - SMALL:** Functions the same as the MONITOR section buttons.

**SR xxx:** Functions the same as the SURROUND buttons in the MONITOR section.

**CR xxx:** Functions the same as the CONTROL ROOM buttons in the MONITOR section.

**SM xxx:** Functions the same as the STUDIO buttons in the MONITOR section.

**xxx UNLATCH:** The assigned function is enabled only while the incoming trigger signal is active.

**xxx ON:** The corresponding channels turn on or off each time the incoming trigger signal becomes active.

**xxx ON UNLATCH:** The corresponding channels turn on only while the incoming trigger signal is active.

**UDEFxxx:** Functions the same as the USER DEFINED KEYS.

**5 To select parameters or controls as trigger signal sources, use the cursor buttons to select an output from OUTPUT 1–8, then select trigger signal parameters as you would for the INPUT section.**

See "GPI Trigger Source & Target List" on page 253 for a complete list of assignable parameters.

**6    Use the buttons located to the right of the OUTPUT (1–8) parameters to switch the polarity of the trigger signals that are output when you control the trigger sources.**

⊓**:** The GPI Output goes High (open) when the trigger signal source is active.

⊔**:** The GPI Output goes Low (ground) when the trigger signal source is active.

**Trigger signal polarity =** ⊔

Output signals from the
CONTROL connector

**Trigger signal polarity =** ⊓

Output signals from the
CONTROL connector
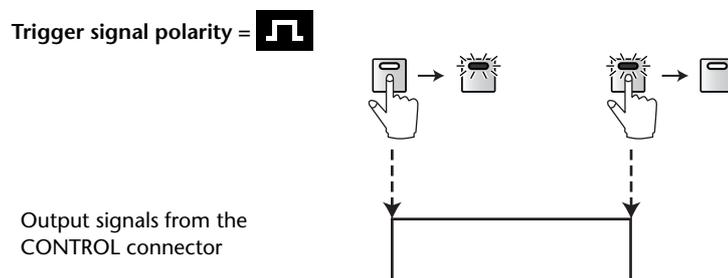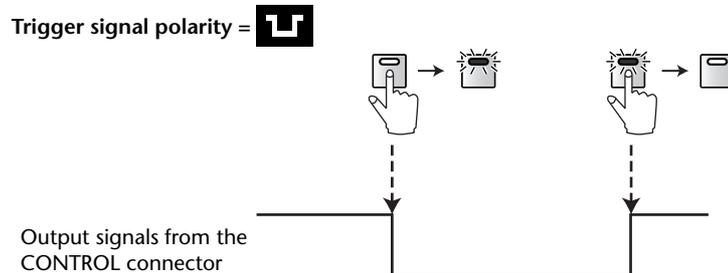
At this time, the trigger signal is output from the CONTROL connector when you operate the assigned parameters or controls.

*Tip: Refer to page 253 for a complete list of assignable parameters and controls.*

**xxx FADER ON:** A trigger signal of 250 ms is transmitted when you raise a fader from –∞.

**xxx FADER OFF:** A trigger signal of 250 ms is transmitted when you lower a fader to –∞.

**xxx FADER TALLY:** The trigger signal becomes active when the fader is set to any level other than –∞, and the trigger signal turns off when the fader is set to –∞.

**UDEFxx LATCH:** Pressing the corresponding button in the USER DEFINED KEYS section activates the trigger signal, and pressing the button again turns it off.

**UDEF xx UNLATCH:** A trigger signal of 250 ms is transmitted each time you press the corresponding button in the USER DEFINED KEYS section.

**REC LAMP:** This source can be used to control a "RECORDING" warning light outside a studio. The trigger signal is active while the [REC] button indicator is lit.

**POWER ON:** The trigger signal is active while the power to the 02R96 is on.

*Important note: GPI outputs are open collector outputs. GPI inputs have an internal pull-up to 5 V.*

# 20 Other Functions

## Using the User Assignable Layers

If you set the Remote layer target to "USER ASSIGNABLE," you can create a custom layer by combining any 02R96 channels (excluding the Stereo Out).

**1 Use the DISPLAY ACCESS [REMOTE] button to locate Remote page.**
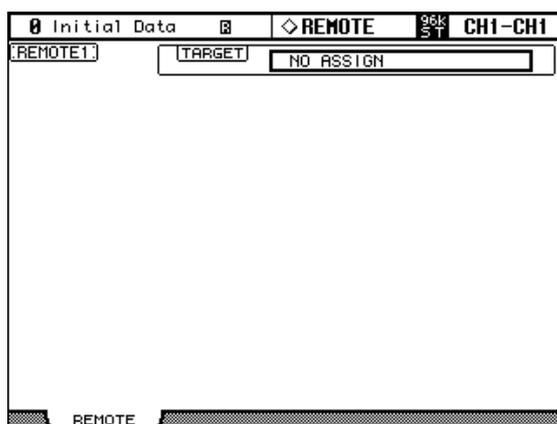


**2 Use the cursor buttons to select the TARGET parameter, use the Parameter wheel or INC/DEC buttons to select USER ASSIGNABLE LAYER, then press [ENTER].**

A confirmation message appears. Select the YES button and press [ENTER].
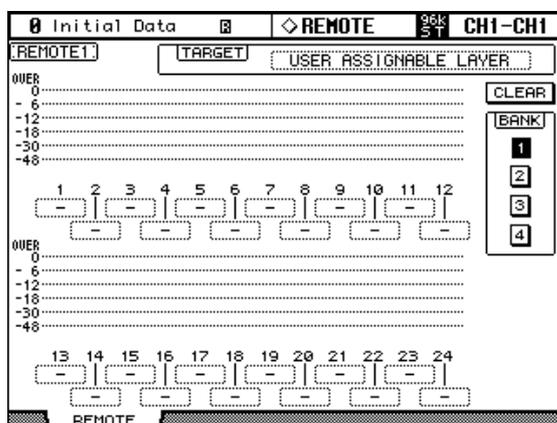


**3 Use the cursor buttons to select parameter 1–24, use the Parameter wheel or INC/DEC buttons to select a channel you want to assign, then press [ENTER].**

You can store up to four 24-channel setups in four banks by switching Banks 1–4 via the BANK 1–4 buttons.

Pressing the [ENTER] button prior to selecting assigned channels enables you to select a channel in the User CH Select window.

**4 Select a Remote layer using the LAYER [REMOTE] button.**

You can use the faders, Encoders, [ON] buttons, [AUTO] buttons, and [SOLO] buttons to control assigned channels. If you connected an optional MB02R96 Meter Bridge, its meters indicate the level of the channels currently-assigned to layer channels 1–24.

# Using the User Defined Keys

Up to 16 functions from a list of over 170 can be assigned to the USER DEFINED KEYS, and up to eight assignment setups can be stored in banks A to H. See page 238 for a list of initial bank assignments.
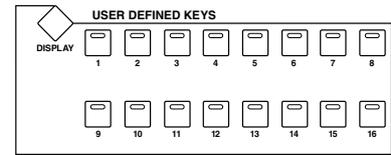
**1**   **Use the USER DEFINED KEYS [DISPLAY] button to locate the User Defined Key Assign page.**
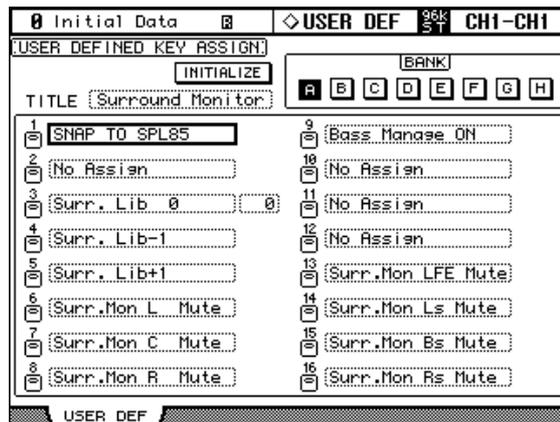
**2**   **Use the cursor buttons to select the BANK buttons, A to H, and press [ENTER] to select a bank.**

The TITLE parameter box displays the name of the selected bank. Select the TITLE parameter box, then press [ENTER]. The Title Edit window appears, enabling you to enter a name.

**3**   **Use the cursor buttons to select from 1–16, then press [ENTER].**

The following User Define Select window opens.
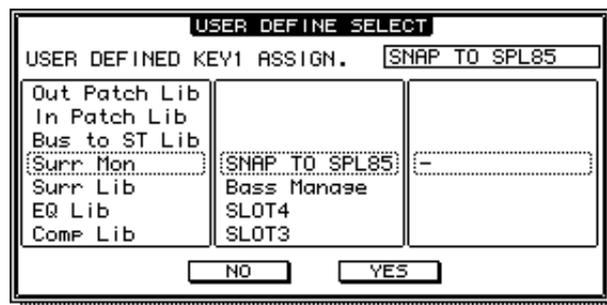
**4**   **Move the cursor to the left column, then rotate the Parameter wheel or press the [INC]/[DEC] buttons to select the function you wish to assign.**

**5**   **Select options in the center and right columns in the same way.**

The items displayed in the center and right columns vary depending on the function assigned in Step 4.

**6**   **Use the cursor buttons to select YES, then press [ENTER].**

When the window closes, the specified function is assigned to the selected User Defined button.

When you select a function that recalls a specific Scene or library memory, you need to specify the number of the memory that you want recalled when the USER DEFINED KEY is pressed. To do this, in the left-hand box, select the number parameter next to the Assign button, and use the Parameter wheel or INC/DEC buttons to specify the number.

You can initialize the assignments of the currently selected bank by selecting the INITIAL-IZE button, and pressing [ENTER].

User Defined Keys banks can be stored to an external MIDI device, such as a MIDI data filer, by using MIDI Bulk Dump (see page 195).

# Setting Preferences

You can customize the operation of the 02R96 by using the preferences pages.

## Preferences 1

1   **Use the DISPLAY ACCESS [SETUP] button to locate the Preferences 1 page.**
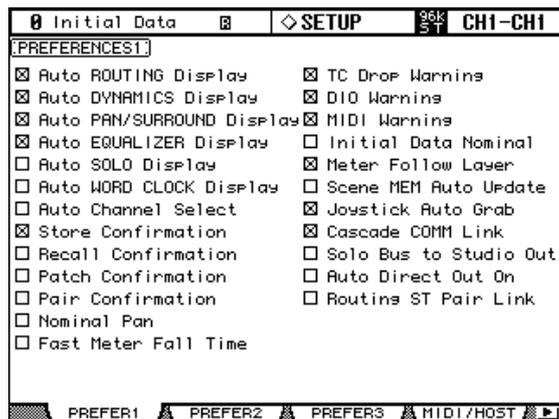


2   **Use the cursor buttons or Parameter wheel to select the preferences, and use the INC/DEC buttons or [ENTER] button to set them.**

**Auto ROUTING Display:** When this preference is on, the Routing pages appear automatically when a button in the SELECTED CHANNEL ROUTING section is pressed (see page 82).

**Auto DYNAMICS Display:** When this preference is on, the Gate Edit page appears automatically when a gate control in the SELECTED CHANNEL DYNAMICS section is operated (see page 74), and the Comp Edit page appears automatically when a Compressor control in the SELECTED CHANNEL DYNAMICS section is operated (see page 116).

**Auto PAN/SURROUND Display:** When this preference is on and Input Channels have been selected, the Pan pages appears automatically when a control in the SELECTED CHANNEL PAN/SURROUND section is operated (see page 84). Similarly, when a Surround Pan mode other than Stereo is selected, the Input Channel Surround Edit page appears automatically when the Joystick is operated (see page 88). Also, when Stereo is selected, the Fader View page appears automatically when the Pan controls are operated.

**Auto EQUALIZER Display:** When this preference is on, the EQ Edit page appears automatically when a control in the SELECTED CHANNEL EQUALIZER section is operated (see page 113).

**Auto SOLO Display:** When this option is on, the Solo Setup page appears automatically when an channel is soloed (see page 121).

**Auto WORD CLOCK Display:** When this preference is on, the Word Clock Select page appears automatically if the currently selected external wordclock source fails (see page 56).

**Auto Channel Select:** When this preference is on, channels can be selected by moving the corresponding fader or Encoder, or by turning on the corresponding [AUTO], [SOLO], or [ON] button.

**Store Confirmation:** When this preference is on, the Title Edit window appears when you store a Scene (page 164) or library memory (page 143).

**Recall Confirmation:** When this preference is on, a confirmation message appears when you recall a Scene (page 164) or library memory (page 143).

**Patch Confirmation:** When this preference is on, a confirmation message appears when you edit the Input and Output Patches (see page 66).

**Pair Confirmation:** When this preference is on, a confirmation message appears when you pair channels using the [SEL] buttons.

**Nominal Pan:** When this preference is on, left/odd and right/even signals will be at nominal level when Input Channel, or Bus to Stereo signals are panned hard left or hard right, and at –3 dB when panned center. When this preference is off, signals panned hard left or hard right will be at 3 dB, and at nominal level when panned center. In Surround mode, this preference setting is used for the signal of any Surround Pan channel that is fully panned.

**Fast Meter Fall Time:** When this preference is on, the level meters fall quicker.

**TC Drop Warning:** When this preference is on, a warning message appears if a dropout is detected in the incoming timecode.

**DIO Warning:** When this preference is on, a warning message appears if any errors are detected in digital audio signals received by the Slot Inputs or 2TR Digital Inputs.

**MIDI Warning:** When this preference is on, a warning message appears if any errors are detected in the incoming MIDI messages.

**Initial Data Nominal:** When this preference is on, Input Channel faders are set to nominal when Scene #0 is recalled.

**Meter Follow Layer:** When this preference is on, the optional MB02R96 Peak Meter Bridge automatically follows the Layer selection on the 02R96.

**Scene MEM Auto Update:** When this preference is on, the Shadow Scene memories can be used (see page 163).

**Joystick Auto Grab:** When this preference is on, the Joystick automatically kicks in as the surround pan control when it's moved to the current surround pan position (see page 88).

**Cascade COMM Link:** When this preference is on, various functions are linked between cascaded 02R96s (see page 63). When this preference is off, only digital audio signals are distributed among the cascaded 02R96s.

**Solo Bus to Studio Out:** When this preference is on and all STUDIO buttons ([CONTROL ROOM], [STEREO], [AUX 7], [AUX 8]) in the MONITOR section are turned off, soloed Input Channel signals are output via the STUDIO MONITOR OUT.

**Auto Direct Out On:** When this preference is on and you change the channel Direct Out destination from "–" to any other output, the channel Direct Out is automatically enabled. If you change the channel Direct Out destination from an output to "–," the channel Direct Out is automatically disabled.

**Routing ST Pair Link:** When this preference is on, routing from paired channels to the Stereo Bus is linked.

### Preferences 2

1   **Use the DISPLAY ACCESS [SETUP] button to locate the Preferences 2 page.**

```
┌──────────────────────────────────────────────┐
│ 0 Initial Data   B  │◇SETUP   96k│ CH1-CH1    │
│                               5 1            │
│ [PREFERENCES2]                               │
│  Short Name                                  │
│      ☐ Channel ID          ☐ Port ID         │
│      ☒ Channel Short Name   ☒ Port Short Name │
│                                              │
│  Channel Copy Parameter                      │
│   ▐ALL▌  [FADER]  [ ON ]  [ PAN ]  [ SURR ]   │
│          [ AUX ]  [AUX ON] [ EQ ]            │
│  Fader Touch Sense                           │
│    [CONTROL]  ▐SELECT▌                        │
│              Sensitivity   [06]              │
│  Display Brightness        [3]               │
│                                              │
│                                              │
│ ▒▒ PREFER1 ▟ PREFER2 ▟ PREFER3 ▟ MIDI/HOST▟ ▶│
└──────────────────────────────────────────────┘
```
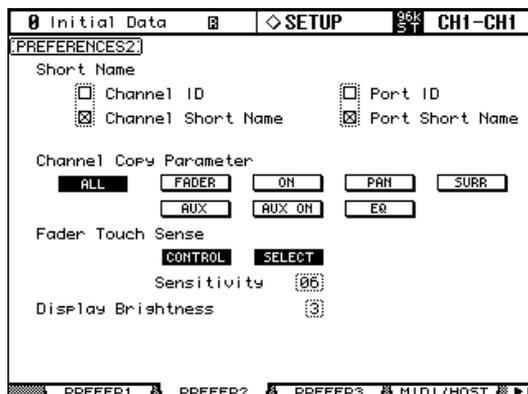
2   **Use the cursor buttons to select the preferences, and use the Parameter wheel, INC/DEC buttons, or [ENTER] button to set them.**

**Channel ID:** The corresponding Channel ID is indicated in the upper right corner of the display.

**Channel Short Name:** The corresponding Channel Short Name is indicated in the upper right corner of the display.

**Port ID:** The Port ID is indicated in the upper right corner of the display.

**Port Short Name:** The Port Short Name is indicated in the upper right corner of the display.

**Channel Copy Parameter:** These buttons allow you to choose which channel parameters are copied by the Channel Copy function: ALL parameters, or any combination of FADER, ON, PAN, SURR, AUX, AUX ON, and EQ.

**Fader Touch Sense:** These parameters control the Touch Sense function. If the CONTROL button is turned on and the touch sensors are not triggered, fader operation is ignored. During Automix recording, you can "cut-in" by touching a fader. When this button is off, the 02R96 always recognizes fader movements. If the SELECT button is on, you can select channels using the Touch Sense function.

The Sensitivity parameter adjusts touch sensitivity. If you're having trouble selecting channels because the fader knobs are insufficiently sensitive, try increasing this value. If they are too sensitive, try reducing it. It's important that the 02R96 is grounded properly for Touch Select to work correctly. See "Grounding screw" on page 42 for more information.

**Display Brightness:** This preference is used to set the brightness of the LED displays and indicators.

### Preferences 3

1    Use the DISPLAY ACCESS [SETUP] button to locate the Preferences 3 page.

```
 0 Initial Data     B   ◇SETUP    96k CH1-CH1
                                   BT
 PREFERENCES3
 ☒ Mix Update Confirmation  ☐ Show Compact Size
 ☒ Auto EQ Edit In          ☒ Automix Store Undo
 ☒ Copy Initial fader
 ☐ Auto Inc TC Capture
 ☐ Link Capture & Locate Memory
 ☒ Clear Edit Channel after REC
 ☐ Timecode Display Relative
 ☐ Receive Full Frame Message
 ☐ Touch Sense Edit In ALL

                    SMPTE       MTC
 Drop Out Time        30  frame   15  frame
 Lock Time             6  frame    1  frame
 Frame Jump Error     45  frame    1  frame
 Fader REC Accuracy         Most
 Insert Time Link   Locate  Off
    PREFER1    PREFER2    PREFER3   MIDI/HOST  ▶
```

2    Use the cursor buttons or Parameter wheel to select the preferences, and use the INC/DEC buttons or [ENTER] button to set them.

**Mix Update Confirmation:** When this preference is on, a confirmation message asking if you want to update the current Automix with the latest edits appears when Automix recording is stopped.

**Auto EQ Edit In:** When this preference is on, EQ is automatically punched into Automix recording when an EQ control is adjusted.

**Copy Initial Fader:** When this preference is on, when Fader events are copied or moved on the Automix Event Copy page, the fader value at the specified IN point is copied to the specified TO point. This eliminates fader position matching problems when no fader event exists at the specified TO point.

**Auto Inc TC Capture:** When this preference is on, the Timecode Capture memory is incremented automatically each time a timecode address is captured on the Automix Event Edit page (see page 185).

**Link Capture & Locate Memory:** When this preference is on, the eight Capture memories on the Automix Event Edit page are linked to the eight Locate memories so that, for example, edits made to Capture memory #1 are reflected on Locate memory #1, and vice versa.

**Clear Edit Channel after REC:** When this preference is on, when using Auto Rec, channels are automatically unarmed (i.e., [AUTO] buttons are turned off) when Automix recording stops. When this preference is off, channels remain armed when recording stops.

**Timecode Display Relative:** When this preference is on, the indicated timecode is offset as specified by the OFFSET parameter on the Automix Main page.

**Receive Full Frame Message:** When this preference is on, MTC full frame messages are recognized and Automix follows them.

**Touch Sense Edit In All:** When this preference is on, using the faders' Touch Sense function enables you to punch in and out all parameters for which the corresponding OVERWRITE buttons are turned on. When this preference is off, you can punch in and out only these faders selected in Fader mode.

**Show Compact Size:** Automix data, except that in the Undo buffer, is compressed while recording. When this preference is on, the compressed size of the Automix is displayed on the Automix Main and Memory pages. When this preference is off, the uncompressed size is displayed.

**Automix Store Undo:** When this preference is on, Automix Store operations can be undone by using the Undo function.

**Drop Out Time:** This parameter sets an interval (in frames) between the interruption of incoming timecode and the stoppage of Automix recording or playback.

**Lock Time:** This parameter sets the interval (in frames) allowed until the Automix locks to incoming timecode messages. If the sync operation is unstable, set this value higher.

**Frame Jump Error:** This parameter sets the time interval (in frames) required by the 02R96 to recognize an error after incoming timecode messages jump. If the actual interval is shorter than the value specified by this parameter, the 02R96 continues the sync operation. If the frame jump causes the recording or playback to stop during the MTC and SMPT sync operation, set the parameter value higher than the number of frames indicated in the error message.

If you set the parameter to a higher value, adjust the Drop Out Time parameter value, if necessary.

**Fader REC Accuracy:** This parameter sets the accuracy of recording faders over time to "Little," "Some," "More," or "Most." If you set the parameter to lower values, you will save Automix memory space.

**Insert Time Link:** This parameter enables you to select the locate memory used for the IN and OUT parameters in the Insert operation.

## Using the Oscillator

The 02R96 features an oscillator that can be used for calibration or diagnostic purposes.

**1 Use the DISPLAY ACCESS [UTILITY] button to locate the Oscillator page.**
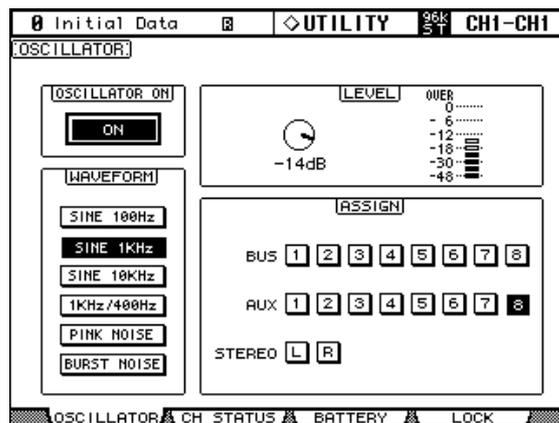


**2 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC button, or [ENTER] button to set them.**

**OSCILLATOR ON:** This turns the Oscillator on or off. While the LEVEL parameter is selected, the [ENTER] button can be used to turn on and off the Oscillator.

*Note: To prevent any sudden tone burst surprises in your monitors or headphones, you may want to set the LEVEL parameter to minimum before turning on the oscillator.*

**LEVEL:** This sets the Oscillator output level, which is displayed by the adjacent meter. This parameter can be set by using the Parameter wheel regardless of which parameter is currently selected.

**WAVEFORM:** These buttons are used to select the waveforms: SINE 100Hz, SINE 1kHz, SINE 10kHz, 1kHz/400Hz, PINK NOISE, or BURST NOISE, which is 200 msec pink noise pulses at four second intervals. If you select 1 kHz/400 Hz, the Oscillator outputs a sine wave at different frequencies to L, R, and odd/even buses.

**ASSIGN:** These buttons are used to assign the Oscillator output to Bus Outs, Aux Sends, and the Stereo Out.

## Operation Lock

The 02R96 features the Operation Lock function, which avoids unintentional edits and uses a password to restrict access to panel operation.

**1    Use the DISPLAY ACCESS [UTILITY] button to locate the Operation Lock page.**

```
┌──────────────────────────────────────────────────┐
│ 0 Initial Data    B   ◇UTILITY  96k  CH1-CH1      │
│                                  ST               │
│ [OPERATION LOCK]                                  │
│               ┌─────────────────┐                 │
│               │ OPERATION LOCK  │                 │
│               └─────────────────┘                 │
│          ┌─ OPERATION LOCK SAFE ─┐                │
│  ┌───────────────────┐  ┌───────────────────┐    │
│  │  CHANNEL FADER    │  │   SCENE MEMORY    │    │
│  │  CHANNEL ENCODER  │  │ SELECTED CHANNEL  │    │
│  │  CHANNEL ON       │  │      LAYER        │    │
│  │  CHANNEL SOLO     │  │ USER DEFINED KEYS │    │
│  │  CHANNEL SEL      │  │  EFFECTS/PLUGINS  │    │
│  │  FADER MODE       │  │     MONITOR       │    │
│  │  ENCODER MODE     │  │ MACHINE CONTROL   │    │
│  │  AUX SELECT       │                           │
│  │  CLEAR ALL        │     PASSWORD              │
│                                                   │
│ OSCILLATOR  CH STATUS  BATTERY    LOCK            │
└──────────────────────────────────────────────────┘
```

**2    Use the cursor buttons to select the PASSWORD button, then press [ENTER].**
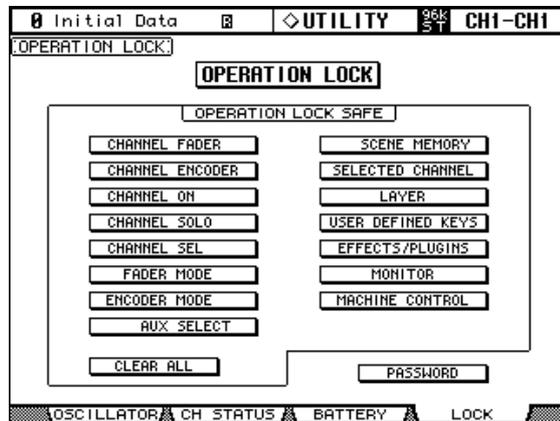
```
┌──────────────────────────────┐
│      SET PASSWORD            │
│     USE [SEL1]-[SEL10]        │
│                               │
│  PASSWORD       [■     ]      │
│  NEW PASSWORD   [      ]      │
│    REENTRY      [      ]      │
│                               │
│ [CANCEL]  [  OK  ]  [CLEAR]   │
└──────────────────────────────┘
```

**3    Use the [SEL] buttons to set the password.**

Enter a four-letter password using the Channel 1–10 [SEL] buttons (Channel 10 [SEL] button enters "0"). (The factory default password is 1234.)

Enter the current password in the PASSWORD field, and a new password in the NEW PASSWORD field. Enter the new password again in the REENTRY field.

**4    Use the cursor buttons to select the OK button, then press [ENTER] to update the password.**

If you forget the password, you will be unable to cancel Operation Lock. Be sure to remember the password.

**5** **Use the buttons in the OPERATION LOCK SAFE section to select certain controls on the panel to exclude from Operation Lock.**

| Buttons | Controls excluded from Operation Lock |
|---|---|
| **CHANNEL FADER** | Channel faders (1–24, STEREO) |
| **CHANNEL ENCODER** | Channel Encoders (1–24) |
| **CHANNEL ON** | Channel [ON] buttons (1–24, STEREO) |
| **CHANNEL SOLO** | Channel [SOLO] buttons (1–24) |
| **CHANNEL SEL** | Channel [SEL] buttons (1–24, STEREO) |
| **FADER MODE** | All buttons in the FADER MODE section |
| **ENCODER MODE** | All buttons in the ENCODER MODE section |
| **AUX SELECT** | All buttons in the AUX SELECT section |
| **SCENE MEMORY** | All buttons in the SCENE MEMORY section (excluding the [STORE] button) |
| **SELECTED CHANNEL** | All controls in the SELECTED CHANNEL section |
| **LAYER** | All buttons in the LAYER section |
| **USER DEFINED KEYS** | All buttons in the USER DEFINED KEYS section |
| **EFFECTS/PLUGINS** | All buttons in the EFFECTS/PLUG-INS section (including the Parameter controls 1–4) |
| **MONITOR** | All controls in the MONITOR section |
| **MACHINE CONTROL**[1] | All buttons in the MACHINE CONTROL section |

1. The Parameter wheel is also excluded from Operation Lock when the [SHUTTLE] or [SCRUB] button is on.

**6** **Use the cursor buttons to select the OPERATION LOCK button, then press [ENTER].**

The Password window appears.



**7** **Use the [SEL] buttons to enter the password you set in Step 4.**

The Operation Lock function is activated.

To cancel Operation Lock, press [ENTER]. The Password window opens again. Enter the same password again, and Operation Lock is cancelled.

## Checking the Battery and the System Version

The condition of the internal memory-backup battery can be checked as follows.

**1    Use the DISPLAY ACCESS [UTILITY] button to locate the Battery Check page.**

```
┌────────────────────────────────────────────┐
│ 0 Initial Data   B  ◇UTILITY  🔲 CH1-CH1    │
│ BATTERY CHECK                               │
│                                             │
│                                             │
│                                             │
│                                             │
│                Status :  Okay               │
│                _____             │
│                ┌──┐ ╭─────────────╮         │
│                │😊│ │ Yes, I'm Fine! │       │
│                └──┘ ╰─────────────╯         │
│                                             │
│                                             │
│                                             │
│                               Ver 2.00      │
│ ░OSCILLATOR░ CH STATUS ░ BATTERY ░ LOCK ░   │
└────────────────────────────────────────────┘
```

If the Status is "Okay," the battery is okay. If the Status is "Getting Low," ask your Yamaha dealer to replace the battery as soon as possible. Do not attempt to replace the battery yourself. Failure to replace a low battery may result in data loss.

**Ver x.xx:** This description identifies the system version number. Check the current system version number against this description before you update the firmware. Visit the following website to check the latest system version number:
http://www.yamahaproaudio.com/

## Initializing the 02R96

The 02R96 can be initialized as follows.

> *Warning: This procedure will clear all user memories and reset all settings to their initial values. You may want to back up any important data beforehand via MIDI Bulk Dump (see page 195). If you want to reset just the mix settings, recall scene memory #0 instead (see page 163).*

**1    Turn off the 02R96.**

**2    While holding down the SCENE MEMORY [STORE] button, turn on the 02R96.**

**3    When the confirmation message appears, release the SCENE MEMORY [STORE] button, select [INITIALIZE] button, and press [ENTER].**

The following message is displayed while initialization is in progress: "Loading Factory Presets & Calibrating the Faders... Do Not Touch the Faders!"

**It's important that you do not touch the faders while this message is displayed, as the faders may not be calibrated correctly.**

The display returns to normal when initialization is complete.

## Initializing the Password

Follow the steps below to initialize the password for the Operation Lock function.

**1    Turn off the power to the 02R96.**

**2    Hold down the SCENE MEMORY[STORE] button, and turn on the power to the 02R96.**

**3    When a confirmation message appears, release the SCENE MEMORY [STORE] button. Use the cursor buttons to select the PASSWORD button, then press [ENTER].**

The password is reset to "1234".

# Appendix A: Parameter Lists

## USER DEFINED KEYS

| # | Function | Display |
|---|----------|---------|
| 0 | No ASSIGN | No Assign |
| 1 | Scene MEM. Recall +1 | Scene +1 Recall |
| 2 | Scene MEM. Recall –1 | Scene –1 Recall |
| 3 | Scene MEM. Recall No. XX | Scene XX Recall |
| 4 | Effect-1 Lib. Recall +1 | Fx1 Lib+1 Recall |
| 5 | Effect-1 Lib. Recall –1 | Fx1 Lib–1 Recall |
| 6 | Effect-1 Lib. Recall No.XX | Fx1 LibXXX RCL. |
| 7 | Effect-2 Lib. Recall +1 | Fx2 Lib+1 Recall |
| 8 | Effect-2 Lib. Recall –1 | Fx2 Lib–1 Recall |
| 9 | Effect-2 Lib. Recall No.XX | Fx2 LibXXX RCL. |
| 10 | Effect-3 Lib. Recall +1 | Fx3 Lib+1 Recall |
| 11 | Effect-3 Lib. Recall –1 | Fx3 Lib–1 Recall |
| 12 | Effect-3 Lib. Recall No.XX | Fx3 LibXXX RCL. |
| 13 | Effect-4 Lib. Recall +1 | Fx4 Lib+1 Recall |
| 14 | Effect-4 Lib. Recall –1 | Fx4 Lib–1 Recall |
| 15 | Effect-4 Lib. Recall No.XX | Fx4 LibXXX RCL. |
| 16 | Effect-1 Bypass On/Off | Fx1 Bypass |
| 17 | Effect-2 Bypass On/Off | Fx2 Bypass |
| 18 | Effect-3 Bypass On/Off | Fx3 Bypass |
| 19 | Effect-4 Bypass On/Off | Fx4 Bypass |
| 20 | Channel Lib. Recall +1 | CH Lib+1 Recall |
| 21 | Channel Lib. Recall –1 | CH Lib–1 Recall |
| 22 | Channel Lib. Recall No. XX | CH LibXXX Recall |
| 23 | GATE Lib. Recall +1 | Gate Lib+1 RCL. |
| 24 | GATE Lib. Recall –1 | Gate Lib–1 RCL. |
| 25 | GATE Lib. Recall No. XX | Gate LibXXX RCL. |
| 26 | COMP Lib. Recall +1 | Comp Lib+1 RCL. |
| 27 | COMP Lib. Recall –1 | Comp Lib–1 RCL. |
| 28 | COMP Lib. Recall No. XX | Comp LibXXX RCL. |
| 29 | EQ Lib. Recall +1 | EQ Lib+1 Recall |
| 30 | EQ Lib. Recall –1 | EQ Lib–1 Recall |
| 31 | EQ Lib. Recall No. XX | EQ LibXXX Recall |
| 32 | SURR. MONI MUTE Mute L On/Off | Surr.Mon L Mute |
| 33 | SURR. MONI MUTE Mute R On/Off | Surr.Mon R Mute |
| 34 | SURR. MONI MUTE Mute Ls On/Off | Surr.Mon Ls Mute |
| 35 | SURR. MONI MUTE Mute Rs On/Off | Surr.Mon Rs Mute |
| 36 | SURR. MONI MUTE Mute C On/Off | Surr.Mon C Mute |
| 37 | SURR. MONI MUTE Mute LFE On/Off | Surr.Mon LFE Mute |
| 38 | SURR. MONI ASSIGN X SLOT1 ON/OFF | Surr.ASGNX SL1 ON |
| 39 | SURR. MONI ASSIGN X SLOT2 ON/OFF | Surr.ASGNX SL2 ON |
| 40 | SURR. MONI ASSIGN X SLOT3 ON/OFF | Surr.ASGNX SL3 ON |
| 41 | SURR. MONI ASSIGN X SLOT4 ON/OFF | Surr.ASGNX SL4 ON |
| 42 | SURR. MONI BASS MANAGE ON/OFF | Bass Manage ON |
| 43 | Input Fader Group Enable A | IN Fader Group A |
| 44 | Input Fader Group Enable B | IN Fader Group B |
| 45 | Input Fader Group Enable C | IN Fader Group C |
| 46 | Input Fader Group Enable D | IN Fader Group D |

| # | Function | Display |
|---|----------|---------|
| 47 | Input Fader Group Enable E | IN Fader Group E |
| 48 | Input Fader Group Enable F | IN Fader Group F |
| 49 | Input Fader Group Enable G | IN Fader Group G |
| 50 | Input Fader Group Enable H | IN Fader Group H |
| 51 | Input MUTE Group Enable I | IN Mute Group I |
| 52 | Input MUTE Group Enable J | IN Mute Group J |
| 53 | Input MUTE Group Enable K | IN Mute Group K |
| 54 | Input MUTE Group Enable L | IN Mute Group L |
| 55 | Input MUTE Group Enable M | IN Mute Group M |
| 56 | Input MUTE Group Enable N | IN Mute Group N |
| 57 | Input MUTE Group Enable O | IN Mute Group O |
| 58 | Input MUTE Group Enable P | IN Mute Group P |
| 59 | Output Fader Group Enable Q | OutFader Group Q |
| 60 | Output Fader Group Enable R | OutFader Group R |
| 61 | Output Fader Group Enable S | OutFader Group S |
| 62 | Output Fader Group Enable T | OutFader Group T |
| 63 | Output MUTE Group Enable U | Out Mute Group U |
| 64 | Output MUTE Group Enable V | Out Mute Group V |
| 65 | Output MUTE Group Enable W | Out Mute Group W |
| 66 | Output MUTE Group Enable X | Out Mute Group X |
| 67 | PEAK HOLD On/Off | Peak Hold |
| 68 | OSCILLATOR On/Off | OSC. ON/OFF |
| 69 | SOLO Enable | SOLO ENABLE |
| 70 | Input Patch Lib. Recall +1 | IN Patch Lib+1 |
| 71 | Input Patch Lib. Recall –1 | IN Patch Lib–1 |
| 72 | Input Patch Lib. Recall No. XX | IN Patch LibXX |
| 73 | Output Patch Lib. Recall +1 | Out Patch Lib+1 |
| 74 | Output Patch Lib. Recall –1 | Out Patch Lib–1 |
| 75 | Output Patch Lib. Recall No. XX | Out Patch LibXX |
| 76 | Channel Name ID/Short | CH Name ID/Short |
| 77 | Port Name ID/Short | PortNameID/Short |
| 78 | Automix REC | Automix REC |
| 79 | Automix PLAY | Automix PLAY |
| 80 | Automix STOP | Automix STOP |
| 81 | Automix ABORT | Automix ABORT |
| 82 | Automix AUTO REC | Automix AUTOREC |
| 83 | Automix ENABLE | Automix ENABLE |
| 84 | Automix RETURN | Automix RETURN |
| 85 | Automix TAKEOVER | Automix TAKEOVER |
| 86 | Automix RELATIVE | Automix RELATIVE |
| 87 | Automix TOUCH SENSE | Automix T.SENSE |
| 88 | Overwrite FADER | Overwrite FADER |
| 89 | Overwrite ON | Overwrite ON |
| 90 | Overwrite PAN | Overwrite PAN |
| 91 | Overwrite SURROUND | Overwrite SURR. |
| 92 | Overwrite EQ | Overwrite EQ |
| 93 | Overwrite AUX | Overwrite AUX |
| 94 | Overwrite AUX ON | Overwrite AUX ON |
| 95 | Track Arming 1 ON/OFF | Track Arming 1 |
| 96 | Track Arming 2 ON/OFF | Track Arming 2 |
| 97 | Track Arming 3 ON/OFF | Track Arming 3 |
| 98 | Track Arming 4 ON/OFF | Track Arming 4 |
| 99 | Track Arming 5 ON/OFF | Track Arming 5 |

| # | Function | Display |
|---|---|---|
| 100 | Track Arming 6 ON/OFF | Track Arming 6 |
| 101 | Track Arming 7 ON/OFF | Track Arming 7 |
| 102 | Track Arming 8 ON/OFF | Track Arming 8 |
| 103 | Track Arming 9 ON/OFF | Track Arming 9 |
| 104 | Track Arming 10 ON/OFF | Track Arming 10 |
| 105 | Track Arming 11 ON/OFF | Track Arming 11 |
| 106 | Track Arming 12 ON/OFF | Track Arming 12 |
| 107 | Track Arming 13 ON/OFF | Track Arming 13 |
| 108 | Track Arming 14 ON/OFF | Track Arming 14 |
| 109 | Track Arming 15 ON/OFF | Track Arming 15 |
| 110 | Track Arming 16 ON/OFF | Track Arming 16 |
| 111 | Track Arming 17 ON/OFF | Track Arming 17 |
| 112 | Track Arming 18 ON/OFF | Track Arming 18 |
| 113 | Track Arming 19 ON/OFF | Track Arming 19 |
| 114 | Track Arming 20 ON/OFF | Track Arming 20 |
| 115 | Track Arming 21 ON/OFF | Track Arming 21 |
| 116 | Track Arming 22 ON/OFF | Track Arming 22 |
| 117 | Track Arming 23 ON/OFF | Track Arming 23 |
| 118 | Track Arming 24 ON/OFF | Track Arming 24 |
| 119 | SURR Lib. Recall +1 | Surr Lib+1  RCL |
| 120 | SURR Lib. Recall –1 | Surr Lib–1  RCL |
| 121 | SURR Lib. Recall No.XX | Surr LibXX  RCL |
| 122 | Channel Copy | Channel Copy |
| 123 | Channel Paste | Channel Paste |
| 124 | Display Back | Display Back |
| 125 | Display Forward | Display Forward |
| 126 | SURR. MONI MUTE Mute Bs On/Off | Surr.Mon Bs Mute |
| 127 | SURR. MONI SNAP TO 85dB SPL | SNAP TO SPL85 |
| 128 | Bus to ST Lib. Recall +1 | BUS To ST LIB+1 |
| 129 | Bus to ST Lib.  Recall –1 | BUS To ST LIB–1 |
| 130 | Bus to ST Lib.  Recall No. XX | BUS To ST LIBXX |
| 131 | Input Fader Group Assign X | IN Fader Assign X |
| 132 | Input Mute Group Assign X | IN Mute Assign X |
| 133 | Input EQ Group Assign X | IN EQ Assign x |
| 134 | Input COMP Group Assign X | IN COMP Assign x |
| 135 | Output Fader Group Assign X | OutFader Assign X |
| 136 | Output Mute Group Assign X | Out Mute Assign X |
| 137 | Output EQ Group Assign X | Out EQ Assign x |
| 138 | Output COMP Group Assign X | Out COMP Assign x |
| 139 | Input Mute Group Master X | In Mute Master X |
| 140 | Output MUTE Group Master X | Out Mute Master X |
| 141 | Automix UPDATE TO END | Amx UPDATE TO END |
| 142 | AUX/SOLO LINK Mode On/Off | AUX/SOLO LINK |
| 143 | FADER/SOLO RELEASE Mode On/Off | FaderSoloRELEASE |
| 144 | Control Room Monitor MONO | C-R MONO |
| 145 | Talkback Assign SLOT1 | Talkback SLOT1-XX |
| 146 | Talkback Assign SLOT2 | Talkback SLOT2-XX |
| 147 | Talkback Assign SLOT3 | Talkback SLOT3-XX |
| 148 | Talkback Assign SLOT4 | Talkback SLOT4-XX |
| 149 | Talkback Assign OMNI OUT | Talkback OMNI-XX |
| 150 | Talkback Studio Monitor Out On/Off | Talkback S.Moni |
| 151 | User Defined Keys BANK +1 | UDEF KEYS BANK+1 |
| 152 | User Defined Keys BANK –1 | UDEF KEYS BANK–1 |
| 153 | User Defined Keys BANK  X | UDEF KEYS BANK X |
| 154 | Remote User Defined BANK +1 | RMT UDEF BANK+1 |
| 155 | Remote User Defined BANK –1 | RMT UDEF BANK–1 |
| 156 | Remote User Defined BANK  X | RMT UDEF BANK X |

| # | Function | Display |
|---|---|---|
| 157 | User Assignable Layer BANK +1 | USER LAYER BANK+1 |
| 158 | User Assignable Layer BANK –1 | USER LAYER BANK–1 |
| 159 | User Assignable Layer BANK  X | USER LAYER BANK X |
| 160 | MIDI NOTE No.XX | MIDI NOTE XXX |
| 161 | MIDI Program change No.XX | MIDI PGM XXX |
| 162 | MIDI Control Change No.XX | MIDI CC XXX |
| 163 | Track Arming All Clear | Track Arming CLR |
| 164 | Studio Manager Window Control Close | SM Ctrl Close |
| 165 | Studio Manager Window Control Close All | SM Ctrl Close All |
| 166 | Studio Manager Window Control Selected Channel | SM Ctrl Sel Ch |
| 167 | Studio Manager Window Control Library | SM Ctrl Library |
| 168 | Studio Manager Window Control Patch Editor | SM Ctrl Patch |
| 169 | Studio Manager Window Control Surround Editor | SM Ctrl Surround |
| 170 | Studio Manager Window Control Time Counter | SM Ctrl TimeCount |
| 171 | Studio Manager Window Control Effect Editor | SM Ctrl Effect |
| 172 | Studio Manager Window Control Meter | SM Ctrl Meter |
| 173 | Studio Manager Window Control Layer | SM Ctrl Layer |
| 174 | Studio Manager Window Control Master | SM Ctrl Master |

## USER DEFINED KEYS Initial Assignments

| No. | Bank A (Surround Monitor) | Bank B (Scene Recall) | Bank C (Group Enable) | Bank D (Automix) | Bank E (Effect Library) | Bank F (Group Assign) | Bank G (Mute Master) | Bank H (Program Change) |
|---|---|---|---|---|---|---|---|---|
| 1 | SNAP TO SPL 85 | Scene 1 Recall | IN Fader Group A | Automix ENABLE | Fx 1 Lib+1 Recall | IN Fader Assign A | IN Mute Master I | MIDI PGM 1 |
| 2 | No Assign | Scene 2 Recall | IN Fader Group B | Automix REC | Fx 2 Lib+1 Recall | IN Fader Assign B | IN Mute Master J | MIDI PGM 2 |
| 3 | Surr Lib 0 Recall | Scene 3 Recall | IN Fader Group C | Automix ABORT | Fx 3 Lib+1 Recall | IN Fader Assign C | IN Mute Master K | MIDI PGM 3 |
| 4 | Surr Lib–1 Recall | Scene 4 Recall | IN Fader Group D | Automix AUTOREC | Fx 4 Lib+1 Recall | IN Fader Assign D | IN Mute Master L | MIDI PGM 4 |
| 5 | Surr Lib+1 Recall | Scene 5 Recall | IN Fader Group E | Automix RETURN | No Assign | IN Fader Assign E | IN Mute Master M | MIDI PGM 5 |
| 6 | Surr Mon L Mute | Scene 6 Recall | IN Fader Group F | Automix RELATIVE | No Assign | IN Fader Assign F | IN Mute Master N | MIDI PGM 6 |
| 7 | Surr Mon C Mute | Scene 7 Recall | IN Fader Group G | Automix T.SENSE | No Assign | IN Fader Assign G | IN Mute Master O | MIDI PGM 7 |
| 8 | Surr Mon R Mute | Scene +1 Recall | IN Fader Group H | Automix TAKEOVER | No Assign | IN Fader Assign H | IN Mute Master P | MIDI PGM 8 |
| 9 | Bass Manage ON | Scene 8 Recall | IN Mute Group I | Overwrite FADER | Fx 1 Lib–1 Recall | IN Mute Assign I | OUT Mute Master U | MIDI PGM 9 |
| 10 | No Assign | Scene 9 Recall | IN Mute Group J | Overwrite ON | Fx 2 Lib–1 Recall | IN Mute Assign J | OUT Mute Master V | MIDI PGM 10 |
| 11 | No Assign | Scene 10 Recall | IN Mute Group K | Overwrite PAN | Fx 3 Lib–1 Recall | IN Mute Assign K | OUT Mute Master W | MIDI PGM 11 |
| 12 | No Assign | Scene 11 Recall | IN Mute Group L | Overwrite SURR. | Fx 4 Lib–1 Recall | IN Mute Assign L | OUT Mute Master X | MIDI PGM 12 |
| 13 | Surr.Mon LFEMute | Scene 12 Recall | IN Mute Group M | Overwrite AUX | No Assign | IN Mute Assign M | No Assign | MIDI PGM 13 |
| 14 | Surr.Mon Ls Mute | Scene 13 Recall | IN Mute Group N | Overwrite AUX ON | No Assign | IN Mute Assign N | No Assign | MIDI PGM 14 |
| 15 | Surr.Mon Bs Mute | Scene 14 Recall | IN Mute Group O | Overwrite EQ | No Assign | IN Mute Assign O | No Assign | MIDI PGM 15 |
| 16 | Surr.Mon Rs Mute | Scene –1 Recall | IN Mute Group P | Automix STOP | No Assign | IN Mute Assign P | No Assign | MIDI PGM 16 |

