

# AEA R88 SERIES

## OWNER'S MANUAL



FAR-FIELD STEREO RIBBON MIC

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# WELCOME

Congratulations on your purchase of an AEA R88 Series stereo ribbon microphone and welcome to the AEA family. There is no easier way to track natural stereo than by using a stereo mic. The natural sound stage and character of R88 Series' Blumlein imaging makes it a great microphone for producing an authentic representation of a performance in its environment. Known as the "set it and forget it mic," using an R88 is an excellent way to effortlessly capture the authentic and natural sound without the hassle of a multi-mic setup. From drum overheads and live concert recordings, to horn and strings sections, the R88's Blumlein system is convenient to use and delivers a phase-coherent, accurate transient response. With sense of depth, the R88 puts the listener right with the performers in the recording room.

Your R88 Series microphone 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 your microphone will capture many magical performances that touch the heart. This manual will help ensure that you get the best sound and longevity from your new microphone. Please become part of the AEA community by sharing your experiences via e-mail, phone or social media.

*Wes Dooley*  
*President of AEA*

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# INTRODUCTION

The R88 Series Microphones (the R88mk2 and the R88A) are blumlein ribbon microphones consisting of two matched bidirectional (or figure-of-8) ribbon transducers. The R88 Series microphones use the same Big Ribbon technology and tuning (16.5 Hz) as used in the classic R44. The passive R88mk2 uses the same 1:28 transformer used in all of AEA's passive mics, and the active R88A uses the same 1:110 transformer and electronics used in our active mics. With the great bass response and smooth top end AEA Big Ribbons are known for, the R88 Series delivers a solid sound stage without ever being harsh. The R88 operates with very low distortion over a huge dynamic and frequency range, with a capability of handling 141 dB SPL (R88A) or 165 dB SPL (R88mk2) at 1kHz. As a far-field stereo ribbon microphone, the R88 captures balanced sound from long distances. From 16 inches to 20 feet, the mic retains its full spectrum and incredible low end. (The R88A is visually distinguished by a red cable at its base)

## WARRANTY

Your R88 Scomes 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.**

Register your microphone at [AEARibbonmics.com/register-your-aea](https://www.aearibbonmics.com/register-your-aea).

## SUPPORT

If you should encounter any problems with your microphone or have questions regarding using your R88 series mic in specific application, please contact our customer support team at [support@ribbonmics.com](mailto:support@ribbonmics.com).

To talk to a live human being, call +1 (800) 798-9127, between 9:00 A.M.- 5:00 P.M. PT Monday through Friday. AEA's repair center is located at 1029 N. Allen Ave, Pasadena, CA 91104, U.S.A.

# GENERAL GUIDELINES

Your microphone is a valuable and important investment. Like any piece of recording equipment or musical instrument, it requires common sense and good basic care to keep it working properly. Given simple, basic care, your new microphone will perform admirably for decades.

## PHANTOM POWER

### **R88 Passive Microphone**

Phantom power is not required or recommended for the passive R88. We recommend avoiding the use of phantom power with your R88 as a general rule. With a correctly wired cable and a properly working phantom power supply, there is actually little danger of damaging an R88 microphone with phantom power. However, passive ribbons such as the R88 will get hurt if ground Pin 1 is accidentally shorted, mis-wired, or hot patched in a patch bay to Pin 2 or 3. Using phantom power with a faulty or mis-wired cable or a defective supply can severely stretch or break a ribbon.

Since passive ribbon microphones or other transformer-coupled microphones are particularly sensitive to phantom-power, it is recommended to make disengaging phantom-power before plugging and unplugging a habit.

### **R88A Phantom-Powered Microphone**

The phantom current draw for active AEA ribbon mics is 7 milliamps. IEC specifies P48 power which should be able to deliver 10 milliamps per input. Some USB and battery-powered audio interfaces will not deliver this. Please check the current values available on your unit to ensure the best performance.

