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**PicMix™**  
MULTI-FORMAT MONITOR SYSTEM  
OPERATION AND MAINTENANCE MANUAL  
FIRST EDITION

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# Preface

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## Safety Instructions

1. Read Instructions - Please read all the safety and operating instructions before operating this equipment.
2. Heed Warnings - All warnings on the equipment and in the operating instructions should be adhered to.
3. Water and Moisture - This equipment should not be used near water. Do not expose this equipment to rain or moisture.
4. Ventilation - This equipment should be installed so that its location does not interfere with its proper ventilation. Do not cover powered equipment with drop cloths or dust covers.
5. Heat - This equipment should be situated away from heat sources such as radiators, heat registers, amplifiers or other equipment that produce heat.
6. Power Sources - This equipment should only be connected to AC power mains of the type described in the operating instructions or as marked on the equipment.
7. Grounding and Polarization - Precautions should be taken to assure that grounding and polarization of the A.C. power lines are correct.
8. Power cord protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the points where they exit from the equipment.
9. Cleaning and Maintenance - The panels and components of the equipment should be cleaned and maintained only as specified by the manufacturer.
10. Object and Liquid Entry - Care should be taken to prevent objects and spillage from entering the equipment through fader slots and switch openings.
11. Servicing - The user should not attempt to service the equipment beyond the procedures described in the operating instructions. All other servicing should be referred to qualified service personnel.
12. Testing - The optional PicMix™ Machine Control Interface is designed to put recording devices in and out of record mode. Since it is impossible to test this device in all operating environments, it must be tested thoroughly in your own environment before use on audio masters.



## Limited Warranty

PicMix is warranted from the date of delivery to the original purchaser to be free from defects in materials or workmanship for a period of one (1) year.

This warranty does not apply to damage resulting from improper or negligent use, inadequate or improper packaging for shipment, damage incurred during shipping, or unauthorized modification.

The sole and exclusive remedy for breach of any warranty concerning PicMix shall be repair or replacement of defective parts at the discretion of OTARI Corporation. Such repair or replacement will be performed at no charge for parts or labor for one year from the date of delivery to the original purchaser at a designated Otari service center or the factory, at Otari's discretion.

OTARI Corporation disclaims any warranty, expressed or implied of suitability for specific use, and disclaims any liability for incidental, special, or consequential damages.

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- Model Number
- Serial Number
- Date of Purchase
- Manual Revision to which you are referring



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## 1.1 Introduction

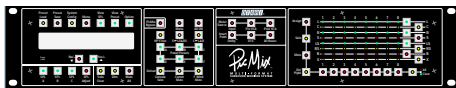
The PicMix Multi-Format Monitor System is a comprehensive digitally controlled audio system used for monitoring and controlling audio recorders in the mix-to-picture post production of audio for surround sound formats. Its flexibility and functionality allow it to be extremely useful and productive in many other audio processes, as well.

The PicMix Monitor takes control of several aspects of mixing audio in the surround sound environment. This section provides an overview of most of PicMix's features.

## 1.2 System Components

The PicMix Monitor System consists of the Master Audio Rack and several other optional components. Throughout this manual the PicMix Monitor System will be referred to as the PicMix Monitor.

### 1.2.1 Monitor Master



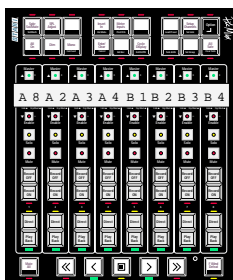
The Monitor Master is the heart of the PicMix Monitor and is required in each monitor system configuration. It is a 2U, 19-inch, rack mounted unit that contains all master audio inputs and outputs for the system as well as the Direct and Playback audio inputs for audio channels 1 through 8. Almost all of the functionality of the PicMix Monitor is available in the Monitor Master alone.

### 1.2.2 Monitor Slave



The Monitor Slave serves as an input expander for the PicMix Monitor. It is a 2U, 19-inch rack mounted unit that adds 8 additional audio input channels (8 Direct inputs and 8 Playback inputs) to the system. Up to 3 Monitor Slaves may be added to a Monitor Master for a total of 32 audio channels (64 audio inputs) in the 4 racks.

The Monitor Slaves are digitally controlled by the PicMix Control Network (PCN), which is a RS-422 based full duplex serial control hardware/software protocol.



### 1.2.3 Monitor Controller

The Monitor Controller, in effect, is a remote control for the PicMix Monitor. In addition, it provides functionality that is not available anywhere else in the system. The Controller is generally mounted in or on the mixing console surface. 1 to 4 Monitor Controllers can be used in a PicMix

Monitor configuration. They are connected in parallel to the PCN connector on the Monitor Master or Slave.

### 1.2.4 Machine Control Interface (MCI)

The MCI controls various types of audio recorders. Both motion control and record on/off functions are provided. Since machine control functions are only available from a Monitor Controller, the MCI can only be used in systems that have at least one Monitor Controller attached. The MCI is connected in parallel to the PCN connector on the Monitor Master or Slave.

### 1.2.5 PicMix Panning System

The PicMix Multi-Format Panning System consists of an independent panner audio rack and controller with remote knob and joystick panning controls. The panning system is described in its own operation manual.

## 1.3 PicMix Monitor Features

### 1.3.1 Monitor Master

These features are standard with every PicMix Monitor System:

#### Speaker Assignment of Recorder Tracks

In the post production of multi-channel (surround) audio, there is not always a one-to-one correspondence of recorder tracks to speaker assignments. For example, an 8-track tape used for effects may be laid out as 2 LCRS mixes (stems) across the eight tracks (ie. 1&5=L, 2&6=C, 3&7=R, 4&8=S). An 8-track dialog tape however, may have all 8 tracks assigned to the Center speaker. The PicMix Monitor allows each recorder track to be assigned to any of 8 speaker buses. This assignment varies from session to session and PicMix allows these assignments to be easily changed, either manually, or by recalling a Preset that was previously set up for a certain type of session.

PicMix can handle from 8 to 32 recorder tracks at one time, depending on how many Slave racks are in the system. Each recorder track in PicMix actually represents 2 audio signals: the console output bus that feeds the recorder track (Direct), and the output of the recorder track (Playback).

#### Direct/Playback Monitor Switching

To assure a seamless punch-in on a master recorder it is necessary to compare the audio signals that are feeding the recorder (Direct signals) with those that were previously recorded on that recorder (Playback signals). In essence, the punch in (or punch out) must be rehearsed just prior to the actual punch. PicMix provides this facility by permitting the smooth and silent switching between the Direct and Playback signals of one or more recorder tracks for performing this punch rehearsal. It is important to note, that while most modern recorders provide their own internal input/playback switching, the only way to truly ensure that the true console signal matches the recorded signal is to A/B the actual console output with the recorder playback, rather than the recorder input with the recorder playback.

#### Muting and Soloing of Recorder Tracks

PicMix provides the facility to mute or solo any recorder track(s) whether those tracks are being monitored in Direct or Playback mode.

#### Muting and Soloing of Speaker Outputs

PicMix provides the facility to mute or solo any speaker output or combination of speaker outputs. This allows the isolation of specific speaker channels for quality checking or troubleshooting.

#### Muting and Soloing of Recorder Tracks and Speaker Outputs

PicMix provides the facility to mute or solo combinations of recorder tracks and speaker outputs.

#### Calibrated Monitor Level

PicMix permits the setting the Sound Pressure Level (monitor level) of all 8 speaker outputs via a digitally controlled, calibrated SPL system. SPL can be set in 1 dB increments over a range of 20 dB SPL to 105 dB SPL. Three user defined SPL levels may be stored for instant recall. SPL accuracy is +/- one quarter of a dB between the critical monitoring levels of 85 to 90 dB SPL.

#### Calibrated Encode/Decode Loop

An insert send/return loop with switching is provided for using matrix type encode/decode processors such as the Dolby™ DS-4.

#### Monitor Master Switchable Meter Outputs

Eight meter outputs are provided in the Master Audio Rack so that any of three meter points may be selected for display on user provided meters. The 3 meter points provided are:

- The 8 audio inputs (based on their Direct/Playback status).
- The 8 outputs of the matrix decoder, if installed and switched in.
- The 8 feeds to the monitor power amplifiers.

### Monitor Slave Switchable Meter Outputs

8 meter outputs are provided in each Master Slave Rack. These allow the metering of the 8 audio inputs (based on their Direct/Playback status) for each Slave rack connected to the Master Audio Rack.

### System Presets

System Presets allow quick loading of previously stored system configurations. This allows the PicMix Monitor to be reconfigured for a specific type of session at the push of a button.

### Seamless Operation with Standard Stereo Consoles

The PicMix Monitor is designed to integrate seamlessly with both dedicated re-recording (dubbing) consoles and standard Stereo consoles with 4 or more tracking buses. In both cases, the console's Control Room or solo outputs are fed into the PicMix Monitor to handle in-place or AFL/PFL type solo signals. When a "standard" stereo console is connected to the PicMix Monitor, a hardwire bypass function is provided so that the console can be fed directly to the left and right amplifiers without the PicMix Monitor "touching" the signal. This passive bypass condition also occurs if the PicMix monitor is not powered.

### Mute All and Dim

All speaker outputs can be dimmed or completely muted at the push of a button or from external logic lines. The absolute dim level is programmable by the user.

## 1.3.2 Optional Monitor Controller

The optional Monitor Controller adds these capabilities to the Monitor Master:

### Machine Masters

Any control strip on a Monitor Controller can be designated as a *Machine Master* which allows any function (Direct/Playback switching, Solo, Mute, etc.) to be applied to all active recorder tracks on a given recorder.

### Global Masters

Any control strip on a Monitor Controller can be designated as a *Global Master* which allows any function to be applied to all active recorder

tracks in the system.

#### Link Masters

Any control strip on a Monitor Controller can be designated as a *Link Master* which allows up to 7 recorder tracks in the system to be mastered by the Link Master, for 8 total tracks in the Link. These linked tracks are “hidden” beneath the Link Master and do not take up additional control strips on the Monitor Controller.

#### Recorder Track Enable

Recorder tracks are only active when they are enabled. Therefore, any track can be set into a safe condition by “disabling” that track. If a track is safe, then its Direct/Playback status cannot be changed and that track cannot be put into record mode. Solo and Mute are always functional regardless of whether or not a track is active.

#### Machine Safe

Any individual recorder can be blocked from going into record by setting that specific machine into a *Record Safe* mode. Only the record enable function is affected— all other functions, including Direct/Playback switching, remain active.

#### All Safe

All recorder tracks can be set to a safe condition by hitting the ALL SAFE button. This locks the Direct/Playback status of all tracks, and no tracks can be put into record mode. Solo and Mute are always functional regardless of whether or not All Safe is enabled.

### 1.3.3 Optional Monitor Controller and Machine Control Interface (MCI)

The optional Machine Control Interface adds the following capabilities to the Monitor Controller:

Note: Not all Recorders are supported by the PicMix Machine Control Interface and not all features may be available for all supported recorders. Please check with your Otari representative for specific details about your recorders.

#### Recorder Motion Control



Basic transport motion control functions can be controlled from the Monitor Controller.

#### Recorder Punch In and Out

Each track of the recorder may be set into record or taken out of record by the RECORD ON and RECORD OFF buttons on the Monitor Controller. Recorder Tracks can be grouped via Machine Masters, Global Masters, and Link Masters.

#### Track Record Tally Backs

The actual record state of each recorder track is displayed on the Record On LEDs on the Monitor Controller. (Not all recorders can support this feature).

## 1.4 Using This Manual

This manual contains all of the information that you need to connect, calibrate, operate, and maintain the PicMix monitor system. It is not a tutorial on the art of Surround mixing. For information on the theory and techniques of Surround mixing and how the PicMix Multi Format Monitor and Panning Systems can help you create a better Surround mixing environment, please read the PicMix White Paper enclosed with this manual.

The bulk of this manual deals with the installation, setup, and operation of the PicMix Monitor and optional Monitor Controller. A separate section is provided specifically for the PicMix Machine Control Interface hardware.

When learning to operate PicMix, it is recommended that you review Section 3 to familiarize yourself with control and indicator terminology before moving on to Section 4, Operation.

### 1.4.1 Section Descriptions

#### Section 2 - Installation

This section contains connector pinouts and instructions for identifying and interfacing the PicMix monitor components. Guidelines and recommendations for installing and interfacing PicMix are also included.

#### Section 3 - Controls and Indicators

Section 3 cross references PicMix operation by its controls. Each control and indicator of the PicMix monitor components is identified along with a brief description of its function.

#### Section 4 - Operation

This section describes the operation of the PicMix monitor system and gives step-by-step examples of how various tasks are accomplished.

### Section 5 - PicMix Machine Control Interface

Section 5 contains information specific to installing, configuring, and operating the optional PicMix Machine Control Interface (MCI).

### Section 6 - Alignment and Maintenance

This section contains technical information and instructions for installing software and aligning the PicMix monitor.

### Section 7 - Appendix

Section 7 contains addendums for the PicMix system and components. Technical Bulletins that may be issued in the future should be put here.

### Section 8 - Schematics and Block Diagrams

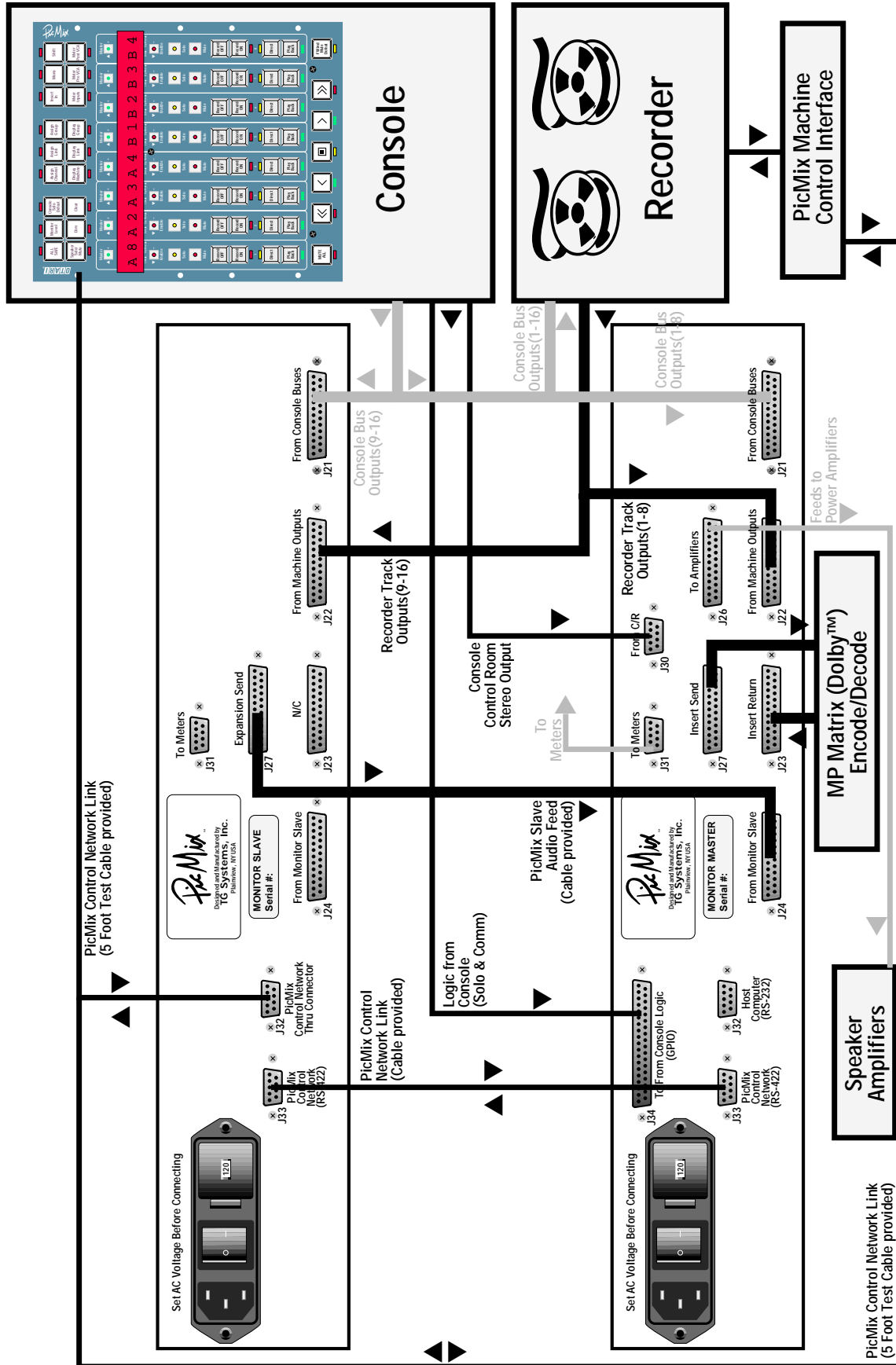
Section 8 contains all technical drawings issued for the PicMix components.

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## Section 2 Installation

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PicMix Interconnect Diagram

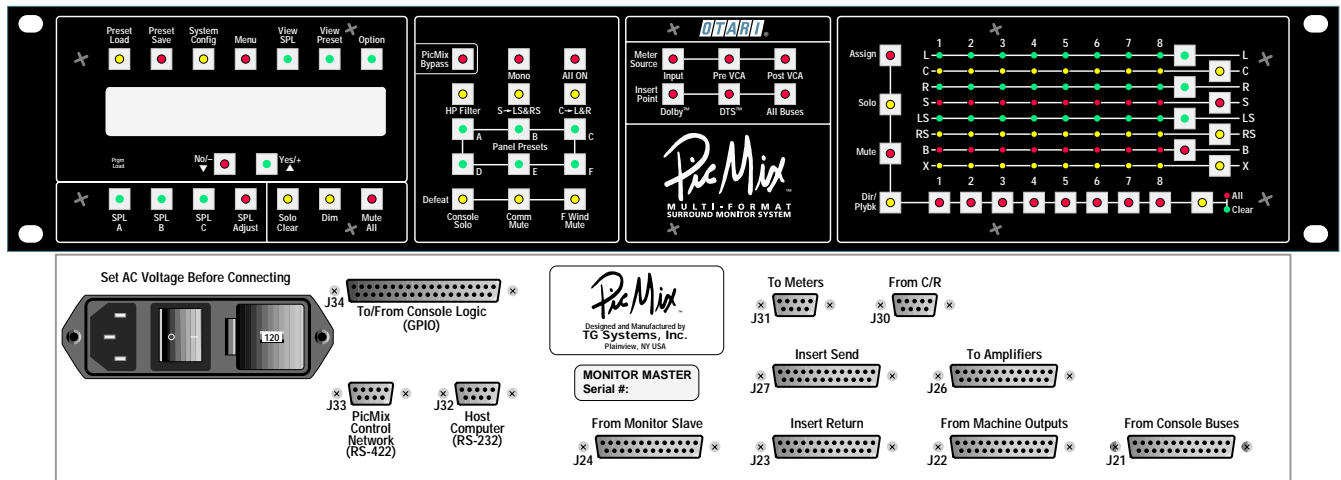
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## 2.1 Taking Inventory

The following items are shipped with each PicMix component:

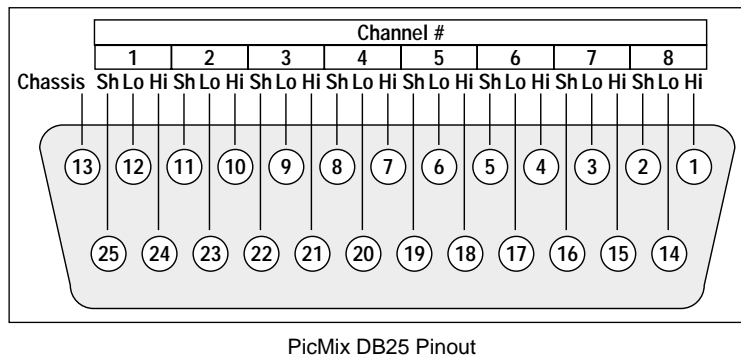
Monitor Master	Monitor Master Rack Unit Audio Expansion Termination Plug Software Safety Disk Power Cord PicMix White Paper This Manual
Monitor Slave	Monitor Slave Rack Unit Audio Interconnect Cable PCN Interconnect Cable Power Cord
Monitor Controller	Monitor Controller Unit 5 Foot PCN Cable
Machine Control Interface	Machine Control Interface Unit



Monitor Master Front and Rear Panels

## 2.2 Connecting Audio to the Monitor Master Rack

All audio inputs and outputs (except Meter Outputs) of the Monitor Master and Slaves are electronically balanced at a nominal level of +4dBu. Connections are made to the Female DB25 connectors on the rear panel of the Monitor Master rack. Mating DB25 Male Connectors are commonly available in several forms with different types of pin styles (crimp, solder, etc.). Standard audio grounding procedures should be followed (ie. shields should be disconnected at one end).



All of the DB25 connectors follow a pin out that is in common use in the pro audio industry. Snakes or cables that are commonly available may be used to interconnect the PicMix Monitor. One popular product that uses the same pin out, and for which cable assemblies are available is the Tascam DA-88 recorder.

### 2.2.1 From Console Buses (J21-Input)

8 Console Track bus outputs should be wired to this connector. These audio signals represent the monitor's Direct inputs.

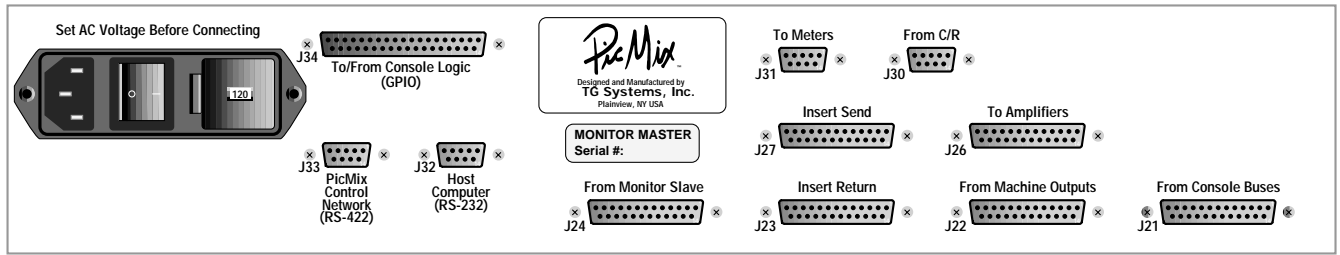
### 2.2.2 From Machine Outputs (J22-Input)

8 Recorder outputs should be wired to this connector. These audio signals represent the monitor's Playback inputs.

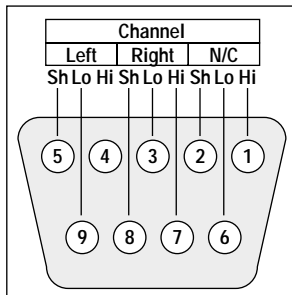
### 2.2.3 To Amplifiers (J26-Output)

This connector should be wired to the power amplifiers that drive the monitor speakers. If signal processors are wired in the power amplifier chain (ie. room equalizers), then this should be wired to the signal processor inputs. The connector pin out numbers are assigned to the system speaker buses as follows:

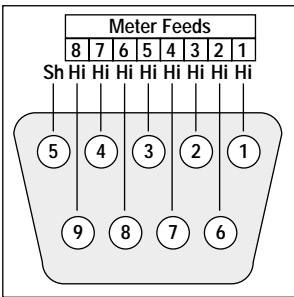
- 1 - Left
- 2 - Center
- 3 - Right
- 4 - Surround (Mono)
- 5 - Left Surround
- 6 - Right Surround
- 7 - Boom (Sub Woofer)
- 8 - eXtra (Spare Bus)



Monitor Master Rear Panel



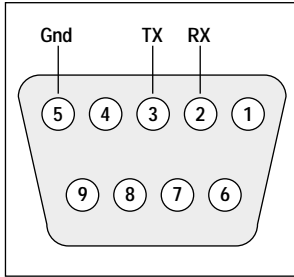
From C/R (J30) Pinout



To Meters (J31) Pinout

### 2.2.4 Insert Send (J27-Output)

This connector should be wired to the input of the signal processor that will be inserted at the end (pre SPL adjust) of the signal chain. Such a device might be the Dolby™ DS-4 encode/decode matrix processor. In many cases there will be no device connected to this connector.