## Input Patch Parameters

| Input Channel Inputs | | Input Channel insert Ins | | Internal Effects Processor Inputs | |
|---|---|---|---|---|---|
| Port ID | Description | Port ID | Description | Port ID | Description |
| NONE | NONE | NONE | NONE | NONE | NONE |
| AD1 | AD IN 1 | AD1 | AD IN 1 | AUX1 | AUX1 |
| AD2 | AD IN 2 | AD2 | AD IN 2 | AUX2 | AUX2 |
| AD3 | AD IN 3 | AD3 | AD IN 3 | AUX3 | AUX3 |
| AD4 | AD IN 4 | AD4 | AD IN 4 | AUX4 | AUX4 |
| AD5 | AD IN 5 | AD5 | AD IN 5 | AUX5 | AUX5 |
| AD6 | AD IN 6 | AD6 | AD IN 6 | AUX6 | AUX6 |
| AD7 | AD IN 7 | AD7 | AD IN 7 | AUX7 | AUX7 |
| AD8 | AD IN 8 | AD8 | AD IN 8 | AUX8 | AUX8 |
| AD9 | AD IN 9 | AD9 | AD IN 9 | INSCH1 | InsertOut-CH1 |
| AD10 | AD IN 10 | AD10 | AD IN 10 | INSCH2 | InsertOut-CH2 |
| AD11 | AD IN 11 | AD11 | AD IN 11 | INSCH3 | InsertOut-CH3 |
| AD12 | AD IN 12 | AD12 | AD IN 12 | INSCH4 | InsertOut-CH4 |
| AD13 | AD IN 13 | AD13 | AD IN 13 | INSCH5 | InsertOut-CH5 |
| AD14 | AD IN 14 | AD14 | AD IN 14 | INSCH6 | InsertOut-CH6 |
| AD15 | AD IN 15 | AD15 | AD IN 15 | INSCH7 | InsertOut-CH7 |
| AD16 | AD IN 16 | AD16 | AD IN 16 | INSCH8 | InsertOut-CH8 |
| AD17 | AD IN 17 | AD17 | AD IN 17 | INSCH9 | InsertOut-CH9 |
| AD18 | AD IN 18 | AD18 | AD IN 18 | INSCH10 | InsertOut-CH10 |
| AD19 | AD IN 19 | AD19 | AD IN 19 | INSCH11 | InsertOut-CH11 |
| AD20 | AD IN 20 | AD20 | AD IN 20 | INSCH12 | InsertOut-CH12 |
| AD21 | AD IN 21 | AD21 | AD IN 21 | INSCH13 | InsertOut-CH13 |
| AD22 | AD IN 22 | AD22 | AD IN 22 | INSCH14 | InsertOut-CH14 |
| AD23 | AD IN 23 | AD23 | AD IN 23 | INSCH15 | InsertOut-CH15 |
| AD24 | AD IN 24 | AD24 | AD IN 24 | INSCH16 | InsertOut-CH16 |
| S1-1 | Slot1 CH1 IN | S1-1 | Slot1 CH1 IN | INSCH17 | InsertOut-CH17 |
| S1-2 | Slot1 CH2 IN | S1-2 | Slot1 CH2 IN | INSCH18 | InsertOut-CH18 |
| S1-3 | Slot1 CH3 IN | S1-3 | Slot1 CH3 IN | INSCH19 | InsertOut-CH19 |
| S1-4 | Slot1 CH4 IN | S1-4 | Slot1 CH4 IN | INSCH20 | InsertOut-CH20 |
| S1-5 | Slot1 CH5 IN | S1-5 | Slot1 CH5 IN | INSCH21 | InsertOut-CH21 |
| S1-6 | Slot1 CH6 IN | S1-6 | Slot1 CH6 IN | INSCH22 | InsertOut-CH22 |
| S1-7 | Slot1 CH7 IN | S1-7 | Slot1 CH7 IN | INSCH23 | InsertOut-CH23 |
| S1-8 | Slot1 CH8 IN | S1-8 | Slot1 CH8 IN | INSCH24 | InsertOut-CH24 |
| S1-9 | Slot1 CH9 IN | S1-9 | Slot1 CH9 IN | INSCH25 | InsertOut-CH25 |
| S1-10 | Slot1 CH10 IN | S1-10 | Slot1 CH10 IN | INSCH26 | InsertOut-CH26 |
| S1-11 | Slot1 CH11 IN | S1-11 | Slot1 CH11 IN | INSCH27 | InsertOut-CH27 |
| S1-12 | Slot1 CH12 IN | S1-12 | Slot1 CH12 IN | INSCH28 | InsertOut-CH28 |
| S1-13 | Slot1 CH13 IN | S1-13 | Slot1 CH13 IN | INSCH29 | InsertOut-CH29 |
| S1-14 | Slot1 CH14 IN | S1-14 | Slot1 CH14 IN | INSCH30 | InsertOut-CH30 |
| S1-15 | Slot1 CH15 IN | S1-15 | Slot1 CH15 IN | INSCH31 | InsertOut-CH31 |
| S1-16 | Slot1 CH16 IN | S1-16 | Slot1 CH16 IN | INSCH32 | InsertOut-CH32 |
| S2-1 | Slot2 CH1 IN | S2-1 | Slot2 CH1 IN | INSCH33 | InsertOut-CH33 |
| S2-2 | Slot2 CH2 IN | S2-2 | Slot2 CH2 IN | INSCH34 | InsertOut-CH34 |
| S2-3 | Slot2 CH3 IN | S2-3 | Slot2 CH3 IN | INSCH35 | InsertOut-CH35 |
| S2-4 | Slot2 CH4 IN | S2-4 | Slot2 CH4 IN | INSCH36 | InsertOut-CH36 |
| S2-5 | Slot2 CH5 IN | S2-5 | Slot2 CH5 IN | INSCH37 | InsertOut-CH37 |
| S2-6 | Slot2 CH6 IN | S2-6 | Slot2 CH6 IN | INSCH38 | InsertOut-CH38 |
| S2-7 | Slot2 CH7 IN | S2-7 | Slot2 CH7 IN | INSCH39 | InsertOut-CH39 |
| S2-8 | Slot2 CH8 IN | S2-8 | Slot2 CH8 IN | INSCH40 | InsertOut-CH40 |
| S2-9 | Slot2 CH9 IN | S2-9 | Slot2 CH9 IN | INSCH41 | InsertOut-CH41 |
| S2-10 | Slot2 CH10 IN | S2-10 | Slot2 CH10 IN | INSCH42 | InsertOut-CH42 |
| S2-11 | Slot2 CH11 IN | S2-11 | Slot2 CH11 IN | INSCH43 | InsertOut-CH43 |

| Input Channel Inputs | | Input Channel insert Ins | | Internal Effects Processor Inputs | |
|---|---|---|---|---|---|
| Port ID | Description | Port ID | Description | Port ID | Description |
| S2-12 | Slot2 CH12 IN | S2-12 | Slot2 CH12 IN | INSCH44 | InsertOut-CH44 |
| S2-13 | Slot2 CH13 IN | S2-13 | Slot2 CH13 IN | INSCH45 | InsertOut-CH45 |
| S2-14 | Slot2 CH14 IN | S2-14 | Slot2 CH14 IN | INSCH46 | InsertOut-CH46 |
| S2-15 | Slot2 CH15 IN | S2-15 | Slot2 CH15 IN | INSCH47 | InsertOut-CH47 |
| S2-16 | Slot2 CH16 IN | S2-16 | Slot2 CH16 IN | INSCH48 | InsertOut-CH48 |
| S3-1 | Slot3 CH1 IN | S3-1 | Slot3 CH1 IN | INSCH49 | InsertOut-CH49 |
| S3-2 | Slot3 CH2 IN | S3-2 | Slot3 CH2 IN | INSCH50 | InsertOut-CH50 |
| S3-3 | Slot3 CH3 IN | S3-3 | Slot3 CH3 IN | INSCH51 | InsertOut-CH51 |
| S3-4 | Slot3 CH4 IN | S3-4 | Slot3 CH4 IN | INSCH52 | InsertOut-CH52 |
| S3-5 | Slot3 CH5 IN | S3-5 | Slot3 CH5 IN | INSCH53 | InsertOut-CH53 |
| S3-6 | Slot3 CH6 IN | S3-6 | Slot3 CH6 IN | INSCH54 | InsertOut-CH54 |
| S3-7 | Slot3 CH7 IN | S3-7 | Slot3 CH7 IN | INSCH55 | InsertOut-CH55 |
| S3-8 | Slot3 CH8 IN | S3-8 | Slot3 CH8 IN | INSCH56 | InsertOut-CH56 |
| S3-9 | Slot3 CH9 IN | S3-9 | Slot3 CH9 IN | INSBUS1 | InsertOut-BUS1 |
| S3-10 | Slot3 CH10 IN | S3-10 | Slot3 CH10 IN | INSBUS2 | InsertOut-BUS2 |
| S3-11 | Slot3 CH11 IN | S3-11 | Slot3 CH11 IN | INSBUS3 | InsertOut-BUS3 |
| S3-12 | Slot3 CH12 IN | S3-12 | Slot3 CH12 IN | INSBUS4 | InsertOut-BUS4 |
| S3-13 | Slot3 CH13 IN | S3-13 | Slot3 CH13 IN | INSBUS5 | InsertOut-BUS5 |
| S3-14 | Slot3 CH14 IN | S3-14 | Slot3 CH14 IN | INSBUS6 | InsertOut-BUS6 |
| S3-15 | Slot3 CH15 IN | S3-15 | Slot3 CH15 IN | INSBUS7 | InsertOut-BUS7 |
| S3-16 | Slot3 CH16 IN | S3-16 | Slot3 CH16 IN | INSBUS8 | InsertOut-BUS8 |
| S4-1 | Slot4 CH1 IN | S4-1 | Slot4 CH1 IN | INSAUX1 | InsertOut-AUX1 |
| S4-2 | Slot4 CH2 IN | S4-2 | Slot4 CH2 IN | INSAUX2 | InsertOut-AUX2 |
| S4-3 | Slot4 CH3 IN | S4-3 | Slot4 CH3 IN | INSAUX3 | InsertOut-AUX3 |
| S4-4 | Slot4 CH4 IN | S4-4 | Slot4 CH4 IN | INSAUX4 | InsertOut-AUX4 |
| S4-5 | Slot4 CH5 IN | S4-5 | Slot4 CH5 IN | INSAUX5 | InsertOut-AUX5 |
| S4-6 | Slot4 CH6 IN | S4-6 | Slot4 CH6 IN | INSAUX6 | InsertOut-AUX6 |
| S4-7 | Slot4 CH7 IN | S4-7 | Slot4 CH7 IN | INSAUX7 | InsertOut-AUX7 |
| S4-8 | Slot4 CH8 IN | S4-8 | Slot4 CH8 IN | INSAUX8 | InsertOut-AUX8 |
| S4-9 | Slot4 CH9 IN | S4-9 | Slot4 CH9 IN | INSSTL | InsertOut-STL |
| S4-10 | Slot4 CH10 IN | S4-10 | Slot4 CH10 IN | INSSTR | InsertOut-STR |
| S4-11 | Slot4 CH11 IN | S4-11 | Slot4 CH11 IN | FX1-1 | Effect1 OUT 1 |
| S4-12 | Slot4 CH12 IN | S4-12 | Slot4 CH12 IN | FX1-2 | Effect1 OUT 2 |
| S4-13 | Slot4 CH13 IN | S4-13 | Slot4 CH13 IN | FX2-1 | Effect2 OUT 1 |
| S4-14 | Slot4 CH14 IN | S4-14 | Slot4 CH14 IN | FX2-2 | Effect2 OUT 2 |
| S4-15 | Slot4 CH15 IN | S4-15 | Slot4 CH15 IN | FX3-1 | Effect3 OUT 1 |
| S4-16 | Slot4 CH16 IN | S4-16 | Slot4 CH16 IN | FX3-2 | Effect3 OUT 2 |
| FX1-1 | Effect1 OUT 1 | FX1-1 | Effect1 OUT 1 | FX4-1 | Effect4 OUT 1 |
| FX1-2 | Effect1 OUT 2 | FX1-2 | Effect1 OUT 2 | FX4-2 | Effect4 OUT 2 |
| FX1-3 | Effect1 OUT 3 | FX1-3 | Effect1 OUT 3 | | |
| FX1-4 | Effect1 OUT 4 | FX1-4 | Effect1 OUT 4 | | |
| FX1-5 | Effect1 OUT 5 | FX1-5 | Effect1 OUT 5 | | |
| FX1-6 | Effect1 OUT 6 | FX1-6 | Effect1 OUT 6 | | |
| FX1-7 | Effect1 OUT 7 | FX1-7 | Effect1 OUT 7 | | |
| FX1-8 | Effect1 OUT 8 | FX1-8 | Effect1 OUT 8 | | |
| FX2-1 | Effect2 OUT 1 | FX2-1 | Effect2 OUT 1 | | |
| FX2-2 | Effect2 OUT 2 | FX2-2 | Effect2 OUT 2 | | |
| FX3-1 | Effect3 OUT 1 | FX3-1 | Effect3 OUT 1 | | |
| FX3-2 | Effect3 OUT 2 | FX3-2 | Effect3 OUT 2 | | |
| FX4-1 | Effect4 OUT 1 | FX4-1 | Effect4 OUT 1 | | |
| FX4-2 | Effect4 OUT 2 | FX4-2 | Effect4 OUT 2 | | |
| 2TD1L | 2TR IN Dig.1 L | 2TD1L | 2TR IN Dig.1 L | | |
| 2TD1R | 2TR IN Dig.1 R | 2TD1R | 2TR IN Dig.1 R | | |

| Input Channel Inputs | | Input Channel insert Ins | |
| --- | --- | --- | --- |
| **Port ID** | **Description** | **Port ID** | **Description** |
| 2TD2L | 2TR IN Dig.2 L | 2TD2L | 2TR IN Dig.2 L |
| 2TD2R | 2TR IN Dig.2 R | 2TD2R | 2TR IN Dig.2 R |
| 2TD3L | 2TR IN Dig.3 L | 2TD3L | 2TR IN Dig.3 L |
| 2TD3R | 2TR IN Dig.3 R | 2TD3R | 2TR IN Dig.3 R |
| 2TA1L | 2TR IN Analog1 L | 2TA1L | 2TR IN Analog1 L |
| 2TA1R | 2TR IN Analog1 R | 2TA1R | 2TR IN Analog1 R |
| 2TA2L | 2TR IN Analog2 L | 2TA2L | 2TR IN Analog2 L |
| 2TA2R | 2TR IN Analog2 R | 2TA2R | 2TR IN Analog2 R |
| BUS1 | BUS1 | | |
| BUS2 | BUS2 | | |
| BUS3 | BUS3 | | |
| BUS4 | BUS4 | | |
| BUS5 | BUS5 | | |
| BUS6 | BUS6 | | |
| BUS7 | BUS7 | | |
| BUS8 | BUS8 | | |
| AUX1 | AUX1 | | |
| AUX2 | AUX2 | | |
| AUX3 | AUX3 | | |
| AUX4 | AUX4 | | |
| AUX5 | AUX5 | | |
| AUX6 | AUX6 | | |
| AUX7 | AUX7 | | |
| AUX8 | AUX8 | | |

# Initial Input Patch Settings

## Input channel Inputs

| # | Source | # | Source |
|---|--------|---|--------|
| 1 | AD01 | 29 | S1-05 |
| 2 | AD02 | 30 | S1-06 |
| 3 | AD03 | 31 | S1-07 |
| 4 | AD04 | 32 | S1-08 |
| 5 | AD05 | 33 | S2-01 |
| 6 | AD06 | 34 | S2-02 |
| 7 | AD07 | 35 | S2-03 |
| 8 | AD08 | 36 | S2-04 |
| 9 | AD09 | 37 | S2-05 |
| 10 | AD10 | 38 | S2-06 |
| 11 | AD11 | 39 | S2-07 |
| 12 | AD12 | 40 | S2-08 |
| 13 | AD13 | 41 | S3-01 |
| 14 | AD14 | 42 | S3-02 |
| 15 | AD15 | 43 | S3-03 |
| 16 | AD16 | 44 | S3-04 |
| 17 | AD17 | 45 | S3-05 |
| 18 | AD18 | 46 | S3-06 |
| 19 | AD19 | 47 | S3-07 |
| 20 | AD20 | 48 | S3-08 |
| 21 | AD21 | 49 | S4-01 |
| 22 | AD22 | 50 | S4-02 |
| 23 | AD23 | 51 | S4-03 |
| 24 | AD24 | 52 | S4-04 |
| 25 | S1-01 | 53 | S4-05 |
| 26 | S1-02 | 54 | S4-06 |
| 27 | S1-03 | 55 | S4-07 |
| 28 | S1-04 | 56 | S4-08 |

## Effects Processors Inputs

| # | Source |
|---|--------|
| 1-1 | AUX1 |
| 1-2 | NONE |
| 1-3 | NONE |
| 1-4 | NONE |
| 1-5 | NONE |
| 1-6 | NONE |
| 1-7 | NONE |
| 1-8 | NONE |
| 2-1 | AUX2 |
| 2-2 | NONE |
| 3-1 | AUX3 |
| 3-2 | NONE |
| 4-1 | AUX4 |
| 4-2 | NONE |

# Output Patch Parameters

Output patch parameters are split into two tables. The first table contains parameters for the Slot Outputs, Omni Outs, and Output Channel Insert Ins. The second table, Direct Outs and, 2TR Digital Outputs.

## Output Patch Table 1

| Slot Outputs | | Omni Outs | | Output Channel Insert Ins | |
|---|---|---|---|---|---|
| **Source** | **Description** | **Source** | **Description** | **Source** | **Description** |
| NONE | NONE | NONE | NONE | NONE | NONE |
| BUS1 | BUS1 | BUS1 | BUS1 | AD1 | AD IN 1 |
| BUS2 | BUS2 | BUS2 | BUS2 | AD2 | AD IN 2 |
| BUS3 | BUS3 | BUS3 | BUS3 | AD3 | AD IN 3 |
| BUS4 | BUS4 | BUS4 | BUS4 | AD4 | AD IN 4 |
| BUS5 | BUS5 | BUS5 | BUS5 | AD5 | AD IN 5 |
| BUS6 | BUS6 | BUS6 | BUS6 | AD6 | AD IN 6 |
| BUS7 | BUS7 | BUS7 | BUS7 | AD7 | AD IN 7 |
| BUS8 | BUS8 | BUS8 | BUS8 | AD8 | AD IN 8 |
| AUX1 | AUX1 | AUX1 | AUX1 | AD9 | AD IN 9 |
| AUX2 | AUX2 | AUX2 | AUX2 | AD10 | AD IN 10 |
| AUX3 | AUX3 | AUX3 | AUX3 | AD11 | AD IN 11 |
| AUX4 | AUX4 | AUX4 | AUX4 | AD12 | AD IN 12 |
| AUX5 | AUX5 | AUX5 | AUX5 | AD13 | AD IN 13 |
| AUX6 | AUX6 | AUX6 | AUX6 | AD14 | AD IN 14 |
| AUX7 | AUX7 | AUX7 | AUX7 | AD15 | AD IN 15 |
| AUX8 | AUX8 | AUX8 | AUX8 | AD16 | AD IN 16 |
| STEREO-L | STEREO L | STEREO-L | STEREO L | AD17 | AD IN 17 |
| STEREO-R | STEREO R | STEREO-R | STEREO R | AD18 | AD IN 18 |
| INSCH1 | InsertOut-CH1 | INSCH1 | InsertOut-CH1 | AD19 | AD IN 19 |
| INSCH2 | InsertOut-CH2 | INSCH2 | InsertOut-CH2 | AD20 | AD IN 20 |
| INSCH3 | InsertOut-CH3 | INSCH3 | InsertOut-CH3 | AD21 | AD IN 21 |
| INSCH4 | InsertOut-CH4 | INSCH4 | InsertOut-CH4 | AD22 | AD IN 22 |
| INSCH5 | InsertOut-CH5 | INSCH5 | InsertOut-CH5 | AD23 | AD IN 23 |
| INSCH6 | InsertOut-CH6 | INSCH6 | InsertOut-CH6 | AD24 | AD IN 24 |
| INSCH7 | InsertOut-CH7 | INSCH7 | InsertOut-CH7 | S1-1 | Slot1 CH1 IN |
| INSCH8 | InsertOut-CH8 | INSCH8 | InsertOut-CH8 | S1-2 | Slot1 CH2 IN |
| INSCH9 | InsertOut-CH9 | INSCH9 | InsertOut-CH9 | S1-3 | Slot1 CH3 IN |
| INSCH10 | InsertOut-CH10 | INSCH10 | InsertOut-CH10 | S1-4 | Slot1 CH4 IN |
| INSCH11 | InsertOut-CH11 | INSCH11 | InsertOut-CH11 | S1-5 | Slot1 CH5 IN |
| INSCH12 | InsertOut-CH12 | INSCH12 | InsertOut-CH12 | S1-6 | Slot1 CH6 IN |
| INSCH13 | InsertOut-CH13 | INSCH13 | InsertOut-CH13 | S1-7 | Slot1 CH7 IN |
| INSCH14 | InsertOut-CH14 | INSCH14 | InsertOut-CH14 | S1-8 | Slot1 CH8 IN |
| INSCH15 | InsertOut-CH15 | INSCH15 | InsertOut-CH15 | S1-9 | Slot1 CH9 IN |
| INSCH16 | InsertOut-CH16 | INSCH16 | InsertOut-CH16 | S1-10 | Slot1 CH10 IN |
| INSCH17 | InsertOut-CH17 | INSCH17 | InsertOut-CH17 | S1-11 | Slot1 CH11 IN |
| INSCH18 | InsertOut-CH18 | INSCH18 | InsertOut-CH18 | S1-12 | Slot1 CH12 IN |
| INSCH19 | InsertOut-CH19 | INSCH19 | InsertOut-CH19 | S1-13 | Slot1 CH13 IN |
| INSCH20 | InsertOut-CH20 | INSCH20 | InsertOut-CH20 | S1-14 | Slot1 CH14 IN |
| INSCH21 | InsertOut-CH21 | INSCH21 | InsertOut-CH21 | S1-15 | Slot1 CH15 IN |
| INSCH22 | InsertOut-CH22 | INSCH22 | InsertOut-CH22 | S1-16 | Slot1 CH16 IN |
| INSCH23 | InsertOut-CH23 | INSCH23 | InsertOut-CH23 | S2-1 | Slot2 CH1 IN |
| INSCH24 | InsertOut-CH24 | INSCH24 | InsertOut-CH24 | S2-2 | Slot2 CH2 IN |
| INSCH25 | InsertOut-CH25 | INSCH25 | InsertOut-CH25 | S2-3 | Slot2 CH3 IN |
| INSCH26 | InsertOut-CH26 | INSCH26 | InsertOut-CH26 | S2-4 | Slot2 CH4 IN |
| INSCH27 | InsertOut-CH27 | INSCH27 | InsertOut-CH27 | S2-5 | Slot2 CH5 IN |

| Slot Outputs | | Omni Outs | | Output Channel Insert Ins | |
|---|---|---|---|---|---|
| Source | Description | Source | Description | Source | Description |
| INSCH28 | InsertOut-CH28 | INSCH28 | InsertOut-CH28 | S2-6 | Slot2 CH6 IN |
| INSCH29 | InsertOut-CH29 | INSCH29 | InsertOut-CH29 | S2-7 | Slot2 CH7 IN |
| INSCH30 | InsertOut-CH30 | INSCH30 | InsertOut-CH30 | S2-8 | Slot2 CH8 IN |
| INSCH31 | InsertOut-CH31 | INSCH31 | InsertOut-CH31 | S2-9 | Slot2 CH9 IN |
| INSCH32 | InsertOut-CH32 | INSCH32 | InsertOut-CH32 | S2-10 | Slot2 CH10 IN |
| INSCH33 | InsertOut-CH33 | INSCH33 | InsertOut-CH33 | S2-11 | Slot2 CH11 IN |
| INSCH34 | InsertOut-CH34 | INSCH34 | InsertOut-CH34 | S2-12 | Slot2 CH12 IN |
| INSCH35 | InsertOut-CH35 | INSCH35 | InsertOut-CH35 | S2-13 | Slot2 CH13 IN |
| INSCH36 | InsertOut-CH36 | INSCH36 | InsertOut-CH36 | S2-14 | Slot2 CH14 IN |
| INSCH37 | InsertOut-CH37 | INSCH37 | InsertOut-CH37 | S2-15 | Slot2 CH15 IN |
| INSCH38 | InsertOut-CH38 | INSCH38 | InsertOut-CH38 | S2-16 | Slot2 CH16 IN |
| INSCH39 | InsertOut-CH39 | INSCH39 | InsertOut-CH39 | S3-1 | Slot3 CH1 IN |
| INSCH40 | InsertOut-CH40 | INSCH40 | InsertOut-CH40 | S3-2 | Slot3 CH2 IN |
| INSCH41 | InsertOut-CH41 | INSCH41 | InsertOut-CH41 | S3-3 | Slot3 CH3 IN |
| INSCH42 | InsertOut-CH42 | INSCH42 | InsertOut-CH42 | S3-4 | Slot3 CH4 IN |
| INSCH43 | InsertOut-CH43 | INSCH43 | InsertOut-CH43 | S3-5 | Slot3 CH5 IN |
| INSCH44 | InsertOut-CH44 | INSCH44 | InsertOut-CH44 | S3-6 | Slot3 CH6 IN |
| INSCH45 | InsertOut-CH45 | INSCH45 | InsertOut-CH45 | S3-7 | Slot3 CH7 IN |
| INSCH46 | InsertOut-CH46 | INSCH46 | InsertOut-CH46 | S3-8 | Slot3 CH8 IN |
| INSCH47 | InsertOut-CH47 | INSCH47 | InsertOut-CH47 | S3-9 | Slot3 CH9 IN |
| INSCH48 | InsertOut-CH48 | INSCH48 | InsertOut-CH48 | S3-10 | Slot3 CH10 IN |
| INSCH49 | InsertOut-CH49 | INSCH49 | InsertOut-CH49 | S3-11 | Slot3 CH11 IN |
| INSCH50 | InsertOut-CH50 | INSCH50 | InsertOut-CH50 | S3-12 | Slot3 CH12 IN |
| INSCH51 | InsertOut-CH51 | INSCH51 | InsertOut-CH51 | S3-13 | Slot3 CH13 IN |
| INSCH52 | InsertOut-CH52 | INSCH52 | InsertOut-CH52 | S3-14 | Slot3 CH14 IN |
| INSCH53 | InsertOut-CH53 | INSCH53 | InsertOut-CH53 | S3-15 | Slot3 CH15 IN |
| INSCH54 | InsertOut-CH54 | INSCH54 | InsertOut-CH54 | S3-16 | Slot3 CH16 IN |
| INSCH55 | InsertOut-CH55 | INSCH55 | InsertOut-CH55 | S4-1 | Slot4 CH1 IN |
| INSCH56 | InsertOut-CH56 | INSCH56 | InsertOut-CH56 | S4-2 | Slot4 CH2 IN |
| INSBUS1 | InsertOut-BUS1 | INSBUS1 | InsertOut-BUS1 | S4-3 | Slot4 CH3 IN |
| INSBUS2 | InsertOut-BUS2 | INSBUS2 | InsertOut-BUS2 | S4-4 | Slot4 CH4 IN |
| INSBUS3 | InsertOut-BUS3 | INSBUS3 | InsertOut-BUS3 | S4-5 | Slot4 CH5 IN |
| INSBUS4 | InsertOut-BUS4 | INSBUS4 | InsertOut-BUS4 | S4-6 | Slot4 CH6 IN |
| INSBUS5 | InsertOut-BUS5 | INSBUS5 | InsertOut-BUS5 | S4-7 | Slot4 CH7 IN |
| INSBUS6 | InsertOut-BUS6 | INSBUS6 | InsertOut-BUS6 | S4-8 | Slot4 CH8 IN |
| INSBUS7 | InsertOut-BUS7 | INSBUS7 | InsertOut-BUS7 | S4-9 | Slot4 CH9 IN |
| INSBUS8 | InsertOut-BUS8 | INSBUS8 | InsertOut-BUS8 | S4-10 | Slot4 CH10 IN |
| INSAUX1 | InsertOut-AUX1 | INSAUX1 | InsertOut-AUX1 | S4-11 | Slot4 CH11 IN |
| INSAUX2 | InsertOut-AUX2 | INSAUX2 | InsertOut-AUX2 | S4-12 | Slot4 CH12 IN |
| INSAUX3 | InsertOut-AUX3 | INSAUX3 | InsertOut-AUX3 | S4-13 | Slot4 CH13 IN |
| INSAUX4 | InsertOut-AUX4 | INSAUX4 | InsertOut-AUX4 | S4-14 | Slot4 CH14 IN |
| INSAUX5 | InsertOut-AUX5 | INSAUX5 | InsertOut-AUX5 | S4-15 | Slot4 CH15 IN |
| INSAUX6 | InsertOut-AUX6 | INSAUX6 | InsertOut-AUX6 | S4-16 | Slot4 CH16 IN |
| INSAUX7 | InsertOut-AUX7 | INSAUX7 | InsertOut-AUX7 | FX1-1 | Effect1 OUT 1 |
| INSAUX8 | InsertOut-AUX8 | INSAUX8 | InsertOut-AUX8 | FX1-2 | Effect1 OUT 2 |
| INSSTL | InsertOut-STL | INSSTL | InsertOut-STL | FX1-3 | Effect1 OUT 3 |
| INSSTR | InsertOut-STR | INSSTR | InsertOut-STR | FX1-4 | Effect1 OUT 4 |
| Surr L | Surround Monitor L | Surr L | Surround Monitor L | FX1-5 | Effect1 OUT 5 |
| Surr R | Surround Monitor R | Surr R | Surround Monitor R | FX1-6 | Effect1 OUT 6 |
| Surr Ls | Surround Monitor Ls | Surr Ls | Surround Monitor Ls | FX1-7 | Effect1 OUT 7 |
| Surr Rs | Surround Monitor Rs | Surr Rs | Surround Monitor Rs | FX1-8 | Effect1 OUT 8 |
| Surr C | Surround Monitor C | Surr C | Surround Monitor C | FX2-1 | Effect2 OUT 1 |
| Surr LFE | Surround Monitor LFE | Surr LFE | Surround Monitor LFE | FX2-2 | Effect2 OUT 2 |

| Slot Outputs | | Omni Outs | | Output Channel Insert Ins | |
|---|---|---|---|---|---|
| **Source** | **Description** | **Source** | **Description** | **Source** | **Description** |
| Surr Ls2 | Surround Monitor Ls2 | Surr Ls2 | Surround Monitor Ls2 | FX3-1 | Effect3 OUT 1 |
| Surr Rs2 | Surround Monitor Rs2 | Surr Rs2 | Surround Monitor Rs2 | FX3-2 | Effect3 OUT 2 |
| | | | | FX4-1 | Effect4 OUT 1 |
| | | | | FX4-2 | Effect4 OUT 2 |
| | | | | 2TD1L | 2TR IN Dig.1 L |
| | | | | 2TD1R | 2TR IN Dig.1 R |
| | | | | 2TD2L | 2TR IN Dig.2 L |
| | | | | 2TD2R | 2TR IN Dig.2 R |
| | | | | 2TD3L | 2TR IN Dig.3 L |
| | | | | 2TD3R | 2TR IN Dig.3 R |
| | | | | 2TA1L | 2TR IN Analog1 L |
| | | | | 2TA1R | 2TR IN Analog1 R |
| | | | | 2TA2L | 2TR IN Analog2 L |
| | | | | 2TA2R | 2TR IN Analog2 R |

## Output Patch Table 2

| Direct Outs | | 2TR Digital Outs | | Direct Outs | | 2TR Digital Outs | |
|---|---|---|---|---|---|---|---|
| Source | Description | Source | Description | Source | Description | Source | Description |
| NONE | NONE | NONE | NONE | S4-4 | Slot4 CH4 OUT | INSCH34 | InsertOut-CH34 |
| S1-1 | Slot1 CH1 OUT | BUS1 | BUS1 | S4-5 | Slot4 CH5 OUT | INSCH35 | InsertOut-CH35 |
| S1-2 | Slot1 CH2 OUT | BUS2 | BUS2 | S4-6 | Slot4 CH6 OUT | INSCH36 | InsertOut-CH36 |
| S1-3 | Slot1 CH3 OUT | BUS3 | BUS3 | S4-7 | Slot4 CH7 OUT | INSCH37 | InsertOut-CH37 |
| S1-4 | Slot1 CH4 OUT | BUS4 | BUS4 | S4-8 | Slot4 CH8 OUT | INSCH38 | InsertOut-CH38 |
| S1-5 | Slot1 CH5 OUT | BUS5 | BUS5 | S4-9 | Slot4 CH9 OUT | INSCH39 | InsertOut-CH39 |
| S1-6 | Slot1 CH6 OUT | BUS6 | BUS6 | S4-10 | Slot4 CH10 OUT | INSCH40 | InsertOut-CH40 |
| S1-7 | Slot1 CH7 OUT | BUS7 | BUS7 | S4-11 | Slot4 CH11 OUT | INSCH41 | InsertOut-CH41 |
| S1-8 | Slot1 CH8 OUT | BUS8 | BUS8 | S4-12 | Slot4 CH12 OUT | INSCH42 | InsertOut-CH42 |
| S1-9 | Slot1 CH9 OUT | AUX1 | AUX1 | S4-13 | Slot4 CH13 OUT | INSCH43 | InsertOut-CH43 |
| S1-10 | Slot1 CH10 OUT | AUX2 | AUX2 | S4-14 | Slot4 CH14 OUT | INSCH44 | InsertOut-CH44 |
| S1-11 | Slot1 CH11 OUT | AUX3 | AUX3 | S4-15 | Slot4 CH15 OUT | INSCH45 | InsertOut-CH45 |
| S1-12 | Slot1 CH12 OUT | AUX4 | AUX4 | S4-16 | Slot4 CH16 OUT | INSCH46 | InsertOut-CH46 |
| S1-13 | Slot1 CH13 OUT | AUX5 | AUX5 | OMNI1 | OMNI OUT 1 | INSCH47 | InsertOut-CH47 |
| S1-14 | Slot1 CH14 OUT | AUX6 | AUX6 | OMNI2 | OMNI OUT 2 | INSCH48 | InsertOut-CH48 |
| S1-15 | Slot1 CH15 OUT | AUX7 | AUX7 | OMNI3 | OMNI OUT 3 | INSCH49 | InsertOut-CH49 |
| S1-16 | Slot1 CH16 OUT | AUX8 | AUX8 | OMNI4 | OMNI OUT 4 | INSCH50 | InsertOut-CH50 |
| S2-1 | Slot2 CH1 OUT | STEREO-L | STEREO L | OMNI5 | OMNI OUT 5 | INSCH51 | InsertOut-CH51 |
| S2-2 | Slot2 CH2 OUT | STEREO-R | STEREO R | OMNI6 | OMNI OUT 6 | INSCH52 | InsertOut-CH52 |
| S2-3 | Slot2 CH3 OUT | INSCH1 | InsertOut-CH1 | OMNI7 | OMNI OUT 7 | INSCH53 | InsertOut-CH53 |
| S2-4 | Slot2 CH4 OUT | INSCH2 | InsertOut-CH2 | OMNI8 | OMNI OUT 8 | INSCH54 | InsertOut-CH54 |
| S2-5 | Slot2 CH5 OUT | INSCH3 | InsertOut-CH3 | 2TD1L | 2TR OUT Dig.1 L | INSCH55 | InsertOut-CH55 |
| S2-6 | Slot2 CH6 OUT | INSCH4 | InsertOut-CH4 | 2TD1R | 2TR OUT Dig.1 R | INSCH56 | InsertOut-CH56 |
| S2-7 | Slot2 CH7 OUT | INSCH5 | InsertOut-CH5 | 2TD2L | 2TR OUT Dig.2 L | INSBUS1 | InsertOut-BUS1 |
| S2-8 | Slot2 CH8 OUT | INSCH6 | InsertOut-CH6 | 2TD2R | 2TR OUT Dig.2 R | INSBUS2 | InsertOut-BUS2 |
| S2-9 | Slot2 CH9 OUT | INSCH7 | InsertOut-CH7 | 2TD3L | 2TR OUT Dig.3 L | INSBUS3 | InsertOut-BUS3 |
| S2-10 | Slot2 CH10 OUT | INSCH8 | InsertOut-CH8 | 2TD3R | 2TR OUT Dig.3 R | INSBUS4 | InsertOut-BUS4 |
| S2-11 | Slot2 CH11 OUT | INSCH9 | InsertOut-CH9 | | | INSBUS5 | InsertOut-BUS5 |
| S2-12 | Slot2 CH12 OUT | INSCH10 | InsertOut-CH10 | | | INSBUS6 | InsertOut-BUS6 |
| S2-13 | Slot2 CH13 OUT | INSCH11 | InsertOut-CH11 | | | INSBUS7 | InsertOut-BUS7 |
| S2-14 | Slot2 CH14 OUT | INSCH12 | InsertOut-CH12 | | | INSBUS8 | InsertOut-BUS8 |
| S2-15 | Slot2 CH15 OUT | INSCH13 | InsertOut-CH13 | | | INSAUX1 | InsertOut-AUX1 |
| S2-16 | Slot2 CH16 OUT | INSCH14 | InsertOut-CH14 | | | INSAUX2 | InsertOut-AUX2 |
| S3-1 | Slot3 CH1 OUT | INSCH15 | InsertOut-CH15 | | | INSAUX3 | InsertOut-AUX3 |
| S3-2 | Slot3 CH2 OUT | INSCH16 | InsertOut-CH16 | | | INSAUX4 | InsertOut-AUX4 |
| S3-3 | Slot3 CH3 OUT | INSCH17 | InsertOut-CH17 | | | INSAUX5 | InsertOut-AUX5 |
| S3-4 | Slot3 CH4 OUT | INSCH18 | InsertOut-CH18 | | | INSAUX6 | InsertOut-AUX6 |
| S3-5 | Slot3 CH5 OUT | INSCH19 | InsertOut-CH19 | | | INSAUX7 | InsertOut-AUX7 |
| S3-6 | Slot3 CH6 OUT | INSCH20 | InsertOut-CH20 | | | INSAUX8 | InsertOut-AUX8 |
| S3-7 | Slot3 CH7 OUT | INSCH21 | InsertOut-CH21 | | | INSSTL | InsertOut-STL |
| S3-8 | Slot3 CH8 OUT | INSCH22 | InsertOut-CH22 | | | INSSTR | InsertOut-STR |
| S3-9 | Slot3 CH9 OUT | INSCH23 | InsertOut-CH23 | | | CR-L | Control Room L |
| S3-10 | Slot3 CH10 OUT | INSCH24 | InsertOut-CH24 | | | CR-R | Control Room R |
| S3-11 | Slot3 CH11 OUT | INSCH25 | InsertOut-CH25 | | | | |
| S3-12 | Slot3 CH12 OUT | INSCH26 | InsertOut-CH26 | | | | |
| S3-13 | Slot3 CH13 OUT | INSCH27 | InsertOut-CH27 | | | | |
| S3-14 | Slot3 CH14 OUT | INSCH28 | InsertOut-CH28 | | | | |
| S3-15 | Slot3 CH15 OUT | INSCH29 | InsertOut-CH29 | | | | |
| S3-16 | Slot3 CH16 OUT | INSCH30 | InsertOut-CH30 | | | | |
| S4-1 | Slot4 CH1 OUT | INSCH31 | InsertOut-CH31 | | | | |
| S4-2 | Slot4 CH2 OUT | INSCH32 | InsertOut-CH32 | | | | |
| S4-3 | Slot4 CH3 OUT | INSCH33 | InsertOut-CH33 | | | | |

## Initial Output Patch Settings

### Slot Outputs

| # | Source | # | Source |
|---|---|---|---|
| SLOT1-01 | BUS1 | SLOT3-01 | BUS1 |
| SLOT1-02 | BUS2 | SLOT3-02 | BUS2 |
| SLOT1-03 | BUS3 | SLOT3-03 | BUS3 |
| SLOT1-04 | BUS4 | SLOT3-04 | BUS4 |
| SLOT1-05 | BUS5 | SLOT3-05 | BUS5 |
| SLOT1-06 | BUS6 | SLOT3-06 | BUS6 |
| SLOT1-07 | BUS7 | SLOT3-07 | BUS7 |
| SLOT1-08 | BUS8 | SLOT3-08 | BUS8 |
| SLOT1-09 | BUS1 | SLOT3-09 | BUS1 |
| SLOT1-10 | BUS2 | SLOT3-10 | BUS2 |
| SLOT1-11 | BUS3 | SLOT3-11 | BUS3 |
| SLOT1-12 | BUS4 | SLOT3-12 | BUS4 |
| SLOT1-13 | BUS5 | SLOT3-13 | BUS5 |
| SLOT1-14 | BUS6 | SLOT3-14 | BUS6 |
| SLOT1-15 | BUS7 | SLOT3-15 | BUS7 |
| SLOT1-16 | BUS8 | SLOT3-16 | BUS8 |
| SLOT2-01 | BUS1 | SLOT4-01 | BUS1 |
| SLOT2-02 | BUS2 | SLOT4-02 | BUS2 |
| SLOT2-03 | BUS3 | SLOT4-03 | BUS3 |
| SLOT2-04 | BUS4 | SLOT4-04 | BUS4 |
| SLOT2-05 | BUS5 | SLOT4-05 | BUS5 |
| SLOT2-06 | BUS6 | SLOT4-06 | BUS6 |
| SLOT2-07 | BUS7 | SLOT4-07 | BUS7 |
| SLOT2-08 | BUS8 | SLOT4-08 | BUS8 |
| SLOT2-09 | BUS1 | SLOT4-09 | BUS1 |
| SLOT2-10 | BUS2 | SLOT4-10 | BUS2 |
| SLOT2-11 | BUS3 | SLOT4-11 | BUS3 |
| SLOT2-12 | BUS4 | SLOT4-12 | BUS4 |
| SLOT2-13 | BUS5 | SLOT4-13 | BUS5 |
| SLOT2-14 | BUS6 | SLOT4-14 | BUS6 |
| SLOT2-15 | BUS7 | SLOT4-15 | BUS7 |
| SLOT2-16 | BUS8 | SLOT4-16 | BUS8 |

### Omni Outs

| # | Source |
|---|---|
| 1 | AUX1 |
| 2 | AUX2 |
| 3 | AUX3 |
| 4 | AUX4 |
| 5 | AUX5 |
| 6 | AUX6 |
| 7 | AUX7 |
| 8 | AUX8 |

### Direct Outs

| # | Destination | # | Destination |
|---|---|---|---|
| 1 | SLOT1-01 | 29 | SLOT4-05 |
| 2 | SLOT1-02 | 30 | SLOT4-06 |
| 3 | SLOT1-03 | 31 | SLOT4-07 |
| 4 | SLOT1-04 | 32 | SLOT4-08 |
| 5 | SLOT1-05 | 33 | NONE |
| 6 | SLOT1-06 | 34 | NONE |
| 7 | SLOT1-07 | 35 | NONE |
| 8 | SLOT1-08 | 36 | NONE |
| 9 | SLOT2-01 | 37 | NONE |
| 10 | SLOT2-02 | 38 | NONE |
| 11 | SLOT2-03 | 39 | NONE |
| 12 | SLOT2-04 | 40 | NONE |
| 13 | SLOT2-05 | 41 | NONE |
| 14 | SLOT2-06 | 42 | NONE |
| 15 | SLOT2-07 | 43 | NONE |
| 16 | SLOT2-08 | 44 | NONE |
| 17 | SLOT3-01 | 45 | NONE |
| 18 | SLOT3-02 | 46 | NONE |
| 19 | SLOT3-03 | 47 | NONE |
| 20 | SLOT3-04 | 48 | NONE |
| 21 | SLOT3-05 | 49 | NONE |
| 22 | SLOT3-06 | 50 | NONE |
| 23 | SLOT3-07 | 51 | NONE |
| 24 | SLOT3-08 | 52 | NONE |
| 25 | SLOT4-01 | 53 | NONE |
| 26 | SLOT4-02 | 54 | NONE |
| 27 | SLOT4-03 | 55 | NONE |
| 28 | SLOT4-04 | 56 | NONE |

## Initial Input Channel Names

| Input Channel ID | Short Name | Long Name |
|---|---|---|
| CH01 | CH01 | CH01 |
| CH02 | CH02 | CH02 |
| CH03 | CH03 | CH03 |
| CH04 | CH04 | CH04 |
| CH05 | CH05 | CH05 |
| CH06 | CH06 | CH06 |
| CH07 | CH07 | CH07 |
| CH08 | CH08 | CH08 |
| CH09 | CH09 | CH09 |
| CH10 | CH10 | CH10 |
| CH11 | CH11 | CH11 |
| CH12 | CH12 | CH12 |
| CH13 | CH13 | CH13 |
| CH14 | CH14 | CH14 |
| CH15 | CH15 | CH15 |
| CH16 | CH16 | CH16 |
| CH17 | CH17 | CH17 |
| CH18 | CH18 | CH18 |
| CH19 | CH19 | CH19 |
| CH20 | CH20 | CH20 |
| CH21 | CH21 | CH21 |
| CH22 | CH22 | CH22 |
| CH23 | CH23 | CH23 |
| CH24 | CH24 | CH24 |
| CH25 | CH25 | CH25 |
| CH26 | CH26 | CH26 |
| CH27 | CH27 | CH27 |
| CH28 | CH28 | CH28 |
| CH29 | CH29 | CH29 |
| CH30 | CH30 | CH30 |
| CH31 | CH31 | CH31 |
| CH32 | CH32 | CH32 |
| CH33 | CH33 | CH33 |
| CH34 | CH34 | CH34 |
| CH35 | CH35 | CH35 |
| CH36 | CH36 | CH36 |
| CH37 | CH37 | CH37 |
| CH38 | CH38 | CH38 |
| CH39 | CH39 | CH39 |
| CH40 | CH40 | CH40 |
| CH41 | CH41 | CH41 |
| CH42 | CH42 | CH42 |
| CH43 | CH43 | CH43 |
| CH44 | CH44 | CH44 |
| CH45 | CH45 | CH45 |
| CH46 | CH46 | CH46 |
| CH47 | CH47 | CH47 |
| CH48 | CH48 | CH48 |
| CH49 | CH49 | CH49 |
| CH50 | CH50 | CH50 |
| CH51 | CH51 | CH51 |
| CH52 | CH52 | CH52 |
| CH53 | CH53 | CH53 |
| CH54 | CH54 | CH54 |
| CH55 | CH55 | CH55 |
| CH56 | CH56 | CH56 |

## Initial Output Channel Names

| Output Channel ID | Short Name | Long Name |
|---|---|---|
| BUS1 | BUS1 | BUS1 |
| BUS2 | BUS2 | BUS2 |
| BUS3 | BUS3 | BUS3 |
| BUS4 | BUS4 | BUS4 |
| BUS5 | BUS5 | BUS5 |
| BUS6 | BUS6 | BUS6 |
| BUS7 | BUS7 | BUS7 |
| BUS8 | BUS8 | BUS8 |
| AUX1 | AUX1 | AUX1 |
| AUX2 | AUX2 | AUX2 |
| AUX3 | AUX3 | AUX3 |
| AUX4 | AUX4 | AUX4 |
| AUX5 | AUX5 | AUX5 |
| AUX6 | AUX6 | AUX6 |
| AUX7 | AUX7 | AUX7 |
| AUX8 | AUX8 | AUX8 |
| ST | ST | STEREO |

# Initial Input Port Names

| Port | PORT ID | Short Name | Long Name | | Port | PORT ID | Short Name | Long Name |
|---|---|---|---|---|---|---|---|---|
| AD1 | AD01 | AD01 | AD IN 1 | | SLOT2-13 | S213 | S213 | Slot2 CH13 IN |
| AD2 | AD02 | AD02 | AD IN 2 | | SLOT2-14 | S214 | S214 | Slot2 CH14 IN |
| AD3 | AD03 | AD03 | AD IN 3 | | SLOT2-15 | S215 | S215 | Slot2 CH15 IN |
| AD4 | AD04 | AD04 | AD IN 4 | | SLOT2-16 | S216 | S216 | Slot2 CH16 IN |
| AD5 | AD05 | AD05 | AD IN 5 | | SLOT3-01 | S3-1 | S3-1 | Slot3 CH1 IN |
| AD6 | AD06 | AD06 | AD IN 6 | | SLOT3-02 | S3-2 | S3-2 | Slot3 CH2 IN |
| AD7 | AD07 | AD07 | AD IN 7 | | SLOT3-03 | S3-3 | S3-3 | Slot3 CH3 IN |
| AD8 | AD08 | AD08 | AD IN 8 | | SLOT3-04 | S3-4 | S3-4 | Slot3 CH4 IN |
| AD9 | AD09 | AD09 | AD IN 9 | | SLOT3-05 | S3-5 | S3-5 | Slot3 CH5 IN |
| AD10 | AD10 | AD10 | AD IN 10 | | SLOT3-06 | S3-6 | S3-6 | Slot3 CH6 IN |
| AD11 | AD11 | AD11 | AD IN 11 | | SLOT3-07 | S3-7 | S3-7 | Slot3 CH7 IN |
| AD12 | AD12 | AD12 | AD IN 12 | | SLOT3-08 | S3-8 | S3-8 | Slot3 CH8 IN |
| AD13 | AD13 | AD13 | AD IN 13 | | SLOT3-09 | S3-9 | S3-9 | Slot3 CH9 IN |
| AD14 | AD14 | AD14 | AD IN 14 | | SLOT3-10 | S310 | S310 | Slot3 CH10 IN |
| AD15 | AD15 | AD15 | AD IN 15 | | SLOT3-11 | S311 | S311 | Slot3 CH11 IN |
| AD16 | AD16 | AD16 | AD IN 16 | | SLOT3-12 | S312 | S312 | Slot3 CH12 IN |
| AD17 | AD17 | AD17 | AD IN 17 | | SLOT3-13 | S313 | S313 | Slot3 CH13 IN |
| AD18 | AD18 | AD18 | AD IN 18 | | SLOT3-14 | S314 | S314 | Slot3 CH14 IN |
| AD19 | AD19 | AD19 | AD IN 19 | | SLOT3-15 | S315 | S315 | Slot3 CH15 IN |
| AD20 | AD20 | AD20 | AD IN 20 | | SLOT3-16 | S316 | S316 | Slot3 CH16 IN |
| AD21 | AD21 | AD21 | AD IN 21 | | SLOT4-01 | S4-1 | S4-1 | Slot4 CH1 IN |
| AD22 | AD22 | AD22 | AD IN 22 | | SLOT4-02 | S4-2 | S4-2 | Slot4 CH2 IN |
| AD23 | AD23 | AD23 | AD IN 23 | | SLOT4-03 | S4-3 | S4-3 | Slot4 CH3 IN |
| AD24 | AD24 | AD24 | AD IN 24 | | SLOT4-04 | S4-4 | S4-4 | Slot4 CH4 IN |
| SLOT1-01 | S1-1 | S1-1 | Slot1 CH1 IN | | SLOT4-05 | S4-5 | S4-5 | Slot4 CH5 IN |
| SLOT1-02 | S1-2 | S1-2 | Slot1 CH2 IN | | SLOT4-06 | S4-6 | S4-6 | Slot4 CH6 IN |
| SLOT1-03 | S1-3 | S1-3 | Slot1 CH3 IN | | SLOT4-07 | S4-7 | S4-7 | Slot4 CH7 IN |
| SLOT1-04 | S1-4 | S1-4 | Slot1 CH4 IN | | SLOT4-08 | S4-8 | S4-8 | Slot4 CH8 IN |
| SLOT1-05 | S1-5 | S1-5 | Slot1 CH5 IN | | SLOT4-09 | S4-9 | S4-9 | Slot4 CH9 IN |
| SLOT1-06 | S1-6 | S1-6 | Slot1 CH6 IN | | SLOT4-10 | S410 | S410 | Slot4 CH10 IN |
| SLOT1-07 | S1-7 | S1-7 | Slot1 CH7 IN | | SLOT4-11 | S411 | S411 | Slot4 CH11 IN |
| SLOT1-08 | S1-8 | S1-8 | Slot1 CH8 IN | | SLOT4-12 | S412 | S412 | Slot4 CH12 IN |
| SLOT1-09 | S1-9 | S1-9 | Slot1 CH9 IN | | SLOT4-13 | S413 | S413 | Slot4 CH13 IN |
| SLOT1-10 | S110 | S110 | Slot1 CH10 IN | | SLOT4-14 | S414 | S414 | Slot4 CH14 IN |
| SLOT1-11 | S111 | S111 | Slot1 CH11 IN | | SLOT4-15 | S415 | S415 | Slot4 CH15 IN |
| SLOT1-12 | S112 | S112 | Slot1 CH12 IN | | SLOT4-16 | S416 | S416 | Slot4 CH16 IN |
| SLOT1-13 | S113 | S113 | Slot1 CH13 IN | | 2TD1L | 2TD1L | 2D1L | 2TR IN Dig.1 L |
| SLOT1-14 | S114 | S114 | Slot1 CH14 IN | | 2TD1R | 2TD1R | 2D1R | 2TR IN Dig.1 R |
| SLOT1-15 | S115 | S115 | Slot1 CH15 IN | | 2TD2L | 2TD2L | 2D2L | 2TR IN Dig.2 L |
| SLOT1-16 | S116 | S116 | Slot1 CH16 IN | | 2TD2R | 2TD2R | 2D2R | 2TR IN Dig.2 R |
| SLOT2-01 | S2-1 | S2-1 | Slot2 CH1 IN | | 2TD3L | 2TD3L | 2D3L | 2TR IN Dig.3 L |
| SLOT2-02 | S2-2 | S2-2 | Slot2 CH2 IN | | 2TD3R | 2TD3R | 2D3R | 2TR IN Dig.3 R |
| SLOT2-03 | S2-3 | S2-3 | Slot2 CH3 IN | | 2TA1L | 2TA1L | 2A1L | 2TR IN Analog1 L |
| SLOT2-04 | S2-4 | S2-4 | Slot2 CH4 IN | | 2TA1R | 2TA1R | 2A1R | 2TR IN Analog1 R |
| SLOT2-05 | S2-5 | S2-5 | Slot2 CH5 IN | | 2TA2L | 2TA2L | 2A2L | 2TR IN Analog2 L |
| SLOT2-06 | S2-6 | S2-6 | Slot2 CH6 IN | | 2TA2R | 2TA2R | 2A2R | 2TR IN Analog2 R |
| SLOT2-07 | S2-7 | S2-7 | Slot2 CH7 IN | | | | | |
| SLOT2-08 | S2-8 | S2-8 | Slot2 CH8 IN | | | | | |
| SLOT2-09 | S2-9 | S2-9 | Slot2 CH9 IN | | | | | |
| SLOT2-10 | S210 | S210 | Slot2 CH10 IN | | | | | |
| SLOT2-11 | S211 | S211 | Slot2 CH11 IN | | | | | |
| SLOT2-12 | S212 | S212 | Slot2 CH12 IN | | | | | |

