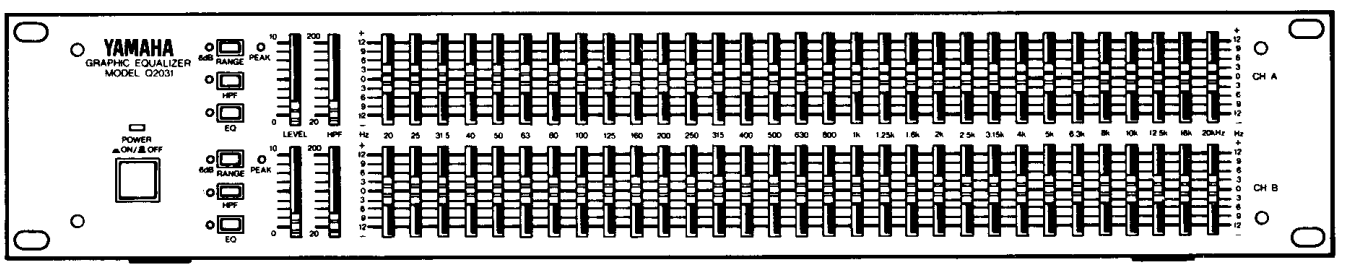
YAMAHA

Stereo 31-Band Graphic Equalizer
Egaliseur Graphique Stereo A31 Gandes
Graphischer 31-Band-Stereo-Equalizer

Q2031

Operating Manual
Mode d'emploi
Bedienungsanleitung



You have made the right choice. The YAMAHA Q2031 Graphic Equalizer offers truly superior price/performance and is fully backed by YAMAHA's wealth of accumulated sound expertise. Congratulations and thank you.

The versatile Q2031 enables you to add up to 12dB of boost or cut at any of 31 bands centered around International Standards Organization (ISO) 1/3 octave frequencies from 20 Hz to 20 kHz. This versatility opens a wide range of applications in sound reinforcement and recording. You can, for example, optimize gain to provide adequate feedback margins at all frequencies. You can also creatively shape frequency characteristics to match the particular room, studio, or hall and thus provide the realism and fidelity that critical audiences demand.

This manual has been written to help you obtain optimum performance and trouble-free operation from new Q2031. Please read it throughly.

FEATURES

- This two-channel system offers completely independent channel control—from the input all the way to the output.
- The narrow, 1/3-octave bandwidth and 31-band control over the entire 20Hz to 20kHz range provides very precise equalization.
- The Q2031 has been very carefully designed from both functional and operational perspectives. Each of the equalization sections, for example, has an independent EQ switch that bypasses the equalizer section, a High-Pass Filter with a slider-adjustable roll-off frequency, and a RANGE switch to select boost/cut ±6dB or ±12dB.
- The highly versatile Q2031 can be used in a wide variety of applications and can be mounted in a standard 19" rack.
  - U.S. & Canadian models
    Transformerless balanced (XLR connectors) or unbalanced (1/4" phone jacks) inputs and outputs are standard, with provisions for both input and output transformer balancing. Two octal socket (CHANNEL A and B) are provided on the rear panel. They will accept optional bridging input transformer if desired. The output transformer should be installed by a qualified service technicians.

CONTENTS

SPECIFICATIONS

FREQUENCY RESPONSE	0 ± 0.5dB, 20Hz ~ 20kHz
TOTAL HARMONIC DISTORTION	Less than 0.1% @ +4dB, 20Hz ~ 20kHz
HUM & NOISE	−96dB (LEVEL Control at maximum and all Equalizer Controls at flat)
MAXIMUM VOLTAGE GAIN	+24dB (INPUT LEVEL Switch at −20dB and OUTPUT LEVEL Switch at +4dB)
EQUALIZER CONTROLS	31 band (1/3 octave)
Center Frequencies	20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1k, 1.25k, 1.6k, 2k, 2.5k, 3.15k, 4k, 5k, 6.3k, 8k, 10k, 12.5k, 16k, 20kHz
Variable Range	±12dB/±6dB
PEAK LED INDICATORS	Light up when the output level is 10dB above the nominal output level.