Host Computer RS-232 (J32) Pinout

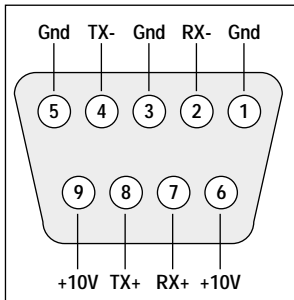
### 2.2.5 Insert Return (J23-Input)

This connector should be wired to the output of the signal processor that will be inserted at the end (pre SPL adjust) of the signal chain. Such a device might be the Dolby™ DS-4 encode/decode matrix processor. In many cases there will be no device connected to this connector.



### 2.2.6 From Monitor Slave (J24-Input)

The PicMix Monitor Slave unit that handles audio input channels 9-16 should be wired to this connector, using the cable supplied with the slave unit. **If no Slave rack is connected, the shorting plug provided with the Monitor Master must be installed on this connector.**



Monitor Master PicMix Control Network RS-422 (J33) Pinout

### 2.2.7 From C/R (J30-Input)

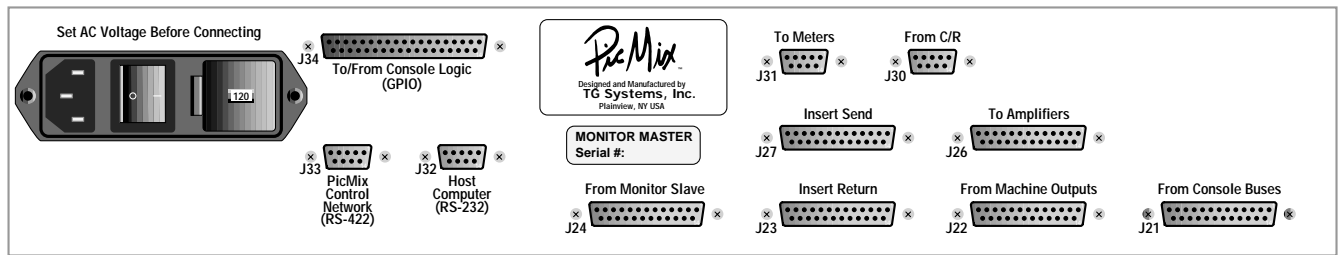
The console's Left and Right Control Room outputs should be wired to J30 as shown. This audio path is used when the console is placed in an AFL or PFL solo mode. If a dedicated Control Room output does not exist, then the appropriate Solo, AFL, PFL, or Cue outputs should be connected here.

In order to have automatic solo switch-over from the console, logic lines from the console must be connected to the GPIO connector (J34) described later in this section.

Note: When PicMix is not powered or is in bypass mode, the Console Control room signals are routed directly to the left and right amplifier feeds via relay contacts. There is no active circuitry in this routing and there is no load presented to the console's C/R signal. This allows the PicMix system to be fully out of the system during "non-PicMix" operation.

### 2.2.8 To Meters (J31-Output)

This DB9 connector should be wired to audio meters if monitor metering is desired. The meters should be buffered and "0" vu adjust capability. These meter signals are at unity gain and are unbalanced. The DB9 pinout is shown to the left.



Monitor Master Rear Panel

### 2.2.9 Host Computer - RS-232 (J32)

This should be connected to the COM 1 or COM 2 port of a DOS type computer when new software is to be downloaded into the PicMix Master.

Important: Because computer noise can be injected into the monitor audio, this should only be connected while downloading software.

### 2.2.10 PicMix Control Network (PCN) - RS-422 (J33)

This should be connected in a parallel fashion (daisy-chained or star) to all PicMix Monitor System Components including Monitor Controllers, Slaves, and Machine Control Interfaces. More information about the PicMix Control Network can be found in Section 6.

### 2.2.11 AC Power Connection

This should be connected to a stable source of AC power. Before doing this, ensure that the voltage setting showing in the voltage setting window matches the voltage of the power source. Voltage settings available are 100, 120, 220, 240. The voltage can be changed by opening the voltage selector door, removing the voltage selector plug, and reinserting it with the proper voltage showing through the window.

## 2.3 Wiring the GPIO Port (J34)

The PicMix GPIO port should be wired to logic outputs from the console and other sources. Logic output signals are available from PicMix for indication of monitor status.

### 2.3.1 Electrical Considerations

All logic connections to the PicMix Monitor are made via J34, a 37 pin female DB type connector located on the rear of the Monitor Master.

All logic is active low. A relay or switch closure from PicMix ground to the

appropriate signal may be used, or a suitable opto-isolated driven logic low may also be used. Use only local PicMix power to drive logic input lines. Ensure that grounds between the console logic and PicMix remain isolated.

Logic inputs to PicMix are 74HC373 ICs pulled high through 10K Ohms. Logic outputs from PicMix are 74HC374 ICs. All logic inputs must be latched except for those marked as "pulse". Those marked "pulse" require a low going pulse of at least 100ms.

For a more detailed discussion of logic connection and example circuits, see Section 6.8, Interfacing PicMix GPIO and Machine Controller Parallel Lines.

### 2.3.2 Solo Mode 1 & 2

Because different audio consoles may provide different logic outputs for solo integration with PicMix, two different logic protocols are provided. Both use the solo logic input pins (14 & 33) on the GPIO connector.

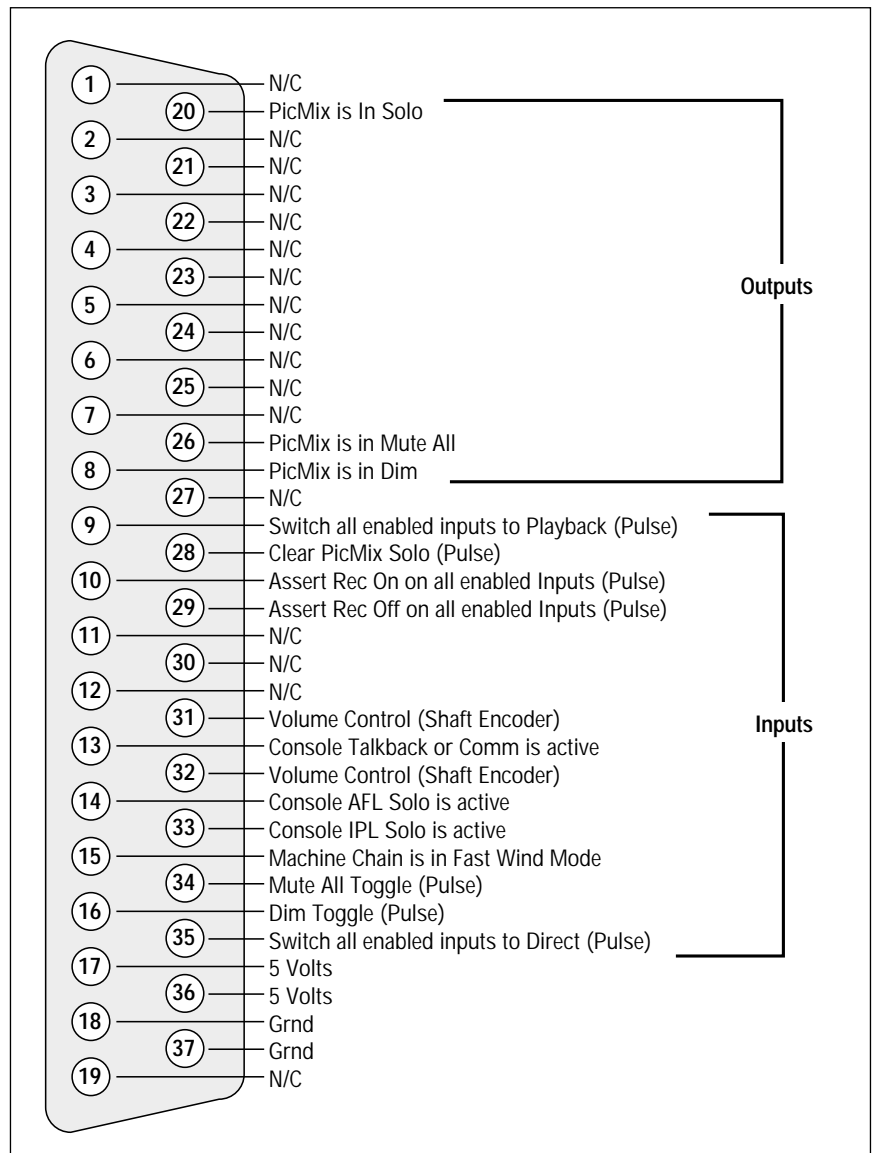
Solo modes are set by selecting EXTSOLO1 or EXTSOLO2 in the System Config Menu. See Section 3.2.3 for an explanation of the System Config button and its operation.

#### Solo Mode 1

When Solo Mode 1 is selected, 1 line (Pin 14) tells PicMix that the console is in solo and the other line (Pin 33) tells PicMix whether it is an in-place (destructive) solo or a monitor interrupt solo (non-destructive).

#### Solo Mode 2

When Solo Mode 2 is selected, 2 lines (Pin 14 & 33) tell PM that the console is in solo, each line being dedicated to in-place or monitor interrupt type solos. When Pin 14 is asserted (active low logic), this tells PicMix that the console is in monitor interrupt solo mode. When Pin 33 is asserted this tells PicMix that the console is in In-Place solo mode.



PicMix GPIO Pinout

### Solo Mode Operation

The following table shows how Solo Modes 1 and 2 operate.

<b>Pin 14</b>	<b>Pin 33</b>	<b>Type 1</b>	<b>Type 2</b>
H	H	No Solo	No Solo
H	L	No Solo	In-Place
L	H	Monitor	Monitor
L	L	In-Place	Monitor

When PicMix sees a monitor interrupt type solo (AFL/PFL), it mutes all inputs and feeds the Control Room signal from the console to the left and right speakers.

When PicMix sees an in-place solo (IPL) it switches all inputs to DI-

RECT. The DIRECT LEDs flash on any affected monitor controllers to indicate this function.

When a console solo is active, the console solo defeat LED on the Master front panel flashes as does the ALL ON LED on the monitor controller. Pressing either of those button will temporarily override the solo and resume normal monitoring.

### 2.3.3 Logic Inputs

Note: Logic Inputs marked with an asterisk (\*) should be considered essential for optimum console integration with PicMix. Those not marked are considered optional as they may not be required in a given application.

*Note: The pin numbers relate to the GPIO connector (J34) on the PicMix Monitor Master Audio Rack. The Hex values in parenthesis may be used as a debugging aid when commissioning a system. PicMix can read out the logic input (or output) as a hex value as part of it's System Config Menu as described in Section 3 - Controls and Indicators.*

Rec On (Used with Machine Control Interface Only)

Pin 10 - Pulse - (0004H) - Assert this line by a pulse to set all enabled machine tracks to record *only if External Record is enabled*. (EXT REC button on the Monitor Controller). Operation is the same as hitting REC ON on a global machine master.

Rec Off (Used with Machine Control Interface Only)

Pin 29 - Pulse - (0008H) - Assert this line by a pulse to set all enabled machine tracks to record off *only if External Record is enabled*. (EXT REC button on the Monitor Controller). Operation is the same as hitting REC OFF on a global machine master.

Comm/TB \*

Pin 13 (0100H) - Assert this line when the console has Communications, Talkback, or Slate functions active. PicMix will mute or dim it's outputs based on the setting in the User Preference System (UPS).

AFL/PFL Solo \*

Pin 14 (0400H) -Assert this line in conjunction with In-Place Solo (Pin 33) to initiate a console solo through the PicMix monitor. Operation if affected by whether Solo Mode 1 or Solo Mode 2 is selected in the System



Config Menu. See Section 2.2.2 for an explanation of Solo Modes 1 and 2.

#### In-place Solo \*

Pin 33 - (0800H) - Assert this line in conjunction with AFL/PFL Solo (Pin 14) to initiate a console solo through the PicMix monitor. Operation is affected by whether Solo Mode 1 or Solo Mode 2 is selected in the System Config Menu. See Section 2.2.2 for an explanation of Solo Modes 1 and 2.

#### To Playback

Pin 9 - Pulse - (0001H) - Asserting this line by a pulse will switch all enabled inputs to Playback mode. This is useful for rehearsing a timed punch-out. This input is active only when the Monitor Controller's EXT DIR/PLBK button is enabled.

#### To Direct

Pin 35 - Pulse - (8000H) - Asserting this line by a pulse will switch all enabled inputs to Direct mode. This is useful for rehearsing a timed punch-in. This input is active only when the Monitor Controller's EXT DIR/PLBK button is enabled.

#### Solo Clear

Pin 28 - Pulse - (0002H) - Asserting this line by a pulse will clear all PicMix initiated solos. This allows a console based "Clear Solo" switch to clear all console and PicMix solos simultaneously.

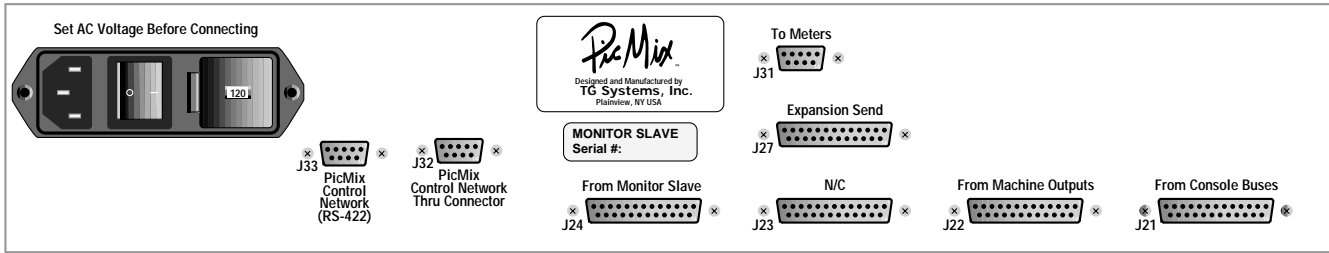
#### Fast Wind

Pin 15 - (1000H) - Asserting this line will cause PicMix to mute or dim its outputs based on the Fast Wind setting in the UPS. This allows the monitor to dim or mute during high speed machine winds.

#### Mute All

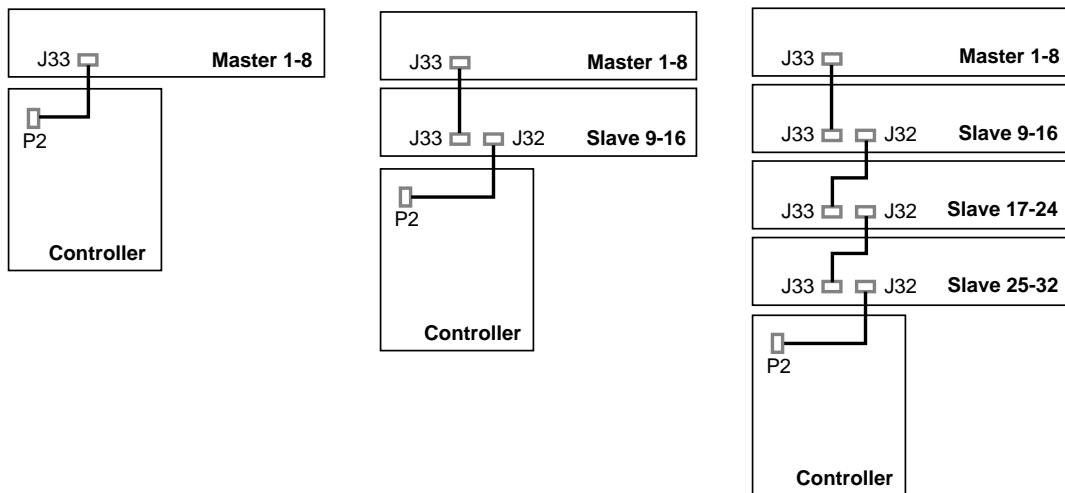
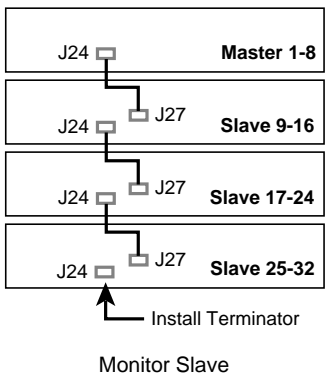
Pin 34 - Pulse - (2000H) - Asserting this line by a pulse will toggle the state of the PicMix Mute All function.

#### Dim

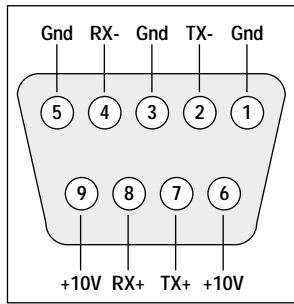


Monitor Slave Rear Panel

Pin 16 - Pulse - (2000H) - Asserting this line by a pulse will toggle the state of the PicMix Dim function.



Typical PicMix Control Network (PCN) Connection



Monitor Slave  
PicMix Control Network  
RS-422 (J33) Pinout

### Volume Control (Shaft Encoder)

Wiring a shaft encoder to pins 31, 32, and PicMix ground provides a continuously variable level control that may be used instead of the front panel nudge buttons to set monitor levels.

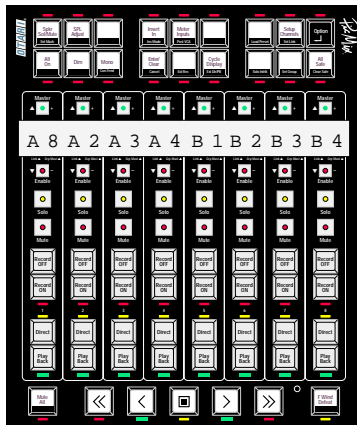
Encoder wiring is as follows:

Shaft Encoder Inputs	Pin 31 and 32
Shaft Encoder Common	Pin 18 or 37

If turning the shaft encoder Counter-Clockwise raises level, reverse the connections to Pin 31 and 32.

## 2.3.4 Logic Outputs

The following outputs should be considered as optional as they are not required for optimal console integration with PicMix.



Monitor Controller

### PM in Solo

Pin 20 - (0002H) - This line will be asserted whenever PicMix is in Solo mode. This can be used to light the console's solo indicator.

### PM in Mute All

Pin 26 - (2000H) - This line will be asserted whenever PicMix is in Mute All mode. This can be used to light the console's C/R Mute indicator.

### PM in Mute All (Dim)

Pin 8 - (4000H) - This line will be asserted whenever PicMix is in Dim mode. This can be used to light the console's C/R Dim indicator.

## 2.4 Connecting Monitor Slaves

Up to 3 Monitor Slaves may be connected to the Monitor Master for a maximum of 32 dual input monitor channels. The Monitor Slave connectors J21 (From Console Buses), J22 (From Machine Outputs), and J31 (To Meters) share the same connector designations and pinouts as the Monitor Master. The following describes the connectors unique to the Monitor Slave unit.

### 2.4.1 Expansion Send (J27-Output)

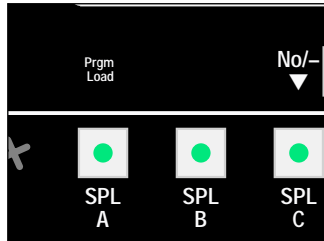
This connector should be wired to the J24 "From Monitor Slave" connector on the Monitor Master or preceding Monitor Slave, using the supplied cable. The termination connector installed on J24 of the monitor master should be installed on J24 of the last Monitor Slave of the system.

### 2.4.2 PicMix Control Network (RS-422) (J33)

J33 of Slave #1 (9-16) should be connected to J33 of the Monitor Master using the cable supplied. J33 of Slaves #2 (17-24) and #3 (25-32) should be connected to J32 (PCN Thru Connector) of the previous slave unit (See PCN Connection Diagram below).

Note: The order in which the components are connected is unimportant as long as the PCN connectors are connected in a parallel fashion. The diagram above is a suggested connection scheme only.

### 2.4.3 PicMix Control Network Thru Connector (J32)



Monitor Master Program Load Access Hole

The PCN Thru connector connects to the next highest Slave in the system. The optional Monitor Controller is connected to J32 of the last Slave unit (See PCN Connection Diagram).

Important: When the Monitor Master is powered up, it downloads software through the PCN to the Monitor Slaves. Therefore, the Monitor Slaves must be connected to the Monitor Master and powered up when the Monitor Master is powered up or reset.

## 2.5 Connecting the Optional Monitor Controller

A single cable connects the Monitor Controller to a PicMix Monitor Master or Slave. This cable is connected from the 10 pin connector P2 on the rear of the Monitor Controller to connector J33 on the rear of the Monitor Master or J32 on the rear of a Monitor Slave rack (See PCN Connection Diagram above). The cable connectors are wired pin-to-pin with conductor #10 disconnected at the DB9 end.

Multiple controllers are connected in parallel like the rest of the units on the PCN network. When multiple controllers are attached, each controller requires a unique DIP switch setting. See Section 6.4 for more information about the PCN Network and setting DIP switches.

Important: When the Monitor Master is powered up, it downloads software through the PCN to the Monitor Controller CPU. Therefore, the Monitor Controller must be connected to the Monitor Master when the Monitor Master is powered up or reset. The Monitor Master should be turned off when connecting the Monitor Controller cable.

In addition to providing full duplex serial communications, the cable also provides power to the Monitor Controller. For final installation, a shielded PCN cable should be used to prevent the serial data transmission from getting into the audio circuits of the console. If this is not an issue then flat ribbon cable may be used. If the cable run is greater than 25 feet, a heavier gauge of wire should be used for at least the power and ground connections. Recommended wire gauges are:



<u>Cable Run</u>	<u>1 Controller</u>	<u>2 Controllers</u>	<u>3 Controllers</u>	<u>4 Controllers</u>
Up to 25 feet	28AWG	26AWG	24AWG	22AWG
25 to 50 feet	26AWG	24AWG	22AWG	20AWG
50 to 100 feet	24AWG	22AWG	20AWG	18AWG



---

## 2.6 Additional Information

### 2.6.1 Ventilation

The PicMix Monitor contains as much circuitry as a small audio console (32 inputs and 24 outputs). As such the monitor hardware generates a reasonable amount of heat. PicMix is designed so that it runs cool as long as there is some air flow against the right side of the chassis (as viewed from the front).

It is essential for proper and long term reliable operation that there be air movement around the PicMix rack units.

Adequate air flow can be provided by:

- Routing air conditioner flow at PicMix
- Installing PicMix in a sealed rack with fan forced cooling installed
- Aiming a small personal fan towards PicMix

### 2.6.2 Output Protection Relays

The PicMix Monitor Master is equipped with Output Protection Relays. Their purpose is to mute, by directly shorting to ground, the inputs to the power amplifiers under the following conditions:

- A gap of 2 cycles of AC power is detected.
- Power is shut off either intentionally or not.
- The system software fails to run in its normal manner

If the condition causing the relays to mute is corrected, the relays will automatically “unmute” after a few seconds.

The purpose of the Output Protection Relays is to help to minimize damage to amplifiers, speakers and ears in the case of a power failure or glitch, or some other abnormal circumstance. The Output Protection Relays are not intended to eliminate the need for the proper procedure of turning Power Amplifiers on last and off first.

Always turn off the power amplifiers before turning off the PicMix Monitor, and always turn on the PicMix Monitor before turning on the Power Amplifiers.

### 2.6.3 PicMix Bypass

Provision is made for the left and right power amplifiers to automatically

be connected to the console Control Room output (if wired to J30 of the PicMix Monitor) when the monitor is not powered. Be aware that after the Output Protection Relays mute the PicMix monitor, the PicMix Bypass will also activate, connecting the left and right power amplifiers to the console Control Room output.

If the Control Room output is not connected to the "From C/R" (J30) connector, a shorting plug should be installed to terminate the input. Alternately, the automatic bypass can be defeated. Please contact your Otari representative for details.

#### 2.6.4 Monitor Reset

The PicMix Monitor CPU can be reset by pushing a small blunt screwdriver into the hole marked Program Load, above the SPL A button. Hold the internal button until just after the display changes (3-5 seconds), then release the button.

Holding the button too long will put the system into Program Load Mode. If this happens, simply reset the monitor again.

#### 2.6.5 PicMix Software

The PicMix Monitor software resides in Flash type Random Access Memory (RAM). Upon boot-up the software is copied from the Flash RAM into other sections of the system. Flash RAM software is installed at the factory and should not have to be loaded into PicMix during installation. The disk provided should only be needed if the supplied version of software needs to be reloaded.

From time to time software upgrades will be issued to add features or correct system bugs. Upgrade software must be copied from a DOS based computer into the Flash RAM in the Monitor Master Rack. Should it become necessary to upgrade PicMix software or reinstall software from the supplied safety disk, refer to Section 6.3, System Software, for instructions.

