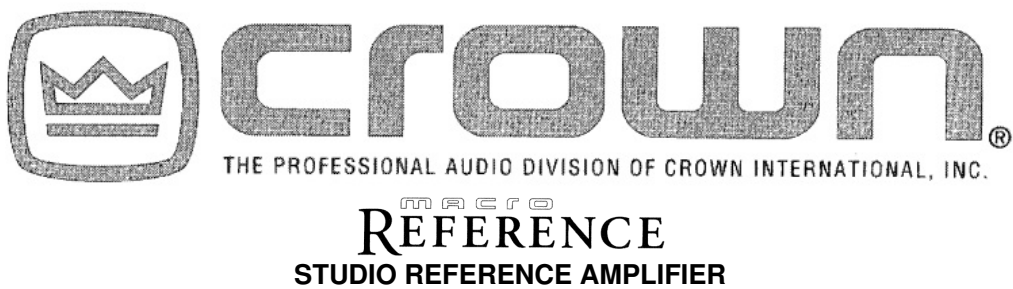




CROWN Macro Reference Studio Reference Amplifier Owner's Manual

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OWNER'S MANUAL

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Macro Reference Studio Reference Amplifier

'SUMMARY OF WARRANTY



SUMMARY OF WARRANTY

The Crown Audio Division of Crown International, Inc., 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Crown Warranty.

' Note: If your unit bears the name "Amcran," please substitute it for the name "Crown" in this warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repairs not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center. All expenses in remedying the defect, including surface shipping costs to the nearest authorized service center, will be borne by us. (You must bear the expense of all taxes, duties and other customs fees when transporting the product.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service not later than ninety (90) days after expiration of the warranty period. All components must be shipped in a factory pack. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

No action to enforce this Crown Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS.

NORTH AMERICA 3 YEAR FULL WARRANTY



SUMMARY OF WARRANTY

The Crown Audio Division of Crown International, Inc., 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of six (6) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less @ reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service not later than ninety (90) days after expiration of the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty.

This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown **Warranty**.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS.

The information furnished in this manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance. If your unit bears the name "Amcron," please substitute it for the name "Crown" in this manual. If you need special assistance beyond the scope of this manual, please contact our Technical Support Group.

Crown Audio Division Technical Support Group

57620 C.R. 105, Elkhart, Indiana 46517 U.S.A.

Phone: 800-342-6939 (U.S.A.) or 219-294-8200 Fax: 219-294-8301

IMPORTANT

THE MACRO REFERENCE REQUIRES CLASS 1 OUTPUT WIRING

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

TO PREVENT ELECTRIC SHOCK DO NOT REMOVE TOP OR BOTTOM COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSON- NEL. DISCONNECT POWER CORD BEFORE REMOVING REAR INPUT MODULE TO ACCESS GAIN SWITCH.



WARNING

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE!

Magnetic Field

CAUTION! Do not locate sensitive high-gain equipment such as preamplifiers or tape decks directly above or below the unit. Because this amplifier has a high power density, it has a strong magnetic field which can induce hum into unshielded devices that are located nearby. The field is strongest just above and below the unit.

If an equipment rack is used, we recommend locating the amplifier(s) in the bottom of the rack and the preamplifier or other sensitive equipment at the top.

WATCH FOR THESE SYMBOLS:



The lightning bolt triangle is used to alert the user to the risk of electric shock.



