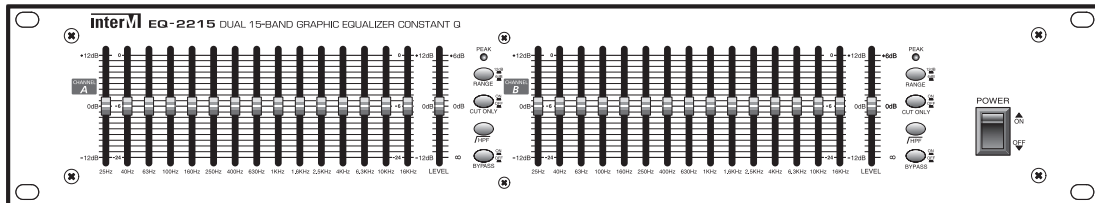
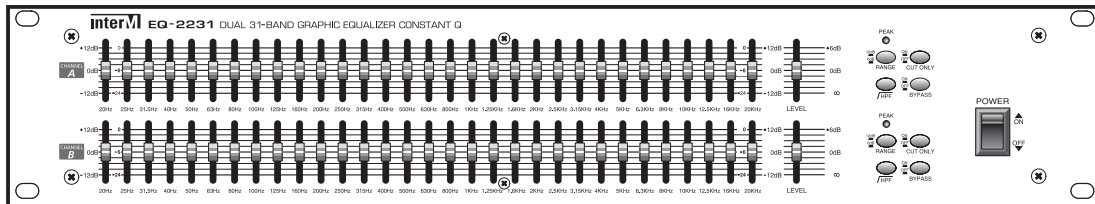
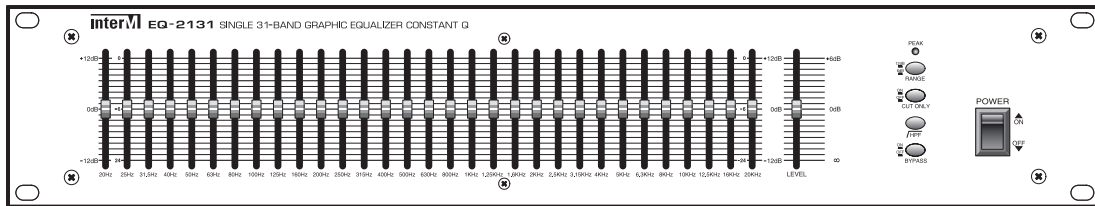


Operation Manual

EQ-2131/2231/2215 Graphic Equalizer



interM

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Welcome

A personal welcome to you from the management and employees of Inter-M

All of the co-workers here at Inter-M are dedicated to providing excellent products with inherently good value, and we are delighted you have purchased one of our products.

We sincerely trust this product will provide years of satisfactory service, but if anything is not to your complete satisfaction, we will endeavor to make things right.

Welcome to Inter-M, and thank you for becoming part of our worldwide extended family!

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



This symbol 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.



This symbol is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.

Caution: To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Attentions: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

*Do not install this equipment in a confined space such as a book case or similar unit.
 *The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
 *Worded: "WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING-WATER AND MOISTURE: Unit should not be used near water(e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so than objects do not fall and liquids are not spilled into the enclosure through openings."

Unpacking

Please take a few minutes to read this manual to familiarize yourself with important information regarding installation, product features, and operation.

As with most electronic devices, ORIGINAL PACKAGING (OR EQUAL) IS REQUIRED in the unlikely event that the product needs to be returned for servicing.

Short Form Instructions

1. Prior to connecting the AC power, adjust the LEVEL slider control to the fully attenuated position (all the way down).
2. All other sliders should be set to the "0" or center position.
3. The BYPASS switch should be in the OFF position.
4. Connect an appropriate line level input signal to either the balanced XLR or the balanced 1/4" TRS (Tip-Ring-Sleeve) connector marked INPUTS.
5. Connect the OUTPUTS using either the balanced XLR or the balanced 1/4" TRS connector to an appropriate device.
6. With the power switch in the OFF position, plug in the supplied Universal AC power cord to the product and an appropriate AC source.
7. Depress the power switch to the ON position. An LED within the power switch will illuminate.
8. The product is ready for operation. Slowly increase the LEVEL slider to the desired operating level without exceeding "0", then make other adjustments as necessary.
9. Operate the product and the system in a manner which DOES NOT illuminate the PEAK warning indicator.

Installation

Environment

Never place this product in an environment which could alter its performance or reduce its service life. Such environments usually include high levels of heat, dust, moisture, and vibration.

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
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 or 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.
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.
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.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. 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.



Description

- EQ-2131
This product is a 2U rack space, single channel, 31 band, graphic equalizer.
- EQ-2231
This product is a 2U rack space, dual channel, 31 band, graphic equalizer.
- EQ-2215
This product is a 2U rack space, dual channel, 15 band, graphic equalizer.