HIGH PASS FILTER (Rolloff Frequency)	12dB/octave (20Hz ~ 200Hz)
POWER REQUIREMENTS	
U.S. & Canadian models	120V, 60Hz
General model	110-120/220−240, 50/60Hz
POWER CONSUMPTION	
U.S. & Canadian models	25W
General model	25W
DIMENSIONS (W x H x D)	480 mm x 88 mm x 298 mm (18-7/8" x 3-1/2" x 11-3/4")
WEIGHT	5.1 kg (11.2 lbs.)

■ INPUT SPECIFICATIONS

INPUT Connectors	INPUT Level Switch	Input Impedance	Source Impedance	Sensitivity* (At Maximum Gain)	Input Level		Connectors**
					Nominal Level	Maximum Before Clipping	
INPUT (A, B)	+4dB	15k ohms	600 ohm LINES	+4dB (1.23V)	+4dB (1.23V)	+20dB (7.75V)	XLR Type Phone Jack
	−20dB			−20dB (77.5mV)	−20dB (77.5mV)	−4dB (489mV)	

■ OUTPUT SPECIFICATIONS

OUTPUT Connectors	OUTPUT LEVEL Switch	Output Impedance	Load Impedance	Output Level		Connectors**
				Nominal Level	Maximum Before Clipping	
OUTPUT (A, B)	+4dB	150 ohms	600 ohm Lines	+4dB (1.23V)	+20dB (7.75V)	XLR Type
			10k ohm Lines		+18dB (6.16V)	Phone Jack
	−20dB	150ohms	600 ohm Lines	−20dB (77.5mV)	−4dB (489mV)	XLR Type
			10k ohm Lines		−6dB (388mV)	Phone Jack

** The input level required to obtain the nominal output level.*

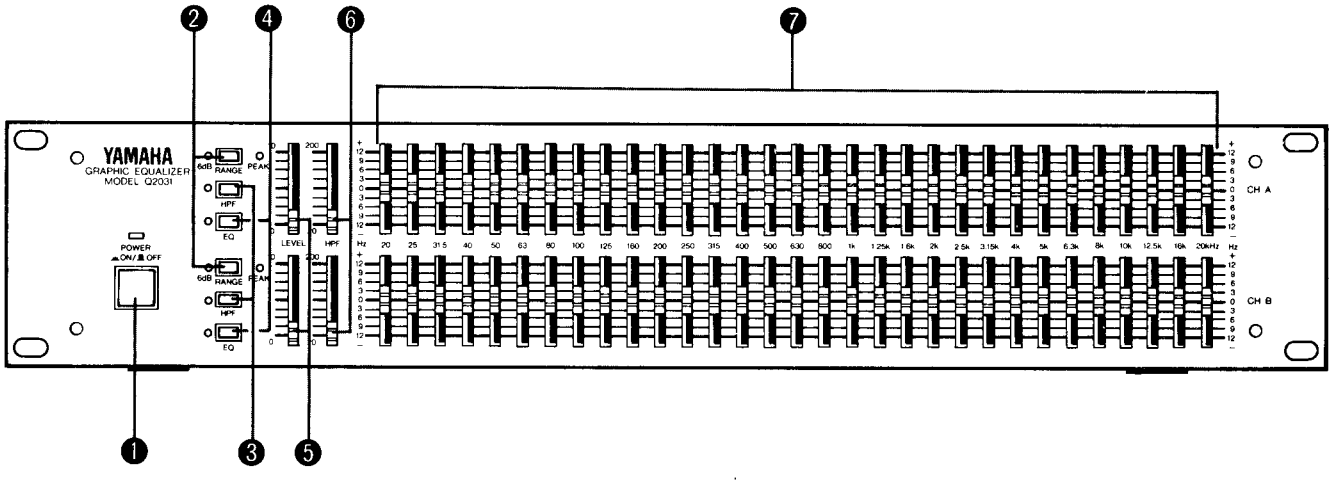
*** XLR-type connectors are balanced. Phone jacks are unbalanced.*

- *0dB is referenced to 0.775V RMS.*
- *Specifications subject to change without notice.*

