

Installation Manual and Operating Instructions

DMS™
DIGITAL MUSIC SERIES



DMS™
DIGITAL MUSIC SERIES

**7 Channel - 3 Zone - Dual VOX -
Dual Mute - MOH - Vox Relay -
Module Port - Phone Interface**

DMS 3040 - 40 Watt RMS

DMS 3080 - 80 Watt RMS

DMS 3120 - 120 Watt RMS

IMPORTANT NOTE: THIS OPERATING MANUAL IS PROVIDED AS AN INSTALLATION AND AS AN OPERATING AID. PASO SOUND PRODUCTS, INC. DOES NOT ASSUME ANY RESPONSIBILITY AS TO ITS ACCURACY AND SHALL NOT BE LIABLE IN TORT OR CONTRACT FOR ANY DIRECT CONSEQUENTIAL OR INCIDENTAL LOSS OR DAMAGE ARISING FROM THE INSTALLATION, USE OR INABILITY TO USE THIS PRODUCT.

CAUTION !

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO WATER, RAIN OR MOISTURE



Innovation through technology since 1931

Digital Music Amplifiers

DESCRIPTION AND APPLICATIONS

- ❑ High Performance - High Reliability Design
- ❑ Wide Frequency Response - Very Low Distortion
- ❑ 7 Channel Inputs - 3 Zone Outputs
- ❑ 5 Balanced Microphone Inputs
- ❑ Phantom Power on all MIC Inputs
- ❑ MIC 4/AUX 1 and MIC 5/AUX 2 Inputs
 With Stereo Summing
- ❑ AUX1 and AUX2 Inputs Attenuator
- ❑ 600 ohm Transformer Balanced
 Telephone Paging Input
- ❑ MIX Buss and 600 ohm Line Output
- ❑ Independent Input Controls
- ❑ Rear Panel Port: Accepts Standard Module
- ❑ Independent Module Level Control
- ❑ AUX1 and Master Remote Volume Controls
- ❑ External EQ Link
- ❑ Tone by-pass and EQ Link switches
- ❑ Pre-EQ Subwoofer Output
- ❑ Post-EQ Subwoofer Output
- ❑ Addressable Dual VOX Buss
 Voice Activated Muting
- ❑ VOX Variable Time Delay Function
- ❑ Addressable Dual MUTE Buss
- ❑ Direct Muting and Unmuting
- ❑ 600 ohm and 8 ohm 1 Watt
 Music on Hold Amplifier
- ❑ MOH Amplifier Source Selector
- ❑ Zone 2 and 3, 1 Watt - 8 ohm Output
 with Separate Control
- ❑ NO/NC VOX Operated Relay
- ❑ 24 V DC 250 mA Regulated Power Supply Output
- ❑ 8 ohm, 25 Volt & 70 Volt Output
- ❑ Optional 19" Rack Mounting with Kit
- ❑ Low profile - 2-Unit of Vertical Rack space
- ❑ UL 6500 Listed (US - CANADA)

UNPACKING

Immediately upon receipt of the amplifier, inspect the unit and shipping container for indications of improper handling or in transit damage. The equipment was carefully inspected and tested before leaving the factory. Notify the Transportation Company immediately if any damage is found. **ONLY THE CONSIGNEE CAN FILE A CLAIM WITH THE CARRIER FOR DAMAGE DURING SHIPMENT.** Be sure to save the carton and packing material as evidence of damage for the shipper inspection. **DO NOT SHIP** the unit back to the factory unless authorized by the factory.

IN TRANSIT DAMAGES ARE NOT COVERED BY THE PASO WARRANTY.

SPECIFICATIONS

Power Output:		
	DMS3040	40 Watt RMS
	DMS3080	80 Watt RMS
	DMS3120	120 Watt RMS
Distortion:		Less than 0.5% THD
Frequency Response:		20 - 20,000 Hz ± 1 db
Inputs:		
	Input 1	Microphone 1 Balanced
	Input 2	Microphone 2 Balanced
	Input 3	Microphone 3 Balanced
	Input 4	Microphone 4 Balanced - AUX 1 (<i>Stereo Summing</i>)
	Input 5	Microphone 5 Balanced - AUX 2 (<i>Stereo Summing</i>)
	Input 6	Telephone Interface - Transformer Balanced
	Input 7	Module Port
Sensitivity & Z:		
	Input 1	Mic 1 = 1.5 Mv - 250 ohm
	Input 2	Mic 2 = 1.5 Mv - 250 ohm
	Input 3	Mic 3 = 1.5 Mv - 250 ohm
	Input 4	Mic 4 = 1.5 Mv - 250 ohm - AUX 1 = 100 Mv - 47K ohm
	Input 5	Mic 5 = 1.5 Mv - 250 ohm - AUX 2 = 100 Mv - 47K ohm
	Input 6	
	Input 7	
	AUX 1 Input	Te=100 Mv - 600 ohm - Transformer Balanced
Attenuator:		Module= 1 V - 47K ohm
	AUX 2 Input	Variable (rear panel control)
Attenuator:		Variable (rear panel control)
Phantom Power:		All Microphone Inputs by internal jumper (18 V)
Hum & Noise:		Mic -70 db, Aux -75 db
Telephone Paging Input:		600 ohm Transformer balanced
Accessory Port:		Accepts Standard Module
EQ LINK:		Preamp out, Power Amp in with EQ Link Switch
Line Outputs:		Line Out 600 ohm - 1.5 V loaded
Inputs/Outputs:		MIX BUSS
Subwoofer Outputs:		Pre-EQ and Post-EQ Outputs
Subwoofer Output Level:		1 Volt
Music on Hold Output:		600 ohm-1 Volt Transformer Balanced
Zone 2 Output:		1 Watt-8 ohm with Control
Zone 3 Output:		1 Watt-8 ohm with Control
Main Output Impedance:		8 ohm, 25 Volt and 70 Volt line
Controls:		
	Front Panel:	Input 1 Level, Input 2 Level, Input 3 Level, Input 4 Level, Input 5 Level, Module Level, Bass and Treble
	Rear Panel:	PHONE Level - AUX 1 Attenuator - AUX 2 Attenuator - MOH/ZONE 1 Level Control - ZONE 2 Level Control - VOX 1/VOX 2 Sensitivity - MUTE 2 Delay ± 10 dB at 100 Hz and 10 KHz On - Off Switch (<i>rear panel</i>)
Bass and Treble Controls:		
Tone By-Pass:		On - Off Switch (<i>rear panel</i>)
Remote Volume Controls:		AUX 1 Input Level and Master Volume (10 K)
MOH Source Selection:		AUX 1 - AUX 2 - MODULE by internal jumper
Zone 2/3 Source Selection:		AUX 1 - AUX 2 - MODULE by internal jumper
DUAL VOX:		Voice Activated Muting
VOX BUSS 1:		Available on all 7 Inputs by internal jumpers
VOX BUSS 2:		Available on all 7 Inputs by internal jumpers
MUTE BUSS 1:		Available on all 7 Inputs by internal jumpers
MUTE BUSS 2:		Available on all 7 Inputs by internal jumpers
MUTE 2 DELAY:		Adjustable from 3 Sec to 30 Sec (rear panel control)
Unmuting:		MUTES/UNMUTES MIC 1 only
Power Supply Output:		24 V DC - 250 mA Regulated
Auto VOX Relay:		NO/NC Contacts - VOX activated - Contacts Rating = 30 VDC - 7 A
Rack Mounting:		Optional Model 27/3501 - 19" Rack Kit
Internal Cooling Fan:		3" Thermally Controlled - <i>Model DMS3120 only</i>
Power Requirement:		117 Volt, 50-60 Hz
Power Consumption:		DMS3040 = AC = 630 VA - DMS3080 = 750 VA - DMS3120 = 850VA Max. 500 W Max. Unswitched
AC Accessory Outlet:		Screw Terminals, RCA Jacks
Terminations:		Black
Housing Finish:		Black
Output Power Indicator:		Multi-color LED (<i>front panel</i>)
Dimensions:		19" W., 12" D., 4" H. with feet (482X305X102 mm) 3.5" H (89 mm). less feet
Net Weight:		
	DMS3040	16 Lbs (8 Kg)
	DMS3080	19 Lbs (8.5 Kg)
	DMS3120	22 Lbs (11 Kg)

IMPORTANT SAFETY INSTRUCTIONS

READ BEFORE OPERATING

BEFORE OPERATING THE AMPLIFIER, BE SURE YOU FULLY UNDERSTAND ALL INSTRUCTIONS AND FEATURES OF THE UNIT.

- 1) **Read these instructions carefully.**
- 2) **Keep these instructions.**
- 3) **Heed all Warnings.**
- 4) **Follow all instructions.**
- 5) **DO NOT** use this apparatus near water.
- 6) Clean **ONLY** with a damp cloth.
- 7) **DO NOT** block any of the ventilation openings. Install in accordance with the instructions provided.
- 8) **DO NOT** install near any heat sources such as radiators, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) **DO NOT** mount amplifier into a container or a closed unventilated closet while operating.
- 10) **DO NOT** place any object or accessory equipment such as Tuners, Mixers, Cassette Decks, etc. on top of the amplifier. Obstructing or closing the cabinet ventilation openings may cause overheating.
- 11) **DO NOT** defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and or the third prong is provided for your safety. When the provided plug does not fit into your

READ BEFORE OPERATING

- outlet, consult an electrician for replacement of the obsolete outlet.
- 12) Use only the attachments and accessories specified in this manual.
 - 13) If a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
 - 14) Unplug this apparatus during lighting storms or when unused for long periods of time.
 - 15) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
 - 16) **DO NOT** replace fuses unless power cord is removed from the AC wall outlet.
 - 17) **DO NOT** install accessories unless the power cord is removed from the AC wall outlet.

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RACK MOUNTING

- A) Procure the optional accessory Rack Mount Kit Model 27/3501.
- B) Turn amplifier up side down and remove the four rubber feet by unscrewing the four holding screws.
- C) Remove two screws on each side of the amplifier holding the amplifier cover.
- D) Install the rack kit brackets by using the self-tapping screws provided.

Fig. 3 - Rack Kit Mounting

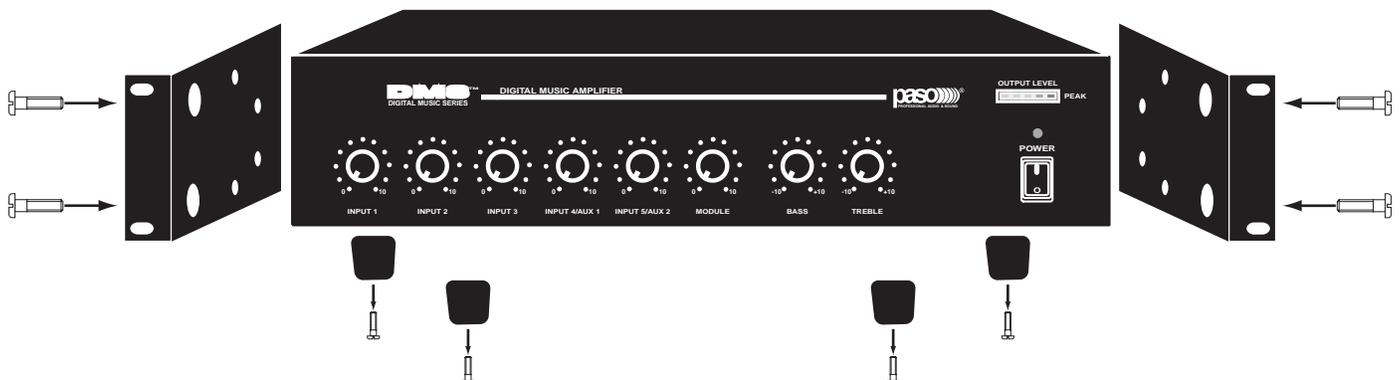
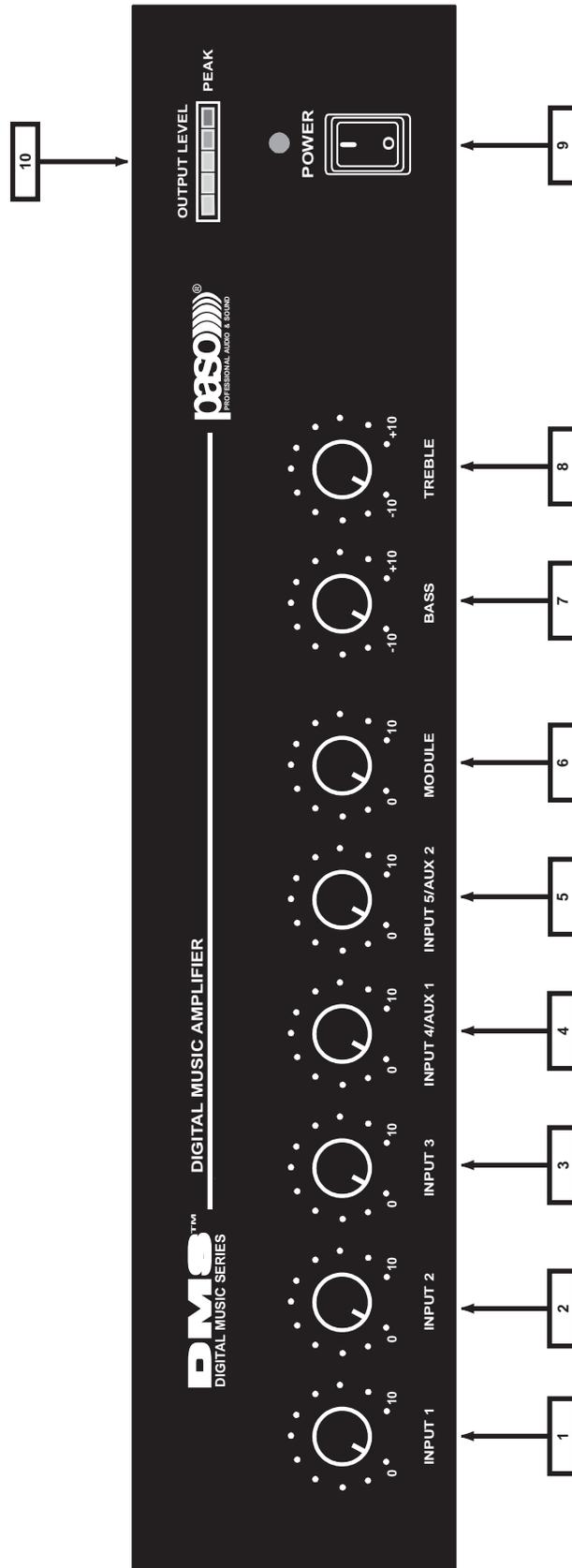


Fig. 4 - FRONT PANEL CONTROLS



- | | |
|---------------------------------|-------------------------------|
| 1) INPUT 1 Volume Control | 6) Input Module Level Control |
| 2) INPUT 2 Volume Control | 7) BASS Control |
| 3) INPUT 3 Volume Control | 8) TREBLE Control |
| 4) INPUT 4/AUX 1 Volume Control | 9) On-Off Power Switch |
| 5) INPUT 5/AUX 2 Volume Control | 10) Output Level Meter |

CAUTION ! REMOVAL OF THE AMPLIFIER COVER PRESENTS AN ELECTRICAL SHOCK HAZARD ALWAYS REMOVE THE POWER CORD FROM THE AC WALL OUTLET

THE FOLLOWING INSTRUCTIONS REQUIRE THE REMOVAL OF THE AMPLIFIER PROTECTIVE COVER AND ARE PROVIDED FOR USE BY QUALIFIED PERSONNEL ONLY.

TO AVOID THE RISK OF ELECTRICAL SHOCK DO NOT PERFORM ANY INSTALLATION OR SERVICING UNLESS YOU ARE QUALIFIED TO DO SO. REFER INSTALLATION OR SERVICING TO QUALIFIED PERSONNEL.

FUNCTION SWITCHES AND JUMPERS DEFAULT SETTING TABLE

JUMPER AND SWITCH ID NO.	JUMPER REFERENCE	FUNCTION DESCRIPTION	FACTORY SETTING	FACTORY SETTING
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MAIN PCB JUMPERS

SW201	INPUT 1 -	PHANTOM POWER ON - OFF	OFF	
SW202	INPUT 2 -	PHANTOM POWER ON - OFF	OFF	
SW203	INPUT 3 -	PHANTOM POWER ON - OFF	OFF	
SW204	INPUT 4 -	PHANTOM POWER ON - OFF	OFF	
SW205	INPUT 1 (MIC 1) -	UNMUTE ON - OFF	OFF	
SW206	VOX RELAY -	MUTE 1 - MUTE 2		M1
SW207	INPUT 5 -	PHANTOM POWER ON - OFF	OFF	
SW210	INPUT 2 -	VOX 1 - VOX 2 - OFF	OFF	
SW211	INPUT 3 -	VOX 1 - VOX 2 - OFF	OFF	
SW212	INPUT 4 -	VOX 1 - VOX 2 - OFF	OFF	
SW213	INPUT 5 -	VOX 1 - VOX 2 - OFF	OFF	
SW214	TEL IN -	VOX 1 - VOX 2 - OFF		V1
SW215	INPUT 1 -	VOX 1 - VOX 2 - OFF		V1
SW216	TEL IN -	MUTE 1 - MUTE 2 - OFF	OFF	
SW217	INPUT 4/AUX 1 -	MUTE 1 - MUTE 2 - OFF		M1
SW218	INPUT 3 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW219	INPUT 2 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW220	INPUT 1 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW221	MODULE -	VOX 1 - VOX 2 - OFF	OFF	
SW222	MODULE -	MUTE 1 - MUTE 2 - OFF	OFF	
SW223	INPUT 5/AUX 2 -	MUTE 1 - MUTE 2 - OFF		M1
SW227	CHIME TRIGGER -	MUTE 1 - MUTE 2		M1

SWITCHES

SW208	INPUT 5 -	MIC 5 OR AUX 2		SWITCH AUX 2
SW209	MODULE IN SOURCE -	AUX 1 OR AUX 2		SWITCH AUX 1
SW228	INPUT 4 -	MIC 4 OR AUX 1		SWITCH AUX 1
SW229	INPUT 5 -	MIC 5 OR AUX 2		SWITCH AUX 2

MOH BOARD JUMPERS

SW701	ZONE 2 INPUT SOURCE -	AUX 1 - AUX 2 - MODULE		AUX 1
SW702	ZONE 1 INPUT SOURCE -	AUX 1 - AUX 2 - MODULE		AUX 1

REAR PANEL SWITCHES

SW301	TONE BYPASS	Defeats Front Panel Bass & Treble	SWITCH OFF
SW302	EQ LINK	Inserts External EQ between Preamp out and Power Amp Input	SWITCH OUT

FUNCTION SWITCHES AND JUMPERS

UNDERSTANDING THE INPUT FUNCTIONS

DUAL VOX AND DUAL MUTE - The Amplifier provides two independent VOX (V1 & V2) and two MUTE (M1 & M2) SYSTEMS

FUNCTION SOCKETS - EACH INPUT IS PROVIDED WITH A VOX (V1 & V2) AND A MUTE (M1 & M2) SOCKET.

