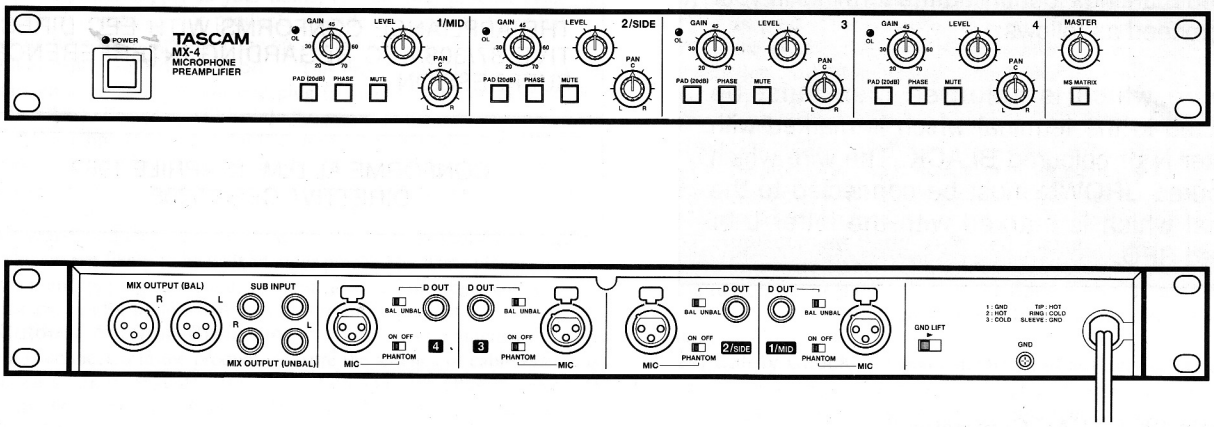
TASCAM

TEAC Professional Division

MX-4

#80096

Mic Preamplifier



OWNER'S MANUAL

D00071400A

Important Notes



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.
Model number _____
Serial number _____

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

NOTE FOR U.K. CUSTOMERS

Due to the variety of plugs being used in the U.K., this unit is sold without an AC plug. Please request your dealer to install the correct plug to match the mains power outlet where your unit will be used as per these instructions.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

BLUE: NEUTRAL
BROWN: LIVE

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

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

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die das

Mikrofon-Verstärker TASCAM MX-4

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

AMTSBLATT 163/1984, VFG 1045/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

TEAC CORPORATION

Name des Herstellers/Importeurs

THE APPLIANCE CONFORMS WITH EEC DIRECTIVE 87/308/EEC REGARDING INTERFERENCE SUPPRESSION

CONFORME AL D.M. 13 APRILE 1989
DIRETTIVA CEE/87/308

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Important Safety Instructions

CAUTION:
- **Read all of these Instructions.**
- **Save these Instructions for later use.**
- **Follow all Warnings and Instructions marked on the audio equipment.**

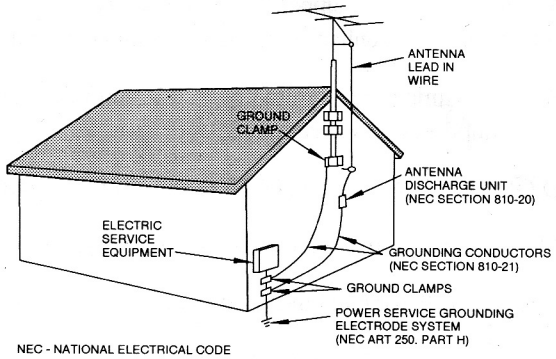
1) Read instructions — All the safety and operating instructions should be read before the product is operated.
2) Retain instructions — The safety and operating instructions should be retained for future reference.
3) Heed Warnings — All warnings on the product and in the operating instructions should be adhered to.
4) Follow instructions — All operating and use instructions shoud be followed.
5) Cleaning — Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6) Attachments — Do not use attachments not recommended by the product manufacturer as they may cause hazards.
7) Water and Moisture — Do not use this product near water – for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
8) Accessories — Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
9) A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



