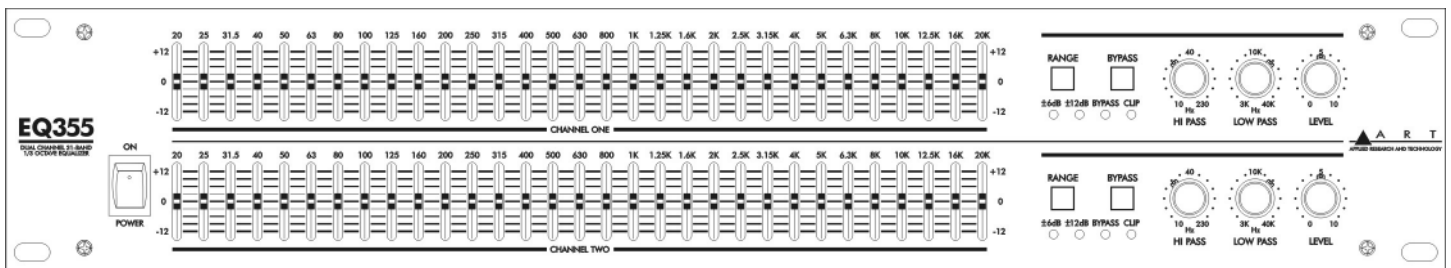
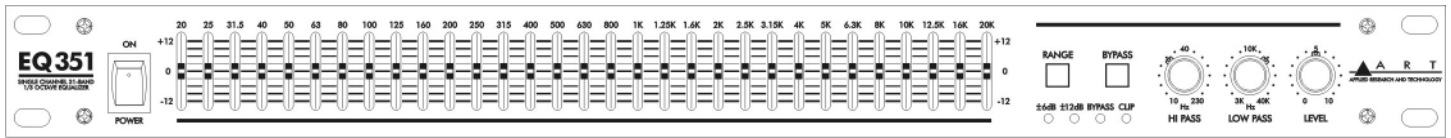
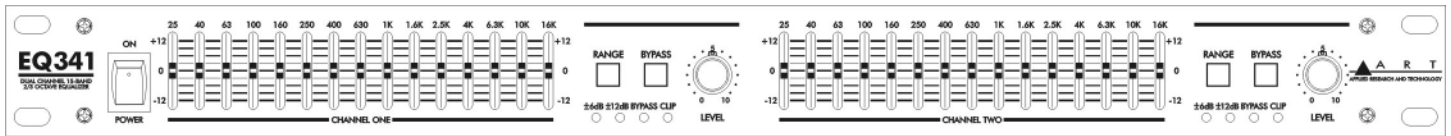


# EQ300 Series Graphic Equalizers



- EQ341 DUAL CHANNEL 15-BAND 2/3 OCTAVE EQUALIZER**
- EQ351 SINGLE CHANNEL 31-BAND 1/3 OCTAVE EQUALIZER**
- EQ355 DUAL CHANNEL 31-BAND 1/3 OCTAVE EQUALIZER**

## USER'S GUIDE



## IMPORTANT SAFETY INSTRUCTIONS – READ FIRST



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltages inside the enclosure that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

### Read instructions

Retain these safety and operating instructions for future reference. Heed all warnings printed here and on the equipment. Follow the operating instructions printed in this user guide.

### Do not open

There are no user serviceable parts inside. Refer any service work to qualified technical personnel only.

### Power sources

Only connect the unit to mains power of the type described in this user guide or marked on the rear panel. The power source must provide a good ground connection.

### Power cord

Use the power cord with sealed mains plug appropriate for your local main supply as provided with the equipment. If the provided plug does not fit into your outlet consult your service agent. Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against.

### Grounding

Do not defeat the grounding and polarization means of the power cord plug. Do not remove or tamper with the ground connection on the power cord.

### Moisture

To reduce the risk of fire or electrical shock, do not expose the unit to rain, moisture or use in damp or wet conditions. Do not place container of liquid on it, which may spill into any openings

### Heat

Do not locate the unit in a place close to excessive heat or direct sunlight, as this could be a fire hazard. Locate the unit away from any equipment, which produces heat such as: power supplies, power amplifiers and heaters.

### Environment

Protect from excessive dirt, dust, heat, and vibration when operating and storing. Avoid tobacco ash, drink spillage and smoke especially that associated with smoke machines.

### Handling

Protect the controls from damage during transit. Use adequate padding if you need to ship the unit. To avoid injury to yourself or damage to the equipment take care when lifting, moving or carrying the unit.

### Servicing

Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid or the power cord or plug becomes damaged during a lightning storm or if smoke odor or noise is noted. Refer servicing to qualified technical personnel only.

