



ROYER Labs

Model R-122

Active Ribbon
Velocity Microphone

Operation Instructions
Manual &
Users Guide

Made in U.S.A.

R-122

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Model R-122 Ribbon Microphone

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R-122 Active Ribbon Microphone

Congratulations on your purchase of a Royer model R-122 active ribbon microphone! The R-122 is a handcrafted precision instrument capable of delivering superior sound quality and overall high performance. The R-122 is the most technologically advanced ribbon microphone available, representing a new level of performance for ribbon microphones. The R-122 active ribbon microphone combines sophisticated technological advancements with old-world craftsmanship. The R-122 incorporates a head amplification system which operates on standard 48-volt simplex power, just like a standard condenser microphone. This enables the R-122 to deliver the same sensitivity and output performance that the recording industry has grown accustomed to with modern condenser microphones. In addition, the active circuitry completely isolates the ribbon element from impedance mismatches, short-circuits and other anomalies that can degrade microphone performance or damage the ribbon. The R-122 breaks the long-standing taboo associated with ribbon microphones and phantom power. It is the first commercially available ribbon microphone that requires phantom power to operate.

- No longer is it necessary to mate a ribbon microphone to an ultra-high gain, low noise preamplifier for optimum performance. Any preamplifier of nominal gain will provide good results with the R-122.
- No longer is it necessary to carefully consider impedance matching characteristics when choosing a preamplifier. Microphone loading is a non-issue and consistent performance is assured, regardless of the preamplifier's impedance characteristics.
- No longer is it necessary to be concerned about damaging the ribbon element with phantom power. The active electronics provide true isolation between the ribbon element and the outside world.
- No longer is it necessary to worry about the effects of long

cable runs degrading the performance of your ribbon microphone. The active electronics provide a robust low impedance signal suitable for all types of preamplifiers.

This operator's manual describes the R-122, its function and method of use. It also describes the care and maintenance required to ensure proper operation and long service life. The User Guide section of this manual offers practical information that is designed to maximize the performance capabilities of this microphone.

Royer Labs products are manufactured to the highest industrial standards using only the finest materials obtainable. Your model R-122 went through extensive quality control checks before leaving the factory. Normal care, given to any quality instrument, is all that is required to assure years of trouble-free service.

Please read the manual thoroughly in order to become familiar with all of the R-122's capabilities. It will assist you in making the most of its superior acoustic properties. This owner's manual is a handy reference guide and we suggest you refer to it whenever questions arise on the use and care of your R-122 active ribbon microphone.

Description

The Royer Labs model R-122 is a compact, active, bi-directional (*figure-eight*) velocity type ribbon microphone designed for professional applications. The figure-eight pickup pattern allows the R-122 to be addressed from either side with equal sensitivity. The *in-phase* signal is achieved when the microphone is addressed from the front, indicated by the "ROYER" logo.

The R-122 is reasonably tolerant to shock and vibration, and performance is unaffected by changes in temperature or humidity. However, ribbon microphones are somewhat more sensitive to direct blasts of air, and the R-122 is no exception to this rule. Discretionary use of a windscreen or pop screen, such as the PS-100, PS-101, WS58 or equivalent is highly recommended for situations

like close miking, especially with vocalists or certain types of percussion and wind instruments.

Applications

The Royer Labs model R-122 is a versatile microphone and is ideally suited for many critical recording applications. Its smooth frequency response characteristics and ability to capture detail make it a fine choice for many instruments, as well as for general broadcast applications. Its gentle low-frequency proximity effect make it especially useful for vocalists and announcers. Female vocalists often benefit from the R-122's ability to capture high frequencies without distortion or edginess. Orchestral instruments are captured in a natural sounding way, free from microphone-induced "hype". The R-122 has exceptionally smooth high frequency characteristics and is devoid of microphone induced ringing. Phase-related distortion and irregular frequency peaks are conspicuously absent. These features make the R-122 ribbon microphone an ideal choice for strings, woodwinds, percussion and amplified instruments. Theater organs and electric guitar amplifiers sound big and fat, without unnatural coloration, when recorded with the R-122. Acoustic pianos can be captured accurately without the comb-filtering effects associated with condenser microphones.

Digital recordings benefit greatly from the properties inherent in ribbon microphones. Since A to D converters cannot distinguish between the sound source being recorded and the complex distortion components associated with condenser microphones, they sometimes have difficulty tracking the signal, resulting in ringing and edgy sounding tracks. With ribbon microphones, ringing is almost non-existent due to the ribbon's lack of distortion artifacts and high frequency peaks. A to D converters have less difficulty tracking the ribbon generated signal, resulting in very smooth digital recordings free of microphone related edginess.

User Guide

Using The R-122 Active Ribbon Microphone

The head amplification system utilized in the active series ribbon microphones is designed to operate with standard 48-volt simplex phantom power sources only. ***The microphone will not work at all if phantom power is not provided to the microphone!*** This aspect of an active ribbon microphone is in sharp contrast to the common wisdom normally applied to ribbon microphones, where phantom power usually spells danger or destruction to the ribbon element. Active ribbon microphones require phantom power to operate.

