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AEA TRP

THE ORIGINAL 2-CHANNEL RIBBON PREAMP

{ OWNER'S MANUAL }

Revision 2, June 2016

{ WELCOME }

Congratulations on your purchase of the AEA TRP preamp and welcome to the AEA family. AEA takes sonic integrity seriously and has created preamps that have been specially designed to meet the particular challenges of ribbon mics and bring out their full potential. Building on the obstacles identified when designing preamps in the 50's, we now use tools like quiet JFETS and transformerless designs to construct super clean, high gain, high impedance preamps. Designed by Fred Forssell, the TRP boasts a FET discrete front end that provides 83 dB of gain – designed to be quiet as physically possible opening up new possibilities for engineers using low sensitivity microphones. By leaving out the phantom power blocking capacitors and by using an external power supply, we created a minimal-path circuitry that captures the pure tone of your passive ribbons all the way down to the lowest bass frequencies. Engineers have discovered that the TRP also complements their moving coil, tube and solid-state mics. By virtue of its sonic qualities and versatility, the AEA TRP is the tool of choice for all passive microphones whenever a true and pristine signal path is needed.

Your TRP is 100% handcrafted in Pasadena, CA. AEA is a family owned company with a small crew of skilled technicians – most of them being musicians themselves. Proudly independent, we still manufacture all our ribbon microphones and preamps by hand from locally sourced parts.

We hope that the TRP will help you capture many magical performances that touch the heart. Please read this manual thoroughly to make sure that you get the best sound and longevity from your new microphone. Become part of the AEA community by sharing your experiences with the TRP via e-mail, phone or our social media channels.

Wes Dooley
President of AEA

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INTRODUCTION

The TRP (The Ribbon Preamp) is a half-rack, two-channel, high gain and high impedance, minimal-path FET microphone preamp designed by Fred Forssell. The TRP's exceptionally high input impedance of 30,000 Ohms means the TRP will not load down a mic and change its sound while its JFET discrete front end provides all the dynamics, subwoofer bass, and fast transients that your microphones can deliver. It is a cost-effective, high-quality solution offering a pure and transparent signal path for all ribbon, tube, and moving coil microphones that do not need or do not want phantom power.

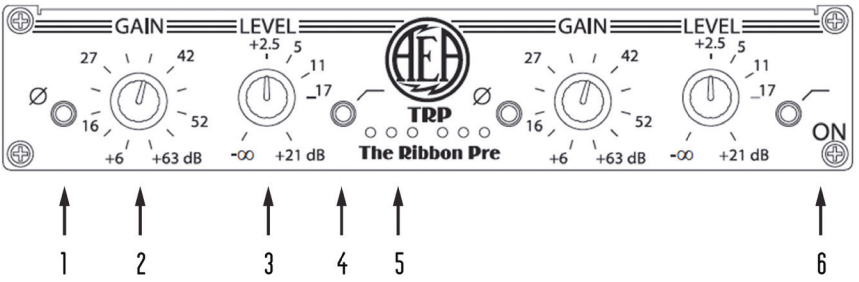
GENERAL GUIDELINES

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

1) Never place preamp on or in proximity 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. Make sure to keep your preamp away from these sources in addition to hot surfaces.

2) Before turning on the power, all connections to the preamp should be made, and the gain controls set at their minimum settings. Be sure to examine your 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



1. *Polarity Invert switch*:
   OUT is normal; IN is inverted.

2. *Input Gain rotary switch*:
   12 position Grayhill switch ranging from +6 to +63 dB.

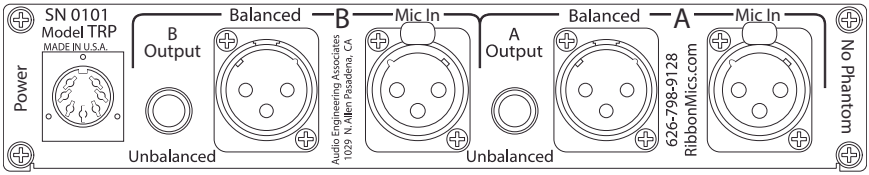
3. *Output Level control*:
   Additional 21 dB of gain.