### Installation

Install the unit in accordance with the instruction printed in the user guide.

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## OVERVIEW

The ART EQ300 Series of graphic equalizers have been designed and engineered to extremely high standards for audio performance and functionality. These innovative, high-quality equalizers are perfect for virtually any audio application where precision frequency tailoring, reliable performance, rugged design and extremely silent processing is important.

### Active Filter Sections

The EQ300 Series of graphic equalizers feature active filter sections, which incorporate a constant-Q design. This constant-Q design, with accurate precision center frequencies), ensures that the bandwidth of every individual filter will be narrow enough to prevent unnecessary interaction between filters, yet still create an equalization curve wide enough to produce the exact and precise processing of audio frequencies the user seeks.

### Precision Slide Potentiometers

The EQ300 Series of graphic equalizers utilize 20mm precision slide potentiometers. These center-detented, precision faders are graphically positioned on ISO center frequencies between 25Hz-16kHz for the EQ341, 20Hz to 20kHz for the EQ351 and EQ355.

### Independent Variable Hi and Low Pass Filtering

In order to deliver superlative performance and control, the EQ351 and EQ355 graphic equalizers incorporate independent variable Hi Pass (low cut) and Low Pass (high cut) filters. Having separate and variable precision control for both the Hi Pass and Low Pass filters, allows the user to custom tailor the audio signal to perfection.

Many competing products only feature shelving switches which have a fixed frequency point. Others do not have separate filtering for both high and low frequencies. These designs do not offer the precision or control of the ART EQ300 Series.

### Additional Controls and Indicators

The EQ300 Series of graphic equalizers utilize a variable output level control, clip level indicator, ground lift switch, and selectable line voltage.

Additional features include selectable scale switching - high slider resolution ( $\pm 12\text{dB}$ ) or normal resolution ( $\pm 6\text{dB}$ ), active balanced and unbalanced input/output connectors, and RFI filtering.

A passive bypass switch allows for direct comparison between the equalized and non-equalized signal for each channel.

### Multiple Connectivity

The EQ300 Series of graphic equalizers can be connected with a wide variety of audio devices. Each unit has three sets of input and output connectors wired in parallel. These connections include XLR connectors, 1/4" phone jacks and RCA phono jacks.

### Durability by Design

The EQ300 Series of graphic equalizers are designed and engineered to be durable and rugged. They are an ideal choice when the need for a robust equalizer is of paramount concern. They are designed for mounting in a standard 19" equipment rack or one of the many rack-type portable cases in existence. The vertical height is 1.75 inches for the EQ341 and EQ351, and 3.5 inches for the EQ355. The depth is 7 inches, exclusive of power cord.

Rugged construction and solid audio performance make these equalizers particularly well suited to fixed installation as well as touring live sound systems.

### Precision and Quality

When considering quality equalization, the ART EQ300 Series of graphic equalizers are an excellent choice. They deliver extremely precise, powerfully flexible and simply great sounding equalization, with the quality features and reliable design necessary for top-level audio performance.

## **GENERAL INFORMATION**

Your ART equalizer is a professional quality unit perfect for virtually any audio application where frequency tailoring is needed. It's features include: constant-Q circuitry with accurate center frequencies, selectable  $\pm 6\text{dB}$  or  $\pm 12\text{dB}$  range, active balanced and unbalanced input and output connectors, RFI filters, independent variable Hi Pass (low cut) and Low Pass (high cut) filters (for the EQ351 and EQ355), variable input level control, passive bypass switch, clip level indicator, ground lift switch, and selectable line voltage. Rugged construction and solid audio performance make these equalizers particularly well suited to fixed installation as well as touring live sound systems.

## **INSTALLATION**

This series of equalizers are designed for mounting in a standard 19" equipment rack or one of the many rack-type portable cases available on the market. The vertical height is 1.75 inches for the EQ351 and EQ341, and 3.5 inches for the EQ355. The depth is 7 inches, exclusive of the power cord.

## **POWER CONNECTORS**

These equalizers have internal power supplies and are designed for operation with 120 or 240 volt (as determined by the rear panel line voltage switch), 50-60Hz mains supply. In new installations and portable sound systems, or any situation where the mains power is in question, it is wise to confirm the voltage and select the appropriate line voltage setting **BEFORE** connecting the equalizer to power sources.

## **INPUT/OUTPUT CONNECTIONS**

The EQ300 series graphic equalizers have three sets of input and output connectors wired in parallel: 1/4" phone, XLR, and RCA connectors. Only one of the three inputs should be used per channel. Any combination of output connectors may be used.

