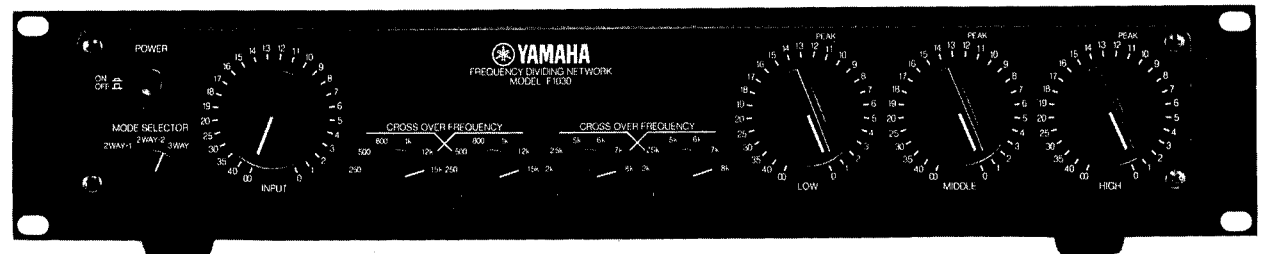


FREQUENCY DIVIDING NETWORK

OWNER'S MANUAL

F1030



Contents	
Features	2
Precautions & Connections	3
How to Use	4
Front & Rear Panels	6
Specifications	7

Congratulations!

You have just joined the large and growing family of satisfied users of Yamaha products. You have chosen wisely when you picked model F1030. Years of dependable service await you.

Please read this OWNER'S MANUAL carefully before connecting your F1030. The few minutes spent with this manual will help you understand its operation and high performance. You will also learn how to connect the Frequency Dividing Network and how to really get the most out of all the features Yamaha has incorporated into this unit.

If you need any special help or service, see your Yamaha dealer. He knows what to do and will be happy to help you. You've made a good choice and we are confident you'll be satisfied with the performance and versatility of the Yamaha F1030 Frequency Dividing Network.

FEATURES

The F1030 is a professional two- or three-way frequency dividing network (electronic crossover) with outstanding built-in versatility and reliability. It does the same work as the traditional crossover network but operates at lower line levels because it is connected between the mixer and power amplifier. In addition, the F1030 provides increased efficiency and headroom and can divide the sound for several amplifiers and sets of speakers. A glance at the features and the following explanation will convince you of the flexibility and performance of the F1030.

Five Filters

The three outputs are derived from a set of five filters, three high pass filters and two low pass filters. The one high pass filter will cut subsonic rumble, and reduce dangerous dropped mic transients. The other four filters divide the frequency spectrum into LOW, MIDDLE and HIGH outputs.

dB-Calibrated Controls

The input and output attenuators are detented and dB-calibrated, which means you can set the system easily and accurately. In practice this means that once the system is set up to your satisfaction, it can be reset the exact same way any time you want. Besides, peak indicators (Light Emitting Diodes) above each output attenuator help prevent overdriving and clipping.

Changeable Crossover Frequencies

The F1030 offers a wide range of crossover frequencies so the frequency dividing network can be adjusted to match recommended crossover frequencies of any speaker. According to the setting of these controls, the F1030 can be used with equal ease with two- or three-way speaker systems.

Switchable Crossover Slope

Four switches are provided inside the unit so the slope, the rate at which frequencies outside the filter's passband are attenuated, can be changed between 12dB/octave and 18dB/octave.

Extremely Adaptable

This unit has such a range of input and output levels that it can be used with any professional system. In addition, the F1030 can also be driven by many semi-professional mixers, equalizers, etc. because it has an actual input impedance of 10K ohms, and because up to 6dB of gain is available.

Choice of Inputs & Outputs

Inputs and outputs are transformer-coupled XLR's for use with balanced or floating lines. And there are also standard phone jacks for use with unbalanced equipment.

Outstanding Performance

The F1030 has an exceptionally flat frequency response extending from the upper to lower limits of the frequency spectrum. And distortion, hum and noise are so low that they are virtually inaudible.

