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# AEA R92

CLASSIC PASSIVE RIBBON FOR UP-CLOSE

{ OWNER'S MANUAL }

*Revision 4, November 2015*



Congratulations on your purchase of the AEA R92 ribbon microphone and welcome to the AEA family. Building on the success of the acclaimed R84 ribbon microphone, AEA's team of engineers set out once again to expand the sonic possibilities of ribbon microphones with the R92 model. Reduced proximity bass boost and excellent wind blast protection make it suitable for close miking of guitar and bass amps, drums and vocals. At half the distance to the source, the R92 delivers a similar bass-to-treble balance as the R84. In addition, the integrated shock mount and swivel allow for easy setup and positioning in tight spaces. Utilizing the R92's option of contrasting 'crisp' front and 'traditional' back lobe make the microphone a great tool to implement in the studio and live.

Your R92 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.

Whether recording guitars, vocals, or kick drum, your R92 will impart its classic Legacy series sound. We hope that the R92 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. We invite you to become part of the AEA community by sharing your experiences with the R92 via e-mail, phone or our social media channels.

***Wes Dooley***  
*President of AEA*

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## { INTRODUCTION }

The R92 is a pill-shaped, side-address, passive ribbon microphone with a bidirectional (or figure-of-8) pickup pattern. It is assembled with the same Big Ribbon™, tuning (16.5 Hz) and transformer as the R44. There are several distinctions that make the R92 exceptional among AEA's Legacy line. The R92 was designed to accommodate close and medium miking duties. It exhibits a flat frequency response when placed 6-12 inches (15-30 cm) away from the source, capturing the classic body and dimension of the Big Ribbon™ sound with reduced bass proximity effect. As a result, the mic is well suited for electric guitar, percussion, brass, vocals and drums. Its compact, lightweight design and integrated 360° swivel mount allows for placement versatility, while the custom shock mount suspension mitigates undesired low frequency mechanical vibrations. What makes the R92 truly unique is the contrasting tonal response on the front and back lobes: the front side is defined by a "crisper" characteristic, while the back side has a smooth, "traditional" top end roll-off.

## { GENERAL GUIDELINES }

To maintain the best performance from your new AEA R92 microphone, take note of these four basic rules:

- 1) Keep the microphone covered when it is not in use.
- 2) Always use a sturdy microphone stand.
- 3) Never expose the microphone to strong air turbulence.
- 4) Be nice to the microphone, and it will be nice to you.

1) Keeping the microphone covered when it is not in use will reduce the possibility of damage that might result from a sudden gust of air coming from air-conditioning or an open door or window. Place the supplied plastic bag over the microphone when it is not in use. For longer-term storage, place the microphone in its protective case.

2) While the R92 was designed to work well with all standard microphone stands, a high-quality boom stand will make your life a little bit easier. 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.

3) 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: 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. 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.

4) Your R92 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 as described above, your new microphone will perform admirably for decades.

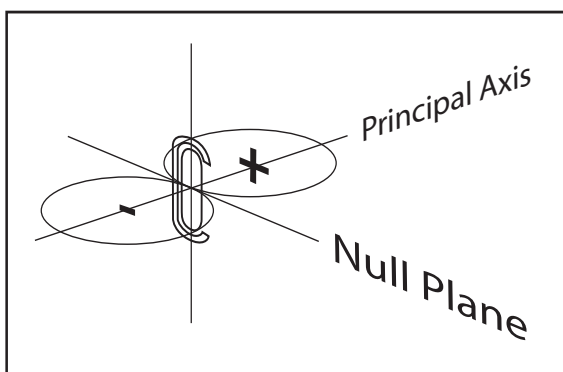
## { APPLICATION ADVICE }

### *Dual Voicings - Endless Possibilities*

AEA intentionally designed the R92 to capture slightly different frequency responses from the front and rear pickup lobes. The front lobe of the R92 (denoted by the AEA emblem) is the “crisp” side, offering exceptionally clean and realistic high end detail. The rear lobe is the traditional “smooth” side, with the classic ribbon extended roll-off of the highs, reminiscent of the iconic R44. This gentle roll off helps handle harsh transients in a refined and flattering way.

The R92's dual characteristic provides two significant options for your recording or live projects. If one side isn't doing the trick, try the other!

Figure-of-8 microphones are constructed with positive polarity on the front and negative polarity on the back. When using the rear lobe, remember to invert the polarity on your preamp or DAW. This ensures your recordings with the back lobe will be in-phase with other microphones.



