4KRF-LI 'LINE ISOLATOR'

by The RADIO WORKS
Where Amateur Radio is a contact sport!

PRELIMINARY

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Manual Price $5

REVISION DATE	REVISION SUMMARY
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4KRF-LI

Congratulations, you have purchased a unique and useful product. The RADIO WORKS' 'LINE ISOLATOR' greatly reduces or eliminates RF energy that travels on the outer braid of a coaxial cable. This can be helpful in reducing TVI, RFI and RF feedback.

SPECIFICATIONS

Ratio Input/Output:	1:1
Design Impedance:	50 Ohms
Int. transmission line Z:	50 ohms
Bandwidth:	160 through 10 meters
Winding Z @ 3.5 MHz:	>3K
Winding Z @ 14 MHz:	>50K
Coefficient of coupling:	100%
Power loss in dB:	nil
Power handling:	3 KW or more when SWR < 2:1

The RADIO WORKS 4KRF-LI 'LINE ISOLATOR' is a current-type balun operating as a RF choke. This prevents RF current from flowing along the outer surface of a coaxial cable's braided shield. At the same time, it has no affect on the signal carried by the cable. In other words, the RADIO WORKS' 'LINE ISOLATOR' does not introduce a reactance that could adversely affect system matching.

The 'LINE ISOLATOR' does slightly lengthen the coaxial cable. In phase sensitive networks, such as multi-element vertical systems, symmetry can be maintained by using 'LINE ISOLATORS' is each leg of the network.

POWER RATING

The 4KRF-LI will handle the legal power limit with a wide safety margin. Since The RADIO WORKS advocates adherence to the legal power limit, I do not like to rate components above that level. However, since 2:1 and 3:1 safety factors are often desirable, the RADIO WORKS does build heavy duty components.

If the SWR on your feed line is reasonable, below 3:1, and there are no other unusual conditions, your 'LINE ISOLATOR' will have a long reliable service life. As with all electrical components, abuse can cause them to fail.

'LINE ISOLATORS' are well designed. They are built with only the very best parts. Each is hand-crafted and individually inspected.

C A U T I O N

This section is included to help you make your antenna installation safe. The following cautions are general and they apply to all antenna and balun installations; they are not specific to this particular antenna, balun, or accessory.

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HAZARDS

This antenna or antenna component is USER INSTALLED. The RADIO WORKS has no control over its installation. Before you begin, you should be qualified and fully aware of the CONSEQUENCES and DANGERS involved in balun, antenna, and transmission line installations.

If you are not totally familiar with SAFE antenna and balun installation practices, GET COMPETENT HELP and ADVICE before installing this antenna, antenna part or accessory.

POWER LINES

DO NOT erect any antenna or tower (or part of an antenna, such as a balun or transmission line) near POWER LINES, POWER POLES, OR ANYTHING ASSOCIATED WITH THEM. THIS INCLUDES THE LINES THAT RUN FROM A POWER POLE TO A BUILDING. Mount your antenna in such a way that it CANNOT fall (or be blown by high winds) into power lines.

LIGHTNING

LIGHTNING is providential and provisions must be made for it. Use appropriate LIGHTNING protection and install it in accordance with the instructions supplied with the device. Better yet, disconnect all your antennas from your equipment and disconnect your equipment from the power lines during weather that is likely to produce lightning.

SHOCK

Extremely HIGH VOLTAGES may exist on certain parts of antennas, including baluns. This represents a possible SHOCK or FIRE HAZARD! It is not a fault of the design, or the designer. It is a result of the physical laws involved. ALL antennas will develop HIGH VOLTAGES at some point on their physical structure. Extremely HIGH VOLTAGES can occur in some antenna designs even when applying low transmitter power. Be certain that your antenna installation provides for this potential HAZARD. Locate all parts of the antenna well out of the reach of people. It is also desirable and proper installation practice to keep all antenna components way from any object not made of insulating material.

IMPORTANT - *Read the safety information and caution page.*

MECHANICAL CONSTRUCTION

The RADIO WORKS' 4KRF-LI 'LINE ISOLATOR' has a SO-239 coaxial connector at one end and a PL-259 on the other end. To insure watertight integrity, each unit is completely potted. For continued protection, use CoaxSeal to seal each coaxial connector. This is of course not necessary if the 'LINE ISOLATOR' is used indoors.

APPLICATIONS

A 4KRF-LI 'LINE ISOLATOR' can augment and improve the balun supplied with your beam or other antenna. This is especially true where a coil of coax functions as a balun. Replace that unsightly coil of coax. While coiled coax will function as a balun, it is not very effective, even at 14 MHz, unless you use a lot of coaxial cable. "Coiled coax" baluns are not useful below 14 MHz.

Use a 'LINE ISOLATOR' in the shack to help reduce RF feedback conducted back to the operating position by the coaxial. RF feedback can cause annoying "mike bite" or even distortion and oscillations on your signal.

INSTALLATION

While there are no special mounting requirements, I do suggest strain relief for long unsupported feed lines.

INPUT AND OUTPUT

The RADIO WORKS 'LINE ISOLATOR' is bidirectional. Either end can be used as the input.

WEATHERPROOFING

Each RADIO WORKS balun is either potted in solid plastic or expansive foam. All critical components are completely protected even if water enters the balun's case.

Moisture can enter the balun case only through the holes where the wires emanate. You can completely seal your balun by putting a small amount of CoaxSeal around wires leaving the case. Press the CoaxSeal firmly around the wire and against the case. Make sure the coax seal 'wets' (or sticks) to both the wire and the case. This will insure a weather tight seal.