To ensure long service life of your R-122 active ribbon microphone, care should be taken when connecting the microphone to a phantom power source. We have prepared a few tips to ensure that your active ribbon microphone will perform perfectly for many years. We offer the following information as a general set of “good habits” that apply to both active ribbon mics and solid-state condenser microphones.

1. Always be certain that the correct microphone cable is used with the microphone, and that the cable is in good serviceable order. Standard microphone cables provide a shielded ground carried along to Pin-1, and a balanced differential signal carried along Pins-2 & 3. Pin-2 is signal hot (in phase) and Pin-3 is signal cold.
2. Although it is usually safe to “hot plug” most phantom powered microphones to a preamplifier or console with the phantom activated, we suggest that if it is possible to de-activate the phantom power prior to plugging the microphone to the cable, do so. This minimizes any chance of random voltage surges entering the microphone. More importantly, it reduces the possibility of loud pops being transmitted to your monitor speakers should the volume control be raised. Serious damage to your speakers could result from this activity.
3. Be certain that the input channel fader or volume control is set to minimum before plugging in *any* microphone. Preamplifier gain trim should be set to minimum. Plug the microphone into the

cable and activate the phantom power switch. The microphone's electronics will stabilize in a few seconds.

4. When the microphone becomes operational, bring the channel fader to 0-dB (unity) and use the trim to set desired level. This technique maximizes the signal-to-noise performance of the pre-amplifier or console input channel.

5. When disconnecting the microphone, bring the channel fader down and unplug the microphone from the cable. It is also advisable to deactivate the phantom power switch before unplugging the microphone whenever possible.

6. If the studio has the microphone lines brought to a patch bay (tie lines), never crosspatch a microphone line when phantom is applied or the monitor volume is raised. This could cause damage to your microphone, preamplifier or monitor speakers.

Operation

The R-122 ribbon microphone is a versatile device capable of accurate sound reproduction. Ribbon microphones are different from other types of microphones and there are a few important characteristics that are key to understanding how to use them intelligently.

1. The R-122 is a *side address*, bi-directional microphone and the rejection in the "dead" areas is very strong. Due to this directionality, ribbon microphones should be placed at 1.3 times the distance normally used with omni-directional microphones, or at about the same distance used for cardioid microphones. This method is used to achieve the same ratio of direct to reflected sound.

2. In the horizontal plane, ribbon microphones do not discriminate against the "highs" off axis; nor do they boost them on axis. Therefore, several instruments or vocalists can be placed in front of the microphone without favoring the performer positioned in the center of the group.

Several performers can be grouped at both the front and back of the microphone, with one proviso; since the outputs are out of phase at the front and back of the microphone, cancellation can result if, for example, two tenors are placed at opposite sides at equal distances and they are singing in unison, so listen to the feed before committing to it.

3. When using a ribbon microphone with loud signal sources, placing the microphone slightly off axis relative to the signal source (either horizontally or vertically) is all that is required for efficient operation. This practice will help to protect the ribbon from extraneous stretching and possible damage.

4. Never attempt to “test” the R-122 or any ribbon microphone with an ohmmeter or continuity tester. On an active microphone, damage to the delicate electronics could occur; on a passive ribbon microphone, a blown ribbon could result.

5. Always provide adequate protection for your R-122, or any ribbon microphone. If the microphone is to remain set up on a stand when not in use, place a “mic sock” (supplied with every Royer microphone) over it until it is to be used. Do not carry the microphone around without placing a mic sock over it. Failure to follow this commonsense practice may yield a stretched ribbon and compromised performance.

6. Do not allow the microphone to be dropped on hard surfaces such as floors or tables - depending on how the mic falls, you could stretch the ribbon. In a situation like this the microphone would likely continue to operate but performance could be compromised considerably. Re-ribboning the microphone would be necessary to restore normal operation.

Amplification Considerations

Almost any microphone preamplifier, with nominal gain characteristics and a built in 48-volt phantom power source will give ex-

cellent results with your R-122 active ribbon microphone. Unlike standard ribbon microphones, which depend on a proper impedance match to deliver optimal performance, the input impedance of your preamplifier will have minimal affect on the R-122's operational performance because the ribbon element is isolated from the outside world via the microphone's electronics package.

Careful consideration should be given to the *quality* of the microphone preamplifier. Studio grade preamplifiers usually sound much better than cheap ones. Headroom, noise floor, transparency and coloration are all factors to consider in determining which preamplifier is suitable for your studio or live sound application. Other features are usually secondary and fall into the category of conveniences or interface capabilities (such as digital or optical outputs). A good preamplifier should sound natural with no sign of edginess or excessive noise. Vacuum tube preamplifiers sound warm, yet wonderfully airy and transparent. Do not expect a vacuum tube preamplifier to be as quiet as a solid-state preamp, as electron emissions from tubes tend to convey more "thermal" noise than transistors. Transformer coupled designs tend to sound punchy and full-bodied and offer the added benefit of true electronic isolation. This greatly enhances their ability to interface with other equipment with minimal noise or hum. There are many excellent preamplifiers on the market today. Choose one that fits your budget and offers good performance, but remember that you get what you pay for. If you have the opportunity to audition one or more preamplifiers before you buy one, do so. Microphones and preamplifiers work together like a team and some are just better matches than others.