### 2.7 Power Up

After all connections are made, and with the power amplifiers turned off, the PicMix Monitor can be turned on by switching the power switch on the rear of the rack. Within a few seconds characters will appear on the front panel display of the Master rack. During this time, software is being downloaded to the other components of the system. After a few more seconds the word "PICMIX" will appear on the display followed by the version number of the software. After this the software completes its initialization of the Master and attached Slaves, Controllers, and Machine



## Section 3 Controls and Indicators

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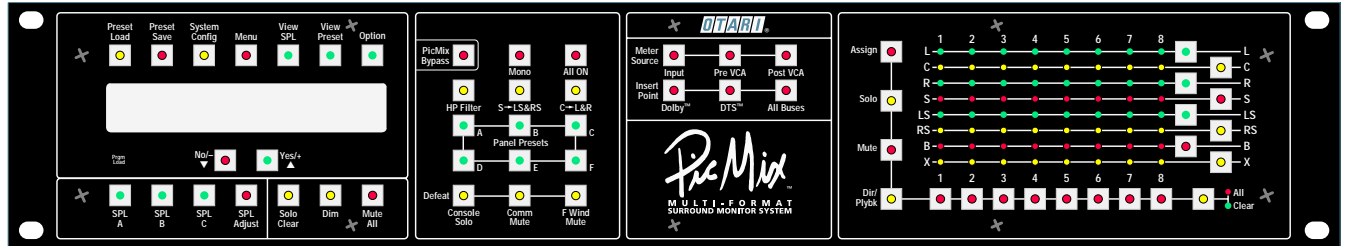
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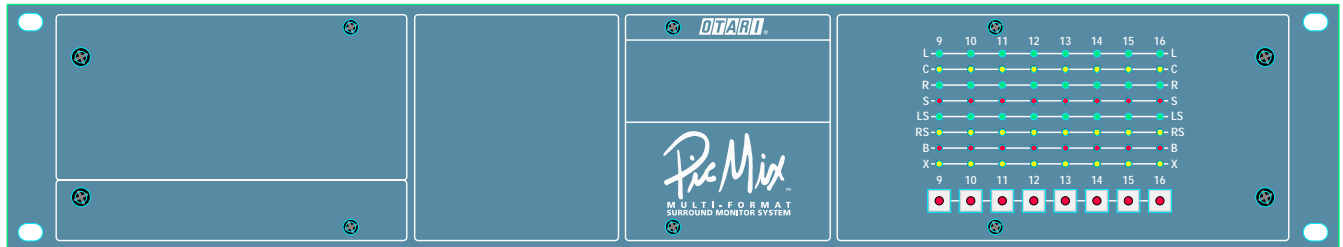
### 3.1 System Components

The PicMix Monitor System consists of the Master Audio Rack and several other optional components. Throughout this manual the PicMix Monitor System will be referred to as the PicMix Monitor.



#### 3.1.1 PicMix Monitor Master Rack

The Monitor Master is the heart of the PicMix Monitor and is required in each monitor system configuration. It is a 2U, 19-inch, rack mounted unit that contains all master audio inputs and outputs for the system as well as the Direct and Playback Audio inputs for audio channels 1 through 8. Almost all of the functionality of the PicMix Monitor is available in the Monitor Master alone.

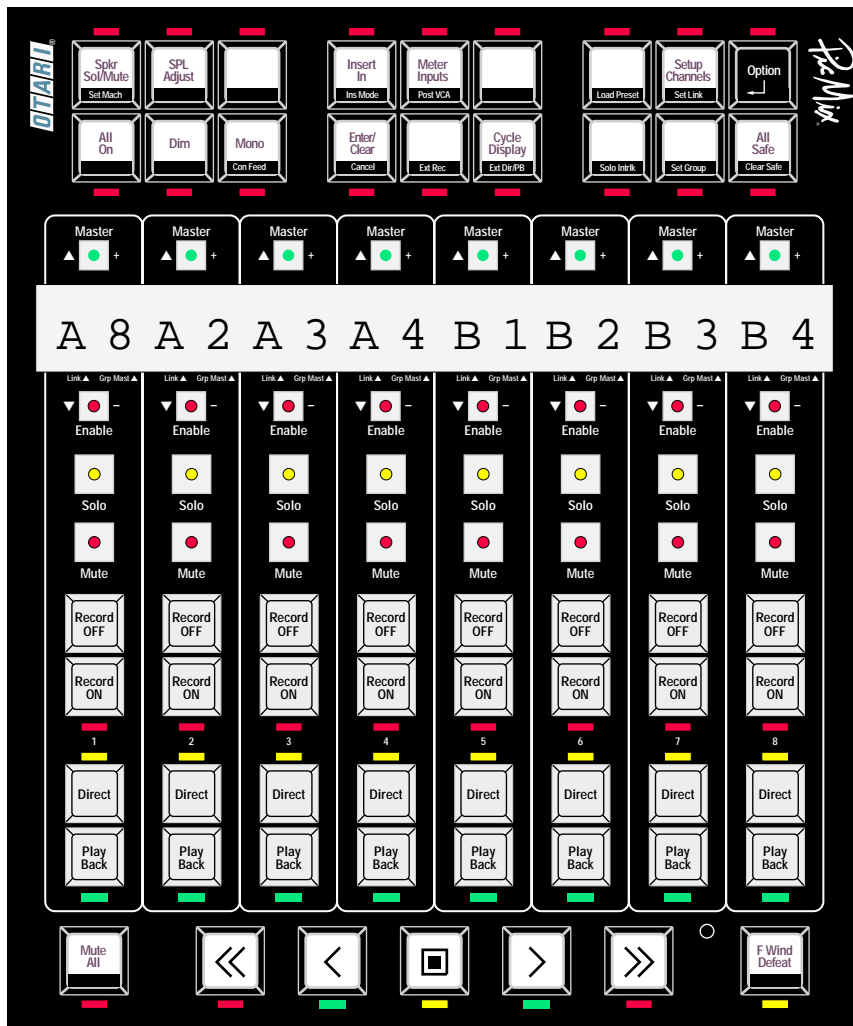


#### 3.1.2 PicMix Monitor Slave Rack

The Monitor Slave serves as an input expander for the PicMix Monitor. It is a 2U, 19-inch rack mounted unit that adds 8 additional audio input channels (8 Direct inputs and 8 Playback inputs) to the system. Up to 3 Monitor Slaves may be added to a Monitor Master for a total of 32 audio channels (64 audio inputs) in the 4 racks.

The audio outputs of the Monitor Slaves connect in a daisy chain fashion, such that each Monitor Slave is connected to the previous Monitor Rack, whether it be a Master or Slave. In a 4 rack system, the #3 Slave is connected to the #2 Slave which is connected to the #1 Slave which is connected to the Master. These connections are made via DB25 male to male cables which are wired in a pin to pin configuration and supplied with each Slave unit.

The Monitor Slaves are digitally controlled by the PicMix Control Network (PCN), which is a RS-422 based full duplex serial control

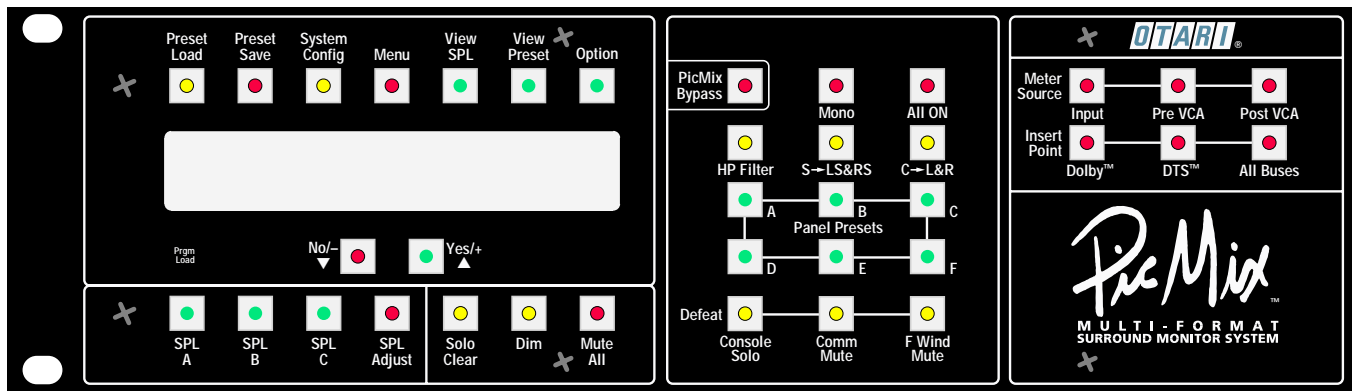


hardware/software protocol. Each rack has a DB9 PCN connector which is wired in parallel to the other racks to facilitate network communications.

### 3.1.3 PicMix Monitor Controller

In effect, the Monitor Controller is a remote control for the PicMix Monitor. In addition, it provides functions that are not available anywhere else in the system.

The Controller is generally mounted in or on the mixing console surface. 1 to 3 Monitor Controllers can be used with a PicMix Monitor system. They are connected in parallel to the PCN connector on the Monitor Master.



### 3.1.4 PicMix Machine Control Interface (MCI)

The MCI controls various types of audio recorders. Both motion control and record on/off functions are provided. Since machine control functions are only available from a Monitor Controller, the MCI can only be used in systems that have at least one Monitor Controller.

The MCI provides both serial and parallel connections for controlling various types of recorders. Serially controlled recorders (if supported by the PicMix software) can be connected directly to the serial ports of the MCI, while parallel controlled recorders must be connected to the MCI via a personality interface card. In some cases Otari can provide the personality card, otherwise the card must be custom built for the specific recorder. Contact Otari for details regarding the recorder to be controlled.

Like all PicMix monitor peripherals, the MCI is connected in parallel to the PCN connector on the Monitor Master.

## 3.2 Monitor Master Panel Buttons

### 3.2.1 Preset Load

Pressing PRESET LOAD displays the currently selected Preset Bank on the LED display. 6 Preset Banks are available. Press YES/+ to increment the Bank number or NO/- to decrement the Bank number.

When a bank is selected, the PANEL PRESET buttons light up if a preset is stored. Pressing one of the PANEL PRESETS A-F buttons will recall that system preset.

To clear a preset, hold OPTION and press the PANEL PRESETS A-F button to be cleared.

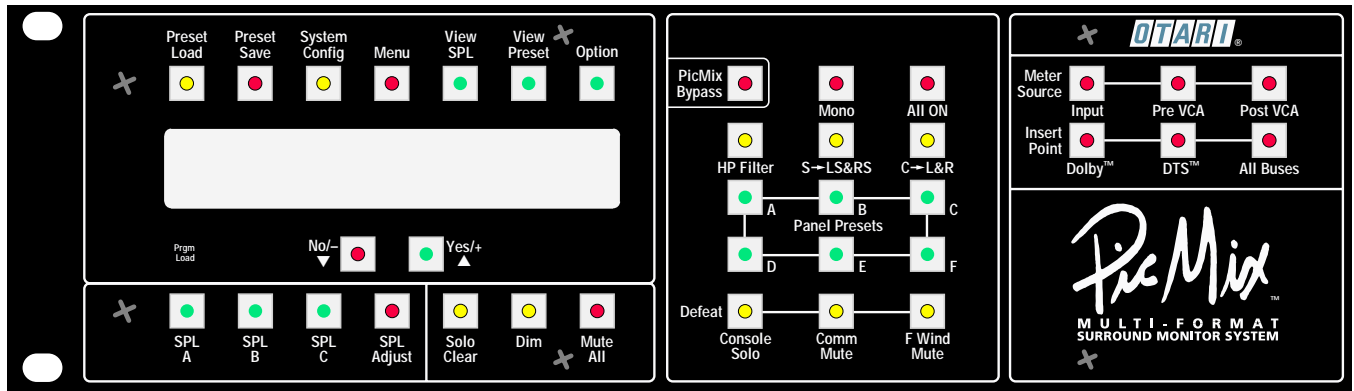
### 3.2.2 Preset Save

Pressing PRESET SAVE displays the currently selected Preset Bank on the LED display. 6 Preset Banks are available. Press YES/+ to increment the Bank number or NO/- to decrement the Bank number.

When a bank is selected, the PANEL PRESET buttons light up if a preset is stored. Pressing one of the PANEL PRESETS A-F buttons will store that system preset.

To clear a preset, hold OPTION and press the PANEL PRESETS A-F button to be cleared.





### 3.2.3 System Config

Hitting this button displays System Configuration options on the LED display for viewing or editing. Each hit of the button sequences to the next Config option. Any changes made to an option are saved in non-volatile RAM (NOVRAM), so that they will be maintained even if the system is re-booted or powered down.

Current System Config options are as follows:

VER X.XX

This option displays the software version number. This option cannot be edited.

CON= X

This option displays the number of Monitor Controllers that are connected to the system. If this number does not match the actual number of Controllers in the system, then check the network connections and re-boot the system. This option cannot be edited.

SLAVE= X

This option displays the number of Monitor Slaves that are connected to the system. If this number does not match the actual number of Slaves in the system, then check the network connections and reboot the system. This option cannot be edited.

MCI= X

This option displays the number of Monitor Machine Control Interfaces that are connected to the system. If this number does not match the actual number of MCIs in the system, then check the network connections and reboot the system. This option cannot be edited.

IN= 0000

This option displays the current state of the GPI port. The status of the port is displayed using Hexadecimal notation. The port uses active low logic and the display shows bits asserted, not the numeric value of the bits.

For example, if the Console Solo logic line is active (low or 0), the actual bits of the port look like this...

11111011 11111111 (Physical Port)

The bits asserted on the port would look like this...

00000100 00000000 (Bits Asserted)

the display shows the asserted bits in Hexadecimal notation as...

0400 (Display).

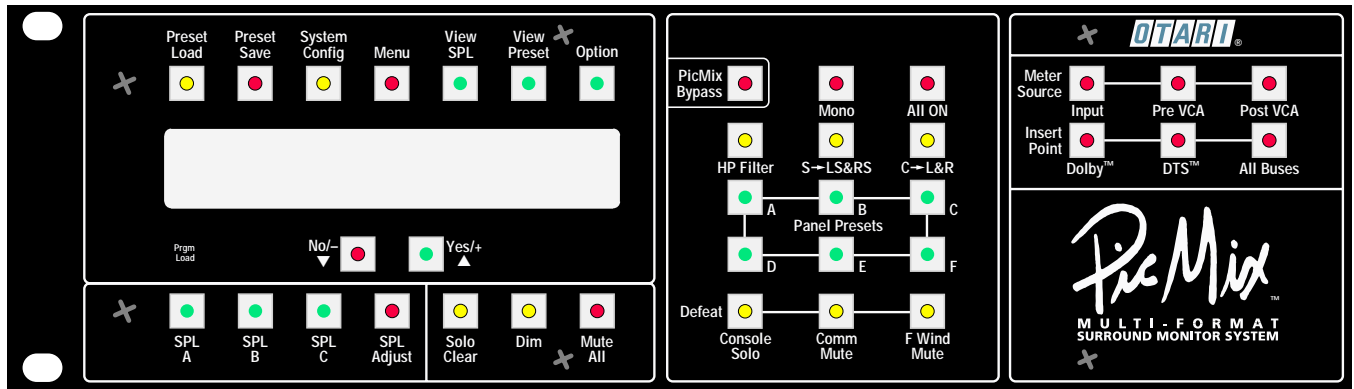
This display can simplify the troubleshooting of external logic signals connected to the PicMix Monitor. The current value of the port is constantly being updated, so this display can be used for interactive debugging. This option cannot be edited.

OUT= 0000

This option displays the current state of the GPO port. The status of the port is displayed using Hexadecimal notation. The port uses active low logic and the display shows bits asserted, not the numeric value of the bits. Operation is the same as the GPI port described above. This option cannot be edited.

Mono= X.X

This option displays the current Mono Offset Value. When the Mono mode is active, all speaker assignments temporarily are routed to the Center speaker output and the monitor level is reduced by the amount of the Mono Offset. This value can be changed by hitting the + or - buttons to increase or decrease the dB offset. Changing this value has immediate effect on Mono mode if it is active.



### PCN ON

This option displays the current state of the PicMix Control Network. When the YES LED is lit, the PCN operates normally. If the option is set to NO, the PCN will no longer be active. This stops the operation of all system peripherals (Slaves, Controllers, Machine Control Interfaces). This option can be changed by hitting the Yes or No button.

**Note:** The PCN should only be turned off during specific trouble shooting procedures. The system will not operate properly if the PCN option is set to No. Unlike all of the other System Config options, the PCN On option always defaults to On at Power Up.

### EXTSOLO#

This option displays the current state of the External (Console) Solo GPI option. There are 2 GPI bits that handle the console solo modes. These bits work in two modes (mode 1 and mode 2) to accommodate a wide variety of consoles. See Section 2.2, Wiring the GPIO Interface, for a complete explanation of these two modes. The mode can be changed by hitting the + or - buttons.

**Note:** Any specific console will only work in one of the two modes. Once the mode is set properly, note the mode in effect. Changing it to the other mode will cause improper operation of the console solo function.

### TEST LED

This option allows the LED Test mode to be entered. If the YES LED is hit, the test mode is entered and the following takes place on the Monitor Master and all attached Monitor Controllers:

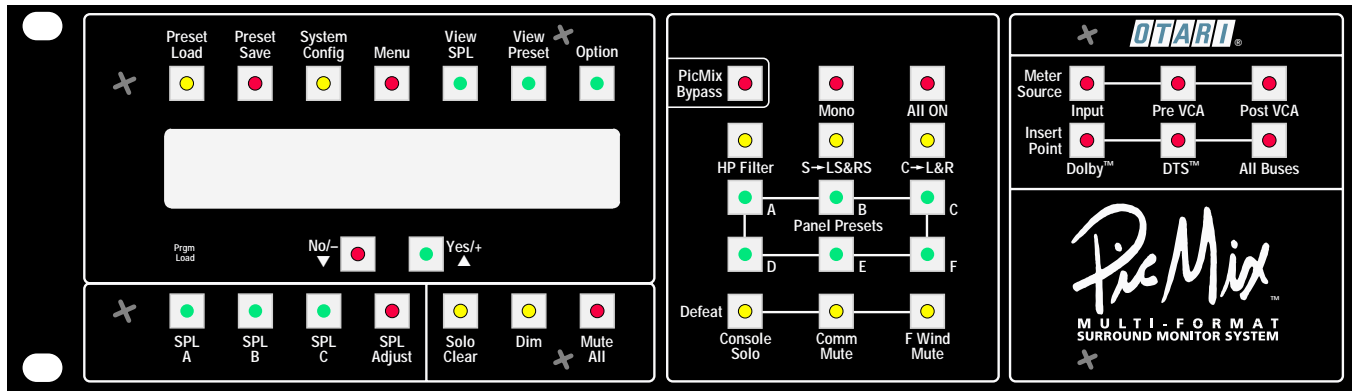
- All of the LEDs light for around 3 seconds.
- All of the LEDs go off.
- Each of the LEDs light in sequence staying on.
- After all of the LEDs are on, they will then go off in sequence.

Hit the NO button to return to the TEST LED prompt

#### TEST BUT

This option allows the Button Test mode to be entered. If the YES LED is hit, the test mode is entered. If any button on the Monitor Master or any Monitor Controller is hit, its internal button number will be displayed.

Hit the NO button to return to the TEST BUT prompt.



### TEST GPO

When TEST GPO is displayed, pressing the YES button puts the system into General Purpose Port Output test mode. When the GPO test mode is active (YES LED is lit), each press of the OPTION button asserts the next bit of the GPIO port output and clears the previous bit.

Hit the NO button to return to the TEST GPO prompt

### SET XOVR

This option allows the Set Crossover mode to be entered. This mode is used to set the optimum transition between Direct and Playback audio levels.

This adjustment was carefully made at the factory and should normally not need to be adjusted. If the YES LED is hit, all channels switch between Direct and Playback at a rate of approximately 4Hz.

Hit the NO button to return to the SET XOVR prompt.

See Section 5, Alignment and Maintenance for information about setting the Direct/Playback transition.

### TEST MCI

When TEST MCI is displayed, pressing the YES button puts the system into Machine Control Interface test mode. When the GPO test mode is active (YES LED is lit), a loopback test is performed on the MCI hardware, if installed.

Hit the NO button to return to the TEST MCI prompt

### 3.2.4 Menu

Hitting this button displays the User Preference System (UPS) options on the display for viewing or editing. Each hit of the button sequences to the next UPS option. Any changes made to an option are saved in NOVRAM, so that they will be maintained even if the system is re-booted or powered down.

Current UPS options are as follows:

SPLA = XX

This option displays the SPL level stored in SPL Preset A. This value can be changed by hitting the + or - buttons to increase or decrease the SPL value. Changing this value does not change the current SPL setting, only the value stored in the SPL Preset A.

SPLB = XX

This option displays the SPL level stored in SPL Preset B. This value can be changed by hitting the + or - buttons to increase or decrease the SPL value. Changing this value does not change the current SPL setting, only the value stored in the SPL Preset B.

SPLC = XX

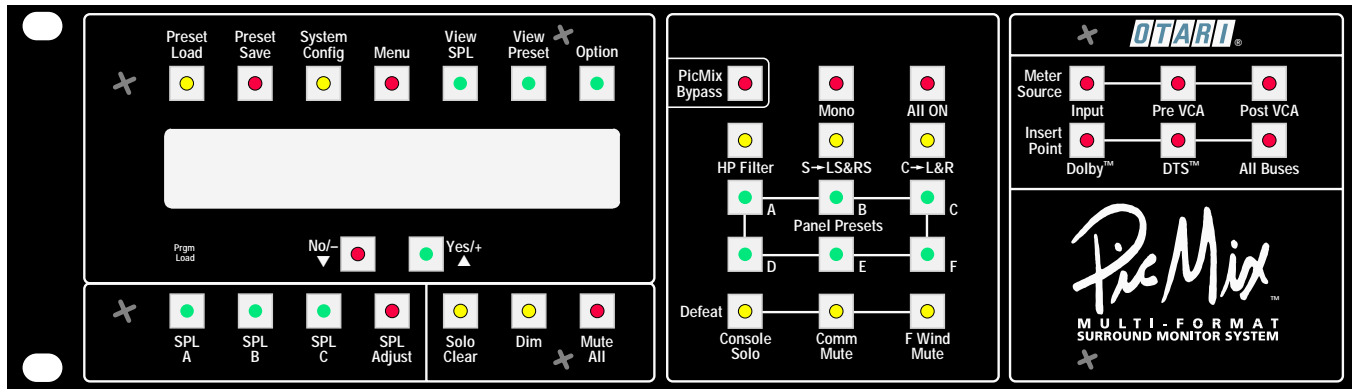
This option displays the SPL level stored in SPL Preset C. This value can be changed by hitting the + or - buttons to increase or decrease the SPL value. Changing this value does not change the current SPL setting, only the value stored in the SPL Preset C.

DIRLEDON (Direct LED On)

This displays the setting of the "LED is On When Direct/Playback is in Direct" option. When the YES LED is lit, each of the eight channel LEDs on the Master and/or Slave front panels will be lit when it's audio channel is in Direct Mode (if the Panel mode is set to Direct/Playback). If the option is set to NO, the LED will be lit when an audio channel is in Playback mode. This option can be changed by hitting the YES or NO button.

FLASHMUT (Flash Mute)

This option displays whether or not the Speaker Assign LED in the assignment matrix flashes when that input channel is muted. When the YES LED is lit, the Speaker Assign LEDs of muted channels will flash. If



the option is set to NO, the LEDs will remain lit and will only flash to indicate that the channel is muted because an In-Place solo is active. This option can be changed by hitting the YES or NO button.

#### MACH LET (Machine Letters)

This option displays whether or not the Virtual Machine letters will normally be displayed on the optional Monitor Controllers. Since the letter can not be displayed on tracks 10 and above (as there are only two digits available), some people might prefer not to display the letters at all. When the YES LED is lit, Virtual Machine letters will be displayed on the Monitor Controllers for tracks 9 and below. If the option is set to NO, the Virtual Machine letters will not be displayed. This option can be changed by hitting the YES or NO button.

**Note:** Virtual Machine letters can always be displayed for all tracks by using the Cycle Display button on the Monitor Controller.

#### DIM = XX

This option displays the SPL level that the Monitor is set to when a Dim condition exists (ie. when a Dim button is hit, or when certain GPI lines are asserted). This value can be changed by hitting the + or - buttons to increase or decrease the SPL value between 20 and 75 dB SPL. Changing this value does not change the current SPL setting, only the absolute value used during a Dim condition.

