

UNIVERSAL MAGNETIC BALUN T2FD

The **Universal Magnetic Balun. UMB T2FD** is a receiving antenna Balun with a **9:1** impedance ratio, and an integral 500 ohm 5W Thick Film termination resistor. This Balun is specifically designed to simplify the construction of the T2FD antenna. Using this Balun removes the problems faced by the constructor of having to wind the Balun and provide a separate termination resistor and encapsulate the two assemblies. A high power termination resistor is used, because it is less likely to be damaged by electrical storms. The feeder winding is also isolated from the antenna to reduce mains borne noise and antenna/feeder interaction. The **T2FD** antenna uses a coaxial feeder cable without an antenna tuner. Low noise performance is assured because there is no antenna return path to mains earth. This reduces Mains Borne Noise such as TVs, etc. The T2FD 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 T2FD FEATURES

- Simplified antenna construction
- Frequency range 3MHz to 30MHz
- Coaxial feeder reduces local interference
- Broadband match using 9:1 impedance ratio
- Lower noise level than Longwire antenna
- Static discharge path to earth
- BNC socket, resin encapsulation
- Terminals for integral 500 ohm Termination resistor

T2FD ANTENNA

This antenna was originally designed in the late forties and has been used by the US military and other professional organisations. The T2FD can be constructed for any frequency in the HF bands. There is however the practical limit of antenna height and length when considering its' use on the lower frequencies. Most published design data is based on the T2FD being used as a transmitting antenna. However, for reception purposes a small loss in efficiency will allow the antenna to work at half the lowest design frequency, thereby increasing the bandwidth to an 8:1 ratio. The T2FD is designed using simple formula; The overall length in metres is $100/f$ MHz and the wire spacing in metres is $3/f$ MHz. Where f is the lowest frequency of operation. It is important to note that this formula is the same as used for a transmitting T2FD. For example a transmitting T2FD antenna designed for 8MHz will work satisfactorily up to 30MHz and down to 4MHz for reception. Therefore, by using the above formula the overall length will be $100/8 = 12.5m$ and the spacing will be $3/8 = 0.375m$. The T2FD when mounted at an angle of 30 degrees will provide an omni-directional response with low noise. The antennas' sensitivity to frequencies lower than half the design optimum is reduced. In some cases this reduced sensitivity on the lower frequencies may be an advantage in preventing the receiver from being over loaded by strong medium and long wave signals.

Feeder: Up to 50m of RG58 50Ω coaxial cable.

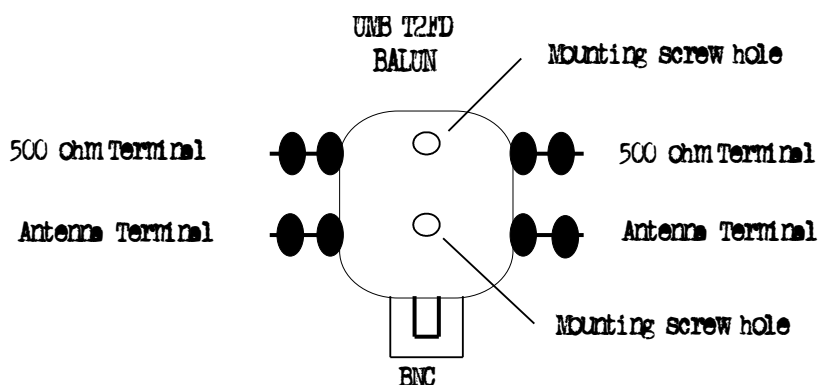
The feeder connector should be wrapped with self-amalgamating tape to make the connection waterproof.

Where Mains borne noise is a serious problem and the feeder is radiating noise back to the antenna, 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.

WARNING: The UMB T2FD must not be used with a transmitter or a transceiver.
Do not allow the antenna into contact with overhead power lines.
Take extra care to avoid injury when erecting antennas.

Size: 25 x 50 x70 mm plus BNC socket and 4 Terminal Posts.



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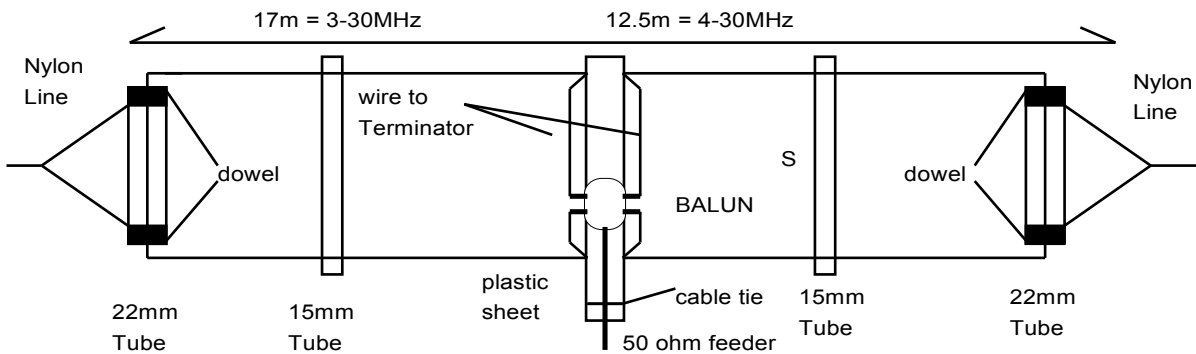
Design/specification subject to change

