



NEW ALA100LN

LARGE APERTURE ACTIVE LOOP ANTENNA

50kHz to 30MHz

New Ultra Low Noise Figure JFet Design

The Active Loop Antenna Model **ALA100LN** is a large aperture antenna designed to provide improved performance compared to traditional active and passive antennas. The ALA100LN has two modes of operation; at Medium and Low Frequencies the antenna is a high efficiency broadband Loop; for High frequencies the antenna has a response similar to a Longwire. The ALA100LN is **primarily designed to reduce local interference**. It is suited to users, who don't have a lot of space to erect large wire antennas.

Over the past 12 years the ALA100 has become the loop antenna of choice for the NDB listener where optimum sensitivity with low noise is required. The ALA 100 is broadband and does not have to be tuned in step with the receiver. The loop can be mounted remotely from the receiver away from local interference. Whereas, traditional antennas require a lot of space and can pick-up local noise. The new ALA100LN is the third generation of this antenna and uses 4 very high gain JFETs in parallel push-pull, cascode operation for extended bandwidth. Optimum noise-less transformer feed-back resulting in a ultra low noise figure. The excellent Intermodulation Distortion (IMD) performance of the ALA100 has been preserved with new ALA100LN.

A resettable fuse is now fitted to Antenna Interface; thus improving ease of operation.

ALA100LN FEATURES

- Balanced low impedance Magnetic loop.
- Large aperture: Ideal for NDB, LW/MW/SW DX.
- Ultra Low Noise figure for enhanced weak signal reception
- 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.
- Very low intermodulation products ensures good performance in a strong signal environment.
- Antenna is balanced/isolated from ground and feeder induced currents.
- Supplied with Antenna Interface and a new linear regulated power supply UK, Europe, Japan, USA & Canada.
- No tuning necessary or matching unit; No planning problems, works close to ground level.

ALA100LN ADVANTAGES

Active antennas are necessary for several reasons:

The difficulty of matching a conventional wire antenna to a 50 ohm feeder and still retaining a broadband response is not easy. At certain frequencies; conventional wire antennas can deliver excessive signal strength, leading to receiver overload. Planning regulations can restrict antenna erections.

The active antenna solves the problem of impedance matching to the feeder and yet the performance is comparable with larger antennas. However, most active antennas are of the whip or dipole type and respond mainly to the electric-field. The ALA100LN is balanced antenna and responds primarily to the magnetic-field at medium and low frequencies, 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 florescent lamps, mains wiring etc. The E-Field response is cancelled out by virtue of the loop aperture being small in terms of wavelength and the phase difference of the balanced loop output is 180 degrees. 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. The large aperture of the ALA100LN improves the signal pickup to optimise the signal to noise ratio and also reduces fading at HF, this is a very important advantage compared to small active antennas.

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 ALA100LN 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 **+49dBm** OIP3 respectively. Thus the level of the intermodulation products are generally below the atmospheric and man made noise.

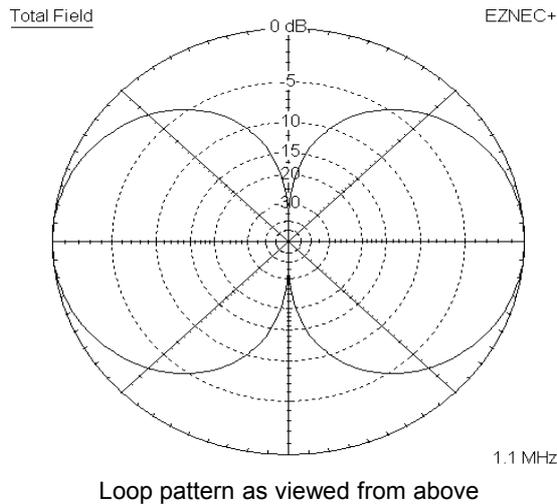
ANTENNA DESIGN

The ALA100LN is high gain balanced broadband amplifier using 4 low noise, high gain RF JFET transistors and is designed to be used with a customer provided 8-18m circumference wire Loop. The amplifier is encapsulated in synthetic resin and housed in a ABS box, this ensures reliable operation in all weather conditions. The ALA100LN is the only loop antenna the where the noise floor is significantly lower than the increase in noise due to the amplifier gain. The new cascode amplifier has extended bandwidth and a large signal handling ability. Rejection of power line/mains borne noise is accomplished by using a balanced amplifier.

INSTALLATION

The ALA100LN Loop Antenna comprises of a loop/amplifier Head Unit together with an Antenna Interface and a new 12 volt 300mA regulated power supply (UK, EU, N. A. and Japan only). RG58C 50 ohm coaxial feeder cable is recommended for the antenna. The maximum feeder length is 100m. The Antenna Interface feeds the 12 volt dc power to the antenna. A 1m coax. lead connects the Antenna Interface to the receiver. The wire Loop is provided by the user. This can be supported by a tree or light weight wooden poles 2-4m high spaced 2-5m apart. Alternatively the Loop can be loft mounted or simply attached to the inside or outside wall of the home. However, for lower noise performance, the ALA100LN should be positioned away from sources of interference such as fluorescent lights, TVs, computers and electrical wiring. In most cases satisfactory results can be obtained by mounting the antenna near ground level and at least 6m from buildings. The Loop size can be altered to match the receiver performance and thus reduce overload problems when used with medium priced price receivers.

The ALA100LN can also be mounted on to an antenna rotator using a simple 3m x 3m wooden frame to exploit the Loops directional characteristics. Alternatively an 21m circumference triangular loop can be used.



TECHNICAL INFORMATION

Power consumption:	12 volts at 100mA
Amplifier Intercept point typically:	OIP2 +90dBm OIP3 +49dBm (MW Band)
Input impedance:	Approx. 50 Ohms Balanced at 1MHz. Other input z to special order
Output impedance:	Designed for a 50 ohm load with BNC connector
Nominal gain:	22dB at 1MHz
Noise Figure:	Approx. 0.0dB when terminated with a 50 Ohm resistor
Noise Floor:	-133dBm,1kHzBW at 1MHz with an equivalent 20m loop inductance

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