Rugged Construction

A rugged, rack-mountable chassis and recessed controls make the F1030 great for fixed installation as well as work on the road. Lasting dependability is built in at the Yamaha factory.



PRECAUTIONS & CONNECTIONS

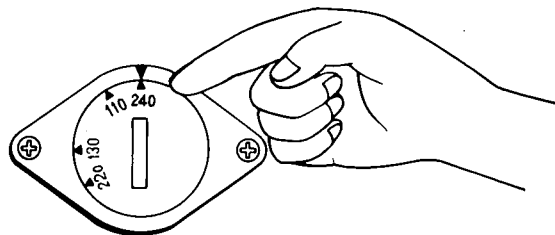
Precautions

The F1030 is rugged and durable, but not indestructible. It has been designed to stand up to tough handling but certain precautions must be taken. The most frequent cause of trouble is improper use due to incomplete understanding of exactly what the F1030 can and cannot do. You can easily avoid these mistakes by following the precautions listed here before plugging in or attempting to operate your Frequency Dividing Network.

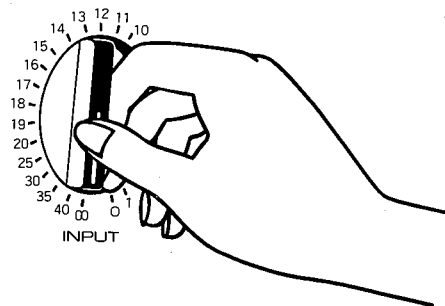
1. Make sure the POWER switch is in the OFF position before plugging in the power cord.
2. Disconnect the power source, or at least make sure the POWER switch is set in the OFF position before connecting or disconnecting any of the lines.
3. If a fuse blows, be sure that the replacement is exactly the same type and rating. Repeated fuse failures indicate a problem with the amplifier or power lines. If you have regular fuse failures, consult your Yamaha dealer.
4. Do not expose your Frequency Dividing Network to direct sunlight or other sources of excessive heat, humidity, dust or shocks.

Connecting Up

1. Before plugging in the power cord, make sure the VOLTAGE SELECTOR is properly set for your locality. (U.S., Canadian and Australian models are preset and thus don't have this feature.) For the British Standard model, please refer to the instructions on page 9.

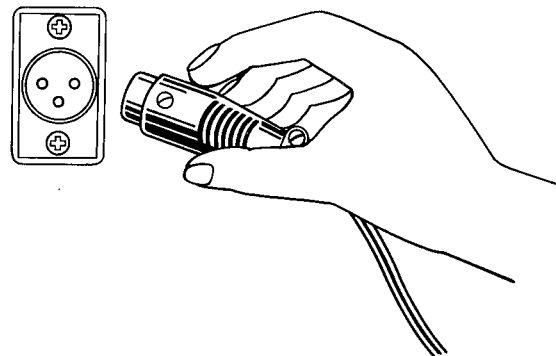


2. Set the INPUT attenuator to minimum (00) and make sure the POWER switch is OFF.

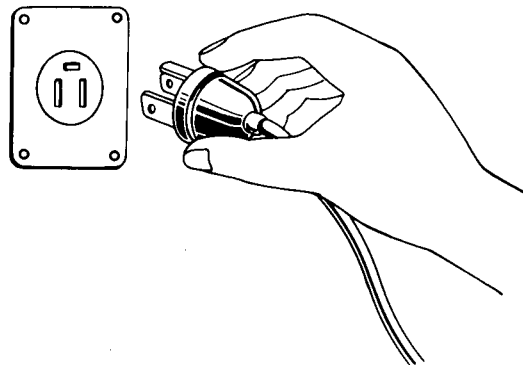


3. Connect your power amp to the output jacks. Check the phase switch position complying with your polarity standard, the speakers being used, etc.