10) Ventilation — Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
11) Power Sources — This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
12) Grounding or Polarization — This procuct may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
13) Power-Cord Protection — Power-supply cords shoud be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.
14) Outdoor Antenna Grounding — If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

"Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Example of Antenna Grounding as per National Electrical Code, ANSI/NFPA 70



15) Lightning — For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
16) Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
17) Overloading — Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in risk of fire or electric shock.
18) Object and Liquid Entry — Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
19) Servicing — Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
20) Damage Requiring Service — Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
a) when the power-supply cord or plug is damaged.
b) if liquid has been spilled, or objects have fallen into the product.
c) if the product has been exposed to rain or water.
d) if the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e) if the product has been dropped or damaged in any way.
f) when the product exhibits a distinct change in performance – this indicates a need for service.
21) Replacement Parts — When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
22) Safety Check — Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
23) Wall or Ceiling Mouting — The product shoud be mounted to a wall or ceiling only as recommended by the manufacturer.
24) Heat — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

Introduction

Thank you for choosing the TASCAM MX-4 Mic Preamplifier.

We recommend that you read this manual before attempting to use the MX-4.

Among the features of MX-4 are the following :

- Mic amp circuit developed through repeated audition and select parts used enhance the quality sound creation.
- Wide dynamic range ensured by ±20 V amplification accommodates digital equipment.
- D OUTs, PHANTOM, and GND LIFT implemented.
- MS MATRIX activated at the touch of one button.
- SUB INPUTs for handling additional mics.
- Can be used as a 4-in, 2-out mixer.

The packing carton contains the following :

	Q'ty
1. MX-4 Mic Preamplifier	1
2. Rack Mount Screw Kit	1
Oval countersunk head screw M 5 x 15 (Ni)	4
Trim washer	4
Fiber washer (BLK) 5 x 10 x 0.5T	4
3. Operation Manual	1
4. Warranty Card	1

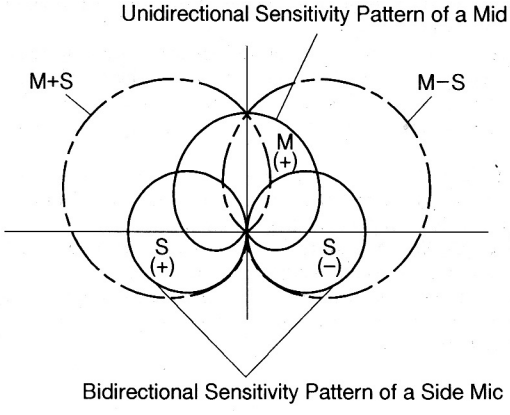
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The MS (Mid-Side) Microphone Technique

The MS technique is a stereo pickup technique using two microphones in a special configuration. They are set up with null distance between them so that sounds picked up by them coincide with each other in timing and phase. To generate a stereo signal, the MS technique uses only level differences coming from the difference of the sensitivity pattern of the mics. In a typical MS setup, a unidirectional mic is used as the mid mic, and a bidirectional mic is used as the side mic. The side mic is located at the rear of the mid mic. The mid mic picks up sounds in front and the side mic picks up sounds on sides. The sounds thus picked up and converted into electrical energy are combined together into a stereo signal through a sum-difference circuit. The combined sensitivity pattern of two mics depends on their sensitivity levels.

The MS technique is effective in creating flawlessly subtle yet open, life like sounds.