The R-122 active ribbon microphone is capable of substantial output signal, especially if used in conjunction with very loud signal sources such as guitar amplifiers. It is therefore recommended that the microphone preamplifier have a switchable pad to prevent the possibility of overloading the preamplifier's input stage electronics. Some preamplifiers are more thoughtfully designed than others, and a suitable pad will be provided before the active electronics, not incorporated into a "feedback loop" as some cheaper

models do. The latter design could still produce unwanted distortion due to overloading, even if the pad were used. Although this is rarely an issue, we felt that it was important to cover the subject.

Since we're on the subject of preamplifiers, we thought you might find the following information on stereo microphones an insightful addition to the information presented on preamplifiers, performance and selection.

Stereo Microphones and Ground Loops

Some preamplifier designs are prone to developing internal ground loops when used in conjunction with stereo or multi-channelled microphones, such as the Royer model SF-12. Although this phenomenon is uncommon, ground loops can develop in the preamplifier with any stereo microphone, regardless of the type (i.e. condenser, dynamic, ribbon). A ground loop manifests itself as unwanted noise, buzz or hum (usually 60 Hz or 120 Hz).

The condition is brought on when the *left* and *right* transducer elements are plugged into two inputs of a stereo or multi-channel preamplifier. Stereo microphones usually have a multi conductor cable that carries the two independent signals and then splits them to a pair of standard three-pin XLR outputs. This pair of three-pin connectors usually shares Pin-1 as ground, so they are grounded to each other through the cable set. If the grounding scheme within the preamplifier is poorly designed, or the distances to internal ground are too great, a ground loop develops. The problem may be more apparent with some low output microphones such as dynamics or passive ribbons because of the high gain required for efficient operation.

You can perform a simple test to check for this condition (preferably done with a pair of headphones to avoid feedback). Plug one side of the stereo microphone into either preamplifier input. Listen to the output of the preamp. All should be quiet except for the mic signal. Now plug the second side into the next preamplifier input. If a noise or buzz develops, you have a

ground loop. The ground loop may be very slight or more pronounced, depending on the preamp. Battery powered preamps usually do not exhibit this problem, and neither do well designed, line operated mic preamps. The simple fix is to disconnect one of the microphone's two Pin-1 ground connections. A better method is to make a small ground lifter adapter out of a male-female XLR barrel adapter. Switchcraft makes a very nice one and it takes less than five minutes to wire it up. Simply connect Pin-2-to-Pin-2, Pin-3 to Pin-3, and leave Pin-1 disconnected. Correcting the problem at the preamplifier would be preferable, but is often more difficult and/or expensive.

In conclusion, try to find the best preamp you can afford that has good gain characteristics and low noise. Coloration is optional and a matter of personal taste. Some people love the effect of coloration while others strive for absolute transparency.

Equalization and Ribbon Microphones

One of the great strengths of ribbon microphones is how well they take EQ. Even with substantial amounts of equalization, ribbons retain their natural, "real" quality. For example, when a lead vocal is being performed on a ribbon microphone, you can actually boost the upper end frequencies to the point where the ribbon mic emulates the performance curve of a condenser mic with excellent results. This is not to say that a ribbon microphone can replace a quality condenser mic in all circumstances, but the EQ friendliness inherent in ribbon microphones does allow for an enormous amount of flexibility.

The reason that ribbon mics take EQ so well is because of their inherent low self-noise (less than 15 dB) and unusually smooth response characteristics. Dialing in high amounts of equalization on condenser or dynamic microphones also means dialing in extra amounts of the microphones distortion products and self noise; garbage that contributes to an unnatural, unpleasant sound. Because distortion and self-noise are almost non-existent in ribbon microphones, high levels of EQ can be used without adding harshness or excessive noise.

Hum, Noise and Mic Orientation

All dynamic microphones, including ribbons, utilize powerful magnets in their motor assemblies and matching transformers, and are, to some degree, susceptible to picking up stray alternating magnetic fields. Power transformers (such as those found in guitar amplifiers) and alternating current motors are the most likely sources of radiated noise. Building wiring and electrical utility transformers are other likely sources. A well-designed microphone provides shielding to minimize the effects of stray magnetic radiation. In some cases complete isolation is impossible and the result is usually hum or buzz. Passive ribbon microphones can potentially manifest this condition to a greater degree because of their higher gain requirements. Even an active ribbon microphone like the R-122 is not completely immune to this phenomenon. With vintage ribbon microphones that employ large bulky magnet structures, the problem can be worse. The cure for this problem is to identify the source of the noise and move the microphone away from it. Another trick is to alter the orientation of the microphone in such a way that the noise is cancelled out. If you ever experience this situation while in the studio, try rotating the microphone to identify the “null” point, then reposition the mic and the sound source.