4. Connect the input cord from your mixer to the INPUT jack.



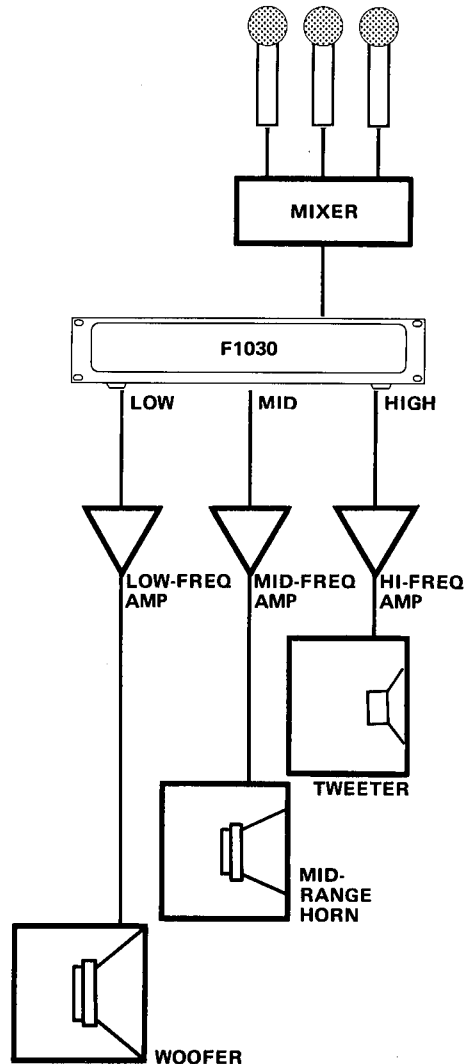
5. Plug in the power cord.



6. Push on the POWER switch.
7. Adjust the INPUT and OUTPUT attenuators to your liking. Now you're ready to go.

HOW TO USE

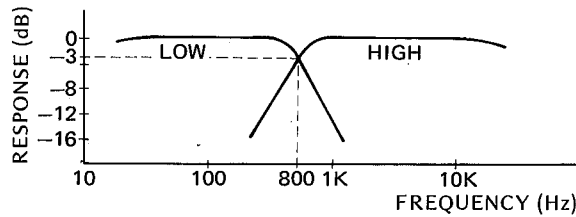
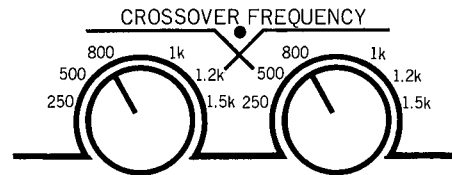
Connection for F1030



Choosing the Crossover Frequency

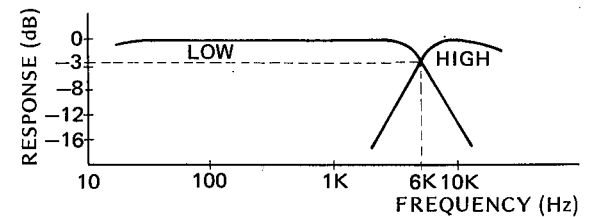
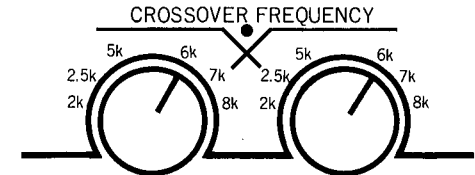
1. Bi-amplified System (2WAY-1)

The left-hand pair of Crossover Frequency controls is used for crossover frequencies from 250Hz to 1.5KHz. For example, for a crossover frequency of 800Hz, turn the two left-hand controls to 800 and the MODE SELECTOR to 2WAY-1. This shuts off the right-hand pair of controls.



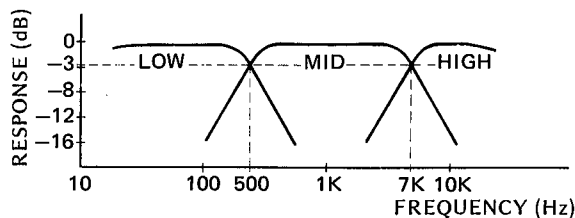
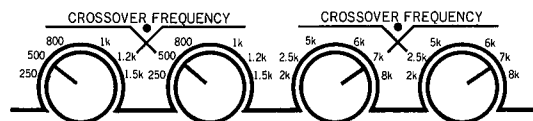
2. Bi-amplified System (2WAY-2)

The right-hand pair of Crossover Frequency controls is used for crossover frequencies from 2KHz to 8KHz. This setup is used if a tweeter is added to the speaker system for better response. For example, for a crossover frequency of 6KHz, turn the two right-hand controls to 6K and the MODE SELECTOR to 2WAY-2. This shuts off the left-hand pair of controls.