# Initial Output Port Names

| Port | Port ID | Short Name | Long Name |
|------|---------|-----------|-----------|
| SLOT1-01 | S1-1 | S1-1 | Slot1 CH1 OUT |
| SLOT1-02 | S1-2 | S1-2 | Slot1 CH2 OUT |
| SLOT1-03 | S1-3 | S1-3 | Slot1 CH3 OUT |
| SLOT1-04 | S1-4 | S1-4 | Slot1 CH4 OUT |
| SLOT1-05 | S1-5 | S1-5 | Slot1 CH5 OUT |
| SLOT1-06 | S1-6 | S1-6 | Slot1 CH6 OUT |
| SLOT1-07 | S1-7 | S1-7 | Slot1 CH7 OUT |
| SLOT1-08 | S1-8 | S1-8 | Slot1 CH8 OUT |
| SLOT1-09 | S1-9 | S1-9 | Slot1 CH9 OUT |
| SLOT1-10 | S110 | S110 | Slot1 CH10 OUT |
| SLOT1-11 | S111 | S111 | Slot1 CH11 OUT |
| SLOT1-12 | S112 | S112 | Slot1 CH12 OUT |
| SLOT1-13 | S113 | S113 | Slot1 CH13 OUT |
| SLOT1-14 | S114 | S114 | Slot1 CH14 OUT |
| SLOT1-15 | S115 | S115 | Slot1 CH15 OUT |
| SLOT1-16 | S116 | S116 | Slot1 CH16 OUT |
| SLOT2-01 | S2-1 | S2-1 | Slot2 CH1 OUT |
| SLOT2-02 | S2-2 | S2-2 | Slot2 CH2 OUT |
| SLOT2-03 | S2-3 | S2-3 | Slot2 CH3 OUT |
| SLOT2-04 | S2-4 | S2-4 | Slot2 CH4 OUT |
| SLOT2-05 | S2-5 | S2-5 | Slot2 CH5 OUT |
| SLOT2-06 | S2-6 | S2-6 | Slot2 CH6 OUT |
| SLOT2-07 | S2-7 | S2-7 | Slot2 CH7 OUT |
| SLOT2-08 | S2-8 | S2-8 | Slot2 CH8 OUT |
| SLOT2-09 | S2-9 | S2-9 | Slot2 CH9 OUT |
| SLOT2-10 | S210 | S210 | Slot2 CH10 OUT |
| SLOT2-11 | S211 | S211 | Slot2 CH11 OUT |
| SLOT2-12 | S212 | S212 | Slot2 CH12 OUT |
| SLOT2-13 | S213 | S213 | Slot2 CH13 OUT |
| SLOT2-14 | S214 | S214 | Slot2 CH14 OUT |
| SLOT2-15 | S215 | S215 | Slot2 CH15 OUT |
| SLOT2-16 | S216 | S216 | Slot2 CH16 OUT |
| SLOT3-01 | S3-1 | S3-1 | Slot3 CH1 OUT |
| SLOT3-02 | S3-2 | S3-2 | Slot3 CH2 OUT |
| SLOT3-03 | S3-3 | S3-3 | Slot3 CH3 OUT |
| SLOT3-04 | S3-4 | S3-4 | Slot3 CH4 OUT |
| SLOT3-05 | S3-5 | S3-5 | Slot3 CH5 OUT |
| SLOT3-06 | S3-6 | S3-6 | Slot3 CH6 OUT |
| SLOT3-07 | S3-7 | S3-7 | Slot3 CH7 OUT |
| SLOT3-08 | S3-8 | S3-8 | Slot3 CH8 OUT |
| SLOT3-09 | S3-9 | S3-9 | Slot3 CH9 OUT |
| SLOT3-10 | S310 | S310 | Slot3 CH10 OUT |
| SLOT3-11 | S311 | S311 | Slot3 CH11 OUT |
| SLOT3-12 | S312 | S312 | Slot3 CH12 OUT |
| SLOT3-13 | S313 | S313 | Slot3 CH13 OUT |
| SLOT3-14 | S314 | S314 | Slot3 CH14 OUT |
| SLOT3-15 | S315 | S315 | Slot3 CH15 OUT |
| SLOT3-16 | S316 | S316 | Slot3 CH16 OUT |
| SLOT4-01 | S4-1 | S4-1 | Slot4 CH1 OUT |
| SLOT4-02 | S4-2 | S4-2 | Slot4 CH2 OUT |
| SLOT4-03 | S4-3 | S4-3 | Slot4 CH3 OUT |
| SLOT4-04 | S4-4 | S4-4 | Slot4 CH4 OUT |

| Port | Port ID | Short Name | Long Name |
|------|---------|-----------|-----------|
| SLOT4-05 | S4-5 | S4-5 | Slot4 CH5 OUT |
| SLOT4-06 | S4-6 | S4-6 | Slot4 CH6 OUT |
| SLOT4-07 | S4-7 | S4-7 | Slot4 CH7 OUT |
| SLOT4-08 | S4-8 | S4-8 | Slot4 CH8 OUT |
| SLOT4-09 | S4-9 | S4-9 | Slot4 CH9 OUT |
| SLOT4-10 | S410 | S410 | Slot4 CH10 OUT |
| SLOT4-11 | S411 | S411 | Slot4 CH11 OUT |
| SLOT4-12 | S412 | S412 | Slot4 CH12 OUT |
| SLOT4-13 | S413 | S413 | Slot4 CH13 OUT |
| SLOT4-14 | S414 | S414 | Slot4 CH14 OUT |
| SLOT4-15 | S415 | S415 | Slot4 CH15 OUT |
| SLOT4-16 | S416 | S416 | Slot4 CH16 OUT |
| OMNI1 | OMNI1 | OMN1 | OMNI OUT 1 |
| OMNI2 | OMNI2 | OMN2 | OMNI OUT 2 |
| OMNI3 | OMNI3 | OMN3 | OMNI OUT 3 |
| OMNI4 | OMNI4 | OMN4 | OMNI OUT 4 |
| OMNI5 | OMNI5 | OMN5 | OMNI OUT 5 |
| OMNI6 | OMNI6 | OMN6 | OMNI OUT 6 |
| OMNI7 | OMNI7 | OMN7 | OMNI OUT 7 |
| OMNI8 | OMNI8 | OMN8 | OMNI OUT 8 |
| 2TD1L | 2TD1L | 2D1L | 2TR OUT Dig. 1L |
| 2TD1R | 2TD1R | 2D1R | 2TR OUT Dig. 1R |
| 2TD2L | 2TD2L | 2D2L | 2TR OUT Dig. 2L |
| 2TD2R | 2TD2R | 2D2R | 2TR OUT Dig. 2R |
| 2TD3L | 2TD3L | 2D3L | 2TR OUT Dig. 3L |
| 2TD3R | 2TD3R | 2D3R | 2TR OUT Dig. 3R |

# GPI Trigger Source & Target List

## INPUT

| # | Target |
|---|--------|
| 0 | NO ASSIGN |
| 1 | TALKBACK |
| 2 | SLATE |
| 3 | DIMMER |
| 4 | MONO |
| 5 | SMALL |
| 6 | SR BUS |
| 7 | SR ASSIGN1 |
| 8 | SR ASSIGN2 |
| 9 | CR STEREO |
| 10 | CR 2TRD1 |
| 11 | CR 2TRD2 |
| 12 | CR 2TRD3 |
| 13 | CR 2TRA1 |
| 14 | CR 2TRA2 |
| 15 | CR ASSIGN1 |
| 16 | CR ASSIGN2 |
| 17 | SM C-R |
| 18 | SM STEREO |
| 19 | SM AUX11 |
| 20 | SM AUX12 |
| 21 | TALKBACK UNLATCH |
| 22 | SLATE UNLATCH |
| 23 | DIMMER UNLATCH |
| 24 | MONO UNLATCH |
| 25 | SMALL UNLATCH |
| 26 | SR BUS UNLATCH |
| 27 | SR ASGN1 UNLATCH |
| 28 | SR ASGN2 UNLATCH |
| 29 | CR ST UNLATCH |
| 30 | CR 2TRD1 UNLATCH |
| 31 | CR 2TRD2 UNLATCH |
| 32 | CR 2TRD3 UNLATCH |
| 33 | CR 2TRA1 UNLATCH |
| 34 | CR 2TRA2 UNLATCH |
| 35 | CR ASGN1 UNLATCH |
| 36 | CR ASGN2 UNLATCH |
| 37 | SD C-R UNLATCH |
| 38 | SD ST UNLATCH |
| 39 | SD AUX11 UNLATCH |
| 40 | SD AUX12 UNLATCH |
| 41 | CH1 ON |
| 42 | CH2 ON |
| 43 | CH3 ON |
| 44 | CH4 ON |
| 45 | CH5 ON |
| 46 | CH6 ON |
| 47 | CH7 ON |
| 48 | CH8 ON |
| 49 | CH9 ON |
| 50 | CH10 ON |

| # | Target |
|---|--------|
| 51 | CH11 ON |
| 52 | CH12 ON |
| 53 | CH13 ON |
| 54 | CH14 ON |
| 55 | CH15 ON |
| 56 | CH16 ON |
| 57 | CH17 ON |
| 58 | CH18 ON |
| 59 | CH19 ON |
| 60 | CH20 ON |
| 61 | CH21 ON |
| 62 | CH22 ON |
| 63 | CH23 ON |
| 64 | CH24 ON |
| 65 | CH25 ON |
| 66 | CH26 ON |
| 67 | CH27 ON |
| 68 | CH28 ON |
| 69 | CH29 ON |
| 70 | CH30 ON |
| 71 | CH31 ON |
| 72 | CH32 ON |
| 73 | CH33 ON |
| 74 | CH34 ON |
| 75 | CH35 ON |
| 76 | CH36 ON |
| 77 | CH37 ON |
| 78 | CH38 ON |
| 79 | CH39 ON |
| 80 | CH40 ON |
| 81 | CH41 ON |
| 82 | CH42 ON |
| 83 | CH43 ON |
| 84 | CH44 ON |
| 85 | CH45 ON |
| 86 | CH46 ON |
| 87 | CH47 ON |
| 88 | CH48 ON |
| 89 | CH49 ON |
| 90 | CH50 ON |
| 91 | CH51 ON |
| 92 | CH52 ON |
| 93 | CH53 ON |
| 94 | CH54 ON |
| 95 | CH55 ON |
| 96 | CH56 ON |
| 97 | AUX1 ON |
| 98 | AUX2 ON |
| 99 | AUX3 ON |
| 100 | AUX4 ON |
| 101 | AUX5 ON |

| # | Target |
|---|--------|
| 102 | AUX6 ON |
| 103 | AUX7 ON |
| 104 | AUX8 ON |
| 105 | STEREO ON |
| 106 | CH1 ON UNLATCH |
| 107 | CH2 ON UNLATCH |
| 108 | CH3 ON UNLATCH |
| 109 | CH4 ON UNLATCH |
| 110 | CH5 ON UNLATCH |
| 111 | CH6 ON UNLATCH |
| 112 | CH7 ON UNLATCH |
| 113 | CH8 ON UNLATCH |
| 114 | CH9 ON UNLATCH |
| 115 | CH10 ON UNLATCH |
| 116 | CH11 ON UNLATCH |
| 117 | CH12 ON UNLATCH |
| 118 | CH13 ON UNLATCH |
| 119 | CH14 ON UNLATCH |
| 120 | CH15 ON UNLATCH |
| 121 | CH16 ON UNLATCH |
| 122 | CH17 ON UNLATCH |
| 123 | CH18 ON UNLATCH |
| 124 | CH19 ON UNLATCH |
| 125 | CH20 ON UNLATCH |
| 126 | CH21 ON UNLATCH |
| 127 | CH22 ON UNLATCH |
| 128 | CH23 ON UNLATCH |
| 129 | CH24 ON UNLATCH |
| 130 | CH25 ON UNLATCH |
| 131 | CH26 ON UNLATCH |
| 132 | CH27 ON UNLATCH |
| 133 | CH28 ON UNLATCH |
| 134 | CH29 ON UNLATCH |
| 135 | CH30 ON UNLATCH |
| 136 | CH31 ON UNLATCH |
| 137 | CH32 ON UNLATCH |
| 138 | CH33 ON UNLATCH |
| 139 | CH34 ON UNLATCH |
| 140 | CH35 ON UNLATCH |
| 141 | CH36 ON UNLATCH |
| 142 | CH37 ON UNLATCH |
| 143 | CH38 ON UNLATCH |
| 144 | CH39 ON UNLATCH |
| 145 | CH40 ON UNLATCH |
| 146 | CH41 ON UNLATCH |
| 147 | CH42 ON UNLATCH |
| 148 | CH43 ON UNLATCH |
| 149 | CH44 ON UNLATCH |
| 150 | CH45 ON UNLATCH |
| 151 | CH46 ON UNLATCH |
| 152 | CH47 ON UNLATCH |

| # | Target |
|---|--------|
| 153 | CH48 ON UNLATCH |
| 154 | CH49 ON UNLATCH |
| 155 | CH50 ON UNLATCH |
| 156 | CH51 ON UNLATCH |
| 157 | CH52 ON UNLATCH |
| 158 | CH53 ON UNLATCH |
| 159 | CH54 ON UNLATCH |
| 160 | CH55 ON UNLATCH |
| 161 | CH56 ON UNLATCH |
| 162 | BUS1 ON UNLATCH |
| 163 | BUS2 ON UNLATCH |
| 164 | BUS3 ON UNLATCH |
| 165 | BUS4 ON UNLATCH |
| 166 | BUS5 ON UNLATCH |
| 167 | BUS6 ON UNLATCH |
| 168 | BUS7 ON UNLATCH |
| 169 | BUS8 ON UNLATCH |
| 170 | AUX1 ON UNLATCH |
| 171 | AUX2 ON UNLATCH |
| 172 | AUX3 ON UNLATCH |
| 173 | AUX4 ON UNLATCH |
| 174 | AUX5 ON UNLATCH |
| 175 | AUX6 ON UNLATCH |
| 176 | AUX7 ON UNLATCH |
| 177 | AUX8 ON UNLATCH |
| 178 | ST ON UNLATCH |
| 179 | UDEF1 |
| 180 | UDEF2 |
| 181 | UDEF3 |
| 182 | UDEF4 |
| 183 | UDEF5 |
| 184 | UDEF6 |
| 185 | UDEF7 |
| 186 | UDEF8 |
| 187 | UDEF9 |
| 188 | UDEF10 |
| 189 | UDEF11 |
| 190 | UDEF12 |
| 191 | UDEF13 |
| 192 | UDEF14 |
| 193 | UDEF15 |
| 194 | UDEF16 |

## OUTPUT

| # | Target | # | Target | # | Target | # | Target |
|---|--------|---|--------|---|--------|---|--------|
| 0 | NO ASSIGN | 64 | BUS8 FADER ON | 128 | CH55 FADER OFF | 192 | CH46 FADER TALLY |
| 1 | CH1 FADER ON | 65 | AUX1 FADER ON | 129 | CH56 FADER OFF | 193 | CH47 FADER TALLY |
| 2 | CH2 FADER ON | 66 | AUX2 FADER ON | 130 | BUS1 FADER OFF | 194 | CH48 FADER TALLY |
| 3 | CH3 FADER ON | 67 | AUX3 FADER ON | 131 | BUS2 FADER OFF | 195 | CH49 FADER TALLY |
| 4 | CH4 FADER ON | 68 | AUX4 FADER ON | 132 | BUS3 FADER OFF | 196 | CH50 FADER TALLY |
| 5 | CH5 FADER ON | 69 | AUX5 FADER ON | 133 | BUS4 FADER OFF | 197 | CH51 FADER TALLY |
| 6 | CH6 FADER ON | 70 | AUX6 FADER ON | 134 | BUS5 FADER OFF | 198 | CH52 FADER TALLY |
| 7 | CH7 FADER ON | 71 | AUX7 FADER ON | 135 | BUS6 FADER OFF | 199 | CH53 FADER TALLY |
| 8 | CH8 FADER ON | 72 | AUX8 FADER ON | 136 | BUS7 FADER OFF | 200 | CH54 FADER TALLY |
| 9 | CH9 FADER ON | 73 | STEREO FADER ON | 137 | BUS8 FADER OFF | 201 | CH55 FADER TALLY |
| 10 | CH10 FADER ON | 74 | CH1 FADER OFF | 138 | AUX1 FADER OFF | 202 | CH56 FADER TALLY |
| 11 | CH11 FADER ON | 75 | CH2 FADER OFF | 139 | AUX2 FADER OFF | 203 | BUS1 FADER TALLY |
| 12 | CH12 FADER ON | 76 | CH3 FADER OFF | 140 | AUX3 FADER OFF | 204 | BUS2 FADER TALLY |
| 13 | CH13 FADER ON | 77 | CH4 FADER OFF | 141 | AUX4 FADER OFF | 20. | BUS3 FADER TALLY |
| 14 | CH14 FADER ON | 78 | CH5 FADER OFF | 142 | AUX5 FADER OFF | 206 | BUS4 FADER TALLY |
| 15 | CH15 FADER ON | 79 | CH6 FADER OFF | 143 | AUX6 FADER OFF | 207 | BUS5 FADER TALLY |
| 16 | CH16 FADER ON | 80 | CH7 FADER OFF | 144 | AUX7 FADER OFF | 208 | BUS6 FADER TALLY |
| 17 | CH17 FADER ON | 81 | CH8 FADER OFF | 145 | AUX8 FADER OFF | 209 | BUS7 FADER TALLY |
| 18 | CH18 FADER ON | 82 | CH9 FADER OFF | 146 | STEREO FADER OFF | 210 | BUS8 FADER TALLY |
| 19 | CH19 FADER ON | 83 | CH10 FADER OFF | 147 | CH1 FADER TALLY | 211 | AUX1 FADER TALLY |
| 20 | CH20 FADER ON | 84 | CH11 FADER OFF | 148 | CH2 FADER TALLY | 212 | AUX2 FADER TALLY |
| 21 | CH21 FADER ON | 85 | CH12 FADER OFF | 149 | CH3 FADER TALLY | 213 | AUX3 FADER TALLY |
| 22 | CH22 FADER ON | 86 | CH13 FADER OFF | 150 | CH4 FADER TALLY | 214 | AUX4 FADER TALLY |
| 23 | CH23 FADER ON | 87 | CH14 FADER OFF | 151 | CH5 FADER TALLY | 215 | AUX5 FADER TALLY |
| 24 | CH24 FADER ON | 88 | CH15 FADER OFF | 152 | CH6 FADER TALLY | 216 | AUX6 FADER TALLY |
| 25 | CH25 FADER ON | 89 | CH16 FADER OFF | 153 | CH7 FADER TALLY | 217 | AUX7 FADER TALLY |
| 26 | CH26 FADER ON | 90 | CH17 FADER OFF | 154 | CH8 FADER TALLY | 218 | AUX8 FADER TALLY |
| 27 | CH27 FADER ON | 91 | CH18 FADER OFF | 155 | CH9 FADER TALLY | 219 | ST FADER TALLY |
| 28 | CH28 FADER ON | 92 | CH19 FADER OFF | 156 | CH10 FADER TALLY | 220 | UDEF1 LATCH |
| 29 | CH29 FADER ON | 93 | CH20 FADER OFF | 157 | CH11 FADER TALLY | 221 | UDEF2 LATCH |
| 30 | CH30 FADER ON | 94 | CH21 FADER OFF | 158 | CH12 FADER TALLY | 222 | UDEF3 LATCH |
| 31 | CH31 FADER ON | 95 | CH22 FADER OFF | 159 | CH13 FADER TALLY | 223 | UDEF4 LATCH |
| 32 | CH32 FADER ON | 96 | CH23 FADER OFF | 160 | CH14 FADER TALLY | 224 | UDEF5 LATCH |
| 33 | CH33 FADER ON | 97 | CH24 FADER OFF | 161 | CH15 FADER TALLY | 225 | UDEF6 LATCH |
| 34 | CH34 FADER ON | 98 | CH25 FADER OFF | 162 | CH16 FADER TALLY | 226 | UDEF7 LATCH |
| 35 | CH35 FADER ON | 99 | CH26 FADER OFF | 163 | CH17 FADER TALLY | 227 | UDEF8 LATCH |
| 36 | CH36 FADER ON | 100 | CH27 FADER OFF | 164 | CH18 FADER TALLY | 228 | UDEF9 LATCH |
| 37 | CH37 FADER ON | 101 | CH28 FADER OFF | 165 | CH19 FADER TALLY | 229 | UDEF10 LATCH |
| 38 | CH38 FADER ON | 102 | CH29 FADER OFF | 166 | CH20 FADER TALLY | 230 | UDEF11 LATCH |
| 39 | CH39 FADER ON | 103 | CH30 FADER OFF | 167 | CH21 FADER TALLY | 231 | UDEF12 LATCH |
| 40 | CH40 FADER ON | 104 | CH31 FADER OFF | 168 | CH22 FADER TALLY | 232 | UDEF13 LATCH |
| 41 | CH41 FADER ON | 105 | CH32 FADER OFF | 169 | CH23 FADER TALLY | 233 | UDEF14 LATCH |
| 42 | CH42 FADER ON | 106 | CH33 FADER OFF | 170 | CH24 FADER TALLY | 234 | UDEF15 LATCH |
| 43 | CH43 FADER ON | 107 | CH34 FADER OFF | 171 | CH25 FADER TALLY | 235 | UDEF16 LATCH |
| 44 | CH44 FADER ON | 108 | CH35 FADER OFF | 172 | CH26 FADER TALLY | 236 | UDEF1 UNLATCH |
| 45 | CH45 FADER ON | 109 | CH36 FADER OFF | 173 | CH27 FADER TALLY | 237 | UDEF2 UNLATCH |
| 46 | CH46 FADER ON | 110 | CH37 FADER OFF | 174 | CH28 FADER TALLY | 238 | UDEF3 UNLATCH |
| 47 | CH47 FADER ON | 111 | CH38 FADER OFF | 175 | CH29 FADER TALLY | 239 | UDEF4 UNLATCH |
| 48 | CH48 FADER ON | 112 | CH39 FADER OFF | 176 | CH30 FADER TALLY | 240 | UDEF5 UNLATCH |
| 49 | CH49 FADER ON | 113 | CH40 FADER OFF | 177 | CH31 FADER TALLY | 241 | UDEF6 UNLATCH |
| 50 | CH50 FADER ON | 114 | CH41 FADER OFF | 178 | CH32 FADER TALLY | 242 | UDEF7 UNLATCH |
| 51 | CH51 FADER ON | 115 | CH42 FADER OFF | 179 | CH33 FADER TALLY | 243 | UDEF8 UNLATCH |
| 52 | CH52 FADER ON | 116 | CH43 FADER OFF | 180 | CH34 FADER TALLY | 244 | UDEF9 UNLATCH |
| 53 | CH53 FADER ON | 117 | CH44 FADER OFF | 181 | CH35 FADER TALLY | 245 | UDEF10 UNLATCH |
| 54 | CH54 FADER ON | 118 | CH45 FADER OFF | 182 | CH36 FADER TALLY | 246 | UDEF11 UNLATCH |
| 55 | CH55 FADER ON | 119 | CH46 FADER OFF | 183 | CH37 FADER TALLY | 247 | UDEF12 UNLATCH |
| 56 | CH56 FADER ON | 120 | CH47 FADER OFF | 184 | CH38 FADER TALLY | 248 | UDEF13 UNLATCH |
| 57 | BUS1 FADER ON | 121 | CH48 FADER OFF | 185 | CH39 FADER TALLY | 249 | UDEF14 UNLATCH |
| 58 | BUS2 FADER ON | 122 | CH49 FADER OFF | 186 | CH40 FADER TALLY | 250 | UDEF15 UNLATCH |
| 59 | BUS3 FADER ON | 123 | CH50 FADER OFF | 187 | CH41 FADER TALLY | 251 | UDEF16 UNLATCH |
| 60 | BUS4 FADER ON | 124 | CH51 FADER OFF | 188 | CH42 FADER TALLY | 252 | REC LAMP |
| 61 | BUS5 FADER ON | 125 | CH52 FADER OFF | 189 | CH43 FADER TALLY | 253 | POWER ON |
| 62 | BUS6 FADER ON | 126 | CH53 FADER OFF | 190 | CH44 FADER TALLY | | |
| 63 | BUS7 FADER ON | 127 | CH54 FADER OFF | 191 | CH45 FADER TALLY | | |

# User Defined Remote Layer Initial Bank Settings

## Bank 1 (GM Vol & Pan)

| ID | Short | Long | Controller | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|----|-------|------|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| RM01 | GM01 | GM-CH01 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B0 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B0 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM02 | GM02 | GM-CH02 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B1 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B1 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM03 | GM03 | GM-CH03 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B2 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B2 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM04 | GM04 | GM-CH04 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B3 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B3 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM05 | GM05 | GM-CH05 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B4 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B4 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM06 | GM06 | GM-CH06 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B5 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B5 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM07 | GM07 | GM-CH07 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B6 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B6 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM08 | GM08 | GM-CH08 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B7 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B7 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM09 | GM09 | GM-CH09 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B8 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B8 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM10 | GM10 | GM-CH10 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B9 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B9 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM11 | GM11 | GM-CH11 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BA | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BA | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM12 | GM12 | GM-CH12 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BB | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BB | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM13 | GM13 | GM-CH13 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BC | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BC | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM14 | GM14 | GM-CH14 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BD | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BD | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM15 | GM15 | GM-CH15 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BE | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BE | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM16 | GM16 | GM-CH16 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BF | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BF | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM17 | GM17 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM18 | GM18 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM19 | GM19 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM20 | GM20 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM21 | GM21 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM22 | GM22 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM23 | GM23 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM24 | GM24 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | BAP | NOP | NTOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |

## Bank 2 (GM Vol & Effect 1)

| ID | Name | | Controller | Data Format | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Short | Long | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| RM01 | GM01 | GM-CH01 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B0 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B0 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM02 | GM02 | GM-CH02 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B1 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B1 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM03 | GM03 | GM-CH03 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B2 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B2 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM04 | GM04 | GM-CH04 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B3 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B3 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM05 | GM05 | GM-CH05 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B4 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B4 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM06 | GM06 | GM-CH06 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B5 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B5 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM07 | GM07 | GM-CH07 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B6 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B6 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM08 | GM08 | GM-CH08 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B7 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B7 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM09 | GM09 | GM-CH09 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B8 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B8 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM10 | GM10 | GM-CH10 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B9 | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B9 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM11 | GM11 | GM-CH11 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BA | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BA | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM12 | GM12 | GM-CH12 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BB | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BB | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM13 | GM13 | GM-CH13 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BC | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BC | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM14 | GM14 | GM-CH14 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BD | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BD | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM15 | GM15 | GM-CH15 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BE | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BE | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM16 | GM16 | GM-CH16 VOL&EFF1 | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BF | 0C | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BF | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM17 | GM17 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM18 | GM18 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM19 | GM19 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM20 | GM20 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM21 | GM21 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM22 | GM22 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM23 | GM23 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM24 | GM24 | NO ASSIGN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |

## Bank 3 (XG Vol & Pan)

| ID | Name | | Controller | Data Format | | | | | | | | | | | | | | |
|----|------|---|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| | Short | Long | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| RM01 | XG01 | XG-CH01 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 00 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 00 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM02 | XG02 | XG-CH02 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 01 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 01 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM03 | XG03 | XG-CH03 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 02 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 02 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM04 | XG04 | XG-CH04 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 03 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 03 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM05 | XG05 | XG-CH05 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 04 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 04 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM06 | XG06 | XG-CH06 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 05 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 05 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM07 | XG07 | XG-CH07 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 06 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 06 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM08 | XG08 | XG-CH08 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 07 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 07 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM09 | XG09 | XG-CH09 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 08 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 08 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM10 | XG10 | XG-CH10 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 09 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 09 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM11 | XG11 | XG-CH11 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0A | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0A | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM12 | XG12 | XG-CH12 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0B | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0B | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM13 | XG13 | XG-CH13 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0C | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0C | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM14 | XG14 | XG-CH14 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0D | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0D | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM15 | XG15 | XG-CH15 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0E | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0E | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM16 | XG16 | XG-CH16 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 0F | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 0F | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM17 | XG17 | XG-CH17 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 10 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 10 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM18 | XG18 | XG-CH18 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 11 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 11 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM19 | XG19 | XG-CH19 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 12 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 12 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM20 | XG20 | XG-CH20 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 13 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 13 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM21 | XG21 | XG-CH21 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 14 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 14 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM22 | XG22 | XG-CH22 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 15 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 15 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM23 | XG23 | XG-CH23 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 16 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 16 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| RM24 | XG24 | XG-CH24 VOL&PAN | ON | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | F0 | 43 | 10 | 4C | 08 | 17 | 0E | ENC | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | F0 | 43 | 10 | 4C | 08 | 17 | 0B | FAD | F7 | END | NOP | NOP | NOP | NOP | NOP | NOP |

## Bank 4 (Nuendo VST Mixer)

| ID | Name Short | Name Long | Controller | Data Format 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM01 | CH1 | VST MIXER CH1 | ON | B0 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B0 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B0 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM02 | CH2 | VST MIXER CH2 | ON | B1 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B1 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B1 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM03 | CH3 | VST MIXER CH3 | ON | B2 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B2 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B2 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM04 | CH4 | VST MIXER CH4 | ON | B3 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B3 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B3 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM05 | CH5 | VST MIXER CH5 | ON | B4 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B4 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B4 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM06 | CH6 | VST MIXER CH6 | ON | B5 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B5 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B5 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM07 | CH7 | VST MIXER CH7 | ON | B6 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B6 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B6 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM08 | CH8 | VST MIXER CH8 | ON | B7 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B7 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B7 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM09 | CH9 | VST MIXER CH9 | ON | B8 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B8 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B8 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM10 | CH10 | VST MIXER CH10 | ON | B9 | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B9 | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B9 | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM11 | CH11 | VST MIXER CH11 | ON | BA | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BA | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BA | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM12 | CH12 | VST MIXER CH12 | ON | BB | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BB | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BB | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM13 | CH13 | VST MIXER CH13 | ON | BC | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BC | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BC | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM14 | CH14 | VST MIXER CH14 | ON | BD | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BD | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BD | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM15 | CH15 | VST MIXER CH15 | ON | BE | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BE | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BE | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM16 | CH16 | VST MIXER CH16 | ON | BF | 40 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | BF | 0A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | BF | 07 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM17 | CH17 | VST MIXER CH17 | ON | B0 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B0 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B0 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM18 | CH18 | VST MIXER CH18 | ON | B1 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B1 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B1 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM19 | CH19 | VST MIXER CH19 | ON | B2 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B2 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B2 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM20 | CH20 | VST MIXER CH20 | ON | B3 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B3 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B3 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM21 | CH21 | VST MIXER CH21 | ON | B4 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B4 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B4 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM22 | CH22 | VST MIXER CH22 | ON | B5 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B5 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B5 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM23 | CH23 | VST MIXER CH23 | ON | B6 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B6 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B6 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| RM24 | CH24 | VST MIXER CH24 | ON | B7 | 60 | SW | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | ENCODER | B7 | 2A | ENC | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |
| | | | FADER | B7 | 27 | FAD | END | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP | NOP |

# Effects Parameters

### REVERB HALL, REVERB ROOM, REVERB STAGE, REVERB PLATE

One input, two output hall, room, stage, and plate reverb simulations, all with gates.

| Parameter | Range | Description |
|---|---|---|
| **REV TIME** | 0.3–99.0 s | Reverb time |
| **INI. DLY** | 0.0–500.0 ms | Initial delay before reverb begins |
| **HI. RATIO** | 0.1–1.0 | High-frequency reverb time ratio |
| **LO. RATIO** | 0.1–2.4 | Low-frequency reverb time ratio |
| **DIFF.** | 0–10 | Reverb diffusion (left–right reverb spread) |
| **DENSITY** | 0–100% | Reverb density |
| **E/R DLY** | 0.0–100.0 ms | Delay between early reflections and reverb |
| **E/R BAL.** | 0–100% | Balance of early reflections and reverb (0% = all reverb, 100% = all early reflections) |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| **GATE LVL** | OFF, –60 to 0 dB | Level at which gate kicks in |
| **ATTACK** | 0–120 ms | Gate opening speed |
| **HOLD** | [1] | Gate open time |
| **DECAY** | [2] | Gate closing speed |

1.  0.02 ms–2.13 s (fs=44.1 kHz), 0.02 ms–1.96 s (fs=48 kHz), 0.01 ms–1.06 s (fs=88.2 kHz), 0.01 ms–981 ms (fs=96 kHz)

2.  6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

### EARLY REF.

One input, two output early reflections.

| Parameter | Range | Description |
|---|---|---|
| **TYPE** | S-Hall, L-Hall, Random, Revers, Plate, Spring | Type of early reflection simulation |
| **ROOMSIZE** | 0.1–20.0 | Reflection spacing |
| **LIVENESS** | 0–10 | Early reflections decay characteristics (0 = dead, 10 = live) |
| **INI. DLY** | 0.0–500.0 ms | Initial delay before reverb begins |
| **DIFF.** | 0–10 | Reflection diffusion (left–right reflection spread) |
| **DENSITY** | 0–100% | Reflection density |
| **ER NUM.** | 1–19 | Number of early reflections |
| **FB GAIN** | –99 to +99% | Feedback gain |
| **HI. RATIO** | 0.1–1.0 | High-frequency feedback ratio |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |

## GATE REVERB, REVERSE GATE

One input, two output early reflections with gate, and early reflections with reverse gate.

| Parameter | Range | Description |
|---|---|---|
| TYPE | Type-A, Type-B | Type of early reflection simulation |
| ROOMSIZE | 0.1–20.0 | Reflection spacing |
| LIVENESS | 0–10 | Early reflections decay characteristics (0 = dead, 10 = live) |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| DIFF. | 0–10 | Reflection diffusion (left–right reflection spread) |
| DENSITY | 0–100% | Reflection density |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| ER NUM. | 1–19 | Number of early reflections |
| FB GAIN | –99 to +99% | Feedback gain |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |

## MONO DELAY

One input, one output basic repeat delay.

| Parameter | Range | Description |
|---|---|---|
| DELAY | 0.0–2730.0 ms | Delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine DELAY |

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## STEREO DELAY

Two input, two output basic stereo delay.

| Parameter | Range | Description |
|---|---|---|
| DELAY L | 0.0–1350.0 ms | Left channel delay time |
| DELAY R | 0.0–1350.0 ms | Right channel delay time |
| FB. G L | –99 to +99% | Left channel feedback (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| FB. G R | –99 to +99% | Right channel feedback (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE L | [1] | Used in conjunction with TEMPO to determine left channel DELAY |
| NOTE R | [1] | Used in conjunction with TEMPO to determine right channel DELAY |

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## MOD. DELAY

One input, two output basic repeat delay with modulation.

| Parameter | Range | Description |
|---|---|---|
| **DELAY** | 0.0–2725.0 ms | Delay time |
| **FB. GAIN** | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **HI. RATIO** | 0.1–1.0 | High-frequency feedback ratio |
| **FREQ.** | 0.05–40.00 Hz | Modulation speed |
| **DEPTH** | 0–100% | Modulation depth |
| **WAVE** | Sine/Tri | Modulation waveform |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **DLY.NOTE** | [1] | Used in conjunction with TEMPO to determine DELAY |
| **MOD.NOTE** | [2] | Used in conjunction with TEMPO to determine FREQ |

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## DELAY LCR

One input, two output 3-tap delay (left, center, right).

| Parameter | Range | Description |
|---|---|---|
| **DELAY L** | 0.0–2730.0 ms | Left channel delay time |
| **DELAY C** | 0.0–2730.0 ms | Center channel delay time |
| **DELAY R** | 0.0–2730.0 ms | Right channel delay time |
| **FB. DLY** | 0.0–2730.0 ms | Feedback delay time |
| **LEVEL L** | –100 to +100% | Left channel delay level |
| **LEVEL C** | –100 to +100% | Center channel delay level |
| **LEVEL R** | –100 to +100% | Right channel delay level |
| **FB. GAIN** | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **HI. RATIO** | 0.1–1.0 | High-frequency feedback ratio |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE L** | [1] | Used in conjunction with TEMPO to determine DELAY L |
| **NOTE C** | [1] | Used in conjunction with TEMPO to determine DELAY C |
| **NOTE R** | [1] | Used in conjunction with TEMPO to determine DELAY R |
| **NOTE FB** | [1] | Used in conjunction with TEMPO to determine FB. DLY |

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## ECHO

Two input, two output stereo delay with crossed feedback loop.

| Parameter | Range | Description |
|---|---|---|
| **DELAY L** | 0.0–1350.0 ms | Left channel delay time |
| **DELAY R** | 0.0–1350.0 ms | Right channel delay time |
| **FB.DLY L** | 0.0–1350.0 ms | Left channel feedback delay time |
| **FB.DLY R** | 0.0–1350.0 ms | Right channel feedback delay time |
| **FB. G L** | –99 to +99% | Left channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **FB. G R** | –99 to +99% | Right channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **L->R FBG** | –99 to +99% | Left to right channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **R->L FBG** | –99 to +99% | Right to left channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **HI. RATIO** | 0.1–1.0 | High-frequency feedback ratio |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE L** | [1] | Used in conjunction with TEMPO to determine DELAY L |
| **NOTE R** | [1] | Used in conjunction with TEMPO to determine DELAY R |
| **NOTE FBL** | [1] | Used in conjunction with TEMPO to determine FB. D L |
| **NOTE FBR** | [1] | Used in conjunction with TEMPO to determine FB. D R |
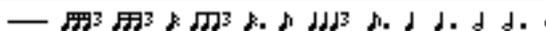
1. ♩♩♩ (Maximum value depends on the tempo setting)
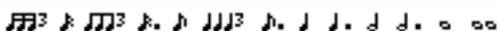
## CHORUS

Two input, two output chorus effect.

| Parameter | Range | Description |
|---|---|---|
| **FREQ.** | 0.05–40.00 Hz | Modulation speed |
| **AM DEPTH** | 0–100% | Amplitude modulation depth |
| **PM DEPTH** | 0–100% | Pitch modulation depth |
| **MOD. DLY** | 0.0–500.0 ms | Modulation delay time |
| **WAVE** | Sine, Tri | Modulation waveform |
| **LSH F** | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| **LSH G** | –12 to +12 dB | Low shelving filter gain |
| **EQ F** | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| **EQ G** | –12 to +12 dB | EQ (peaking type) gain |
| **EQ Q** | 10.0–0.10 | EQ (peaking type) bandwidth |
| **HSH F** | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| **HSH G** | –12 to +12 dB | High shelving filter gain |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE** | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## FLANGE

Two input, two output flange effect.

| Parameter | Range | Description |
|-----------|-------|-------------|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| WAVE | Sine, Tri | Modulation waveform |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| EQ F | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| EQ G | –12 to +12 dB | EQ (peaking type) gain |
| EQ Q | 10.0–0.10 | EQ (peaking type) bandwidth |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## SYMPHONIC

Two input, two output symphonic effect.

| Parameter | Range | Description |
|-----------|-------|-------------|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| EQ F | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| EQ G | –12 to +12 dB | EQ (peaking type) gain |
| EQ Q | 10.0–0.10 | EQ (peaking type) bandwidth |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## PHASER

Two input, two output 16-stage phaser.

| Parameter | Range | Description |
|---|---|---|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| OFFSET | 0–100 | Lowest phase-shifted frequency offset |
| PHASE | 0.00–354.38 degrees | Left and right modulation phase balance |
| STAGE | 2, 4, 6, 8, 10, 12, 14, 16 | Number of phase shift stages |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## AUTOPAN

Two input, two output autopanner.

| Parameter | Range | Description |
|---|---|---|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| DIR. | [1] | Panning direction |
| WAVE | Sine, Tri, Square | Modulation waveform |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| EQ F | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| EQ G | –12 to +12 dB | EQ (peaking type) gain |
| EQ Q | 10.0–0.10 | EQ (peaking type) bandwidth |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [2] | Used in conjunction with TEMPO to determine FREQ. |

1. L<->R, L—>R, L<—R, Turn L, Turn R

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## TREMOLO

Two input, two output tremolo effect.

| Parameter | Range | Description |
|---|---|---|
| **FREQ.** | 0.05–40.00 Hz | Modulation speed |
| **DEPTH** | 0–100% | Modulation depth |
| **WAVE** | Sine, Tri, Square | Modulation waveform |
| **LSH F** | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| **LSH G** | –12 to +12 dB | Low shelving filter gain |
| **EQ F** | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| **EQ G** | –12 to +12 dB | EQ (peaking type) gain |
| **EQ Q** | 10.0–0.10 | EQ (peaking type) bandwidth |
| **HSH F** | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| **HSH G** | –12 to +12 dB | High shelving filter gain |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE** | [1] | Used in conjunction with TEMPO to determine FREQ. |

1.  ♫♫³ ♪ ♫♫³ ♪. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. ○ ○○

## HQ. PITCH

One input, two output high-quality pitch shifter.

| Parameter | Range | Description |
|---|---|---|
| **PITCH** | –12 to +12 semitones | Pitch shift |
| **FINE** | –50 to +50 cents | Pitch shift fine |
| **DELAY** | 0.0–1000.0 ms | Delay time |
| **FB. GAIN** | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| **MODE** | 1–10 | Pitch shift precision |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE** | [1] | Used in conjunction with TEMPO to determine DELAY |

1.  —— ♫♫³ ♫♫³ ♪ ♫♫³ ♪. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. ○ (Maximum value depends on the tempo setting)

## DUAL PITCH

Two input, two output pitch shifter.

| Parameter | Range | Description |
|---|---|---|
| PITCH 1 | –24 to +24 semitones | Channel #1 pitch shift |
| FINE 1 | –50 to +50 cents | Channel #1 pitch shift fine |
| LEVEL 1 | –100 to +100% | Channel #1 level (plus values for normal phase, minus values for reverse phase) |
| PAN 1 | L63 to R63 | Channel #1 pan |
| DELAY 1 | 0.0–1000.0 ms | Channel #1 delay time |
| FB. G 1 | –99 to +99% | Channel #1 feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| PITCH 2 | –24 to +24 semitones | Channel #2 pitch shift |
| FINE 2 | –50 to +50 cents | Channel #2 pitch shift fine |
| LEVEL 2 | –100 to +100% | Channel #2 level (plus values for normal phase, minus values for reverse phase) |
| PAN 2 | L63 to R63 | Channel #2 pan |
| DELAY 2 | 0.0–1000.0 ms | Channel #2 delay time |
| FB. G 2 | –99 to +99% | Channel #2 feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| MODE | 1–10 | Pitch shift precision |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE 1 | [1] | Used in conjunction with TEMPO to determine Channel #1 delay |
| NOTE 2 | [1] | Used in conjunction with TEMPO to determine Channel #2 delay |
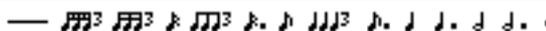
1. ♩ ♪♪♪³ ♪♪♪³ ♪ ♪♪♪³ ♪. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. 𝅝 (Maximum value depends on the tempo setting)

## ROTARY

One input, two output rotary speaker simulator.

| Parameter | Range | Description |
|---|---|---|
| ROTATE | STOP, START | Rotation stop, start |
| SPEED | SLOW, FAST | Rotation speed (see SLOW and FAST parameters) |
| SLOW | 0.05–10.00 Hz | SLOW rotation speed |
| FAST | 0.05–10.00 Hz | FAST rotation speed |
| DRIVE | 0–100 | Overdrive level |
| ACCEL | 0–10 | Acceleration at speed changes |
| LOW | 0–100 | Low-frequency filter |
| HIGH | 0–100 | High-frequency filter |

## RING MOD.

Two input, two output ring modulator.

| Parameter | Range | Description |
|---|---|---|
| SOURCE | OSC, SELF | Modulation source: oscillator or input signal |
| OSC FREQ | 0.0–5000.0 Hz | Oscillator frequency |
| FM FREQ. | 0.05–40.00 Hz | Oscillator frequency modulation speed |
| FM DEPTH | 0–100% | Oscillator frequency modulation depth |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE FM | [1] | Used in conjunction with TEMPO to determine FM FREQ |

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### MOD. FILTER

Two input, two output modulation filter.

| Parameter | Range | Description |
|---|---|---|
| **FREQ.** | 0.05–40.00 Hz | Modulation speed |
| **DEPTH** | 0–100% | Modulation depth |
| **PHASE** | 0.00–354.38 degrees | Left-channel modulation and right-channel modulation phase difference |
| **TYPE** | LPF, HPF, BPF | Filter type: low pass, high pass, band pass |
| **OFFSET** | 0–100 | Filter frequency offset |
| **RESO.** | 0–20 | Filter resonance |
| **LEVEL** | 0–100 | Output level |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE** | [1] | Used in conjunction with TEMPO to determine FREQ |

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### DISTORTION

One input, two output distortion effect.

| Parameter | Range | Description |
|---|---|---|
| **DST TYPE** | DST1, DST2, OVD1, OVD2, CRUNCH | Distortion type (DST = distortion, OVD = overdrive) |
| **DRIVE** | 0–100 | Distortion drive |
| **MASTER** | 0–100 | Master volume |
| **TONE** | –10 to +10 | Tone |
| **N. GATE** | 0–20 | Noise reduction |

### AMP SIMULATE

One input, two output guitar amp simulator.

| Parameter | Range | Description |
|---|---|---|
| **AMP TYPE** | [1] | Guitar amp simulation type |
| **DST TYPE** | DST1, DST2, OVD1, OVD2, CRUNCH | Distortion type (DST = distortion, OVD = overdrive) |
| **DRIVE** | 0–100 | Distortion drive |
| **MASTER** | 0–100 | Master volume |
| **BASS** | 0–100 | Bass tone control |
| **MIDDLE** | 0–100 | Middle tone control |
| **TREBLE** | 0–100 | High tone control |
| **CAB DEP** | 0–100% | Speaker cabinet simulation depth |
| **EQ F** | 100 Hz–8.0 kHz | EQ (peaking type) frequency |
| **EQ G** | –12 to +12 dB | EQ (peaking type) gain |
| **EQ Q** | 10.0–0.10 | EQ (peaking type) bandwidth |
| **N. GATE** | 0–20 | Noise reduction |

1.  STK-M1, STK-M2, THRASH, MIDBST, CMB-PG, CMB-VR, CMB-DX, CMB-TW, MINI, FLAT

## DYNA. FILTER

Two input, two output dynamically controlled filter.

| Parameter | Range | Description |
|-----------|-------|-------------|
| SOURCE | INPUT, MIDI | Control source: input signal or MIDI Note On velocity |
| SENSE | 0–100 | Sensitivity |
| DIR. | UP, DOWN | Upward or downward frequency change |
| DECAY | [1] | Filter frequency change decay speed |
| TYPE | LPF, HPF, BPF | Filter type |
| OFFSET | 0–100 | Filter frequency offset |
| RESO. | 0–20 | Filter resonance |
| LEVEL | 0–100 | Output Level |

1. 6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

## DYNA. FLANGE

Two input, two output dynamically controlled flanger.

| Parameter | Range | Description |
|-----------|-------|-------------|
| SOURCE | INPUT, MIDI | Control source: input signal or MIDI Note On velocity |
| SENSE | 0–100 | Sensitivity |
| DIR. | UP, DOWN | Upward or downward frequency change |
| DECAY | [1] | Decay speed |
| OFFSET | 0–100 | Delay time offset |
| FB.GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| EQ F | 100 Hz–8.00 kHz | EQ (peaking type) frequency |
| EQ G | –12 to +12 dB | EQ (peaking type) gain |
| EQ Q | 10.0–0.10 | EQ (peaking type) bandwidth |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |

1. 6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

## DYNA. PHASER

Two input, two output dynamically controlled phaser.

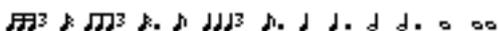| Parameter | Range | Description |
|-----------|-------|-------------|
| SOURCE | INPUT, MIDI | Control source: input signal or MIDI Note On velocity |
| SENSE | 0–100 | Sensitivity |
| DIR. | UP, DOWN | Upward or downward frequency change |
| DECAY | [1] | Decay speed |
| OFFSET | 0–100 | Lowest phase-shifted frequency offset |
| FB.GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| STAGE | 2, 4, 6, 8, 10, 12, 14, 16 | Number of phase shift stages |
| LSH F | 21.2 Hz–8.00 kHz | Low shelving filter frequency |
| LSH G | –12 to +12 dB | Low shelving filter gain |
| HSH F | 50.0 Hz–16.0 kHz | High shelving filter frequency |
| HSH G | –12 to +12 dB | High shelving filter gain |

1. 6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

## REV+CHORUS

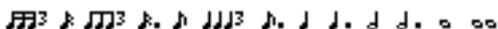One input, two output reverb and chorus effects in parallel.

| Parameter | Range | Description |
|-----------|-------|-------------|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV/CHO | 0–100% | Reverb and chorus balance (0% = all reverb, 100% = all chorus) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| AM DEPTH | 0–100% | Amplitude modulation depth |
| PM DEPTH | 0–100% | Pitch modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

1. ♫♪♩♫♩♪♩♪♪♪♩♪♩♩♩♩♩♩♩♩♩

## REV->CHORUS

One input, two output reverb and chorus effects in series.

| Parameter | Range | Description |
|-----------|-------|-------------|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV.BAL | 0–100% | Reverb and chorused reverb balance (0% = all chorused reverb, 100% = all reverb) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| AM DEPTH | 0–100% | Amplitude modulation depth |
| PM DEPTH | 0–100% | Pitch modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

1. ♫♪♩♫♩♪♩♪♪♪♩♪♩♩♩♩♩♩♩♩♩

## REV+FLANGE

One input, two output reverb and flanger effects in parallel.

| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV/FLG | 0–100% | Reverb and flange balance (0% = all reverb, 100% = all flange) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## REV->FLANGE

One input, two output reverb and flanger effects in series.

| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV.BAL | 0–100% | Reverb and flanged reverb balance (0% = all flanged reverb, 100% = all reverb) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

1. ♩♩♩³ ♪ ♫³ ♪. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. ○ ○○

### REV+SYMPHO.

One input, two output reverb and symphonic effects in parallel.

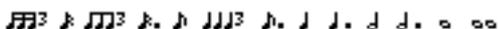| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV/SYM | 0–100% | Reverb and symphonic balance (0% = all reverb, 100% = all symphonic) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

1. 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯³ 𝄾 𝅘𝅥𝅮𝅘𝅥𝅮³ 𝄽 𝅘𝅥𝅮 𝅘𝅥𝅮𝅘𝅥𝅮𝅘𝅥𝅮³ 𝄾 𝅘𝅥 𝅘𝅥. 𝅗𝅥 𝅗𝅥. 𝅝 𝅝𝅝
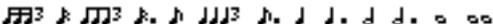
### REV->SYMPHO.

