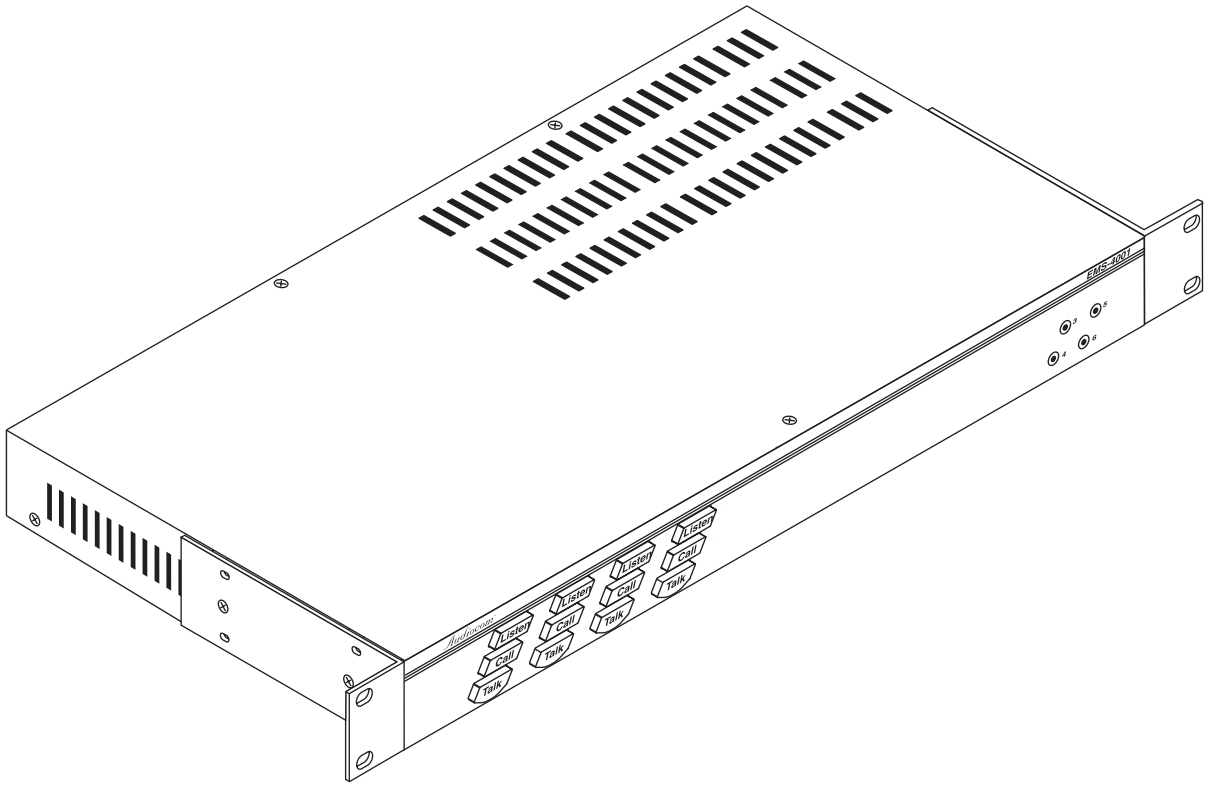
Telex®

User Instructions



Model EMS-4001
Expansion Master Station

Audiocom® Intercom Systems

9350-7713-000 Rev. B, 3/2005

FCC Statement

This equipment uses, and can radiate radio frequency energy that may cause interference to radio communications if not installed in accordance with this manual. The equipment has been tested and found to comply with the limits of a Class A computing device pursuant to Subpart J, Part 15 of FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference which the user (at his own expense) will be required to correct.

CE This product meets Electromagnetic Compatibility Directive 89/336/EEC

WARRANTY INFORMATION
Products are warranted by Telex Communications, Inc. to be free from defects in materials and workmanship for a period of one year from the date of sale.

The sole obligation of Telex during the warranty period is to provide, without charge, parts and labor necessary to remedy covered defects appearing in products returned prepaid to Telex. This warranty does not cover any defect, malfunction or failure caused beyond the control of Telex, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improper associated equipment, attempts at modification and repair not authorized by Telex, and shipping damage. Products with their serial numbers removed or effaced are not covered by this warranty.