4. *HPF In switch*:
   OUT is bypass; IN inserts 100 Hz, 12 dB per octave high pass filter.

5. *Three-LED level display:*
   Green and red LEDs snap on to full brightness at -5 and +20 levels respectively. The amber LED increases in brightness between 0 and +20.

6. AC Power On/Off indicator LED:
   OUT is off; when IN the unit is on and the indicator LED is illuminated.

INPUT & OUTPUT CONNECTIONS



Input Connections

The TRP rear panel supplies two Neutrik 3-pin XLR inputs. The 3-pin balanced input connectors are wired Pin-2 + or high, and Pin-3 – or low.

The input electronics are DC-coupled and zener diodes protect them from external P48 DC. The diodes will mute the inputs if external DC is present (which could happen if working with mic splits, for example). The absence of phantom power means that the traditional DC-blocking capacitors can be omitted.

Output Connections

The TRP rear panel supplies two Neutrik 3-pin XLR outputs and two ¼" unbalanced TRS outputs. The 3-pin balanced output connectors are wired Pin-2 + or high, and Pin-3 – or low. The balanced output stage drivers allow either Pin-3 or Pin-2 to be tied to Pin-1, with a reduction of headroom being the significant performance penalty. The unbalanced ¼" outputs can drive either balanced or unbalanced loads but provide roughly 6dB less output. All outputs will drive a 600 Ohm load, but normal bridging loads of 5,000 Ohms or more are recommended for maximum headroom. To preserve maximum headroom we recommend only using the XLR outputs to drive balanced, floating, or differential inputs.

The simultaneously balanced and TRS unbalanced outputs allow the TRP's signals to be sent to two devices at the same time without the need for additional splitting. For example, in a live recording situation, the balanced outputs could feed the live mixing console while the unbalanced TRS signal is sent to a recorder or DAW interface.

To prevent damaging the equipment in your system, it is a good idea to test your microphone cables regularly to determine whether they have any open, shorted, reversed, or intermittent connections.

Input Impedance

The TRP has a very high input impedance of 33,000 Ohms. The average preamp has an input impedance sitting around 1200 Ohms. Passive ribbon microphones and numerous 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.” The lower impedance a mic must drive, the harder it 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 less overall frequency response. There are no negative consequences of using high input impedance preamps.

{ SETTING THE GAIN }

Despite the small half-rack footprint, the TRP packs several key features that are critical for professional recording. The gain structure of the 2-channel (dual mono) preamp consists of an input gain control and an output level control. As with any piece of audio equipment, setting and maintaining proper signal levels are critical to obtaining optimum performance.

Designed by Fred Forssell to handle extreme dynamics, the TRP recovers instantaneously from unexpected “solid red” overloads. Each channel features a three-LED level display (ref #5). Green and red LEDs snap on to full brightness at -5 and +20 levels respectively. The amber LED increases in brightness between 0 and +20.

High precision resistors set the first stage gain to ensure exceptional gain accuracy. The match between channels is typically within 0.01 of 1dB.

Input Gain Control

The Input Gain (ref. #2) is set with a high-grade twelve position Grayhill switch providing +6 to +63dB of gain.

Best practice is to start with the Input Gain control (ref. #2) fully counterclockwise and the Level control (ref. #3) at 0dB. Then, with the microphone in position you cans increase the Input Gain until the red LED turns on when the sound source is at its loudest.

It should be noted that the energy and excitement generated during a performance guarantees that it will always be louder than the rehearsal. After determining the gain during the sound-check, it is a good idea to set the Input Gain control one or two clicks lower for the performance to allow a margin for headroom.

