

## **NEW ALA1530LN and FLX1530LN MAGNETIC ACTIVE LOOP ANTENNA**

**50kHz to 30MHz**

**Ultra low Noise Figure JFET Design  
New 26dB gain amplifier with 10dB gain boost above 10MHz**



The **ALA1530LN** and the **FLX1530LN** are compact Active Magnetic loop antennas primarily designed to provide improved performance over conventional passive and active antennas. The new antennas have higher gain compared to the original ALA1530LN plus additional 10dB sensitivity in the mid./upper HF region. Wellbrook are the only company to manufacture active loops that use an ultra low noise JFET design. This new design has significantly improved the LW/MW and SW reception by increasing the Signal to Noise ratio by up to 16dB compared to some other active loop antenna manufacturers. The LW and MW 3rd order IMD is now approx. 20dB lower compared to previous models. This being due to the lower IMD of the JFETs. Over the last 20 years the ALA1530 range of loops has redefined the active antenna market place; by affording the user the possibility to reject locally radiated and mains borne noise and still provide improved sensitivity compared to larger antennas. The 1m dia. Aluminium loop is designed for outdoors, even at ground level. The loop has a frequency range from **50kHz to 30MHz** and matches directly to the receiver. The ALA1530 series are now the premiere active loop antennas for the Radio Enthusiast, Government Monitoring and Broadcast organisations. The amplifier is fitted in a separate module to reduce mechanical stress and facilitate easy replacement. The base of the loop is now reinforced to minimised damage due to weather extremities. The new ALA1530LN is the second generation of this antenna and uses 8 very high gain JFETs in parallel push-pull with a transistor cascode stage with noise-less transformer feed-back.

- New design has higher HF gain
- Much higher signal handling compared to MMIC designs and 5V USB driven antennas
- FLX1530LN low cost flexible loop version where the user provides a LMR400 or RG58c Coax. antenna
- Ultra low noise JFET design with up to 16dB lower noise floor compared to other active loops
- Suitable for SDRs, HF Amateur, Broadcast, Air and Utility bands and MW DX
- Up to 30dB rejection of locally radiated and power-line noise compared to an active whip
- Figure of eight directivity and deep nulls to further reduce interference; Ideal for LW/MW with antenna rotator
- Very low intermodulation, up to 50dB lower 3<sup>rd</sup> order IMD compared to loops using conventional low noise amps. and MMIC devices; thus ideally suited for North America where users can be close to AM BC transmitters
- Rugged construction 1m dia, Aluminium loop, with Antenna Interface and a regulated power supply for most countries
- No tuning necessary or matching unit; No planning problems, works at ground level, can be camouflaged
- Separate Head Amplifier fits on top of loop to reduce mechanical stress and afford easy replacement.

### **This is no ordinary loop antenna**

The ALA1530LN is the result of several years development spun off the design of the large aperture loop, the ALA100LN. Most Broadband loops work by a current induced by the H or Magnetic Field increases with a rising frequency to negate losses with the loop's inductance. Hence, the loop tends to have a flat sensitivity versus frequency. Loop antennas are usually designed by connecting a low impedance, high gain amplifier to a single or multi-turn loop (shielded). This approach presents several problems:

1. If the amplifier input impedance is very low this causes a too low gain at HF.
2. Optimum loop/amplifier power transfer occurs over a narrow bandwidth. Also the loops radiation resistance is very small, meaning that it picks up little signal and hence requires an extremely low noise, high gain amplifier to provide optimum reception.

Wellbrook has solved the above problems by designing amplifier so that the very low noise of the loop's real resistance is mismatched to the input impedance of the low noise amplifier. Hence, reducing the amplifier noise floor by up to 16dB compared to more conventional low noise amplifiers. This can only be done with JFET amplifiers with a near to zero noise figure.

