The **LFL1010** is a new LF Active magnetic loop antenna developed from the highly acclaimed ALA 1530 Magnetic loop. The LFL 1010 is primarily designed to provide improved performance compared active LF E-Field antennas. Applications include reception of Time and Frequency stations, Sub-marine and other Military Communications, Non-Directional Aero/Marine Beacons (NDBs) and Longwave Broadcasting. The Magnetic loop antenna has been recognised since the early days of LF Radio communication as the only type of antenna that affords key parameters; of directivity and rejection of locally radiated noise and co-channel interference.

Furthermore, this loop antenna has a unique property of also rejecting mains borne/power-line noise. Thus the LFL1010 will deliver a very low noise floor and provide a far higher sensitivity compared to an active LF E-field antenna. 1m dia. Aluminium loop is designed for outdoors, even at ground level. The loop matches directly to the receiver and is primarily designed for use from **10kHz to 500kHz** with an upper frequency of **10MHz** and the LFL1010 is probably the only Commercial Active antenna available to the Radio Enthusiast to provide directional reception of the VLF and MF bands. The LFL1010 is designed to be mounted remotely from the receiver to reduce local interference. The amplifier is fitted in a separate module to reduce mechanical stress on the amplifier and facilitate easy replacement.

- Balanced low impedance Magnetic loop with enhanced performance compared to shielded and Moebius loop types
- Very low intermodulation ensures good performance in a strong signal environment
- Up to 40dB rejection of locally radiated noise compared to active LF E-Field antenna
- Deep nulls to reduce interference
- Ideal for LW/MW with antenna rotator
- Rejects mains borne/power-line noise
- Rugged construction, 1.1m dia. Aluminium loop, supplied with Interface and 12 volt PSU (UK, Europe and N. America) only
- No tuning necessary or matching unit
- No planning problems, works at ground level
- Separate Head Amplifier fits on top of loop to reduce mechanical stress and afford easy replacement.

**MAGNETIC LOOP ANTENNA ADVANTAGE**

The magnetic Loop antenna provides far better signal quality and lower noise compared to an active E-Field (whip) antenna for the following reasons:
The magnetic Loop responds primarily to the magnetic-field, this ensures high rejection of Local Noise **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. The magnetic loop is isolated from the ground and power-line earth noise. Most active E-Field antennas are susceptible to this type of noise.

The 'Figure-of-Eight' directivity pattern of the magnetic loop provides for a further noise reduction, an active E-Field antennas is omni-directional and so picks up more noise. The E-Field is cancelled out by virtue of the loop aperture being very small in terms of wavelength and the phase difference of the balanced loop output is 180 degrees.

**INTERMODULATION**

Some active antennas generate intermodulation products which can appear as spurious signals interfering with reception. This interference or second order intermodulation is caused by non-linearity in the amplifier, producing signals which are the usually the sum and difference of strong Broadcast stations. The LFL 1010 has been specifically designed to reduce intermodulation products to a minimum. The 2nd order and the 3rd order intercept points are typically **+80dBm** (IP2) and **+48dBm** (IP3) 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 a balanced gain optimised broadband amplifier using low noise RF power transistors. 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 LFL1010 is supplied Antenna Interface and a 12 volt regulated power supply. RG58C 50 ohm coaxial feeder cable is recommended for the antenna. The maximum feeder length is 100m. A 1m coax. lead connects the Antenna Interface to the receiver. The LFL1010 should be positioned approximately 5m away from any buildings.

**TECHNICAL INFORMATION**

- **Power consumption:** 12 volts at 120mA
- **Intercept point typically MW band:** 2nd order +80dBm 3rd order +48dBm
- **1dB compression point:** +26dBm
- **Output impedance:** 50 ohms
- **Max. Field strength:** 400V/m or 1.0A/m pulse
- **Output impedance:** 50 ohms BNC

*See Review in the Nov. 2001 SWM*

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