

# AEA TRP500

## OWNER'S MANUAL



500 SERIES MICROPHONE PREAMPLIFIER

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# WELCOME

Congratulations on your purchase of the AEA TRP500 microphone preamplifier, AEA's third iteration of our low noise, ultra-high gain and impedance architecture. 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.

In the past 16 years, AEA's preamps have surpassed the limitations of 20th century electronics, allowing you to fully appreciate the sonic complexities of your microphone. The TRP500 leans on the side of neutral but is unlike other "clean" preamps because of its rich and musical tonality. It offers up to 85dB of effortless gain for any microphone and sonics that invite hearts to listen deeper.

Your TRP500 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 and preamps by hand, in-house, from locally sourced parts.

We hope the TRP500 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 TRP500 via email, phone, or our social media channels.

*Wes Dooley*  
*President of AEA*

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# INTRODUCTION

Based on the circuit and topology of our original AEA TRP preamp, the TRP500 has the low noise, musical sonics, and ultra-high gain and impedance (100,000 Ohms) that AEA is renowned for. The TRP500 excels at drawing out the warmth and lush sound of ribbon mics as well as other top-level microphones. With up to 85 dB of quiet DC-coupled gain, minimal path architecture, and a gentle 115 Hz or 230 Hz high pass filter, this preamp puts as little as possible between you and your audience.

## WARRANTY

Your TRP500 comes with a one-year limited warranty on parts and labor, shipping not included. **Registering your product with AEA will extend the warranty to a full three years.**

Scan the QR code to register.



## SUPPORT

If you should encounter any problems with your TRP500 preamp or have questions regarding specific applications, please contact our customer support team at [support@ribbonmics.com](mailto:support@ribbonmics.com) for the quickest response.

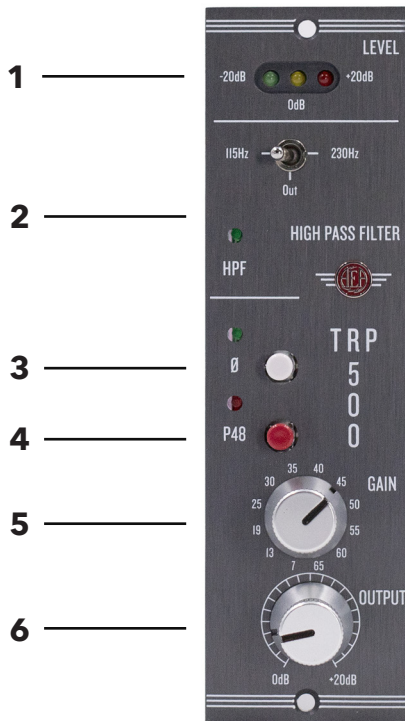
To contact us by phone, please call +1-800-798-9127 from 9:00 a.m.- 5:00 p.m. PST Monday-Friday. AEA's repair center is located at 1029 N. Allen Ave, Pasadena, CA 91104, U.S.A.

# GENERAL GUIDELINES

To maintain the best performance from your new AEA TRP500 preamp, 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 flathead 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.

## FRONT PANEL GUIDE



# FRONT PANEL GUIDE

## **1 - Audio Signal Level Indicators:**

The green LED snaps on at -20 dBu to indicate the presence of signal.

The yellow LED snaps on at 0 dBu.

The red LED snaps on at +20 dBu to warn of approaching signal overload.

## **2 - High Pass Filter (HPF):**

3-position switch provides a gentle 6 dB per octave with choice of -3 dB points at 115 Hz or 230 Hz.

## **3 - Polarity Invert Switch:**

OUT is normal; IN is inverted.

The green LED near the switch indicates inverted polarity.

## **4 - Phantom Power (P48) Switch:**

OUT is off and increases the preamp's input impedance to 100,000 Ohms.

IN ramps up full-spec P48 phantom power to the input, which reduces the input impedance to 11,900 Ohms.

The red LED near the switch indicates when P48 phantom power is engaged.

## **5 - Mic Gain Rotary Switch:**

12-position precision switch adjusts gain from +7 dB to +65 dB.

## **6 - Output Stage Gain Control:**

A potentiometer varies gain from 0 dB to +20 dB.

Full Counterclockwise = 0 dB (unity) gain.

Full Clockwise = +20 dB gain.

9 o'clock is ~+3 dB, 12 o'clock is ~+7 dB, 3 o'clock is ~+17 dB.

# INPUT & OUTPUT CONNECTIONS

## ***Input Connection***

When the TRP500 is operated with 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 TRP500 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 TRP500.

## ***Input Impedance***

The ultra-high gain DC-coupled JFET circuit has two input impedances: 11,900 Ohms with phantom power "ON" and 100,000 Ohms with phantom power "OFF." The 100,000 Ohm mode 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.

## ***Should the microphone source impedance be the same as its load impedance?***

This is a telephone technique from before tubes were invented. Matching the impedance of a telephone's microphone with the load maximized the listener's volume at the other end of the line. But now it just increases distortion, decreases headroom, and degrades transient and frequency response. When a mic's output impedance matches the preamp's input impedance, 6 dB of level is lost. The noise floor goes up 6 dB and the preamp will need 6 dB more gain.

The high-impedance design of the TRP500 results in no loss of level or signal quality due to impedance mismatching.

## **SETTING THE GAIN**

The TRP500'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. Its DC-coupled circuit extends the low frequency response and speeds recovery to linear operation after overloads.

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 TRP500 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.