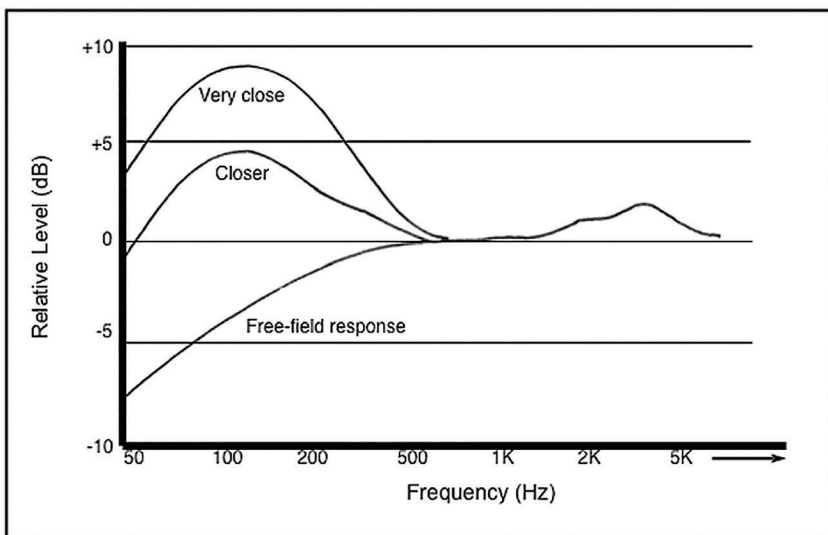
Here is an illustration of the pickup pattern of the R92. The AEA logo on the front of the R92 points directly towards the 'principal axis' (+) indicated in the diagram.

### *Controlling Leakage*

A significant and ever-present challenge in contemporary studio recording is minimizing “bleed” (also called “leakage” or “crosstalk”) from nearby instruments into the various microphones. The deep nulls of bidirectional ribbon microphones provide good rejection of unwanted sounds, which also can be beneficial in sound reinforcement situations where feedback is always a threat. While gobos can be effective in isolating performers from each other, they introduce their own set of problems - not the least of which are reflections in close proximity to the performers and/or microphones that result in comb-filter distortions. Since gobos usually are bulky, they also inhibit the ability of the musicians to hear and see each other easily. Such a setup requires complex and often cumbersome headphone monitor mixes for the musicians.

Since the R92 is bidirectional, it has nulls at right angles to the principal axis. These nulls produce a “plane of rejection” around the sides, top and bottom of the mic that can be used effectively to reduce leakage. Simply arrange the musicians so that nearby instruments are placed in the “null” of their neighbor’s microphone, and vice versa. Although this does not entirely eliminate the need for gobos, it can significantly reduce their number.

Keep in mind that a certain degree of bleed does not necessarily have to be bad. For some styles and genres it can in fact be beneficial to embrace a little bit of bleed in order to create cohesive and natural



sounding recordings. The important thing to listen for is whether or not other instruments that bleed into a specific instrument microphone still sound natural. You will generally find that well-designed ribbon microphones like the R92 capture a natural off-axis sound, which means that bleed from other instruments can contribute to the overall sound in a pleasing way.

### *Proximity Effect*

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 male 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.

The R92 and the AEA Nuvo N22 were both designed to shine on close miking applications. However, as figure-of-8 microphones, they intrinsically exhibit proximity effect. Compared to the R44, which achieves proximity effect from six feet away, the proximity effect from the R92 is substantially less and exhibits a flat frequency response when placed at a distance of 6-12 inches (15-30 cm).

Experienced vocalists instinctively locate the proper working distances for the microphones they are using. From as early as the 1930s, Frank Sinatra always kept one hand on the microphone stand while singing. Some joked that he simply was steadying himself, but more

knowledgeable people noticed that he would bring the mic closer for more intimate moments, and then move it farther away when he belted out a line. This technique became known as “working the mic”. A simple technique for maintaining the proper working distance from the microphone is to place a pop-screen between the performer and the microphone. By doing this, performers, will naturally work at the distance you have established.

## *Preamps*

The R92’s passive system yields spectacular headroom and operates with very low distortion over a huge dynamic and frequency range. Without active electronics the R92 can handle 136dB SPL at 40 Hz and withstand 165+ dB SPL at 1 kHz and higher. Passive ribbon microphones generally have low output level and require preamps that supply a high level of gain. If the preamp you use does not have enough gain, the signal might seem too soft or noisy.