INPUTS VOX AND MUTE FUNCTION - All Inputs including the Module provide 2 - VOX SEND and 2 MUTE RECEIVE functions. The VOX and MUTE functions are SWITCHED-ON, on each Input, by Internal Jumpers provided for each Input. Two VOX BUSS SEND (V1 & V2) and two MUTE BUSS RECEIVE (M1 & M2) can be independently or simultaneously SWITCHED-ON to suit the application requirement.

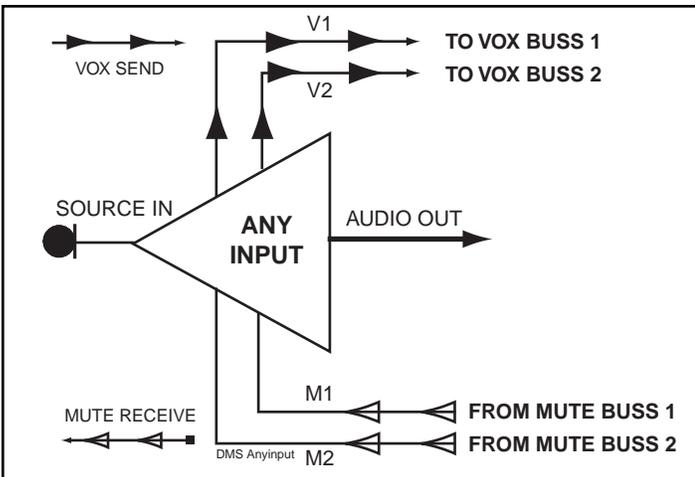


Fig. 8 - Any Input VOX and MUTE Functions

The figure below shows how the VOX 1 Logic Switch and the MUTE 2 Logic Switch are SWITCHED-ON by moving the Jumpers from the OFF position to the V 1 and M 2 position. When the Input is activated by a Source signal the corresponding VOX Signal is sent to the V1 BUSS. When the VOX 2 is activated by another Input the MUTE Signal is present on the MUTE 2 BUSS and it will MUTE this Input

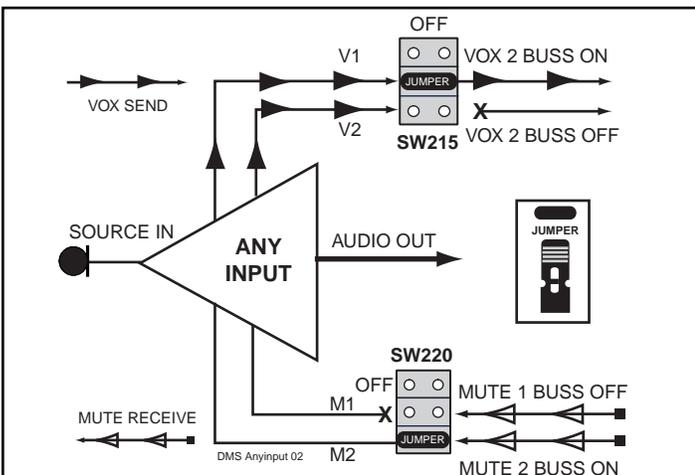


Fig. 8B - Any Input VOX 1 and MUTE 2 Activated

SETTING THE VOX AND MUTE JUMPERS

JUMPER SETTINGS - The VOX and MUTE Functions are SWITCHED-ON or OFF by setting the JUMPERS on the VOX (A) and MUTE (B) SOCKET. See Fig. 8A.

The SOCKETS are located on the Main PCB inside the Amplifier as shown on the SWITCHES and JUMPERS LOCATION DIAGRAM in this Manual. Each Socket is identified by an ID NUMBER and the FUNCTION and DEFAULT settings are listed on the FUNCTION SWITCHES and JUMPERS DEFAULT SETTING TABLE in this Manual.

TO SET: Lift the Jumper and reset as required, making sure that the JUMPER is properly positioned over the two shorting pins.

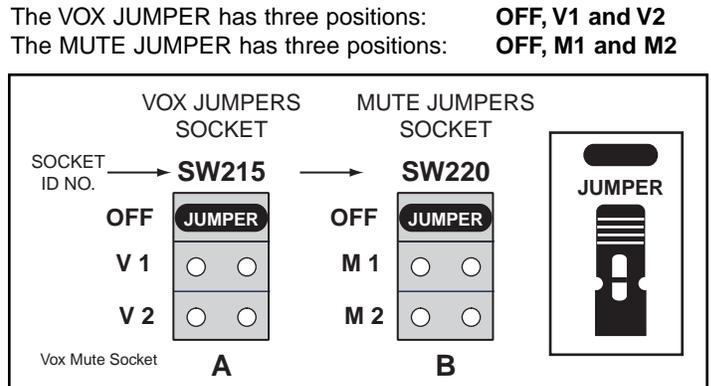
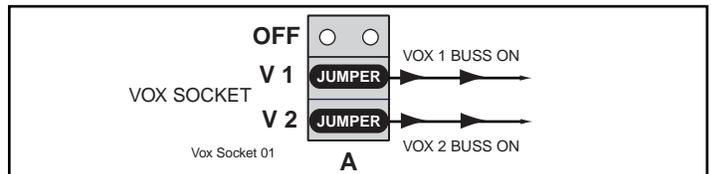


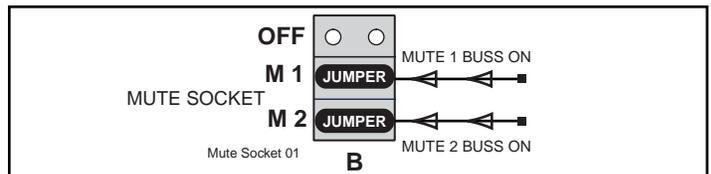
Fig. 8A - VOX and MUTE Sockets

SETTING MORE THAN ONE FUNCTION

More than one JUMPER may be used on a VOX SOCKET as shown below. In this example both the VOX 1 and VOX 2 functions are SWITCHED -ON when the Input is activated. For this purpose additional JUMPERS are packed with each Amplifier.



More than one JUMPER may be used on a MUTE SOCKET as shown below. In this example both the MUTE 1 and MUTE 2 functions will MUTE this INPUT when either VOX 1 or VOX 2 are activated by other INPUTS.

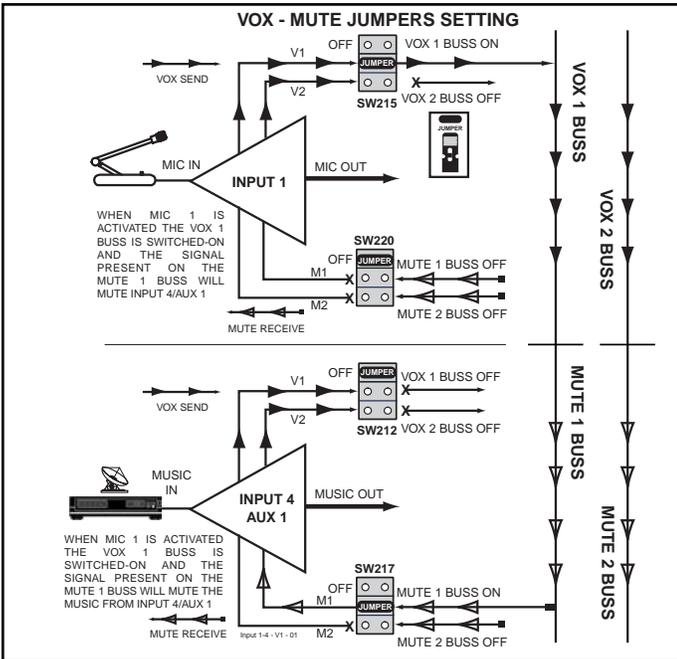


NOTE: BE SURE NOT TO SET BOTH THE VOX AND CORRESPONDING MUTE ON THE SAME INPUT OR THE INPUT WILL MUTE ITSELF WHEN ACTIVATED.

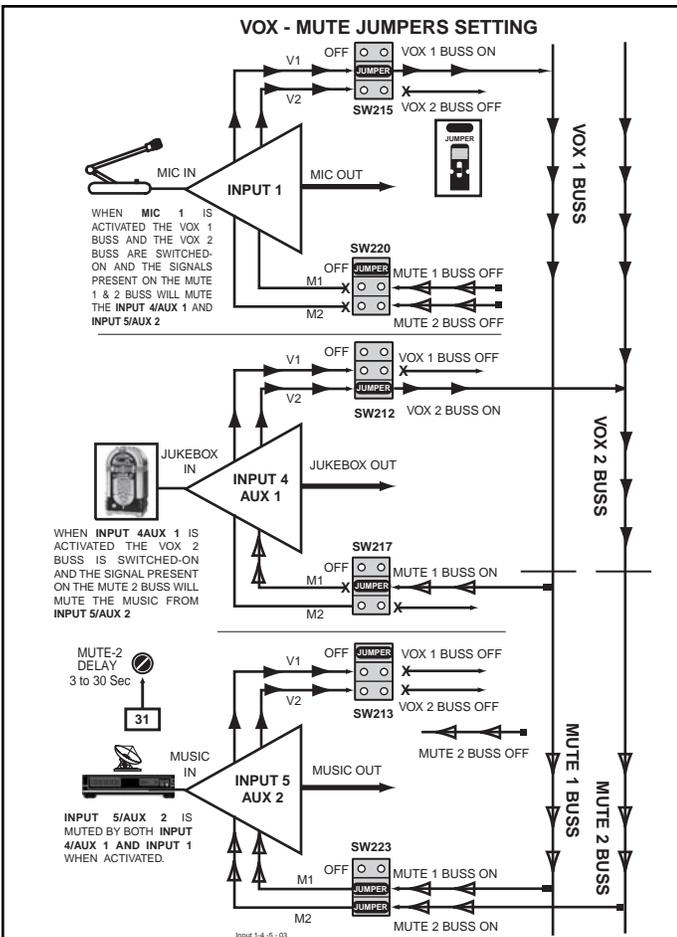
EXAMPLE: INPUT 1 - V 1 and M 1 BOTH ON.

FUNCTION SETTINGS EXAMPLES

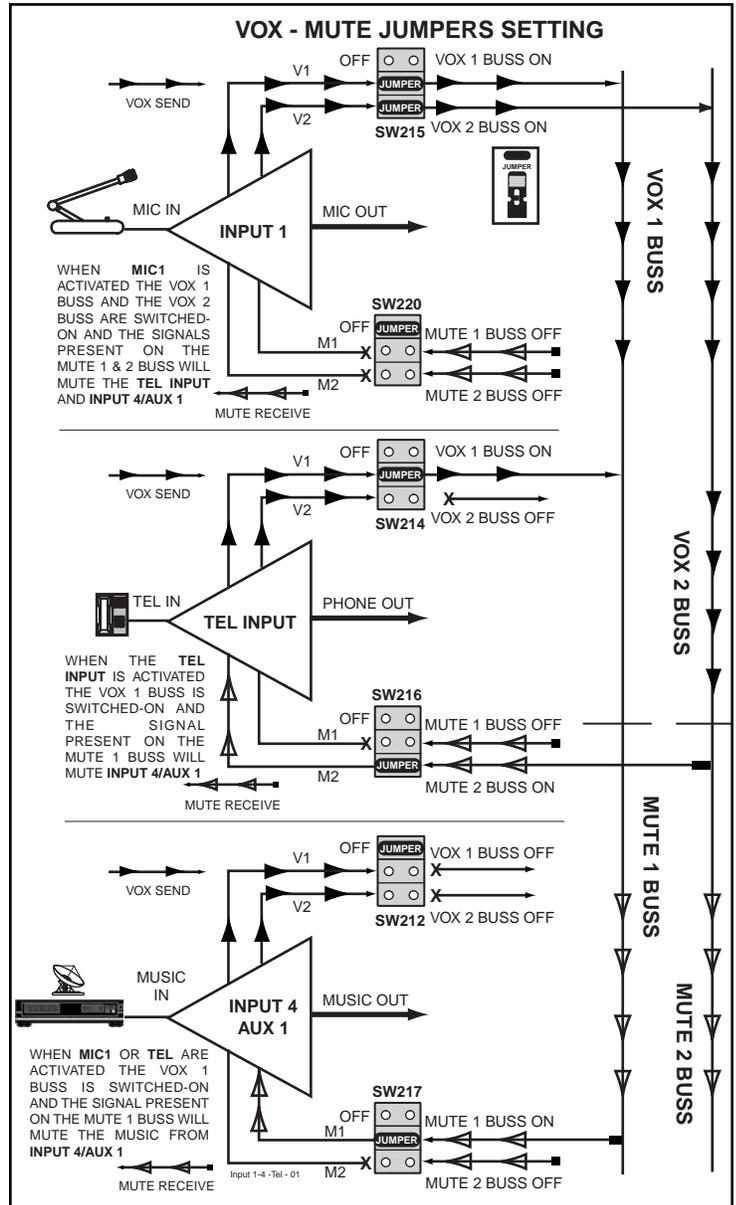
EXAMPLE 9



EXAMPLE 9B



EXAMPLE 9A



EXAMPLES

EXAMPLE 9 - INPUT 1 (MIC 1) mutes INPUT 4/AUX 1. When the Microphone is activated the Music on AUX 1 is muted.

EXAMPLE 9A - INPUT 1 (MIC 1) and TEL IN (Phone Paging) both mute INPUT 4/AUX 1. When the Microphone or the Phone Paging are activated the Music on AUX 1 is muted. The Microphone has priority over the Phone Paging. When MIC 1 is activated both the Phone Paging and the Music on AUX 1 are muted.

EXAMPLE 9B - INPUT 1 (MIC 1) mutes INPUT 4/AUX 1 and INPUT 5/AUX 2. INPUT 4 (Jukebox) mutes INPUT 5 (Sat. Rcvr). When the Jukebox is turned-On the Background Music on AUX 2 is muted. MUTE 2 DELAY (Reference 31) Control is provided. The Microphone Paging has priority over the Background Music and the Jukebox.

INSTALLATION AND WIRING

INPUT 1 SETTING AS A MICROPHONE INPUT

CAUTION: TO PREVENT POSSIBLE DAMAGE TO SPEAKERS OR THE AMPLIFIER ALL INPUT CONNECTIONS MUST BE MADE WITH THE AMPLIFIER POWER OFF.

MICROPHONE TYPE

The Microphone Input accepts Low Impedance (250-600 ohm) Dynamic Microphones. The Microphone may be a balanced output type (three wire) or an unbalanced output type (two wire).

PASO MICROPHONES

All PASO low impedance Microphones have a balanced output for best performance. Connect the RED lead to terminal HOT, the WHITE lead to terminal COM and the SHIELD to terminal G.

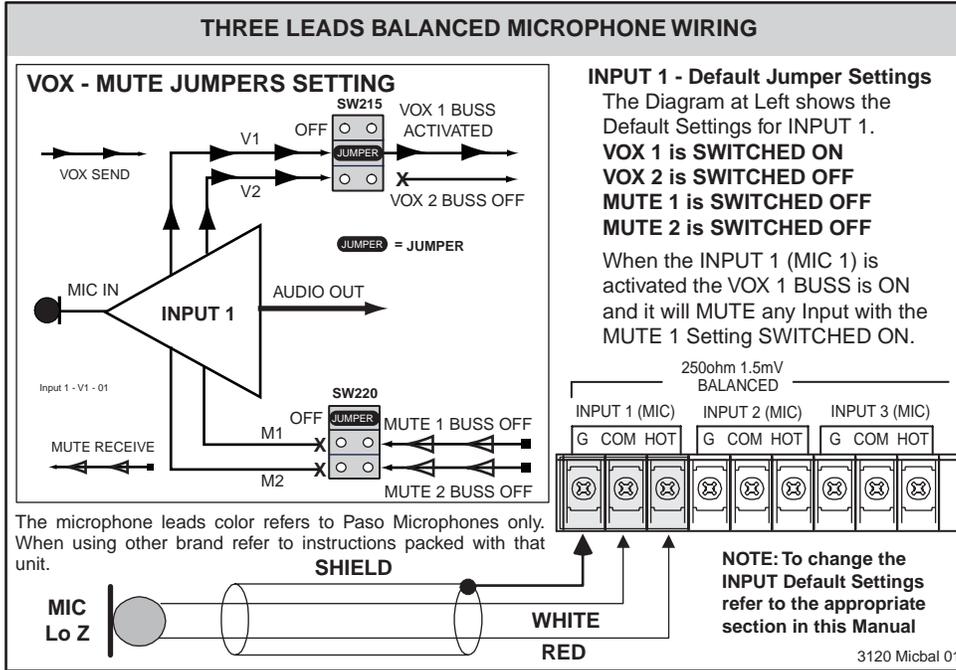


Fig. 10 - Balanced Microphone Input 1 Wiring

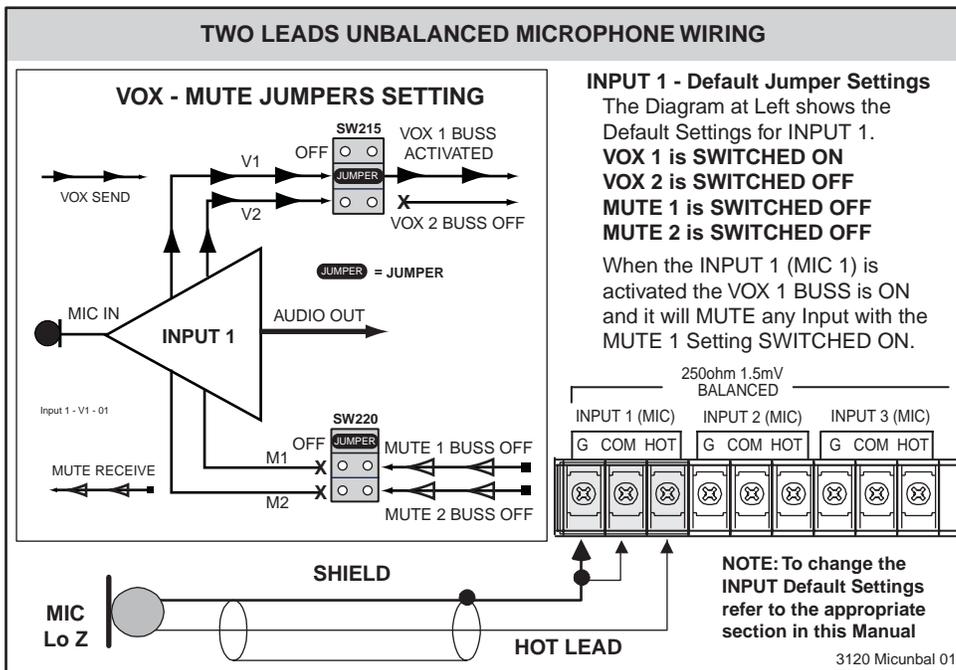


Fig. 10A - Unbalanced Microphone Input 1 Wiring

WIRING

MICROPHONE INPUT

Attach the microphone leads to the terminal strip as per diagrams at left.