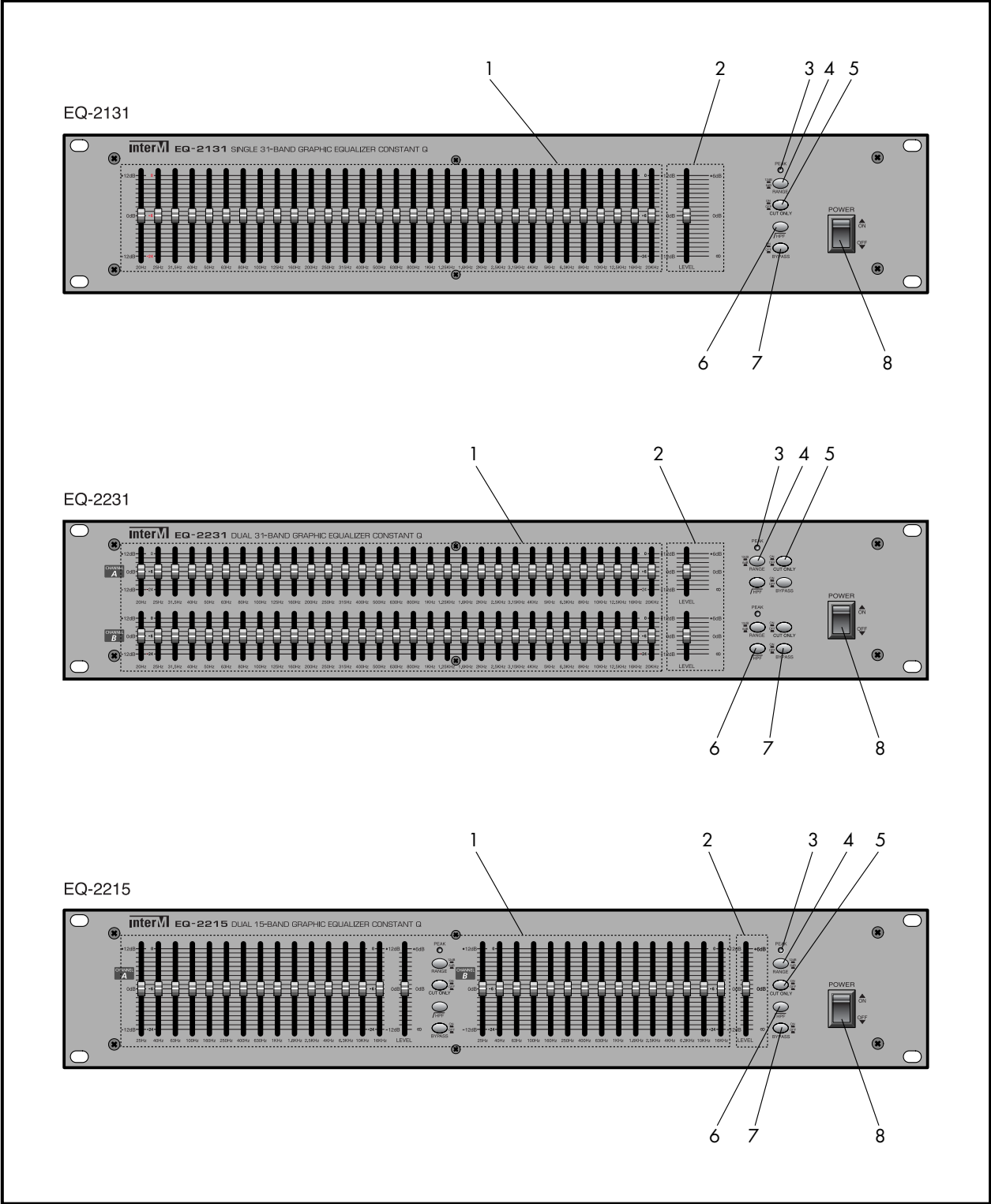
Features

- Constant Q (Constant Bandwidth) filter design
- Long throw (45mm) slider controls
- Balanced XLR and balanced 1/4" TRS input and output connectors
- Selectable adjustment range of $\pm 6\text{dB}$ or $\pm 12\text{dB}$
- Signal Bypass switch allows for a quick assessment of the effect of the equalizer's settings.
- Peak warning indicator (active 6dB below peak)
- Selectable, Cut Only or Boost/Cut, operation.
- Selectable 80Hz high pass filter to reduce frequency response below 80Hz.
- Illuminated Power Switch
- Rack Ears for permanent installation in a standard 19" (rack mount width) enclosure.
- Detachable AC power cord

Accessories

One detachable AC power cord is provided for use with this product.

Front Panel



1. EQ BOOST / CUT CONTROL

These 45mm sliders control the amount of boost or cut applied to the indicated center frequency.

2. INPUT GAIN CONTROL

The position of the Input Gain slider determines the overall signal to the circuitry. The "0" position of each slider indicates the position where no cut or boost occurs. This position (also known as unity gain) is the optimum position.

3. PEAK WARNING INDICATOR

This LED illuminates red whenever the corresponding input signal is within 6dB of clipping. During normal operation the Peak Warning Indicator will remain off or only rarely illuminate. A single Peak Warning Indicator is provided for the EQ-2131 and two are provided on the EQ-2231 and EQ-2215, one for each of the two channels (Channel A and Channel B).

4. RANGE SWITCH

The position of this switch determines if the slider controls operate over a ± 6 dB or a ± 12 dB range in the boost/cut mode. In the CUT ONLY mode the position of this switch changes the adjustments from -12dB to -24dB. In most cases the ± 6 dB (-12dB in cut only) range is sufficient. Excessive adjustments may indicate a problem elsewhere in the system that requires attention. A single RANGE switch is provided for the EQ-2131 and two are provided on the EQ-2231 and EQ-2215, one for each of the two channels (Channel A and Channel B). The RANGE switch will illuminate when engaged, effectively doubling the normal range of the slider controls.

5. CUT ONLY SWITCH

The position of this switch determines whether the corresponding slide controls perform a boost/cut or cut only function. The switch will illuminate when the switch is in the CUT ONLY mode. In this mode, the "0" position of the sliders is at the top of the range and any adjustment of the sliders will only attenuate the level as indicated by the red CUT ONLY graphics. Usually -12dB of attenuation is sufficient. However the RANGE switch can be employed to provide up to -24dB of attenuation if more than -12dB is needed. A single CUT ONLY switch is provided for the EQ-2131 and two are provided on the EQ-2231 and EQ-2215, one for each of the two channels (Channel A and Channel B).

6. HIGH PASS FILTER

The position of this switch determines if the 80Hz High Pass Filter is applied to the signal. The switch will illuminate when the High Pass Filter is engaged. A single HPF switch is provided on the EQ-2131 and two are provided on the EQ-2231 and EQ-2215, one for each of the two channels (Channel A and Channel B). This feature is effective at removing rumble or other low frequency information (below 80Hz) which may be undesirable.