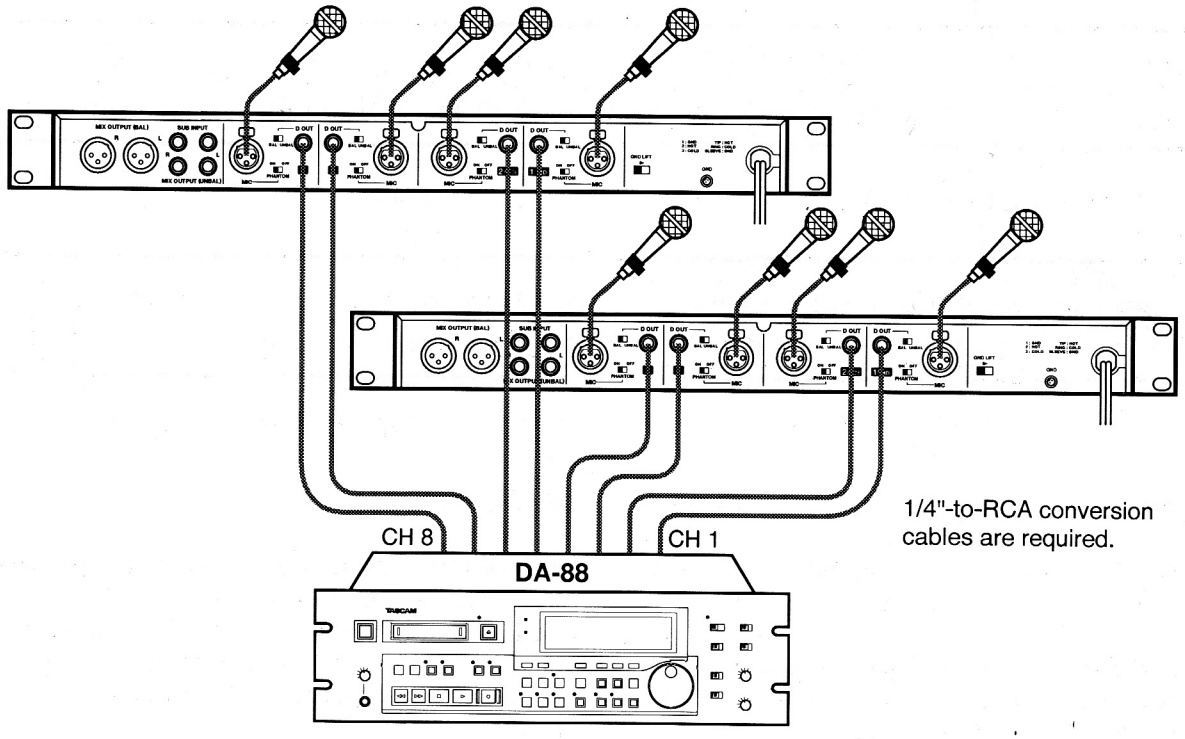


To create MS-enhanced stereo sounds with the MX-4, perform the following :

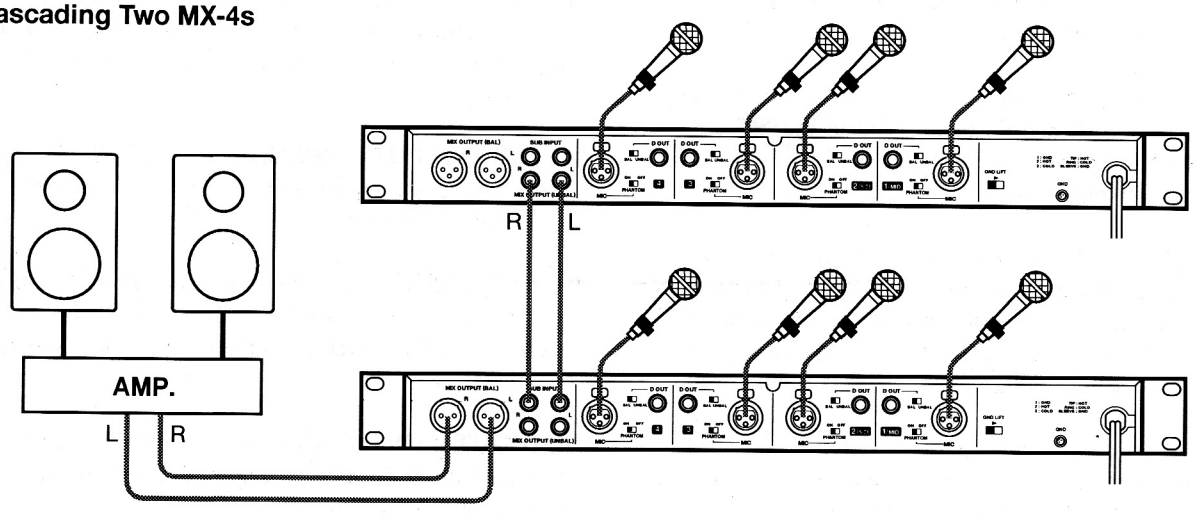
1. Plug a mid mic into the MIC connector on channel 1, and plug a side mic into the MIC connector on channel 2.
2. Connect the MIX OUTPUT L and R to a mixer.
3. Properly set the GAIN, LEVEL and other controls.
4. Depress the MS MATRIX switch.