Although the R88A needs a phantom power source to operate, ensure that phantom power is turned off before plugging and unplugging the microphone or when patching. The loud pops that occur when the microphone is plugged in with phantom power engaged can damage speakers, headphones, and ears.

## MICROPHONE STORAGE

**Keep the microphone covered when it is not in use.** This prevents potential damage to the ribbon from a strong gust of air. Place the supplied protective slip cover over the microphone when it is not in use. For long term storage, place the microphone in its protective case. Minute iron particles, sometimes known as “tramp iron,” are common within our environment. AEA ribbon microphones contain powerful magnets that produce strong magnetic fields. These fields can attract any ferric metal near the microphone that, if they are small enough, can penetrate the outer screening and work their way inside the microphone. Over time, this “tramp iron” can build up sufficiently in the magnetic gap to rub against the ribbon causing distortion, electrical shorts or tearing of the ribbon.

## AIR TURBULENCE

**Never expose the microphone to strong air turbulence.** Ribbon microphones can withstand very high SPL (Sound Pressure Level) without difficulty, but can be damaged easily by a sudden, strong gust of air or high levels of very low frequency sound waves (like from a kick drum or bass cabinet). This can stretch the ribbon, causing the microphone to start sounding flabby.

To avoid possible damage, follow this simple procedure when positioning the microphone called “The Hand Test”: put the back of your hand where the mic will be; if you can feel the motion of air on your hand, place a pop-filter between the microphone and the source of the wind gusts or simply pull the mic further back. When recording kick drums or bass guitar cabinets, angle the microphone to make sure that no wind blasts hit the microphone directly on-axis from the front or back.

Never blow directly into any microphone to test it. Not only does this force moisture and dirt into the microphone, strong air movement also can stretch the ribbon and while it may not break, it nonetheless could significantly degrade the microphone’s performance. The ribbon in the R88 is protected by multi-layered screens and grille cloths to provide superior wind protection. Nonetheless, using it outdoors requires special care to avoid wind which can damage the ribbon.

## MAGNETIC STRAY FIELDS

Ribbon microphones are fundamentally prone to picking up strong external magnetic fields caused by light dimmers or nearby power transformers. Guitar players will know this phenomenon from single-coil pickups. Even though much attention was paid to suppressing such sensitivity to external magnetic fields in the design of your microphone, it is still possible that you might encounter this problem. If you should pick up a hum, try rotating or moving the microphone to find a spot where the hum disappears, and try eliminating potential sources of stray magnetic fields. You can use the microphone to find where hum is originating. Rotate the mic for maximum interference and move it back and forth to sense its direction.

The high-performance magnets used in AEA microphones are incredibly strong, and a significant amount of stray magnetic field lines surround the microphone. Avoid placing the microphone in close proximity to hard drives, credit cards, analog tape, or any other magnetically sensitive items to prevent any data loss.

## MICROPHONE POSITIONING

**Always use a sturdy microphone stand.** Mounting the microphone on a strong, sturdy microphone stand with a heavy base (or tripod) is essential. If you are using a boom, make sure that it is properly balanced and that the tripod legs are positioned appropriately to prevent tipping. The R88mk2 uses a weighted, integrated shock mount and is supplied with a swivel mount adapter which allows for easy positioning. Please ensure that the swivel mount is properly tightened during use.

## WHICH PREAMP SHOULD I USE?

In the case of the passive R88, the preamp is critical for optimum performance. Passive ribbon microphones generally have low output level and require preamps that supply a high level of gain. If the preamp you use doesn't have enough gain, the signal might seem too soft or noisy. We recommend using a high-input impedance preamp with gain at least +60dB or higher.

