

Operation - The L-600 VLF Loop Antenna

The L-600 loop is a unidirectional unbalanced antenna that can easily null out 60 Hz power line noise in normal listening situations. If you are surrounded by power lines it will be difficult to null most of the noise effectively. A good location some distance (300 meters minimum) from power lines is best for VLF/ELF signal and phenomenon monitoring.

Rotate the loop for the best nulling or peaking of signals that you desire to monitor. As little as 10 degrees of rotation can null or peak a signal. Use the L-600 antenna with the recommended L-600 VLF receiver for best results.

For permanent outdoor mounting, we suggest that the loop bundle and contacts be coated with an anti-fungus varnish. The loop can be hand held for portable operation or can be mounted onto a standard camera type tripod. When tripod mounting, it may be easier to first mount the handle separate from the loop, then reattach the loop to the handle.

Specifications - L-600 VLF Receiver

Receiver Size	4.19"L x 2.74"W x 1.57"H
Frequency Response	300 Hz to 30 kHz +/- 3 dB (zero impedance amplifier)
System Sensitivity	268mV/V/meter, 9e-4 uT/V/meter
HP Mode	1.5 kHz (highpass, single pole)
Audio Output	300 mW maximum, 4-32 ohms (earphones) 10k ohms (recorder or sound card)
DC Power	9 volt, 7 to 10 ma typical

Specifications - L-600 VLF Loop Antenna

Loop Size	24 inch square / 12" handle, 1.5 lb (PVC pipe)
Loop DC Resistance	50 ohms typical (unbalanced)
Loop Inductance	28 mH
Heff	6.7 mm @10 kHz, self resonance 23 kHz
Loop Sensitivity	0.23 μ v \sqrt Hz @ 5 kHz

WARRANTY

LF Engineering Co. Inc. warrants that at the time of shipment the L-600 VLF Receiver and antenna manufactured by LF Engineering Co. is free from defects in material and workmanship. LF Engineering Co. obligation under this warranty is limited to the replacement or repair of the product within 1 year from date of shipment.

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Model L-600S ELF/VLF H-Field Loop Receiving System

The **L-600S Receiving System** is designed for listening to VLF/ELF signals, spurious radiation and phenomenon below 10 kHz. The system consists of the L-600 VLF receiver and L-600 VLF H-Field loop antenna.

The receiving system is highly directional and sensitive enough for effective utility line noise tracing applications and for ELF research with the serious Natural Radio experimenter in mind. The L-600S is an effective H-Field receiving system for use in EMI noisy areas, or within E-field quiet areas. The directional loop can be used for nulling out noise sources. Frequency response is 300 Hz to 30 kHz (broadband). The 24 inch square PVC loop may be broken down into components for storage. The loop antenna and receiver may be hand held or tripod mounted. Switchable high pass filter for noise reduction. The extended 30 kHz upper range can be used for solar flare studies. Tape recorder and earphone outputs included with the receiver for connection to a recorder, sound card or spectrum analyzer.

The **L-600 VLF Receiver** is a current mode amplifier and audio amplifier with with broadband loop equalization. Design features a broadband, low-cut 1.5 kHz highpass filter for reduction of 60 Hz (hum) harmonics.

The **L-600 VLF Loop Antenna** is used in a current mode broad band configuration with the L-600 receiver input circuit. The loop is constructed of double enameled - UV protected #28 copper wire, and is secured to a light weight 24 inch diameter pvc collapsible frame.



Assembly - L-600 VLF Receiver

Remove the front panel secured by the four screws. Install a standard 9 volt transistor battery (alkaline recommended). Plug in the earphones provided, turn the receiver on and the LED should illuminate. Note the volume control, antenna input jack, and the switch marked "BB" - broadband, "HP" - highpass.

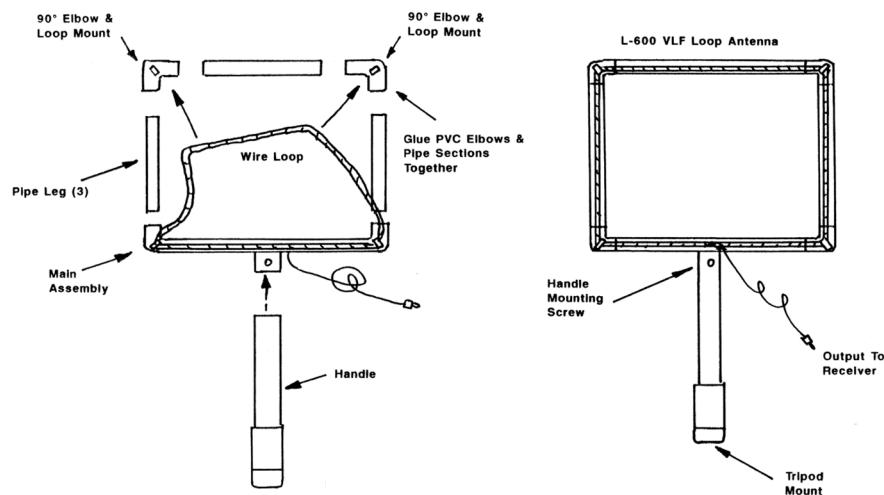
Assembly - L-600 VLF Loop Antenna

The Loop Antenna is in a partial kit form and must be assembled carefully to prevent damage to the wire loop - do not twist or kink the loop wire.

Tools Required: Screwdriver, Optional - PVC Cement for permanent assembly.

Parts List:	Quantity	Description	Part Number
	2	Elbow Ends	E5010
	3	Pipe Legs	L5020
	1	Main Loop Assy.	A5030
	1	Handle/Mount	H5040

1. Assemble the three pipe legs and two elbows to the main frame as shown in the illustration. The PVC sections will fit friction tight but may be glued for permanent assembly.
2. Carefully mount the loop to the corner clips and secure with the clip mounting screws.
3. Assemble the handle to the main frame and tighten mounting screw.



Operation - L-600 VLF Receiver

Connect the L-600 Loop Antenna into the input jack of the receiver. Plug in the supplied earphones and turn the unit on. A small speaker can also be used in place of the earphones.

Adjust the volume control to a comfortable level and use the "BB" - broadband or "HP" - highpass switch as required. In the broadband switch position, the full frequency response is used. Broadband operation is for quiet areas away from power lines. The highpass position is used to effectively attenuate 60 Hz harmonic noise.

When using the L-600 receiver with a high volume setting, oscillation may occur. To reduce this effect, move the loop antenna away from your earphones. Oscillation is normal with some earphones without good shielding. This condition should not occur with normal listening since full audio gain is not usually required.

If noticeable drop in sensitivity occurs during operation, check your battery. Battery drain is approximately 7 - 30 ma depending on listening levels.

Note: When listening, be careful not to raise the volume level too high for long listening periods to avoid ear injury, Because of receiver sensitivity, do not use as an audio listening device such as for telephone line monitoring, since there is no AGC protection to limit audio output.

The belt clip is for the convenience of hand free operation. See illustration for details.

