



O2R 96

DIGITAL MIXING CONSOLE

Owner's Manual



Keep This Manual For Future Reference.



FCC INFORMATION (U.S.A.)

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!** This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.
2. **IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s. In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

WARNING: THIS APPARATUS MUST BE EARTHED

IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH
BLUE : NEUTRAL
BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN and YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured GREEN and YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

ADVARSEL!

Lithumbatteri—Eksplodingsfare ved fejlagtig håndtering. Udsiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandoren.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparatillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

* This applies only to products distributed by YAMAHA KEMBLE MUSIC (U.K.) LTD.

NEDERLAND

- Dit apparaat bevat een lithium batterij voor geheugen back-up.
- Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat aan het einde van de levensduur afdankt of de volgende Yamaha Service Afdeling:
Yamaha Music Nederland Service Afdeling
Kanaalweg 18-G, 3526 KL UTRECHT
Tel. 030-2828425
- Gooi de batterij niet weg, maar lever hem in als KCA.

THE NETHERLANDS

- This apparatus contains a lithium battery for memory back-up.
- For the removal of the battery at the moment of the disposal at the end of the service life please consult your retailer or Yamaha Service Center as follows:
Yamaha Music Nederland Service Center
Address: Kanaalweg 18-G, 3526 KL
UTRECHT
Tel: 030-2828425
- Do not throw away the battery. Instead, hand it in as small chemical waste.



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 side 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 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.
- 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.
- 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.

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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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.yamaha.co.jp/product/proaudio/homeenglish/>>.

Package Contents

- 02R96 Digital Mixing Console
- CD-ROM
- Power cord
- This manual

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 29.

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 87. 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 31 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.

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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 52 presets, 76 user memories
- 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 and 5.1 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

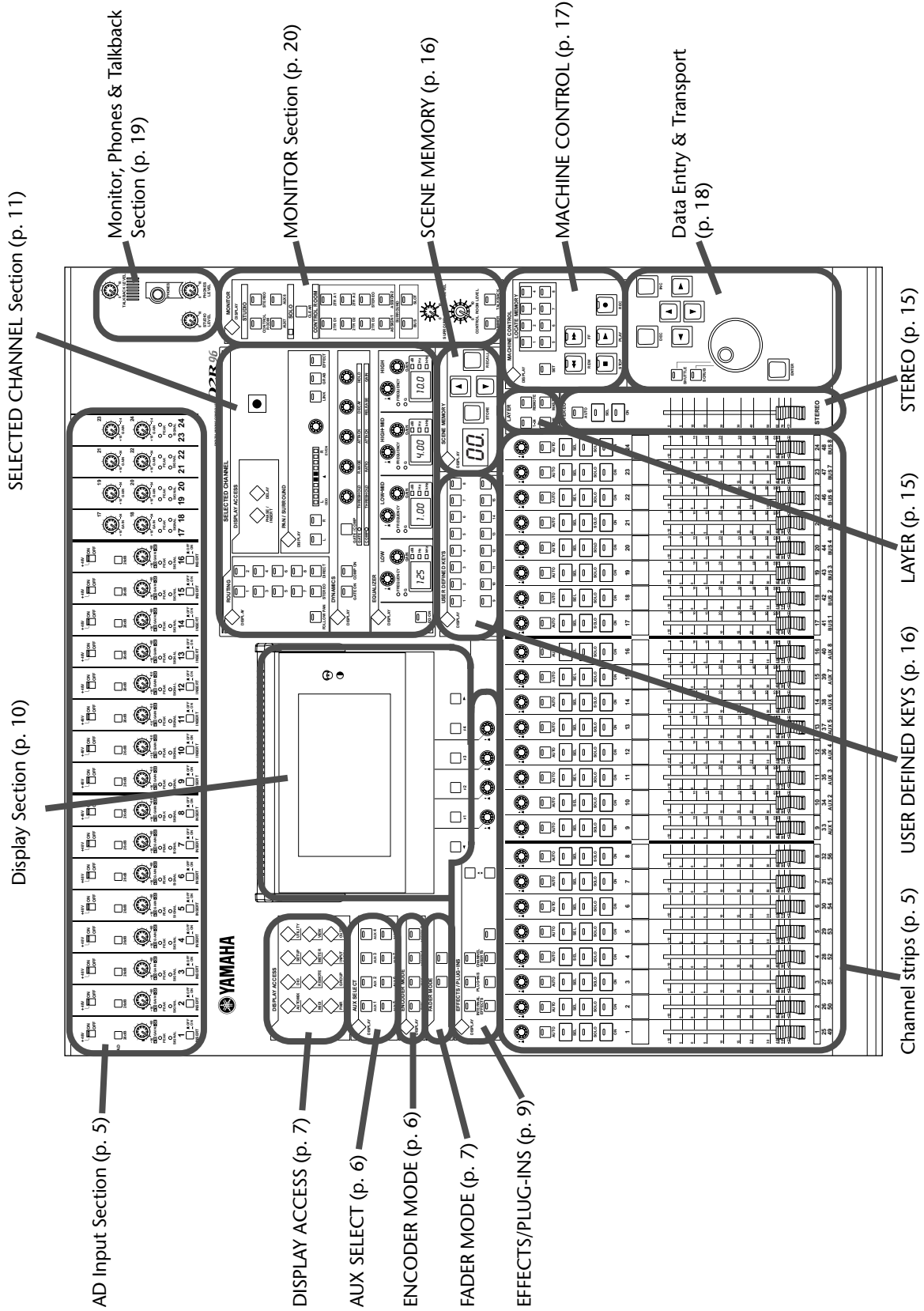
- Standard MIDI ports, USB TO HOST port, SERIAL TO HOST port, or mLAN MIDI I/O
- USB, SERIAL, and mLAN option offer multiport operation
- Scene recall, mix parameter control, Bulk Dump, MTC and MIDI Clock for Automix synchronization, MMC for external machine control

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

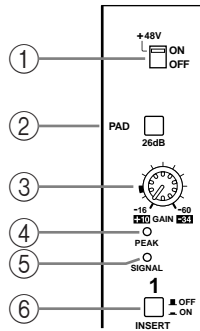
2 Control Surface & Rear Panel

Control Surface



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 39 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 39 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 39 for more information.

④ PEAK indicators

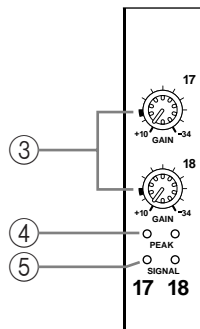
These indicators light up when the input signal level is 3 dB below clipping. See “PEAK & SIGNAL Indicators” on page 39 for more information.

⑤ SIGNAL indicators

These indicators light up when the input signal level is 20 dB below nominal. See “PEAK & SIGNAL Indicators” on page 39 for more information.

⑥ INSERT ON/OFF switches (AD 1–16)

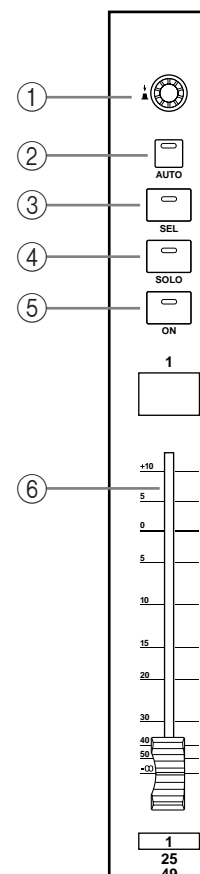
These switches are for turning on and off the AD Input inserts. See “AD Inserts (AD 1–16)” on page 40 for more information.



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 33 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 36 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 156 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 149 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 34 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 102 for more information.

⑤ ON buttons

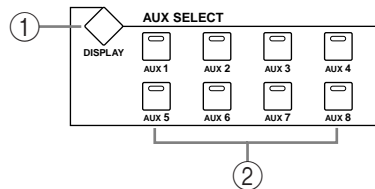
These buttons are used to mute Input and Output Channels. Their exact operation depends on the currently selected Layer. The [ON] button indicators of channels that are on light up.

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 35 for more information. Faders can be grouped for simultaneous operation. See “Grouping Input Channel Faders” on page 65 and “Grouping Output Channel Faders” on page 106 for more information.

Faders can also be used to select Input and Output Channels. See “Auto Channel Select & Touch Sense Select” on page 34 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 156 for more information.

AUX SELECT



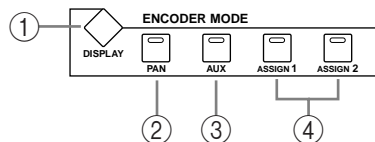
① AUX SELECT DISPLAY button

This button is used to select the following pages: Aux Send, Aux Send Pan, and Input Channel Aux View. See “Aux Sends” on page 79 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 79 for more information. These buttons can also be used to pair Aux Sends. See “Pairing Channels” on page 104 for more information.

ENCODER MODE



① ENCODER MODE DISPLAY button

This button is used to select the Encoder Mode Assign page. See “Selecting Encoder Modes” on page 36 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 36 for more information.

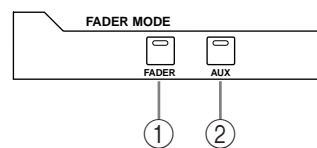
③ AUX button

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 36.

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 37 for more information.

FADER MODE



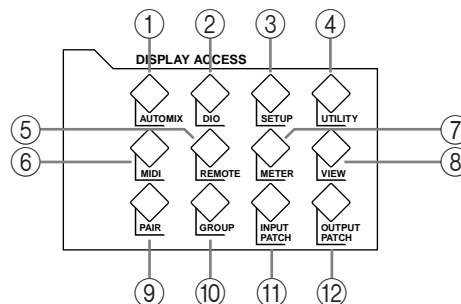
① FADER button

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 35 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 35 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 145 for more information.

② DIO button

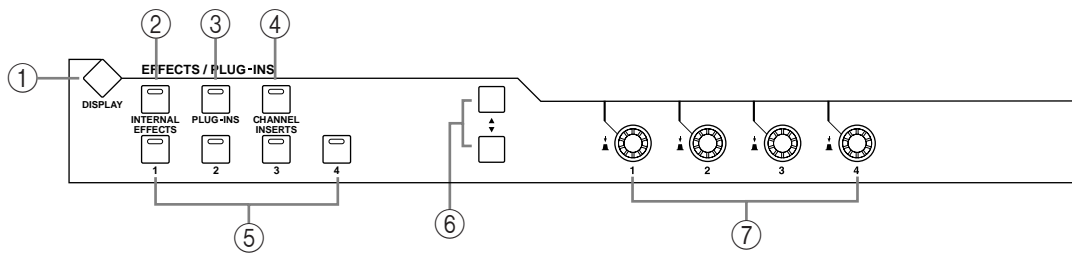
This button is used to select the following pages: Word Clock Select, Dither, Cascade In, Cascade Out, Sampling Rate Converter, and Higher Sample Rate Data Format. See “Digital I/O & Cascading” on page 41 for more information.

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, and Time Signature.

- ④ **UTILITY button**
This button is used to select the following pages: Oscillator, Channel Status Monitor, and Battery Check.
- ⑤ **REMOTE button**
This button is used to select the Remote page. See “About the Remote Layer” on page 189 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 163 for more information.
- ⑦ **METER button**
This button is used to select the following pages: Input Channel Meter, Master Meter, Effect 1-4, Stereo Meter, and Metering Position. See “Metering” on page 87 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 108, “Viewing Channel Fader Settings” on page 109, and “Channel Library” on page 123 for more information.
- ⑨ **PAIR button**
This button is used to select the Input and Output Pair pages. See “Pairing Channels” on page 104 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, and the Output Comp Link.
- ⑪ **INPUT PATCH button**
This button is used to select the following pages: Input Channel Patch, Input Channel Insert In Patch, Effects 1–4 Input Patch, Input Channel Name, and Input Patch Library. See “Input Patching” on page 52 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, Output Channel Name, and Output Patch Library. See “Output Patching” on page 54 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 131 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 133 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 136 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 133 and “Editing Plug-Ins” on page 136 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

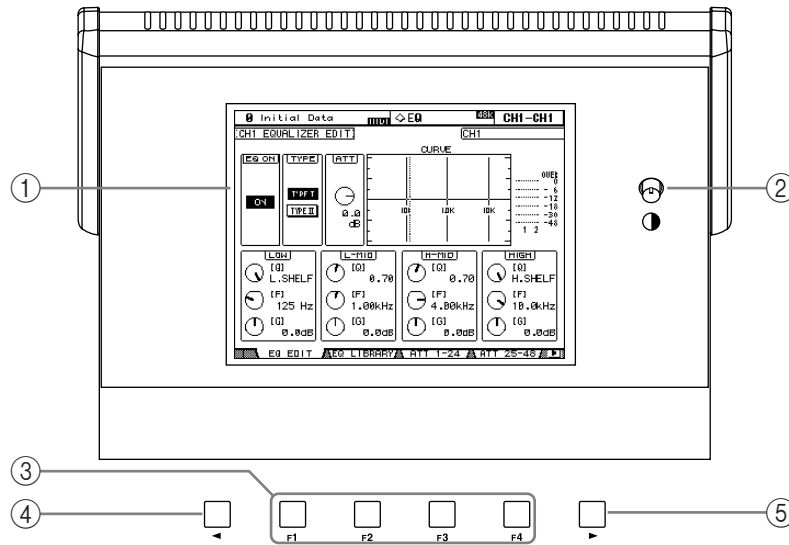
These buttons are used to select the rows of internal effects processor and Plug-In parameters for editing with Parameter controls 1–4. The parameters in the currently selected row appear highlighted. Up to 16 parameters can be displayed at a time. If more are available, an up or down arrow is displayed. See “Editing Effects” on page 133 and “Editing Plug-Ins” on page 136 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 133 and “Editing Plug-Ins” on page 136 for more information.

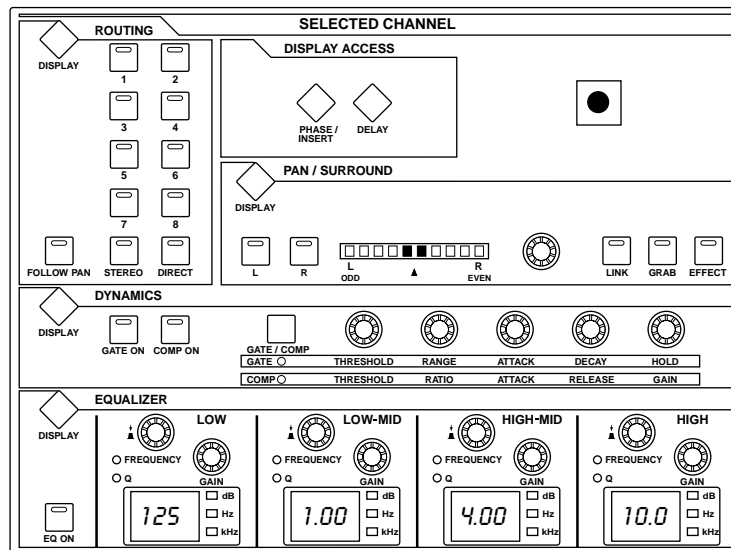
The push switches are used to punch the Effects or Plug-In parameters currently being controlled by the rotary controls in and out during Automix recording. See “Punching In & Out Individual Parameters” on page 156 for more information.

Display Section



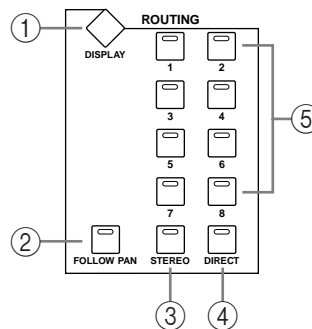
- ① **Display**
This 320 x 240 dot display with fluorescent backlight displays pages, information on the currently selected Scene and channel, the sampling rate, and more. See “About the Display” on page 29 for more information.
- ② **Contrast control**
This control is used to adjust the contrast of 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 31 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 31 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 31 for more information.

SELECTED CHANNEL Section



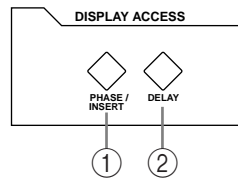
The subsections of the SELECTED CHANNEL section are explained below.

ROUTING



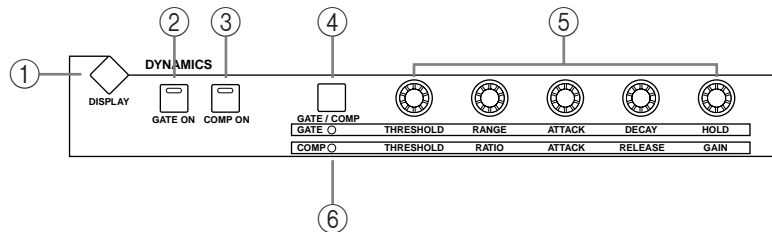
- ① **ROUTING DISPLAY button**
This button is used to select the following pages: Input Channel Routing, Bus to Stereo, and Bus to Stereo Library. See “Routing Input Channels” on page 66 and “Sending Bus Outs to the Stereo Out” on page 78 for more information.
- ② **FOLLOW PAN button**
This button determines whether or not the currently selected Input Channel’s pan setting is applied to the Bus Outs. Its indicator lights up when it’s pressed. See “Routing Input Channels” on page 66 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 66 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 66 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 66 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 59 and “Using Inserts” on page 95 for more information.
- ② **DELAY button**
This button is used to select the Delay pages. See “Delaying Channel Signals” on page 101 for more information.

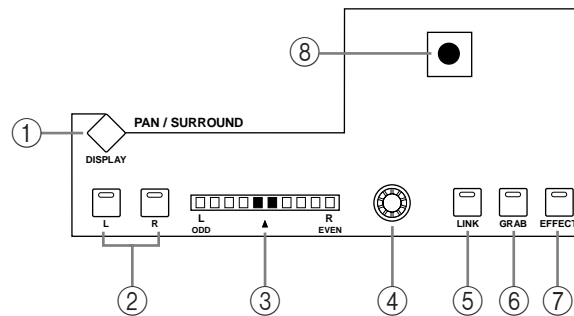
DYNAMICS



- 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 60 and “Compressing Channels” on page 97 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 60 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 97 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 60 and “Compressing Channels” on page 97 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 60 and “Compressing Channels” on page 97 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 60 and “Compressing Channels” on page 97 for more information.

PAN/SURROUND

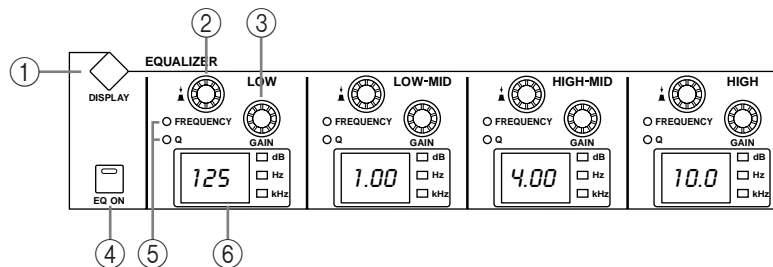


- ① **PAN/SURROUND DISPLAY button**
This button is used to select the Input Channel Pan pages, the Surround Mode page, and the Surround Edit pages. See “Panning Input Channels” on page 67 and “Using Surround Pan” on page 69.
- ② **L & R buttons**
These buttons can be used to select horizontally or vertically 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 67 and “Balancing the Stereo Out” on page 75.
- 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 67 and “Using Surround Pan” on page 69 for more information.
- ⑥ **GRAB button**
This button, which is enabled only when a Surround mode other than Stereo is selected, 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. 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.

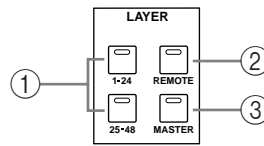
- ⑦ **EFFECT button**
This button is used to select the Joystick for parameter control of the Reverb 5.1 effect. Its indicator lights up when Reverb 5.1 effect control is on, and the Joystick cannot be used for surround panning. See “REVERB 5.1” on page 245 for more information.

- 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 245 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 69 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 67 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 91 for more information.
- ③ **EQ GAIN controls**
These controls are used to set the gain of each EQ band. See “Using EQ” on page 91 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 91 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 91 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 91 for more information.

LAYER**① 1–24 & 25–48 buttons**

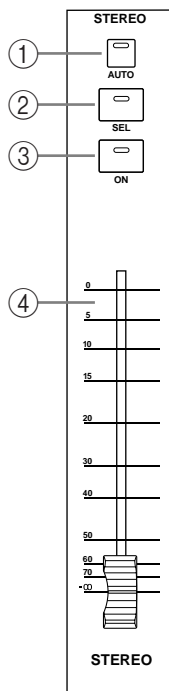
These buttons select the Input Channel Layers, which determine which Input Channels are controlled by the channel strips. The LAYER button indicator for the currently selected Layer lights up. See “Selecting Layers” on page 33 for more information.

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 189 for more information. Its button indicator lights up when the Remote Layer is selected. See “Selecting Layers” on page 33 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 33 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 149 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 34 for more information. It can also be used to add and remove the Stereo Out to and from EQ, Comp, Fader, and Mute groups.

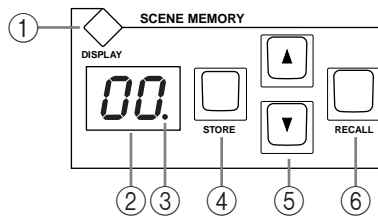
③ ON button

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 74 for more information.

④ Fader

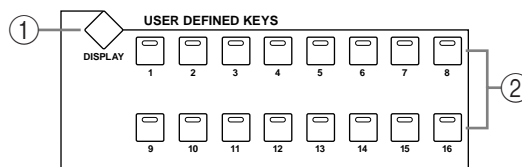
This 100 mm touch-sensitive motorized fader is used exclusively to adjust the level of the Stereo Out. See “Setting the Stereo Out Level” on page 74 for more information. It can be grouped with other Output Channel faders for simultaneous operation. See “Grouping Output Channel Faders” on page 106 for more information. It can also be used to select the Stereo Out, see “Auto Channel Select & Touch Sense Select” on page 34, or to punch the Stereo Out in and out during Automix recording. See “Punching In & Out Individual Parameters” on page 156 for more information.

SCENE MEMORY



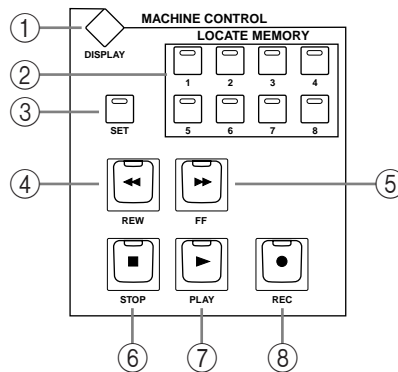
- ① **SCENE MEMORY DISPLAY button**
This button is used to select the following pages: Scene Memory, Input Channel Fade Time, Output Fade Time, Recall Safe, and Scene Memory Sort. See “Scene Memories” on page 138 for more information.
- ② **Scene memory display**
This displays the number of the currently selected Scene memory. See “Scene Memories” on page 138 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 138 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 140.
- 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 140.
- ⑥ **RECALL button**
This button is used to recall the selected Scene memory. See “Storing & Recalling Scenes with the SCENE MEMORY Buttons” on page 140.

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 196 for more information.
- ② **USER DEFINED KEYS 1–16 buttons**
Up to 16 functions, from a list of over 150, can be assigned to these buttons. See “Using the User Defined Keys” on page 196 for more information. These buttons have specific functions when the DAW Remote Layer is selected. See “About the Remote Layer” on page 189 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 194 and “Configuring Machines” on page 192 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 194 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 194 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 193.

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 193.

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 193.

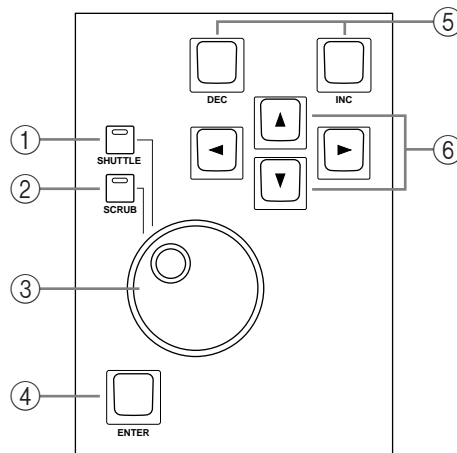
⑦ PLAY button

This button starts playback on the target machine (DAW, MMC). Its indicator lights up while playback is in progress. See “Transport Buttons” on page 193.

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 193.

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 193 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 193 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 193 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.

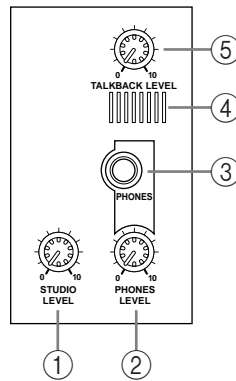
These buttons can also be used to set on/off-type parameters, such as EQ ON/OFF. When such a parameter is selected, pressing the [DEC] button turns the function off, pressing the [INC] button turns it on.

These buttons can also be 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**

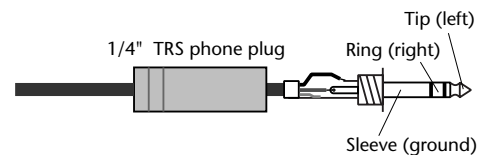
This control is used to set the level of the STUDIO MONITOR OUT. See “Studio Monitoring” on page 115 for more information.

② **PHONES LEVEL control**

This control is used to set the level of the PHONES. See “Control Room Monitoring” on page 114 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 121 for more information.

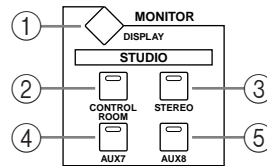
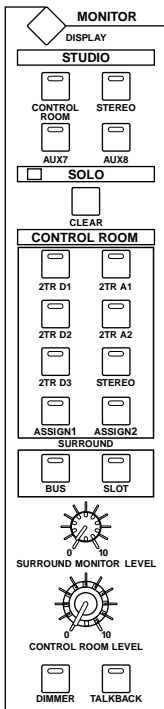
⑤ **TALKBACK LEVEL control**

This control is used to set the level of the built-in talkback microphone. See “Using Talkback” on page 121 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, and Talkback Setup. See “Configuring Solo” on page 102, “Control Room Monitoring” on page 114, and “Using Talkback” on page 121 respectively for more information. When a Surround Pan mode is selected, the following pages can also be selected: Surround Monitor, Surround Monitor Setup, Surround Monitor Patch, and Surround Monitor Library. See “Surround Monitoring” on page 116 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 115 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 115 for more information.

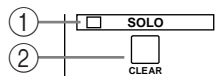
④ AUX 7 button

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 115 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 115 for more information.

SOLO



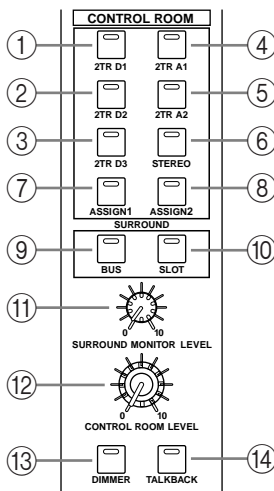
① SOLO indicator

This indicator flashes when one or more Channels are soloed, indicating that the Solo function is active. See “Soloing Channels” on page 102 for more information.

② CLEAR button

This button can be used to unsolo all soloed Channels. See “Soloing Channels” on page 102 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 114 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 114 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 114 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 114 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 114 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 114 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 115 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 115 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 116 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 116 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 116 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 114 for more information.

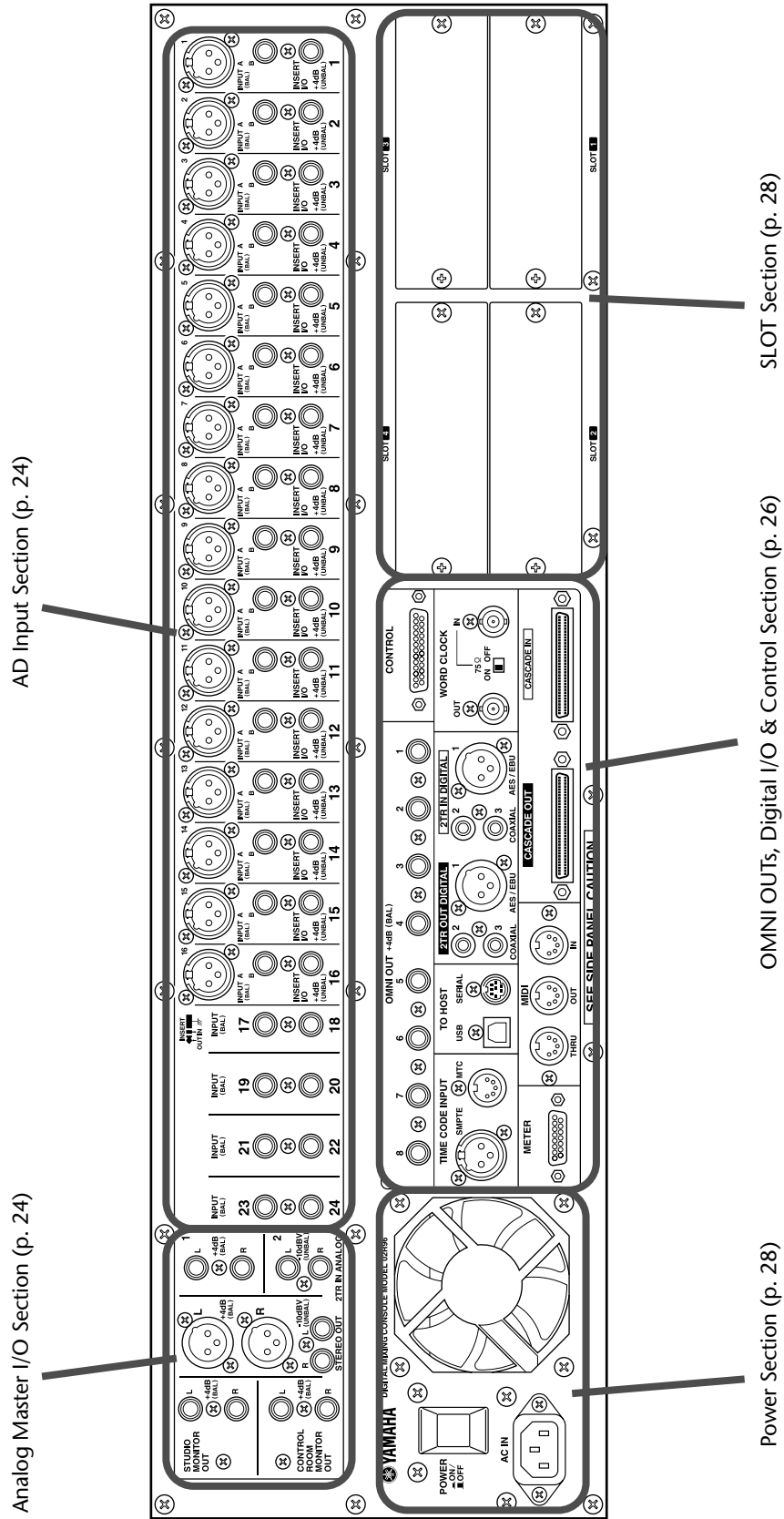
⑬ DIMMER button

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 114 for more information.

⑭ TALKBACK button

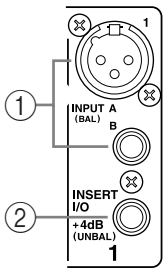
This button turns on the Talkback function, which distributes the Talkback mic signal to the Studio Monitor Outs and any Slot or Omni Outputs specified on the Talkback Setup page. See “Using Talkback” on page 121 for more information.

Rear Panel



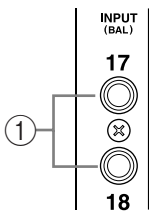
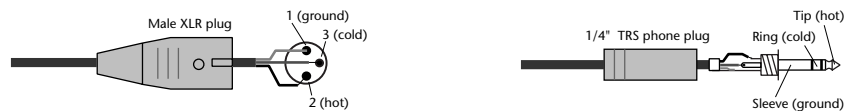
AD Input Section

AD Input #1 is shown at the top; AD Inputs #17 and #18 below



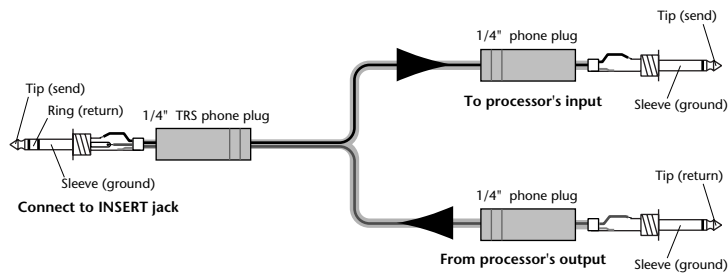
① **INPUT A & B (BAL) connectors**

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 39 for more information.

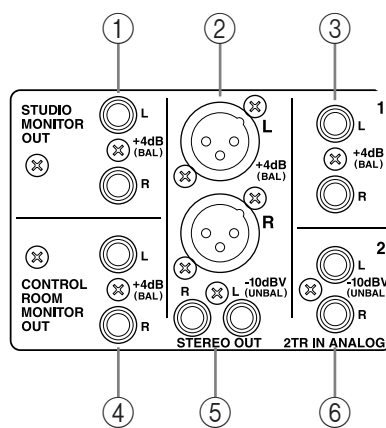


② **INSERT I/O +4dB (UNBAL) connectors (AD 1–16)**

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 39 for more information.

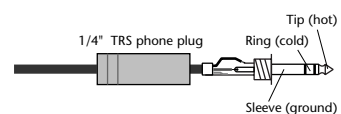


Analog Master I/O Section



① **STUDIO MONITOR OUT +4 dB (BAL)**

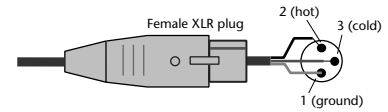
These balanced 1/4-inch TRS phone jacks, nominal output level +4 dB, output the analog Studio Monitor signal for monitoring in the actual studio. The source, which is selected by using the STUDIO buttons in the MONITOR section, can be Aux Send #7, Aux Send #8, the Stereo Out, or Control Room. The output



level is controlled by the STUDIO LEVEL control. See “Studio Monitoring” on page 115 for more information.

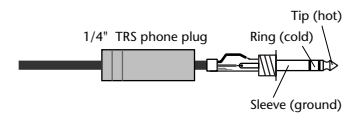
② **STEREO OUT +4 dB (BAL)**

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 73.



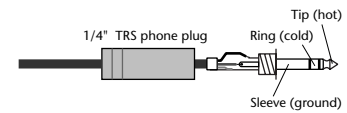
③ **2TR IN ANALOG 1 +4 dB (BAL)**

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 40.



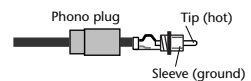
④ **CONTROL ROOM MONITOR OUT +4 dB (BAL)**

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 114 for more information.



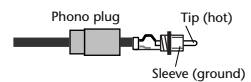
⑤ **STEREO OUT –10 dBV (UNBAL)**

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 73.

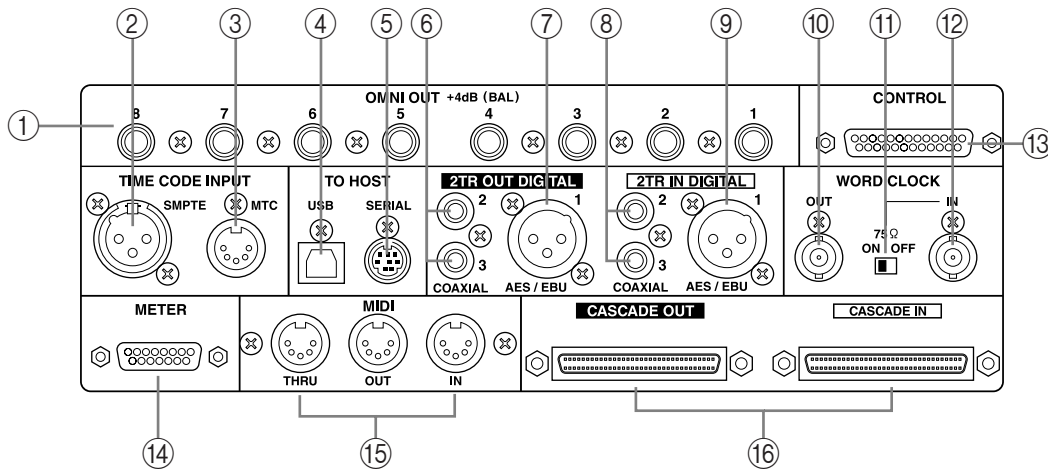


⑥ **2TR IN ANALOG 2 –10 dBV (UNBAL)**

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 40.

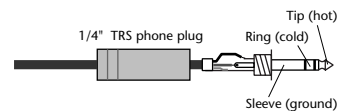


OMNI OUTs, Digital I/O & Control Section



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 Channels. See “Omni Outs” on page 40.



② SMPTE TIME CODE INPUT connector

This balanced XLR-3-31-type connector is used to input SMPTE timecode for synchronizing the Automix function. See “Selecting the Timecode Source & Frame Rate” on page 152.

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 152.

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 163 for more information.

⑤ SERIAL TO HOST port

This 8-pin mini DIN port is for MIDI communication between the 02R96 and a host computer with a serial port. See “MIDI I/O” on page 163 for more information.

⑥ 2TR OUT DIGITAL COAXIAL 2 & 3

These phono connectors output consumer format (IEC-60958) digital audio, and are typically 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 43 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 connected 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 43 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 44 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 44 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 41 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 43 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 42 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 195 for more information.

⑭ METER port

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

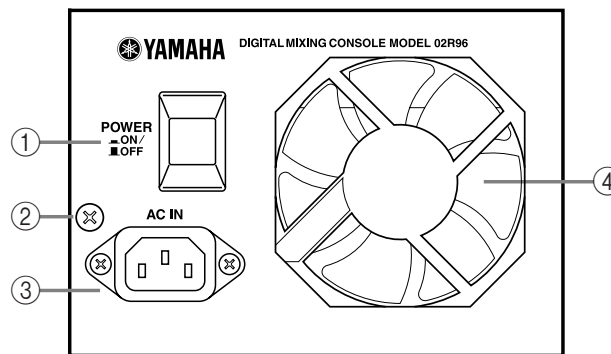
⑮ MIDI IN, OUT & THRU ports

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 163 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 49 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 29 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.

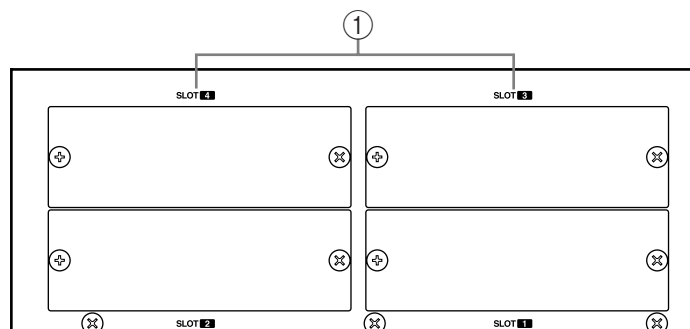
③ AC IN connector

This connector is used to connect the 02R96 to an AC outlet via the supplied power cord. See “Connecting the Power Cord” on page 29 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

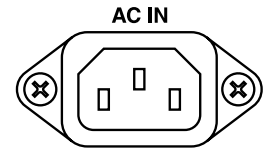
These four slots are for use with optional mini YGDAI cards, which offer a variety of analog and digital I/O options. See “Slot I/O” on page 45 for more information. Slot inputs can be patched to Input Channels or Insert Ins. See “Input Patching” on page 52 for more information. The following signals 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 54 for more information.

3 Operating Basics

Connecting the Power Cord

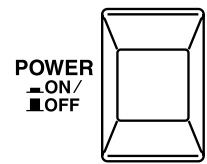
Warning: Turn off all equipment connected to the 02R96 before making any power connections.

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

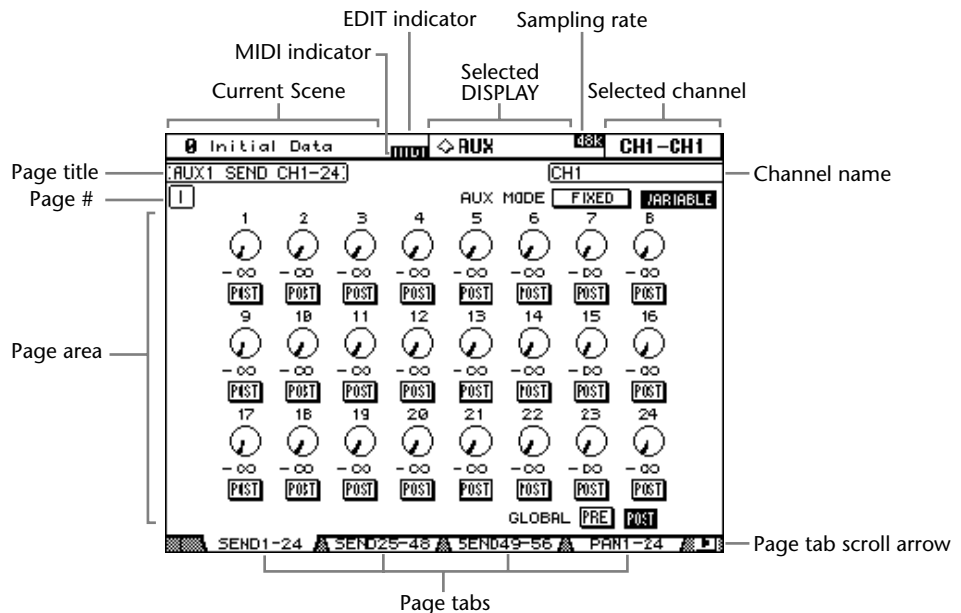
To prevent loud clicks and thumps in your speakers, turn on your audio equipment in the following order (reverse this order when turning off)—sound sources, multitrack and master recorders, 02R96, monitoring power amplifiers.