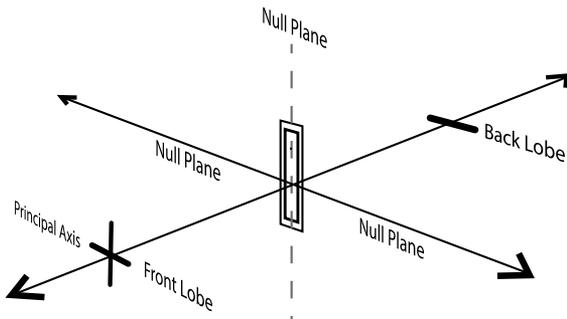
To guarantee consistent, full-range ribbon sound, we recommend AEA's RPO2, RPQ500 and TRP2 preamps, which were specially designed for ribbon microphones. On quiet sound sources or for distance recording, an AEA preamp is highly recommended.

# APPLICATIONS ADVICE

We actively encourage users to visit [AEAribbonmics.com](http://AEAribbonmics.com) to access our comprehensive collection of in-depth articles and tutorials featuring the R88 stereo microphone, along with a library of audio and video demonstrations of the R88 in action.

## A FIGURE-OF-8 MICROPHONE

Figure-of-8 microphones are constructed with positive polarity on the front and negative polarity on the back. Positive pressure on the front side of the ribbon produces a positive voltage on Pin-2, with respect to Pin-3 on the output connector. The R88 consists of two figure-of-8 transducers in a fixed Blumlein array.



## A BLUMLEIN MICROPHONE

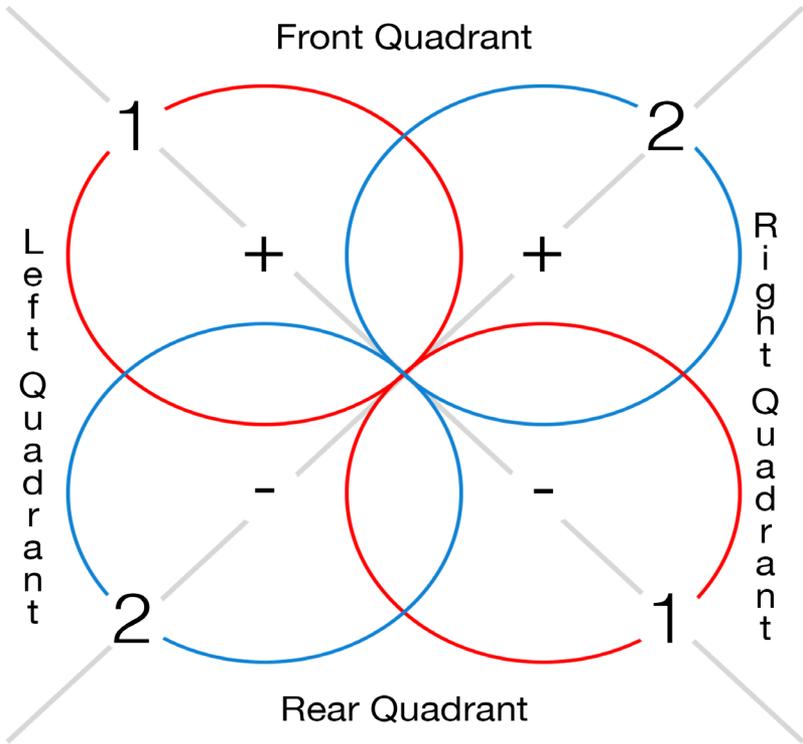
The stereo R88 is a coincident microphone system. Coincident mic techniques use two or more transducers placed closely together. Coincident systems have good time coherence between their channels which means that sounds from the same source all arrive at close to the same time. One advantage of phase coherence is that when channels are summed to mono, there is no comb-filtering effect.

Blumlein is a type of coincident array technique that is configured with two vertically figure-8 pattern microphones positioned 90-degrees to each other. A Blumlein array delivers stable, in-phase

sound stages from their front and rear quadrants with an excellent sense of depth.

## USING THE R88 IN BLUMLEIN

The Blumlein "sweet spot" is the center point, directly in front of the lines on the cups, where channel 1 and 2 bisect. When placing the R88, position it so that the instruments are + or - 45 degrees from the centerline. Align the AEA logo and vertical marks with the instrument or ensemble you are recording.