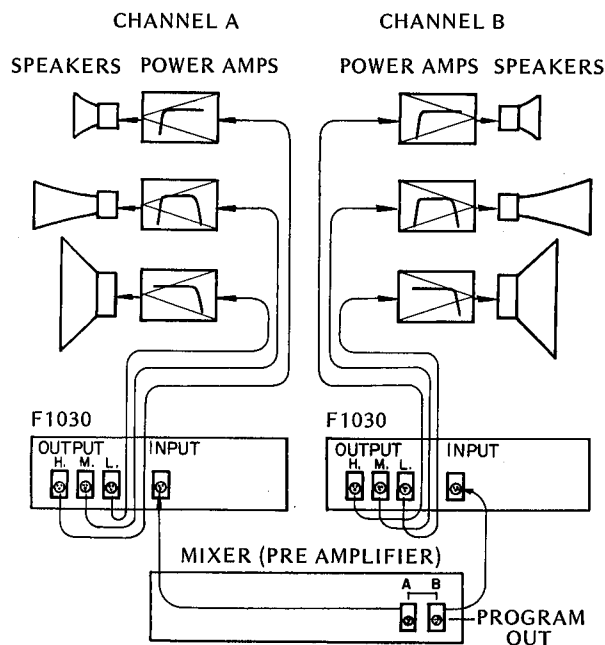
3. Triamplified System (3WAY)

The left-hand pair of CROSSOVER FREQUENCY controls is used for the LOW and MIDDLE crossover frequency and the right-hand pair of CROSSOVER FREQUENCY controls for the MIDDLE and HIGH crossover frequency. For example, for crossover frequencies of 500Hz and 7KHz, turn the two left-hand controls to 500 and the two right-hand controls to 7K, and the MODE SELECTOR to 3WAY.



Stereo Reproduction

When using the F1030 for stereo, connect it in the following way.



Determining the Crossover Frequency

Set the crossover frequency of the F1030 within the reproduction range recommended for the speaker being used. If the crossover frequency is lower than the recommended value of high range speakers and a low range signal is added to these speakers, they may be damaged. Set the crossover frequency for the high range speakers very carefully.

CAUTIONS

• Slope Switches

The F1030 has four internal switches for selecting 12dB/octave or 18dB/octave slope. They are preset at 12dB/octave but, if you want to change them to 18dB/octave, see your Yamaha dealer.

• 40Hz High Pass Filter

Inside the F1030 is an ON/OFF switch for the 40Hz (12dB/octave) high pass filter. It is set at OFF position, but if you want to change it to ON, ask your Yamaha dealer.

FRONT & REAR PANELS

FRONT PANEL

1 POWER SWITCH

This recessed, push-on, push-off switch controls the AC power to the F1030.

2 MODE SELECTOR

This three position switch allows the F1030 to be either a two-way or a three-way crossover. In the *2WAY-1* position, the F1030 is a two-way crossover using the crossover frequencies selected by the left-hand pair of *CROSSOVER FREQUENCY* controls; in the *2WAY-2* position, the F1030 is a two-way crossover using the crossover frequencies selected by the right-hand pair of *CROSSOVER FREQUENCY* controls; in the *3WAY* position, the F1030 is a three-way crossover using both left- and right-hand pairs of *CROSSOVER FREQUENCY* controls.

3 INPUT ATTENUATOR

This is a stepped, dB-calibrated input attenuator.