PRECAUTIONS

- **LOCATION**
  Do not install the Q2031 in location where it might be subjected to the following;
  - ○ Direct sunlight or excessive heat
  - ○ Extreme cold
  - ○ High humidity or dust
  - ○ Strong vibrations
- **HANDLING**
  Do not apply undue force to the switches or controls.
- **POWER CORD**
  Pull the power cord from the wall outlet by the plug only. Never pull on the cord as this may lead to breaking or shorting.
- **CONNECTIONS**
  Turn off all equipment power switches before making any connections. Before moving the Q2031, disconnect cords to other equipment to avoid damaging connectors and cables.
- **CABINET CLEANING AND CARE**
  Wipe the Q2031 cabinet clean with a soft, dry cloth. Do not clean it with benzene or other solvents and avoid spraying insecticides near it.
- **LIGHTNING**
  If your area is prone to lightning strikes, unplug the Q2031 power cord during storms to prevent lightning induced transients on the power lines from damaging the equipment.

FRONT PANNEL



❶ POWER switch
When this switch is pressed to turn power on, the POWER indicator LED will light. Pressing the switch again turns the power off.

❷ RANGE switches
The RANGE switches select the filter boost or cut range for the respective channels. When the switches are off, the normal range of +/—12 dB is selected; when on, the +/—6 dB range is selected. This latter range is useful for very accurate equalization. When the Range switch is on, the LED indicator to its left lights to show that the +/—6dB range is in effect.

❸ HPF (High Pass Filter) switches
Each channel has an independent HPF switch to switch the HPF in or out of the audio path before the graphic equalizer section. With the HPF switch off, the input signal goes directly to the equalizer, bypassing the HPF.
When the HPF switch is on, the HPF is switched into the audio path and provides 12 dB per octave rolloff below the frequency set by the HPF frequency control ❻ . LED indicators associated with each switch light when the switch is on to show that the HPF is being used.

❹ EQ switch

When the EQ switch, provided for each channel, is off, the equalizer is bypassed. When the switch is on, its associated LED indicator lights, and the equalizer is switched into the audio path. The equalized signal can be compared with the un-equalized signal simply by alternately turning the EQ switch on and off.

❺ LEVEL controls

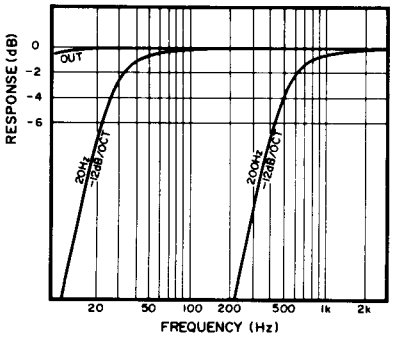
Individual LEVEL controls for both channels adjust the input sensitivity for optimum input level. When the LEVEL control is at the top of the scale, the input source signal level remains unchanged (+4 dB or −20 dB). As the LEVEL control is moved downward, the input level is reduced.

This control can be used restore the output level when the overall level has been changed during the equalization process. This, however, will also change the input level. Equalization methods which do not change the LEVEL control setting will yield a better signal-to noise ratio and wider dynamic range.

❻ HPF (High Pass Filter) controls

The HPF controls continuously adjust the rolloff frequency over the entire 20 Hz to 200 Hz range for their associated HPFs and channels. Below the selected frequency, there will be a 12 dB per octave rolloff.

The HPF can be adjusted to eliminate low-range standing waves that sometimes occur in indoor environments, control vocal "pops" and wind noise in microphones, and reduce AC hum.