Hookup Examples

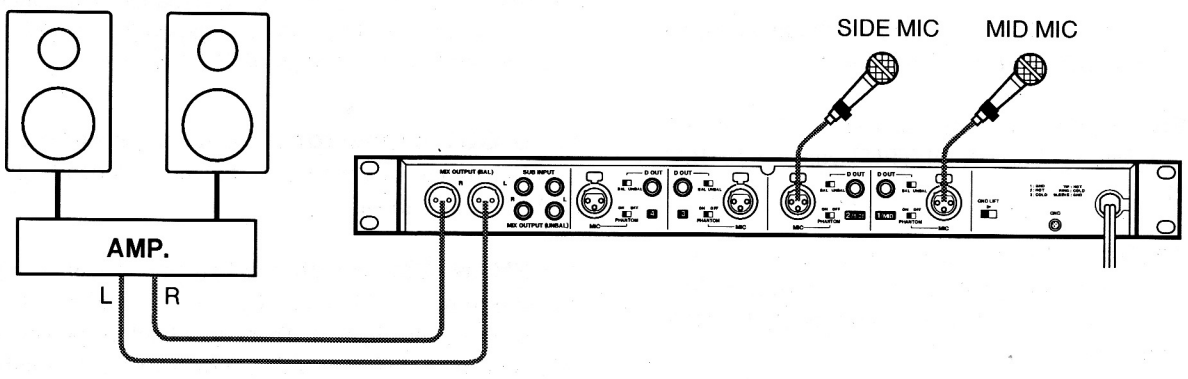
1. Recording to a TASCAM DA-88 Digital Multitrack Deck