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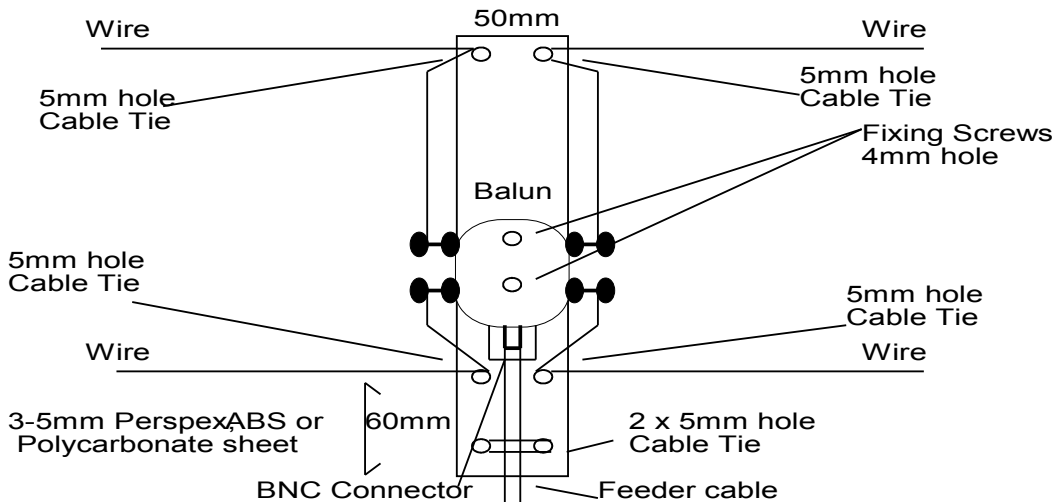
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CONSTRUCTIONAL SUGGESTIONS

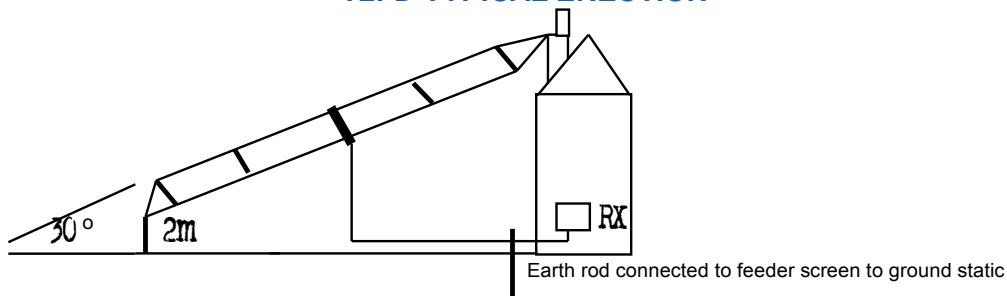


S= Spacing = 3MHz = 0.5m S= Spacing = 4MHz = 0.375m



The tube is polypropylene as used for plumbing. Alternatively a similar size ABS tube can be used. The tube is drilled to take the wire as shown. The intermediate 15mm spreader can be held in position by cable ties either side of the tube. The ends of the 22mm tube have a 25mm length of hard wood dowel securely fitted with 2 brass screws. A small hole drilled into the dowel allows the antenna wire through. The entrance hole in the dowel should be opened up to increase the wire bending radius to reduce stress on the wire. The dowel is necessary to prevent the antenna wire cutting into the tube. The plastic sheet is 50mm wide and there should be an additional 60mm length to allow the feeder cable to be tied so that the cable connector at the Balun is not strained. The Balun is secured to the plastic sheet using 4mm brass or stainless steel screws with a washer on the screw and nut. The total antenna wire required is 2 x antenna length plus 2m. The recommended antenna wire is Hard drawn 16 SWG copper. This cable is available from **Henry Westlake (01409 253758)** together with 50 ohm feeder cable and BNC connectors. When the antenna is assembled, ensure all the cable ties are all pulled tight so that the antenna wire does not put unnecessary strain on the Balun. Also ensure that the terminals on the Balun are tight (do not overtighten) and smear a small amount of *Vaseline* to prevent the terminals from seizing up.

T2FD TYPICAL ERECTION



The assembled T2FD must be supported by strong Nylon or polypropylene line. Also lower noise performance will be possible if the antenna is placed as far as possible from the house or building where there is electrical noise.