1/4" phone jack connections may be used balanced or unbalanced. When balanced, the tip is High (+), the ring is Low (-) and the sleeve is Ground. To use unbalanced, use a mono 1/4" phone cable, which will automatically ground the ring to the sleeve.

XLR connections are balanced where pin 2 is High (+), pin 3 is Low (-), and pin 1 is Ground.

RCA jack connections are unbalanced.

## **SIGNAL LEVELS**

Signal levels from -10dBm to +4dBm are considered normal with maximum levels of approximately +18dBm balanced or +22dBm unbalanced. Do not connect microphones directly to the equalizer. Most microphones, as well as instrument pickups, require a preamp to get the signal level up to a line level. The outputs of the equalizer are also designed to connect into line level inputs and should not be connected into sensitive microphone or instrument Inputs for best results.

## CHASSIS GROUNDING

The equalizers are equipped with a rear panel grounding screw and Ground Lift switch. The Ground Lift switch should normally be set to the **GND** position. After set up, if your system exhibits excessive hum or buzzing, the problem may be due to a ground differential between your equalizer and other equipment in the same system. The Ground Lift switch lets you try several combinations to minimize system hum.

**NOTE: ALWAYS TURN YOUR AMPLIFIERS DOWN BEFORE CHANGING GROUNDS.**

Try different combinations of lifting grounds on units that are supplied with ground lift switches or make sure all chassis are connected to earth ground, either through the AC Power cord grounds or by the rear panel grounding screws.

If the EQ300 series equalizer is mounted in a grounded rack of equipment, the ground to the grounding screw of the equalizer may be lifted to prevent multiple ground paths, which may cause a ground loop to occur.

## INITIAL SETUP

Before starting to equalize your sound system there is some information you should know and procedures you should follow. Your equalizer is equipped with a bypass switch. The BYPASS switch, when activated, lights the bypass LED and cancels all equalization settings while allowing signal to flow directly through the unit at unity gain.

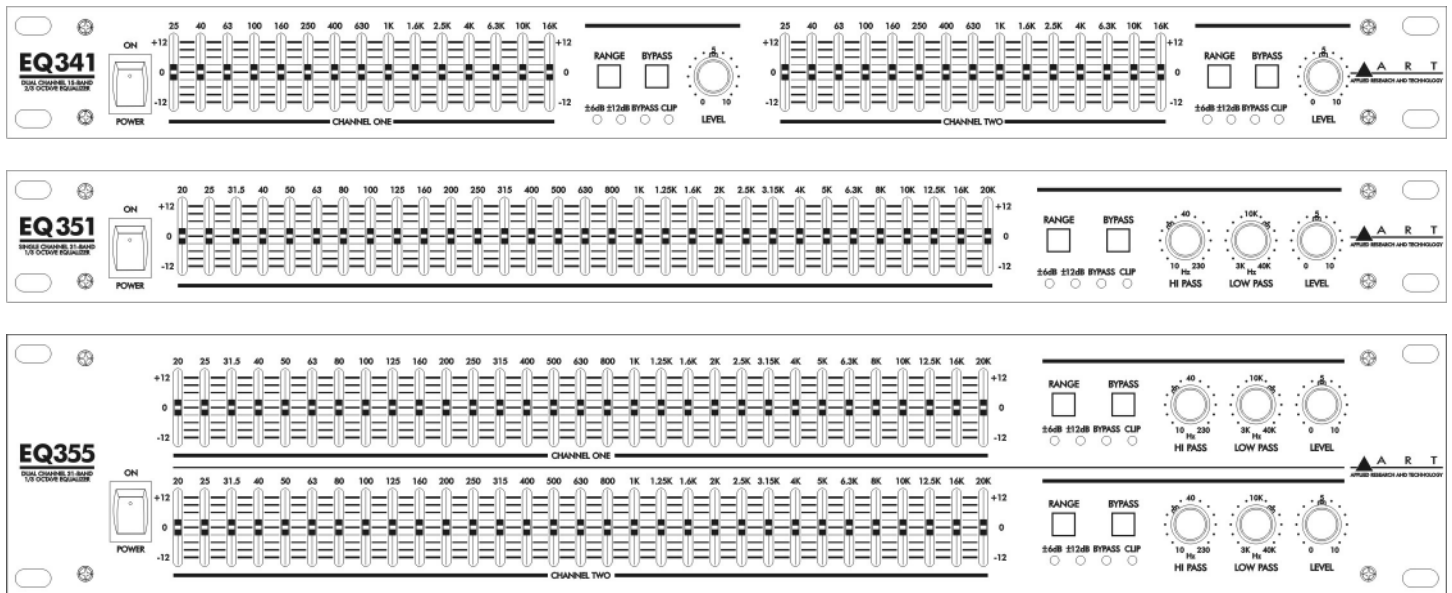
Also included is a RANGE selection switch with LED indicators,  $\pm 6\text{dB}$  (green),  $\pm 12\text{dB}$  (yellow). This switch changes how much effect the slide controls have. In addition to the RANGE selection switch there is an output LEVEL control potentiometer. The LEVEL control operates between off and  $+6\text{dB}$ . Note: If there is too much gain, your equalizer has a red LED CLIP indicator that illuminates when signals are within 6dB of clipping. If the CLIP LED flashes occasionally, this is okay, but if this LED is on steadily you should reduce the level control.