The Sweet Spot

Finding and Working with the Sweet Spot

Good engineers know the importance and benefits of finding and working with the “sweet spot” of a given microphone. The sweet spot is usually defined as the optimum placement (working distance and angular position) of any microphone relative to the sound source.

Each microphone has its own sweet spot whether it is a ribbon, dynamic or condenser type. The sweet spot will vary with the type of sound source and its volume intensity, the polar pattern of the microphone and how consistent it is with frequency, and the acoustic environment.

This condition is called the sweet spot because the microphone and the sound source are in a harmony of sorts; the acoustic information is exciting the microphone in such a fashion that the resulting reproduction is very desirable, usually without the need for additional equalization or electronic manipulation.

There are only general rules as to where the sweet spot may be found for any given microphone, and usually experimentation reveals it. The sweet spot can be extremely variable since it depends on the quirks of a given microphone and acoustics of a given room. Once the sweet spot is discovered, this placement can become a “rule of thumb” starting point for future microphone placement with similar sound sources. Remember this: If it sounds good, it’s probably right. If it doesn’t, move the microphone. It’s often more effective to reposition the microphone than to start fiddling with knobs. Knob twisting can affect headroom and phase coherency and add unwanted noise.

The following is a list of variables that also account for “sweet spot” effect.

1. Frequency response variations due to proximity effect.
2. Frequency response variation due to treble losses as a result of absorption and “narrowing” of the pattern at high frequencies, causing weakening of highs as the microphone is moved away from the sound source.
3. Rise in treble response on-axis due to diffraction.
4. Loss of treble response off-axis due to phase-loss effect.
5. Variation in ratio of direct/reverberant sound.
6. Tendency of a microphone to favor the nearest sound source due to a combination of these items, plus the influence of inverse square law.

Other Types of Microphones

For the same ratio of direct/reverberant sound, omni-directional microphones must be closer to the sound source than cardioid or bi-directional microphones. Microphones should generally face the sound source head-on; if not, treble losses due to phase loss will result. The exception here is for large condenser microphones, which often give the flattest response at an angle of about 10-20 degrees (off axis), where phase loss and diffraction effect offset each other somewhat.

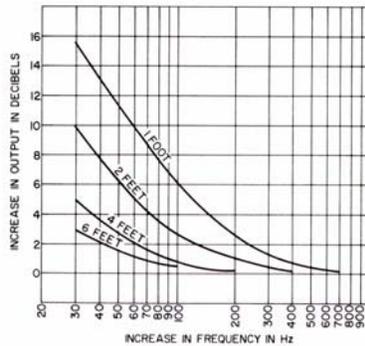
Proximity Effect and Working Distance The Sound That Is “More Real than Real”

Ribbon microphones have long been renowned for “rich bass”. This effect is largely due to the fact that ribbon microphones generally have excellent bass response to begin with, and at the same time exhibit an effect known as “proximity effect” or “bass tip-up”.

As illustrated in the following graph, a typical bi-directional ribbon microphone will have a flat frequency response at a distance of about six feet from the microphone but at shorter distances the bass response becomes boosted; the effect becomes increasingly pronounced as the distance between the microphone and the sound source is reduced.

This bass-boosting characteristic can become quite intense and, if desired, can be corrected by equalization. However, for a multiple microphone setup, the pronounced bass boosting (due to proximity effect) can be turned to an advantage. If an instrument, such as a trumpet, is extremely close-miked and the bass is cut to restore flat response, unwanted low-frequency sounds are cut back by upwards of 20 dB compared to an unequalized microphone with a flat response. This discrimination is *independent* of the microphone’s polar response.

Typical relationship of microphone distance to frequency response for ribbon-velocity bi-directional microphone.



Another area where proximity effect can be turned to an advantage is to make things sound

more “real than real”. For example, many voices and certain musical instruments produce fundamental frequencies within the bass range (below 150 Hz or so) but the fundamentals are weak. If a microphone which has no proximity effect and a rising high frequency response is used on an upright piano, or on a person with a thin, weak voice, the recorded sound is likely to sound even thinner than it was in real life. In contrast, using a microphone with strong proximity effect on such sound sources could result in a “better than real” sound since the boosted bass response will compensate for the weak fundamentals in the sound source. Since the fundamentals are present, but weakened, boosting them by several dB will sound “natural”, even though the sound has been “sweetened”.

Radio and television announcers have long relied on proximity effect to produce a full, rich, “authoritative” quality to their voices. By knowing how to work with the proximity effect, the engineer can get several useful effects without resorting to a “box”.

General Tips for Using Ribbon Microphones

Brass Instruments and ribbon microphones go together very well. Mic the instrument from a distance of a couple of feet, and increase the working distance a little if several instruments are being used.

Reed Instruments sound full and never edgy when captured with a ribbon microphone. Normal working distances are about a foot or two from the instrument.

Strings sound very sweet and clean with ribbon microphones. Place the microphone several feet from the instrument. For larger string sections, placing the microphone slightly above the instrumentalists and angled down; a distance of three or four feet will do the trick nicely.