4 CROSSOVER FREQUENCY SELECTORS

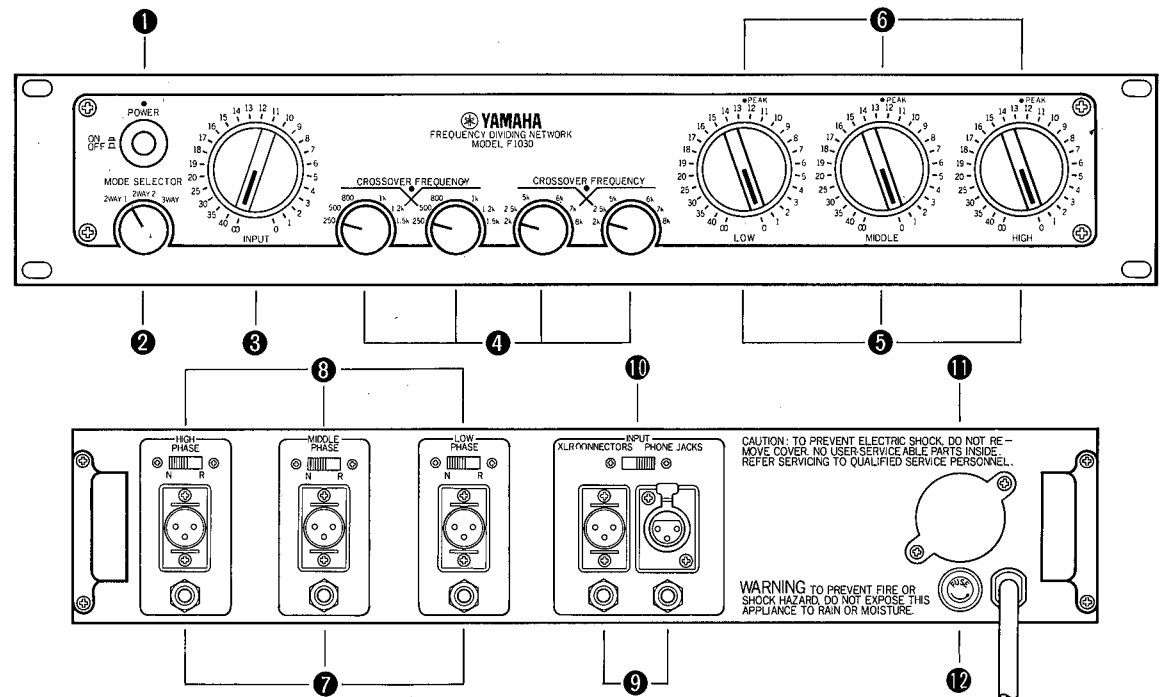
These four controls select the -3dB points of each of the four filters used in the crossover circuits.

5 LOW, MIDDLE, HIGH ATTENUATORS

These are stepped, dB-calibrated volume controls for the F1030's LOW frequency, MIDDLE frequency and HIGH frequency outputs. They allow the relative audio levels to be balanced in systems where the power amplifiers or speakers driven by each section have different sensitivities.

6 PEAK INDICATORS

Above each output control is a peak indicating L.E.D. (Light Emitting Diode) that turns on whenever the instantaneous output reaches $+14\text{dB}$ (3.88 volts). When the PEAK indicator turns on, *there is still 10dB of headroom left before clipping.*



REAR PANEL

7 HIGH, MIDDLE, LOW OUTPUT JACKS

These outputs carry the high frequency, mid frequency, and low frequency energy from the crossover circuits. The XLR connectors are floating, and the phone jacks are unbalanced. All outputs will drive a full $+24\text{dBm}$ (12.3V) into 600 ohms.

8 N/R PHASE SWITCHES

These switches allow the selection of either pin 2 or pin 3 on the output XLR connectors as the "hot" pin, to comply with your standards, and to aid in acoustic "phase matching".

9 INPUT CONNECTORS

The two XLR input connectors are paralleled and floating. The two phone jacks are also paralleled, but are unbalanced. Together, the four connectors

make it easy to "bridge" an input line to feed another F1030 or another device, such as a digital delay for rear channels.