Here are some tips to help you with the initial set up:

1. Set channel output LEVELs to the center detent (0dB) on the front panel.
2. Select the BYPASS switch to bypass the equalizer. (Note: The red LED is on)
3. Set the frequency slide controls to the center detent (0dB).
4. If applicable, set the HI PASS filter to 10Hz and the LOW PASS filter to 40kHz.
5. Select the  $\pm 6\text{dB}$  RANGE. (Note: The green LED is on)
6. Apply a signal to the system and if the CLIP LED is on, reduce your signal to the unit.
7. Unselect the BYPASS switch (Note: The red LED is off)
8. If the CLIP LED is on, turn down the Output LEVEL control.
9. You may now start equalizing your system.
10. If you do not have enough equalization control, switch the range switch to the  $\pm 12\text{dB}$  setting.

# OPERATION

## FRONT PANEL CONTROLS



## POWER SWITCH

To turn the equalizer on or off, press the upper or lower portion of the POWER switch. **CAUTION:** Always turn on your equalizer **BEFORE** your power amplifiers are turned on, and always turn off your equalizer **AFTER** your power amplifiers have been turned off.

## FILTER LEVEL CONTROLS

Each of these sliders controls the signal level of each of the 31 (or 15) bandpass filters. A detent at the center position helps center the controls for a flat response.

## FILTER RANGE SWITCH & INDICATORS

The gain range of the filter sliders is switchable (as a group) from  $\pm 6\text{dB}$  to  $\pm 12\text{dB}$  for maximum boost/cut capability. At  $\pm 6\text{dB}$  the green LED will illuminate, and at  $\pm 12\text{dB}$  the yellow LED will illuminate.

## BYPASS SWITCH & CLIP INDICATOR LED

When the red BYPASS LED is illuminated, this indicates that the unit or channel is in the bypass mode. Signal is routed directly from the input to the output without passing through any circuitry (often referred to as "hard-wire bypass"). Use this switch to compare equalized and unequalized material, or to bypass the EQ section in the event of total unit failure.

The red CLIP LED illuminates if any section of the equalizer is near clipping. Occasional flickering of this LED is acceptable, but if it remains on more than intermittently, you should reduce the output level of the preceding equipment or, if that is not possible, turn down the equalizer's LEVEL control to avoid audible distortion.

## **HI PASS FILTER (LOW-CUT FREQUENCY CONTROL) (EQ351 and EQ355 only)**

To cut down on unwanted low frequency signals, this control determines the roll-off frequency of the Hi-Pass Filter (HPF). The roll-off frequency can be adjusted from 10Hz to 250Hz by turning this knob. Because of its high roll-off slope, the HPF can be efficiently used to cut down hum and low frequency noise from preceding instruments, or to reduce low frequency resonances, when speakers are installed in an enclosed acoustic environment. It is also very effective at removing power robbing and potentially destructive rumble.

## **LOW PASS FILTER (HIGH-CUT FREQUENCY CONTROL) (EQ351 and EQ355 only)**

To cut down on unwanted high frequency signals, this control determines the roll-off frequency of the Low-Pass Filter (LPF). The roll-off frequency can be adjusted from 3kHz to 40kHz by turning the knob. Because of its high roll-off slope, the LPF can be effectively used to cut down the high frequency noise from preceding instruments, or roll-off excessive high frequency sounds to obtain a more natural sound in some acoustic situations.