The preamp input impedance affects the output level of the mic in addition to the mic’s frequency and transient response characteristics. It is generally recommended to use a preamp that is at least 4 times the input impedance of the microphone’s output impedance. However, a low or very high input impedance on a preamp will not hurt a ribbon microphone. We recommend clean, high impedance preamps with a minimum input impedance of 1.2k $\Omega$  and at least 65dB of gain.

It is recommended to make a habit of disengaging phantom power a minute or two before plugging in your R92.

To unleash the full potential from your R92, AEA manufactures high-quality, high-gain, low-noise preamps with a very high input impedance designed to bring out the full frequency response of ribbon microphones. Visit our preamplifier page ([www.ribbonmics.com/preamps](http://www.ribbonmics.com/preamps)) to view our line of exceptional preamps.

## *Application Examples*

Your ears are obviously the best judge of microphone choice and placement, but AEA has garnered a great deal of experience testing the R92 in a variety of recording settings and by talking to experienced musicians and engineers. As a result we suggest the following guidelines to help you achieve optimal results when using the R92.



Watch the videos on our website ([www.ribbonmics.com](http://www.ribbonmics.com), [www.aeasessions.com](http://www.aeasessions.com)) and on our YouTube channel ([www.youtube.com/AEARibbonmics](http://www.youtube.com/AEARibbonmics)) for more tips and tricks for our microphones and preamps.

## *Vocals*

Try using the R92 for a warm, clear vocal sound. The smooth character of the R92's treble response means that it may be extensively shaped and processed without risk of nasty resonance artifacts.

Start by positioning the singer 4 to 6 inches (10-15 cm) directly on axis from the microphone. The ribbon is well protected from damaging plosive blasts, but to avoid noises from wind blasts, we recommend using a pop filter.

If you are recording a musician who sings and plays an instrument at the same time, you can make use of the exceptional rejection offered by the 90° “null” planes of the bidirectional pickup pattern to reduce the pickup of the instrument in the vocal microphone.

## *Acoustic Guitar*

When recording a solo acoustic guitar a good starting point is to position the R92 4-8 inches (10-20 cm) away from the guitar roughly pointing at the 12th fret or where the neck meets the body. This placement will capture clear midrange and pick articulation with a balanced low end.

As the bass response of the R92 is sensitive to the miking distance, try rotating the mic to use its excellent horizontal off-axis performance to find the “sweet spot”. Try pulling the microphone away from the guitar in increments of 1-2 inches (2-5 cm). Listen to the guitar up close and when you find a spot that sounds good, try putting the R92 there. Let your ears be your guide.

## *Electric Guitar*

To capture an authentic and balanced guitar tone with your R92, place the mic directly in front of the grille. Identify where the center of the speaker cone is located, and place the R92 a few inches (5-10 cm) away from the speaker. Pointing the mic at the center of the cone will deliver a very direct, “in-your-face” sound. This is the spot that will obtain the most high-frequency content. If it sounds too harsh, try

moving the microphone slightly off center of the speaker cone. You can also try positioning the R92 at an angle. You will find that small differences in positioning can make huge differences in the sound, so experiment until you find the spots you like. Close up, the R92 is very good at spotlighting a speaker's unique sounds at various cone locations.

When using multiple microphones on a guitar cabinet at once and mixing them to create a particular sound, it is important to pay attention to the phase relationship between the different signals. Try to position the different microphones as close to each other as possible, to avoid phase problems caused by sound arriving at the microphones at slightly different path lengths. Make sure to listen to the combined signal summed to mono to catch potential comb filtering that could be caused by out-of-phase signals. If you are recording with the back lobe of the R92, it is important to invert the polarity on the preamp or DAW.

For a more natural sound that captures the sound of the amp in your room, try moving the microphone back a couple of feet.

### *Brass & Woodwinds*

The R92's warm and detailed characteristics make it a great focus mic for brass and woodwinds. Soprano saxophone, trumpet and most high-pitched brass and woodwind instruments are known to have "edgier" or "brilliant" frequency characteristics. The R92's smooth treble response on the back lobe is great at preserving these frequencies without aggravating the striking tonal qualities.

Depending on the instrument's dynamic range, we recommend starting by positioning the R92 8-16 inches (20-41 cm) away from the source.