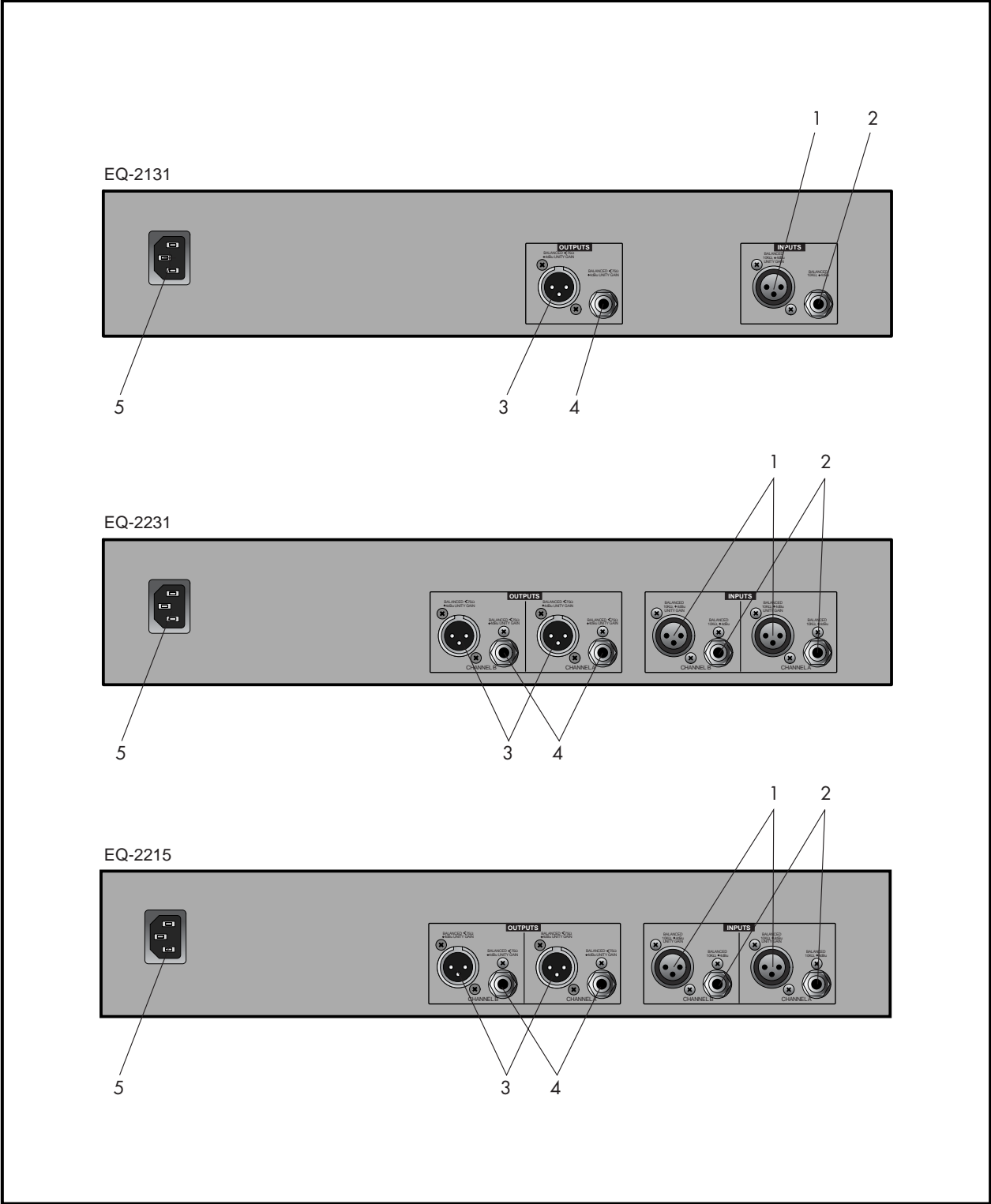
7. BYPASS SWITCH

The position of this switch determines whether the product operates normally or allows the signal to bypass all equalization settings and pass through unaffected. The switch will illuminate when it is in the BYPASS mode. A single BYPASS switch is provided on the EQ-2131 and two are provided on the EQ-2231 and EQ-2215, one for each of the two channels (Channel A and Channel B). In the event of a loss of power, the product will default to BYPASS mode allowing the signal to pass.

8. POWER SWITCH

The position of this switch determines whether the power is ON or OFF. The power-on status is indicated by the LED inside the switch. In the OFF position the input(s) are hard bypassed to the output(s) to allow the signal to pass through unaffected as it does in BYPASS.

Rear Panel



1. BALANCED XLR INPUT CONNECTORS

One balanced 3-pin female XLR input connector is provided for each channel. This connector is wired in Parallel to the corresponding balanced 1/4" TRS input connector.

2. BALANCED 1/4" TRS INPUT CONNECTORS

One balanced female 1/4" TRS input connector is provided for each channel. This connector is wired in Parallel to the corresponding balanced XLR input connector.

3. BALANCED XLR OUTPUT CONNECTORS

One balanced 3-pin male XLR output connector is provided for each channel. This connector is wired in Parallel to the corresponding balanced 1/4" TRS output connector.