Output Level Control

The Output Level control (ref. #3) provides 21dB of additional gain. This variable output stage is controlled via a continuous pot that acts like a fader. The Output Level control not only allows for click-free gain adjustments while recording, it also facilitates the possibility of fade-outs.

Except for fade-outs, the Output Level control should not be used below its center position at 12 o'clock.

{ OTHER FEATURES }

The internal audio switching for polarity reversal and high-pass filters are handled by gold-contact Aeromat relays. These high-end components help keep the audio path short and simple for best sound.

High-Passs Filter

The TRP's high-pass filter (ref. #4) features a 12dB per octave slope from 100Hz. This HPF is intended to moderate proximity effect and reduce other unwanted low-frequency noise, such as air-conditioning rumble, traffic noise, "P-pops" and breath noise.

When directional microphones are moved closer on-axis to a sound source, they become more sensitive to low frequencies. This proximity effect, otherwise known as "bass tip-up," becomes more pronounced the closer a mic is to the sound source. With some large transducer microphones such as the RCA-44 BX, proximity effect begins at six feet and is extremely pronounced at a distance of one inch. However, sometimes such strong low frequency content can mask high frequency intelligibility. The TRP's high-pass filter helps diminish this low frequency energy.

Polarity

All inputs and outputs maintain proper polarity with each other and international standards. The 3 pin balanced mic input and line output connectors are wired Pin-2 + or high, and Pin-3 – or low. The unbalanced outputs have the tip as the high or + side, with the ring and barrel connected to the – or low side.

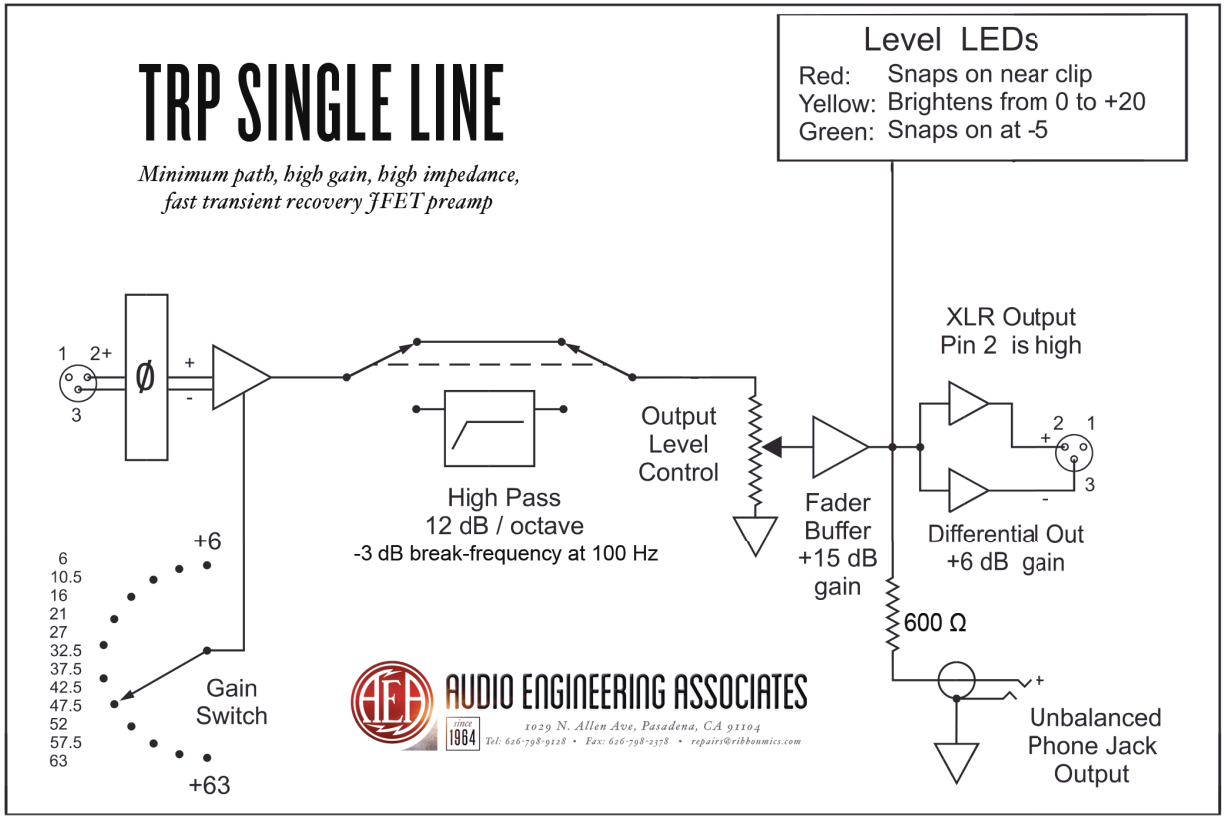
As noted before, to prevent damaging the equipment in your system, it is a good idea to test your microphone cables regularly to determine whether they have any reversed connections.