One input, two output reverb and symphonic effects in series.

| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV.BAL | 0–100% | Reverb and symphonic reverb balance (0% = all symphonic reverb, 100% = all reverb) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–500.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

1. 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯³ 𝄾 𝅘𝅥𝅮𝅘𝅥𝅮³ 𝄽 𝅘𝅥𝅮 𝅘𝅥𝅮𝅘𝅥𝅮𝅘𝅥𝅮³ 𝄾 𝅘𝅥 𝅘𝅥. 𝅗𝅥 𝅗𝅥. 𝅝 𝅝𝅝

## REV->PAN

One input, two output reverb and autopan effects in parallel.

| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| REV.BAL | 0–100% | Reverb and panned reverb balance (0% = all panned reverb, 100% = all reverb) |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| DIR. | [1] | Panning direction |
| WAVE | Sine, Tri, Square | Modulation waveform |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [2] | Used in conjunction with TEMPO to determine FREQ. |

1.  L<–>R, L–>R, L<–R, Turn L, Turn R

2.  ♫³ 𝄽 ♫³ ♩. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. 𝅝 𝅝𝅝

## DELAY+ER.

One input, two output delay and early reflections effects in parallel.

| Parameter | Range | Description |
|---|---|---|
| DELAY L | 0.0–1000.0 ms | Left channel delay time |
| DELAY R | 0.0–1000.0 ms | Right channel delay time |
| FB. DLY | 0.0–1000.0 ms | Feedback delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| DLY/ER | 0–100% | Delay and early reflections balance (0% = all delay, 100% = all early reflections) |
| TYPE | S-Hall, L-Hall, Random, Revers, Plate, Spring | Type of early reflection simulation |
| ROOMSIZE | 0.1–20.0 | Reflection spacing |
| LIVENESS | 0–10 | Early reflections decay characteristics (0 = dead, 10 = live) |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| ER NUM. | 1–19 | Number of early reflections |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE L | [1] | Used in conjunction with TEMPO to determine left channel DELAY L |
| NOTE R | [1] | Used in conjunction with TEMPO to determine right channel DELAY R |
| NOTE FB | [1] | Used in conjunction with TEMPO to determine FB. DLY |

1.  —  ♫³ ♫³ 𝄽 ♫³ ♩. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. 𝅝 (Maximum value depends on the tempo setting)

## DELAY->ER.

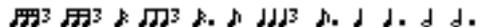One input, two output delay and early reflections effects in series.

| Parameter | Range | Description |
|---|---|---|
| DELAY L | 0.0–1000.0 ms | Left channel delay time |
| DELAY R | 0.0–1000.0 ms | Right channel delay time |
| FB. DLY | 0.0–1000.0 ms | Feedback delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| DLY.BAL | 0–100% | Delay and early reflected delay balance (0% = all early reflected delay, 100% = all delay) |
| TYPE | S-Hall, L-Hall, Random, Revers, Plate, Spring | Type of early reflection simulation |
| ROOMSIZE | 0.1–20.0 | Reflection spacing |
| LIVENESS | 0–10 | Early reflections decay characteristics (0 = dead, 10 = live) |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| ER NUM. | 1–19 | Number of early reflections |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE L | [1] | Used in conjunction with TEMPO to determine left channel DELAY L |
| NOTE R | [1] | Used in conjunction with TEMPO to determine right channel DELAY R |
| NOTE FB | [1] | Used in conjunction with TEMPO to determine FB. DLY |

1. ▬ ♬♬³ ♬♬³ ♪ ♫³ ♪. ♪ ♩♩♩³ ♪. ♩ ♩. ♩ ♩. ○ (Maximum value depends on the tempo setting)

## DELAY+REV

One input, two output delay and reverb effects in parallel.

| Parameter | Range | Description |
|---|---|---|
| DELAY L | 0.0–1000.0 ms | Left channel delay time |
| DELAY R | 0.0–1000.0 ms | Right channel delay time |
| FB. DLY | 0.0–1000.0 ms | Feedback delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| DELAY HI | 0.1–1.0 | Delay high-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| DLY/REV | 0–100% | Delay and reverb balance (0% = all delay, 100% = all reverb) |
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| REV HI | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE L | [1] | Used in conjunction with TEMPO to determine left channel DELAY L |
| NOTE R | [1] | Used in conjunction with TEMPO to determine right channel DELAY R |
| NOTE FB | [1] | Used in conjunction with TEMPO to determine FB. DLY |

1. ▬ ♬♬³ ♬♬³ ♪ ♫³ ♪. ♪ ♩♩♩³ ♪. ♩ ♩. ♩ ♩. ○ (Maximum value depends on the tempo setting)

## DELAY->REV

One input, two output delay and reverb effects in series.

| Parameter | Range | Description |
|---|---|---|
| DELAY L | 0.0–1000.0 ms | Left channel delay time |
| DELAY R | 0.0–1000.0 ms | Right channel delay time |
| FB. DLY | 0.0–1000.0 ms | Feedback delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| DELAY HI | 0.1–1.0 | Delay high-frequency feedback ratio |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| DLY.BAL | 0–100% | Delay and delayed reverb balance (0% = all delayed reverb, 100% = all delay) |
| REV TIME | 0.3–99.0 s | Reverb time |
| INI. DLY | 0.0–500.0 ms | Initial delay before reverb begins |
| REV HI | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Spread |
| DENSITY | 0–100% | Reverb density |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE L | 1 | Used in conjunction with TEMPO to determine left channel DELAY L |
| NOTE R | *1 | Used in conjunction with TEMPO to determine right channel DELAY R |
| NOTE FB | *1 | Used in conjunction with TEMPO to determine FB. DLY |

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## DIST->DELAY

One input, two output distortion and delay effects in series.

| Parameter | Range | Description |
|---|---|---|
| DST TYPE | DST1, DST2, OVD1, OVD2, CRUNCH | Distortion type (DST = distortion, OVD = overdrive) |
| DRIVE | 0–100 | Distortion drive |
| MASTER | 0–100 | Master volume |
| TONE | –10 to +10 | Tone control |
| N. GATE | 0–20 | Noise reduction |
| DELAY | 0.0–2725.0 ms | Delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| HI. RATIO | 0.1–1.0 | High-frequency feedback ratio |
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| DLY.BAL | 0–100% | Distortion and delay balance (0% = all distortion, 100% = all delayed distortion) |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| DLY.NOTE | 1 | Used in conjunction with TEMPO to determine DELAY |
| MOD.NOTE | 2 | Used in conjunction with TEMPO to determine FREQ. |

1. ▬ ♫♫³ ♫♫³ ♪ ♫♪³ ♪. ♪ ♪♪♪³ ♪. ♩ ♩. ♩ ♩. 𝅝 𝅝𝅝 (Maximum value depends on the tempo setting)

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## MULTI FILTER

Two input, two output 3-band multi-filter (24 dB/octave).

| Parameter | Range | Description |
|-----------|-------|-------------|
| TYPE 1 | HPF, LPF, BPF | Filter 1 type: high pass, low pass, band pass |
| TYPE 2 | HPF, LPF, BPF | Filter 2 type: high pass, low pass, band pass |
| TYPE 3 | HPF, LPF, BPF | Filter 3 type: high pass, low pass, band pass |
| FREQ. 1 | 28.0 Hz–16.0 kHz | Filter 1 frequency |
| FREQ. 2 | 28.0 Hz–16.0 kHz | Filter 2 frequency |
| FREQ. 3 | 28.0 Hz–16.0 kHz | Filter 3 frequency |
| LEVEL 1 | 0–100 | Filter 1 level |
| LEVEL 2 | 0–100 | Filter 2 level |
| LEVEL 3 | 0–100 | Filter 3 level |
| RESO. 1 | 0–20 | Filter 1 resonance |
| RESO. 2 | 0–20 | Filter 2 resonance |
| RESO. 3 | 0–20 | Filter 3 resonance |

## FREEZE

One input, one output basic sampler.

| Parameter | Range | Description |
|-----------|-------|-------------|
| REC MODE | MANUAL, INPUT | In MANUAL mode, recording is started by pressing the REC and PLAY buttons. In INPUT mode, Record-Ready mode is engaged by pressing the REC button, and actual recording is triggered by the input signal. |
| REC DLY | –1000 to +1000 ms | Recording delay. For plus values, recording starts after the trigger is received. For minus values, recording starts before the trigger is received. |
| TRG LVL | –60 to 0 dB | Input trigger level (i.e., the signal level required to trigger recording or playback) |
| TRG MASK | 0–1000 ms | Once playback has been triggered, subsequent triggers are ignored for the duration of the TRG MASK time. |
| PLY MODE | MOMENT, CONTI., INPUT | In MOMENT mode, the sample plays only while the that the PLAY button is pressed. In CONT mode, playback continues once the PLAY button has been pressed. The number of times the sample plays is set using the LOOP NUM parameter. In INPUT mode, playback is triggered by the input signal. |
| START | [1] | Playback start point in milliseconds |
| END | [1] | Playback end point in milliseconds |
| LOOP | [1] | Loop start point in milliseconds |
| LOOP NUM | 0–100 | Number of times the sample plays |
| START [SAMPLE] | 0–262000 | Playback start point in samples |
| END [SAMPLE] | 0–262000 | Playback end point in samples |
| LOOP [SAMPLE] | 0–262000 | Loop start point in samples |
| PITCH | –12 to +12 semitones | Playback pitch shift |
| FINE | –50 to +50 cents | Playback pitch shift fine |
| MIDI TRG | OFF, C1–C6, ALL | PLAY button can be triggered by using MIDI Note on/off messages. |

1. 0.0–5941.0 ms (fs=44.1 kHz), 0.0 ms–5458.3 ms (fs=48 kHz), 0.0–2970.5 ms (fs=88.2 kHz),
   0.0 ms–2729.2 ms (fs=96 kHz)

## ST REVERB

Two input, two output stereo reverb.

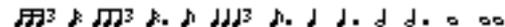| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| REV TYPE | Hall, Room, Stage, Plate | Reverb type |
| INI. DLY | 0.0–100.0 ms | Initial delay before reverb begins |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| LO. RATIO | 0.1–2.4 | Low-frequency reverb time ratio |
| DIFF. | 0–10 | Reverb diffusion (left–right reverb spread) |
| DENSITY | 0–100% | Reverb density |
| E/R BAL. | 0–100% | Balance of early reflections and reverb (0% = all reverb, 100% = all early reflections) |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |

## REVERB 5.1

One input, six output reverb for 5.1 surround, with surround panning.

| Parameter | Range | Description |
|---|---|---|
| REV TIME | 0.3–99.0 s | Reverb time |
| REV TYPE | Hall, Room, Stage, Plate | Reverb type |
| HI. RATIO | 0.1–1.0 | High-frequency reverb time ratio |
| DIFF. | 0–10 | Reverb diffusion (left–right reverb spread) |
| DENSITY | 0–100% | Reverb density |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| DIV. | 0–100% | Divergence determines how the front center signal is fed to the Left, Right, and Center channels. When set to 0%, it's fed only to the Left and Right channels (i.e., Phantom Center). When set to 50%, it's fed equally to the Left, Right, and Center channels. When set to 100%, it's fed to only the Center channel (i.e., Real Center). |
| ROOMSIZE | 0.1–20.0 | Size of simulated room's reverb |
| POS L/R | L63–R63 | Left/right listening position |
| POS F/R | F63–R63 | Front/rear listening position |
| POS CTRL | OFF, NORMAL, INVERT | [1] |
| ER L/R | L63–R63 | Left/right early reflections position |
| ER F/R | F63–R63 | Front/rear early reflections position |
| ER LVL | 0–100% | Early reflections level |
| ER CTRL | OFF, NORMAL, INVERT | [1] |
| REV L/R | L63–R63 | Left/right reverb position |
| REV F/R | F63–R63 | Front/rear reverb position |
| REV LVL | 0–100% | Reverb level |
| REV CTRL | OFF, NORMAL, INVERT | [1] |
| POS RAD. | 0–63 | Radius of the panning track at the listening position |
| ER RAD. | 0–63 | Radius of the panning track for early reflections |
| REV RAD. | 0–63 | Radius of the panning track for reverb |

1. When set to NOR, the position can be set by using the Joystick so long as the SELECTED CHANNEL PAN/SUR-ROUND [EFFECT] button's indicator is on. When set to INV, the Joystick will work inversely. When set to OFF, Joystick control is off. The CTRL button on the Effect Edit page works the same as the [EFFECT] button.

## OCTA REVERB

Eight input, eight output reverb.

| Parameter | Range | Description |
|---|---|---|
| **REV TIME** | 0.3–99.0 s | Reverb time |
| **REV TYPE** | Hall, Room, Stage, Plate | Reverb type |
| **INI. DLY** | 0.0–100.0 ms | Initial delay before reverb begins |
| **HI. RATIO** | 0.1–1.0 | High-frequency reverb time ratio |
| **LO. RATIO** | 0.1–2.4 | Low-frequency reverb time ratio |
| **DIFF.** | 0–10 | Reverb diffusion (left–right reverb spread) |
| **DENSITY** | 0–100% | Reverb density |
| **E/R BAL.** | 0–100% | Balance of early reflections and reverb (0% = all reverb, 100% = all early reflections) |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |

## AUTO PAN 5.1

Six input, six output autopanner for 5.1 surround. You can reset to the pan position specified by the OFFSET parameter by pressing the RESET button.

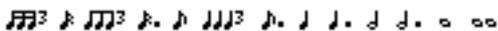| Parameter | Range | Description |
|---|---|---|
| **SOURCE** | OFF, HOLD, INPUT1, INPUT2, INPUT3, INPUT4, INPUT5, INPUT6, MIDI | When set to OFF, the TRIGGER button is used to start autopan. When set to HOLD, autopan runs continuously. When set to INPUT 1–6, the specified channel's input signal triggers autopan. When set to MIDI, a MIDI Note On message can be used to trigger autopan. |
| **TRIG. LVL** | –60 to 0 dB | Input trigger level (i.e., the signal level required to trigger panning when SOURCE set to INPUT) |
| **TRG MASK** | 0–1000 ms | Trigger Mask specifies the time from when a trigger is received until the next trigger will be accepted. |
| **TIME** | 0.0 s–10.0 s | The time after which autopan starts once it's been triggered |
| **SPEED** | 0.05 Hz–40.00 Hz | Autopan speed |
| **DIR.** | Turn L, Turn R | Autopan direction |
| **OFFSET** | –180 to +180 degrees | Pan offset |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |

## CHORUS 5.1

Six input, six output chorus for 5.1 surround.

| Parameter | Range | Description |
|---|---|---|
| **FREQ.** | 0.05–40.00 Hz | Modulation speed |
| **AM DEPTH** | 0–100% | Amplitude modulation depth |
| **PM DEPTH** | 0–100% | Pitch modulation depth |
| **MOD. DLY** | 0.0–400.0 ms | Modulation delay time |
| **WAVE** | Sine, Tri | Modulation waveform |
| **HPF** | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| **LPF** | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| **SYNC** | OFF/ON | Tempo parameter sync on/off |
| **NOTE** | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## FLANGE 5.1

Six input, six output flanger for 5.1 surround.

| Parameter | Range | Description |
|---|---|---|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–400.0 ms | Modulation delay time |
| FB. GAIN | –99 to +99% | Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback) |
| WAVE | Sine, Tri | Modulation waveform |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## SYMPHO 5.1

Six input, six output symphonic effect for 5.1 surround.

| Parameter | Range | Description |
|---|---|---|
| FREQ. | 0.05–40.00 Hz | Modulation speed |
| DEPTH | 0–100% | Modulation depth |
| MOD. DLY | 0.0–400.0 ms | Modulation delay time |
| WAVE | Sine, Tri | Modulation waveform |
| HPF | THRU, 21.2 Hz–8.00 kHz | High-pass filter cutoff frequency |
| LPF | 50.0 Hz–16.0 kHz, THRU | Low-pass filter cutoff frequency |
| SYNC | OFF/ON | Tempo parameter sync on/off |
| NOTE | [1] | Used in conjunction with TEMPO to determine FREQ. |

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## M. BAND DYNA.

Two input, two output 3-band dynamics processor, with individual solo and gain reduction metering for each band.

| Parameter | Range | Description |
|---|---|---|
| LOW GAIN | –96.0 to +12.0 dB | Low band level |
| MID GAIN | –96.0 to +12.0 dB | Mid band level |
| HI. GAIN | –96.0 to +12.0 dB | High band level |
| PRESENCE | –10 to +10 | For positive values, the threshold of the high band is lowered and the threshold of the low band is increased. For negative values, the opposite will occur. When set to 0, all three bands are affected the same. |
| CMP. THRE | –24.0 dB to 0.0 dB | Compressor threshold |
| CMP. RAT | 1:1 to 20:1 | Compressor ratio |
| CMP. ATK | 0–120 ms | Compressor attack |
| CMP. REL | 1 | Compressor release time |
| CMP. KNEE | 0–5 | Compressor knee |
| LOOKUP | 0.0–100.0 ms | Lookup delay |
| CMP. BYP | ON/OFF | Compressor bypass |
| L–M XOVR | 21.2 Hz–8.00 kHz | Low/mid crossover frequency |
| M–H XOVR | 21.2 Hz–8.00 kHz | Mid/high crossover frequency |
| SLOPE | –6 dB, –12 dB | Filter slope |
| CEILING | –6.0 dB to 0.0 dB, OFF | Specifies the maximum output level |
| EXP. THRE | –54.0 dB to –24.0 dB | Expander threshold |
| EXP. RAT | 1:1 to ∞:1 | Expander ratio |
| EXP. REL | 1 | Expander release time |
| EXP. BYP | ON/OFF | Expander bypass |
| LIM. THRE | –12.0 dB to 0.0 dB | Limiter threshold |
| LIM. ATK | 0–120 ms | Limiter attack |
| LIM. REL | 1 | Limiter release time |
| LIM. BYP | ON/OFF | Limiter bypass |
| LIM. KNEE | 0–5 | Limiter knee |

1. 6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

## COMP 5.1

Six input, six output compressor for 5.1 surround, with individual solo for each band, and gain reduction metering of left and right (L+R), left surround and right surround (LS+RS), center (C), or LFE channels.

| Parameter | Range | Description |
|---|---|---|
| **LOW GAIN** | –96.0 to +12.0 dB | Low band level |
| **MID GAIN** | –96.0 to +12.0 dB | Mid band level |
| **HI. GAIN** | –96.0 to +12.0 dB | High band level |
| **PRESENCE** | –10 to +10 | For positive values, the threshold of the high band is lowered and the threshold of the low band is increased. For negative values, the opposite will occur. When set to 0, all three bands are affected the same. |
| **THRE** | –24.0 dB to 0.0 dB | Compressor threshold |
| **RATIO** | 1:1 to ∞:1 | Compressor ratio |
| **ATTACK** | 0–120 ms | Attack |
| **RELEASE** | [1] | Expander release time |
| **KNEE** | 0–5 | Compressor knee |
| **LOOKUP** | 0.0–100.0 ms | Lookup delay |
| **KEY LINK** | [2] | Key-in linking |
| **L–M XOVR** | 21.2 Hz–8.00 kHz | Low/mid crossover frequency |
| **M–H XOVR** | 21.2 Hz–8.00 kHz | Mid/high crossover frequency |
| **SLOPE** | –6 dB, –12 dB | Filter slope |
| **CEILING** | –6.0 dB to 0.0 dB, OFF | Specifies the maximum output level |

1.  6.0 ms–46.0 s (fs=44.1 kHz), 5.0 ms–42.3 s (fs=48 kHz), 3 ms–23.0 s (fs=88.2 kHz), 3 ms–21.1 s (fs=96 kHz)

2.  5.1: key-in of all inputs are linked. 5.0: key-in of the L, C, R, LS, and RS are linked (LFE is independent). 3+2: key-in of L, C, and R are linked, and LS and RS are linked. 2+2: key-in of L and R are linked, and LS and RS are linked.

## COMPAND 5.1

Six input, six output compander for 5.1 surround, with individual solo for each band, and gain reduction metering of left and right (L+R), left surround and right surround (LS+RS), center (C), or LFE channels.

| Parameter | Range | Description |
|---|---|---|
| **LOW GAIN** | –96.0 to +12.0 dB | Low band level |
| **MID GAIN** | –96.0 to +12.0 dB | Mid band level |
| **HI. GAIN** | –96.0 to +12.0 dB | High band level |
| **PRESENCE** | –10 to +10 | For positive values, the threshold of the high band is lowered and the threshold of the low band is increased. For negative values, the opposite will occur. When set to 0, all three bands are affected the same. |
| **THRE** | –24.0 dB to 0.0 dB | Compressor threshold |
| **RATIO** | 1:1 to 20:1 | Compressor ratio |
| **ATTACK** | 0–120 ms | Compressor attack |
| **WIDTH** | 1–90 dB | Width before the expander operates |
| **TYPE** | Soft, Hard | Compander type |
| **LOOKUP** | 0.0–100.0 ms | Lookup delay |
| **KEY LINK** | [1] | Key-in linking |
| **L–M XOVR** | 21.2 Hz–8.00 kHz | Low/mid crossover frequency |
| **M–H XOVR** | 21.2 Hz–8.00 kHz | Mid/high crossover frequency |
| **SLOPE** | –6 dB, –12 dB | Filter slope |
| **CEILING** | –6.0 dB to 0.0 dB, OFF | Specifies the maximum output level |

1.  5.1: key-in of all inputs are linked. 5.0: key-in of the L, C, R, LS, and RS are linked (LFE is independent). 3+2: key-in of L, C, and R are linked, and LS and RS are linked. 2+2: key-in of L and R are linked, and LS and RS are linked.

Other preset effects (COMP276, COMP276S, COMP260, COMP260S, EQUALIZER601, OPEN-DECK, REV-X HALL, REV-X HALL, REV-X ROOM, REV-X PLATE) are optional Add-On Effects. For more information on these effects, refer to the Owner's Manual that comes with the Add-On Effects package.

# Effects and tempo synchronization

Some of the 02R96's effects allow you to synchronize the effect with the tempo. There are two such types of effect; delay-type effects and modulation-type effects. For delay-type effects, the delay time will change according to the tempo. For modulation-type effects, the frequency of the modulation signal will change according to the tempo.

- **Parameters related to tempo synchronization**
  The following five parameters are related to tempo synchronization.
  1) SYNC   2) NOTE   3) TEMPO   4) DELAY   5) FREQ.
  SYNC: ........................... This is the on/off switch for tempo synchronization.
  NOTE and TEMPO:..... These are the basic parameters for tempo synchronization.
  DELAY and FREQ.: ...... DELAY is the delay time, and FREQ. is the frequency of the modulation signal. These directly affect the way in which the effect sound will change. DELAY is relevant only for delay-type effects, and FREQ. is relevant only for modulation-type effects.

- **How the parameters are related**
  Tempo synchronization uses TEMPO and NOTE to calculate a value that will be the basis for the tempo, and continues making adjustments so that this tempo basis stays essentially the same as the DELAY (or FREQ.). This means that when TEMPO, NOTE, and DELAY (or FREQ.) are synchronized, and you change any of these values, the other parameters will be re-set in order to maintain the correct relationship. The parameters that are re-set and the calculation method(*a) used are as follows.

  **If you turn SYNC on → NOTE will be set**
  **If you edit DELAY (or FREQ.) → NOTE will be set**
  In this case, the NOTE value is calculated as follows.
  NOTE = DELAY (or FREQ.)/(4 x (60/TEMPO))

  **If you edit NOTE → DELAY (or FREQ.) will be set**
  In this case, the DELAY (or FREQ.) value is calculated as follows.
  DELAY (or FREQ.) = NOTE x 4 x (60/TEMPO)

  **If you edit TEMPO → DELAY (or FREQ.) will be set**
  In this case, the DELAY (or FREQ.) value is calculated as follows.
  DELAY (or FREQ.) = original DELAY (or FREQ.) x (previous TEMPO/new TEMPO)
  Example 1:  When SYNC=ON, DELAY=250 ms, TEMPO=120, you change NOTE from 8th note to quarter note
  　　　　　DELAY= new NOTE x 4 x (60/TEMPO)
  　　　　　= (1/4) x 4 x (60/120)
  　　　　　= 0.5 (sec)
  　　　　　= 500 ms
  　　　Thus, the DELAY will change from 250 ms to 500 ms.
  Example 2:  When SYNC=ON, DELAY=250 ms, NOTE=8th note, you change TEMPO from 120 to 121
  　　　　　DELAY= original DELAY x (previous TEMPO/new TEMPO)
  　　　　　= 250 x (120/121)
  　　　　　= 247.9 (ms)
  　　　Thus, the TEMPO will change from 250 ms to 247.9 ms.

  *a Rounded values are used for the calculation results.

- **Ranges of the NOTE and TEMPO values**
  The ranges of the NOTE and TEMPO values are limited by the ranges of the DELAY or FREQ. values. You cannot set NOTE or TEMPO values that would cause DELAY or FREQ. to exceed their maximum possible values when synchronized to tempo. This limitation also applies even when SYNC is OFF.

- **Special characteristics of the TEMPO parameter**
  The TEMPO parameter has the following characteristics that are unlike other parameters.
  - It is a common value shared by all effects
  - You cannot stored it to or recall it from the Effects Library. (You can store it to and recall it from a Scene.)
  This means that the TEMPO value may not necessarily be the same when an effect is recalled as when that effect was stored. Here is an example.
  　　Store the effect: TEMPO=120 → Change TEMPO to 60 → Recall the effect: TEMPO=60
  Normally when you change the TEMPO, the DELAY (or FREQ.) will be re-set accordingly. However if the DELAY (or FREQ.) were changed, the effect would sound differently when recalled than when it was stored. To prevent the effect from changing in this way between store and recall, the 02R96 does not update the DELAY (or FREQ.) value when an effect is recalled, even if the TEMPO is no longer the same as when that effect was stored.

  * The NOTE parameter is calculated based on the following values.

  | ♫♫♫³ = 1/48 | ♫♫³ = 1/24 | ♪ = 1/16 | ♫♫³ = 1/12 | ♪. = 3/32 | ♪ = 1/8 | ♪♪♪³ = 1/6 |
  |---|---|---|---|---|---|---|
  | ♪. = 3/16 | ♩ = 1/4 | ♩. = 3/8 | ♩ = 1/2 | ♩. = 3/4 | 𝅝 = 1/1 | 𝅝𝅝 = 2/1 |

# Preset EQ Parameters

| # | Title | | LOW | L-MID | H-MID | HIGH |
|---|-------|---|-----|-------|-------|------|
| 01 | Bass Drum 1 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +3.5 dB | –3.5 dB | 0.0 dB | +4.0 dB |
| | | F | 100 Hz | 265 Hz | 1.06 kHz | 5.30 kHz |
| | | Q | 1.2 | 10 | 0.9 | — |
| 02 | Bass Drum 2 | | PEAKING | PEAKING | PEAKING | LPF |
| | | G | +8.0 dB | –7.0 dB | +6.0 dB | ON |
| | | F | 80 Hz | 400 Hz | 2.50 kHz | 12.5 kHz |
| | | Q | 1.4 | 4.5 | 2.2 | — |
| 03 | Snare Drum 1 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | –0.5 dB | 0.0 dB | +3.0 dB | +4.5 dB |
| | | F | 132 Hz | 1.00 kHz | 3.15 kHz | 5.00 kHz |
| | | Q | 1.2 | 4.5 | 0.11 | — |
| 04 | Snare Drum 2 | | L.SHELF | PEAKING | PEAKING | PEAKING |
| | | G | +1.5 dB | –8.5 dB | +2.5 dB | +4.0 dB |
| | | F | 180 Hz | 335 Hz | 2.36 kHz | 4.00 kHz |
| | | Q | — | 10 | 0.7 | 0.1 |
| 05 | Tom-tom 1 | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | +2.0 dB | –7.5 dB | +2.0 dB | +1.0 dB |
| | | F | 212 Hz | 670 Hz | 4.50 kHz | 6.30 kHz |
| | | Q | 1.4 | 10 | 1.2 | 0.28 |
| 06 | Cymbal | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –2.0 dB | 0.0 dB | 0.0 dB | +3.0 dB |
| | | F | 106 Hz | 425 Hz | 1.06 kHz | 13.2 kHz |
| | | Q | — | 8 | 0.9 | — |
| 07 | High Hat | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –4.0 dB | –2.5 dB | +1.0 dB | +0.5 dB |
| | | F | 95 Hz | 425 Hz | 2.80 kHz | 7.50 kHz |
| | | Q | — | 0.5 | 1 | — |
| 08 | Percussion | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –4.5 dB | 0.0 dB | +2.0 dB | 0.0 dB |
| | | F | 100 Hz | 400 Hz | 2.80 kHz | 17.0 kHz |
| | | Q | — | 4.5 | 0.56 | — |
| 09 | E. Bass 1 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –7.5 dB | +4.5 dB | +2.5 dB | 0.0 dB |
| | | F | 35.5 Hz | 112 Hz | 2.00 kHz | 4.00 kHz |
| | | Q | — | 5 | 4.5 | — |
| 10 | E. Bass 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +3.0 dB | 0.0 dB | +2.5 dB | +0.5 dB |
| | | F | 112 Hz | 112 Hz | 2.24 kHz | 4.00 kHz |
| | | Q | 0.1 | 5 | 6.3 | — |
| 11 | Syn. Bass 1 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +3.5 dB | +8.5 dB | 0.0 dB | 0.0 dB |
| | | F | 85 Hz | 950 Hz | 4.00 kHz | 12.5 kHz |
| | | Q | 0.1 | 8 | 4.5 | — |
| 12 | Syn. Bass 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +2.5 dB | 0.0 dB | +1.5 dB | 0.0 dB |
| | | F | 125 Hz | 180 Hz | 1.12 kHz | 12.5 kHz |
| | | Q | 1.6 | 8 | 2.2 | — |

| # | Title | | LOW | L-MID | H-MID | HIGH |
|---|-------|---|-----|-------|-------|------|
| 13 | Piano 1 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –6.0 dB | 0.0 dB | +2.0 dB | +4.0 dB |
| | | F | 95 Hz | 950 Hz | 3.15 kHz | 7.50 kHz |
| | | Q | — | 8 | 0.9 | — |
| 14 | Piano 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +3.5 dB | –8.5 dB | +1.5 dB | +3.0 dB |
| | | F | 224 Hz | 600 Hz | 3.15 kHz | 5.30 kHz |
| | | Q | 5.6 | 10 | 0.7 | — |
| 15 | E. G. Clean | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +2.0 dB | –5.5 dB | +0.5 dB | +2.5 dB |
| | | F | 265 Hz | 400 Hz | 1.32 kHz | 4.50 kHz |
| | | Q | 0.18 | 10 | 6.3 | — |
| 16 | E. G. Crunch 1 | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | +4.5 dB | 0.0 dB | +4.0 dB | +2.0 dB |
| | | F | 140 Hz | 1.00 kHz | 1.90 kHz | 5.60 kHz |
| | | Q | 8 | 4.5 | 0.63 | 9 |
| 17 | E. G. Crunch 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +2.5 dB | +1.5 dB | +2.5 dB | 0.0 dB |
| | | F | 125 Hz | 450 Hz | 3.35 kHz | 19.0 kHz |
| | | Q | 8 | 0.4 | 0.16 | — |
| 18 | E. G. Dist. 1 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | +5.0 dB | 0.0 dB | +3.5 dB | 0.0 dB |
| | | F | 355 Hz | 950 Hz | 3.35 kHz | 12.5 kHz |
| | | Q | — | 9 | 10 | — |
| 19 | E. G. Dist. 2 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | +6.0 dB | –8.5 dB | +4.5 dB | +4.0 dB |
| | | F | 315 Hz | 1.06 kHz | 4.25 kHz | 12.5 kHz |
| | | Q | — | 10 | 4 | — |
| 20 | A. G. Stroke 1 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | –2.0 dB | 0.0 dB | +1.0 dB | +4.0 dB |
| | | F | 106 Hz | 1.00 kHz | 1.90 kHz | 5.30 kHz |
| | | Q | 0.9 | 4.5 | 3.5 | — |
| 21 | A. G. Stroke 2 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | –3.5 dB | –2.0 dB | 0.0 dB | +2.0 dB |
| | | F | 300 Hz | 750 Hz | 2.00 kHz | 3.55 kHz |
| | | Q | — | 9 | 4.5 | — |
| 22 | A. G. Arpeg. 1 | | L.SHELF | PEAKING | PEAKING | PEAKING |
| | | G | –0.5 dB | 0.0 dB | 0.0 dB | +2.0 dB |
| | | F | 224 Hz | 1.00 kHz | 4.00 kHz | 6.70 kHz |
| | | Q | — | 4.5 | 4.5 | 0.12 |
| 23 | A. G. Arpeg. 2 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | 0.0 dB | –5.5 dB | 0.0 dB | +4.0 dB |
| | | F | 180 Hz | 355 Hz | 4.00 kHz | 4.25 kHz |
| | | Q | — | 7 | 4.5 | — |
| 24 | Brass Sec. | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | –2.0 dB | –1.0 dB | +1.5 dB | +3.0 dB |
| | | F | 90 Hz | 850 Hz | 2.12 kHz | 4.50 kHz |
| | | Q | 2.8 | 2 | 0.7 | 7 |

| # | Title | | LOW | L-MID | H-MID | HIGH |
|---|-------|---|-----|-------|-------|------|
| | | | **Parameter** | | | |
| 25 | Male Vocal 1 | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | −0.5 dB | 0.0 dB | +2.0 dB | +3.5 dB |
| | | F | 190 Hz | 1.00 kHz | 2.00 kHz | 6.70 kHz |
| | | Q | 0.11 | 4.5 | 0.56 | 0.11 |
| 26 | Male Vocal 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +2.0 dB | −5.0 dB | −2.5 dB | +4.0 dB |
| | | F | 170 Hz | 236 Hz | 2.65 kHz | 6.70 kHz |
| | | Q | 0.11 | 10 | 5.6 | — |
| 27 | Female Vo. 1 | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | −1.0 dB | +1.0 dB | +1.5 dB | +2.0 dB |
| | | F | 118 Hz | 400 Hz | 2.65 kHz | 6.00 kHz |
| | | Q | 0.18 | 0.45 | 0.56 | 0.14 |
| 28 | Female Vo. 2 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | −7.0 dB | +1.5 dB | +1.5 dB | +2.5 dB |
| | | F | 112 Hz | 335 Hz | 2.00 kHz | 6.70 kHz |
| | | Q | — | 0.16 | 0.2 | — |
| 29 | Chorus & Harmo | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | −2.0 dB | −1.0 dB | +1.5 dB | +3.0 dB |
| | | F | 90 Hz | 850 Hz | 2.12 kHz | 4.50 kHz |
| | | Q | 2.8 | 2 | 0.7 | 7 |
| 30 | Total EQ 1 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | −0.5 dB | 0.0 dB | +3.0 dB | +6.5 dB |
| | | F | 95 Hz | 950 Hz | 2.12 kHz | 16.0 kHz |
| | | Q | 7 | 2.2 | 5.6 | — |
| 31 | Total EQ 2 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +4.0 dB | +1.5 dB | +2.0 dB | +6.0 dB |
| | | F | 95 Hz | 750 Hz | 1.80 kHz | 18.0 kHz |
| | | Q | 7 | 2.8 | 5.6 | — |
| 32 | Total EQ 3 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | +1.5 dB | +0.5 dB | +2.0 dB | +4.0 dB |
| | | F | 67 Hz | 850 Hz | 1.90 kHz | 15.0 kHz |
| | | Q | — | 0.28 | 0.7 | — |
| 33 | Bass Drum 3 | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | +3.5 dB | −10.0 dB | +3.5 dB | 0.0 dB |
| | | F | 118 Hz | 315 Hz | 4.25 kHz | 20.0 kHz |
| | | Q | 2 | 10 | 0.4 | 0.4 |
| 34 | Snare Drum 3 | | L.SHELF | PEAKING | PEAKING | PEAKING |
| | | G | 0.0 dB | +2.0 dB | +3.5 dB | 0.0 dB |
| | | F | 224 Hz | 560 Hz | 4.25 kHz | 4.00 kHz |
| | | Q | — | 4.5 | 2.8 | 0.1 |
| 35 | Tom-tom 2 | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | −9.0 dB | +1.5 dB | +2.0 dB | 0.0 dB |
| | | F | 90 Hz | 212 Hz | 5.30 kHz | 17.0 kHz |
| | | Q | — | 4.5 | 1.2 | — |

| # | Title | | LOW | L-MID | H-MID | HIGH |
|---|-------|---|-----|-------|-------|------|
| | | | **Parameter** | | | |
| 36 | Piano 3 | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | +4.5 dB | −13.0 dB | +4.5 dB | +2.5 dB |
| | | F | 100 Hz | 475 Hz | 2.36 kHz | 10.0 kHz |
| | | Q | 8 | 10 | 9 | — |
| 37 | Piano Low | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | −5.5 dB | +1.5 dB | +6.0 dB | 0.0 dB |
| | | F | 190 Hz | 400 Hz | 6.70 kHz | 12.5 kHz |
| | | Q | 10 | 6.3 | 2.2 | — |
| 38 | Piano High | | PEAKING | PEAKING | PEAKING | PEAKING |
| | | G | −5.5 dB | +1.5 dB | +5.0 dB | +3.0 dB |
| | | F | 190 Hz | 400 Hz | 6.70 kHz | 5.60 kHz |
| | | Q | 10 | 6.3 | 2.2 | 0.1 |
| 39 | Fine-EQ Cass | | L.SHELF | PEAKING | PEAKING | H.SHELF |
| | | G | −1.5 dB | 0.0 dB | +1.0 dB | +3.0 dB |
| | | F | 75 Hz | 1.00 kHz | 4.00 kHz | 12.5 kHz |
| | | Q | — | 4.5 | 1.8 | — |
| 40 | Narrator | | PEAKING | PEAKING | PEAKING | H.SHELF |
| | | G | −4.0 dB | −1.0 dB | +2.0 dB | 0.0 dB |
| | | F | 106 Hz | 710 Hz | 2.50 kHz | 10.0 kHz |
| | | Q | 4 | 7 | 0.63 | — |

# Preset Gate Parameters
## (fs = 44.1 kHz)

| # | Title | Type | Parameter | Value |
|---|-------|------|-----------|-------|
| 1 | Gate | GATE | Threshold (dB) | −26 |
| | | | Range (dB) | −56 |
| | | | Attack (ms) | 0 |
| | | | Hold (ms) | 2.56 |
| | | | Decay (ms) | 331 |
| 2 | Ducking | DUCKING | Threshold (dB) | −19 |
| | | | Range (dB) | −22 |
| | | | Attack (ms) | 93 |
| | | | Hold (ms) | 1.20 S |
| | | | Decay (ms) | 6.32 S |
| 3 | A. Dr. BD | GATE | Threshold (dB) | −11 |
| | | | Range (dB) | −53 |
| | | | Attack (ms) | 0 |
| | | | Hold (ms) | 1.93 |
| | | | Decay (ms) | 400 |
| 4 | A. Dr. SN | GATE | Threshold (dB) | −8 |
| | | | Range (dB) | −23 |
| | | | Attack (ms) | 1 |
| | | | Hold (ms) | 0.63 |
| | | | Decay (ms) | 238 |

## Preset Compressor Parameters (fs = 44.1 kHz)

| # | Title | Type | Parameter | Value | # | Title | Type | Parameter | Value |
|---|-------|------|-----------|-------|---|-------|------|-----------|-------|
| 1 | Comp | COMP | Threshold (dB) | –8 | 10 | A. Dr. Tom | EXPAND | Threshold (dB) | –20 |
| | | | Ratio ( :1) | 2.5 | | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 60 | | | | Attack (ms) | 2 |
| | | | Out gain (dB) | 0.0 | | | | Out gain (dB) | 5.0 |
| | | | Knee | 2 | | | | Knee | 2 |
| | | | Release (ms) | 250 | | | | Release (ms) | 749 |
| 2 | Expand | EXPAND | Threshold (dB) | –23 | 11 | A. Dr. OverTop | COMPAND-S | Threshold (dB) | –24 |
| | | | Ratio ( :1) | 1.7 | | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 1 | | | | Attack (ms) | 38 |
| | | | Out gain (dB) | 3.5 | | | | Out gain (dB) | –3.5 |
| | | | Knee | 2 | | | | Width (dB) | 54 |
| | | | Release (ms) | 70 | | | | Release (ms) | 842 |
| 3 | Compander (H) | COMPAND-H | Threshold (dB) | –10 | 12 | E. B. Finger | COMP | Threshold (dB) | –12 |
| | | | Ratio ( :1) | 3.5 | | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 1 | | | | Attack (ms) | 15 |
| | | | Out gain (dB) | 0.0 | | | | Out gain (dB) | 4.5 |
| | | | Width (dB) | 6 | | | | Knee | 2 |
| | | | Release (ms) | 250 | | | | Release (ms) | 470 |
| 4 | Compander (S) | COMPAND-S | Threshold (dB) | –8 | 13 | E. B. Slap | COMP | Threshold (dB) | –12 |
| | | | Ratio ( :1) | 4 | | | | Ratio ( :1) | 1.7 |
| | | | Attack (ms) | 25 | | | | Attack (ms) | 6 |
| | | | Out gain (dB) | 0.0 | | | | Out gain (dB) | 4.0 |
| | | | Width (dB) | 24 | | | | Knee | hard |
| | | | Release (ms) | 180 | | | | Release (ms) | 133 |
| 5 | A. Dr. BD | COMP | Threshold (dB) | –24 | 14 | Syn. Bass | COMP | Threshold (dB) | –10 |
| | | | Ratio ( :1) | 3 | | | | Ratio ( :1) | 3.5 |
| | | | Attack (ms) | 9 | | | | Attack (ms) | 9 |
| | | | Out gain (dB) | 5.5 | | | | Out gain (dB) | 3.0 |
| | | | Knee | 2 | | | | Knee | hard |
| | | | Release (ms) | 58 | | | | Release (ms) | 250 |
| 6 | A. Dr. BD | COMPAND-H | Threshold (dB) | –11 | 15 | Piano1 | COMP | Threshold (dB) | –9 |
| | | | Ratio ( :1) | 3.5 | | | | Ratio ( :1) | 2.5 |
| | | | Attack (ms) | 1 | | | | Attack (ms) | 17 |
| | | | Out gain (dB) | –1.5 | | | | Out gain (dB) | 1.0 |
| | | | Width (dB) | 7 | | | | Knee | hard |
| | | | Release (ms) | 192 | | | | Release (ms) | 238 |
| 7 | A. Dr. SN | COMP | Threshold (dB) | –17 | 16 | Piano2 | COMP | Threshold (dB) | –18 |
| | | | Ratio ( :1) | 2.5 | | | | Ratio ( :1) | 3.5 |
| | | | Attack (ms) | 8 | | | | Attack (ms) | 7 |
| | | | Out gain (dB) | 3.5 | | | | Out gain (dB) | 6.0 |
| | | | Knee | 2 | | | | Knee | 2 |
| | | | Release (ms) | 12 | | | | Release (ms) | 174 |
| 8 | A. Dr. SN | EXPAND | Threshold (dB) | –23 | 17 | E. Guitar | COMP | Threshold (dB) | –8 |
| | | | Ratio ( :1) | 2 | | | | Ratio ( :1) | 3.5 |
| | | | Attack (ms) | 0 | | | | Attack (ms) | 7 |
| | | | Out gain (dB) | 0.5 | | | | Out gain (dB) | 2.5 |
| | | | Knee | 2 | | | | Knee | 4 |
| | | | Release (ms) | 151 | | | | Release (ms) | 261 |
| 9 | A. Dr. SN | COMPAND-S | Threshold (dB) | –8 | 18 | A. Guitar | COMP | Threshold (dB) | –10 |
| | | | Ratio ( :1) | 1.7 | | | | Ratio ( :1) | 2.5 |
| | | | Attack (ms) | 11 | | | | Attack (ms) | 5 |
| | | | Out gain (dB) | 0.0 | | | | Out gain (dB) | 1.5 |
| | | | Width (dB) | 10 | | | | Knee | 2 |
| | | | Release (ms) | 128 | | | | Release (ms) | 238 |

| # | Title | Type | Parameter | Value |
|---|-------|------|-----------|-------|
| 19 | **Strings1** | COMP | Threshold (dB) | –11 |
| | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 33 |
| | | | Out gain (dB) | 1.5 |
| | | | Knee | 2 |
| | | | Release (ms) | 749 |
| 20 | **Strings2** | COMP | Threshold (dB) | –12 |
| | | | Ratio ( :1) | 1.5 |
| | | | Attack (ms) | 93 |
| | | | Out gain (dB) | 1.5 |
| | | | Knee | 4 |
| | | | Release (ms) | 1.35 S |
| 21 | **Strings3** | COMP | Threshold (dB) | –17 |
| | | | Ratio ( :1) | 1.5 |
| | | | Attack (ms) | 76 |
| | | | Out gain (dB) | 2.5 |
| | | | Knee | 2 |
| | | | Release (ms) | 186 |
| 22 | **BrassSection** | COMP | Threshold (dB) | –18 |
| | | | Ratio ( :1) | 1.7 |
| | | | Attack (ms) | 18 |
| | | | Out gain (dB) | 4.0 |
| | | | Knee | 1 |
| | | | Release (ms) | 226 |
| 23 | **Syn. Pad** | COMP | Threshold (dB) | –13 |
| | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 58 |
| | | | Out gain (dB) | 2.0 |
| | | | Knee | 1 |
| | | | Release (ms) | 238 |
| 24 | **SamplingPerc** | COMPAND-S | Threshold (dB) | –18 |
| | | | Ratio ( :1) | 1.7 |
| | | | Attack (ms) | 8 |
| | | | Out gain (dB) | –2.5 |
| | | | Width (dB) | 18 |
| | | | Release (ms) | 238 |
| 25 | **Sampling BD** | COMP | Threshold (dB) | –14 |
| | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 2 |
| | | | Out gain (dB) | 3.5 |
| | | | Knee | 4 |
| | | | Release (ms) | 35 |
| 26 | **Sampling SN** | COMP | Threshold (dB) | –18 |
| | | | Ratio ( :1) | 4 |
| | | | Attack (ms) | 8 |
| | | | Out gain (dB) | 8.0 |
| | | | Knee | hard |
| | | | Release (ms) | 354 |
| 27 | **Hip Comp** | COMPAND-S | Threshold (dB) | –23 |
| | | | Ratio ( :1) | 20 |
| | | | Attack (ms) | 15 |
| | | | Out gain (dB) | 0.0 |
| | | | Width (dB) | 15 |
| | | | Release (ms) | 163 |

| # | Title | Type | Parameter | Value |
|---|-------|------|-----------|-------|
| 28 | **Solo Vocal1** | COMP | Threshold (dB) | –20 |
| | | | Ratio ( :1) | 2.5 |
| | | | Attack (ms) | 31 |
| | | | Out gain (dB) | 2.0 |
| | | | Knee | 1 |
| | | | Release (ms) | 342 |
| 29 | **Solo Vocal2** | COMP | Threshold (dB) | –8 |
| | | | Ratio ( :1) | 2.5 |
| | | | Attack (ms) | 26 |
| | | | Out gain (dB) | 1.5 |
| | | | Knee | 3 |
| | | | Release (ms) | 331 |
| 30 | **Chorus** | COMP | Threshold (dB) | –9 |
| | | | Ratio ( :1) | 1.7 |
| | | | Attack (ms) | 39 |
| | | | Out gain (dB) | 2.5 |
| | | | Knee | 2 |
| | | | Release (ms) | 226 |
| 31 | **Click Erase** | EXPAND | Threshold (dB) | –33 |
| | | | Ratio ( :1) | 2 |
| | | | Attack (ms) | 1 |
| | | | Out gain (dB) | 2.0 |
| | | | Knee | 2 |
| | | | Release (ms) | 284 |
| 32 | **Announcer** | COMPAND-H | Threshold (dB) | –14 |
| | | | Ratio ( :1) | 2.5 |
| | | | Attack (ms) | 1 |
| | | | Out gain (dB) | –2.5 |
| | | | Width (dB) | 18 |
| | | | Release (ms) | 180 |
| 33 | **Limiter1** | COMPAND-S | Threshold (dB) | –9 |
| | | | Ratio ( :1) | 3 |
| | | | Attack (ms) | 20 |
| | | | Out gain (dB) | –3.0 |
| | | | Width (dB) | 90 |
| | | | Release (ms) | 3.90 s |
| 34 | **Limiter2** | COMP | Threshold (dB) | 0 |
| | | | Ratio ( :1) | ∞ |
| | | | Attack (ms) | 0 |
| | | | Out gain (dB) | 0.0 |
| | | | Knee | hard |
| | | | Release (ms) | 319 |
| 35 | **Total Comp1** | COMP | Threshold (dB) | –18 |
| | | | Ratio ( :1) | 3.5 |
| | | | Attack (ms) | 94 |
| | | | Out gain (dB) | 2.5 |
| | | | Knee | hard |
| | | | Release (ms) | 447 |
| 36 | **Total Comp2** | COMP | Threshold (dB) | –16 |
| | | | Ratio ( :1) | 6 |
| | | | Attack (ms) | 11 |
| | | | Out gain (dB) | 6.0 |
| | | | Knee | 1 |
| | | | Release (ms) | 180 |

# Dynamics Parameters

The dynamics effects for each channel strip include a Gate section (only for Input Channels) and a Comp section. The Gate section includes Gate and Ducking types. The Comp section includes Compressor, Expander, Compander Hard (COMP. (H)), and Compander Soft (COMP. (S)) types.

## GATE Section (Only for Input Channels)

### GATE
A gate attenuates signals below a set THRESHOLD level by a specified amount (RANGE).

| Parameter | Range | Description |
|---|---|---|
| **THRESHOLD (dB)** | –54.0 to 0.0 (541 points) | This determines the level at which the gate effect is applied. |
| **RANGE (dB)** | –70 to 0 (71 points) | This determines the amount of attenuation when the gate closes. |
| **ATTACK (ms)** | 0–120 (121 points) | This determines how fast the gate opens when the signal exceeds the threshold level. |
| **HOLD (ms)** | 44.1kHz: 0.02 ms – 2.13 sec<br>48kHz: 0.02 ms – 1.96 sec<br>88.2kHz: 0.01 ms – 1.06 sec<br>96kHz: 0.01 ms – 981 ms<br>(160 points) | This determines how long the gate stays open once the trigger signal has fallen below the threshold. |
| **DECAY (ms)** | 44.1kHz: 6 ms – 46.0 sec<br>48kHz: 5 ms – 42.3 sec<br>88.2kHz: 3 ms – 23.0 sec<br>96kHz: 3 ms – 21.1 sec<br>(160 points) | This determines how fast the gate closes once the hold time has expired. The value is expressed as the duration required for the level to change by 6 dB. |

**I/O Characteristics**
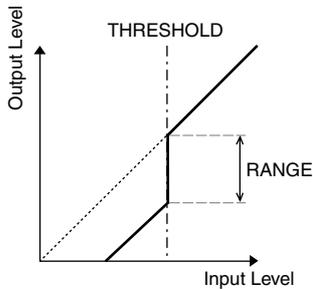
**Time Series Analysis**
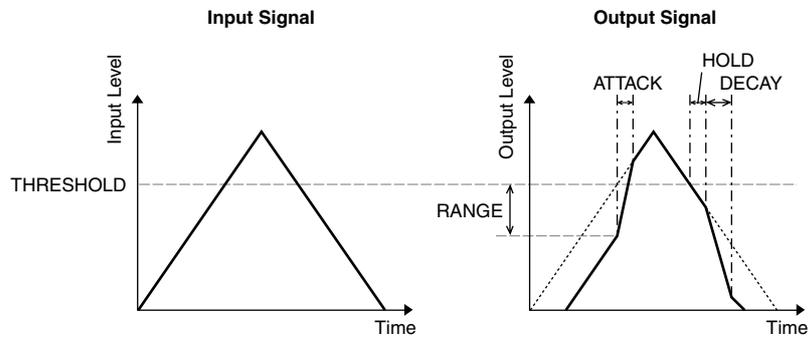
## DUCKING

Ducking is commonly used for voice-over applications in which the background music level is reduced automatically when an announcer speaks. When the KEY IN source signal level exceeds the specified THRESHOLD, the output level is attenuated by a specified amount (RANGE).

| Parameter | Range | Description |
|---|---|---|
| **THRESHOLD (dB)** | –54.0 to 0.0 (541 points) | This determines the level of trigger signal (KEY IN) required to activate ducking. |
| **RANGE (dB)** | –70 to 0 (71 points) | This determines the amount of attenuation when ducking is activated. |
| **ATTACK (ms)** | 0–120 (121 points) | This determines how soon the signal is ducked once the ducker has been triggered. |
| **HOLD (ms)** | 44.1kHz: 0.02 ms – 2.13 sec<br>48kHz: 0.02 ms – 1.96 sec<br>88.2kHz: 0.01 ms – 1.06 sec<br>96kHz: 0.01 ms – 981 ms<br>(160 points) | This determines how long ducking remains active once the trigger signal has fallen below the THRESHOLD level. |
| **DECAY (ms)** | 44.1kHz: 6 ms – 46.0 sec<br>48kHz: 5 ms – 42.3 sec<br>88.2kHz: 3 ms – 23.0 sec<br>96kHz: 3 ms – 21.1 sec<br>(160 points) | This determines how soon the ducker returns to its normal gain once the trigger signal level drops below the threshold. The value is expressed as the duration required for the level to change by 6 dB. |

**I/O Characteristics**
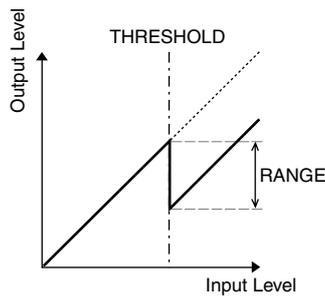
**Time Series Analysis**
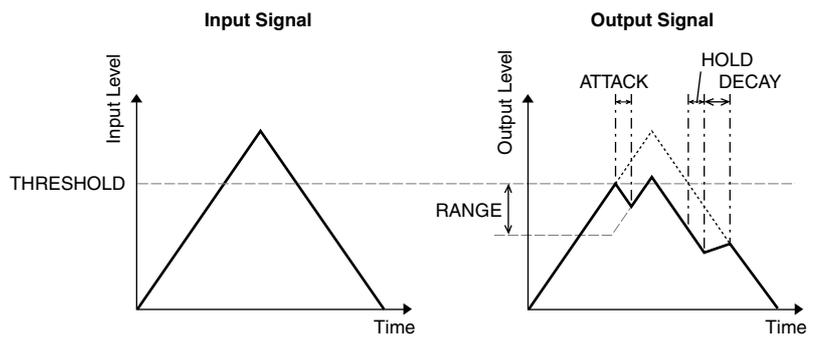
## COMP Section

### COMP

The COMP processor attenuates signals above a specified THRESHOLD by a specified RATIO. The COMP processor can also be used as a limiter, which, with a RATIO of ∞:1, reduces the level to the threshold. This means that the limiter's output level never actually exceeds the threshold.

| Parameter | Range | Description |
|---|---|---|
| **THRESHOLD (dB)** | –54.0 to 0.0 (541 points) | This determines the level of input signal required to trigger the compressor. |
| **RATIO** | 1.0:1, 1.1:1, 1.3:1, 1.5:1, 1.7:1, 2.0:1, 2.5:1, 3.0:1, 3.5:1, 4.0:1, 5.0:1, 6.0:1, 8.0:1, 10:1, 20:1, ∞:1 (16 points) | This determines the amount of compression, that is, the change in output signal level relative to change in input signal level. |
| **ATTACK (ms)** | 0–120 (121 points) | This determines how soon the signal will be compressed once the compressor has been triggered. |
| **RELEASE (ms)** | 44.1kHz: 6 ms – 46.0 sec 48kHz: 5 ms – 42.3 sec 88.2kHz: 3 ms – 23.0 sec 96kHz: 3 ms – 21.1 sec (160 points) | This determines how soon the compressor returns to its normal gain once the trigger signal level drops below the threshold. The value is expressed as the duration required for the level to change by 6 dB. |
| **OUT GAIN (dB)** | 0.0 to +18.0 (180 points) | This sets the compressor's output signal level. |
| **KNEE** | Hard, 1–5 (6 points) | This determines how compression is applied at the threshold. For higher knee settings, compression is applied gradually as the signal exceeds the specified threshold, creating a more natural sound. |

**I/O Characteristics**
**(KNEE=hard, OUT GAIN=0.0dB)**
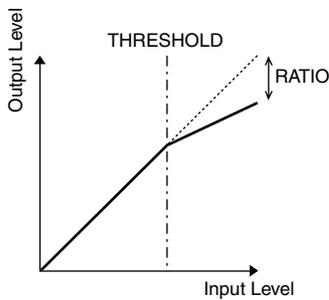
**Time Series Analysis (RATIO=∞:1)**
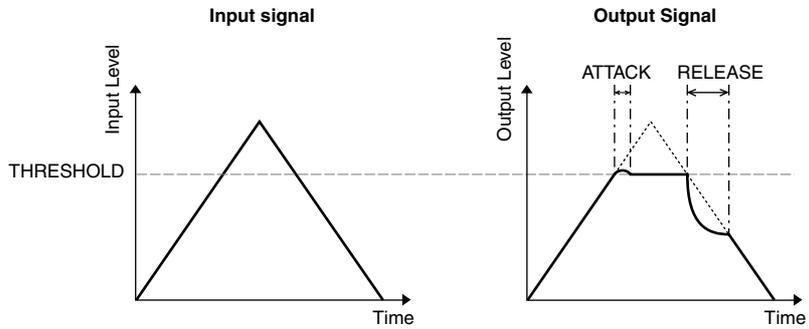
## EXPAND

An expander attenuates signals below a specified THRESHOLD by a specified RATIO.

| Parameter | Range | Description |
|---|---|---|
| **THRESHOLD (dB)** | −54.0 to 0.0 (541 points) | This determines the level of input signal required to trigger the expander. |
| **RATIO** | 1.0:1, 1.1:1, 1.3:1, 1.5:1, 1.7:1, 2.0:1, 2.5:1, 3.0:1, 3.5:1, 4.0:1, 5.0:1, 6.0:1, 8.0:1, 10:1, 20:1, ∞:1 (16 points) | This determines the amount of expansion. |
| **ATTACK (ms)** | 0–120 (121 points) | This determines how soon the expander returns to its normal gain once the trigger signal level exceeds the threshold. |
| **RELEASE (ms)** | 44.1kHz: 6 ms – 46.0 sec 48kHz: 5 ms – 42.3 sec 88.2kHz: 3 ms – 23.0 sec 96kHz: 3 ms – 21.1 sec (160 points) | This determines how soon the signal is expanded once the signal level drops below the threshold. The value is expressed as the duration required for the level to change by 6 dB. |
| **OUT GAIN (dB)** | 0.0 to +18.0 (180 points) | This sets the expander's output signal level. |
| **KNEE** | Hard, 1–5 (6 points) | This determines how expansion is applied at the threshold. For higher knee settings, expansion is applied gradually as the signal falls below the specified threshold, creating a more natural sound. |

**I/O Characteristics
(KNEE=hard, OUT GAIN=0.0dB)**
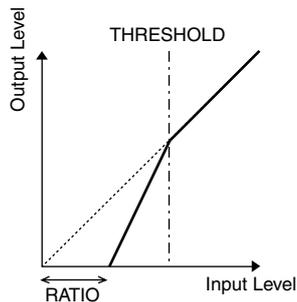
**Time Series Analysis (RATIO=∞:1)**
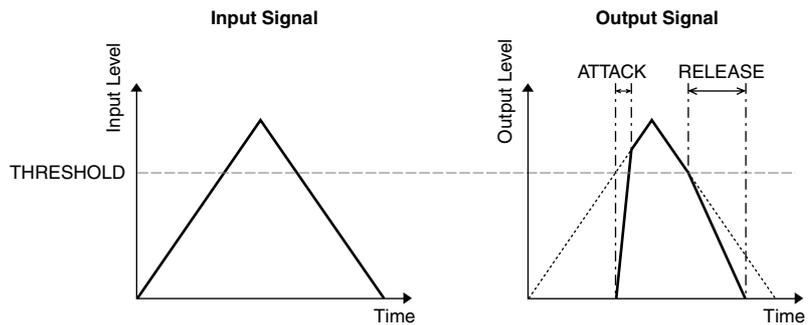
### COMPANDER HARD (H)
### COMPANDER SOFT (S)

The hard and soft companders combine the effects of the compressor, expander and limiter.
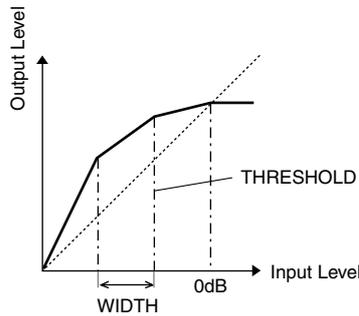
The companders function differently at the following levels:

① 0 dB and higher ..................................... Functions as a limiter.