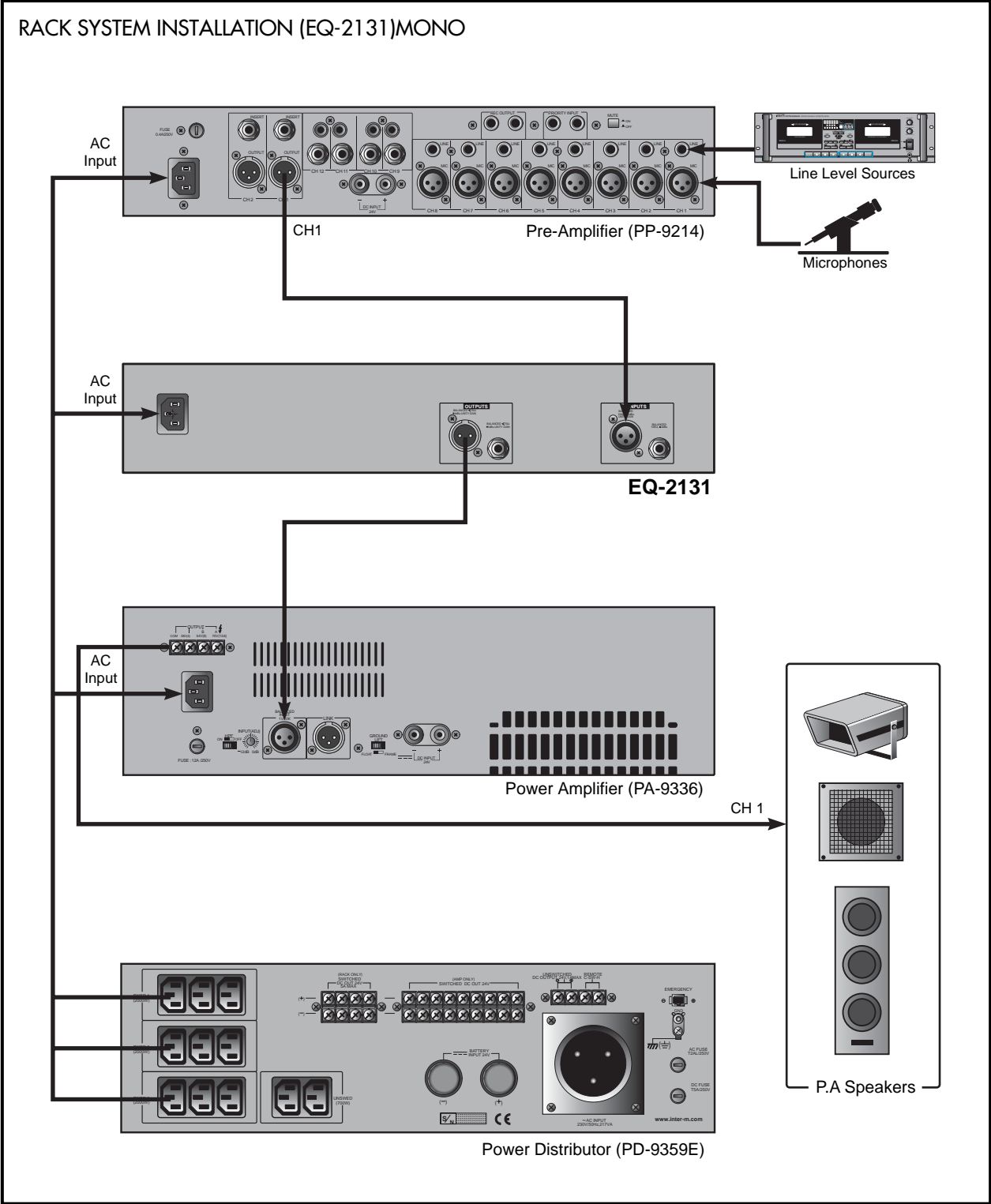
4. BALANCED 1/4" TRS OUTPUT CONNECTORS

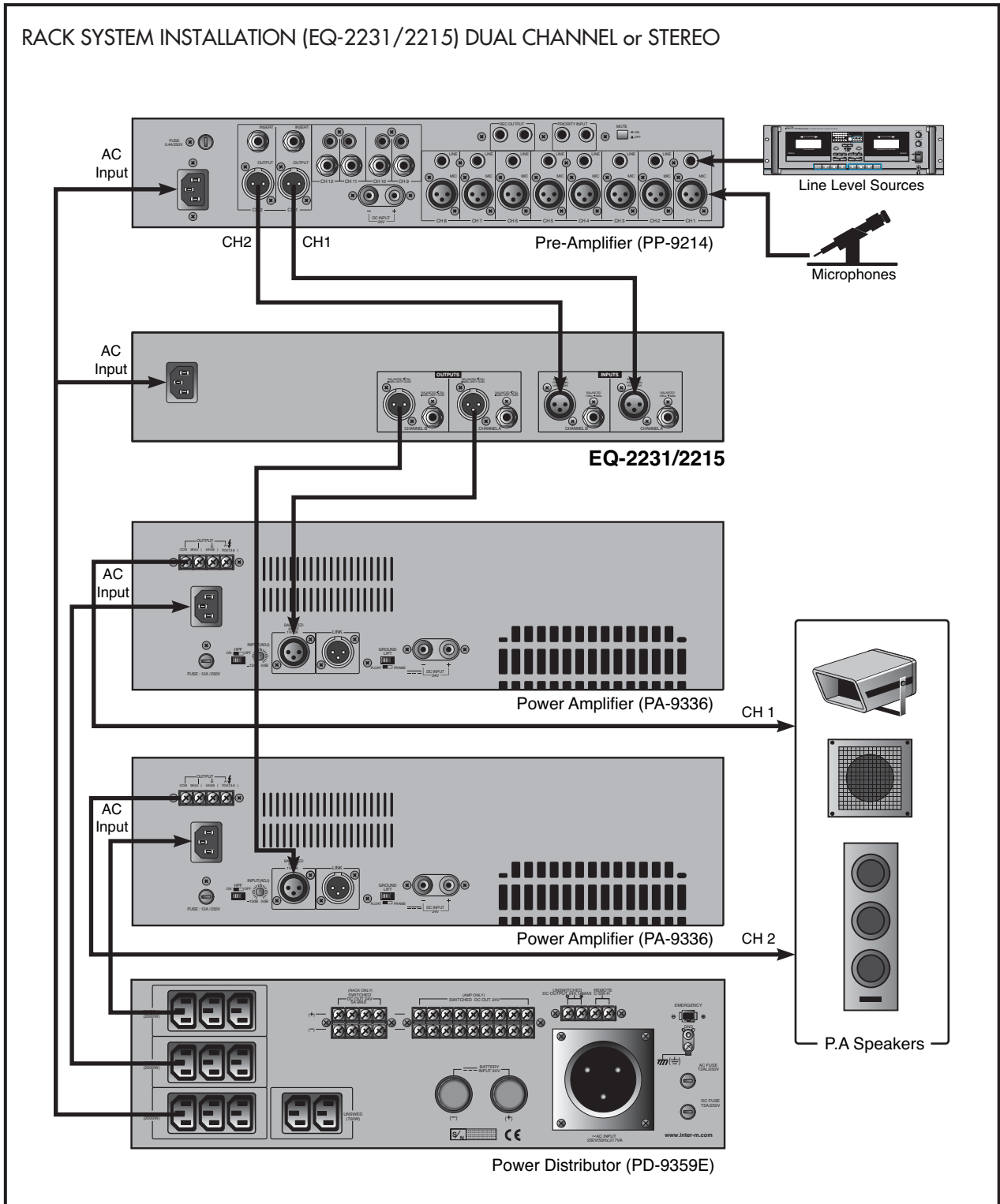
One balanced female 1/4" TRS output connector is provided for each channel. This connector is wired in Parallel to the corresponding balanced XLR output connector.

