

## SM120 RACK MOUNT 120 WATT AMPLIFIER

### INTRODUCTION

These instructions contain the specifications and information necessary to install, operate and maintain the SM120, 120 Watt Mixer-Amplifier. The SM120 provides up to 120 Watts of audio power for voice paging or background music systems.



Aux Input Impedance	10K Ohms
Aux Input Sensitivity	200mVRMS
Line Out Impedance	10K Ohms
Line Out Level	1VRMS

### SPECIFICATIONS

#### Access Methods

- Paging and Sound Reinforcement Systems
- Stand Alone Background Music Systems

#### Features

- Active mix or Priority override on inputs (override is voice operated)
- Rack Mount
- Mic 1/Tel on Input 1, plus 3 standard MIC/AUX inputs
- Volume control for each input
- Master Volume, Bass and Treble Controls
- Overload limiting circuit protection
- Screw terminals for all connections
- Power "ON" indicator
- Clipping and Fault indicators
- 8 Ohm, 25 and 70 Volt selectable output
- Tone generator (Warble or Continuous)
- Optional external volume control

#### Nominal Power Requirements

Input Voltage:	85-265VAC
Current @ 120VAC:	0.28A Typical

#### Environment

Temperature	0 to +40° C	+32° to +104° F
Humidity	0 to 85% non-precipitating	

#### Dimensions and Weight

- 17.0" W x 12.0" D x 1.75" H  
(43.23cm W x 30.5cm D x 4.4cm H)
- Weight: 5.1 lbs. (2.3 kg)

#### Precautionary Designations


- **WARNING-To Reduce The Risk Of Fire Or Electric Shock. Do Not Expose This Apparatus To Rain Or Moisture.**
- **AVERTISSEMENT - Afin de réduire les risques d'incendie ou de décharge électrique, évitez d'exposer le système à la pluie ou à l'humidité.**
- **Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.**
- **L'appareil ne doit pas être exposé à des égouttements et éclaboussures et aucun Objet Rempli de liquide, comme vase, ne doit être place sur l'appareil.**

#### Nominal Specifications

Wattage Output	120 Watts Peak
Type Outputs	8 Ohm or 25V or 70V
Frequency Response	20 to 20kHz +/-2dBm
Distortion	< 2% @ 1kHz Rated Output
Number of Inputs	4 (1 Mic/Tel Line, 3 Mic/Aux)
Voice Switch Sensitivity	31dBm
Mic Input Impedance	600 Ohms Balanced
Mic Input Sensitivity	1.0mVRMS
Tel Line Input Impedance	600 Ohms
Tel Line Sensitivity	70mVRMS



**IMPORTANT SAFETY INFORMATION**  
**CONSIGNES DE SÉCURITÉ IMPORTANTES**

1. Read these instructions.  
*Lisez ces instructions.*
2. Keep these instructions.  
*Conservez ces instructions.*
3. Heed all warnings.  
*Respectez tous les avertissements.*
4. Follow all instructions.  
*Suivez toutes les instructions.*
5. Do not use this apparatus near water.  
*Ne pas utiliser cet appareil près de l'eau.*
6. Clean only with dry cloth.  
*Nettoyer avec un chiffon sec.*
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.  
*Ne pas bloquer les ouvertures de ventilation. Installer conformément aux instructions du fabricant.*
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.  
*Ne pas installer à proximité de sources de chaleur telles que radiateurs, registres de chaleur, poêles ou autres appareils (y compris les amplificateurs) produisant de la chaleur.*
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and the third prong are provided for your safety. If the provided plug does not fit into your outlet consult an electrician for replacement of the obsolete outlet.  
*Ne pas contourner le dispositif de sécurité de la fiche polarisée ou de mise à la terre. Une fiche polarisée possède deux lames dont une plus large que l'autre. Une fiche de terre a deux lames et une troisième broche de mise à la terre. La lame large et la troisième broche sont fournies pour votre sécurité. Si la fiche fournie ne rentre pas dans votre prise, veuillez consulter un électricien pour le remplacement de la prise obsolète.*
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.  
*N'utilisez que des fixations / accessoires spécifiés par le fabricant.*
12. Use only with the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.  
  