The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

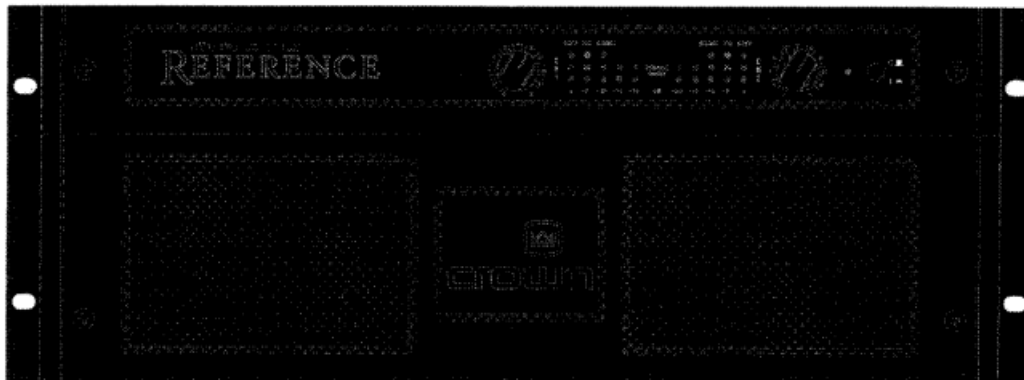


Fig. 1.1 Macro Reference Amplifier with Engraved Electroluminescent Front Panel

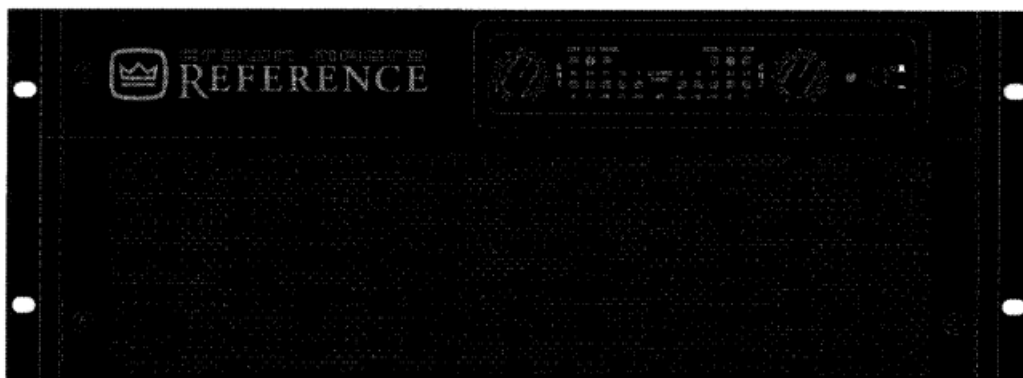


Fig. 1.2 Macro Reference Amplifier with Steel Front Panel

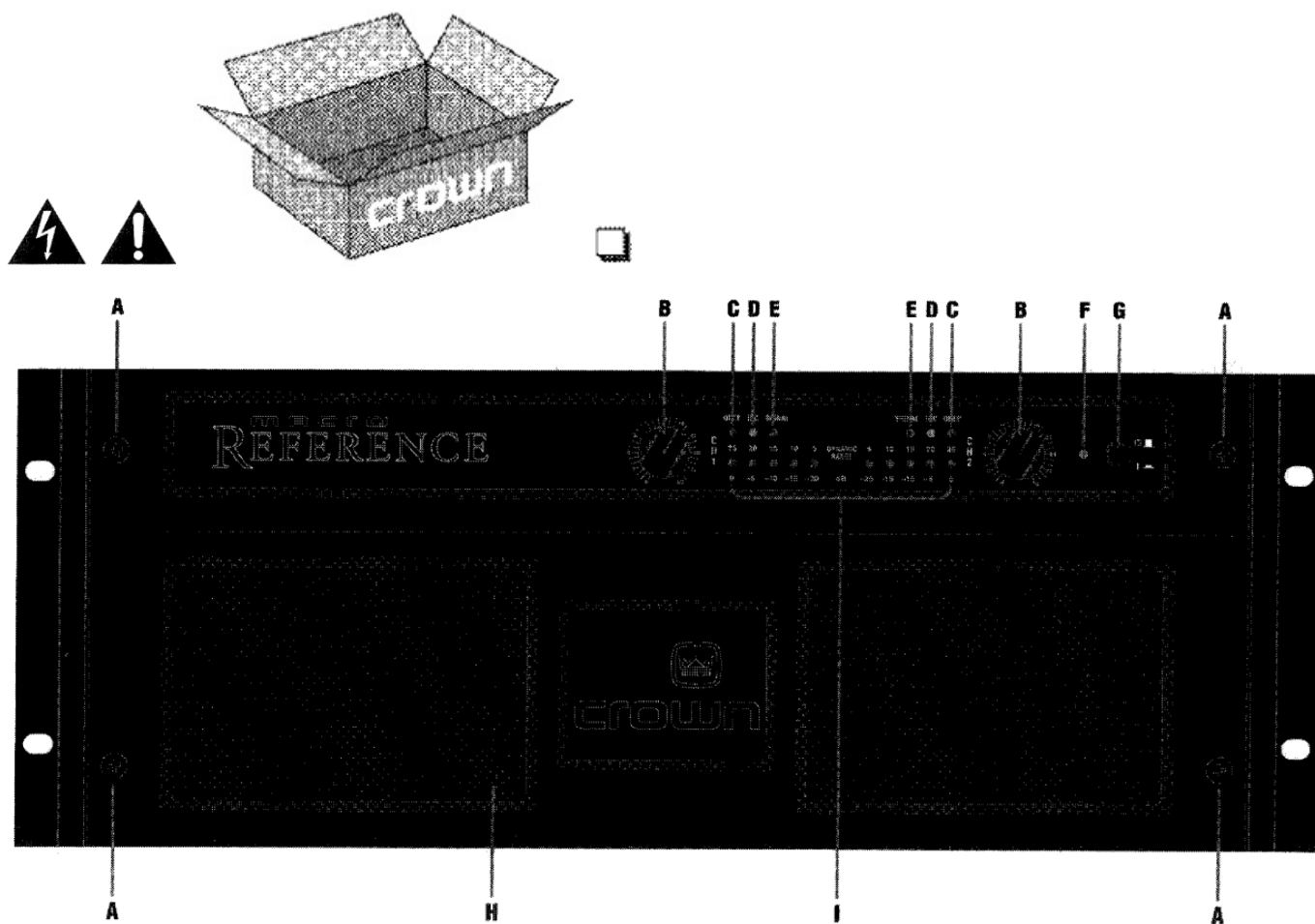


Fig. 2.1 Front Facilities

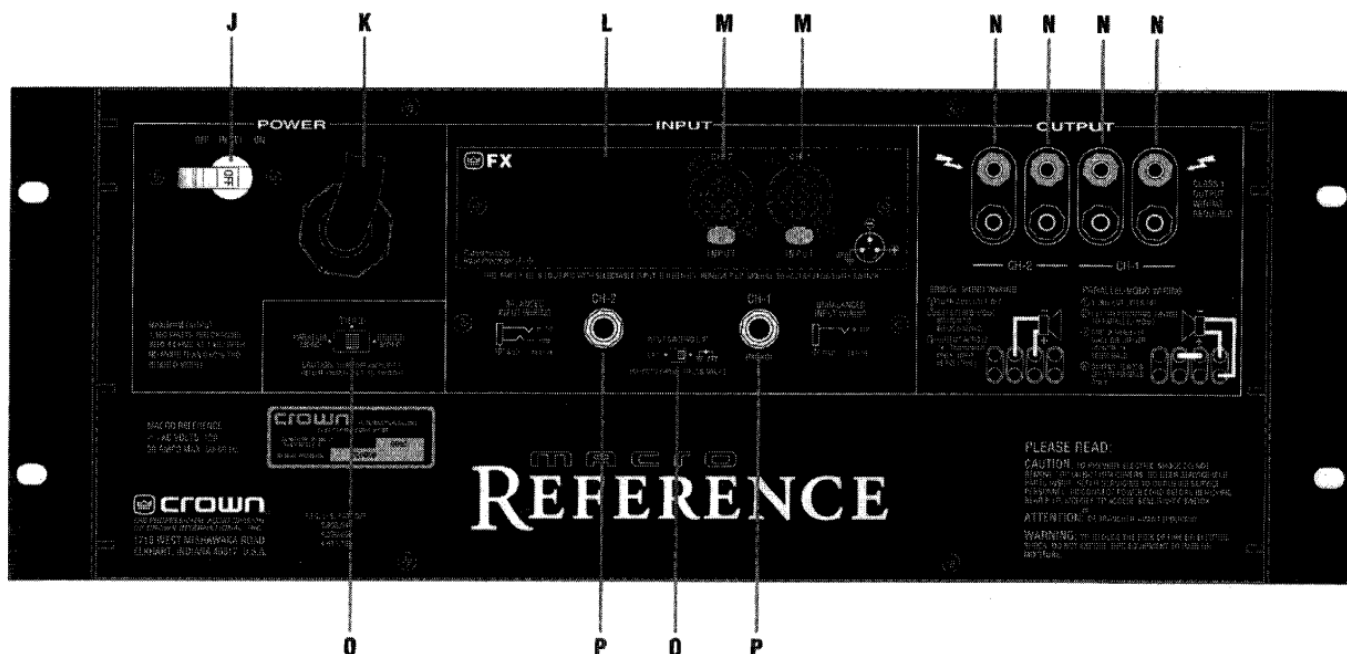


Fig. 2.2 Rear Facilities

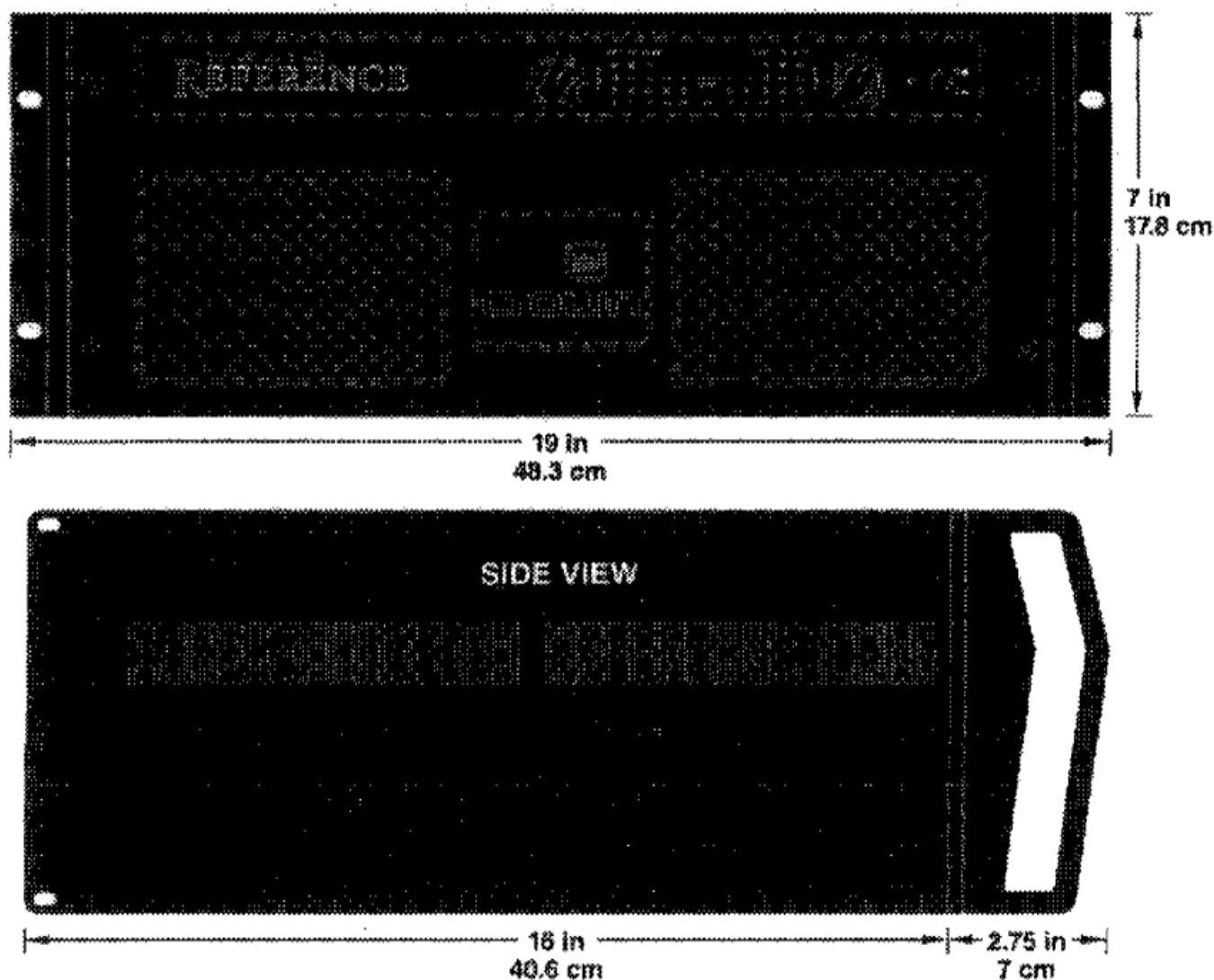


Fig. 3.1 Mounting Dimensions

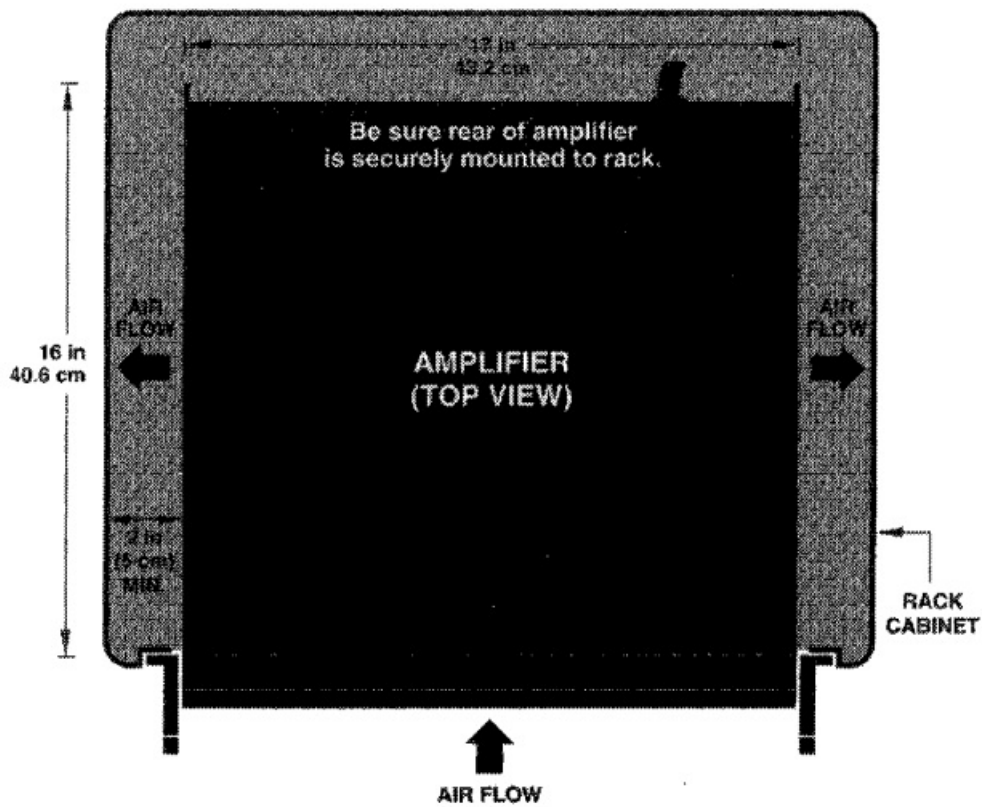


Fig. 3.2 Top View of a Rack-Mounted Unit

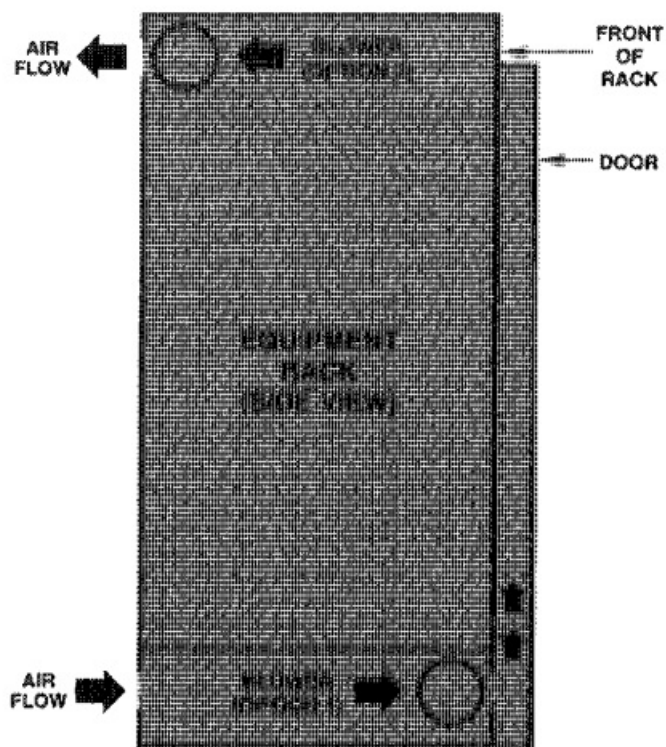


Fig. 3.3 Proper Air Flow in a Rack Cabinet

STEREO MODE

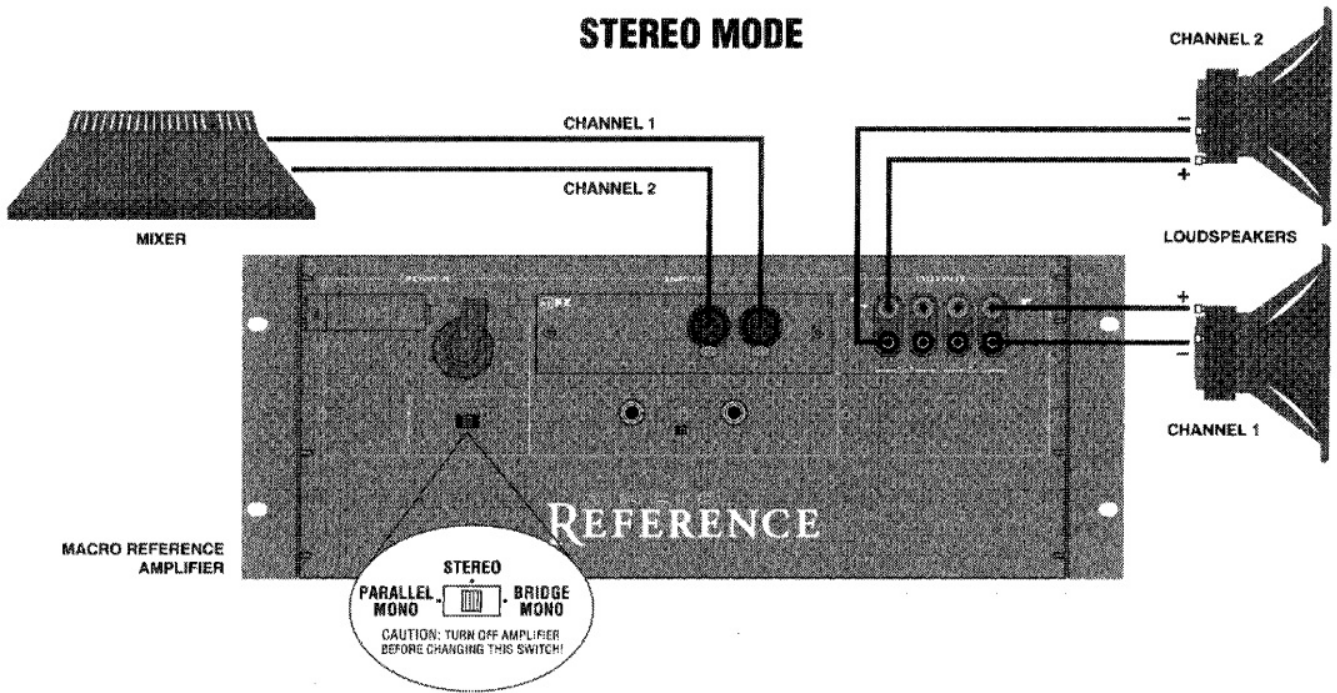