Always protect all coaxial connectors with CoaxSeal.
Seal all electrical components and coaxial connectors exposed to the weather.

Use CoaxSeal(r) to wrap any connector that is exposed to the weather. Generously wrap each connector and mold the layers together with your fingers to insure a solid, impenetrable seal.

IMPORTANT - *Read the safety information and caution page.*

Weather Sealing
Baluns, Line Isolators, & Dedicated Matching Units

Each RADIO WORKS balun or 'Dedicated Matching Unit' is potted in either solid plastic or expansive foam. All critical components are completely protected even if water enters the unit's case.

Moisture can enter the balun case only through the holes where the output wires emanate. You can completely seal your balun or 'Dedicated Matching Unit' by putting a small amount of CoaxSeal around wires leaving the case. Press the CoaxSeal firmly around the wire and against the case. Make sure the coax seal 'wets' (or sticks) to both the wire and the case. This will insure a weather tight seal.

Always protect all coaxial connectors with CoaxSeal.

B1-2K	Seal 2 output leads + Coax Connector
B1-4K	Seal 2 output leads + Coax Connector
B1-5K	Seal 2 output leads + Coax Connector
C1-2K	Seal 2 Coax Connectors
C75-4K	Seal 2 Coax Connectors
B4-1.5K	Seal 2 output leads + Coax Connector
B4-2K	Seal 2 output leads + Coax Connector
B4-2KX	Seal 2 output leads + Coax Connector
4K-LI	Seal 2 Coax Connectors
Y1-4K	Seal 2 output leads + Coax Connector
RemoteBalun	Seal 2 output leads + Coax Connector
Carolina Windom	All wires and connectors + vertical radiator
New G5RV	Seal 2 output leads + Coax Connector
Classic G5RV	Coax connector
BigSig Loop	2 wires on DMU + Coax connector
SuperLoop	2 wires at DMU + Coax connector on stub
InTreeVert	Vertical radiator + coax connector
VHF/UHF InTreeVert	Coax connector
Universal	No weatherproofing needed

WARNING!

PROTECT YOUR WARRANTY!

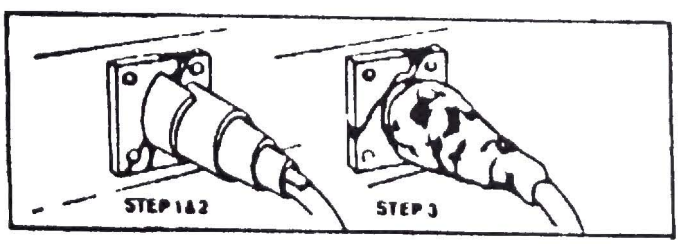
THE ENCLOSED COAX-SEAL MUST BE USED AND APPLIED CORRECTLY.

Most weatherproofing techniques used by amateurs are not reliable. Occasionally, a customer returns an antenna or balun that no longer works properly. In nearly every case, the product had not failed, connectors and coaxial cable had failed as the result of improperly applied weatherproofing. 99+% of all failures have been traced to corroded connectors and moisture contaminated coax. Reported product failures due to manufacturing defects has been insignificant in terms of the number of units built Each RADIO WORKS' product has weatherproofing instructions in its manual, but the technique used was left up to the user.

Now, as a service to our customers, we are including COAX-SEAL with each product. We know that this product works reliably. We have taken apart connectors that have been in the weather for 10 years and they are still looked like new.

Applying Coax-Seal

NOTE:
If any other weather sealer or weatherproofing technique is used with any RADIO WORKS product or if the COAX-SEAL is not installed according to directions, ***the warranty is void.***



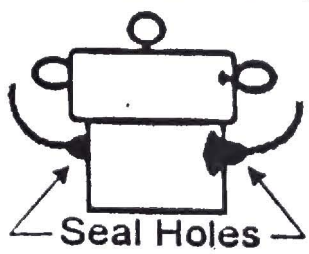
1. Make sure the coaxial connector and the coax cable are clean and dry.

2. Peel approximately 5 inches of COAX-SEAL from the paper backing. Start winding from the coax cover towards the connector, with one half overlap with each winding making sure all joints are well covered. This is shown in the illustration, "STEP 1 & 2".

3. After the entire connector and coax cable are covered with 3/16" thick layers, mold and form the COAX-SEAL with your fingers to make a smooth surface and to force out any air. COAX-SEAL must stick to the connector and coax jacket. See illustration "STEP 3."

4. If more COAX-SEAL is necessary to complete the seal, simply cut the needed amount and add to the existing COAX-SEAL. Mold and press into the other material. COAX-SEAL adheres to itself with slight pressure.

5. Carefully inspect the seal to make certain that all joints and openings are covered and sealed.



BALUN WIRES

Baluns and matching transformers are filled with a sealing compound. However, to prevent any moisture entering into the case, apply COAX-SEAL to fill the holes where wires exit the balun's case.

Pull *lightly* on each of the two wires to be sure they are fully extended out of the case. Peel a small piece of COAX-SEAL from its paper backing. Ball up this COAX-SEAL and press around one of the wires where it exits the case. Press and mold the COAX-SEAL so that it sticks to the case and to the wire's jacket.

Repeat for the second wire on the opposite side of the case.

Inspect for complete sealing.

Again, *lightly* pull on each wire to be sure that the seal is secure.