*Utilisez uniquement avec le chariot, stand, trépied, support ou table spécifié par le fabricant ou vendu avec l'appareil. Quand un chariot est utilisé, Soyez prudent lorsque vous déplacez l'ensemble chariot / appareil pour éviter des blessures dues au renversement.*
13. Unplug this apparatus during lightning storms or when unused for a long period of time.  
*Débranchez cet appareil pendant les orages ou lorsqu'il n'est pas utilisé pendant une longue période de temps.*
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way. Such as when the power supply cord or plug is damaged, liquid has been spilled, objects have fallen into the apparatus or the apparatus has been exposed to rain or moisture and does not operate normally or has been dropped.  
*Confiez toute réparation à un personnel qualifié. Une réparation est nécessaire lorsque l'appareil a été endommagé de quelque façon. Par exemple lorsque le cordon d'alimentation ou la fiche est endommagé, du liquide a été renversé, si des objets sont tombés dans l'appareil ou le appareil a été exposé à la pluie ou à l'humidité et ne fonctionne pas normalement ou s'il est tombé.*

## INSTALLATION

### FCC Information

**This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.**

**These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at his own expense.**

### General Mounting Information

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an

environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.  
B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

F) Equipment only suitable for mounting at heights less than or equal to 2m (6.56').

## DESIGN

The SM120 amplifier may be used to operate 8 Ohm, 25 Volt or 70 Volt speakers and horns.

The SM120 will actively mix all inputs or will provide priority inputs. If priority input is selected, the Mic/Tel input will override all inputs that are active (refer to Table 1 in the Operation Section for the override sequence). When the SM120 is in the priority mode, the switching is voice operated (no contacts are required).

The SM120 amplifier has a master volume control plus a separate volume control for each input. Bass and treble controls are also provided.

The mixer-amplifier contains a limiting circuit for protection against short circuits or impedance mismatches. The unit will shut down in the event of a trouble condition and reactivate automatically when the condition is corrected.

## INSTALLATION

### General

Figure 1 shows volume control locations. Figure 2 shows output terminal strips and switches on the back of the amplifier as well as typical connections to the mixer-amplifier.

All connections on the back of the SM120 are accessed by removing the rear cover. Replace the cover after connections have been completed.

## Mounting

The SM120 is designed for rack mounting. Make certain the unit is not mounted near heat sources or strong magnetic fields. Verify control and terminal strip accessibility. It is recommended that a minimum of 1 Rack Unit (1.75") of space above the SM120 be empty for adequate ventilation. See Figure 3.

## Telephone System 600 Ohm Page Port Connection

The SM120 can be used with a PBX Page Port using the TEL connection. Connect the page port Tip to TEL (+) and the page port Ring to TEL (-) as shown in Figure 4.

**NOTE: Interface devices are required when connecting to outside C.O. Lines, PABX extensions or single line telephones.**

## MIC Connections

The SM120 has connections for up to four low impedance microphones. All of the connections are made the same for MIC1, MIC2, MIC3 or MIC4. Connect the positive lead of the microphone to the MIC (+) terminal, negative lead of the microphone to the MIC (-) terminal and the shield to MIC "C" terminal. See Figure 5.

## Auxiliary Connections

The SM120 has connections for up to three high impedance auxiliary devices, such as a tuner, tone generator, etc. All of the connections are made the same for AUX1, AUX2 or AUX3. Connect the auxiliary device's positive lead to the AUX (+) terminal and the device's negative lead to the AUX (-) terminal, as shown in Figure 6. If the Auxiliary device provides a shield conductor, it may be connected to terminal "C".

## Tone Connections & Volume

The SM120 has a built-in tone generator that can create either a Warble tone or a Single tone output to the speaker using a contact closure. The tone will be generated while the contact is closed and stop when the contact is opened. Either or both tones may be used. If used simultaneously, the Single tone will have priority. For the Warble tone, connect one lead from a contact closure (relay, push button, etc.) to the "W" terminal and the other lead to the "C" terminal. For the Single tone, connect the closure leads to the "S" and "C" terminals. See Figure 7. The two terminals marked (+) and (-) are not used.