Fig. 3.4 Stereo Wiring

BRIDGE-MONO MODE

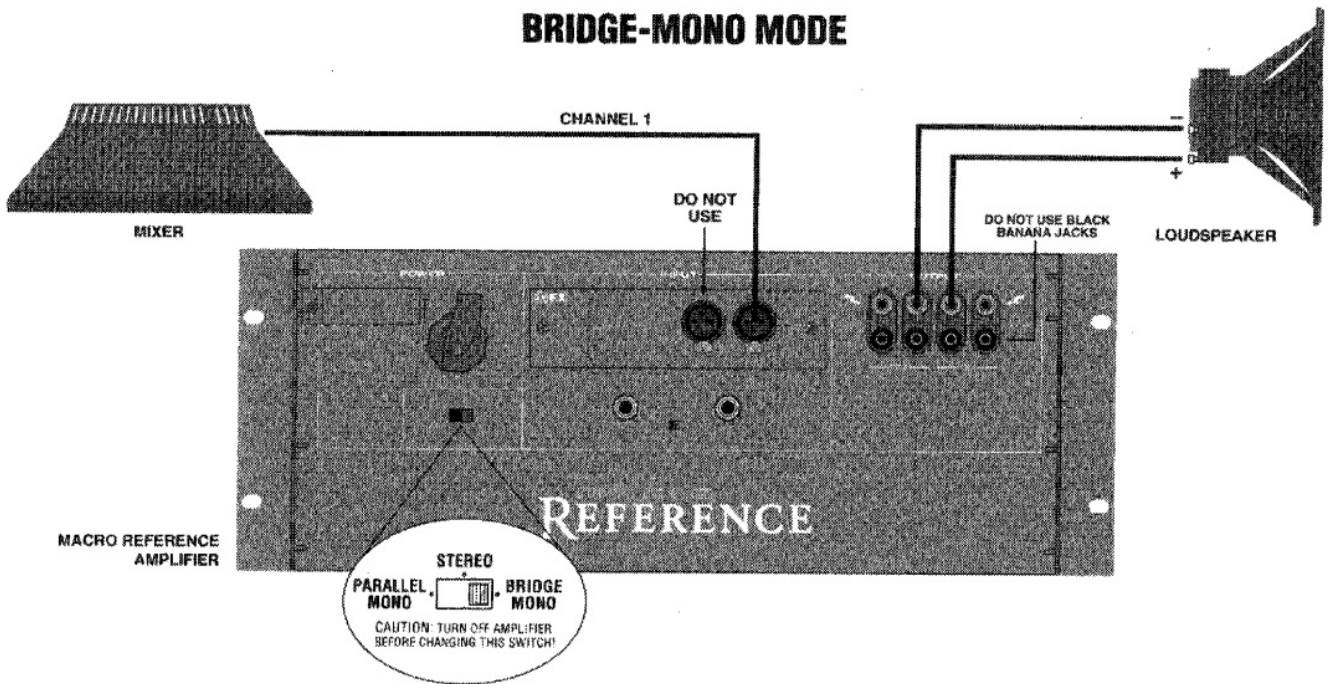


Fig. 3.5 Bridge-Mono Wiring

PARALLEL-MONO MODE

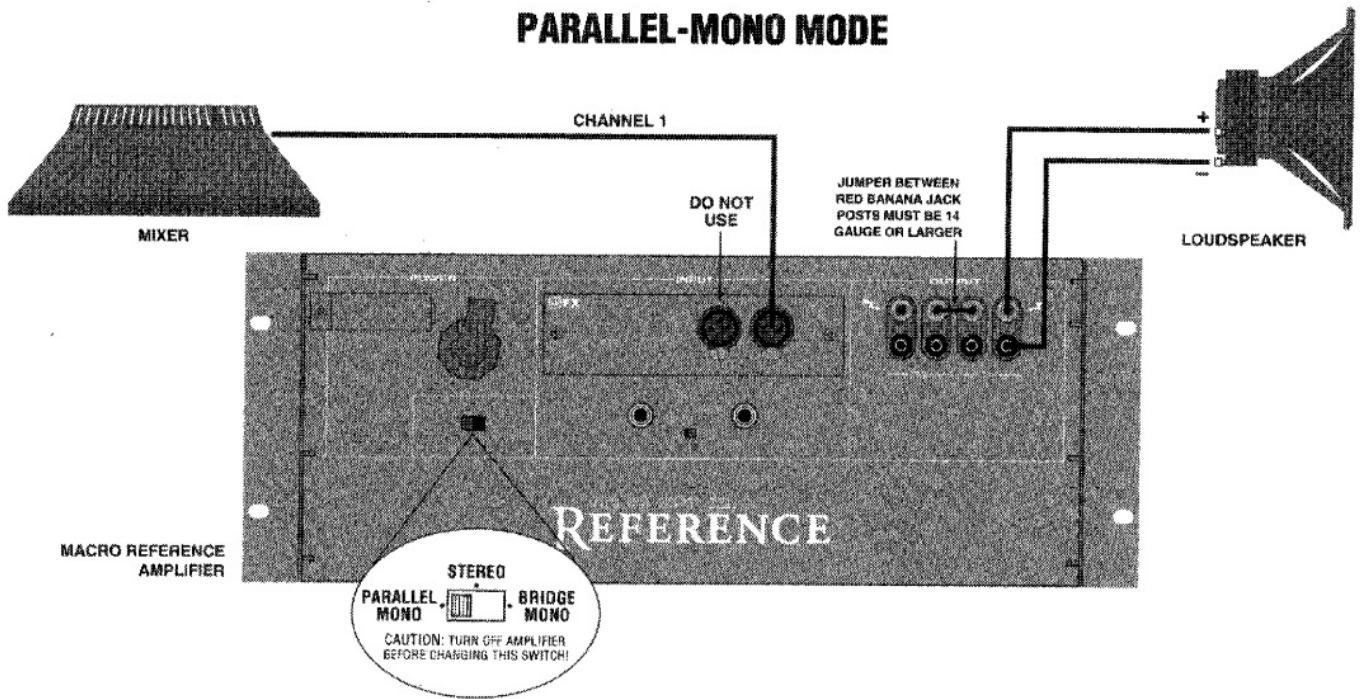


Fig. 3.6 Parallel-Mono Wiring

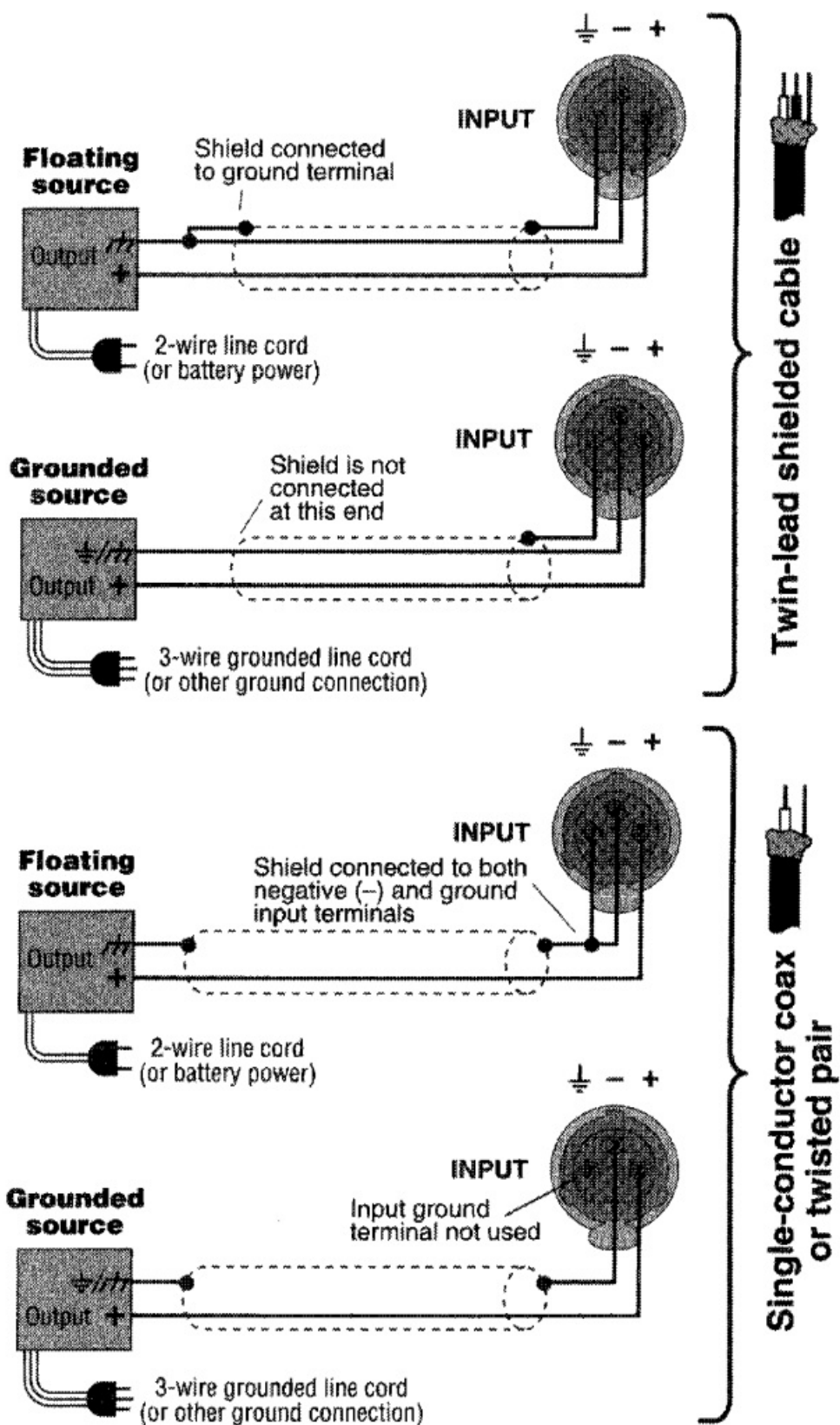


Fig. 3.7 Unbalanced Input Wiring

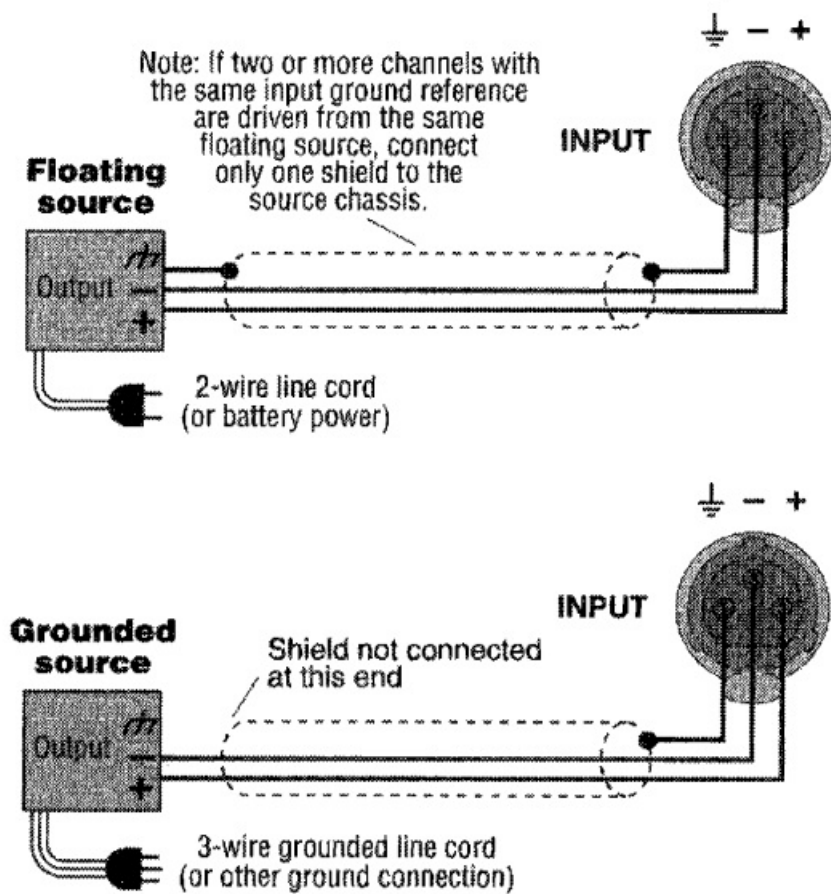


Fig. 3.8 Balanced Input Wiring

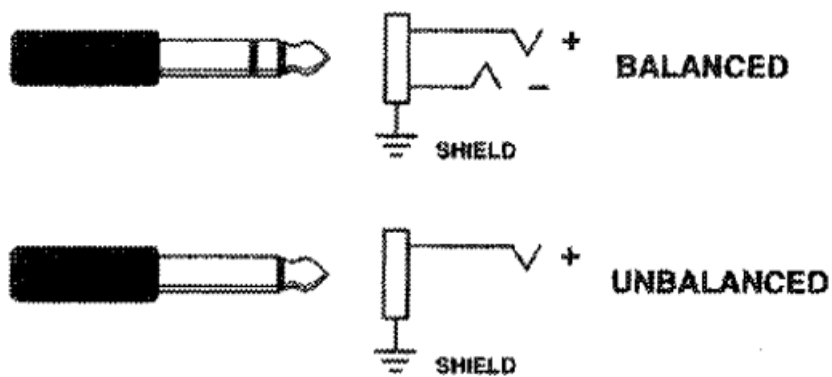


Fig. 3.9 Balanced and Unbalanced Phone Plugs

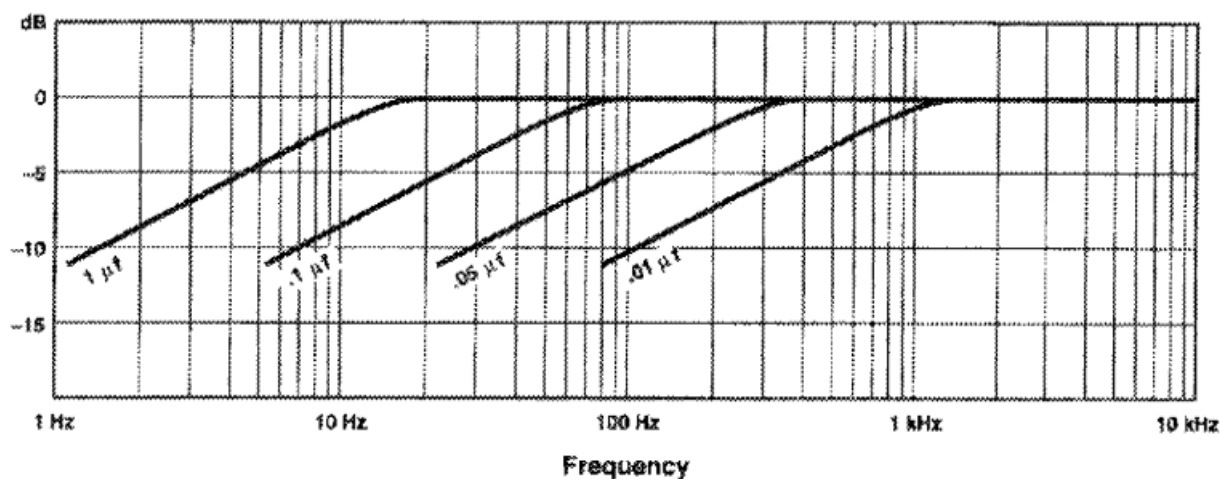


Fig. 3.10 Subsonic Filter Capacitors

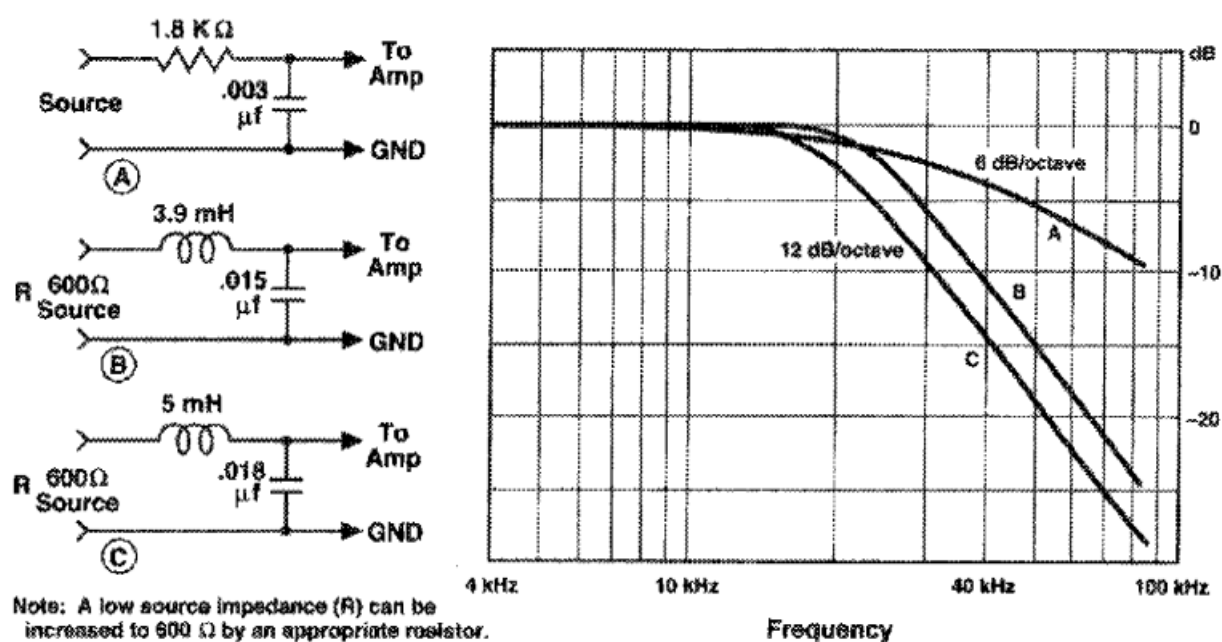


Fig. 3.11 Unbalanced RFI Filters

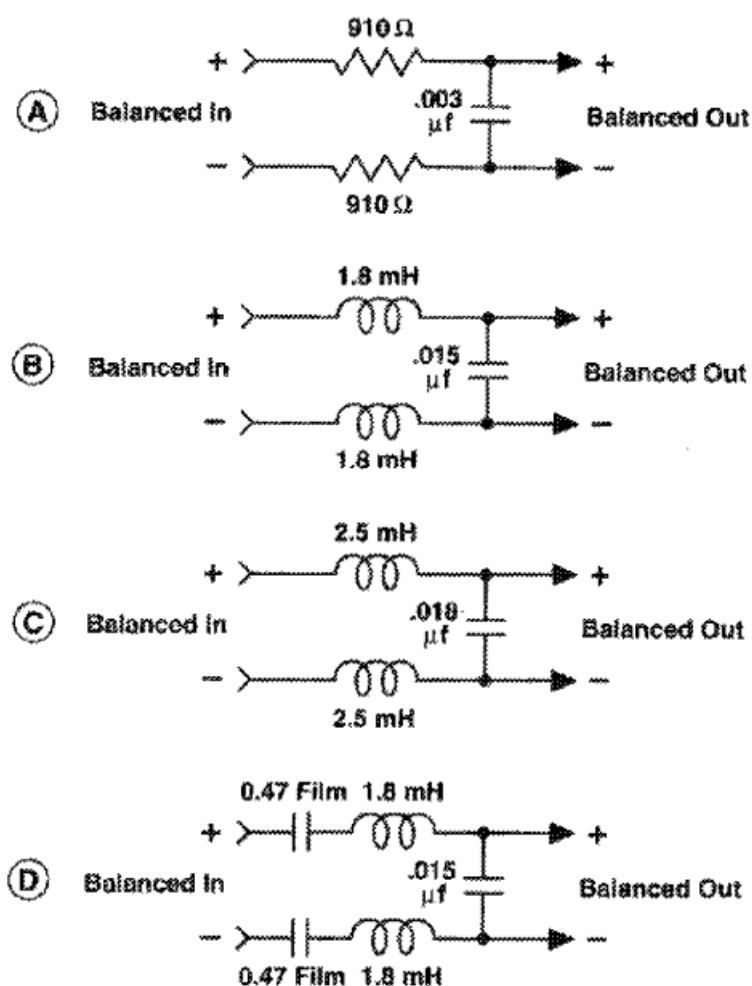


Fig. 3.12 Balanced RFI Filters

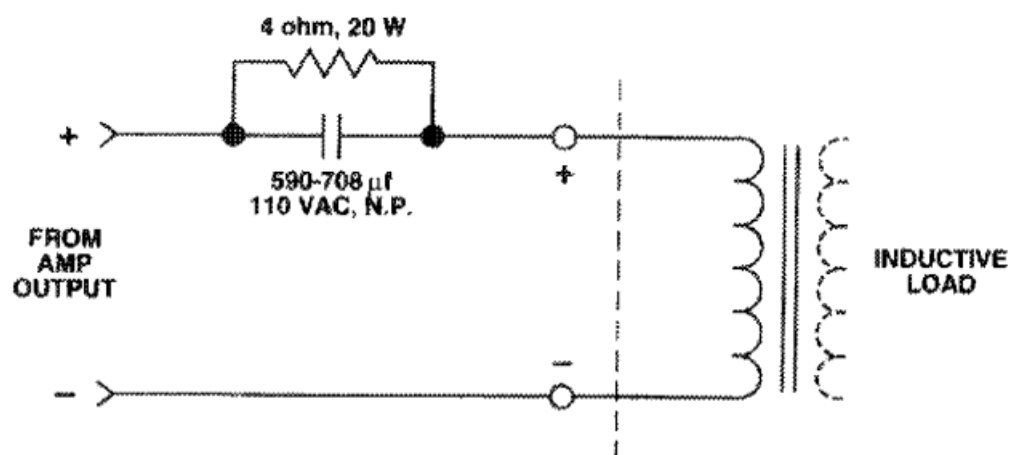