DO NOT GROUND THE MICROPHONE CABLE SHIELD TO THE CHASSIS OF THE AMPLIFIER

BALANCED MICROPHONE

IMPORTANT NOTE: The use of an unbalanced Microphone (two leads) is not recommended. For best results in a PA Application always use a Unidirectional Dynamic, Low Impedance, Balanced Microphone (three leads).

UNBALANCED MICROPHONE

Attach the Microphone leads to the terminal strip as per diagram in Fig 8A. The cable length should not exceed: 15 Ft. (4.5 m).

CABLE

CABLE LENGTH - If the distance between the Microphone and the Amplifier Input is greater than 15 ft (4.5 m) a Balanced Microphone must be used. Use a two conductor shielded wire and connect Microphone to Amplifier as per Diagram in Fig. 10.

MICROPHONE CABLE ROUTING - The Microphone Cable should be carefully routed. Improper Cable routing will cause spurious oscillations, regenerative noises, hum, etc. that may permanently damage the Amplifier.

- Do not route cable next to power lines.
- Do not route cable near or over Fluorescent Fixtures.
- Do not route cable next to Speaker Wires.
- Do not install cable inside Power Line Conduits.
- Avoid the use of staples that may penetrate the cable.

INSTALLATION AND WIRING

INPUT 1 - USING A DESK BASE MICROPHONE

USING A PUSH-TO-TALK DESK BASE MICROPHONE

Microphone paging and precedence over AUX 1 or AUX 2 channels may be accomplished by using a Desk Base or a Gooseneck Microphone. Wire the Microphone output leads to the MIC input terminals as per Fig. 11A.

MUTING: The Amplifier is equipped with two independent Muting Circuits:

- **Direct Muting by shorting the MUTE Terminals**
- **Automatic Muting with VOX - Voice Activated Muting**

For additional information on the Muting operation refer to the Muting Functions section of this Manual.

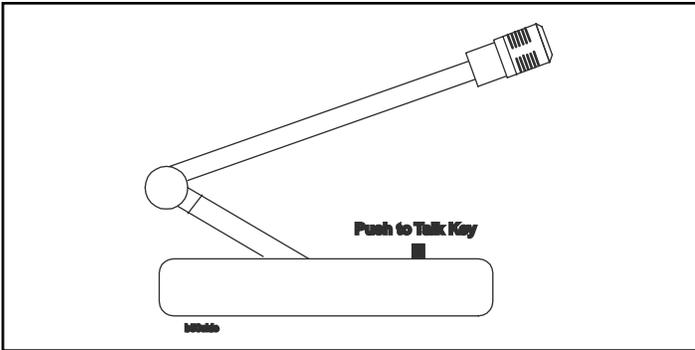


Fig. 11 - Desk Base Microphone

CAUTION: TO PREVENT POSSIBLE DAMAGE TO SPEAKERS OR THE AMPLIFIER ALL INPUT CONNECTIONS MUST BE MADE WITH THE AMPLIFIER POWER OFF.

WIRING

Wire the Desk Base Microphone leads to the Microphone Input terminal strip as per diagram in Fig 11A. Check Microphone instructions and connect HOT LEAD (B) to Terminal HOT, COMMON LEAD (A) to Terminal COM and SHIELD LEAD to Terminal G. Connect Muting Switch to Terminals MUTE 1 or MUTE 2 and G as shown.

DO NOT GROUND THE MICROPHONE CABLE SHIELD TO THE CHASSIS OF THE AMPLIFIER

MUTING - PRIORITY SETTINGS

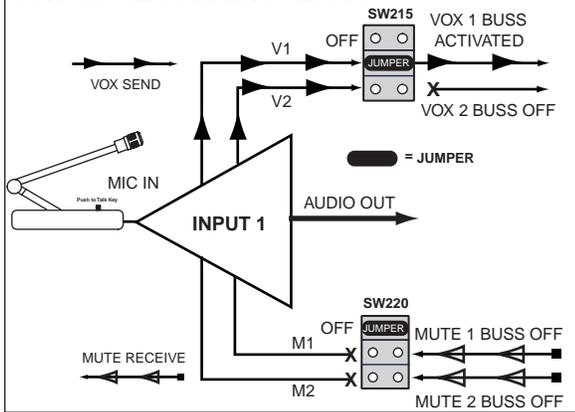
Direct Muting is provided by the Desk Base Muting Switch wired as per diagram in Fig. 11A. If Auto-Mute (VOX) is desired follow instructions below. The Desk Base Muting Switch can be omitted.

MUTING INPUT 4/AUX 1 (MUSIC INPUT)

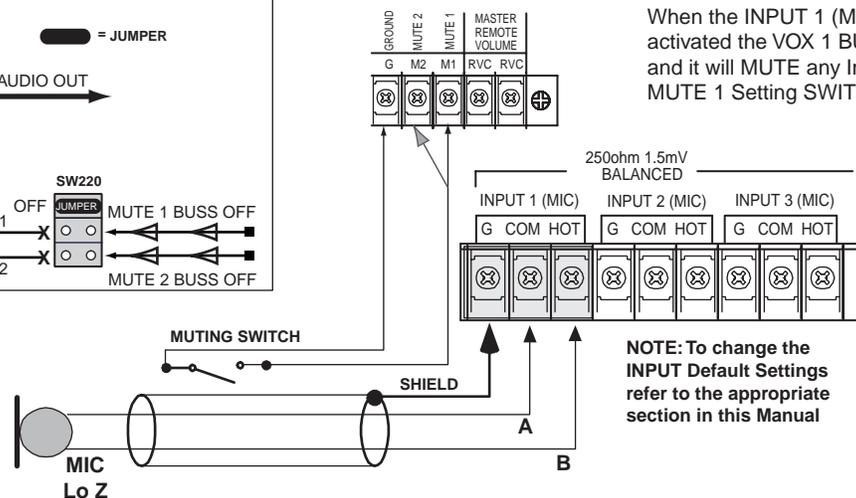
To mute Input 4/AUX 1 (Music Input) when Paging from MIC 1, set INPUT 4/AUX 1 MUTE 1 JUMPER to ON Position. Each time MIC 1 is activated the Program on Input 4/AUX 1 is automatically muted by the VOX.

DESK BASE/GOOSENECK MICROPHONE WITH MUTING SWITCH

VOX - MUTE JUMPERS SETTING



Connect Desk Base or Gooseneck Microphone as per diagram below. Connect Muting Switch to MUTE 1 or MUTE 2 and G Terminals. If using the VOX system the muting switch is unnecessary.



INPUT 1 - Default Jumper Settings

The Diagram at Left shows the Default Settings for INPUT 1.

- VOX 1 is SWITCHED ON**
- VOX 2 is SWITCHED OFF**
- MUTE 1 is SWITCHED OFF**
- MUTE 2 is SWITCHED OFF**

When the INPUT 1 (MIC 1) is activated the VOX 1 BUSS is ON and it will MUTE any Input with the MUTE 1 Setting SWITCHED ON.

NOTE: To change the INPUT Default Settings refer to the appropriate section in this Manual

3120 Micbase 01

Fig. 11A - Input 1 and Muting Terminals

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INPUT CONNECTIONS

CONDENSER AND ELECTRET MICROPHONES

CONDENSER AND ELECTRET TYPE MICROPHONES

Condenser and Electret Microphones require a DC Operating Voltage. The Amplifier provides this operating voltage or Phantom Power selectively on Inputs.1-2-3-4-5.

Prior to selecting the Condenser or Electret Microphone be sure that the Operating Voltage and Output Impedance of the device match the Input characteristics of the Amplifier listed below.

Phantom Power = 18 Volt DC
Input Impedance = 250 to 600 ohm

ACCESS TO PHANTOM POWER SELECTORS

- 1) Remove Power Cord from AC Outlet.
- 2) Remove the three screws on each side of the Amplifier.
- 3) Lift Cover and carefully slide Cover out towards the rear.
- 4) Jumpers are located on the Main Printed Circuit Board.

CONFIGURATION TABLES

BALANCED CONDENSER/ELECTRET MICROPHONE WIRING

MIC INPUTS PHANTOM POWER JUMPER SETTING WHEN USING ELECTRET MICROPHONES	INPUT 4 - 5 SWITCH SETTINGS WHEN CONFIGURING AS MICROPHONE INPUT	INPUT 4 - 5 DEFAULT SWITCH SETTINGS																								
INPUT 1 On <input type="checkbox"/> JUMPER <input type="checkbox"/> OFF SW201	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Input</th> <th>Switch No.</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>INPUT 4</td> <td>SW228</td> <td>MIC 4</td> </tr> <tr> <td>INPUT 5</td> <td>SW208</td> <td>MIC 5</td> </tr> <tr> <td>INPUT 5</td> <td>SW229</td> <td>MIC 5</td> </tr> </tbody> </table>	Input	Switch No.	Setting	INPUT 4	SW228	MIC 4	INPUT 5	SW208	MIC 5	INPUT 5	SW229	MIC 5	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Input</th> <th>Switch No.</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>INPUT 4</td> <td>SW228</td> <td>AUX 1</td> </tr> <tr> <td>INPUT 5</td> <td>SW208</td> <td>AUX 2</td> </tr> <tr> <td>INPUT 5</td> <td>SW229</td> <td>AUX 2</td> </tr> </tbody> </table>	Input	Switch No.	Setting	INPUT 4	SW228	AUX 1	INPUT 5	SW208	AUX 2	INPUT 5	SW229	AUX 2
Input	Switch No.	Setting																								
INPUT 4	SW228	MIC 4																								
INPUT 5	SW208	MIC 5																								
INPUT 5	SW229	MIC 5																								
Input	Switch No.	Setting																								
INPUT 4	SW228	AUX 1																								
INPUT 5	SW208	AUX 2																								
INPUT 5	SW229	AUX 2																								
INPUT 2 On <input type="checkbox"/> JUMPER <input type="checkbox"/> OFF SW202		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Input</th> <th>Jumper No.</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>INPUT 1</td> <td>SW201</td> <td>OFF</td> </tr> <tr> <td>INPUT 2</td> <td>SW202</td> <td>OFF</td> </tr> <tr> <td>INPUT 3</td> <td>SW203</td> <td>OFF</td> </tr> <tr> <td>INPUT 4</td> <td>SW204</td> <td>OFF</td> </tr> <tr> <td>INPUT 5</td> <td>SW207</td> <td>OFF</td> </tr> </tbody> </table>	Input	Jumper No.	Setting	INPUT 1	SW201	OFF	INPUT 2	SW202	OFF	INPUT 3	SW203	OFF	INPUT 4	SW204	OFF	INPUT 5	SW207	OFF						
Input		Jumper No.	Setting																							
INPUT 1		SW201	OFF																							
INPUT 2		SW202	OFF																							
INPUT 3		SW203	OFF																							
INPUT 4	SW204	OFF																								
INPUT 5	SW207	OFF																								
INPUT 3 On <input type="checkbox"/> JUMPER <input type="checkbox"/> OFF SW203																										
INPUT 4 On <input type="checkbox"/> JUMPER <input type="checkbox"/> OFF (When set as MIC 4) SW204																										
INPUT 5 On <input type="checkbox"/> JUMPER <input type="checkbox"/> OFF (When set as MIC 5) SW207																										

Fig. 12 - Balanced Condenser/Electret Microphone Wiring - Configuration Tables

INSTALLATION AND WIRING

PAGING FROM THE TELEPHONE SYSTEM

CAUTION: TO PREVENT POSSIBLE DAMAGE TO SPEAKERS OR THE AMPLIFIER ALL INPUT CONNECTIONS MUST BE MADE WITH THE AMPLIFIER OFF (POWER OFF).

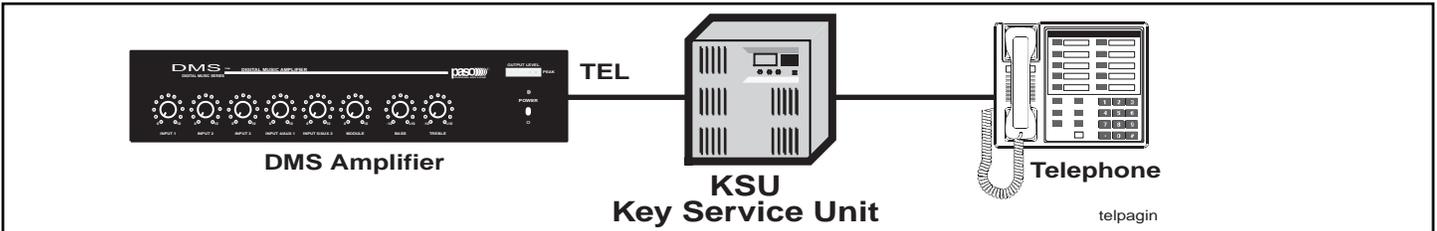


Fig. 13 - Connecting to the Telephone Paging KSU

WIRING - The Amplifier is interface ready for the Telephone line in applications requiring paging from the telephone system. The Telephone line Paging Output (Tip and Ring) can be directly connected to the TEL input and to the HOT and COM as shown in the wiring diagram Fig. 12A

CABLE - Use a two conductor twisted wire.

NOTE: The Telephone Paging Input is a Transformer Balanced 600 ohm input.

DO NOT GROUND THE TIP OR RING WIRE TO THE CHASSIS OF THE AMPLIFIER

OUTPUT LEVEL CONTROL - Use TEL OUTPUT LEVEL Control located on the Rear panel. After wiring adjust control for the desired output level.

VOICE ACTIVATED MUTING (VOX) - Muting of the AUX 1 channel (music muting) during Paging is automatic via the Voice Activated Muting System. No contact closure for the Muting Circuit is required from the Telephone system. For additional information on the Muting operation refer to the Muting Functions section of this Manual.

PHONE PAGING PRIORITY OVER MICROPHONES - Priority over any Microphone Input may be accomplished by setting the MIC Inputs MUTE Jumpers.

TELEPHONE SYSTEM PAGING WIRING

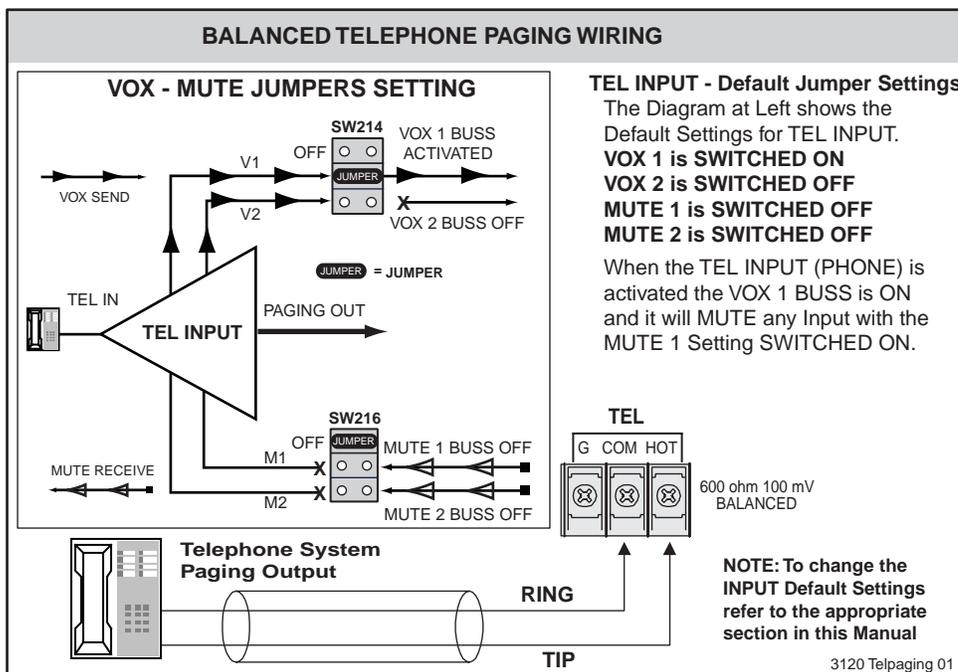


Fig. 13A - Balanced Telephone Input Wiring

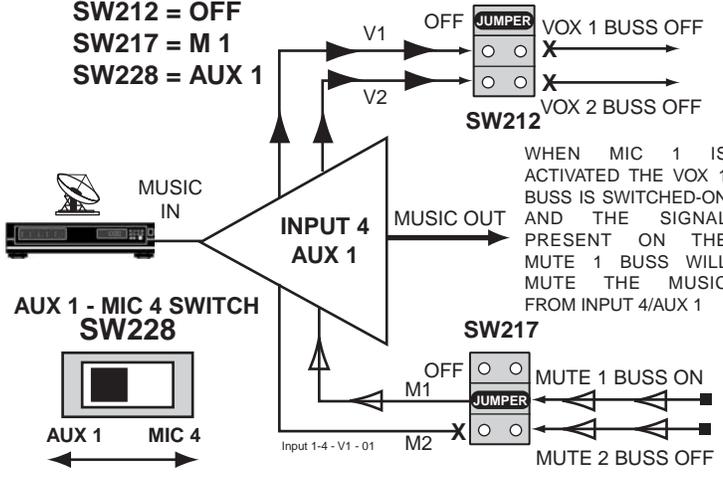
INSTALLATION AND WIRING

SETTING INPUT 4 AS AUX 1

INPUT 4/AUX 1 DEFAULT SETTING

DEFAULT JUMPERS AND SWITCH SETTING

SW212 = OFF
SW217 = M 1
SW228 = AUX 1



JUMPERS/SWITCH NO.	FACTORY SETTING
SW212 - VOX JUMPER	= OFF
SW217 - MUTE JUMPER	= M 1
SW228 - AUX1-MIC4 SWITCH	= AUX 1

AUX 1

INPUT 4 SET AS AUX 1 (Reference. 19)

The AUX 1 input is provided for high level program source. The output from a Satellite Receiver, Tuner, Tape Cassette Deck, CD Player or other high level program source may be directly connected to this input.

AUX 1 SENSITIVITY ATTENUATOR (Reference. 18)

The AUX 1 Input is equipped with a Sensitivity Attenuator that allows the interface of the Input with Devices having a wide range of Output Levels.

TYPICAL OUTPUT LEVEL OF MUSIC DEVICES:

Satellite Receivers	= 1 to 5 Volt
Digital Tuners/Receivers	= 100 to 300 Mv
CD Players/Changers	= 2 to 3 Volt
Tape Decks	= 500 to 700 Mv

By adjusting the Input Sensitivity to the level that matches the device used the correct interface with the Amplifier is achieved resulting in lower overall distortion and better frequency response characteristics.