To obtain warranty service, follow the procedures entitled “Procedure for Returns” and “ Shipping to Manufacturer for Repair or Adjustment”.

This warranty is the sole and exclusive express warranty given with respect to Audiocom products. It is the responsibility of the user to determine before purchase that this product is suitable for the user’s intended purpose.

ANY AND ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY ARE LIMITED TO THE DURATION OF THIS EXPRESS LIMITED WARRANTY.

NEITHER TELEX NOR THE DEALER WHO SELLS TELEX PRODUCTS IS LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

CUSTOMER SUPPORT
Technical questions should be directed to:

Customer Service Department
Telex
12000 Portland Avenue South
Burnsville, MN 55337 U.S.A
Telephone: (952) 884-4051
Fax: (952) 884-0043

RETURN SHIPPING INSTRUCTIONS
Procedure for Returns
If a return is necessary, contact the dealer where this unit was purchased.

If a return through the dealer is not possible, obtain a RETURN AUTHORIZATION from:

Customer Service Department
Telex Communications, Inc.
Telephone: 1-800-392-3497 or (952) 884-4051
Fax: 1-800-323-0498 or (952) 884-0043

DO NOT RETURN ANY EQUIPMENT DIRECTLY TO THE FACTORY WITHOUT FIRST OBTAINING A RETURN AUTHORIZATION.

Be prepared to provide the company name, address, phone number, a person to contact regarding the return, purchase order number, the type and quantity of equipment, a description of the problem and the serial number(s).

Shipping to Manufacturer for Repair or Adjustment
All shipments of products should be made via United Parcel Service or the best available shipper prepaid. The equipment should be shipped in the original packing carton; if that is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material. All returns must include the return authorization number. Units sent for repair or adjustment **DO NOT** need a return authorization number

Factory Service department
Telex Communications, Inc.
West 1st Street
Blue Earth, MN 56013 U.S.A.

Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper collect.

Table of Contents

Description

The EMS-4001 adds four powered intercom channels to an MS-2001 Master Station, and it provides talk, listen and call buttons for the added channels. Up to four EMS-4001 Expansion Master Stations may be connected to the MS-2001 to add up to 16 channels (18 channels total). The MS-2001 microphone is used to talkback to the EMS-4001 channels, and the MS-2001 speaker is typically used for listening. However, there are also separate speaker jacks on the back panel of the EMS-4001 for independent monitor speakers, if desired. There are also 4 additional program inputs on the back of the EMS-4001, one for each added channel.

The MS-2001/EMS-4001 combination can be used as a simple, multichannel intercom user station. In this configuration, the program inputs (and possibly the PA output of the MS-2001) are most likely not used, and the station operator has only talk, listen and call capability. It is also possible that advanced features of the MS-2001, such as Mic Kill Send, might be turned off. Alternatively, the MS-2001/EMS-4001 can be used as a master station. In this application, one or more program inputs and the PA output may be connected, and the program signals to the intercom channels can be turned on or off from the MS-2001. Additionally, the Mic Kill Send feature can be enabled, and microphones on any channels may then be turned off from the MS-2001.

