AEA RPQ503

500 SERIES RIBBON PREAMP WITH EQ

OWNER'S MANUAL

WELCOME

Congratulations on your purchase of the AEA RPQ503 microphone preamplifier, AEA's third iteration of our low noise, ultra-high gain and impedance architecture. Inspired by its older sibling the RPQ3, the RPQ503 brings the same trusted blueprint to the 500 Series format.

At AEA, we put the same thought and care into our preamps as we put into the development of our microphones: sonic quality comes first.

Since 2006, AEA's preamps have surpassed the limitations of 20th century electronics, allowing you to fully appreciate the sonic complexities of your microphone. The RPQ503 leans on the side of neutral but is unlike other "clean" preamps because of its rich and musical tonality. It offers up to 85 dB of effortless gain for any microphone, as well as an expanded EQ section that allows you to finely tune your signal.

Your RPQ503 is 100 percent handcrafted in Pasadena, California. AEA is a family-owned company with a small crew of skilled technicians, many of whom are musicians themselves. Proudly independent, we still manufacture all our ribbon microphones, preamps, and other pro audio gear by hand, in-house, from locally sourced parts.

We hope the RPQ503 helps capture many magical musical performances. Read this manual thoroughly to make sure you get the best sound and longevity from your new preamp. We invite you to become part of the AEA community by sharing your experiences with the RPQ503 via email, phone, or our social media channels.

The AEA Team

CONTENTS

WHAT'S IN THE BOX

ALONG WITH YOUR RPQ503 YOU SHOULD FIND:

Two #4-40 Phillips Flat Head Screws

This Manual

WARRANTY

Your RPQ503 comes with a one year limited warranty on parts and labor*. **Registering your product within 90 days will extend the warranty to three (3) years.** Scan the QR code or visit our website to register.

*AEA is not responsible for shipping costs.

INTRODUCTION

Based on the circuit design of our celebrated RPQ3, the RPQ503 features a powerful combination of ultra-low noise, low-distortion op-amps, ultra-high 68 kΩ input impedance, and 85 dB of clean gain, all packaged in a compact 500 Series format. The RPQ503 also includes an expanded EQ section with boost and cut controls for both low and high end as well as a new low-end frequency sweep to identify and eliminate rumbles and resonances.

The RPQ503 was designed to work great on passive ribbon microphones, however, when a preamp works well with a passive ribbon microphone, it will excel on every microphone. At once open, transparent, and musical, the RPQ503 is a versatile tool for the front end of any signal path.

As with all AEA electronics, the circuit in the RPQ503 was designed by Fred Forssell.

SUPPORT

If you should encounter any problems with your RPQ503 or have questions regarding specific applications, please contact our customer support team at support@ribbonmics.com for the quickest response.

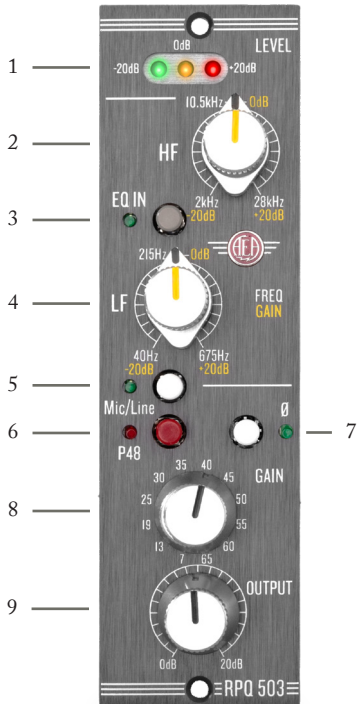
To contact us by phone, please call +1 626-798-9128 from 9:00 a.m.- 5:00 p.m. PST Monday-Friday.

AEA's repair center is located at:

1029 N. Allen Ave, Pasadena, CA 91104, U.S.A.

GENERAL GUIDELINES

FRONT PANEL GUIDE



1) Audio Signal Level Indicators:

Green LED - On at -20 dBu to indicate the presence of signal
Yellow LED - On at 0dBu
Red LED - On at +20dBu to warn of approaching signal overload

2) High Frequency Curve Gain and Filter Control: Dual-concentric potentiometer controls Curve Gain and Filter Frequency.

Black Knob (Frequency) - Continuously variable control adjusts the +3 dB break-frequency (as measured at full boost; +20 dB on the HF Gain) from 2 kHz to 28 kHz.
Yellow Knob (Gain) - Continuously variable control adjusts the HF gain from -20 dB to +20 dB; the slope of the CurveShaper™ EQ varies as Curve Frequency and Curve Gain settings interact.