### ***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.#5) until the yellow LED usually lights and the red LED rarely lights. The control uses ultra-low noise and high precision resistors with gold-plated 12-position switches made in the USA. We've used them for 37 years without a failure.

### ***Second Stage OUTPUT Gain Trim***

The OUTPUT Control (ref. #6) 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. To reset to an in-between position, mark it during the session. Approximate OUTPUT gain at 9, 12, and 3 o'clock are +3 dB, +7 dB, and +17 dB. The red LED lights 8 dB before clipping with a balanced load, so listen carefully to see how it sounds when the red LED lights up more often.

During rehearsal, check the input level adjustment for your DAW, console, or audio recording device. If the red LED is illuminated too often or too long, reduce the Mic GAIN one step at a time until the red LED illuminates briefly on the loudest peaks. If the red LED occasionally flashes while recording, this does not necessarily mean that the preamp is clipping.

The energy and excitement generated during a performance guarantees it will be louder than the rehearsal. After setting the GAIN during sound-check, operators might want to reset the GAIN control one or two clicks lower for the actual performance. When needed, this GAIN decrease can be added back in by turning the OUTPUT knob up.

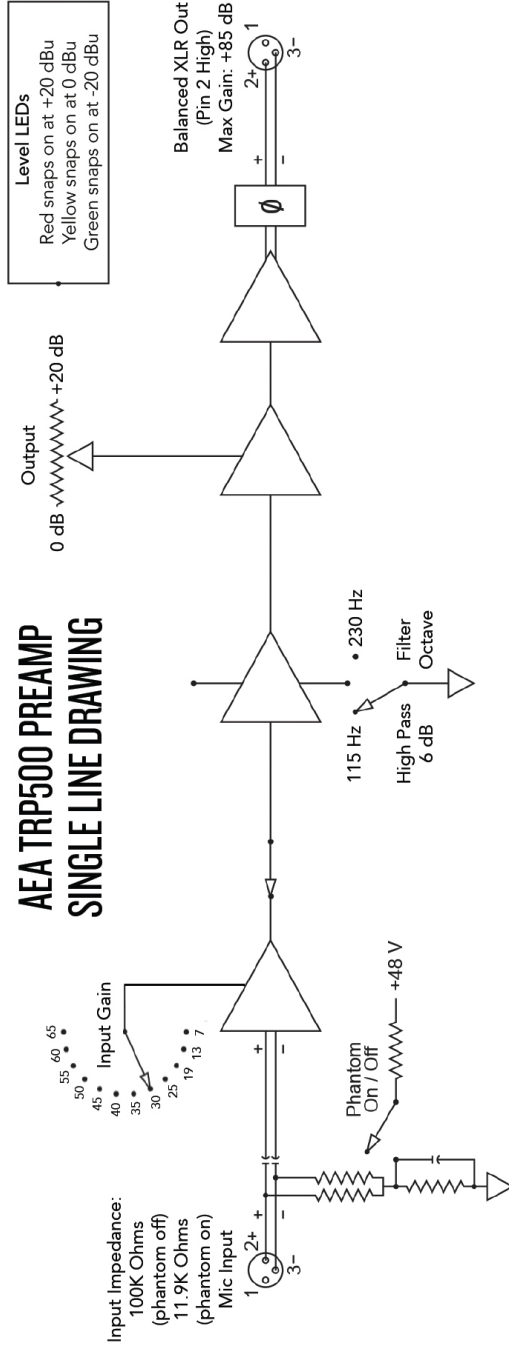
# SPECIFICATIONS

- Max Gain at 1kHz: 85 dB of gain, balanced-in to balanced-out
- EIN (Max gain): < -128 dBu (22 Hz to 22 KHz, unweighted, 40 Ohm source), typically -130 dBu
- DC Current Draw: from +16/-16V Rails: 130 mA
- Frequency Response: 30 dB gain: (+0/-0.6 dB from <10 Hz to 200kHz)  
85 dB gain: (+0/-1 dB <20 Hz to >100kHz)  
(+0/-2.5 dB <10 Hz to 200kHz)
- THD+N: 0.0017% (1kHz, 22Hz-22kHz @30 dB Gain  
+4 dBu output)
- XLR Output Max Level: +28.5 dBu into 600Ω load (before 1% THD)
- Input Impedance: 11.9kΩ (with Phantom), 100kΩ (no Phantom)
- Output Impedance: 50Ω
- Max Input Signal Level: 21.5 dBu at minimum gain (before 1% THD)
- Mic Gain Control: 12-position switch provides from +7dB to +65dB of gain for the preamplifier circuit, as measured between the input and output when the OUTPUT control is set fully counterclockwise (0 dB)
- Mic Output Trim: Output potentiometer provides from 0 dB (unity gain) to +20 dB of gain
- High Pass Filter Frequencies: 3-position on-off-on switch provides switchable first order passive high pass filter (-6 dB per octave) with cutoff frequencies (-3 dB) at 115 Hz and 230 Hz
- XLR Connector Polarity: Pin-1 is ground, pin-2 is high, pin-3 is low
- LED Signal Level Indicators: The green LED snaps on at -20 dBu to indicate the presence of signal; the yellow LED snaps on at 0 dBu; the red LED snaps on at +20 dBu to warn of approaching signal overload, which is 8 dB prior to clipping

## Dimensions:

- Front Panel: 0.125" (0.32 cm) anodized aluminum
- Width: 1.5" (3.81 cm)
- Depth: 6.8" (17.27 cm)
- Height: 5.2" (13.21 cm)
- Weight: 10.1 oz (~0.29 kg)

# AEA TRP500 PREAMP SINGLE LINE DRAWING





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