Features

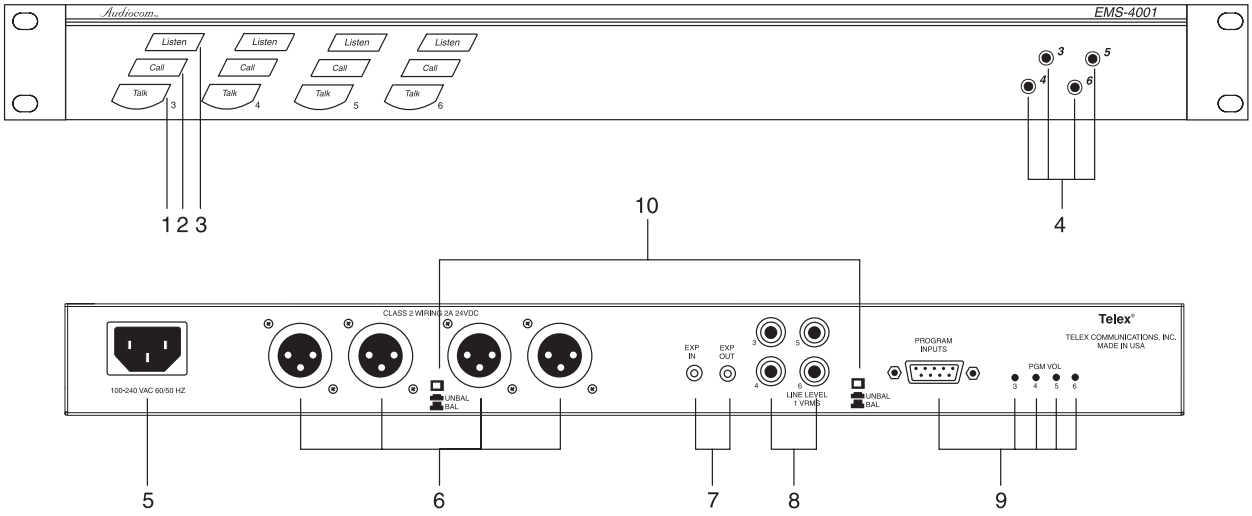


Figure 1 *- EMS-4001 Front and back features.*

1. **Intercom Talk Keys**: Momentary or latching (hands-free operation possible).
2. **Call Keys**: used to call intercom channels and to indicate incoming calls.
3. **Intercom Listen Keys**: Momentary or latching operation possible.
4. **Channel Power Status Indicators**: The indicators are green for normal operation and change to red if there is a short circuit or overload condition on a power output line. If an indicator turns red, either disconnect the corresponding channel connector or turn off the intercom systems and locate the problem before resuming operation.
5. **Universal AC Power Connector**: The unit accepts any input power in the range of 100-240 VAC, 50/60 Hz.
6. **Intercom Channel Connectors**: These connectors provide the power and audio connections for each of the four intercom channels.
7. **EXP IN and EXP OUT Connectors**: The EXP IN connector receives the microphone audio signal from the MS-2001, and it sends the monaural mix of the four EMS-4001 channels to the MS-2001 speaker or headset. The EXP OUT connector connects to the EXP IN connector of an additional EMS-4001. Up to four EMS-4001 Expansion Master Stations may be daisy chained with the EXP IN and EXP OUT connectors. An EXP IN/OUT cable is supplied with each EMS-4001.
8. **SPEAKERS**: Usually, the listen mix of all four EMS-4001 channels is sent to the MS-2001 speaker or headset via the EXP IN connector. Alternatively, speakers may be connected to one or more of the speaker outputs of the EMS-4001.

9. **Program Inputs Connector and Trimmers**: Each intercom channel has its own program input and level adjust trimmer. For each program input, there is an internal jumper which routes the program either to the intercom channel only, or to both the intercom channel and the MS-2001 headset or speaker (default setting). Additionally, the program signal to the intercom channel may be turned on or off via the MS-2001 front panel programming. There is also an internal program interrupt DIP switch which selects either automatic program interrupt when the station operator activates a channel's talk key, or no program interrupt during talk. The EMS-4001 program input connectors may be broken out to common 3-pin XLR audio cables using the optional XP-4PGM Breakout Panel.
10. **BAL/UNBAL switch**: This selector switch sets the EMS-4001 for compatibility with either Audiocom or Clear-Com channel connector pin-outs, channel power requirements, and call signaling requirements.
11. **Configuration switches, Jumpers and Sidetone Controls**: These let you customize the operation of the EMS-4001 to match your intercom system requirements.

