HAMTRONICS® LNW-WB WIDEBAND PREAMP

GENERAL INFORMATION.

The LNW-WB is a low-noise, wideband amplifier designed to give about 10-15 dB of gain over a frequency range of 20-500 MHz. The unit operates on either 50Ω or 75Ω systems, and it is designed specifically to be used 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 GaAsFET used in the other preamps of the LNW-( ) 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 ±10%. 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 12Vdc nominal.

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

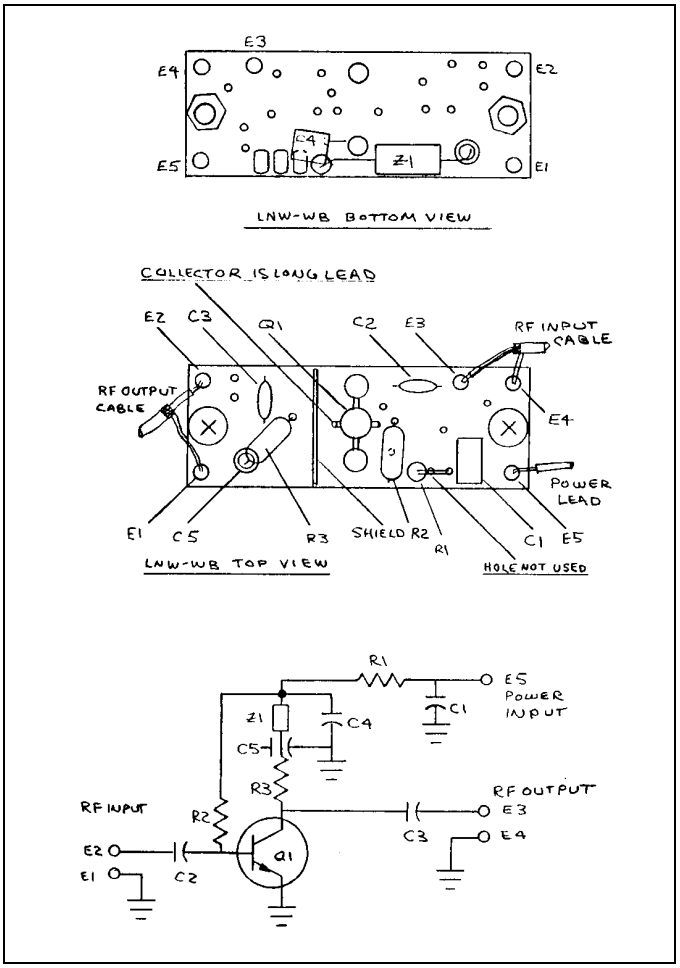
INSTALLATION.

The preamp can be mounted to any flat surface. Simply drill two 1/8 inch holes 1-7/16 inch apart, and attach the preamp with 4-40 screws and standoffs or spacers as desired.

Complete shielding of the preamp is not required. However, some care should be given to selection of the mounting location with regard to feedback from adjacent receiver circuits or rf pickup if mounted very close to a high power transmitter circuit. Because the unit is small, make sure that it isn't installed tight against the rf amplifier or first mixer of the receiver to minimize feedback effects.

Connect the input and output terminals in the receive signal path with miniature coax, such as RG-174/u, as shown in the top view. Be sure to keep the stripped pigtails as short as possible to maintain a 50Ω path.

Pin connections can be made either by wrapping leads around pins and soldering or by filling insides of pins with solder and inserting leads while solder is molten. Don't connect the preamp in the transmit signal path.



Connect power supply lead to E5. The LNW requires filtered +11 to 15 Vdc. Current drain is about 10-12 mA. Caution is advised in selecting a power source.

Caution: solid state amplifiers can be damaged by large voltage transients and reverse polarity. Care should be taken especially to install reverse diodes across any inductive devices, such as relays, on the same B+ line to absorb transients.

OPERATION.

The LNW-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.

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 voltage should be about 0.75V, and the collector should be about 5.5V.

TYPICAL GAINS.

Although there are variations from unit to unit, following are the typical gain measurements taken on a sample unit used in a 50Ω system.

Freq (MHz)	Gain (dB)
20	10
40	15
80	17
100	18
200	17
300	16
400	14
500	10
600	8

PARTS LIST.

Ref #	Value (marking)
C1	0.1 µf monolithic
C2-C3	27 pf NP0
C4	.001 µf (1nK)
C5	Solder-in feedthrough cap.
J1,J2	BNC jack
Q1	NEC 21937 (2SC2369) bipolar microwave xstr
R1	680Ω
R2	47K
R3	100Ω

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