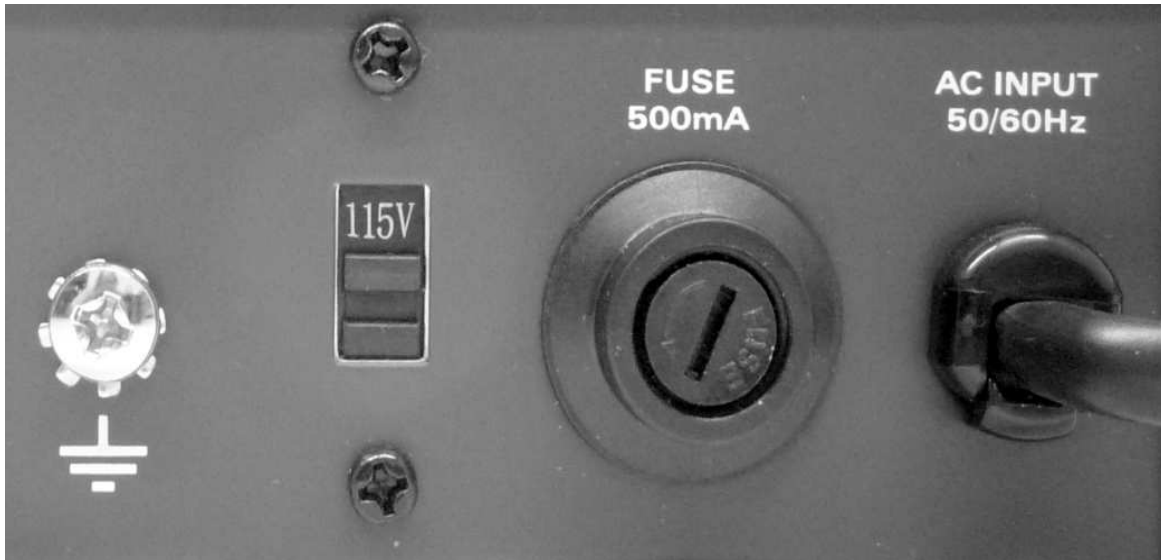
## **LEVEL CONTROL**

This controls the output signal level from the equalizer. Turn this control down if the CLIP LED illuminates steadily (meaning too strong an input signal). Unity gain can be set by adjusting this knob so that as you toggle the BYPASS switch the overall level sounds the same.

Signal levels should be kept normalized through the equalizer. That is, the signal level, when bypassed, should be the same (or a little lower) than when active.



## REAR PANEL CONNECTORS & CONTROLS



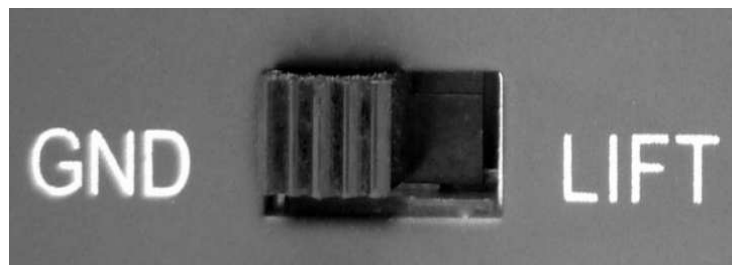
### POWER CORD

This cord is used to connect the AC power source to your equalizer. **CAUTION:** Equipment for USA installation includes a power cord with a three-pin polarized plug. **DO NOT REMOVE THE CENTER GROUNDING PIN.**

### FUSE HOLDER, LINE VOLTAGE SWITCH & GROUNDING SCREW

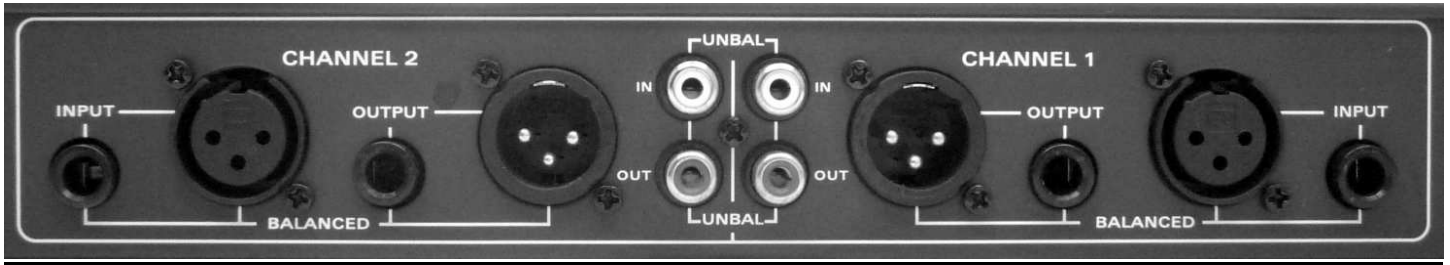
This fuse holder contains the AC primary fuse. This fuse should be replaced with the same type fuse if it is blown. If they continuously blow, stop replacing fuses and refer servicing to qualified personnel. **CAUTION:** After checking the AC supply voltage, be sure that the correct fuse is in the fuse holder - 0.5Amp (500mA) for 95-125VAC, as well as for 220-240VAC. When changing the fuse, make sure that the holder is seated securely. The position of the line voltage switch determines the line voltage range and is labeled on the switch