Fig. 3.14 Inductive Load (Transformer) Network

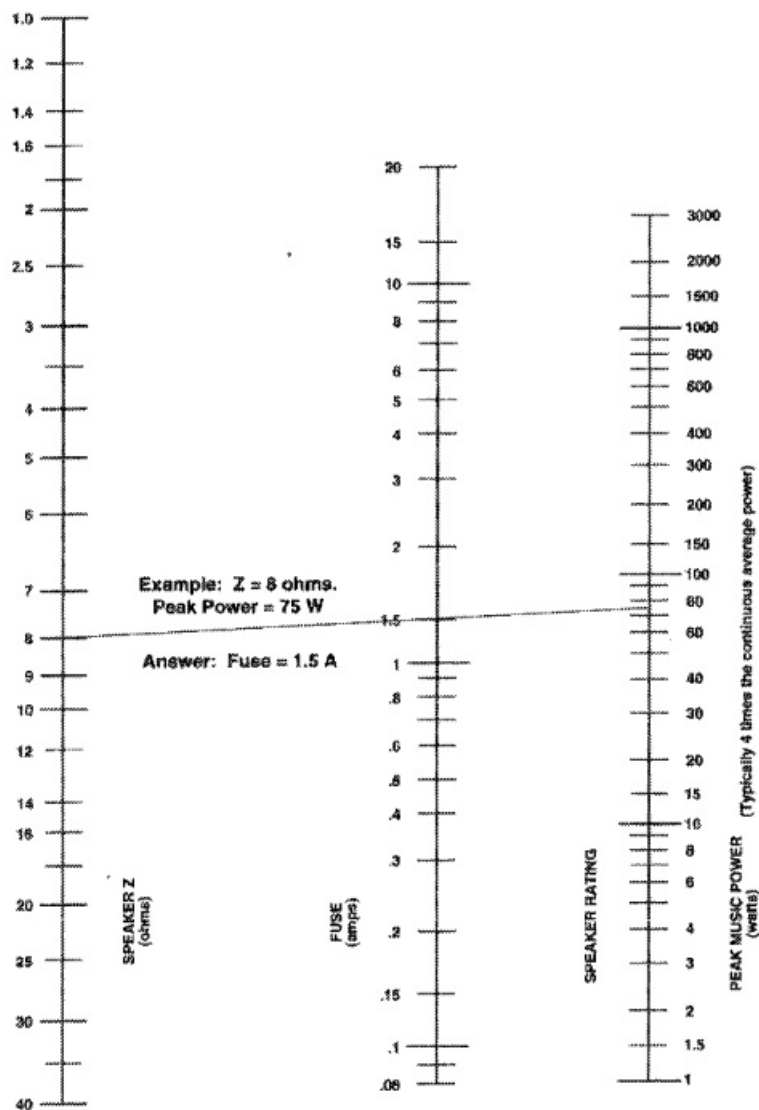
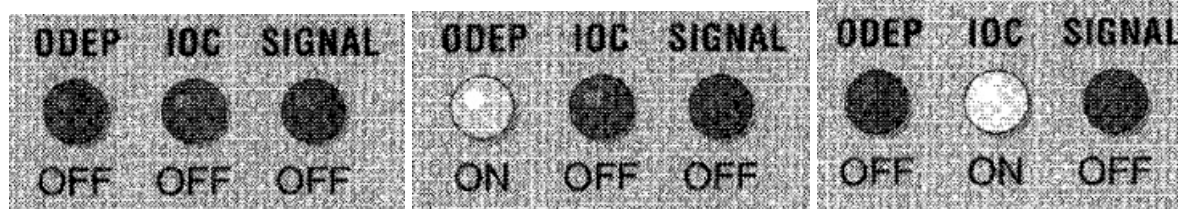
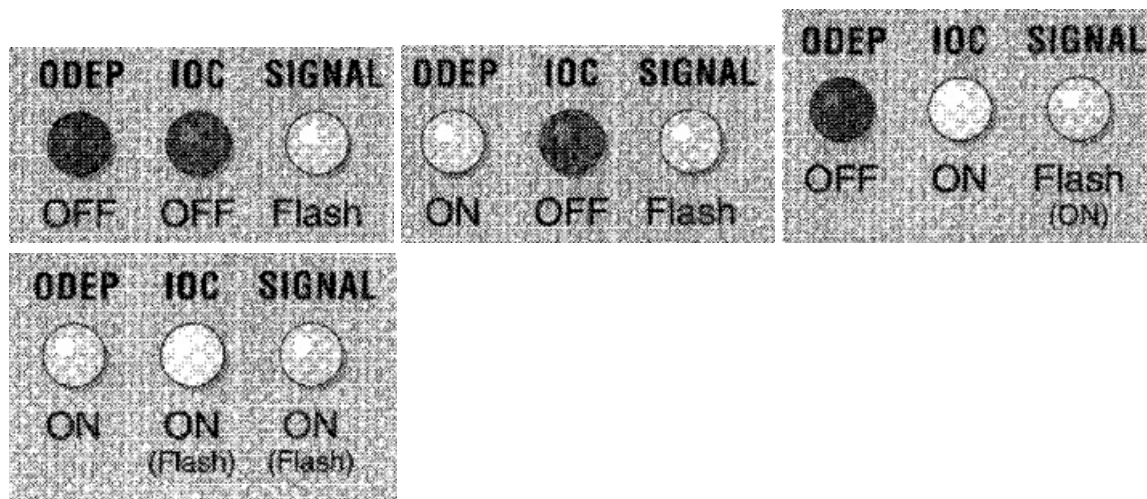


Fig. 3.15 Loudspeaker Fuse Selector Nomograph



Fig. 4.1 Indicators





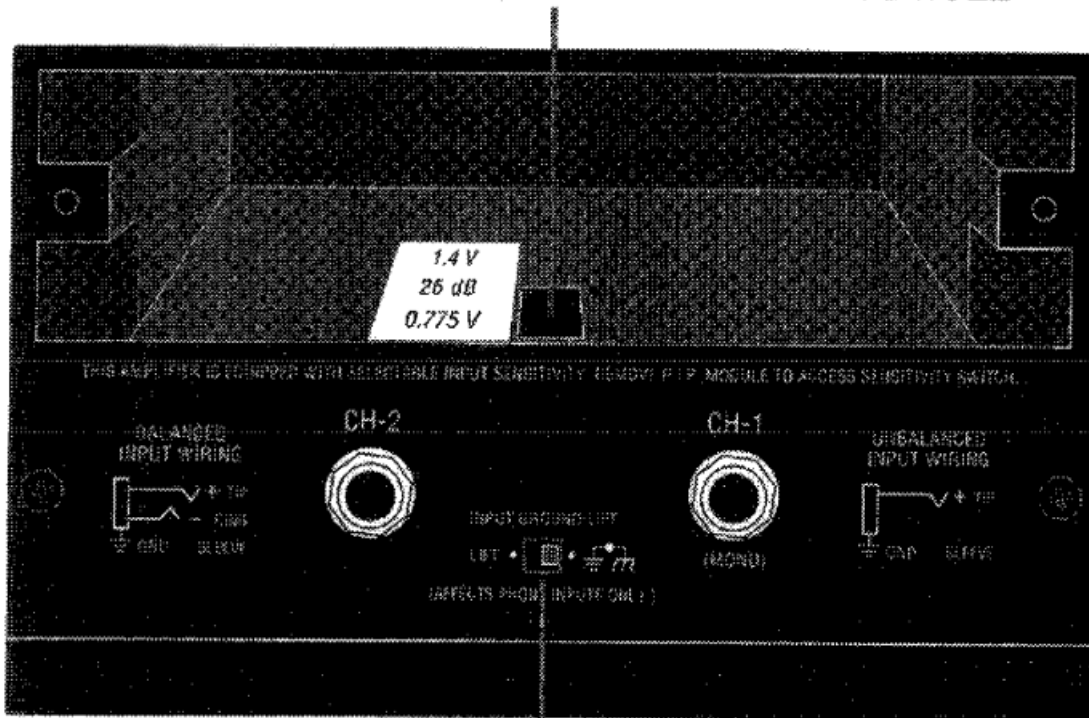
METER MODE SWITCH

OUTPUT LEVEL ← → DYNAMIC RANGE



Fig. 4.3 Meter Mode Switch

INPUT SENSITIVITY SWITCH INSIDE ACCESS HOLE



GROUND LIFT SWITCH

Fig. 4.4 Input Sensitivity and Ground Lift Switches

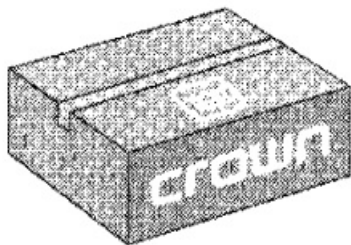


ENGRAVED
ELECTRO-
LUMINESCENT
FRONT PANEL

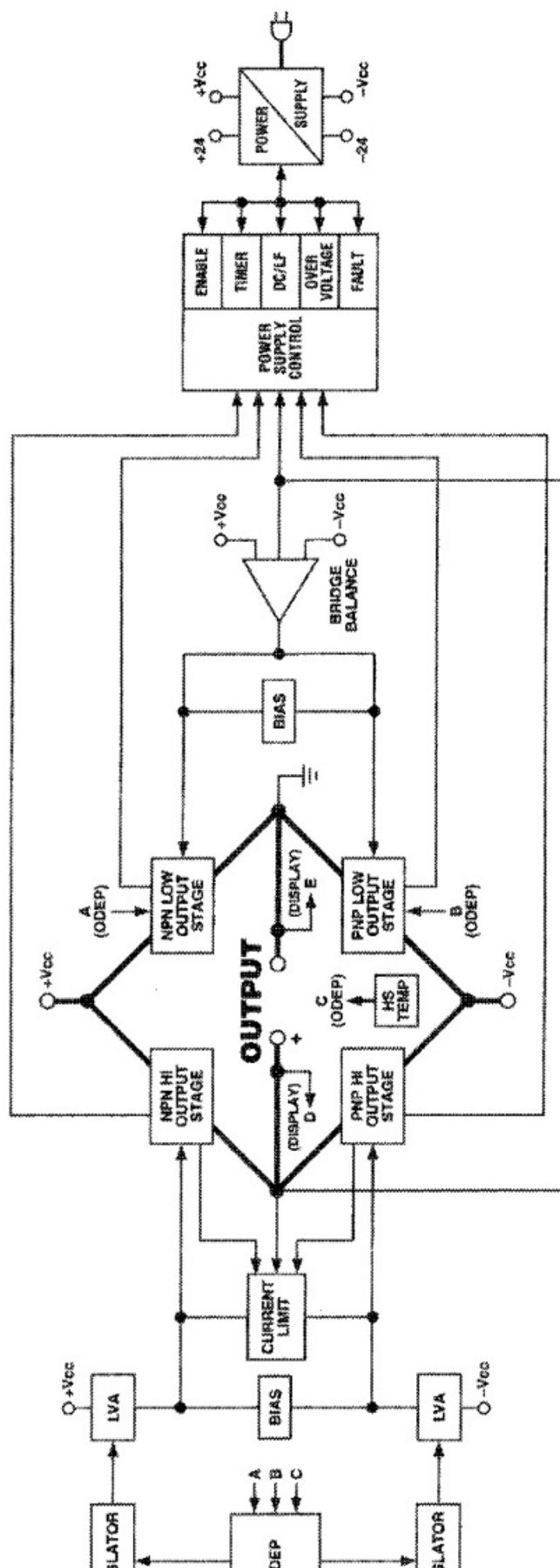


STEEL FRONT
PANEL

Fig. 4.5 Macro Reference Front Panels



Always use the original factory pack to transport the unit.