The front quadrant (pictured above) is the positive polarity stereo image, and the rear quadrant is the negative polarity stereo image. This is the stereo equivalent of the difference in sound between speaking into the front and rear of a bidirectional; the recording sounds as if it is coming from behind you. What is physically happening in a negative polarity recording is that the impulse that would usually push air towards your ears is now pulling air away from your ears.

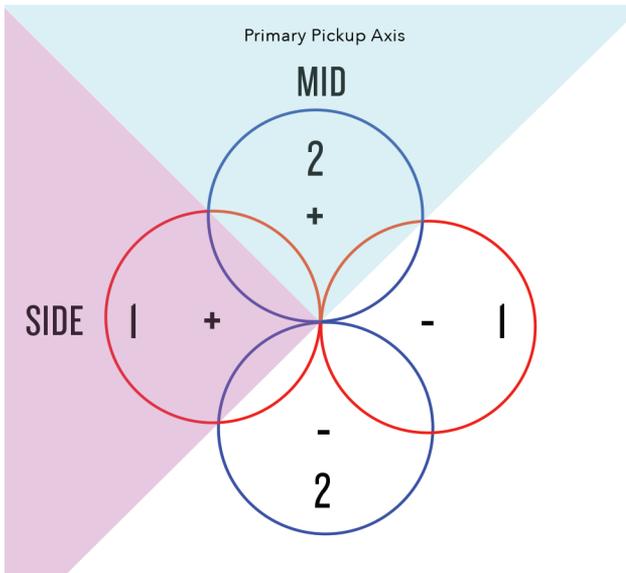
The left and right quadrants are the “out-of-polarity” zones of the microphone. This is because the positive lobe of one transducer is in one channel and the negative lobe of the second transducer is in the other channel. Sources recorded in this area make the listener want to turn their head, because the polarity in one ear is off. Additionally, it decreases the mono-compatibility of the microphone, as switching to mono results in electrical destructive interference. Prominent early reflections from these regions can cause an ill-defined and inaccurate stereo image. Take care not to place sound sources in these out-of-polarity zones.

Note that this out-of-polarity low frequency material from the left and right quadrants is also responsible for the sense of spaciousness. Nevertheless, it is best to keep the sound sources in the front and/or rear quadrants to ensure consistency of polarity in your signal and an accurate stereo image.

## USING THE R88 IN M/S

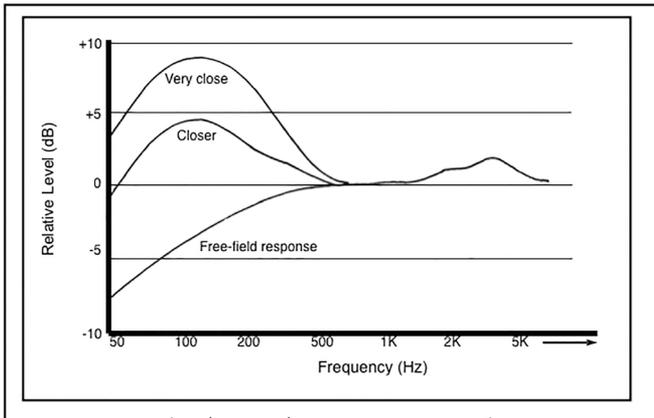
The R88 also works well with Mid-Side, or M/S, recording. M/S is worth experimenting with as it has the ability to control the stereo width by varying the Mid to Side ratio. This is especially convenient when recording a solo sound source where the emphasis on the center of the stereo image.

Mid Side recording requires a "decoding matrix". There are many popular M/S decoders available in hardware and software format.