- 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 140 for more information. If the selected Scene is write-protected, a padlock icon appears. See “Using the Scene Memory Page” on page 141 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 138 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: This indicates the current sampling rate—44.1 kHz (44k), 48 kHz (48k), 88.2 kHz (88k), or 96 kHz (96k).

Selected channel: The Input or Output Channel currently selected by the [SEL] buttons is indicated here. See “Selecting Channels” on page 34. 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 112. If the Channel ID preference is on, only the Channel ID is displayed. See “Channel ID/Channel” on page 198 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 31 for more information.

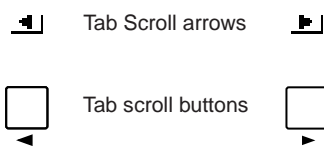
Page tab scroll arrows: These arrows indicate that there are more pages available. See “Selecting Display Pages” on page 31 for more information.

Selecting Display Pages



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, EQUALIZER, SCENE MEMORY, USER DEFINED KEYS, MACHINE CONTROL, MONITOR. 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.



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.

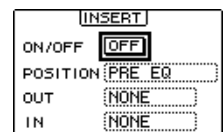
The currently selected page in a group, and the parameter selected on that page, are remembered when you select another group of pages, so when you return to that group, by pressing its [DISPLAY] button, that page is displayed with the same parameter selected.

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 EQUALIZER control is operated. See page 197 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.



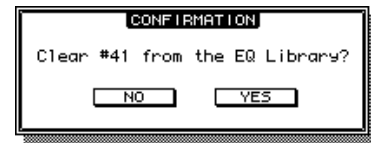
Parameter Windows

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.



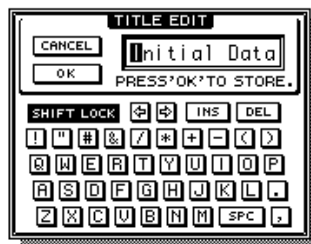
Confirmation Messages

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, lowercase characters and numbers.



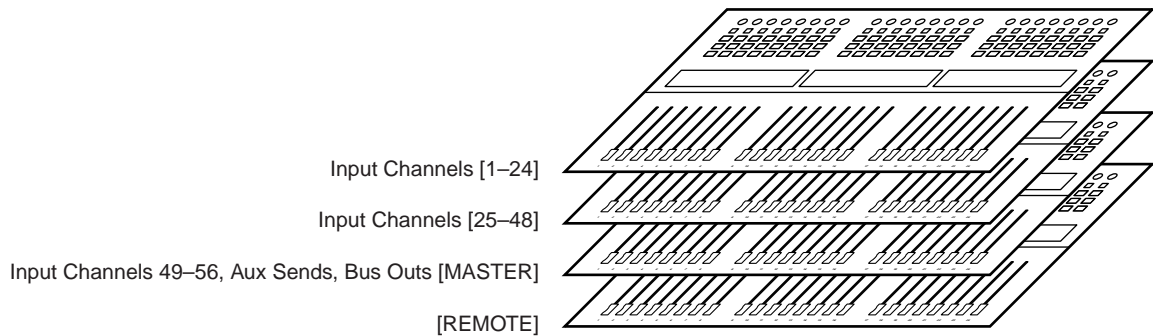
Use the cursor buttons to select characters, and the [ENTER] button to enter them into the title. The cursor moves to the right automatically as each character is entered. The Parameter wheel or the arrow buttons can be used to move the cursor within the title.

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.

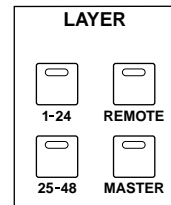
Selecting Layers

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.



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.



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 189 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 35 and “Selecting Encoder Modes” on page 36 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 33.**
- 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 30).

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 189 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.

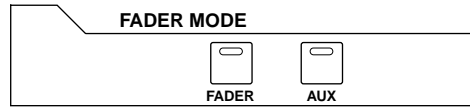
Auto Channel Select & Touch Sense Select

While the Auto Channel Select preference is on (see page 197), channels can be selected by moving the corresponding fader or Encoder, or by turning on the corresponding [AUTO], [SOLO], or [ON] button. While the Touch Sense Select preference is on (see page 199), 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 33.**
- 2 **Use the FADER MODE buttons to select a Fader mode.**



[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.

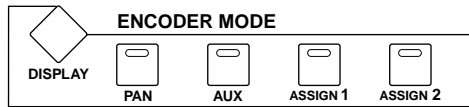
Layer	Fader Mode	Fader		
		1-8	9-16	17-24
1-24	Fader	Input Channels 1-24 level		
	Aux	Input Channels 1-24 Aux Send level		
25-48	Fader	Input Channels 25-48 level		
	Aux	Input Channels 25-48 Aux Send level		
Master	Fader	Input Channels 49-56 level	Aux Sends 1-8 master level	Bus Outs 1-8 master level
	Aux	Input Channels 49-56 Aux Send level	No operation: faders fixed at $-\infty$	
Remote	Fader	Operation depends on the selected target. See "About the Remote Layer" on page 189 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 33.**
- 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 37 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		
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		
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 189 for more information.		
	Aux			
	Assign 1/2			

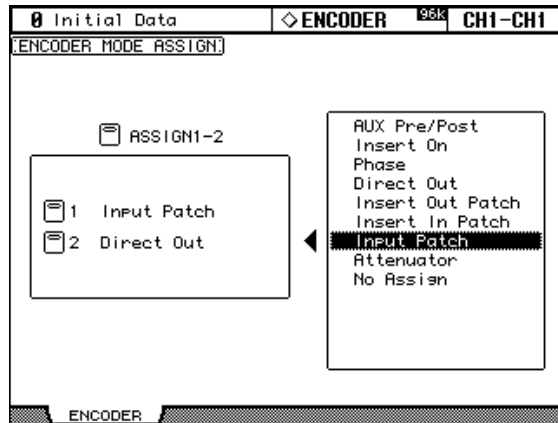
Assigning Parameters to the ENCODER MODE Assign Buttons

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 38 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 patch selection
4	Insert In Patch	Insert In patch	Confirm patch selection
5	Insert Out Patch	Insert Out patch	Confirm patch selection
6	Direct Out	Direct Out patch	Confirm 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. LFE Level	Surround LFE level	—
42	Surr. Pan Wheel	Surround Pan Wheel	—
43	Scene Fade Time	Scene Fade Time	—

4 Analog I/O & the AD Input Section

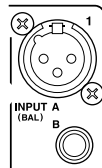
AD Input Section

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 52).

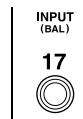
They can also be patched to Output Channel Insert Ins (see page 55).

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)



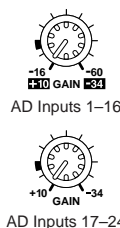
AD Inputs 1 through 16 feature switchable $+48$ V phantom powering for use with condenser-type microphones and direct boxes. Phantom power is supplied to the balanced XLR-3-31-type connector, and can be switched individually for each AD Input.

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



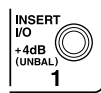
AD Inputs feature detented rotary gain controls with an input sensitivity of -16 dB to -60 dB, or $+10$ dB to -34 dB when the Pad is on ($+10$ dB to -34 dB for AD Inputs 17–24). The GAIN controls adjust the gain of the Head Amps, allowing you to optimize input signal levels for the best signal-to-noise 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 nominal. 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 nominal signal level 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 73 for information on the Stereo Out outputs.

Control Room Monitor Out

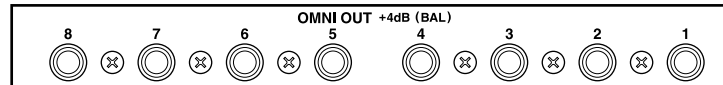
See page 114 for information on the Control Room Monitor output.

Studio Monitor Out

See page 115 for information on the Studio Monitor output.

Omni Outs

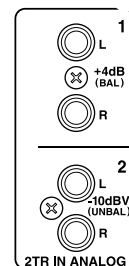
The 02R96 features assignable Omni Outs on balanced 1/4-inch TRS phone jacks. Omni Outs can be patched to Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or Surround Monitor Channels (see page 55). In addition, Input Channel Direct Outs can be patched to the Omni Outs (see page 56).



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 52), Input Channel Insert Ins (see page 53), or Output Channel Insert Ins (see page 55).



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.

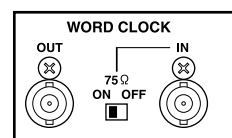
If you're connecting to the 02R96 using only analog inputs and outputs, no special wordclock settings are required, and the 02R96 can be set to use its own internally generated wordclock. If you're connecting other equipment digitally, however, you must decide which device to use as the wordclock master 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 43). The WORD CLOCK OUT outputs a wordclock signal at the same clock rate as the 02R96.

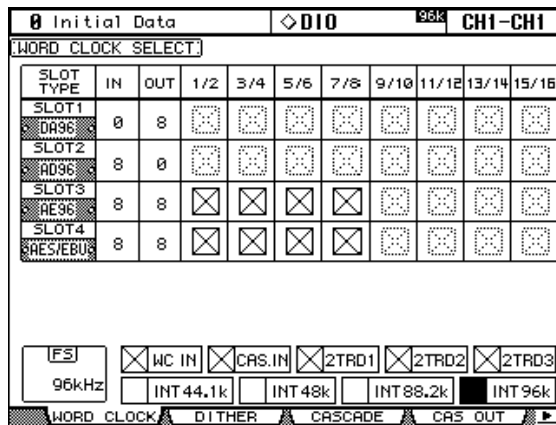


Selecting the Wordclock Source

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.

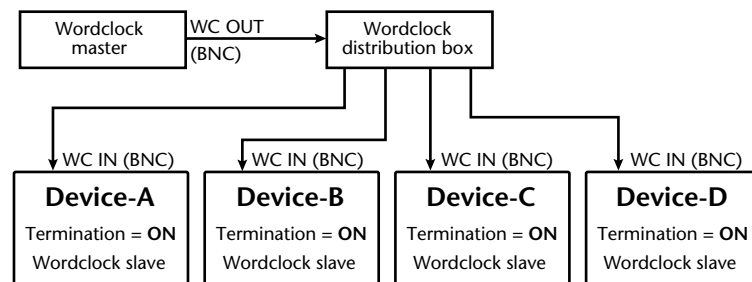
If an external wordclock source fails for some reason, the 02R96 automatically switches to its internal wordclock generator at the closest frequency.

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.

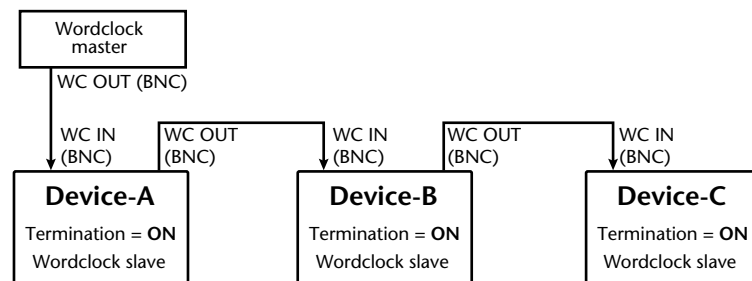
Star Distribution

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



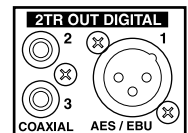
Daisy Chain Distribution

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.



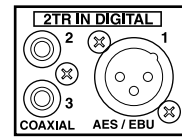
2TR Digital Outs

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 56). They can also be patched to Direct Outs (see page 56). Digital output signals can be dithered for transfer to lower-resolution systems (see page 48).



2TR Digital Ins

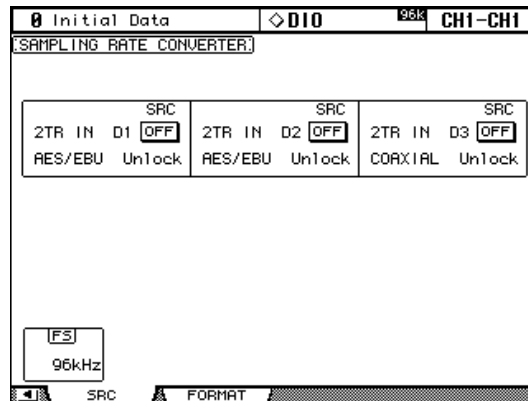
The 02R96 features three sets of 2-track digital inputs: 2TR IN DIGITAL AES/EBU 1 uses an XLR-3-31-type connector and accepts AES/EBU format digital audio. 2TR IN DIGITAL COAXIAL 2 and 3 use phono connectors and accept consumer format (IEC-60958) digital audio. These inputs can be monitored via the Control Room monitors by using the CONTROL ROOM [2TR D1], [2TR D2], and [2TR D3] buttons. They can be patched to Input Channels (see page 52), Input Channel Insert Ins (see page 53), or Output Channel Insert Ins (see page 55). Digital audio signals received at sampling rates other than the current 02R96 rate can be converted by the internal sampling rate converters (see page 44). You can monitor the Channel Status of digital signals present at these inputs on the Channel Status Monitor page (see page 48).



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 52), or to Output Channel Insert Ins (see page 55). Slot Outputs can be assigned to Bus Outs, Aux Sends, the Stereo Out, Insert Outs, or the Surround Monitor Channels (see page 54), or Direct Outs (see page 56).

Slot outputs can be dithered for digital audio transfer to lower-resolution systems (see page 48).

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.yamaha.co.jp/product/proaudio/homeenglish/>>.

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		8	—	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	25-pin D-sub
MY4-DA	Analog out	—	4	24-bit, 44.1/48 kHz	XLR-3-32 type (balanced) x4
MY8-DA96		—	8	24-bit, 44.1/48/88.2/96 kHz	
MY8-AE ²	AES/EBU I/O	8	8	24-bit, 44.1/48 kHz	25-pin D-sub
MY8-AE96				24-bit, 44.1/48/88.2/96 kHz	
MY8-AE96S ³					
MY8-AT ²	ADAT I/O				Optical x2
MY8-TD ²	Tascam			24-bit, 44.1/48 kHz	25-pin D-sub BNC wordclock output
MY8-mLAN	IEEE1394				6-pin 1394 connector x2

1. This card supersedes the 20-bit MY8-AD card.

2. Can handle 24-bit/96 kHz in Double Channel mode.

3. Same as MY8-AE96 except for onboard sampling rate converters.

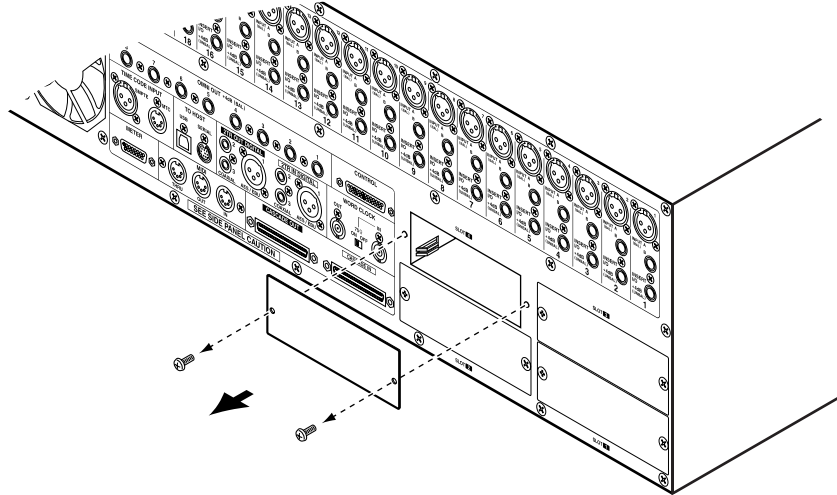
Card Combination Restrictions

For technical reasons, certain I/O Card combinations are not supported. If you use an unsupported combination, you run the risk of damaging the 02R96, in which case Yamaha will not take responsibility for any such damage. See the Yamaha Professional Audio Web site at the following URL for more details: <<http://www.yamaha.co.jp/product/proaudio/homeenglish/>>.

Installing I/O Cards

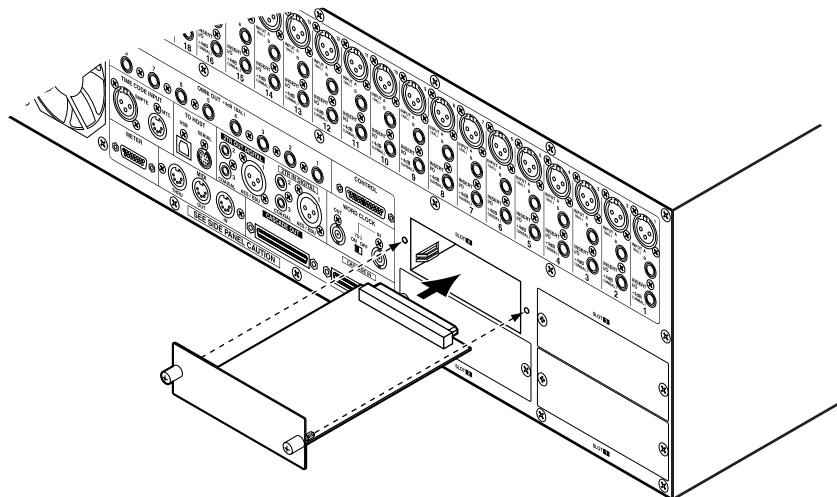
This section explains how to install I/O Cards.

- 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 42).

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.

Initial Data		DIO		96k		CH1-CH1	
HIGHER SAMPLE RATE DATA TRANSFER FORMAT							
SLOT TYPE	IN	OUT	SRC				
			1/2	3/4	5/6	7/8	
SLOT1	DOUBLE CHANNEL	DOUBLE CHANNEL	-	-	-	-	-
SLOT2	DOUBLE SPEED	DOUBLE CHANNEL	OFF	ON	ON	ON	96kHz
SLOTS	DOUBLE CHANNEL	DOUBLE CHANNEL	-	-	-	-	44.1kHz
SLOT4	DOUBLE CHANNEL	DOUBLE CHANNEL	-	-	-	-	48kHz
			-	-	-	-	88.2kHz
			-	-	-	-	

- 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 or Double Speed. 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.

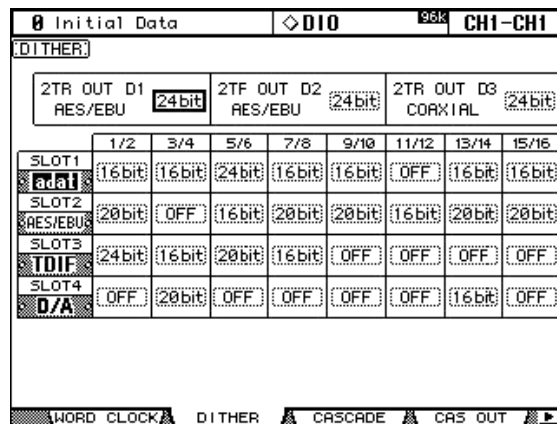
The IN and OUT parameters are only available when a higher sampling rate (i.e., 88.2 kHz or 96 kHz) is selected. When the sampling rate is 44.1 kHz or 48 kHz, all parameters on this page are unavailable. As are individual parameters for Slots with analog I/O Cards installed, or no I/O Card installed. 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 are fixed at Double Channel 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.

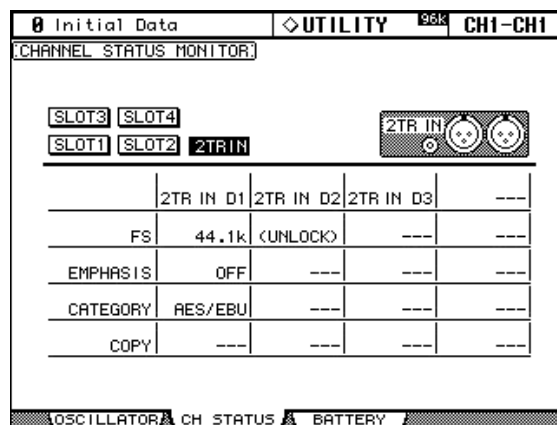
The SLOT column displays the names of any installed I/O Cards.

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.



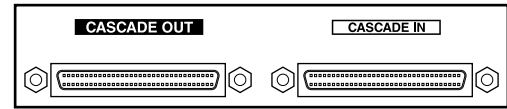
- 2 Use the cursor buttons to select the SLOT 1–4 and 2TR IN buttons, and the press [ENTER].

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

Cascading Consoles

Up to four 02R96s 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.



Linked Functions

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

- AUX SELECT
- Display page selection
- 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, Undo, 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.

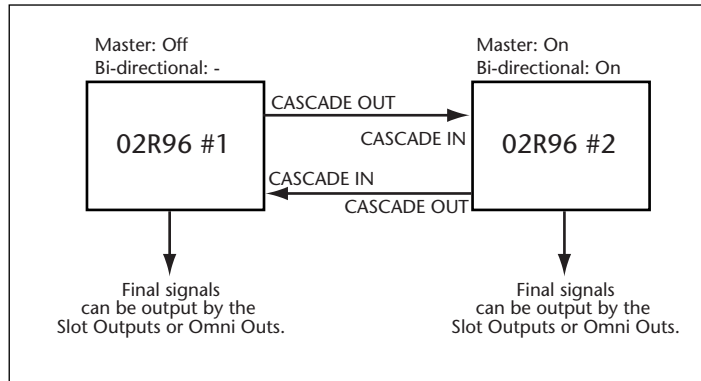
Function and parameter linking can be turned on or off by using the Cascade COMM Link preference (see page 198). The Solo function is always linked regardless of this preference.

Note: When the Cascade COMM Link preference is on, do not make any MIDI connections between cascaded 02R96s. If two 02R96s 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.

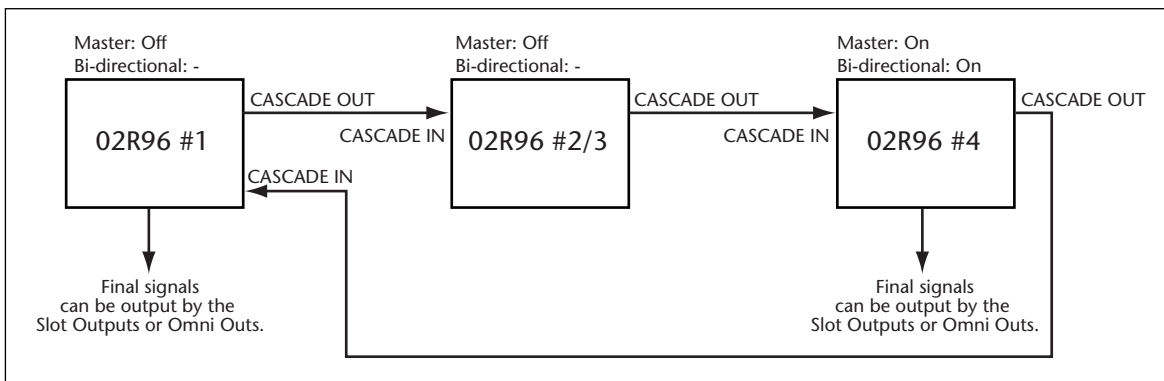
When the 02R96 is cascaded with a Yamaha DM2000 Digital Production Console, display page selection is not linked, and Matrix Send select actions, and Aux Send 9–12 select actions performed on the DM2000 are ignored by the 02R96.

Cascade Hookup Examples

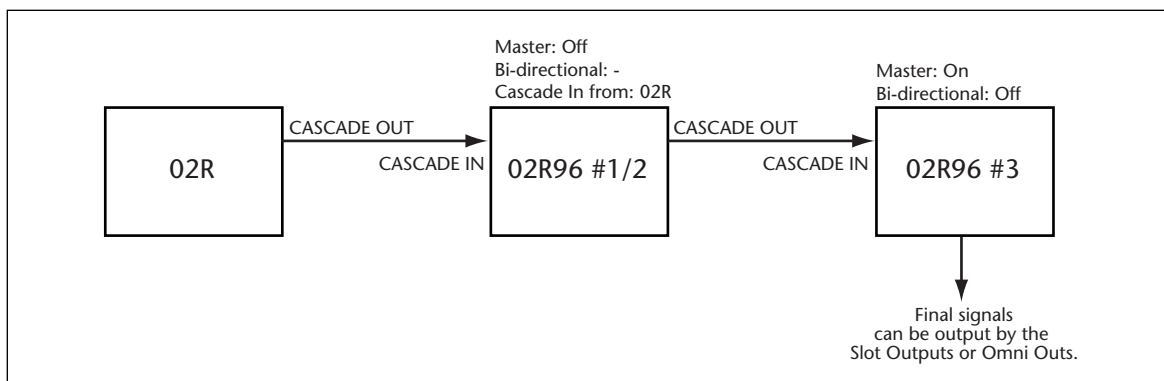
Cascading Two 02R96s



Cascading Three or More 02R96s



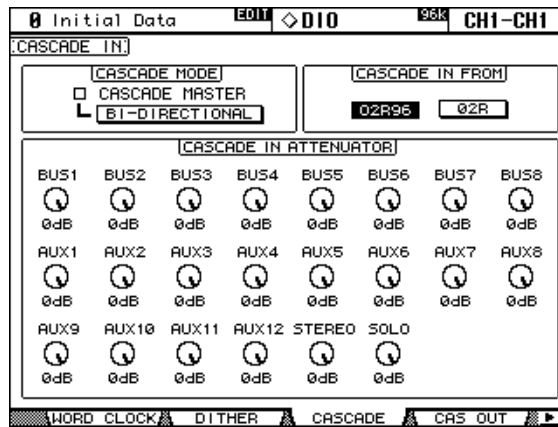
Cascading an 02R Digital Recording Console



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.



- 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.

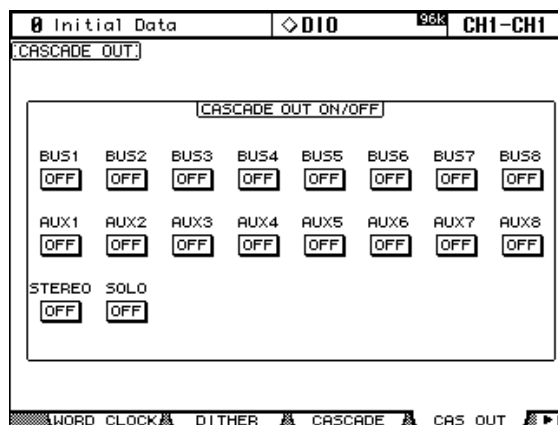
CASCADE IN FROM: This is used to specify the type of device connected to the CASCADE IN port, either 02R96 or 02R. When a 02R96 is connected to the CASCADE IN port, 02R96 is specified automatically.

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.



- 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

Signal sources 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.

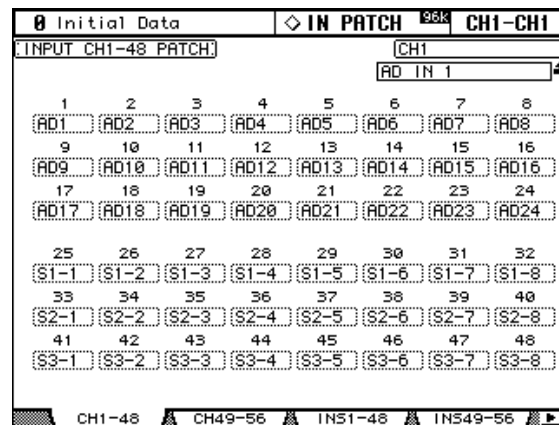
Patching can also be done by using the Patch Select Window (see page 57). Input Channel Inputs, Insert Ins, and Insert Outs can also be patched by using the Encoders (see page 58). See page 204 for a complete list of input patch sources. See page 207 for a list of initial input patches.

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 124 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.

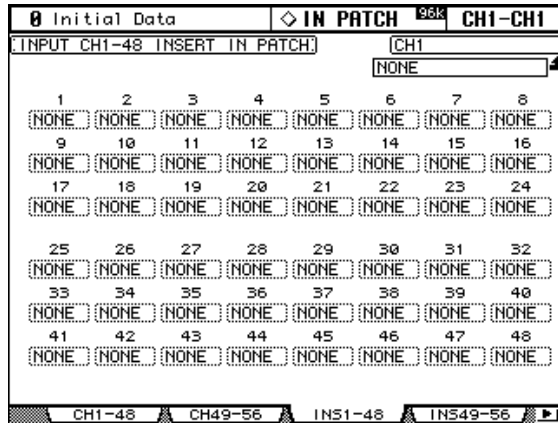


In addition to using the cursor buttons, Patch parameters can also be selected by using the LAYER and [SEL] buttons.

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.

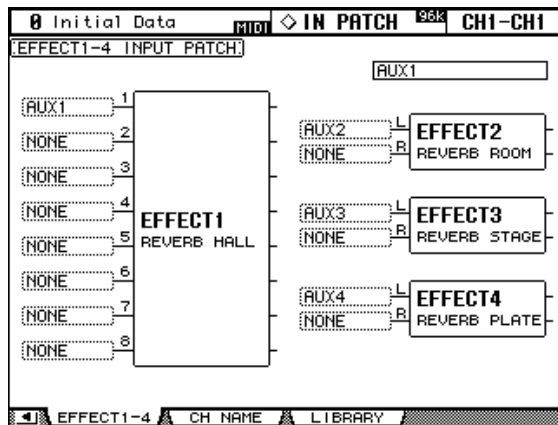
The Input Channel Insert In Patch parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Insert In Patch page is shown below. The layout of the other page is the same. When Vertical Input Channel pairing mode is selected, patch parameters for vertical partners are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

Aux Sends, internal effects processor outputs, or Output Channel Insert Outs can be patched to the internal effects processor inputs on the Effect 1–4 Input Patch page.



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 57). Insert Ins, Insert Outs, and Direct Outs can also be patched by using the Encoders (see page 58).

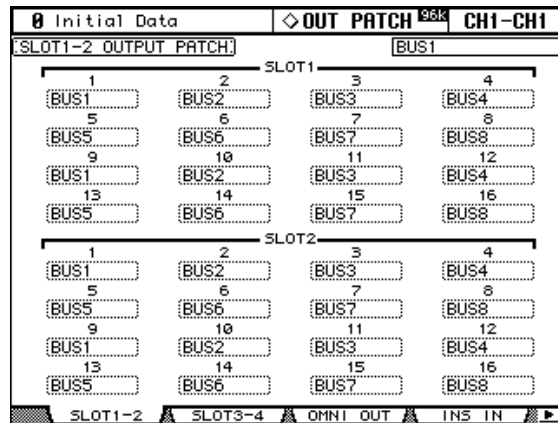
See page 208 for a complete list of output patch sources. See page 213 for a list of initial output patches.

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 124 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 56).

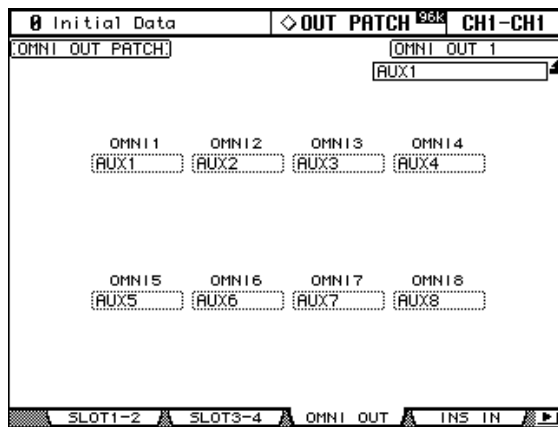
The Slot Output Patch parameters for the four Slots are arranged into two pages. The Slot 1–2 Output Patch page is shown below. The layout of the other page is the same.



When a Slot Output is patched to a Direct Out (see page 56), and that Direct Out is assigned on an Input Channel Routing page, the Slot Output patch cannot be changed here.

Patching Omni Outs

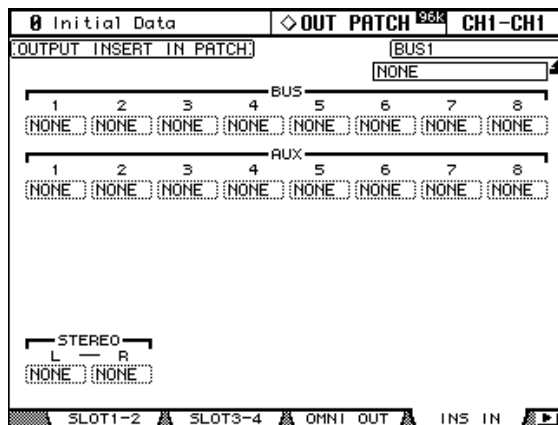
Bus Outs, Aux Sends, the Stereo Out, Input or Output Channel Insert Outs, or Surround Monitor Channels can be patched to the Omni Outs. Omni Outs can be patched to Direct Outs on the Direct Out Destination pages (see page 56).



When an Omni Out is patched to a Direct out (see page 56), 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.

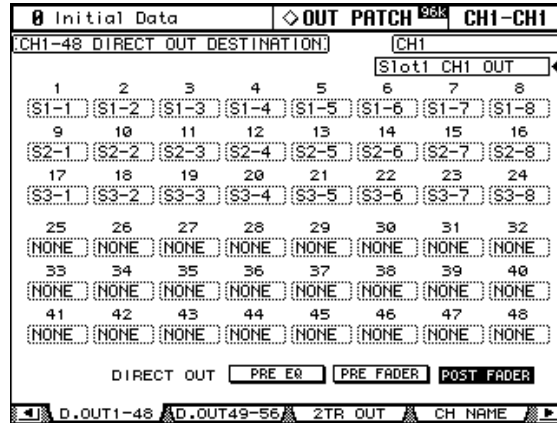


In addition to using the cursor buttons, Patch parameters can also be selected by using [SEL] buttons 9–24 and the STEREO [SEL] button while the Master Layer is selected.

Patching Direct Outs

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

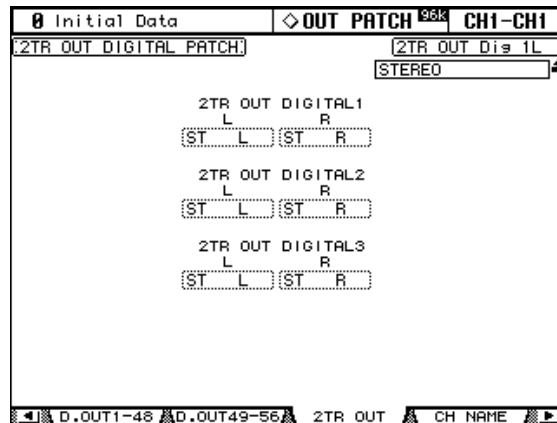
The Direct Out Destination parameters for the 56 Input Channels are divided between two pages. The Input Channel 1–48 Direct Out Destination page is shown below. The layout of the other page is the same.



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 56). 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 56), 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 215 for a list of the initial Input Port names; page 216 for Output Port names.

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

ID	SHORT	LONG
AD7	<AD7 >	<AD IN 7 >
AD6	<AD6 >	<AD IN 6 >
AD5	<AD5 >	<AD IN 5 >
AD4	<AD4 >	<AD IN 4 >
AD3	<AD3 >	<AD IN 3 >
AD2	<AD2 >	<AD IN 2 >
AD1	<AD1 >	<AD IN 1 >

ID	SHORT	LONG
SLOT1-7	<S1-7 >	<Slot1 CH7 OUT >
SLOT1-6	<S1-6 >	<Slot1 CH6 OUT >
SLOT1-5	<S1-5 >	<Slot1 CH5 OUT >
SLOT1-4	<S1-4 >	<Slot1 CH4 OUT >
SLOT1-3	<S1-3 >	<Slot1 CH3 OUT >
SLOT1-2	<S1-2 >	<Slot1 CH2 OUT >
SLOT1-1	<S1-1 >	<Slot1 CH1 OUT >

- 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 32 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 37.**
- 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 corresponding 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 52 for more information.

Metering Input Channels

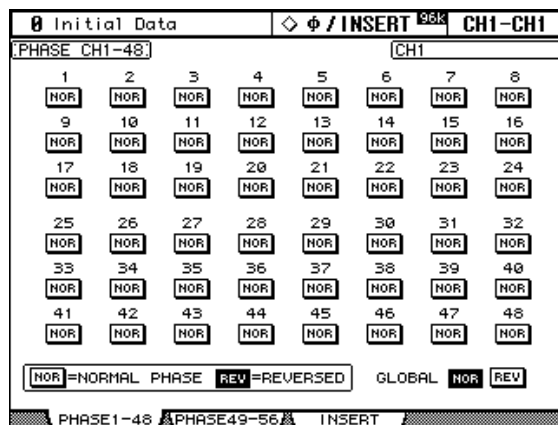
Input Channel signal levels can be metered on the Meter pages. See “Metering” on page 87 for more information.

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 LAYER and [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 88 user memories. See “Gate Library” on page 127 for more information.

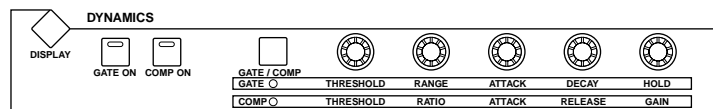
Preset Gates & Types

The following table lists the preset Gates and types. See page 255 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.

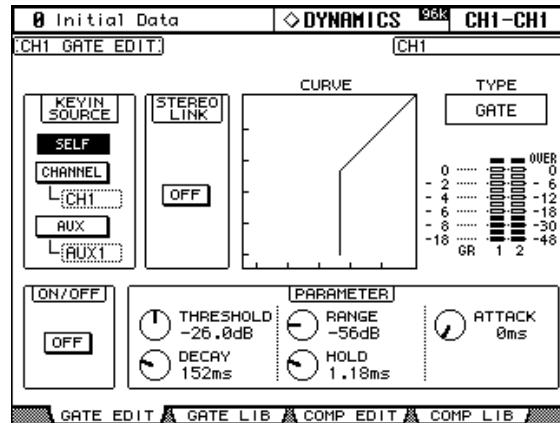
Gate Edit Page

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 127 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 104 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 90 for more information.

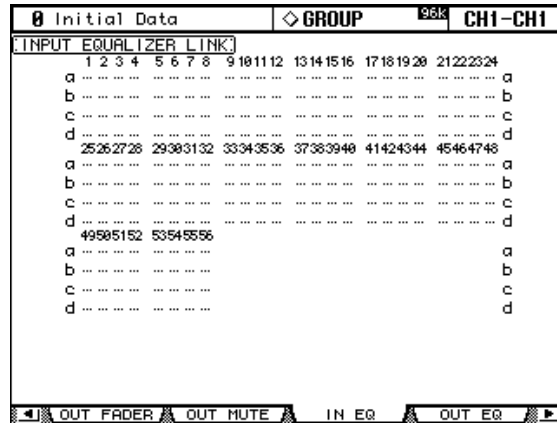
EQ'ing Input Channels

Each Input Channel features 4-band parametric EQ. See “Using EQ” on page 91 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 95 for more information.

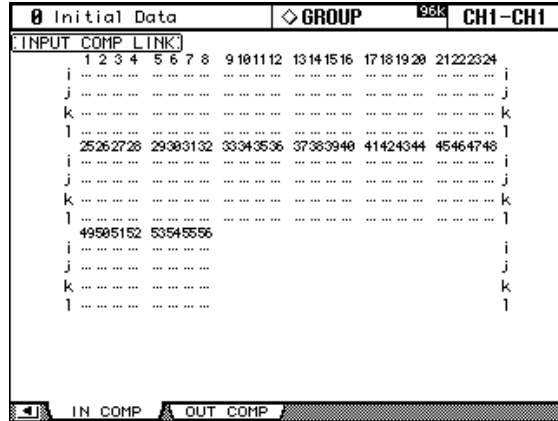
Compressing Input Channels

Each Input Channel features a Compressor. See “Compressing Channels” on page 97 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.

If an Input Channel Compressor's Stereo Link option is on, it's turned off when that Input Channel is added to a Comp group.

Delaying Input Channels

Each Input Channel features a Delay function. See "Delaying Channel Signals" on page 101 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.

ON

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.

0 Initial Data		GROUP 96k		CH1-CH1																						
MUTE	GROUP	CH1-48																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	ENABLE
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	ENABLE
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P

- 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.

Mute groups may contain a combination of channels that are on and channels that are off.

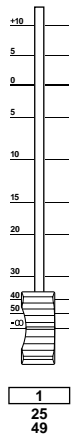
Setting Input Channel Levels

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 109 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.

0 Initial Data		GROUP		96k		CH1-CH1																			
[FADER GROUP CH1-48]																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	ENABLE
A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A
B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	B
C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	C
D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D
E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	E
F	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	F
G	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	G
H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	H
	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	ENABLE
A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	A
B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	B
C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	C
D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	D
E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	E
F	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	F
G	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	G
H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	H

- 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.

You can temporarily disable a Fader group in order to make adjustments to individual faders by touching two or more faders in the group, or by operating the fader while holding down its [SEL] button.

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 35 for more information.

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

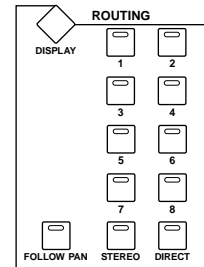
- 1 Use the **LAYER** buttons to select the Layers, and use the **[SEL]** buttons to select the Input Channels.
- 2 Use the **[1–8]**, **[STEREO]**, and **[DIRECT]** buttons to route the currently selected Input Channel.