② Exceeding the threshold ....................... Functions as a compressor.

③ Below the threshold and width ............ Functions as an expander.

The hard compander has an expansion ratio of 5:1, while the soft compander has an expansion ratio of 1.5:1. The expander is essentially turned off when the width is set to maximum. The compressor has a fixed knee setting of 2.

* The gain is automatically adjusted according to the ratio and threshold values, and can be increased by up to 18 dB.

* The OUT GAIN parameter enables you to compensate for the overall level change caused by the compression and expansion processes.

| Parameter | Range | Description |
|---|---|---|
| THRESHOLD (dB) | –54.0 to 0.0 (541 points) | This determines the level at which compression is applied. |
| RATIO | 1.0:1, 1.1:1, 1.3:1, 1.5:1, 1.7:1, 2.0:1, 2.5:1, 3.0:1, 3.5:1, 4.0:1, 5.0:1, 6.0:1, 8.0:1, 10:1, 20:1, (15 points) | This determines the amount of compression. |
| ATTACK (ms) | 0–120 (121 points) | This determines how soon the signal is compressed or expanded once the compander has been triggered. |
| RELEASE (ms) | 44.1kHz: 6 ms – 46.0 sec<br>48kHz: 5 ms – 42.3 sec<br>88.2kHz: 3 ms – 23.0 sec<br>96kHz: 3 ms – 21.1 sec<br>(160 points) | This determines how soon the compressor or expander returns to the normal gain once the trigger signal level drops below or exceeds the threshold respectively. The value is expressed as the duration required for the level to change by 6 dB. |
| OUT GAIN (dB) | –18.0 to 0.0 (180 points) | This sets the compander's output signal level. |
| WIDTH (dB) | 0–90 (91 points) | This determines how far below the threshold expansion will be applied. The expander is activated when the level drops below the threshold and width. |

# Appendix B: Specifications

## General Spec

| | | |
|---|---|---|
| **Number of scene memories** | | 99 |
| **Sampling Frequency** | Internal | 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz |
| | External | Normal rate: 44.1 kHz–10% to 48 kHz+6% |
| | | Double rate: 88.2 kHz–10% to 96 kHz+6% |
| **Signal Delay** | | Less than 2.0 ms CH INPUT to STEREO OUT (fs=48 kHz) |
| | | Less than 1.1 ms CH INPUT to STEREO OUT (fs=96 kHz) |
| **Fader** | | 100 mm motorized with touch sense × 25 |
| **Fader Resolution** | | +10 to –138, –∞dB input faders (10bit fader data) |
| | | 0 to –138, –∞dB master fader (10bit fader data) |
| **Total Harmonic Distortion[1]** (CH INPUT to STEREO OUT) (Input Gain=Min.) | fs=48 kHz | Less than 0.05% 20 Hz to 20 kHz @ +14 dB into 600 Ω Less than 0.01% 1 kHz @ +18 dB into 600 Ω |
| | fs=96 kHz | Less than 0.05% 20 Hz to 40 kHz @ +14 dB into 600 Ω Less than 0.01% 1 kHz @ +18 dB into 600 Ω |
| **Frequency Response** (CH INPUT to STEREO OUT) | | 20 Hz–20 kHz, 0.5, –1.5 dB @ +4 dB into 600 Ω (fs=48 kHz) |
| | | 20 Hz–40 kHz, 0.5, –1.5 dB @ +4 dB into 600 Ω (fs=96 kHz) |
| **Dynamic Range** (maximum level to noise level) | | 110 dB typ. DA Converter (STEREO OUT) |
| | | 105 dB typ. AD+DA (to STEREO OUT) @ fs=48 kHz |
| | | 105 dB typ. AD+DA (to STEREO OUT) @ fs=96 kHz |
| **Hum & Noise[2]** (20 Hz–20 kHz) Rs=150 Ω Input Gain=Max. Input Pad =0 dB | | –128 dB Equivalent Input Noise |
| | | –92 dB residual output noise. STEREO OUT (STEREO OUT off) |
| | | –92 dB (96 dB S/N) STEREO OUT (STEREO fader at nominal level and all CH INPUT faders at minimum level) |
| | | –64 dB (68 dB S/N) STEREO OUTPUT (STEREO fader at nominal level and one CH INPUT fader at nominal level) |
| **Maximum Voltage Gain** | | 74 dB CH INPUT (CH1–24) to STEREO OUT/OMNI (BUS) OUT |
| | | 74 dB CH INPUT (CH1–24) to OMNI (AUX) OUT (via pre input fader) |
| | | 74 dB CH INPUT (CH1–24) to CONTROL ROOM MONITOR OUT (via STEREO bus) |
| **Crosstalk** (@ 1 kHz) Input Gain=Min. | | –80 dB adjacent input channels (CH1–24) |
| | | –80 dB input to output |
| **AD Input (1–16: A/B)** | Phantom switch | +48 V DC is supplied to A (XLR-3-31 type) input |
| | Pad switch | 0/26 dB attenuation |
| | Gain control | 44 dB (–60 to –16), detented |
| | Peak indicator | LED (red) turns on when post HA level reaches 3 dB below clipping |
| | Signal indicator | LED (green) turns on when post HA level reaches 20 dB below nominal |
| | Insert | I/O (pre AD converter) |
| | Insert switch | on/off |
| | AD converter | 24-bit linear, 128-times oversampling (fs=48 kHz) |
| **AD Input (17–24)** | Gain control | 44 dB (–34 to +10), detented |
| | Peak indicator | LED (red) turns on when post HA level reaches 3 dB below clipping |
| | Signal indicator | LED (green) turns on when post HA level reaches 20 dB below nominal |
| | AD converter | 24-bit linear, 128-times oversampling (fs=48 kHz) |
| **Analog Input** (2TR IN ANALOG 1, 2) | AD converter | 24-bit linear, 128-times oversampling (fs=48 kHz) |
| **Option Input (SLOT 1–4)** | Available cards | Optional digital interface cards (MY16, MY8, MY4 series) |
| **Digital Input** (2TR IN DIGITAL 1–3) | SRC | On/off (1:3 and 3:1 maximum input to output sample rate ratio) |

| | | |
|---|---|---|
| **Input Channel CH1–56** | **Input patch** | — |
| | **Phase** | Normal/reverse |
| | **Gate-type[3]** | On/off |
| | | Key in: 12 ch Group (1–12, 13–24, 25–36, 37–48, 49–56)/AUX1–8 |
| | **Comp-type[4]** | On/off |
| | | Key in: self /Stereo Link |
| | | Pre EQ/pre fader/post fader |
| | **Attenuator** | –96.0 to +12.0 dB (0.1 dB step) |
| | **EQ** | 4-band PEQ[5] |
| | | On/off |
| | **Delay** | 0–43400 samples |
| | **On/off** | — |
| | **Fader** | 100 mm motorized (INPUT/AUX1–8) |
| | **Aux send** | On/off |
| | | AUX1–8; pre fader/post fader |
| | **Solo** | On/off |
| | | Pre fader/after pan |
| | **Pan** | 127 positions (Left= 1–63, Center, Right= 1–63) |
| | **Surround pan** | 127 × 127 positions |
| | **LFE level** | –∞, –96 dB to +10 dB (256 step) |
| | **Routing** | STEREO, BUS1–8, DIRECT OUT |
| | **Direct out** | Pre EQ/pre fader/post fader |
| | **Metering** | Displayed on LCD |
| | | Peak hold on/off |
| **TALKBACK** | **Level control** | Analog rotary potentiometer |
| | **AD converter** | 24-bit linear, 128-times oversampling |
| | **Talkback select** | Built-in microphone/AD IN 1–16 |
| | **On/off** | — |
| **OSCILLATOR** | **Level** | 0 to –96 dB (1 dB step) |
| | **On/off** | — |
| | **Waveform** | Sine 100 Hz, sine 1 kHz, sine 10 kHz, pink noise, burst noise |
| | **Routing** | BUS1–8, AUX1–8, STEREO L, R |
| **STEREO OUT** | **DA converter** | 24-bit linear, 128-times oversampling |
| **OMNI OUT 1–8** | **Output patch** | SURROUND MONITOR, STEREO, BUS1–8, AUX1–8, DIRECT OUT 1–56, INSERT OUT (CH1–56, BUS1–8, AUX1–8, STEREO) |
| | **DA converter** | 24-bit linear, 128-times oversampling |
| **CONTROL ROOM MONITOR OUT** | **Monitor select** | STEREO, 2TR IN DIGITAL 1, 2TR IN DIGITAL 2, 2TR IN DIGITAL 3, 2TR I N ANALOG 1, 2TR IN ANALOG 2, ASSIGN 1, 2 (BUS 1–8/AUX 1–8) |
| | **Mono** | On/off |
| | **Dimmer** | On/off |
| | **DA converter** | 24-bit linear, 128-times oversampling |
| | **Level control** | Analog rotary potentiometer |
| | **Phones level** | Analog rotary potentiometer |
| **STUDIO MONITOR OUT** | **Monitor select** | CONTROL ROOM, STEREO, AUX 7, AUX 8, TALKBACK |
| | **DA converter** | 24-bit linear, 128-times oversampling |
| | **Level control** | Analog rotary potentiometer |
| **2TR OUT DIGITAL 1–3** | **Dither** | On/off |
| | | Word length 16, 20, 24-bit |
| | **Output patch** | STEREO, BUS1–8, AUX 1–8, DIRECT OUT 1–56, INSERT OUT, CONTROL ROOM |
| **Option Output (SLOT 1–4)** | **Available card** | Optional digital interface card (MY16, MY8, MY4 series) |
| | **Output patch** | SURROUND MONITOR, STEREO, BUS1–8, AUX1–8, DIRECT OUT 1–56, INSERT OUT (CH1–56, BUS1–8, AUX1–8, STEREO) |
| | **Dither** | On/off |
| | | Word length 16/20/24-bit |

| | | |
|---|---|---|
| **STEREO** | **Comp-type**[4] | On/off |
| | | Pre EQ/pre fader/post fader |
| | **Attenuator** | –96.0 to +12.0 dB (0.1 dB step) |
| | **EQ** | 4-band PEQ[5] |
| | | On/off |
| | **On/off** | — |
| | **Fader** | 100 mm motorized |
| | **Balance** | 127 positions (Left=1–63, Center, Right=1–63) |
| | **Delay** | 0–43400 samples |
| | **Metering** | Displayed on LCD |
| | | Peak hold on/off |
| **BUS1–8** | **Comp-type**[4] | On/off |
| | | Pre EQ/pre fader/post fader |
| | **Attenuator** | –96.0 to +12.0 dB (0.1 dB step) |
| | **EQ** | 4-band PEQ[5] |
| | | On/off |
| | **On/off** | — |
| | **Fader** | 100 mm motorized |
| | **Delay** | 0–43400 samples |
| | **Bus to stereo** | Level (–∞, –130 dB to 0 dB) |
| | | On/off |
| | | Pan: 127 positions (Left=1–63, Center, Right=1–63) |
| | **Metering** | Displayed on LCD |
| | | Peak hold on/off |
| **AUX1–8** | **Comp-type**[4] | On/off |
| | | Pre EQ/pre fader/post fader |
| | **Attenuator** | –96.0 to +12.0 dB (0.1 dB step) |
| | **EQ** | 4-band PEQ[5] |
| | | On/off |
| | **On/off** | — |
| | **Fader** | 100 mm motorized |
| | **Delay** | 0–43400 samples |
| | **Metering** | Displayed on LCD |
| | | Peak hold on/off |
| **SURROUND MONITOR** | **Mute** | On/off |
| | **Solo** | On/off |
| | **Source** | BUS1–8, SLOT 1–4 |
| | **Monitor to C-R** | On/off |
| | **Oscillator** | Pink noise/500–2 kHz/1 kHz/50 Hz |
| | **Monitor matrix** | 6.1→6.1, 6.1→5.1, 6.1→3-1, 6.1→ST, 5.1→5.1, 5.1→3-1, 5.1→ST, 3.1→3.1, 3.1→ST |
| | **Bass management** | 5 presets |
| | **Monitor alignment** | ATT (–12.0 dB to 12 dB 0.1 dB step), Delay (0–30.0 msec 0.02 msec step) |
| **INTERNAL EFFECTS** (EFFECT 1–4) | **Bypass** | On/off |
| | **In/out** | 8-in, 8-out (EFFECT1): depends on effects type |
| | | 2-in, 2-out (EFFECT2–4): depends on effects type |
| | **Effect-in from** | AUX1–8/INSERT OUT/effect-out |
| | **Effect-out to** | Input patch/effect-in |
| **Power Requirements** | **U.S./Canada** | 120 V, 60 Hz 200 W |
| | **Other** | 220–240 V, 50/60 Hz 200 W |
| **Dimensions** | **(H x D x W)** | 239 x 697 x 667 mm (9.4" x 27.4" x 26.3") |
| **Net weight** | | 34 kg (75 lbs) |
| **Operating free-air temperature range** | | 10–35°C (50–95°F) |
| **Storage temperature range** | | –20 to 60°C (–4 to 140°F) |

| Supplied Accessories | AC Cable<br>CD-ROM (Studio Manager) |
|---|---|
| Options | Digital interface card (MY16, MY8, MY4 series)<br>PEAK METER BRIDGE: MB02R96<br>SIDE PANEL: SP02R96 |

1. Total harmonic distortion is measured with a 6 dB/octave filter @ 80 kHz.
2. Hum & Noise are measured with a 6 dB/octave filter @ 12.7 kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.
3. See "Gate Parameters" on page 294.
4. See "Comp Parameters" on page 295.
5. See "EQ Parameters" on page 294.

## EQ Parameters

|  | LOW/HPF | L-MID | H-MID | HIGH /LPF |
|---|---|---|---|---|
| Q | 0.1–10.0<br>(41 points)<br>low shelving<br>HPF | 0.1–10.0<br>(41 points) | | 0.1–10.0<br>(41 points)<br>high shelving<br>LPF |
| F | 21.2 Hz–20 kHz (1/12 oct step) | | | |
| G | ±18 dB<br>(0.1 dB step)<br>HPF: on/off | ±18 dB<br>(0.1 dB step) | | ±18 dB<br>(0.1 dB step)<br>LPF: on/off |

## Gate Parameters

| | | |
|---|---|---|
| **Gate** | Threshold | –54 dB to 0 dB (0.1 dB step) |
| | Range | –70 dB to 0 dB (1 dB step) |
| | Attack | 0 ms–120 ms (1 ms step) |
| | Hold | 0.02 ms–1.96 s (216 points) @ 48 kHz |
| | | 0.02 ms–2.13 s (216 points) @ 44.1 kHz |
| | | 0.01 ms–981 ms (216 points) @ 96 kHz |
| | | 0.01 ms–1.06 s (216 points) @ 88.2 kHz |
| | Decay | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |
| **Ducking** | Threshold | –54 dB to 0 dB (0.1 dB step) |
| | Range | –70 dB to 0 dB (1 dB step) |
| | Attack | 0 ms–120 ms (1 ms step) |
| | Hold | 0.02 ms–1.96 s (216 points) @ 48 kHz |
| | | 0.02 ms–2.13 s (216 points) @ 44.1 kHz |
| | | 0.01 ms–981 ms (216 points) @ 96 kHz |
| | | 0.01 ms–1.06 s (216 points) @ 88.2 kHz |
| | Decay | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |

## Comp Parameters

| | | |
|---|---|---|
| **Compressor** | **Threshold** | –54 dB to 0 dB (0.1 dB step) |
| | **Ratio (x :1)** | x=1, 1.1, 1.3, 1.5, 1.7, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 20, ∞ (16 points) |
| | **Out gain** | 0 dB to +18 dB (0.1 dB step) |
| | **Knee** | Hard, 1, 2, 3, 4, 5 (6 step) |
| | **Attack** | 0 ms–120 ms (1 ms step) |
| | **Release** | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |
| **Expander** | **Threshold** | –54 dB to 0 dB (0.1 dB step) |
| | **Ratio (x :1)** | x=1, 1.1, 1.3, 1.5, 1.7, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 20, ∞ (16 points) |
| | **Out gain** | 0 dB to +18 dB (0.1 dB step) |
| | **Knee** | Hard, 1, 2, 3, 4, 5 (6 points) |
| | **Attack** | 0 ms–120 ms (1 ms step) |
| | **Release** | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |
| **Compander H** | **Threshold** | –54 dB to 0 dB (0.1 dB step) |
| | **Ratio (x :1)** | x=1, 1.1, 1.3, 1.5, 1.7, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 20 (15 points) |
| | **Out gain** | –18 dB to 0 dB (0.1 dB step) |
| | **Width** | 1 dB–90 dB (1 dB step) |
| | **Attack** | 0 ms–120 ms (1 ms step) |
| | **Release** | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |
| **Compander S** | **Threshold** | –54 dB to 0 dB (0.1 dB step) |
| | **Ratio (x :1)** | x=1, 1.1, 1.3, 1.5, 1.7, 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 20 (15 points) |
| | **Out gain** | –18 dB to 0 dB (0.1 dB step) |
| | **Width** | 1 dB–90 dB (1 dB step) |
| | **Attack** | 0 ms–120 ms (1 ms step) |
| | **Release** | 5 ms–42.3 s (160 points) @ 48 kHz |
| | | 6 ms–46.0 s (160 points) @ 44.1 kHz |
| | | 3 ms–21.1 s (160 points) @ 96 kHz |
| | | 3 ms–23.0 s (160 points) @ 88.2 kHz |

## Libraries

| | | |
|---|---|---|
| **Effect library (EFFECT 1–4)** | Presets | 61 (EFFECT 2–4: 53)[1] |
| | User memories | 67 |
| **Compressor library** | Presets | 36 |
| | User memories | 92 |
| **Gate library** | Presets | 4 |
| | User memories | 124 |
| **EQ library** | Presets | 40 |
| | User memories | 160 |
| **Channel library** | Presets | 2 |
| | User memories | 127 |
| **Surround Monitor library** | Presets | 1 |
| | User memories | 32 |
| **Input patch library** | Presets | 1 |
| | User memories | 32 |
| **Output patch library** | Presets | 1 |
| | User memories | 32 |
| **Bus to Stereo library** | Presets | 1 |
| | User memories | 32 |

1. Effects #53–61 are Add-On Effects.

## Analog Input Spec

| Input | PAD | GAIN | Actual Load Impedance | For Use With Nominal | Input level | | | Connector |
|---|---|---|---|---|---|---|---|---|
| | | | | | Sensitivity[1] | Nominal | Max. before clip | |
| INPUT A/B 1–16 | 0 | –60 dB | 3k Ω | 50–600 Ω Mics & 600 Ω Lines | –70 dB (0.245 mV) | –60 dB (0.775 mV) | –46 dB (3.88 mV) | A: XLR-3-31 type (Balanced)[2] |
| | | –16 dB | | | –26 dB (38.8 mV) | –16 dB (0.123 V) | –2 dB (616 mV) | B: Phone jack (TRS) (Balanced)[3] |
| | 26 | | | | 0 dB (775 mV) | +10 dB (2.45 V) | +24 dB (12.28 V) | |
| INPUT 17–24 | — | –34 dB | 4K Ω | 600 Ω Lines | –44 dB (4.89 mV) | –34 dB (15.5 mV) | –20 dB (77.5 mV) | Phone jack (TRS) (Balanced)[3] |
| | | +10 dB | | | 0 dB (775 mV) | +10 dB (2.45 V) | +24 dB (12.28 V) | |
| INSERT IN 1–16 | | — | 10K Ω | 600 Ω Lines | –6 dB (388 mV) | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone jack (TRS)[4] |
| 2TR IN ANALOG 1 [L, R] | | — | 10K Ω | 600 Ω Lines | +4 dB (1.23 V) | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone jack (TRS) (Balanced)[3] |
| 2TR IN ANALOG 2 [L, R] | | — | 10K Ω | 600 Ω Lines | –10 dBV (0.316 V) | –10 dBV (0.316 V) | +4 dBV (1.58 V) | Phono (Unbalanced) |

1. Sensitivity is the lowest level that will produce an output of +4 dB (1.23 V) or the nominal output level when the unit is set to maximum gain. (All faders and level controls are maximum position.)
2. XLR-3-31 type connectors are balanced (1=GND, 2=HOT, 3=COLD).
3. Phone jacks are balanced (Tip=HOT, Ring=COLD, Sleeve=GND).
4. Phone jacks are wired: Tip=OUT, Ring=IN, Sleeve=GND

In these specifications, when dB represents a specific voltage, 0 dB is referenced to 0.775 Vrms.
For 2TR IN ANALOG 2 levels, 0 dBV is referenced to 1.00 Vrms.
All input AD converters (except INSERT I/O 1–16) are 24-bit linear, 128-times oversampling.
+48 V DC (phantom power) is supplied to CH INPUT (1–16) XLR type connectors via individual switches.

## Analog Output Spec

| Output | Actual Source Impedance | For Use With Nominal | GAIN SW[1] | Output level | | Connector |
|---|---|---|---|---|---|---|
| | | | | Nominal | Max. before clip | |
| STEREO OUT [L, R] | 600 Ω | 10k Ω Lines | — | –10 dBV (0.316 V) | +4 dBV (1.58 V) | Phono (Unbalanced) |
| | 75 Ω | 600 Ω Lines | — | +4 dB (1.23 V) | +18 dB (6.16 V) | XLR-3-32 type (Balanced)[2] |
| STUDIO MONITOR OUT [L, R] | 150 Ω | 10k Ω Lines | — | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone Jack (TRS) (Balanced)[3] |
| C-R MONITOR OUT [L, R] | 150 Ω | 10k Ω Lines | — | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone Jack (TRS) (Balanced)[3] |
| OMNI OUT 1–8 | 150 Ω | 10k Ω Lines | +18 dB (default) | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone Jack (TRS) (Balanced)[3] |
| | | | +4 dB | –10 dB (0.245 V) | +4 dB (1.23 V) | |
| INSERT OUT 1–16 | 600 Ω | 10k Ω Lines | — | +4 dB (1.23 V) | +18 dB (6.16 V) | Phone Jack (TRS)[4] |
| PHONES | 100 Ω | 8 Ω Phones | — | 4 mW | 25 mW | Stereo Phone Jack (TRS) (Unbalanced)[5] |
| | | 40 Ω Phones | — | 12 mW | 75 mW | |

1. The maximum output level of each OMNI OUT can be set internally.
2. XLR-3-32 type connectors are balanced (1=GND, 2=HOT, 3=COLD).
3. Phone jacks are balanced (Tip=HOT, Ring=COLD, Sleeve=GND).
4. Phone jacks are wired: Tip=OUT, Ring=IN, Sleeve=GND
5. PHONES stereo phone jack is unbalanced (Tip=LEFT, Ring=RIGHT, Sleeve=GND).

STEREO OUT [L, R], 0 dBV is referenced to 1.00 Vrms.
In these specifications, when dB represents a specific voltage, 0 dB is referenced to 0.775 Vrms.
All output DA converters (except INSERT OUT 1–16) are 24-bit, 128-times oversampling.

## Digital Input Spec

| Input | | Format | Data length | Level | Connector |
|---|---|---|---|---|---|
| **2TR IN DIGITAL** | **1** | AES/EBU | 24-bit | RS422 | XLR-3-31 type (Balanced)[1] |
| | **2** | IEC-60958 | 24-bit | 0.5 Vpp/75 Ω | RCA pin jack |
| | **3** | IEC-60958 | 24-bit | 0.5 Vpp/75 Ω | RCA pin jack |
| **CASCADE IN** | | — | — | RS422 | D-SUB Half Pitch Connector 68P (Female) |

1. XLR-3-31 type connectors are balanced (1=GND, 2=HOT, 3=COLD).

## Digital Output Spec

| Output | | Format | Data length | Level | Connector |
|---|---|---|---|---|---|
| **2TR OUT DIGITAL** | **1** | AES/EBU[1]<br>Professional use | 24-bit[2] | RS422 | XLR-3-32 type (Balanced)[3] |
| | **2** | IEC-60958[4]<br>Consumer use | 24-bit[2] | 0.5V pp/75 Ω | RCA pin jack |
| | **3** | IEC-60958[4]<br>Consumer use | 24-bit[2] | 0.5V pp/75 Ω | RCA pin jack |
| **CASCADE OUT** | | — | — | RS422 | D-SUB Half Pitch Connector 68P (Female) |

1. Channel status of 2TR OUT DIGITAL 1
   Type:          2 audio channels
   Emphasis:      NO
   Sampling rate: depends on the internal configuration

2. Dither:        word length 16/20/24 bit

3. XLR-3-32 type connectors are balanced (1=GND, 2=HOT, 3=COLD).

4. Channel status of 2TR OUT DIGITAL 2, 3
   Type:          2 audio channels
   Category code: 2 channel PCM encoder/decoder
   Copy prohibit: NO
   Emphasis:      NO
   Clock accuracy: Level II (1000 ppm)
   Sampling rate: depends on the internal configuration

## I/O Slot Spec (1–4)

Each I/O SLOT accepts a digital interface card. Only SLOT #1 has a serial interface.

| Card Name | Function | Input | Output | Number of available cards |
|---|---|---|---|---|
| **MY16-AT** | ADAT | 16 IN | 16OUT (depends on output patch)[1] | 4 |
| **MY8-AT** | ADAT | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY16-TD** | TASCAM | 16 IN | 16 OUT (depends on output patch)[1] | 4 |
| **MY8-TD** | TASCAM | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY16-AE** | AES/EBU | 16 IN | 16 OUT (depends on output patch)[1] | 4 |
| **MY8-AE** | AES/EBU | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY8-AEB** | AES/EBU | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY4-AD** | ANALOG IN | 4 IN | — | 4 |
| **MY8-AD** | ANALOG IN | 8 IN | — | 4 |
| **MY4-DA** | ANALOG OUT | — | 4 OUT (depends on output patch)[1] | 4 |
| **MY8-AD24** | ANALOG IN | 8 IN | — | 4 |
| **MY8-AD96** | ANALOG IN | 8 IN | — | 4 |
| **MY8-DA96** | ANALOG OUT | — | 8 OUT (depends on output patch)[1] | 4 |
| **MY8-AE96S** | AES/EBU | 8 IN | 8 OUT (depends on output patch)[1] | 2 |
| **MY8-AE96** | AES/EBU | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY8-mLAN** | mLAN | 8 IN | 8 OUT (depends on output patch)[1] | 4 |
| **MY16-mLAN** | mLAN | 16 IN | 16 OUT (depends on output patch)[1] | 3 |
| **Waves Y56K** | Effect & I/O | 8 IN | 8 OUT (depends on output patch)[1] | 2 |
| **Waves Y96K** | Effect & I/O | 8 IN | 8 OUT (depends on output patch)[1] | 2 |
| **Apogee AP8AD** | ANALOG IN | 8 IN | — | 2 |
| **Apogee AP8DA** | ANALOG OUT | — | 8 OUT (depends on output patch)[1] | 2 |

1. See the Digital I/O chapter.
Details depend on each interface card.

## Control I/O Spec

| I/O Port | | Format | Level | Connector in Console |
|---|---|---|---|---|
| **TO HOST** | Serial | — | RS422 | Mini DIN Connector 8P |
| | USB | USB 1.1 | 0 V–3.3 V | B type USB connector |
| **MIDI** | IN | MIDI | — | DIN Connector 5P |
| | OUT | MIDI | — | DIN Connector 5P |
| | THRU | MIDI | — | DIN Connector 5P |
| **TIME CODE IN** | MTC | MIDI | — | DIN Connector 5P |
| | SMPTE | SMPTE | Nominal –10 dB/10k Ω | XLR-3-31 type (Balanced)[1] |
| **WORD CLOCK** | IN | — | TTL/75 Ω (ON/OFF)[2] | BNC Connector |
| | OUT | — | TTL/75 Ω | BNC Connector |
| **CONTROL** | | — | — | D-SUB Connector 25P (Female) |
| **METER** | | — | RS422 | D-SUB Connector 15P (Female) |

1. XLR-3-31 type connectors are balanced (1=GND, 2=HOT, 3=COLD).
2. This switch is on the rear panel.

# Connector Pin Assignments

## CASCADE IN

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | GND | 35 | GND |
| 2 | INPUT 1-2(+) | 36 | INPUT 1-2(−) |
| 3 | INPUT 3-4(+) | 37 | INPUT 3-4(−) |
| 4 | INPUT 5-6(+) | 38 | INPUT 5-6(−) |
| 5 | INPUT 7-8(+) | 39 | INPUT 7-8(−) |
| 6 | INPUT 9-10(+) | 40 | INPUT 9-10(−) |
| 7 | INPUT 11-12(+) | 41 | INPUT 11-12(−) |
| 8 | INPUT 13-14(+) | 42 | INPUT 13-14(−) |
| 9 | INPUT 15-16(+) | 43 | INPUT 15-16(−) |
| 10 | DTR IN(+) | 44 | DTR IN(−) |
| 11 | RTS OUT(+) | 45 | RTS OUT(−) |
| 12 | GND | 46 | GND |
| 13 | WORD CLOCK IN(+) | 47 | WORD CLOCK IN(−) |
| 14 | WORD CLOCK OUT(+) | 48 | WORD CLOCK OUT(−) |
| 15 | CONTROL IN(+) | 49 | CONTROL IN(−) |
| 16 | CONTROL OUT(+) | 50 | CONTROL OUT(−) |
| 17 | GND | 51 | ID6 IN |
| 18 | GND | 52 | ID6 OUT |
| 19 | INPUT 17-18(+) | 53 | INPUT 17-18(−) |
| 20 | INPUT 19-20(+) | 54 | INPUT 19-20(−) |
| 21 | INPUT 21-22(+) | 55 | INPUT 21-22(−) |
| 22 | INPUT 23-24(+) | 56 | INPUT 23-24(−) |
| 23 | RESERVED | 57 | RESERVED |
| 24 | RESERVED | 58 | RESERVED |
| 25 | RESERVED | 59 | RESERVED |
| 26 | RESERVED | 60 | RESERVED |
| 27 | ID0 IN | 61 | ID1 IN |
| 28 | ID2 IN | 62 | ID3 IN |
| 29 | ID4 IN | 63 | ID5 IN |
| 30 | ID0 OUT | 64 | ID1 OUT |
| 31 | ID2 OUT | 65 | ID3 OUT |
| 32 | ID4 OUT | 66 | ID5 OUT |
| 33 | MSB IN | 67 | 2CH/LINE IN |
| 34 | FG | 68 | FG |

## CASCADE OUT

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | GND | 35 | GND |
| 2 | OUTPUT 1-2(+) | 36 | OUTPUT 1-2(−) |
| 3 | OUTPUT 3-4(+) | 37 | OUTPUT 3-4(−) |
| 4 | OUTPUT 5-6(+) | 38 | OUTPUT 5-6(−) |
| 5 | OUTPUT 7-8(+) | 39 | OUTPUT 7-8(−) |
| 6 | OUTPUT 9-10(+) | 40 | OUTPUT 9-10(−) |
| 7 | OUTPUT 11-12(+) | 41 | OUTPUT 11-12(−) |
| 8 | OUTPUT 13-14(+) | 42 | OUTPUT 13-14(−) |
| 9 | OUTPUT 15-16(+) | 43 | OUTPUT 15-16(−) |
| 10 | DTR OUT(+) | 44 | DTR OUT(−) |
| 11 | RTS IN(+) | 45 | RTS IN(−) |
| 12 | GND | 46 | GND |
| 13 | WORD CLOCK OUT(+) | 47 | WORD CLOCK OUT(−) |
| 14 | WORD CLOCK IN(+) | 48 | WORD CLOCK IN(−) |
| 15 | CONTROL OUT(+) | 49 | CONTROL OUT(−) |
| 16 | CONTROL IN(+) | 50 | CONTROL IN(−) |
| 17 | GND | 51 | ID6 OUT |
| 18 | GND | 52 | ID6 IN |
| 19 | OUTPUT 17-18(+) | 53 | OUTPUT 17-18(−) |
| 20 | OUTPUT 19-20(+) | 54 | OUTPUT 19-20(−) |
| 21 | OUTPUT 21-22(+) | 55 | OUTPUT 21-22(−) |
| 22 | OUTPUT 23-24(+) | 56 | OUTPUT 23-24(−) |
| 23 | RESERVED | 57 | RESERVED |
| 24 | RESERVED | 58 | RESERVED |
| 25 | RESERVED | 59 | RESERVED |
| 26 | RESERVED | 60 | RESERVED |
| 27 | ID0 OUT | 61 | ID1 OUT |
| 28 | ID2 OUT | 62 | ID3 OUT |
| 29 | ID4 OUT | 63 | ID5 OUT |
| 30 | ID0 IN | 64 | ID1 IN |
| 31 | ID2 IN | 65 | ID3 IN |
| 32 | ID4 IN | 66 | ID5 IN |
| 33 | MSB OUT | 67 | 2CH/LINE OUT |
| 34 | FG | 68 | FG |

## CONTROL Port

| Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|
| 1 | GPO0 | 10 | GPI1 | 19 | GND |
| 2 | GPO2 | 11 | N.C. | 20 | GND |
| 3 | GPO4 | 12 | SMODE[1] | 21 | +5V |
| 4 | GPO6 | 13 | SPARE[1] | 22 | GPI0 |
| 5 | GND | 14 | GPO1 | 23 | N.C. |
| 6 | GND | 15 | GPO3 | 24 | SOLO[1] |
| 7 | GND | 16 | GPO5 | 25 | MAS/SLV[1] |
| 8 | GND | 17 | GPO7 | | |
| 9 | +5V | 18 | GND | | |

1. For 02R SOLO control.

# Dimensions
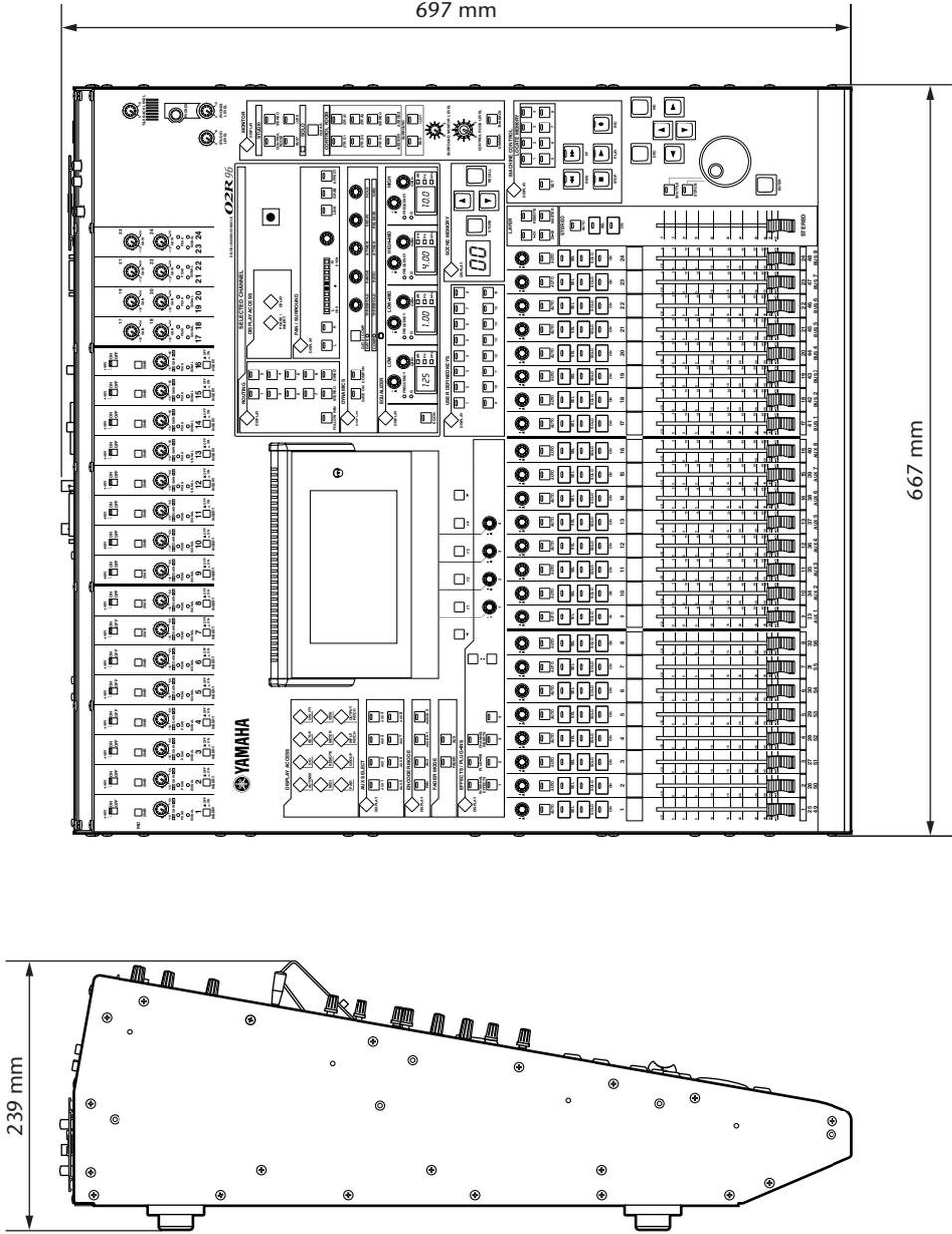


Specifications and external appearance subject to change without notice.

For European Model

Purchaser/User Information specified in EN55103-1 and EN55103-2.
Inrush Current: 70 A
Conformed Environment: E1, E2, E3 and E4

# Appendix C: MIDI

## Scene Memory to Program Change Table

| Program Change # | Initial Scene # | User Scene # | Program Change # | Initial Scene # | User Scene # | Program Change# | Initial Scene # | User Scene # |
|---|---|---|---|---|---|---|---|---|
| 1 | 01 | | 44 | 44 | | 87 | 87 | |
| 2 | 02 | | 45 | 45 | | 88 | 88 | |
| 3 | 03 | | 46 | 46 | | 89 | 89 | |
| 4 | 04 | | 47 | 47 | | 90 | 90 | |
| 5 | 05 | | 48 | 48 | | 91 | 91 | |
| 6 | 06 | | 49 | 49 | | 92 | 92 | |
| 7 | 07 | | 50 | 50 | | 93 | 93 | |
| 8 | 08 | | 51 | 51 | | 94 | 94 | |
| 9 | 09 | | 52 | 52 | | 95 | 95 | |
| 10 | 10 | | 53 | 53 | | 96 | 96 | |
| 11 | 11 | | 54 | 54 | | 97 | 97 | |
| 12 | 12 | | 55 | 55 | | 98 | 98 | |
| 13 | 13 | | 56 | 56 | | 99 | 99 | |
| 14 | 14 | | 57 | 57 | | 100 | 00 | |
| 15 | 15 | | 58 | 58 | | 101 | — | |
| 16 | 16 | | 59 | 59 | | 102 | — | |
| 17 | 17 | | 60 | 60 | | 103 | — | |
| 18 | 18 | | 61 | 61 | | 104 | — | |
| 19 | 19 | | 62 | 62 | | 105 | — | |
| 20 | 20 | | 63 | 63 | | 106 | — | |
| 21 | 21 | | 64 | 64 | | 107 | — | |
| 22 | 22 | | 65 | 65 | | 108 | — | |
| 23 | 23 | | 66 | 66 | | 109 | — | |
| 24 | 24 | | 67 | 67 | | 110 | — | |
| 25 | 25 | | 68 | 68 | | 111 | — | |
| 26 | 26 | | 69 | 69 | | 112 | — | |
| 27 | 27 | | 70 | 70 | | 113 | — | |
| 28 | 28 | | 71 | 71 | | 114 | — | |
| 29 | 29 | | 72 | 72 | | 115 | — | |
| 30 | 30 | | 73 | 73 | | 116 | — | |
| 31 | 31 | | 74 | 74 | | 117 | — | |
| 32 | 32 | | 75 | 75 | | 118 | — | |
| 33 | 33 | | 76 | 76 | | 119 | — | |
| 34 | 34 | | 77 | 77 | | 120 | — | |
| 35 | 35 | | 78 | 78 | | 121 | — | |
| 36 | 36 | | 79 | 79 | | 122 | — | |
| 37 | 37 | | 80 | 80 | | 123 | — | |
| 38 | 38 | | 81 | 81 | | 124 | — | |
| 39 | 39 | | 82 | 82 | | 125 | — | |
| 40 | 40 | | 83 | 83 | | 126 | — | |
| 41 | 41 | | 84 | 84 | | 127 | — | |
| 42 | 42 | | 85 | 85 | | 128 | — | |
| 43 | 43 | | 86 | 86 | | | | |

# Initial Parameter to Control Change Table

## CHANNEL1

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | FADER H | CHANNEL | INPUT1 | | 58 | NO ASSIGN | | |
| 2 | FADER H | CHANNEL | INPUT2 | | 59 | NO ASSIGN | | |
| 3 | FADER H | CHANNEL | INPUT3 | | 60 | NO ASSIGN | | |
| 4 | FADER H | CHANNEL | INPUT4 | | 61 | NO ASSIGN | | |
| 5 | FADER H | CHANNEL | INPUT5 | | 62 | FADER L | MASTER | STEREO |
| 6 | FADER H | CHANNEL | INPUT6 | | 63 | BALANCE | MASTER | STEREO |
| 7 | FADER H | CHANNEL | INPUT7 | | 64 | ON | CHANNEL | INPUT1 |
| 8 | FADER H | CHANNEL | INPUT8 | | 65 | ON | CHANNEL | INPUT2 |
| 9 | FADER H | CHANNEL | INPUT9 | | 66 | ON | CHANNEL | INPUT3 |
| 10 | FADER H | CHANNEL | INPUT10 | | 67 | ON | CHANNEL | INPUT4 |
| 11 | FADER H | CHANNEL | INPUT11 | | 68 | ON | CHANNEL | INPUT5 |
| 12 | FADER H | CHANNEL | INPUT12 | | 69 | ON | CHANNEL | INPUT6 |
| 13 | FADER H | CHANNEL | INPUT13 | | 70 | ON | CHANNEL | INPUT7 |
| 14 | FADER H | CHANNEL | INPUT14 | | 71 | ON | CHANNEL | INPUT8 |
| 15 | FADER H | CHANNEL | INPUT15 | | 72 | ON | CHANNEL | INPUT9 |
| 16 | FADER H | CHANNEL | INPUT16 | | 73 | ON | CHANNEL | INPUT10 |
| 17 | FADER H | CHANNEL | INPUT17 | | 74 | ON | CHANNEL | INPUT11 |
| 18 | FADER H | CHANNEL | INPUT18 | | 75 | ON | CHANNEL | INPUT12 |
| 19 | FADER H | CHANNEL | INPUT19 | | 76 | ON | CHANNEL | INPUT13 |
| 20 | FADER H | CHANNEL | INPUT20 | | 77 | ON | CHANNEL | INPUT14 |
| 21 | FADER H | CHANNEL | INPUT21 | | 78 | ON | CHANNEL | INPUT15 |
| 22 | FADER H | CHANNEL | INPUT22 | | 79 | ON | CHANNEL | INPUT16 |
| 23 | FADER H | CHANNEL | INPUT23 | | 80 | ON | CHANNEL | INPUT17 |
| 24 | FADER H | CHANNEL | INPUT24 | | 81 | ON | CHANNEL | INPUT18 |
| 25 | NO ASSIGN | | | | 82 | ON | CHANNEL | INPUT19 |
| 26 | NO ASSIGN | | | | 83 | ON | CHANNEL | INPUT20 |
| 27 | NO ASSIGN | | | | 84 | ON | CHANNEL | INPUT21 |
| 28 | NO ASSIGN | | | | 85 | ON | CHANNEL | INPUT22 |
| 29 | NO ASSIGN | | | | 86 | ON | CHANNEL | INPUT23 |
| 30 | FADER H | MASTER | STEREO | | 87 | ON | CHANNEL | INPUT24 |
| 31 | ON | MASTER | STEREO | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | PAN | CHANNEL | INPUT1 |
| 33 | FADER L | CHANNEL | INPUT1 | | 90 | PAN | CHANNEL | INPUT2 |
| 34 | FADER L | CHANNEL | INPUT2 | | 91 | PAN | CHANNEL | INPUT3 |
| 35 | FADER L | CHANNEL | INPUT3 | | 92 | PAN | CHANNEL | INPUT4 |
| 36 | FADER L | CHANNEL | INPUT4 | | 93 | PAN | CHANNEL | INPUT5 |
| 37 | FADER L | CHANNEL | INPUT5 | | 94 | PAN | CHANNEL | INPUT6 |
| 38 | FADER L | CHANNEL | INPUT6 | | 95 | PAN | CHANNEL | INPUT7 |
| 39 | FADER L | CHANNEL | INPUT7 | | 102 | PAN | CHANNEL | INPUT8 |
| 40 | FADER L | CHANNEL | INPUT8 | | 103 | PAN | CHANNEL | INPUT9 |
| 41 | FADER L | CHANNEL | INPUT9 | | 104 | PAN | CHANNEL | INPUT10 |
| 42 | FADER L | CHANNEL | INPUT10 | | 105 | PAN | CHANNEL | INPUT11 |
| 43 | FADER L | CHANNEL | INPUT11 | | 106 | PAN | CHANNEL | INPUT12 |
| 44 | FADER L | CHANNEL | INPUT12 | | 107 | PAN | CHANNEL | INPUT13 |
| 45 | FADER L | CHANNEL | INPUT13 | | 108 | PAN | CHANNEL | INPUT14 |
| 46 | FADER L | CHANNEL | INPUT14 | | 109 | PAN | CHANNEL | INPUT15 |
| 47 | FADER L | CHANNEL | INPUT15 | | 110 | PAN | CHANNEL | INPUT16 |
| 48 | FADER L | CHANNEL | INPUT16 | | 111 | PAN | CHANNEL | INPUT17 |
| 49 | FADER L | CHANNEL | INPUT17 | | 112 | PAN | CHANNEL | INPUT18 |
| 50 | FADER L | CHANNEL | INPUT18 | | 113 | PAN | CHANNEL | INPUT19 |
| 51 | FADER L | CHANNEL | INPUT19 | | 114 | PAN | CHANNEL | INPUT20 |
| 52 | FADER L | CHANNEL | INPUT20 | | 115 | PAN | CHANNEL | INPUT21 |
| 53 | FADER L | CHANNEL | INPUT21 | | 116 | PAN | CHANNEL | INPUT22 |
| 54 | FADER L | CHANNEL | INPUT22 | | 117 | PAN | CHANNEL | INPUT23 |
| 55 | FADER L | CHANNEL | INPUT23 | | 118 | PAN | CHANNEL | INPUT24 |
| 56 | FADER L | CHANNEL | INPUT24 | | 119 | NO ASSIGN | | |