### GROUND LIFT SWITCH

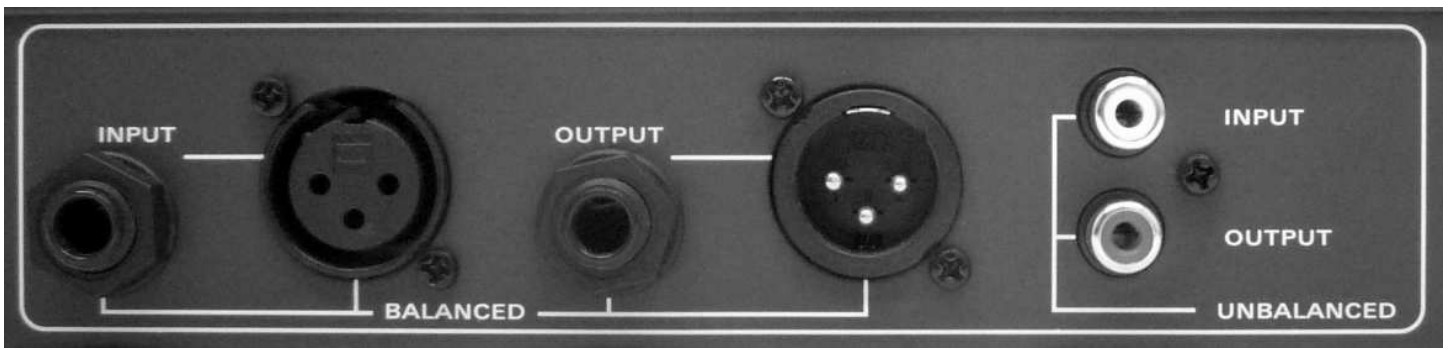


This switch is used to disconnect signal ground from the mains and chassis earth ground. You may set the switch to the LIFT position if "Hum", caused by a ground loop, can be heard at the speakers.

