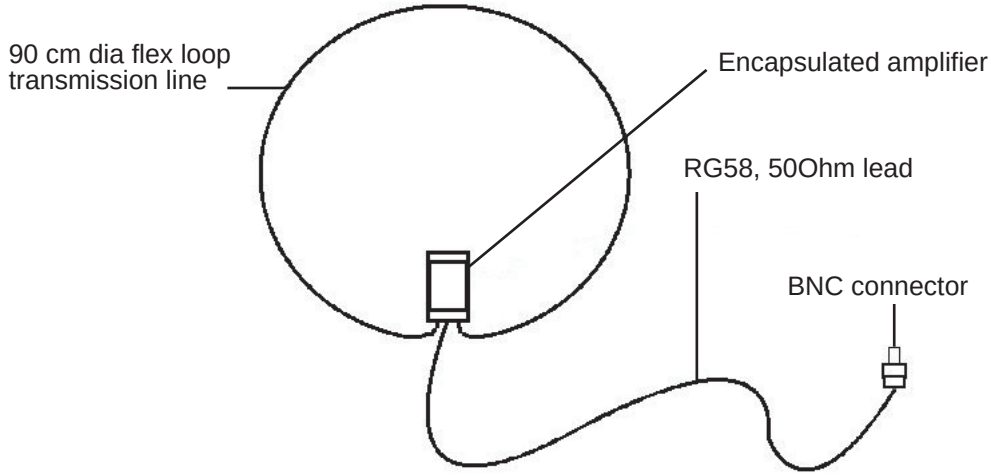
# Active Loop Antenna




**Predictable Performance**
Computer optimised design
Extremely broadband 10kHz -30MHz
Sensitivity set by received background noise
High linearity complementary push pull amplifier
Good response to high angle and low angle DX
Deep broadside nulls for ground wave signals

**Easy to Use**
Mount near ground level
Encapsulated for outdoor use
Very compact size: 1.3m diameter
Easily transported

**Noise Immunity**
Immunity to electrical field interference
Easily located away from local interference sources
Isolated from mains borne interference
Survives RF fields of 13V/m