Pianos sound excellent with ribbon microphones and are free of phase-related comb filtering. The bass is full and rich while the top remains clean with no clatter. Mic the piano at a distance of one foot to several feet, depending on taste. A more direct “up front” sound will be achieved when the microphone is placed closer to the soundboard.

For capturing a piano in stereo, place the microphones apart, one over the bass strings and the other over the high strings. The farther the mics are from each other, the wider the stereo spread. For a more direct stereo effect, the microphones may be placed in an “X” pattern a couple of feet from the center of the soundboard.

Amplified Instruments should be miked from a distance of one foot or more. The smooth undistorted response of a ribbon microphone is very useful for electric guitars and electric bass.

Since guitar amplifier speakers are often “beamy”, experiment with mic placement to find just the right spot. Placing the mic at greater distances from the speaker cabinet adds more room ambience to the mix. You will find that a ribbon microphone does not add any undesirable elements to the sound. Basically, what you hear at the amp is what you get in the control room.

Choirs and Orchestras can be picked up well with two microphones. Place the microphones at a distance of ten feet above the floor, and a few feet behind the conductor. The microphones should be spaced apart approximately one foot and angled, one toward the left and one toward the right.

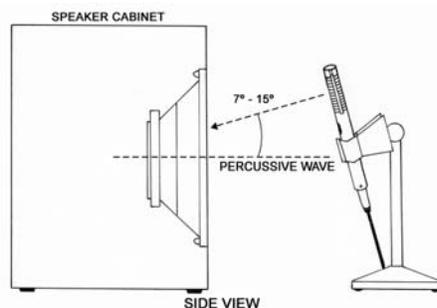
Drums and Percussion instruments sound natural when microphones are placed at a distance of several feet. For a drum set,

placing the microphone(s) at a distance of four to six feet above the kit works very well without the cymbals sounding splattered. A kick drum should be miked at a distance of at least 18 inches and possibly used in conjunction with a blast filter to prevent excessive ribbon movement. If the front head has a hole cut in, position the microphone away from the hole to avoid excessive air blasts.

For closer miking of a kick drum (10 to 18 inches), the microphone should be leaned forward at a 45 degree angle to protect the ribbon element from excessive plosive forces. This microphone position also provides good kick drum isolation because the top of the microphone, which does not pick up sound, is aimed at the rest of drum kit.

Recording Loud or Plosive Sound Sources

Certain types of instruments and sound sources contain powerful blasts of air that are potentially harmful to ribbon microphones of all types. Kick drums, close miked horns, guitar and electric bass amplifiers are typical examples of the sources that can produce potentially harmful air currents. You can place your hand in front of a sound source (where the microphone is to be placed) to feel if the air pressure is excessive. A simple technique that can avert damage due to overstressing the ribbon is as follows: After choosing the optimum placement for the microphone, slightly angle the microphone is such a way that the percussive wave is not directed at the front of the mic “head on”. Often, a slight angular tilt (either vertically or horizontally) is all that is required to prevent potential harm to the ribbon.

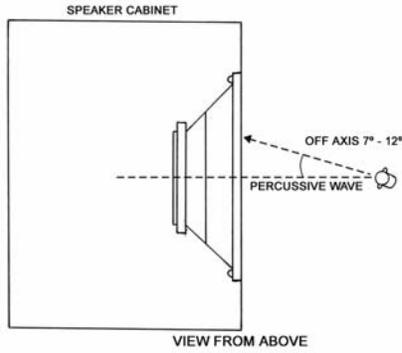


Example of the vertical positioning technique

Slight off-axis positioning will minimize stressing the ribbon on loud sound sources.

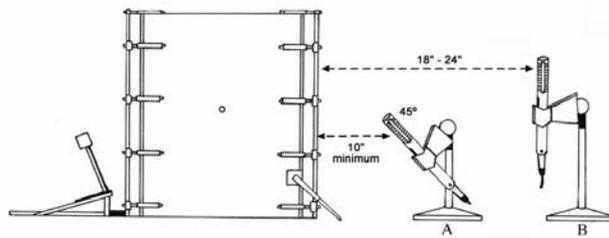
Example of horizontal positioning technique

Angling the microphone slightly



will minimize stressing the ribbon. Due to the microphone's pickup pattern, sound will not be affected.

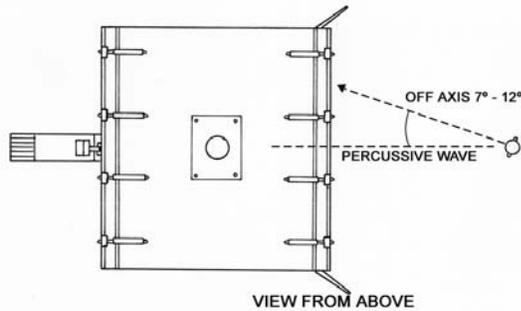
Side view of kick drum miking technique



A) Close miking—angle mic so that pressure

wave is off-axis
B) Standard miking position

Horizontal positioning technique



Applied to kick drum— similar to that utilized for other loud or percussive instruments