## MAGNETIC LOOP ANTENNA ADVANTAGE

Most active antennas are the whip type and respond mainly to the electric-field. The Magnetic Broadband Loop responds primarily to the magnetic-field, this ensures high rejection of nearby **electric-fields**. The intensity of the electric-field is usually higher than the magnetic-field when an antenna is close to interference sources such as TVs fluorescent lamps, mains wiring etc. Therefore, by rejecting the electric-field there will be a reduction in local interference compared to other types of active and passive antennas. Interference reduction is further enhanced by the deep nulls of the 'Figure-of-Eight' directivity pattern.

## INTERMODULATION

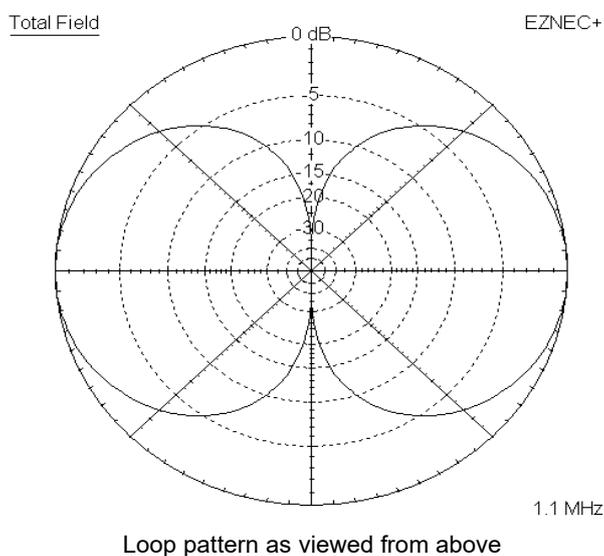
Some active antennas generate intermodulation products which can appear as spurious signals interfering with reception. This interference is usually second order intermodulation is caused by non-linearity in the amplifier, producing signals which are the sum and difference of strong Broadcast stations. The ALA1530LN Broadband Loop has been specifically designed to reduce intermodulation products to a minimum. The second order and the third order intercept points are typically **+90dBm OIP2** and **+50dBm OIP3** respectively. Thus the level of the intermodulation products are generally below the atmospheric and man made noise.

## ANTENNA DESIGN

The Loop antenna consists of a rigid aluminium loop and uses 8 very high gain JFETs in parallel push-pull with a Bipolar transistor cascode stage for extended bandwidth. Optimum noise-less transformer feed-back dynamically drives the JFET source resistance to a fraction of an Ohm, resulting in an ultra low noise figure. The amplifier is encapsulated in resin and housed in a uPVC box, this ensures reliable operation in all weather conditions. The antenna provides low noise performance, large signal handling ability. Rejection of mains borne noise is accomplished by using a balanced amplifier so that the feeder does not form part of the antenna return path. The amplifier input is protected with high speed diodes.

The loops are supplied with an Antenna Interface and a 12 volt regulated power supply. RG58C 50 ohm coaxial feeder cable is recommended for the antenna. The recommended maximum feeder length is 100m. A 1m coax. lead connects the Antenna Interface to the receiver. To realize to benefit of the improved s/n, the ambient local noise needs to be low too.

The FLX1530LN flexible version is housed in a small plastic box with two BNC connectors is available for a user provided coax. Loop. The loops should be positioned approximately 5m away from any buildings and at least 10m from Ham Radio TX antennas.



## TECHNICAL INFORMATION

Power consumption:	12 volts at 110mA	
Amplifier Intercept point typically (MW Band):	OIP2 +90dBm, OIP3 +50dBm	1dB compression point +25dBm
Amplifier Noise Figure:	Approx. 0.2dB	
Output impedance:	50 ohms BNC	
Max. Field strength	400V/m or 1.0A/m pulse	

Note: The antenna can be susceptible to emissions at frequencies beyond the specified frequency range.

**Wellbrook Communications**  
The Farthings  
Beulah  
Llanwrtyd Wells, Powys  
LD5 4YD



Design/specification subject to change without notice  
© 2019  
All products are design copyright  
Phone 01591 620316  
E-mail: [sales@wellbrook.uk.com](mailto:sales@wellbrook.uk.com)

GB

[www.wellbrook.uk.com](http://www.wellbrook.uk.com)

ALA1530LN and FLX1530LN2 11-12-19