Note: The DIM SPL level is an absolute level, not an offset from the current SPL setting.

#### SOLOMUTE

This option displays the action taken when soloing a muted channel. When the YES LED is lit, soloing a muted channel will temporarily, override the mute, turning the channel on, so that the audio may be heard. The mute LED flashes to indicate this condition. If the option is set to

NO, then muted channels will remain muted even if that channel is soloed. This option can be changed by hitting the YES or NO button.

The No setting allows “pure” operation of Solo, whereby soloing a muted channel, causes the mute to be “heard” (silence). The Yes setting allows the convenience of soloing a muted channel and hearing it’s audio, somewhat like a cue or PFL solo.

COM = XXX

This option displays the action that will be taken when the Com GPI (General Purpose Input) line is asserted. The options are:

DIM - Set the monitor to the Dim level (see above).

MUTE - Mute the monitor completely.

OFF - Ignore the Com GPI and take no action when it is asserted.

This value can be changed by hitting the + or - buttons to cycle through the options.

WIND = XXX

This option displays the action that will be taken when the Fast Machine Wind GPI (General Purpose Input) line is asserted. The options are:

DIM - Set the monitor to the Dim level (see above).

MUTE - Mute the monitor completely.

OFF - Ignore the Fast Wind GPI and take no action when it is asserted.

This value can be changed by hitting the + or - buttons to cycle through the options

ABUS = XXX

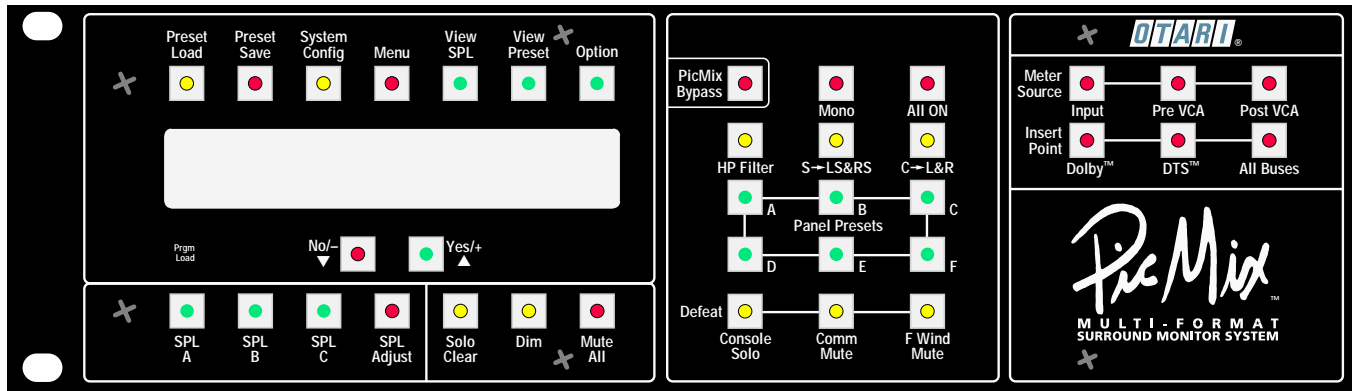
This option displays whether the Auto Bus Switching is active and if it is, which mode it is in. Auto Bus Switching automatically sets the Direct/Playback mode of a channel when it goes in or out of record. The options are

IN - Set the channel to Direct when the track is put into Record.

OUT - Set the channel to Direct when the track is put into Record and set the channel to Playback when the track comes out of record.

OFF - Do not affect the Direct or Playback state when going into or out of Record.





This value can be changed by hitting the + or - buttons to cycle through the options.

**ONCLRMUTE (ALL ON Clears Mutes)**

This option displays the action taken when using the ALL ON feature. When the YES LED is lit, setting the ALL ON mode will temporarily un-mute muted channels. If the option is set to NO, then the All On mode will have no affect on muted channels. This option can be changed by hitting the YES or NO button

**Note:** The purpose of All On is to allow the immediate turning on of all audio that has been “muted” because of a Solo or an external condition, such as a Fast Wind Mute. When this option is set to Yes, the ALL ON mode will also turn on muted channels temporarily so that all audio may be heard. In many cases, muted channels are muted for long periods of time during a session, and they wouldn’t want to be turned on by ALL ON, since they are not really part of the session mix at the time. This option allows either form of operation.

#### FLASHREC (Flash Record Until Talley Received))

This option determines how the REC ON LED on the Monitor Controller responds when the REC ON button is pressed on enabled tracks. When the YES LED is lit, the REC ON LEDs will flash until the talley back is received from the recorder. If the option is set to NO, the REC ON LEDs will not light until the talley back is received. This option can be changed by hitting the YES or NO button.

#### T RECOFF (No Talley=Record Off)

This option determines how the REC ON status of the controller is affected when a talley back is cancelled by the recorder. When the YES LED is lit, the REC ON status within PicMix is cancelled if the talley back is lost. If the option is set to NO and the talley back is lost, the REC ON LED turns off but the REC ON status within PicMix remains. This option can be changed by hitting the YES or NO button.

#### R BUTREV (Record Buttons Reversed)

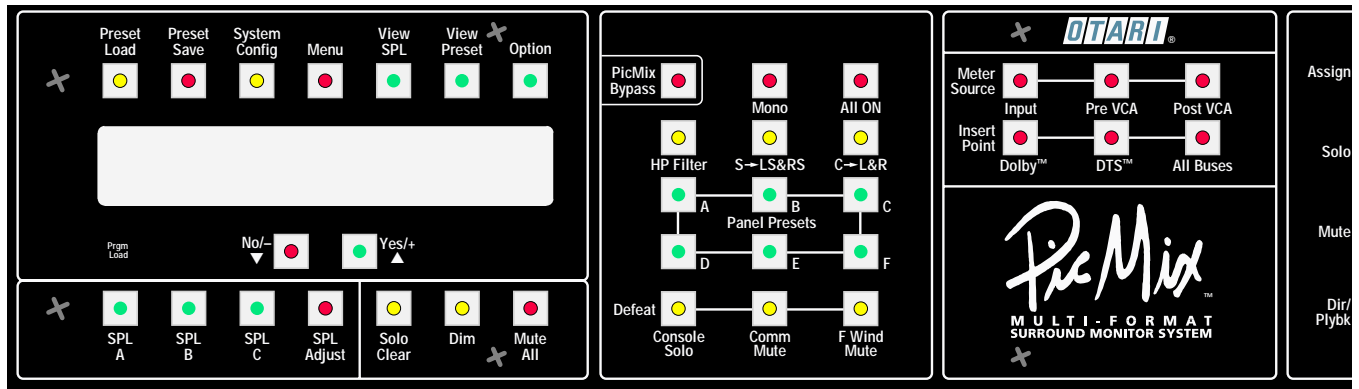
This option allows swapping of the RECORD ON and RECORD OFF button functions, if desired. As shipped, the RECORD ON button is below the RECORD OFF button and has an LED associated with it. If BUTREV is set to Yes, the RECORD OFF button becomes the lower button with the LED.

**Note:** If BUTREV is set to Yes, the REC ON and REC OFF buttons must be physically swapped so that the button legend matches the reversed function. The function of the LED remains the same.

### 3.2.5 View SPL

This sets the Display to show the current SPL setting. This is the default display mode.

### 3.2.6 View Preset



This button currently has no function.

### 3.2.7 Option

This button currently has no function.

### 3.2.8 No/ –

This button is used to change the setting of system options.

### 3.2.9 Yes/+

This button is used to change the setting of system options.

### 3.2.10 SPL A

Hitting this button changes the SPL level of the system to the value stored in the SPL A Preset. This LED is lit if the current SPL level matches the value stored in SPL Preset A.

SPL Presets are set in the Menu Options displayed by pressing the MENU button.

### 3.2.11 SPL B

Hitting this button changes the SPL level of the system to the value stored in the SPL B Preset. This LED is lit if the current SPL level matches the value stored in SPL Preset B.

SPL Presets are set in the Menu Options displayed by pressing the MENU button.

### 3.2.12 SPL C

Hitting this button changes the SPL level of the system to the value stored in the SPL C Preset. This LED is lit if the current SPL level matches the value stored in SPL Preset C.

SPL Presets are set in the Menu Options displayed by pressing the MENU button.

### 3.2.13 SPL Adjust

When this button is pressed the current SPL level of the system can be changed in one dB increments by pressing the YES/+ or NO/- buttons.

### 3.2.14 Solo Clear

This LED lights whenever the PicMix Monitor has an active solo. Pressing the button during this time will clear all Solos.

### 3.2.15 Dim

Pressing this button temporarily sets the SPL level of the system to the current Dim Level set in the UPS options. Whenever the Dim mode is enabled this LED flashes. The Mute All mode overrides the Dim mode.

### 3.2.16 Mute All

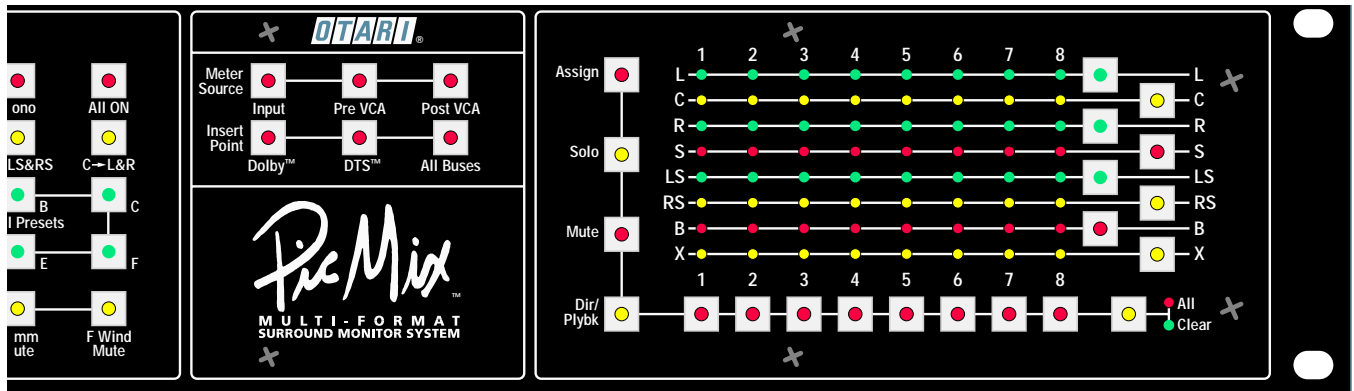
Pressing this button temporarily mutes the eight Speaker Outputs. Whenever the Mute All mode is enabled this LED flashes.

### 3.2.17 Alpha-Numeric LED Display

This displays various system information and messages depending on the system mode.

### 3.2.18 PicMix Bypass

Pressing this button enables relays that connect the left and right speaker outputs directly to the Left and Right Console Inputs (Connector J30). All active circuitry is bypassed. All 8 Mute Protection Relays are also enabled during the PicMix Bypass mode thereby muting all other outputs. This mode, from an audio standpoint, emulates the PicMix Monitor being in a powered down state. When PicMix is bypassed the PICMIX BYPASS LED lights on the Monitor Master and all Monitor Con-



trollers display “PICMIX BYPASSED” on their alphanumeric display.

### 3.2.19 Mono

Pressing the MONO button puts the system into Mono mode which flashes the MONO LED and assigns all currently assigned audio channels to the Center speaker. The SPL level of the system is reduced by the offset specified in the MONOF (Mono Offset) UPS option. Neither the SPL display or the LED Assignment Matrix change their normal display status while in Mono mode.

### 3.2.20 All On

Pressing this button lights the LED and engages the ALL ON mode. While in the ALL ON mode, all (except as noted) special modes which cause mutes and dims are temporarily overridden so that full level audio may be heard. The modes that are overridden include:

- PicMix initiated Solo
- External Console generated Solo
- Internal or external generated Dim
- Machine Fast Wind Mute or Dim

The modes that are not overridden include:

- Internal or External generated Mute All
- Communications/Talkback generated Mute or Dim

The following is optionally overridden based on the UPS option status:

- Input channel or Speaker Output mutes. If UPS Option ONCLRMUT is set to Yes then the mutes are overridden. If the option is set to No, they are not.

### 3.2.21 HP Filter

This button is reserved for future use.

### 3.2.22 S->LS&RS (Mono Surround Mode)

This button toggles Mono Surround Mode on and off, lighting the LED when Mono Surround Mode is active. When in this mode the Surround speaker bus is sent to the Left Surround and Right Surround speaker outputs. This is extremely useful in facilities where both stereo and mono surround formats are used.

In a stereo surround installation, PicMix's Left and Right Surround (LS and RS) Speaker outputs are wired to their respective power amplifiers and speakers. When the PicMix Monitor is to be used for a Mono Surround mix, the Mono Surround Mode is engaged. The surround recorder tracks can now be assigned directly to the Surround (S) bus and will be sent to both surround speakers. By using this special mode, the need to assign surround tracks to both stereo surround buses, or to re-patch the power amplifiers is eliminated.

If the mono surround is to be used in conjunction with a surround encode/decode system, such as a Dolby™DS-4, then the surround output of the decoder should be patched into both the LS and RS insert returns. This will allow proper operation of both mono and stereo surround with and without the surround processor inserted.

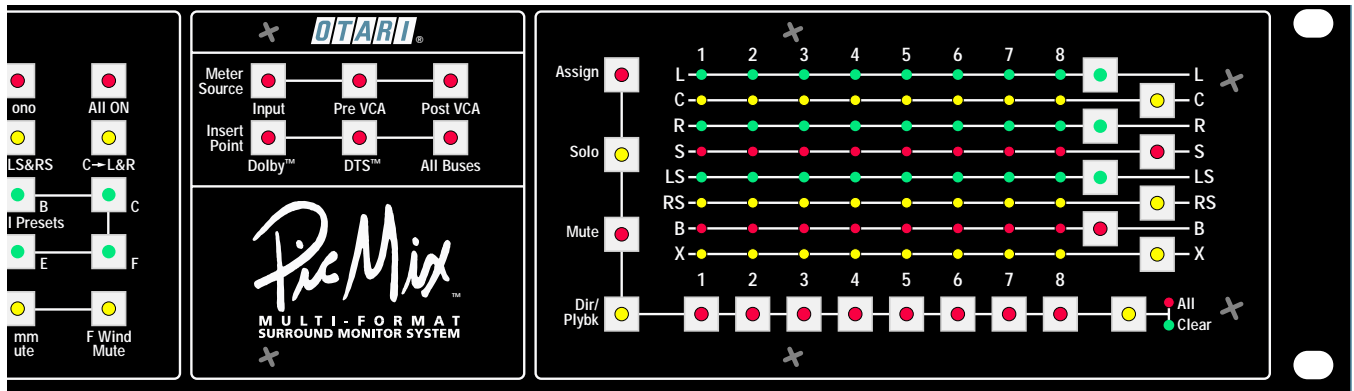
### 3.2.23 C->L&R (Phantom Center Mode)

This button toggles Phantom Center Mode on and off, lighting the button LED when Phantom Center Mode is active. When in this mode the Center speaker bus is sent to the Left and Right speaker outputs. This mode is useful in facilities where a phantom center format is used. Recorder tracks assigned to the Center bus (C) will be sent to both the Left and Right speakers. The center bus should be muted if it is connected to an active center channel amplifier/speaker.

### 3.2.24 Panel Presets A–F

These buttons are used in conjunction with the PRESET LOAD and PRESET SAVE buttons. A Panel Preset LED lights when a Preset is stored in its location. While holding the PRESET LOAD or PRESET SAVE button, press one of the Panel Preset A-F buttons to Load or Save a Preset.

After recalling a Preset, the Preset light remains lit to show that the preset has been loaded. It goes out when something changes.



A preset holds the entire system configuration and status except the following:

- Solos and Mutes (All solos and mutes are cleared when a Preset is loaded).
- The UPS options.
- Mute All and Dim (Status does not change upon load).
- PicMix Bypass (Status does not change upon load).

### 3.2.25 Console Solo Defeat

This button toggles the Console Solo Defeat mode on and off, lighting the button LED when Console Solo Defeat is active. A console solo flashes the SOLO DEFEAT LED unless Solo Defeat is active, in which case the LED stays on.

See Section 2.2 for information about console (external) solos and the PicMix GPIO port.

### 3.2.26 Comm Mute Defeat

This button toggles the Communications/Talkback Mute Defeat mode on and off, lighting the button LED when the mode is active. When this mode is set, all external (GPI) Communications and Talkback Mute enables are ignored. When the defeat mode is not set, an external Communications and Talkback Mute enable either mutes or dims the PicMix Monitor, depending on the setting of the COM UPS option.

- COM=MUTE - PicMix Monitor mutes during a Comm Mute enable.
- COM=DIM - PicMix Monitor dims during a Comm Mute enable.
- COM=OFF - Comm Mute enables are ignored.

Setting the UPS option COM= to OFF is the same as setting the Comm Mute Defeat, except that there is no LED indication. If the option is set to

COM=MUTE or COM=DIM and the defeat is not enabled, the LED will flash while a Comm Mute is enabled.

See Section 2.2 for information about Communications/Talkback muting and the PicMix GPIO port.

### 3.2.27 Fast Wind Mute Defeat

This button toggles the Fast Wind Mute Defeat mode on and off, lighting the button LED when the mode is active. When this mode is set, all external (GPI) Fast Wind Mute enables are ignored. When the defeat mode is not set, an external Fast Wind Mute enable either mutes or dims the PicMix Monitor depending on the setting of the WIND UPS option:

WIND =MUTE - PicMix Monitor mutes during a Fast Wind enable.

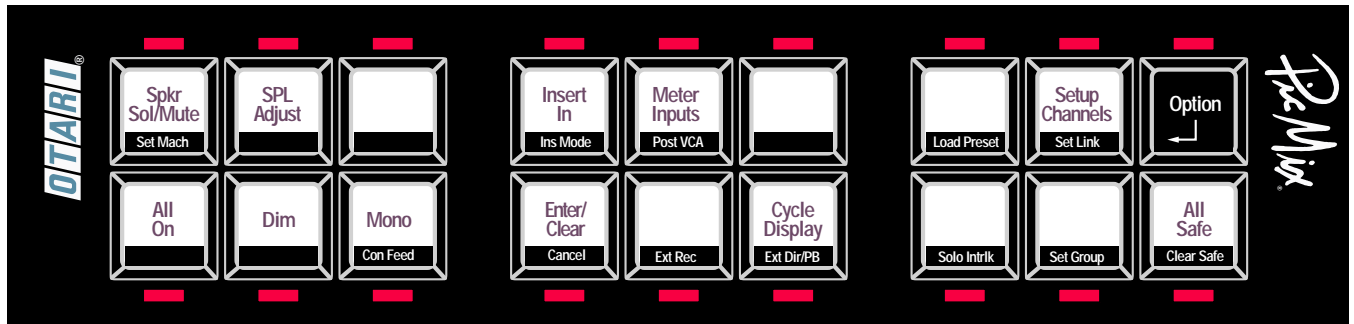
WIND =DIM - PicMix Monitor dims during a Fast Wind enable.

WIND =OFF - Fast Wind Mute enables are ignored.

Setting the UPS option WIND= to OFF is the same as setting the Fast Wind Defeat, except that there is no LED indication. If the option is set to WIND =MUTE or WIND =DIM and the defeat is not enabled, the LED will flash while a Fast Wind Mute is enabled.



### 3.2.28 Meter Source (Input, Pre VCA, and Post VCA)



Pressing one of these 3 buttons determines where the Meter Outputs are sourced from. Only one of the three sources may be selected.

#### Input

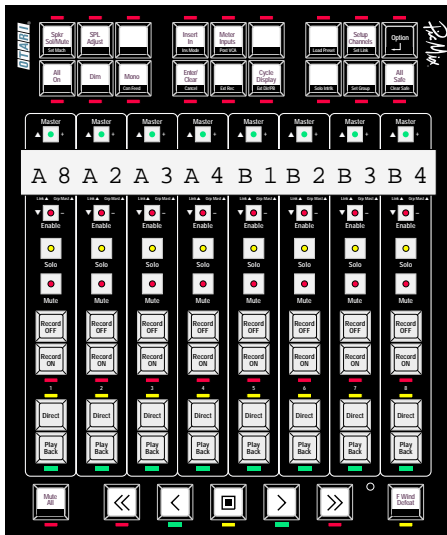
When INPUT is selected, meter outputs 1 through 8 are sourced post the Direct/Playback switching network. Each meter output will be sourced from either the Direct or Playback (or both) audio signals, depending on the status of each audio input channel.

#### Pre VCA

When PRE VCA is selected, meter outputs 1 through 8 are sourced from the Speaker Buses before the output level VCAs and after the Insert Return switching network. By switching the Insert Return in and out, the send and return signals from encode/decode systems, such as the Dolby™ DS-4, can be metered.

#### Post VCA

When POST VCA is selected, meter outputs 1 through 8 are sourced from the Speaker Buses after the output level VCAs. The meter signal represents the signal level that is feeding the monitor power amplifiers.



PicMix Monitor Controller

### 3.2.29 Insert Point (Dolby™, DTS™, All Buses)

Pressing one of these 3 buttons determines the status of the Insert Return switching network. The Insert Point may be set to one of the 3 modes or completely out.

When one of the three Insert Point buttons is pressed, that insert point is selected and its button LED lights. Pressing the button whose LED is lit, deselects that Insert Point and sets the insert status to Out. No LED is lit when the insert status is Out.

When no insert point is selected, Insert Returns 1 through 8 (L/C/R/S/LS/RS/B/X) are switched out of the signal path, bypassing any signal processing device that is wired into the insert point. The Insert Send signal for all 8 speaker buses is always active regardless of the status of the Insert Point (Return) mode.

#### Dolby™

When DOLBY is selected, Insert Returns 1 through 4 (L/C/R/S) are switched into the signal path, while 5 through 8 (LS/RS/B/X) are switched out of the signal path. This mode is used to switch a four channel encode/decode system such as the Dolby™ DS-4, into the Monitor path.

#### DTS™

When DTS is selected, Insert Returns 5 through 7 (LS/RS/B) are switched into the signal path, while 1 through 4 and 8 (L/C/R/S/X) are switched out of the signal path. This mode is used to switch a three channel encode/decode system like those optionally used in the DTS process into the Monitor path.

#### All Buses

When ALL BUSES is selected, insert Returns 1 through 8 (L/C/R/S/LS/RS/B/X) are switched into the signal path.

### 3.2.30 Panel Mode Buttons (Assign, Solo, Mute, and Dir/Plybk)

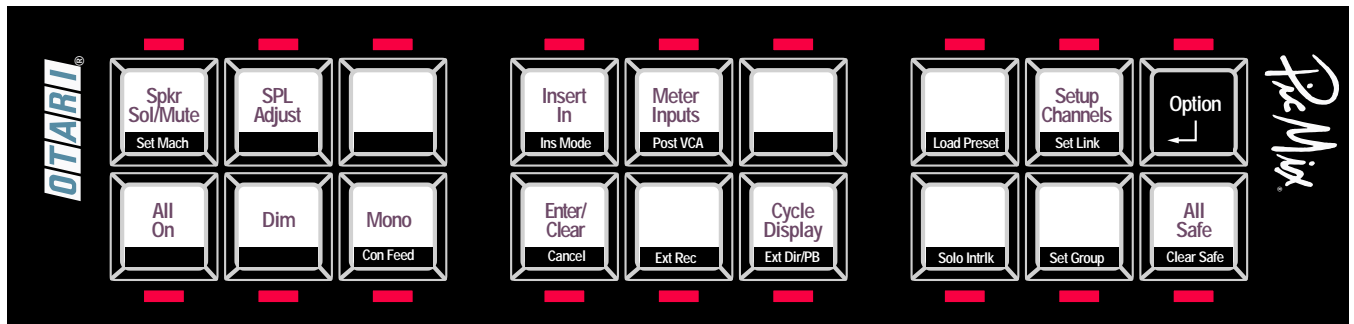
By pressing one of these 4 buttons, the system is set into one of 4 panel modes. The Input Channel and Speaker Bus Select buttons are used to select, mute, or solo signal sources, with the status being displayed on the Input/Output Assignment Display Matrix.

The panel mode is displayed by lighting one of the four LEDs. If any audio path in the system is in solo, the Solo Mode LED flashes, even if another panel mode is set.