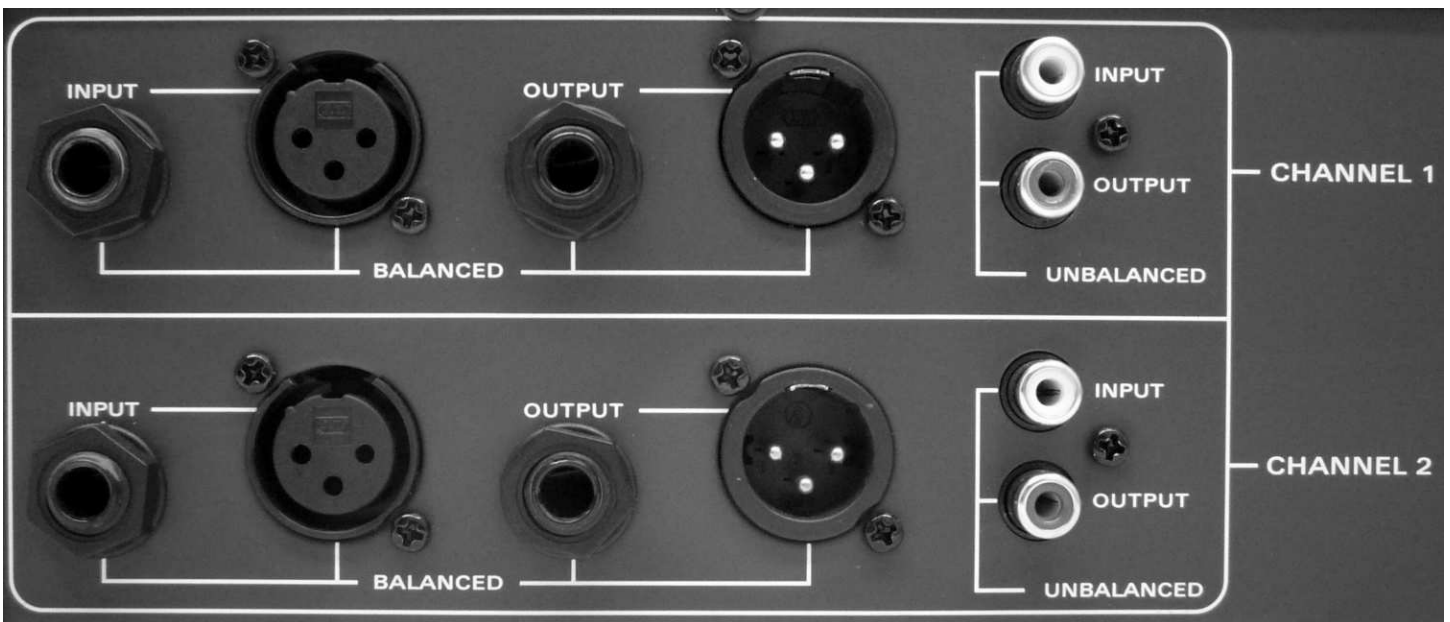
# INPUT/OUTPUT CONNECTORS



**EQ341**



**EQ351**



**EQ355**

## 1/4" TRS Phone Jacks

The TRS (Tip Ring Sleeve) connectors are balanced and wired as Tip = High (+), Ring = Low (-), and Sleeve = Ground.

For **balanced** connections using 1/4" TRS phone plugs, wire them as follows:

tip	=	High (+)
ring	=	Low (-)
sleeve	=	Ground

For **unbalanced** connections using 1/4" TRS or mono (tip/sleeve) phone plugs, wire them as follows:

tip	=	High (+)
ring	=	no connection
sleeve	=	Ground

## XLR Connectors

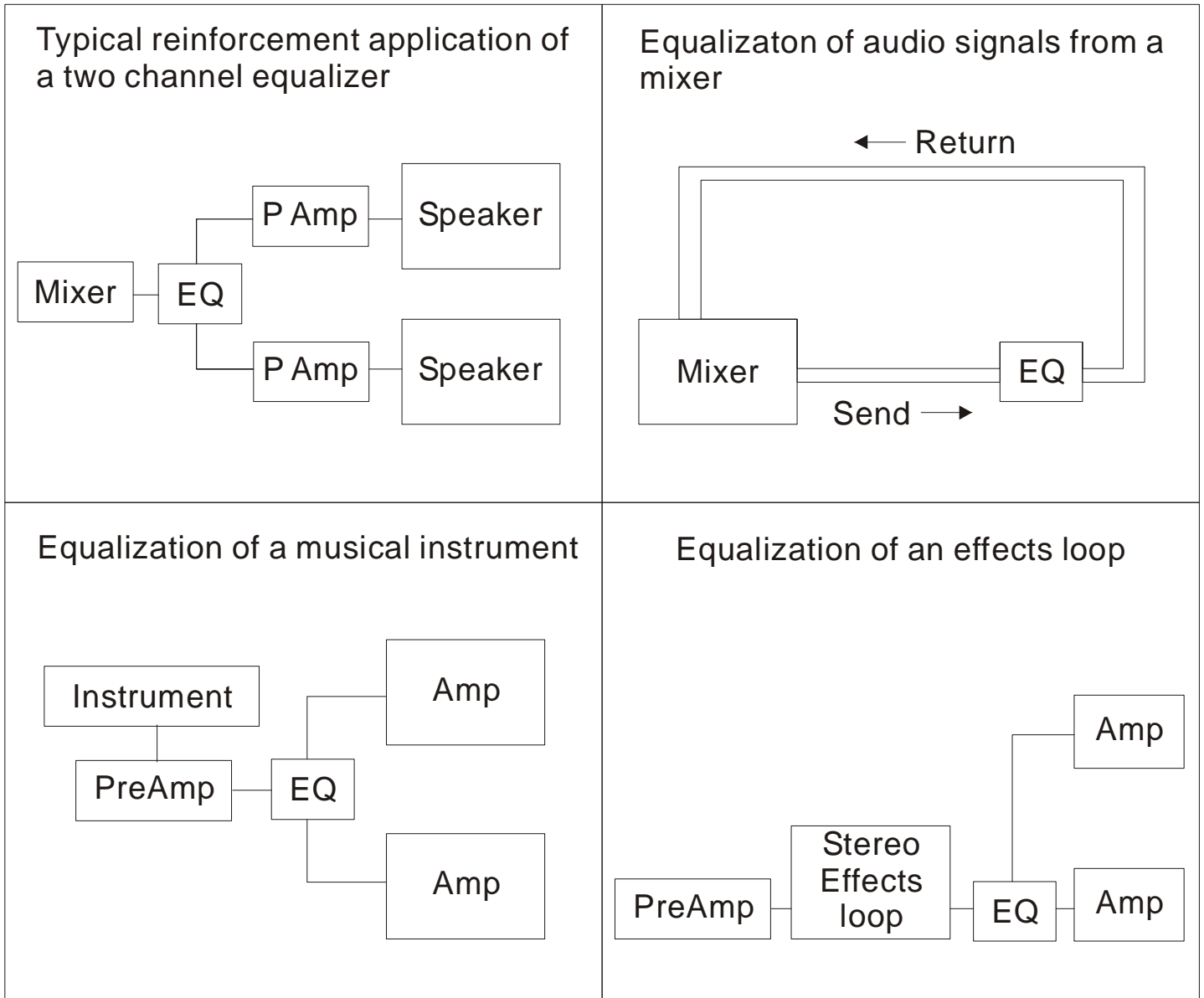
The XLR input connectors are balanced and wired as Pin 2 = High (+), Pin 3 = Low (-), and Pin 1 = Ground.