The positive polarity of the Mid of 'M' transducer is aligned on-axis to the primary sound source. The Side or 'S' is oriented 90-degrees to this axis. The positive polarity of the 'S' mic is typically aimed sound stage left. Such an orientation yields Left/Right stereo from a sum and difference matrix where  $Left = Mid + Side$  and  $Right = Mid - Side$ . This means that the right and left channels are hard panned and opposite polarity copies of each other, so they sound beautifully wide, but when switched to mono, they perfectly cancel each other out, leaving just the "mid".

# PROXIMITY EFFECT



(graph is a visualization, not a measurement)

Proximity effect is a characteristic of all directional microphones; it is a rise in low-frequency response that increases at closer working distances. While this can be used to good effect, particularly with low-register voices to give them an enhanced richness and depth, the potential trade-off is reduced articulation or clarity that can result from the masking effect on the treble due to “excessive” bass boost.

As a stereo far-field ribbon microphone, the R88 was designed to capture balanced sound from long distances. Sound sources should be measured in feet rather than inches away from the mic. From 16 inches to 20 feet, the mic retains its full spectrum and incredible low end. When positioned closer than 16 inches, the mic adds proximity effect. When carefully used, this proximity effect can beef up thin sounds – either voices or instruments.

# SPECIFICATIONS

**Operating Principle:** Pressure gradient transducer  
**Directional Pattern:** Bidirectional  
**Frequency Range:** 20 Hz to 20 kHz  
**Polarity:** Pin 2 and 4 high for positive pressure at the front of the microphone.

## **Polar Response**

**Horizontal:** Level changes with angle, frequency response is consistent, -35dB null at 90° / 270°

**Vertical:** Level changes with angle, reduced HF response above and below 0° / 180°, -25 dB null at 90° / 270°

**Transducer Element Material:** Aluminum corrugated ribbon

**Thickness:** 1.8  $\mu$ m

**Width:** 0.185 in (4.7 mm)

**Length:** 2.35 in (59.7 mm)

## **Microphone Dimensions**

**Height:** 15 in (38.1 cm)

**Width:** 3.9 in (9.9 cm)

**Weight:** 2 lb 9.8 oz (1.19 kg)

**Shipping weight:** 5 lb 3 oz (2.36 kg)

**Connector:** XLR-5M, includes breakout cable - 2 XLR-3M

## **R88 Passive Microphone**

**Maximum SPL:** 165 dB SPL (1% third harmonic > 1 kHz)

**Sensitivity:** 2.5 mV/Pa (-52 dBV) into unloaded circuit

**Output Impedance:** 270  $\Omega$  broadband

**Load Impedance:** 1.2 k $\Omega$  or greater

**Phantom Power:** Not required or recommended

## **R88A Active Microphone**

**Maximum SPL:** 141 dB SPL

**Sensitivity:** 7.4 mV/Pa (-42.6 dBV)

**Output Impedance:** 92  $\Omega$  broadband

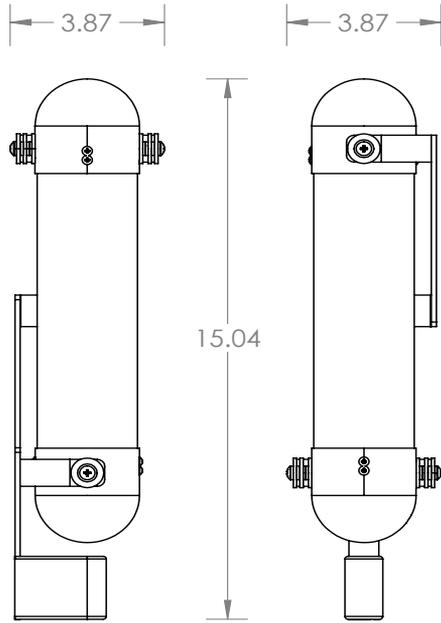
**Load Impedance:** 1.0 k $\Omega$  or greater