Stereophonic Microphone Technique

Classic Blumlein Technique

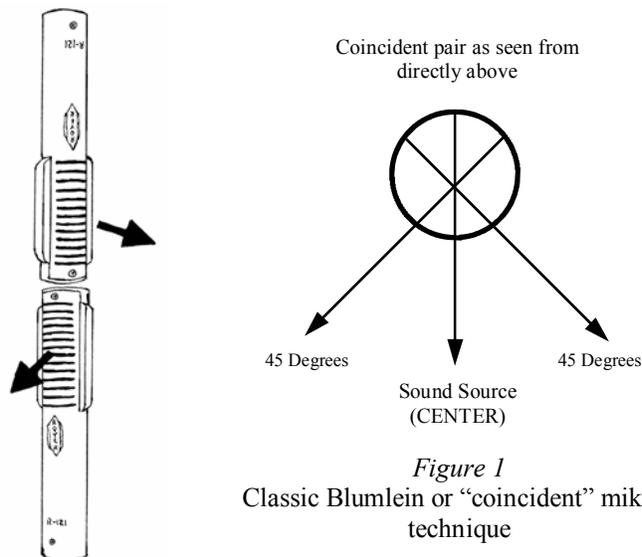
For many years, several “coincident” microphone setups have been widely used for picking up sounds in stereo as naturally as possible.

The “Blumlein” technique, named for A.D. Blumlein of England, involves the use of two figure-eight microphones positioned as in the sketch (*see Figure 1*), so that one faces left and the other right, at an angle of 90° (i.e. each displaced 45° from center).

Each microphone ultimately feeds one speaker in a stereo system, and due to the directionality of the microphones, the result is a very well defined stereo effect on playback. For classical music, particularly, the reproduction can be very satisfying.

Mid-Side Technique

In the early days of stereo radio broadcasting, there was a need for a mic setup that would allow for simultaneous stereo and mono feeds from the same mic array and for electronic “fiddling” with the severity of the stereo effect.



The result was what is known as the mid-side microphone technique. One mic faces sideways, one faces forward as shown in

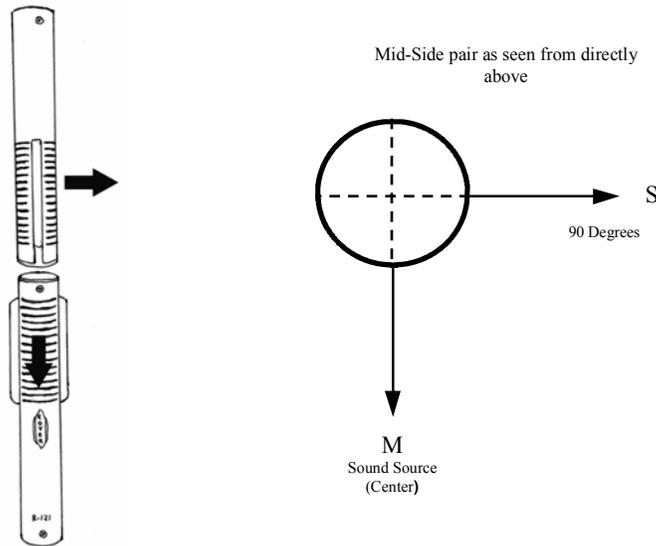
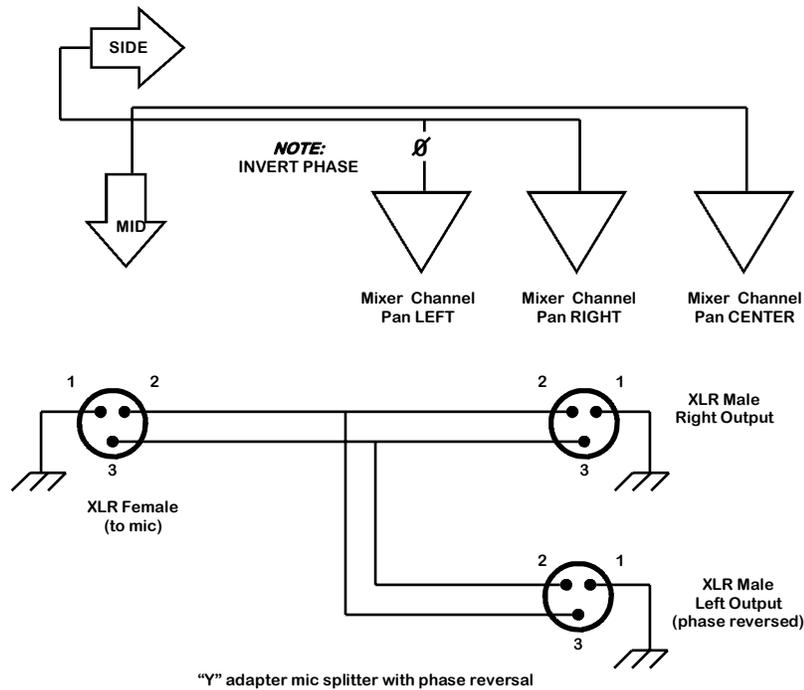


Figure 2 - Typical M-S miking technique



"Y" adapter mic splitter with phase reversal

Figure 3 - Typical M-S connection set-up

Figure 2, and they are connected as shown in *Figure 3*.