## RCA Jacks

The RCA jacks are unbalanced, with the pin High (+) and the outside Low (-).

# APPLICATIONS

Graphic equalizers may be used wherever modification of the frequency contour of a sound system is needed. A graphic equalizer is a solution to any number of sound problems or creative urges.



## WARRANTY INFORMATION

### Limited Warranty

Applied Research and Technology will provide warranty and service for this unit in accordance with the following warrants:

Applied Research and Technology, (ART) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of three years from the date of purchase. Applied Research and Technology will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

### Exclusions

**This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.**

ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may have other rights, which vary from state to state.

For units purchased outside the United States, an authorized distributor of Applied Research and Technology will provide service.

## SERVICE

The following information is provided in the unlikely event that your unit requires service.

1. Be sure that the unit is the cause of the problem. Check to make sure that the unit has power supplied, that all cables are connected correctly, and that the cables themselves are in working condition. You may want to consult with your dealer for assistance in troubleshooting or testing your particular configuration.
2. If you believe that the ART unit is at fault, go to [www.artproaudio.com](http://www.artproaudio.com). You may contact Customer Service for more assistance, or directly request a Return Authorization for service in the “resources” area of the website.
3. If you are returning the unit for service, pack the unit in its original carton or a reasonable substitute. The original packaging may not be suitable as a shipping carton, so consider putting the packaged unit in another box for shipping. Print the RA number clearly on the outside of the shipping box. Print your return shipping address on the outside of the box.
4. Include with your unit: a note with the RA number and your contact information, including a return shipping address (we cannot ship to a P.O. box) and a daytime phone number, and a description of the problem, preferably attached to the top of the unit. Also include a copy of your purchase receipt.

Fill in the following information for your reference:

Date of purchase \_\_\_\_\_  
Purchased from \_\_\_\_\_  
Serial number \_\_\_\_\_

# SPECIFICATIONS

## EQUALIZER

Bands	2 x 15, 2/3 octave, ISO spacing (EQ341) 1 x 31, 1/3 octave, ISO spacing (EQ351) 2 x 31, 1/3 octave, ISO spacing (EQ355)
Type / Accuracy	Constant-Q / 3% center frequency
Travel	20mm w/ positive center detent
Range	±6dB or ±12dB, selectable
Overall Gain Range	Off to +6dB (unbalanced out) sliders centered Off to +12dB (balanced out) sliders centered

## INPUTS

Type	Active balanced/unbalanced
Connectors	3-Pin XLR, 1/4" TRS (balanced), RCA (unbalanced)
Impedance	20k Ohms balanced; 15k Ohms unbalanced
Maximum Level	+22dBm (level control at center)

## OUTPUTS

Type	Active balanced/unbalanced
Connectors	3-Pin XLR, 1/4" TRS (balanced), RCA (unbalanced)
Impedance	<150 Ohms, typical
Maximum Level	+18dBm (balanced) (600 Ohm load) +22dBm (unbalanced) (2k Ohm load)
Passive Bypass Switches	Yes
Overload LED Threshold	6 dB below clipping, (all filters set to flat)
High Pass Filter (EQ351,EQ355)	10-250Hz, 12dB/octave
Low Pass Filter (EQ351, EQ355)	3k-40kHz, 12dB/octave
Frequency Response	20-20kHz, ±0.5dB
THD + Noise	.01%
Signal to Noise Ratio	-94dB
Channel Separation	>50dB

<b>POWER (switchable)</b>	95-130VAC, 50/60Hz 190-250VAC, 50Hz
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<b>POWER CONSUMPTION</b>	12 Watts
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<b>SIZE</b>	1.75" H *19" W *7" D (1U) (EQ351 and EQ341) (4.45cm * 48.3cm * 17.8cm) 3.5" H *19" W *7" D (2U) (EQ355) (8.9cm * 48.3cm * 17.8cm)
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<b>WEIGHT</b>	7.1 lbs (3.2 kg) (EQ351 and EQ341) 11.6 lbs (5.2 kg) (EQ355)
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**[www.artproaudio.com](http://www.artproaudio.com)**  
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**EQ341, EQ351, EQ355**  
V1.0