[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.

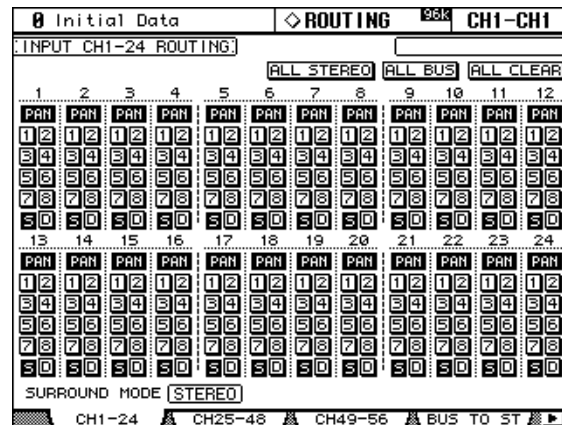


Routing Pages

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 197.

- 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 to the Stereo Out.

ALL BUS: This button assigns all Input Channels to all Bus Outs

ALL CLEAR: This button clears all routing assignments.

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 69 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

1. Short for LFE (Low frequency Effects).

Panning Input Channels

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

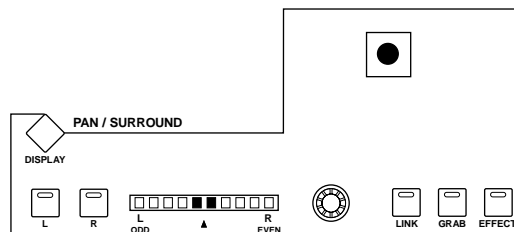
Using the Encoders

- 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.

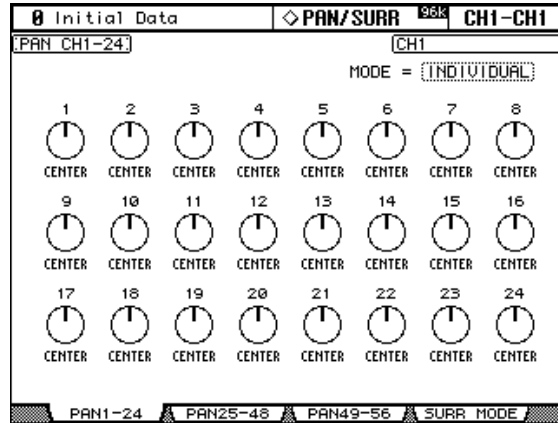
The [LINK] button, which is enabled only when a Surround mode other than Stereo is selected, is used to link the Pan control and the Joystick so that either control can be used for panning. It's a global setting that applies to all Input Channels. For this to work, the [EFFECT] button indicator must 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. If both the [LINK] and [GRAB] button indicators are on, these pages will also appear when the Joystick is operated. See “Auto PAN/SURROUND Display” on page 197.

- 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.

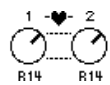
Pan parameters can also be selected by using the LAYER buttons and [SEL] buttons.

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 84). While linked, the Pan mode can be set on the Aux Pan page or the Input Channel Pan page.

Using Surround Pan

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

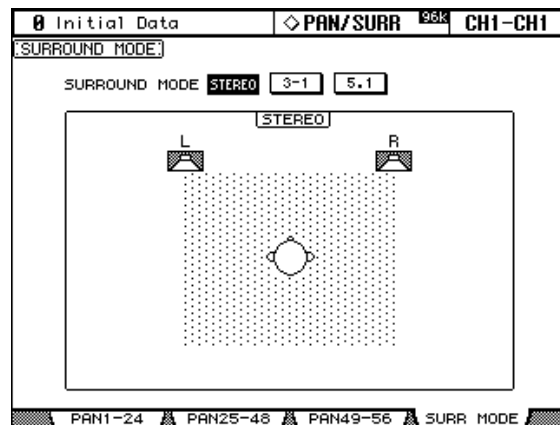
Surround Mode	Bus Outs					
	1	2	3	4	5	6
3-1	Left	Right	Center	Surround	—	—
5.1	Left	Right	Left Surround	Right Surround	Center	LFE

See page 116 for information on surround monitoring.

Selecting Surround Pan Modes

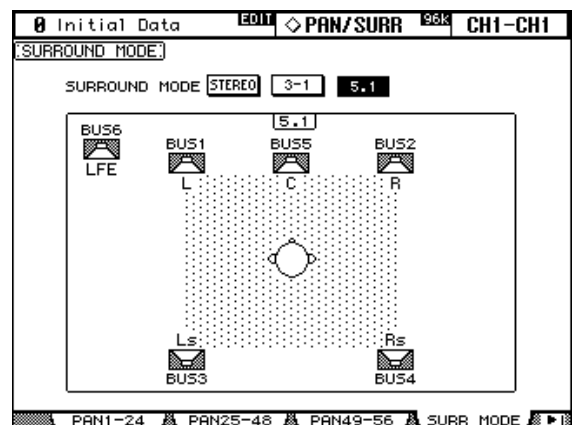
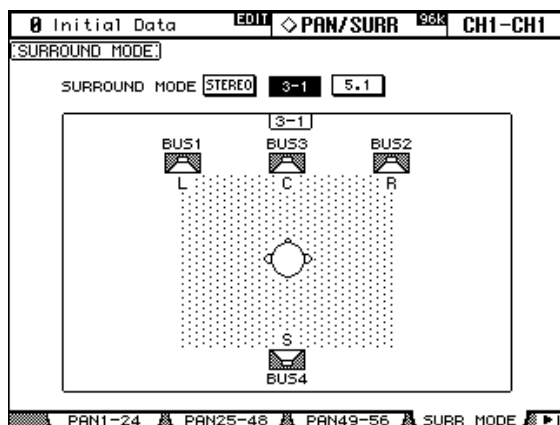
The Surround mode can be selected as follows.

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



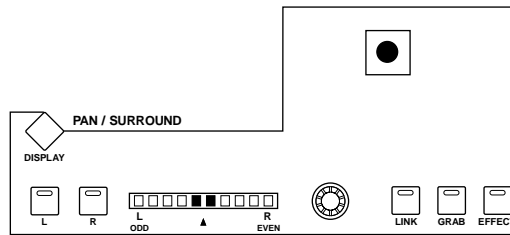
- 2 Use the cursor buttons to select the surround mode buttons, and press **[ENTER]** to activate the selected mode.

The 3-1 Surround mode page is shown on the left; the 5.1 page on the right. The diagram on each page shows the typical sound image placement and the Surround channel to Bus Out configuration.



Using the Joystick

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



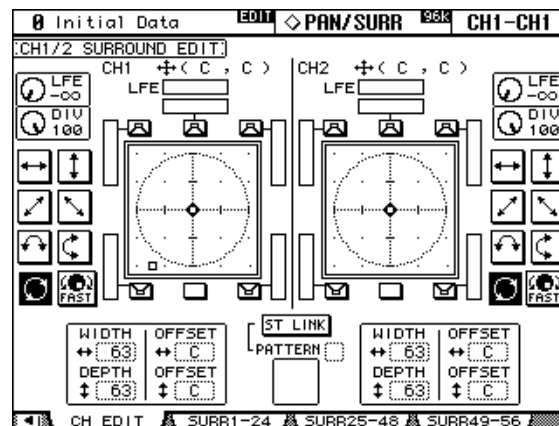
- 2 Press the **[GRAB]** button to grab the current Joystick position, and then use the Joystick to set the surround pan.

The **[GRAB]** button, which is enabled only when a Surround mode other than Stereo is selected, 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 197.

- 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 198), 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.

LFE: This sets the level of the LFE (Low Frequency Effects) Channel (5.1 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).

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.

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.

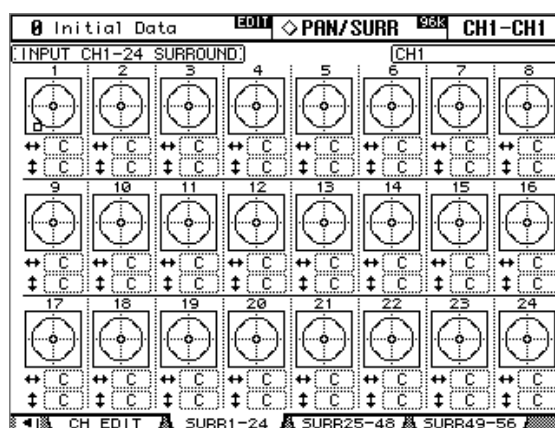
PATTERN: When Input Channels are linked, the seven patterns selectable here determine how the linked surround pan moves by the Parameter wheel and INC/DEC buttons.

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 80 and “Pre-Fader or Post-Fader Aux Sends” on page 79.

Soloing Input Channels

Input Channels can be soloed. See page 102 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 56 and “Routing Input Channels” on page 66 for more information.

Pairing Input Channels

Horizontal or vertical Input Channel partners can be paired for stereo operation. See “Pairing Channels” on page 104 for more information.

Using MS Decoding

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. See “Pairing Channels” on page 104 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 108 and “Viewing Channel Fader Settings” on page 109 for more information.

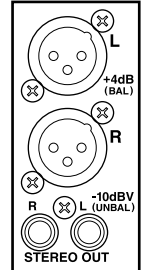
Naming Input Channels

Input Channels can be named for easy identification. See “Naming Channels” on page 112 for more information.

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 54 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 66 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 78 for more information.

Metering the Stereo Out

Stereo Out signal levels can be metered on the Meter pages. See “Metering” on page 87 for more information.

Monitoring the Stereo Out

The Stereo Out can be monitored via the CONTROL ROOM MONITOR OUTs and the PHONES (see page 114) or the STUDIO MONITOR OUT (see page 115).

Attenuating the Stereo Out

Stereo Out signals can be attenuated pre-EQ. See “Attenuating Signals” on page 90 for more information.

EQ'ing the Stereo Out

The Stereo Out features 4-band parametric EQ. See “Using EQ” on page 91 for more information.

Grouping Master EQs

The Stereo Out EQ can be grouped with the EQs of other Output Channels. See “Grouping Output Channel EQs” on page 94 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 95 for more information.

Compressing the Stereo Out

Signal dynamics can be controlled by using the Stereo Out Compressor. See “Compressing Channels” on page 97 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 100 for more information.

Muting the Stereo Out (ON/OFF)



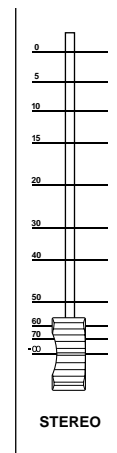
The Stereo Out can be muted by using the STEREO [ON] button, which is used exclusively for this task and is not affected by the Layers. Its indicator lights up when the Stereo Out is on.

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 107 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.



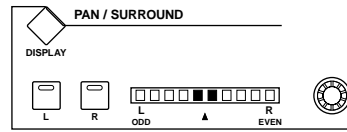
Grouping Master Faders

The Stereo Out fader can be grouped with the faders of other Output Channels. See “Grouping Output Channel Faders” on page 106 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 balance can be set to center by pressing [ENTER].

The Stereo Out balance can also be set on the Stereo Fader View page. See “Viewing Channel Fader Settings” on page 109 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 101 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 108 and “Viewing Channel Fader Settings” on page 109 for more information.

Naming the Stereo Out

The Stereo Out can be named for easy identification. See “Naming Channels” on page 112 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 54 for more information.

Routing Input Channels to Bus Outs

Input Channels can be routed to the Bus Outs. See “Routing Input Channels” on page 66 for more information.

Metering Bus Outs

Bus Out signal levels can be metered on the Meter pages. See “Metering” on page 87 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 114 for more information.

Attenuating Bus Outs

Bus Out signals can be attenuated pre-EQ. See “Attenuating Signals” on page 90 for more information.

EQ'ing Bus Outs

Each Bus Out features 4-band parametric EQ. See “Using EQ” on page 91 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 94 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 95 for more information.

Compressing Bus Outs

Signal dynamics can be controlled by using the Bus Out Compressors. See “Compressing Channels” on page 97 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 100 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)

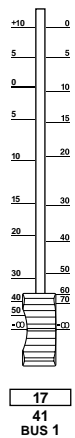
Bus Out Mutes can be grouped with the Mutes of other Output Channels. See “Grouping Output Channel Mutes (ON/OFF)” on page 107 for more information.

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 106 for more information.

Delaying Bus Outs

Each Bus Out features a Delay function. See “Delaying Channel Signals” on page 101 for more information.

Soloing Bus Outs

Bus Outs can be soloed. See page 102 for more information.

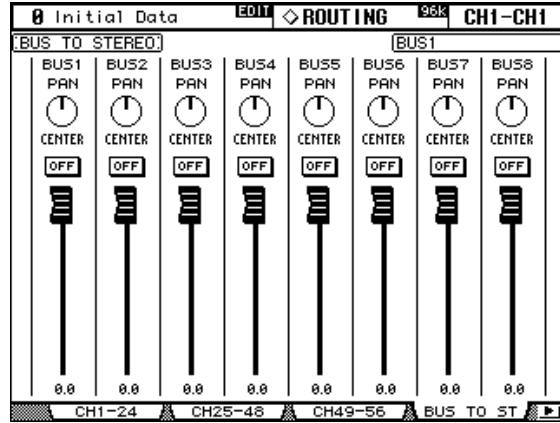
Pairing Bus Outs

Bus Outs can be paired for stereo operation. See “Pairing Channels” on page 104 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 126 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.

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 108 and “Viewing Channel Fader Settings” on page 109 for more information.

Naming Bus Outs

Bus Outs can be named for easy identification. See “Naming Channels” on page 112 for more information.

10 Aux Sends

Patching Aux Send Masters to Outputs

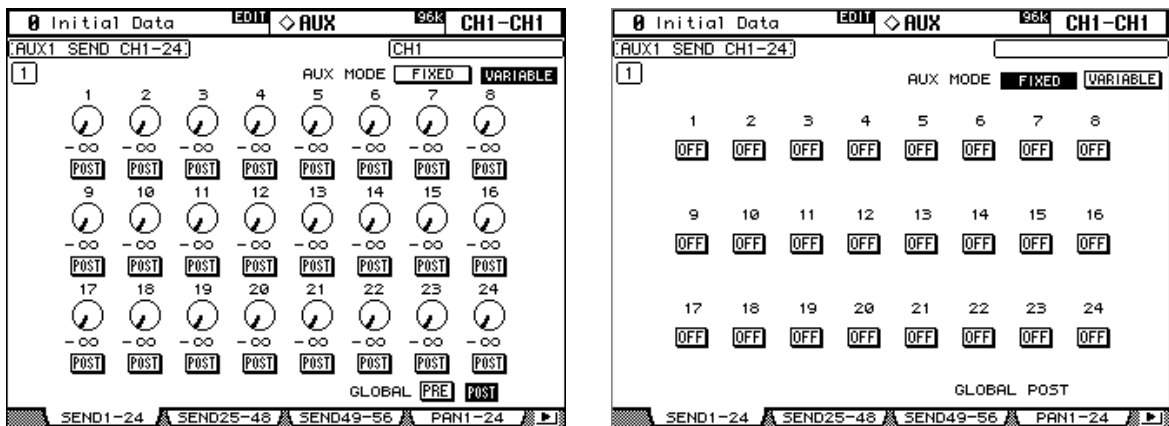
Aux Send Masters can be patched to the Slot Outputs, Omni Outs, or the 2TR Digital Outputs. See “Output Patching” on page 54 for more information.

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 [1–8]** 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 $-\infty$
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 80) or the Aux View pages (see page 83).

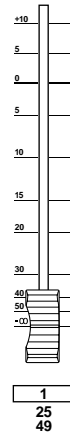
Setting Aux Send Levels

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 [1–8] 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 [1–8] buttons to select Aux Sends 1–8.
- 4 Use the Encoders to set the Aux Send levels.



Aux Send Pages

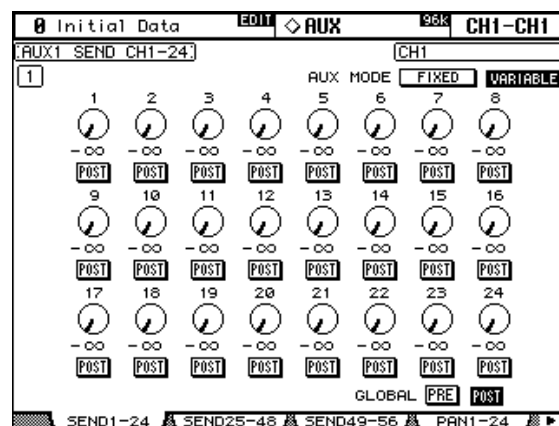
You can view and set the Aux Send parameters of all Input Channels on the Aux Send pages. Operation of the Aux Send pages in Variable and Fixed mode is explained separately.

Variable Mode

See page 79 for information on how to select Variable Aux 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.



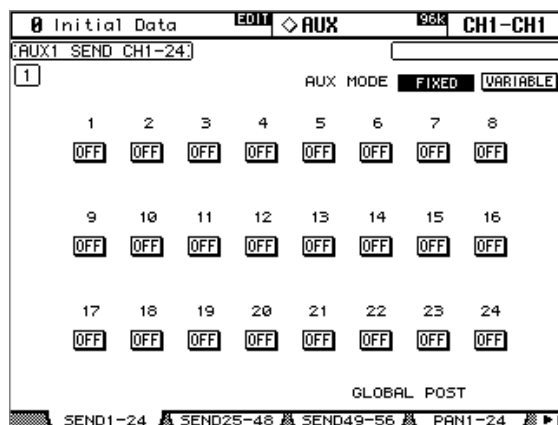
- 2 Use the AUX SELECT [1–8] buttons to select Aux Sends 1–8.
- 3 Use the cursor buttons to select the Input Channel Aux Send controls.
Input Channels can also be selected by using the LAYER buttons and [SEL] buttons.

- 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.**
- 6 **To set the Pre/Post 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 appears highlighted, and remains highlighted until the Pre/Post setting of one or more channels is changed, so you can quickly see if all Input Channels are set to either pre-fader or post-fader.

Fixed Mode

See page 79 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 [1–8] 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 $-\infty$ position. On/Off settings cannot be changed by using the faders.

Viewing Aux Send Settings

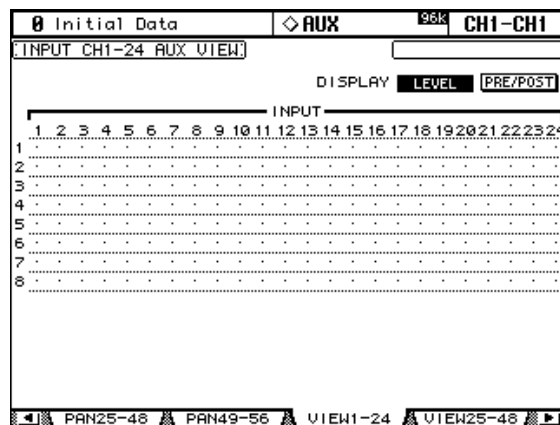
You can view and set settings of all Aux Sends on the Aux View pages. Level and Pre/Post parameters are displayed separately.

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.
- 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 $-\infty$, 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.”

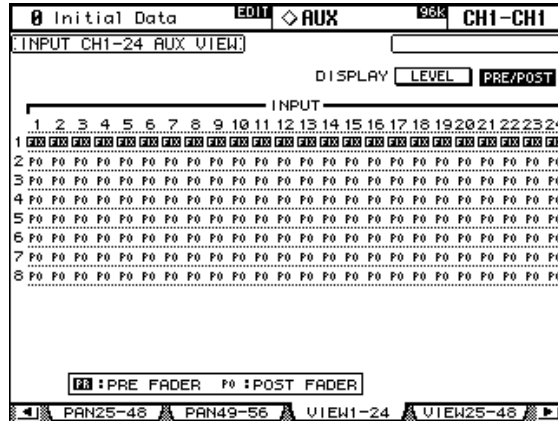
In Fixed Aux mode, the On/Off parameter values for the selected Aux Send are displayed in the lower-right corner of the page, for example, “LEVEL: FIXED ON/OFF: ON.”

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.
- 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:

-  Aux Send configured pre-fader.
-  Aux Send configured post-fader.
-  Fixed mode Aux Send.

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

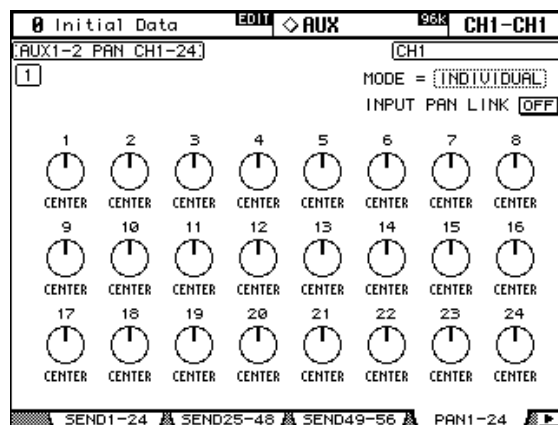
Panning Aux Sends

When Aux Sends are paired, Aux Sends can be panned between the paired Aux buses. See “Pairing Channels” on page 104 for more information. If the selected Aux Send is not paired, the message “AUXx-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 AUXx-x PAN Following Surround” appears. See “Pairing Aux Sends” on page 86 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 [1–8] 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 a global setting that applies to all paired Aux Send Masters.

 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 67).

Metering Aux Send Masters

Aux Send Master levels can be metered on the Meter pages. See “Metering” on page 87 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 114 for more information. Aux 11 and Aux 12 can be monitored via the STUDIO MONITOR OUT (see page 115).

Attenuating Aux Send Masters

Aux Send Master signals can be attenuated pre-EQ. See “Attenuating Signals” on page 90 for more information.

EQ'ing Aux Send Masters

Each Aux Send Master features 4-band parametric EQ. See “Using EQ” on page 91 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 94 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 95 for more information.

Compressing Aux Send Masters

Signal dynamics can be controlled by using the Aux Send Master Compressors. See “Compressing Channels” on page 97 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 100 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)

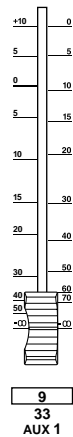
Aux Send Master Mutes can be grouped with the Mutes of other Output Channels. See “Grouping Output Channel Mutes (ON/OFF)” on page 107 for more information.

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 106 for more information.

Delaying Aux Send Masters

Each Aux Send Master features a Delay function. See “Delaying Channel Signals” on page 101 for more information.

Soloing Aux Sends

Aux Sends can be soloed. See page 102 for more information.

Pairing Aux Sends

Aux Sends can be paired for stereo operation. See “Pairing Channels” on page 104 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 108 and “Viewing Channel Fader Settings” on page 109 for more information.

Naming Aux Send Masters

Aux Send Masters can be named for easy identification. See “Naming Channels” on page 112 for more information.

11 Common Channel Functions

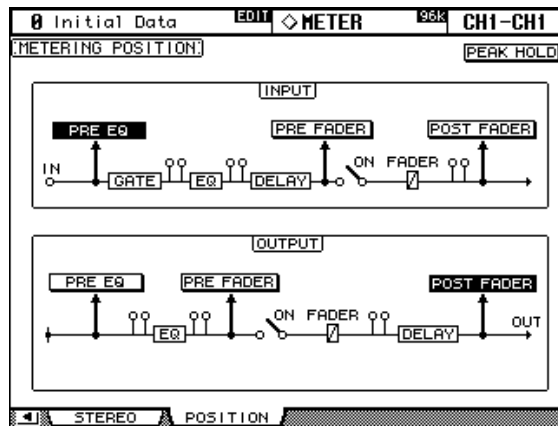
Metering

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.

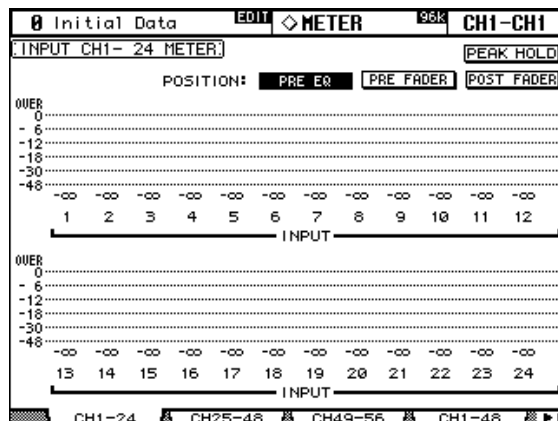
PRE FADER: Channels are metered pre-fader.

POST FADER: Channels are metered post-fader.

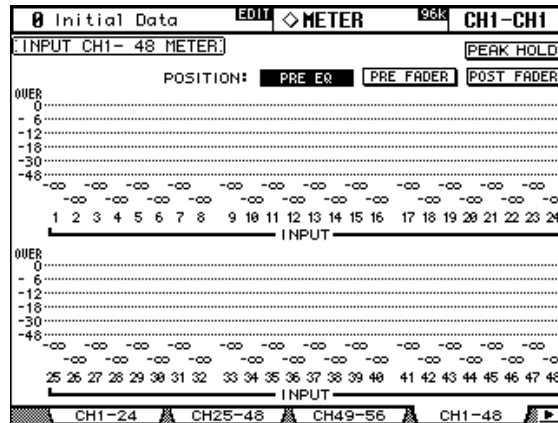
Metering Input Channels

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.

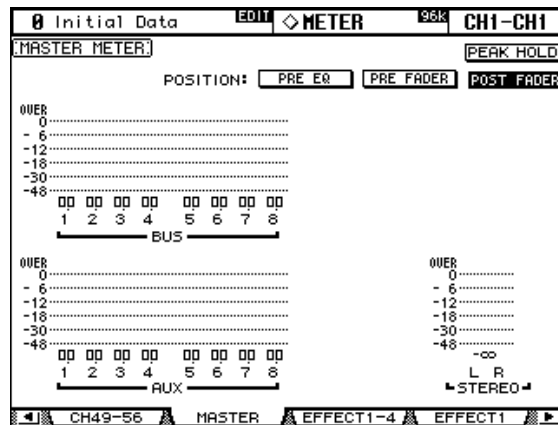


There are two 48-channel Meter pages. The Input Channel 1–48 Meter page is shown below. The layout of the other page is the same.



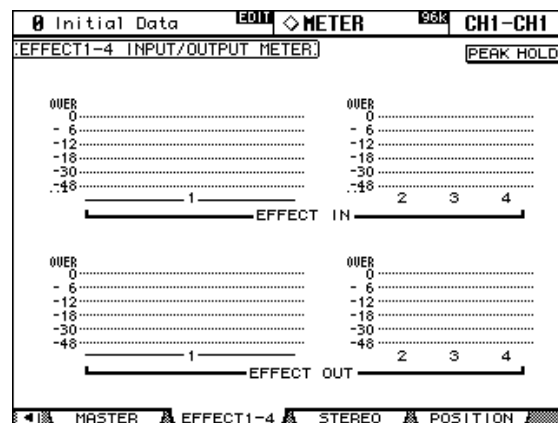
Metering Output Channels

Bus Outs, Aux Sends, and the Stereo Out can all be metered on the Master Meter page.



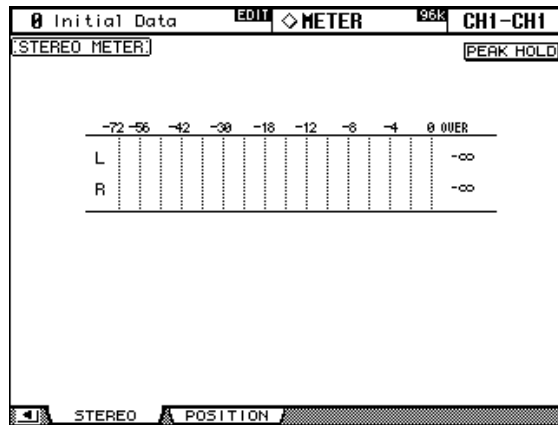
Metering Effects

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.

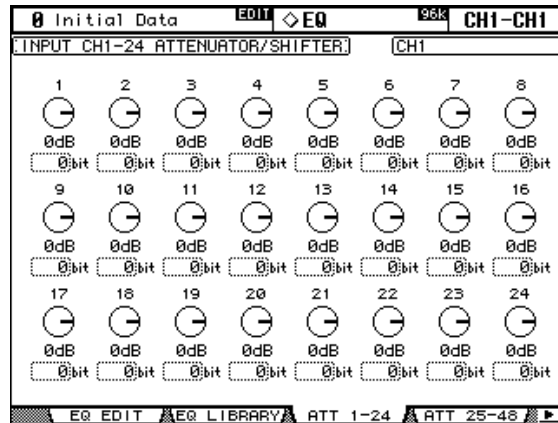


Attenuating Signals

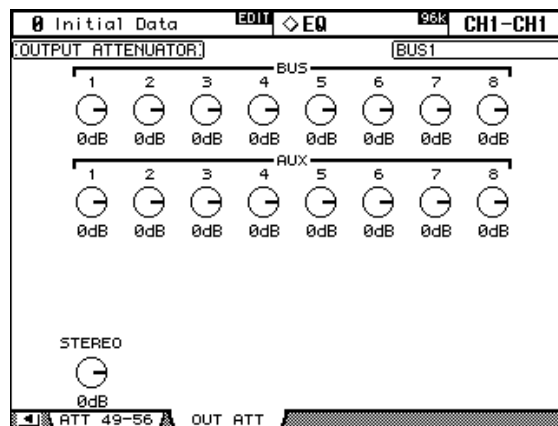
Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature pre-EQ attenuation, which is useful for attenuating “hot” signals before EQ’ing.

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.

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 129 for more information.

Preset EQs

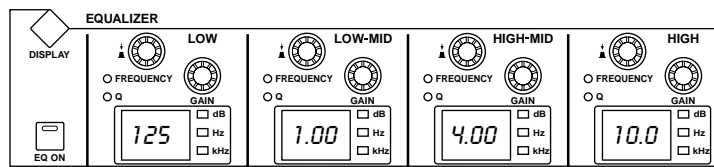
The following table lists the preset EQs. See page 251 for detailed parameter information.

#	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	21.1 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.

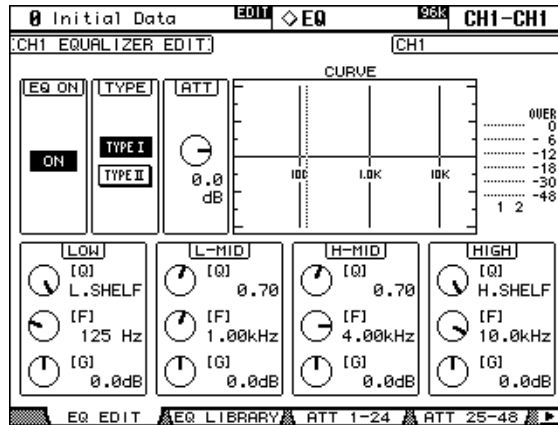
The initial EQ parameter settings are as follows.

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 197.

- 1 Use the **EQUALIZER [DISPLAY]** button to select the EQ Edit 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** 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 90 for more information.

CURVE: This displays the EQ curve of the currently selected Input Channel.

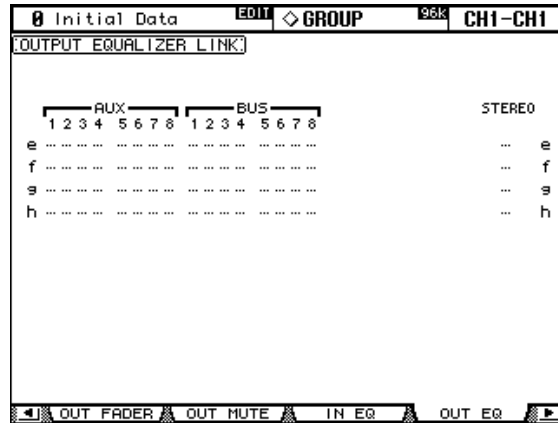
Level meters: These meters indicate the levels of the currently selected Input Channel and its horizontal or vertical partner.

LOW, L-MID, H-MID, HIGH: These are the Q, Frequency (F), and Gain (G) parameters for the four bands.

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.

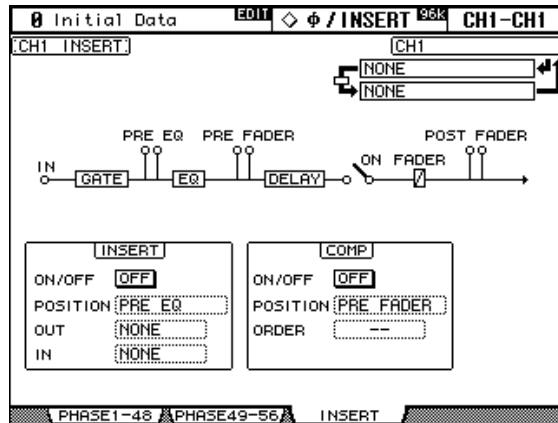
When an Output Channel is added to a group, its **[SEL]** button indicator lights up.

Using Inserts

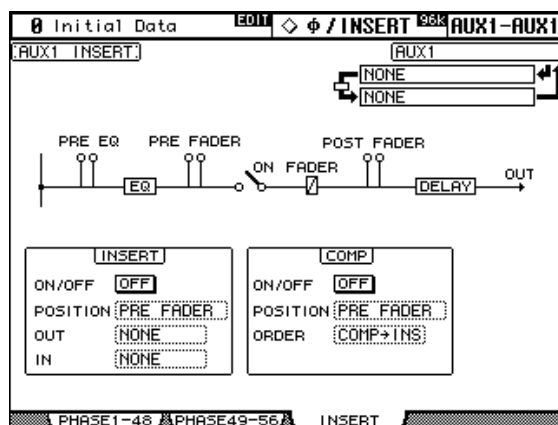
Input Channels, Bus Outs, Aux Sends, and the Stereo Out all feature assignable Inserts.

- 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.

INSERT ON/OFF: This turns the currently selected channel's Insert on and off.

INSERT POSITION: This determines the position of the Insert within the channel, and can be set to pre-EQ, pre-fader, or post-fader.

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 204 and page 208 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 57), 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 54 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 204 for a list of Input Channel Insert In sources; page 208 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 57), 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 53 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 97 for more information.

COMP 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 POSITION parameter on the Comp Edit page. See "Compressing Channels" on page 97 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 88 user memories. See “Comp Library” on page 128 for more information.

Preset Comps & Types

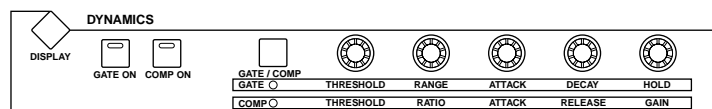
The following table lists the preset Comps and types. See page 255 for detailed parameter information.

#	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.
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.

#	Preset Name	Type	Description
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 musician's 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.

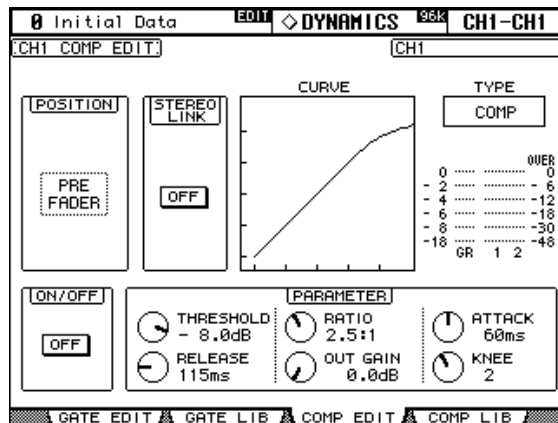
Comp Edit Page

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 197.

- 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 128 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 95 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 104 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.

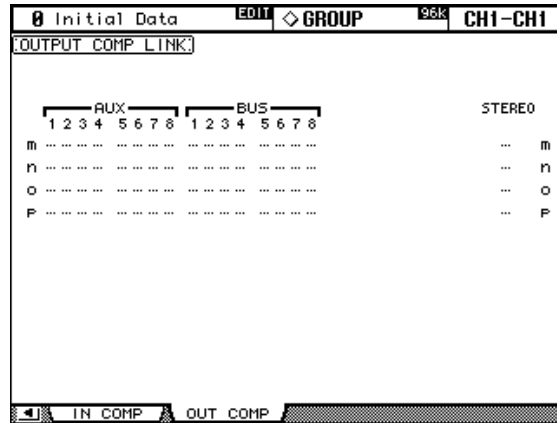
ON/OFF: This turns the currently selected channel’s Compressor on and off. It works in unison with the **SELECTED CHANNEL DYNAMICS [COMP ON]** button.

PARAMETER: These controls are used to set the Threshold, Ratio, Attack, Release, Out Gain, and Knee 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.

0 Initial Data		EDIT		◇ DELAY		96k		CH1-CH1		
[INPUT CH1-24 DELAY]										
DELAY SCALE										
meter feet sample beat frame GANG										
	1	2	3	4	5	6	7	8		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	9	10	11	12	13	14	15	16		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	18	19	20	21	22	23	24		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CH1-24 CH25-48 CH49-56 OUTPUT										

The Delay parameters for the Bus Outs, Aux Sends, and the Stereo Out appear on the Output Delay page.

0 Initial Data		EDIT		◇ DELAY		96k		AUX1-AUX1		
[INPUT CH1-24 DELAY]										
DELAY SCALE										
meter feet sample beat frame GANG										
	1	2	3	4	5	6	7	8		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	9	10	11	12	13	14	15	16		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	17	18	19	20	21	22	23	24		
[msec]	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0	0.0
[sample]	0	0	0	0	0	0	0	0	0	0
MIX	+100	+100	+100	+100	+100	+100	+100	+100	0%	0%
FB.GAIN	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CH1-24 CH25-48 CH49-56 OUTPUT										

- 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**.

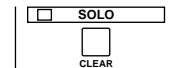
Input and Output Channels cannot be soloed simultaneously. Soloed Input Channels will be unsoloed when an Output Channel is soloed, and vice versa.

- 2 Use the **[SOLO]** buttons to solo the channels on the selected Layer.



The **[SOLO]** button indicators of channels that are soloed light up.

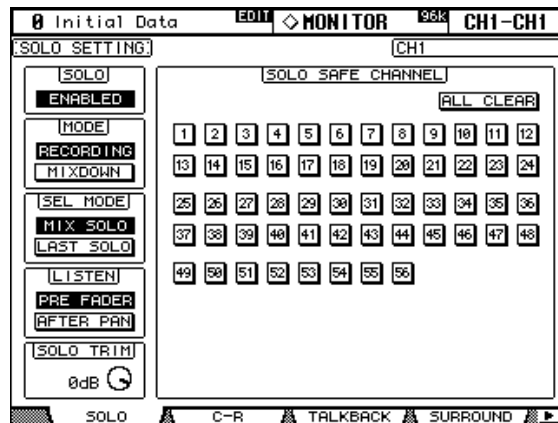
The SOLO indicator in the MONITOR section flashes when the Solo function is active. You can unsolo all soloed channels by pressing the SOLO **[CLEAR]** button.



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 197.

- 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.

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].

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.

Aux Sends can also be paired by using the AUX SELECT buttons.

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 Level, Aux Pre/Post, 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.

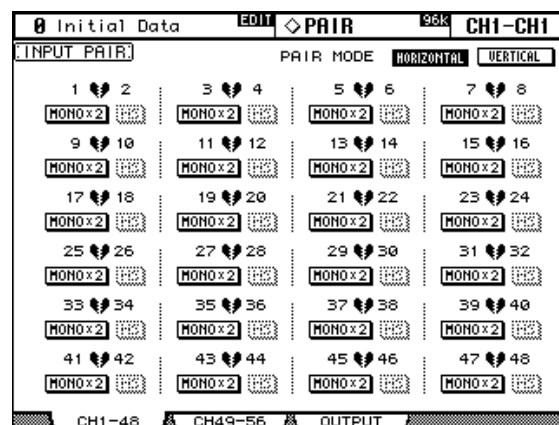
The following channel parameters are not copied, or controlled together, when channels are paired: Input Patch, Insert Patch, Output Patch, Comp Position, Phase, Delay On/Off, Delay Time, Delay Feedback, Delay Mix, Routing, Pan, Follow Pan, Surround Pan, Bus to Stereo Pan, Aux Send Pan, Balance, Attenuator.

Pairing Channels by Using the Pair Pages

Both horizontal and vertical pairing can be set on the Pair pages.

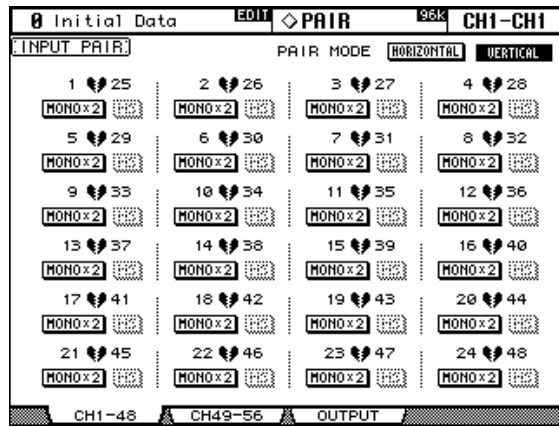
- 1 Use the DISPLAY ACCESS [PAIR] button to locate the Pair pages.

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.