The volume of the generated tones can be adjusted using the small knob labeled "Volume" on the rear panel.

## Remote Volume Control Connections

An optional remote volume control may be connected to the SM120. The control is connected to the V-, R and V+ terminals (see Figure 8). The two terminals marked (+) and (-) are not used. The recommended Valcom part number is SM-VC.

## Priority Switch Setting

The SM120 has two modes of operation for the input connections, either Mixing or Priority. In Mixing mode, all inputs are mixed together. In Priority mode, only one input is active at any time. The selection is made using switch #4, as shown in Figure 9b. If switch #4 is ON, the SM120 mixes all inputs. If switch #4 is OFF, the inputs are prioritized as shown in Table 1. The SM120 must be power cycled for switch setting changes to be recognized.

## Output Switch Settings

The SM120 output is selectable as either 25 Volt, 70 Volt or 8 Ohm as shown in Figure 9a. For 25 Volt output, set #1 and #2 OFF. For 70 Volt output, set #1 ON and #2 OFF. For 8 Ohm output, set #1 and #2 ON.

## Speaker Connections

When the 8 Ohm output is used, standard two conductor speaker wire can be used (18-20 AWG determined by load). If the 25V or 70V output is used, two conductor shielded cable is recommended for speaker connections. 8 Ohm, 25V or 70V speakers are connected to the terminal labeled "Speaker".

**NOTE: When shielded cable is used, the shield should be connected to the Ground lug located on the rear of the SM120.**

The terminal labeled "Line Out" provides a line level signal suitable for passing audio to other devices that accept a signal up to 1 VRMS.

## Amplifier Setup

During initial system set up, it is recommended that the individual gain controls be set 1/4 turn clockwise and the master volume control be set 1/2 turn clockwise.

**NOTE: Double-check all amplifier connections before the AC power cord is plugged in.**

The power indicator will illuminate when the AC power cord is plugged in.

## OPERATION

The SM120 provides two modes of operation, either active mix or priority override.

When the amplifier is in the active mix mode, signals on all inputs are mixed and sent to the speakers. When the priority input is selected, a signal on the MIC/TEL input will override all other active inputs (see Table 1 for override sequence). The override is voice activated and does not require the use of an external relay or contact closure. The separate gain controls on the unit allow adjustment of the volume levels of each input.

A clipping light is provided on the front of the unit. This light will illuminate when the output signal exceeds the power rating of the amplifier.

Table 1 - Override Sequence	
Input	Priority Level
Mic 1/TEL	1
Mic 2/Aux 1	2
Mic 3/Aux 2	3
Mic 4 /Aux 3	4

**NOTE: Level 1 is highest priority.**

## TECHNICAL ASSISTANCE

When trouble is reported, verify power is being supplied to the unit and there are no broken connections. If a spare unit is available, substitute a spare unit for the suspected defective unit.

Assistance in troubleshooting is available from the factory. Call (540) 563-2000 and press 1 for Technical Support or visit our website at <http://www.valcom.com>

Valcom equipment is not field repairable. Valcom, Inc. maintains service facilities in Roanoke, VA.

Should repairs be necessary, attach a tag to the unit clearly stating your company name, address, phone number, contact person and the nature of the problem. Send the unit to:

**Valcom, Inc.**  
**Repair & Return Dept.**  
**5614 Hollins Road**  
**Roanoke, Va. 24019-5056**

### WARRANTY

Warranty information may be found on our website at [www.valcom.com/warranty](http://www.valcom.com/warranty).