**Phantom Power:** P48 phantom power, 7mA

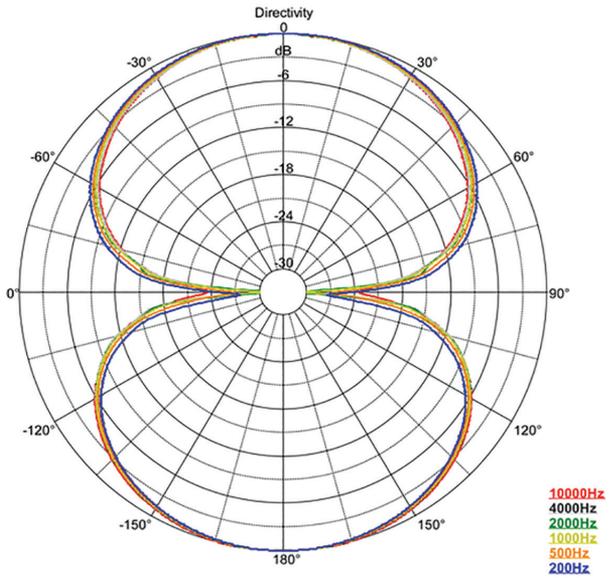
## **Accessories Included:**

Storage case, swivel adapter,  
custom protective mic sleeve, user manual

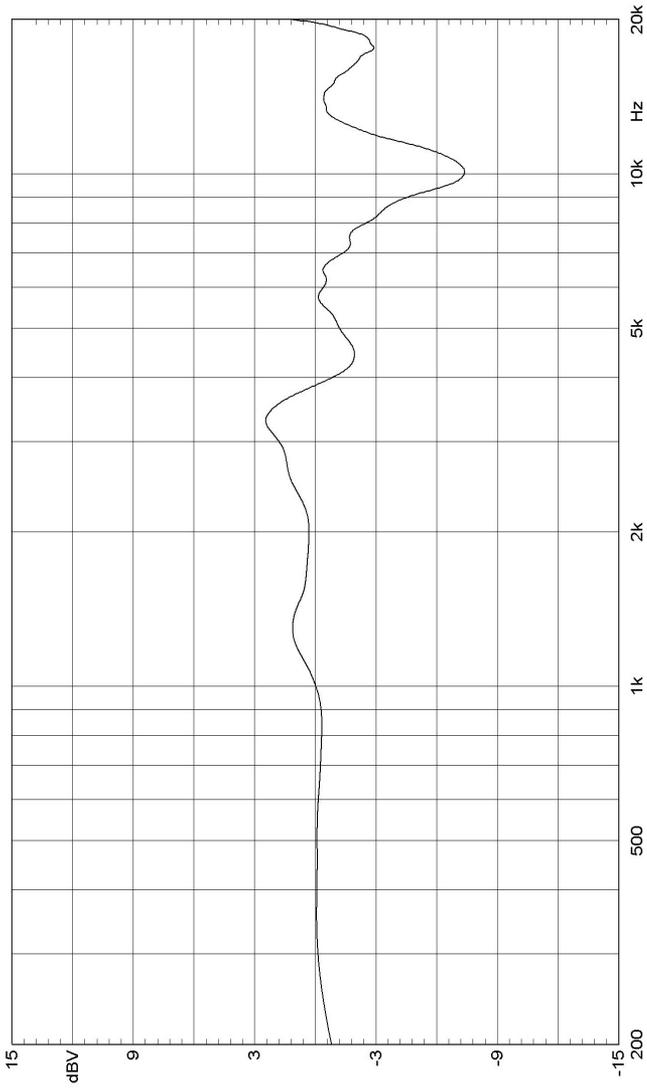
R88 Breakout Cable Extensions are available for purchase on our website.



**FIGURE-OF-8 POLAR PATTERN**



# FREQUENCY RESPONSE



Data below 200 Hz omitted due to measuring room restrictions.

0 dBV is equivalent to 2.5 mV/Pa (-52 dBV) for the R88mk2 and 7.4 mV/Pa (-42.6 dBV) for the R88A at 1kHz

Normalized to 0 dB at 1kHz. 1/3 octave smoothing



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