When the outputs of the pair of microphones are combined at the mixer, they will behave like a pair of microphones, one facing left and one right, provided that the sensitivities of the mics are equal and the mixer channel gains are equal.

Turning down the side mic all the way will give a mono pickup; as the side mic is turned up, the stereo effect will gradually appear.

If the outputs of the “mid” and “side” microphones are recorded on separate tracks, the electrical connections shown in *Figure 3* could be made at the mixer outputs and the adjustment of the stereo separation could be done during mixdown, rather than during the actual recording - very useful for live recording.

Specialized Recording Techniques

Recording on the back side of the R-122

The R-122 incorporates an “offset ribbon” design that enables it to handle high sound pressure levels such as those produced by loud guitar amplifiers and other instruments. An interesting phenomenon as a result of this “offset ribbon” construction occurs *at the microphone’s backside*, which affects the high frequency and low frequency response characteristics within the microphone’s proximity range. This proximity range is loosely defined as sound sources that are three feet or closer to the microphone.

Normal proximity effect (increase of bass), which is prevalent on the R-122 and all ribbon microphones, occurs normally at 4-6 feet from a ribbon microphone and increases with closeness. Vocalists and voice-over talents often take advantage of proximity effect to give an authoritative quality or rich texture to their voice.

Due to the R-122’s unique offset ribbon design, the backside of the R-122 records somewhat brighter than the front (logo) side, when the microphone is three feet or closer to the sound source. This can be extremely useful for recording acoustic instruments and vocalists where a little less warmth may be desirable. When

recording vocals on either side of an R-122, a quality pop filter (such as the Royer PS-100 or PS-101 metal pop screen) is essential to protect the ribbon element from windblasts. As with any figure-8 microphone, the front side of the R-122 is in-phase and the backside is out-of-phase. We suggest that that you reverse the phase polarity on your microphone preamplifier to achieve in-phase recordings when tracking on the backside of an R-122.

Cautionary Note:

It is important to note that the SPL handling capability of the rear side of the R-122 is less than its front side. When tracking loud sounds on the front side, the R-122's offset-ribbon design allows ample space for rearward excursions of the ribbon. However, tracking on the back side causes the ribbon to move forward towards the *front* side of the microphone, where the dampening screen is much closer to the ribbon element. Rear side recordings of loud sounds, or vocalists with no pop filter, can drive the ribbon into the front dampening screen, creating noise and possibly damaging the ribbon element. Limit backside recording on your R-122 to lower SPL sound sources and the microphone will be fine.

Care and Maintenance

The R-122 is a well-built precision instrument. All that is required to ensure proper operation of this microphone is to follow some commonsense rules.

1. Avoid transducer damage by not exposing the microphone to severe shock or vibration. If the microphone is accidentally dropped, test it to see if damage has occurred before returning it to service.
2. Do not expose the microphone to direct blasts of air. Use a windscreen or suitable blast filter when close miking a vocalist or certain types of wind instruments. P-popping does not necessarily damage the ribbon element but may produce unacceptable preamplifier overload and could cause damage to speaker systems.

3. Do not expose the microphone to liquids or caustic smoke.
4. Do not expose the microphone to strong alternating electromagnetic fields, i.e. the power transformers in amps, or a hum may result.
5. Use a soft cloth to clean the microphone body. A small amount of denatured alcohol can be used to remove fingerprints and other stains.
6. Keep metal filings away from the microphone at all times.
7. When not in use, store the microphone in its protective wooden case.
8. Leave disassembly of the microphone to a trained technician. There are no user-serviceable parts inside.

Caution!

Keep recorded tapes, spring-wound watches, and personal credit cards using magnetic coding away from the microphone to prevent possible damage caused by the transducer's powerful magnets.

A Little Bit of History

The ribbon-velocity microphone design first gained popularity in the early 1930s and remained the industry standard for many years. Their characteristic sound signature can still be appreciated today in recordings of the 30s, 40s, 50s and early 60s.

Ribbon microphone development reached its pinnacle during this time. Though they were popular with announcers, one of the disadvantages of ribbon microphones was their immense size. Even though these devices were considered state-of-the-art, magnetic structures of the time were bulky and inefficient. Transformers suffered a similar deficiency. When television gained popularity in the late 1940s, it was obvious that their size was intrusive and objectionable. They were difficult to maneuver and broadcasters soon looked for a suitable replacement. Even though these micro-

phones performed very well, their days were numbered. Newer dynamic and condenser mics would soon replace them. The new designs were compact, rugged and sensitive. It wasn't long before the television industry embraced these new designs. Radio followed the trend shortly afterward. Further technological development of ribbon microphones was considered unnecessary and the beloved ribbon soon faded into obscurity. It is a fate reminiscent of that of the vacuum tube when transistors hit the scene less than a decade later.