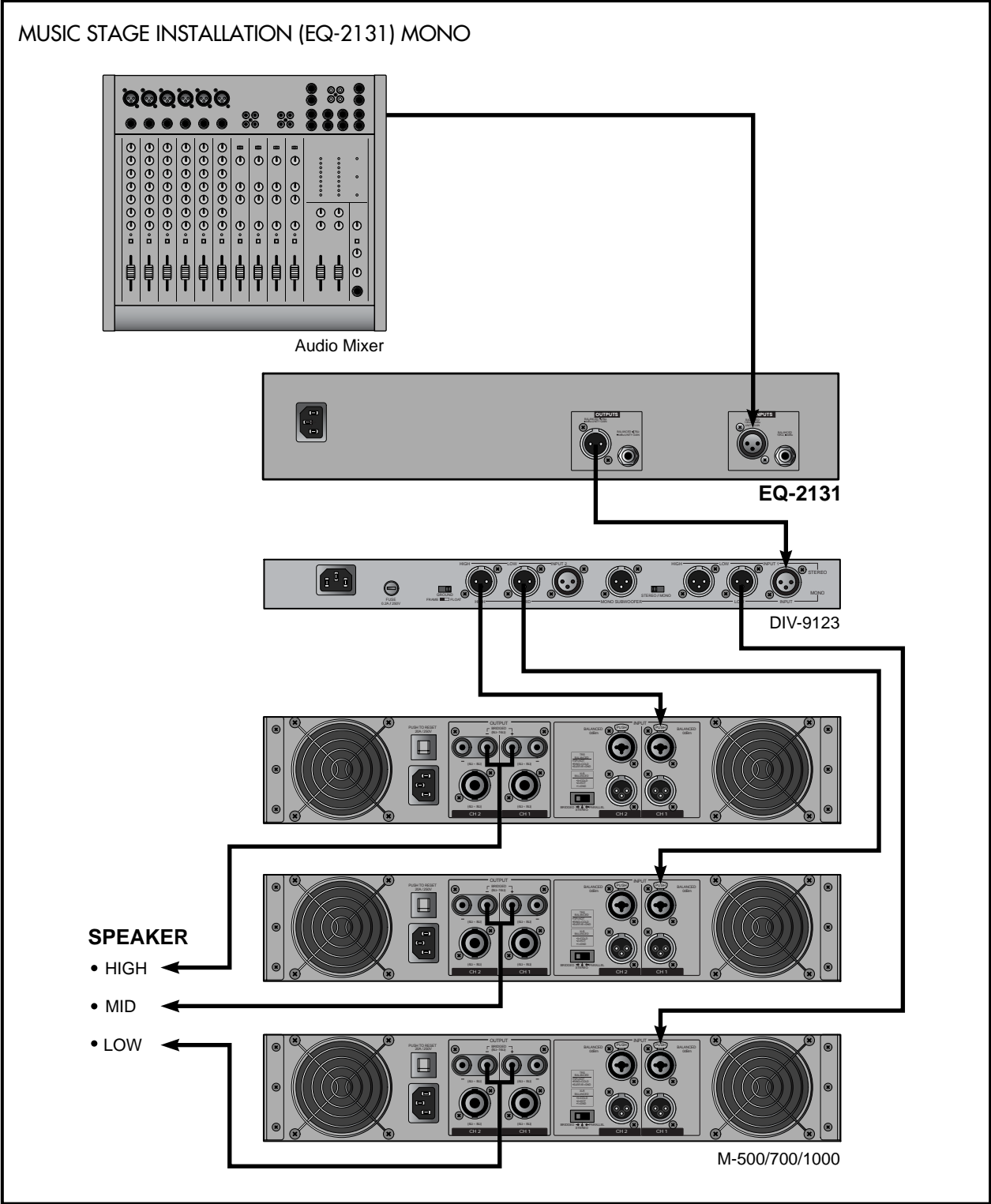
5. AC INPUT

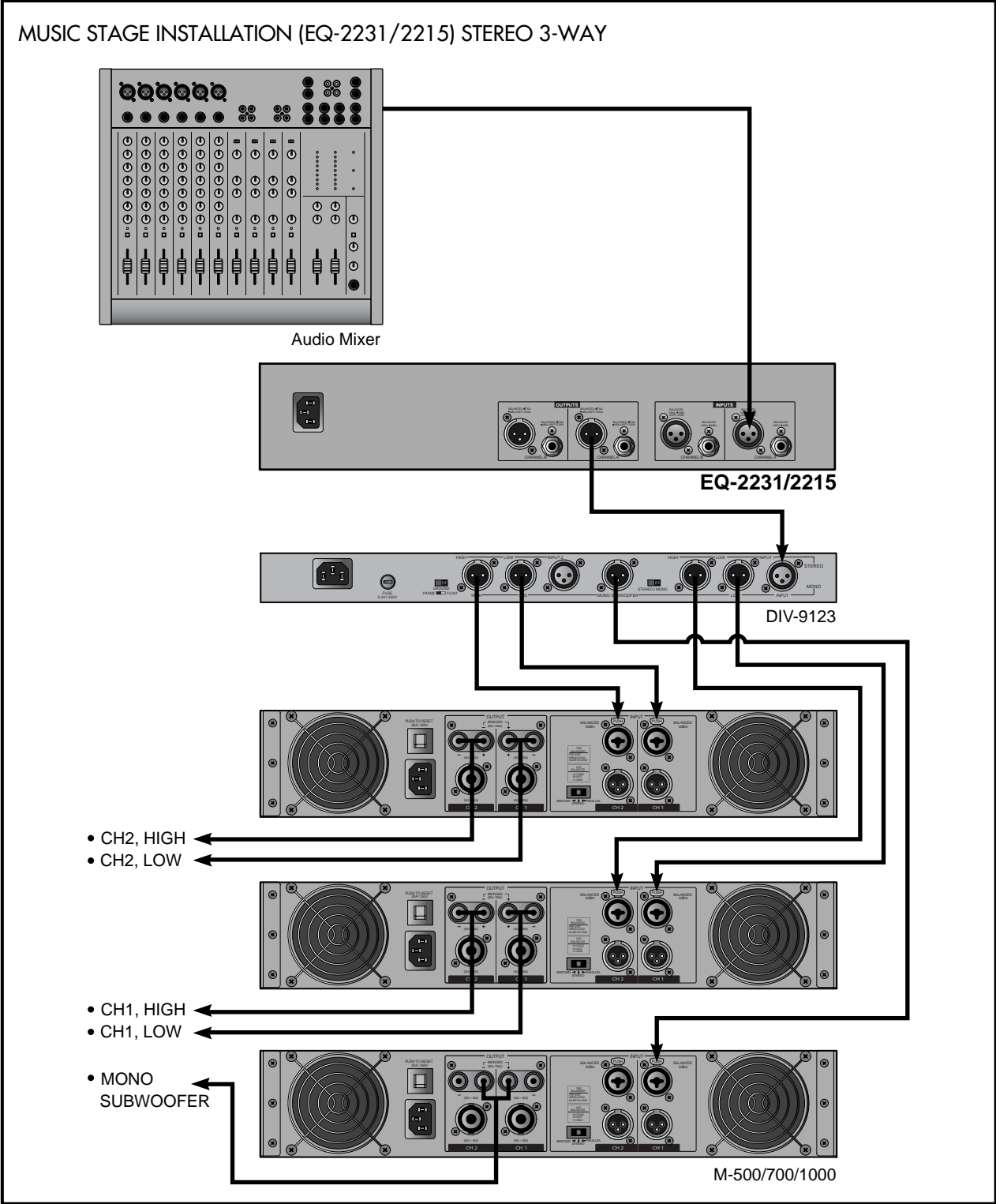
Connect this product to an appropriate AC power source using the supplied Universal AC Power Cord.

Applications









Connections

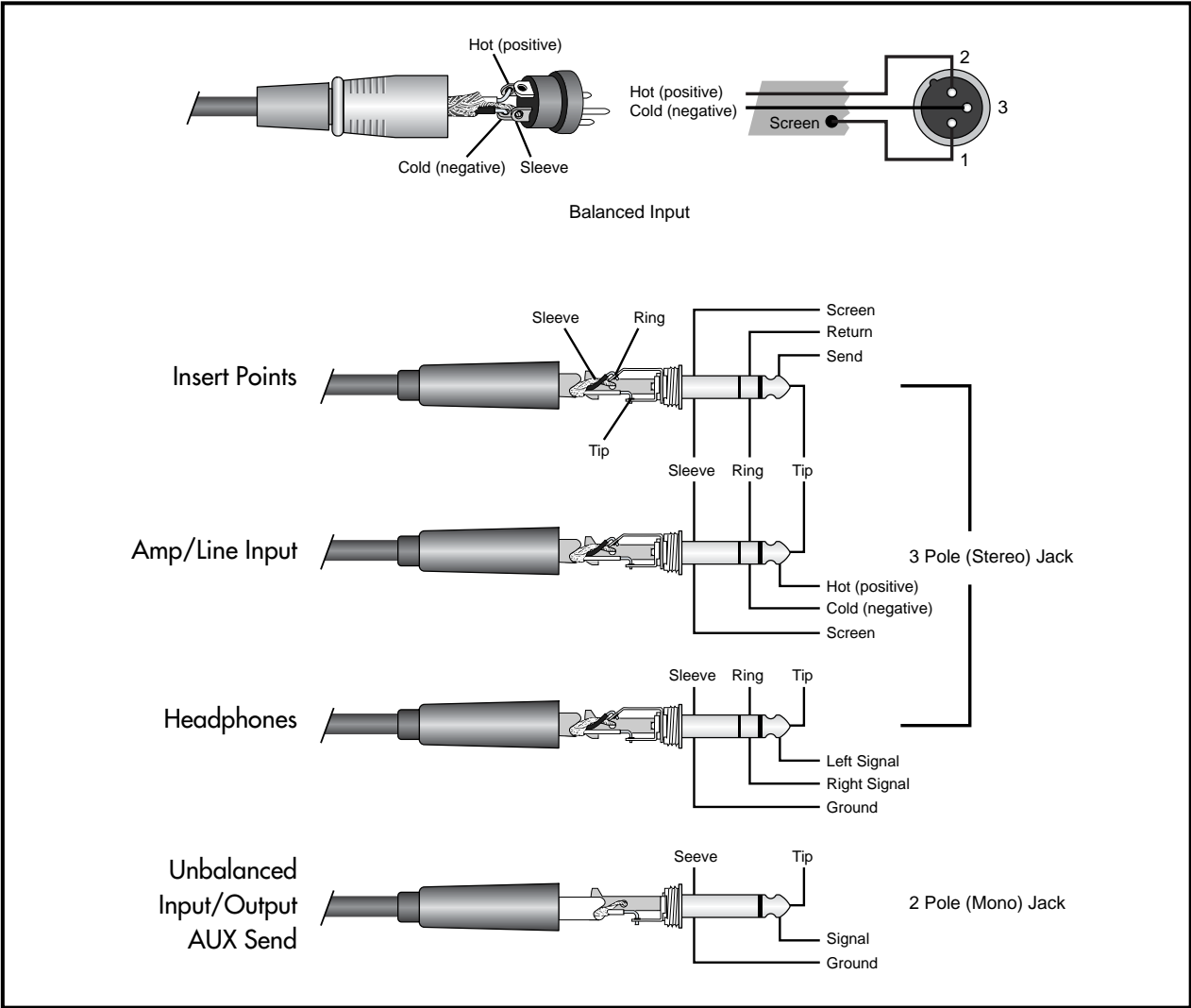
Inter-M products are wired to reflect accepted wiring practices used throughout the world.