Power Supply

An external desktop power supply with a grounded AC plug is used with the TRP so hum fields can be kept away from the high-gain electronics.

The power supply uses a seven pin circular DIN connector for its output. It has one 18 volt AC secondary winding, which is used within the TRP to provide three regulated DC voltages. Bi-polar 18-volt rails are provided for the electronics and a +12 volt rail for the Aeromat relays.

The power supply transformer is not designed to be used outdoors or in a wet environment.



AEA TRP Single Line Diagram

SPECIFICATIONS

Gain at 1kHz:	83dB of gain at 1 kHz, balanced-in to balanced-out in Microphone Input Mode
Noise figure, rms A-weighted:	<0.5 dBu A-weighted
Noise figure, rms unweighted:	<3 dBu unweighted
EIN:	-130 dBu A-weighted, 150 Ohm resistive source
Frequency Response:	-3dB <6Hz and >300 kHz
THD:	0.005% at 1 kHz
Balanced Microphone Input Impedance:	>33K Ohms
Input Gain Control:	Twelve-position switch provides from +6 to +63dB of gain for the preamplifier circuit, as measured between the input and the before the output line driver.
Output Level Potentiometer:	21dB
High-Pass Filter:	12dB per octave from 100 Hz
Balanced XLR:	Balanced XLR +4 dBu, Pin-2 + or high, and Pin-3 – or low
Balanced XLR Output Maximum Level into 100 k load:	>+28 dBu
Unbalanced Outputs:	Tip + side, with the ring and barrel connected – side
Unbalanced TRS Output Maximum Level into 100 k load:	+22 dBu
LED Signal Level Indicators:	Green snaps on at -6 dBu, red snaps on at +23 dBu, and yellow varies in brightness with level from -3 dBu to +20 dBu.
Dimensions:	Half-rack wide, rack unit high (measured without knobs and switches): 8.5" w, 8.5 d, 1.5" h (36.7 cm x 36.7 cm x 4.3 cm
Weight:	2lbs oz (0.9 kg)
Power Supply Weight:	1.5 lbs (0.7 kg)
Power Supply Length:	12 feet (3.6 m)

WARRANTY

Your TRP comes with a one-year limited warranty on parts and labor, shipping not included. Please see the supplied warranty card for details.

Registering your preamp with AEA will extend the warranty to a full three years. Simply fill out the supplied registration form and send it to:

Audio Engineering Associates
1029 N. Allen Ave
Pasadena, CA 91104

You may also register your AEA equipment online at
http://www.ribbonmics.com/aea/form.php

SUPPORT

If you should encounter any problems with your preamp, or if you have questions regarding using the TRP in specific application, please contact our customer support team at *support@ribbonmics.com*

To talk to a live human being, call +1 (626) 798-9128, between 9:00 a.m.- 5:00 p.m. PT Monday through Friday.

There are a number or audio and video recordings of various AEA microphones online. Please visit www.ribbonmics.com.

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