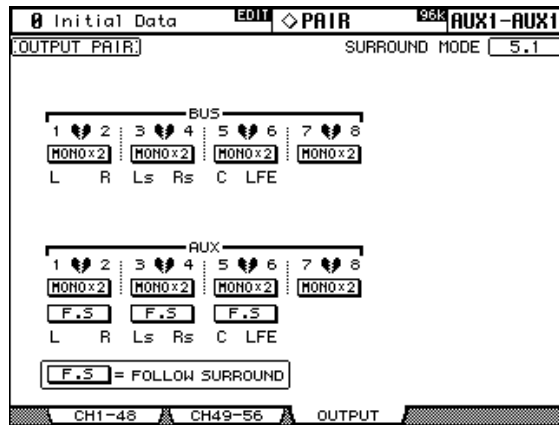


- To set the pair mode, select the **PAIR MODE HORIZONTAL** or **VERTICAL** buttons, and press **[ENTER]**.

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.



- 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, or 5.1), which can be set on the Surround Mode page (see page 69). 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.

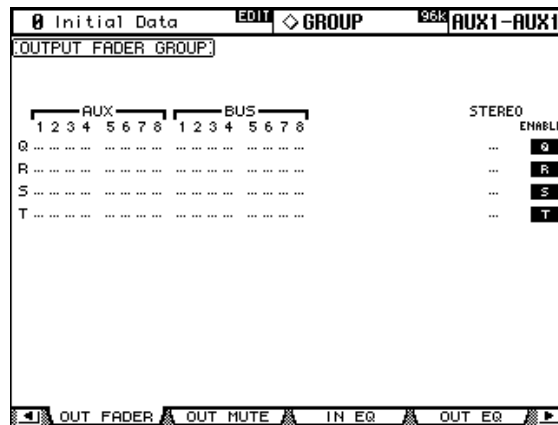
Surround Mode	Bus Out/Aux Send					
	1	2	3	4	5	6
3-1	L	R	C	S	—	—
5.1	L	R	Ls	Rs	C	LFE

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 84) 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.

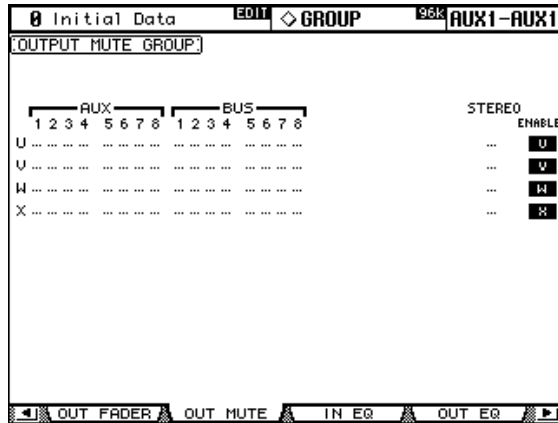
You can temporarily disable a Fader group in order to make adjustments to individual faders by touching two or more faders in the group, or by operating the fader while holding down its [SEL] button.

Fader groups are active only in Fader mode. See “Selecting Fader Modes” on page 35 for more information.

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.

Mute groups may contain a combination of channels that are on and channels that are off.

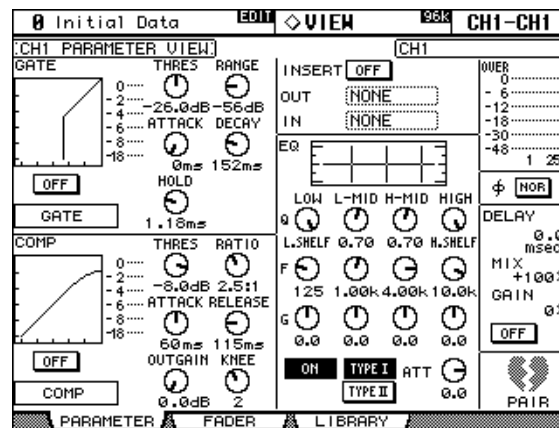
Viewing Channel Parameter Settings

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 60 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 97 for more information.

INSERT: The currently selected channel’s Insert can be turned on and off and patched. See “Using Inserts” on page 95 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 91 for more information.

Meters: These meters indicate the levels of the currently selected channel and its horizontal or vertical partner.

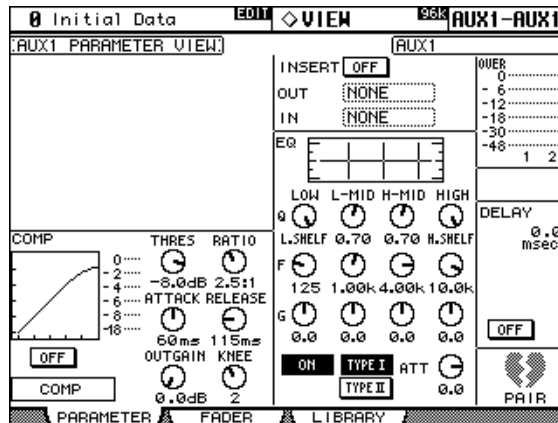
Phase: The signal phase of the currently selected Input Channel can be reversed. See “Reversing the Signal Phase” on page 59 for more information.

DELAY: The currently selected channel’s Delay function can be set. See “Delaying Channel Signals” on page 101 for more information.

PAIR: This heart icon indicates whether or not channels are paired. See “Pairing Channels” on page 104 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

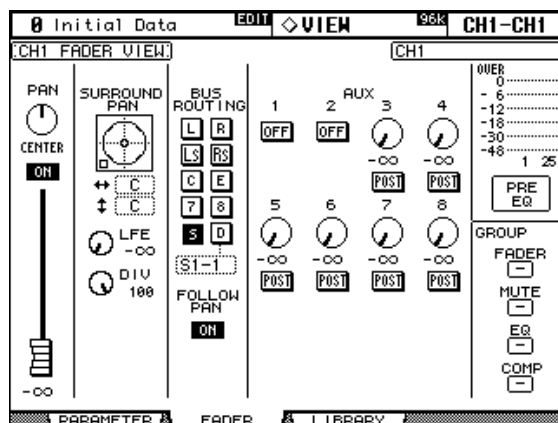
The fader-related settings of the currently selected Input Channel, Bus Out, Aux Send, or the Stereo Out can be viewed and set on the Fader View pages.

- 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. See "Panning Input Channels" on page 67 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 63 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 65 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 69 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 66 for more information. The Direct Out output patch can also be set. See “Patching Direct Outs” on page 56 for more information.

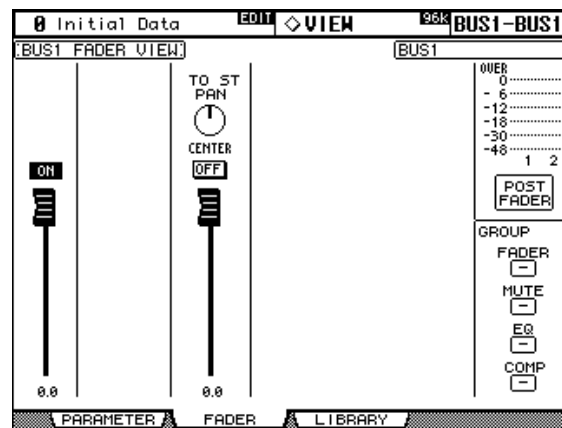
AUX: These are the currently selected Input Channel’s Aux Send Level, On/Off, and Pre/Post parameters. While a rotary control is selected, the Aux Send can be turned on and off by pressing [ENTER]. See “Aux Sends” on page 79 for more information.

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 77 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 77 for more information.

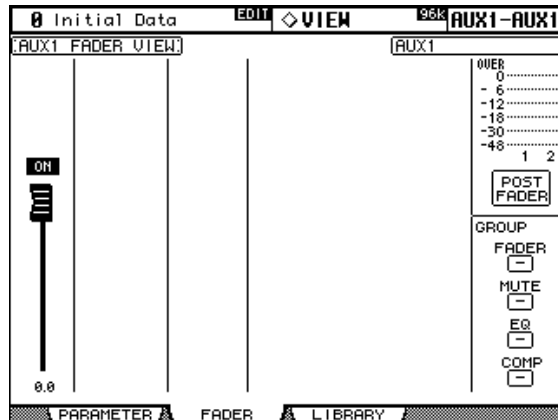
TO ST PAN, ON/OFF & Fader: These are the Bus Out to Stereo Out Pan, On/Off, and Fader parameters for the currently selected Bus Out. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See “Sending Bus Outs to the Stereo Out” on page 78 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 80 for more information.

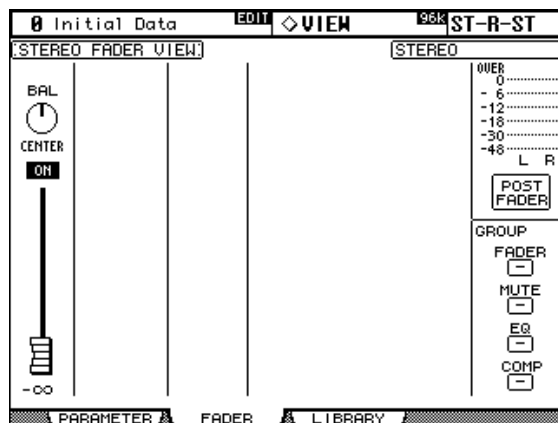
Fader: This indicates the fader position of the currently selected Aux Send. The fader knob appears highlighted when the fader is set to 0.0 dB. The fader position is displayed numerically below the fader. See “Settings Aux Send Master Levels” on page 86.

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. See “Balancing the Stereo Out” on page 75 for more information.

ON/OFF: This is the On/Off parameter of the Stereo Out. See “Muting the Stereo Out (ON/OFF)” on page 74 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 74 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.

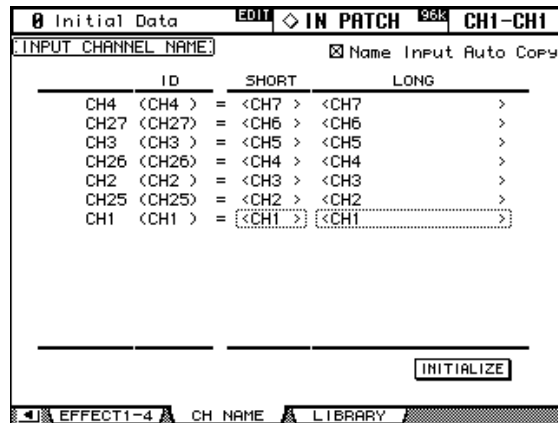
Naming Channels

You can specify Long and Short names for the Input Channels, Bus Outs, Aux Sends, and the Stereo Out as follows.

See page 214 for a list of initial Input Channel names; page 214 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.

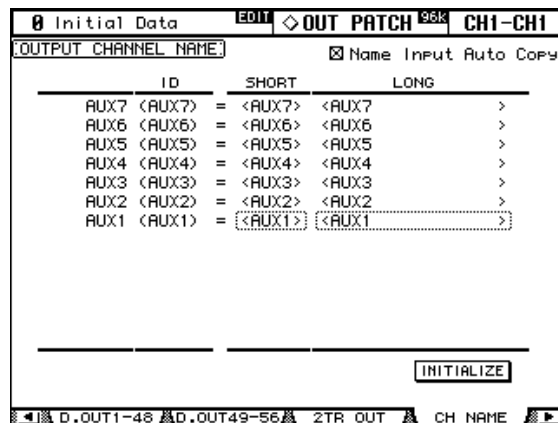
- 3 Use the cursor buttons to select the Input Channel's Long or Short name, and then press [ENTER].

When the Title Edit window appears, edit the Input Channel name, and press OK when you've finished. See "Title Edit Window" on page 32 for more information.

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

Output Channels

- 1 Use the DISPLAY ACCESS [OUTPUT PATCH] button to locate the Output Channel Name page



- 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].

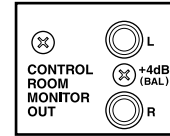
When the Title Edit window appears, edit the Output Channel name, and press OK when you've finished. See "Title Edit Window" on page 32 for more information.

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

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.

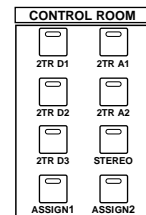
[2TR A1]: Selects the 2TR IN ANALOG 1.

[2TR A2]: Selects the 2TR IN ANALOG 2.

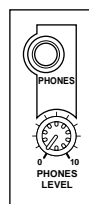
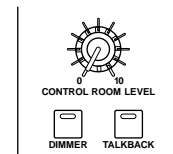
[STEREO]: Selects the Stereo Out.

[ASSIGN 1]: Selects the Output Channel assigned to this button on the Control Room Setup page. See “Control Room Setup” on page 115.

[ASSIGN 2]: Selects the Output Channel assigned to this button on the Control Room Setup page. See “Control Room Setup” on page 115.



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 115). The Dimmer function is activated automatically when the Talkback or Oscillator function is active.

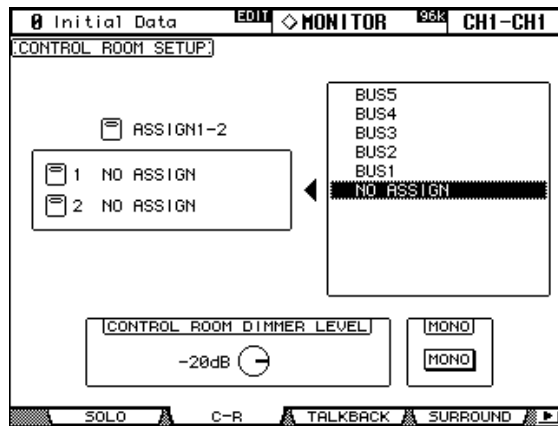


The Control Room Monitor signal is also fed to the PHONES jack, the level of which is set by using the PHONES LEVEL control.

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.

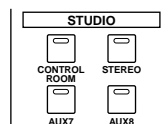
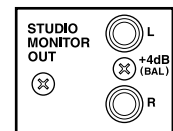
The other parameters on this page are as follows.

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 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.



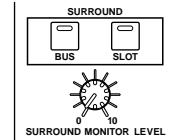
The level of the Studio Monitor signal can be set by using the STUDIO LEVEL control.

Surround Monitoring

The 02R96 features comprehensive surround monitoring functions, including a pink noise generator for speaker setup, Bass Management, and down mixing.

The Surround pages explained in this section are available only when a Surround mode other than Stereo is selected (see page 69).

The Surround Monitor signal source is selected by using the SURROUND 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 120) and selecting with the [SLOT] button. The level of the Surround Monitor can be set by using the SURROUND MONITOR LEVEL control.



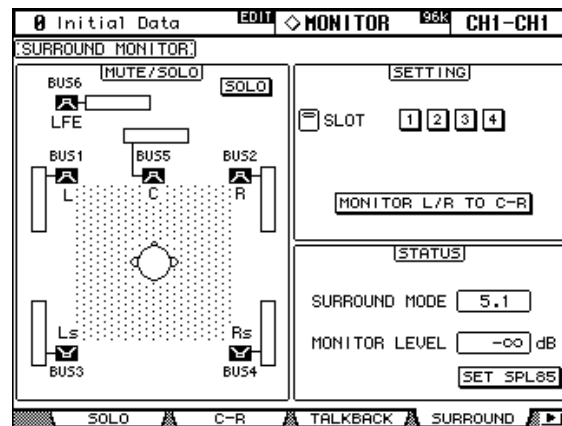
Surround monitor speakers can be aligned by using the individual Attenuator and Delay parameters on each Surround Monitor Channel. In addition to the standard Ls and Rs speakers, the 02R96 supports Ls2 and Rs2 speakers, with independent Attenuator and Delay parameters, for a more diffused surround monitoring environment. See “Configuring Surround Monitoring” on page 117 for more information.

Surround Monitor Channels can be patched to Slot Outputs or Omni Outputs. See “Output Patching” on page 54 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 130 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 120).

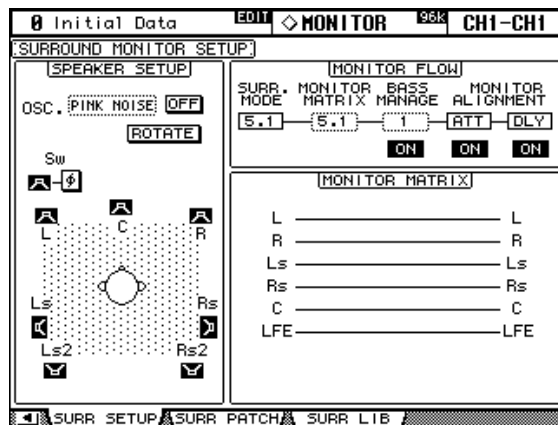
When the MONITOR L/R to C-R button is on, the Left and Right Surround Monitor Channels are fed to the Control Room Monitors. This is useful when you want to use the same speakers for Left and Right Surround Monitors and Control Room Monitors.

STATUS: SURROUND MODE indicates the currently selected Surround mode, which is set on the Surround Mode page (see page 69). 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 117), 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.

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.



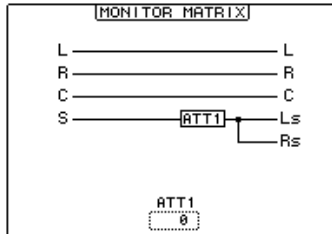
- 2 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.

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).

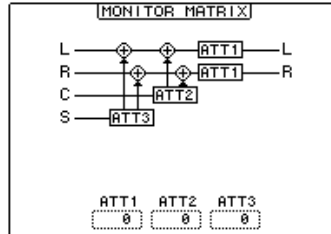
SURR. MODE: This indicates the currently selected Surround mode, which is set on the Surround Mode page (see page 69).

MONITOR MATRIX: This is used to select the Surround Monitor Matrix. 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. The ATT parameters can be used to attenuate individual Surround Channel signals. The following diagrams, which show the Monitor Matrixes available in each Surround mode, are displayed when this parameter is selected.

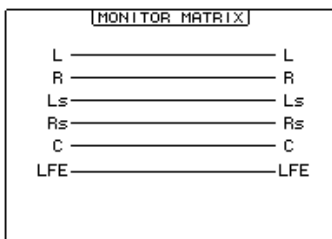
3-1 to 3-1



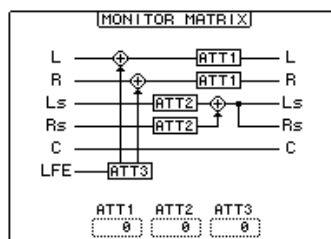
3-1 to ST



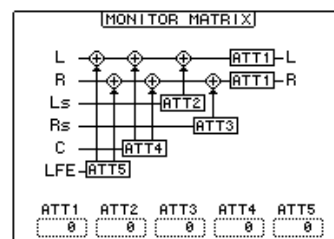
5.1 to 5.1



5.1 to 3-1



5.1 to ST



BASS MANAGE: This parameter is used to select the five preset Bass Management modes. Use the ON/OFF button to turn Bass Management on and off. The following table lists the Bass Management preset parameter values (“w/BS” means with Bass Management). SMALL speakers are assumed for the presets.

Presets		Parameters				
#	Title	HPF	LPF1	LPF2	ATT	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

If you are using the 3-1 monitor matrix, even with film sources, use presets 1 and 2, as presets 3 and 4 may not provide correct monitoring.

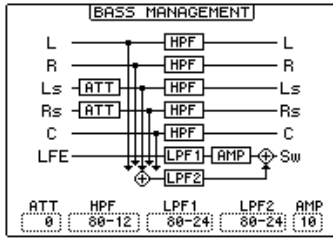
Bass Management parameters can be set as follows.

Parameter	Range
HPF	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	0 to -12 dB (1 dB steps)
AMP	0 to +12 dB (1 dB steps)

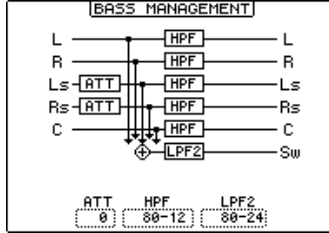
“80-12” means a cutoff frequency of 80 Hz and a filter response of -12 dB/octave. “L” means Linkwitz filter. Other filters are Butterworth.

The following diagrams show the Bass Management configuration for each monitor matrix setting, with Bass Management turned on and off.

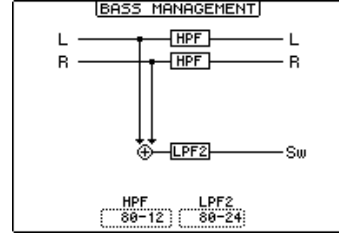
5.1 ON



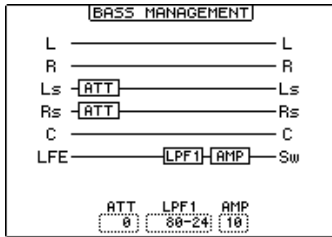
3-1 ON



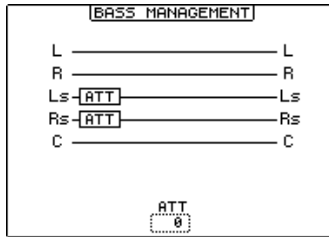
ST ON



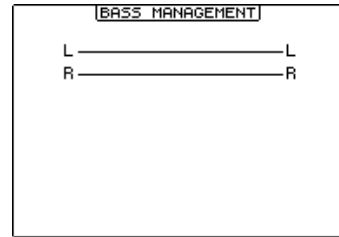
5.1 OFF



3-1 OFF

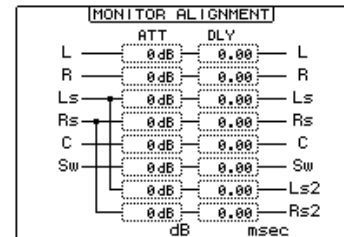


ST OFF



MONITOR ALIGNMENT ATT & DLY ON/OFF:

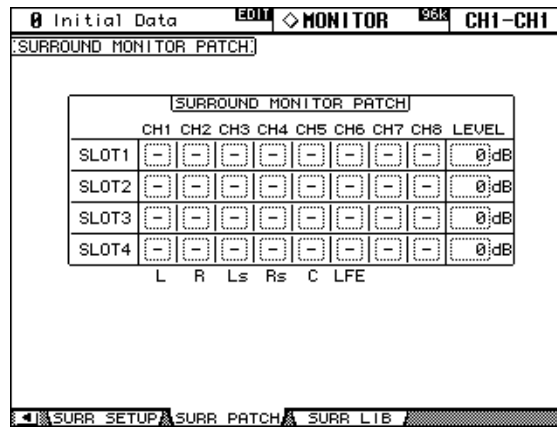
These buttons are used to turn on and off the Monitor Alignment Attenuator and Delay parameters of all Surround speakers. The MONITOR ALIGNMENT diagram and Surround Channel Attenuator and Delay parameters, which are displayed when either of these buttons are selected, allow you to align the surround monitor speakers by attenuating and delaying Surround Channels as necessary. The Attenuator parameters can be set from -12 dB to +12 dB in 0.1 dB steps. The Delay parameters can be set from 0.0 to 30.0 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 1–8 from each of the four Slots to Surround Monitor Channels 1–8. 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.



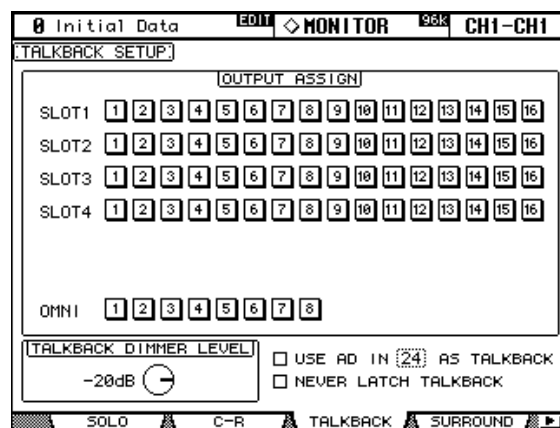
The TALKBACK LEVEL control sets the level of the built-in talkback microphone.



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.

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.

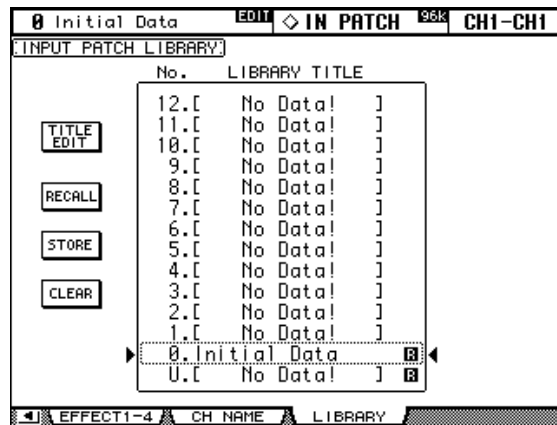
Library data can be stored to an external MIDI device, such as a MIDI data file, by using MIDI Bulk Dump (see page 168).

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 32 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 32 for more information. You can stop the Title Edit window from appearing by turning off the Store Confirmation preference on page 197.

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.

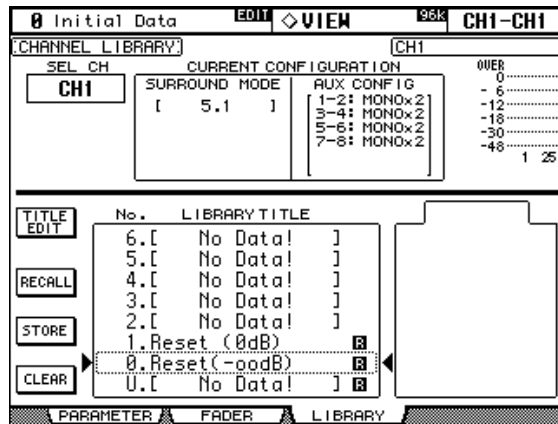
Read-only preset memories have an "R" icon next to their name. You cannot store, clear, or edit the title of these memories. Empty memories have the title "No Data!" Memory #0 is a read-only memory that you can recall to reset settings to their initial values.

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.

- 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.

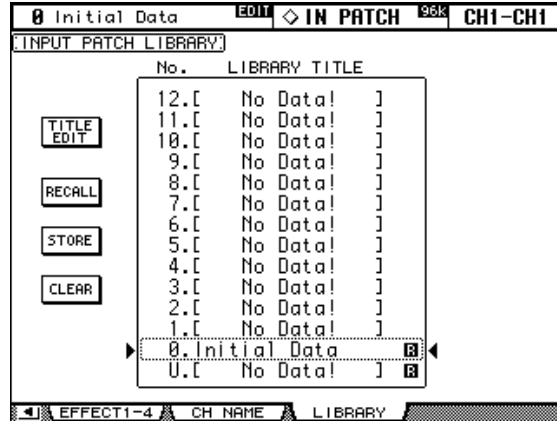
STORED FROM: This indicates the channel whose settings were originally stored in the selected memory. If the currently selected channel is an Input channel, Pan mode and Aux pairing information is also displayed.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 122.

Input Patch Library

Input Patch settings can be stored in the Input Patch library, which contains 1 preset memory and 32 user memories. See page 52 for information on Input Patch settings.

- 1 Use the **DISPLAY ACCESS [INPUT PATCH]** button to select the **Input Patch Library** page.



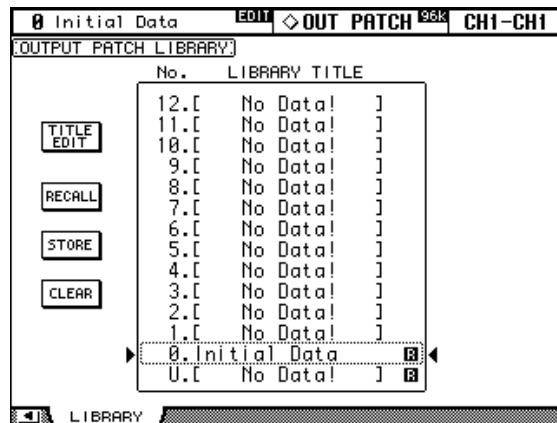
When storing, the current Input Patch settings are stored to the selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

Output Patch Library

Output Patch settings can be stored in the Output Patch library, which contains 1 preset memory and 32 user memories. See page 54 for information on Output Patch settings.

- 1 Use the **DISPLAY ACCESS [OUTPUT PATCH]** button to select the **Output Patch Library** page.



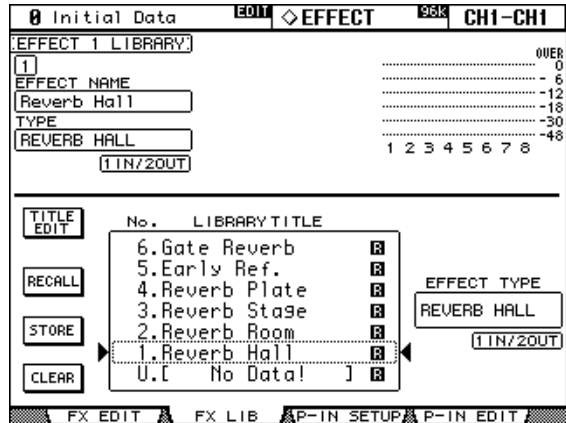
When storing, the current Output Patch settings are stored to the selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

Effects Library

Effects settings can be stored in the Effects library, which contains 52 preset memories and 76 user memories. See page 131 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.

Level meters: These meters indicate the output levels of the currently selected Effects processor. There are eight output meters for Effects processor #1, and two output meters for Effects processors #2 through #4.

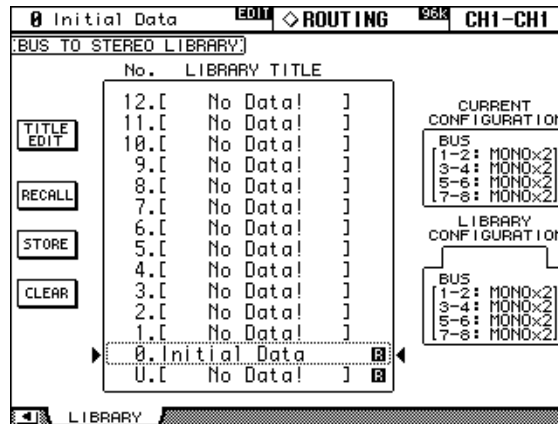
EFFECT TYPE: This is the effects type in the selected memory. Its I/O configuration is shown below this.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

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. See page 78 for information on Bus to Stereo routing.

- 1 Use the **ROUTING [DISPLAY]** button to select the **Bus to Stereo Library** page.



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.

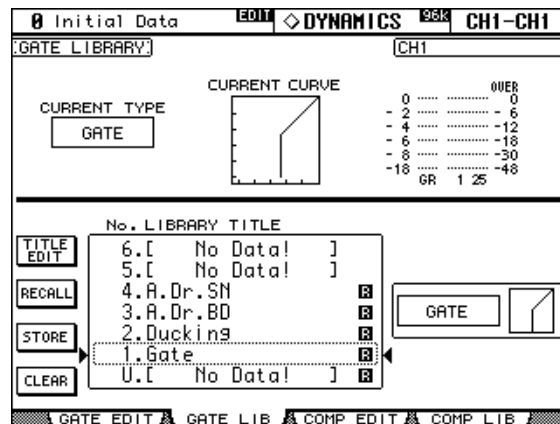
Only memories whose Bus Out pairing configuration matches the current configuration can be recalled. When the current configuration and the selected memory don't match, the word "CONFLICT" appear in the LIBRARY CONFIGURATION box.

For details on the Store, Recall, Title Edit, and Clear functions, see "General Library Operation" on page 122.

Gate Library

Input Channel Gate settings can be stored in the Gate library, which contains 4 preset memories and 124 user memories. See page 60 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.

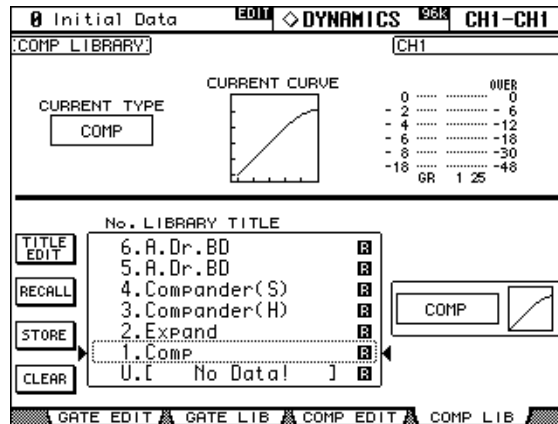
The type (Gate or Ducking) and curve of the currently selected memory is displayed to the right of the memory list.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

Comp Library

Comp settings can be stored in the Comp library, which contains 36 preset memories and 92 user memories. See page 97 for information on the Comps.

- 1 Use the **DYNAMICS [DISPLAY]** button to select the **Comp Library** page.



- 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.

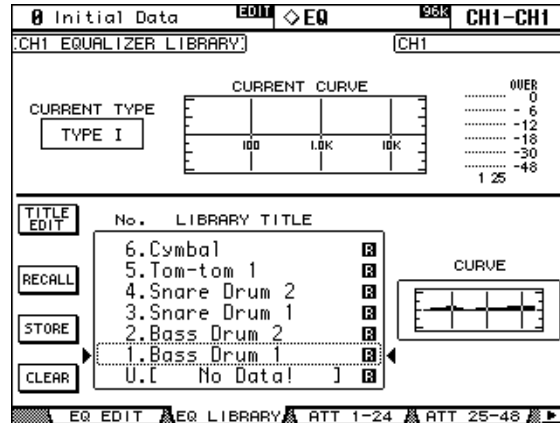
The type (Comp, Expand, Comp Soft, Comp Hard) and curve of the currently selected memory is displayed to the right of the memory list.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

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. See page 91 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.

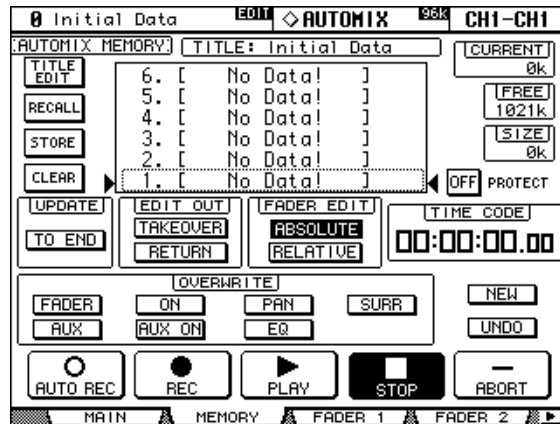
CURVE: This displays the EQ curve in the currently selected memory.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

Automix Library

Up to 16 Automixes can be stored in the Automix library. See page 145 for information on using Automix.

- 1 Use the **AUTOMIX [DISPLAY]** 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.

FREE: This is the amount of free memory for storing the current Automix.

SIZE: This is the size of the selected Automix memory.

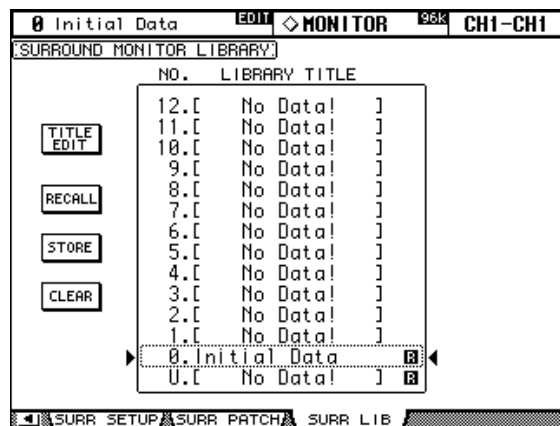
PROTECT: To protect the contents of the selected memory, select this and press [ENTER]. A padlock icon appears next to the titles of memories that are write-protected. Automixes cannot be stored to write-protected memories.

For details on the Store, Recall, Title Edit, and Clear functions, see “General Library Operation” on page 122.

Surround Monitor Library

Surround Monitor settings can be stored in the Surround Monitor library, which contains 1 preset memory and 32 user memories. See page 116 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 122.

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 output signal levels of the currently selected effects processor can be metered on the Effects Edit page. The input and output signal levels of all effects processors can be metered on the Meter pages. See “Metering” on page 87 for more information.

Effects settings can be stored in the Effects library, which contains 52 preset memories and 76 user memories. See “Effects Library” on page 125 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” on page 53 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 54 for more information.

Preset Effects & Types

The following tables list the preset effects and types. See page 223 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

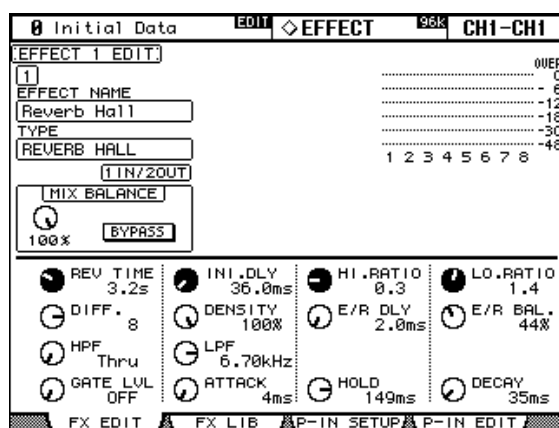
#	Preset Name	Type	Description
41	Multi.Filter	MULTI.FILTER	3-band parallel filter (24 dB/octave)
42	Freeze	FREEZE	Simple sampler
43	Stereo Reverb	ST REVERB	Stereo reverb
44 ¹	Reverb 5.1	REVERB 5.1 ²	6-channel reverb for 5.1 surround
45 ¹	Octa Reverb	OCTA REVERB ²	8-channel reverb for 7.1 surround
46 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

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.

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 125 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 131 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 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.

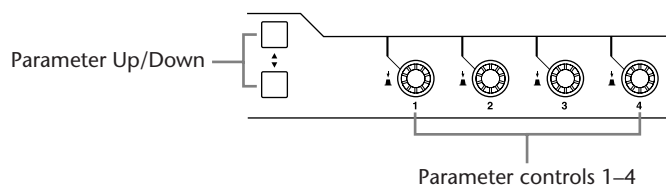
MIX BALANCE: This is used to set the balance between the wet and dry signals. When set to 0%, only the dry signal is heard. When set to 100%, only the wet signal is heard.

BYPASS: This button is used to bypass the currently selected effects processor.

TEMPO: These parameters, which appear only when an effects type with a delay parameter, or a modulation-based effects type with a Frequency parameter is selected, are used to automatically calculate and set the delay time, or modulation frequency relative to the specified tempo and note length. Use the Note parameter to specify the note length, and use the BPM control to specify the tempo. You can also specify the tempo by tapping the TAP TEMPO button, which calculates the tempo based on the time interval between two taps. When the MIDI CLK button is on, the tempo is derived from the MIDI Clock information received at the specified MIDI Rx port. See “MIDI I/O” on page 163.

Meters: These are output meters for the currently selected effects processor. There are eight meters when processor #1 is selected; two when processors 2–4 are selected.

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.

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 52.

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.

TARGET	NAME	PORT
PLUG-IN1	PLUG-IN CARD <WAVES >	SLOT1
PLUG-IN2	PLUG-IN CARD <WAVES >	SLOT2
PLUG-IN3	USER DEFINED <REV500 >	SERIAL 1
PLUG-IN4	USER DEFINED <BANK2 TITLE >	USB 1

- 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.

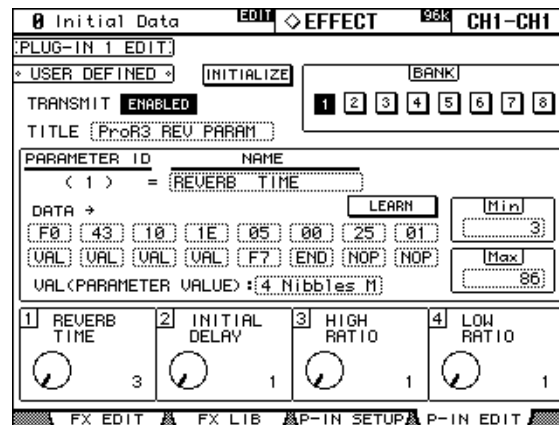
PORT: If a Y56K card is installed, its Slot number is displayed here. If the target is set to USER DEFINED, you can specify the Plug-Ins MIDI port as MIDI, SERIAL 1–8, USB 1–8, or SLOT1 1–8. Plug-In MIDI Ports can also be set on the MIDI/To Host Setup page. See "MIDI I/O" on page 163 for more information.

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 file, by using MIDI Bulk Dump (see page 168).

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 32 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 32 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.

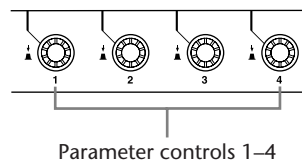
MIN/MAX: These parameters determine the minimum and maximum values of the MIDI data transmitted when each parameter control is adjusted. Use the PARAMETER ID/NAME parameter to select a Parameter ID from 1–4, and then edit as necessary.

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 4 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 4-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.



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 166 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 145 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 168).

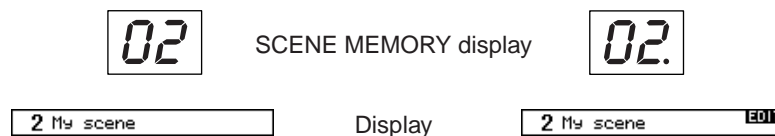
What’s Stored in a Scene?

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 $-\infty$ dB or nominal, depending on the Initial Data Nominal preference (see page 198).

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 198 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 197.

- 3 **Enter a title.**

See “Title Edit Window” on page 32 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.**

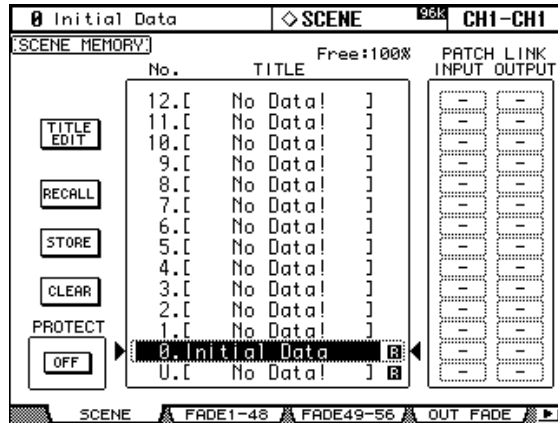
The contents of the selected Scene memory are recalled and all mix parameters are set accordingly. If the Recall Confirmation preference is on, a confirmation window appears before a Scene is recalled.