Balanced XLR connectors are wired as described:

- Pin #1 Shield
- Pin #2 Positive
- Pin #3 Negative

Balanced 1/4" TRS connectors are wired as described:

- Tip is Positive
- Ring is Negative
- Sleeve is Shield



Input

Connect an appropriate line level input signal to either the balanced XLR or the balanced 1/4" TRS connector marked INPUTS. Common and standard rules of interconnect apply, including limiting the number of inputs to one per channel. Knowledge of the input signal is required and should be Balanced Low Impedance 1KOhm +4dBu.

Output

Connect the OUTPUTS using either the balanced XLR or the balanced 1/4" TRS connector to an appropriate device. Common and standard rules of interconnect apply, including the ability to split output signals. Knowledge of the input requirements of the receiving device is required and should be Balanced +4dBu and at least 10kOhms.

Operation

Correctly operating an equalizer is easier said than done. The explanation provided will direct the user on how to make adjustments but cannot explain how to get the system to sound good, since that will come from experience and patience.

It must first be determined how the Equalizer will be used in this system. Its primary task may be to treat feedback, improve tonal quality, or both. Each task is explained below. If the plan is to use it for both, begin by treating feedback first, then improve tonality second.

Treating Feedback

1. Begin with the all sliders set to the "0" position.
2. Determine the two or three frequencies that are most prone to feedback. This is best achieved through the use of an audio frequency (or audio spectrum) analyzer but one is not required. Go directly to step #3 if you are able to determine the frequencies of interest.
 - a. Treating Feedback (without the use of an analyzer)

As mentioned earlier, an analyzer is the best way for most people to determine which frequencies need lowering. Two other methods exist but care must be taken to prevent feedback from occurring at levels which could be damaging.

 - I The Boost-To-Find method is performed while the system is near feeding back. Slowly and carefully increase one slider at a time to see how close it is to causing feedback then return it to the "0" position. Do this one time for each slider making note of the two or three most prone to feeding back, these are the frequencies of interest.
 - II The Cut-To-Find method is performed while the system is already feeding back or ringing (ringing is an early stage of feedback). Feedback can cause damage to the system. Much care should be taken to insure that feedback is not occurring at such levels as to cause damage. The procedure requires the lowering of one slider at a time in an attempt to see if it's the correct slider to affect the problem frequency. Only one slider (out of many) will be the correct one. Assuming that the first one tried is incorrect, return it to the "0" position and quickly try another. Repeat as necessary to locate the frequency.
3. Locate the slider that controls the feedback frequency and slowly lower the slider until the feedback stops. Be sure not to lower the level more than the minimum amount required to stop the feedback. This will need to be repeated as necessary to treat the worst frequencies. Usually it is not practical to treat more than two or three frequencies as doing so will have a negative effect on tonality.
4. When finished, all but a few of the sliders will be at the "0" position. The few that were used to treat feedback will be at approximately the -2dB or -3dB position.
5. Document your settings using the "Notes" page at the back of this manual. This will be useful in the vent that the settings are inadvertently altered.

System Tuning

1. Begin with the all sliders set to the "0" position unless adjustments have been made to treat feedback.
2. Have a Plan. Identify what improvements the system needs and which of those are capable of being addressed through equalization. System design, not equalization, determines the general parameters of system performance. Do not attempt to counteract design shortfalls with an equalizer. An equalizer is the perfect tool for making frequency specific adjustments which improve overall system performance.
3. Make the necessary adjustments remembering two important items.
 - a. Proper equalization is achieved with minimal equalization.
 - b. Better to cut than to boost. Cut excessive frequencies rather than boost weak frequencies.
4. Document your settings.

Troubleshooting

Assistance

This section assumes that the product functions properly and that one or more product features or functions have been engaged, defeated, or not properly adjusted.

Begin troubleshooting by taking a moment to review the "Short Form Instructions" portion of this manual. It may help to identify a feature that has been overlooked and related to the problem.

Symptom:

None of the frequency related slide controls have any affect.

Probable cause#1: The BYPASS switch is engaged, confirmed by illumination.

Probable cause#2: Loss of power, either the POWER switch is in the OFF position, or the product is not connected to an AC source. The POWER LED will illuminate when the POWER switch is in the ON position and AC power is available.

Symptom:

The frequency related slide controls below 80Hz have little or no affect.

Probable cause: The HPF has been engaged as confirmed by the illuminated corresponding LED.

Symptom:

Low output even with reasonable settings (approximately "0")

Probable cause#1: The CUT ONLY switch is engaged as confirmed by the corresponding LED. With the CUT ONLY switch engaged the red graphics are used and indicate that the 0 position (unity) has moved from the middle to the top of the slider. The RANGE switch will magnify this effect if it is engaged as confirmed by the corresponding LED.

Probable cause#2: Incompatible signal to or from other devices in the system.