#### Assign

Pressing ASSIGN puts the panel into Assign mode and allows the audio channels to be assigned to a Speaker Output Bus

#### Solo



Pressing SOLO puts the panel into Solo mode and allows input channels, speaker outputs, or both to be soloed.

#### Mute

Pressing MUTE puts the panel into Mute Mode and allows input channels, speaker outputs, or both to be muted.

#### Dir/Plybk

Pressing DIR/PLYBK puts the panel into Dir/Playback Mode allowing input channels to be set to Direct, Playback or both.

### 3.2.31 Input Channel Buttons 1-8

These buttons allow channel assignment, soloing, muting, and Direct/Playback selection of the input channels based on the Panel Mode in effect.

### 3.2.32 Speaker Bus Select Buttons (L, C, R, S, Ls, Rs, B, and X)

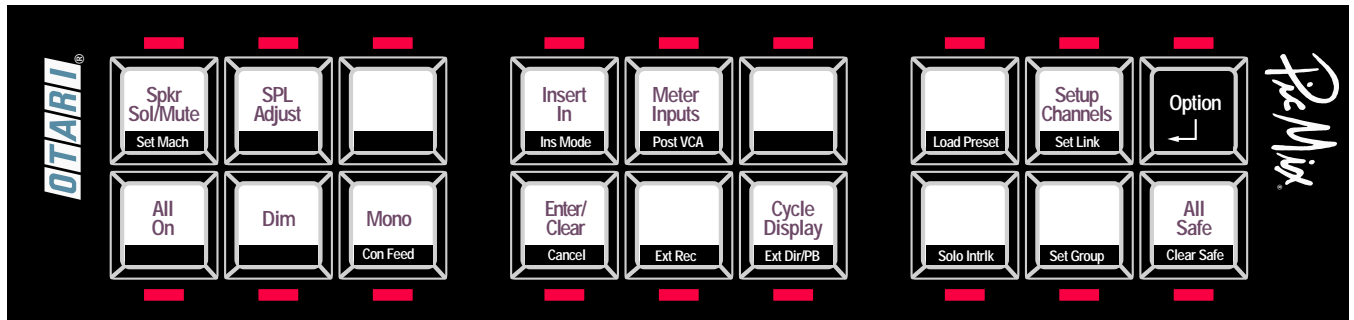
These buttons allow channel assignment, and soloing and muting of the Speaker Outputs based on the Panel Mode in effect.

### 3.2.33 Input/Output Assignment Display Matrix

This 64 LED display matrix always shows the speaker assignment of all 8 audio input channels. If no LED is lit in a vertical column above a channel button then that input channel is not assigned to a speaker output. If an LED is flashing it means that this audio input channel is muted. The mute could have been initiated by a number of sources:

- Input channel mute
- Speaker output mute
- Input channel solo of a different audio input channel
- Speaker Solo of a Speaker bus other than the one the input channel

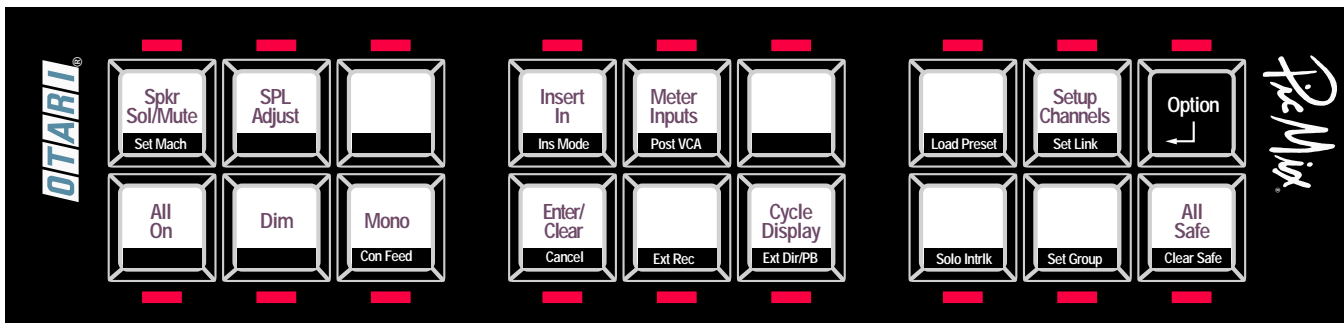
is assigned to.



Since all audio input channels are muted during a Mute All condition, the Matrix display does not flash to indicate this.

### 3.2.34 All/Clear

This button interacts with the current Panel Mode. If the CLEAR LED is lit then the button will clear one or more mutes, solos, or output assignments. If the ALL LED is lit, then the button will set all input channels to a speaker output, or to a Direct/Playback status.



### 3.3 Monitor Controller Buttons

The Master buttons on the Monitor Controller are the 18 buttons located at the top of the panel. Each of the Master buttons have two functions. The main function is activated by simply pressing the button. The alternate function is activated by holding the OPTION button and pressing the desired Master button. Main functions are labeled in Black type on a white background, while the alternate functions are labeled at the bottom of each button in white type on a black background. The following section describes the Master button functions:

#### 3.3.1 Speaker Solo/Mute

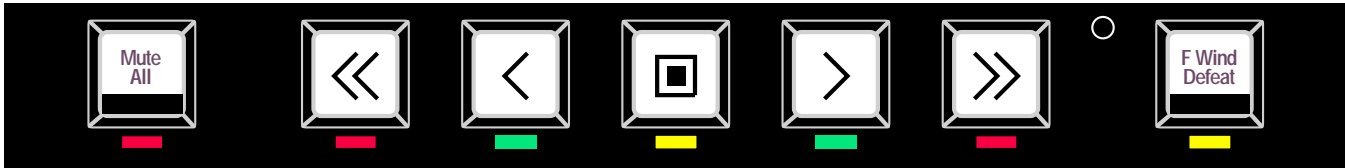
This button toggles the controller into a mode that allows the speaker outputs to be soloed and/or muted from the controller panel. When active, the display changes to indicate the speaker output buses across the display. Hitting a solo or mute button activates that function on that speaker output.

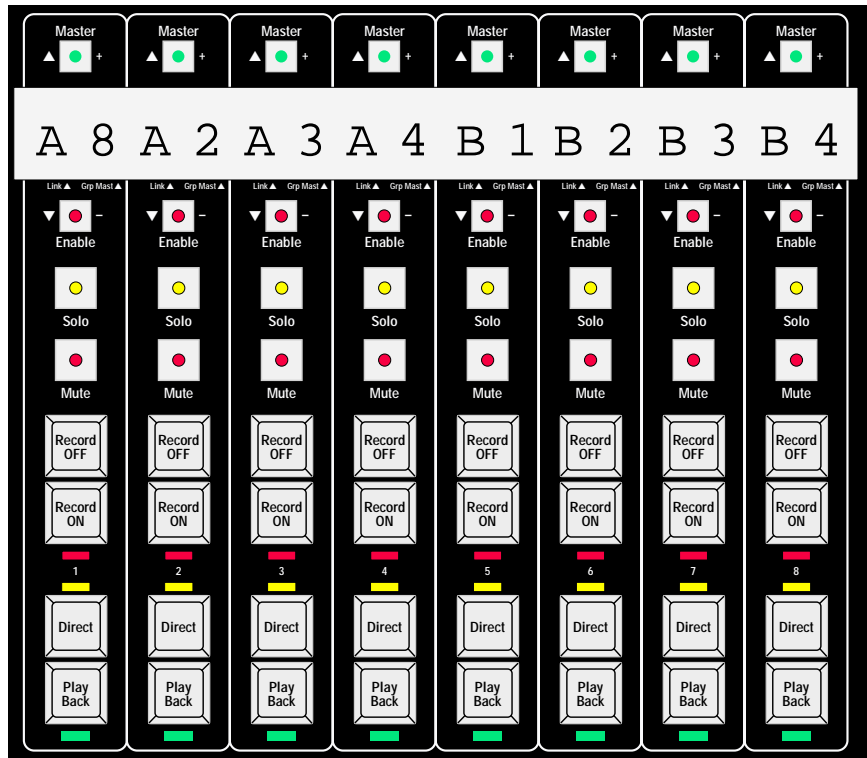
During this special monitor mode, normal input enabling, soloing and muting is suspended. Record On/Off and Direct/Playback of enabled channels continue to operate as normal.

To exit this mode hit either SPEAKER SOLO/MUTE again or hit ENTER/CLEAR. Mutes and Solos remain even after you have exited this mode. While in Speaker Solo/Mute mode, solos can be cleared by hitting ENTER/CLEAR, hitting ENTER/CLEAR again exits the mode. Mutes must be cleared by un-muting the individual speaker buses. The solos and mutes that are activated in this mode are identical to those activated using the front panel of the Monitor Master. They can be initiated or cleared from either location.

#### 3.3.2 Set Machs (Alternate Mode)

This button toggles the controller into a mode that allows you to create and edit Physical Machines and Virtual Machines. See Section 4, Operation, for an explanation of Physical and Virtual Machines.





### 3.3.3 SPL Adjust

This button toggles the controller into a mode that allows the monitor SPL level to be changed from the controller panel. While in this mode hit the flashing Master button above the SPL setting to increase the SPL, or press the flashing Enable button to decrease the SPL. SPL Presets A, B, or C can be selected by pressing the Enable button below the A, B, or C shown in the display in physical channels. To exit this mode, press SPL ADJUST again or press ENTER/CLEAR.

### 3.3.4 Physical Machine Record Enable (SPL Adjust Alternate Mode)

Holding OPTION and pressing SPL ADJUST puts the Monitor Controller into Physical Machine Record Enable mode. While in this mode, the record function of whole physical machines can be disabled, preventing any controller strip that is associated with the machine from issuing a Record On command.

When in Physical Machine Enable mode, the designations P1 through P8 are displayed on the controller's LED readout. Pressing the ENABLE button under the designation toggles the Physical machine's Record Enable status. When any machine's Record Enable is disabled, a Record Off command is sent to all tracks of all machines.

Press ENTER/CLEAR to exit Physical Machine Enable mode.



### 3.3.5 Insert In

This button toggles the insert mode displayed on the Monitor Master front panel In or Out. When the LED is lit the Insert returns are inserted into the signal path.

### 3.3.6 Ins Mode ( Insert In Alternate Mode)

To select the Insert Mode (Dolby, DTS, All) of the Insert Point, hold OPTION and hit the INSERT IN button. While holding the OPTION button, the first hit of the INSERT IN button displays the current Insert Mode. Subsequent hits of the INSERT IN button (while still holding the OPTION button) cycles through the three Insert Modes.

### 3.3.7 Meter Inputs

Hitting this button toggles the state of the PicMix Meter feeds from Input mode to Pre or Post VCA mode. When the LED is lit, channel inputs are being metered.

### 3.3.8 Post VCA (Meter Inputs Alternate Mode)

To select Pre or Post as the alternate toggle mode for the Meter Inputs button, hold OPTION and hit POST VCA. The alternate mode will be changed from Pre VCA to Post VCA or from Post VCA to Pre VCA. While holding the OPTION button, if the LED on this button is lit, then the alternate mode is Post VCA.

### 3.3.9 Load Preset (Option Function)

Holding OPTION and hitting this button sets the Controller into Load Preset Mode. This allows Presets to be loaded or saved from the Monitor Controller.

When OPTION - LOAD PRESET is pressed, the display shows "LD # A B C D E F". "LD" represents LOAD. The number (#) after LD represents the Preset Bank number. The letters A-F represent Presets.

Press the channel 1 MASTER or ENABLE buttons to toggle between "LD" (Load) and "SV" (Save). Press the channel 2 MASTER or ENABLE buttons to increment or decrement the Preset Bank.

If "LD" is selected, hitting the ENABLE button beneath any of the letters loads the Preset from that Preset bank if a Preset exists in that location. If "SV" is selected, hitting the ENABLE button beneath any of the letters saves the monitor setup to that Preset location.

### 3.3.10 Setup Channels

Pressing this button toggles the panel into the Setup Channels mode. This allows each of the 8 physical controller strips to be assigned to a Recorder Track (which also represents a physical audio input channel).

Each physical controller strip on the panel operates in the following manner:

- To increment the track number - press the "+" button.
- To decrement the track number - press the "-" button.
- To increment the Virtual Machine (recorder) Letter - press the SOLO button.
- To decrement the Virtual Machine (recorder) Letter - press the MUTE button.
- To de-assign the controller strip press the "+" and "-" buttons at the same time or press the MUTE and SOLO buttons at the same time.

To exit Channel Setup, press SETUP CHANNELS or ENTER/CLEAR.

### 3.3.11 Option

Holding this button selects the alternate function on all of the other Master buttons. While the OPTION button is held down, the LEDs associated with each button show the state of the alternate function of that button.

### 3.3.12 All On

ALL ON functions the same as the Master panel All On mode.

Pressing this button lights the LED and engages the All On mode. While in the All On mode, all (except as noted) special audio modes which cause mutes and dims are temporarily canceled so that full level audio may be heard. The modes that are overridden include:

- PicMix initiated Solo.
- External Console generated Solo.
- Internal or external generated Dim.
- Machine Fast Wind Mute or Dim.

The modes that are not overridden include:

- Internal or External generated Mute All.
- Communications/Talkback generated Mute or Dim

The following is optionally overridden based on the UPS option status:

- Input channel or Speaker Output mutes. If UPS Option ONCLRMUT is set to Yes then the mutes are overridden. If the option is set to No, they are not.

### 3.3.13 Dim

Pressing this button temporarily sets the SPL level of the system to the current Dim Level set in the UPS options. This is the same as pressing DIM on the Monitor Master panel. Whenever the Dim mode is enabled this LED flashes. The Mute All mode overrides the Dim mode.

### 3.3.14 Mono

Pressing the MONO button puts the system into Mono mode which flashes the LED and assigns all currently assigned audio channels to the Center speaker. This is the same as pressing MONO on the Monitor Master panel. The SPL level of the system is reduced by the offset specified in the MONOF (Mono Offset) UPS option. Neither the SPL display or the LED Assignment Matrix change their normal display status while

in Mono mode.

### 3.3.15 Enter/Clear

Pressing this button allows the controller to exit from most of the special controller modes and return to normal operation. When this is hit during normal operation it functions as a solo clear button, clearing any solos initiated by the PicMix system. The LED flashes when one or more channels or speakers is in solo mode. Hitting this button a second time sets the Cycle Display mode to it's normal Virtual Machine Track assignment display.

Pressing ENTER/CLEAR to exit a Machine Setup mode exits the mode and advises that a system reboot is necessary. Pressing OPTION - ENTER/CLEAR exits without saving changes or rebooting.

### 3.3.16 Option Enter/Clear (Alternate Mode)

Pressing OPTION - ENTER/CLEAR cancels any Machine Setup mode without saving changes or requiring a system reboot. Use this to exit Machine Setup mode when viewing machine setups or to exit machine setup without making changes.

---

# Section 4 Operation

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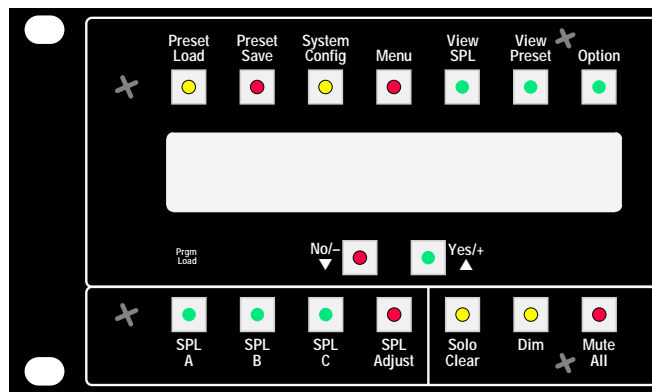
## 4.1 PicMix Monitor Rack Operation

The following section explains the operation of the PicMix Monitor rack units. Most of the following tasks can also be accomplished using the optional PicMix Monitor Controller, which is explained in Section 4.2.

### 4.1.1 Setting the Monitor SPL (Sound Pressure Level)

The Monitor SPL is adjusted using these Monitor Rack controls:

- SPL A
- SPL B
- SPL C
- SPL ADJUST
- YES/+
- NO/-



SPL Presets are stored using the MENU button.

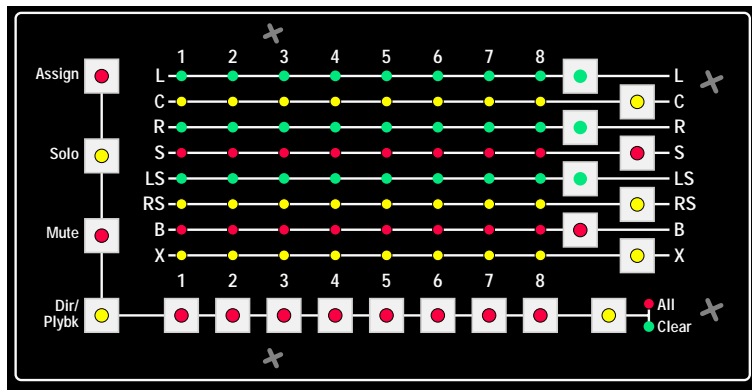
#### Setting the Current SPL from SPL Presets

Pressing SPL A, SPL B, or SPL C on the Monitor Master displays the preset's stored level and sets the monitor to that level. The LED on the SPL A, B, or C button lights when the displayed SPL matches the level stored in the preset.

#### Changing the Monitor SPL Manually

To change the SPL level, press SPL ADJUST. Pressing the YES/+ button increments the monitor level in 1 dB steps, pressing the NO/- button decrements the monitor level in 1 dB steps.

Press VIEW SPL to display the current SPL in effect and exit the SPL Adjust mode.





### Storing SPL presets

To store a level in an SPL Preset:

1. Press MENU until the desired SPL Preset A, B, or C is displayed. (ie. SPLA= 87)
2. Pressing the YES/+ button to increment the Preset level in 1 dB steps, pressing the NO/- button to decrement the Preset level in 1 dB steps.
3. Press MENU to change other SPL Presets or VIEW SPL to display the current SPL in effect.

## 4.1.2 Assigning Channels to Speakers

Channels are assigned to speakers using the Input/Output Assign Matrix on the monitor rack front panel. Each monitor rack's 8 input pairs (Direct and Playback) are represented by the Channel buttons 1-8, 9-16, 17-24, and 25-32. The monitor outputs are represented by the Speaker buttons L, C, R, S, LS, RS, B, and X on the Monitor Master.

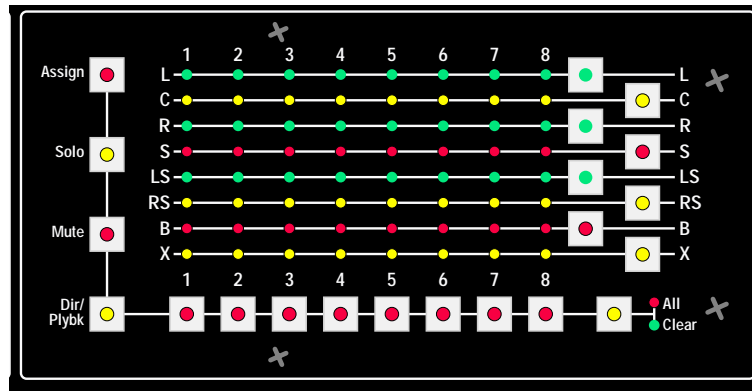
To assign channels to speakers, the Input/Output Assign Matrix must be in Assign mode. Press the ASSIGN button to do this.

### Assigning One Channel to One Speaker

1. Press ASSIGN until it's LED is lit steadily.
2. Press the Channel button desired (ie. 5). The ASSIGN button will flash indicating that an assignment is in progress.
3. Press the Speaker button that you wish to assign the channel to (ie. C). The matrix LED where 5 and C intersect will light indicating the assignment.
4. Press ASSIGN to complete the assignment or press another Channel button to assign a another channel to a speaker output.

### Assigning a Number of Channels to One Speaker

1. Press ASSIGN until it's LED is lit steadily.
2. Press the Speaker button desired (ie. R). The ASSIGN button will flash indicating that an assignment is in progress.
3. Press the Channel buttons that you wish to assign to the speaker (ie. 1, 2, 5, 8). A matrix LED will light for each channel indicating the assignment. Pressing a Channel button a second time will deassign it from the speaker.



4. Press ASSIGN to complete the assignment or another Speaker button to assign other channels to speakers.

#### Assigning All Channels to One Speaker

If ALL/CLEAR is pressed after selecting a speaker, all channels will be assigned. For example, to assign all channels to the Center speaker:

1. Press ASSIGN until it's LED is lit steadily.
2. Press the Speaker button desired (ie. C). The ASSIGN button will flash indicating that an assignment is in progress. the ALL LED will light indicating the function of the ALL/CLEAR button.
3. Press ALL/CLEAR. All Channels will be assigned to C.
4. Press ASSIGN to complete the assignment.

#### Clearing the Assignment for One Channel

If ALL/CLEAR is pressed after selecting a channel, the channel's assignment will be cleared. For example, to clear channel 1's assignment:

1. Press ASSIGN until it's LED is lit steadily.
2. Press the Channel 1 button . The ASSIGN button will flash indicating that an assignment is in progress. the CLEAR LED will light indicating the function of the ALL/CLEAR button.
3. Press ALL/CLEAR. Channel 1 is deassigned. It can now be re-assigned, if desired. Assigning the channel to another speaker automatically deassigns the channel from its previous speaker assignment
4. Press ASSIGN to complete the assignment.

### Clear Assignments for All Channels

If ALL/CLEAR is pressed before selecting a channel or speaker, all assignments will be cleared. For example:

1. Press ASSIGN until it's LED is lit steadily.
2. Press ALL/CLEAR. All channels are deassigned.

### 4.1.3 Soloing

Channels are soloed using the Input/Output Assign Matrix on the monitor rack front panel. Each monitor rack's 8 input pairs (Direct and Playback) are represented by the Channel buttons 1-8, 9-16, 17-24, and 25-32. The monitor outputs are represented by the Speaker buttons L, C, R, S, LS, RS, B, and X on the Monitor Master.

To solo from the Monitor Master front panel, the Input/Output Assign Matrix must be in Solo mode. Press the SOLO button to do this. When a channel is soloed, all other channel assign LEDs flash, indicating that they are muted by an In-Place solo.

Solos are cleared by either of the following actions:

- Pressing the soloed Channel or Speaker buttons
- Pressing ALL/CLEAR while still in panel Solo mode
- Pressing SOLO CLEAR at any time

Solos are temporarily overridden by pressing ALL ON.

#### Soloing a Channel

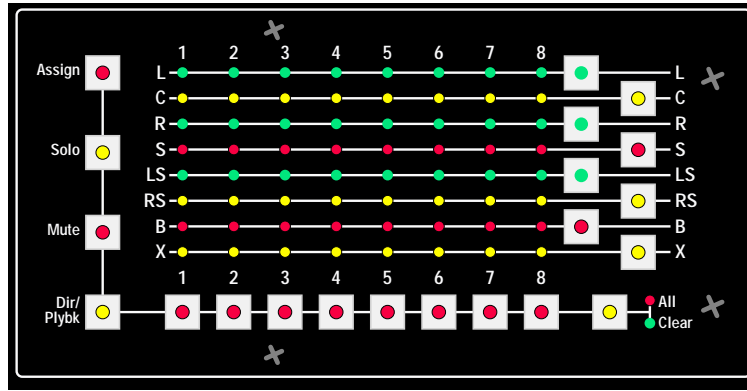
1. Press SOLO until it's LED is lit.
2. Press the Channel button that you want to solo (ie. 5). The SOLO button will flash indicating that a Solo is active, all other assignment LEDs will flash, indicating that they are muted by the solo.

Additional channels can be soloed by pressing their buttons at this time.

3. Press a soloed Channel button again to unsolo the channel, or press ALL/CLEAR or SOLO CLEAR to clear all soloed channels.

#### Soloing a Speaker Output

1. Press SOLO until it's LED is lit.
2. Press the Speaker button that you want to solo (ie. C). All of the



channels assigned to that speaker will be soloed. The SOLO button will flash indicating that a Solo is active, all other assignment LEDs will flash, indicating that they are muted by the solo.

Additional speakers can be soloed by pressing their Speaker buttons at this time.

3. Press the soloed Speaker button again to unsolo the speaker, or press ALL/CLEAR or SOLO CLEAR to clear all soloed speakers.

#### Clearing Solos

Solos are cleared by either of the following actions:

- Pressing the soloed Channel or Speaker buttons
- Pressing ALL/CLEAR while still in panel Solo mode
- Pressing SOLO CLEAR at any time

Solos are temporarily overridden by pressing ALL ON.