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.



- 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 32 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 32 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 197. 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: These INPUT and OUTPUT parameters allow you to link Scene memories to Input and Output Patch library memories, so that when a Scene is recalled, the linked input and output patches are recalled as well. If the linked Input or Output Patch library memory contains no data, only the specified Scene is recalled, the input and output patching remains the same.

Fading Scenes

Fade times can be specified for individual Input Channels, Bus Outs, Aux Sends, and the Stereo Out. 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. You must store these settings in a Scene beforehand in order for them to take effect. 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.

0 Initial Data		◇ SCENE		00k CH1-CH1				
INPUT CH1-48 FADE TIME						CH1		
						ALL CLEAR		
INPUT CH [sec]	1	2	3	4	5	6	7	8
	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
	9	10	11	12	13	14	15	16
	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
	17	18	19	20	21	22	23	24
	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
25	26	27	28	29	30	31	32	
00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	
33	34	35	36	37	38	39	40	
00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	
41	42	43	44	45	46	47	48	
00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	
Double-click to copy to all Inputs								
SCENE		FADE1-48		FADE49-56		OUT FADE		

The Fade Time parameters for the Output Channels appear on the Output Fade Time page.

0 Initial Data		◇ SCENE		00k CH1-CH1				
OUTPUT FADE TIME						BUS1		
						ALL CLEAR		
BUS [sec]	1	2	3	4	5	6	7	8
	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
AUX [sec]	1	2	3	4	5	6	7	8
	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
STEREO [sec]	00.0							
Double-click to copy to all Outputs								
SCENE		FADE1-48		FADE49-56		OUT FADE		

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.

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.

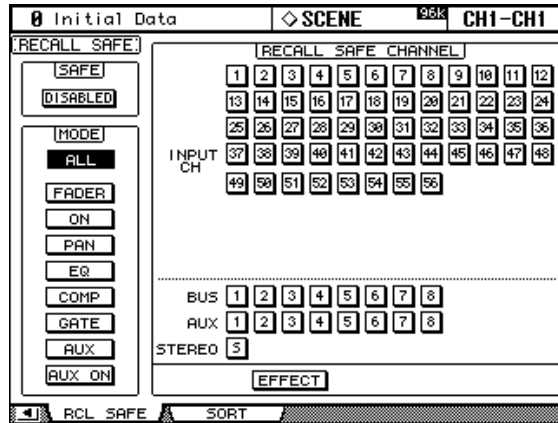
The Fade Time can be set from 0 to 30 seconds in 0.1 second steps.

You can reset all Fade Time parameters to zero by selecting the ALL CLEAR button, and then pressing [ENTER].

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 Channels, Bus Outs, Aux Sends, and the Stereo Out.

- 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 selected by using the **[SEL]** buttons, its Long name appears in the upper-right corner of the display. When a channel is Safe, its number appears highlighted.

- 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).

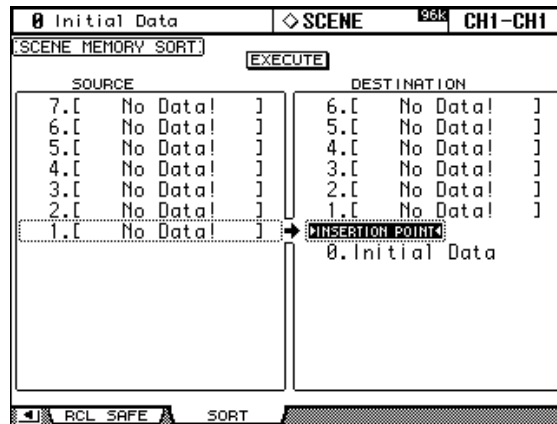
The **EFFECT** button operates independently of the **MODE** buttons and can be used to make the effects Safe.

Recall safe settings are stored in Scenes 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 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 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.

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 130 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 168).

What's Recorded in an Automix?

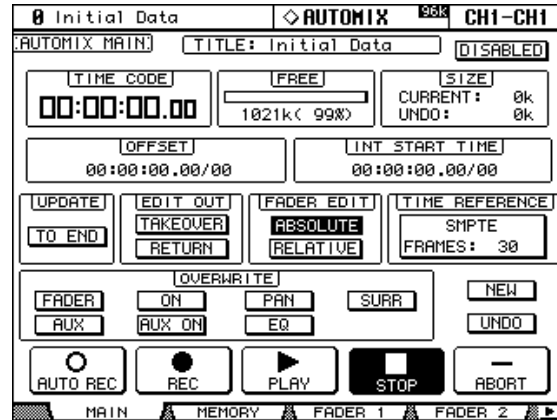
The following parameters can be recorded in an Automix.

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	—	—	—
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.

DISABLED/ENABLED: This button is used to enable and disable the Automix function.

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.

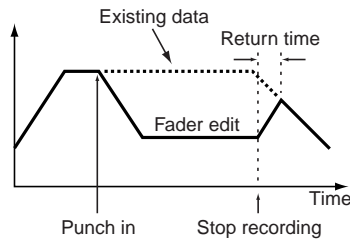
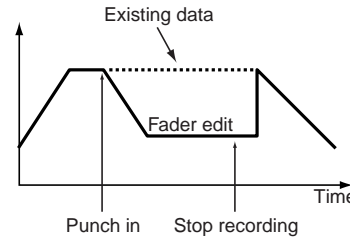
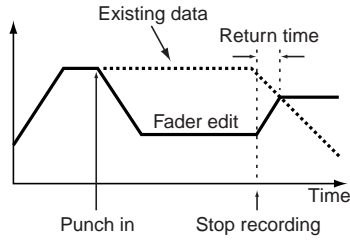
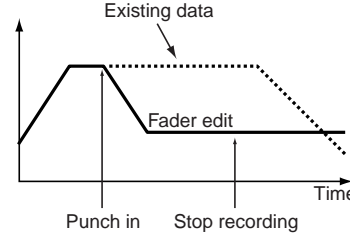
SIZE: The size of the current Automix and the size of any Automix data in the undo buffer are displayed here in kilobytes.

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.”

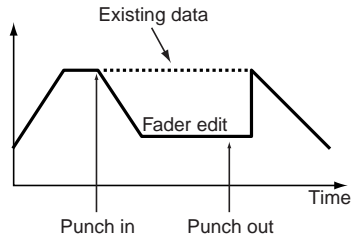
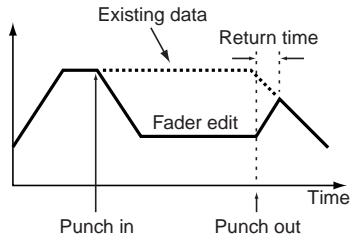
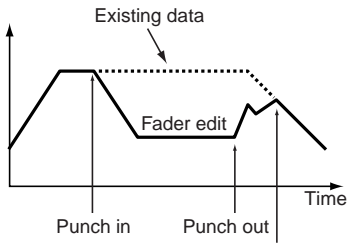
INT START TIME: This parameter is used to set the start time of the internal timecode generator in hours, minutes, seconds, frames, and subframes. Press the [ENTER] button to reset the currently selected digits to “00.” The internal timecode generator is selected on the Time Reference page (see page 152).

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.

TO END	Return	Takeover or Off
<p>OFF</p>	<p>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.</p> 	<p>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.</p> 
<p>ON</p>	<p>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.</p> 	<p>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.</p> 

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, and User Defined Remote Layer faders. The Edit Out modes are explained in the following table. The Return Time is specified on the Fader Edit page (see page 151).

Off	Return	Takeover
<p>At the punch out point, the fader remains at the same position until the next Fader event in the existing data occurs.</p> 	<p>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.</p> 	<p>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.</p>  <p>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.</p>

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, and User Defined Remote Layer faders.

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.

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 152).

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, and User Defined Layer faders)
ON	Channel Mutes (ON/OFF), User Defined Layer [ON] buttons
PAN	Input Channel Pan, User Defined Layer Encoders
SURR	Input Channel Surround pan, LFE level, DIV 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.

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 130).

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. This button can also be used to stop 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 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.



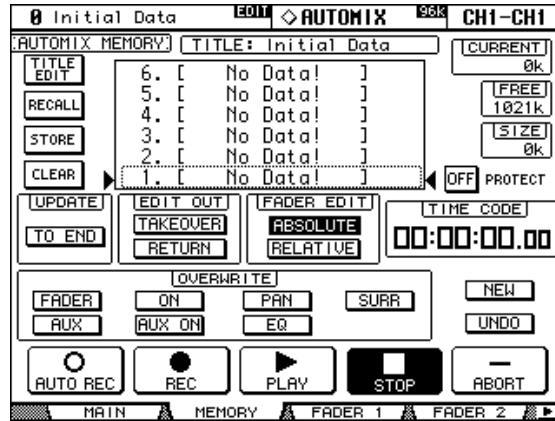
The [AUTO] button indicators operate as follows:

- Off: Automix playback disabled
- Green: Automix stopped or playing
- Orange: Record-Ready mode
- Red: Recording (even for individual parameters, see page 156)
- 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 130. The remaining items are the same as on the Main page and are explained on page 146.

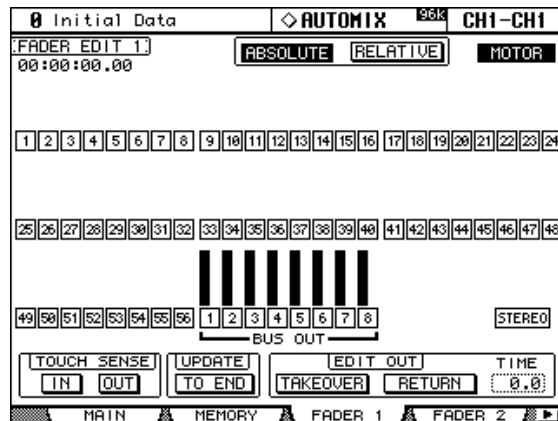
Fader Edit Pages

During playback, fader positions are displayed graphically as black bars on the Fader Edit page, of which there are two. 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. 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 button and then double-clicking the [ENTER] button. A confirmation message appears and you can elect to make one channel safe or all channels. 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 146 for more information.

MOTOR: This button is used to turn the fader motors 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: Touch sense allows you to punch faders in and out during recording simply by touching fader knobs. Touch sense IN and touch sense OUT can be turned on and off independently.

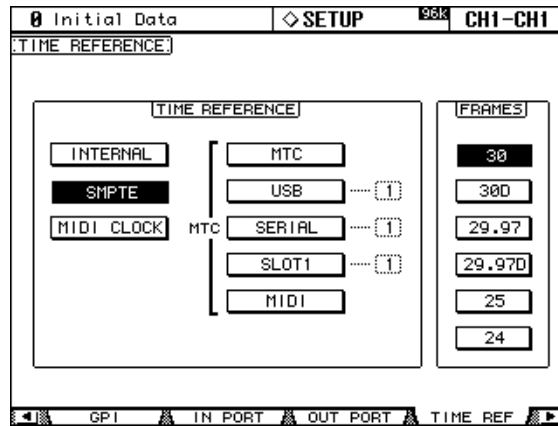
UPDATE: This button is the same as that on the Main and Memory pages. See “Automix Main Page” on page 146 for more information.

EDIT OUT: The TAKEOVER and RETURN buttons are the same as those on the Main and Memory pages. See “Automix Main Page” on page 146 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.



- 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**, **SERIAL**, and **SLOT1** 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.

MEAS	TIME	MEAS	TIME	MEAS	TIME	MEAS	TIME
1	4/4						

- 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 152 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.**

A confirmation message appears asking if you want to update the existing Automix data (i.e., keep the edits just recorded).

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 156). Use the Update To End option to determine how existing events are handled when rerecording is stopped (see page 146). Use the Edit Out (see page 147) and Fader Edit (see page 148) 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	OVERWRITE	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	
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	
Pan	Input	PAN	Set Layer to input, Encoder mode to Pan, use Encoders (Also use SELECTED CHANNEL section PAN control, or Joystick if [LINK] is on)	If Pan mode is Gang or Inverse-Gang, paired channels are recorded together.
Surround Pan	Input	SURR	Use Joystick (If [LINK] is on, also use SELECTED CHANNEL section PAN control) (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)	—
User Defined Plug-Ins (parameters 1–4)	Plug-Ins 1–4	—	Use Parameter controls 1–4 (push to punch in/out)	—
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	OVERWRITE	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		
Pan	Input	PAN	Set Layer to input, Encoder mode to Pan (Also use SELECTED CHANNEL section PAN control, or Joystick if [LINK] is on)	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 199). 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	Push Parameter 1–4 control
User Defined Plug-Ins (parameters 1–4)	Plug-Ins 1–4	—	Select Plug-Ins	Push Parameter 1–4 control	Push Parameter 1–4 control
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 IN on Fader Edit page must be on.
2. TOUCH SENSE OUT on Fader Edit page must be on.

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, if the OVERWRITE 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 151). Fader events can be viewed on the Fader Edit pages (see page 151).

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.

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 158 for more information.

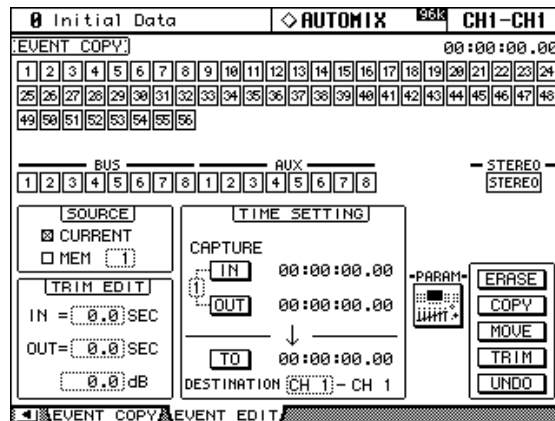
Editing Events Offline

Automix events can be edited offline on the Event Copy and Event Edit pages. Offline editing can be performed only while the Automix function is stopped.

Event Copy Page

On the Event Copy 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 Copy page.



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

Channel buttons: These buttons are used to specify the Input and Output Channels whose Automix data you want to erase, copy, move/merge, or trim. In other words, the source data. A channel is specified when its button appears highlighted. Multiple channels can be specified. Channel buttons can be selected by using the Parameter wheel or the cursor buttons. You can specify all channels by double-clicking any channel button. A confirmation message appears and you can select one or all channels. It's not necessary to select source channels when editing library or Scene recall events or effects or Plug-Ins events.

SOURCE: These parameters are used to select the source Automix for copying and moving/merging. You can select CURRENT, i.e., the current Automix, or MEM and any Automix from 1 to 16. When MEM is selected, the MOVE button changes to MERGE. The Erase and Trim functions work only with the current Automix and ignore these settings.

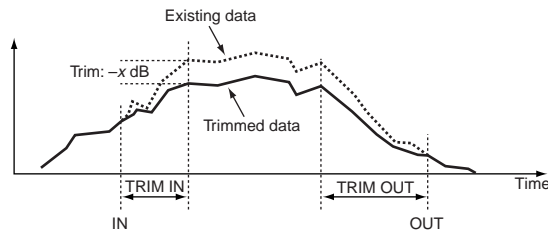
TIME SETTING: The IN and OUT parameters are used to specify the region of Automix data to be erased, copied, moved/merged, or trimmed. The IN and OUT points can be set on-the-fly by pressing the [ENTER] button while the IN or OUT button is selected. The captured timecode values can be edited by using 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.

The TO parameter is used to specify the point to which the specified data will be copied or moved/merged. The TO point can be set on-the-fly by pressing the [ENTER] button while the TO button is selected. The captured timecode value 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."

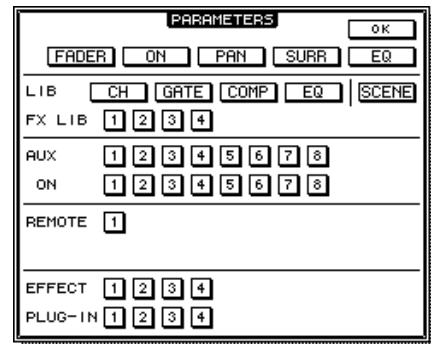
The DESTINATION parameter is used to specify the channel to which the specified data will be copied or moved/merged. The number of destination channels depends on the number of source channels specified. For example, if Input Channels 1 through 8 are specified as the source, then the number of destination channels will be eight. Destination channels are contiguous and only the first channel in the range can be specified.

TRIM EDIT: These parameters are used to specify the TRIM IN and TRIM OUT times and the trim level, which can be set in 0.5 dB steps. The TRIM IN parameter determines the time in which the fader level must achieve the specified trim amount. The TIME SETTING IN point determines the point at which trimming starts.

The TRIM OUT time determines the time from which the Fader level can start returning to the previous level. The TIME SETTING OUT point determines the point at which trimming ends.



PARAM: Pressing this button opens the PARAMETERS window, which is used to specify which parameters will be erased, copied, moved/merged, or trimmed. A parameter is selected when its button appears highlighted. Multiple parameters can be specified. You can select all parameters by double-clicking any parameter button. A confirmation message appears and you can select one or all parameters.



Button		Events
FADER		Channel Fader events (Inputs Channels, Bus Out masters, Aux Send masters, and the Stereo Out)
ON		Channel Mute events
PAN		Input Channel pan events
SURR		Input Channel surround pan, LFE level, and DIV 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

ERASE button: This button is used to erase the specified Automix data. Use the channel buttons to select the source channels. Use the IN and OUT parameters to specify the region to be erased. Use the PARAMETERS window to specify which Automix events are to be erased. Then select the ERASE button and press [ENTER].

COPY button: This button is used to copy the specified Automix data. Use the channel buttons to select the source channels. Use the IN and OUT parameters to specify the region to be copied. Use the TO parameter to specify the point to which the specified data is to be copied. Use the DESTINATION parameter to specify the channels to which the specified data is to be copied. Use the PARAMETERS window to specify which Automix events are to be copied. Then select the COPY button and press [ENTER]. Duplicate events at the specified destination will be erased.

MOVE/MERGE button: This button is used to move/merge the specified Automix data. To move events, set the SOURCE to CURRENT. Use the channel buttons to select the source channels. Use the IN and OUT parameters to specify the region to be moved. Use the TO parameter to specify the point to which the specified data is to be moved. Use the DESTINATION parameter to specify the channels to which the specified data is to be moved. Use the PARAMETERS window to specify which Automix events are to be moved. Then select the MOVE button and press [ENTER].

To merge events from another Automix, select the SOURCE MEM option and specify the source Automix. Use the channel buttons to select the source channels. Use the IN and OUT parameters to specify the region to be merged. Use the TO parameter to specify the point to which the specified data is to be merged. Use the DESTINATION parameter to specify the channels to which the specified data is to be merged. Use the PARAMETERS window to specify which Automix events are to be merged. Then select the MERGE button and press [ENTER].

TRIM button: This button is used to trim the specified Automix data. Use the channel buttons to select the source channels. Use the IN and OUT parameters to specify the region to be trimmed. Use the TRIM EDIT IN and OUT parameters to specify the TRIM IN and OUT times, and set the trim amount. Use the PARAMETERS window to specify which Automix events are to be trimmed (see below). Then select the TRIM button and press [ENTER].

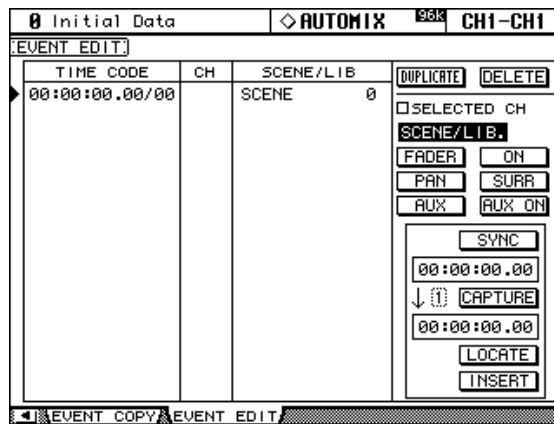
For trimming, you can select the following Fader events on the PARAMETERS window: FADER (i.e., Inputs Channels, Bus Out masters, Aux Send masters, and the Stereo Out), AUX 1–8 (i.e., Aux Send levels 1–8).

UNDO button: This button works the same as the UNDO button on the Automix Main page. See “UNDO” on page 148 for more information.

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 DUPLICATE, DELETE, SELECTED CH, Event select, or SYNC 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.

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, 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	Surround pan	TIME CODE, CH, SURR
AUX	Aux Send 1–8 levels	TIME CODE, CH, AUX, dB
AUX ON	Aux Send 1–8 mutes	TIME CODE, CH, AUX, ON/OFF

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.

Timecode counter: This counter displays the current timecode position.

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 199), Capture memories increment automatically each time a timecode position is captured.

If the Link Capture & Locate Memory preference is on (see page 199), 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.

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.”

LOCATE button: This button is used to locate events at the Capture memory display position.

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].

17 MIDI

MIDI & the 02R96

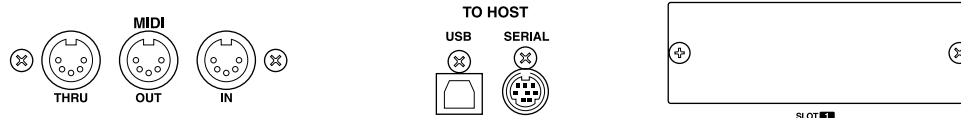
The 02R96 supports the following MIDI messages:

- Program Changes for recalling Scenes (see page 166)
- Control Changes for real-time parameter control (see page 167)
- System Exclusive Parameter Changes for real-time parameter control (see page 167)
- MIDI Note On/Off for Freeze effect (see page 244)
- Bulk Dump for transmitting Scene, library, and setup data (see page 168)
- MTC and MIDI Clock for Automix synchronization (see page 152)
- MMC for external machine control (see page 192)
- User Defined Plug-Ins transmit user-specified MIDI data when Parameter controls 1–4 are operated (see page 135)
- User Defined Remote Layer transmits user-specified MIDI data when the channel strip faders, Encoders, and [ON] buttons are operated (see page 189)
- Predefined Remote Layers for controlling popular DAWs (Digital Audio Workstations), including Pro Tools (see page 169)

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, TO HOST USB, and SLOT1 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 29).

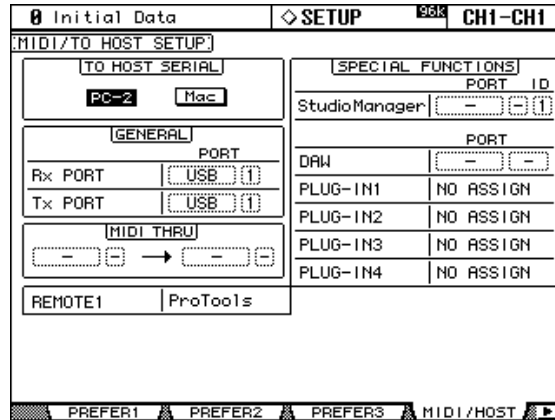
If you are connecting a Windows computer to the TO HOST USB or TO HOST SERIAL port, you must install and use the YAMAHA CBX Driver for Windows and the YAMAHA USB Driver for Windows, which are included on the supplied CD-ROM.

If you are connecting a Macintosh computer to the TO HOST USB or TO HOST SERIAL port, you must install and use the YAMAHA USB Driver for Macintosh and OMS 2.3.8, which are included on the supplied CD-ROM.

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 1–8.

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 1–8.

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 1–8. 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 1–8. See the Studio Manager documentation for more information.

DAW: These parameters are used to select ports for use with DAWs. Since three ports are required to control DAWs, ports are selected in groups of three, as follows: 1–3, 2–4, 3–5, 4–6, 5–7, 6–8. Available ports include: SERIAL, USB, and SLOT1.

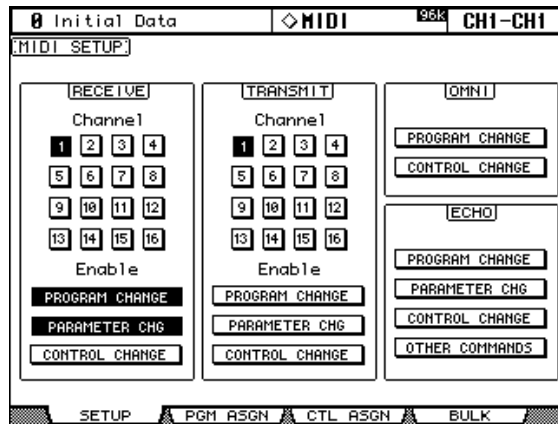
PLUG-IN1–4: These parameters are used to select ports for use with the Plug-Ins. If a Waves Plug-In card is installed in a Slot, the number of that Slot is displayed and no settings can be made. If the Plug-In target is set to USER DEFINED, you can select a port from MIDI, SERIAL 1–8, USB 1–8, or SLOT1 1–8. Ports for User Defined Plug-Ins can also be set on the Plug-In Setup page (see page 135).

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.



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

RECEIVE: The Channel buttons are used to select a MIDI Channel for MIDI message reception. The Enable buttons are used to turn on and off reception of Program Change, Parameter Change, and Control Change messages.

TRANSMIT: The Channel buttons are used to select a MIDI Channel for MIDI message transmission. The Enable buttons are used to turn on and off transmission of Program Change, Parameter Change, and Control Change messages.

OMNI: These buttons determine whether the 02R96 responds to Program Change and Control Change messages only on the specified MIDI Receive Channel or on all Channels.

ECHO: These buttons determine whether Program Change, Parameter Change, Control Change, and Other Commands received at the MIDI IN port are echoed through to the MIDI OUT port.

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 165).

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 273. This table can be stored to an external MIDI device, such as a MIDI data file, by using MIDI Bulk Dump (see page 168).

- 1 Use the **DISPLAY ACCESS [MIDI]** button to locate the **Program Change Assign Table** page.

PGM CHG	SCENE NO./TITLE
7 =	7.[No Data!]
6 =	6.[No Data!]
5 =	5.[No Data!]
4 =	4.[No Data!]
3 =	3.[No Data!]
2 =	2.[No Data!]
No. 1 =	1.[No Data!]

- 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 165).

A Parameter to Control Change assignment table, listing the initial assignments, is provided on page 274. This table can be stored to an external MIDI device, such as a MIDI data file, by using MIDI Bulk Dump (see page 168).

- 1 Use the **DISPLAY ACCESS [MIDI]** button to locate the Control Change Assign Table page.

CTL CHG	PARAMETER	CHANNEL	INPUT
6	= FADER H	CHANNEL	INPUT 6
5	= FADER H	CHANNEL	INPUT 5
4	= FADER H	CHANNEL	INPUT 4
3	= FADER H	CHANNEL	INPUT 3
2	= FADER H	CHANNEL	INPUT 2
1	= FADER H	CHANNEL	INPUT 1
No. 0	= NO ASSIGN		

- 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 **CTL CHG.** 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].

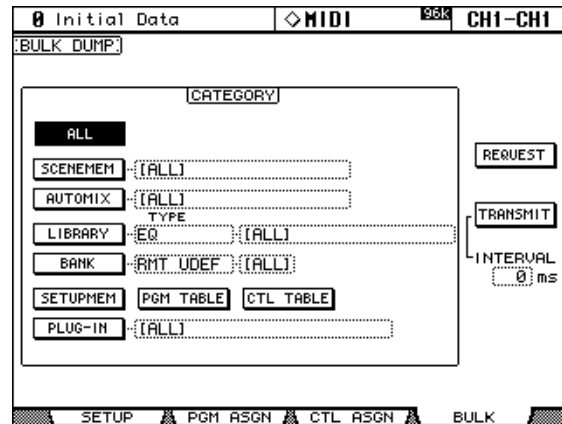
Controlling Parameters by Using Parameter Changes

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 275 for detailed information. You must set the MIDI Setup parameters in order to transmit and receive Parameter Change messages (see page 165).

Using Bulk Dump

02R96 data can be stored to an external MIDI device, such as a MIDI data file, 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]**.
- 3 To receive data, use the **CATEGORY** parameters to select the type of data you want to receive, select the **REQUEST** 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, User Defined Plug-Ins banks, or the User Defined Keys banks. 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 166.

CTL TABLE: Parameter to MIDI Control Change table. See “Assigning Parameters to Control Changes” on page 167.

PLUG-IN: The settings of any installed Y56K cards. You can specify ALL Slots or Slot 3 or 4.

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 164).

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

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 164).

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 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 164 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 189 for more information.

3 Use the LAYER [REMOTE] button to select the Remote Layer.

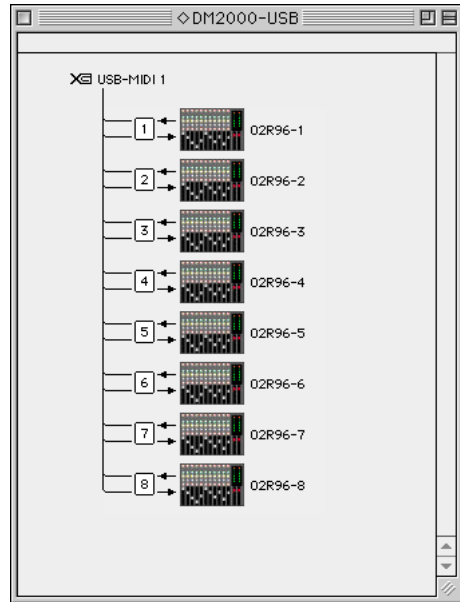
When the Pro Tools Remote Layer is selected, the 02R96's control surface controls Pro Tools, not the 02R96. In order to control the 02R96, you need to select an Input Channel Layer or the Master Layer. Audio mixing on the other Layers and Automix continues while the Pro Tools Layer is selected.

Configuring Pro Tools

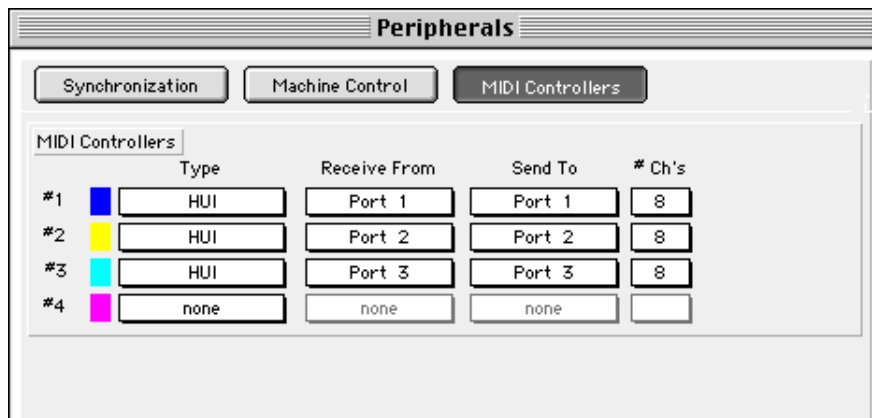
Pro Tools needs to be configured as follows. For more information, see your Pro Tools documentation.

- 1 **Launch Pro Tools.**
- 2 **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.**
- 6 **Select the Receive From and Send To ports, and then click OK.**

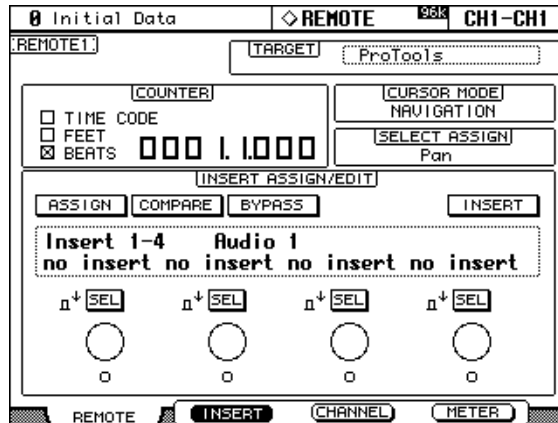
The 02R96 can emulate up to three typical 8-channel Pro Tools MIDI controllers. A single MIDI port is required for every eight channels. So you must configure MIDI Controller #2 to use channels 9 through 16, and configure MIDI Controller #3 to use channels 17 through 24.

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.



F2 (INSERT), F3 (CHANNEL), F4 (METER) buttons

These buttons are used to select the following display modes:

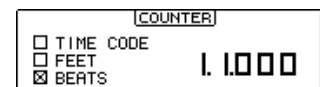
- [F2]—Insert Assign/Edit Display mode (see page 172)
- [F3]—Channel Display mode (see page 172)
- [F4]—Meter Display mode (see page 173)

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 189 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:



TIME CODE: Pro Tools timecode format set to “Time Code.”

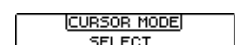
FEET: Pro Tools timecode format set to “Feet:Frames.”

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.

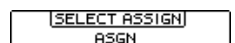
CURSOR MODE

The currently selected Cursor mode is displayed here: NAVIGATION, ZOOM, or SELECT. Cursor modes are selected by using the [INC] (CURSOR MODE) button.



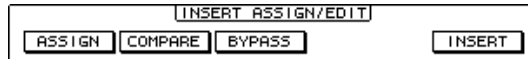
SELECT ASSIGN

This indicates the current function of the Encoders. For example, Pan (PanR), SndA, SndB, SndC, SndD, or SndE.



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 182 for more information.

COMPARE: This indicator appears highlighted when the EFFECTS/PLUG-INS [2] (COMPARE) button is pressed. See “Editing Plug-ins” on page 183 for more information.

BYPASS: This indicator appears highlighted when the EFFECTS/PLUG-INS [3] (BYPASS) button is pressed. See “Editing Plug-ins” on page 183 and “Bypassing Plug-ins” on page 184 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 183 for more information.

INSERT/PARAM Display



This section displays mainly insert and plug-in-related information, although other messages are also displayed here.

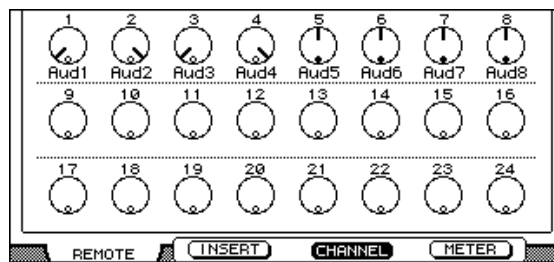
Encoder Display



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

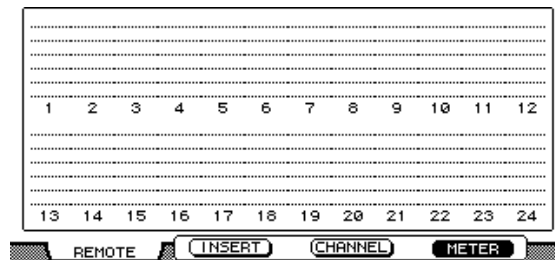
Press the [F3] button to select this display mode.



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 187, “Viewing Send Destinations” on page 180, and “Configuring Sends as Pre or Post” on page 180 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 187, “Viewing Send Destinations” on page 180, and “Configuring Sends as Pre or Post” on page 180 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 176).

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 179)	Reset pan (see page 184)
[SEND LEVEL]	Send levels (see page 180)	Send pre/post (see page 180) Reset send levels (see page 184)

[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 187 for more information.

[SEL] buttons

These buttons are used to select channels (see page 179) and to select inserts (see page 183).

[SOLO] buttons

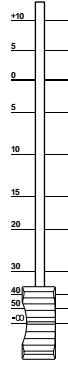
These buttons are used to solo channels. See “Soloing Channels” on page 179 for more information.

[ON] buttons

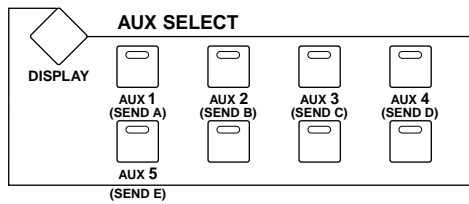
These buttons are used to mute channels. See “Muting Channels” on page 179 for more information.

Faders

The faders are used to set channel levels (see page 179), or to set send levels in Flip mode (see page 181).

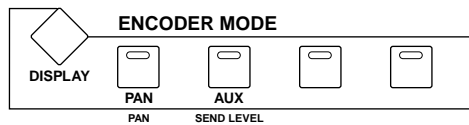


AUX SELECT Section



AUX SELECT [AUX 1–5] buttons are used to select sends A–E. The button indicator of the currently selected send lights up.

ENCODER MODE Section



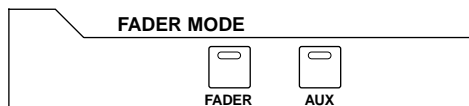
[PAN] (PAN) button

When this button is pressed, the Encoders work as channel panpots. Its indicator lights up when it's pressed. See “Panning Channels” on page 179 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 1–5] (SEND A–E) buttons is pressed.

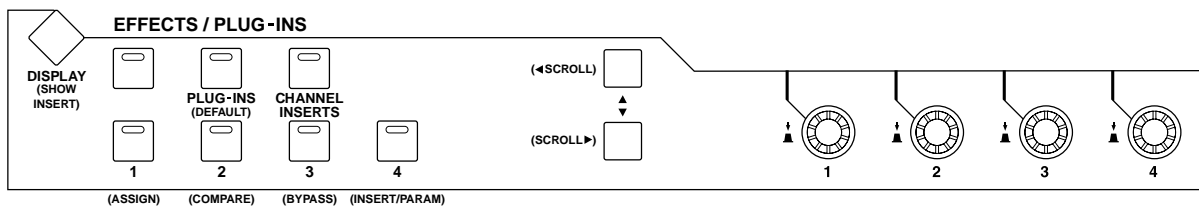
FADER MODE Section



[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 181 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 184 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 179). When its indicator is on (Insert Select mode), they select inserts/plug-ins (see page 183).

[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 182 for more information.

[2] (COMPARE) button

This button is used to compare plug-in edits before and after. See “Editing Plug-ins” on page 183 for more information.

[3] (BYPASS) button

This button is used to bypass plug-ins. See “Editing Plug-ins” on page 183 and “Bypassing Plug-ins” on page 184 for more information.

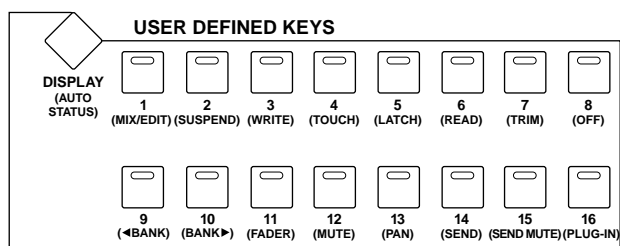
[4] (INSERT/PARAM) button

This button is used in conjunction with other controls when editing plug-ins. See “Editing Plug-ins” on page 183 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 182 and “Editing Plug-ins” on page 183 for more information.

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 187 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 187 for more information.

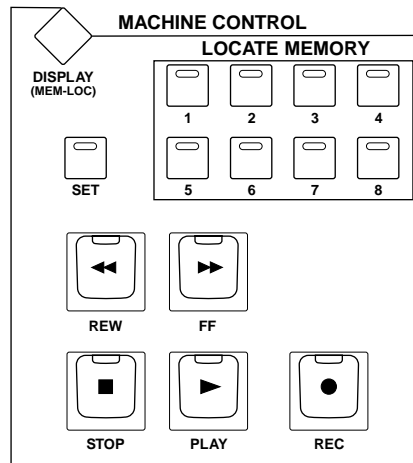
[9] (◀ BANK) & [10] (BANK ▶) buttons

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 188 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

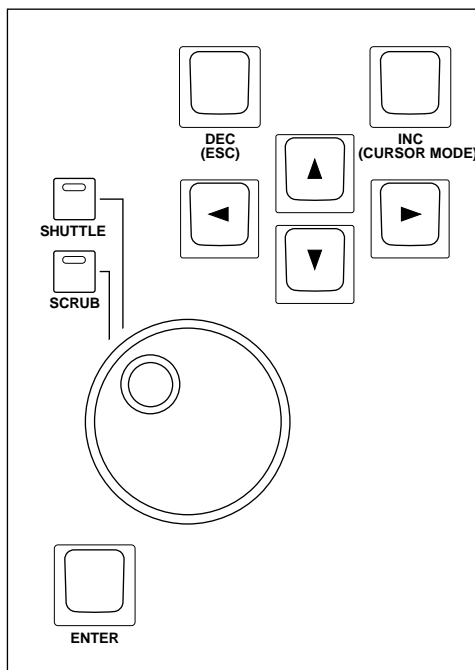
This button starts playback from the current cursor position.

[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).

Normally the MACHINE CONTROL section can be used to control Pro Tools only while the Pro Tools Remote Layer is selected. By turning on the DAW CONTROL option on either the Locate Memory page (see page 194) or the Machine Configuration page (see page 192), the MACHINE CONTROL section can be used to control Pro Tools regardless of which Layer is currently selected.

Data Entry Section



Parameter Wheel

The Parameter wheel is used for shuttling and scrubbing (see page 186). It's also used for making fine adjustments to the selected region (see page 185).

[SHUTTLE] & [SCRUB] buttons

These buttons are used to select the Shuttle and Scrub modes. See “Scrub & Shuttle” on page 186 for more information.

[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 184), Zoom (see page 185), and Select (see page 185).

Cursor buttons

These buttons can be used to navigate the Edit window (see page 184), zoom waveforms (see page 185), and to make fine adjustments to the selected region (see page 185). 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 172 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 172) by pressing the holding the AUX SELECT [AUX 1–5] (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 1–5] (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 181 for more information.