SETTING THE AUX 1 INPUT ATTENUATOR

Connect a Music Source to the Amplifier. Turn Attenuator (rear panel) fully counterclockwise. Turn INPUT 4 Front Panel Control to midway. Switch Amplifier and Music Source ON. Turn Attenuator Control (rear panel) until desired Output Level is achieved. Adjust INPUT 4 Front Panel Level Control Up-Down as desired.

STEREO SUMMING

Most Music Source Devices provide a Stereo Output. Accordingly the Amplifier is equipped with two Jacks for the AUX 1 Input (L and R). The two Inputs are internally buffered and electronically mixed to Mono. This system ensures that the Music Device is properly loaded and that the Stereo Signals are correctly summed (L+R) to Mono without distortion.

CABLE

To connect the music source devices to the AUX 1 Input use two single conductor shielded audio cable terminated in a single prong phono plug on both ends.

AUX 1 INPUT MUTING

MUTING - WHEN MIC 1 OR THE TEL IN ARE ACTIVATED THE VOX 1 BUSS IS SWITCHED-ON AND THE SIGNAL PRESENT ON THE MUTE 1 BUSS WILL MUTE THE MUSIC FROM AUX 1.

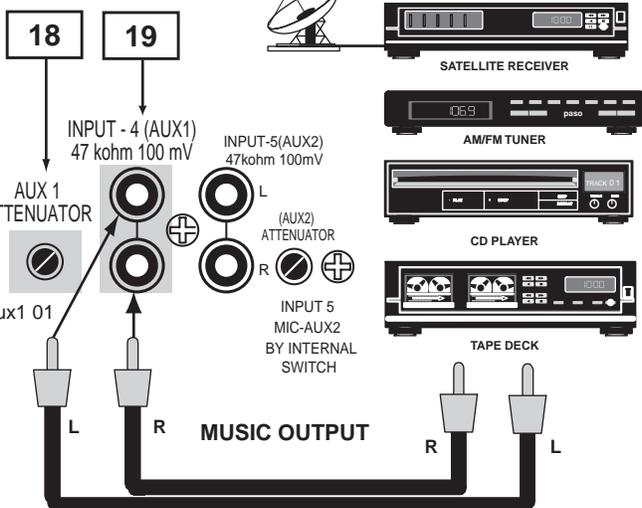


Fig. 14 - Rear Panel AUX 1 Input Diagram

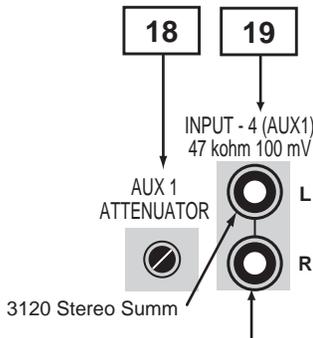


Fig. 14A - Stereo Summing and AUX 1 Input Attenuator

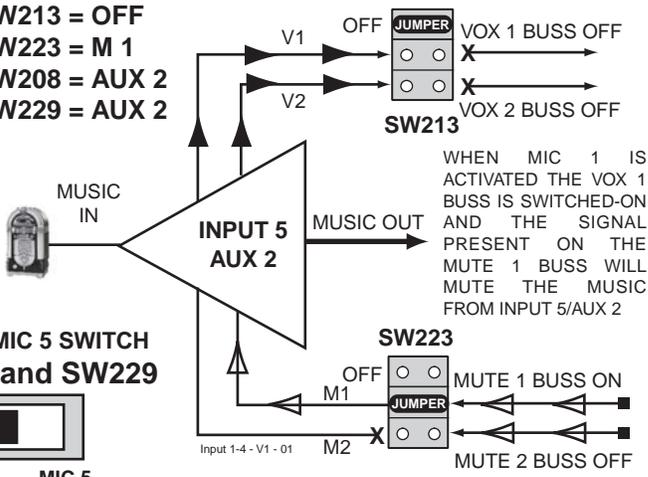
INSTALLATION AND WIRING

SETTING INPUT 5 AS AUX 2

INPUT 5/AUX 2 DEFAULT SETTING

DEFAULT JUMPERS AND SWITCH SETTING

SW213 = OFF
SW223 = M 1
SW208 = AUX 2
SW229 = AUX 2



JUMPERS/SWITCH NO.	FACTORY SETTING
SW213 - VOX JUMPER	= OFF
SW223 - MUTE JUMPER	= M 1
SW208 - AUX 2-MIC 5 SWITCH	= AUX 2
SW229 - AUX 2-MIC 5 SWITCH	= AUX 2

AUX 2

INPUT 5 SET AS AUX 2 (Reference. 20)

The AUX 2 input is provided for high level program source. The output from a Jukebox, Tuner, Tape Cassette Deck, CD Player or other high level program source may be directly connected to this input.

AUX 2 SENSITIVITY ATTENUATOR (Reference. 21)

The AUX 2 Input is equipped with a Sensitivity Attenuator that allows the interface of the Input with Devices having a wide range of Output Levels.

TYPICAL OUTPUT LEVEL OF MUSIC DEVICES:

Satellite Receivers	= 1 to 5 Volt
Digital Tuners/Receivers	= 100 to 300 Mv
CD Players/Changers	= 2 to 3 Volt
Tape Decks	= 500 to 700 Mv

By adjusting the Input Sensitivity to the level that matches the device used the correct interface with the Amplifier is achieved resulting in lower overall distortion and better frequency response characteristics.

SETTING THE AUX 2 INPUT ATTENUATOR

Connect a Music Source to the Amplifier. Turn Attenuator (rear panel) fully counterclockwise. Turn INPUT 5 Front Panel Control to midway. Switch Amplifier and Music Source ON. Turn Attenuator Control (rear panel) until desired Output Level is achieved. Adjust INPUT 5 Front Panel Level Control Up-Down as desired.

STEREO SUMMING

Most Music Source Devices provide a Stereo Output. Accordingly the Amplifier is equipped with two Jacks for the AUX 1 Input (L and R). The two Inputs are internally buffered and electronically mixed to Mono. This system ensures that the Music Device is properly loaded and that the Stereo Signals are correctly summed (L+R) to Mono without distortion.

CABLE

To connect the music source devices to the AUX 1 Input use two single conductor shielded audio cable terminated in a single prong phono plug on both ends.

AUX 2 INPUT MUTING

MUTING - WHEN MIC 1 OR THE TEL IN ARE ACTIVATED THE VOX 1 BUSS IS SWITCHED-ON AND THE SIGNAL PRESENT ON THE MUTE 1 BUSS WILL MUTE THE MUSIC FROM AUX 2.

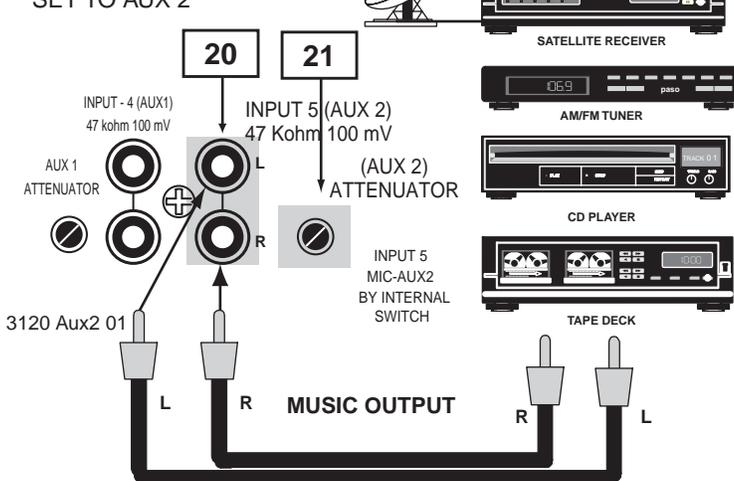


Fig. 15 - Rear Panel AUX 2 Input Diagram

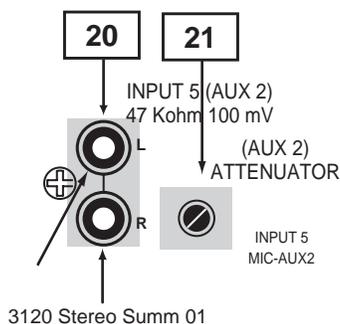


Fig. 15A - Stereo Summing and AUX 2 Input Attenuator

INSTALLATION AND WIRING

ADDRESSABLE DUAL VOX SYSTEM

VOX - VOICE ACTIVATED MUTING

DUAL VOX - VOICE ACTIVATED MUTING - The Amplifier is equipped with a DUAL noiseless, fast acting Logic VOX Switching System. When any of the INPUTS are activated and a Signal is present on a given INPUT and either VOX 1 or VOX 2 or BOTH are Switched-ON (using internal Jumpers) then the MUTE 1 or MUTE 2 BUSS or BOTH are ACTIVE. If any of the INPUTS have the MUTE 1 or MUTE 2 Switched-ON (by Internal Jumpers) then the INPUT (or INPUTS) will be MUTED according to the Jumpers Setting. Once the SIGNAL-ON on the ACTIVE INPUT is terminated the normal functions are automatically restored on all muted inputs.

ACCESS TO VOX AND MUTE JUMPERS
REFER TO JUMPERS AND SWITCHES INTERNAL ACCESS.

CAUTION: PRIOR TO PERFORMING THE ABOVE OPERATION BE SURE TO FOLLOW THE SAFETY NOTES REFERRING TO THE REMOVAL OF THE AMPLIFIER COVER.

VOX SENSITIVITY CONTROLS

VOX 1 AND VOX 2 SENSITIVITY CONTROLS

The VOX 1 and VOX 2 Sensitivity Controls set the sensitivity level at which point the VOX 1 and VOX 2 are respectively engaged during INPUT ACTIVATION. The VOX Sensitivity Controls are located on the Amplifier Rear Panel.

VOX 1 SENSITIVITY CONTROL = Reference 33
VOX 2 SENSITIVITY CONTROL = Reference 32

VOX SENSITIVITY CONTROLS

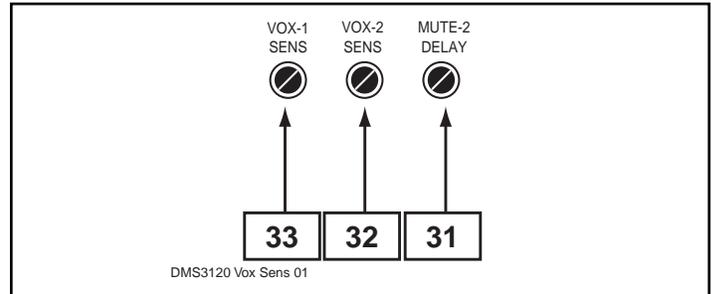


Fig. 16 - Rear Panel VOX 1 and VOX 2 Sensitivity Control and MUTE 2 Delay Control

VOX SENSITIVITY ADJUSTMENT

VOX SENSITIVITY ADJUSTMENT

- 1) Turn all Front Panel Input Level Controls to 0.
- 2) Turn VOX Sensitivity Control counterclockwise until it stops.
- 3) Connect a Signal Source (Microphone, Telephone or Music) to the respective Input Terminals (For connection details refer to the appropriate section in this Manual).
- 4) While talking from a Paging Source (Microphone or Telephone) or Playing Music rotate the INPUT LEVEL CONTROLS (Front Panel) until the desired output level is achieved.
- 5) While talking from a Paging Source (Microphone or Telephone) or Playing Music, turn the Sensitivity Control (VOX 1 or VOX 2) slowly clockwise until the Muting (MUTE 1 or MUTE 2) is activated.

VOX JUMPERS DEFAULT SETTING TABLE

JUMPER ID NO.	JUMPER REFERENCE	FUNCTION DESCRIPTION	FACTORY SETTING	FACTORY SETTING
MAIN PCB JUMPERS				
SW210	INPUT 2 -	VOX1 - VOX2 - OFF	OFF	
SW211	INPUT 3 -	VOX1 - VOX2 - OFF	OFF	
SW212	INPUT 4 -	VOX1 - VOX2 - OFF	OFF	
SW213	INPUT 5 -	VOX1 - VOX2 - OFF	OFF	
SW214	TEL IN -	VOX1 - VOX2 - OFF		V1
SW215	INPUT 1 -	VOX1 - VOX2 - OFF		V1
SW221	MODULE -	VOX1 - VOX2 - OFF	OFF	

INSTALLATION AND WIRING

ADDRESSABLE DUAL MUTING SYSTEM

DUAL MUTING SYSTEM - The Amplifier is equipped with a DUAL noiseless, fast acting Logic MUTING Switching System. When any of the INPUTS are activated and a Signal is present on a given INPUT and either VOX 1 or VOX 2 or BOTH are Switched-ON (using internal Jumpers) then the MUTE 1 or MUTE 2 BUSS or BOTH are ACTIVE. If any of the INPUTS have the MUTE 1 or MUTE 2 Switched-ON (by Internal Jumpers) then the INPUT (or INPUTS) will be MUTED according to the Jumpers Setting. Once the SIGNAL-ON on the ACTIVE INPUT is terminated the normal functions are automatically restored on all muted inputs.

ACCESS TO MUTE JUMPERS

REFER TO JUMPERS AND SWITCHES INTERNAL ACCESS.

CAUTION: PRIOR TO PERFORMING THE ABOVE OPERATION BE SURE TO FOLLOW THE SAFETY NOTES REFERRING TO THE REMOVAL OF THE AMPLIFIER COVER.

MUTING TIMING - The MUTING is preset for -60 db Attenuation. When MUTE 1 or 2 are activated the MUTE BUSS is instantaneously Switched-ON. When the Muting is deactivated the program source is gradually restored.

MUTE 1 (M1) = TIMING PRESET 2-3 SECONDS
MUTE 2 (M2) = TIMING ADJUSTABLE 3-30 SECONDS
MUTE 2 DELAY = USE REAR PANEL CONTROL Reference 31

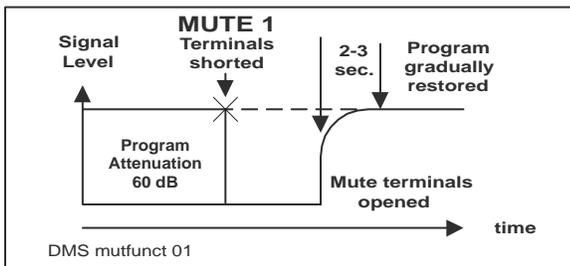


Fig. 17B - M 1 Function Timing Diagram

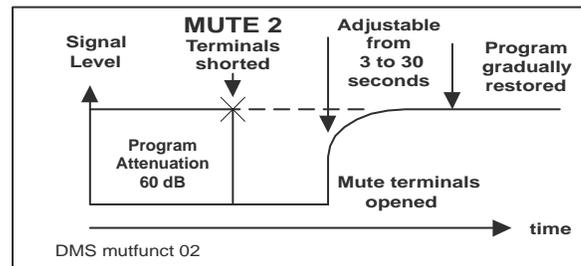


Fig. 17C - M 2 Function Timing Diagram

DIRECT MUTING

DIRECT MUTING - Direct Muting may be accomplished by shorting the MUTE 1 and MUTE 2 Terminals to the G Terminal through an external switch. Each time the Muting Switch is closed the corresponding MUTE BUSS is activated.

WIRING

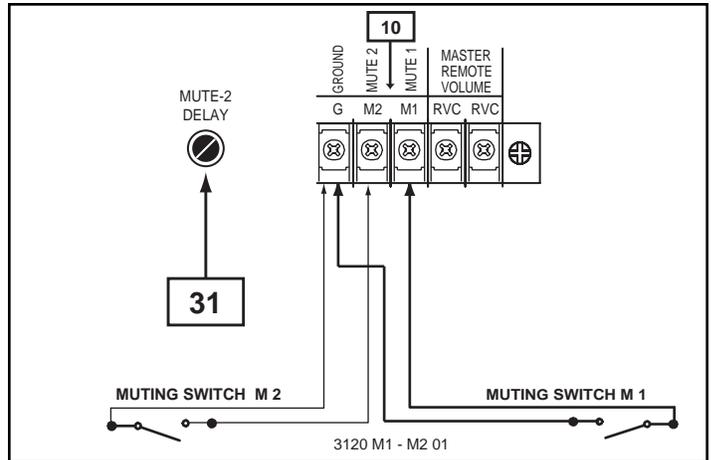


Fig. 17 - Direct Muting Terminals and Diagram

MUTE 2 DELAY - The M 2 Delay can be adjusted by using the MUTE 2 DELAY CONTROL on the rear panel (reference 31).

MUTE JUMPERS DEFAULT SETTING TABLE

JUMPER ID NO.	JUMPER REFERENCE	FUNCTION DESCRIPTION	FACTORY SETTING	FACTORY SETTING
MAIN PCB JUMPERS				
SW206	VOX RELAY -	MUTE 1 - MUTE 2		M1
SW216	TEL IN -	MUTE 1 - MUTE 2 - OFF	OFF	
SW217	INPUT 4/AUX 1 -	MUTE 1 - MUTE 2 - OFF		M1
SW218	INPUT 3 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW219	INPUT 2 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW220	INPUT 1 -	MUTE 1 - MUTE 2 - OFF	OFF	
SW222	MODULE -	MUTE 1 - MUTE 2 - OFF	OFF	
SW223	INPUT 5/AUX 2 -	MUTE 1 - MUTE 2 - OFF		M1
SW227	CHIME TRIGGER -	MUTE 1 - MUTE 2		M1

INSTALLATION AND WIRING

CAUTION ! REMOVAL OF THE AMPLIFIER COVER PRESENTS AN ELECTRICAL SHOCK HAZARD ALWAYS REMOVE THE POWER CORD FROM THE AC WALL OUTLET

THE FOLLOWING INSTRUCTIONS REQUIRE THE REMOVAL OF THE AMPLIFIER PROTECTIVE COVER AND ARE PROVIDED FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID THE RISK OF ELECTRICAL SHOCK DO NOT PERFORM ANY INSTALLATION OR SERVICING UNLESS YOU ARE QUALIFIED TO DO SO.

INPUT 1 (MIC 1) UNMUTING FUNCTION

DIRECT UNMUTING

INPUT 1 (MIC 1) UNMUTING FUNCTION

The Input 1 (MIC 1) can be preset to be normally MUTED (INPUT OFF) when the **JUMPER SW205 - MIC 1 UNMUTE - IS SET TO THE ON POSITION**. The MIC 1 is SWITCHED-ON when the UNMUTE and G Terminals are shorted by a Switch Contact Closure. This function allows for a multi zone installation using two or more Amplifiers and a single Microphone and Zone Switches. When the Jumper SW205 is set to the ON Position the Microphone Input is OFF and it is turned ON when the UNMUTE and the G terminals are closed by a switch.

JUMPER NO.	FUNCTION	POSITION SET
SW205	MIC 1 Muted	ON

If the Jumper requires resetting follow the instruction below.