Unlike brass instruments, whose sound emanates entirely from the bell, woodwinds produce sound from the entire length of the body of the instrument. When mics are placed favoring the bell, only lowest fundamentals dominate. For a focused sound, use the swivel mount (not the mic stand) to point the microphone on axis so that its pickup encompasses the entire instrument.

If you are concerned about wind blasts, use a pop filter, or position the microphone slightly off axis.

## *Drums & Percussion*

The R92 excels at close and medium miking of drums and percussion. A common use for the R92 is on kick drum. While it is never recommended to put a ribbon mic inside or in front of the kick drum port, positioning the mic a few inches away from the resonant head angled slightly down can capture a very natural sound. Make sure that you don't feel an air blast on axis to the microphone.

Engineers also love this mic on toms. The R92 is great at capturing huge low end and upper midrange. A common technique is to angle the R92 so that it picks up the floor tom, but position it in a way that the ride cymbal is in the null. It can produce a huge thud that is very natural.

### **{ PRECAUTIONS }**

Most ribbon microphones need little, if any, maintenance. Given proper care they last for decades. Bing Crosby's personal RCA-44BX (now in the collection of the Pacific Pioneer Broadcasters in Hollywood) sounds as good today as it did when he recorded his radio broadcasts in the 1940s.

A few simple precautions will help you to keep your AEA R92 working well for life.

## *Phantom Power*

Phantom power is not required or recommended for passive ribbon mics. Passive ribbon or any other microphones with transformer-coupled outputs, from Shure SM57s to Neumann U47s, may be damaged by phantom power. In most circumstances, accidentally supplying phantom power to your passive ribbon or other transformer-coupled mics will NOT hurt the mic.

With a correctly wired cable and a properly working phantom power supply, there is actually little danger of damaging the microphone with phantom power. However, ribbons WILL get hurt if ground Pin 1 is accidentally shorted, or miswired to Pin 2 or 3. Using phantom power with a faulty or miswired cable or a defective supply can severely stretch or break a ribbon. Even if the ribbon survives, the microphone's output transformer core will now be magnetized and the sound of the microphone will have changed. We recommend avoiding the use of

phantom power with your R92 as a general rule. It is recommended to make a habit of disengaging phantom power a minute or two before plugging in your R92.

### *Wind Gusts*

A second and equally important rule is 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 R92 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. Indoors, however, it is also important to avoid serious air movement from stage curtains, open windows, doors, or air-conditioning systems. High SPL sound sources do not usually pose a problem because AEA ribbon microphones can handle 165 dB SPL or more without difficulty. It is only those "explosive" sources that produce a strong blast of air, such as the bass port on an electric guitar or bass amp, a guitar being plugged (or unplugged) while the amp level is turned fully up, an on-axis kick-drum (particularly with a port on the front head), that are potentially damaging. If you are unsure about how much wind is hitting the microphone, place the back of your hand where the microphone is going to be. If you can feel significant wind blasts, angle the microphone or use a pop screen to avoid direct hits.

### *Tramp Iron*

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. The best prevention is to keep the microphone covered with the supplied plastic bag when it is not in use.

The R92 was designed to be less sensitive to external interference. It's design attract less "tramp iron" while retaining the overall sound and 20 Hz bass response of the original RCA 44.

Under no circumstances should you disassemble and take the grille off

of the microphone as this could allow tramp iron to enter the narrow gap between the ribbon and the pole pieces. Disassembling the microphone will VOID your warranty.

### *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 the R92, 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*

The R92 was designed with placement versatility and vibration isolation in mind. The microphone body is supported by a C-shaped yoke, and is suspended using an elastic shock mount system. This structure was designed to mitigate unwanted low frequency artifacts. To obtain the shock mount benefits of the R92, we suggest adjusting the swivel mount towards the source then positioning the angle of the mic stand.

The R92 includes a fixed XLR cable which is routed from the bottom of the mic and secured to the right of the swivel on the yoke. Securing the XLR cable to the stand is suggested to avoid accidents. To complete isolation of the microphone from external sources of mechanical noise, it is important to provide a slack loop by tying the microphone cable tightly to the microphone stand with a cable tie, shoelace, or string. (A Velcro® tie will not be tight enough.)