Send pre/post status can be viewed in Channel Display mode [F3] or Meter Display mode [F4] (see page 172) by pressing the holding the Encoder push-switches.

Setting Send Levels

Send levels can be set as follows.

- 1 Use the AUX SELECT [AUX 1–5] (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 172 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 181 for more information.

Muting Sends

Sends can be muted by using the [ON] buttons in Flip mode. See “Flip Mode” on page 181 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 181 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 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 1–5] (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 channel 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 [AUX1–5], 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.

19 Remote Control

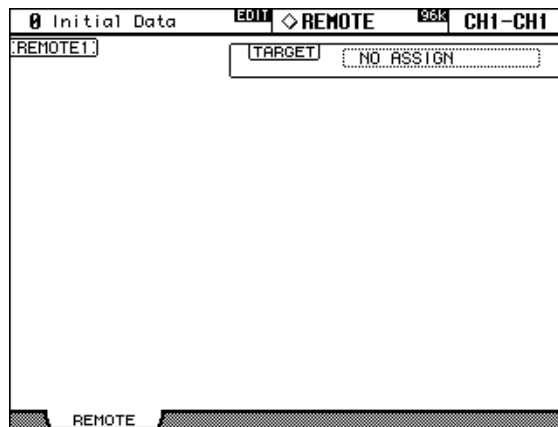
About the Remote Layer

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) is specified on the Remote page. There are three types of target: User Defined, Nuendo, and Pro Tools. The User Defined target allows 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 Nuendo and Pro Tools targets have been especially designed for controlling Nuendo and Pro Tools.

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.

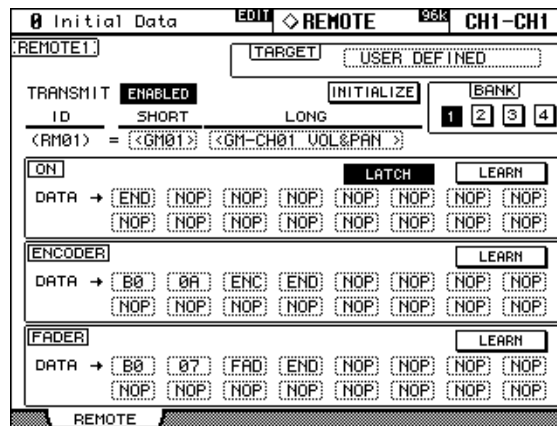


- 2 Use the cursor buttons to select the **TARGET** parameter, use the Parameter wheel or INC/DEC buttons to select a target, and then press [ENTER].
TARGET: This can be set to NO ASSIGN, USER DEFINED, Nuendo, or Pro Tools. See page 190 for more information on the User Defined target. See page 169 for more information on the Pro Tools target.

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 168). See “User Defined Remote Layer Initial Bank Settings” on page 219 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 32 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. NOP 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. NOP 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.

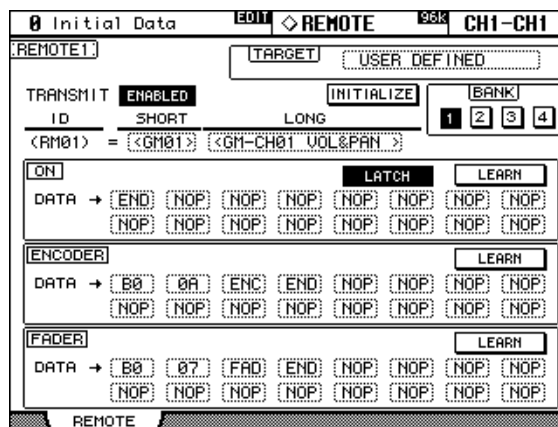
FADER: These parameters are used to specify the MIDI message (up to 16 bytes) to be transmitted when a fader is operated. Use the [SEL] buttons to select the channel strips, and then edit as necessary. When a value from 00 to FF is specified, that value is transmitted when a fader is adjusted. For the 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. NOP 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.

MACHINE	TYPE	PORT	DEVICE ID	TRANSPORT CONTROL
1	NONE	-	-	DISABLED
2	NONE	-	-	DISABLED
3	NONE	-	-	DISABLED
4	NONE	-	-	DISABLED
5	NONE	-	-	DISABLED
6	NONE	-	-	DISABLED
7	NONE	-	-	DISABLED
8	NONE	-	-	DISABLED

- 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, except when a DAW Remote layer is selected, in which case it controls the DAW. When the DAW CONTROL option is on, the MACHINE CONTROL section controls the DAW regardless of which Layer is currently selected. These settings also appear on the Locate Memory page (see page 194).

TYPE: This is used to specify the type of machine: MMC or NONE.

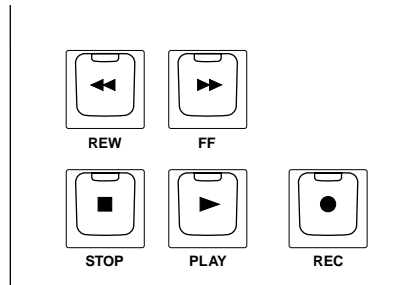
PORT: When the machine TYPE is MMC, use this parameter to specify the port for MMC communications. Available ports include: MIDI, SERIAL 1–8, USB 1–8, and SLOT1 1–8.

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 192).



[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

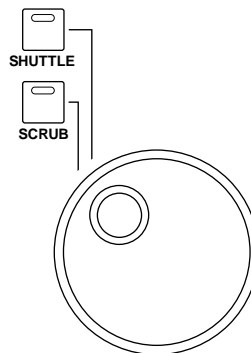
This button starts playback on the external machines. It's also used to punch out of recording.

[REC] button

This button is used in conjunction with the [PLAY] button to start recording on the external machines. Pressing the [REC] button on its own has no effect.

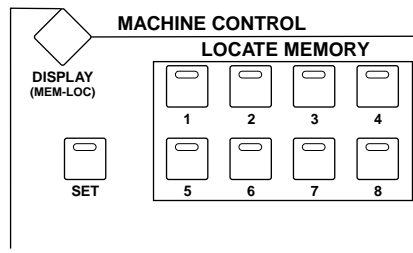
Using Shuttle & Scrub

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 194). 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.

The screenshot shows the "LOCATE MEMORY" page. At the top, it displays "0 Initial Data", "50M", "LOCATOR", "96k", and "CHI-CHI". Below this, there are checkboxes for "MACHINE CONTROL" (checked) and "DAW CONTROL" (unchecked). A table with two columns, "LOCATE MEMORY" and "TIME", lists eight memory points, each with a time value of "00:00:00.00".

LOCATE MEMORY	TIME
1	00:00:00.00
2	00:00:00.00
3	00:00:00.00
4	00:00:00.00
5	00:00:00.00
6	00:00:00.00
7	00:00:00.00
8	00:00:00.00

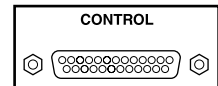
- 2 Use the cursor buttons to select the parameters, and use the Parameter wheel, INC/DEC buttons, and [ENTER] button to set them.

MACHINE CONTROL/DAW CONTROL: When the MACHINE CONTROL option is on, the MACHINE CONTROL section controls external MMC machines, except when a DAW Remote layer is selected, in which case it controls the DAW. When the DAW CONTROL option is on, the MACHINE CONTROL section controls the DAW regardless of which Layer is currently selected.

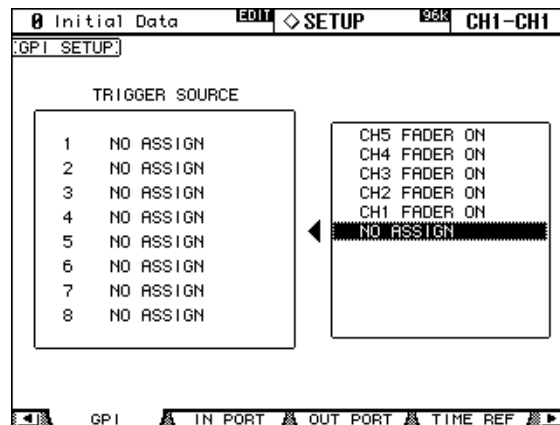
LOCATE MEMORY 1–8: These time values determine the points that will be located when the LOCATE MEMORY [1–8] buttons are pressed. They can only be set while the MACHINE CONTROL option is on. Locate points can be specified in hours, minutes, seconds, and frames, the frame range being dependent on the frame rate setting on the Time Reference page (see page 152).

GPI (General Purpose Interface)

The 02R96's CONTROL port (25-pin D-sub connector) provides a GPI (General Purpose Interface) for controlling external equipment. Pinouts are provided on page 271. The eight GPI outputs can be configured so that they output trigger signals when faders or USER DEFINED KEYS are operated. The GPI can also be used to control a "RECORDING" warning light outside a studio, or to trigger the Solo function of a Yamaha 02R Digital Recording Console.



- 1 Use the **DISPLAY ACCESS [SETUP]** button to select the GPI page.



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

- 2 Use the **Up/Down cursor buttons** to select a GPI Output.
- 3 Use the **Parameter wheel or the INC/DEC buttons** to select a function.

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

See the "GPI Trigger Source List" on page 217 for a complete list of assignable functions.

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

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

Faders: Faders can be used to control external equipment. A FADER ON event occurs when a fader is moved up from $-\infty$. A FADER OFF event occurs when a fader is moved down to $-\infty$. When such an event occurs, the assigned GPI Output goes High (+5 V) for approximately 250 msec.

USER DEFINED KEYS: These buttons can be used as general-purpose triggers. For UNLATCH, when a USER DEFINED KEY is pressed, the assigned GPI Output goes High (+5 V) for approximately 250 msec. For LATCH, when a USER DEFINED KEY is pressed, the assigned GPI Output goes High (+5 V) and remains High until the USER DEFINED KEY is pressed again.

REC LAMP: This source can be used to control a "RECORDING" warning light outside a studio. When the [REC] button indicator is lit, the assigned GPI Output goes High (+5 V).

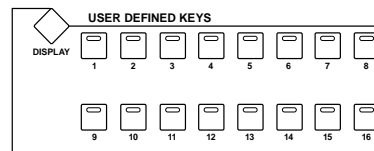
POWER ON: While the 02R96 is powered up, the assigned GPI output is High (+5 V).

The 02R96 also features two fixed GPI inputs for use with talkback and dimmer. Each time the GPI0 input goes Low (ground), the TALKBACK button is turned on or off. Each time the GPI1 input goes Low (ground), the DIMMER button is turned on or off.

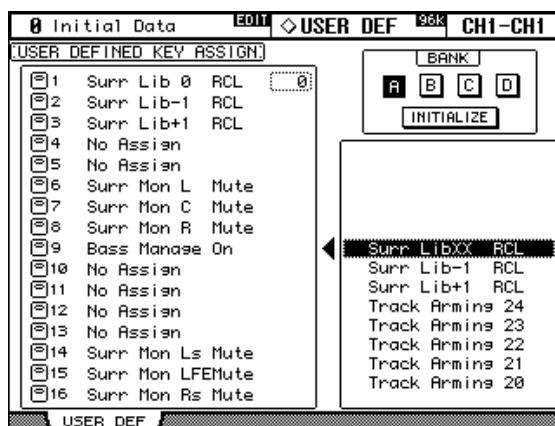
20 Other Functions

Using the User Defined Keys

Up to 16 functions from a list of over 150 can be assigned to the USER DEFINED KEYS, and up to four assignment setups can be stored in banks A, B, C, and D. See page 202 for a list of initial bank assignments.



- 1 Use the **USER DEFINED KEYS [DISPLAY]** button to locate the **User defined Key Assigned** page.



- 2 Use the cursor buttons to select the **BANK** buttons, **A**, **B**, **C**, and **D**, and press **[ENTER]** to select a bank.
- 3 Use the cursor buttons to select the **Assign** buttons in the left-hand box, and use the **Parameter wheel** or **INC/DEC** buttons to select a function.

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

See page 202 for a complete list of assignable functions.

- 4 Press **[ENTER]** to activate your selection.

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 **INITIALIZE** button, and pressing **[ENTER]**.

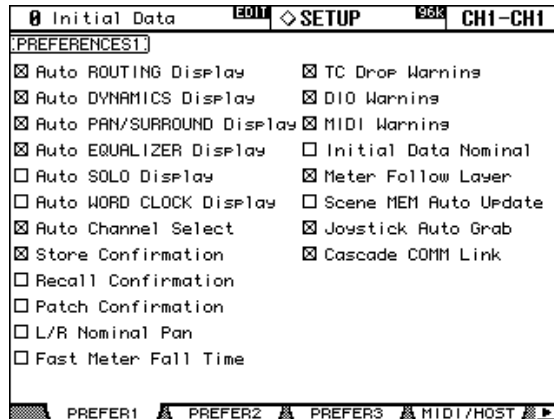
User Defined Keys banks can be stored to an external MIDI device, such as a MIDI data file, by using **MIDI Bulk Dump** (see page 168).

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 66).

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 60), and the Comp Edit page appears automatically when a Compressor control in the SELECTED CHANNEL DYNAMICS section is operated (see page 97).

Auto PAN/SURROUND Display: When this preference is on, the Pan pages appear automatically when a control in the SELECTED CHANNEL PAN/SURROUND section is operated (see page 68). 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 70).

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 93).

Auto SOLO Display: When this option is on, the Solo Setup page appears automatically when an channel is soloed (see page 102).

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 42).

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 140) or library memory (page 122).

Recall Confirmation: When this preference is on, a confirmation message appears when you recall a Scene (page 140) or library memory (page 122).

Patch Confirmation: When this preference is on, a confirmation message appears when you edit the Input and Output Patches (see page 52).

L/R Nominal Pan: When this preference is on, left/odd and right/even signals will be at nominal level when Input Channels 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.

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.

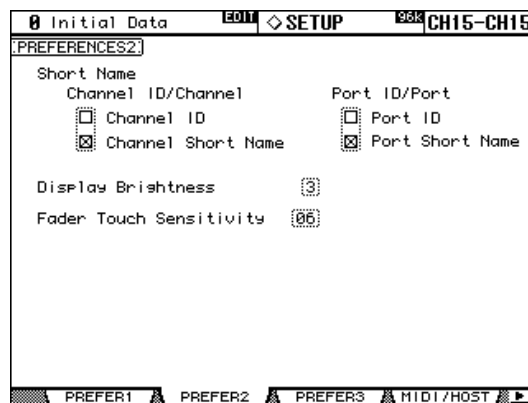
Scene MEM Auto Update: When this preference is on, the Shadow Scene memories can be used (see page 139).

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 70).

Cascade COMM Link: When this preference is on, various functions are linked between cascaded 02R96s (see page 49). When this preference is off, only digital audio signals are distributed among the cascaded 02R96s.

Preferences 2

- 1 Use the DISPLAY ACCESS [SETUP] button to locate the Preferences 2 page.



- 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/Channel: When the Channel ID preference is on, the Channel ID appears in the upper-right corner of the display pages (e.g., CH1-CH1). When the Channel Short Name preference is on, the Channel ID and Channel Short name appear (e.g., CH1-NAME).

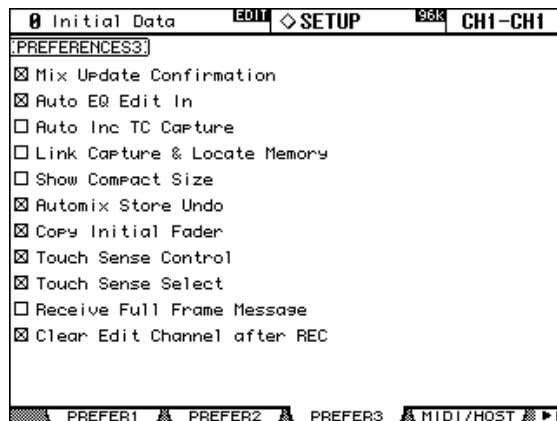
Port ID/Port: When the Port ID preference is on, patch pages show Port IDs. When the Port Short Name preference is on, they display Short Port names. See “Patching with the Encoders” on page 58.

Display Brightness: This preference is used to set the brightness of the LED displays and indicators.

Fader Touch Sensitivity: This determines the touch sensitivity of the fader knobs when they are used for selecting channels. If you're having trouble selecting channels because the fader knobs are not sensitive enough, 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 28 for more information.

Preferences 3

- 1 Use the **DISPLAY ACCESS [SETUP]** button to locate the Preferences 3 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.

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.

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 158).

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.

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.

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.

Touch Sense Control: When this preference is on, fader movements are ineffective when the touch sensors are not triggered (i.e., when fader knobs are moved by an insulated item, such as a fingernail, instead of a fingertip), allowing “cut-in” style operation. When this preference is off, fader movements are always recognized.

Touch Sense Select: When this preference is on, channels can be selected simply by touching the fader knobs.

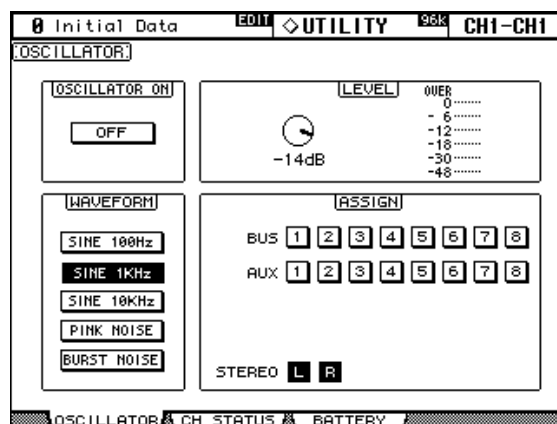
Receive Full Frame Message: When this preference is on, MTC full frame messages are recognized and Automix follows them.

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.

Using the Oscillator

The O2R96 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, PINK NOISE, or BURST NOISE, which is 200 msec pink noise pulses at four second intervals.

ASSIGN: These buttons are used to assign the Oscillator output to Bus Outs, Aux Sends, and the Stereo Out.

Checking the Battery

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.



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.

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 168). If you want to reset just the mix settings, recall scene memory #0 instead (see page 139).

- 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 YES, 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.

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 SLOT1 ON/OFF	Surr.SLOT1 ON
39	SURR. MONI SLOT2 ON/OFF	Surr.SLOT2 ON
40	SURR. MONI SLOT3 ON/OFF	Surr.SLOT3 ON
41	SURR. MONI SLOT4 ON/OFF	Surr.SLOT4 ON
42	SURR. MONI BASS MANAGE ON/OFF	Bass Manage ON

#	Function	Display
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
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.

#	Function	Display
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
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	CH Copy	Channel Copy
123	CH Paste	Channel Paste
124	Display Back	Display Back
125	Display Forward	Display Forward

USER DEFINED KEYS Initial Assignments

#	Bank A	Bank B	Bank C	Bank D
1	Surr Lib 0 Recall	Scene 1 Recall	IN Fader Group A	Automix ENABLE
2	Surr Lib -1 Recall	Scene 2 Recall	IN Fader Group B	Automix REC
3	Surr Lib +1 Recall	Scene 3 Recall	IN Fader Group C	Automix ABORT
4	No Assign	Scene 4 Recall	IN Fader Group D	Automix AUTOREC
5	No Assign	Scene 5 Recall	IN Fader Group E	Automix RETURN
6	Surr.Mon L Mute	Scene 6 Recall	IN Fader Group F	Automix RELATIVE
7	Surr.Mon C Mute	Scene 7 Recall	IN Fader Group G	Automix T. SENSE
8	Surr.Mon R Mute	Scene +1 Recall	IN Fader Group H	Automix TAKEOVER
9	Bass Manage ON	Scene 8 Recall	IN Mute Group I	Overwrite FADER
10	No Assign	Scene 9 Recall	IN Mute Group J	Overwrite ON
11	No Assign	Scene 10 Recall	IN Mute Group K	Overwrite PAN
12	No Assign	Scene 11 Recall	IN Mute Group L	Overwrite SURR
13	No Assign	Scene 12 Recall	IN Mute Group M	Overwrite AUX
14	Surr.Mon Ls Mute	Scene 13 Recall	IN Mute Group N	Overwrite AUX ON
15	Surr.Mon LFEMute	Scene 14 Recall	IN Mute Group O	Overwrite EQ
16	Surr.Mon Rs Mute	Scene -1 Recall	IN Mute Group P	Automix STOP

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

Input Channel Inputs		Input Channel insert Ins		Internal Effects Processor Inputs	
Port ID	Description	Port ID	Description	Port ID	Description
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
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

Input Channel Inputs		Input Channel insert Ins		Internal Effects Processor Inputs	
Port ID	Description	Port ID	Description	Port ID	Description
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		
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

Slot Outputs		Omni Outs		Output Channel Insert Ins	
Source	Description	Source	Description	Source	Description
INSCH26	InsertOut-CH26	INSCH26	InsertOut-CH26	S2-4	Slot2 CH4 IN
INSCH27	InsertOut-CH27	INSCH27	InsertOut-CH27	S2-5	Slot2 CH5 IN
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

Slot Outputs		Omni Outs		Output Channel Insert Ins	
Source	Description	Source	Description	Source	Description
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
Surr Ls2	Surround Monitor Ls2	Surr Ls2	Surround Monitor Ls2	2TD1L	2TR IN Dig.1 L
Surr Rs2	Surround Monitor Rs2	Surr Rs2	Surround Monitor Rs2	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	
Source	Description	Source	Description
NONE	NONE	NONE	NONE
S1-1	Slot1 CH1 OUT	BUS1	BUS1
S1-2	Slot1 CH2 OUT	BUS2	BUS2
S1-3	Slot1 CH3 OUT	BUS3	BUS3
S1-4	Slot1 CH4 OUT	BUS4	BUS4
S1-5	Slot1 CH5 OUT	BUS5	BUS5
S1-6	Slot1 CH6 OUT	BUS6	BUS6
S1-7	Slot1 CH7 OUT	BUS7	BUS7
S1-8	Slot1 CH8 OUT	BUS8	BUS8
S1-9	Slot1 CH9 OUT	AUX1	AUX1
S1-10	Slot1 CH10 OUT	AUX2	AUX2
S1-11	Slot1 CH11 OUT	AUX3	AUX3
S1-12	Slot1 CH12 OUT	AUX4	AUX4
S1-13	Slot1 CH13 OUT	AUX5	AUX5
S1-14	Slot1 CH14 OUT	AUX6	AUX6
S1-15	Slot1 CH15 OUT	AUX7	AUX7
S1-16	Slot1 CH16 OUT	AUX8	AUX8
S2-1	Slot2 CH1 OUT	STEREO-L	STEREO L
S2-2	Slot2 CH2 OUT	STEREO-R	STEREO R
S2-3	Slot2 CH3 OUT	INSCH1	InsertOut-CH1
S2-4	Slot2 CH4 OUT	INSCH2	InsertOut-CH2
S2-5	Slot2 CH5 OUT	INSCH3	InsertOut-CH3
S2-6	Slot2 CH6 OUT	INSCH4	InsertOut-CH4
S2-7	Slot2 CH7 OUT	INSCH5	InsertOut-CH5
S2-8	Slot2 CH8 OUT	INSCH6	InsertOut-CH6
S2-9	Slot2 CH9 OUT	INSCH7	InsertOut-CH7
S2-10	Slot2 CH10 OUT	INSCH8	InsertOut-CH8
S2-11	Slot2 CH11 OUT	INSCH9	InsertOut-CH9
S2-12	Slot2 CH12 OUT	INSCH10	InsertOut-CH10
S2-13	Slot2 CH13 OUT	INSCH11	InsertOut-CH11
S2-14	Slot2 CH14 OUT	INSCH12	InsertOut-CH12
S2-15	Slot2 CH15 OUT	INSCH13	InsertOut-CH13
S2-16	Slot2 CH16 OUT	INSCH14	InsertOut-CH14
S3-1	Slot3 CH1 OUT	INSCH15	InsertOut-CH15
S3-2	Slot3 CH2 OUT	INSCH16	InsertOut-CH16
S3-3	Slot3 CH3 OUT	INSCH17	InsertOut-CH17
S3-4	Slot3 CH4 OUT	INSCH18	InsertOut-CH18
S3-5	Slot3 CH5 OUT	INSCH19	InsertOut-CH19
S3-6	Slot3 CH6 OUT	INSCH20	InsertOut-CH20
S3-7	Slot3 CH7 OUT	INSCH21	InsertOut-CH21
S3-8	Slot3 CH8 OUT	INSCH22	InsertOut-CH22
S3-9	Slot3 CH9 OUT	INSCH23	InsertOut-CH23
S3-10	Slot3 CH10 OUT	INSCH24	InsertOut-CH24
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

Direct Outs		2TR Digital Outs	
Source	Description	Source	Description
S4-2	Slot4 CH2 OUT	INSCH32	InsertOut-CH32
S4-3	Slot4 CH3 OUT	INSCH33	InsertOut-CH33
S4-4	Slot4 CH4 OUT	INSCH34	InsertOut-CH34
S4-5	Slot4 CH5 OUT	INSCH35	InsertOut-CH35
S4-6	Slot4 CH6 OUT	INSCH36	InsertOut-CH36
S4-7	Slot4 CH7 OUT	INSCH37	InsertOut-CH37
S4-8	Slot4 CH8 OUT	INSCH38	InsertOut-CH38
S4-9	Slot4 CH9 OUT	INSCH39	InsertOut-CH39
S4-10	Slot4 CH10 OUT	INSCH40	InsertOut-CH40
S4-11	Slot4 CH11 OUT	INSCH41	InsertOut-CH41
S4-12	Slot4 CH12 OUT	INSCH42	InsertOut-CH42
S4-13	Slot4 CH13 OUT	INSCH43	InsertOut-CH43
S4-14	Slot4 CH14 OUT	INSCH44	InsertOut-CH44
S4-15	Slot4 CH15 OUT	INSCH45	InsertOut-CH45
S4-16	Slot4 CH16 OUT	INSCH46	InsertOut-CH46
OMNI1	OMNI OUT 1	INSCH47	InsertOut-CH47
OMNI2	OMNI OUT 2	INSCH48	InsertOut-CH48
OMNI3	OMNI OUT 3	INSCH49	InsertOut-CH49
OMNI4	OMNI OUT 4	INSCH50	InsertOut-CH50
OMNI5	OMNI OUT 5	INSCH51	InsertOut-CH51
OMNI6	OMNI OUT 6	INSCH52	InsertOut-CH52
OMNI7	OMNI OUT 7	INSCH53	InsertOut-CH53
OMNI8	OMNI OUT 8	INSCH54	InsertOut-CH54
2TD1L	2TR OUT Dig.1 L	INSCH55	InsertOut-CH55
2TD1R	2TR OUT Dig.1 R	INSCH56	InsertOut-CH56
2TD2L	2TR OUT Dig.2 L	INSBUS1	InsertOut-BUS1
2TD2R	2TR OUT Dig.2 R	INSBUS2	InsertOut-BUS2
2TD3L	2TR OUT Dig.3 L	INSBUS3	InsertOut-BUS3
2TD3R	2TR OUT Dig.3 R	INSBUS4	InsertOut-BUS4
		INSBUS5	InsertOut-BUS5
		INSBUS6	InsertOut-BUS6
		INSBUS7	InsertOut-BUS7
		INSBUS8	InsertOut-BUS8
		INSAUX1	InsertOut-AUX1
		INSAUX2	InsertOut-AUX2
		INSAUX3	InsertOut-AUX3
		INSAUX4	InsertOut-AUX4
		INSAUX5	InsertOut-AUX5
		INSAUX6	InsertOut-AUX6
		INSAUX7	InsertOut-AUX7
		INSAUX8	InsertOut-AUX8
		INSSTL	InsertOut-STL
		INSSTR	InsertOut-STR
		CR-L	Control Room L
		CR-R	Control Room R

Initial Output Patch Settings

Slot Outputs

#	Source
SLOT1-01	BUS1
SLOT1-02	BUS2
SLOT1-03	BUS3
SLOT1-04	BUS4
SLOT1-05	BUS5
SLOT1-06	BUS6
SLOT1-07	BUS7
SLOT1-08	BUS8
SLOT1-09	BUS1
SLOT1-10	BUS2
SLOT1-11	BUS3
SLOT1-12	BUS4
SLOT1-13	BUS5
SLOT1-14	BUS6
SLOT1-15	BUS7
SLOT1-16	BUS8
SLOT2-01	BUS1
SLOT2-02	BUS2
SLOT2-03	BUS3
SLOT2-04	BUS4
SLOT2-05	BUS5
SLOT2-06	BUS6
SLOT2-07	BUS7
SLOT2-08	BUS8
SLOT2-09	BUS1
SLOT2-10	BUS2
SLOT2-11	BUS3
SLOT2-12	BUS4
SLOT2-13	BUS5
SLOT2-14	BUS6
SLOT2-15	BUS7
SLOT2-16	BUS8
SLOT3-01	BUS1
SLOT3-02	BUS2
SLOT3-03	BUS3
SLOT3-04	BUS4
SLOT3-05	BUS5
SLOT3-06	BUS6
SLOT3-07	BUS7
SLOT3-08	BUS8
SLOT3-09	BUS1
SLOT3-10	BUS2
SLOT3-11	BUS3
SLOT3-12	BUS4
SLOT3-13	BUS5
SLOT3-14	BUS6
SLOT3-15	BUS7
SLOT3-16	BUS8
SLOT4-01	BUS1

#	Source
SLOT4-02	BUS2
SLOT4-03	BUS3
SLOT4-04	BUS4
SLOT4-05	BUS5
SLOT4-06	BUS6
SLOT4-07	BUS7
SLOT4-08	BUS8
SLOT4-09	BUS1
SLOT4-10	BUS2
SLOT4-11	BUS3
SLOT4-12	BUS4
SLOT4-13	BUS5
SLOT4-14	BUS6
SLOT4-15	BUS7
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
1	SLOT1-01
2	SLOT1-02
3	SLOT1-03
4	SLOT1-04
5	SLOT1-05
6	SLOT1-06
7	SLOT1-07
8	SLOT1-08
9	SLOT2-01
10	SLOT2-02
11	SLOT2-03
12	SLOT2-04
13	SLOT2-05
14	SLOT2-06
15	SLOT2-07
16	SLOT2-08
17	SLOT3-01
18	SLOT3-02
19	SLOT3-03
20	SLOT3-04
21	SLOT3-05
22	SLOT3-06

#	Destination
23	SLOT3-07
24	SLOT3-08
25	SLOT4-01
26	SLOT4-02
27	SLOT4-03
28	SLOT4-04
29	SLOT4-05
30	SLOT4-06
31	SLOT4-07
32	SLOT4-08
33	NONE
34	NONE
35	NONE
36	NONE
37	NONE
38	NONE
39	NONE
40	NONE
41	NONE
42	NONE
43	NONE
44	NONE
45	NONE
46	NONE
47	NONE
48	NONE
49	NONE
50	NONE
51	NONE
52	NONE
53	NONE
54	NONE
55	NONE
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

Input Channel ID	Short Name	Long Name
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

Output Channel ID	Short Name	Long Name
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
AD1	AD01	AD01	AD IN 1
AD2	AD02	AD02	AD IN 2
AD3	AD03	AD03	AD IN 3
AD4	AD04	AD04	AD IN 4
AD5	AD05	AD05	AD IN 5
AD6	AD06	AD06	AD IN 6
AD7	AD07	AD07	AD IN 7
AD8	AD08	AD08	AD IN 8
AD9	AD09	AD09	AD IN 9
AD10	AD10	AD10	AD IN 10
AD11	AD11	AD11	AD IN 11
AD12	AD12	AD12	AD IN 12
AD13	AD13	AD13	AD IN 13
AD14	AD14	AD14	AD IN 14
AD15	AD15	AD15	AD IN 15
AD16	AD16	AD16	AD IN 16
AD17	AD17	AD17	AD IN 17
AD18	AD18	AD18	AD IN 18
AD19	AD19	AD19	AD IN 19
AD20	AD20	AD20	AD IN 20
AD21	AD21	AD21	AD IN 21
AD22	AD22	AD22	AD IN 22
AD23	AD23	AD23	AD IN 23
AD24	AD24	AD24	AD IN 24
SLOT1-01	S1-01	S101	Slot1 CH1 IN
SLOT1-02	S1-02	S102	Slot1 CH2 IN
SLOT1-03	S1-03	S103	Slot1 CH3 IN
SLOT1-04	S1-04	S104	Slot1 CH4 IN
SLOT1-05	S1-05	S105	Slot1 CH5 IN
SLOT1-06	S1-06	S106	Slot1 CH6 IN
SLOT1-07	S1-07	S107	Slot1 CH7 IN
SLOT1-08	S1-08	S108	Slot1 CH8 IN
SLOT1-09	S1-09	S109	Slot1 CH9 IN
SLOT1-10	S1-10	S110	Slot1 CH10 IN
SLOT1-11	S1-11	S111	Slot1 CH11 IN

Port	PORT ID	Short Name	Long Name
SLOT1-12	S1-12	S112	Slot1 CH12 IN
SLOT1-13	S1-13	S113	Slot1 CH13 IN
SLOT1-14	S1-14	S114	Slot1 CH14 IN
SLOT1-15	S1-15	S115	Slot1 CH15 IN
SLOT1-16	S1-16	S116	Slot1 CH16 IN
SLOT2-01	S2-01	S201	Slot2 CH1 IN
SLOT2-02	S2-02	S202	Slot2 CH2 IN
SLOT2-03	S2-03	S203	Slot2 CH3 IN
SLOT2-04	S2-04	S204	Slot2 CH4 IN
SLOT2-05	S2-05	S205	Slot2 CH5 IN
SLOT2-06	S2-06	S206	Slot2 CH6 IN
SLOT2-07	S2-07	S207	Slot2 CH7 IN
SLOT2-08	S2-08	S208	Slot2 CH8 IN
SLOT2-09	S2-09	S209	Slot2 CH9 IN
SLOT2-10	S2-10	S210	Slot2 CH10 IN
SLOT2-11	S2-11	S211	Slot2 CH11 IN
SLOT2-12	S2-12	S212	Slot2 CH12 IN
SLOT2-13	S2-13	S213	Slot2 CH13 IN
SLOT2-14	S2-14	S214	Slot2 CH14 IN
SLOT2-15	S2-15	S215	Slot2 CH15 IN
SLOT2-16	S2-16	S216	Slot2 CH16 IN
SLOT3-01	S3-01	S301	Slot3 CH1 IN
SLOT3-02	S3-02	S302	Slot3 CH2 IN
SLOT3-03	S3-03	S303	Slot3 CH3 IN
SLOT3-04	S3-04	S304	Slot3 CH4 IN
SLOT3-05	S3-05	S305	Slot3 CH5 IN
SLOT3-06	S3-06	S306	Slot3 CH6 IN
SLOT3-07	S3-07	S307	Slot3 CH7 IN
SLOT3-08	S3-08	S308	Slot3 CH8 IN
SLOT3-09	S3-09	S309	Slot3 CH9 IN
SLOT3-10	S3-10	S310	Slot3 CH10 IN
SLOT3-11	S3-11	S311	Slot3 CH11 IN
SLOT3-12	S3-12	S312	Slot3 CH12 IN
SLOT3-13	S3-13	S313	Slot3 CH13 IN
SLOT3-14	S3-14	S314	Slot3 CH14 IN
SLOT3-15	S3-15	S315	Slot3 CH15 IN
SLOT3-16	S3-16	S316	Slot3 CH16 IN
SLOT4-01	S4-01	S401	Slot4 CH1 IN
SLOT4-02	S4-02	S402	Slot4 CH2 IN
SLOT4-03	S4-03	S403	Slot4 CH3 IN
SLOT4-04	S4-04	S404	Slot4 CH4 IN
SLOT4-05	S4-05	S405	Slot4 CH5 IN
SLOT4-06	S4-06	S406	Slot4 CH6 IN
SLOT4-07	S4-07	S407	Slot4 CH7 IN
SLOT4-08	S4-08	S408	Slot4 CH8 IN
SLOT4-09	S4-09	S409	Slot4 CH9 IN
SLOT4-10	S4-10	S410	Slot4 CH10 IN
SLOT4-11	S4-11	S411	Slot4 CH11 IN
SLOT4-12	S4-12	S412	Slot4 CH12 IN
SLOT4-13	S4-13	S413	Slot4 CH13 IN
SLOT4-14	S4-14	S414	Slot4 CH14 IN

Port	PORT ID	Short Name	Long Name
SLOT4-15	S4-15	S415	Slot4 CH15 IN
SLOT4-16	S4-16	S416	Slot4 CH16 IN
2TD1L	2TD1L	2D1L	2TR IN Dig.1 L
2TD1R	2TD1R	2D1R	2TR IN Dig.1 R
2TD2L	2TD2L	2D2L	2TR IN Dig.2 L
2TD2R	2TD2R	2D2R	2TR IN Dig.2 R
2TD3L	2TD3L	2D3L	2TR IN Dig.3 L
2TD3R	2TD3R	2D3R	2TR IN Dig.3 R
2TA1L	2TA1L	2A1L	2TR IN Analog1 L
2TA1R	2TA1R	2A1R	2TR IN Analog1 R
2TA2L	2TA2L	2A2L	2TR IN Analog2 L
2TA2R	2TA2R	2A2R	2TR IN Analog2 R

Initial Output Port Names

Port	Port ID	Short Name	Long Name
SLOT1-01	S1-01	S101	Slot1 CH1 OUT
SLOT1-02	S1-02	S102	Slot1 CH2 OUT
SLOT1-03	S1-03	S103	Slot1 CH3 OUT
SLOT1-04	S1-04	S104	Slot1 CH4 OUT
SLOT1-05	S1-05	S105	Slot1 CH5 OUT
SLOT1-06	S1-06	S106	Slot1 CH6 OUT
SLOT1-07	S1-07	S107	Slot1 CH7 OUT
SLOT1-08	S1-08	S108	Slot1 CH8 OUT
SLOT1-09	S1-09	S109	Slot1 CH9 OUT
SLOT1-10	S1-10	S110	Slot1 CH10 OUT
SLOT1-11	S1-11	S111	Slot1 CH11 OUT
SLOT1-12	S1-12	S112	Slot1 CH12 OUT
SLOT1-13	S1-13	S113	Slot1 CH13 OUT
SLOT1-14	S1-14	S114	Slot1 CH14 OUT
SLOT1-15	S1-15	S115	Slot1 CH15 OUT
SLOT1-16	S1-16	S116	Slot1 CH16 OUT
SLOT2-01	S2-01	S201	Slot2 CH1 OUT
SLOT2-02	S2-02	S202	Slot2 CH2 OUT
SLOT2-03	S2-03	S203	Slot2 CH3 OUT
SLOT2-04	S2-04	S204	Slot2 CH4 OUT
SLOT2-05	S2-05	S205	Slot2 CH5 OUT
SLOT2-06	S2-06	S206	Slot2 CH6 OUT
SLOT2-07	S2-07	S207	Slot2 CH7 OUT
SLOT2-08	S2-08	S208	Slot2 CH8 OUT
SLOT2-09	S2-09	S209	Slot2 CH9 OUT
SLOT2-10	S2-10	S210	Slot2 CH10 OUT
SLOT2-11	S2-11	S211	Slot2 CH11 OUT
SLOT2-12	S2-12	S212	Slot2 CH12 OUT
SLOT2-13	S2-13	S213	Slot2 CH13 OUT
SLOT2-14	S2-14	S214	Slot2 CH14 OUT
SLOT2-15	S2-15	S215	Slot2 CH15 OUT

Port	Port ID	Short Name	Long Name
SLOT2-16	S2-16	S216	Slot2 CH16 OUT
SLOT3-01	S3-01	S301	Slot3 CH1 OUT
SLOT3-02	S3-02	S302	Slot3 CH2 OUT
SLOT3-03	S3-03	S303	Slot3 CH3 OUT
SLOT3-04	S3-04	S304	Slot3 CH4 OUT
SLOT3-05	S3-05	S305	Slot3 CH5 OUT
SLOT3-06	S3-06	S306	Slot3 CH6 OUT
SLOT3-07	S3-07	S307	Slot3 CH7 OUT
SLOT3-08	S3-08	S308	Slot3 CH8 OUT
SLOT3-09	S3-09	S309	Slot3 CH9 OUT
SLOT3-10	S3-10	S310	Slot3 CH10 OUT
SLOT3-11	S3-11	S311	Slot3 CH11 OUT
SLOT3-12	S3-12	S312	Slot3 CH12 OUT
SLOT3-13	S3-13	S313	Slot3 CH13 OUT
SLOT3-14	S3-14	S314	Slot3 CH14 OUT
SLOT3-15	S3-15	S315	Slot3 CH15 OUT
SLOT3-16	S3-16	S316	Slot3 CH16 OUT
SLOT4-01	S4-01	S401	Slot4 CH1 OUT
SLOT4-02	S4-02	S402	Slot4 CH2 OUT
SLOT4-03	S4-03	S403	Slot4 CH3 OUT
SLOT4-04	S4-04	S404	Slot4 CH4 OUT
SLOT4-05	S4-05	S405	Slot4 CH5 OUT
SLOT4-06	S4-06	S406	Slot4 CH6 OUT
SLOT4-07	S4-07	S407	Slot4 CH7 OUT
SLOT4-08	S4-08	S408	Slot4 CH8 OUT
SLOT4-09	S4-09	S409	Slot4 CH9 OUT
SLOT4-10	S4-10	S410	Slot4 CH10 OUT
SLOT4-11	S4-11	S411	Slot4 CH11 OUT
SLOT4-12	S4-12	S412	Slot4 CH12 OUT
SLOT4-13	S4-13	S413	Slot4 CH13 OUT
SLOT4-14	S4-14	S414	Slot4 CH14 OUT
SLOT4-15	S4-15	S415	Slot4 CH15 OUT
SLOT4-16	S4-16	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 List