ONLY ONE CHANNEL SHOWN

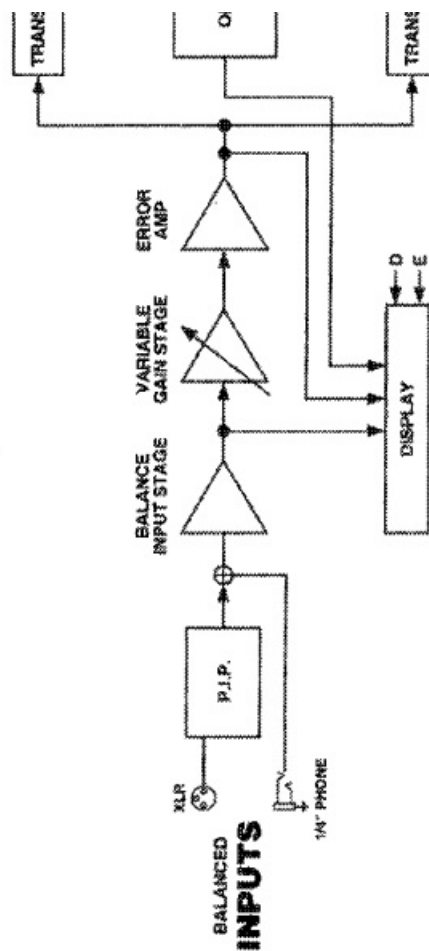


Fig. 6.1 Circuit Block Diagram

$$\text{AC Mains Power Draw (watts)} = \frac{\text{Rated amplifier output with both channels driven (watts)} \times \text{Duty Cycle}}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (90 watts)}$$

$$\text{Thermal Waste (btu/hr)} = \left[(1 - \text{Power to Loads}) + \text{Ambient Power Draw (90 watts)} \right] \times 3.415$$

or

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Rated amplifier output both channels (watts)} \times \text{Duty Cycle} \times .35}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (90 watts)} \right) \times 3.415$$

$$\text{Current Draw (amperes)} = \frac{\text{AC Mains Power Draw (watts)}}{\text{AC Mains Voltage} \times \text{Power Factor (.83)}}$$

Macro Reference

Duty Cycle	LOAD														
	4 Ohm Stereo					4 Ohm Stereo / 8 Ohm Bridge Mono / 2 Ohm Parallel Mono					2 Ohm Stereo / 4 Ohm Bridge Mono / 1 Ohm Parallel Mono				
	AC Music Power (Watts)	Current Draw (Amperes)	Thermal Dissipation		AC Music Power (Watts)	Current Draw (Amperes)	Thermal Dissipation		AC Music Power (Watts)	Current Draw (Amperes)	Thermal Dissipation		AC Music Power (Watts)	Current Draw (Amperes)	Thermal Dissipation
	100-120 V	220-240 V	Channel	Total		100-120 V	220-240 V	Channel	Total		100-120 V	220-240 V	Channel	Total	
90%	265	2.1	1.1	445	115	270	2.7	1.4	520	130	320	3.2	1.6	555	145
80%	325	2.3	1.2	585	150	445	4.5	2.3	785	185	585	5.5	2.8	860	215
60%	450	4.4	2.2	725	185	625	6.3	3.2	945	240	750	7.9	4.0	1135	265
50%	580	5.5	2.9	865	220	805	8.1	4.1	1190	295	1015	10.2	5.1	1410	355
10%	675	6.6	3.4	1005	255	990	9.9	5.0	1375	345	1245	12.5	6.3	1665	425

Fig. 8.1 Power Draw, Current Draw and Thermal Dissipation at Full Rated Power for the Listed Duty Cycles

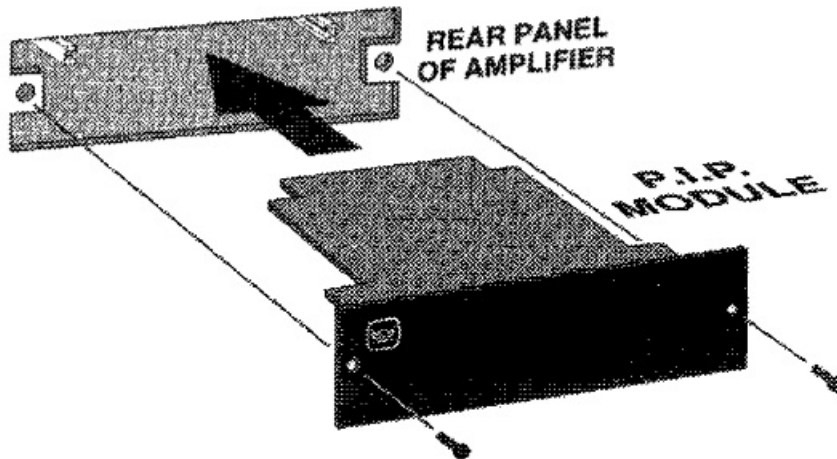
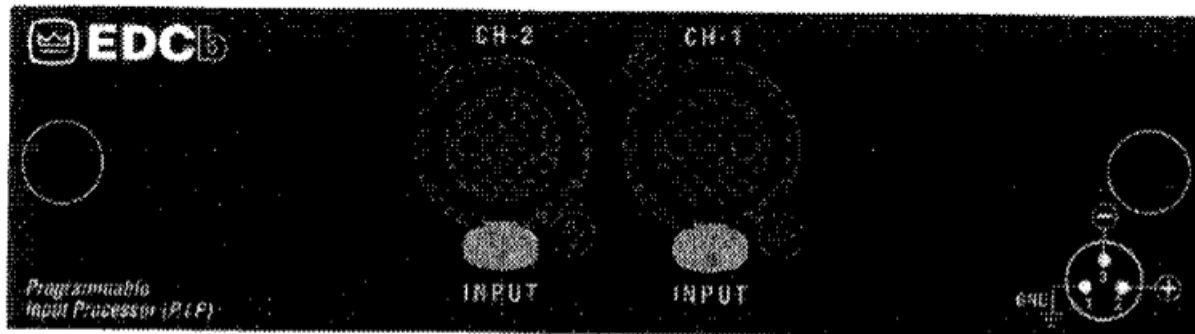
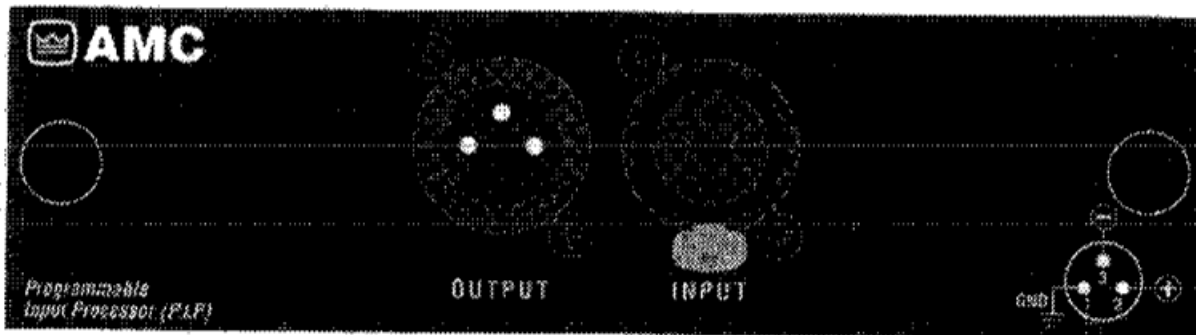


Fig. 9.1 Installing a P.I.P. Module



FTE

CH-2 INPUT
+ μ -

CH-1 INPUT
+ μ -

Programmable
Input Processor (P.I.P.)

IC P.I.P.

DATA OUT

AUX

DSPI

DATA IN

CROWN
BUS

CH-2

CH-1

AUDIO IN

AUDIO IN

END

Programmable
Input Processor

CLP

CH-2

CH-1

INPUT

INPUT

END

Programmable
Input Processor (P.I.P.)

ISO CH-2 INPUT
+ μ -

CH-1 INPUT
+ μ -

—WARNING—

THIS P.I.P. PROVIDES FULL ISOLATION
FOR ISO-MODIFIED AMPLIFIERS ONLY!
DO NOT CONNECT THE OUTPUT GROUND
LUG TO THE INPUT COMMON OR CHASSIS
GROUND. REFER TO P.I.P.-ISO OWNER'S
MANUAL FOR FURTHER INFORMATION.

Programmable
Input Processor (P.I.P.)

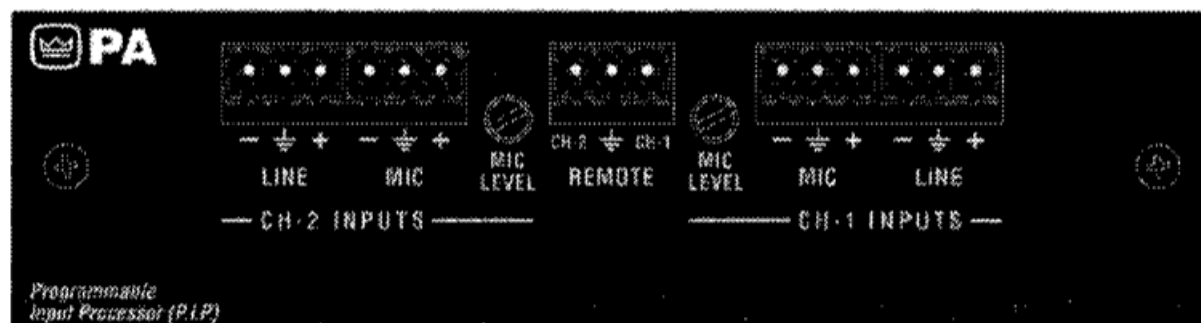
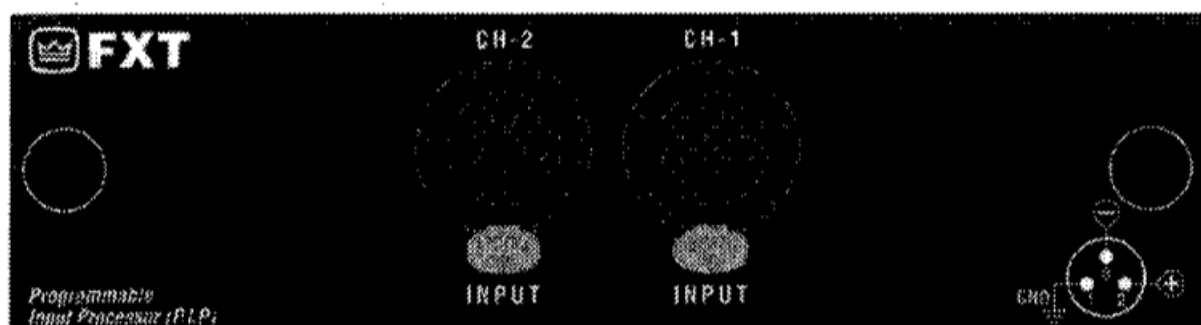
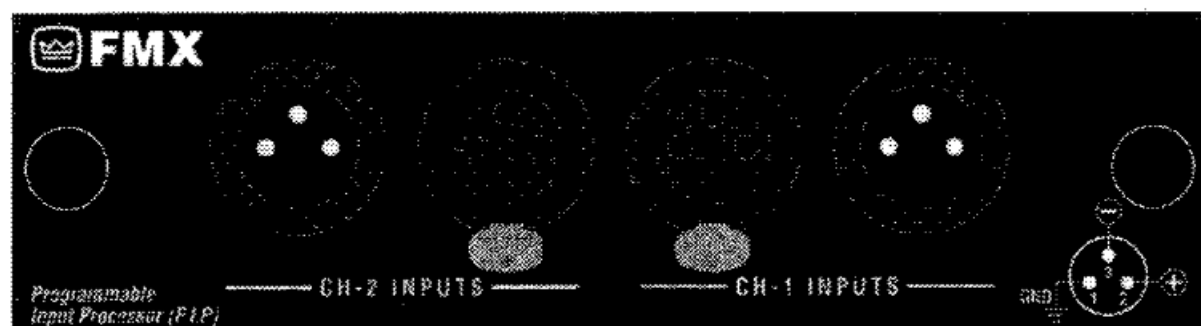
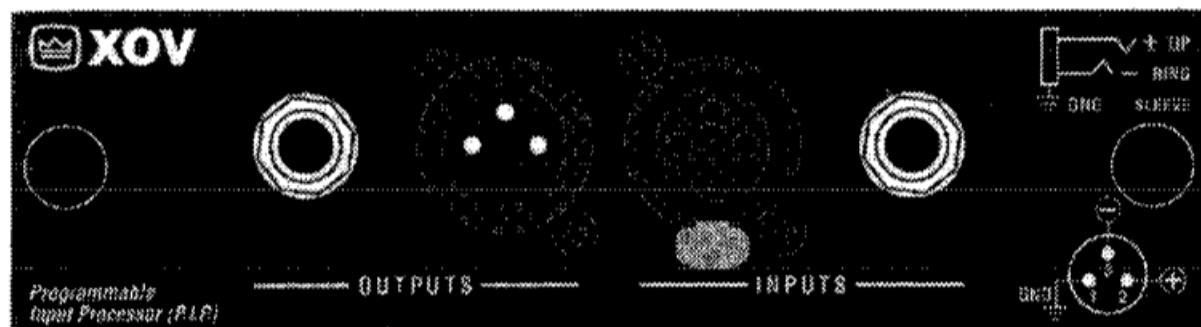
ATN CH-2 INPUT
+ μ -

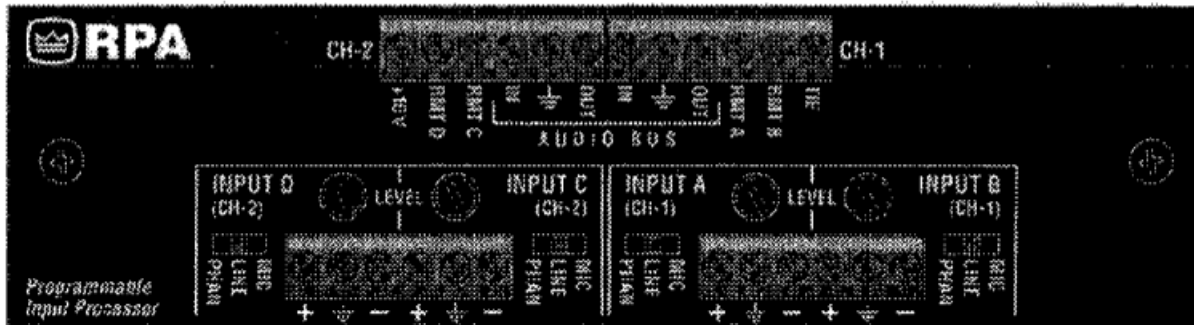
ATTENUATION

CH-1 INPUT
+ μ -

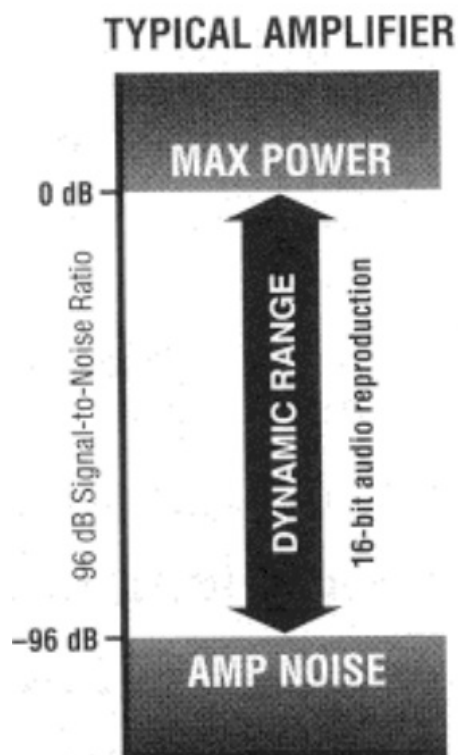
ATTENUATION

Programmable
Input Processor (P.I.P.)

