

# HAMTRONICS® LNK-WB WIDEBAND RECEIVER PREAMP: INSTALLATION, OPERATION, & MAINTENANCE



## DESCRIPTION.

The LNK-WB is a low-noise, wide-band amplifier designed to give about 10-20 dB of gain over a frequency range of 10-500 MHz, with more gain at the lower end of the frequency range and less at the higher end of the range. It will actually give useful gain up to 1000 MHz, but with somewhat less gain (typically 5-6 dB at 1000 MHz).

The unit operates on either 50Ω or 75Ω systems, and it is especially suited for use with scanner radios on all bands, on vhf and uhf tv receivers, and on test equipment, such as service monitors.

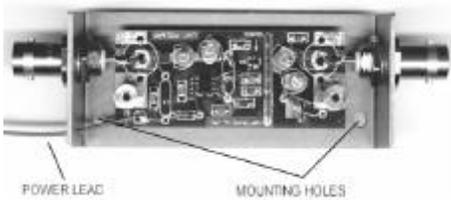
The active device is a low-noise bipolar microwave transistor. This was chosen, instead of the MOSFET used in the other preamps of the LNK-( ) series, because it allows a good impedance match over a wide range of frequencies without the need for elaborate matching devices, and it is inherently stable.

Operating power is +13.6Vdc nominal; however, it will operate well over a range of 10-15Vdc. Diode protection is built in to protect against damage from reverse polarity. Current drain is about 10 mA. The unit can be operated from any well filtered and regulated source of dc power, such as the power supply which operates the receiver if it is about 12Vdc.

The preamp is a linear amplifier; so it can be used on any mode of reception, including fm, cw, ssb, am, tv, etc.

## INSTALLATION.

**MOUNTING.** The preamp can be mounted to any flat surface with screws through the two mounting holes inside the chassis, as shown below. When replacing the cover screws,



be careful not to make them so tight that the cover is bowed. It is not necessary that the cover screws be very tight. It also is not necessary to make the mounting screws overly tight. Because of the thickness of the screw heads under the chassis, if you do want to make the mounting screws really tight, you should add flat washers under the chassis on the mounting screws.

For best results, in a receiving system when antenna is not also used for transmit, preamp can be mounted right at the antenna. Install the preamp on a flat aluminum panel U-bolted to the antenna mast. Then, caulk around base of preamp and around B+ and coax cables to weatherproof unit. Silicone sealant is good for this purpose.

**RF CONNECTIONS.** Antenna and receiver connections are made with BNC plugs to the input and output jacks on the preamp. The RF INPUT must be connected to the antenna, and the RF OUTPUT must be connected to the receiver input.

**CAUTION:** The preamp cannot be used on a transceiver unless you have a way to connect it only in the receive rf path.

Use good quality low-loss coax to maintain low noise operation. Remember that any loss in coax from antenna cannot be made up later in the preamp; it adds directly to system noise figure.

**POWER CONNECTIONS.** Power for the unit must be filtered +10 to 15 Vdc. Current drain is about 10 mA. Connect positive supply to wire extending from case. If you need a longer wire, you can either splice onto the existing wire or replace it by soldering a long wire to the power pad on the pc board inside the unit. Most times, the power supply ground connection can be made through the coax shield. Otherwise, connect a separate power supply ground wire to one mounting screw at the chassis.

⊗ **CAUTION:** Solid state amplifiers can be damaged by large voltage transients and reverse polarity. Although protection is provided in the preamp, avoid such conditions as a matter of principle. Special care should be taken to install reverse transient absorbing diodes across any inductive devices, such as relays. If the preamp is connected to an antenna used for transmit as well as receive, be sure

## WHEN DOES A PREAMP HELP?

It is tempting to hope that a preamp can make any receiver more sensitive in any situation. It is important to understand what happens when you add a preamp before a receiver.

A preamp can help overcome a deficiency in receiver sensitivity *only* if the noise figure is poor, either due to the design or because a lossy filter or cable adds to the noise figure. For instance, a preamp up at the antenna can overcome the effects of coax cable loss.

However, adding gain in the front end raises all signal levels; so, in effect, every dB of gain added overrides 1 dB of i-f selectivity or dynamic range. Therefore, adding a preamp can result in intermod or desense. The only way to know is to try it!

that the unit is connected only in the receive path and that the coax relay has sufficient isolation to avoid coupling large amounts of rf to the preamp.

## OPERATION.

The LNK-WB preamp operates in linear mode; so it may be used to receive any mode of transmission, including ssb and atv.

Low-noise preamps are effective in improving sensitivity of receivers in weak signal areas. However, it is normally considered inadvisable to use a preamp, even with a well designed receiver, in very strong signal areas, such as the center of a large city or other locations with high powered transmitters on all sorts of frequencies.

Adding gain ahead of a receiver degrades the selectivity of a receiver by an equivalent amount by boosting undesirable signals as well as desirable ones. In severe cases, strong signals which do not cause intermod by themselves will create intermod in the rf stage or mixer of your receiver after being amplified an additional amount by the preamp.

## ALIGNMENT.

Because this is a wideband preamp, no tuning is necessary.

## TROUBLESHOOTING.

Since the unit is fairly simple, troubleshooting usually is limited to checking the dc voltages on the transistor. These will vary somewhat; but, in general, the base of the transistor should be about 0.7Vdc and the collector should be about 6 Vdc. Current drain should be no more than 20 mA (10mA typical).

## PARTS LIST.

Ref #	Value (marking)
C1-C5	.001 $\mu$ f chip cap.
D1	1N4148 diode
J1,J2	BNC jack
Q1	2SC2369 microwave xstr
R1	47K
R2	100 $\Omega$
R3	680 $\Omega$