10 INPUT CONNECTOR SELECTOR SWITCH

(XLR CONNECTORS/PHONE JACKS)

This switch selects either the two XLR connectors or the two phone jacks as the F1030's input connectors. (The XLR's cannot be used at the same time as the phone jacks.)

11 VOLTAGE SELECTOR

Not provided in U.S., Canadian and Australian models.

12 FUSE HOLDER

This fuse protects the primary (AC line) side of the power supply. If a fuse blows, be sure to replace it with one of the same type and rating as noted on the chassis.

SPECIFICATIONS

General Specifications

CONTROLS AND SWITCHES: POWER ON/OFF switch, MODE SELECTOR, 26-Position Log-Linear Detented and dB-calibrated INPUT and OUTPUT Attenuators, CROSSOVER FREQUENCY Selectors, N/R output phase switches, SLOPE internal switches, 40Hz HIGH PASS internal switch, Input connector selector switch (XLR CONNECTORS/PHONE JACKS).

FREQUENCY RESPONSE: Each output is -3dB at the chosen crossover frequency (relative to its mid-band level). All outputs are essentially flat within their respective passbands (see graph).
At the Phone Jack inputs and outputs, the LOW output is $\pm 0.5\text{dB}$ to 20Hz with the 40Hz High Pass filter switched out. The HIGH output is $\pm 0.5\text{dB}$ to 20KHz. At the XLR inputs and outputs, the LOW output is $\pm 0.5\text{dB}$ to 20Hz with the 40Hz High Pass filter switched out. The HIGH output is $+0.5, -1.5\text{dB}$ to 20KHz.

INDICATORS: 3 PEAK L.E.D. (Light Emitting Diode) indicators above LOW, MIDDLE, and HIGH controls turn on when output level reaches $+14\text{dB}$ (3.88 volts).

T.H.D.: Less than 0.05% at $+24\text{dB}$ (12.3 volts) output (30Hz ~ 20KHz).

HUM AND NOISE*: -76dB (80dB S/N ratio) with INPUT level control at -6 , output level controls at maximum, inputs and outputs terminated by 600 ohms.

MAXIMUM VOLTAGE GAIN: $+6\text{dB}$

MAXIMUM INPUT LEVEL: $+30\text{dB}$ (24.5 volts); INPUT attenuator at the -6 position.

MAXIMUM OUTPUT LEVEL: $+24\text{dB}$ (12.3 volts), (see graph).

POWER REQUIREMENTS: 110, 117, 130, 220 or 240V AC, 50/60Hz, 10W.

FINISH: Semi-Gloss Black

DIMENSIONS (WxHxD): 480x95.5x238.7mm (18-7/8x3-3/4x9-3/8")

NET WEIGHT: 7.5Kg (16.5lbs.)

FILTERS

	Filters	Mode	-3dB Frequencies	Slope
40Hz Filter	High Pass	Switchable in any mode	40Hz	12dB/octave
Left-Hand Set of Crossover Frequency Controls	Low Pass	2WAY-1, 3WAY	250, 500, 800, 1K, 1.2K, 1.5KHz	12 or 18dB/octave
	High Pass	2WAY-1, 3WAY	250, 500, 800, 1K, 1.2K, 1.5KHz	12 or 18dB/octave
Right-Hand Set of Crossover Frequency Controls	Low Pass	2WAY-2, 3WAY	2K, 2.5K, 5K, 6K, 7K, 8KHz	12 or 18dB/octave
	High Pass	2WAY-2, 3WAY	2K, 2.5K, 5K, 6K, 7K, 8KHz	12 or 18dB/octave

INPUT & OUTPUT CHARACTERISTICS

	Connector**	Impedance		Sensitivity***	Level	
		Actual	Nominal		Nominal	Maximum
INPUT	XLR-3-31 XLR-3-32 Phone Jack	10K Ω	600 Ω	-2dB (616mV)	$+4\text{dB}$ (1.23V)	$+30\text{dB}$ (24.5V)
OUTPUT (HIGH, MIDDLE, LOW)	XLR-3-32	200 Ω	600 Ω	—	$+4\text{dB}$ (1.23V)	$+24\text{dB}$ (12.3V)
	Phone Jack	5 Ω	600 Ω	—	$+4\text{dB}$ (1.23V)	$+24\text{dB}$ (12.3V)