## TROUBLESHOOTING CHART

PROBLEM	POSSIBLE SOLUTION
No Output	<ol style="list-style-type: none"> <li>1. Verify AC power is being supplied to the unit.</li> <li>2. Verify that input signal is present at amplifier connection.</li> <li>3. Verify all speaker wiring (no opens, shorts or grounds).</li> </ol>
Distorted output	<ol style="list-style-type: none"> <li>1. Check input wiring for proper polarity connections.</li> <li>2. Verify that speaker load does not exceed amplifier rating.</li> <li>3. Verify input signal does not exceed input voltage rating.</li> <li>4. Verify all speaker wiring (no opens, shorts or grounds).</li> </ol>
Override does not operate	<ol style="list-style-type: none"> <li>1. Verify input signal is at proper level.</li> </ol>

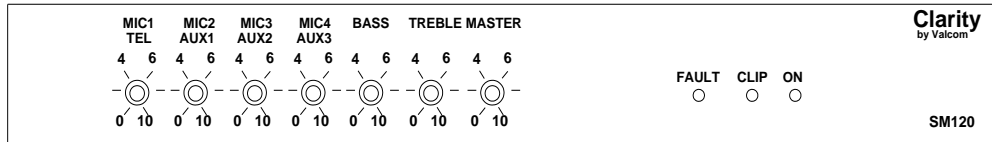


Figure 1. Front view

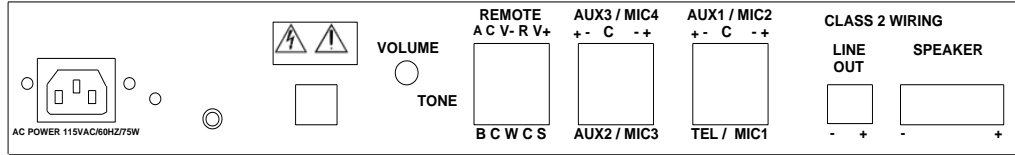


Figure 2. Rear View

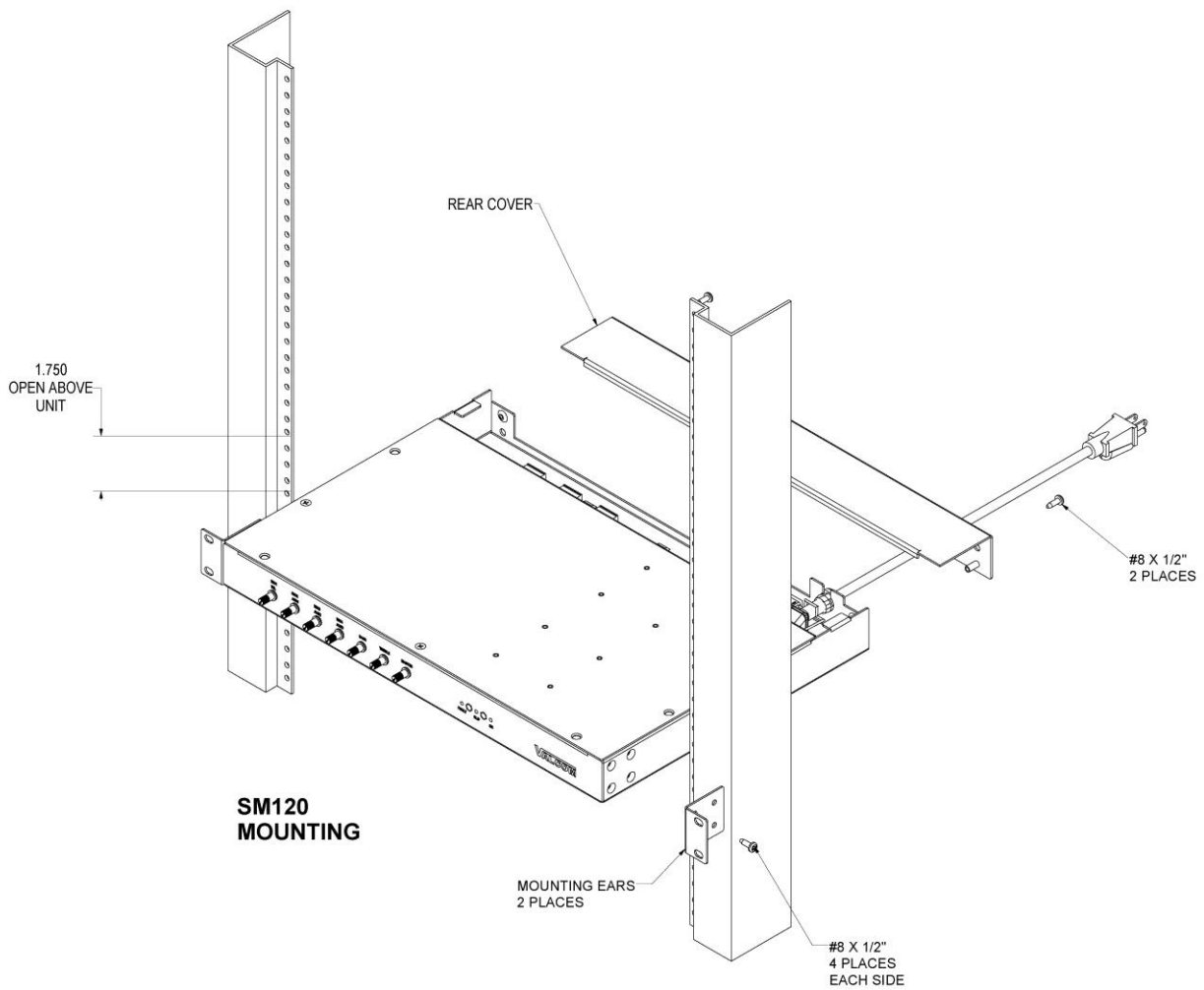