Symptom:

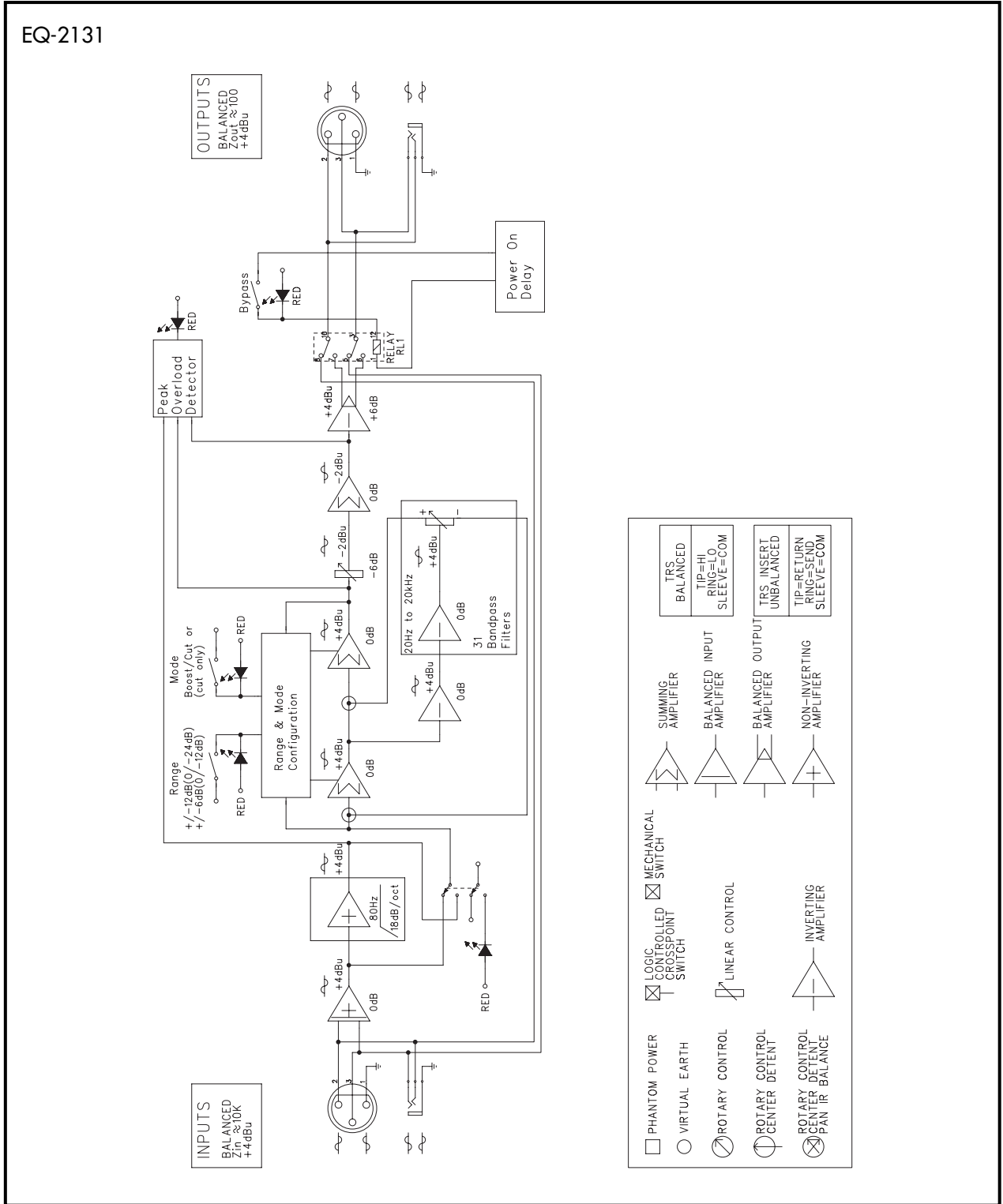
Distorted sound and/or the PEAK LED is illuminated.

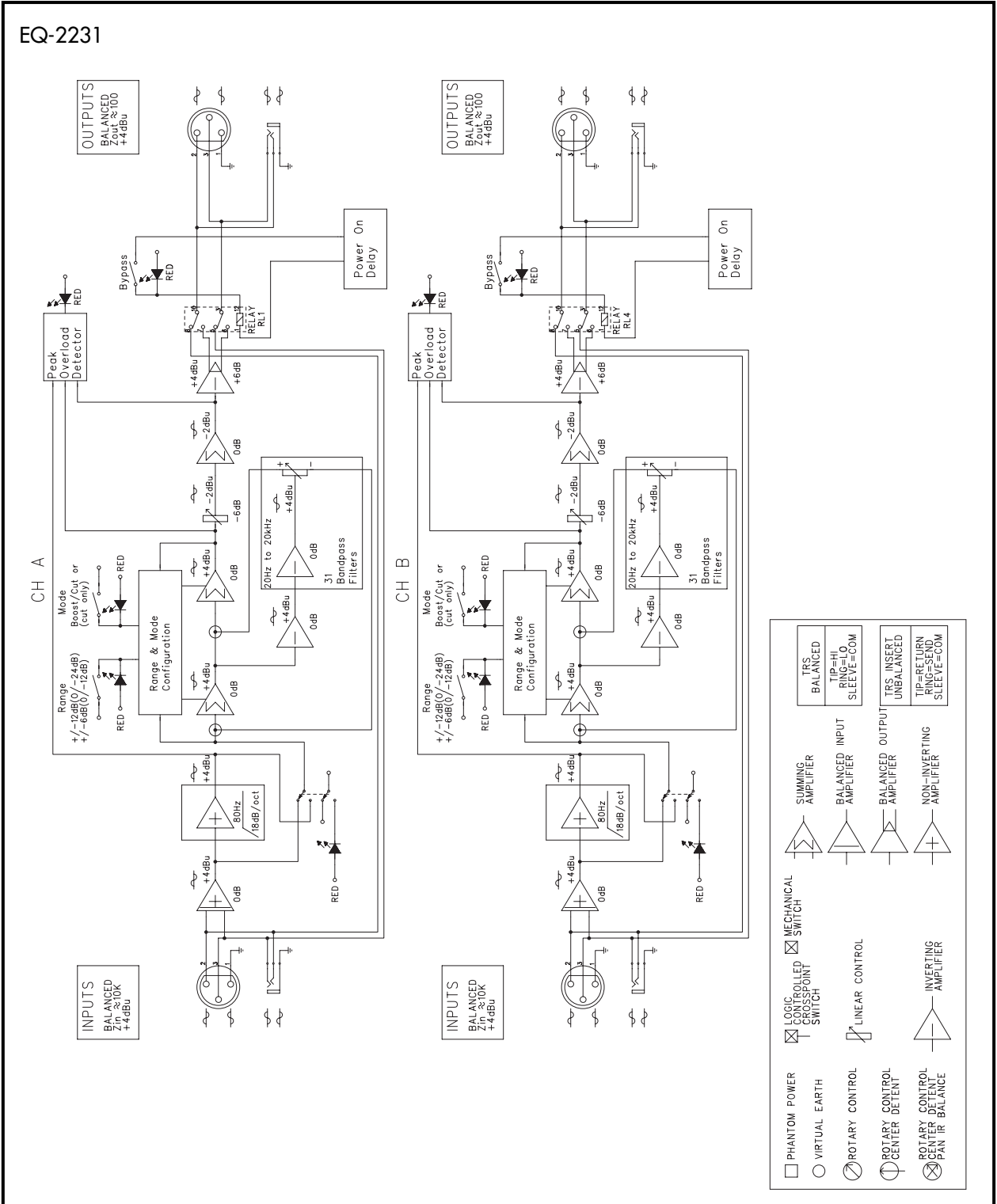
Probable cause#1: Too much boost because the RANGE switch is doubling the amount of boost.