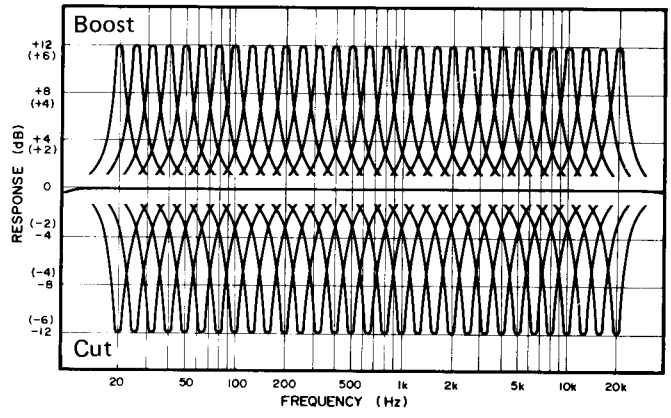


❼ Equalizer Boost/Cut controls

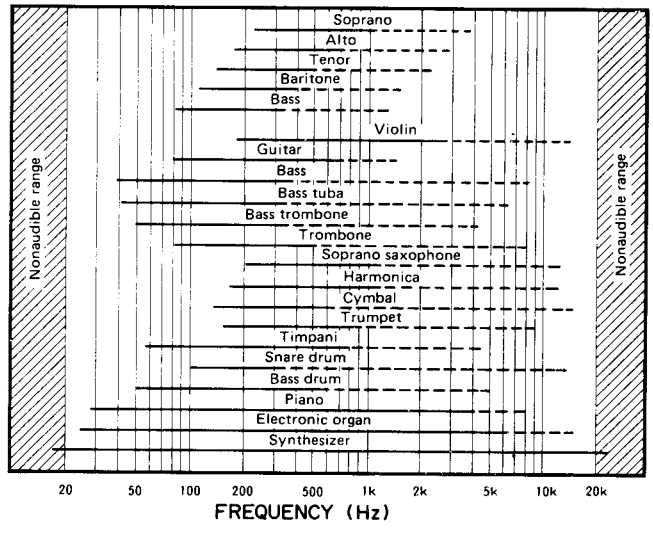
The 20 Hz to 20 kHz spectrum is divided into thirty-one 1/3 octave bands, each of which has an equalizer boost/cut slider center (0) detected position. Moving the slider up boosts that band, moving it down cuts that band.

Convenient scales on either side of the sliders are calibrated in dB. The +/−12 dB range is used when the RANGE switch is off. When the RANGE switch is on, the +/−6 dB range is used, and the true values are one-half of the calibrated values.

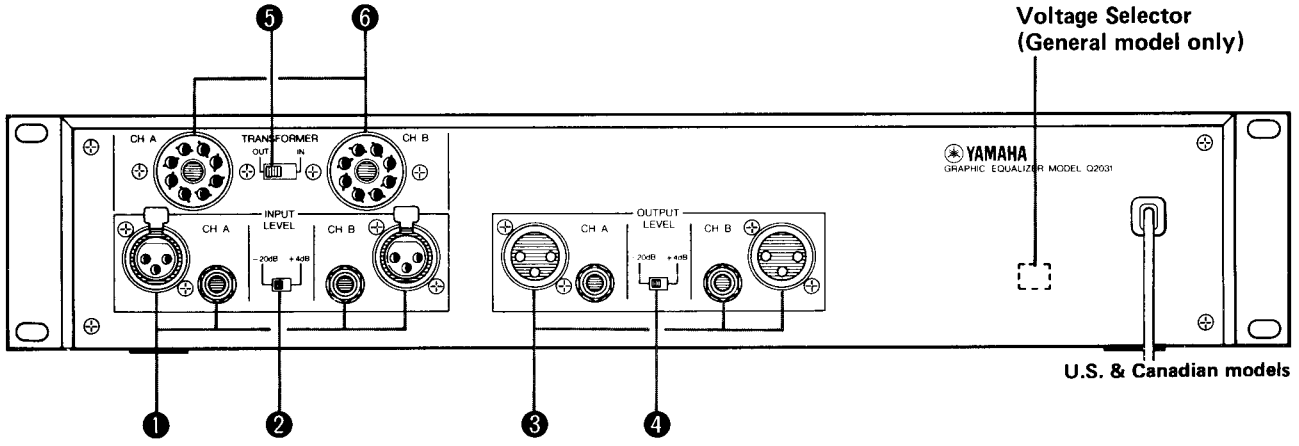
Peak LED indicators on the right of the RANGE switches ❷ light when the output level exceeds the rated output level by 10 dB. Though the Q2031's clipping level is 4 to 6 dB above the level at which the PEAK indicators light, if the PEAK indicators remain lit, you should reduce the overall settings of the equalizer sliders.



To get the best performance from your 31-band Q2031 stereo graphic equalizer, it is important that you understand the frequency components that make up the sounds of each musical instrument. The following graph is provided to aid this understanding. You should also bear in mind that harmonics of fundemental frequencies, plotted as dotted lines in the graph, can have a significant impact on timbre.