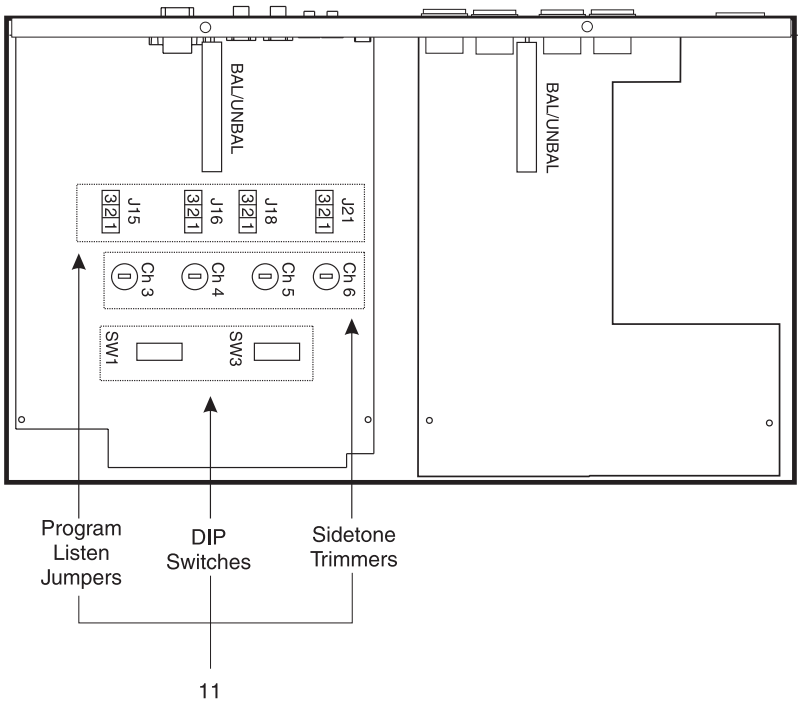


***Figure 2** - EMS-4001 internal DIP switches, jumpers and adjustments.*

Installation

Unpacking

The EMS-4001 is supplied with the following items. Contact the shipper or your Audiocom dealer immediately if anything is damaged or missing. Detach and fill out the registration card and return it to Telex to properly register your intercom station.

Quantity	Description
1	EMS-4001 Expansion Master Station and Power Supply
1	Warranty and registration card
1	User Instructions
1	EXP IN/OUT cable, with 1/8-inch (3.5 mm) phone plugs
2	Rack mount cosmetic covers

WARNING

The following instructions are for use by qualified personnel only. To avoid electric shock, do not remove the cover unless you are qualified to do so.

AVERTISSMENT

Les instructions qui suivent s'adressent uniquement a un technicien qualifie. Pour evite des chocs electriques, ne pas ouvrir le boitier, a moins d'y habilite.

Configuration Pre-check

Before making connections, read the configuration notes that follow, and make sure that all switches and jumpers are properly set for your intended usage. Locations of configuration switches and jumpers are shown in Figure 2. Only the DIP switches and jumpers require internal access. If access is required, remove three screws from the top cover and three screws along the bottom edge from each side.

DIP Switches

DIP switches and their default settings are listed in Table 1. The following paragraphs provide additional details.

Program Interrupt DIP Switches
Each intercom channel has a dedicated program input. These can be used to feed background music, mix-minus audio (for broadcasting usage) etc. to the intercom channels. If external program sources will be connected to the EMS-4001, you have a choice of whether or not you want the program audio to interrupt (shut off) on the intercom channel while the MS-2001/EMS-4001 station operator is talking.

Audiocom Call Send and Receive DIP Switches
By default, all channels of the EMS-4001 can send and receive Audiocom call signals. You can disable call send or call receive capability for selected channels if desired.

Balanced/Unbalanced Switch

The switch is located on the back panel. The switch must be set to the balanced (BAL) position for use with an Audiocom Intercom System. Set the switch to the unbalanced (UNBAL) position when using the unit with a Clear-Com Intercom System.

Direct Program Listen Enable/Disable Jumpers

By default, each program input can be heard by intercom stations on the corresponding intercom channel. (This can be turned on or off for each program input via the MS-2001 front panel programming. See "Turning the Program Inputs ON and OFF" in the Operations section of the MS-2001 User Instructions.) Additionally, all program signals can be heard directly in the MS-2001 speaker or headset, and each program is output at the corresponding speaker jack on the back of the EMS-4001. To disable direct program listening for a program input, reset the appropriate jumper as shown in Table 2. Locations of the jumpers are shown in Figure 2.

Sidetone Trimmers

These trimmers are normally adjusted after all components are connected, and they can be accessed through the bottom cover as depicted in Figure 3. Refer to the MS-2001 User Instructions for the sidetone adjustment procedure.