#### 4.1.4 Muting

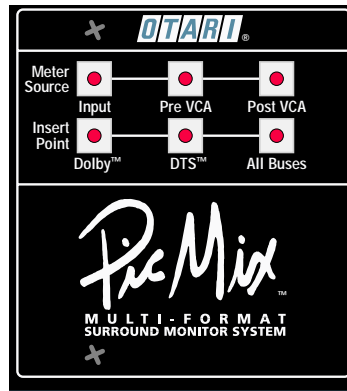
Channels are muted using the Input/Output Assign Matrix on the monitor rack front panel. Each monitor rack's 8 input pairs (Direct and Playback) are represented by the Channel buttons 1-8, 9-16, 17-24, and 25-32. The monitor outputs are represented by the Speaker buttons L, C, R, S, LS, RS, B, and X on the Monitor Master.

To mute from the Monitor Master front panel, the Input/Output Assign Matrix must be in Mute mode. Press the MUTE button to do this. When a channel is muted it's assignment LED flashes if the FLASHMUT option is set to YES in the system configuration.

Mutes are cleared by either of the following actions:

- Pressing the muted Channel or Speaker buttons.
- Pressing ALL/CLEAR.

Mutes can be temporarily overridden by pressing ALL ON if the ONCLR-MUT menu option is set to yes. See Section 3.2.4 for more information about menu options.



### Muting a Channel

1. Press MUTE until it's LED is lit.
2. Press the Channel button that you want to mute (ie. 5). The channel's assignment LED will flash, indicating that it is muted. The MUTE button will also flash indicating that a Mute is active.

Additional channels can be muted by pressing their buttons at this time.

3. Press the Channel button again to unmute the channel, or press ALL/CLEAR to clear all muted channels.

### Muting a Speaker

1. Press MUTE until it's LED is lit.
2. Press the Speaker button that you want to mute (ie. C). All channels assigned to that speaker will be muted. The channel assignment LED of all muted channels will flash, indicating that they are muted. The MUTE button will also flash indicating that a Mute is active.

Additional speakers can be muted by pressing their buttons at this time.

3. Press the Channel button again to unmute the channel, or press ALL/CLEAR to clear all muted channels.

### Clearing all Mutes

Mutes are cleared by either of the following actions:

- Pressing the muted Channel or Speaker buttons.
- Pressing ALL/CLEAR.

Mutes can be temporarily overridden by pressing ALL ON if the ONCLR-MUT menu option is set to yes. See Section 3.2.4 for more information

about menu options.

### 4.1.5 Audio Source Selection

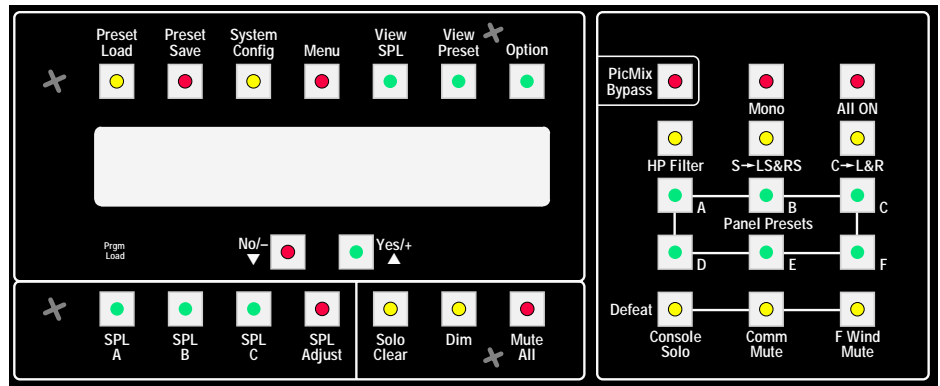
A channel's Direct or Playback input is selected using the Input/Output Assign Matrix on the monitor rack front panel. Each monitor rack's 8 input pairs are represented by the Input buttons 1-8, 9-16, 17-24, and 25-32.

To select an input from the Monitor Master front panel, the Input/Output Assign Matrix must be in Direct/Playback mode. Press the DIR/PLYBK button to do this. Depending on how the DIRLEDON option in the System Configuration is set, the Channel LEDs indicate what inputs are selected as follows:

Source	DIRLEDON=YES	DIRLEDON=NO (Dflt)
Playback Input	OFF	ON
Direct Input	ON	OFF
Direct and Playback Inputs Summed	FLASH	FLASH

#### Switching Between Direct and Playback Sources

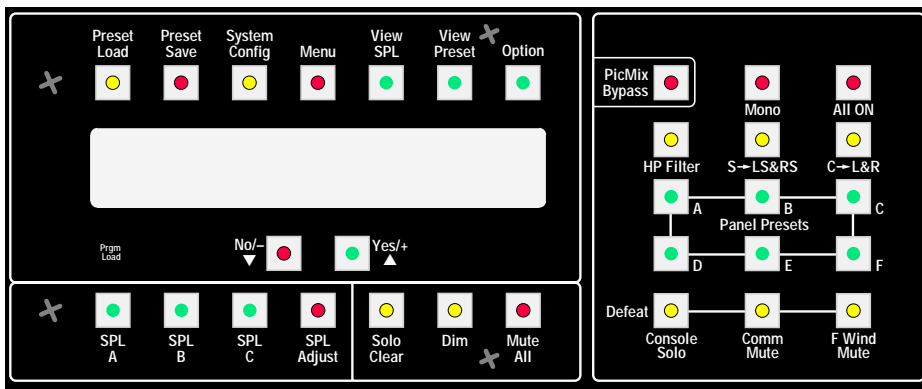
1. Press DIR/PLYBK until it's LED is lit.



2. Pressing a Channel button toggles it's source between Direct (LED Off) and Playback (LED On).

Other channels can be set by pressing their Channel buttons at this time.

#### Setting an Input to Sum Direct and Playback Sources



Holding DIR/PLYBK while pressing a Channel button sums the Direct and Playback inputs into the channel. The Channel LED flashes when the inputs are summed.



### 4.1.6 Meter Source Selection

Pressing one of the 3 Meter Source buttons determines from where the Meter Outputs are sourced. Only one of the three sources may be selected.

#### Input

When INPUT is selected, meter outputs 1 through 8 are sourced post the Direct/Playback switching network. Each meter output will be sourced from either the Direct or Playback (or both) audio signals, depending on the status of each audio input channel.

#### Pre VCA

When PRE VCA is selected, meter outputs 1 through 8 are sourced from the Speaker Buses before the output level VCAs and after the Insert Return switching network. By switching the Insert Return in and out, the send and return signals from encode/decode systems, such as the Dolby™ DS-4, can be metered.

#### Post VCA

When POST VCA is selected, meter outputs 1 through 8 are sourced from the Speaker Buses after the output level VCAs. The meter signal represents the signal level that is feeding the monitor power amplifiers.

### 4.1.7 Inserting an External Processor in the Signal Path

Pressing one of the 3 Insert Point buttons determines the status of the Insert Return switching network. The Insert Point may be set to one of the 3 modes or completely out.

When one of the three Insert Point buttons is pressed, that insert point is selected and its button LED lights. Pressing the button whose LED is lit, deselects that Insert Point and sets the insert status to Out. No LED is lit when the insert status is Out.

When no insert point is selected, Insert Returns 1 through 8 (L/C/R/S/LS/RS/B/X) are switched out of the signal path, bypassing any signal processing device that is wired into the insert point. The Insert Send signal for all 8 speaker buses is always active regardless of the status of the Insert Point (Return) mode.

#### Inserting All 8 Buses

Press ALL BUSES to insert Returns 1 through 8 (L/C/R/S/LS/RS/B/X)

into the signal path.



#### Inserting LCRS Buses Only

When DOLBY is selected, Insert Returns 1 through 4 (L/C/R/S) are switched into the signal path, while 5 through 8 (LS/RS/B/X) are switched out of the signal path. This mode is used to switch a four channel encode/decode system such as the Dolby™ DS-4, into the Monitor path.

#### Inserting Ls,Rs, and B Buses Only

When DTS is selected, Insert Returns 5 through 7 (LS/RS/B) are switched into the signal path, while 1 through 4 and 8 (L/C/R/S/X) are switched out of the signal path. This mode is used to switch a three channel encode/decode system, like the one optionally used in the DTS process, into the Monitor path.

### 4.1.8 Monitor Presets

Monitor Presets store Monitor Master setups for recall at any time. Six Preset Banks are provided, each containing 6 Presets labeled A through F.

Presets hold the entire system configuration except the following:

- Solos and Mutes (All solos and mutes are cleared when a Preset is loaded.)
- UPS Options
- Mute All and Dim settings (Status does not change during load.)
- PicMix Bypass (Status does not change during load.)

#### Selecting a Preset Bank

To select a Preset Bank:

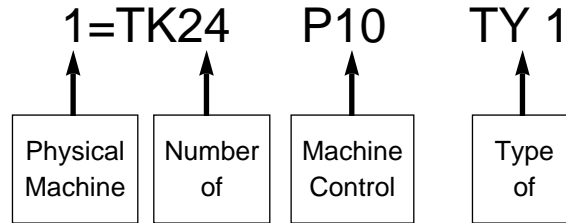
1. Press PRESET LOAD or PRESET SAVE. The display will show LOAD <#> or SAVE <#>. (# represents the Preset Bank number)
2. Press YES/+ or NO/- to increment or decrement the Preset Bank number to the one desired.

#### Loading Presets

To load a Preset:

1. Press PRESET LOAD. The display will show LOAD <#>. (# represents the Preset Bank number)
2. Press YES/+ or NO/- to increment or decrement the Preset Bank number to the one desired.
3. The Panel Preset buttons A - F will be lit if a Preset is stored in that location. Press one of the lit Panel Preset buttons to load the desired Preset.

### Saving Presets



To save a Preset:

1. Press PRESET SAVE. The display will show SAVE <#>. (# represents the Preset Bank number)
2. Press YES/+ or NO/- to increment or decrement the Preset Bank number to the one desired.
3. The Panel Preset buttons A - F will be lit if a Preset is stored in that location. Press one of the unlit Panel Preset buttons to save the Preset in that location. If you save into a location that already holds a preset (a lit Panel Preset button) the previous Preset will be overwritten.

### Clearing Presets

To clear a Preset:

1. Press PRESET SAVE. The display will show SAVE <#>. (# represents the Preset Bank number)
2. Press YES/+ or NO/- to increment or decrement the Preset Bank number to the one desired.
3. Hold OPTION and press the Preset letter to be cleared.

## 4.1.9 Resetting PicMix

### Reset PicMix

To reset PicMix, power down all monitor rack units for 10 seconds then power up or:

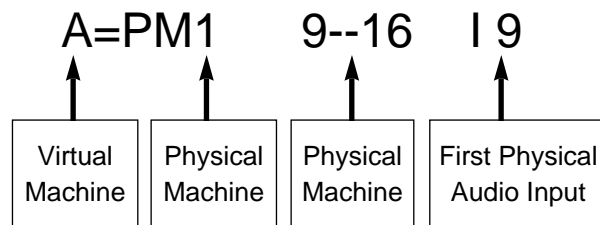
1. Push a small blunt screwdriver into the hole marked Program Load, above the SPL A button. Hold the internal button until just after the display changes, and then release the button.

Holding the button too long will put the system into Program Load

Mode. If this happens, simply reset PicMix again.

#### Resetting PicMix to Factory Defaults

To reset PicMix to the factory default settings, hold OPTION while booting. When the display shows "PICMIX", the OPTION button can be released.





### Initializing the NOVRAM

**Caution: Initializing NOVRAM erases all Presets, UPS, and System options. This should only be done as a last resort when directed by service personnel at the factory.**

To initialize the Non-Volatile RAM, hold PRESET SAVE while booting the system as above.

## 4.2 Monitor Controller Operation

### 4.2.1 Monitor Controller Concepts

#### Physical and Virtual Machines

The Monitor Controller is basically a remote control for the PicMix Monitor system. In addition to being remotely located at the console, the controller is virtual in nature providing a wide range of system functions and flexibility.

The Controller consists of 8 identical controller strips numbered 1 through 8. Each of these control strips has the ability to control any machine track (recorder channel) and physical audio input channel in the Monitor Master and Slaves. The relationship between the machine tracks and the audio channels is determined by how the PicMix Monitor system is connected to the Console Record Buses and the Recorder Tracks.

For example, in a 24 channel PicMix Monitor system (1 Monitor Master plus 2 Monitor Slaves), operating with one 24 track tape machine, the

system would typically be connected so that the PicMix audio channels 1 through 24 are connected to the tape machine tracks 1 through 24. However, if the same PicMix system is operating with three 8-track tape machines, tape machine A would be connected to PicMix channels 1 through 8, tape machine B would be connected to 9 through 16, and tape machine C would be connected to PicMix channels 17-24.

In the second example, PicMix can be set up so that we can refer to the three machines as A, B and C, and the system would know that Machine Tracks B1 through B8 are associated with audio channels 9 through 16. To access and control those recorder tracks we can simply dial up Machine B on the Monitor Controller.

Working with the 24 track machine in the first example is no problem for PicMix, but working with the three 8-track machines seems easier to control because we are able to deal with 3 smaller blocks of tracks. Wouldn't it be great if the 24-track tape machine could be broken down into smaller blocks of tracks that emulated 4, 6, or 8 track recorders? Well, that's exactly what PicMix is able to do.

PicMix deals with 2 types of recorders, *Physical Machines* and *Virtual Machines*. A Physical Machine is the actual hardware that is connected to the PicMix Monitor. A Virtual Machine is a number of tracks set up to appear as a recorder to the mix engineer.

It is important that PicMix deals with the actual physical machine because it has to know how to control the transport and track arming. The physical machine is of little importance to the mix engineer, however. Because of this, PicMix allows a physical 24 track machine to be broken down into smaller "Virtual Machines". A virtual machine can be as small as 2 tracks and as large as the actual physical machine. So we can create several virtual machines from 1 physical machine.

As an example, we can create the following virtual machines from our 24 track physical machine...

<b>Virtual Machine A</b> - Tracks 1 - 24	General Music Recording
<b>Virtual Machine B</b> - Tracks 1 - 8	Music 5.1 Format
<b>Virtual Machine C</b> - Tracks 9 - 16	Dialog 5.1 Format
<b>Virtual Machine D</b> - Tracks 17- 24	Effects 5.1 Format
<b>Virtual Machine E</b> - Tracks 1- 4	Music LCRS Format
<b>Virtual Machine F</b> - Tracks 5 - 8	Dialog LCRS Format
<b>Virtual Machine G</b> - Tracks 9 - 12	Effects LCRS Format

Depending on the session and type of mixing to be done, the appropriate virtual machines can be immediately dialed up

### 4.2.2 Setting Up Physical Machines

Before Virtual Machines can be created, the PicMix Monitor needs to know what type of recorder hardware is actually connected to the system. These Physical Machines are set up by entering the Machine Edit mode on the PicMix Controller.

To setup Physical Machines:

1. Hold OPTION and press the SET MACHS (Spkr Sol/Mute) button
2. The Controller will display "SETUP PHYS VIRT" (Setup Physical or Virtual Machines). Press the Channel Enable button under PHYS (Enable #4) to select Setup Physical Machine Edit Mode.
3. The Controller will display "SET PHYSMACH Y N" (Setup Physical Machines? Y/N). Press the Channel Enable button under Y (Enable #7) to confirm your choice.

Note: It is intentionally difficult to enter Machine Edit mode because entering the wrong data can adversely affect the operation of the system. In order for the PicMix Monitor to operate properly, the Physical and Virtual Machine data must be set accurately.

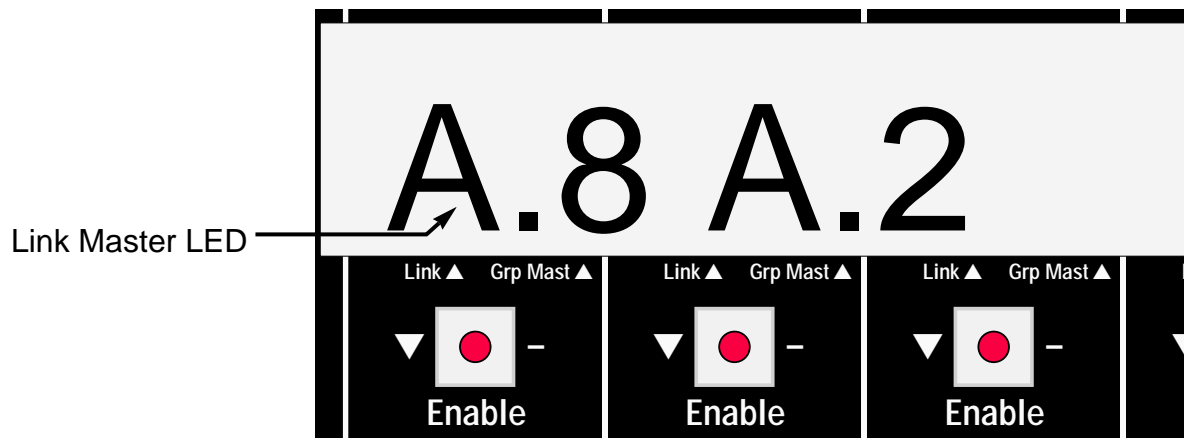


- When you have entered Physical Machine Edit Mode the display will show something like this:

Each of the values can be edited by hitting the flashing Master and Enable buttons above and below each of the values.

The display should be interpreted as follows...

- 1= This number represents the physical machine number. 1 through 8 represent physical machines 1 through 8, 0 is reserved for motion control port and type. See Section 5 for information on the motion control settings of the Machine Control Interface.
- TK=24 This number represents the total number of tracks that the machine has. Any number from 1 to 64 may be entered.
- P10 This number represents the control port of the Machine Control Interface used to communicate with the machine. If machine control is not being used, set this to OFF. See Section 5 for more information on the port settings of the Machine Control Interface.
- TY1 This number represents the type of logic used by the machine control port. See Section 5 for information on the type settings of the Machine Control Interface.



- When all settings have been entered, press ENTER/CLEAR on the Monitor Controller to exit Physical Machine setup.
- Reboot the PicMix monitor master by pushing a small blunt screwdriver into the hole marked Program Load, above the SPL A button. Hold the internal button until just after the display changes, then quickly release the button.

Important: Since the proper Physical and Virtual Machine data is necessary for system operation, it should be written down in case it ever

needs to be re-entered.

### 4.2.3 Setting Up Virtual Machines

Once the Physical Machines have been established by setting the physical machine data and re-booting the system, the Virtual Machines can be created. These Virtual Machines are set up by entering the Virtual Machine Edit mode.

To setup Virtual Machines:

1. Hold OPTION and press the SET MACHS (Spkr Sol/Mute) button
2. The Controller will display "SETUP PHYS VIRT" (Setup Physical or Virtual Machines). Press the Channel Enable button under VIRT (Enable #7) to select Setup Virtual Machine Edit Mode.
3. The Controller will display "SET VIRTMACH Y N" (Setup Virtual Machines? Y/N). Press the Channel Enable button under Y (Enable #7) to confirm your choice.

Note: It is intentionally difficult to enter Machine Edit mode because entering the wrong data can adversely affect the operation of the system. In order for the PicMix Monitor to operate properly, the Physical and Virtual Machine data must be set accurately.

4. When you have entered Virtual Machine Edit Mode the display will show something like this:

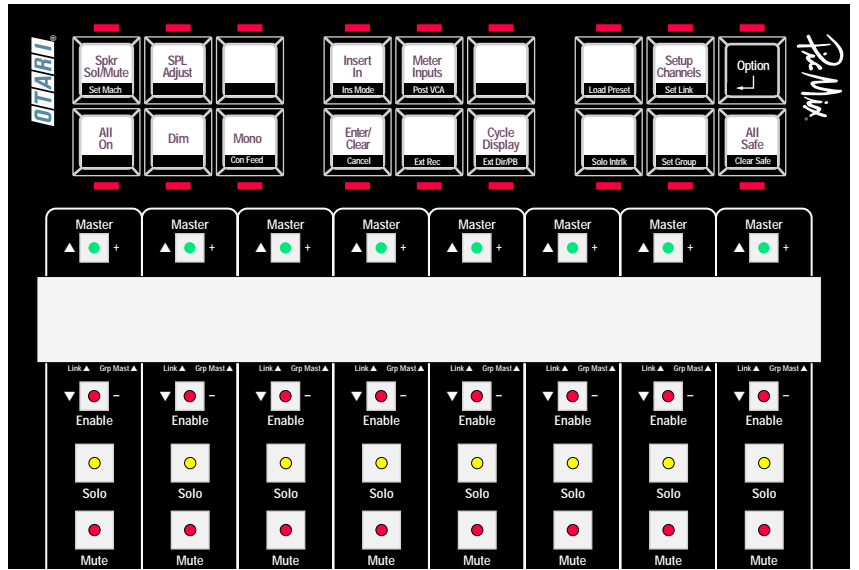
Each of the values can be edited by hitting the flashing Master and Enable buttons above and below each of the values.

The display should be interpreted as follows...

- |       |  |
|-------|--|
| A=    | This letter represents the Virtual Machine ID letter. Up to 26 Virtual Machines can be entered from A to Z.  |
| PM1   | This number is the Physical Machine that the Virtual Machine tracks represent.   |
| 9--16 | These number represents the range of tracks that will be controlled on the Physical Machine. The first and last tracks are adjusted independently. |
| I 9   | This number represents the PicMix monitor audio input that will be controlled by the first track of the Virtual Machine.                           |

When the data for each of the Virtual Machines has been entered, hit ENTER/CLEAR to exit the edit mode.

In order for the new Virtual Machine settings to take effect, the PicMix Monitor must now be re-booted. To exit without saving changes or hav-



ing to reboot, hold OPTION and press ENTER/CLEAR (Cancel).

To demonstrate, the Virtual machine in the previous example will be referred to as machine A. Because it is made up of Physical Machine 1 Tracks 9 through 16, it is obviously 8 tracks in size. There is a one to one correspondence of the Virtual Tracks to the Physical tracks, so that the Virtual Tracks A1-A8 will refer to the physical tracks 9-16 of the Physical Machine 1. Because the starting input is set to 9, A1-A8 will refer to PicMix audio channels 9-16.

Here is another example of a Virtual Machine...

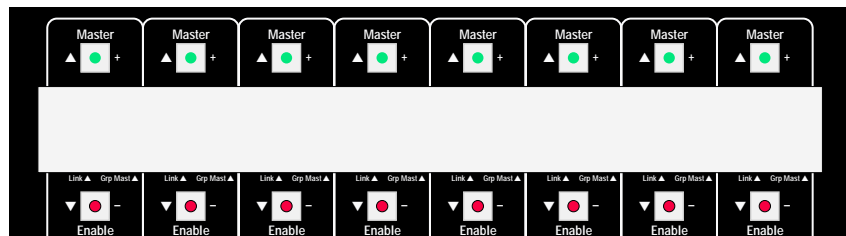
B=PM1 1—16 | 1

The above is interpreted as follows:

- Virtual Machine B
- Controls tracks on Physical Machine 1.
- Controls Physical Tracks 1-16.
- Controls PicMix audio channels starting at Input 1 (and ending at Input 16)

This Virtual machine will be referred to as machine B. Because it is made up of Physical machine 1 Tracks 1-16 it is obviously 16 tracks in size. There is a one to one correspondence of the Virtual Tracks to the Physical tracks, so that the Virtual Tracks B1-B16 will refer to the physical tracks 1-16 of the Physical Machine 1. Because the starting audio channel is set to 1, B1-B16 will refer to PicMix audio channels 1-16.

As you can see from the above two examples, the Virtual Machines can

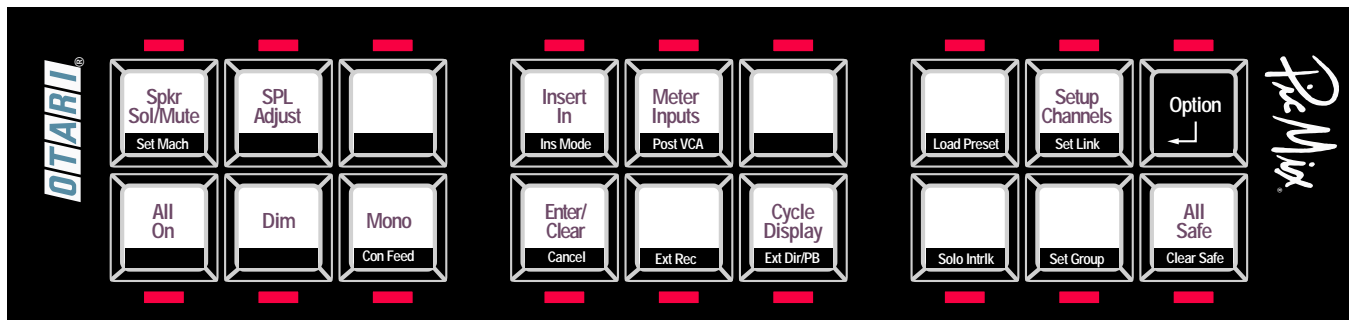


overlap. In the above case, Physical machine 1 Track 9 can be addressed from A1 or B9.