#	Source
0	NO ASSIGN
1	CH1 FADER ON
2	CH2 FADER ON
3	CH3 FADER ON
4	CH4 FADER ON
5	CH5 FADER ON
6	CH6 FADER ON
7	CH7 FADER ON
8	CH8 FADER ON
9	CH9 FADER ON
10	CH10 FADER ON
11	CH11 FADER ON
12	CH12 FADER ON
13	CH13 FADER ON
14	CH14 FADER ON
15	CH15 FADER ON
16	CH16 FADER ON
17	CH17 FADER ON
18	CH18 FADER ON
19	CH19 FADER ON
20	CH20 FADER ON
21	CH21 FADER ON
22	CH22 FADER ON
23	CH23 FADER ON
24	CH24 FADER ON
25	CH25 FADER ON
26	CH26 FADER ON
27	CH27 FADER ON
28	CH28 FADER ON
29	CH29 FADER ON
30	CH30 FADER ON
31	CH31 FADER ON
32	CH32 FADER ON
33	CH33 FADER ON
34	CH34 FADER ON
35	CH35 FADER ON
36	CH36 FADER ON
37	CH37 FADER ON
38	CH38 FADER ON
39	CH39 FADER ON
40	CH40 FADER ON
41	CH41 FADER ON
42	CH42 FADER ON
43	CH43 FADER ON
44	CH44 FADER ON
45	CH45 FADER ON
46	CH46 FADER ON
47	CH47 FADER ON
48	CH48 FADER ON
49	CH49 FADER ON
50	CH50 FADER ON
51	CH51 FADER ON
52	CH52 FADER ON

#	Source
53	CH53 FADER ON
54	CH54 FADER ON
55	CH55 FADER ON
56	CH56 FADER ON
57	BUS1 FADER ON
58	BUS2 FADER ON
59	BUS3 FADER ON
60	BUS4 FADER ON
61	BUS5 FADER ON
62	BUS6 FADER ON
63	BUS7 FADER ON
64	BUS8 FADER ON
65	AUX1 FADER ON
66	AUX2 FADER ON
67	AUX3 FADER ON
68	AUX4 FADER ON
69	AUX5 FADER ON
70	AUX6 FADER ON
71	AUX7 FADER ON
72	AUX8 FADER ON
73	STEREO FADER ON
74	CH1 FADER OFF
75	CH2 FADER OFF
76	CH3 FADER OFF
77	CH4 FADER OFF
78	CH5 FADER OFF
79	CH6 FADER OFF
80	CH7 FADER OFF
81	CH8 FADER OFF
82	CH9 FADER OFF
83	CH10 FADER OFF
84	CH11 FADER OFF
85	CH12 FADER OFF
86	CH13 FADER OFF
87	CH14 FADER OFF
88	CH15 FADER OFF
89	CH16 FADER OFF
90	CH17 FADER OFF
91	CH18 FADER OFF
92	CH19 FADER OFF
93	CH20 FADER OFF
94	CH21 FADER OFF
95	CH22 FADER OFF
96	CH23 FADER OFF
97	CH24 FADER OFF
98	CH25 FADER OFF
99	CH26 FADER OFF
100	CH27 FADER OFF
101	CH28 FADER OFF
102	CH29 FADER OFF
103	CH30 FADER OFF
104	CH31 FADER OFF
105	CH32 FADER OFF
106	CH33 FADER OFF
107	CH34 FADER OFF

#	Source
108	CH35 FADER OFF
109	CH36 FADER OFF
110	CH37 FADER OFF
111	CH38 FADER OFF
112	CH39 FADER OFF
113	CH40 FADER OFF
114	CH41 FADER OFF
115	CH42 FADER OFF
116	CH43 FADER OFF
117	CH44 FADER OFF
118	CH45 FADER OFF
119	CH46 FADER OFF
120	CH47 FADER OFF
121	CH48 FADER OFF
122	CH49 FADER OFF
123	CH50 FADER OFF
124	CH51 FADER OFF
125	CH52 FADER OFF
126	CH53 FADER OFF
127	CH54 FADER OFF
128	CH55 FADER OFF
129	CH56 FADER OFF
130	BUS1 FADER OFF
131	BUS2 FADER OFF
132	BUS3 FADER OFF
133	BUS4 FADER OFF
134	BUS5 FADER OFF
135	BUS6 FADER OFF
136	BUS7 FADER OFF
137	BUS8 FADER OFF
138	AUX1 FADER OFF
139	AUX2 FADER OFF
140	AUX3 FADER OFF
141	AUX4 FADER OFF
142	AUX5 FADER OFF
143	AUX6 FADER OFF
144	AUX7 FADER OFF
145	AUX8 FADER OFF
146	STEREO FADER OFF
147	UDEF1 LATCH
148	UDEF2 LATCH
149	UDEF3 LATCH
150	UDEF4 LATCH
151	UDEF5 LATCH
152	UDEF6 LATCH
153	UDEF7 LATCH
154	UDEF8 LATCH
155	UDEF9 LATCH
156	UDEF10 LATCH
157	UDEF11 LATCH
158	UDEF12 LATCH
159	UDEF13 LATCH
160	UDEF14 LATCH
161	UDEF15 LATCH
162	UDEF16 LATCH

#	Source
163	UDEF1 UNLATCH
164	UDEF2 UNLATCH
165	UDEF3 UNLATCH
166	UDEF4 UNLATCH
167	UDEF5 UNLATCH
168	UDEF6 UNLATCH
169	UDEF7 UNLATCH
170	UDEF8 UNLATCH
171	UDEF9 UNLATCH
172	UDEF10 UNLATCH
173	UDEF11 UNLATCH
174	UDEF12 UNLATCH
175	UDEF13 UNLATCH
176	UDEF14 UNLATCH
177	UDEF15 UNLATCH
178	UDEF16 UNLATCH
179	REC LAMP
180	POWER ON

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.	0.0–1.0	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

- 0.02 ms–2.13 s (fs=44.1 kHz), 0.02 ms–1.96 s (fs=48 kHz), 0.01 ms–1.07 s (fs=88.2 kHz), 0.01 ms–980 ms (fs=96 kHz)
- 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.	0.0–1.0	Reflection diffusion (left–right reflection spread)
DENSITY	0–100%	Reflection density
ER NUM.	1–19	Number of early reflections
FB GAIN	–100 to +100%	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

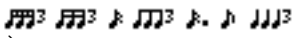
One input, two output early reflections with gate, and early reflections with reverse gate.

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	–100 to +100%	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.

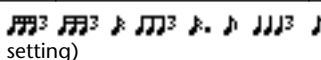
Parameter	Range	Description
DELAY	0.0–2730.0 ms	Delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI. RATIO	0.1–1.0	High-frequency feedback ratio
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency
LPF	50.0 Hz–16.0 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

1.  (Max. value depends on tempo setting)

STEREO DELAY

Two input, two output basic stereo delay.

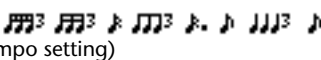
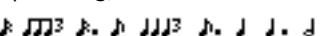
Parameter	Range	Description
DELAY L	0.0–1350.0 ms	Left channel delay time
DELAY R	0.0–1350.0 ms	Right channel delay time
FB. G L	–99 to +99%	Left channel feedback (plus values for normal-phase feedback, minus values for reverse-phase feedback)
FB. G R	–99 to +99%	Right channel feedback (plus values for 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

1.  (Maximum value depends on the tempo setting)

MOD. DELAY

One input, two output basic repeat delay with modulation.

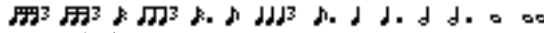
Parameter	Range	Description
DELAY	0.0–2725.0 ms	Delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI. RATIO	0.1–1.0	High-frequency feedback ratio
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
WAVE	Sine/Tri	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

1.  (Maximum value depends on the tempo setting)
2. 

DELAY LCR

One input, two output 3-tap delay (left, center, right).

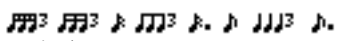
Parameter	Range	Description
DELAY L	0.0–2730.0 ms	Left channel delay time
DELAY C	0.0–2730.0 ms	Center channel delay time
DELAY R	0.0–2730.0 ms	Right channel delay time
FB. DLY	0.0–2730.0 ms	Feedback delay time
LEVEL L	–100 to +100%	Left channel delay level
LEVEL C	–100 to +100%	Center channel delay 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

1.  (Maximum value depends on the tempo setting)

ECHO

Two input, two output stereo delay with crossed feedback loop.

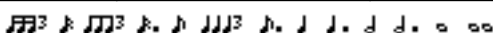
Parameter	Range	Description
DELAY L	0.0–1350.0 ms	Left channel delay time
DELAY R	0.0–1350.0 ms	Right channel delay time
FB. D L	0.0–1350.0 ms	Left channel feedback delay time
FB. D R	0.0–1350.0 ms	Right channel feedback delay time
FB. G L	–99 to +99%	Left channel feedback gain (plus values for normal-phase 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 FB. G	–99 to +99%	Left to right channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
R->L FB. G	–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.

1. 

FLANGE

Two input, two output flange effect.

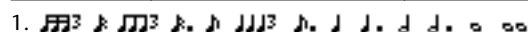
Parameter	Range	Description
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
MOD. DLY	0.0–500.0 ms	Modulation delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
WAVE	Sine, Tri	Modulation waveform
LSH F	21.2 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.

1. 

SYMPHONIC

Two input, two output symphonic effect.

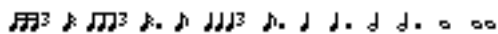
Parameter	Range	Description
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
MOD. DLY	0.0–500.0 ms	Modulation delay time
WAVE	Sine, Tri	Modulation waveform
LSH F	21.2 Hz–8.00 kHz	Low shelving filter frequency
LSH G	–12 to +12 dB	Low shelving filter gain
EQ F	100 Hz–8.00 kHz	EQ (peaking 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
NOTE	1	Used in conjunction with TEMPO to determine FREQ.
SYNC	OFF/ON	Tempo parameter sync on/off

1. 

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.

1. 

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.

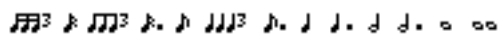
1. L<->R, L->R, L<-R, Turn L, Turn R

2. 

TREMOLO

Two input, two output tremolo effect.

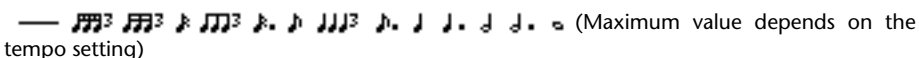
Parameter	Range	Description
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
WAVE	Sine, Tri, Square	Modulation waveform
LSH F	21.2 Hz–8.00 kHz	Low shelving filter frequency
LSH G	–12 to +12 dB	Low shelving filter gain
EQ F	100 Hz–8.00 kHz	EQ (peaking type) frequency
EQ G	–12 to +12 dB	EQ (peaking type) gain
EQ Q	10.0–0.10	EQ (peaking type) bandwidth
HSF F	50.0 Hz–16.0 kHz	High shelving filter frequency
HSF 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. 

HQ. PITCH

One input, two output high-quality pitch shifter.

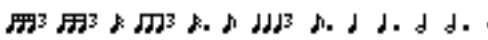
Parameter	Range	Description
PITCH	–12 to +12 semitones	Pitch shift
FINE	–50 to +50 cents	Pitch shift fine
DELAY	0.0–1000.0 ms	Delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
MODE	1–10	Pitch shift precision
SYNC	OFF/ON	Tempo parameter sync on/off
NOTE	1	Used in conjunction with TEMPO to determine DELAY

1.  (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.  (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

1. 

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°	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

1. 

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	99–8.0 kHz	Parametric equalizer frequency
EQ G	–12 to +12 dB	Parametric equalizer gain
EQ Q	10.0–0.10	Parametric equalizer 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 ($f_s=44.1$ kHz), 5.0 ms–42.3 s ($f_s=48$ kHz), 3 ms–23.0 s ($f_s=88.2$ kHz), 3 ms–21.1 s ($f_s=96$ 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
HSF F	50.0 Hz–16.0 kHz	High shelving filter frequency
HSF 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.

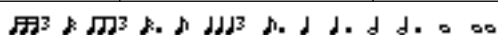
Parameter	Range	Description
SOURCE	INPUT, MIDI	Control source: input signal or MIDI Note On velocity
SENSE	0–100	Sensitivity
DIR.	UP, DOWN	Upward or downward frequency change
DECAY	1	Decay speed
OFFSET	0–100	Lowest phase-shifted frequency offset
FB GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
STAGE	2, 4, 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
HSF F	50.0 Hz–16.0 kHz	High shelving filter frequency
HSF 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.

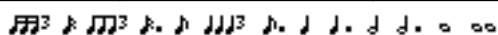
Parameter	Range	Description
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	Spread
DENSITY	0–100%	Reverb density
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency
LPF	50.0 Hz–16.0 kHz, 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
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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.

1. 

REV->FLANGE

One input, two output reverb and flanger effects in series.

Parameter	Range	Description
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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. 

REV+SYMPHO.

One input, two output reverb and symphonic effects in parallel.

Parameter	Range	Description
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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. 

REV->SYMPHO.

One input, two output reverb and symphonic effects in series.

Parameter	Range	Description
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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.

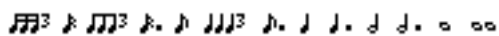
1. 

REV->PAN

One input, two output reverb and autopan effects in parallel.

Parameter	Range	Description
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
HI. RATIO	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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. 

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.	0.1–1.0	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.  (Maximum value depends on the tempo setting)

DELAY->ER.

One input, two output delay and early reflections effects in series.

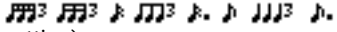
Parameter	Range	Description
DELAY L	0.0–1000.0 ms	Left channel delay time
DELAY R	0.0–1000.0 ms	Right channel delay time
FB. DLY	0.0–1000.0 ms	Feedback delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI. RATIO	0.1–1.0	High-frequency 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.	0.1–1.0	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.  (Maximum value depends on the tempo setting)

DELAY+REV

One input, two output delay and reverb effects in parallel.

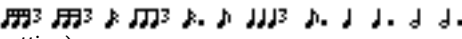
Parameter	Range	Description
DELAY L	0.0–1000.0 ms	Left channel delay time
DELAY R	0.0–1000.0 ms	Right channel delay time
FB. DLY	0.0–1000.0 ms	Feedback delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
DELAY HI	0.1–1.0	Delay 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)
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
REV HI	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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.  (Maximum value depends on the tempo setting)

DELAY->REV

One input, two output delay and reverb effects in series.

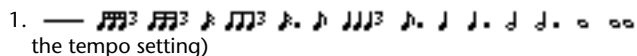

Parameter	Range	Description
DELAY L	0.0–1000.0 ms	Left channel delay time
DELAY R	0.0–1000.0 ms	Right channel delay time
FB. DLY	0.0–1000.0 ms	Feedback delay time
FB. GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
DELAY HI	0.1–1.0	Delay 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)
INI. DLY	0.0–500.0 ms	Initial delay before reverb begins
REV TIME	0.3–99.0 s	Reverb time
REV HI	0.1–1.0	High-frequency reverb time ratio
DIFF.	0.1–1.0	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.  (Maximum value depends on the tempo setting)

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.  (Maximum value depends on the tempo setting)
2. 

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 Hz–16.0 kHz	Filter 1 frequency
FREQ. 2	28 Hz–16.0 kHz	Filter 2 frequency
FREQ. 3	28 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.
PLAY MODE	MOMENT, CONT., 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-2729.1 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.	0.0-1.0	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
E/R BAL.	0-100%	Balance of early reflections and reverb (0% = all reverb, 100% = all early reflections)

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.	0.0–1.0	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, NOR, INV	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, NOR, INV	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, NOR, INV	1

1. When set to NOR, the position can be set by using the Joystick so long as the SELECTED CHANNEL PAN/SURROUND [EFFECT] button's indicator is on. When set to INV, the Joystick will work inversely. When set to OFF, Joystick control is off.

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.	0.0–1.0	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
E/R BAL.	0–100%	Balance of early reflections and reverb (0% = all reverb, 100% = all early reflections)

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, INPUT, MIDI	When set to OFF, the TRIGGER button is used to start autopan. When set to HOLD, autopan runs continuously. When set to INPUT, the 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)
TIME	0.1 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.

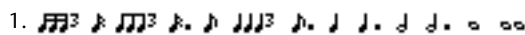
Parameter	Range	Description
FREQ.	0.05–40.00 Hz	Modulation speed
AM DEPTH	0–100%	Amplitude modulation depth
PM DEPTH	0–100%	Pitch modulation depth
MOD. DLY	0.0–400.0 ms	Modulation delay time
WAVE	Sine, Tri	Modulation waveform
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency
LPF	50.0 Hz–16.0 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.

1. 

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.

1. 

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.

1. 

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.
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
CMP. THRE	-24.0 dB to 0.0 dB	Compressor threshold
CMP. RAT	1:1 to 20:1	Compressor ratio
CMP. REL	1	Compressor release time
CMP. ATK	0-120 ms	Compressor attack
CMP. KNEE	0-5	Compressor knee
CMP. BYP	ON/OFF	Compressor bypass
LIM. THRE	-12.0 dB to 0.0 dB	Limiter threshold
LIM. REL	1	Limiter release time
LIM. ATK	0-120 ms	Limiter attack
LIM. KNEE	0-5	Limiter knee
LIM. BYP	ON/OFF	Limiter bypass
LOOKUP	0.0-100.0 ms	Lookup delay
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 to -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)

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	Compressor attack
RELEASE	1	Expander release time
KNEE	0–5	Compressor knee
LOOKUP	0.0–100.0 ms	Lookup delay
CEILING	–6.0 dB to 0.0 dB, OFF	Specifies the maximum output level
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 to –12 dB	Filter slope
KEY LINK	2	Key-in linking

1. 6.0 ms–46.0 s ($f_s=44.1$ kHz), 5.0 ms–42.3 s ($f_s=48$ kHz), 3 ms–23.0 s ($f_s=88.2$ kHz), 3 ms–21.1 s ($f_s=96$ 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
CEILING	-6.0 dB to 0.0 dB, OFF	Specifies the maximum output level
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 to -12 dB	Filter slope
KEY LINK	1	Key-in linking

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.

Preset EQ Parameters

#	Title	Parameter				
			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	—

#	Title	Parameter				
			LOW	L-MID	H-MID	HIGH
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	—
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	—

#	Title	Parameter				
			LOW	L-MID	H-MID	HIGH
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
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	—

#	Title	Parameter				
			LOW	L-MID	H-MID	HIGH
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	—
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
1	Comp	COMP	Threshold (dB)	-8
			Ratio (:1)	2.5
			Attack (ms)	60
			Out gain (dB)	0.0
			Knee	2
			Release (ms)	250
2	Expand	EXPAND	Threshold (dB)	-23
			Ratio (:1)	1.7
			Attack (ms)	1
			Out gain (dB)	3.5
			Knee	2
			Release (ms)	70
3	Compander (H)	COMPAND-H	Threshold (dB)	-10
			Ratio (:1)	3.5
			Attack (ms)	1
			Out gain (dB)	0.0
			Width (dB)	6
			Release (ms)	250
4	Compander (S)	COMPAND-S	Threshold (dB)	-8
			Ratio (:1)	4
			Attack (ms)	25
			Out gain (dB)	0.0
			Width (dB)	24
			Release (ms)	180

#	Title	Type	Parameter	Value
5	A. Dr. BD	COMP	Threshold (dB)	-24
			Ratio (:1)	3
			Attack (ms)	9
			Out gain (dB)	5.5
			Knee	2
			Release (ms)	58
6	A. Dr. BD	COMPAND-H	Threshold (dB)	-11
			Ratio (:1)	3.5
			Attack (ms)	1
			Out gain (dB)	-1.5
			Width (dB)	7
			Release (ms)	192
7	A. Dr. SN	COMP	Threshold (dB)	-17
			Ratio (:1)	2.5
			Attack (ms)	8
			Out gain (dB)	3.5
			Knee	2
			Release (ms)	12
8	A. Dr. SN	EXPAND	Threshold (dB)	-23
			Ratio (:1)	2
			Attack (ms)	0
			Out gain (dB)	0.5
			Knee	2
			Release (ms)	151
9	A. Dr. SN	COMPAND-S	Threshold (dB)	-8
			Ratio (:1)	1.7
			Attack (ms)	11
			Out gain (dB)	0.0
			Width (dB)	10
			Release (ms)	128
10	A. Dr. Tom	EXPAND	Threshold (dB)	-20
			Ratio (:1)	2
			Attack (ms)	2
			Out gain (dB)	5.0
			Knee	2
			Release (ms)	749
11	A. Dr. OverTop	COMPAND-S	Threshold (dB)	-24
			Ratio (:1)	2
			Attack (ms)	38
			Out gain (dB)	-3.5
			Width (dB)	54
			Release (ms)	842
12	E. B. Finger	COMP	Threshold (dB)	-12
			Ratio (:1)	2
			Attack (ms)	15
			Out gain (dB)	4.5
			Knee	2
			Release (ms)	470

#	Title	Type	Parameter	Value
13	E. B. Slap	COMP	Threshold (dB)	-12
			Ratio (:1)	1.7
			Attack (ms)	6
			Out gain (dB)	4.0
			Knee	hard
			Release (ms)	133
14	Syn. Bass	COMP	Threshold (dB)	-10
			Ratio (:1)	3.5
			Attack (ms)	9
			Out gain (dB)	3.0
			Knee	hard
			Release (ms)	250
15	Piano1	COMP	Threshold (dB)	-9
			Ratio (:1)	2.5
			Attack (ms)	17
			Out gain (dB)	1.0
			Knee	hard
			Release (ms)	238
16	Piano2	COMP	Threshold (dB)	-18
			Ratio (:1)	3.5
			Attack (ms)	7
			Out gain (dB)	6.0
			Knee	2
			Release (ms)	174
17	E. Guitar	COMP	Threshold (dB)	-8
			Ratio (:1)	3.5
			Attack (ms)	7
			Out gain (dB)	2.5
			Knee	4
			Release (ms)	261
18	A. Guitar	COMP	Threshold (dB)	-10
			Ratio (:1)	2.5
			Attack (ms)	5
			Out gain (dB)	1.5
			Knee	2
			Release (ms)	238
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

#	Title	Type	Parameter	Value
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
28	Solo Vocal1	COMP	Threshold (dB)	-20
			Ratio (:1)	2.5
			Attack (ms)	31
			Out gain (dB)	2.0
			Knee	1
			Release (ms)	342

#	Title	Type	Parameter	Value
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

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 –96, –∞ dB (256 steps/100 mm) input faders
		0 to –130, –∞ dB (256 steps/100 mm) master faders, stereo fader
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 (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-type³	On/off
		Key in: 12 ch Group (1–12, 13–24, 25–36, 37–48, 49–56)/AUX1–8
	Comp-type⁴	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 (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)
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	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 CD-ROM (Studio Manager)
Options		Digital interface card (MY8, MY4 series) PEAK METER BRIDGE: MB02R96 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 264.
4. See "Comp Parameters" on page 264.
5. See "EQ Parameters" on page 263.

EQ Parameters

	LOW/HPF	L-MID	H-MID	HIGH /LPF
Q	0.1–10.0 (41 points) low shelving HPF	0.1–10.0 (41 points)		0.1–10.0 (41 points) high shelving LPF
F	21.2 Hz–20 kHz (1/12 oct step)			
G	±18 dB (0.1 dB step) HPF: on/off	±18 dB (0.1 dB step)		±18 dB (0.1 dB step) 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		

Controls

Analog Section

INPUT 1-16	+48 V switch	ON/OFF
	PAD switch	0/26 dB
	GAIN control	-16 to -60 dB
	INSERT switch	ON/OFF
INPUT 17-24	GAIN control	+10 to -34 dB
TALKBACK	TALKBACK LEVEL control	
STUDIO MONITOR OUT	STUDIO LEVEL control	
CONTROL ROOM MONITOR OUT	CONTROL ROOM LEVEL control	
PHONES	PHONES LEVEL control	

Digital Section

FADER MODE Section	AUX SELECT	DISPLAY button
		AUX 1, AUX 2, AUX 3, AUX 4, AUX 5, AUX 6, AUX 7, AUX 8 buttons (w/LED)
	FADER MODE	FADER, AUX button (w/LED)
ENCODER MODE	DISPLAY button	
	PAN, AUX, ASSIGN 1, ASSIGN 2 buttons (w/LED)	
DISPLAY CONTROL Section	DISPLAY ACCESS buttons	AUTOMIX, DIO, SETUP, UTILITY, MIDI, REMOTE, METER, VIEW, PAIR, GROUP, INPUT PATCH, OUTPUT PATCH
	EFFECTS/PLUG-INS	DISPLAY access, ▲, ▼
		INTERNAL EFFECTS, PLUG-INS, CHANNEL INSERTS, 1, 2, 3, 4 Parameter control: 1, 2, 3, 4
	Others	◀, F1, F2, F3, F4, ▶ buttons
LCD contrast control		

SELECTED CHANNEL Section	ROUTING	DISPLAY button
		1, 2, 3, 4, 5, 6, 7, 8, STEREO, DIRECT, FOLLOW PAN buttons (w/LED)
	DISPLAY ACCESS	PHASE/INSERT, DELAY buttons
	DYNAMICS	DISPLAY, GATE /COMP buttons
		GATE ON, COMP ON buttons (w/LED)
		Parameter control x 5
	PAN/SURROUND	DISPLAY button
		L, R, LINK, GRAB, EFFECT buttons (w/LED)
		Pan control
		Joystick (Sound image position control)
	EQUALIZER	DISPLAY button
		EQ ON button (w/LED)
GAIN controls: LOW, LOW-MID, HIGH-MID, HIGH		
FREQUENCY/Q controls: LOW, LOW-MID, HIGH-MID, HIGH controls (w/SW)		
MONITOR Section	MONITOR	DISPLAY button
	STUDIO	CONTROL ROOM, STEREO, AUX 7, AUX 8 buttons (w/LED)
	SOLO	CLEAR button
	CONTROL ROOM	2TR D1, 2TR D2, 2TR D3, 2TR A1, 2TR A2, STEREO, ASSIGN 1, ASSIGN 2 buttons (w/LED)
	SURROUND	BUS, SLOT buttons (w/LED)
		SURROUND MONITOR LEVEL control
Others	TALKBACK, DIMMER buttons (w/LED)	
	CONTROL ROOM LEVEL control	
SCENE MEMORY and USER DEFINED KEYS section	SCENE MEMORY	DISPLAY button
		▲, ▼, STORE, RECALL buttons
	USER DEFINED KEYS	DISPLAY button 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 buttons (w/LED)
MACHINE CONTROL Section	LOCATOR	DISPLAY button
		LOCATE MEMORY: 1, 2, 3, 4, 5, 6, 7, 8, SET buttons (w/LED)
	TRANSPORT CONTROL	REW, FF, STOP, PLAY, REC, SHUTTLE, SCRUB (w/LED)
CHANNEL STRIP Section	Encoders	x 24 (1–24)
	Buttons	AUTO x 24 (1–24), SEL x 24 (1–24), SOLO x 24 (1–24), ON x 24 (1–24)
	Faders (w/ touch sense)	x 24 (1–24)
MASTER Section	LAYER	1–24, 25–48, MASTER, REMOTE buttons (w/LED)
	STEREO	AUTO, SEL, ON buttons (w/LED)
Fader (w/touch sense) x 1		
DATA ENTRY Section	Buttons	INC, DEC, ▲, ▼, ◀, ▶, ENTER buttons
	Encoder	Parameter wheel

Indicators

Analog Section

PEAK LED	x24	INPUT 1–24
SIGNAL LED	x24	INPUT 1–24

Digital Section

DISPLAY CONTROL Section	DISPLAY	320 × 240 dot graphic LCD (w/contrast control potentiometer)
SELECTED CHANNEL Section	DYNAMICS	GATE, COMP LEDs x2
	PAN/SURROUND	Pan position LEDs x10
	EQUALIZER	FREQUENCY, Q LEDs 2 × 4
		dB, Hz, kHz 3 × 4
		3-digit numeric LEDs x4 (parameter value)
MONITOR Section	SOLO	LED x1
SCENE MEMORY section	Scene memory number	2-digit numeric LED x1

Libraries

Effect library (EFFECT 1–4)	Presets	52 (EFFECT 2–4: 44)
	User memories	76
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

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 B: Phone jack (TRS) (Balanced) ³
		–16 dB			–26 dB (38.8 mV)	–16 dB (0.123 V)	–2 dB (616 mV)	
	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)
	150 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	Phono
	3	IEC-60958	24-bit	0.5 Vpp/75 Ω	Phono
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 Professional use	24-bit ²	RS422	XLR-3-32 type (Balanced) ³
	2	IEC-60958 ⁴ Consumer use	24-bit ²	0.5V pp/75 Ω	Phono
	3	IEC-60958 ⁴ Consumer use	24-bit ²	0.5V pp/75 Ω	Phono
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	Accept	Input	Output	Number of available cards
MY8-AT	ADAT	YES	8 IN	8 OUT (depends on output patch) ¹	4
MY8-TD	TASCAM	YES	8 IN	8 OUT (depends on output patch) ¹	4
MY8-AE	AES/EBU	YES	8 IN	8 OUT (depends on output patch) ¹	4
MY4-AD	ANALOG IN	YES	4 IN	—	4
MY8-AD	ANALOG IN	YES	8 IN	—	4
MY4-DA	ANALOG OUT	YES	—	4 OUT (depends on output patch) ¹	4
MY8-AD24	ANALOG IN	YES	8 IN	—	4
MY8-AD96	ANALOG IN	YES	8 IN	—	4
MY8-DA96	ANALOG OUT	YES	—	8 OUT (depends on output patch) ¹	4
MY8-AE96S	AES/EBU	YES	8 IN	8 OUT (depends on output patch) ¹	2
MY8-AE96	AES/EBU	YES	8 IN	8 OUT (depends on output patch) ¹	4

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

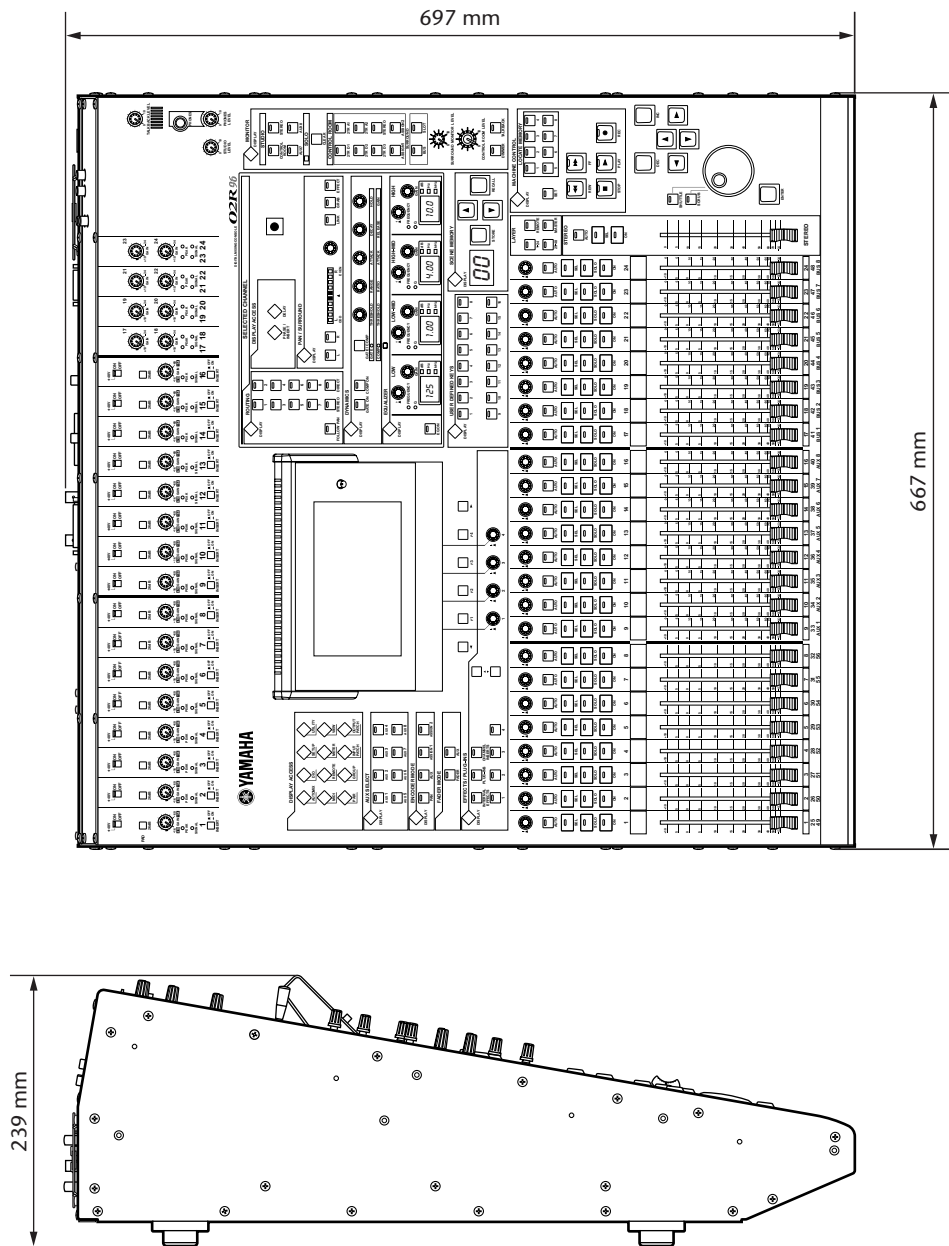
Pin	Signal	Pin	Signal
1	GND	35	GND
2	OUTPUT 1-2(+)	36	OUTPUT 1-2(-)
3	OUTPUT 3-4(+)	37	OUTPUT 3-4(-)
4	OUTPUT 5-6(+)	38	OUTPUT 5-6(-)
5	OUTPUT 7-8(+)	39	OUTPUT 7-8(-)
6	OUTPUT 9-10(+)	40	OUTPUT 9-10(-)
7	OUTPUT 11-12(+)	41	OUTPUT 11-12(-)
8	OUTPUT 13-14(+)	42	OUTPUT 13-14(-)
9	OUTPUT 15-16(+)	43	OUTPUT 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
1	GPO0	14	GPO1
2	GPO2	15	GPO3
3	GPO4	16	GPO5
4	GPO6	17	GPO7
5	GND	18	GND
6	GND	19	GND
7	GND	20	GND
8	GND	21	+5V
9	+5V	22	GPI0
10	GPI1	23	N.C.
11	N.C.	24	SOLO ¹
12	SMODE ¹	25	MAS/SLV ¹
13	SPARE ¹		

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 #
1	01	
2	02	
3	03	
4	04	
5	05	
6	06	
7	07	
8	08	
9	09	
10	10	
11	11	
12	12	
13	13	
14	14	
15	15	
16	16	
17	17	
18	18	
19	19	
20	20	
21	21	
22	22	
23	23	
24	24	
25	25	
26	26	
27	27	
28	28	
29	29	
30	30	
31	31	
32	32	
33	33	
34	34	
35	35	
36	36	
37	37	
38	38	
39	39	
40	40	
41	41	
42	42	
43	43	

Program Change #	Initial Scene #	User Scene #
44	44	
45	45	
46	46	
47	47	
48	48	
49	49	
50	50	
51	51	
52	52	
53	53	
54	54	
55	55	
56	56	
57	57	
58	58	
59	59	
60	60	
61	61	
62	62	
63	63	
64	64	
65	65	
66	66	
67	67	
68	68	
69	69	
70	70	
71	71	
72	72	
73	73	
74	74	
75	75	
76	76	
77	77	
78	78	
79	79	
80	80	
81	81	
82	82	
83	83	
84	84	
85	85	
86	86	

Program Change#	Initial Scene #	User Scene #
87	87	
88	88	
89	89	
90	90	
91	91	
92	92	
93	93	
94	94	
95	95	
96	96	
97	97	
98	98	
99	99	
100	00	
101	—	
102	—	
103	—	
104	—	
105	—	
106	—	
107	—	
108	—	
109	—	
110	—	
111	—	
112	—	
113	—	
114	—	
115	—	
116	—	
117	—	
118	—	
119	—	
120	—	
121	—	
122	—	
123	—	
124	—	
125	—	
126	—	
127	—	
128	—	

Initial Parameter to Control Change Table

#	High	Mid	Low
0	NO ASSIGN		
1	FADER H	CHANNEL	INPUT1
2	FADER H	CHANNEL	INPUT2
3	FADER H	CHANNEL	INPUT3
4	FADER H	CHANNEL	INPUT4
5	FADER H	CHANNEL	INPUT5
6	FADER H	CHANNEL	INPUT6
7	FADER H	CHANNEL	INPUT7
8	FADER H	CHANNEL	INPUT8
9	FADER H	CHANNEL	INPUT9
10	FADER H	CHANNEL	INPUT10
11	FADER H	CHANNEL	INPUT11
12	FADER H	CHANNEL	INPUT12
13	FADER H	CHANNEL	INPUT13
14	FADER H	CHANNEL	INPUT14
15	FADER H	CHANNEL	INPUT15
16	FADER H	CHANNEL	INPUT16
17	FADER H	CHANNEL	INPUT17
18	FADER H	CHANNEL	INPUT18
19	FADER H	CHANNEL	INPUT19
20	FADER H	CHANNEL	INPUT20
21	FADER H	CHANNEL	INPUT21
22	FADER H	CHANNEL	INPUT22
23	FADER H	CHANNEL	INPUT23
24	FADER H	CHANNEL	INPUT24
25	FADER H	CHANNEL	INPUT25
26	FADER H	CHANNEL	INPUT26
27	FADER H	CHANNEL	INPUT27
28	FADER H	CHANNEL	INPUT28
29	FADER H	CHANNEL	INPUT29
30	FADER H	CHANNEL	INPUT30
31	FADER H	CHANNEL	INPUT31
32	NO ASSIGN		
33	FADER L	CHANNEL	INPUT1
34	FADER L	CHANNEL	INPUT2
35	FADER L	CHANNEL	INPUT3
36	FADER L	CHANNEL	INPUT4
37	FADER L	CHANNEL	INPUT5
38	FADER L	CHANNEL	INPUT6
39	FADER L	CHANNEL	INPUT7
40	FADER L	CHANNEL	INPUT8
41	FADER L	CHANNEL	INPUT9
42	FADER L	CHANNEL	INPUT10
43	FADER L	CHANNEL	INPUT11
44	FADER L	CHANNEL	INPUT12
45	FADER L	CHANNEL	INPUT13
46	FADER L	CHANNEL	INPUT14
47	FADER L	CHANNEL	INPUT15
48	FADER L	CHANNEL	INPUT16
49	FADER L	CHANNEL	INPUT17
50	FADER L	CHANNEL	INPUT18
51	FADER L	CHANNEL	INPUT19
52	FADER L	CHANNEL	INPUT20
53	FADER L	CHANNEL	INPUT21
54	FADER L	CHANNEL	INPUT22
55	FADER L	CHANNEL	INPUT23
56	FADER L	CHANNEL	INPUT24
57	FADER L	CHANNEL	INPUT25
58	FADER L	CHANNEL	INPUT26
59	FADER L	CHANNEL	INPUT27

#	High	Mid	Low
60	FADER L	CHANNEL	INPUT28
61	FADER L	CHANNEL	INPUT29
62	FADER L	CHANNEL	INPUT30
63	FADER L	CHANNEL	INPUT31
64	ON	CHANNEL	INPUT1
65	ON	CHANNEL	INPUT2
66	ON	CHANNEL	INPUT3
67	ON	CHANNEL	INPUT4
68	ON	CHANNEL	INPUT5
69	ON	CHANNEL	INPUT6
70	ON	CHANNEL	INPUT7
71	ON	CHANNEL	INPUT8
72	ON	CHANNEL	INPUT9
73	ON	CHANNEL	INPUT10
74	ON	CHANNEL	INPUT11
75	ON	CHANNEL	INPUT12
76	ON	CHANNEL	INPUT13
77	ON	CHANNEL	INPUT14
78	ON	CHANNEL	INPUT15
79	ON	CHANNEL	INPUT16
80	ON	CHANNEL	INPUT17
81	ON	CHANNEL	INPUT18
82	ON	CHANNEL	INPUT19
83	ON	CHANNEL	INPUT20
84	ON	CHANNEL	INPUT21
85	ON	CHANNEL	INPUT22
86	ON	CHANNEL	INPUT23
87	ON	CHANNEL	INPUT24
88	ON	CHANNEL	INPUT25
89	PAN	CHANNEL	INPUT1
90	PAN	CHANNEL	INPUT2
91	PAN	CHANNEL	INPUT3
92	PAN	CHANNEL	INPUT4
93	PAN	CHANNEL	INPUT5
94	PAN	CHANNEL	INPUT6
95	PAN	CHANNEL	INPUT7
96	PAN	CHANNEL	INPUT8
97	PAN	CHANNEL	INPUT9
98	PAN	CHANNEL	INPUT10
99	PAN	CHANNEL	INPUT11
100	PAN	CHANNEL	INPUT12
101	PAN	CHANNEL	INPUT13
102	PAN	CHANNEL	INPUT14
103	PAN	CHANNEL	INPUT15
104	PAN	CHANNEL	INPUT16
105	PAN	CHANNEL	INPUT17
106	PAN	CHANNEL	INPUT18
107	PAN	CHANNEL	INPUT19
108	PAN	CHANNEL	INPUT20
109	PAN	CHANNEL	INPUT21
110	PAN	CHANNEL	INPUT22
111	PAN	CHANNEL	INPUT23
112	PAN	CHANNEL	INPUT24
113	PAN	CHANNEL	INPUT25
114	PAN	CHANNEL	INPUT1
115	PAN	CHANNEL	INPUT2
116	PAN	CHANNEL	INPUT3
117	PAN	CHANNEL	INPUT4
118	PAN	CHANNEL	INPUT5
119	PAN	CHANNEL	INPUT6

MIDI Data Format

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 MIDI CLOCK.
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 RESET	rx	Clear running status

Received only when the Automix TIME REFERENCE setting is MIDI CLOCK.