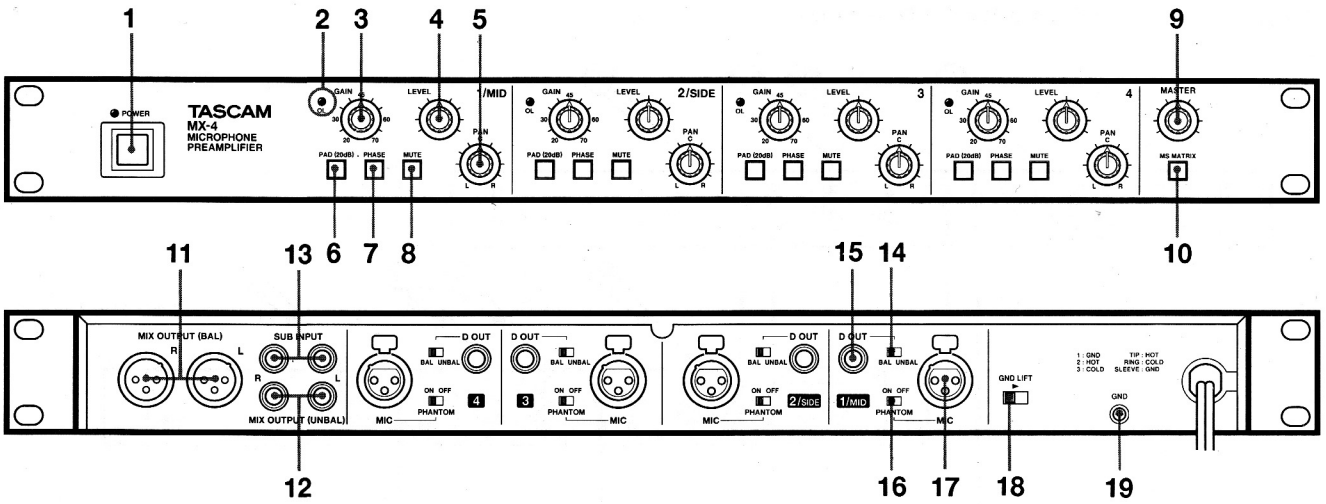


2. Cascading Two MX-4s



3. Using the MS MATRIX Feature





FRONT PANEL

1. POWER : Controls the power to the MX-4. When the power is turned on, an LED will light above the switch.

2. OL (OverLoad) : If the mic input signal level is too high, the channel OL indicator will light. If this indicator comes on, turn the PAD or GAIN control down.

3. GAIN : This controls the channel's amplifier gain over a wide range of from 20 dB to 70 dB.

4. LEVEL : The control on channels 1 and 2 sets the send level to the stereo (L and R) busses and to the MS (M+S and M-S) busses. LEVEL on channels 3 and 4 sets the send level to the stereo busses only.

5. PAN : This sends the channel's signal in continuously variable degrees anywhere to the left or right of the stereo mix. Turning the knob all the way to the left sends the signal to the stereo L buss only. Turning the knob all the way to the right sends the signal to the stereo R buss only.

6. PAD : If the GAIN control is fully down and yet the channel OL indicator is lit, depress PAD on the channel, which inserts a 20 dB pad in the mic input path.

7. PHASE : This is a phase reverse switch and is used to overcome phasing irregularities of the input signals.

8. MUTE : This switch cuts down the channel's signal feeding the stereo, MS and D OUT busses.

9. MASTER : This provides the final level adjustment to the stereo mix feeding the MIX OUTPUT connectors (BAL and UNBAL).

10. MS MATRIX : If this switch is depressed, the MIX OUTPUT connectors get signals from the MS busses (M+S and M-S). If the switch is off, the stereo busses (L and R) feed the outputs instead.

REAR PANEL

11. MIX OUTPUT (BAL) : These XLR-type connectors carry signals at a nominal +4 dBm level. Even when cold side is grounded for an externally connected unbalanced unit, level compensation can be attained while amplifier on the cold side is protected, thereby preventing level decrease.
If the MS MATRIX switch is on, the L connector carries the M+S signal and the R connector carries the M-S signal (see diagram on p. 4). If the MS MATRIX is off, the outputs get signals from the stereo L and R busses, respectively.

12. MIX OUTPUT (UNBAL) : This pair of 1/4" jacks is similar in operation to the outputs above, but carries signals at a nominal −2 dBu level.

13. SUB INPUT : This pair of unbalanced −2 dBu 1/4" jacks allow you to connect the MIX OUTPUTs (UNBAL) of a second MX-4 directly to the stereo L and R busses of the first MX-4.

14. D OUT switch : Determines whether the D OUT jack on the channel supplies balanced +4 dBm signals or unbalanced −10 dBV signals.

> **WARNING**
> With balanced setting selected, avoid using the unbalanced connection. This is because this condition lowers output level by 6 dB and generates enough heat to shorten the life of the grounded amplifier.

15. D OUT connector : Carries the post-GAIN, pre-LEVEL signal, balanced or unbalanced depending on the D OUT switch above.

16. PHANTOM switch : When pressed, this supplies phantom power (+48 volts DC) to pins 2 and 3 of the MIC connector on the channel. There are phantom-powered mics that require a different voltage or a different method of

supplying the voltage to the connector pins. Before plugging in, check the manual for your mics.

WARNING

If no phantom-powered mics are connected, the PHANTOM switch on the channels must be OFF.

17. MIC : These XLR-type connectors are for connection of balanced mics. The pin assignment : Pin 1 is GND, Pin 2 is HOT, and Pin 3 is COLD.

When using the MS technique, connect a middle mic to channel 1 and a side mic to channel 2.

18. GND LIFT : This switch is used to eliminate a ground loop noise developed via the enclosure of units mounted in a metal rack.

19. GND : This is a ground point connected to the MX-4 chassis. A proper audio grounding is a study in itself. If necessary, consult a person familiar with studio grounding techniques.