REAR PANNEL



❶ INPUT Connectors
Both balanced (3-pin female XLR type connectors) and unbalanced (1/4" phone jacks) input connectors are available. A 600 ohm line should be used for both. Use the INPUT LEVEL switch to set the rated input level to either +4 dB or −20 dB.

❷ INPUT LEVEL Switch
Use this switch to set the rated nominal input level to correspond to the rated output level of the equipment to be connected.

❸ OUTPUT Connectors
Both balanced (3-pin male XLR type connectors) and unbalanced (1/4" phone jacks) output connectors are available. A 600 ohm lines should be used for the balanced XLR's and a 10k ohm line for the unbalanced 1/4" phone jacks. Use the OUTPUT LEVEL switch to set the rated nominal output level to either +4 or −20 dB.

❹ OUTPUT LEVEL Switch
Use this switch to set the rated nominal output level to correspond to the rated input level of the equipment to be connected.

U.S. & Canadian models only

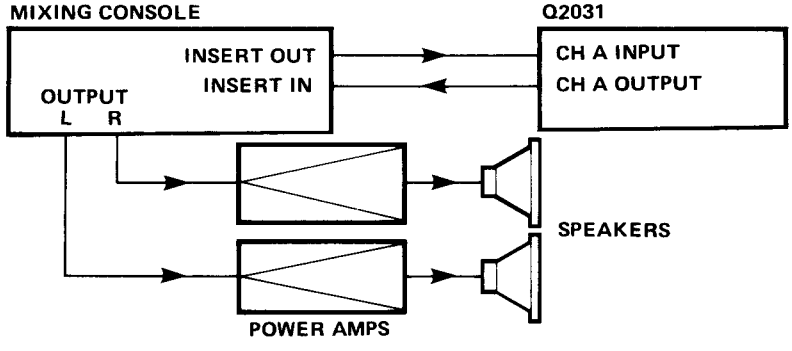
❺ TRANSFORMER In/Out Switch
This switch inserts the optional (See item ❻) Input Transformers into the input stage, bypassing internal electronic balancing.

❻ Input Transformer Octal Sockets
Two Octal Sockets are provided to accept optional 15k to 15k ohm bridging Input Transformers.

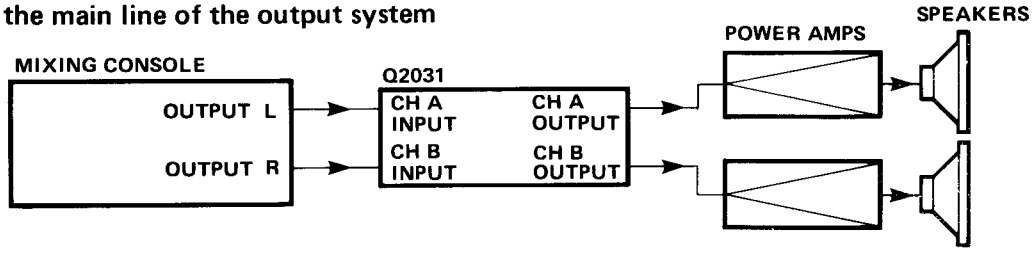
❼ Internal Output Transformer (Optionals)
The Output Transformer should be installed by a qualified service technicians.