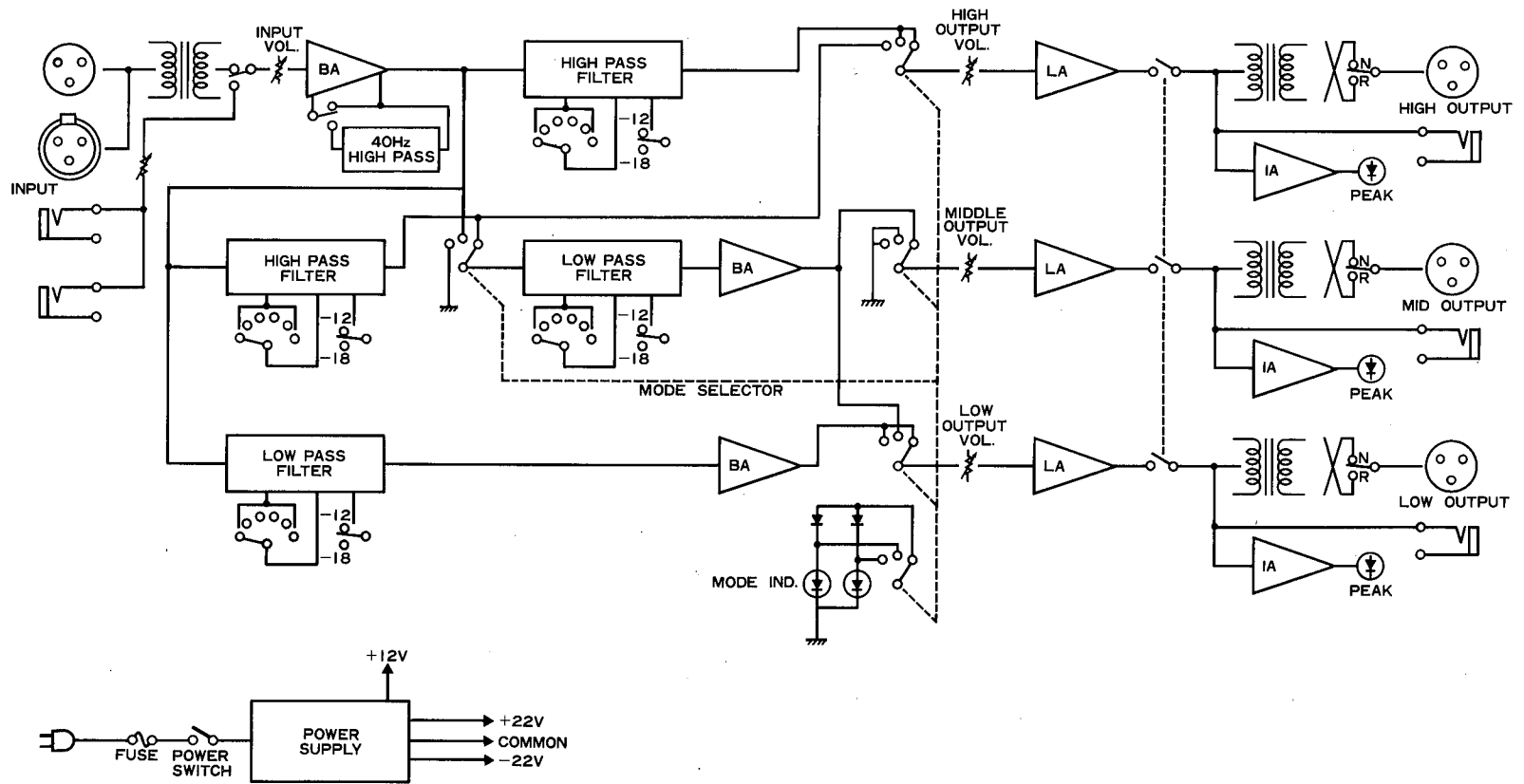
* Measured with a -6dB/octave filter at 12.47KHz equivalent to a 20KHz filter with infinite dB/octave attenuation.