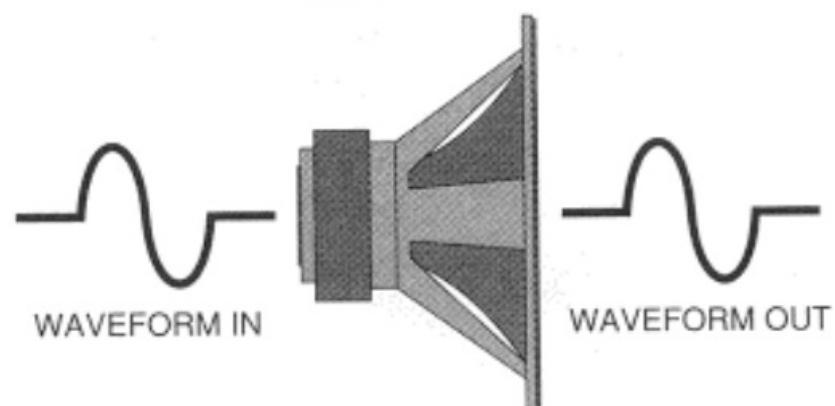




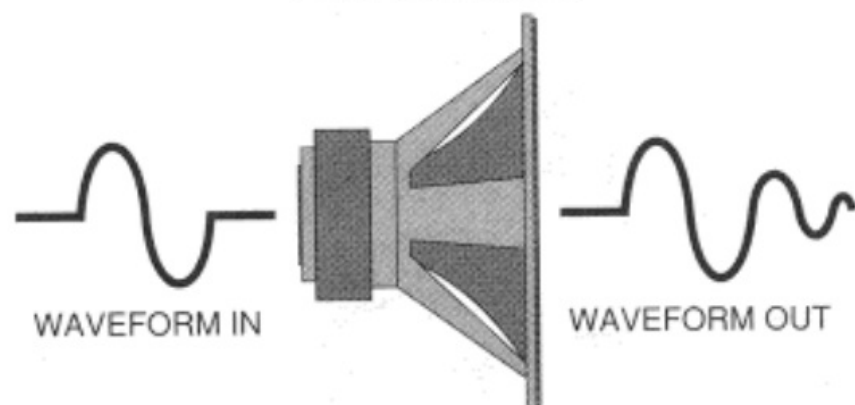
MACRO REFERENCE



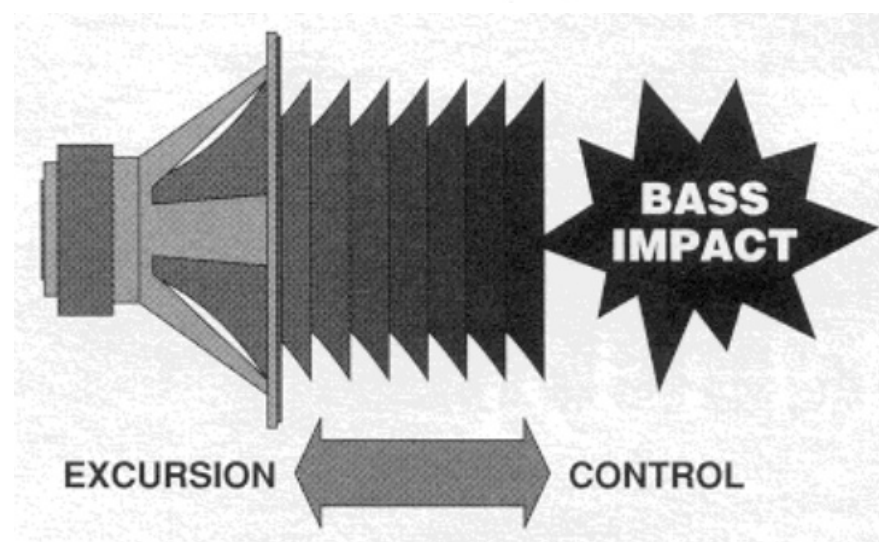
GOOD DAMPING



POOR DAMPING

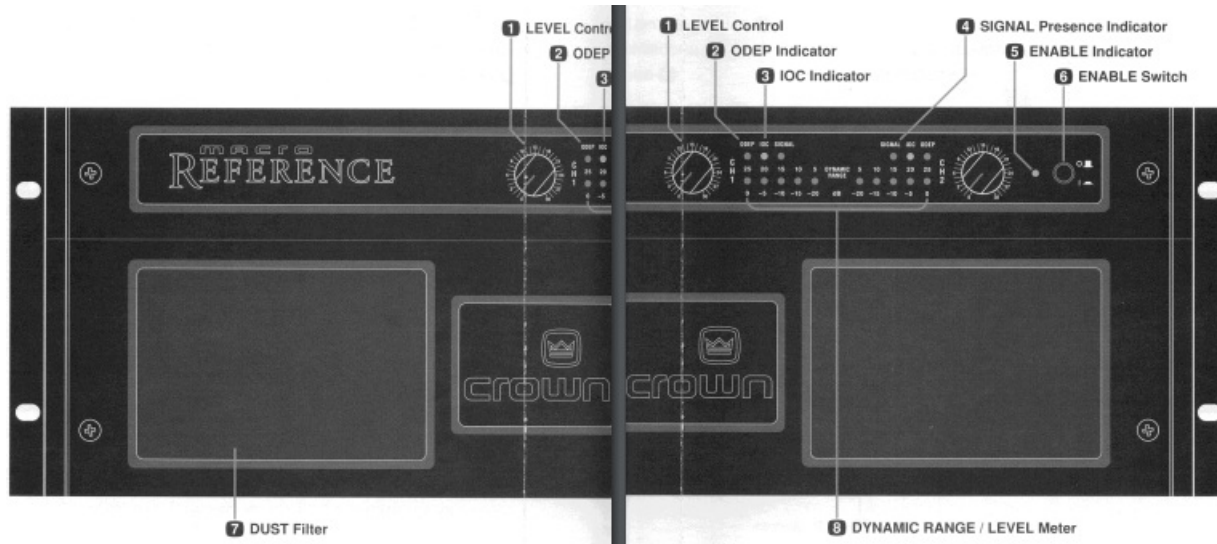
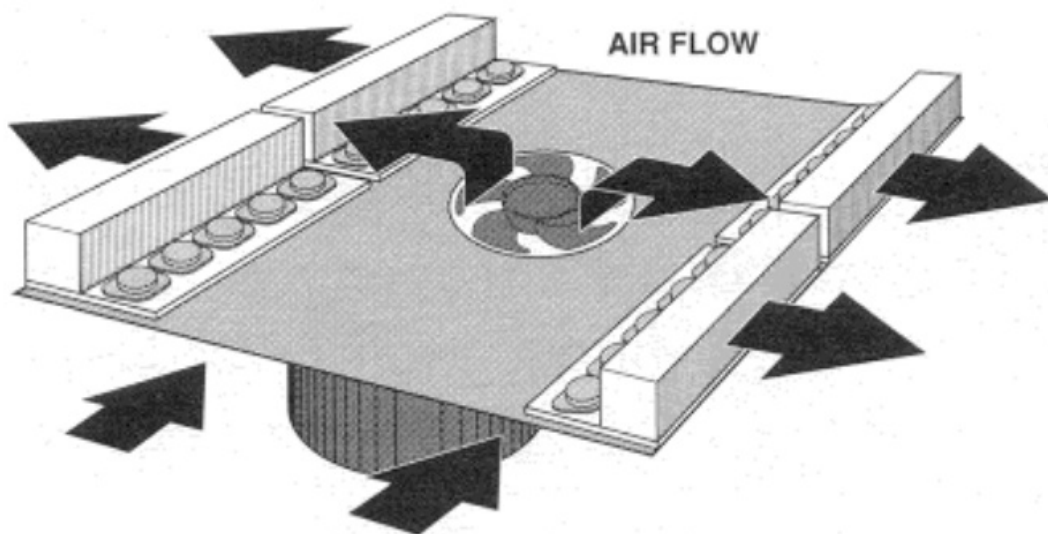
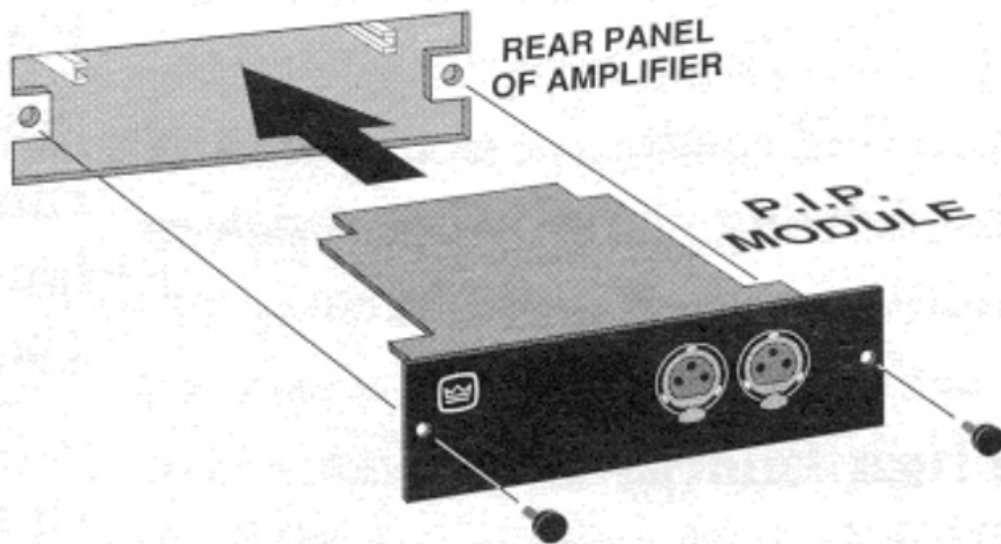