Table 1 *- EMS-4001 configuration switch settings.*

Switch Number	Description	Settings	Default Setting
DIP Switch SW1 (Internal)			
SW1-1	Program Interrupt, CH 6	On (Closed): Enabled Off (Open): Disabled	Off
SW1-2	Program Interrupt, CH 5	On (Closed): Enabled Off (Open): Disabled	Off
SW1-3	Program Interrupt, CH 4	On (Closed): Enabled Off (Open): Disabled	Off
SW1-4	Program Interrupt, CH 3	On (Closed): Enabled Off (Open): Disabled	Off
SW1-5	Audiocom Call Send, CH 3*	On (Closed): Enabled Off (Open): Disabled	On
SW1-6	Audiocom Call Receive, CH 3*	On (Closed): Enabled Off (Open): Disabled	On
SW1-7	Audiocom Call Send, CH 4*	On (Closed): Enabled Off (Open): Disabled	On
SW1-8	Audiocom Call Receive, CH 4*	On (Closed): Enabled Off (Open): Disabled	On
Balanced (BAL) - Unbalanced (UNBAL) operation Important! Both Switches on the back of the unit must be set the same.			
SW1	Audiocom or Clear-Com Operation	On (Audiocom): BAL Off (Clear-Com): UNBAL	Out
SW2	Audiocom or Clear-Com Operation	On (Audiocom): BAL Off (Clear-Com): UNBAL	Out
DIP Switch SW3 (Internal)			
SW2-1	Audiocom Call Send, CH 5*	On (Closed): Enabled Off (Open): Disabled	On
SW2-2	Audiocom Call Receive, CH 5*	On (Closed): Enabled Off (Open): Disabled	On
SW2-3	Audiocom Call Send, CH 6*	On (Closed): Enabled Off (Open): Disabled	On
SW2-4	Audiocom Call Receive, CH 6*	On (Closed): Enabled Off (Open): Disabled	On
SW2-5	Not used	On (Closed): N/A Off (Open): N/A	N/A
SW2-6	Not used	On (Closed): N/A Off (Open): N/A	N/A
SW2-7	Not used	On (Closed): N/A Off (Open): N/A	N/A
SW2-8	Not used	On (Closed): N/A Off (Open): N/A	N/A

* These switches apply only when in Audiocom (BAL) mode. Call send and receive are always enabled in Clear-Com (UNBAL) mode.

Table 2 *- EMS-4001 jumper settings.*

Jumper	Description	Settings for All Jumpers
J15	Program 3 direct to Headset or Speaker	Pins 2 & 3 Shorted: Enable Pins 1 & 2 Shorted: Disable
J16	Program 4 direct to Headset or Speaker	Pins 2 & 3 Shorted: Enable Pins 1 & 2 Shorted: Disable
J18	Program 5 direct to Headset or Speaker	Pins 2 & 3 Shorted: Enable Pins 1 & 2 Shorted: Disable
J21	Program 6 direct to Headset or Speaker	Pins 2 & 3 Shorted: Enable Pins 1 & 2 Shorted: Disable

Mounting Configurations

The EMS-4001 mounts in a standard 19 inch equipment rack and is 1 rack unit high. Install the two supplied rack mount cosmetic covers when installing the EMS-4001 in the rack.

When rack mounting components, you may not be able to access the sidetone trimmers after the components have been mounted. In this case, you can position the components in the rack and make all required connections. Then adjust the sidetone trimmers before installing and tightening all rack mount screws.

Connection Notes

Typical connections for the MS-2001/EMS-4001 are shown in Figure 3.

Cables

The numbers below correspond to the cable numbers in the connection drawing in Figure 3.

1. Single channel intercom cable. Sold separately. Use Telex “ME” cables, below, or can also be built by using two twisted pairs in a shielded cable: Pair 1 in used for pins 2 and 3. Pair 2 has both wires connected to pin 1.
   ME-25: 25’ (7.6 m) cable with male and female 3-pin XLR connectors.
   ME-50: 50’ (15.2 m) cable with male and female 3-pin XLR connectors.
   ME-100: 100’ (30.4 m) cable with male and female 3-pin XLR connectors.

2. Shielded patch cable, 9-pin Male D-sub to 9-pin Female D-sub. Customer local purchase: available at Radio Shack, etc. Note: All pins must be connected straight through (i.e. pin 1 to pin 1, pin 2 to pin 2, etc...).

3. Shielded patch cable, stereo miniplug to stereo miniplug. Customer local purchase. Available at Radio Shack, etc...

4. 18” (457 mm) EXP IN/OUT cable, stereo miniplug to stereo miniplug. One supplied with each EMS-4001.