Important: Since the proper Physical and Virtual Machine data is necessary for system operation, it should be written down in case it ever needs to be re-entered.

#### 4.2.4 Assigning Machine Tracks to Controller Strips

Once Physical and Virtual Machines have been entered into the system, Virtual Machine tracks can assigned to the controller strips. When CYCLE DISPLAY is in its normal display mode (LED Off) each control strip



displays the Virtual Machine Track that it is assigned to. By entering the Setup Channels Mode, the Virtual Machine Track assignment can be changed for each controller strip.

To assign Virtual Machine tracks to a controller strip:

1. Press SETUP CHANNELS. The MASTER, ENABLE, SOLO, and MUTE buttons on all controller strips flash.
2. Press SOLO on the desired controller strip to Increment the Virtual Machine letter or MUTE to decrement the Virtual Machine letter.
3. Press MASTER on the desired controller strip to Increment the track number or ENABLE to decrement the track number.
4. To deassign a controller strip, press ENABLE and MASTER at the same time or SOLO and MUTE at the same time.
5. Repeat this procedure for each controller strip that is to be assigned. When finished, press SETUP CHANNELS or ENTER/CLEAR to exit the Channel Setup mode.
6. If desired, store the current setup in a Preset for future recall.

#### 4.2.5 Enabling Machine Tracks

Machine tracks cannot be controlled unless they are *enabled*. This is done by pressing the machine track's ENABLE button until it's LED is On.

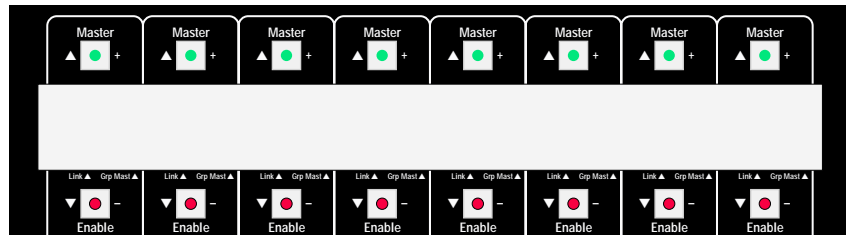
##### Enabling Physical Machines

Entire Physical Machines can be enabled and disabled to prevent accidental arming and recording. This provides a "safety" for entire Physical machines. Machine enabling should not be confused with individual Track enables. *Enabled* is the default state of all Physical machines.

To enable or disable a Physical machine:

1. Hold OPTION and press SPL ADJUST. This puts the controller into

Physical Machine Enable mode.



2. The display will show P1 (Physical Machine 1) through P8 (Physical Machine 8). Press the ENABLE button under each machine label to toggle enabling of that machine. If the LED is ON, the machine is enabled.
3. Press ENTER/CLEAR to exit Physical Machine Enable mode.

## 4.2.6 Selecting Audio Sources

### Switching Between Direct and Playback Sources

To select an audio source on a controller strip:

1. Be sure that the machine track is enabled. Press ENABLE if the ENABLE LED is not lit.
2. Pressing the controller strip DIRECT and PLAYBACK buttons select the direct or playback audio source for that strip. Switching between sources is silent.

### Setting an Input to Sum Direct and Playback Sources

The Direct and Playback sources can be summed into the controller strip. To do this:

1. Be sure that the machine track is enabled. Press ENABLE if the ENABLE LED is not lit.
2. Hold OPTION and press DIRECT or PLAYBACK. Both LEDs will light, indicating that both sources are on.
3. To select a single source again, press DIRECT or PLAYBACK.

## 4.2.7 Grouping Machine Tracks

One of the main reasons to break large physical machines into smaller Virtual Machines is to allow for the grouping of Virtual Machine Tracks.

PicMix has several mechanisms that allow the controlling of several machine tracks from from a single controller strip.

#### Machine Masters

The simplest and most convenient means of grouping tracks is known as the Machine Master, which is actually short for Virtual Machine Master. By simply pressing the MASTER button on a channel strip until its LED is lit (not flashing), that controller strip becomes the master for the Virtual Machine assigned to it. All tracks of that Virtual Machine that are assigned to a channel strip and enabled will follow the commands of the Machine Master

In order for the channels controlled by the Machine Master to respond to Direct/Playback and Record On/Off switching, they must be enabled. All channel strip buttons except MASTER are propagated by the Machine Master mechanism. Any or all channel strips can act as Machine Masters.

The versatility of Machine Masters can be enhanced by selectively disabling certain tracks within a Virtual Machine. In this way the Machine Master can act on some of the tracks in a Virtual Machine while not affecting others.

#### Global Machine Masters

By pressing the MASTER button on a channel strip until its LED is flashing, that channel strip becomes a Global Master for all Virtual Machines. All enabled Virtual Machine Tracks that are assigned to any channel strip will follow the commands of the Global Master.

In order for the channels controlled by the Global Master to respond to the Direct/Playback and the Record On/Off switching, they must be enabled. All channel strip buttons except Master are propagated by the Global Master mechanism. Any or all channel strips can act as Global Masters.

Like the Machine Masters, the versatility of Global Masters can be enhanced by selectively disabling certain tracks within the system. In this way the Global Master can act on some of the tracks in a group of Virtual Machines while not affecting others.

#### Setting Up and Using Links

Machine Masters are very versatile because they allow the machine tracks to be accessed individually *and* they allow for control of an entire Virtual Machine. In some cases, however, individual tracks never need to be accessed, only an entire group needs to be controlled.

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## Section 5 PicMix Machine Control Interface (MCI)

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## 5.1 Overview

The PicMix Machine Control Interface (MCI) is optional hardware that allows PicMix to put recorder tracks in and out of record, and to allow simple motion control of one machine in the synchronized machine chain.

The MCI connects to the PicMix Control Network (PCN) in the same way as a Monitor Slave or Monitor Controller and receives its power from the Monitor Master. Like the Slaves and Controllers, the MCI has a separate micro-processor whose software is loaded from the Monitor Master during the boot-up process. When multiple interfaces are attached, each interface requires a unique DIP switch setting. See Section 6.4 for more information about the PCN Network and setting DIP switches.

## 5.2 Supported Machines

The MCI may simultaneously control up to 4 serial ports and 2 parallel ports, for a total of 6 machines. The current software can support the following machines:

### Record Control Serial Type 1

Basic Sony 9-Pin Protocol - This has been tested and optimized for the Otari RADAR, Otari DTR-90T and Tascam DA-88 recorders. Other recorders using this protocol may also work.

### Record Control Parallel Type 1

Basic Mutli-track recorders - Active low TTL logic outputs are provided for up to 24 tracks, plus a master record pulse. A record tally for each track is required. A personality interface is required between the MCI and the recorder.

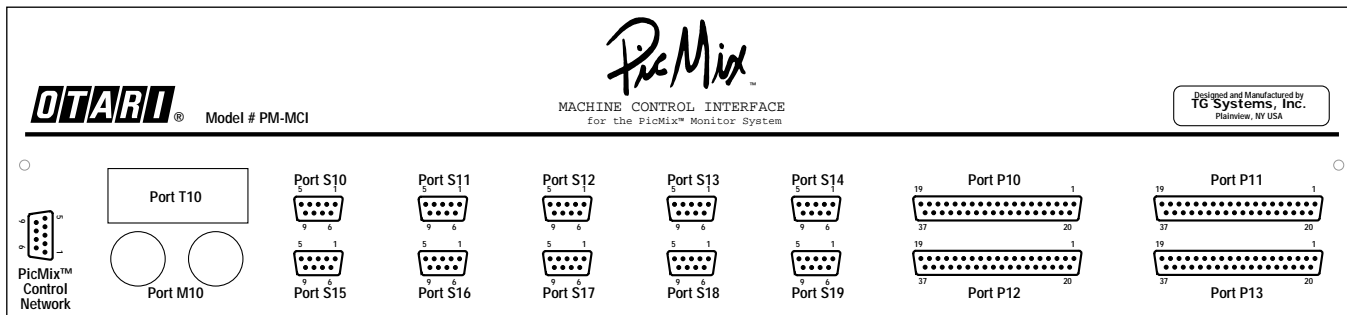
### Record Control Parallel Type 2

Basic Mutli-track recorders - Active low TTL logic outputs are provided for up to 24 tracks, plus a master record pulse. One master record tally is required. A personality interface is required between the MCI and the recorder.

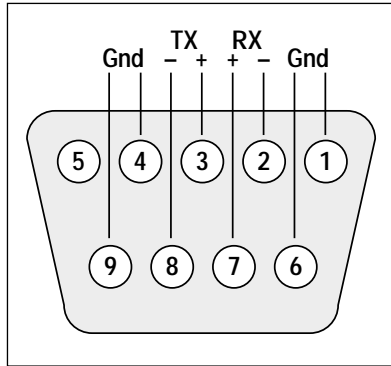
### Motion Control Serial Type 1

Basic Sony 9-Pin Protocol - This has been tested and optimized for the Otari RADAR, Otari DTR-90T and Tascam DA-88 recorders. Other recorders using this protocol may also work. Serial motion tally is ex-

pected from the recorder.



Machine Control Interface Rear Panel



Connector Pinout for RS-422 Serial Ports S11 - S14 and S16 - S19.

### Motion Control Serial Type 2

Basic Ketchum (JSK) Protocol - Serial control based on the Ketchum motion control protocol. Serial Motion Tally is expected from the recorder.

### Motion Control Parallel Type 1

Issues TTL logic low pulsed lines for each of the motion control buttons. Parallel motion tallys (latched) are required.

### Motion Control Parallel Type 2

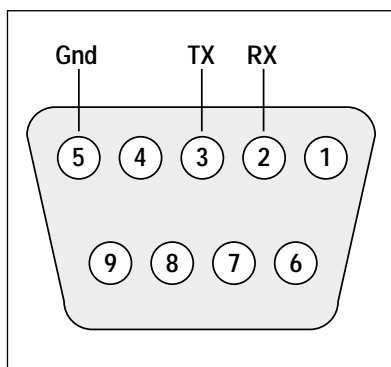
Issues TTL logic low pulsed lines for each of the motion control buttons. Virtual motion tallys are internally generated based on the last motion button pressed.

## 5.3 Hardware Installation

The MCI “sits” on the PicMix Control Network (PCN) the same as Monitor Slaves and Monitor Controllers. The PCN DB9 connector on the rear of the MCI should be connected in parallel with the rest of the PicMix Monitor units in the system. Power to the MCI is provided through the PCN along with full duplex communications.

## 5.4 Record Control Assignment for Physical Machines

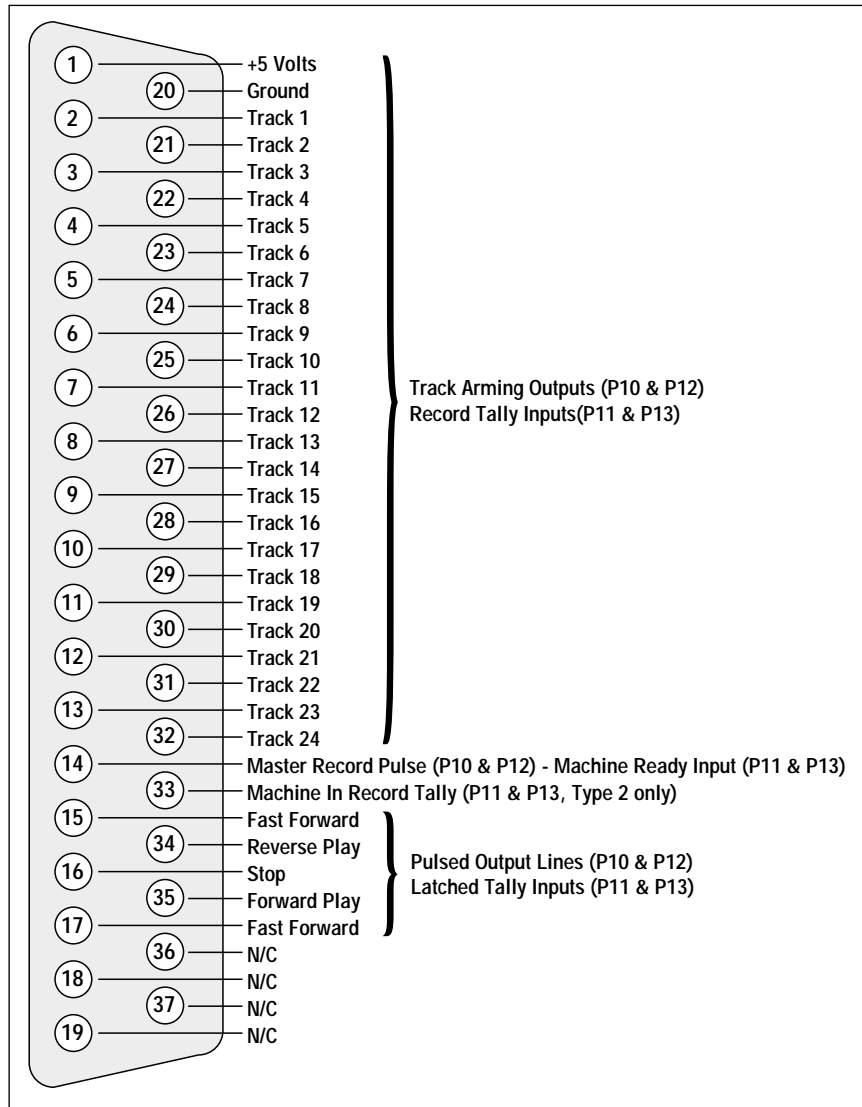
### 5.4.1 MCI Port Setting



Connector Pinout for Serial Ports S10 and S15.

In the setup of Physical Machines that follows in Section 5.6, a Type and Port may be specified in Physical Machines 1 through 8 that configures the MCI for control of the record On and Off functions. By setting the port, the system knows if the record control will be by serial or parallel control. The “P” ports are used for parallel control while the “S” ports are used for serial control. The following port options are available:

- P10 Selects the P10 (Output) and P11 (Input) pair of DB 37 connectors (parallel).
- P12 Selects the P12 (Output) and P13 (Input) pair of DB 37 connectors (parallel).
- S11 Selects DB9 connector S11 (serial).
- S12 Selects DB9 connector S12 (serial).



Ports P10, P11, P12, and P13 DB37 Connector Pinout

- S16 Selects DB9 connector S16 (serial).
- S17 Selects DB9 connector S17 (serial).

Note: Serial Ports S10, S13, S14, S15, S18, & S19 are not currently supported. Ports M10 and T10 may be implemented in the future. Currently their connectors are not installed in the MCI.

## 5.4.2 Record Control Type Setting

Once the Physical Machine Port is selected a Record Control type may be selected.

### Serial Record Control Protocols

Type 1 Sony Serial Protocol. This protocol has been tested on the Otari RADAR, Otari DTR-90T and Tascam DA-88 recorders, but may work for many other machines that are controlled by Sony "9-Pin" Serial Protocol.

### Parallel Record Control Protocols

Type 1 24 Track Parallel control with 24 individual record tally backs.

Type 2 24 Track Parallel control with a single "machine in record" tally back

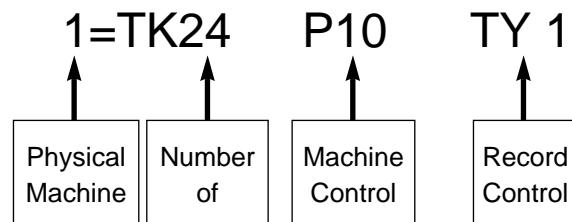
Important: Do not to select a type that is not supported above. Unpredictable operation may result.

### 24 Track Machine Parallel Control Type 1

DB37 Ports P10 through P13 are used for parallel machine control interfacing. Ports P10 and P12 are output ports, P11 and P13 are input ports. The P10 output port is always associated with the P11 input port, the P12 output port is always associated with the P13 input port. During setup, "P10" designates the P10 and P11 port pair, "P12" designates the P12 and P13 port pair.

Port P10 or P12 are the output ports that feed the record enable logic of the 24 track machine. Whenever a track of the Physical Machine connected to this port is put into record using the Record On button, the appropriate logic line is held low. When a machine track is not in record it's logic line is held high.

Port P11 or P13 is the input port that accepts the tally back record status

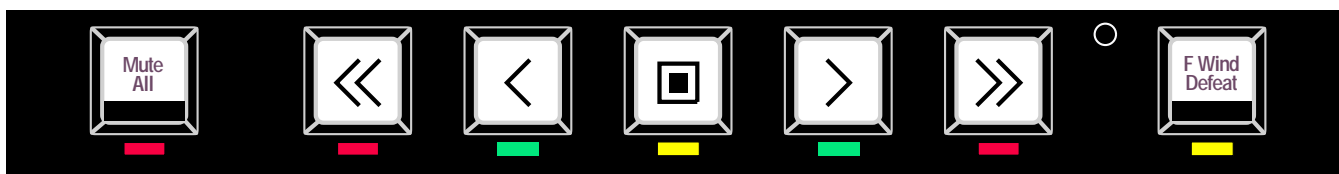


of the 24 track machine. Whenever a track is actually in record, the appropriate logic line should be held low. When a machine track is not in record it's logic line should be held high. The Record ON LEDs on the Monitor Controllers will always reflect the Record On/Off status of the machine based on the record tally.

Pin assignments of the DB37 parallel connectors are shown in the following diagram.

### 24 Track Machine Parallel Control Type 2

Type 2 record control is identical to type 1 except that the 24 tallies are ignored and just a Machine In record tally (P11 or P13 Pin 33) is used to logically determine when to light the Red record LEDs on the Monitor Controller.

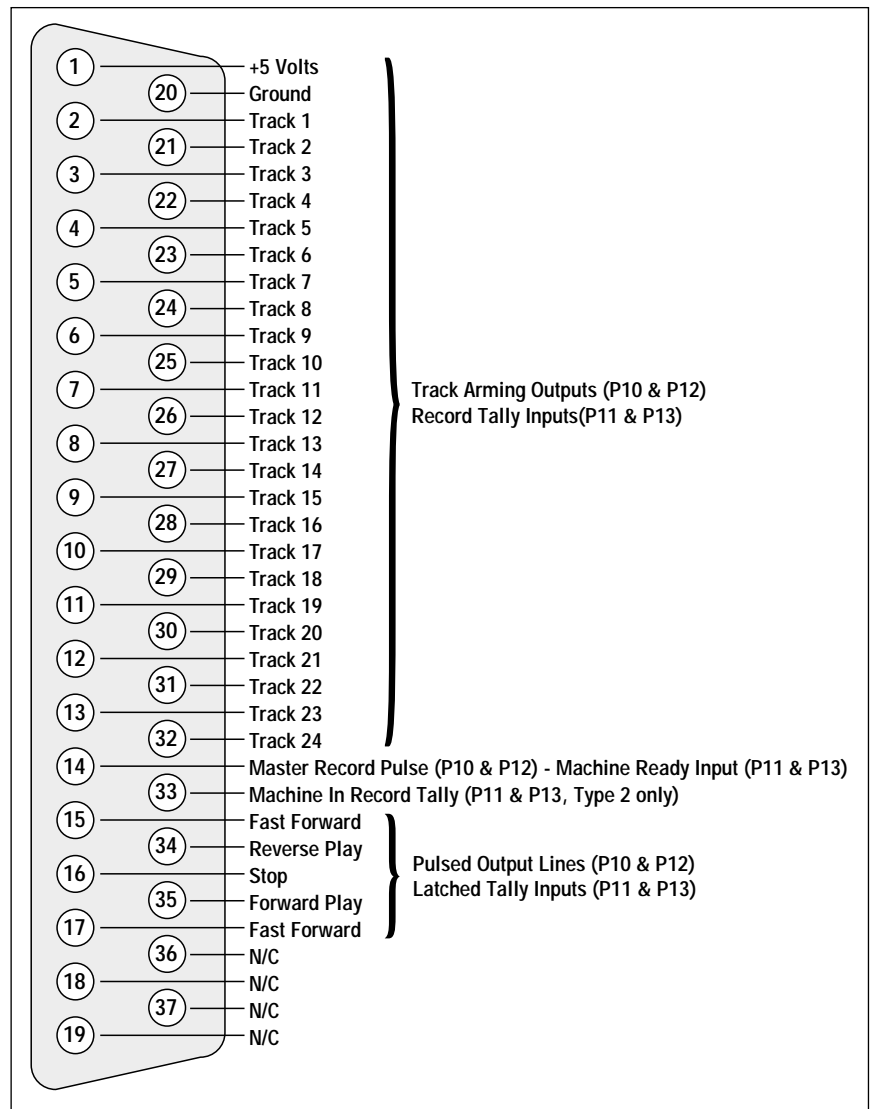




In order for a RECORD ON button to actually put a machine track into record the following must be true:

- The Machine Track must be “Enabled”. (The Enable LED lit on the Monitor Controller Strip).
- The ALL SAFE button on the Monitor Controller must not be set.
- The Physical machine must be enabled.
- The Ready/Safe Input (P11 or P13 Pin 14) must be set to ready by pulling the pin low.
- If the motion control buttons have been assigned to the machine (Physical Machine 0), then the machine must be in Play mode.

A Master Record Pulse (Low going 100ms) is issued each time a track is put into record. This pulse is on Pin 18 of the Port P10 or P12.



Ports P10, P11, P12, and P13 DB37 Connector Pinout

### 5.4.3 Setting Record Control Port and Type

*A complete discussion of Physical and Virtual machines is provided in Section 4.3, Monitor Controller Operation. The following instructions assume that you have already set up the Physical machines or are familiar with their purpose.*

Record Control port and type are set by entering Physical Machine Setup mode on the Monitor Controller. To do this:

1. Hold OPTION and press the SET MACHS (Spkr Sol/Mute) button
2. The Controller will display "SETUP PHYS VIRT" (Setup Physical or Virtual Machines). Press the Channel Enable button under PHYS (Enable #4) to select Setup Physical Machine Edit Mode.
3. The Controller will display "SET PHYSMACH Y N" (Setup Physical Machines? Y/N). Press the Channel Enable button under Y (Enable #7) to confirm your choice.

Note: It is intentionally difficult to enter Machine Edit mode because entering the wrong data can adversely affect the operation of the system. In order for the PicMix Monitor to operate properly, the Physical and Virtual Machine data must be set accurately.

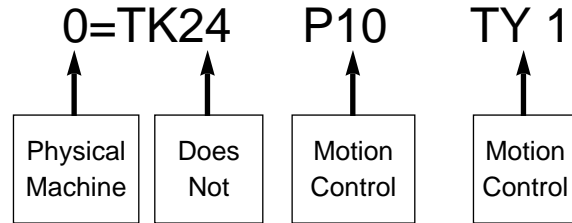
4. When you have entered Physical Machine Edit Mode the display will show something like this:

Each of the values can be edited by hitting the flashing Master and Enable buttons above and below each of the values.

The display should be interpreted and set as follows...

- 1=      This number represents the physical machine number.
- Record control type and port are entered in Physical machines 1 through 8.
- TK=24   This number represents the total number of tracks that the machine has. This should not need to be changed.
- P10     This number represents the machine control port used to communicate with the machine (See Section 5.4.3). "P" numbers are parallel ports, "S" numbers are serial ports. If machine control is not being used, set this to OFF.
- TY1     This number represents the type of logic used by the machine control port (See Section 5.4.4).
5. When all settings have been entered, press ENTER/CLEAR on the Monitor Controller to exit Physical Machine setup.
  6. Reboot the PicMix monitor master by pushing a small blunt screwdriver into the hole marked Program Load, above the SPL A button.

Hold the internal button until just after the display changes, then



quickly release the button.

*Important: Since the proper Physical and Virtual Machine data is necessary for system operation, it should be written down in case it ever needs to be re-entered.*

## 5.5 Motion Control Button Assignment

### 5.5.1 Motion Control Type Setting

In the setup of Physical Machines that follows in Section 5.6, a Type and Port may be specified in Physical Machine 0 which configures the MCI for motion control of one port. By setting the port, the system knows if the motion control will be by serial or parallel control. The "P" ports are used for parallel control while the "S" ports are used for serial control.