3) EQ IN Switch: OUT bypasses the EQ circuitry; IN engages the EQ circuitry. The green LED will indicate when the EQ is engaged.

4) Low Frequency Curve Gain and Filter Control: Dual-concentric potentiometer controls Curve Gain and Filter Frequency.

Black Knob (Frequency) - Continuously variable control adjusts the -3 dB break-frequency (as measured at full cut; -20 dB on the LF Gain) of the filter from 40 Hz to 675 Hz; max LF reduction is -20 dB.
Yellow Knob (Gain) - Continuously variable control adjusts the LF gain from -20 dB to +20 dB; the slope of the CurveShaper™ EQ varies as Curve Frequency and Curve Gain settings interact.

5) Mic/Line Switch: OUT is Mic Input mode; IN is Line Input mode which bypasses the mic preamp stage to accomodate line-level signals. The green LED near the switch will indicate when the Line Input mode is engaged.

6) Phantom Power (P48) Switch: OUT is off; IN applies full-spec P48 phantom power to the input. The red LED near the switch will indicate when P48 phantom power is engaged.

7) Polarity Invert Switch: OUT is normal; IN is inverted. The green LED near the switch will indicate when the Polarity Invert mode is engaged.

8) Mic Gain Rotary Switch: This twelve-position switch selects from +7 dB to +65 dB of preamplifier gain.

9) Output Level Control: This continuously variable control provides up to +20 dB additional output gain following the optional CurveShaper™ EQ circuitry. Fully counter-clockwise -- 0 dB -- indicates unity.

To maintain the best performance from your new AEA RPQ503, take note of these three requirements:

1) Before powering up the unit, make sure the preamp is properly secured and seated in the slot. Two flat head Phillips screws are supplied with each preamp.

2) Never place the rack or preamp close to electromagnetic fields or hot surfaces. Electromagnetic fields created by power transformers, motors, or RF transmitters can potentially damage or interfere with the preamp functionality.

3) Before turning on the power, all connections to the preamp should be made and the Mic Gain and Output Level control set at their minimum setting. Be sure to examine the signal chain before powering up the preamp to ensure sudden loud noises are not emitted which could damage your system or hearing.

THE RPQ503 IN USE

INPUT AND OUTPUT CONNECTIONS

Input Connection
When the RPQ503 is operated with a passive ribbon, moving-coil dynamic, tube, and any other microphone that does not use phantom power, it is recommended that the P48 switch (ref. #4) be set to the OUT position before any input is connected, to prevent loud pops when plugged in. The P48 LED will be lit in red when phantom power is engaged.

Cable Care
To prevent possibly damaging the equipment in your system and to ensure consistent performance, we recommend you regularly test your microphone cables to determine whether they have any open, shorted, reversed, or intermittent connections.

Output Connection
The output of the RPQ503 emulates a transformer-coupled output and can be used as either a balanced or unbalanced signal (depending on how your cable/system is configured). When balanced, the maximum output level is +28 dBu; when unbalanced, the maximum level is +22 dBu. (These are as measured into a 600 Ohm load; the recommended load is > 10K Ohms; 0 dBu = 0.7746 V rms.)

When unbalancing the XLR output, pin-3 must be tied to ground at the receiving end (i.e. the input of the following device) Use a balanced cable to the unbalanced load. Do not tie pin-3 to ground directly at the output of the RPQ503.

Input Impedance
Passive ribbon microphones and numerous moving coil dynamic microphones are very particular about how they interact with preamps and their respective impedances play an important part in this. Since passive ribbon microphones and some dynamic microphones generally have a very high impedance, they are sensitive to what is referred to as “loading.”

(Continued)
The lower impedance a mic must drive, the harder the mic has to work. If the input impedance of a preamp is too close to the impedance of the microphone, it may exhibit increased distortion, decreased headroom, poor transient response, and reduced overall frequency range.

There are no negative consequences to using high input impedance preamps. The ultra-high gain JFET circuit has two input impedances: 11.3 kΩ with phantom power "ON" and 68 kΩ with phantom power "OFF."

The 68 kΩ brings out the best in passive ribbons and tube mics, and also provides a unique balanced input for vintage, high impedance dynamic mics. This versatility ensures the highest sensitivity, bandwidth, transient response, and clarity possible for a wide variety of microphones.

SETTING THE GAIN

The RPQ503's minimalist JFET circuit design delivers up to 85 dB of clean, quiet gain. With extended bandwidth from below 10 Hz to beyond 200 kHz, it delivers effortless dynamic range and transient response that complements all microphones.