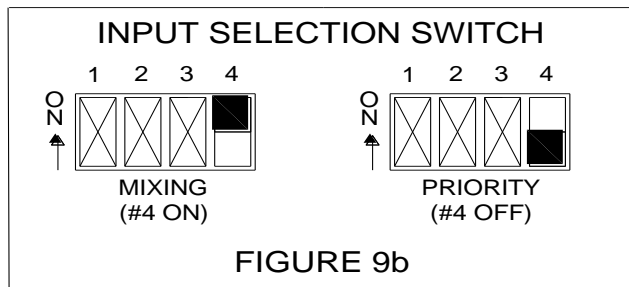
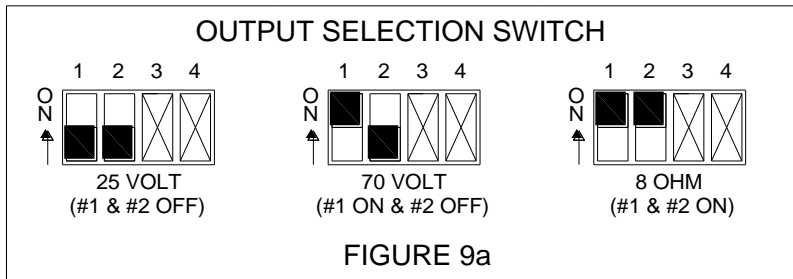
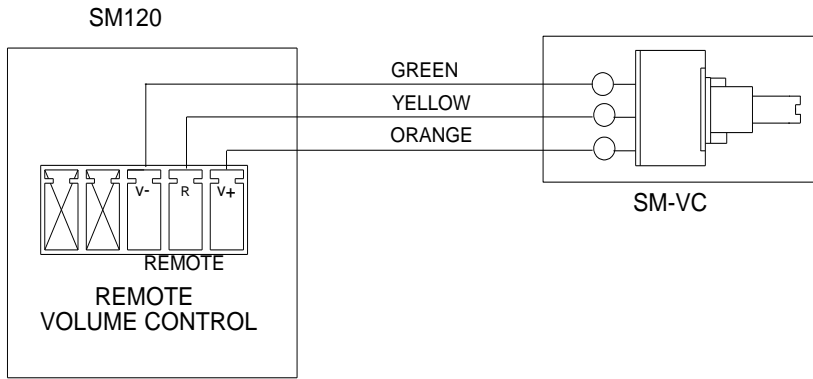
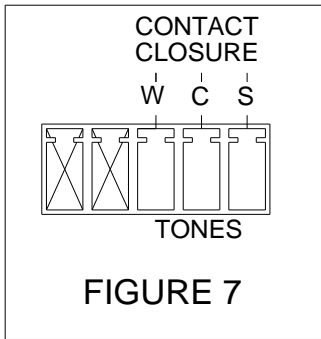
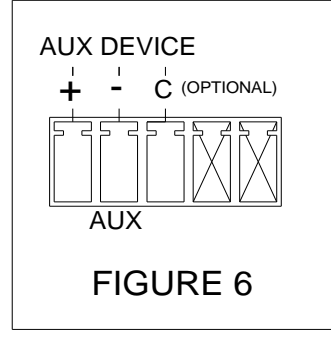
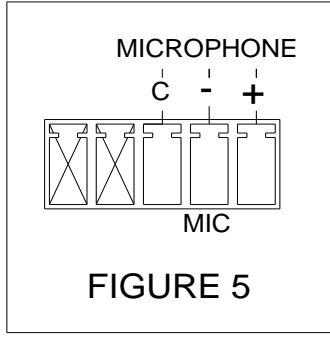
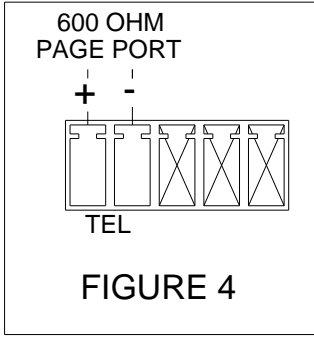
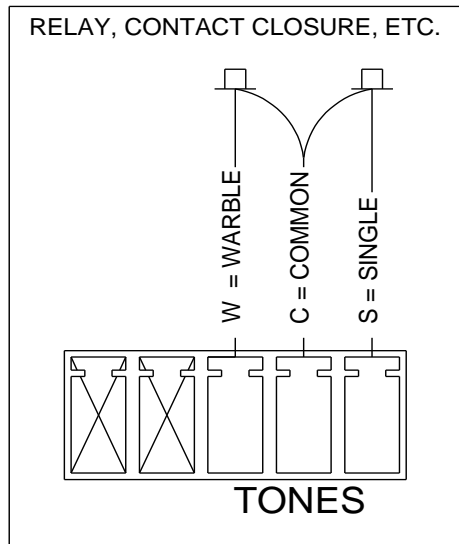
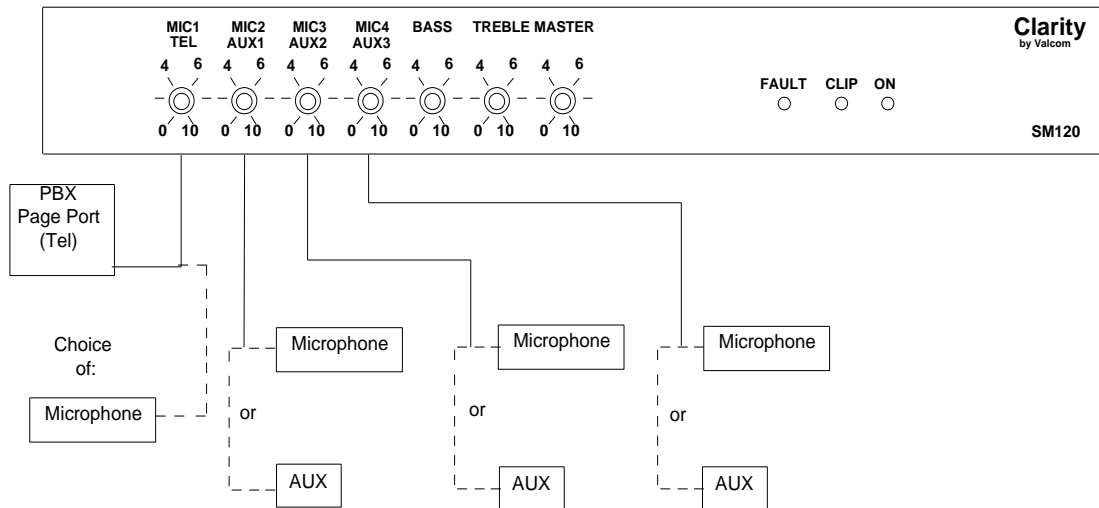


Figure 3. Mounting





### SM120 MIXER AMPLIFIER



**Typical Installation Block Diagram**