**All XLR connectors are floating and transformer-isolated; phone jacks are unbalanced.

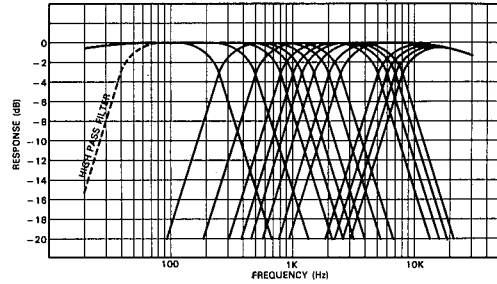
***Nominal source level required for an output of $+4\text{dB}$ (1.23 volts), all attenuators at maximum gain.

NOTE: Unless the circuit impedance is 600 ohms, we use the term "dB", rather than "dBm". This is because, since it is a power expression, the value of "dBm" changes with impedance. The "0dB" reference is 0.775 volts rms, just like 0dBm. However the level in "dB" denotes voltage instead of power, and so is less misleading than "dBm" at impedances other than 600 ohms.

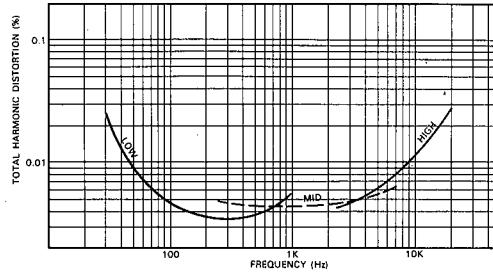
Block Diagram



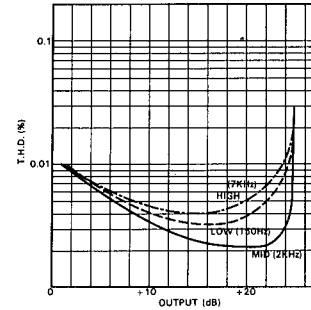
Frequency Response
Crossover slope switch: 12dB/octave



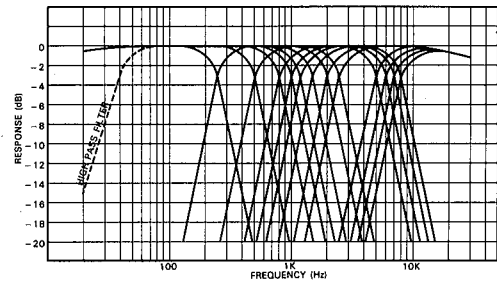
Frequency Response vs. T.H.D.



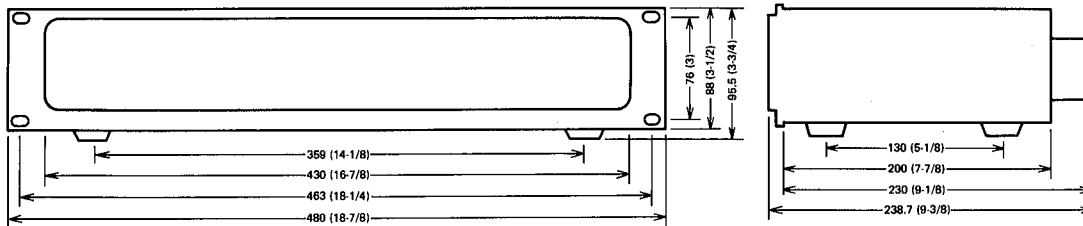
Total Harmonic Distortion



Crossover slope switch: 18dB/octave



Dimensions



Standard 19" rack mounting that is rugged and ideal for permanent installation.

Unit: mm (in.)

FOR THE BRITISH STANDARD MODELS

As the colours of the wires in the mains lead of the apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured GREEN or GREEN-and-YELLOW. 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.

IMPORTANT:

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

- GREEN-and-YELLOW Earth
- BLUE Neutral
- BROWN Live

WARNING:

This apparatus must be earthed.