As with any piece of audio equipment, setting and maintaining proper signal levels is critical to obtaining optimum performance. If the level is set too low, noise performance is sacrificed; if the level is too high, there's a risk of overload distortion.

Setting the AEA RPQ503 gain begins by setting the first stage GAIN and second stage OUTPUT knobs fully counterclockwise. The first stage GAIN control has 12 precision steps from +7 dB to +65 dB. The second stage OUTPUT potentiometer knob when all the way down (counterclockwise) adds no gain, and all the way up adds +20 dB. The three LEDs: green, yellow and red (ref. #1) snap on at -20, 0, and +20 dBu to indicate signal activity.

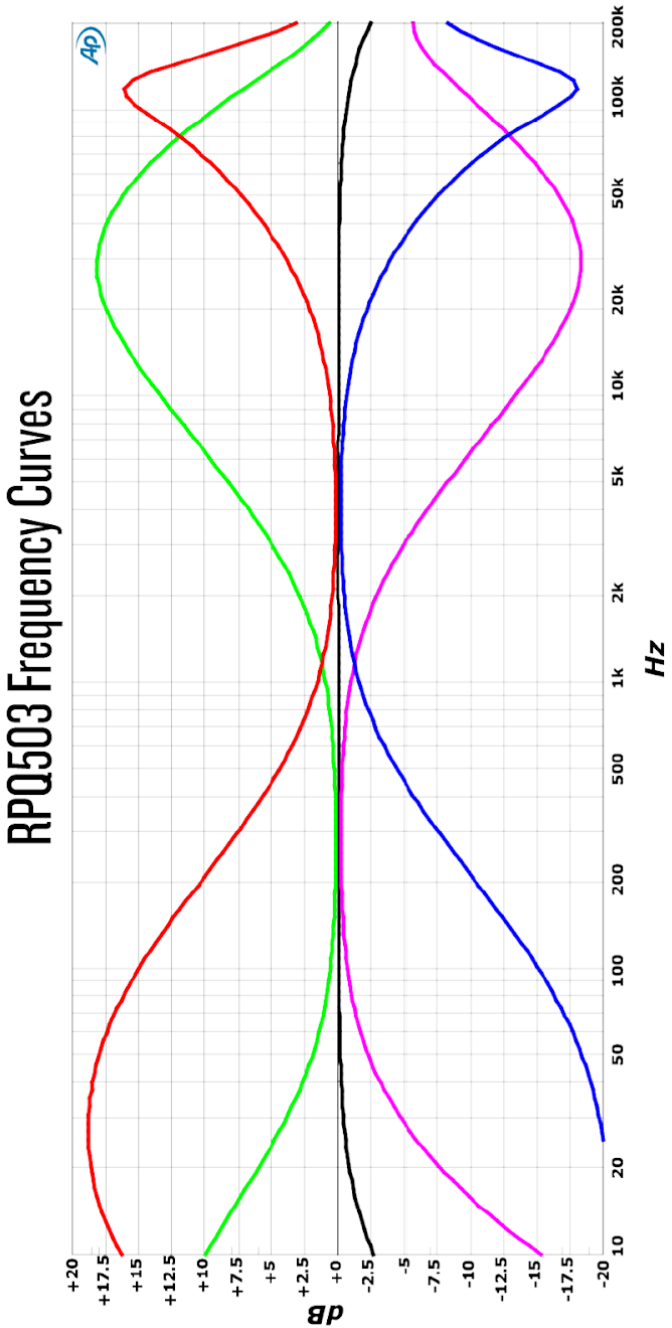
SETTING THE GAIN (CONTINUED)

First Stage GAIN Control Adjustment
Connect the microphone and then, if needed, turn on phantom power. Have the performer(s) play a louder section and click up the GAIN (ref. #8) until the yellow LED usually lights and the red LED rarely lights.