TYPICAL CONFIGURATIONS

■ **Insertion between the channel (master) insert out/in**



■ **Insertion in the main line of the output system**



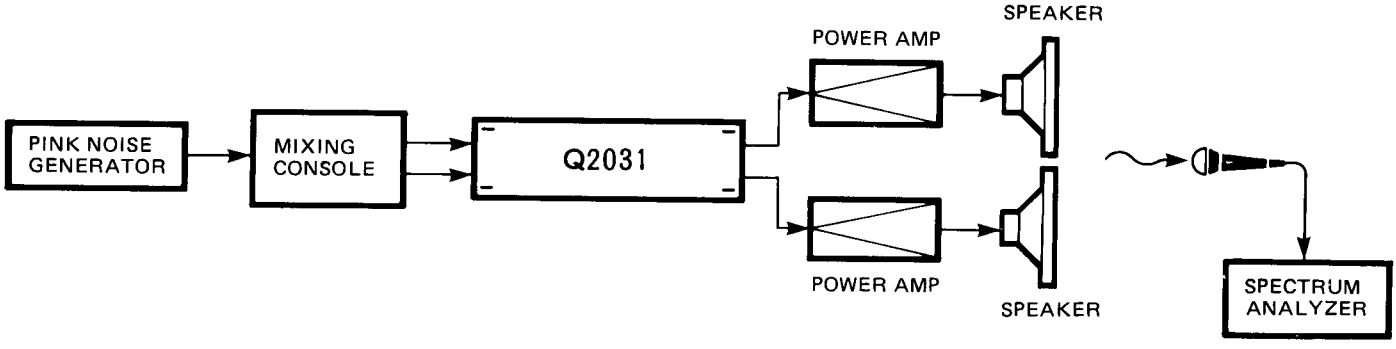
ACOUSTIC CONTROL

The Q2031's 20Hz to 20 kHz spectrum enable it to be applied in a variety of ways to improve the listening environment. Some of these are described below.

• Maintaining Ideal Indoor Propagation Characteristcs

Speaker systems that demonstrate flat responses in anechoic rooms will normally have irregular responses in a concert hall due to acoustic conditions. The Q2031 equalizer can be used to minimize these irregularities.

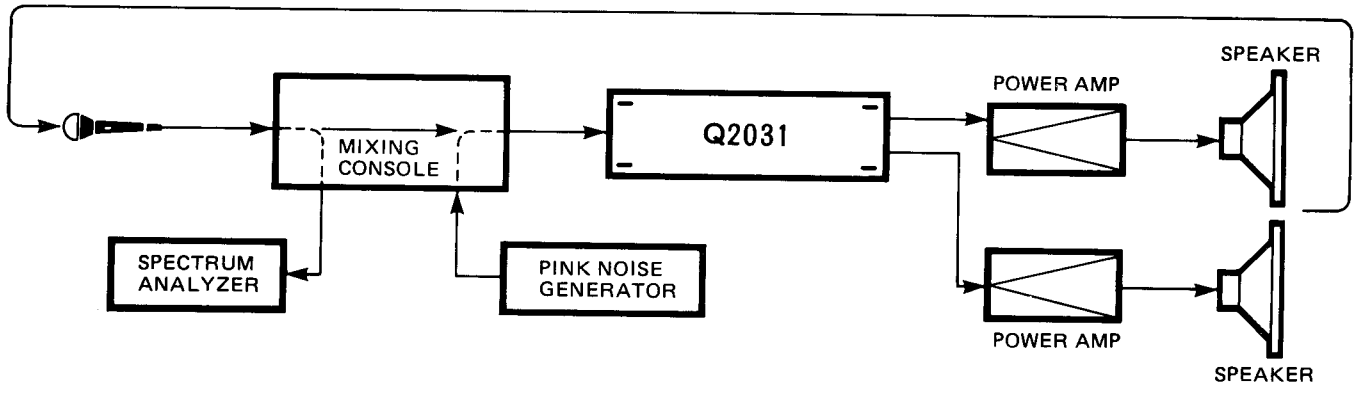
To smooth the playback system response, connect a pink noise generator to the console so that pink noise is radiated from the speakers. While measuring the pink noise at strategic listening positions in the room using a spectrum analyzer, adjust the Q2031 until preferred response is displayed.



• Ensuring Adequate Feedback Margins in Stage Monitor Systems

Feedback can result in howling or ringing being generated at specific frequencies dependent on the monitor system and microphone characteristics. The Q2031 can be adjusted to reduce levels at the effected frequencies and thereby control the feedback, but a pink noise generator and a spectrum analyzer are again required.