For motion control, the following types may be selected.

#### Serial Motion Control Protocols

- Type 1 Sony P2 Motion Control
- Type 2 Ketchum Serial Control. Port S11 must be used for this protocol.

#### Parallel Motion Control Protocols

- Type 1 Reads Tally back to light Motion LEDs
- Type 2 Uses internal logic to light motion LEDs

### 5.5.2 Motion Control Parallel Port Operation

Hitting any of the motion control buttons will assert 100ms low going pulses on the following lines.

#### Output Ports P10 and P12

Pin 15	Fast Rewind	(1DBY2)
Pin 34	Reverse Play	(1DBY3)
Pin 16	Stop	(1DBY4)
Pin 35	Forward Play	(1DBY5)
Pin 17	Fast Forward	(1DBY6)

If Motion Tally backs are available (Type 1 setting only) they are input as follows:

#### Input Ports P11 and P13

Pin 15	Fast Rewind	(1DBY2)
Pin 34	Reverse Play	(1DBY3)
Pin 16	Stop	(1DBY4)
Pin 35	Forward Play	(1DBY5)
Pin 17	Fast Forward	(1DBY6)

If an above line is low then the button LED is lit.

If motion tally backs are not available (type 2) then the last button hit determines the LED that is lit (only one at a time).

### 5.5.3 Setting Motion Control Port and Type

The Motion Control buttons on the bottom of the Monitor Controller can

be “attached” to a recorder by selecting an appropriate port for Physical Machine 0 and connecting the recorder to that port. Motion Control port and type are set by entering Physical Machine Setup mode on the Monitor Controller. To do this:

1. Hold OPTION and press the SET MACHS (Spkr Sol/Mute) button
2. The Controller will display “SETUP PHYS VIRT” (Setup Physical or Virtual Machines). Press the Channel Enable button under PHYS (Enable #4) to select Setup Physical Machine Edit Mode.
3. The Controller will display “SET PHYSMACH Y N” (Setup Physical Machines? Y/N). Press the Channel Enable button under Y (Enable #7) to confirm your choice.

Note: It is intentionally difficult to enter Machine Edit mode because entering the wrong data can adversely affect the operation of the system. In order for the PicMix Monitor to operate properly, the Physical and Virtual Machine data must be set accurately.

4. When you have entered Physical Machine Edit Mode the display will show something like this:

Each of the values can be edited by hitting the flashing Master and Enable buttons above and below each of the values.

The display should be interpreted and set as follows...

0= This number represents the physical machine number. Set this to 0

TK=24 This item does not apply to Physical Machine 0.

P10 This number represents the motion control port used to communicate with the machine (See Section 5.4.3). "P" numbers are parallel ports, "S" numbers are serial ports. Set this to be the port of the machine that is to be controlled by the Motion Control buttons.

TY1 This number represents the type of logic used by the Motion Control port (See Section 5.5.1).

5. When all settings have been entered, press ENTER/CLEAR on the Monitor Controller to exit Physical Machine setup.
6. Reboot the PicMix monitor master by pushing a small blunt screwdriver into the hole marked Program Load, above the SPL A button. Hold the internal button until just after the display changes, then quickly release the button.

*Important: Since the proper Physical and Virtual Machine data is necessary for system operation, it should be written down in case it ever needs to be re-entered.*

#### 5.5.4 How Motion Control Affects Record Logic

If the motion control buttons are enabled, PicMix will only issue Record On commands if the motion controlled machine is in Play mode, as determined by the PicMix input logic.

### 5.5.5 Config Options

The following config options can be used to test Machine Controller operation. A description of the SYSTEM CONFIG button and all config options can be found in Section 3.2.3.

MCI= X

This option displays the number of Monitor Machine Control Interfaces that are connected to the system. If this number does not match the actual number of MCIs in the system, then check the network connections and reboot the system. This option cannot be edited.

TEST MCI

When TEST MCI is displayed, pressing the YES button puts the system into Machine Control Interface test mode. When the GPO test mode is active (YES LED is lit), a loopback test is performed on the MCI hardware, if installed.

Hit the NO button to return to the TEST MCI prompt

### 5.5.6 UPS Options

The following UPS options can be set to customize Monitor Controller and Machine Controller operation. A description of the MENU button and all UPS options can be found in Section 3.2.4.

FLASHREC (Flash Record Until Talley Received))

This option determines how the REC ON LED on the Monitor Controller responds when the REC ON button is pressed on enabled tracks. When the YES LED is lit, the REC ON LEDs will flash until the talley back is received from the recorder. If the option is set to NO, the REC ON LEDs will not light until the talley back is received. This option can be changed by hitting the YES or NO button.

T RECOFF (No Talley=Record Off)

This option determines how the REC ON status of the controller is affected when a talley back is cancelled by the recorder. When the YES LED is lit, the REC ON status within PicMix is cancelled if the talley back is lost. If the option is set to NO and the talley back is lost, the REC ON LED turns off but the REC ON status within PicMix remains. This option can be changed by hitting the YES or NO button.





### R BUTREV (Record Buttons Reversed)

This option allows swapping of the RECORD ON and RECORD OFF button functions, if desired. As shipped, the RECORD ON button is below the RECORD OFF button and has an LED associated with it. If BUTREV is set to Yes, the RECORD OFF button becomes the lower button with the LED.

**Note:** *If BUTREV is set to Yes, the REC ON and REC OFF buttons must be physically swapped so that the button legend matches the reversed function. The function of the LED remains the same.*

## 5.6 Tascam DA-88 Dip Switch Settings

In order for the Tascam DA-88 recorder to be controlled by PicMix, the DA-88 DIP switch settings must be set as follows:

### SY-88 - Internal Dip Switches

S2     All On

S3     1, 2, 3, 5 OFF  
         4, 6, 7, 8 ON

### SY-88 Back Panel Dip Switch

Mode   All ON



## Section 6 Alignment and Maintenance

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## 6.1 Resetting the PicMix Monitor

### Reset PicMix

To reset PicMix, power down all monitor rack units for 10 seconds then power up or:

1. Push a small blunt screwdriver into the hole marked Program Load, above the SPL A button. Hold the internal button until just after the display changes, and then release the button.

Holding the button too long will put the system into Program Load Mode. If this happens, simply reset PicMix again.

### Resetting PicMix to Factory Defaults

To reset PicMix to the factory default settings, hold OPTION while booting. When the display shows "PICMIX", the OPTION button can be released.

## 6.2 Initializing NOVRAM



**Caution: Initializing NOVRAM erases all Presets, UPS, and System options. This should only be done as a last resort when directed by service personnel at the factory.**

To initialize the Non-Volatile RAM, hold PRESET SAVE while booting the system as above.

## 6.3 System Software

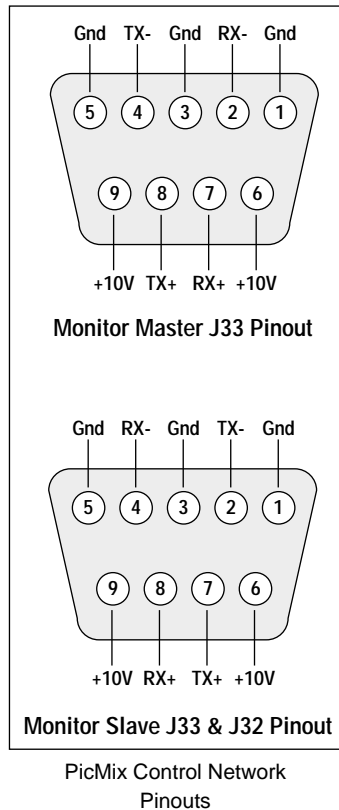
The PicMix Monitor Software resides in a non-volatile Flash type Random Access Memory (RAM). Upon boot-up the software is copied from the Flash RAM into other sections of the system. From time to time software upgrades will be issued to add features or correct system bugs. This software must be copied into the Flash RAM of the Monitor Master Rack.

Software is provided on a DOS type 3.5 inch floppy disk. A DOS based computer COM 1 or COM 2 port must be connected to the Host Computer connector J32 on the rear of the rack unit to be updated.

Note: It is recommended that the Host computer be disconnected when it is not being used for downloading software. If it will remain connected, check carefully that the connection does not introduce audible noise into the system.



### 6.3.1 Loading Monitor Master Software



1. After connecting COM 1 or COM 2 of the host computer to J32 on the Monitor Master rack, put the PicMix Monitor Master into Program Load mode by pushing a small blunt screwdriver into the hole marked Program Load, above the SPL A button on the front panel. Hold the internal button for 10 seconds. The display will be blank or show random characters or symbols.
2. Insert the PicMix Software disk into the floppy drive on the PC computer. Log onto that drive by typing A: or B:, depending on whether the disk is in drive A or B. At this time the DOS prompt should look something like this: A:>.
3. Type the following:
 

**loadmon 1** (if connected to COM Port 1)

or.....

**loadmon 2** (if connected to COM Port 2)

and hit the ENTER key.

">" and "." symbols should flash across the computer screen. When the screen activity stops and the DOS prompt appears the download is complete. This should take about a minute or two.
4. The PicMix unit will reboot automatically after downloading. Check that the version number displayed by PicMix matches the version number on the software upgrade disk.

## 6.4 The PicMix Control Network (PCN)

### 6.4.1 Overview

The PicMix Control Network is a bidirectional serial communications link that allows the Monitor Master to communicate with the other devices attached to the system.

All PCN cables are standard DB9 male to male cables wired pin to pin. All Slave and Controller PCN connectors have identical pinouts. The Monitor Master swaps the RX and TX lines to allow bidirectional communication.

### 6.4.2 DIP Switch Settings

In order for the PicMix peripheral units to be recognized properly, the DIP switch on each unit's internal CPU board should be set as follows:

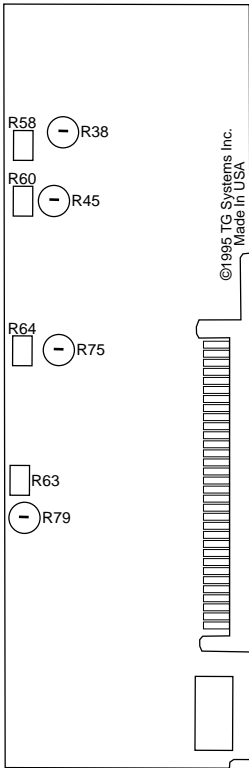
- 1 - Device ID
- 2 - Device ID
- 3 - Device ID
- 4 - Device ID
- 5 - Varies
- 6 - On
- 7 - On
- 8 - Varies

Switches 1 through 4 (Device ID) must be set to a unique setting so that no two devices on the network have the same device ID.

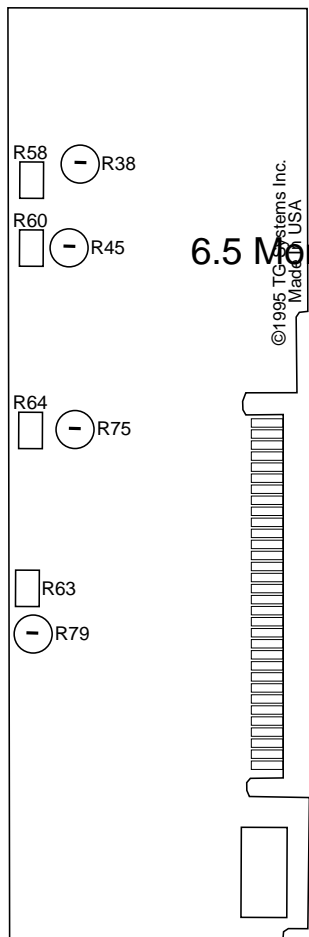
14 settings are available excluding all On and all Off. The settings of any particular device are arbitrary, except that Monitor Slaves must be set in ascending binary order. While any setting of these four switches can technically be used, the factory recommends the follow settings for Device IDs:

DIP Switch	<u>8</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Slave 1 (9-16)	Off	On	On	On	On	On	On	Off
Slave 2 (17-24)	Off	On	On	On	On	On	Off	On
Slave 3 (25-32)	Off	On	On	On	On	On	Off	Off
Reserved	Off	On	On	On	On	Off	On	On
Reserved	Off	On	On	On	On	Off	On	Off
Monitor Controller 1	On	On	On	On	On	Off	Off	On
Monitor Controller 2	On	On	On	On	On	Off	Off	Off
Monitor Controller 3	On	On	On	On	Off	On	On	On
Monitor Controller 4	On	On	On	On	Off	On	On	Off
MCI 1	On	On	On	Off	Off	On	Off	On
MCI 2	On	On	On	Off	Off	On	Off	Off





PicMix Audio Board



PicMix Audio Board

Note: Setting a switch to Off asserts that bit. For example:

DIP Switch	4	3	2	1	
On	On	On	On	Off	=1
On	Off	Off	Off	Off	=7

## 6.5 Monitor Calibration

### 6.5.1 Introduction

The following section outlines the procedures for calibrating the PicMix monitor system. All of these calibrations were done at the factory and should not need to be done in the field.

This section assumes a technical knowledge sufficient to perform normal professional audio calibration tasks, and as such are in brief outline form. It is also assumed that you have an understanding of the architecture and operation of the PicMix system.

The following guidelines apply to this section:

- All audio levels are expressed in dBu unless noted.
- All audio adjustments should be made to within 1/10 dB unless noted.
- All test signals are at 1kHz unless noted.
- All calibrations should be made after PicMix has been powered on for at least one hour with the cover in place.
- All calibrations should be made when PicMix is operating at the same temperature as in normal operation.
- Distortion calibrations should be made with a Low Pass filter (approx 20kHz) if possible.
- All level calibrations should be made with the cover in place.

### 6.5.2 Trim Pots

The trim pots are located on the audio boards inside the Monitor chassis. 8 audio boards are plugged into slots J1-J4 and J6-J10 of the Monitor Master motherboard.

### White Flat Trim Pots

The white flat trim pots on the audio boards should not require field calibration. These pots include:

R38 - Direct Input Distortion Trim

R45 - Playback Input Distortion Trim

R75 - Main Output Distortion Trim

R79 - Direct/Playback Crossover Trim

### Blue Right Angle Trim Pots

The blue right angle trim pots are accessible through the monitor cover and may require field calibration, depending on the installation. These pots include:

R58 - Direct Input Level Trim

R60 - Playback Input Level Trim

R64 - Main Output Level Trim

R63 - Main Output VCA Scale Factor Trim

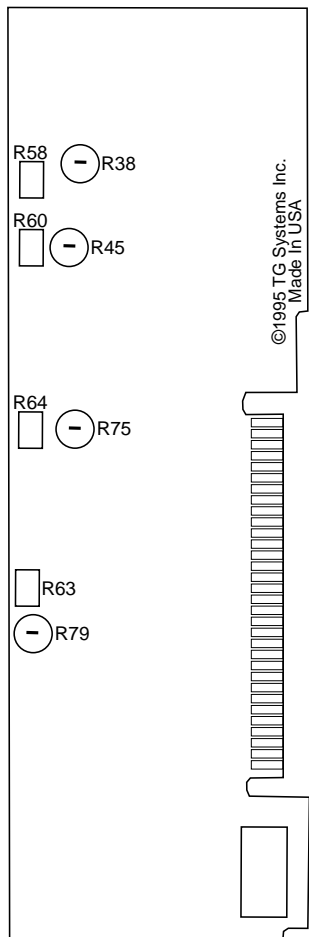


## 6.6 Level Calibration

### 6.6.1 Main Output Level Calibration

The following calibration should be made with the cover in place to help maintain operating temperature.

1. Mute All Input Channels.
2. Turn off Insert return.
3. Clear All speaker assignments.
4. Set SPL to 85.
5. For each of the 8 channels:
  - a) Insert 0 level signal into expansion input (J24).
  - b) Measure Main Output (J26) and trim R64 for 0 level.



PicMix Audio Board

### 6.6.2 Main Output Scale Factor Calibration

The following calibration should be made with the cover in place to help maintain operating temperature. Perform the Main Output Calibration first and leave the system setup the same.

*Tip: Store SPL 105 and SPL 85 into two SPL Presets (SPL A, B or C) to speed up setting of SPLs.*

1. Set SPL to 105
2. For each of the 8 channels:
  - a) Insert 0 level signal into expansion input (J24).
  - b) Measure Main Output (J26) and trim R63 for +20 level.
  - c) Set SPL to 85 and check for 0 level (adjust R64 if needed).
  - d) Set SPL to 105 and confirm +20 level.

Note: SPL=85 repro sets unity gain through the signal path.

### 6.6.3 Direct Level Calibration

Note: Crossover calibration affects the Direct and Playback Level calibrations. If Crossover calibration is to be done, do it before performing Direct and Playback Level calibrations.

The following calibration should be made with the cover in place to help maintain operating temperature. Perform Main Output Calibration and leave setup the same.

1. Set SPL to 85.
2. All inputs to Direct.
3. Assign inputs on a one to one basis to speakers (ie. 1->L, 2->C, 3->R, etc.).
4. For each of the 8 channels:
  - a) Insert 0 level signal into direct input (J21).
  - b) Measure Main Output (J26) and trim R58 for 0 level.

### 6.6.4 Playback Level Calibration

Note: Crossover calibration affects the Direct and Playback Level calibrations. If Crossover calibration is to be done, do it before performing Direct and Playback Level calibrations.

The following calibration should be made with the cover in place to help maintain operating temperature. Perform Main Output Calibration and leave setup the same.

1. Set SPL to 85.
2. All inputs to Playback.
3. Assign inputs on a one to one basis to speakers (ie. 1->L, 2->C, 3->R, etc.)
4. For each of the 8 channels:
  - a) Insert 0 level signal into direct input (J22).
  - b) Measure Main Output (J26) and trim R58 for 0 level.

## 6.7 Distortion and Crossover Calibration

The following calibrations have been performed at the factory. In normal use they should not have to be adjusted in the field.

If required, these calibrations must be performed with the cover removed. The most accurate calibration will be obtained if PicMix is at its normal operating temperature when it is being calibrated. Therefore only remove the cover just preceding calibration, and replace the cover during idle time.

Caution: With the cover remove dangerous high voltage is present. Only technically qualified personnel should remove the cover and perform this operation.

### 6.7.1 Removing the Rack Cover

1. Power down and disconnect AC.
2. Remove three #4 flat head screws in the top of the front panel
3. Remove all of the #4 pan head screws in top cover

### 6.7.2 Main Output VCA Distortion Calibration

1. Clear All speaker assignments
2. Set SPL to 85
3. For each of the 8 channels:
  - a) Insert +10dBu level signal into expansion input (J24)

- b) Measure Main Output (J26) and trim R75 for minimum THD (<.015%)

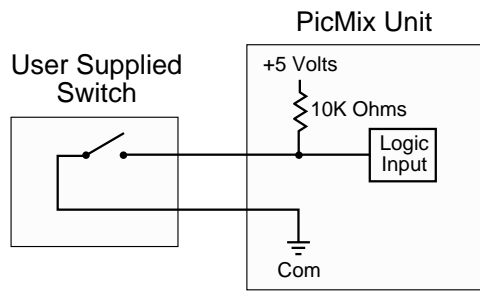


Figure 1

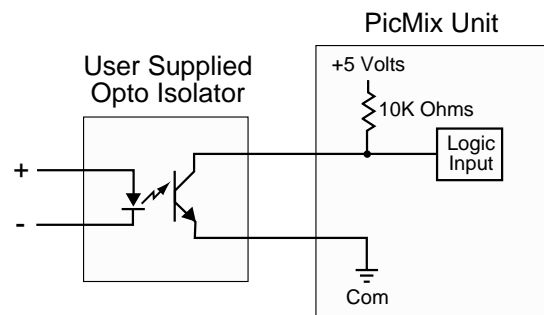


Figure 2

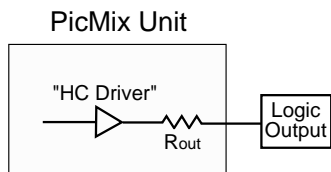


Figure 3

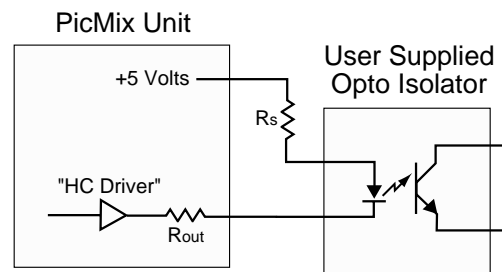


Figure 4

### 6.7.3 Direct Input VCA Distortion Calibration

1. All inputs to Direct
2. Assign inputs one to one to speakers (1->L, 2->C, 3->R, etc.)
3. For each of the 8 channels:
  - a) Insert +10dBu level signal into Direct input (J21)
  - b) Measure Insert Send Output (J27) and trim R38 for minimum THD (<.015%)

### 6.7.4 Playback Input VCA Distortion Calibration

1. All inputs to Playback.
2. Assign inputs on a one to one basis to speakers (ie. 1->L, 2->C, 3->R, etc.)
3. For each of the 8 channels:
  - a) Insert +10dBu level signal into Playback input (J22)
  - b) Measure Insert Send Output (J27) and trim R45 for minimum THD (<.015%)

### 6.7.5 Direct/Playback Cross Over Calibration

1. Assign inputs on a one to one basis to speakers (ie. 1->L, 2->C, 3->R, etc.)
2. Set SET XOVER in the System Config to YES
3. For each of the 8 channels:
  - a) Insert 0 level 2kHz signal into both Direct (J21) and Playback (J22) inputs
  - b) Turn R79 Full counter-clockwise
  - c) Adjust R79 by ear for minimum cross over anomalies

Please Note:

- The 2kHz signal is used because it is the worst case frequency (it emphasizes the cross over anomalies)
- Adjusting R79 affects the Direct and Playback Levels, so after this calibration, the Direct and Playback Levels trims must be reset.
- Any level discrepancies between Direct and Playback will make ad-

justing for minimum cross over anomalies difficult.



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## 6.8 Interfacing PicMix GPIO and Machine Controller Parallel Lines

### 6.8.1 General Information

All of the PicMix GPIO lines are derived from CMOS HC type latches buffers. As such, the logic control is in the range of 0 to +5 Volts. The logic is defined as active LOW, meaning that +5 Volts (nominal) is a logical ZERO and 0 Volts (nominal) is a logical ONE. The actual switching threshold voltages are defined by standard CMOS HC margins available in any data book.

### 6.8.2 Inputs

The inputs have internal (to PicMix) pull up resistors so that all unterminated inputs will be at +5 Volts (logical ZERO). Grounding any input to the common provided on the PicMix connector will cause that input to be a logical ONE.

Inputs should never be connected to any other ground or +5 Volt source that may be at a different potential than the PicMix chassis. Inputs on the GPIO connector are connected directly to the IC pins. Inputs on the Machine Controller are isolated by 100 Ohm series resistors. These resistors have no measurable effect on the operational voltage levels.

### 6.8.3 Outputs

Outputs on the GPIO connectors are derived directly from the IC pins. Machine Controller outputs are derived through 100 Ohm series isolation resistors. These outputs are capable of sinking and sourcing current in accordance with the normal HC specifications. Care should be taken to provide enough total series resistance (including the 100 Ohm isolation resistors) to limit the current to about 10mA per pin.

Any external supply used must be limited to 5 Volts maximum and must be returned to the PicMix common ground. The output pins will be at +5 Volts when inactive (logical ZERO) and at ground (plus one saturation drop) when active (logical ONE).

### 6.8.4 Example Circuits

Figure 1 shows how an externally isolated mechanical switch or relay may be connected to any input pin. All switches tied to a particular connector will have a common ground connection

Figure 2 shows the use of an external opto isolator to eliminate any possibility of ground loops. The transistor part of the opto isolator must be capable of pulling down below the HC threshold with the 10K Ohm internal pull-up resistor in PicMix providing the collector current.

Figure 3 shows the PicMix output configuration. The GPIO ports have an Rout value of 0 Ohms and the Machine Controller ports have an Rout value of 100 Ohms.

Figure 4 shows a method of using opto isolation of the outputs of the GPIO or Machine Controller ports. The total limiting resistance consisting of  $R_s + R_{out}$  should be no less than 200 Ohms considering a normal LED drop of about 2.2 Volts. Check the speed and current transfer ratio of the chosen opto isolator for conformance to the needs of the driven equipment.

# Section 8 Block Diagram