5. Shielded audio cable. Must have male 3-pin XLR connector at one end for connection to the XP-USPG or XP-4PGM program inputs. Pin-out for program inputs is as follows:
   Pin 1: common
   Pin 2: + program input
   Pin 3: - program input

6. Shielded audio cable. Must have male 3-pin XLR connector at one end for connection to the XP-USPG PA output. Pin-out for PA output is as follows:
   Pin 1: common
   Pin 2: + PA output
   Pin 3: - PA output

Power-Up

Plug in the power cord. The EMS-4001 channels power-up identically to channels one and two of the MS-2001. Refer to the MS-2001 User Instructions for all power-up information. The MS-2001 and EMS-4001 can be powered up in any order.

Sidetone Adjustments

Use the sidetone adjustment procedure as described in the MS-2001 User Instructions, except substitute channel 3, channel 4, etc. The locations of the EMS-4001 sidetone trimmers are shown in Figure 4.

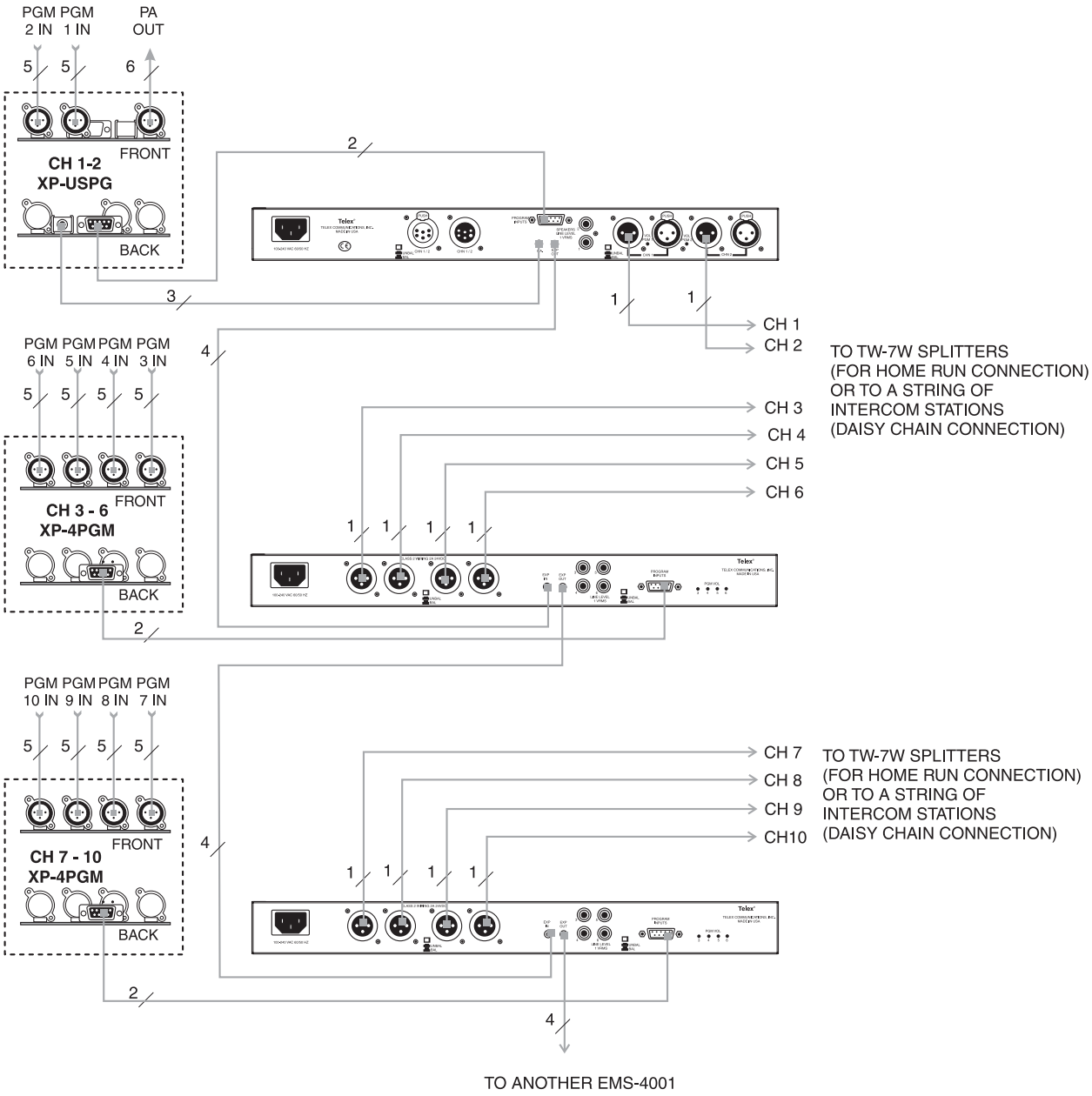


Figure 3 *- Example of EMS-4001 in a system.*

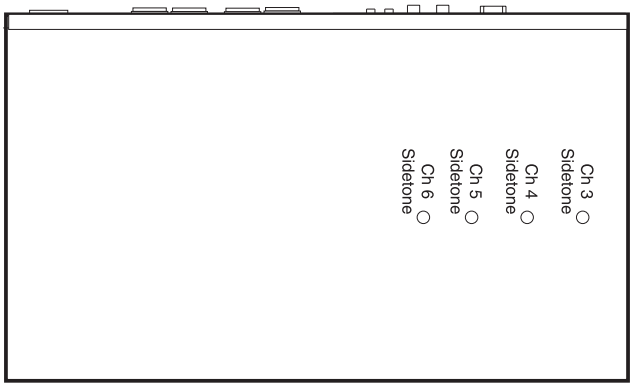


***Figure 4** - EMS-4001 sidetone adjustment locations.*

Operation

The EMS-4001 channels operate identically to channels one and two of the MS-2001. Refer to the MS-2001 User Instructions for all operating information.

Specifications

General

Input and Output Power:
- AC Input: 100-240 VAC, 50/60 Hz
- Channel Power (each channel): 24 ±1 VDC, 2 A

Dimensions: 1.75” (44.5 mm) high, 19” (483 mm) wide, 10.31” (261.9 mm) deep
Weight: approximately 4.5lbs (2kg)
Environmental Requirements:
- Storage: -20°C to 80°C; 0% to 95% humidity, non-condensing
- Operating: -15°C to 60°C; 0% to 95% humidity, non-condensing

Program Input Connectors