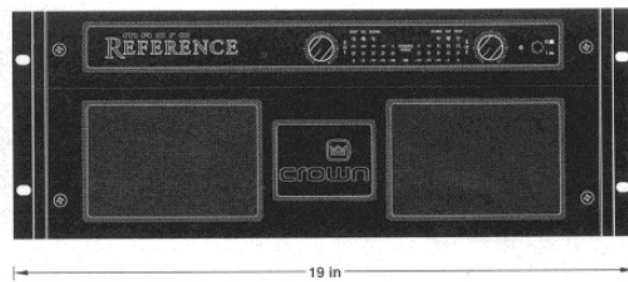
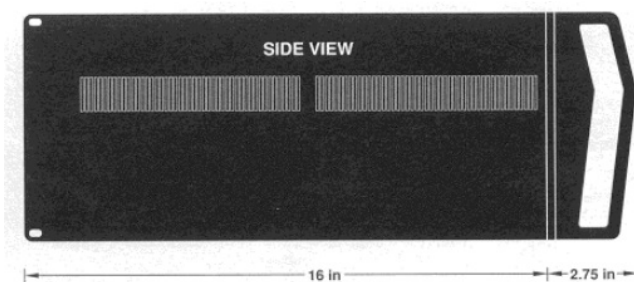
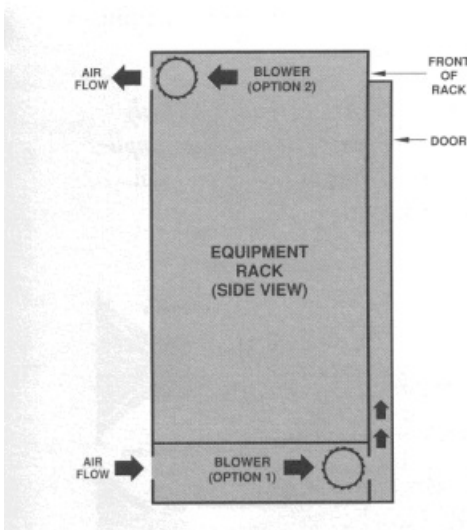
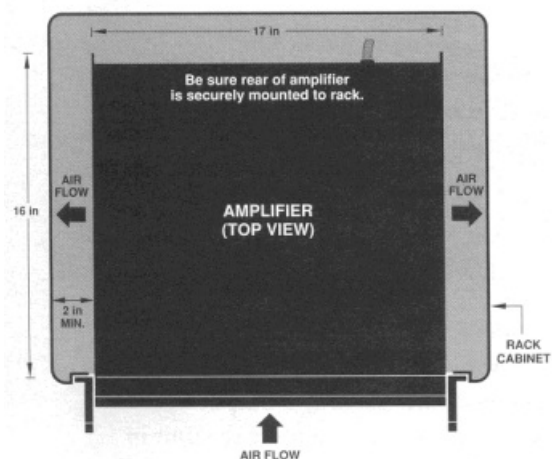
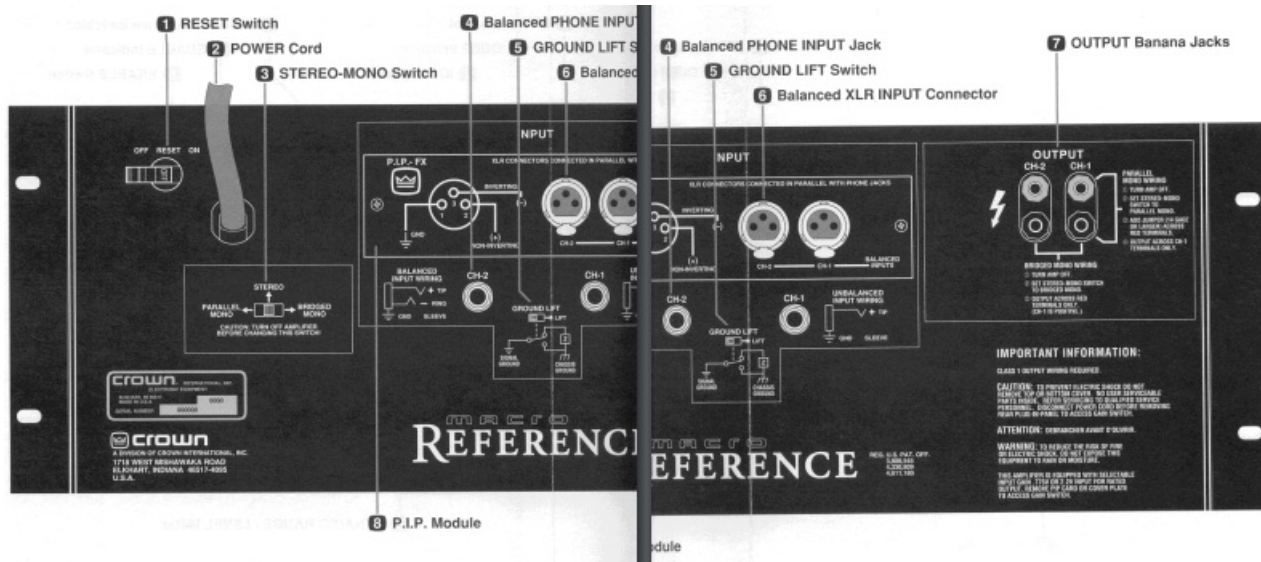
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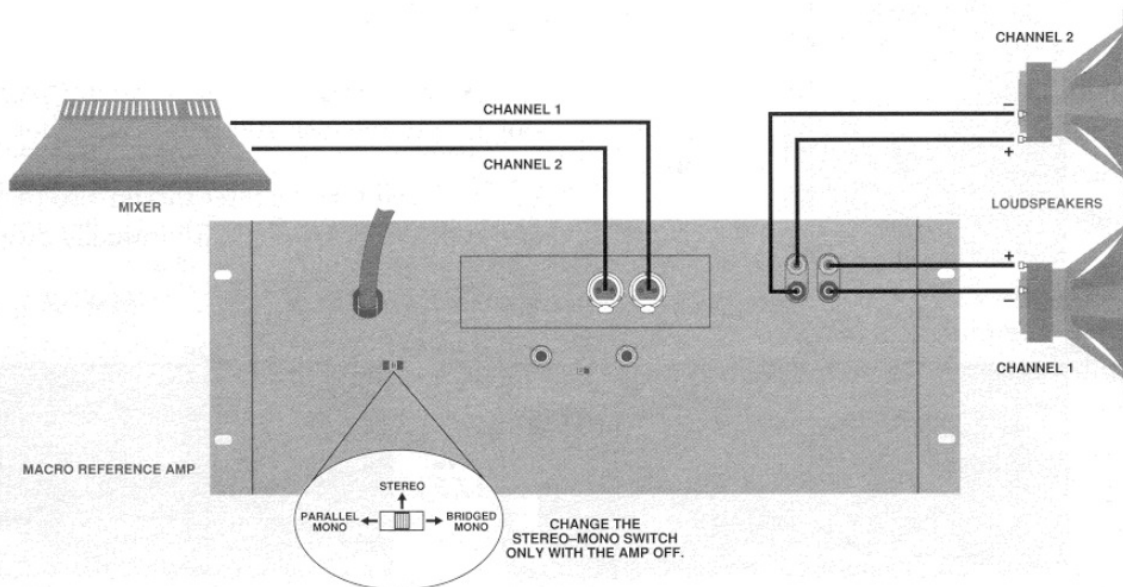
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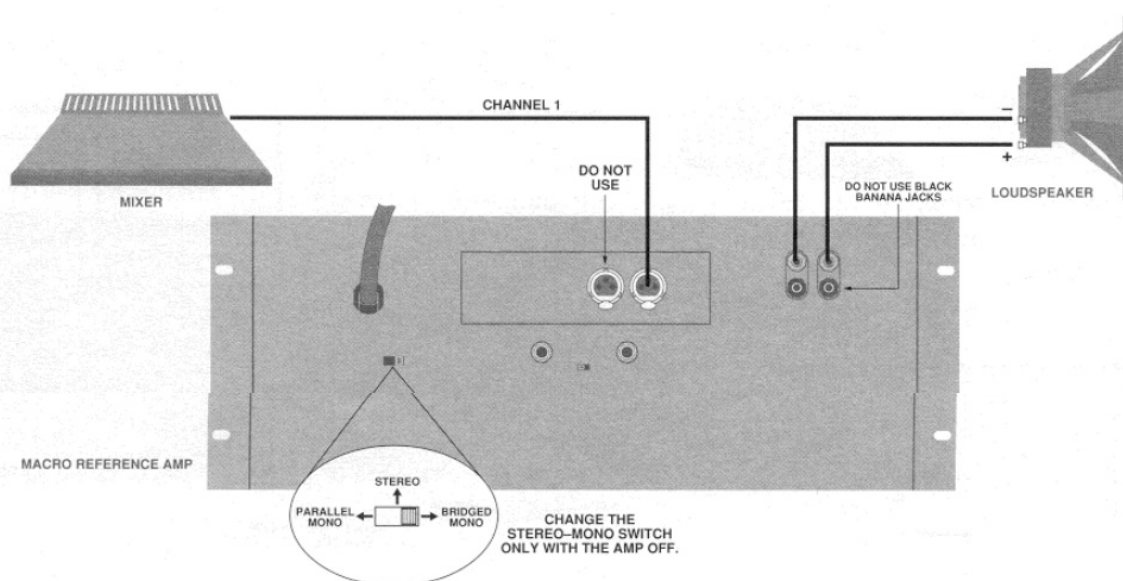




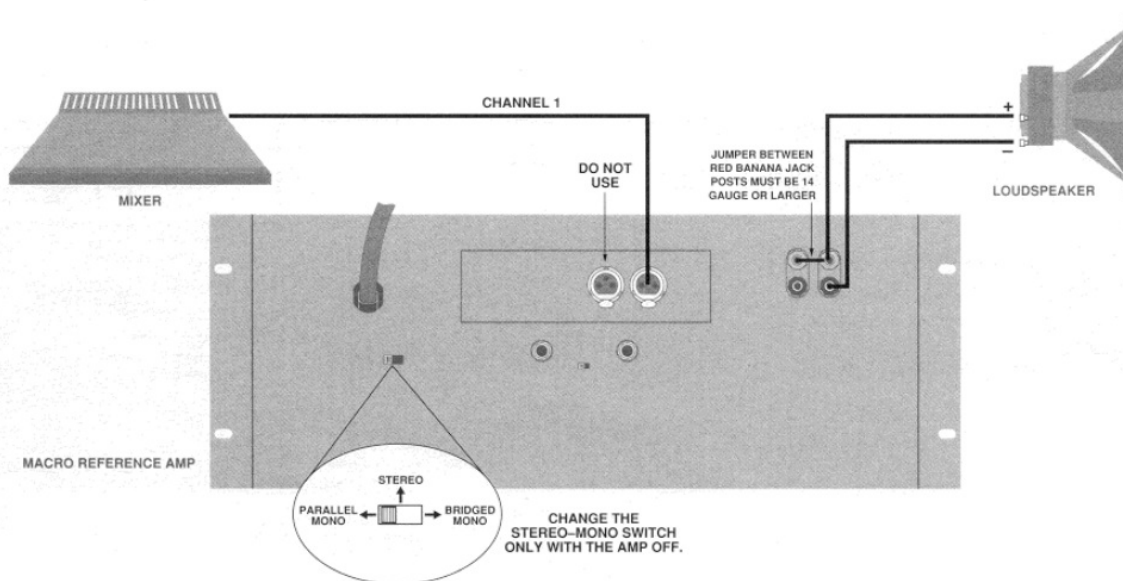
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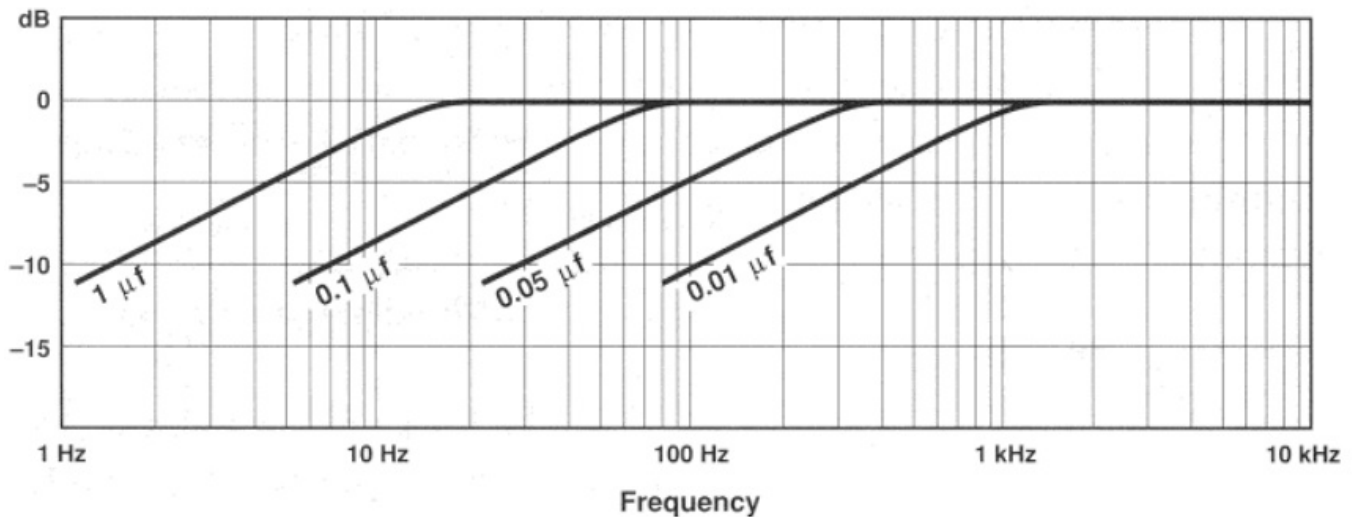


Bridged-Mono

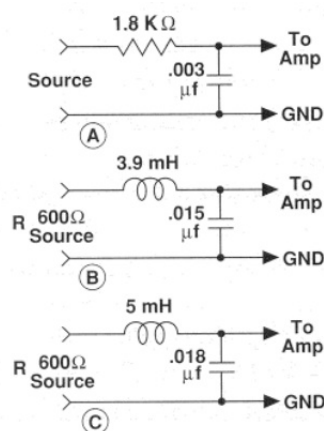


Parallel-Mono

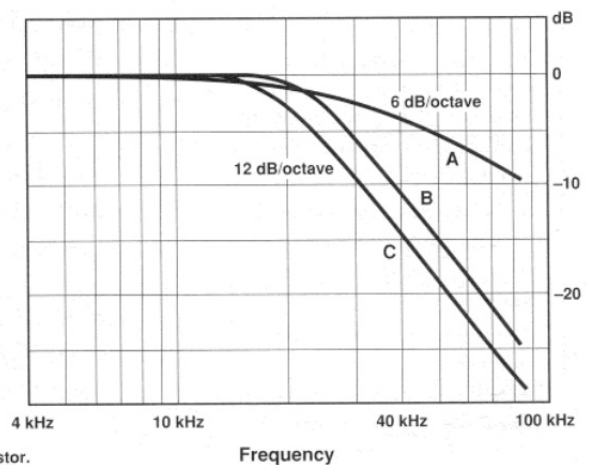




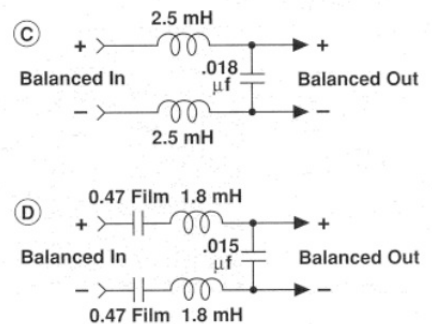
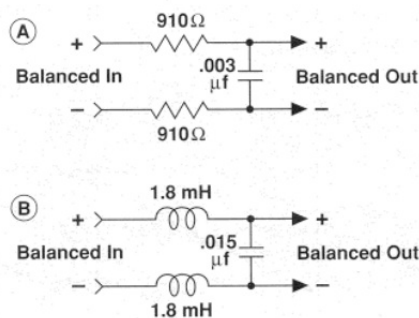
Unbalanced RF Filters



Note: A low source impedance (R) can be increased to 600 Ω by an appropriate resistor.