**No Tuning**
No inconvenience
No band changing elements
Narrowband/ VLF version 30-300KHz

**Applications**
Surveillance
VLF time and frequency receiver
EMC & EMI testing

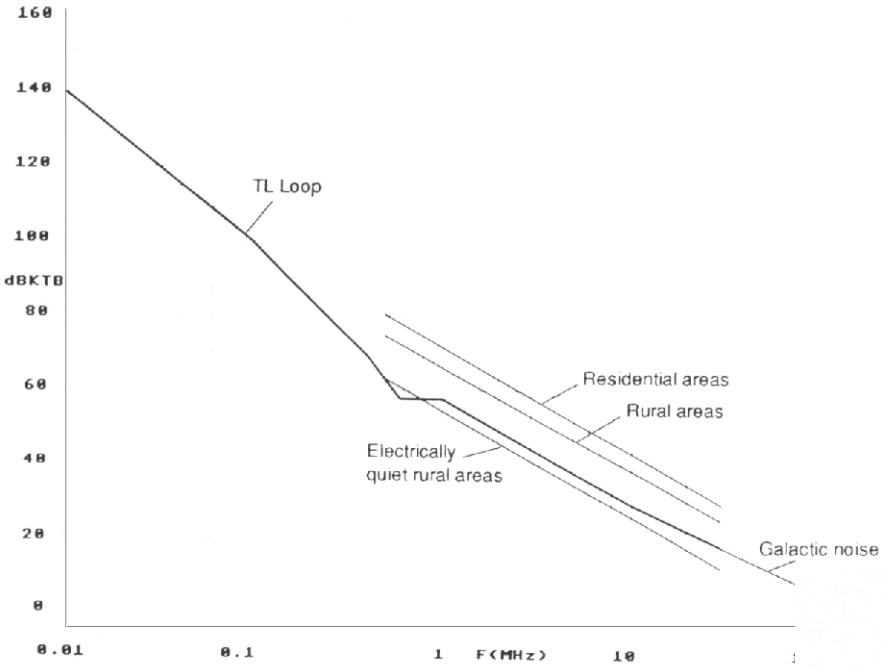
## Introduction

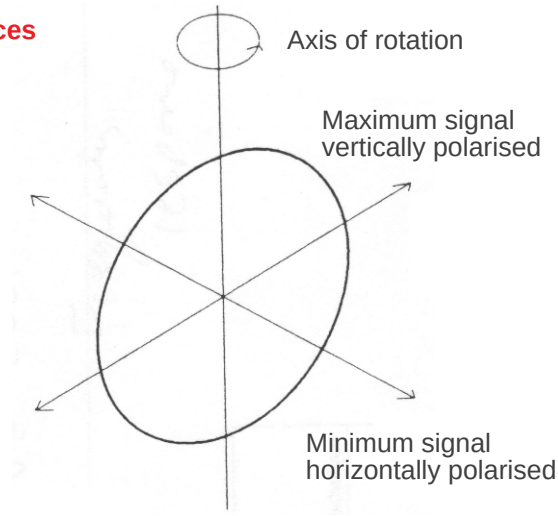
The principle of operation is that an rf voltage appears across the terminals of a loop when it is placed in an electromagnetic field. This voltage is proportional to frequency for a given field strength. Therefore at Very Low Frequencies, the voltage is very small, and requires greater amplification. The new TL Loop uses a unique feedback system to optimise the amplification factor. The method uses a loop constructed of transmission line in which the line is also part of the feedback system. The antenna is broadband and requires no adjustment other than orientation since it has deep broadside nulls for "Vertically polarised ground waves. There is no null in the vertical direction, as with whips, so that short hop high angle sky wave reception and long hop low angle reception can both be excellent. Best results are obtained with a clear site. No radio frequency grounding of the antenna is required.

A perfectly lossless antenna picks up more ambient noise, due to atmospherics, interference, etc., as one goes down in frequency. Such high levels of signal and noise can be considerably attenuated without seriously affecting the overall signal to noise ratio. In other words a smaller less efficient antenna can be used just as effectively coupled with a low noise amplifier. Active antennas therefore do not produce high signal levels but nor do they need to; S/N is what counts. It is preferable that the antenna is positioned vertically, just above ground in an open area. Being an antenna which responds to the magnetic field component, it is highly immune to capacitively coupled local interference which is a common problem of active whips, and local interference can be reduced either by nulling or by relocating the antenna far away.

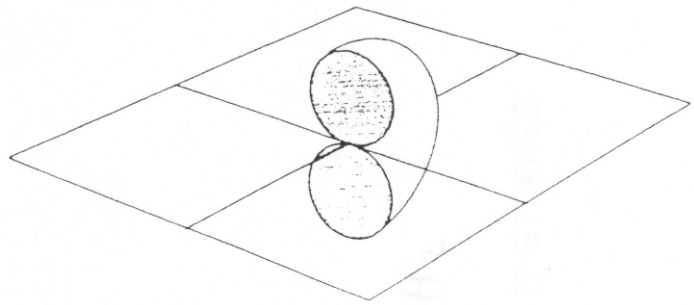
The antenna is highly portable yet may be permanently installed outdoors. Permanent support is easily arranged by attaching the loop to a circular hoop on a short pole. The power requirements are 12V at 50mA. This is fed via the coaxial cable from the receiver using an 'isolating T' section.

## Effective Noise Of AE30-300 (TL Loop) Compared To Typical Noise Sources

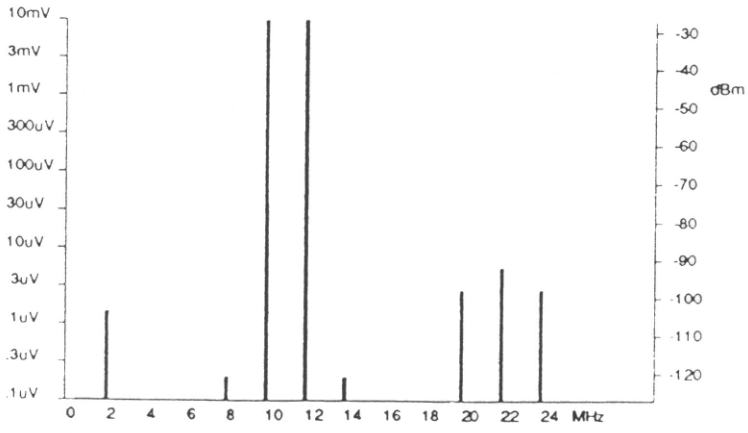


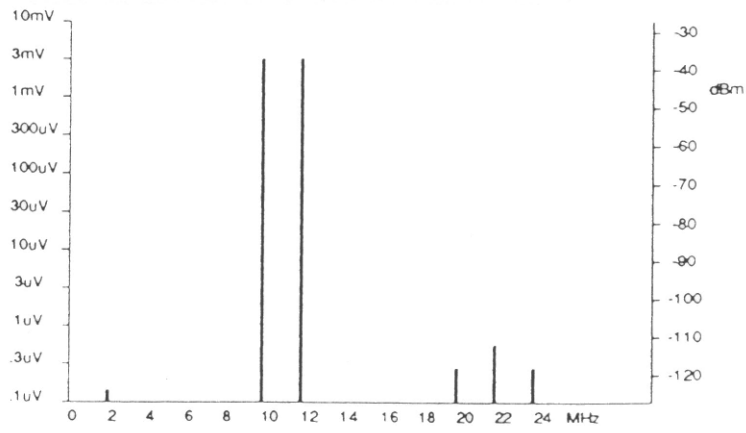

## Vertical Loop & Section Through Doughnut Radiation Pattern In Free Space



## Typical Intermodulation Products At Antenna Output




Two very strong signals at 10 and 12 MHz rarely encountered




Two strong signals at 10 and 12 MHz sometimes encountered

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