Some of their unique characteristics, unmatched even by today's modern condensers and dynamics, are still revered by many professionals, as evidenced by the high prices that vintage ribbons command in the marketplace.

Traditional-style ribbon microphones are still being manufactured in limited quantities today by a few dedicated companies. These microphones are essentially similar to the designs of the 1930s and limited to specialized applications.

Recent developments in magnetics, electronics and mechanical construction procedures have made it possible to once again bring the ribbon microphone to the forefront of the audio field. This is similar to the resurgence vacuum tubes have made in recent years now that technology has enabled further development of the state of the art in numerous areas. A renewed interest in these designs (both tube technology and ribbon microphones) is driven by the unique characteristics these devices possess, which remain unmatched even by some of today's marvels.

Today's ribbon microphones can be produced smaller and with sensitivity levels matching those of modern dynamic and condenser microphones. Aside from the superlative audio qualities of modern ribbon microphones, their smooth frequency response and phase linearity make them ideally suited for the new digital formats that dominate recording today. Now, with the introduction of the world's first active ribbon microphone, the R-122 adds a whole new chapter to the story of microphones, bringing a new

level of performance to ribbons and greatly enhancing the desirability of ribbon microphones across the board. We like to think that it's like going from black and white television to color.

Features and Specifications

R-122 Features:

- Very high overload characteristics – maximum SPL greater than 135 dB
- Active electronics offered greatly enhanced output and true ribbon isolation.
- Extremely low residual noise
- Ribbon element is unaffected by heat or humidity
- Absence of high frequency phase distortion
- Excellent phase linearity – even off axis
- Equal sensitivity from front or back of element
- Consistent frequency response regardless of distance
- No power supply required
- Compact size

Electrical Specifications

Acoustic Operating Principle	Electro-dynamic pressure gradient
Polar Pattern	Figure-8
Generating Element	2.5 micron aluminum ribbon
Frequency Range	30 HZ – 15,000 HZ \pm 3 dB
Sensitivity	-37 dBv (or greater) referenced Ref 1 v/pa
Self Noise	<20 dB
Output Impedance	200 Ohms balanced
Rated Load Impedance	> 1000 Ohms
Maximum SPL	> 135 dB
Output Connector	Male XLR 3 pin (Pin 2 Hot)
Power Requirements	48-Volt Phantom Only
Supply Current	4 mA

All Royer monaural microphones are also available in matched pairs.

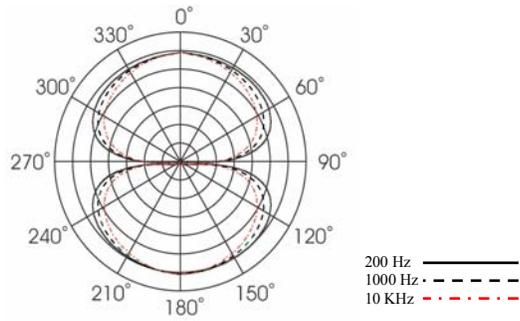
Mechanical Specifications

High grade Neodymium magnet assembly in Royer's patented Flux-Frame
1.5" x 3/16" x 2.5 micron ribbon assembly
Stainless steel internal baffle and dampener

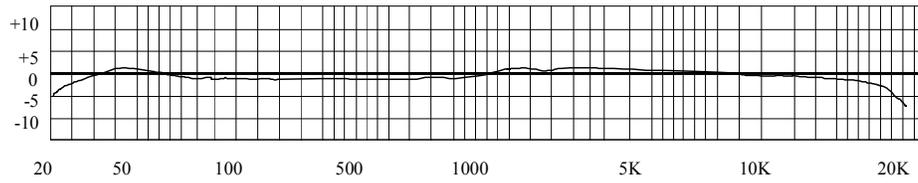
Dimensions	206 mm L x 25 mm W (8-1/8" L x 1" W)
Weight	309 grams (10.9 ounces)
Finish	Dull Satin Nickel or Matte Black Chrome
Accessories	Protective wood case, mic clip, and protective mic sock
Optional Accessories	Shock mount, pop screen
Warranty	Lifetime to original owner (repair or replace at Royer's option)

For up to the minute information on Royer products and their usage visit our website at www.royerlabs.com

Polar Pattern



Frequency Response



Notes:

WARRANTY

Royer Labs warrants its products to be free from defects in materials or imperfect workmanship. This warranty is offered to the original owner without time limit. Royer Labs will repair or replace any product that fails to meet published specifications during the warranty period. This warranty does not apply if the product has been damaged by accident or misuse, or as a result of repair or modification by other than a Royer Labs customer service facility authorized to service this product. To validate this warranty, the registration card and a photocopy of the sales receipt from an authorized Royer Labs dealer must be on file with the Royer Labs. Should it ever become necessary to service your Royer Labs product, please contact the factory. In our continuing effort to improve our products, Royer Labs reserves the right to make improvements without notice or obligation. Specifications and prices are subject to change without notice or obligation.

Serial Number _____

Sensitivity _____ Resonance _____

Date of Purchase _____

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