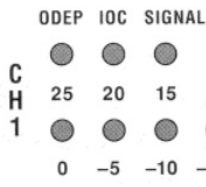
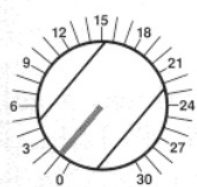
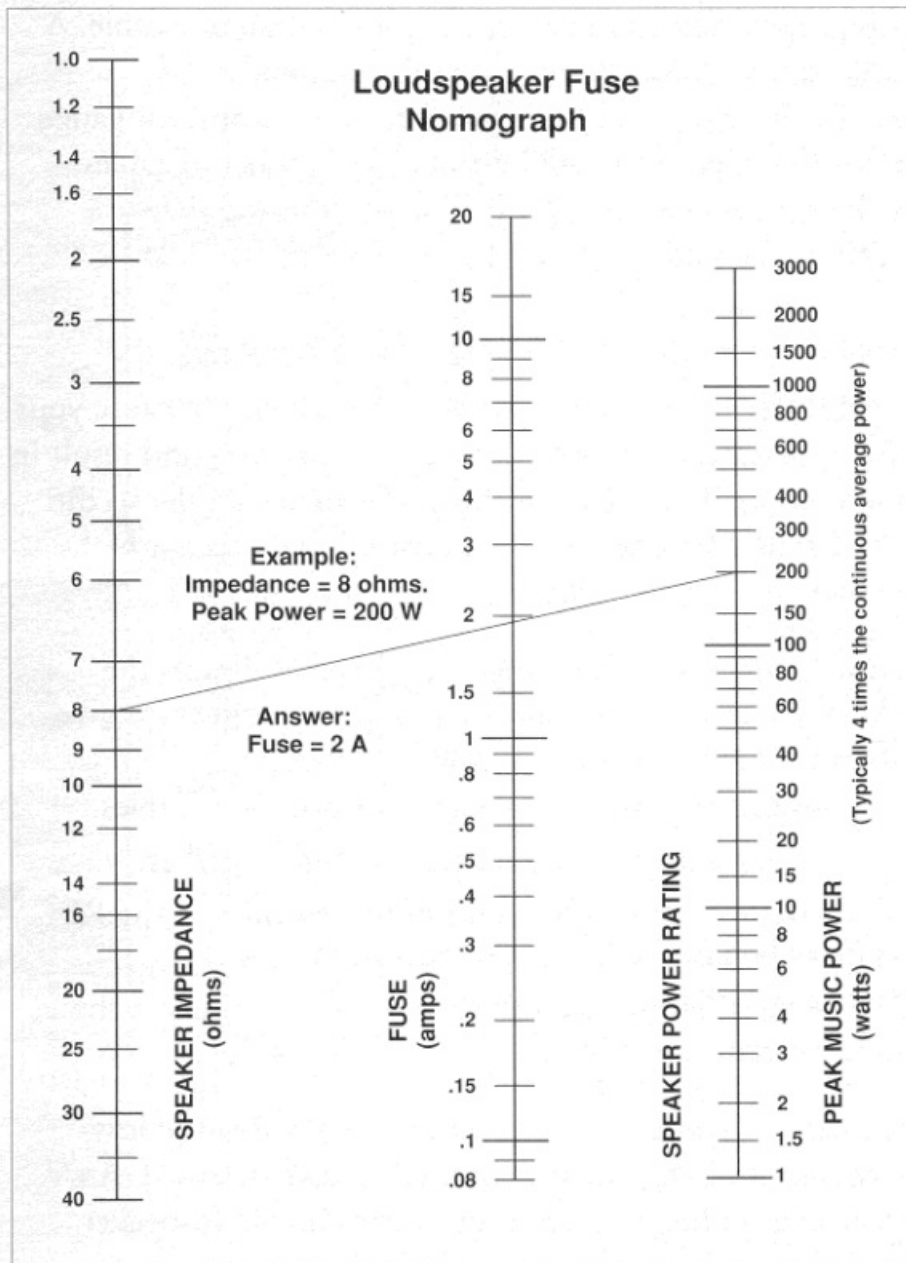


Balanced RF Filters

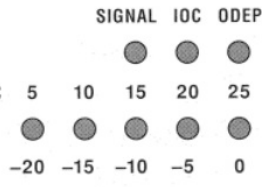


$$\text{Source Impedance} = \frac{\text{Loudspeaker Impedance}}{\text{Damping Factor}}$$

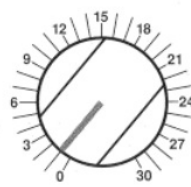
$$\text{Ohms per 1000 ft} = \frac{\text{Source Impedance} \times 1000}{\text{Cable Length (ft)} \times 2}$$



DYNAMIC RANGE



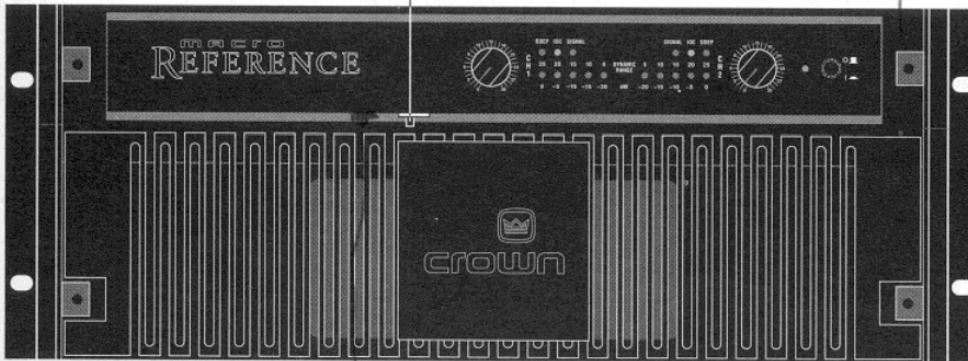
CH 2



EMR

Switch on/off
EL display

METER SWITCH
OUTPUT LEVEL ← → DYNAMIC RANGE

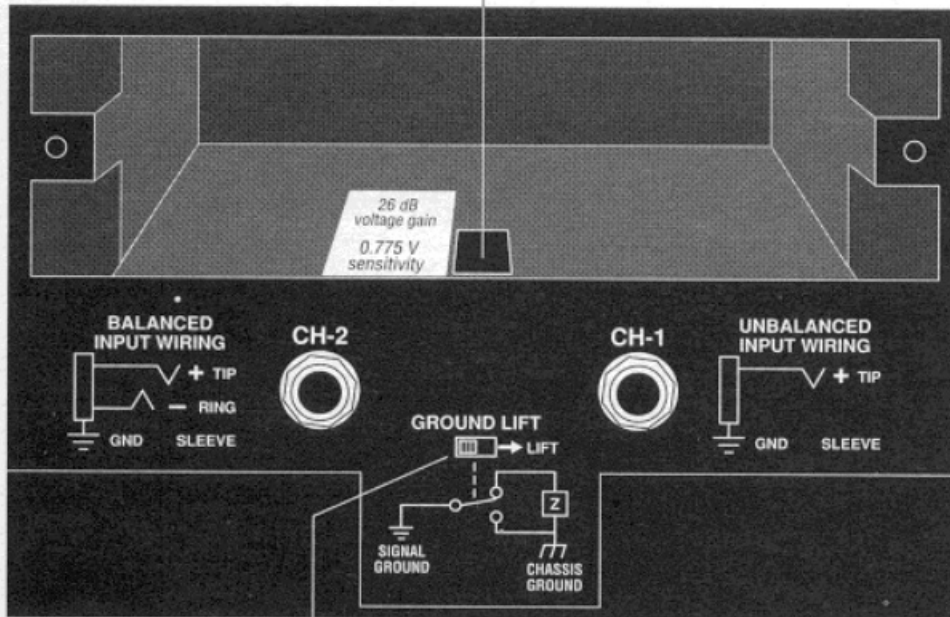


OFF ON

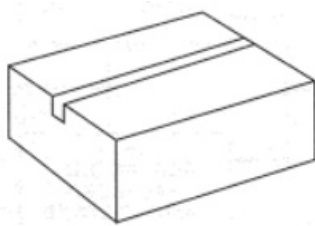
METER

EMR

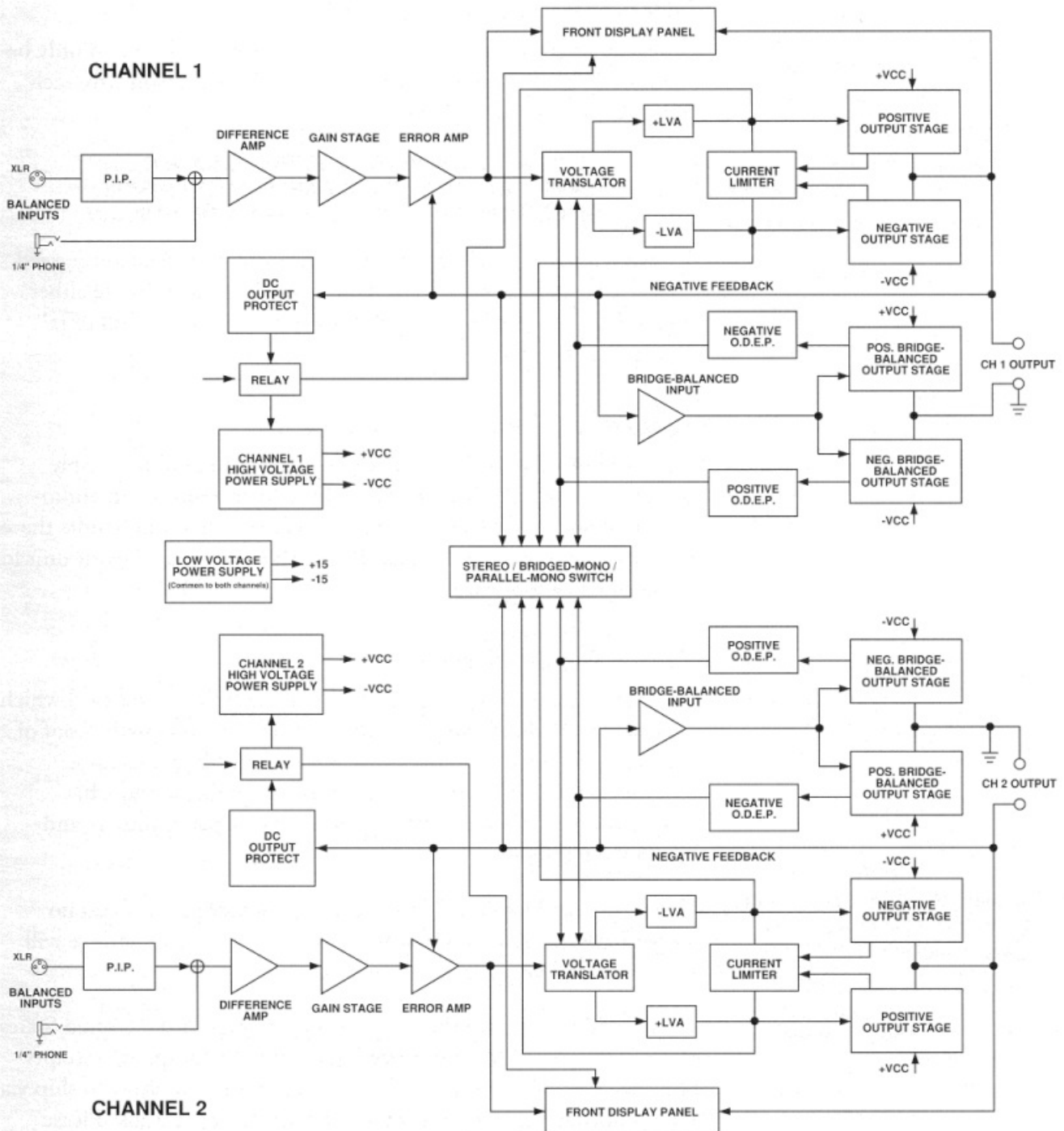
SENSITIVITY SWITCH INSIDE ACCESS HOLE

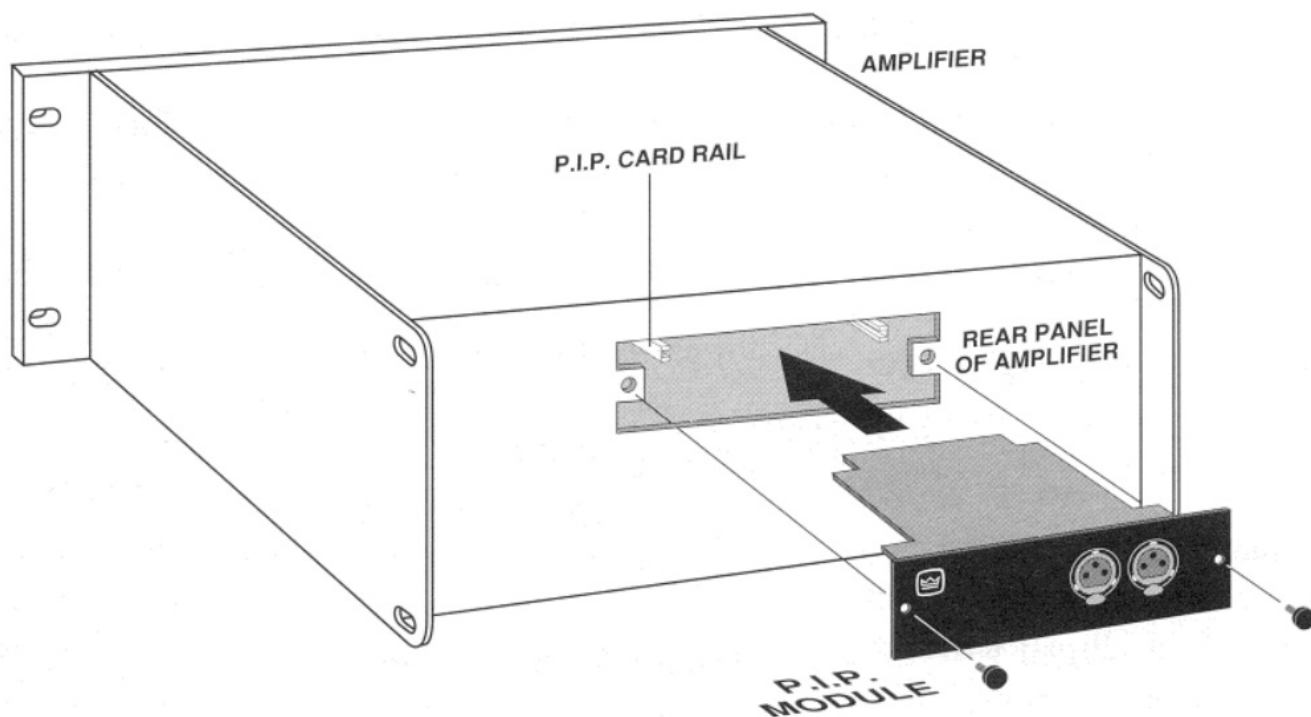


GROUND LIFT SWITCH




CHANNEL 1





Documents / Resources

 <p>CROWN REFERENCE STUDIO REFERENCE AMPLIFIER OWNER'S MANUAL</p>	<p>CROWN Macro Reference Studio Reference Amplifier [pdf] Owner's Manual Macro Reference Studio Reference Amplifier, Macro, Reference Studio Reference Amplifier, Studio Reference Amplifier, Reference Amplifier, Amplifier</p>
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