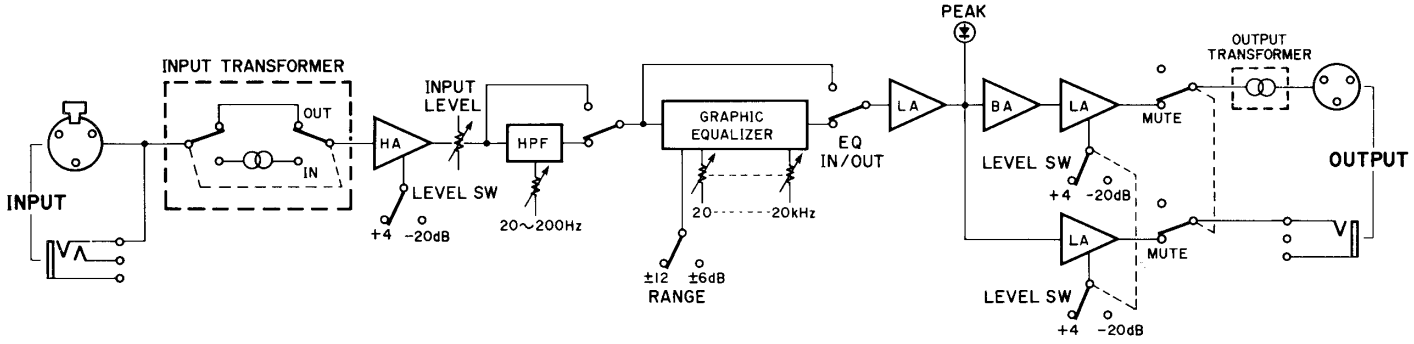
Set the equipment up just as for an actual performance. Connect the pink noise generator to the spare input connectors on the console. After ensuring that pink noise is being properly radiated from all monitor speakers, gradually raise the output level until it is evident at which frequencies feedback will occur, using the spectrum analyzers and calbrated microphone near the monitor speakers. Use the Q2031 to reduce the levels of these specific frequencies and provide a safety margin against feedback when the output level is raised.



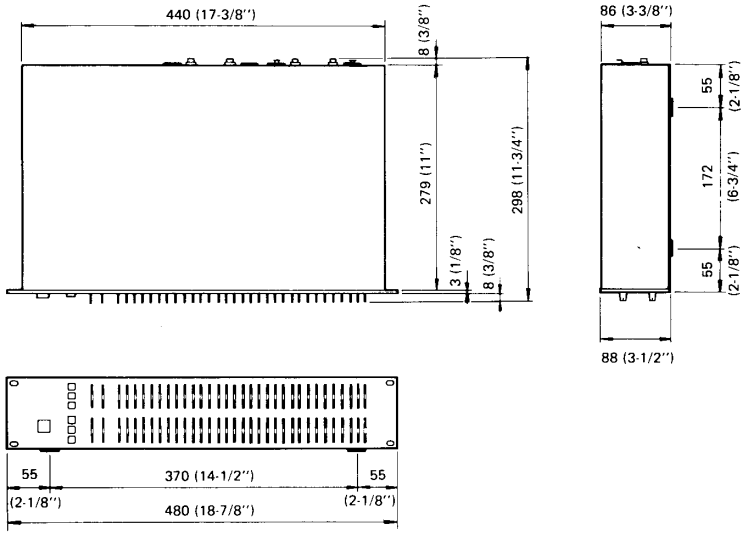
Measuring instruments can only go so far in providing sound realism. After you have completed the indoor propagation and feedback compensating adjustments, make the final adjustments using the ultimate judge, your trained ears.

A Pink Noise Generator generates a uniform level of random noise throughout the audio spectrum. (Equal Energy per octave)
A Spectrum Analyzer divides the audio spectrum into ranges and indicates the sound pressure for each range.

BLOCK DIAGRAM
SCHEMA SYNOPTIQUE
BLOCKSCHALTBILD



DIMENSIONS
DIMENSIONS
AUSSENABMESSUNGEN



Units : mm (Inch)
Units : mm (Inch)
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SERVICE

The Q2031 are supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha dealer.

SERVICE ARRÊS-VENTE

L'égaliseur Q2031 est supporté par un réseau mondial de services après-vente Yamaha animés par un personnel de vente et des techniciens dépanneurs qualifiés et formés en usine. N'hésitez pas à vous en remettre au distributeur Yamaha le plus proche de votre domicile en cas de doute ou de panne.

KUNDENDIENST

Yamaha's weltweit verbreitete, fabrikgeschulte und qualifizierte Verkaufs-Kundendienstpersonal ist mit dem Q2031 bestens vertraut. Im Falle eines Problems treten Sie mit Ihrer nächsten Yamaha-Zweigstelle in Verbindung.

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