ACCESS TO UNMUTING JUMPER

- 1) Remove Power Cord from AC Outlet.
- 2) Remove the three screws on each side of the Amplifier securing the Top Cover to the Chassis.
- 3) Lift Cover and carefully and slide Cover out towards the rear.
- 4) On the Main Amplifier Printed Board locate the SW205 - MIC 1 UNMUTE Jumper Set.
- 5) Set Jumper to the ON position.

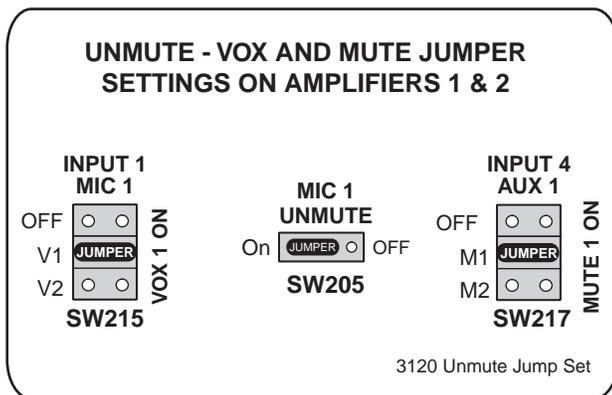


Fig. 18A - 2 - Zone System Jumper Settings

The Fig. at right shows a typical 2 Zone Switching Panel. Use SPST Momentary Contact Switches. See complete 2 - Zone Wiring Diagram provided in this Manual.

WIRING

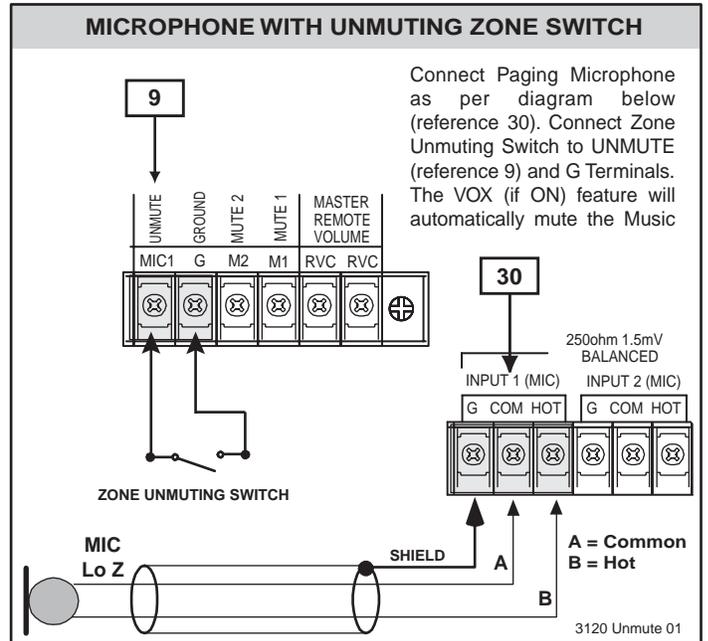


Fig. 18 - Microphone and Zone Unmuting Diagram

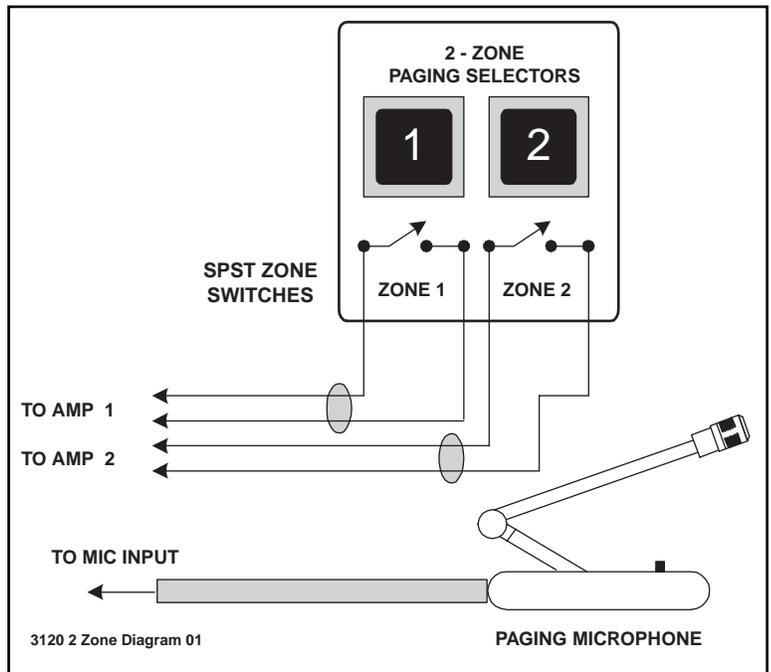
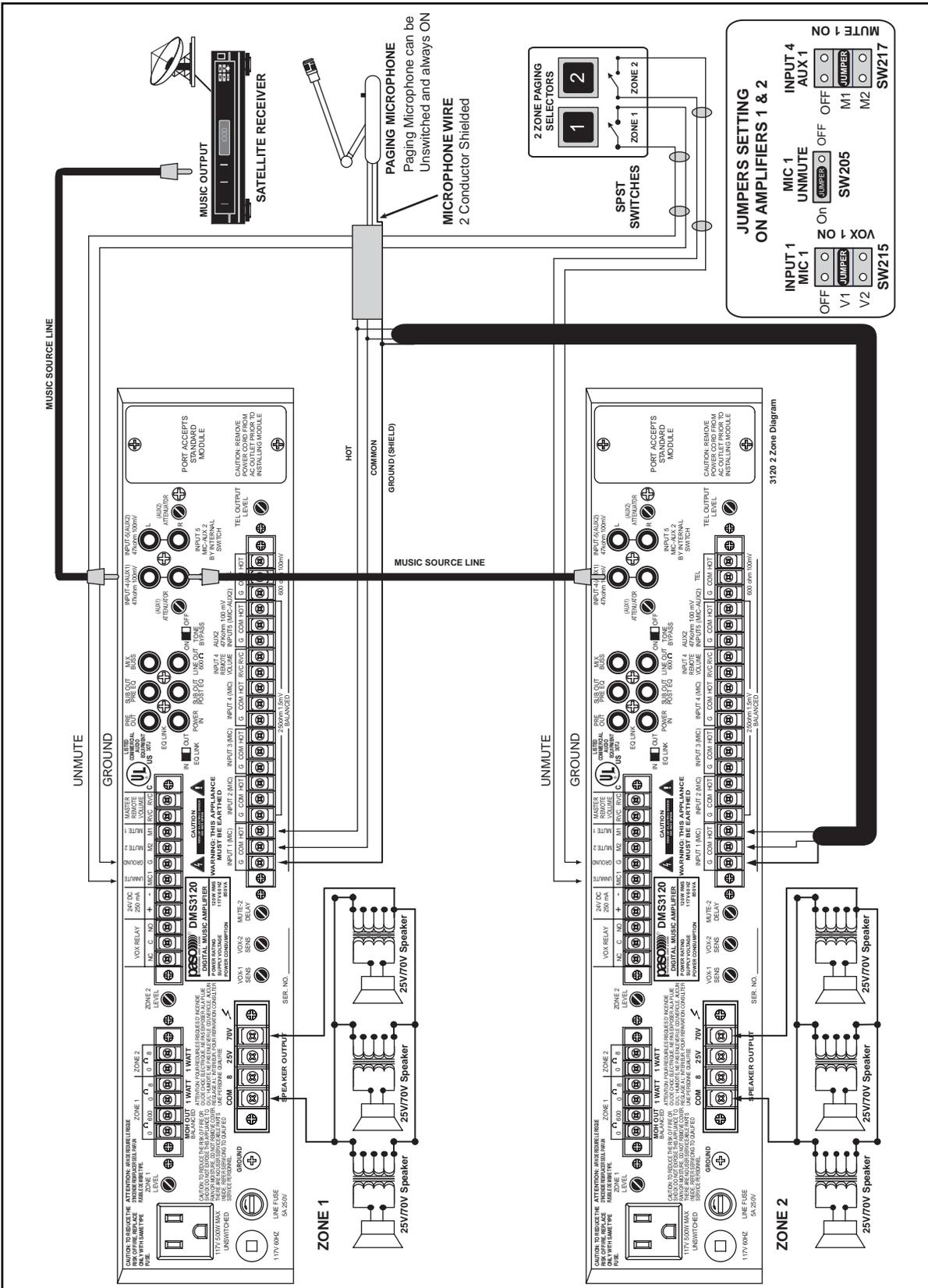


Fig. 18B - 2 - Zone Switching Panel

INSTALLATION AND WIRING

2 ZONE PAGING AND MUSIC WIRING DIAGRAM

Fig. 19 - 2 Zone Paging and Music System



OPERATION - A 2 - Zone Paging Wiring Diagram Application is provided. The Paging Microphone is connected in parallel to all the Microphone Inputs. Two Independent SPST Switches are provided for the Paging Zone Selection. MUSIC - The MUSIC SOURCE (Satellite Receiver) is cascade connected to the two Amplifiers. ZONE PAGING - When one or more Zone Switches are activated the UNMUTE Function OPENS the Microphone Channel on the Amplifier selected and the MICROPHONE is active for the PAGING. Simultaneously the MUSIC is MUTED ONLY ON THE ZONE (OR ZONES) SELECTED. Independent MUSIC SOURCE may be provided to each of the Amplifiers if required. MOH - MUSIC ON HOLD is available from each of the Amplifiers used. The MOH source may be selected from either the AUX 1, AUX 2 or the MODULE Input and is immune to Paging or the MUTE/UNMUTE Function.

INSTALLATION AND WIRING

EXTERNAL EQUALIZER LINK

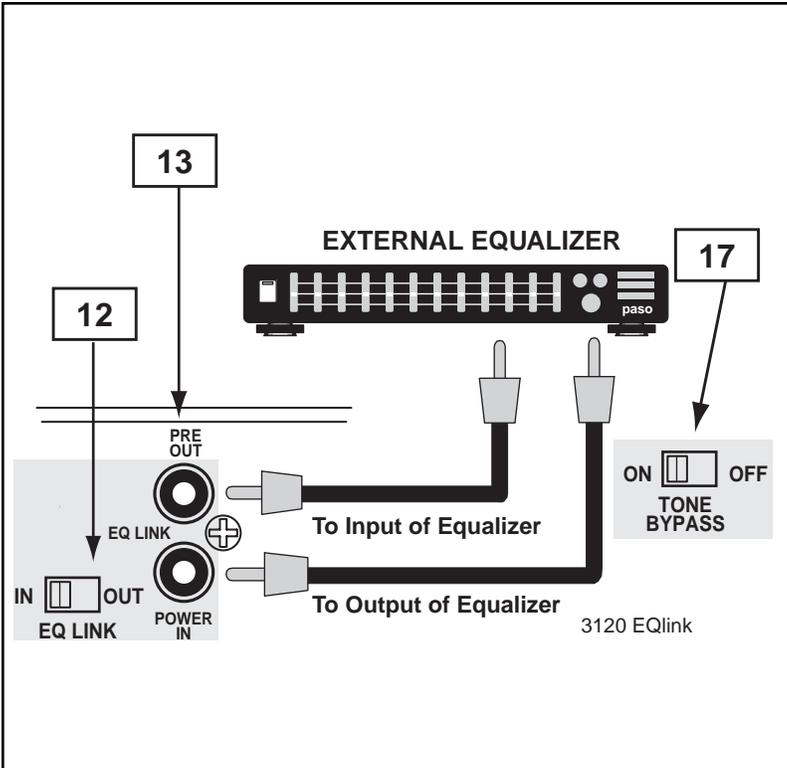


Fig. 20 - Rear Panel External Equalizer Link Diagram

SET EQ LINK SWITCH TO IN

SET TONE BY PASS SWITCH TO ON

CONNECTING TO AN EXTERNAL EQUALIZER

The Amplifier is equipped with an External Equalizer Link to allow the use of an External Equalizer for applications requiring *Frequency Selective Acoustic Correction*. The Amplifier is furnished with the two jacks of the Link bridged by a SELECTOR SWITCH. When the **EQ LINK Switch (REFERENCE 12)** is the **IN** position the internal Preamplifier to Amplifier Link (Reference 13) is broken allowing the insertion of an External Equalizer.

INSTALLATION TIPS

- 1) Use high quality, short length audio cables and position the Equalizer in close proximity to the Amplifier. Avoid mounting the EQ on top of the Amplifier unless is Rack mounted.
- 2) Be sure that the Amplifier input controls and the EQ level control are set at zero prior to turning the system On.
- 3) The Amplifier TONE BY PASS SWITCH (Reference 17) should be set to ON (linear response position).
- 4) Carefully adjust the EQ Level Control to avoid distortion caused by excessive signal boost.
- 5) Follow the instructions supplied with the Equalizer.

WIRING

To connect to an External Equalizer use two (2) single conductor shielded audio cables terminated in a single prong phono plug on both ends.

MIX BUSS BRIDGING

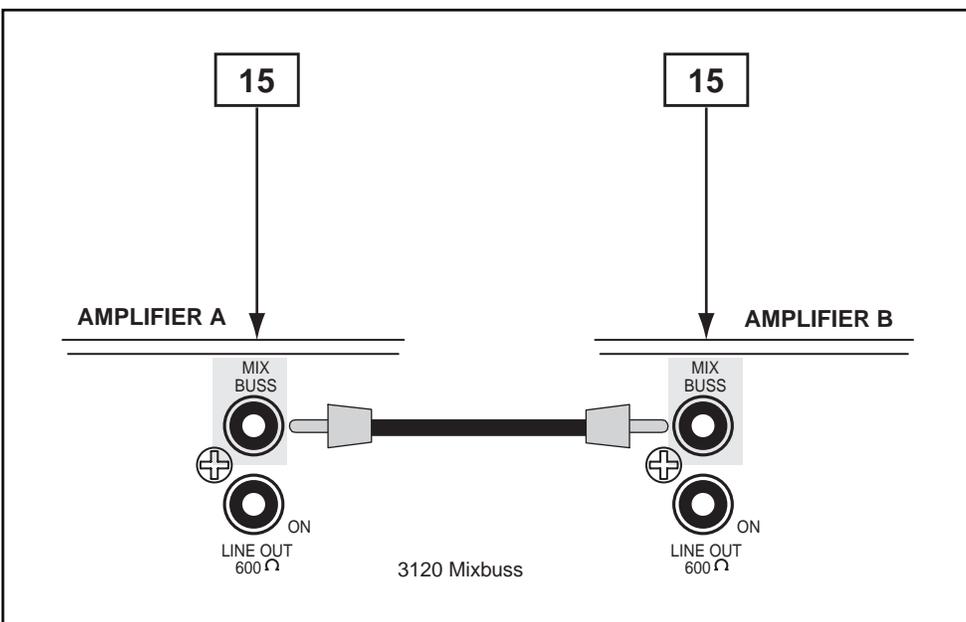


Fig. 20B - Rear Panel Mix Buss Bridging Diagram

MIX BUSS BRIDGING

BRIDGING TWO AMPLIFIERS

The MIX BUSS (Reference 15) allows two Amplifiers to be bridged and share all inputs.

All signal sources connected to all the inputs are common to the output of both amplifiers. Muting and level controls operate in exactly the same way as if only one amplifier was used.

WIRING

CABLE

To bridge two amplifiers or to connect to an external Mixer use a single conductor shielded audio cable terminated in a single prong phono plug on both ends.

INSTALLATION AND WIRING

MASTER REMOTE VOLUME

INPUT 4 (AUX 1) REMOTE VOLUME

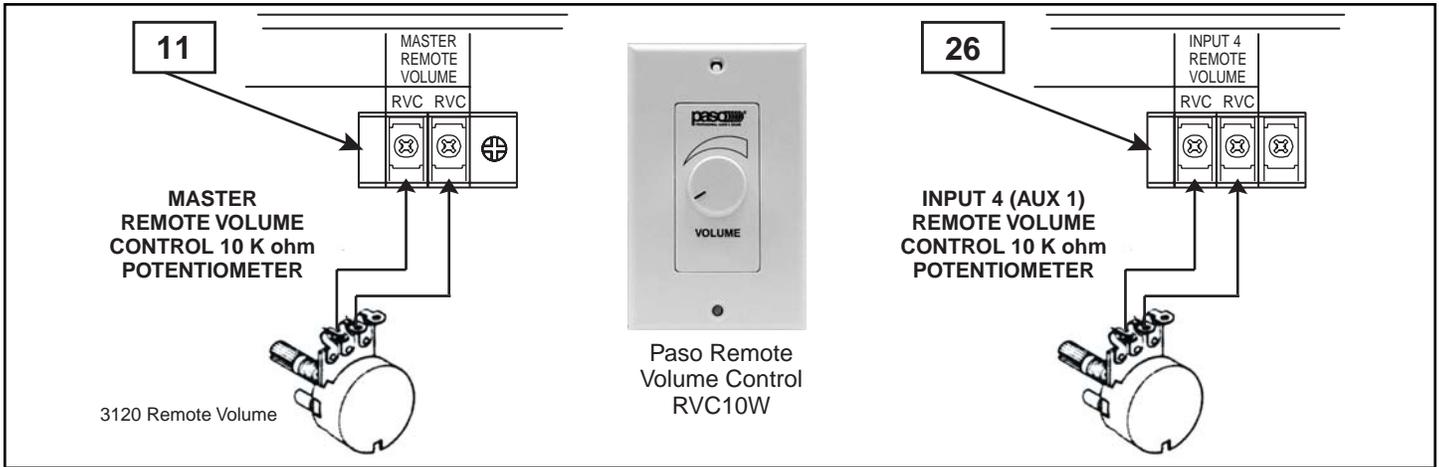


Fig. 21 - Master Remote Volume Control Diagram

Fig. 21B - Input 4 Remote Volume Control Diagram

REMOTE VOLUME CONTROLS

The Amplifier features two independent Remote Volume Control Capability: The INPUT 4 (AUX 1) Remote Volume (Reference 26) and the MASTER REMOTE VOLUME CONTROL (Reference 11). A 10 K ohm Potentiometer is required for either control. Mount the 10 K Pot on a suitable Wall Plate or any other convenient surface and connect to the Amplifier RVC Terminals as shown in the Diagram. The Paso Model RVC10W Decora Style Remote Volume Control may be used.

INPUT 4 (AUX 1) OPERATION

When connected the Remote Volume adjusts the INPUT 4 (AUX 1) Level only. Usually this input is utilized for the Music Source (Satellite Receiver, CD Player, etc.).

MASTER VOLUME OPERATION

The Control is a Master Volume and controls all the Inputs of the Amplifier with the exception of the MOH and ZONE 1 and ZONE 2 Outputs.

CABLE

To connect the Remote Control to the Amplifier use a two conductor wire not less than AWG 24. While the Remote Volume System uses DC rather than audio caution should be exercised in the layout of the wire. Always avoid routing next to power lines. If the total wire resistance exceeds 3 K ohm the Volume may not go down to zero.