**CHANNEL2**

| # | HIGH | MID | LOW | # | HIGH | MID | LOW |
|---|------|-----|-----|---|------|-----|-----|
| 0 | NO ASSIGN | | | 57 | NO ASSIGN | | |
| 1 | FADER H | CHANNEL | INPUT25 | 58 | NO ASSIGN | | |
| 2 | FADER H | CHANNEL | INPUT26 | 59 | NO ASSIGN | | |
| 3 | FADER H | CHANNEL | INPUT27 | 60 | NO ASSIGN | | |
| 4 | FADER H | CHANNEL | INPUT28 | 61 | NO ASSIGN | | |
| 5 | FADER H | CHANNEL | INPUT29 | 62 | NO ASSIGN | | |
| 6 | FADER H | CHANNEL | INPUT30 | 63 | NO ASSIGN | | |
| 7 | FADER H | CHANNEL | INPUT31 | 64 | ON | CHANNEL | INPUT25 |
| 8 | FADER H | CHANNEL | INPUT32 | 65 | ON | CHANNEL | INPUT26 |
| 9 | FADER H | CHANNEL | INPUT33 | 66 | ON | CHANNEL | INPUT27 |
| 10 | FADER H | CHANNEL | INPUT34 | 67 | ON | CHANNEL | INPUT28 |
| 11 | FADER H | CHANNEL | INPUT35 | 68 | ON | CHANNEL | INPUT29 |
| 12 | FADER H | CHANNEL | INPUT36 | 69 | ON | CHANNEL | INPUT30 |
| 13 | FADER H | CHANNEL | INPUT37 | 70 | ON | CHANNEL | INPUT31 |
| 14 | FADER H | CHANNEL | INPUT38 | 71 | ON | CHANNEL | INPUT32 |
| 15 | FADER H | CHANNEL | INPUT39 | 72 | ON | CHANNEL | INPUT33 |
| 16 | FADER H | CHANNEL | INPUT40 | 73 | ON | CHANNEL | INPUT34 |
| 17 | FADER H | CHANNEL | INPUT41 | 74 | ON | CHANNEL | INPUT35 |
| 18 | FADER H | CHANNEL | INPUT42 | 75 | ON | CHANNEL | INPUT36 |
| 19 | FADER H | CHANNEL | INPUT43 | 76 | ON | CHANNEL | INPUT37 |
| 20 | FADER H | CHANNEL | INPUT44 | 77 | ON | CHANNEL | INPUT38 |
| 21 | FADER H | CHANNEL | INPUT45 | 78 | ON | CHANNEL | INPUT39 |
| 22 | FADER H | CHANNEL | INPUT46 | 79 | ON | CHANNEL | INPUT40 |
| 23 | FADER H | CHANNEL | INPUT47 | 80 | ON | CHANNEL | INPUT41 |
| 24 | FADER H | CHANNEL | INPUT48 | 81 | ON | CHANNEL | INPUT42 |
| 25 | NO ASSIGN | | | 82 | ON | CHANNEL | INPUT43 |
| 26 | NO ASSIGN | | | 83 | ON | CHANNEL | INPUT44 |
| 27 | NO ASSIGN | | | 84 | ON | CHANNEL | INPUT45 |
| 28 | NO ASSIGN | | | 85 | ON | CHANNEL | INPUT46 |
| 29 | NO ASSIGN | | | 86 | ON | CHANNEL | INPUT47 |
| 30 | NO ASSIGN | | | 87 | ON | CHANNEL | INPUT48 |
| 31 | NO ASSIGN | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | 89 | PAN | CHANNEL | INPUT25 |
| 33 | FADER L | CHANNEL | INPUT25 | 90 | PAN | CHANNEL | INPUT26 |
| 34 | FADER L | CHANNEL | INPUT26 | 91 | PAN | CHANNEL | INPUT27 |
| 35 | FADER L | CHANNEL | INPUT27 | 92 | PAN | CHANNEL | INPUT28 |
| 36 | FADER L | CHANNEL | INPUT28 | 93 | PAN | CHANNEL | INPUT29 |
| 37 | FADER L | CHANNEL | INPUT29 | 94 | PAN | CHANNEL | INPUT30 |
| 38 | FADER L | CHANNEL | INPUT30 | 95 | PAN | CHANNEL | INPUT31 |
| 39 | FADER L | CHANNEL | INPUT31 | 102 | PAN | CHANNEL | INPUT32 |
| 40 | FADER L | CHANNEL | INPUT32 | 103 | PAN | CHANNEL | INPUT33 |
| 41 | FADER L | CHANNEL | INPUT33 | 104 | PAN | CHANNEL | INPUT34 |
| 42 | FADER L | CHANNEL | INPUT34 | 105 | PAN | CHANNEL | INPUT35 |
| 43 | FADER L | CHANNEL | INPUT35 | 106 | PAN | CHANNEL | INPUT36 |
| 44 | FADER L | CHANNEL | INPUT36 | 107 | PAN | CHANNEL | INPUT37 |
| 45 | FADER L | CHANNEL | INPUT37 | 108 | PAN | CHANNEL | INPUT38 |
| 46 | FADER L | CHANNEL | INPUT38 | 109 | PAN | CHANNEL | INPUT39 |
| 47 | FADER L | CHANNEL | INPUT39 | 110 | PAN | CHANNEL | INPUT40 |
| 48 | FADER L | CHANNEL | INPUT40 | 111 | PAN | CHANNEL | INPUT41 |
| 49 | FADER L | CHANNEL | INPUT41 | 112 | PAN | CHANNEL | INPUT42 |
| 50 | FADER L | CHANNEL | INPUT42 | 113 | PAN | CHANNEL | INPUT43 |
| 51 | FADER L | CHANNEL | INPUT43 | 114 | PAN | CHANNEL | INPUT44 |
| 52 | FADER L | CHANNEL | INPUT44 | 115 | PAN | CHANNEL | INPUT45 |
| 53 | FADER L | CHANNEL | INPUT45 | 116 | PAN | CHANNEL | INPUT46 |
| 54 | FADER L | CHANNEL | INPUT46 | 117 | PAN | CHANNEL | INPUT47 |
| 55 | FADER L | CHANNEL | INPUT47 | 118 | PAN | CHANNEL | INPUT48 |
| 56 | FADER L | CHANNEL | INPUT48 | 119 | NO ASSIGN | | |

## CHANNEL3

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|---|---|---|---|---|---|---|---|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | FADER H | CHANNEL | INPUT49 | | 58 | NO ASSIGN | | |
| 2 | FADER H | CHANNEL | INPUT50 | | 59 | NO ASSIGN | | |
| 3 | FADER H | CHANNEL | INPUT51 | | 60 | NO ASSIGN | | |
| 4 | FADER H | CHANNEL | INPUT52 | | 61 | NO ASSIGN | | |
| 5 | FADER H | CHANNEL | INPUT53 | | 62 | NO ASSIGN | | |
| 6 | FADER H | CHANNEL | INPUT54 | | 63 | NO ASSIGN | | |
| 7 | FADER H | CHANNEL | INPUT55 | | 64 | ON | CHANNEL | INPUT49 |
| 8 | FADER H | CHANNEL | INPUT56 | | 65 | ON | CHANNEL | INPUT50 |
| 9 | FADER H | MASTER | BUS1 | | 66 | ON | CHANNEL | INPUT51 |
| 10 | FADER H | MASTER | BUS2 | | 67 | ON | CHANNEL | INPUT52 |
| 11 | FADER H | MASTER | BUS3 | | 68 | ON | CHANNEL | INPUT53 |
| 12 | FADER H | MASTER | BUS4 | | 69 | ON | CHANNEL | INPUT54 |
| 13 | FADER H | MASTER | BUS5 | | 70 | ON | CHANNEL | INPUT55 |
| 14 | FADER H | MASTER | BUS6 | | 71 | ON | CHANNEL | INPUT56 |
| 15 | FADER H | MASTER | BUS7 | | 72 | ON | MASTER | BUS1 |
| 16 | FADER H | MASTER | BUS8 | | 73 | ON | MASTER | BUS2 |
| 17 | FADER H | MASTER | AUX1 | | 74 | ON | MASTER | BUS3 |
| 18 | FADER H | MASTER | AUX2 | | 75 | ON | MASTER | BUS4 |
| 19 | FADER H | MASTER | AUX3 | | 76 | ON | MASTER | BUS5 |
| 20 | FADER H | MASTER | AUX4 | | 77 | ON | MASTER | BUS6 |
| 21 | FADER H | MASTER | AUX5 | | 78 | ON | MASTER | BUS7 |
| 22 | FADER H | MASTER | AUX6 | | 79 | ON | MASTER | BUS8 |
| 23 | FADER H | MASTER | AUX7 | | 80 | ON | MASTER | AUX1 |
| 24 | FADER H | MASTER | AUX8 | | 81 | ON | MASTER | AUX2 |
| 25 | NO ASSIGN | | | | 82 | ON | MASTER | AUX3 |
| 26 | NO ASSIGN | | | | 83 | ON | MASTER | AUX4 |
| 27 | NO ASSIGN | | | | 84 | ON | MASTER | AUX5 |
| 28 | NO ASSIGN | | | | 85 | ON | MASTER | AUX6 |
| 29 | NO ASSIGN | | | | 86 | ON | MASTER | AUX7 |
| 30 | NO ASSIGN | | | | 87 | ON | MASTER | AUX8 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | PAN | CHANNEL | INPUT49 |
| 33 | FADER L | CHANNEL | INPUT49 | | 90 | PAN | CHANNEL | INPUT50 |
| 34 | FADER L | CHANNEL | INPUT50 | | 91 | PAN | CHANNEL | INPUT51 |
| 35 | FADER L | CHANNEL | INPUT51 | | 92 | PAN | CHANNEL | INPUT52 |
| 36 | FADER L | CHANNEL | INPUT52 | | 93 | PAN | CHANNEL | INPUT53 |
| 37 | FADER L | CHANNEL | INPUT53 | | 94 | PAN | CHANNEL | INPUT54 |
| 38 | FADER L | CHANNEL | INPUT54 | | 95 | PAN | CHANNEL | INPUT55 |
| 39 | FADER L | CHANNEL | INPUT55 | | 102 | PAN | CHANNEL | INPUT56 |
| 40 | FADER L | CHANNEL | INPUT56 | | 103 | NO ASSIGN | | |
| 41 | FADER L | MASTER | BUS1 | | 104 | NO ASSIGN | | |
| 42 | FADER L | MASTER | BUS2 | | 105 | NO ASSIGN | | |
| 43 | FADER L | MASTER | BUS3 | | 106 | NO ASSIGN | | |
| 44 | FADER L | MASTER | BUS4 | | 107 | NO ASSIGN | | |
| 45 | FADER L | MASTER | BUS5 | | 108 | NO ASSIGN | | |
| 46 | FADER L | MASTER | BUS6 | | 109 | NO ASSIGN | | |
| 47 | FADER L | MASTER | BUS7 | | 110 | NO ASSIGN | | |
| 48 | FADER L | MASTER | BUS8 | | 111 | NO ASSIGN | | |
| 49 | FADER L | MASTER | AUX1 | | 112 | NO ASSIGN | | |
| 50 | FADER L | MASTER | AUX2 | | 113 | NO ASSIGN | | |
| 51 | FADER L | MASTER | AUX3 | | 114 | NO ASSIGN | | |
| 52 | FADER L | MASTER | AUX4 | | 115 | NO ASSIGN | | |
| 53 | FADER L | MASTER | AUX5 | | 116 | NO ASSIGN | | |
| 54 | FADER L | MASTER | AUX6 | | 117 | NO ASSIGN | | |
| 55 | FADER L | MASTER | AUX7 | | 118 | NO ASSIGN | | |
| 56 | FADER L | MASTER | AUX8 | | 119 | NO ASSIGN | | |

**CHANNEL4**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | EQ | G LOW H | INPUT1 | | 58 | NO ASSIGN | | |
| 2 | EQ | G LOW H | INPUT2 | | 59 | NO ASSIGN | | |
| 3 | EQ | G LOW H | INPUT3 | | 60 | NO ASSIGN | | |
| 4 | EQ | G LOW H | INPUT4 | | 61 | NO ASSIGN | | |
| 5 | EQ | G LOW H | INPUT5 | | 62 | NO ASSIGN | | |
| 6 | EQ | G LOW H | INPUT6 | | 63 | NO ASSIGN | | |
| 7 | EQ | G LOW H | INPUT7 | | 64 | EQ | F LOW | INPUT1 |
| 8 | EQ | G LOW H | INPUT8 | | 65 | EQ | F LOW | INPUT2 |
| 9 | EQ | G LOW H | INPUT9 | | 66 | EQ | F LOW | INPUT3 |
| 10 | EQ | G LOW H | INPUT10 | | 67 | EQ | F LOW | INPUT4 |
| 11 | EQ | G LOW H | INPUT11 | | 68 | EQ | F LOW | INPUT5 |
| 12 | EQ | G LOW H | INPUT12 | | 69 | EQ | F LOW | INPUT6 |
| 13 | EQ | G LOW H | INPUT13 | | 70 | EQ | F LOW | INPUT7 |
| 14 | EQ | G LOW H | INPUT14 | | 71 | EQ | F LOW | INPUT8 |
| 15 | EQ | G LOW H | INPUT15 | | 72 | EQ | F LOW | INPUT9 |
| 16 | EQ | G LOW H | INPUT16 | | 73 | EQ | F LOW | INPUT10 |
| 17 | EQ | G LOW H | INPUT17 | | 74 | EQ | F LOW | INPUT11 |
| 18 | EQ | G LOW H | INPUT18 | | 75 | EQ | F LOW | INPUT12 |
| 19 | EQ | G LOW H | INPUT19 | | 76 | EQ | F LOW | INPUT13 |
| 20 | EQ | G LOW H | INPUT20 | | 77 | EQ | F LOW | INPUT14 |
| 21 | EQ | G LOW H | INPUT21 | | 78 | EQ | F LOW | INPUT15 |
| 22 | EQ | G LOW H | INPUT22 | | 79 | EQ | F LOW | INPUT16 |
| 23 | EQ | G LOW H | INPUT23 | | 80 | EQ | F LOW | INPUT17 |
| 24 | EQ | G LOW H | INPUT24 | | 81 | EQ | F LOW | INPUT18 |
| 25 | NO ASSIGN | | | | 82 | EQ | F LOW | INPUT19 |
| 26 | NO ASSIGN | | | | 83 | EQ | F LOW | INPUT20 |
| 27 | NO ASSIGN | | | | 84 | EQ | F LOW | INPUT21 |
| 28 | NO ASSIGN | | | | 85 | EQ | F LOW | INPUT22 |
| 29 | NO ASSIGN | | | | 86 | EQ | F LOW | INPUT23 |
| 30 | NO ASSIGN | | | | 87 | EQ | F LOW | INPUT24 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | EQ | Q LOW | INPUT1 |
| 33 | EQ | G LOW L | INPUT1 | | 90 | EQ | Q LOW | INPUT2 |
| 34 | EQ | G LOW L | INPUT2 | | 91 | EQ | Q LOW | INPUT3 |
| 35 | EQ | G LOW L | INPUT3 | | 92 | EQ | Q LOW | INPUT4 |
| 36 | EQ | G LOW L | INPUT4 | | 93 | EQ | Q LOW | INPUT5 |
| 37 | EQ | G LOW L | INPUT5 | | 94 | EQ | Q LOW | INPUT6 |
| 38 | EQ | G LOW L | INPUT6 | | 95 | EQ | Q LOW | INPUT7 |
| 39 | EQ | G LOW L | INPUT7 | | 102 | EQ | Q LOW | INPUT8 |
| 40 | EQ | G LOW L | INPUT8 | | 103 | EQ | Q LOW | INPUT9 |
| 41 | EQ | G LOW L | INPUT9 | | 104 | EQ | Q LOW | INPUT10 |
| 42 | EQ | G LOW L | INPUT10 | | 105 | EQ | Q LOW | INPUT11 |
| 43 | EQ | G LOW L | INPUT11 | | 106 | EQ | Q LOW | INPUT12 |
| 44 | EQ | G LOW L | INPUT12 | | 107 | EQ | Q LOW | INPUT13 |
| 45 | EQ | G LOW L | INPUT13 | | 108 | EQ | Q LOW | INPUT14 |
| 46 | EQ | G LOW L | INPUT14 | | 109 | EQ | Q LOW | INPUT15 |
| 47 | EQ | G LOW L | INPUT15 | | 110 | EQ | Q LOW | INPUT16 |
| 48 | EQ | G LOW L | INPUT16 | | 111 | EQ | Q LOW | INPUT17 |
| 49 | EQ | G LOW L | INPUT17 | | 112 | EQ | Q LOW | INPUT18 |
| 50 | EQ | G LOW L | INPUT18 | | 113 | EQ | Q LOW | INPUT19 |
| 51 | EQ | G LOW L | INPUT19 | | 114 | EQ | Q LOW | INPUT20 |
| 52 | EQ | G LOW L | INPUT20 | | 115 | EQ | Q LOW | INPUT21 |
| 53 | EQ | G LOW L | INPUT21 | | 116 | EQ | Q LOW | INPUT22 |
| 54 | EQ | G LOW L | INPUT22 | | 117 | EQ | Q LOW | INPUT23 |
| 55 | EQ | G LOW L | INPUT23 | | 118 | EQ | Q LOW | INPUT24 |
| 56 | EQ | G LOW L | INPUT24 | | 119 | NO ASSIGN | | |

CHANNEL5

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | NO ASSIGN | | |
| 1 | EQ | G LOW H | INPUT25 |
| 2 | EQ | G LOW H | INPUT26 |
| 3 | EQ | G LOW H | INPUT27 |
| 4 | EQ | G LOW H | INPUT28 |
| 5 | EQ | G LOW H | INPUT29 |
| 6 | EQ | G LOW H | INPUT30 |
| 7 | EQ | G LOW H | INPUT31 |
| 8 | EQ | G LOW H | INPUT32 |
| 9 | EQ | G LOW H | INPUT33 |
| 10 | EQ | G LOW H | INPUT34 |
| 11 | EQ | G LOW H | INPUT35 |
| 12 | EQ | G LOW H | INPUT36 |
| 13 | EQ | G LOW H | INPUT37 |
| 14 | EQ | G LOW H | INPUT38 |
| 15 | EQ | G LOW H | INPUT39 |
| 16 | EQ | G LOW H | INPUT40 |
| 17 | EQ | G LOW H | INPUT41 |
| 18 | EQ | G LOW H | INPUT42 |
| 19 | EQ | G LOW H | INPUT43 |
| 20 | EQ | G LOW H | INPUT44 |
| 21 | EQ | G LOW H | INPUT45 |
| 22 | EQ | G LOW H | INPUT46 |
| 23 | EQ | G LOW H | INPUT47 |
| 24 | EQ | G LOW H | INPUT48 |
| 25 | NO ASSIGN | | |
| 26 | NO ASSIGN | | |
| 27 | NO ASSIGN | | |
| 28 | NO ASSIGN | | |
| 29 | NO ASSIGN | | |
| 30 | NO ASSIGN | | |
| 31 | NO ASSIGN | | |
| 32 | NO ASSIGN | | |
| 33 | EQ | G LOW L | INPUT24 |
| 34 | EQ | G LOW L | INPUT25 |
| 35 | EQ | G LOW L | INPUT26 |
| 36 | EQ | G LOW L | INPUT27 |
| 37 | EQ | G LOW L | INPUT28 |
| 38 | EQ | G LOW L | INPUT29 |
| 39 | EQ | G LOW L | INPUT30 |
| 40 | EQ | G LOW L | INPUT31 |
| 41 | EQ | G LOW L | INPUT32 |
| 42 | EQ | G LOW L | INPUT33 |
| 43 | EQ | G LOW L | INPUT34 |
| 44 | EQ | G LOW L | INPUT35 |
| 45 | EQ | G LOW L | INPUT36 |
| 46 | EQ | G LOW L | INPUT37 |
| 47 | EQ | G LOW L | INPUT38 |
| 48 | EQ | G LOW L | INPUT39 |
| 49 | EQ | G LOW L | INPUT40 |
| 50 | EQ | G LOW L | INPUT41 |
| 51 | EQ | G LOW L | INPUT42 |
| 52 | EQ | G LOW L | INPUT43 |
| 53 | EQ | G LOW L | INPUT44 |
| 54 | EQ | G LOW L | INPUT45 |
| 55 | EQ | G LOW L | INPUT46 |
| 56 | EQ | G LOW L | INPUT47 |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | NO ASSIGN | | |
| 58 | NO ASSIGN | | |
| 59 | NO ASSIGN | | |
| 60 | NO ASSIGN | | |
| 61 | NO ASSIGN | | |
| 62 | NO ASSIGN | | |
| 63 | NO ASSIGN | | |
| 64 | EQ | F LOW | INPUT25 |
| 65 | EQ | F LOW | INPUT26 |
| 66 | EQ | F LOW | INPUT27 |
| 67 | EQ | F LOW | INPUT28 |
| 68 | EQ | F LOW | INPUT29 |
| 69 | EQ | F LOW | INPUT30 |
| 70 | EQ | F LOW | INPUT31 |
| 71 | EQ | F LOW | INPUT32 |
| 72 | EQ | F LOW | INPUT33 |
| 73 | EQ | F LOW | INPUT34 |
| 74 | EQ | F LOW | INPUT35 |
| 75 | EQ | F LOW | INPUT36 |
| 76 | EQ | F LOW | INPUT37 |
| 77 | EQ | F LOW | INPUT38 |
| 78 | EQ | F LOW | INPUT39 |
| 79 | EQ | F LOW | INPUT40 |
| 80 | EQ | F LOW | INPUT41 |
| 81 | EQ | F LOW | INPUT42 |
| 82 | EQ | F LOW | INPUT43 |
| 83 | EQ | F LOW | INPUT44 |
| 84 | EQ | F LOW | INPUT45 |
| 85 | EQ | F LOW | INPUT46 |
| 86 | EQ | F LOW | INPUT47 |
| 87 | EQ | F LOW | INPUT48 |
| 88 | NO ASSIGN | | |
| 89 | EQ | Q LOW | INPUT25 |
| 90 | EQ | Q LOW | INPUT26 |
| 91 | EQ | Q LOW | INPUT27 |
| 92 | EQ | Q LOW | INPUT28 |
| 93 | EQ | Q LOW | INPUT29 |
| 94 | EQ | Q LOW | INPUT30 |
| 95 | EQ | Q LOW | INPUT31 |
| 102 | EQ | Q LOW | INPUT32 |
| 103 | EQ | Q LOW | INPUT33 |
| 104 | EQ | Q LOW | INPUT34 |
| 105 | EQ | Q LOW | INPUT35 |
| 106 | EQ | Q LOW | INPUT36 |
| 107 | EQ | Q LOW | INPUT37 |
| 108 | EQ | Q LOW | INPUT38 |
| 109 | EQ | Q LOW | INPUT39 |
| 110 | EQ | Q LOW | INPUT40 |
| 111 | EQ | Q LOW | INPUT41 |
| 112 | EQ | Q LOW | INPUT42 |
| 113 | EQ | Q LOW | INPUT43 |
| 114 | EQ | Q LOW | INPUT44 |
| 115 | EQ | Q LOW | INPUT45 |
| 116 | EQ | PRQ LOW | INPUT46 |
| 117 | EQ | Q LOW | INPUT47 |
| 118 | EQ | Q LOW | INPUT48 |
| 119 | NO ASSIGN | | |

**CHANNEL6**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | EQ | G LOW H | INPUT49 | | 58 | NO ASSIGN | | |
| 2 | EQ | G LOW H | INPUT50 | | 59 | NO ASSIGN | | |
| 3 | EQ | G LOW H | INPUT51 | | 60 | NO ASSIGN | | |
| 4 | EQ | G LOW H | INPUT52 | | 61 | NO ASSIGN | | |
| 5 | EQ | G LOW H | INPUT53 | | 62 | NO ASSIGN | | |
| 6 | EQ | G LOW H | INPUT54 | | 63 | NO ASSIGN | | |
| 7 | EQ | G LOW H | INPUT55 | | 64 | EQ | F LOW | INPUT49 |
| 8 | EQ | G LOW H | INPUT56 | | 65 | EQ | F LOW | INPUT50 |
| 9 | EQ | G LO-MID H | INPUT1 | | 66 | EQ | F LOW | INPUT51 |
| 10 | EQ | G LO-MID H | INPUT2 | | 67 | EQ | F LOW | INPUT52 |
| 11 | EQ | G LO-MID H | INPUT3 | | 68 | EQ | F LOW | INPUT53 |
| 12 | EQ | G LO-MID H | INPUT4 | | 69 | EQ | F LOW | INPUT54 |
| 13 | EQ | G LO-MID H | INPUT5 | | 70 | EQ | F LOW | INPUT55 |
| 14 | EQ | G LO-MID H | INPUT6 | | 71 | EQ | F LOW | INPUT56 |
| 15 | EQ | G LO-MID H | INPUT7 | | 72 | EQ | F LO-MID | INPUT1 |
| 16 | EQ | G LO-MID H | INPUT8 | | 73 | EQ | F LO-MID | INPUT2 |
| 17 | EQ | G LO-MID H | INPUT9 | | 74 | EQ | F LO-MID | INPUT3 |
| 18 | EQ | G LO-MID H | INPUT10 | | 75 | EQ | F LO-MID | INPUT4 |
| 19 | EQ | G LO-MID H | INPUT11 | | 76 | EQ | F LO-MID | INPUT5 |
| 20 | EQ | G LO-MID H | INPUT12 | | 77 | EQ | F LO-MID | INPUT6 |
| 21 | EQ | G LO-MID H | INPUT13 | | 78 | EQ | F LO-MID | INPUT7 |
| 22 | EQ | G LO-MID H | INPUT14 | | 79 | EQ | F LO-MID | INPUT8 |
| 23 | EQ | G LO-MID H | INPUT15 | | 80 | EQ | F LO-MID | INPUT9 |
| 24 | EQ | G LO-MID H | INPUT16 | | 81 | EQ | F LO-MID | INPUT10 |
| 25 | NO ASSIGN | | | | 82 | EQ | F LO-MID | INPUT11 |
| 26 | NO ASSIGN | | | | 83 | EQ | F LO-MID | INPUT12 |
| 27 | NO ASSIGN | | | | 84 | EQ | F LO-MID | INPUT13 |
| 28 | NO ASSIGN | | | | 85 | EQ | F LO-MID | INPUT14 |
| 29 | NO ASSIGN | | | | 86 | EQ | F LO-MID | INPUT15 |
| 30 | NO ASSIGN | | | | 87 | EQ | F LO-MID | INPUT16 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | EQ | Q LOW | INPUT49 |
| 33 | EQ | G LOW | INPUT49 | | 90 | EQ | Q LOW | INPUT50 |
| 34 | EQ | G LOW | INPUT50 | | 91 | EQ | Q LOW | INPUT51 |
| 35 | EQ | G LOW | INPUT51 | | 92 | EQ | Q LOW | INPUT52 |
| 36 | EQ | G LOW | INPUT52 | | 93 | EQ | Q LOW | INPUT53 |
| 37 | EQ | G LOW | INPUT53 | | 94 | EQ | Q LOW | INPUT54 |
| 38 | EQ | G LOW | INPUT54 | | 95 | EQ | Q LOW | INPUT55 |
| 39 | EQ | G LOW | INPUT55 | | 102 | EQ | Q LOW | INPUT56 |
| 40 | EQ | G LOW | INPUT56 | | 103 | EQ | Q LO-MID | INPUT1 |
| 41 | EQ | G LO-MID L | INPUT1 | | 104 | EQ | Q LO-MID | INPUT2 |
| 42 | EQ | G LO-MID L | INPUT2 | | 105 | EQ | Q LO-MID | INPUT3 |
| 43 | EQ | G LO-MID L | INPUT3 | | 106 | EQ | Q LO-MID | INPUT4 |
| 44 | EQ | G LO-MID L | INPUT4 | | 107 | EQ | Q LO-MID | INPUT5 |
| 45 | EQ | G LO-MID L | INPUT5 | | 108 | EQ | Q LO-MID | INPUT6 |
| 46 | EQ | G LO-MID L | INPUT6 | | 109 | EQ | Q LO-MID | INPUT7 |
| 47 | EQ | G LO-MID L | INPUT7 | | 110 | EQ | Q LO-MID | INPUT8 |
| 48 | EQ | G LO-MID L | INPUT8 | | 111 | EQ | Q LO-MID | INPUT9 |
| 49 | EQ | G LO-MID L | INPUT9 | | 112 | EQ | Q LO-MID | INPUT10 |
| 50 | EQ | G LO-MID L | INPUT10 | | 113 | EQ | Q LO-MID | INPUT11 |
| 51 | EQ | G LO-MID L | INPUT11 | | 114 | EQ | Q LO-MID | INPUT12 |
| 52 | EQ | G LO-MID L | INPUT12 | | 115 | EQ | Q LO-MID | INPUT13 |
| 53 | EQ | G LO-MID L | INPUT13 | | 116 | EQ | Q LO-MID | INPUT14 |
| 54 | EQ | G LO-MID L | INPUT14 | | 117 | EQ | Q LO-MID | INPUT15 |
| 55 | EQ | G LO-MID L | INPUT15 | | 118 | EQ | Q LO-MID | INPUT16 |
| 56 | EQ | G LO-MID L | INPUT16 | | 119 | NO ASSIGN | | |

## CHANNEL7

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | NO ASSIGN | | |
| 1 | EQ | G LO-MID H | INPUT17 |
| 2 | EQ | G LO-MID H | INPUT18 |
| 3 | EQ | G LO-MID H | INPUT19 |
| 4 | EQ | G LO-MID H | INPUT20 |
| 5 | EQ | G LO-MID H | INPUT21 |
| 6 | EQ | G LO-MID H | INPUT22 |
| 7 | EQ | G LO-MID H | INPUT23 |
| 8 | EQ | G LO-MID H | INPUT24 |
| 9 | EQ | G LO-MID H | INPUT25 |
| 10 | EQ | G LO-MID H | INPUT26 |
| 11 | EQ | G LO-MID H | INPUT27 |
| 12 | EQ | G LO-MID H | INPUT28 |
| 13 | EQ | G LO-MID H | INPUT29 |
| 14 | EQ | G LO-MID H | INPUT30 |
| 15 | EQ | G LO-MID H | INPUT31 |
| 16 | EQ | G LO-MID H | INPUT32 |
| 17 | EQ | G LO-MID H | INPUT33 |
| 18 | EQ | G LO-MID H | INPUT34 |
| 19 | EQ | G LO-MID H | INPUT35 |
| 20 | EQ | G LO-MID H | INPUT36 |
| 21 | EQ | G LO-MID H | INPUT37 |
| 22 | EQ | G LO-MID H | INPUT38 |
| 23 | EQ | G LO-MID H | INPUT39 |
| 24 | EQ | G LO-MID H | INPUT40 |
| 25 | NO ASSIGN | | |
| 26 | NO ASSIGN | | |
| 27 | NO ASSIGN | | |
| 28 | NO ASSIGN | | |
| 29 | NO ASSIGN | | |
| 30 | NO ASSIGN | | |
| 31 | NO ASSIGN | | |
| 32 | NO ASSIGN | | |
| 33 | EQ | G LO-MID L | INPUT17 |
| 34 | EQ | G LO-MID L | INPUT18 |
| 35 | EQ | G LO-MID L | INPUT19 |
| 36 | EQ | G LO-MID L | INPUT20 |
| 37 | EQ | G LO-MID L | INPUT21 |
| 38 | EQ | G LO-MID L | INPUT22 |
| 39 | EQ | G LO-MID L | INPUT23 |
| 40 | EQ | G LO-MID L | INPUT24 |
| 41 | EQ | G LO-MID L | INPUT25 |
| 42 | EQ | G LO-MID L | INPUT26 |
| 43 | EQ | G LO-MID L | INPUT27 |
| 44 | EQ | G LO-MID L | INPUT28 |
| 45 | EQ | G LO-MID L | INPUT29 |
| 46 | EQ | G LO-MID L | INPUT30 |
| 47 | EQ | G LO-MID L | INPUT31 |
| 48 | EQ | G LO-MID L | INPUT32 |
| 49 | EQ | G LO-MID L | INPUT33 |
| 50 | EQ | G LO-MID L | INPUT34 |
| 51 | EQ | G LO-MID L | INPUT35 |
| 52 | EQ | G LO-MID L | INPUT36 |
| 53 | EQ | G LO-MID L | INPUT37 |
| 54 | EQ | G LO-MID L | INPUT38 |
| 55 | EQ | G LO-MID L | INPUT39 |
| 56 | EQ | G LO-MID L | INPUT40 |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | NO ASSIGN | | |
| 58 | NO ASSIGN | | |
| 59 | NO ASSIGN | | |
| 60 | NO ASSIGN | | |
| 61 | NO ASSIGN | | |
| 62 | NO ASSIGN | | |
| 63 | NO ASSIGN | | |
| 64 | EQ | F LO-MID | INPUT17 |
| 65 | EQ | F LO-MID | INPUT18 |
| 66 | EQ | F LO-MID | INPUT19 |
| 67 | EQ | F LO-MID | INPUT20 |
| 68 | EQ | F LO-MID | INPUT21 |
| 69 | EQ | F LO-MID | INPUT22 |
| 70 | EQ | F LO-MID | INPUT23 |
| 71 | EQ | F LO-MID | INPUT24 |
| 72 | EQ | F LO-MID | INPUT25 |
| 73 | EQ | F LO-MID | INPUT26 |
| 74 | EQ | F LO-MID | INPUT27 |
| 75 | EQ | F LO-MID | INPUT28 |
| 76 | EQ | F LO-MID | INPUT29 |
| 77 | EQ | F LO-MID | INPUT30 |
| 78 | EQ | F LO-MID | INPUT31 |
| 79 | EQ | F LO-MID | INPUT32 |
| 80 | EQ | F LO-MID | INPUT33 |
| 81 | EQ | F LO-MID | INPUT34 |
| 82 | EQ | F LO-MID | INPUT35 |
| 83 | EQ | F LO-MID | INPUT36 |
| 84 | EQ | F LO-MID | INPUT37 |
| 85 | EQ | F LO-MID | INPUT38 |
| 86 | EQ | F LO-MID | INPUT39 |
| 87 | EQ | F LO-MID | INPUT40 |
| 88 | NO ASSIGN | | |
| 89 | EQ | Q LO-MID | INPUT17 |
| 90 | EQ | Q LO-MID | INPUT18 |
| 91 | EQ | Q LO-MID | INPUT19 |
| 92 | EQ | Q LO-MID | INPUT20 |
| 93 | EQ | Q LO-MID | INPUT21 |
| 94 | EQ | Q LO-MID | INPUT22 |
| 95 | EQ | Q LO-MID | INPUT23 |
| 102 | EQ | Q LO-MID | INPUT24 |
| 103 | EQ | Q LO-MID | INPUT25 |
| 104 | EQ | Q LO-MID | INPUT26 |
| 105 | EQ | Q LO-MID | INPUT27 |
| 106 | EQ | Q LO-MID | INPUT28 |
| 107 | EQ | Q LO-MID | INPUT29 |
| 108 | EQ | Q LO-MID | INPUT30 |
| 109 | EQ | Q LO-MID | INPUT31 |
| 110 | EQ | Q LO-MID | INPUT32 |
| 111 | EQ | Q LO-MID | INPUT33 |
| 112 | EQ | Q LO-MID | INPUT34 |
| 113 | EQ | Q LO-MID | INPUT35 |
| 114 | EQ | Q LO-MID | INPUT36 |
| 115 | EQ | Q LO-MID | INPUT37 |
| 116 | EQ | PRQ LO-MID | INPUT38 |
| 117 | EQ | Q LO-MID | INPUT39 |
| 118 | EQ | Q LO-MID | INPUT40 |
| 119 | NO ASSIGN | | |

**CHANNEL8**

| # | HIGH | MID | LOW | # | HIGH | MID | LOW |
|---|------|-----|-----|---|------|-----|-----|
| 0 | NO ASSIGN | | | 57 | NO ASSIGN | | |
| 1 | EQ | G LO-MID H | INPUT41 | 58 | NO ASSIGN | | |
| 2 | EQ | G LO-MID H | INPUT42 | 59 | NO ASSIGN | | |
| 3 | EQ | G LO-MID H | INPUT43 | 60 | NO ASSIGN | | |
| 4 | EQ | G LO-MID H | INPUT44 | 61 | NO ASSIGN | | |
| 5 | EQ | G LO-MID H | INPUT45 | 62 | NO ASSIGN | | |
| 6 | EQ | G LO-MID H | INPUT46 | 63 | NO ASSIGN | | |
| 7 | EQ | G LO-MID H | INPUT47 | 64 | EQ | F LO-MID | INPUT41 |
| 8 | EQ | G LO-MID H | INPUT48 | 65 | EQ | F LO-MID | INPUT42 |
| 9 | EQ | G LO-MID H | INPUT49 | 66 | EQ | F LO-MID | INPUT43 |
| 10 | EQ | G LO-MID H | INPUT50 | 67 | EQ | F LO-MID | INPUT44 |
| 11 | EQ | G LO-MID H | INPUT51 | 68 | EQ | F LO-MID | INPUT45 |
| 12 | EQ | G LO-MID H | INPUT52 | 69 | EQ | F LO-MID | INPUT46 |
| 13 | EQ | G LO-MID H | INPUT53 | 70 | EQ | F LO-MID | INPUT47 |
| 14 | EQ | G LO-MID H | INPUT54 | 71 | EQ | F LO-MID | INPUT48 |
| 15 | EQ | G LO-MID H | INPUT55 | 72 | EQ | F LO-MID | INPUT49 |
| 16 | EQ | G LO-MID H | INPUT56 | 73 | EQ | F LO-MID | INPUT50 |
| 17 | EQ | G HI-MID H | INPUT1 | 74 | EQ | F LO-MID | INPUT51 |
| 18 | EQ | G HI-MID H | INPUT2 | 75 | EQ | F LO-MID | INPUT52 |
| 19 | EQ | G HI-MID H | INPUT3 | 76 | EQ | F LO-MID | INPUT53 |
| 20 | EQ | G HI-MID H | INPUT4 | 77 | EQ | F LO-MID | INPUT54 |
| 21 | EQ | G HI-MID H | INPUT5 | 78 | EQ | F LO-MID | INPUT55 |
| 22 | EQ | G HI-MID H | INPUT6 | 79 | EQ | F LO-MID | INPUT56 |
| 23 | EQ | G HI-MID H | INPUT7 | 80 | EQ | F HI-MID | INPUT1 |
| 24 | EQ | G HI-MID H | INPUT8 | 81 | EQ | F HI-MID | INPUT2 |
| 25 | NO ASSIGN | | | 82 | EQ | F HI-MID | INPUT3 |
| 26 | NO ASSIGN | | | 83 | EQ | F HI-MID | INPUT4 |
| 27 | NO ASSIGN | | | 84 | EQ | F HI-MID | INPUT5 |
| 28 | NO ASSIGN | | | 85 | EQ | F HI-MID | INPUT6 |
| 29 | NO ASSIGN | | | 86 | EQ | F HI-MID | INPUT7 |
| 30 | NO ASSIGN | | | 87 | EQ | F HI-MID | INPUT8 |
| 31 | NO ASSIGN | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | 89 | EQ | Q LO-MID | INPUT41 |
| 33 | EQ | G LO-MID L | INPUT41 | 90 | EQ | Q LO-MID | INPUT42 |
| 34 | EQ | G LO-MID L | INPUT42 | 91 | EQ | Q LO-MID | INPUT43 |
| 35 | EQ | G LO-MID L | INPUT43 | 92 | EQ | Q LO-MID | INPUT44 |
| 36 | EQ | G LO-MID L | INPUT44 | 93 | EQ | Q LO-MID | INPUT45 |
| 37 | EQ | G LO-MID L | INPUT45 | 94 | EQ | Q LO-MID | INPUT46 |
| 38 | EQ | G LO-MID L | INPUT46 | 95 | EQ | Q LO-MID | INPUT47 |
| 39 | EQ | G LO-MID L | INPUT47 | 102 | EQ | Q LO-MID | INPUT48 |
| 40 | EQ | G LO-MID L | INPUT48 | 103 | EQ | Q LO-MID | INPUT49 |
| 41 | EQ | G LO-MID L | INPUT49 | 104 | EQ | Q LO-MID | INPUT50 |
| 42 | EQ | G LO-MID L | INPUT50 | 105 | EQ | Q LO-MID | INPUT51 |
| 43 | EQ | G LO-MID L | INPUT51 | 106 | EQ | Q LO-MID | INPUT52 |
| 44 | EQ | G LO-MID L | INPUT52 | 107 | EQ | Q LO-MID | INPUT53 |
| 45 | EQ | G LO-MID L | INPUT53 | 108 | EQ | Q LO-MID | INPUT54 |
| 46 | EQ | G LO-MID L | INPUT54 | 109 | EQ | Q LO-MID | INPUT55 |
| 47 | EQ | G LO-MID L | INPUT55 | 110 | EQ | Q LO-MID | INPUT56 |
| 48 | EQ | G LO-MID L | INPUT56 | 111 | EQ | Q HI-MID | INPUT1 |
| 49 | EQ | G HI-MID L | INPUT1 | 112 | EQ | Q HI-MID | INPUT2 |
| 50 | EQ | G HI-MID L | INPUT2 | 113 | EQ | Q HI-MID | INPUT3 |
| 51 | EQ | G HI-MID L | INPUT3 | 114 | EQ | Q HI-MID | INPUT4 |
| 52 | EQ | G HI-MID L | INPUT4 | 115 | EQ | Q HI-MID | INPUT5 |
| 53 | EQ | G HI-MID L | INPUT5 | 116 | EQ | Q HI-MID | INPUT6 |
| 54 | EQ | G HI-MID L | INPUT6 | 117 | EQ | Q HI-MID | INPUT7 |
| 55 | EQ | G HI-MID L | INPUT7 | 118 | EQ | Q HI-MID | INPUT8 |
| 56 | EQ | G HI-MID L | INPUT8 | 119 | NO ASSIGN | | |

## CHANNEL9

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | NO ASSIGN | | |
| 1 | EQ | G HI-MID H | INPUT9 |
| 2 | EQ | G HI-MID H | INPUT10 |
| 3 | EQ | G HI-MID H | INPUT11 |
| 4 | EQ | G HI-MID H | INPUT12 |
| 5 | EQ | G HI-MID H | INPUT13 |
| 6 | EQ | G HI-MID H | INPUT14 |
| 7 | EQ | G HI-MID H | INPUT15 |
| 8 | EQ | G HI-MID H | INPUT16 |
| 9 | EQ | G HI-MID H | INPUT17 |
| 10 | EQ | G HI-MID H | INPUT18 |
| 11 | EQ | G HI-MID H | INPUT19 |
| 12 | EQ | G HI-MID H | INPUT20 |
| 13 | EQ | G HI-MID H | INPUT21 |
| 14 | EQ | G HI-MID H | INPUT22 |
| 15 | EQ | G HI-MID H | INPUT23 |
| 16 | EQ | G HI-MID H | INPUT24 |
| 17 | EQ | G HI-MID H | INPUT25 |
| 18 | EQ | G HI-MID H | INPUT26 |
| 19 | EQ | G HI-MID H | INPUT27 |
| 20 | EQ | G HI-MID H | INPUT28 |
| 21 | EQ | G HI-MID H | INPUT29 |
| 22 | EQ | G HI-MID H | INPUT30 |
| 23 | EQ | G HI-MID H | INPUT31 |
| 24 | EQ | G HI-MID H | INPUT32 |
| 25 | NO ASSIGN | | |
| 26 | NO ASSIGN | | |
| 27 | NO ASSIGN | | |
| 28 | NO ASSIGN | | |
| 29 | NO ASSIGN | | |
| 30 | NO ASSIGN | | |
| 31 | NO ASSIGN | | |
| 32 | NO ASSIGN | | |
| 33 | EQ | G HI-MID L | INPUT9 |
| 34 | EQ | G HI-MID L | INPUT10 |
| 35 | EQ | G HI-MID L | INPUT11 |
| 36 | EQ | G HI-MID L | INPUT12 |
| 37 | EQ | G HI-MID L | INPUT13 |
| 38 | EQ | G HI-MID L | INPUT14 |
| 39 | EQ | G HI-MID L | INPUT15 |
| 40 | EQ | G HI-MID L | INPUT16 |
| 41 | EQ | G HI-MID L | INPUT17 |
| 42 | EQ | G HI-MID L | INPUT18 |
| 43 | EQ | G HI-MID L | INPUT19 |
| 44 | EQ | G HI-MID L | INPUT20 |
| 45 | EQ | G HI-MID L | INPUT21 |
| 46 | EQ | G HI-MID L | INPUT22 |
| 47 | EQ | G HI-MID L | INPUT23 |
| 48 | EQ | G HI-MID L | INPUT24 |
| 49 | EQ | G HI-MID L | INPUT25 |
| 50 | EQ | G HI-MID L | INPUT26 |
| 51 | EQ | G HI-MID L | INPUT27 |
| 52 | EQ | G HI-MID L | INPUT28 |
| 53 | EQ | G HI-MID L | INPUT29 |
| 54 | EQ | G HI-MID L | INPUT30 |
| 55 | EQ | G HI-MID L | INPUT31 |
| 56 | EQ | G HI-MID L | INPUT32 |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | NO ASSIGN | | |
| 58 | NO ASSIGN | | |
| 59 | NO ASSIGN | | |
| 60 | NO ASSIGN | | |
| 61 | NO ASSIGN | | |
| 62 | NO ASSIGN | | |
| 63 | NO ASSIGN | | |
| 64 | EQ | F HI-MID | INPUT9 |
| 65 | EQ | F HI-MID | INPUT10 |
| 66 | EQ | F HI-MID | INPUT11 |
| 67 | EQ | F HI-MID | INPUT12 |
| 68 | EQ | F HI-MID | INPUT13 |
| 69 | EQ | F HI-MID | INPUT14 |
| 70 | EQ | F HI-MID | INPUT15 |
| 71 | EQ | F HI-MID | INPUT16 |
| 72 | EQ | F HI-MID | INPUT17 |
| 73 | EQ | F HI-MID | INPUT18 |
| 74 | EQ | F HI-MID | INPUT19 |
| 75 | EQ | F HI-MID | INPUT20 |
| 76 | EQ | F HI-MID | INPUT21 |
| 77 | EQ | F HI-MID | INPUT22 |
| 78 | EQ | F HI-MID | INPUT23 |
| 79 | EQ | F HI-MID | INPUT24 |
| 80 | EQ | F HI-MID | INPUT25 |
| 81 | EQ | F HI-MID | INPUT26 |
| 82 | EQ | F HI-MID | INPUT27 |
| 83 | EQ | F HI-MID | INPUT28 |
| 84 | EQ | F HI-MID | INPUT29 |
| 85 | EQ | F HI-MID | INPUT30 |
| 86 | EQ | F HI-MID | INPUT31 |
| 87 | EQ | F HI-MID | INPUT32 |
| 88 | NO ASSIGN | | |
| 89 | EQ | Q HI-MID | INPUT9 |
| 90 | EQ | Q HI-MID | INPUT10 |
| 91 | EQ | Q HI-MID | INPUT11 |
| 92 | EQ | Q HI-MID | INPUT12 |
| 93 | EQ | Q HI-MID | INPUT13 |
| 94 | EQ | Q HI-MID | INPUT14 |
| 95 | EQ | Q HI-MID | INPUT15 |
| 102 | EQ | Q HI-MID | INPUT16 |
| 103 | EQ | Q HI-MID | INPUT17 |
| 104 | EQ | Q HI-MID | INPUT18 |
| 105 | EQ | Q HI-MID | INPUT19 |
| 106 | EQ | Q HI-MID | INPUT20 |
| 107 | EQ | Q HI-MID | INPUT21 |
| 108 | EQ | Q HI-MID | INPUT22 |
| 109 | EQ | Q HI-MID | INPUT23 |
| 110 | EQ | Q HI-MID | INPUT24 |
| 111 | EQ | Q HI-MID | INPUT25 |
| 112 | EQ | Q HI-MID | INPUT26 |
| 113 | EQ | Q HI-MID | INPUT27 |
| 114 | EQ | Q HI-MID | INPUT28 |
| 115 | EQ | Q HI-MID | INPUT29 |
| 116 | EQ | PQ HI-MID | INPUT30 |
| 117 | EQ | Q HI-MID | INPUT31 |
| 118 | EQ | Q HI-MID | INPUT32 |
| 119 | NO ASSIGN | | |

**CHANNEL10**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | EQ | G HI-MID H | INPUT33 | | 58 | NO ASSIGN | | |
| 2 | EQ | G HI-MID H | INPUT34 | | 59 | NO ASSIGN | | |
| 3 | EQ | G HI-MID H | INPUT35 | | 60 | NO ASSIGN | | |
| 4 | EQ | G HI-MID H | INPUT36 | | 61 | NO ASSIGN | | |
| 5 | EQ | G HI-MID H | INPUT37 | | 62 | NO ASSIGN | | |
| 6 | EQ | G HI-MID H | INPUT38 | | 63 | NO ASSIGN | | |
| 7 | EQ | G HI-MID H | INPUT39 | | 64 | EQ | F HI-MID | INPUT33 |
| 8 | EQ | G HI-MID H | INPUT40 | | 65 | EQ | F HI-MID | INPUT34 |
| 9 | EQ | G HI-MID H | INPUT41 | | 66 | EQ | F HI-MID | INPUT35 |
| 10 | EQ | G HI-MID H | INPUT42 | | 67 | EQ | F HI-MID | INPUT36 |
| 11 | EQ | G HI-MID H | INPUT43 | | 68 | EQ | F HI-MID | INPUT37 |
| 12 | EQ | G HI-MID H | INPUT44 | | 69 | EQ | F HI-MID | INPUT38 |
| 13 | EQ | G HI-MID H | INPUT45 | | 70 | EQ | F HI-MID | INPUT39 |
| 14 | EQ | G HI-MID H | INPUT46 | | 71 | EQ | F HI-MID | INPUT40 |
| 15 | EQ | G HI-MID H | INPUT47 | | 72 | EQ | F HI-MID | INPUT41 |
| 16 | EQ | G HI-MID H | INPUT48 | | 73 | EQ | F HI-MID | INPUT42 |
| 17 | EQ | G HI-MID H | INPUT49 | | 74 | EQ | F HI-MID | INPUT43 |
| 18 | EQ | G HI-MID H | INPUT50 | | 75 | EQ | F HI-MID | INPUT44 |
| 19 | EQ | G HI-MID H | INPUT51 | | 76 | EQ | F HI-MID | INPUT45 |
| 20 | EQ | G HI-MID H | INPUT52 | | 77 | EQ | F HI-MID | INPUT46 |
| 21 | EQ | G HI-MID H | INPUT53 | | 78 | EQ | F HI-MID | INPUT47 |
| 22 | EQ | G HI-MID H | INPUT54 | | 79 | EQ | F HI-MID | INPUT48 |
| 23 | EQ | G HI-MID H | INPUT55 | | 80 | EQ | F HI-MID | INPUT49 |
| 24 | EQ | G HI-MID H | INPUT56 | | 81 | EQ | F HI-MID | INPUT50 |
| 25 | NO ASSIGN | | | | 82 | EQ | F HI-MID | INPUT51 |
| 26 | NO ASSIGN | | | | 83 | EQ | F HI-MID | INPUT52 |
| 27 | NO ASSIGN | | | | 84 | EQ | F HI-MID | INPUT53 |
| 28 | NO ASSIGN | | | | 85 | EQ | F HI-MID | INPUT54 |
| 29 | NO ASSIGN | | | | 86 | EQ | F HI-MID | INPUT55 |
| 30 | NO ASSIGN | | | | 87 | EQ | F HI-MID | INPUT56 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | EQ | Q HI-MID | INPUT33 |
| 33 | EQ | G HI-MID L | INPUT33 | | 90 | EQ | Q HI-MID | INPUT34 |
| 34 | EQ | G HI-MID L | INPUT34 | | 91 | EQ | Q HI-MID | INPUT35 |
| 35 | EQ | G HI-MID L | INPUT35 | | 92 | EQ | Q HI-MID | INPUT36 |
| 36 | EQ | G HI-MID L | INPUT36 | | 93 | EQ | Q HI-MID | INPUT37 |
| 37 | EQ | G HI-MID L | INPUT37 | | 94 | EQ | Q HI-MID | INPUT38 |
| 38 | EQ | G HI-MID L | INPUT38 | | 95 | EQ | Q HI-MID | INPUT39 |
| 39 | EQ | G HI-MID L | INPUT39 | | 102 | EQ | Q HI-MID | INPUT40 |
| 40 | EQ | G HI-MID L | INPUT40 | | 103 | EQ | Q HI-MID | INPUT41 |
| 41 | EQ | G HI-MID L | INPUT41 | | 104 | EQ | Q HI-MID | INPUT42 |
| 42 | EQ | G HI-MID L | INPUT42 | | 105 | EQ | Q HI-MID | INPUT43 |
| 43 | EQ | G HI-MID L | INPUT43 | | 106 | EQ | Q HI-MID | INPUT44 |
| 44 | EQ | G HI-MID L | INPUT44 | | 107 | EQ | Q HI-MID | INPUT45 |
| 45 | EQ | G HI-MID L | INPUT45 | | 108 | EQ | Q HI-MID | INPUT46 |
| 46 | EQ | G HI-MID L | INPUT46 | | 109 | EQ | Q HI-MID | INPUT47 |
| 47 | EQ | G HI-MID L | INPUT47 | | 110 | EQ | Q HI-MID | INPUT48 |
| 48 | EQ | G HI-MID L | INPUT48 | | 111 | EQ | Q HI-MID | INPUT49 |
| 49 | EQ | G HI-MID L | INPUT49 | | 112 | EQ | Q HI-MID | INPUT50 |
| 50 | EQ | G HI-MID L | INPUT50 | | 113 | EQ | Q HI-MID | INPUT51 |
| 51 | EQ | G HI-MID L | INPUT51 | | 114 | EQ | Q HI-MID | INPUT52 |
| 52 | EQ | G HI-MID L | INPUT52 | | 115 | EQ | Q HI-MID | INPUT53 |
| 53 | EQ | G HI-MID L | INPUT53 | | 116 | EQ | Q HI-MID | INPUT54 |
| 54 | EQ | G HI-MID L | INPUT54 | | 117 | EQ | Q HI-MID | INPUT55 |
| 55 | EQ | G HI-MID L | INPUT55 | | 118 | EQ | Q HI-MID | INPUT56 |
| 56 | EQ | G HI-MID L | INPUT56 | | 119 | NO ASSIGN | | |