Specifications

MIC (XLR-type, Balanced)
Input Impedance : 2k ohms
Nominal Input Level : –68 dBm (0.3 mV) (GAIN full up) to +2 dBm (1.0 V) (GAIN full down, PAD on)
Gain Range : 50 dB
Pad Attenuation : 20 dB

SUB INPUT (1/4", Unbalanced)
Input Impedance : 22k ohms
Nominal Input Level : –2 dBu (0.6 V)
Maximum Input Level : +24 dBu (12.2 V)

D OUT (1/4")
Balanced
Output Impedance : 100 ohms
Nominal Output Level : +4 dBm (1.2 V)
Maximum Output Level : +28.5 dBm (20.6 V)
Unbalanced
Output Impedance : 100 ohms
Nominal Output Level : –10 dBV (0.3 V)
Maximum Output Level : +15.5 dBV (5.9 V)

OL : Lights at about 3 dB below clipping level (+24 dBu)

MIX OUTPUT
BAL (XLR-type, Balanced)
Output Impedance : 75 ohms
Nominal Output Level : +4 dBm (1.2 V)
Maximum Output Level : +28.5 dBm (20.6 V)
UNBAL (1/4", Unbalanced)
Output Impedance : 100 ohms
Nominal Output Level : –2 dBu (0.6 V)
Maximum Output Level : +23.5 dBu (11.5 V)

Power Requirements
USA/CANADA : 120 V AC, 60 Hz
EUROPE : 230 V AC, 50 Hz

Power Consumption : 22 Watts

Weight : 3.0 kg (6-10/16 lbs)

TYPICAL PERFORMANCE

Equivalent Mic Input Noise (DIN AUDIO, GAIN full up, 150-ohm source) : –129 dB

CMRR (Common Mode Rejection Ratio) : Better than 80 dB

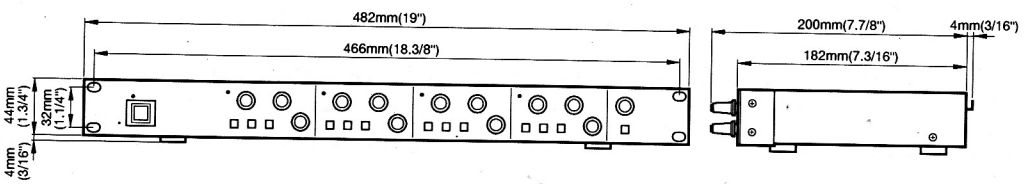
Noise Level (IHF-A)
MIX OUTPUT : MASTER full down = –100 dBV or less
MASTER at nominal position, LEVEL full up, GAIN full down = –80 dBV or less

Distortion (THD) (at 1 kHz, 30-kHz LPF inserted)
1 MIC to MIX OUTPUT 1 : 0.008% or less
1 MIC to D OUT : 0.008% or less