Probable cause#2: Too much boost is occurring due the position of the sliders (above "0").

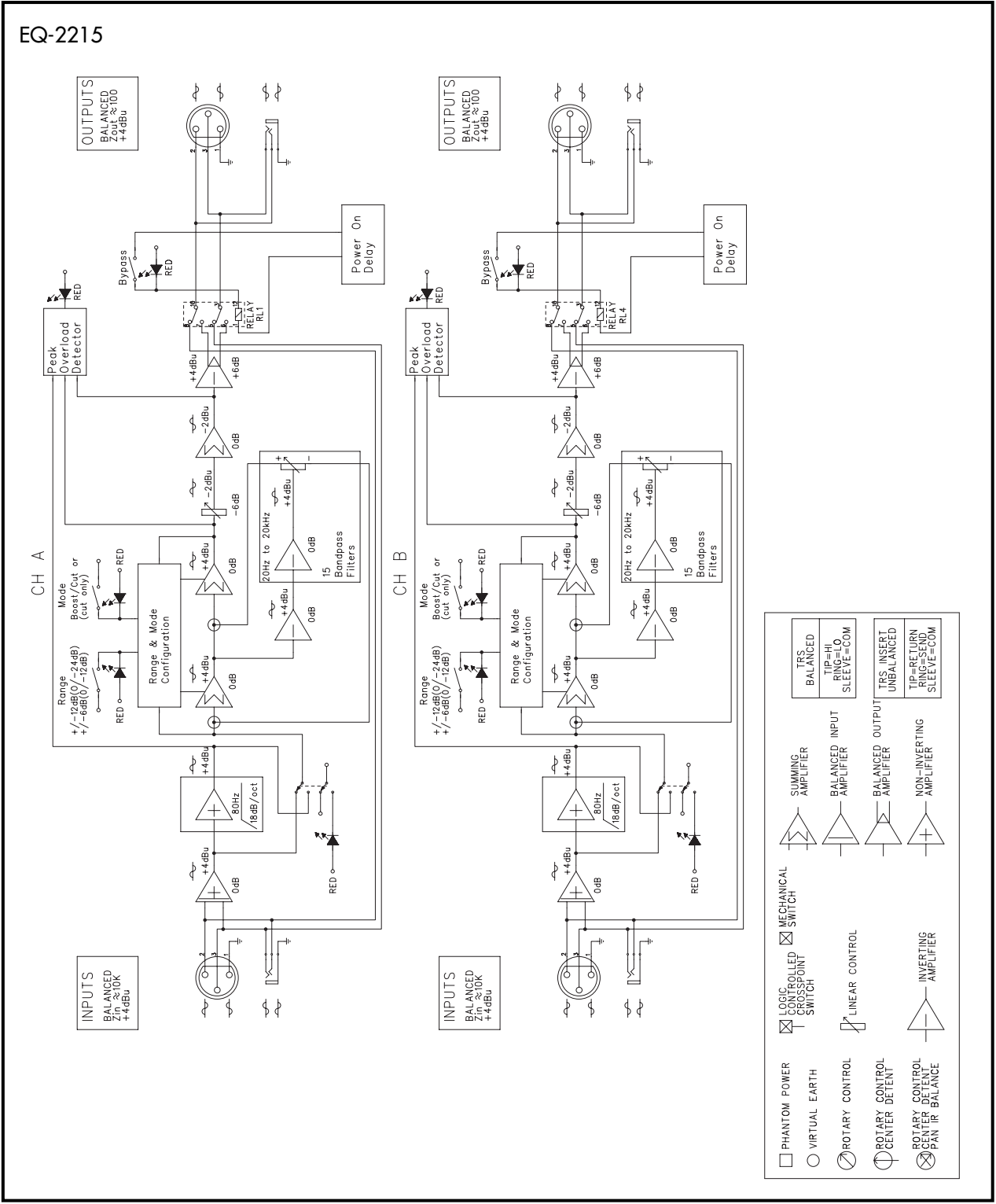
Probable cause#3: Incorrect or overdriven input signal being received from another product. Be sure that this product is only receiving one input signal per channel, XLR or 1/4", not both.

Block Diagrams





GRAPHIC EQUALIZER



Specifications

0dB=1Vrms

- ELECTRICAL

Output Level / Impedance	0dB/600Ω, BAL
Input Sensitivity / Impedance.....	0dB/600Ω, BAL
Total Harmonic Distortion	Less than 0.01%
Frequency Response.....	20Hz~20kHz (±1dB)
Signal to Noise Ratio.....	Better than 85dB
Equalizer Level	±6dB
Equalizer Frequency	
EQ-2131/2231	1/3 Octave ISO (International-Standard-Organization) centers
EQ-2215	2/3 Octave ISO centers
High Pass Filter.....	80Hz (18dB/oct)
Cut Only Mode.....	-12dB or -24dB±3dB

- GENERAL

Power Source	100–120VAC or 220V–240VAC; 50/60Hz (Supplied AC mains transformer depends on country requirements)
Power Consumption	EQ-2131/2215: 15W EQ-2231: 20W
Weight	EQ-2131/2215: 4.5kg/10lb EQ-2231: 5kg/11lb
Dimensions	482(W)x88(H)x280(D)mm / 19(W)x3.5(H)x11(D)in

*Specifications and design subject to change without notice.

Service

Procedures

Take steps to insure the problem is not related to operator error or other products within the system. Information provided in the troubleshooting portion of this manual may help with this process. Once it is certain that the problem is related to the product contact your warranty provider as described in the warranty section of this manual.

Schematic

A Schematic is available by contacting your warranty provider.

Parts List

A Parts List is available by contacting your warranty provider.

Variations and Options

Variations

Variations of this product exist to reflect the variations in AC power requirements throughout the world. Product supplied through local sources are compatible with local AC power requirements.

Options

No optional items are available for this product.

Warranty

To obtain the specific warranty information for your product as well as the location of a service station, please contact Inter-M Ltd. in Korea, Inter-M Americas, Inc. in the United States of America, or the local distributor or dealer where you purchased this product.



Inter-M, Ltd. (Korea) began operations in 1983.

Since then, Inter-M has grown to become one of the largest manufacturers of professional audio and commercial sound electronics equipment in the world.

Inter-M has gained worldwide recognition for its own branded products, as well as private label manufacturing of electronics sold under other names (OEM).

The company is no longer just a Korean company, but rather a global company that is truly international in scope, with factories and offices in Korea and China, and sales and marketing operations located in Japan, Europe, and the U.S.A.

With more than 850 employees around the globe, Inter-M is well-poised for further growth and expansion.

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