4. EXCLUSIVE MESSAGE

4.1 Real Time System Exclusive

Command	rx/tx	function
F0 7F dd 06 MMC COMMAND	tx	MMC command (refer to MMC specification)
F0 7F dd 07 MMC RESPONSE	rx	MMC response (refer to MMC specification)
F0 7F dd 01 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 BULK DUMP DATA	rx/tx	BULK DUMP DATA
F0 43 2n 7E BULK DUMP REQUEST	rx/tx	BULK DUMP REQUEST

The following data types of bulk dump are used on the 02R96.

Data name	tx/rx	function
'm'	tx/rx	Scene Memory & Request
'S'	tx/rx	Setup Memory & Request
'a'	tx/rx	Automix data & Request
'R'	tx/rx	Input patch library & Request
'O'	tx/rx	Output patch library & Request
'H'	tx/rx	Channel library & Request
'G'	tx/rx	Gate library & Request
'Y'	tx/rx	Compressor library & Request
'Q'	tx/rx	Equalizer library & Request
'E'	tx/rx	Effect library & Request
'J'	tx/rx	Bus to Stereo library & Request
'K'	tx/rx	Surround Monitor library & Request
'P'	tx/rx	Program change table & Request
'C'	tx/rx	Control change table & Request
'L'	tx/rx	User define layer & Request
'I'	tx/rx	Plug-in User define & Request
'V'	tx/rx	User define key & Request
'N'	tx/rx	Plug-in Effect Card Data & Request

4.2.2 PARAMETER CHANGE

Command	rx/tx	function
F0 43 1n 3E 0B PARAMETER CHANGE	rx/tx	02R96-specific parameter change
F0 43 3n 3E 0B PARAMETER REQUEST	rx/tx	02R96-specific parameter request
F0 43 1n 3E 7F PARAMETER CHANGE	rx/tx	General purpose digital mixer parameter change
F0 43 3n 3E 7F PARAMETER REQUEST	rx/tx	General purpose digital mixer parameter request

The following data types of parameter change are used by the 02R96.

Type	tx/rx	function
1	tx/rx	Edit buffer
2	tx/rx	Patch data
3	tx/rx	Setup data
4	tx/rx	Backup data
16	tx/rx	Function (recall, store, title)
17	rx	Function (pair)
18	rx	Function (event)
32	rx	Key remote
33	tx/rx	remote meter
34	tx/rx	remote counter

** tx means that the data can be transmitted from the 02R96. rx means that the data can be received by the 02R96.

Format Details

1. NOTE OFF (8n)

Reception

Received when the [Rx CH] matches.
Used to control effects.

STATUS	1 000nnnn	8n	Note off message
DATA	0nnnnnnn	nn	Note number
	0vvvvvvv	vv	Velocity (ignored)

2. NOTE ON (9n)

Reception

Received when the [Rx CH] matches.
Used to control effects.

STATUS	1 001nnnn	9n	Note on message
DATA	0nnnnnnn	nn	Note number
	0vvvvvvv	vv	Velocity (1-127:on, 0:off)

3. CONTROL CHANGE (Bn)

Reception

Received when [Control Change Rx] is ON and the [Rx CH] matches. However if [OMNI] is ON, this is received regardless of the channel. If [Control Change ECHO] is ON, these messages are echoed to MIDI OUT. If [TABLE] is selected, parameters will be controlled according to the settings of the [Control assign table]. The parameters that can be set are defined in the CONTROL CHANGE ASSIGN PARAMETER LIST. If [NRPN] is selected, four messages are used to control the defined parameter: NRPN control numbers (62h, 63h) and DATA ENTRY control numbers (06h, 26h). Parameter settings are defined in the CONTROL CHANGE ASSIGN PARAMETER LIST.

Transmission

If [TABLE] is selected, operating the parameters specified in the [Control assign table] will cause these messages to be transmitted on the [Tx CH] 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 the specified parameters will cause data to be transmitted on the [Tx CH] if [Control Change TX] is ON, using four messages: NRPN control numbers (62h, 63h) and DATA ENTRY control numbers (06h, 26h). Parameter settings are defined in the CONTROL CHANGE ASSIGN PARAMETER LIST.

If [TABLE] is selected

STATUS	1011nnnn	Bn	Control change
DATA	0ccccccc	cc	Control number (0-95, 102-119)
	0vvvvvvv	vv	Control value (0-127)

If [NRPN] is selected

STATUS	1011nnnn	Bn	Control change	
DATA	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	00100110	26	LSB of data entry	
	0vvvvvvv	vv	LSB of parameter data	
STATUS	1011nnnn	Bn	Control change	*1, *2
DATA	00000110	06	MSB of data entry	*2
	0vvvvvvv	vv	MSB of parameter data	*2

*1) There is no particular need to add the 2nd, 3rd, and 4th status for transmission. However if these are present during reception, they should be received.

*2) Does not need to be transmitted if the parameter data fits within 7 bits.

4. PROGRAM CHANGE (Cn)**Reception**

This message is received if [Program Change RX] is ON and [Rx CH] matches. However if [OMNI] is ON, this is received regardless of the channel.

A scene memory will be recalled according to the settings of the [Program Change Table].

This message will be echoed if [Program Change ECHO] is ON.

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. 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

6. 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
--------	----------	----	--------------

7. 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
--------	----------	----	-------

8. 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
--------	----------	----	----------

9. 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
--------	----------	----	------

10. 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	11111101	FE	Active sensing
--------	----------	----	----------------

11. 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
--------	----------	----	--------------

12. SYSTEM EXCLUSIVE MESSAGE (F0)**12.1 MIDI MACHINE CONTROL (MMC)**

These messages are transmitted when the Machine Control section of the 02R96 is operated. For details, refer to the MMC specification.

12.2 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 the 02R96, this is 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
```

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]);
}
}
```

12.2.1 Scene memory bulk dump format

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	'S'
	00110100	34	'4'
DATA NAME	01101101	6D	'm'
	0mmmmmmm	mh	m=0-99, 256(Scene0-99, EDIT BUFFER)
	0mmmmmmm	ml	Receive is effective 1-99, 256
BLOCK INFO.	0ttttttt	tt	total block number(minimum number is 0)
	0bbbbbbb	bb	current block number(0-total block number)
DATA	0ddddd	ds	Scene data of block[mm]
	:	:	
	0ddddd	de	
CHECK SUM	0eeeeeee	ee	ee=(Invert('L'+...+de)+1)&0x7F
EOX	11110111	F7	End of exclusive

12.2.2 Scene memory bulk dump request format

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.

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	'S'
	00110100	34	'4'
DATA NAME	01101101	6D	'm'
	0mmmmmmm	mh	m=0-99, 256(Scene0-99, EDIT BUFFER)
	0mmmmmmm	ml	
EOX	11110111	F7	End of exclusive

12.2.3 Setup memory bulk dump format

Of the setup memory of the 02R96, this bulk-dumps data other than the User define layer, User define plug-in, User define keys, 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	'S'
	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	0ddddd	ds	Setup memory data
	:	:	
	0ddddd	de	
CHECK SUM	0eeeeeee	ee	ee=(Invert('L'+...+de)+1)&0x7F
EOX	11110111	F7	End of exclusive

12.2.4 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	'S'
	00110100	34	'4'
DATA NAME	01010011	53	'S'
	00000010	02	
	00000000	00	No.256 = Current
EOX	11110111	F7	End of exclusive

12.2.5 User define 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	'S'
	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 define layer
: :
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.6 User define 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

```

12.2.7 User define 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
: :
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.8 User define 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

```

12.2.9 User Define Key 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 cccccccc ch data count = ch * 128 + cl
COUNT LOW cccccccc 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=0-3(bank no.A-D)
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 key data
: :
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.10 User Define Key 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
BANK No. 00000000 00
0bbbbbbb bb b=0-3(bank no.A-D)
EOX 11110111 F7 End of exclusive

```

12.2.11 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 00000011 ch data count = ch * 128 + cl
COUNT LOW  00010010 c1
              01001100 4C 'L'
              01001101 4D 'M'
              00100000 20 ''
              00100000 20 ''
              00111000 38 '8'
              01000011 43 'C'
              00110101 35 'S'
              00110100 34 '4'
DATA NAME    01000011 43 'C'
              00000000 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
              :         : (342/7)*8+(342%7)+1=391bytes→
              :         : unfixed
              0ddddddd de
CHECK SUM    0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX         11110111 F7 End of exclusive
    
```

12.2.12 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 'S'
              00110100 34 '4'
DATA NAME    01000011 43 'C'
              00000000 02
              00000000 00 No.256 = Current
EOX         11110111 F7 End of exclusive
    
```

12.2.13 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 c1
              01001100 4C 'L'
              01001101 4D 'M'
              00100000 20 ''
              00100000 20 ''
              00111000 38 '8'
              01000011 43 'C'
              00110101 35 'S'
              00110100 34 '4'
DATA NAME    01010000 50 'P'
              00000000 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
    
```

```

:         :
0ddddddd de
CHECK SUM  0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX       11110111 F7 End of exclusive
    
```

12.2.14 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 'S'
              00110100 34 '4'
DATA NAME    01010000 50 'P'
              00000000 02
              00000000 00 No.256 = Current
EOX         11110111 F7 End of exclusive
    
```

12.2.15 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
 256 and following are data for the corresponding channel of the edit buffer.
 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 c1
              01001100 4C 'L'
              01001101 4D 'M'
              00100000 20 ''
              00100000 20 ''
              00111000 38 '8'
              01000011 43 'C'
              00110101 35 'S'
              00110100 34 '4'
DATA NAME    01010001 51 'Q'
LIB. No. H  0bbbbbbb bb 0-199(EQ Library no.1-200),
              256-(channel current data)
LIB. No. L  0bbbbbbb bb
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
              :         :
              0ddddddd de
CHECK SUM    0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX         11110111 F7 End of exclusive
    
```

12.2.16 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 'S'
00110100 34 '4'
DATA NAME 01010001 51 'Q'
LIB. No. H 0bbbbbbb bb 0-199(EQ Library no.1-200),
256-(channel current data)
LIB. No. L 0bbbbbbb bb
EOX 11110111 F7 End of exclusive

```

12.2.17 Compressor library bulk dump format

The second and third bytes of the DATA NAME indicate the library 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 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 'S'
00110100 34 '4'
DATA NAME 01011001 59 'Y'
LIB. No. H 0bbbbbbb bb 0-127(COMP Library no.1-128),
256-(channel current data)
LIB. No. L 0bbbbbbb bb
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
: :
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.18 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 'S'
00110100 34 '4'
DATA NAME 01011001 59 'Y'
LIB. No. H 0bbbbbbb bb 0-127(COMP Library no.1-128),
256-(channel current data)
LIB. No. L 0bbbbbbb bb
EOX 11110111 F7 End of exclusive

```

12.2.19 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 256 and following are data for the corresponding channel of the edit buffer.

```

er.
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 'S'
00110100 34 '4'
DATA NAME 01000111 47 'G'
LIB. No. H 0bbbbbbb bh 0-127(GATE Library no.1-128),
256-351(channel current data)
LIB. No. L 0bbbbbbb bl
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
: :
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.20 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 'S'
00110100 34 '4'
DATA NAME 01000111 47 'G'
LIB. No. H 0bbbbbbb bh 0-127(GATE Library no.1-128),
256-351(channel current data)
LIB. No. L 0bbbbbbb bl
EOX 11110111 F7 End of exclusive

```

12.2.21 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:EFFECT8 256-259 are the data for the corresponding area of the edit buffer. For reception by the 02R96, only the user area is valid. (52-127, 256-259)

```

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 'S'

```

```

00110100 34 '4'
DATA NAME 01000100 45 'E'
LIB. No. H 0bbbbbbb bh 0-127(Effect Library no.1-128),
256-259(Effect1-4 current)
LIB. No. L 0bbbbbbb bl
BLOCK INFO. 0ttttttt tt total block number(minimum number
is 0)
0bbbbbbb bb current block number(0-total block
number)
DATA 0ddddd ds Effect Library data
: :
0ddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.22 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 01000100 45 'E'
LIB. No. H 0bbbbbbb bh 0-127(Effect Library no.1-128),
256-259(Effect1-4 current)
LIB. No. L 0bbbbbbb bl
EOX 11110111 F7 End of exclusive

```

12.2.25 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
256 and following are the 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'
LIB. No. H 0bbbbbbb bh 0-128(Channel Library no.0-128),
256-(current)
LIB. No. L 0bbbbbbb bl
BLOCK INFO. 0ttttttt tt total block number(minimum number
is 0)
0bbbbbbb bb current block number(0-total block
number)
DATA 0ddddd ds channel Library data
: :
0ddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.26 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'
00110001 31 '1'
00110010 32 '2'
DATA NAME 01001000 48 'H'
LIB. No. H 0bbbbbbb bh 0-128(Channel Library no.0-128),
256-(current)
LIB. No. L 0bbbbbbb bl
EOX 11110111 F7 End of exclusive

```

12.2.27 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 input patch data
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'
0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
0bbbbbbb bl
BLOCK INFO. 0ttttttt tt total block number(minimum number
is 0)
0bbbbbbb bb current block number(0-total block
number)
DATA 0ddddd ds Input Patch Library data
: :
0ddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.28 Input patch library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number.

0:Library no.0 - 32:Library no.32, 256:current input patch data

```

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'

```

```

0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
0bbbbbbb b1
EOX 11110111 F7 End of exclusive

```

12.2.29 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 output patch data
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'
0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
00100000 b1
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
:
:
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.30 Output patch library bulk dump request format

The second and third bytes of the DATA NAME indicate the library number.

0:Library no.0 - 32:Library no.32, 256:current output patch data

```

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'
0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
0bbbbbbb b1
EOX 11110111 F7 End of exclusive

```

12.2.31 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
For reception by the 02R96, only the user area is valid.

```

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'
0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
0bbbbbbb b1
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
:
:
0ddddddd de
CHECK SUM 0eeeeeee ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive

```

12.2.32 Bus to Stereo library bulk dump request 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

```

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'
0bbbbbbb bh 0-32 (Library no.0-32), 256 (Current
data)
0bbbbbbb b1
EOX 11110111 F7 End of exclusive

```

12.2.33 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

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'
0bbbbbbb bh 0-32(Library no.0-32), 256(Current
data)
0bbbbbbb b1
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
:
:

```

```

00000000 de
CHECK SUM 00000000 ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive
    
```

12.2.34 Surround Monitor library bulk dump request 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

```

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'
00000000 bh 0-32(Library no.0-32), 256(Current data)
00000000 b1
EOX 11110111 F7 End of exclusive
    
```

12.2.35 Plug-in effect card bulk dump format

The second byte of the DATA NAME indicates the slot number.

0:SLOT 1 - 3: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'
00000000 mh 0-3 (SLOT1-4)
00000000 ml
DATA 0xxxxxxx xh block count (High)
0xxxxxxx xl block count (Low)
0yyyyyyy yh total size (High)
0yyyyyyy yl total size (Low)
0000iiii Developer id (High)
0000iiii Developer id (Low)
0000jjjj Product id (High)
0000jjjj Product id (Low)
00000000 ds Plug-in Effect card memory data
: : (1024/7)*8+(1024%7)+1=1171bytes
00000000 de
CHECK SUM 00000000 ee ee=(Invert('L'+...+de)+1)&0x7F
EOX 11110111 F7 End of exclusive
    
```

12.2.36 Plug-in effect card bulk dump request format

The second byte of the DATA NAME indicates the library number.

0:SLOT 1 - 3:SLOT 4

```

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 01000001 41 'A'
00000000 mm 0-3 (SLOT1-4)
00000000 ml
EOX 11110111 F7 End of exclusive
    
```

12.3 PARAMETER CHANGE

12.3.1 Parameter change basic 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 00001011 0B 02R96
ADDRESS 0ttttttt tt Data type
00000000 ee Element No.
(If 'ee' is 0, 'ee' is expanded to two bytes)
0ppppppp pp Parameter No.
0ccccccc cc Channel No.
DATA * ) 00000000 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.

12.3.2 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
00000000 ee Element No.
(If 'ee' is 0, 'ee' is expanded to two bytes)
0ppppppp pp Parameter No.
0ccccccc cc Channel No.
DATA * ) 00000000 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.

12.3.3 Parameter request basic 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 00001011 0B 02R96
ADDRESS 0ttttttt tt Data type
00000000 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
    
```


12.3.4 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

```

12.3.5 Parameter Address

Consult your dealer for parameter address details.

12.3.6 Parameter change (Edit buffer)

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 specified parameter will be controlled.

Transmission

If [Parameter change TX] is ON and a parameter not specified in the [Control assign table] is modified, this message will be transmitted with the device number specified by the [Tx CH].

```

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

```

12.3.7 Parameter request (Edit buffer)

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 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

```

12.3.8 Parameter change (Patch 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.

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

```

12.3.9 Parameter request (Patch 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.

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

```

12.3.10 Parameter change (Setup memory)

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 value of 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 memory
            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

```

12.3.11 Parameter request (Setup memory)

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 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 memory
            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

```

12.3.12 Parameter change (Backup memory)

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 value of 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 memory
            0aaaaaaa ee Element No.
            0aaaaaaa pp Parameter No.
            0ccccccc cc Channel No.
DATA        0ddddd dd Data
            :
            :
EOX         11110111 F7 End of exclusive
```

12.3.13 Parameter request (Backup memory)

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 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 memory
            0aaaaaaa ee Element No.
            0aaaaaaa pp Parameter No.
            0ccccccc cc Channel No.
EOX         11110111 F7 End of exclusive
```

12.3.14 Parameter change (Function call Library: store/recall)

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 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    00000110 7F Universal
ADDRESS     00010000 10 Address UU
            00ffffff ff Address UL (function)
            0aaaaaaa aa Address LU (number H)
            0aaaaaaa aa Address LL (number L)
DATA        0ddddd dd channel High
            0ddddd dd channel Low
EOX         11110111 F7 End of exclusive
```

function	number	channel*1)	tx/rx
SCENE RECALL	0x00	0-99	256 tx*2)/rx x
EQ LIB RECALL	0x01	1-200	0-513 tx/rx
GATE LIB RECALL	0x02	1-128	0-95 tx/rx
COMP LIB RECALL	0x03	1-128	0-513 tx/rx
EFF LIB RECALL	0x04	1-128	0-7 tx/rx
CHANNEL LIB RECALL	0x06	0-128	0-513 tx/rx
INPATCH LIB RECALL	0x07	0-32	256 tx/rx
OUTPATCH LIB RECALL	0x08	0-32	256 tx/rx
Bus to Stereo LIB RECALL	0x09	0-32	256 tx/rx

function	number	channel*1)	tx/rx
Surround Monitor LIB RECALL	0x0A	0-32	256 tx/rx
AUTOMIX LIB RECALL	0x0B	1-16	256 tx/rx
SCENE STORE	0x20	1-99	256, 16383 tx/rx
EQ LIB STORE	0x21	41-200	0-513, 16383 tx/rx
GATE LIB STORE	0x22	5-128	0-56, 16383 tx/rx
COMP LIB STORE	0x23	37-128	0-513, 16383 tx/rx
EFF LIB STORE	0x24	53-128	0-7, 16383 tx/rx
CHANNEL LIB STORE	0x26	3-128	0-513, 16383 tx/rx
INPATCH LIB STORE	0x27	1-32	256, 16383 tx/rx
OUTPATCH LIB STORE	0x28	1-32	256, 16383 tx/rx
Bus to Stereo LIB STORE	0x29	1-32	256, 16383 tx/rx
Surround Monitor LIB STORE	0x2A	1-32	256, 16383 tx/rx
AUTOMIX LIB STORE	0x2B	1-32	256, 16383 tx/rx

*1) 0:CH1 - 55:CH56, 128:BUS1 - 135:BUS8, 256:AUX1 - 263:AUX5, 512:STEREO L - 513:STEREO R
Use 256 if the recall destination or store source is a single data item.

Effect is 0:Effect 1-3:Effect 4

If the store destination is 16383 (0x3FFF), this indicates that the library data has been changed by an external cause (only transmitted by the 02R96)

*2) This is also transmitted when a program that has not been assigned to the [Program change table] is recalled. (Normally this would be transmitted as a program change message.)

12.3.15 Parameter change (Function call: title)

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 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    00000110 7F Universal
ADDRESS     00010000 10 Function call Library
            0100aaaa 4a Address UL (function)
            0nnnnnnn nn Address LU (number H)
            0nnnnnnn nn Address LL (number L)
DATA        0ddddd dd title 1
            :
            :
            0ddddd 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(1-52: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

12.3.16 Parameter request (Function call: title)

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	Manufacturer'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	00000110	7F	Universal
ADDRESS	00010000	10	Function call Library
	0100aaaa	4a	Address UL (function)
	0nnnnnnn	nn	Address LU (number H)
	0nnnnnnn	nn	Address LL (number L)
EOX	11110111	F7	End of exclusive

12.3.17 Parameter change (Function call: Scene/Library Clear)

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 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	Manufacturer'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	00000110	7F	Universal
ADDRESS	00010000	10	Function call Library
	0110aaaa	6a	Address UL (function)
	0nnnnnnn	nn	Address LU (number H)
	0nnnnnnn	nn	Address LL (number L)
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 1-128
CHANNEL LIB CLEAR	0x66 2-128
INPATCH LIB CLEAR	0x67 0-32
OUTPATCH LIB CLEAR	0x68 0-32
Bus to Stereo LIB CLEAR	0x69 0-32
Surround Monitor LIB CLEAR	0x6A 0-32
AUTOMIX LIB CLEAR	0x6B 1-16

12.3.18 Parameter change (Function call: pair, copy)

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, pairing will be enabled/disabled for the specified channel. (Items other than PAIR are reserved for future use.)

STATUS	11110000	F0	System exclusive message
ID No.	01000011	43	Manufacturer'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	00000110	7F	Universal
ADDRESS	00010001	11	Function call Pair
	0000aaaa	0a	Function
DATA	0ddddddd	dd	Source channel number H
	0ddddddd	dd	Source channel number L
	0ddddddd	dd	Destination channel number H
	0ddddddd	dd	Destination channel number 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 - 55:CH56, 128:BUS1 - 135:BUS8, 256:AUX1 - 263:AUX8, 512:STEREO L - 513:STEREO R

Effect is 0:Effect 1-3:Effect 4

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.

12.3.19 Parameter change (Function call Event: Effect 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 corresponding effect's function activates (depending on the effect type).

STATUS	11110000	F0	System exclusive message
ID No.	01000011	43	Manufacturer'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	00000110	7F	Universal
ADDRESS	00010010	12	Function call Event
	0000aaaa	0a	Function
DATA	00000000	00	-
	0ddddddd	dd	Release:0, Press:1
	00000000	00	-
	0ddddddd	dd	Destination Effect Number 0 - 7
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
Auto Pan 5.1 Reset Button	0x03 0:Effect1

• This does not activate when the effect type is different.

12.3.20 Parameter change (Key remote)

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 same processing that is executed when the key specified by Address is pressed (released). (Refer to the PARAMETER CHANGE PARAMETER NUMBER LIST.)

Transmission

If [Parameter Change ECHO] is ON, this message is retransmitted without change.

STATUS	11110000	F0	System exclusive message
ID No.	01000011	43	Manufacturer'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	00010111	0B	02R96
ADDRESS	00100000	20	Address UU
	0aaaaaaaa	aa	Address UL
	0aaaaaaaa	aa	Address LU
	0aaaaaaaa	aa	Address LL
DATA	0ddddddd	dd	0:press, 1:release
EOX	11110111	F7	End of exclusive

12.3.21 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 (see PARAMETER CHANGE PARAMETER NUMBER LIST) 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 is 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 Address UU
              0aaaaaaa aa Address UL
              0aaaaaaa aa Address LU
              0aaaaaaa aa Address LL
DATA        0ddddd dd Data1 H
              0ddddd dd Data1 L
              :
EOX         11110111 F7 End of exclusive
    
```

Meter data uses the unmodified DECAF value of the DSP. For the interpretation of the value, refer to the PARAMETER CHANGE PARAMETER NUMBER LIST.

12.3.22 Parameter request (Remote Meter)

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 parameter specified by Address (refer to PARAMETER CHANGE PARAMETER NUMBER LIST) will be transmitted on the [Rx CH] at 50 msec intervals for a duration 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 is 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 Address UU
              0aaaaaaa aa Address UL
              0aaaaaaa aa Address LU
              0aaaaaaa aa Address LL
DATA        0cccccccccc Count H
              0ccccccccCc Count L
EOX         11110111 F7 End of exclusive
    
```

12.3.23 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 is 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 22 Remote Time Counter
              0000tttt 0t 0:Time Code, 1: Measure, Beat, Clock
DATA        0ddddd dd Hour / Measure H
              0ddddd dd Min / Measure L
              0ddddd dd Sec / Beat
              0ddddd dd Frame / Clock
    
```

```
EOX         11110111 F7 End of exclusive
```

12.3.24 Parameter request (Remote Time Counter)

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 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.

Transmission

If [Parameter Change ECHO] is ON, this message is 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 22 Remote Time Counter
              0aaaaaaa aa 0:Transmission request,
              0x7F:Transmission stop request
EOX         11110111 F7 End of exclusive
    
```

12.3.25 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 is 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
DATA        0000ddd dd Automix Status H
              0000ddd dd Automix Status L
EOX         11110111 F7 End of exclusive
    
```

12.3.26 Parameter request (Automix Status)

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 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 is retransmitted without change.

```

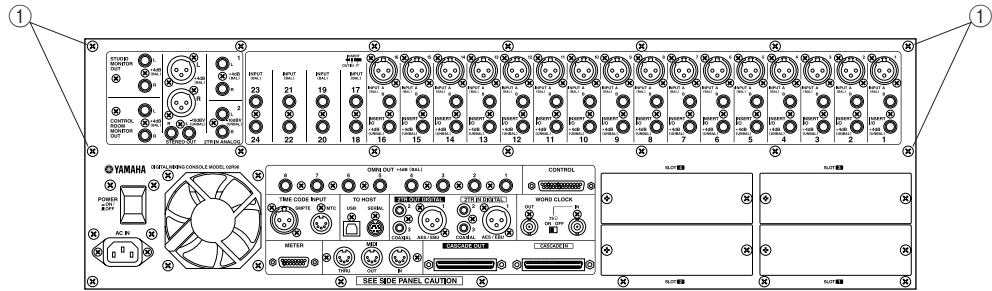
STATUS      11110000 F0 System exclusive message
ID No.      01000011 43 Manufacture's ID number (YAMAHA)
SUB STATUS  0011nnnn 3n n=0-15 (Device number=MIDI Channel)
GROUP ID    00111110 3E MODEL ID (digital mixer)
MODEL ID    00001011 0B 02R96
ADDRESS     00100011 23 Automix Status
              0aaaaaaa aa 0:Transmission request,
              0x7F:Transmission stop request
EOX         11110111 F7 End of exclusive
    
```

Appendix D: Options

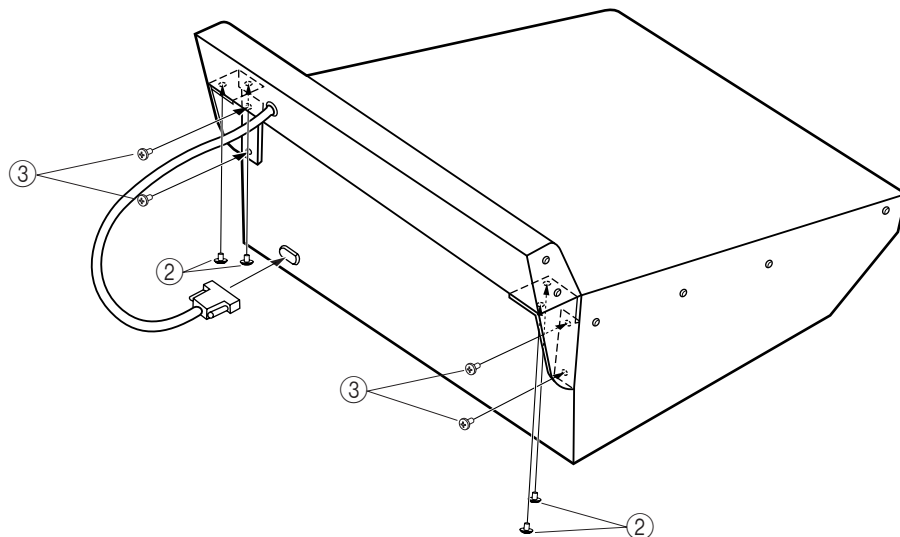
MB02R96 Peak Meter Bridge

Installation

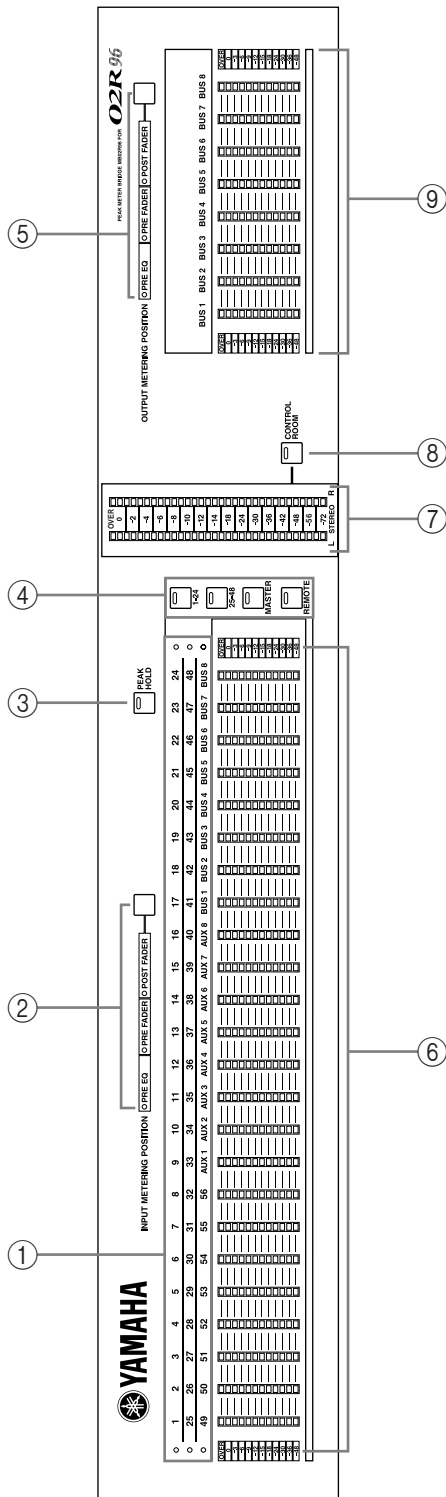
- 1 Unscrew the four fixing screws ① on the 02R96 rear panel to which the meter bridge will be attached.



- 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.



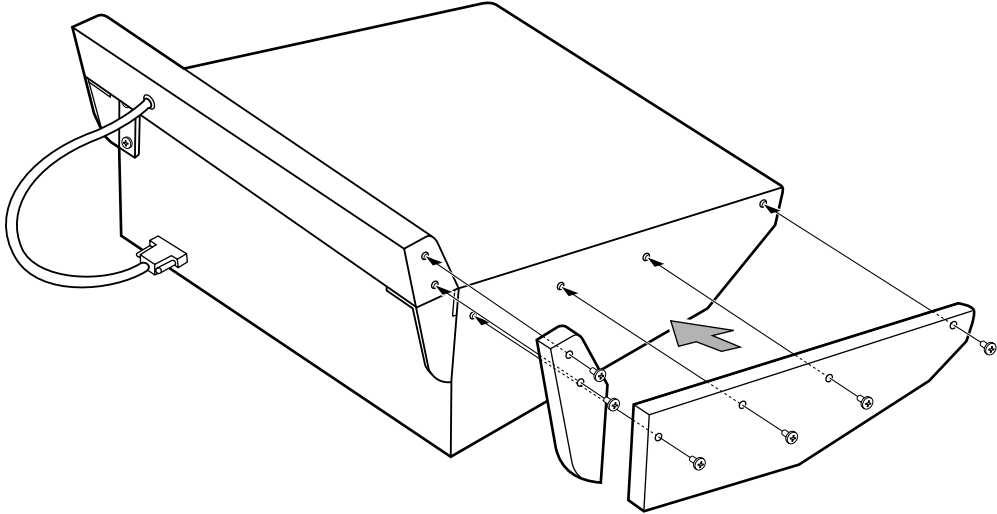
Meter Bridge Controls



- 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 198), 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.



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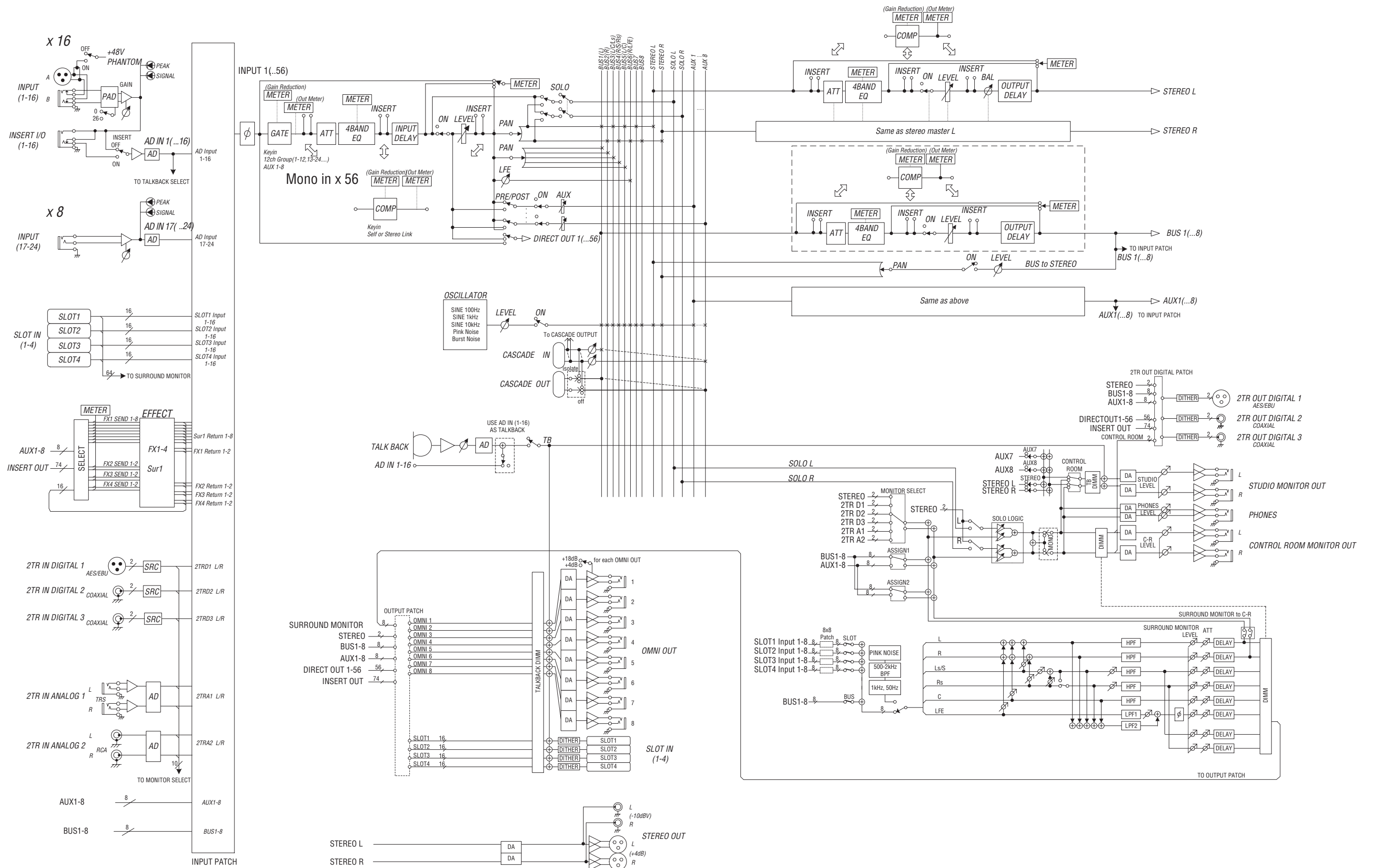
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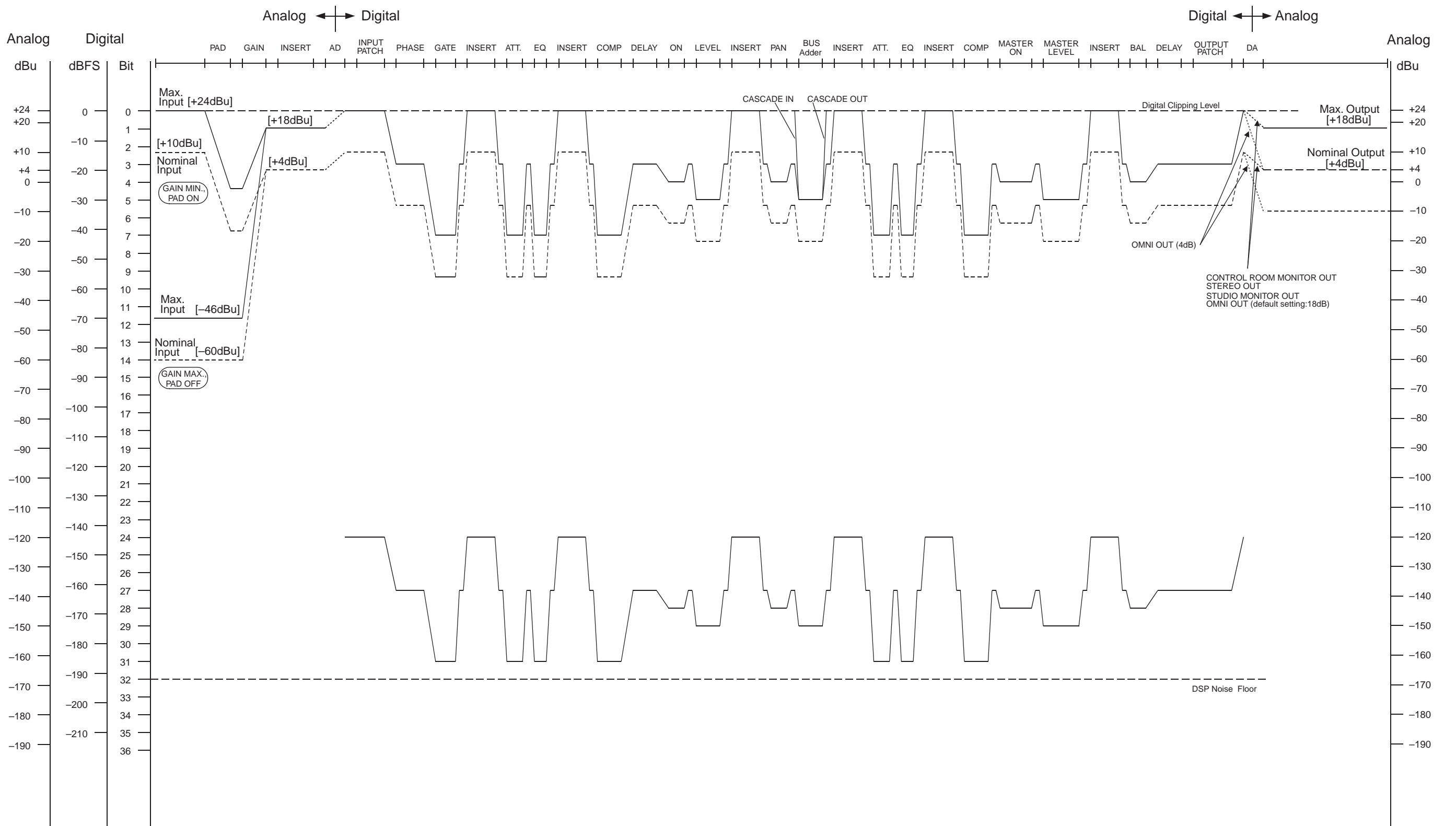
Y

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02R96 Block Diagram



02R96 Level Diagram



[0dBu = 0.775Vrms]
 [0dBFS = Full Scale]

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized
Mode	Default Messages Altered	X X *****	OMNI off/OMNI on X X	Memorized
Note Number	True Voice	X *****	0-127 X	
Velocity	Note On Note Off	X X	O O	Effect Control
After	Key's Ch's	X X	X X	
Pitch Bend		X	X	
Control Change	0-95,102-119	O	O	Assignable
Prog Change	:True#	0-127 *****	0-127 0-99	Assignable
System Exclusive		O	O	*1
System Common	:Song Pos :Song Sel :Tune	X X X	O X X	Automix
System Real Time	:Clock :Commands	X X	O O	Automix, Effect Control
Aux Messages	:Local ON/OFF :All Notes OFF :Active Sense :Reset	X X X X	X X O 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 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

O: Yes
X: No