Input Level: 100mV maximum
Voltage Gain: 25 ±3 dB
Output Level (to intercom channel): 1.0Vrms nominal, 2.3Vrms max.
Input Impedance: 75k ohms
Common Mode Rejection: Greater than 50 dB
Connector type: DB9F female, 9-pin D-Sub
- Pin 1: Common
- Pin 2: Channel 3 program in low
- Pin 3: Channel 4 program in low
- Pin 4: Channel 5 program in low
- Pin 5: Channel 6 program in low
- Pin 6: Channel 3 program in high
- Pin 7: Channel 4 program in high
- Pin 8: Channel 5 program in high
- Pin 9: Channel 6 program in high

Intercom Channels, Balanced Mode (BAL/UNBAL switch set to BAL)

Output Level: 1 Vrms nominal
Input Impedance: 300 ohms ±10%
Bridging Impedance: greater than 10,000 ohms
Sidetone: -40 dB, 35 dB adjustable range

Call Signaling:
- Send: 20 kHz ±100 Hz, 0.5 Vrms ±10%
- Receive: 20 kHz ±800Hz, 100 mVrms

Mic-Kill Frequency:
- Send: 24 kHz ±100 Hz, 0.5 Vrms ±10%
- Receive: 24 kHz ±800 Hz, 100 mVrms

Noise Contribution: less than -70 dB
Common Mode Rejection Ratio: greater than 50 dB
Connector type: One XLR-3M for each channel
Balanced Configuration Pinouts
- Pin 1: DC/audio Common
- Pin 2: Intercom audio low and +24 VDC output
- Pin 3: Intercom audio high and +24 VDC output

Intercom Channel, Unbalanced Mode (BAL/UNBAL switch set to UNBAL)

Output Level: 2 Vp-p (750 mVrms)
Input Impedance: 200 Ohms ±10%
Bridging Impedance: greater than 10k ohms ±5%
Call Signaling:
- Send: 11 ±3 VDC
- Receive: 4 VDC minimum

Connector Type: One XLR-3M for each channel
- Pin 1: Common
- Pin 2: +30 ±1 VDC output
- Pin 3: Intercom audio high

Expansion Input/Output

Connector Type: 1/8” Stereo phone jack
- Tip: Talk output
- Ring: Listen input
- Sleeve: Common