UMB 130

UNIVERSAL MAGNETIC BALUN

The Universal Magnetic Balun. UMB is a receiving antenna Balun with a **9:1** impedance ratio. The feeder winding is isolated from the antenna to reduce mains borne noise and antenna/feeder interaction. The UMB allows for Longwire, dipole and **Terminated Loop** to use a coaxial feeder cable without an antenna tuner. The UMB is specifically designed to reduce Mains Borne Noise such as TVs, by ensuring that the antenna earth return path is isolated from the receiver/mains earth. The UMB solves the problem of providing the antenna/feeder impedance match outside the local interference zone, so that the feed to the receiver is free from interference.

UMB FEATURES

- **Frequency range 100kHz to 30MHz**
- **Up to 20dB reduction in Mains Borne Noise compared to other Longwire Baluns**
- **Up to 40dB noise reduction when used with the Antenna Feeder Isolator AFI 5030**
- **Ideal for LW/MW Terminated Loop, with up to25dB Front-to-Back Ratio**
- **Matches Longwire, dipole, to 50 ohm feeder**
- **Coaxial feeder reduces local interference**
- **Passive with no intermodulation products**
- **BNC socket, epoxy resin construction**
- **Terminal for connection to a separate earth and a static discharge path to earth**

ANTENNAS

Longwire and dipole antennas are simple to build and provide excellent performance. They can work over a wide frequency range and provide good results during fading. The performance of the antenna is also dependant on the impedance match to the feeder. The antenna impedance can vary by a 10:1 ratio over its frequency range, therefore an impedance matching transformer is essential to prevent signal attenuation due to the high feeder cable capacitance of up to 100pF/metre. Most Longwire matching transformers "Baluns" simply match the high antenna impedance to that of a low impedance feeder cable. However, this has one serious drawback, in that the antenna's return path is the receiver/mains earth, resulting in considerable noise pickup. Thus the advantage of placing the Longwire antenna away from the local interference is lost. In order to reduce interference or noise, it is necessary to provide a separate earth or counterpoise that is free from Mains noise. This separate earth/counterpoise also has to be isolated from the receiver/mains earth to reduce Mains Borne Noise.

UMB 130 INSTALLATION

Longwire Antenna: The Longwire and the UMB 130 should be positioned far 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 8-10m above ground level and at least 6m from any buildings. The antenna's length should be a minimum of 12m. The UMB should be placed near the ground at the rear of the garden. Using a sloping or "Inverted L" antenna will ensure that the connection to the earth system will be as short as possible. If the Longwire is supported from the house, then a length of nylon line should used so that the antenna is 5-6m from the house. This will reduce local interference pickup. Where space is limited, a 7-10m vertical aluminium pole with a ground rod or a groundplane of four 3m radials can be used.

A separate earth system can be a 4ft copper earth rod driven into wet ground away from buried Gas Mains, Electricity cables or other Utilities. Alternatively a counterpoise can be used consisting a single or series of wires spread out at near ground level under the long wire antenna. Both earth systems should be tried to achieve the lowest noise level. **The antenna and earth can be connected to either Terminal of UMB .**

Dipole antennas: The UMB can be used with a horizontal dipole to provide a broadband match to a 50 ohm feeder. The dipole is connected to the Terminal Posts of the UMB. The dipole should be at least 8 -10m high and 10 -20m long. This configuration should provide excellent short-wave reception. However medium/long wave signals will have reduced strength. The UMB can also be used for the T2FD, 8-10m vertical dipole and a LW and MW directional Terminated Loop providing up to a 25dB Front-to-Back ratio.

Feeder: Up to 50m of RG58 50Ω coax cable.
The feeder connector should be wrapped with self-amalgamating tape to make the connection waterproof.
Where a further reduction in Mains borne noise is required, then the Antenna Feeder Isolator **AFI 5030** is recommended to be inserted at the receiver end of the feeder cable.

Note: 1) Ensure that the feeder screen at the radio receiver is earthed so that there is a static discharge path to earth.

2) Do not let the UMB 130 take the strain of the antenna. i.e. nylon cord should be used to hold the antenna wire at the UMB 130.

WARNING: **The UMB must not be used with a transmitter or a transceiver.**
Do not allow the antenna into contact with overhead power lines.

Size: 20 x 40 x40 mm plus BNC socket and Terminal Posts.

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UMB130M.doc

Design/specification subject to change without notice.

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