## CHANNEL11

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | | NO ASSIGN | |
| 1 | EQ | G HIGH H | INPUT1 |
| 2 | EQ | G HIGH H | INPUT2 |
| 3 | EQ | G HIGH H | INPUT3 |
| 4 | EQ | G HIGH H | INPUT4 |
| 5 | EQ | G HIGH H | INPUT5 |
| 6 | EQ | G HIGH H | INPUT6 |
| 7 | EQ | G HIGH H | INPUT7 |
| 8 | EQ | G HIGH H | INPUT8 |
| 9 | EQ | G HIGH H | INPUT9 |
| 10 | EQ | G HIGH H | INPUT10 |
| 11 | EQ | G HIGH H | INPUT11 |
| 12 | EQ | G HIGH H | INPUT12 |
| 13 | EQ | G HIGH H | INPUT13 |
| 14 | EQ | G HIGH H | INPUT14 |
| 15 | EQ | G HIGH H | INPUT15 |
| 16 | EQ | G HIGH H | INPUT16 |
| 17 | EQ | G HIGH H | INPUT17 |
| 18 | EQ | G HIGH H | INPUT18 |
| 19 | EQ | G HIGH H | INPUT19 |
| 20 | EQ | G HIGH H | INPUT20 |
| 21 | EQ | G HIGH H | INPUT21 |
| 22 | EQ | G HIGH H | INPUT22 |
| 23 | EQ | G HIGH H | INPUT23 |
| 24 | EQ | G HIGH H | INPUT24 |
| 25 | | NO ASSIGN | |
| 26 | | NO ASSIGN | |
| 27 | | NO ASSIGN | |
| 28 | | NO ASSIGN | |
| 29 | | NO ASSIGN | |
| 30 | | NO ASSIGN | |
| 31 | | NO ASSIGN | |
| 32 | | NO ASSIGN | |
| 33 | EQ | G HIGH L | INPUT1 |
| 34 | EQ | G HIGH L | INPUT2 |
| 35 | EQ | G HIGH L | INPUT3 |
| 36 | EQ | G HIGH L | INPUT4 |
| 37 | EQ | G HIGH L | INPUT5 |
| 38 | EQ | G HIGH L | INPUT6 |
| 39 | EQ | G HIGH L | INPUT7 |
| 40 | EQ | G HIGH L | INPUT8 |
| 41 | EQ | G HIGH L | INPUT9 |
| 42 | EQ | G HIGH L | INPUT10 |
| 43 | EQ | G HIGH L | INPUT11 |
| 44 | EQ | G HIGH L | INPUT12 |
| 45 | EQ | G HIGH L | INPUT13 |
| 46 | EQ | G HIGH L | INPUT14 |
| 47 | EQ | G HIGH L | INPUT15 |
| 48 | EQ | G HIGH L | INPUT16 |
| 49 | EQ | G HIGH L | INPUT17 |
| 50 | EQ | G HIGH L | INPUT18 |
| 51 | EQ | G HIGH L | INPUT19 |
| 52 | EQ | G HIGH L | INPUT20 |
| 53 | EQ | G HIGH L | INPUT21 |
| 54 | EQ | G HIGH L | INPUT22 |
| 55 | EQ | G HIGH L | INPUT23 |
| 56 | EQ | G HIGH L | INPUT24 |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | | NO ASSIGN | |
| 58 | | NO ASSIGN | |
| 59 | | NO ASSIGN | |
| 60 | | NO ASSIGN | |
| 61 | | NO ASSIGN | |
| 62 | | NO ASSIGN | |
| 63 | | NO ASSIGN | |
| 64 | EQ | F HIGH | INPUT1 |
| 65 | EQ | F HIGH | INPUT2 |
| 66 | EQ | F HIGH | INPUT3 |
| 67 | EQ | F HIGH | INPUT4 |
| 68 | EQ | F HIGH | INPUT5 |
| 69 | EQ | F HIGH | INPUT6 |
| 70 | EQ | F HIGH | INPUT7 |
| 71 | EQ | F HIGH | INPUT8 |
| 72 | EQ | F HIGH | INPUT9 |
| 73 | EQ | F HIGH | INPUT10 |
| 74 | EQ | F HIGH | INPUT11 |
| 75 | EQ | F HIGH | INPUT12 |
| 76 | EQ | F HIGH | INPUT13 |
| 77 | EQ | F HIGH | INPUT14 |
| 78 | EQ | F HIGH | INPUT15 |
| 79 | EQ | F HIGH | INPUT16 |
| 80 | EQ | F HIGH | INPUT17 |
| 81 | EQ | F HIGH | INPUT18 |
| 82 | EQ | F HIGH | INPUT19 |
| 83 | EQ | F HIGH | INPUT20 |
| 84 | EQ | F HIGH | INPUT21 |
| 85 | EQ | F HIGH | INPUT22 |
| 86 | EQ | F HIGH | INPUT23 |
| 87 | EQ | F HIGH | INPUT24 |
| 88 | | NO ASSIGN | |
| 89 | EQ | Q HIGH | INPUT1 |
| 90 | EQ | Q HIGH | INPUT2 |
| 91 | EQ | Q HIGH | INPUT3 |
| 92 | EQ | Q HIGH | INPUT4 |
| 93 | EQ | Q HIGH | INPUT5 |
| 94 | EQ | Q HIGH | INPUT6 |
| 95 | EQ | Q HIGH | INPUT7 |
| 102 | EQ | Q HIGH | INPUT8 |
| 103 | EQ | Q HIGH | INPUT9 |
| 104 | EQ | Q HIGH | INPUT10 |
| 105 | EQ | Q HIGH | INPUT11 |
| 106 | EQ | Q HIGH | INPUT12 |
| 107 | EQ | Q HIGH | INPUT13 |
| 108 | EQ | Q HIGH | INPUT14 |
| 109 | EQ | Q HIGH | INPUT15 |
| 110 | EQ | Q HIGH | INPUT16 |
| 111 | EQ | Q HIGH | INPUT17 |
| 112 | EQ | Q HIGH | INPUT18 |
| 113 | EQ | Q HIGH | INPUT19 |
| 114 | EQ | Q HIGH | INPUT20 |
| 115 | EQ | Q HIGH | INPUT21 |
| 116 | EQ | PRQ HIGH | INPUT22 |
| 117 | EQ | Q HIGH | INPUT23 |
| 118 | EQ | Q HIGH | INPUT24 |
| 119 | | NO ASSIGN | |

**CHANNEL12**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | EQ | G HIGH H | INPUT25 | | 58 | NO ASSIGN | | |
| 2 | EQ | G HIGH H | INPUT26 | | 59 | NO ASSIGN | | |
| 3 | EQ | G HIGH H | INPUT27 | | 60 | NO ASSIGN | | |
| 4 | EQ | G HIGH H | INPUT28 | | 61 | NO ASSIGN | | |
| 5 | EQ | G HIGH H | INPUT29 | | 62 | NO ASSIGN | | |
| 6 | EQ | G HIGH H | INPUT30 | | 63 | NO ASSIGN | | |
| 7 | EQ | G HIGH H | INPUT31 | | 64 | EQ | F HIGH | INPUT25 |
| 8 | EQ | G HIGH H | INPUT32 | | 65 | EQ | F HIGH | INPUT26 |
| 9 | EQ | G HIGH H | INPUT33 | | 66 | EQ | F HIGH | INPUT27 |
| 10 | EQ | G HIGH H | INPUT34 | | 67 | EQ | F HIGH | INPUT28 |
| 11 | EQ | G HIGH H | INPUT35 | | 68 | EQ | F HIGH | INPUT29 |
| 12 | EQ | G HIGH H | INPUT36 | | 69 | EQ | F HIGH | INPUT30 |
| 13 | EQ | G HIGH H | INPUT37 | | 70 | EQ | F HIGH | INPUT31 |
| 14 | EQ | G HIGH H | INPUT38 | | 71 | EQ | F HIGH | INPUT32 |
| 15 | EQ | G HIGH H | INPUT39 | | 72 | EQ | F HIGH | INPUT33 |
| 16 | EQ | G HIGH H | INPUT40 | | 73 | EQ | F HIGH | INPUT34 |
| 17 | EQ | G HIGH H | INPUT41 | | 74 | EQ | F HIGH | INPUT35 |
| 18 | EQ | G HIGH H | INPUT42 | | 75 | EQ | F HIGH | INPUT36 |
| 19 | EQ | G HIGH H | INPUT43 | | 76 | EQ | F HIGH | INPUT37 |
| 20 | EQ | G HIGH H | INPUT44 | | 77 | EQ | F HIGH | INPUT38 |
| 21 | EQ | G HIGH H | INPUT45 | | 78 | EQ | F HIGH | INPUT39 |
| 22 | EQ | G HIGH H | INPUT46 | | 79 | EQ | F HIGH | INPUT40 |
| 23 | EQ | G HIGH H | INPUT47 | | 80 | EQ | F HIGH | INPUT41 |
| 24 | EQ | G HIGH H | INPUT48 | | 81 | EQ | F HIGH | INPUT42 |
| 25 | NO ASSIGN | | | | 82 | EQ | F HIGH | INPUT43 |
| 26 | NO ASSIGN | | | | 83 | EQ | F HIGH | INPUT44 |
| 27 | NO ASSIGN | | | | 84 | EQ | F HIGH | INPUT45 |
| 28 | NO ASSIGN | | | | 85 | EQ | F HIGH | INPUT46 |
| 29 | NO ASSIGN | | | | 86 | EQ | F HIGH | INPUT47 |
| 30 | NO ASSIGN | | | | 87 | EQ | F HIGH | INPUT48 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | EQ | Q HIGH | INPUT25 |
| 33 | EQ | G HIGH L | INPUT25 | | 90 | EQ | Q HIGH | INPUT26 |
| 34 | EQ | G HIGH L | INPUT26 | | 91 | EQ | Q HIGH | INPUT27 |
| 35 | EQ | G HIGH L | INPUT27 | | 92 | EQ | Q HIGH | INPUT28 |
| 36 | EQ | G HIGH L | INPUT28 | | 93 | EQ | Q HIGH | INPUT29 |
| 37 | EQ | G HIGH L | INPUT29 | | 94 | EQ | Q HIGH | INPUT30 |
| 38 | EQ | G HIGH L | INPUT30 | | 95 | EQ | Q HIGH | INPUT31 |
| 39 | EQ | G HIGH L | INPUT31 | | 102 | EQ | Q HIGH | INPUT32 |
| 40 | EQ | G HIGH L | INPUT32 | | 103 | EQ | Q HIGH | INPUT33 |
| 41 | EQ | G HIGH L | INPUT33 | | 104 | EQ | Q HIGH | INPUT34 |
| 42 | EQ | G HIGH L | INPUT34 | | 105 | EQ | Q HIGH | INPUT35 |
| 43 | EQ | G HIGH L | INPUT35 | | 106 | EQ | Q HIGH | INPUT36 |
| 44 | EQ | G HIGH L | INPUT36 | | 107 | EQ | Q HIGH | INPUT37 |
| 45 | EQ | G HIGH L | INPUT37 | | 108 | EQ | Q HIGH | INPUT38 |
| 46 | EQ | G HIGH L | INPUT38 | | 109 | EQ | Q HIGH | INPUT39 |
| 47 | EQ | G HIGH L | INPUT39 | | 110 | EQ | Q HIGH | INPUT40 |
| 48 | EQ | G HIGH L | INPUT40 | | 111 | EQ | Q HIGH | INPUT41 |
| 49 | EQ | G HIGH L | INPUT41 | | 112 | EQ | Q HIGH | INPUT42 |
| 50 | EQ | G HIGH L | INPUT42 | | 113 | EQ | Q HIGH | INPUT43 |
| 51 | EQ | G HIGH L | INPUT43 | | 114 | EQ | Q HIGH | INPUT44 |
| 52 | EQ | G HIGH L | INPUT44 | | 115 | EQ | Q HIGH | INPUT45 |
| 53 | EQ | G HIGH L | INPUT45 | | 116 | EQ | Q HIGH | INPUT46 |
| 54 | EQ | G HIGH L | INPUT46 | | 117 | EQ | Q HIGH | INPUT47 |
| 55 | EQ | G HIGH L | INPUT47 | | 118 | EQ | Q HIGH | INPUT48 |
| 56 | EQ | G HIGH L | INPUT48 | | 119 | NO ASSIGN | | |

## CHANNEL13

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | | NO ASSIGN | |
| 1 | EQ | G HIGH H | INPUT49 |
| 2 | EQ | G HIGH H | INPUT50 |
| 3 | EQ | G HIGH H | INPUT51 |
| 4 | EQ | G HIGH H | INPUT52 |
| 5 | EQ | G HIGH H | INPUT53 |
| 6 | EQ | G HIGH H | INPUT54 |
| 7 | EQ | G HIGH H | INPUT55 |
| 8 | EQ | G HIGH H | INPUT56 |
| 9 | EQ | ATT H | INPUT1 |
| 10 | EQ | ATT H | INPUT2 |
| 11 | EQ | ATT H | INPUT3 |
| 12 | EQ | ATT H | INPUT4 |
| 13 | EQ | ATT H | INPUT5 |
| 14 | EQ | ATT H | INPUT6 |
| 15 | EQ | ATT H | INPUT7 |
| 16 | EQ | ATT H | INPUT8 |
| 17 | EQ | ATT H | INPUT9 |
| 18 | EQ | ATT H | INPUT10 |
| 19 | EQ | ATT H | INPUT11 |
| 20 | EQ | ATT H | INPUT12 |
| 21 | EQ | ATT H | INPUT13 |
| 22 | EQ | ATT H | INPUT14 |
| 23 | EQ | ATT H | INPUT15 |
| 24 | EQ | ATT H | INPUT16 |
| 25 | | NO ASSIGN | |
| 26 | | NO ASSIGN | |
| 27 | | NO ASSIGN | |
| 28 | | NO ASSIGN | |
| 29 | | NO ASSIGN | |
| 30 | | NO ASSIGN | |
| 31 | | NO ASSIGN | |
| 32 | | NO ASSIGN | |
| 33 | EQ | G HIGH L | INPUT49 |
| 34 | EQ | G HIGH L | INPUT50 |
| 35 | EQ | G HIGH L | INPUT51 |
| 36 | EQ | G HIGH L | INPUT52 |
| 37 | EQ | G HIGH L | INPUT53 |
| 38 | EQ | G HIGH L | INPUT54 |
| 39 | EQ | G HIGH L | INPUT55 |
| 40 | EQ | G HIGH L | INPUT56 |
| 41 | EQ | ATT L | INPUT1 |
| 42 | EQ | ATT L | INPUT2 |
| 43 | EQ | ATT L | INPUT3 |
| 44 | EQ | ATT L | INPUT4 |
| 45 | EQ | ATT L | INPUT5 |
| 46 | EQ | ATT L | INPUT6 |
| 47 | EQ | ATT L | INPUT7 |
| 48 | EQ | ATT L | INPUT8 |
| 49 | EQ | ATT L | INPUT9 |
| 50 | EQ | ATT L | INPUT10 |
| 51 | EQ | ATT L | INPUT11 |
| 52 | EQ | ATT L | INPUT12 |
| 53 | EQ | ATT L | INPUT13 |
| 54 | EQ | ATT L | INPUT14 |
| 55 | EQ | ATT L | INPUT15 |
| 56 | EQ | ATT L | INPUT16 |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | | NO ASSIGN | |
| 58 | | NO ASSIGN | |
| 59 | | NO ASSIGN | |
| 60 | | NO ASSIGN | |
| 61 | | NO ASSIGN | |
| 62 | | NO ASSIGN | |
| 63 | | NO ASSIGN | |
| 64 | EQ | F HIGH | INPUT49 |
| 65 | EQ | F HIGH | INPUT50 |
| 66 | EQ | F HIGH | INPUT51 |
| 67 | EQ | F HIGH | INPUT52 |
| 68 | EQ | F HIGH | INPUT53 |
| 69 | EQ | F HIGH | INPUT54 |
| 70 | EQ | F HIGH | INPUT55 |
| 71 | EQ | F HIGH | INPUT56 |
| 72 | EQ | HPF ON | INPUT1 |
| 73 | EQ | HPF ON | INPUT2 |
| 74 | EQ | HPF ON | INPUT3 |
| 75 | EQ | HPF ON | INPUT4 |
| 76 | EQ | HPF ON | INPUT5 |
| 77 | EQ | HPF ON | INPUT6 |
| 78 | EQ | HPF ON | INPUT7 |
| 79 | EQ | HPF ON | INPUT8 |
| 80 | EQ | HPF ON | INPUT9 |
| 81 | EQ | HPF ON | INPUT10 |
| 82 | EQ | HPF ON | INPUT11 |
| 83 | EQ | HPF ON | INPUT12 |
| 84 | EQ | HPF ON | INPUT13 |
| 85 | EQ | HPF ON | INPUT14 |
| 86 | EQ | HPF ON | INPUT15 |
| 87 | EQ | HPF ON | INPUT16 |
| 88 | | NO ASSIGN | |
| 89 | EQ | Q HIGH | INPUT49 |
| 90 | EQ | Q HIGH | INPUT50 |
| 91 | EQ | Q HIGH | INPUT51 |
| 92 | EQ | Q HIGH | INPUT52 |
| 93 | EQ | Q HIGH | INPUT53 |
| 94 | EQ | Q HIGH | INPUT54 |
| 95 | EQ | Q HIGH | INPUT55 |
| 102 | EQ | Q HIGH | INPUT56 |
| 103 | EQ | LPF ON | INPUT1 |
| 104 | EQ | LPF ON | INPUT2 |
| 105 | EQ | LPF ON | INPUT3 |
| 106 | EQ | LPF ON | INPUT4 |
| 107 | EQ | LPF ON | INPUT5 |
| 108 | EQ | LPF ON | INPUT6 |
| 109 | EQ | LPF ON | INPUT7 |
| 110 | EQ | LPF ON | INPUT8 |
| 111 | EQ | LPF ON | INPUT9 |
| 112 | EQ | LPF ON | INPUT10 |
| 113 | EQ | LPF ON | INPUT11 |
| 114 | EQ | LPF ON | INPUT12 |
| 115 | EQ | LPF ON | INPUT13 |
| 116 | EQ | LPF ON | INPUT14 |
| 117 | EQ | LPF ON | INPUT15 |
| 118 | EQ | LPF ON | INPUT16 |
| 119 | | NO ASSIGN | |

**CHANNEL14**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | NO ASSIGN | | | | 57 | NO ASSIGN | | |
| 1 | EQ | ATT H | INPUT17 | | 58 | NO ASSIGN | | |
| 2 | EQ | ATT H | INPUT18 | | 59 | NO ASSIGN | | |
| 3 | EQ | ATT H | INPUT19 | | 60 | NO ASSIGN | | |
| 4 | EQ | ATT H | INPUT20 | | 61 | NO ASSIGN | | |
| 5 | EQ | ATT H | INPUT21 | | 62 | NO ASSIGN | | |
| 6 | EQ | ATT H | INPUT22 | | 63 | NO ASSIGN | | |
| 7 | EQ | ATT H | INPUT23 | | 64 | EQ | HPF ON | INPUT17 |
| 8 | EQ | ATT H | INPUT24 | | 65 | EQ | HPF ON | INPUT18 |
| 9 | EQ | ATT H | INPUT25 | | 66 | EQ | HPF ON | INPUT19 |
| 10 | EQ | ATT H | INPUT26 | | 67 | EQ | HPF ON | INPUT20 |
| 11 | EQ | ATT H | INPUT27 | | 68 | EQ | HPF ON | INPUT21 |
| 12 | EQ | ATT H | INPUT28 | | 69 | EQ | HPF ON | INPUT22 |
| 13 | EQ | ATT H | INPUT29 | | 70 | EQ | HPF ON | INPUT23 |
| 14 | EQ | ATT H | INPUT30 | | 71 | EQ | HPF ON | INPUT24 |
| 15 | EQ | ATT H | INPUT31 | | 72 | EQ | HPF ON | INPUT25 |
| 16 | EQ | ATT H | INPUT32 | | 73 | EQ | HPF ON | INPUT26 |
| 17 | EQ | ATT H | INPUT33 | | 74 | EQ | HPF ON | INPUT27 |
| 18 | EQ | ATT H | INPUT34 | | 75 | EQ | HPF ON | INPUT28 |
| 19 | EQ | ATT H | INPUT35 | | 76 | EQ | HPF ON | INPUT29 |
| 20 | EQ | ATT H | INPUT36 | | 77 | EQ | HPF ON | INPUT30 |
| 21 | EQ | ATT H | INPUT37 | | 78 | EQ | HPF ON | INPUT31 |
| 22 | EQ | ATT H | INPUT38 | | 79 | EQ | HPF ON | INPUT32 |
| 23 | EQ | ATT H | INPUT39 | | 80 | EQ | HPF ON | INPUT33 |
| 24 | EQ | ATT H | INPUT40 | | 81 | EQ | HPF ON | INPUT34 |
| 25 | NO ASSIGN | | | | 82 | EQ | HPF ON | INPUT35 |
| 26 | NO ASSIGN | | | | 83 | EQ | HPF ON | INPUT36 |
| 27 | NO ASSIGN | | | | 84 | EQ | HPF ON | INPUT37 |
| 28 | NO ASSIGN | | | | 85 | EQ | HPF ON | INPUT38 |
| 29 | NO ASSIGN | | | | 86 | EQ | HPF ON | INPUT39 |
| 30 | NO ASSIGN | | | | 87 | EQ | HPF ON | INPUT40 |
| 31 | NO ASSIGN | | | | 88 | NO ASSIGN | | |
| 32 | NO ASSIGN | | | | 89 | EQ | LPF ON | INPUT17 |
| 33 | EQ | ATT L | INPUT17 | | 90 | EQ | LPF ON | INPUT18 |
| 34 | EQ | ATT L | INPUT18 | | 91 | EQ | LPF ON | INPUT19 |
| 35 | EQ | ATT L | INPUT19 | | 92 | EQ | LPF ON | INPUT20 |
| 36 | EQ | ATT L | INPUT20 | | 93 | EQ | LPF ON | INPUT21 |
| 37 | EQ | ATT L | INPUT21 | | 94 | EQ | LPF ON | INPUT22 |
| 38 | EQ | ATT L | INPUT22 | | 95 | EQ | LPF ON | INPUT23 |
| 39 | EQ | ATT L | INPUT23 | | 102 | EQ | LPF ON | INPUT24 |
| 40 | EQ | ATT L | INPUT24 | | 103 | EQ | LPF ON | INPUT25 |
| 41 | EQ | ATT L | INPUT25 | | 104 | EQ | LPF ON | INPUT26 |
| 42 | EQ | ATT L | INPUT26 | | 105 | EQ | LPF ON | INPUT27 |
| 43 | EQ | ATT L | INPUT27 | | 106 | EQ | LPF ON | INPUT28 |
| 44 | EQ | ATT L | INPUT28 | | 107 | EQ | LPF ON | INPUT29 |
| 45 | EQ | ATT L | INPUT29 | | 108 | EQ | LPF ON | INPUT30 |
| 46 | EQ | ATT L | INPUT30 | | 109 | EQ | LPF ON | INPUT31 |
| 47 | EQ | ATT L | INPUT31 | | 110 | EQ | LPF ON | INPUT32 |
| 48 | EQ | ATT L | INPUT32 | | 111 | EQ | LPF ON | INPUT33 |
| 49 | EQ | ATT L | INPUT33 | | 112 | EQ | LPF ON | INPUT34 |
| 50 | EQ | ATT L | INPUT34 | | 113 | EQ | LPF ON | INPUT35 |
| 51 | EQ | ATT L | INPUT35 | | 114 | EQ | LPF ON | INPUT36 |
| 52 | EQ | ATT L | INPUT36 | | 115 | EQ | LPF ON | INPUT37 |
| 53 | EQ | ATT L | INPUT37 | | 116 | EQ | LPF ON | INPUT38 |
| 54 | EQ | ATT L | INPUT38 | | 117 | EQ | LPF ON | INPUT39 |
| 55 | EQ | ATT L | INPUT39 | | 118 | EQ | LPF ON | INPUT40 |
| 56 | EQ | ATT L | INPUT40 | | 119 | NO ASSIGN | | |

## CHANNEL15

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 0 | | NO ASSIGN | |
| 1 | EQ | ATT H | INPUT41 |
| 2 | EQ | ATT H | INPUT42 |
| 3 | EQ | ATT H | INPUT43 |
| 4 | EQ | ATT H | INPUT44 |
| 5 | EQ | ATT H | INPUT45 |
| 6 | EQ | ATT H | INPUT46 |
| 7 | EQ | ATT H | INPUT47 |
| 8 | EQ | ATT H | INPUT48 |
| 9 | EQ | ATT H | INPUT49 |
| 10 | EQ | ATT H | INPUT50 |
| 11 | EQ | ATT H | INPUT51 |
| 12 | EQ | ATT H | INPUT52 |
| 13 | EQ | ATT H | INPUT53 |
| 14 | EQ | ATT H | INPUT54 |
| 15 | EQ | ATT H | INPUT55 |
| 16 | EQ | ATT H | INPUT56 |
| 17 | | NO ASSIGN | |
| 18 | | NO ASSIGN | |
| 19 | | NO ASSIGN | |
| 20 | | NO ASSIGN | |
| 21 | | NO ASSIGN | |
| 22 | | NO ASSIGN | |
| 23 | | NO ASSIGN | |
| 24 | | NO ASSIGN | |
| 25 | | NO ASSIGN | |
| 26 | | NO ASSIGN | |
| 27 | | NO ASSIGN | |
| 28 | | NO ASSIGN | |
| 29 | | NO ASSIGN | |
| 30 | | NO ASSIGN | |
| 31 | | NO ASSIGN | |
| 32 | | NO ASSIGN | |
| 33 | EQ | ATT L | INPUT41 |
| 34 | EQ | ATT L | INPUT42 |
| 35 | EQ | ATT L | INPUT43 |
| 36 | EQ | ATT L | INPUT44 |
| 37 | EQ | ATT L | INPUT45 |
| 38 | EQ | ATT L | INPUT46 |
| 39 | EQ | ATT L | INPUT47 |
| 40 | EQ | ATT L | INPUT48 |
| 41 | EQ | ATT L | INPUT49 |
| 42 | EQ | ATT L | INPUT50 |
| 43 | EQ | ATT L | INPUT51 |
| 44 | EQ | ATT L | INPUT52 |
| 45 | EQ | ATT L | INPUT53 |
| 46 | EQ | ATT L | INPUT54 |
| 47 | EQ | ATT L | INPUT55 |
| 48 | EQ | ATT L | INPUT56 |
| 49 | | NO ASSIGN | |
| 50 | | NO ASSIGN | |
| 51 | | NO ASSIGN | |
| 52 | | NO ASSIGN | |
| 53 | | NO ASSIGN | |
| 54 | | NO ASSIGN | |
| 55 | | NO ASSIGN | |
| 56 | | NO ASSIGN | |

| # | HIGH | MID | LOW |
|---|------|-----|-----|
| 57 | | NO ASSIGN | |
| 58 | | NO ASSIGN | |
| 59 | | NO ASSIGN | |
| 60 | | NO ASSIGN | |
| 61 | | NO ASSIGN | |
| 62 | | NO ASSIGN | |
| 63 | | NO ASSIGN | |
| 64 | EQ | HPF ON | INPUT41 |
| 65 | EQ | HPF ON | INPUT42 |
| 66 | EQ | HPF ON | INPUT43 |
| 67 | EQ | HPF ON | INPUT44 |
| 68 | EQ | HPF ON | INPUT45 |
| 69 | EQ | HPF ON | INPUT46 |
| 70 | EQ | HPF ON | INPUT47 |
| 71 | EQ | HPF ON | INPUT48 |
| 72 | EQ | HPF ON | INPUT49 |
| 73 | EQ | HPF ON | INPUT50 |
| 74 | EQ | HPF ON | INPUT51 |
| 75 | EQ | HPF ON | INPUT52 |
| 76 | EQ | HPF ON | INPUT53 |
| 77 | EQ | HPF ON | INPUT54 |
| 78 | EQ | HPF ON | INPUT55 |
| 79 | EQ | HPF ON | INPUT56 |
| 80 | EQ | ON | INPUT1 |
| 81 | EQ | ON | INPUT2 |
| 82 | EQ | ON | INPUT3 |
| 83 | EQ | ON | INPUT4 |
| 84 | EQ | ON | INPUT5 |
| 85 | EQ | ON | INPUT6 |
| 86 | EQ | ON | INPUT7 |
| 87 | EQ | ON | INPUT8 |
| 88 | | NO ASSIGN | |
| 89 | EQ | LPF ON | INPUT41 |
| 90 | EQ | LPF ON | INPUT42 |
| 91 | EQ | LPF ON | INPUT43 |
| 92 | EQ | LPF ON | INPUT44 |
| 93 | EQ | LPF ON | INPUT45 |
| 94 | EQ | LPF ON | INPUT46 |
| 95 | EQ | LPF ON | INPUT47 |
| 102 | EQ | LPF ON | INPUT48 |
| 103 | EQ | LPF ON | INPUT49 |
| 104 | EQ | LPF ON | INPUT50 |
| 105 | EQ | LPF ON | INPUT51 |
| 106 | EQ | LPF ON | INPUT52 |
| 107 | EQ | LPF ON | INPUT53 |
| 108 | EQ | LPF ON | INPUT54 |
| 109 | EQ | LPF ON | INPUT55 |
| 110 | EQ | LPF ON | INPUT56 |
| 111 | EQ | ON | INPUT9 |
| 112 | EQ | ON | INPUT10 |
| 113 | EQ | ON | INPUT11 |
| 114 | EQ | ON | INPUT12 |
| 115 | EQ | ON | INPUT13 |
| 116 | EQ | ON | INPUT14 |
| 117 | EQ | ON | INPUT15 |
| 118 | EQ | ON | INPUT16 |
| 119 | | NO ASSIGN | |

**CHANNEL16**

| # | HIGH | MID | LOW | | # | HIGH | MID | LOW |
|---|------|-----|-----|---|---|------|-----|-----|
| 0 | | NO ASSIGN | | | 57 | | NO ASSIGN | |
| 1 | | NO ASSIGN | | | 58 | | NO ASSIGN | |
| 2 | | NO ASSIGN | | | 59 | | NO ASSIGN | |
| 3 | | NO ASSIGN | | | 60 | | NO ASSIGN | |
| 4 | | NO ASSIGN | | | 61 | | NO ASSIGN | |
| 5 | | NO ASSIGN | | | 62 | | NO ASSIGN | |
| 6 | | NO ASSIGN | | | 63 | | NO ASSIGN | |
| 7 | | NO ASSIGN | | | 64 | EQ | ON | INPUT17 |
| 8 | | NO ASSIGN | | | 65 | EQ | ON | INPUT18 |
| 9 | | NO ASSIGN | | | 66 | EQ | ON | INPUT19 |
| 10 | | NO ASSIGN | | | 67 | EQ | ON | INPUT20 |
| 11 | | NO ASSIGN | | | 68 | EQ | ON | INPUT21 |
| 12 | | NO ASSIGN | | | 69 | EQ | ON | INPUT22 |
| 13 | | NO ASSIGN | | | 70 | EQ | ON | INPUT23 |
| 14 | | NO ASSIGN | | | 71 | EQ | ON | INPUT24 |
| 15 | | NO ASSIGN | | | 72 | EQ | ON | INPUT25 |
| 16 | | NO ASSIGN | | | 73 | EQ | ON | INPUT26 |
| 17 | | NO ASSIGN | | | 74 | EQ | ON | INPUT27 |
| 18 | | NO ASSIGN | | | 75 | EQ | ON | INPUT28 |
| 19 | | NO ASSIGN | | | 76 | EQ | ON | INPUT29 |
| 20 | | NO ASSIGN | | | 77 | EQ | ON | INPUT30 |
| 21 | | NO ASSIGN | | | 78 | EQ | ON | INPUT31 |
| 22 | | NO ASSIGN | | | 79 | EQ | ON | INPUT32 |
| 23 | | NO ASSIGN | | | 80 | EQ | ON | INPUT33 |
| 24 | | NO ASSIGN | | | 81 | EQ | ON | INPUT34 |
| 25 | | NO ASSIGN | | | 82 | EQ | ON | INPUT35 |
| 26 | | NO ASSIGN | | | 83 | EQ | ON | INPUT36 |
| 27 | | NO ASSIGN | | | 84 | EQ | ON | INPUT37 |
| 28 | | NO ASSIGN | | | 85 | EQ | ON | INPUT38 |
| 29 | | NO ASSIGN | | | 86 | EQ | ON | INPUT39 |
| 30 | | NO ASSIGN | | | 87 | EQ | ON | INPUT40 |
| 31 | | NO ASSIGN | | | 88 | | NO ASSIGN | |
| 32 | | NO ASSIGN | | | 89 | EQ | ON | INPUT41 |
| 33 | | NO ASSIGN | | | 90 | EQ | ON | INPUT42 |
| 34 | | NO ASSIGN | | | 91 | EQ | ON | INPUT43 |
| 35 | | NO ASSIGN | | | 92 | EQ | ON | INPUT44 |
| 36 | | NO ASSIGN | | | 93 | EQ | ON | INPUT45 |
| 37 | | NO ASSIGN | | | 94 | EQ | ON | INPUT46 |
| 38 | | NO ASSIGN | | | 95 | EQ | ON | INPUT47 |
| 39 | | NO ASSIGN | | | 102 | EQ | ON | INPUT48 |
| 40 | | NO ASSIGN | | | 103 | EQ | ON | INPUT49 |
| 41 | | NO ASSIGN | | | 104 | EQ | ON | INPUT50 |
| 42 | | NO ASSIGN | | | 105 | EQ | ON | INPUT51 |
| 43 | | NO ASSIGN | | | 106 | EQ | ON | INPUT52 |
| 44 | | NO ASSIGN | | | 107 | EQ | ON | INPUT53 |
| 45 | | NO ASSIGN | | | 108 | EQ | ON | INPUT54 |
| 46 | | NO ASSIGN | | | 109 | EQ | ON | INPUT55 |
| 47 | | NO ASSIGN | | | 110 | EQ | ON | INPUT56 |
| 48 | | NO ASSIGN | | | 111 | | NO ASSIGN | |
| 49 | | NO ASSIGN | | | 112 | | NO ASSIGN | |
| 50 | | NO ASSIGN | | | 113 | | NO ASSIGN | |
| 51 | | NO ASSIGN | | | 114 | | NO ASSIGN | |
| 52 | | NO ASSIGN | | | 115 | | NO ASSIGN | |
| 53 | | NO ASSIGN | | | 116 | | NO ASSIGN | |
| 54 | | NO ASSIGN | | | 117 | | NO ASSIGN | |
| 55 | | NO ASSIGN | | | 118 | | NO ASSIGN | |
| 56 | | NO ASSIGN | | | 119 | | NO ASSIGN | |

# MIDI Data Format

In the following tables, "tx" means that transmission from the 02R96 is possible, and "rx" means that receiving messages at the 02R96 is possible.

## 1. CHANNEL MESSAGE

| Command | rx/tx | function |
|---|---|---|
| 8n NOTE OFF | rx | Control the internal effects |
| 9n NOTE ON | rx | Control the internal effects |
| Bn CONTROL CHANGE | rx/tx | Control parameters |
| Cn PROGRAM CHANGE | rx/tx | Switch scene memories |

## 2. SYSTEM COMMON MESSAGE

| Command | rx/tx | function |
|---|---|---|
| F1 MIDI TIME CODE QUARTER FRAME | rx | Used when TIME REFERENCE is MTC. |
| F2 SONG POSITION POINTER | rx | Used when TIME REFERENCE is MIDI CLOCK. |

## 3. SYSTEM REALTIME MESSAGE

| Command | rx/tx | function |
|---|---|---|
| F8 TIMING CLOCK | rx | MIDI clock |
| FA START | rx* | Start automix (from the beginning) |
| FB CONTINUE | rx* | Start automix (from the middle) |
| FC STOP | rx* | Stop automix |
| FE ACTIVE SENSING | rx | Check MIDI cable connections |
| FF SYSTEM RESET | rx | Clear running status |

* Received only when the AUTOMIX TIME REFERENCE setting is set to MIDI CLOCK.

## 4. EXCLUSIVE MESSAGE

The 02R96 can correctly process Exclusive Messges of a length of F0 through F7 of 4096 bytes or shorter.

### 4.1 Real Time System Exclusive

| Command | rx/tx | function |
|---|---|---|
| F0 7F dd 06 ... F7 MMC COMMAND | tx | MMC command |
| F0 7F dd 07 ... F7 MMC RESPONSE | rx | MMC response |
| F0 7F dd 01 ... F7 MIDI TIME CODE | rx | Used when TIME REFERENCE is MTC. |

### 4.2 System Exclusive Message

#### 4.2.1 Bulk Dump

| Command | rx/tx | function |
|---|---|---|
| F0 43 0n 7E ... F7 BULK DUMP DATA | rx/tx | BULK DUMP DATA |
| F0 43 2n 7E ... F7 BULK DUMP REQUEST | rx/tx | BULK DUMP REQUEST |

The following data types of bulk dump are used on the 02R96.

| Data name | rx/tx | function |
|---|---|---|
| 'm' | rx/tx | Scene memory & request (compressed data) |
| 'S' | rx/tx | Setup memory & request |
| 'L' | rx/tx | User defined layer & request |
| 'I' | rx/tx | User defined plug-in & request |
| 'V' | rx/tx | User defined key & request |
| 'U' | rx/tx | User assignable layer & request |
| 'C' | rx/tx | Control change table & request |
| 'P' | rx/tx | Program change table & request |
| 'Q' | rx/tx | Equalizer library & request |
| 'Y' | rx/tx | Compressor library & request |
| 'G' | rx/tx | Gate library & request |
| 'E' | rx/tx | Effect library & request |
| 'H' | rx/tx | Channel library & request |
| 'R' | rx/tx | Input patch library & request |
| 'O' | rx/tx | Output patch library & request |
| 'J' | rx/tx | Bus to stereo library & request |
| 'K' | rx/tx | Surround monitor library & request |
| 'a' | rx/tx | Automix & request (compressed data) |
| 'N' | rx/tx | Plug-in effect card & request |

#### 4.2.2 PARAMTER CHANGE

| Command | rx/tx | function |
|---|---|---|
| F0 43 1n 3E 0B ... F7 RARAMETER CHANGE | rx/tx | 02R96-specific parameter change |
| F0 43 3n 3E 0B ... F7 PARAMETER REQUEST | rx/tx | 02R96-specific parameter request |
| F0 43 1n 3E 7F ... F7 PARAMETER CHANGE | rx/tx | General purpose digital mixer parameter change |
| F0 43 3n 3E 7F ... F7 PARAMETER REQUEST | rx/tx | General purpose digital mixer parameter request |

The following data types of parameter change are used by the 02R96.

| Type (HEX) | rx/tx | function |
|---|---|---|
| 1 (01) | rx/tx | Edit buffer |
| 2 (02) | rx/tx | Patch data |
| 3 (03) | rx/tx | Setup memory |
| 4 (04) | rx/tx | Backup memory |
| 16 (10) | rx/tx | Function (recall, store, title, clear) |
| 17 (11) | rx | Function (pair) |
| 18 (12) | rx | Function (effect) |
| 19 (13) | rx/tx | Sort table data |
| 20 (14) | rx/tx | Function (attribute, link) |
| 32 (20) | rx | Key remote |
| 33 (21) | rx/tx | Remote meter |
| 34 (22) | rx/tx | Remote time counter |
| 35 (23) | rx/tx | Automix status |

# Format Details

## 1. NOTE OFF                              (8n)

**Reception**

If [OTHER ECHO] is ON, these message are echoed.
If the [Rx CH] matches, these messages are received and used to control effects.

| STATUS | 1000nnnn | 8n | Note off message |
|---|---|---|---|
| DATA | 0nnnnnnn | nn | Note number |
| | 0vvvvvvv | vv | Velocity (ignored) |

## 2. NOTE ON                              (9n)

**Reception**

If [OTHER ECHO] is ON, these messages are echoed.
If the [Rx CH] matches, these messages are received and used to control effects.

| STATUS | 1001nnnn | 9n | Note on message |
|---|---|---|---|
| DATA | 0nnnnnnn | nn | Note number |
| | 0vvvvvvv | vv | Velocity (1-127:on, 0:off) |

## 3. CONTROL CHANGE                       (Bn)

**Reception**

If [Control Change ECHO] is ON, these messages are echoed.
If [TABLE] is selected, these message are received if [Control Change Rx] is ON, and will control parameters according to the [Control assign table] settings.
The parameters that can be set are defined in the Control Change Assign Parameter List.
If [NRPN] is selected, these messages are received if [Control Change Rx] is ON and the [Rx CH] matches, and will control the parameter that is specified by the four messages NRPN control number (62h, 63h) and Data Entry control number (06h, 26h). Parameter settings are defined in the Control Change Assign Parameter List.

**Transmission**

If [TABLE] is selected, operating a parameter specified in the [Control assign table] will cause these messages to be transmitted if [Control Change Tx] is ON. The parameters that can be specified are defined in the Control Change Assign Parameter List.
If [NRPN] is selected, operating a specified parameter will cause data to be transmitted on the [Tx CH] if [Control Change Tx] is ON, using the four messages NRPN control number (62h, 63h) and Data Entry control number (06h, 26h). Parameter settings are defined in the Control Change Assign Parameter List.

This data cannot be transmitted via Program Change to Studio Manager since there is no guarantee that the contents of the tables will match. (Parameter Change messages will always be used.)

### If [TABLE] is selected

| STATUS | 1011nnnn Bn | Control change |
| DATA | 0nnnnnnn nn | Control number (0-95, 102-119) |
| | 0vvvvvvv vv | Control Value (0-127) |

Formula for converting Control values into parameter data:

paramSteps= paramMax - paramMin + 1;
add= paramWidth / paramSteps;
mod= paramWidth - add * paramSteps;
curValue= parm * add + mod / 2;

(1) When the assigned parameter can be set in 128 steps or less:
paramWidth = 127; rxValue = Control value;

(2) When the assigned parameter can be set in 128 through 16383 steps:
paramWidth = 16383;

(2-1) When both High and Low data are received:
rxValue = Control value (High) * 128 + Control value (Low);

(2-2) When only Low data is received:
rxValue = (curValue & 16256) + Control value (Low);

(2-3) When only High data is received:
rxValue = Control value (High) * 128 + (curValue & 127);

(3) When the assigned parameter can be set in 16384 through 2097151 steps:
paramWidth = 2097151;

(3-1) When High, Middle, and Low data are received:
rxValue = Control value (High) * 16384 + Control value (Middle) * 128 + Control value (Low);

(3-2) When only Low data is received:
rxValue = (curValue & 2097024) + Control value (Low);

(3-3) When only Middle data is received:
rxValue = (curValue & 2080895) + Control value (Middle) * 128;

(3-4) When only High data is received:
rxValue = (curValue & 16383) + Control value (High) * 16384;

(3-5) When Middle and Low data are received:
rxValue = (curValue & 2080768) + Control value (Middle) * 128 + Control value (Low);

(3-6) When High and Low data are received:
rxValue = (curValue & 16256) + Control value (High) * 16384 + Control value (Low);

(3-7) When High and Middle data are received:
rxValue = (curValue & 127) + Control value (High) * 16384 + Control value (Middle) * 128;
if ( rxValue > paramWidth)
rxValue = paramWidth;
param = ( rxValue - mod / 2) / add;

### If [NRPN] is selected

| STATUS | 1011nnnn Bn | Control changeDATA |
| | 01100010 62 | NRPN LSB |
| | 0vvvvvvv vv | LSB of parameter number |
| STATUS | 1011nnnn Bn | Control change*1 |
| DATA | 01100011 63 | NRPN MSB |
| | 0vvvvvvv vv | MSB of parameter number |
| STATUS | 1011nnnn Bn | Control change*1 |
| DATA | 00000110 06 | MSB of data entry |
| | 0vvvvvvv vv | MSB of parameter data |
| STATUS | 1011nnnn Bn | Control change*1 |
| DATA | 00100110 26 | LSB of data entry |
| | 0vvvvvvv vv | LSB of parameter data |

*1) The second and subsequent STATUS need not be added during transmission. Reception must be implemented so that reception occurs whether or not STATUS is present.

## 4. PROGRAM CHANGE          (Cn)

**Reception**
If [Program Change ECHO] is ON, these messages are echoed.
If [Program Change RX] is ON and the [Rx CH] matches, these messages will be received. However if [OMNI] is ON, they will be received regardless of the channel. When a message is received, a Scene Memory will be recalled according to the settings of the [Program Change Table].

**Transmission**
If [Program Change TX] is ON, this message is transmitted according to the settings of the [Program Change Table] on the [Tx CH] channel when a scene memory is recalled.
If the recalled scene has been assigned to more than one program number, the lowest-numbered program number will be transmitted. Transmission to Studio Manager using Program Change messages will not be performed since there is no guarantee that the contents of the tables will match. (Parameter Changes will always be used.)

| STATUS | 1100nnnn Cn | Program change |
| DATA | 0nnnnnnn nn | Program number (0-127) |

## 5 MIDI TIME CODE QUARTER FRAME(F1)

**Reception**
This is echoed if [OTHER COMMANDS ECHO] is ON.
Automix synchronizes this if the data is received at the port specified by the TIME REFERENCE setting.

| STATUS | 1100nnnn F1 | Quarter frame message |
| DATA | 0tttdddd td | Type & data |

## 6. SONG POSITION POINTER     (F2)

**Reception**
If this is received when the automix TIME REFERENCE setting is MIDI CLOCK, the automix will move to the song position that was received.

| STATUS | 11110010 F2 | Song position pointer |
| DATA | 0vvvvvvv vv | Song position LSB |
| | 0vvvvvvv vv | Song position MSB |

## 7. TIMING CLOCK          (F8)

**Reception**
If the automix TIME REFERENCE setting is MIDI CLOCK, this message is used to synchronize automix. It is also used to control effects. This message is transmitted 24 times per quarter note.

| STATUS | 11111000 F8 | Timing clock |

## 8. START          (FA)

**Reception**
This message is received if the automix TIME REFERENCE setting is MIDI CLOCK, and will start the automix. In actuality, automix will start when the next TIMING CLOCK is received after receiving the START message.

| STATUS | 11111010 FA | Start |

## 9. CONTINUE          (FB)

**Reception**
This message is received if the automix TIME REFERENCE setting is MIDI CLOCK, and will cause automix to start from the current song position. In actuality, automix will start when the next TIMING CLOCK is received after receiving the CONTINUE message.

| STATUS | 11111011 FB | Continue |

## 10. STOP          (FC)

**Reception**
This message is received if the automix TIME REFERENCE setting is MIDI CLOCK, and will cause automix to stop.

| STATUS | 11111100 FC | Stop |

## 11. ACTIVE SENSING (FE)

### Reception

Once this message has been received, the failure to receive any message for an interval of 400 ms or longer will cause MIDI transmission to be initialized, such as by clearing the Running Status.

| STATUS | 11111110 FE | Active sensing |
|---|---|---|

## 12. SYSTEM RESET (FF)

### Reception

When this message is received, MIDI communications will be cleared, e.g., by clearing the Running Status.

| STATUS | 11111111 FF | System reset |
|---|---|---|

## 13. SYSTEM EXCLUSIVE MESSAGE (F0)

### 13.1 MIDI TIME CODE (FULL MESSAGE)

The Automix synchronizes these messages when they are received at a port specified by the TIME REFERENCE setting.

### 13.2 MIDI MACHINE CONTROL (MMC)

These messages are transmitted when the Machine Control section of the 02R96 is operated.

### 13.3 BULK DUMP

This message sends or receives the contents of various memories stored within the 02R96.
The basic format is as follows.

#### For DUMP DATA

```
F0 43 0n 7E cc cc <Model ID> tt mm mm [Data ...]
cs F7
```

#### For DUMP REQUEST

```
F0 43 2n 7E <Model ID> tt mm mm F7
```

| n | Device Number |
|---|---|
| cc cc | DATA COUNT (the number of bytes that follow this, ending before the checksum) |
| <Model ID> | Model ID (for 02R96, 4C 4D 20 20 38 43 35 34) |
| tt | DATA TYPE |
| mm mm | DATA NUMBER |
| cs | CHECK SUM |

A unique header (Model ID) is used to determine whether the device is a 02R96.
CHECK SUM is obtained by adding the bytes that follow BYTE COUNT (LOW) and end before CHECK SUM, taking the binary compliment of this sum, and then setting bit 7 to 0.
CHECK SUM = (-sum)&0x7F
The 02R96 can transmit and receive BULK data only if the size of a MIDI packet (F0 - F7) is 4096 bytes or smaller.
If large data consists of multiple MIDI packets, they can be transferred sequentially.

#### Reception

This message is received if [Bulk RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS.
When a bulk dump is received, it is immediately written into the specified memory.
When a bulk dump request is received, a bulk dump is immediately transmitted.

#### Transmission

This message is transmitted on the [Tx CH] by key operations in the [MIDI]-[BULK DUMP] screen.
A bulk dump is transmitted on the [Rx CH] in response to a bulk dump request.
The data area is handled by converting seven words of 8-bit data into eight words of 7-bit data.