## { SPECIFICATIONS }

Operating Principle:	Pressure gradient transducer
Directional Pattern:	Bidirectional
Frequency Range:	<20 Hz to >20 kHz
Maximum SPL:	165+ dB SPL (1% third harmonic > 1 kHz)
Sensitivity:	1.8 mV/Pa (-55 dBV) into unloaded circuit
Output Impedance:	270 $\Omega$ Broadband
Recommended Load Impedance:	1.2k $\Omega$ or greater
Phantom Power:	Not required or recommended
Polarity:	Pin 2 high for positive pressure at the front of the microphone.

<b>Polar Response:</b>	Native bidirectional, figure-of-8 pattern
Horizontal:	Up to 90 dB rejection at right angles to the front/back axis.
Vertical:	Level changes with angle of incidence, but frequency response is consistent.

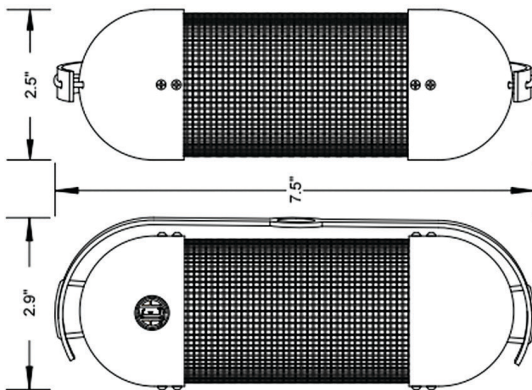
<b>Transducer Element Material:</b>	Pure aluminum corrugated ribbon
Thickness:	1.8 $\mu$ m
Width:	0.185 in (4.7 mm)
Length:	2.35 in (59.7 mm)

### Microphone Dimensions:

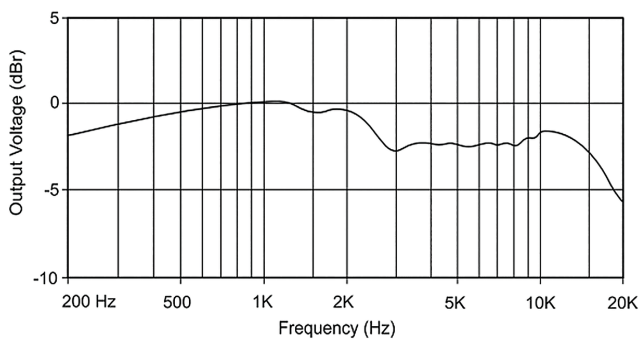
Height:	7.5 in (19.1 cm)
Width:	2.9 in (7.4 cm)
Depth:	2.5 in (6.4 cm)
Weight:	1.97 lb (893 g)
Shipping Weight:	2 lbs (0.9 kg)
Connector:	XLR-3M

### Accessories Included:

Storage/shipping case, user manual, captive 10" (3 meter) output cable with XLR-3M connector.



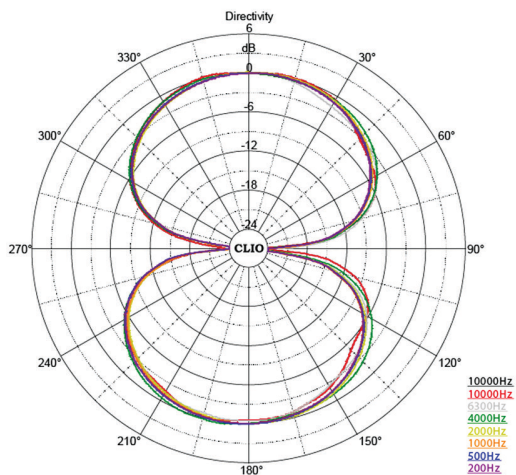
### On-Axis Frequency Response (1 meter)



Data below 200 Hz omitted due to measuring room restrictions.

0 dBr is equivalent to 1.8 mV/Pa at 1 kHz.

Normalized to 0 dBr at 1 kHz.



## { WARRANTY }

Your R92 microphone comes with a one-year limited warranty on parts and labor, shipping not included. Please see the supplied warranty card for details.

Registering your microphone 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 microphone or if you have questions regarding using the R92 in specific applications, please contact our customer support team at [support@ribbonmics.com](mailto:support@ribbonmics.com)

To talk to a live human being, call +1 (626) 798-9128, between 8:00 a.m.- 6:00 p.m. PT Monday through Friday.

There are a number of audio and video recordings of various AEA microphones online. Please visit [www.ribbonmics.com](http://www.ribbonmics.com)