REMOTE VOLUME CONTROL - OPTIONAL ACCESSORY

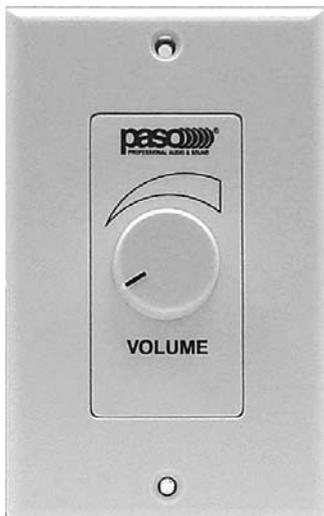


Fig. 21C - RVC10W Front View

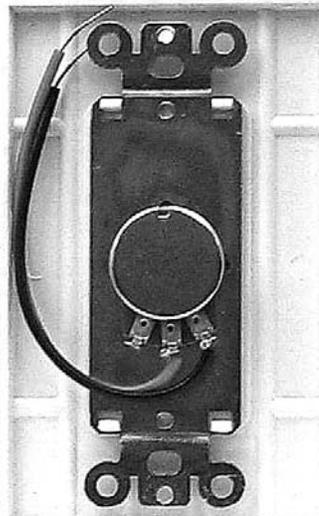


Fig. 21D - RVC10W Rear View

MODEL RVC10W REMOTE VOLUME CONTROL
Remote Volume Control Potentiometer. Single Gang Decora Style Plate.

SPECIFICATIONS

Control: 10 K ohm High Quality Control.
Connection: 6" Two Wire, color coded (Black and Red) Pigtails stripped and tinned. Color Finish: White. Dimensions: Front Plate = 4.5" High, 2.75" Wide. Depth: 0.5". Mounting Hardware: Supplied.

INSTALLATION AND WIRING

INSTALLING A MODULE

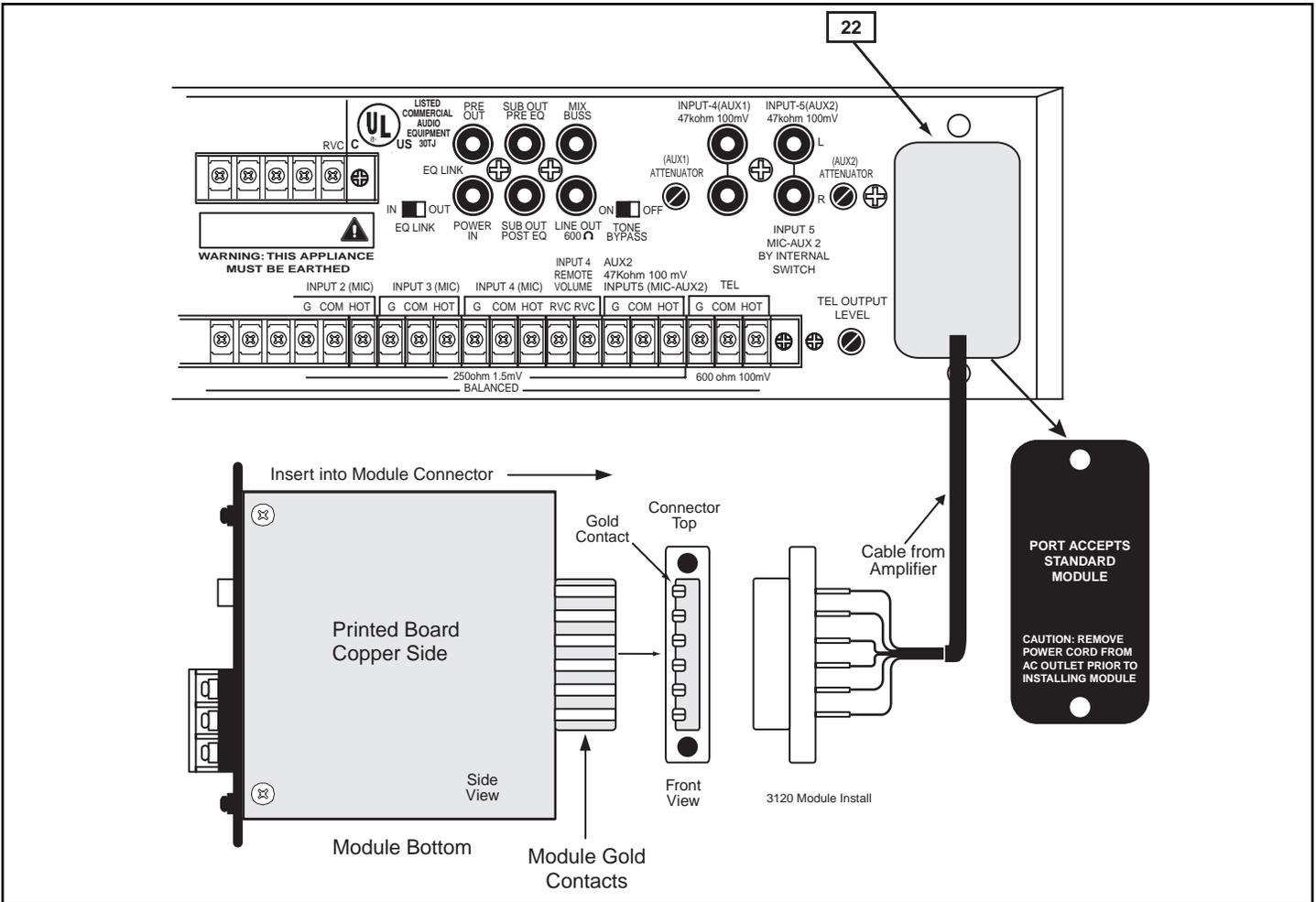


Fig. 22 - Rear Panel Module Installation Diagram

MODULE INSTALLATION

MODULE TYPE

The Amplifier accepts Audio Modules having a 6 Contact PCB Derivation. Module mounting panel should be 3" H., 1-3/8" W. (78 X 35 mm).

INSTALLATION

CAUTION: REMOVE POWER CORD FROM AC OUTLET PRIOR TO INSTALLING A MODULE. BE SURE THAT THE MODULE OUTPUT LEVEL CONTROL IS SET AT "0" PRIOR TO THE INSTALLATION.

- 1) Locate Rear Panel Module Port (Reference 22) and unscrew the two crosshead screws holding the cover and set aside.
- 2) Reach inside the Amplifier and gently pull-out the Module Blue Ribbon Connector. If the Connector is tied to the chassis remove the Amplifier Top Cover and with a cutter cut the Nylon Tie holding the connector.

NOTE: BE CAREFUL NOT TO CUT THE CONNECTOR WIRE HARNESS.

- 3) Pull-out the blue-ribbon connector through the port opening (do not pull-out wire harness excessively).
- 4) By keeping the connector gold contacts on the left insert the Module PCB contacts into the socket.
- 5) Push Module through port opening and secure to rear panel by using the two screws removed with the Module cover.

INSTALLATION AND WIRING

MODULE CONNECTOR DIAGRAM

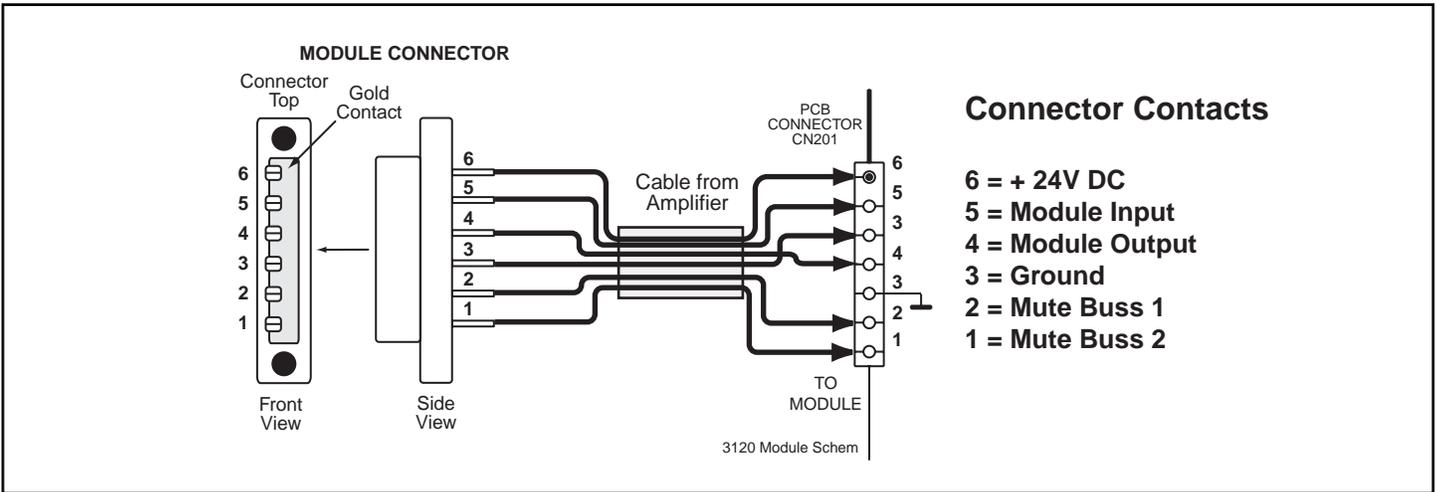


Fig. 23 - Module Connector Contacts Diagram

MODULE CONNECTOR DIAGRAM - The above Diagram indicates the function of each of the six contacts of the Module Connector. The Module Blue Ribbon Connector is attached to a wire harness and left floating beyond the Module Port Cover. The Wire Harness Amplifier End is attached to Connector No. CN201 and plugged into the mating connector on the Main Printed Circuit Board.

MODULE DEFAULT SETTINGS

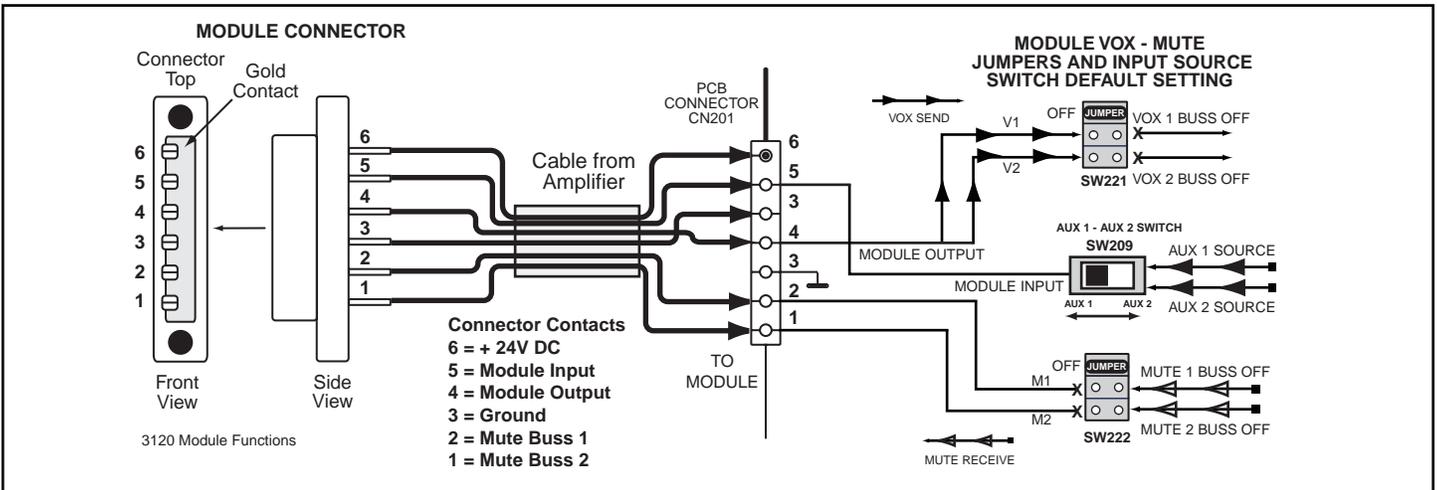


Fig. 23A - Module VOX - MUTE - INPUT SOURCE Default Settings

MODULE FUNCTIONS - The Module Port accepts a standard audio Module. When a Module is utilized several functions can be activated by the Jumpers and Switch provided for this Input.

VOX SEND - The **SW221** Jumpers Set activates the VOX 1 - VOX 2 SEND or both. When a Signal is present at the Module Output (Contact 4) then the VOX BUSS selected will be active.

MUTE RECEIVE - The **SW222** Jumpers Set activates the

MUTE 1 - MUTE 2 RECEIVE or both. When a Signal is present at the MUTE BUSS 1 or MUTE BUSS 2 the MODULE will be MUTED accordingly.

INPUT SOURCE - The **SW209** Switch selects the Input Source for the Module either AUX 1 or AUX 2. The Signal present at either Input will be sent to the MODULE INPUT (Contact 5).

By selecting the proper Setting several functions can be derived from the Module.

INSTALLATION AND WIRING

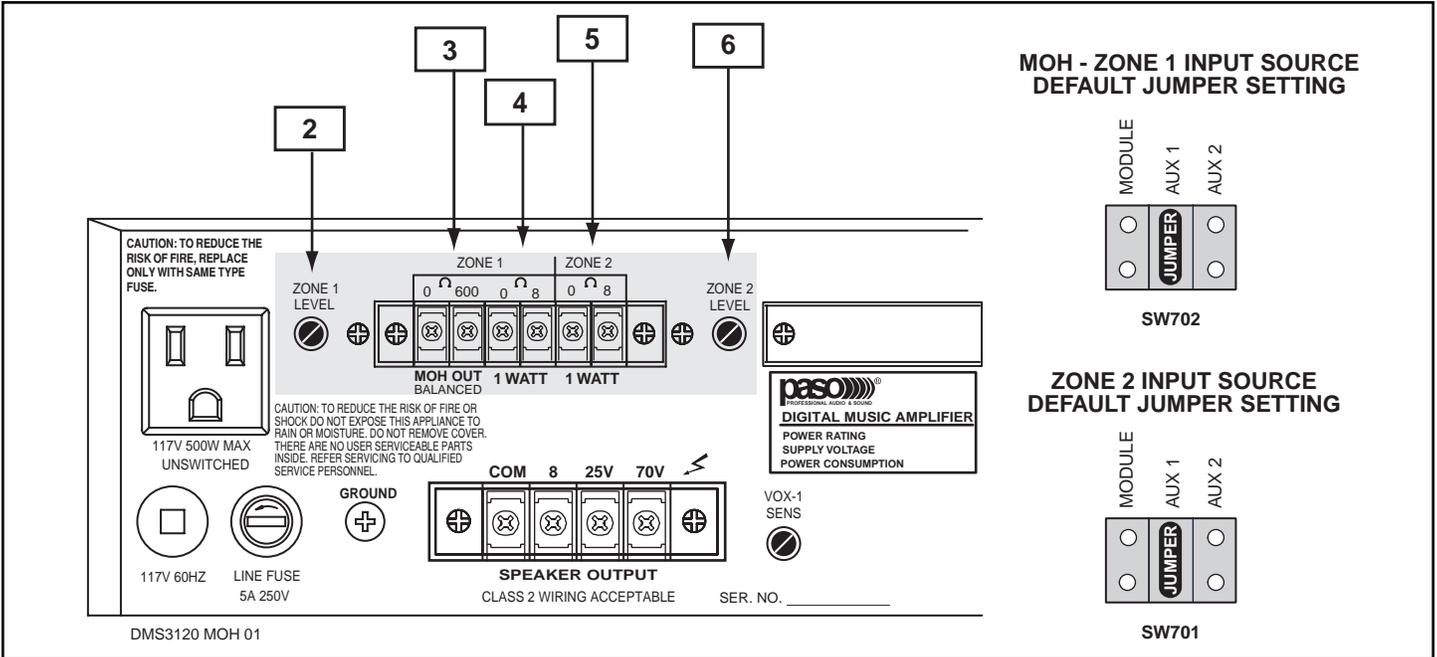


Fig. 24 - Rear Panel View - ZONE 1 - ZONE 2 - MOH Outputs - Source Selectors and Controls

ZONE 1 MOH AND 8 OHM OUTPUTS

ZONE 1 OUTPUTS

The DMS Amplifier is equipped with two 1 Watt, 8 ohm Amplifiers and a separate 600 ohm MUSIC ON HOLD AMPLIFIER.

600 Ohm MOH - The MOH Output provides a 600 ohm, 1 Volt Transformer Balanced Output (Reference 3).

1 WATT, 8 Ohm - Simultaneously a Second Zone 8 ohm, 1 Watt Output may be utilized to drive up to 4 Speakers (Reference 4).

OUTPUT LEVEL CONTROL - A Level Control for both the 600 ohm Output and the 1 Watt Output is provided (Reference 2)

MOH AND 8 Ohm AMPLIFIER INPUT SOURCE SELECTION

The program source for the Input of the 600 ohm MOH Output and the 8 ohm Output can be selected from either AUX 1 - AUX 2 or the MODULE source. Set the Jumpers Set No. SW 702 to desired position. Default setting is AUX 1.

ZONE 2 OUTPUT

1 WATT, 8 Ohm - A Second Zone 8 ohm, 1 Watt Output may be utilized to drive up to 4 Speakers (Reference 5).

OUTPUT LEVEL CONTROL - A Level Control for the 1 Watt Output is provided (Reference 6)

ZONE 2 - 8 Ohm AMPLIFIER INPUT SOURCE SELECTION

The program source for the Input of the 8 ohm Output can be selected from either AUX 1 - AUX 2 or the MODULE source. Set the Jumpers Set No. SW 701 to desired position. Default setting is AUX 1.

MOH - ZONE 1 & 2 AMPLIFIER FUNCTIONS

MOH AMPLIFIER

- a) The MOH Amplifier can receive programs from AUX 1 - AUX 2 and the MODULE.
- b) Selection of the input source is by Internal Jumper.
- c) The ZONE 1 independent 600 Ohm and 8 Ohm Outputs may be used simultaneously.
- d) The MOH 600 ohm Output is Transformer Balanced.
- e) The Rear Panel ZONE 1 Level Control operates both the 600 Ohm and 8 Ohm Outputs simultaneously.

MOH AND ZONE 1-2 OPERATION ISSUES

- 1) Paging from the Microphone Inputs or the Telephone Input does not effect the MOH/ZONE 1-2 Amplifier.
- 2) Position of the INPUTS Level Control does not affect the MOH/ZONE 1-2 Amplifier Output Level.
- 3) Position of the AUX 1 and AUX 2 ATTENUATOR does not affect the MOH/ZONE 1-2 Amplifier Output Level.
- 4) Muting activation of M1 or M2 Buss (from Microphones or Telephone) does not effect the Output of the MOH/ZONE 1-2 Amplifier except if the INPUT SOURCE is set to MODULE and the Module Output is Muted. See Module Settings.