#### Conversion from actual data into bulk data

```
d[0~6]: actual data
b[0~7]: bulk data
b[0] = 0;
for( I=0; I<7; I++){
    if( d[I]&0x80){
        b[0] |= 1<<(6-I);
    }
    b[I+1] = d[I]&0x7F;
}
```

#### Restoration from bulk data into actual data

```
d[0~6]: actual data
b[0~7]: bulk data
for( I=0; I<7; I++){
    b[0] <<= 1;
    d[I] = b[I+1]+(0x80&b[0]);
}
```

#### 13.3.1 Scene memory bulk dump format (compressed data)

The 02R96 can transmit and receive scene memories in compressed form.

| STATUS | 11110000 F0 | System exclusive message |
|---|---|---|
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc cl | |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01101101 6D | 'm' |
| | 0mmmmmmm mh | m=0-99, 256, 8192 (Scene0-99, EDIT BUFFER, UNDO) |
| | 0mmmmmmm ml | Receive is effective 1-99, 256, 8192 |
| BLOCK INFO. | 0ttttttt tt | total block number (minimum number is 0) |
| | 0bbbbbbb bb | current block number (0-total block number) |
| DATA | 0ddddddd ds | Scene data of block[bb] |
| | : | |
| | : | |
| | 0ddddddd de | |
| CHECK SUM | 0eeeeeee ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 F7 | End of exclusive |

#### 13.3.2 Scene memory bulk dump request format (compressed data)

The second and third bytes of the DATA NAME indicate the scene number that is being requested. If this is 256, the data of the Edit Buffer will be bulk-dumped. If this is 8192, the data of the Undo Buffer will be bulk-dumped.

| STATUS | 11110000 F0 | System exclusive message |
|---|---|---|
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01101101 6D | 'm' |
| | 0mmmmmmm mh | m=0-99, 256, 8192 (Scene0-99, EDIT BUFFER, UNDO) |
| | 0mmmmmmm ml | |

| | | | |
|---|---|---|---|
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.3 Setup memory bulk dump format

Of the setup memory of the 02R96, this bulk-dumps data other than the User defined layer, User define plug-in, User defined keys, User assignable layer, Control change table, and Program change table.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010011 | 53 | 'S' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Setup data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.4 Setup memory bulk dump request format

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010011 | 53 | 'S' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.5 User defined layer bulk dump format

The second and third bytes of the DATA NAME indicate the bank number.
Be aware that the state of the transmission destination will (in some cases) change if the same bank is being used.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001100 | 4C | 'L' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-3 (bank no.1-4) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | User defined layer data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.6 User defined layer bulk dump request format

The second and third bytes of the DATA NAME indicate the bank number.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | | | |
| | 01001100 | 4C | 'L' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-3 (bank no.1-4) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.7 User defined plug-in bulk dump format

The second and third bytes of the DATA NAME indicate the bank number.
Be aware that the state of the transmission destination will (in some cases) change if the same bank is being used.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001001 | 49 | 'I' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-7 (bank no.1-8) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | User define plug-in data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.8 User defined plug-in bulk dump request format

The second and third bytes of the DATA NAME indicate the bank number.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001001 | 49 | 'I' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-7 (bank no.1-8) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.9 User defined keys bulk dump format

The second and third bytes of the DATA NAME indicate the bank number.
Be aware that the state of the transmission destination will (in some cases) change if the same bank is being used.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010110 | 56 | 'V' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-7 (bank no.A-H) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | User defined key data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.10 User defined keys bulk dump request format

The second and third bytes of the DATA NAME indicate the bank number.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010110 | 56 | 'V' |
| | 00000000 | 00 | |

| | | | |
|---|---|---|---|
| | 0bbbbbbb | bb | b=0-7 (bank no.A-H) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.11 User assignable layer bulk dump format

The second and third bytes of the DATA NAME indicate the bank number.
Be aware that the state of the transmission destination will (in some cases) change if the same bank is being used.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010101 | 55 | 'U' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-3 (bank no.1-4) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | User assignable layer data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.12 User assignable layer bulk dump request format

The second and third bytes of the DATA NAME indicate the bank number.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010101 | 55 | 'U' |
| | 00000000 | 00 | |
| | 0bbbbbbb | bb | b=0-3 (bank no.1-4) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.13 Control change table bulk dump format

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |

| | | | |
|---|---|---|---|
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000011 | 43 | 'C' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Control change table data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.14 Control change table bulk dump request format

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000011 | 43 | 'C' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.15 Program change table bulk dump format

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010000 | 50 | 'P' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Program change table data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.16 Program change table bulk dump request format

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |

| | | | |
|---|---|---|---|
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010000 | 50 | 'P' |
| | 00000010 | 02 | |
| | 00000000 | 00 | No.256 = Current |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.17 Equalizer library bulk dump format

The second and third bytes of the DATA NAME indicate the bank number.
0:Library no.1 - 199:Library no.200, 256:CH1 - 311:CH56, 384:BUS1 - 391:BUS8, 512:AUX1 - 519:AUX8, 768:STEREO L - 769:STEREO R, 8192:UNDO
256 and up are data for the corresponding channel of the edit buffer (excluding UNDO).
For reception by the 02R96, only the user area is valid. (40-199, 256-)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010001 | 51 | 'Q' |
| | 0mmmmmmm | mh | 0-199 (EQ Library no.1-200), |
| | 0mmmmmmm | ml | 256- (Channel current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | EQ Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.18 Equalizer library bulk dump request format

The second and third bytes of the DATA NAME indicate the bank number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010001 | 51 | 'Q' |
| | 0mmmmmmm | mh | 0-199 (EQ Library no.1-200), |
| | 0mmmmmmm | ml | 256- (Channel current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.19 Compressor library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.1 - 127:Library no.128, 256:CH1 - 351:CH96, 384:BUS1 - 391:BUS8, 512:AUX1 - 523:AUX12, 640:MATRIX1L - 647:MATRIX4R, 768:STEREO L - 769:STEREO R, 8192:UNDO
256 and following are data for the corresponding channel of the edit buffer. For reception by the 02R96, only the user area is valid. (36-127, 256-)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01011001 | 59 | 'Y' |
| | 0mmmmmmm | mh | 0-127 (COMP Library no.1-128), |
| | 0mmmmmmm | ml | 256- (Channel current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | COMP Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.20 Compressor library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01011001 | 59 | 'Y' |
| | 0mmmmmmm | mh | 0-127 (COMP Library no.1-128), |
| | 0mmmmmmm | ml | 256- (Channel current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.21 Gate library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.1 - 127:Library no.128, 256:CH1 - 311:CH56, 8192:UNDO
256 and following are data for the corresponding channel of the edit buffer. For reception by the 02R96, only the user area is valid. (4-127, 256-)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000111 | 47 | 'G' |
| | 0mmmmmmm | mh | 0-127 (GATE Library no.1-128), |
| | 0mmmmmmm | ml | 256-351 (Channel current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | GATE Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.22 Gate library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000111 | 47 | 'G' |
| | 0mmmmmmm | mh | 0-127 (GATE Library no.1-128), |
| | 0mmmmmmm | ml | 256-351 (Channel current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.23 Effect library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.1 - 127:Library no.128, 256:Effect1 - 259:Effect4, 8192:UNDO
256-263 are the data for the corresponding area of the edit buffer.
For reception by the 02R96, only the user area is valid. (61-127, 256-263)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000101 | 45 | 'E' |
| | 0mmmmmmm | mh | 0-127 (Effect Library no.1-128), |
| | 0mmmmmmm | ml | 256-259 (Effect1-4 current) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Effect Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |

| | | | |
|---|---|---|---|
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.24 Effect library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01000101 | 45 | 'E' |
| | 0mmmmmmm | mh | 0-127 (Effect Library no.1-128), |
| | 0mmmmmmm | ml | 256-259 (Effect1-4 current) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.25 Channel library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.0 - 128:Library no.128, 256:CH1 - 311:CH56, 384:BUS1 - 391:BUS8, 512:AUX1 - 519:AUX8, 768:STEREO L - 769:STEREO R, 8192:UNDO
256 and following are data for the corresponding channel of the edit buffer. For reception by the 02R96, only the user area is valid. (2-128,256-)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001000 | 48 | 'H' |
| | 0mmmmmmm | mh | 0-128 (Channel Library no.0-128), |
| | 0mmmmmmm | ml | 256- (Current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Channel Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.26 Channel library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |

| | | | |
|---|---|---|---|
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001000 | 48 | 'H' |
| | 0mmmmmmm | mh | 0-128 (Channel Library no.0-128), |
| | 0mmmmmmm | ml | 256- (Current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.27 Input patch library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.0 - 32:Library no.32, 256:Current data, 8192:UNDO
For reception by the 02R96, only the user area is valid. (1-32,256)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010010 | 52 | 'R' |
| | 0mmmmmmm | mh | 0-32 (Input patch Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Input patch Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.28 Input patch library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01010010 | 52 | 'R' |
| | 0mmmmmmm | mh | 0-32 (Input patch Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.29 Output patch library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.0 - 32:Library no.32, 256:Current data, 8192:UNDO
For reception by the 02R96, only the user area is valid. (1-32,256)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |

| | | | |
|---|---|---|---|
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001111 | 4F | 'O' |
| | 0mmmmmmm | mh | 0-32 (Output patch Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Output patch Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.30 Output patch library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001111 | 4F | 'O' |
| | 0mmmmmmm | mh | 0-32 (Output patch Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.31 Bus to stereo library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.0 - 32:Library no.32, 256:Current data, 8192:UNDO
For reception by the 02R96, only the user area is valid. (1-32,256)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001010 | 4A | 'J' |
| | 0mmmmmmm | mh | 0-32 (Bus to stereo Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |

| | | | |
|---|---|---|---|
| DATA | 0ddddddd | ds | Bus to stereo Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.32 Bus to stereo library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001010 | 4A | 'J' |
| | 0mmmmmmm | mh | 0-32 (Bus to stereo Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.33 Surround monitor library bulk dump format

The second and third bytes of the DATA NAME indicate the library number.
0:Library no.0 - 32:Library no.32, 256:Current data, 8192:UNDO
For reception by the 02R96, only the user area is valid. (1-32,256)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn | 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc | ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc | cl | |
| | 01001100 | 4C | 'L' |
| | 01001101 | 4D | 'M' |
| | 00100000 | 20 | ' ' |
| | 00100000 | 20 | ' ' |
| | 00111000 | 38 | '8' |
| | 01000011 | 43 | 'C' |
| | 00110101 | 35 | '5' |
| | 00110100 | 34 | '4' |
| DATA NAME | 01001011 | 4B | 'K' |
| | 0mmmmmmm | mh | 0-32 (Surround Monitor Library no.0-32), |
| | 0mmmmmmm | ml | 256 (Current data) |
| BLOCK INFO. | 0ttttttt | tt | total block number (minimum number is 0) |
| | 0bbbbbbb | bb | current block number (0-total block number) |
| DATA | 0ddddddd | ds | Surround Monitor Library data of block[bb] |
| | : | | |
| | : | | |
| | 0ddddddd | de | |
| CHECK SUM | 0eeeeeee | ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 | F7 | End of exclusive |

### 13.3.34 Surround monitor library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn | 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 | 7E | Universal bulk dump |

| | | |
|---|---|---|
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01001011 4B | 'K' |
| | 0mmmmmmm mh | 0-32 (Surround Monitor Library no.0-32), |
| | 0mmmmmmm ml | 256 (Current data) |
| EOX | 11110111 F7 | End of exclusive |

### 13.3.35 Automix bulk dump format (compressed data)

The second byte of the DATA NAME indicates the library number.
0:Library no.1 - 15:Library no.16, 256:Current automix data

| | | |
|---|---|---|
| STATUS | 11110000 F0 | System exclusive message |
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc cl | |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01100001 61 | 'a' |
| | 0mmmmmmm mh | 0-15 (Automix no.1-16), 256 (Current data) |
| | 0mmmmmmm ml | BLOCK INFO. |
| | 0bbbbbbb bh | current block number (0-total block number) |
| | 0bbbbbbb bl | |
| | 0ttttttt th | total block number (minimum number is 0) |
| | 0ttttttt tl | |
| DATA | 0ddddddd ds | Automix memory data of block[bb] |
| | : | |
| | : | |
| | 0ddddddd de | |
| CHECK SUM | 0eeeeeee ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 F7 | End of exclusive |

### 13.3.36 Automix bulk dump request format (compressed data)

The second and third bytes of the DATA NAME indicate the library number. (See above)

| | | |
|---|---|---|
| STATUS | 11110000 F0 | System exclusive message |
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01100001 61 | 'a' |
| | 0mmmmmmm mh | 0-15 (Automix no.1-16), 256 (Current data) |
| | 0mmmmmmm ml | |
| EOX | 11110111 F7 | End of exclusive |

### 13.3.37 Plug-in effect card bulk dump format

The second byte of the DATA NAME indicates the slot number.
0:SLOT 3 - 1:SLOT 4
The data is not received if the Developer ID and Product ID are different than the card that is installed in the slot.
The data is not transmitted if a valid plug-in effect card is not installed.

| | | |
|---|---|---|
| STATUS | 11110000 F0 | System exclusive message |
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0000nnnn 0n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| COUNT HIGH | 0ccccccc ch | data count = ch * 128 + cl |
| COUNT LOW | 0ccccccc cl | |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01001110 4E | 'N' |
| | 0mmmmmmm mh | m=0-1 (SLOT 2-3) |
| | 0mmmmmmm ml | BLOCK INFO. |
| | 0bbbbbbb bh | current block number (0-total block number) |
| | 0bbbbbbb bl | |
| | 0ttttttt th | total block number (minimum number is 0) |
| | 0ttttttt tl | |
| | 0000iiii 0i | Developer id (High) |
| | 0000iiii 0i | Developer id (Low) |
| | 0000jjjj 0j | Product id (High) |
| | 0000jjjj 0j | Product id (Low) |
| DATA | 0ddddddd ds | Plug-in Effect card memory data of block[bb] |
| | : | |
| | : | |
| | 0ddddddd de | |
| CHECK SUM | 0eeeeeee ee | ee= (Invert ('L'+...+de)+1)&0x7F |
| EOX | 11110111 F7 | End of exclusive |

### 13.3.38 Plug-in effect card bulk dump request format

The second and third bytes of the DATA NAME indicate the slot number. (See above)

| | | |
|---|---|---|
| STATUS | 11110000 F0 | System exclusive message |
| ID No. | 01000011 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0010nnnn 2n | n=0-15 (Device number=MIDI Channel) |
| FORMAT No. | 01111110 7E | Universal bulk dump |
| | 01001100 4C | 'L' |
| | 01001101 4D | 'M' |
| | 00100000 20 | ' ' |
| | 00100000 20 | ' ' |
| | 00111000 38 | '8' |
| | 01000011 43 | 'C' |
| | 00110101 35 | '5' |
| | 00110100 34 | '4' |
| DATA NAME | 01001110 4E | 'N' |
| | 0mmmmmmm mh | m=0-1 (SLOT 2-3) |
| | 0mmmmmmm ml | |
| EOX | 11110111 F7 | End of exclusive |

## 13.4 PARAMETER CHANGE

### Reception

If [Parameter change ECHO] is ON, these messages are echoed.
If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. A specific parameter is controlled when a Parameter Change is received. When a Parameter Request is received, the current value of the specified parameter will be transmitted as a Parameter Change with the Device Number set to [Rx CH].

**Transmission**

If [Parameter change TX] is ON and you operate a parameter for which Control Change transmission is not enabled, a parameter change will be transmitted with [Tx CH] as the Device Number.

As a response to a Parameter Request, a parameter change will be transmitted with [Rx CH] as the Device Number.

### 13.4.1 Parameter change basic format (02R96-specific)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 0ttttttt | tt | Data type |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA *) | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

*) For parameters with a data size of 2 or more, data for that size will be transmitted.

### 13.4.2 Parameter Change basic format (Universal format)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 0ttttttt | tt | Data type |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA *) | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

*) For parameters with a data size of 2 or more, data for that size will be transmitted.

### 13.4.3 Parameter request basic format (02R96-specific)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 0ttttttt | tt | Data type |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.4 Parameter request basic format (Universal format)

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 0ttttttt | tt | Data type |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.5 Parameter Address

Consult your dealer for parameter address details.

### 13.4.6 Parameter change (Edit buffer)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When this is received, the specified parameter will be controlled.

**Transmission**

If [Parameter change TX] is ON and a parameter that is not assigned in the [Control Assign Table] is changed, the Parameter Change messages are transmitted on [Tx CH] device number channel.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00000001 | 01 | Edit Buffer |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.7 Parameter request (Edit buffer)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When this is received, the value of the specified parameter will be transmitted as a Parameter change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00000001 | 01 | Edit Buffer |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.8 Parameter change (Patch data)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When this is received, the specified parameter will be controlled.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000010 | 02 | Patch data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.9 Parameter request (Patch data)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the value of the specified parameter will be transmitted as a Parameter change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000010 | 02 | Patch data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.10 Parameter change (Setup memory)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the specified parameter will be controlled.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000011 | 03 | Setup data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.11 Parameter request (Setup memory)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the value of the specified parameter will be transmitted as a Parameter change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000011 | 03 | Setup data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.12 Parameter change (Backup memory)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the specified parameter will be controlled.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000100 | 04 | Backup data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| DATA | 0ddddddd | dd | data |
| | : | | |
| | : | | |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.13 Parameter request (Backup memory)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the value of the specified parameter will be transmitted as a Parameter change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00000100 | 04 | Backup data |
| | 0eeeeeee | ee | Element no. (If 'ee' is 0, 'ee' is expanded to two bytes) |
| | 0ppppppp | pp | Parameter no. |
| | 0ccccccc | cc | Channel no. |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.14 Parameter change
### (Function call Library: store / recall)
**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the specified memory/library will be stored/recalled.

**Transmission**

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010000 | 10 | Function call |
| | 00ffffff | ff | function |
| | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| DATA | 0ccccccc | ch | channel High |
| | 0ccccccc | cl | channel Low |
| EOX | 11110111 | F7 | End of exclusive |

| function | | number | channel*1) | rx/tx |
|---|---|---|---|---|
| SCENE RECALL | 0x00 | 0-99, 8192 | 256 | rx/tx*2) |
| EQ LIB RECALL | 0x01 | 1-200, 8192 | 0-513 | rx/tx |
| GATE LIB RECALL | 0x02 | 1-128, 8192 | 0-95 | rx/tx |
| COMP LIB RECALL | 0x03 | 1-128, 8192 | 0-513 | rx/tx |
| EFF LIB RECALL | 0x04 | 1-128, 8192 | 0-3 | rx/tx |
| CHANNEL LIB RECALL | 0x06 | 0-128, 8192 | 0-513 | rx/tx |
| INPATCH LIB RECALL | 0x07 | 0-32, 8192 | 256 | rx/tx |
| OUTPATCH LIB RECALL | 0x08 | 0-32, 8192 | 256 | rx/tx |
| Bus to Stereo LIB RECALL | 0x09 | 0-32, 8192 | 256 | rx/tx |
| Surround Monitor LIB RECALL | 0x0A | 0-32, 8192 | 256 | rx/tx |
| AUTOMIX LIB RECALL | 0x0B | 1-16 | 256 | rx/tx |
| | | | | |
| SCENE STORE | 0x20 | 1-99 | 256, 16383 | rx/tx |
| EQ LIB STORE | 0x21 | 41-200 | 0-513, 16383 | rx/tx |
| GATE LIB STORE | 0x22 | 5-128 | 0-95, 16383 | |
| COMP LIB STORE | 0x23 | 37-128 | 0-513, 16383 | rx/tx |
| EFF LIB STORE | 0x24 | xx*3)-128 | 0-3, 16383 | rx/tx |
| CHANNEL LIB STORE | 0x26 | 2-128 | 0-513, 16383 | rx/tx |
| INPATCH LIB STORE | 0x27 | 1-32 | 256, 16383 | rx/tx |
| OUTPATCH LIB STORE | 0x28 | 1-32 | 256, 16383 | rx/tx |

| function | | number | channel*1) | rx/tx |
|---|---|---|---|---|
| Bus to Stereo LIB STORE | 0x29 | 1-32 | 256, 16383 | rx/tx |
| Surround Monitor LIB STORE | 0x2A | 1-32 | 256, 16383 | rx/tx |
| AUTOMIX LIB STORE | 0x2B | 1-16 | 256, 16383 | rx/tx |

*1) 0:CH1 - 55:CH56, 128:BUS1 - 135:BUS8, 256:AUX1 - 263:AUX8, 512:STEREO L - 513:STEREO R
Use 256 if the recall destination or store source is a single data item.
Effect is 0:Effect1 - 3:Effect4
If the store destination is 16383 (0x3FFF), this indicates that the library data has been changed by a external cause (such as bulk reception) (only transmitted by the 02R96)

*2) This is also transmitted when a program that is not assigned in the [Program Change Table] is recalled. (Normally, it is transmitted by Program Change messages.)

*3) Varies with the firmware version.

### 13.4.15 Parameter change (Function call: title)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the title of the specified memory/library will be changed.

**Transmission**

In response to a request, a Parameter Change message will be transmitted on the [Rx CH].
If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010000 | 10 | Function call |
| | 0100ffff | 4f | title |
| | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| DATA | 0ddddddd | dd | title 1 |
| | : | | |
| | : | | |
| | : | | |
| | 0ddddddd | dd | title x (depend on the library) |
| EOX | 11110111 | F7 | End of exclusive |

| function | | number | size |
|---|---|---|---|
| SCENE LIB TITLE | 0x40 | 0-99,256 (0:response only) | 16 |
| EQ LIB TITLE | 0x41 | 1-200 (1-40:response only) | 16 |
| GATE LIB TITLE | 0x42 | 1-128 (1-4:response only) | 16 |
| COMP LIB TITLE | 0x43 | 1-128 (1-36:response only) | 16 |
| EFF LIB TITLE | 0x44 | 1-128 (1-xx(*):response only) | 16 |
| CHANNEL LIB TITLE | 0x46 | 0-128 (0-1:response only) | 16 |
| INPATCH LIB TITLE | 0x47 | 0-32 (0:response only) | 16 |
| OUTPATCH LIB TITLE | 0x48 | 0-32 (0:response only) | 16 |
| Bus to Stereo LIB TITLE | 0x49 | 0-32 (0:response only) | 16 |
| Surround Monitor LIB TITLE | 0x4A | 0-32 (0:response only) | 16 |
| AUTOMIX LIB TITLE | 0x4B | 1-16 | 16 |

* Varies with the firmware version.

### 13.4.16 Parameter request (Function call: title)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, a Parameter Change message will be transmitted on the [Rx CH].
Refer to the above table for the Functions and Numbers.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010000 | 10 | Function call |

| | 0100ffff | 4f | |
|---|---|---|---|
| TITLE | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.17 Parameter change (Function call: scene/library clear)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the specified memory/library will be cleared.

**Transmission**

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010000 | 10 | Function call |
| | 0110ffff | 6f | clear function |
| | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| EOX | 11110111 | F7 | End of exclusive |

| function | | number |
|---|---|---|
| SCENE LIB CLEAR | 0x60 | 1-99 |
| EQ LIB CLEAR | 0x61 | 41-200 |
| GATE LIB CLEAR | 0x62 | 5-128 |
| COMP LIB CLEAR | 0x63 | 37-128 |
| EFF LIB CLEAR | 0x64 | xx(*)-128 |
| CHANNEL LIB CLEAR | 0x66 | 2-128 |
| INPATCH LIB CLEAR | 0x67 | 1-32 |
| OUTPATCH LIB CLEAR | 0x68 | 1-32 |
| Bus to Stereo LIB CLEAR | 0x69 | 1-32 |
| Surround Monitor LIB CLEAR | 0x6A | 1-32 |
| AUTOMIX LIB CLEAR | 0x6B | 1-16 |

* Varies with the firmware version.

### 13.4.18 Parameter change (Function call: pair)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, pairing will be enabled/disabled for the specified channel. (Otherwise, these messages are reserved for future use.)

| STATUS | 11110000 | F0 | System exclusive message |
|---|---|---|---|
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010001 | 11 | Function call Pair |
| | 0000ffff | 0f | function |
| | 0sssssss | sh | Source channel H |
| | 0sssssss | sl | Source channel L |
| DATA | 0ddddddd | dh | Destination channel H |
| | 0ddddddd | dl | Destination channel L |
| EOX | 11110111 | F7 | End of exclusive |

| function | | channel |
|---|---|---|
| PAIR ON with COPY | 0x00 | *1) |
| PAIR ON with RESET BOTH | 0x01 | *1) |
| PAIR OFF | 0x02 | *1) |

*1) 0:CH1 - 95:CH96, 128:BUS1 - 135:BUS8, 256:AUX1 - 267:AUX12
• In the case of PAIR, you must specify channels for which pairing is possible.
• In the case of PAIR ON with COPY, you must specify Source Channel as the copy source, and Destination Channel as the copy destination.

### 13.4.19 Parameter change (Function call: effect)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When this is received, the corresponding effect's function activates (depending on the effect type).

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010010 | 12 | Function call Effect Event |
| | 0000ffff | 0f | function |
| | 00000000 | 00 | |
| | 0ppppppp | pp | Release:0, Press:1 |
| DATA | 00000000 | 00 | |
| | 0eeeeeee | ee | Effect number (0:Effect1 - 3:Effect4) |
| EOX | 11110111 | F7 | End of exclusive |

| function | | channel |
|---|---|---|
| Freeze Play button | 0x00 | 0:Effect1 - 3:Effect4 |
| Freeze Record button | 0x01 | 0:Effect1 - 3:Effect4 |
| Auto Pan 5.1 Trigger Button | 0x02 | 0:Effect1 - 3:Effect4 |
| Auto Pan 5.1 Reset Button | 0x03 | 0:Effect1 - 3:Effect4 |

• This does not activate when the effect type is different.

### 13.4.20 Parameter Change        (Sort table data)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

The Scene memory Sort table is updated as soon as the messages are received.

If Studio Manager performs a scene memory sort, it will transmit this data to the 02R96.

**Transmission**

When scene memory sort is executed on the 02R96, the memory sort table will be transmitted to Studio Manager.

Studio Manager will sort the memories according to this data.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00010011 | 13 | Library sort table |
| | 0000ffff | 0f | Library type |
| DATA | 0ddddddd | ds | Data |
| | : | | |
| | : | | |
| | 0ddddddd | de | Data |
| EOX | 11110111 | F7 | End of exclusive |

8-7 conversion is performed on the data area in the same way as for bulk.

### 13.4.21 Parameter Request        (Sort table data)

**Reception**

This is received if [Parameter change RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS.

This is echoed if [Parameter change ECHO] is ON.

Sort table data is transmitted as Parameter Change messages on the [Rx CH] channel.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00010011 | 13 | Library sort table |
| | 0000ffff | 0f | Library type |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.22 Parameter change (Function call: attribute)

**Reception**

This is received if [Parameter change RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS.

This is echoed if [Parameter change ECHO] is ON.

When this is received, the attribute of the specified memory/library will be changed.

**Transmission**

In response to a request, a Parameter Change message will be transmitted on the [Rx CH].

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010100 | 14 | Function call |
| | 0000ffff | 0f | attribute |
| | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| DATA | 0ttttttt | th | attribute (protect:0x0001, normal:0x0000) |
| | 0ttttttt | tl | |
| EOX | 11110111 | F7 | End of exclusive |

| function | | number |
|---|---|---|
| SCENE LIB ATTRIBUTE | 0x00 | 0-99 (0:response only) |
| AUTOMIX LIB ATTRIBUTE | 0x0B | 1-16 |

### 13.4.23 Parameter request (Function call: attribute)

**Reception**

This is received if [Parameter change RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS. This is echoed if [Parameter change ECHO] is ON.

When this is received, a Parameter Change message will be transmitted on the [Rx CH].

Refer to the above table for the Functions and Numbers.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010100 | 14 | Function call |
| | 0000ffff | 0f | |
| ATTRIBUTE | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.24 Parameter change        (Function call: link)

**Reception**

This is received if [Parameter change RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS. This is echoed if [Parameter change ECHO] is ON.

When this is received, the patch link data of the specified scene will be modified.

**Transmission**

In response to a request, a Parameter Change message will be transmitted on the [Rx CH].

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 01111111 | 7F | Universal |
| ADDRESS | 00010100 | 14 | Function call |
| | 0010ffff | 2f | link |
| | 0mmmmmmm | mh | number High |
| | 0mmmmmmm | ml | number Low |

```
DATA          0iiiiiii  ih   inpatch
              0iiiiiii  il
              0ooooooo  oh   outpatch
              0ooooooo  ol
EOX           11110111  F7   End of exclusive
```

| function | | number | |
|---|---|---|---|
| SCENE LIB LINK | | 0x20 | 0-99 (0:response only) |

### 13.4.25 Parameter request          (Function call: link)
**Reception**
This is received if [Parameter change RX] is ON and the [Rx CH] matches the device number included in the SUB STATUS. This is echoed if [Parameter change ECHO] is ON.
When this is received, a Parameter Change message will be transmitted on the [Rx CH].
Refer to the above table for the Functions and Numbers.

```
STATUS        11110000  F0   System exclusive message
ID No.        01000011  43   Manufacture's ID number (YAMAHA)
SUB STATUS    0011nnnn  3n   n=0-15 (Device number=MIDI Channel)
GROUP ID      00111110  3E   MODEL ID (digital mixer)
MODEL ID      01111111  7F   Universal
ADDRESS       00010100  14   Function call
              0010ffff  2f   link
              0mmmmmmm  mh   number High
              0mmmmmmm  ml   number Low
EOX           11110111  F7   End of exclusive
```

### 13.4.26 Parameter change          (Key remote)
**Reception**
If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, the same processing that is executed when the key specified by Address is pressed (released).
**Transmission**
If [Parameter change ECHO] is ON, this message will be retransmitted without change.

```
STATUS        11110000  F0   System exclusive message
ID No.        01000011  43   Manufacture's ID number (YAMAHA)
SUB STATUS    0001nnnn  1n   n=0-15 (Device number=MIDI Channel)
GROUP ID      00111110  3E   MODEL ID (digital mixer)
MODEL ID      00001011  0B   02R96
ADDRESS       00100000  20   Key remote
              0kkkkkkk  kk   Key address H
              0kkkkkkk  kk   Key address M
              0kkkkkkk  kk   Key address L
DATA          0ppppppp  pp   Release:0, Press:1
EOX           11110111  F7   End of exclusive
```

### 13.4.27 Parameter change          (Remote meter)
When transmission is enabled by receiving a Request of Remote meter, the specified meter information is transmitted every 50 msec for 10 seconds.
When you want to transmit meter information continuously, a Request must be transmitted continuously within every 10 seconds.
**Reception**
This is echoed if [Parameter change ECHO] is ON.
**Transmission**
When transmission has been enabled by a Request, the parameter specified by Address will be transmitted on the [Rx CH] channel at 50 msec intervals for a duration of 10 seconds.
Transmission will be disabled if the power is turned off and on again, or if the PORT setting is changed.
If [Parameter change ECHO] is ON, this message will be retransmitted without change.

```
STATUS        11110000  F0   System exclusive message
ID No.        01000011  43   Manufacture's ID number (YAMAHA)
SUB STATUS    0001nnnn  1n   n=0-15 (Device number=MIDI Channel)
GROUP ID      00111110  3E   MODEL ID (digital mixer)
MODEL ID      00001011  0B   02R96
```

```
ADDRESS       00100001  21   Remote meter
              0mmmmmmm  mm   ADDRESS UL
              0mmmmmmm  mm   ADDRESS LU
              0mmmmmmm  mm   ADDRESS LL
DATA          0ddddddd  dd   data1 H
              0ddddddd  dd   Data1 L
              :
              :
EOX           11110111  F7   End of exclusive
```

### 13.4.28 Parameter request          (Remote meter)
**Reception**
If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.
When this is received, data of the specified address is transmitted on the [Rx CH] at intervals of 50 msec as a rule, for a period of 10 seconds.
If Address UL= 0x7F is received, transmission of all meter data will be halted immediately. (disable)
**Transmission**
If [Parameter change ECHO] is ON, this message will be retransmitted without change.

```
STATUS        11110000  F0   System exclusive message
ID No.        01000011  43   Manufacture's ID number (YAMAHA)
SUB STATUS    0011nnnn  3n   n=0-15 (Device number=MIDI Channel)
GROUP ID      00111110  3E   MODEL ID (digital mixer)
MODEL ID      00001011  0B   02R96
ADDRESS       00100001  21   Remote meter
              0mmmmmmm  mm   ADDRESS UL
              0mmmmmmm  mm   ADDRESS LU
              mmmmmmmm  mm   ADDRESS LL
              0ccccccc  ch   Count H
              0ccccccc  cl   Count L
EOX           11110111  F7   End of exclusive
```

### 13.4.29 Parameter change (Remote time counter)
When transmission is enabled by receiving a Request of Remote Time Counter, the Time Counter data is transmitted every 50 msec for 10 seconds. When you want to transmit Counter information continuously, a Request must be transmitted within every 10 seconds.
**Reception**
This is echoed if [Parameter change ECHO] is ON.
**Transmission**
When transmission is enabled by receiving a Request, the Time Counter information is transmitted on [RxCH] channel every 50 msec for 10 seconds.
Transmission will be disabled if the power is turned off and on again, or if the PORT setting is changed.
If [Parameter change ECHO] is ON, this message will be retransmitted without change.

```
STATUS        11110000  F0   System exclusive message
ID No.        01000011  43   Manufacture's ID number (YAMAHA)
SUB STATUS    0001nnnn  1n   n=0-15 (Device number=MIDI Channel)
GROUP ID      00111110  3E   MODEL ID (digital mixer)
MODEL ID      00001011  0B   02R96
ADDRESS       00100010  22   Remote Time counter
              0000tttt  0t   0:Time code, 1:Measure.Beat.Clock
              0ddddddd  dd   Hour / Measure H
              0ddddddd  dd   Minute / Measure L
DATA          0ddddddd  dd   Second / Beat
              0ddddddd  dd   Frame / Clock
EOX           11110111  F7   End of exclusive
```

### 13.4.30 Parameter request (Remote time counter)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When this is received, the Time Counter information is transmitted on the [Rx CH] channel every 50 msec for 10 seconds.

When the second byte of Address is received on 0x7F, data transmission will be halted immediately. (disable)

**Transmission**

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00100010 | 22 | Remote Time counter |
| | 0ddddddd | dd | 0:Transmission request, 0x7F:Transmission stop request |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.31 Parameter change　　　　(Automix status)

When transmission is enabled by receiving a Request of Automix status, the Automix Status data is transmitted every second for 10 seconds. When you want to transmit the Automix Status information continuously, the Request must be transmitted continuously minimum within 10 seconds interval. The data is transmitted continuously while the transmission is enabled, even when the Automix Status on the 02R96 has been changed.

**Reception**

This is echoed if [Parameter change ECHO] is ON.

**Transmission**

When the transmission is set to enable by receiving a Request. The Automix Status data is transmitted on the [Rx CH] channel every second for 10 seconds. The data is transmitted continuously while the transmission is enabled, even when the Automix Status on the 02R96 has been changed. Transmission will be disabled if the power is turned off and on again, or if the PORT setting is changed.

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0001nnnn | 1n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00100011 | 23 | Automix status |
| | 00000000 | 00 | |
| | 0000dddd | 0d | Automix status H |
| | 0000dddd | 0d | Automix status L |
| EOX | 11110111 | F7 | End of exclusive |

### 13.4.32 Parameter request　　　　(Automix status)

**Reception**

If [Parameter change RX] is ON and the [Rx CH] matches the Device Number included in the SUB STATUS, these messages are received. If [Parameter change ECHO] is ON, these messages are echoed.

When the data is received, the Automix Status data is transmitted on the [Rx CH] every second for 10 seconds.

When the second byte of Address is received on 0x7F, data transmission will be halted immediately (disable).

**Transmission**

If [Parameter change ECHO] is ON, this message will be retransmitted without change.

| | | | |
|---|---|---|---|
| STATUS | 11110000 | F0 | System exclusive message |
| ID No. | 01000011 | 43 | Manufacture's ID number (YAMAHA) |
| SUB STATUS | 0011nnnn | 3n | n=0-15 (Device number=MIDI Channel) |
| GROUP ID | 00111110 | 3E | MODEL ID (digital mixer) |
| MODEL ID | 00001011 | 0B | 02R96 |
| ADDRESS | 00100011 | 23 | Automix status |
| | 0ddddddd | dd | 0:Transmission request, 0x7F:Transmission stop request |
| EOX | 11110111 | F7 | End of exclusive |

# Appendix D: Options

## MB02R96 Peak Meter Bridge

### Installation

1   Unscrew the four fixing screws ① on the 02R96 rear panel to which the meter bridge will be attached.
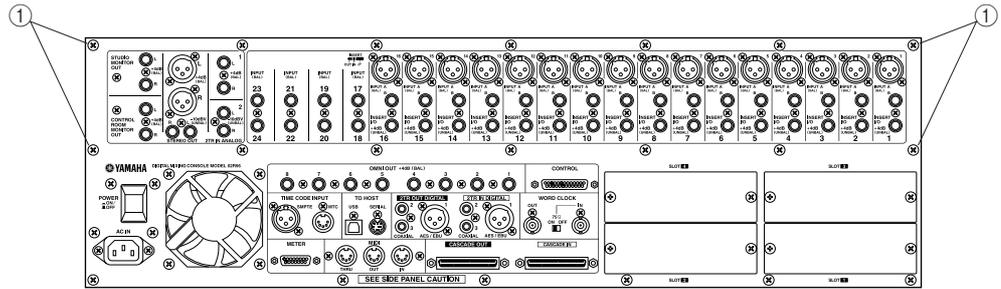


2   Using the four supplied 8 mm screws ②, attach the brackets to the meter bridge, as shown below.

3   Align the meter bridge with the 02R96, and, using two of the supplied 12 mm screws ③, screw in the top two fixing screws, but don't tighten them fully.

4   Screw in the bottom two screws ③ and tighten them fully.

5   Fully tighten the top two screws ③.

6   Connect the meter bridge cable to the 02R96's METER port.
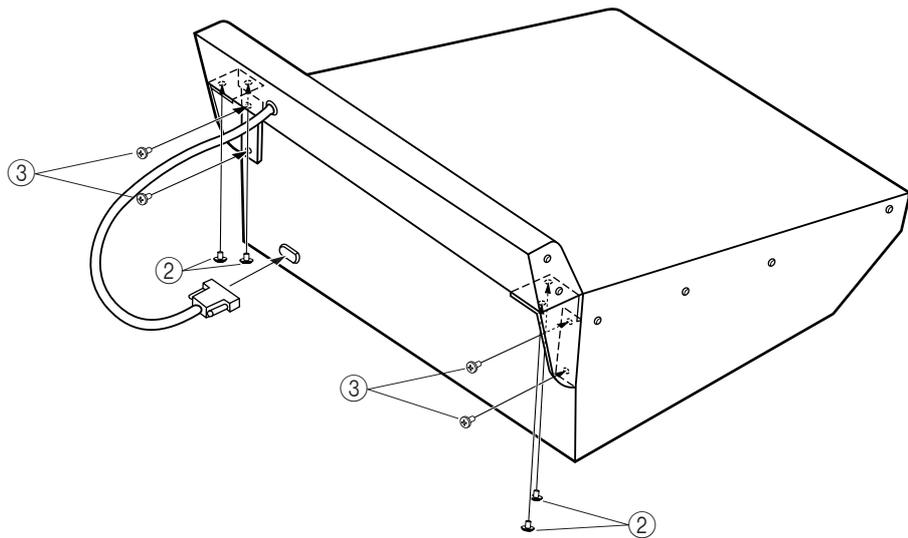
## Meter Bridge Controls
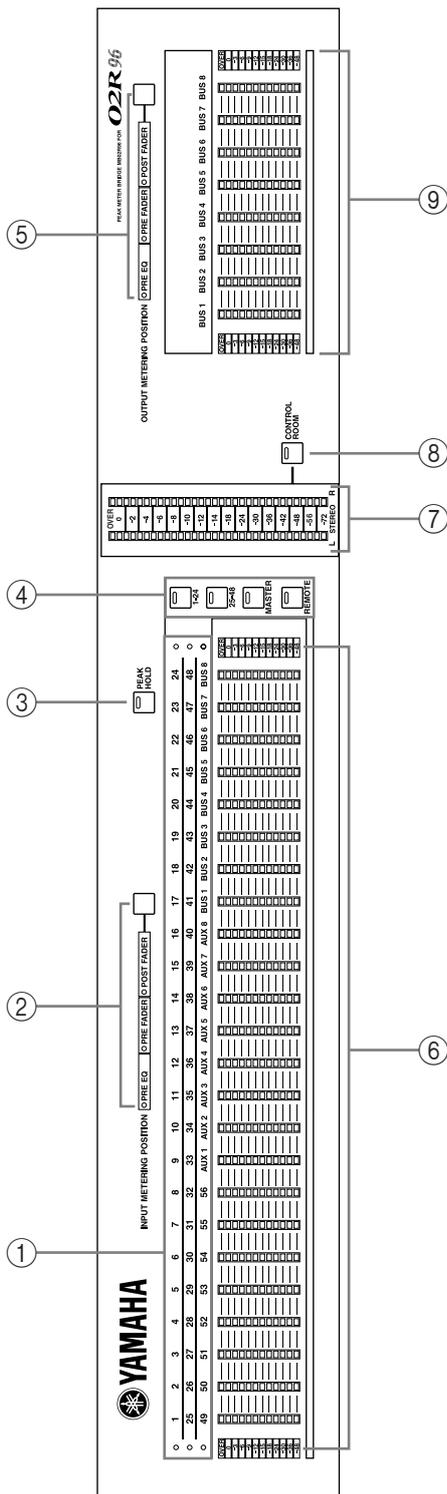


① **Channel indicators**
These indicators show which channels are currently being metered: Input Channels 1–24, 25–48, or 49–56 and Aux Sends 1–8 and Bus Outs 1–8.

② **INPUT METERING POSITION button & indicators**
This button is used to set the metering position for Input Channels to pre-EQ, pre-fader, or post-fader. It works in unison with the PRE EQ, PRE FADER, and POST FADER buttons for Input Channels on the Meter pages. The indicators show the current setting.

③ **PEAK HOLD button**
This button is used to turn the Peak Hold function on and off. Its indicator lights up when Peak Hold is on. It works in unison with the PEAK HOLD buttons on the Meter pages.

④ **LAYER buttons**
These button are used to select Layers for metering. The button indicator for the currently selected Layer lights up. If the Meter Follow Layer preference is on (see page 231), these Layers are selected automatically when the LAYER buttons on the 02R96 are pressed.

⑤ **OUTPUT METERING POSITION button & indicators**
This button is used to set the metering position for Output Channels to pre-EQ, pre-fader, or post-fader. It works in unison with the PRE EQ, PRE FADER, and POST FADER buttons for Output Channels on the Meter pages. The indicators show the current setting.

⑥ **Meters**
These 12-segment LED meters display the signals levels of the channels on the currently selected Layer.

⑦ **STEREO meters**
These 32-segment meters display the signal levels of the Stereo Out.

⑧ **CONTROL ROOM button**
This button is used to display the level of the Control Room signal on the STEREO meters. Its indicator lights up when the STEREO meters are displaying Control Room levels.

⑨ **BUS meters**
These 12-segment LED meters display Bus Out signal levels.

## SP02R96 Wooden Side Panels

Attach the side panels as shown below.
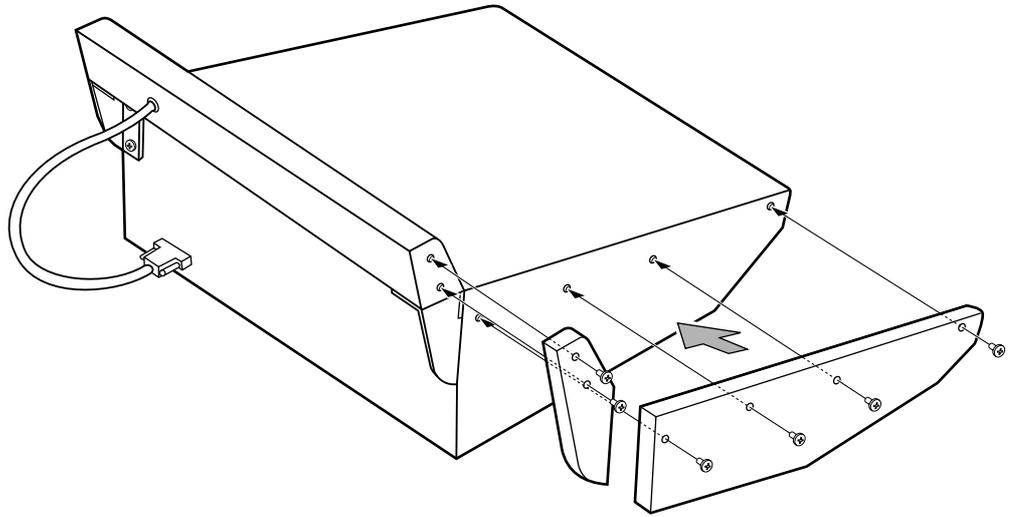
# Index

## Symbols

+48V ON/OFF switches 20

## Numerics

## A

## CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

The above warning is located on the top, side, or rear of the unit.

### Explanation of Graphical Symbols
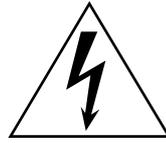
The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

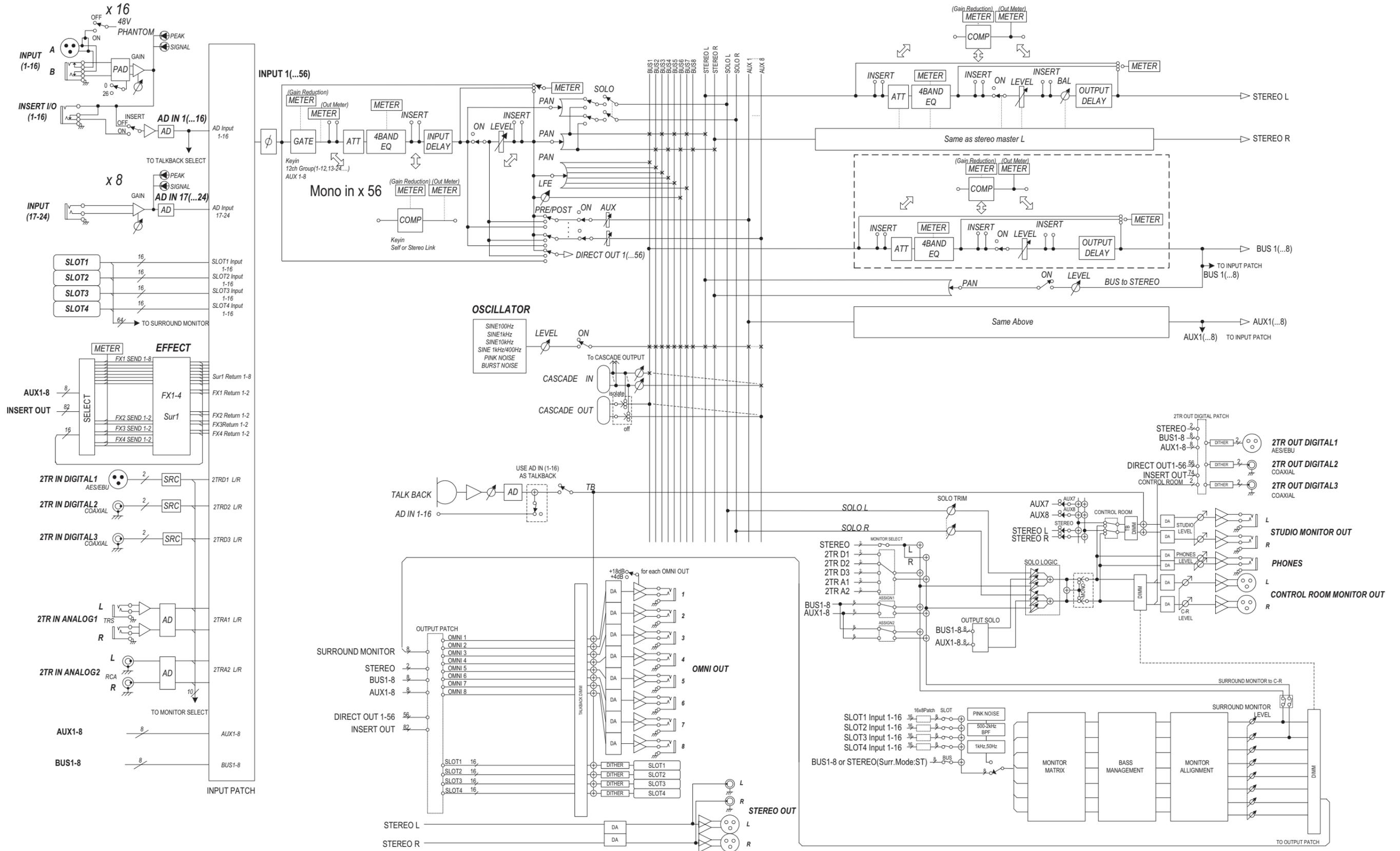# IMPORTANT SAFETY INSTRUCTIONS

1 Read these instructions.
2 Keep these instructions.
3 Heed all warnings.
4 Follow all instructions.
5 Do not use this apparatus near water.
6 Clean only with dry cloth.
7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11 Only use attachments/accessories specified by the manufacturer.
12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13 Unplug this apparatus during lightning storms or when unused for long periods of time.
14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
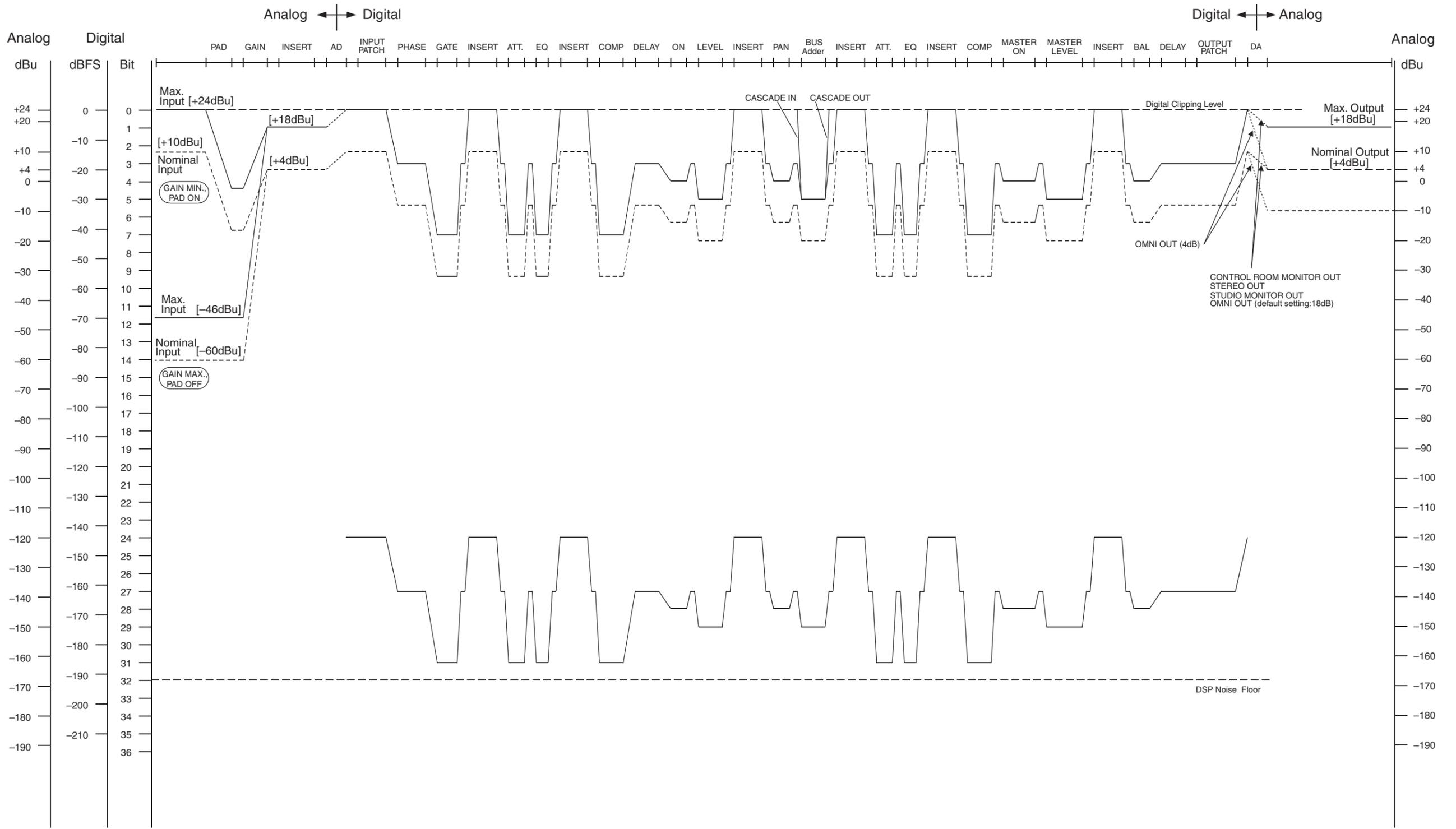
**WARNING**
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

(UL60065_03)

# 02R96 Block Diagram

# 02R96 Level Diagram



[0dBu = 0.775Vrms]
[0dBFS = Full Scale]

YAMAHA [Digital Mixing Console-Internal Parameters]    Date: 20 Mar. 2002

Model: 02R96          MIDI Implementation Chart    Version: 1.0

| Function... | | Transmitted | Recognized | Remarks |
|---|---|---|---|---|
| Basic Channel | Default | 1–16 | 1–16 | Memorized |
| | Changed | 1–16 | 1–16 | |
| Mode | Default | X | OMNI off/OMNI on | Memorized |
| | Messages | X | X | |
| | Altered | ************** | X | |
| Note Number | | X | 0–127 | |
| | True Voice | ************** | X | |
| Velocity | Note On | X | O | Effect Control |
| | Note Off | X | O | |
| After | Key's | X | X | |
| | Ch's | X | X | |
| Pitch Bend | | X | X | |
| Control Change | 0-95,102-119 | O | O | Assignable |
| Prog Change | | 0–127 | 0–127 | Assignable |
| | :True# | ************** | 0–99 | |
| System Exclusive | | O | O | *1 |
| System Common | :Song Pos | X | O | Automix |
| | :Song Sel | X | X | |
| | :Tune | X | X | |
| System Real Time | :Clock | X | O | Automix, Effect Control |
| | :Commands | X | O | |
| Aux Messages | :Local ON/OFF | X | X | |
| | :All Notes OFF | X | X | |
| | :Active Sense | X | O | |
| | :Reset | X | O | |
| Notes | | MTC quarter frame message is recognized (MTC IN & MIDI IN). *1: Bulk Dump/Request, Parameter Change/Request, and MMC. For MIDI Remote, ALL messages can be transmitted. | | |

Mode 1: OMNI ON, POLY      Mode 2: OMNI ON, MONO       O: Yes
Mode 3: OMNI OFF, POLY     Mode 4: OMNI OFF, MONO      X: No

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