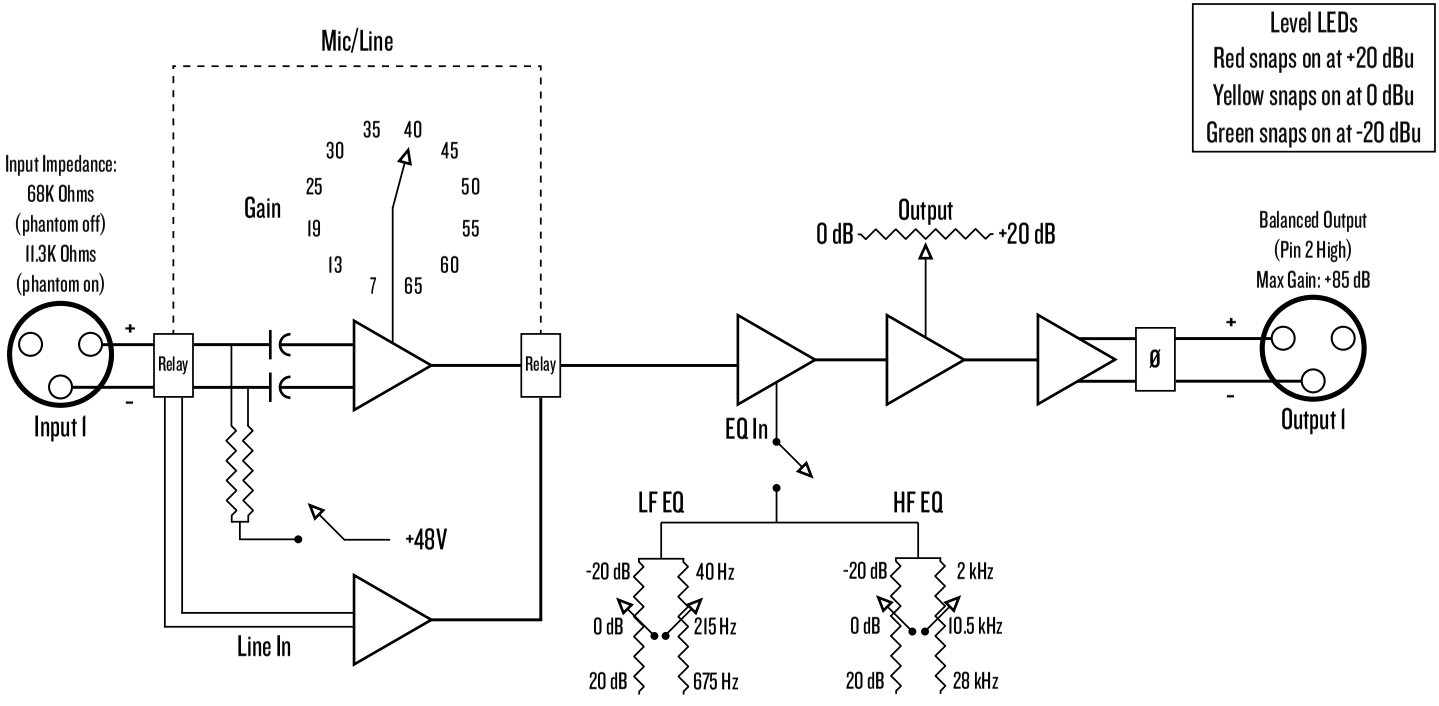
Second Stage OUTPUT Gain Trim
The OUTPUT Control (ref. #9) potentiometer adjusts gain from 0 dB (unity gain) at the bottom to +20 dB gain when fully turned up. Like the 12-step GAIN control, the 0 dB and +20 dB OUTPUT positions are accurate and repeatable. Approximate OUTPUT gain at 9, 12, and 3 o'clock are +3 dB, +7 dB, and +17 dB. The red LED lights 7 dB before clipping with a balanced load, so listen carefully to see how it sounds when the red LED lights up more often.

We highly recommend familiarizing yourself with the maximum input level of the piece of equipment that follows the RPQ503 in your signal chain. Thus, the Red (+20dBu) Indicator may signify to you that you're approaching the input limit to your converter, or that you have *surpassed* the input limit of your converter. The same goes for all outboard gear.