INSTALLATION AND WIRING

MOH CONNECTIONS

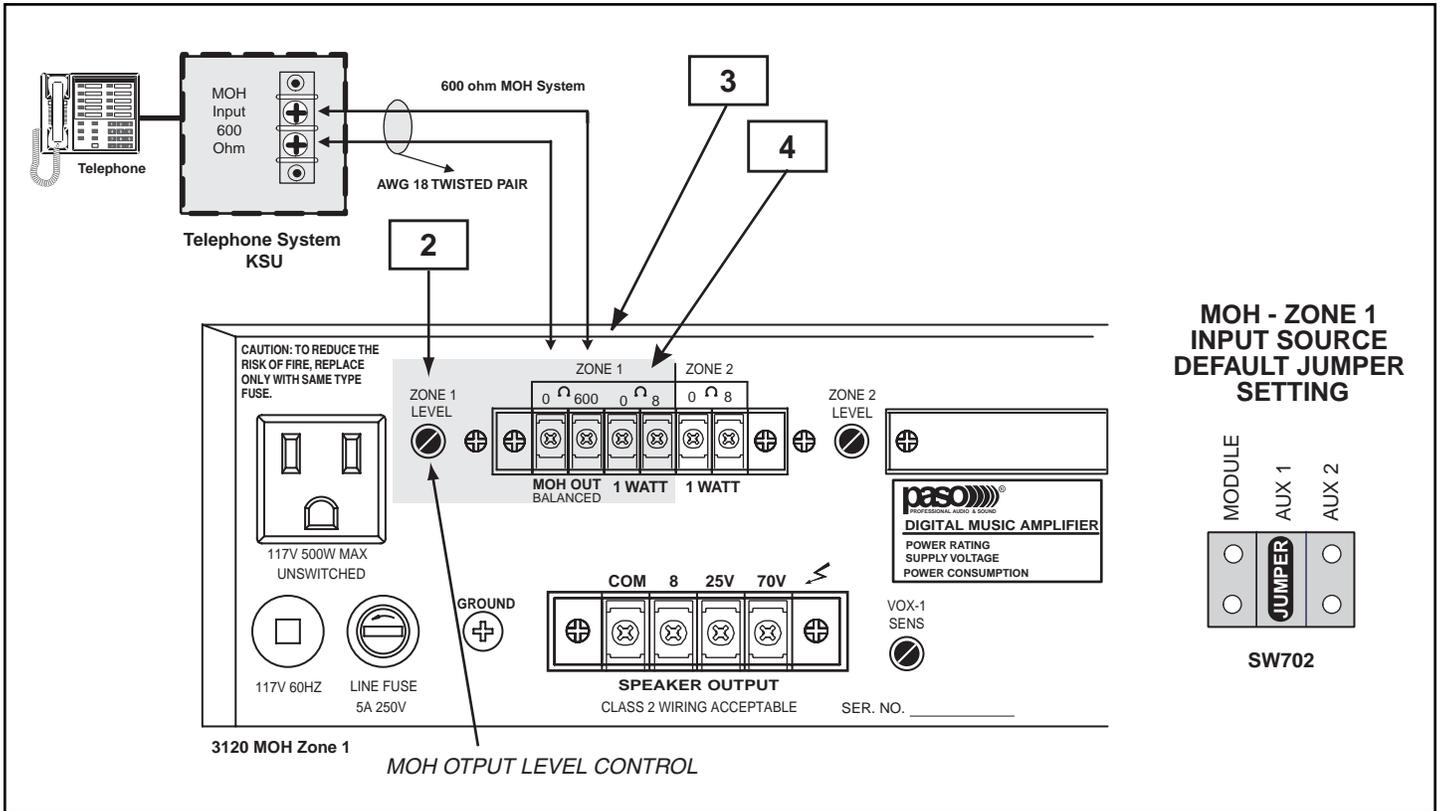


Fig. 25 - Rear Panel MOH Connection Diagram

MUSIC ON HOLD AMPLIFIER

MOH AMPLIFIER

An independent 600 ohm, 1 Volt Output, Transformer Balanced MUSIC-ON-HOLD Amplifier is provided. The Input SOURCE of the MOH Amplifier can be selected from either the AUX 1 - AUX 2 or MODULE.

MOH - 600 OHM SYSTEM

Most Phone systems operate on a 600 ohm Input Impedance, if the Impedance required is 600 ohm connect the Amplifier to the Phone System MOH by using the diagram above (Reference 3).

MOH - 8 OHM, 1 WATT SYSTEM

Some older Key Phone systems require a 1 watt Power Output having an Output Impedance of 8 ohm to drive the Music on Hold feature. If the Impedance required is 8 ohm connect the Phone system MOH to the 8 ohm, 1 Watt MOH Output of the Amplifier (Reference 4).

CABLE

Use a cable consisting of a twisted pair of at least AWG 18. Use care in extending the cable and avoid routing near power lines, fluorescent lights and other systems that may generate a disturbing electric field.

SOURCE SELECTOR

Select the Input Source desired by following the instructions at right.

CAUTION: REMOVAL OF THE COVER PRESENTS AN ELECTRICAL SHOCK HAZARD !

LEVEL CONTROL

After the wiring is completed adjust the MOH/ZONE 1 Amplifier Level Control on the rear panel to the desired output level (Reference 2).

MOH/ZONE 1 AMPLIFIER SOURCE SELECTOR

MOH/ZONE 1 SOURCE SELECTOR

The Source for the MOH/ZONE 1 Amplifier can be selected from either the AUX 1 - AUX 2 or MODULE by setting the JUMPER SET No. SW702 provided for this purpose. Default Setting for this Jumper Set is AUX 1. To change the setting do the following:

ACCESS TO THE MOH/ZONE 1 INPUT SOURCE SETTING

- 1) Remove Power Cord from AC Outlet.
- 2) Remove the three screws on each side of the amplifier holding the amplifier cover.
- 3) Lift Cover and locate the Jumpers Set No SW702 on the MOH Amplifier Board (see Function Switches Jumpers Location Diagram).
- 4) Set Jumper as required (AUX 1 - AUX 2 or MODULE)
- 5) Replace protective cover.

INSTALLATION AND WIRING

USING SPEAKERS FOR ZONE 1 - ZONE 2

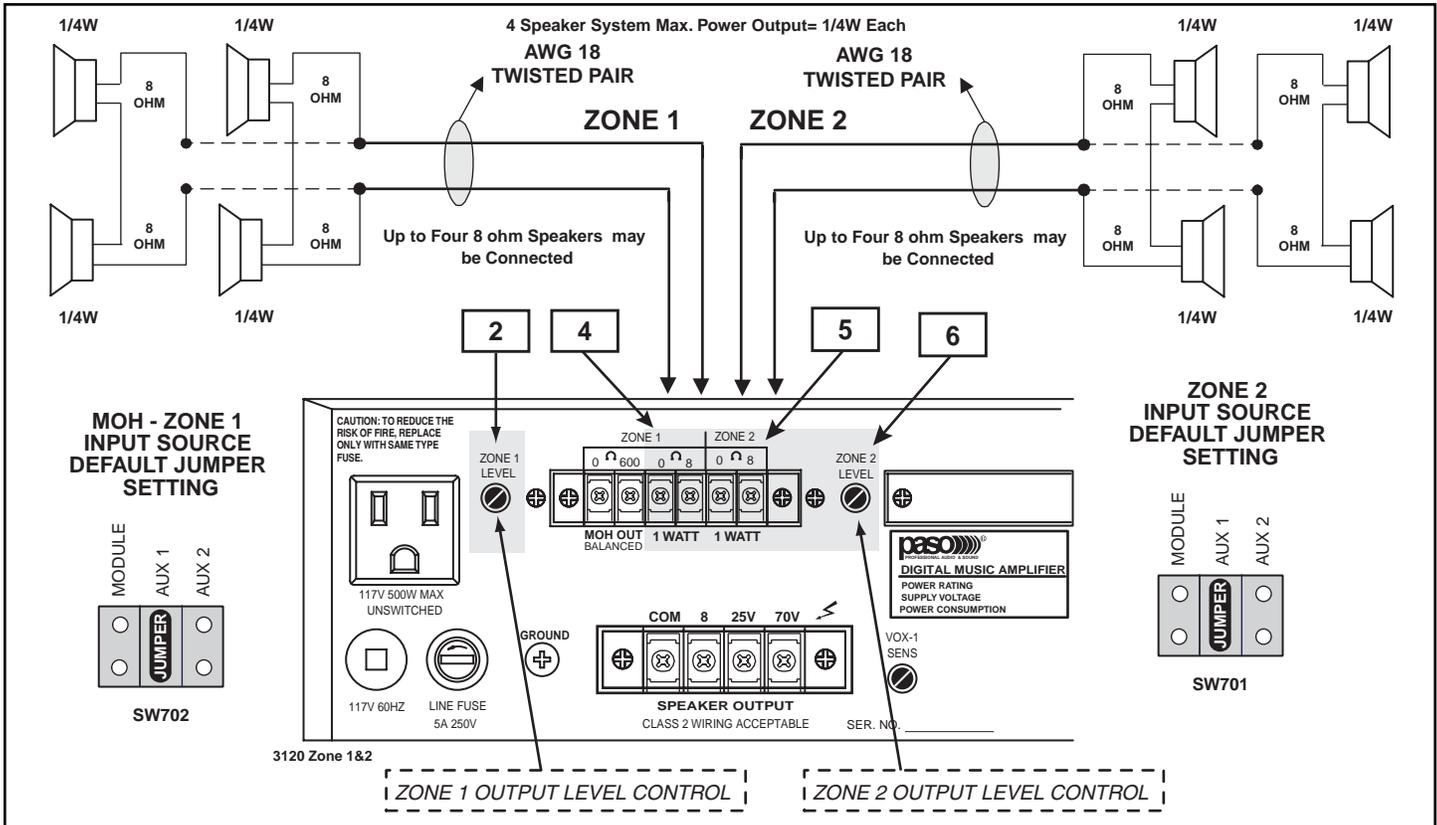


Fig. 26 - Rear Panel Zone 1 and 2 Speaker Connection Diagram

ZONE 1 AND 2 OPERATION

ZONE 1 AND 2 OPERATION

The Amplifier is equipped with two independent 1 Watt, 8 ohm Outputs designated ZONE 1 (Reference 4) and ZONE 2 (Reference 5). The Outputs may be utilized to power up to 4 speakers in various combinations as described in the diagrams on the next page. This feature will provide a SECOND and THIRD ZONE (in addition to the main output) with up to 1 Watt of output power and will amplify only the Source from either AUX 1 - AUX 2 or MODULE (see input source selection) and will not be affected by the Paging (from MIC or TEL), VOX or MUTING.

It can be used in any area (up to 1 Watt) where only a Program Source is desired uninterrupted by Paging.

CABLE

Use an AWG 18 jacketed, twisted pair cable.

ZONE 1 AND 2 SETTINGS

INPUT SOURCE SELECTOR

Independent JUMPER SETS for ZONE 1 (SW702) and ZONE 2 (SW701) are available to select the Input Source for the two 1 Watt Amplifiers.

DUAL PROGRAM SOURCE CAPABILITY

If desired separate program Sources may be used for ZONE 1 and ZONE 2.

EXAMPLE: Use the program source from AUX 1 for ZONE 2 and the program source from AUX 2 for ZONE 2.

Select the Input Source desired by following the instructions in the MOH Amplifier Source Selection section.

LEVEL CONTROL

After the wiring is completed adjust the ZONE 1 (Reference 2) and ZONE 2 (Reference 6) Level Controls on the rear panel to the desired output level.

INSTALLATION AND WIRING

ZONE 1 - ZONE 2 CONNECTING SPEAKERS

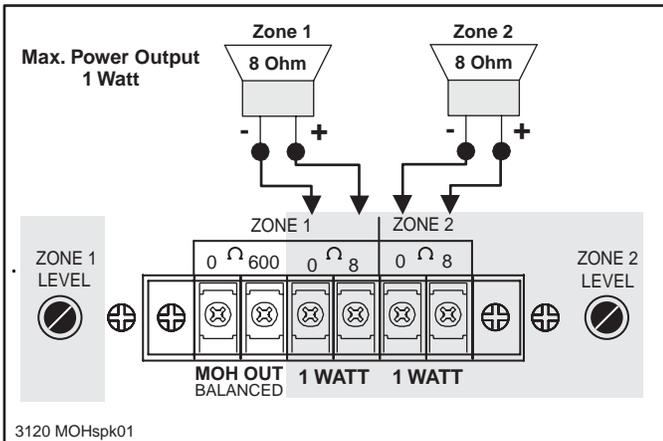


Fig 27 - Using one 8 ohm Speaker

USING A SINGLE 8 OHM SPEAKER WIRING

USING A SINGLE 8 OHM SPEAKER PER ZONE

A single 8 ohm Speaker may be used connected to the ZONE 1 and ZONE 2 1 Watt Output. In this configuration up to 1 Watt of Power will be available on each Speaker.

Independent Level Controls are provided.

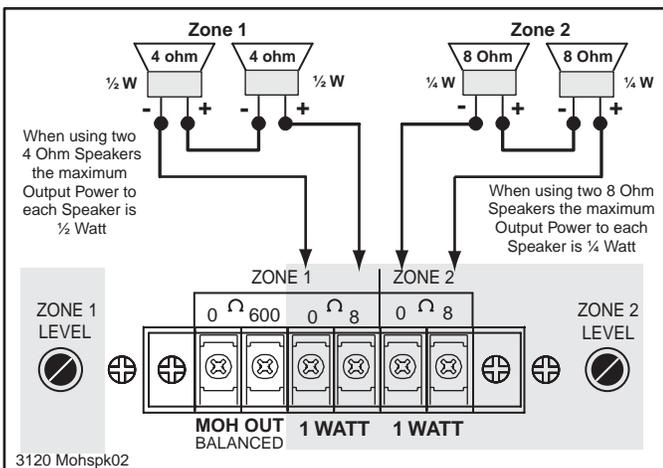


Fig 27A - Using two 4 or 8 ohm Speakers

USING TWO 4 OR 8 OHM SPEAKERS WIRING

USING TWO 4 OR 8 OHM SPEAKERS

The Figure at left shows:

ZONE 1 with two 4 ohm speakers connected in series, each speaker provides 1/2 Watt power output (1 Watt Total).

ZONE 2 with two 8 ohm speakers connected in series, each speaker provides 1/4 Watt power output (1/2 Watt Total).

Independent Level Controls are provided.

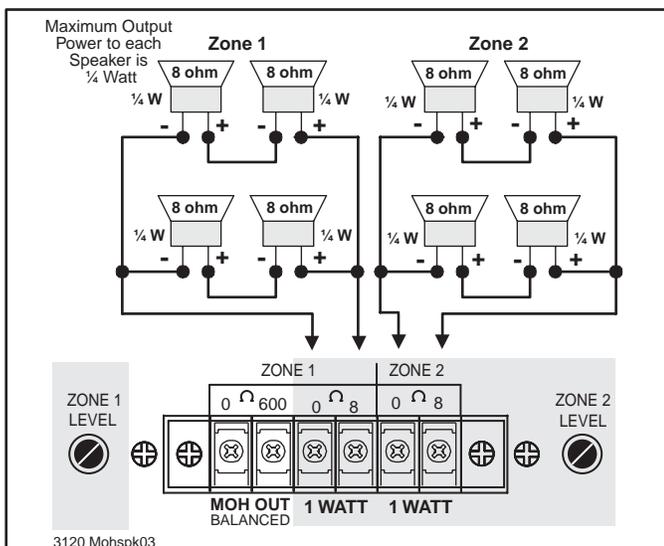


Fig 27B - Using four 8 ohm Speakers

USING FOUR 8 OHM SPEAKERS WIRING

USING FOUR 8 OHM SPEAKERS PER ZONE

Four 8 ohm Speakers are used and connected to the 1 Watt Output. In this configuration up to 1/4 Watt of Power will be available on each Speaker (1 Watt Total).

Independent Level Controls are provided.

INSTALLATION AND WIRING

REGULATED AUXILIARY POWER SUPPLY

24 VOLT POWER SUPPLY

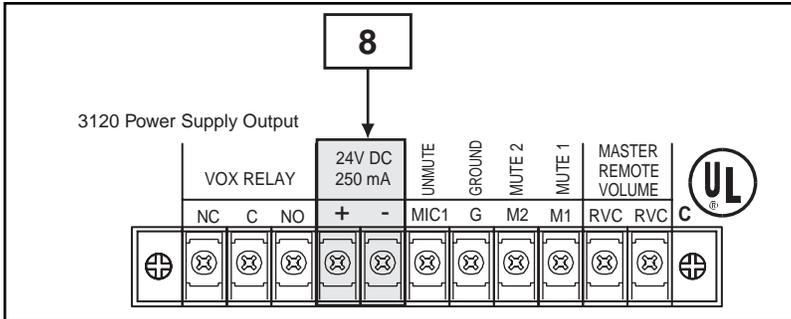


Fig. 28 - 24 Volt Power Supply Output Diagram

POWER SUPPLY

The Amplifier provides a 24 Volt - 250 mA DC Regulated Auxiliary Power Supply Output (Reference 8).

CABLE

To connect the Power Supply Output to accessories use a two conductor wire not less than AWG 18. This minimum wire gauge is necessary to minimize potential Voltage Drops in long wire connection applications. For wire resistance refer to Table below.

WIRE GAUGE - RESISTANCE TABLE

WIRE AWG	RESISTANCE IN OHMS per 1000 Ft.
16	4.016
18	6.385
20	10.15
22	16.14
24	25.67
26	40.81

NOTE:

When calculating the Wire Resistance for each run using a two conductor Wire the wire Resistance should be doubled.

EXAMPLE: The Total Resistance of a 1000 Ft. run of a AWG 24 two conductor Wire is:

25.67 X 2= 51.34 Ohm

VOX RELAY

VOX RELAY FUNCTIONS

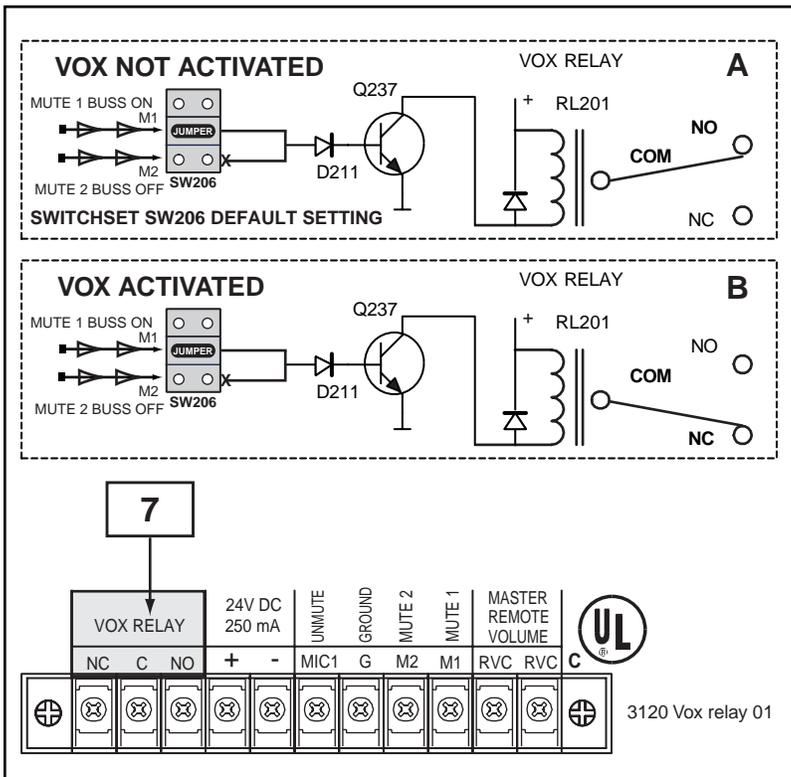


Fig. 28A - VOX Relay Output Terminals

VOX RELAY

The Amplifier provides a VOX RELAY (Reference 7) with a single pole dual throw set of contacts. **Figure A** at left shows the contacts when the Relay is not activated. **Figure B** shows the contacts when the Relay is activated.