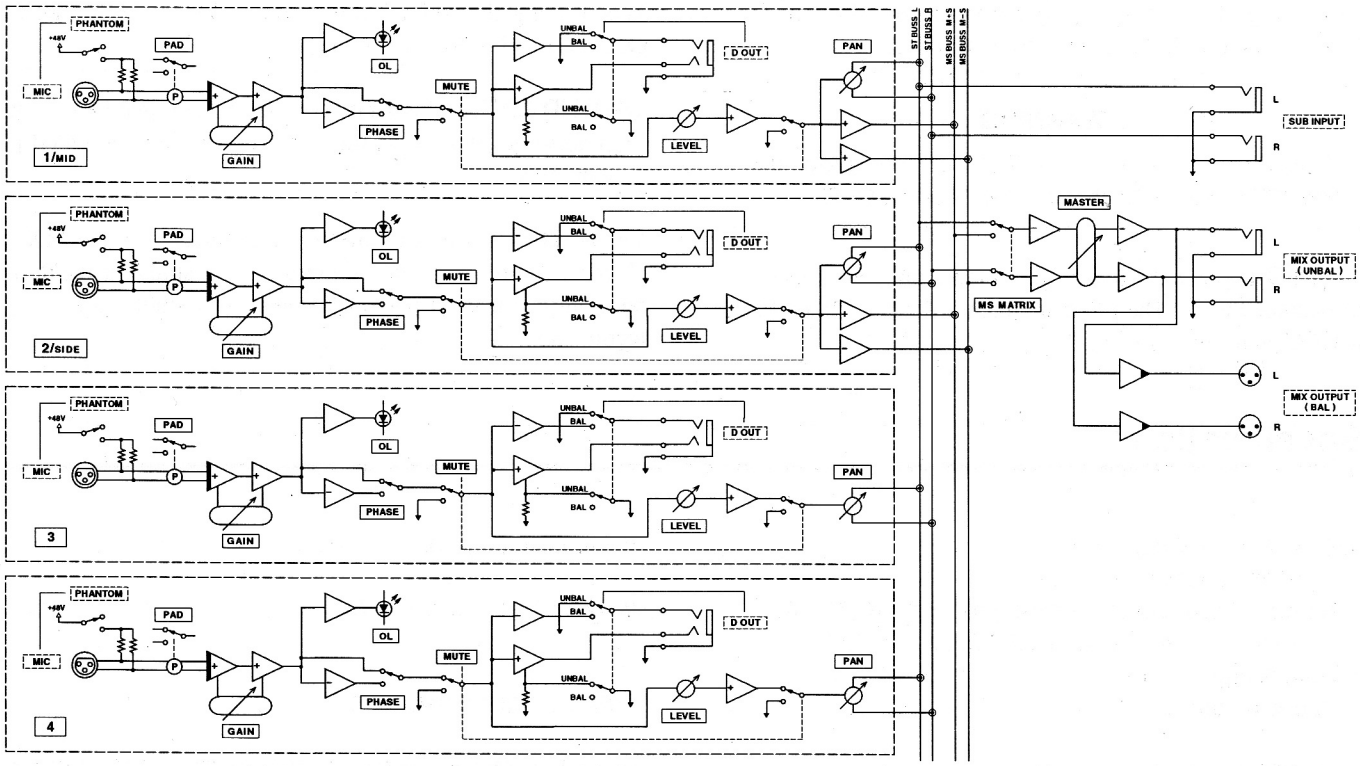
Frequency Response
All Inputs to All Outputs : 20 Hz to 30 kHz +0, –1.0 dB

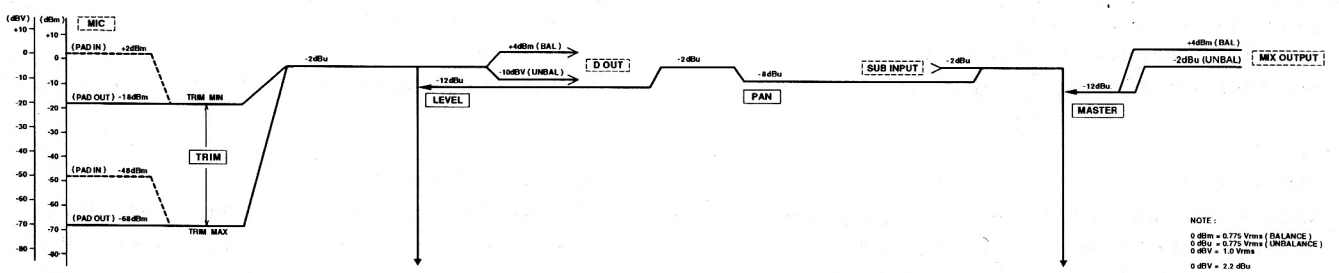
Crosstalk (at 1 kHz) : At D OUTs of adjacent channels, 150-ohm source = Better than 80 dB

- In these specs : 0 dBV = 1.0 Vrms, 0 dBm (balanced) = 0 dBu (unbalanced) = 0.775 Vrms. Actual voltage for –10 dBV (0.316 V) is rounded to 0.3 V.
- Changes in specs and features may be made without notice or obligation.



Block/Level Diagram





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