FREQUENCY RESPONSE

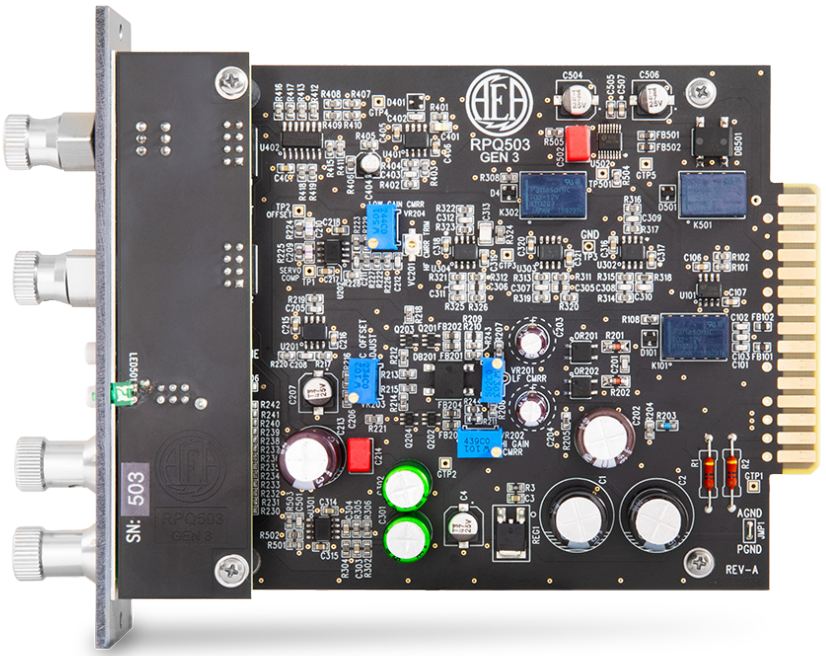


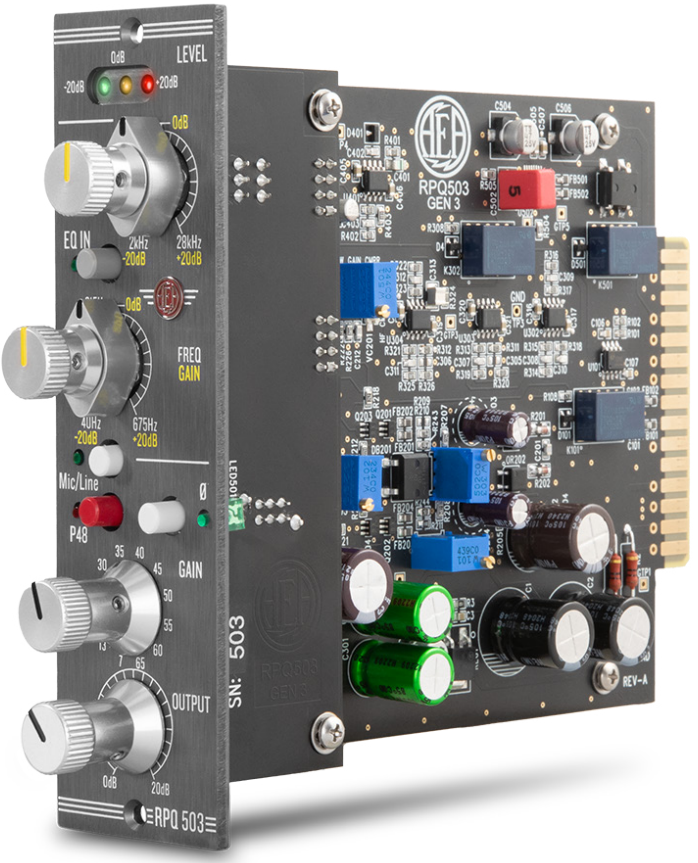
AEA RPQ503
Block Diagram



SPECIFICATIONS

Max Gain at 1kHz:	85 dB
EIN (Max Gain 22 Hz to 22 kHz):	-130 dBu (typical), 40 Ω source unweighted -128 dBu (typical), 150 Ω source unweighted
Frequency Response:	30 dB gain: (-0.6 dB 10 Hz, -3 dB 160 kHz) 85 dB gain: (-3 dB 10 Hz and 160 kHz)
THD+N:	0.0018% (1 kHz, 22 Hz-22 kHz @30 dB Gain +4 dBu output)
XLR Output Maximum Level:	+27 dBu into 600 Ω load
Input Impedance:	68 kΩ
Input Impedance (P48 Engaged):	11.3 kΩ
Output Impedance:	50 Ω
Max Input Signal Level	+20 dBu (minimum gain)
Mic Gain Control:	12-position switch from +7 dB to +65 dB
Output Trim:	Continuously variable from 0 dB to +20 dB
EQ Circuitry:	First order shelving response - 20 dB max boost/cut - Low frequency sweep continuously variable 40 Hz to 675 Hz - High frequency sweep continuously variable 2 kHz to 28 kHz
Input and Output XLR Polarity:	Pin 2 high
LED Signal Level Indicators:	Green LED = -20 dBu; Yellow LED = 0 dBu; Red LED = +20 dBu (clipping +27 dBu)
Dimensions:	0.125" anodized aluminum front panel measured with knobs and switches: 1.5"W, 6.8"D, 5.2"H (3.8cm x 17.27cm x 13.34cm)
Weight	12 oz (~0.338 kg)


RPQ503
GEN 3
SN: 503
REV-A


LEVEL
0dB
-20dB
+20dB
EQ IN
2kHz
-20dB
28kHz
+20dB
FREQ
GAIN
4UHz
-20dB
675Hz
+20dB
Mic/Line
P48
Ø
GAIN
OUTPUT
SN: 503
RPQ 503
RPQ503
GEN 3
REV-A

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In compliance with the following requirements: RoHS2 Directive: 2011/65/EU