The Relay can be configured to activate when either VOX 1 (M1) or VOX 2 (M2) or both (VOX 1 and VOX 2) are activated.

The VOX RELAY will remain engaged for as long as the VOX is active.

SWITCHSET SW206 - The SW206 is defaulted to M1. When VOX 1 is activated the Relay is switched ON. The factory setting can be changed to set the Relay to activate with either VOX 1 - VOX 2 or both.

Both Jumpers (M1 - M2) may be installed.

RELAY CONTACTS RATING

7 AMPERE AT 30 VDC MAXIMUM RATING.

INSTALLATION AND WIRING

INSTALLING AND USING A BOSE® EQUALIZER MODULE

CAUTION: PRIOR TO INSTALLING THE BOSE® MODULE IN THE AMPLIFIER FOLLOW THE INSTRUCTIONS SUPPLIED WITH THE MODULE AND THEN READ THE INSTRUCTIONS IN THIS MANUAL'S "INSTALLING A MODULE" SECTION

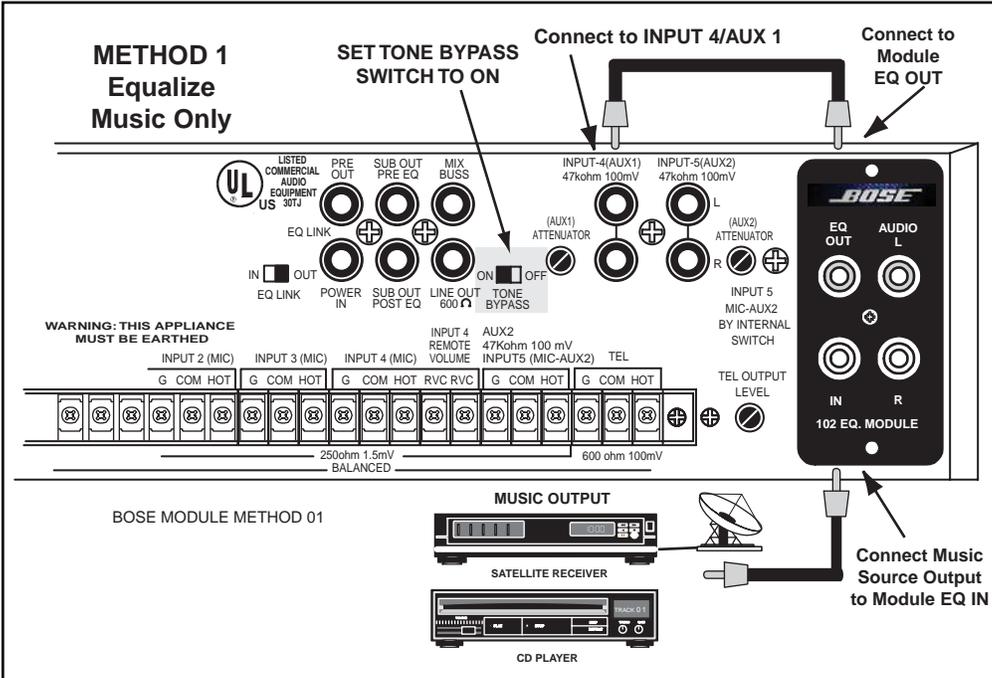


Fig. 26 - Method 1 Module Wiring Diagram

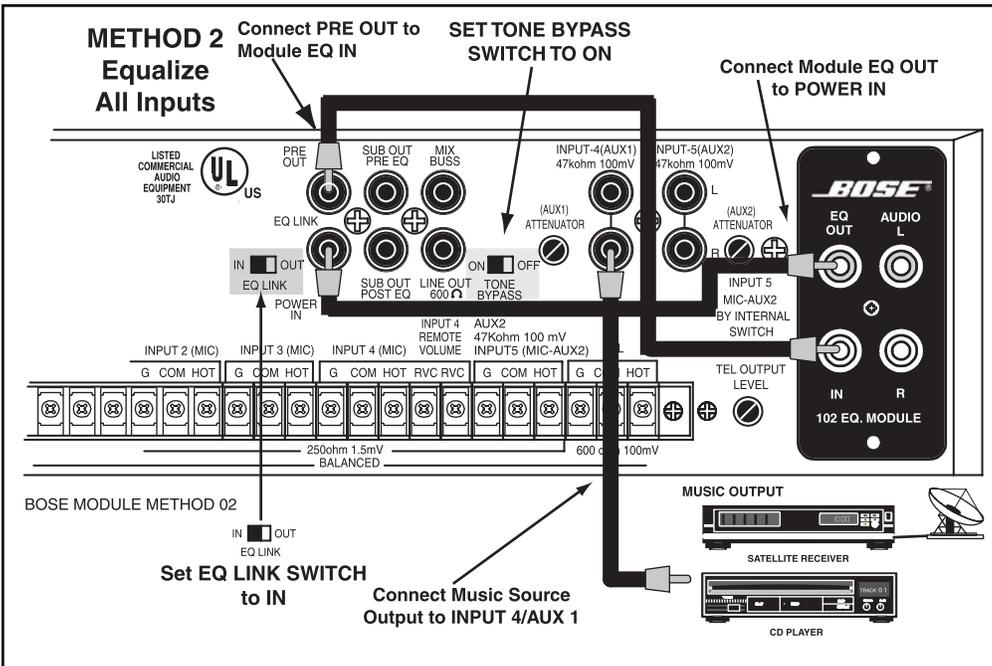


Fig. 26B - Method 2 Module Wiring Diagram

METHOD 1

EQUALIZING THE PROGRAM ONLY BY USING THIS METHOD THE MUSIC PROGRAM ONLY IS EQUALIZED BY THE MODULE.

BE SURE THAT THE TONE BYPASS SWITCH IS IN THE ON POSITION

- 1) Connect the Output of the PROGRAM SOURCE unit to the Module IN Jack.
- 2) Connect the EQ. OUT Jack of the Module to INPUT 4/AUX 1 of the Amplifier.

LEVEL CONTROLS - Adjust INPUT 4/AUX 1 Front Panel Control to 1 o'clock. Turn Rear Panel ATTENUATOR Control slowly clockwise until the desired Output Level is achieved After above adjustments are completed use the INPUT 4/AUX 1 Front Panel Control to increase or decrease the Music Level as desired.

METHOD 2

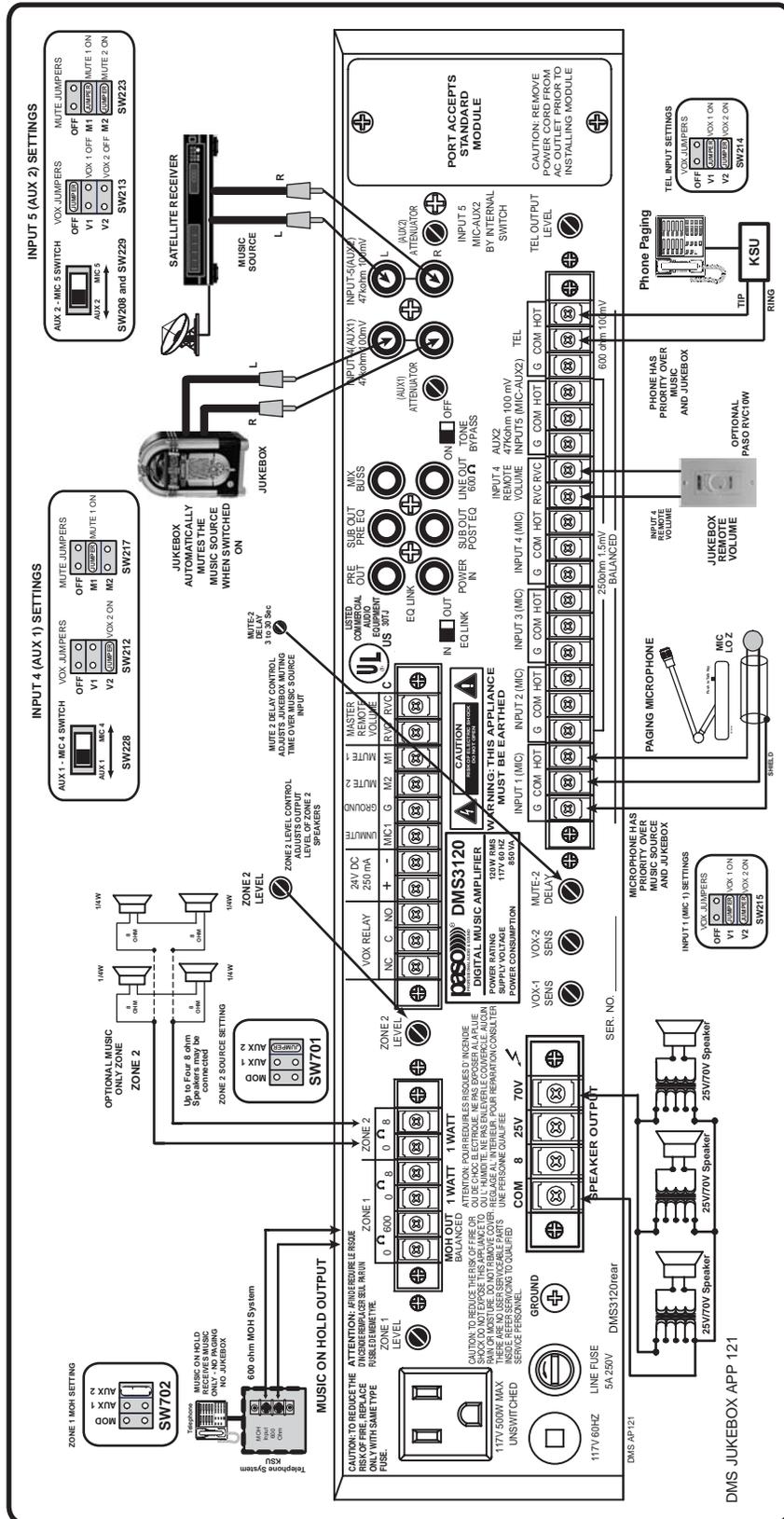
USING THE EQ LINK BY USING THIS METHOD ALL THE AMPLIFIER INPUTS ARE EQUALIZED BY THE MODULE.

BE SURE THAT THE TONE BYPASS SWITCH IS IN THE ON POSITION

- 1) Connect the Output of the PROGRAM SOURCE unit to the INPUT 4 (or INPUT 2) L and R Jacks.
- 2) Connect the EQ. OUT Jack of the Module to the POWER IN Jack of the Amplifier.
- 3) Connect the EQ. IN Jack of the Module to the PREAMP. OUT Jack of the Amplifier.
- 4) Set EQ LINK Switch on the Amplifier to IN.

LEVEL CONTROLS - Adjust INPUT 4/AUX 1 Front Panel Control to 1 o'clock. Turn Rear Panel ATTENUATOR Control slowly clockwise until the desired Output Level is achieved After above adjustments are completed use the INPUT 4/AUX 1 Front Panel Control to increase or decrease the Music Level as desired.

RESTAURANT/DINER WITH MUSIC AND JUKEBOX - APP. DATA 121



APPLICATION

This Note illustrates a typical installation in a Restaurant/Diner/Lounge using Background Music and a Jukebox. The Background Music can be automatically interrupted when the Jukebox is activated. The Background Music is then automatically restored once the Jukebox stops playing. This built-in feature of the DMS Amplifier eliminates the need of any external device.

PAGING MICROPHONE

PRIORITY PAGING MICROPHONE - A Low Impedance Dynamic Microphone can be connected to the Amplifier INPUT 1. The Microphone Input can be set to provide *Priority Paging* over both the Music Program and the Jukebox if activated. Optionally Paging may be generated from the Phone system if desired.

PAGING FROM THE PHONE SYSTEM

PRIORITY PAGING FROM THE PHONE SYSTEM - Paging may be generated from a Phone System by using the TEL INPUT of the Amplifier. The TEL INPUT can be set to provide *Priority Paging* over both the Music Program and the Jukebox if activated. The TEL INPUT provides a 600 ohm Transformer balanced Phone interface.

MUTE 2 DELAY

The Jukebox Configuration utilizes the VOX/MUTE 2 Buss. In order to prevent the premature JUKEBOX/MUSIC SOURCE switching (the Music Source cuts-in while the Jukebox is active) a MUTE 2 DELAY TRIMMER is available on the Rear panel to increase the MUTE 2 DELAY as necessary. The MUTE 2 DELAY can be adjusted from 3 to 30 Seconds.

EXAMPLE: If the Jukebox is playing and the Tune has a long pause or the long pause while the Jukebox is cycling between CD's it is possible that the Music Source (Background Music) may cut-in causing annoying and unwanted *chatter* while the Jukebox is still active. To prevent this problem the MUTE 2 TIME DELAY should be adjusted accordingly.

JUKEBOX REMOTE VOLUME CONTROL

A Jukebox Remote Volume Control may be provided to adjust the Output Level independently from the Background Music Source. The Jukebox Music Level should be set in accordance to the ambient noise which may change during peak business hours. The AUX 1 Input (used for the Jukebox) is equipped with a Remote Volume Control Feature. Use the optional PASO Model RVC10W (10K) Volume Control mounted on a single gang plate.

MUSIC ON HOLD

The Zone 1 Amplifier provides a separate 600 ohm Transformer Balanced Music on Hold Output for the Telephone system. If the Zone 1 Input Selector Switch is set to Input 3, the MOH Output receives only the PROGRAM from the MUSIC SOURCE without Paging or the Jukebox interruptions.

ZONE 1 & 2 ONE WATT - 8 OHM OUTPUT

The ZONE 1 and ZONE 2 Outputs may be used to cover small area with MUSIC ONLY without interruption from the Microphone or Phone Paging or the music from the Jukebox. The Program Source for both 1 Watt Amplifiers may be independently selected through Internal Jumpers (see Diagram). Output Level may be also independently adjusted by the separate Level Controls.

ZONE 1 AND 2 SPEAKERS

The Wiring Diagram shows the connection of up to 4 (8 ohm) Speakers for the Zone 1 & 2 - 1 Watt Amplifier. When 4 Speakers are used each Speaker Output will be a 1/4 Watt.

INPUT JUMPERS - SWITCHES SETTING

The Diagram indicates the various Input Settings for this application. Some settings may be already "Defaulted" when the Amplifier is shipped and do not need re-setting.

CUSTOMER SERVICE

REPAIR SERVICE

REPLACEMENT PARTS

Please provide complete information when you request replacement parts from either the Factory or a Paso Authorized Distributor. Be certain to include the Part Number and Description as it appears on the parts list, the Model Number of the unit and if possible the Serial Number and the date of purchase of the unit. Replacement parts inventory is maintained specifically to repair Paso products. Part sales for other reasons or applications will be declined.

ORDERING FROM THE FACTORY

Print all information on a purchase order form and mail to:
PASO SOUND PRODUCTS, INC.
4750 Goer Drive - Building F
CHARLESTON, SC 29406

Be sure to include the following:

- Paso part number
- Part description
- Quantity required
- Model number of the unit
- Serial number of the unit
- Your payment or your authorization for COD shipment for parts not covered by the Warranty or if your company has a current account with the factory

RETAIN ORIGINAL IN WARRANTY PARTS UNTIL YOU RECEIVE REPLACEMENTS. PARTS THAT SHOULD BE RETURNED TO THE FACTORY WILL BE LISTED ON YOUR PACKING SLIP.

For your convenience replacement parts are also available through Paso Authorized Distributors and Dealers nation wide. Obtain a location list directly from the Factory or your regional Paso Representative.

TECHNICAL CONSULTATION

- Need help with your installation ?
- Need help with the operation of the unit ?
- Need help with a repair ?

Call or write for assistance. You will find our Technical Dept. eager to help or assist you with any technical problem you may have encountered except "Customizing" for a unique application.

The effectiveness of our consultation service depends on the accuracy of the information you furnish.

Be sure to tell us:

- The Model and Serial number of the unit
- The date of purchase
- An exact description of the difficulty
- All you have done in attempting to correct the problem

Call our toll-free phone number:

1-800 231 3034

REPAIR SERVICE

Repair service for out of warranty Paso products may be obtained from your local Paso distributor or any other qualified repair station.

In warranty repairs must be returned to the Factory. Prior authorization must be obtained from the Factory. Products received without authorization will be refused by our Receiving Dept..

IN WARRANTY REPAIR SERVICE

Call or write the Factory to obtain an authorization to return the product for repairs.

Pack the equipment in the original carton or in a strong carton with at least THREE INCHES of resilient packing material on all sides, top and bottom. Seal the carton with reinforced tape and mark it FRAGILE on at least two sides. Remember, the Carrier will not accept liability for shipping damages if the unit is improperly packed.

EQUIPMENT RECEIVED IN DAMAGED CONDITION DUE TO POOR PACKING WILL BE REFUSED AND THE WARRANTY COVERAGE IS AUTOMATICALLY VOIDED.

The Paso Sound Limited Warranty provides:

The examination of the returned product must disclose in our judgement, a manufacturing defect. The warranty does not extend to any product that has been subject to misuse, neglect, accident, improper installation or where the serial number of the product has been removed or defaced.

Ship via insured prepaid United Parcel Service or Parcel Post to:

PASO SOUND PRODUCTS, INC.

4750 Goer Drive - Building F
CHARLESTON, SC 29406

Attn. SERVICE DEPARTMENT

The equipment will be returned freight prepaid after repairs.

Be sure to include the following:

- Your name and address
- Date of purchase and copy of invoice
- A brief description of the difficulty
- A return address shipping label
-

OUT OF WARRANTY REPAIR SERVICE

Follow return instructions as per in warranty repair service. Prior to performing all necessary repairs, you will be advised of the charges and at that time a written authorization by you will be required including authorization to return the equipment COD for the service and shipping charges. This will avoid unnecessary delays in returning the equipment to you.