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TZ-WD-80 Low Band Wire Dipole Installation Manual

The TZ-WD-80 is a trapped dipole antenna for the 80m amateur bands. The antenna has two (2) wire elements for the 80m band. The antenna can be configured in a dipole formation or an inverted Vee formation although the lengths of the elements may need to be altered to achieve an acceptable VSWR. All hardware supplied is stainless steel to cope with aggressive environmental conditions except for the mounting eye bolt which is galvanised steel.

The antenna can be mounted and configured as a dipole or an inverted vee. For an inverted vee configuration use the supplied balun, with integral eyebolt as the support for the centre of the antenna. When used in a dipole configuration, be sure to support the coaxial cable at the feed. RG-58 is recommended for such an installation as the weight of RG-8 or RG-213 will be too heavy and place too much strain on the radiating element.

The antenna may be mounted on a separate tower or mast to other HF antennas or mounted on the same tower or support as your 10/15/20m tri-bander or other antenna.

Due to the wide variation of installation types and heights the antenna is supplied with elements that are cut too long for the 80m band. The user may trim or coil excess length at the end of the antenna so that if the installation is changed or the main frequency of operation is changed, the antenna can be re-resonated.

When mounted at a height of 100ft or more, for instance using very high trees, the antenna will have excellent performance for DX contacts.

Supplied Equipment

The following equipment and/or facilities are supplied with the TZ-WD-80 antenna:

Radiating element:	Radiating section – 2 by 21m lengths of 2.5mm^2 electrical wire.
Balun	(1) 1:1 high Power HF Balun, optimized for 3.5 MHz performance.
End Eyelets	(2) Two nylon thimbles to use as end insulators.
Instruction Manual	This document.

Guidance for all installation types

To assist with corrosion protection for the RF connectors and radiating element connection, a layer of plastic insulation tape followed by a layer of self-amalgamating tape (bhutal rubber) tape may be used. The electrical tape assists in making removal of the self-amalgamating tape easier when maintenance is required. Use drip loops to form a single coil of cable that assists with corrosion protection and provides stress relief for the RF coaxial feeder. Do not over tighten the radiating element connection terminal nuts. Use only enough torque to cause the spring washers to “flatten”. Further torque may crack the internal lock tight adhesive making later removal of the balun difficult. Simply “nip up’ the nuts just past finger tight.

Tools Required for Assembly and Tuning.

The following tools are required to assemble the TZ-RD-3w antenna:

a. Long nose pliers,

b. Wire Cutters,

c. Heat gun, and

d. VSWR Meter or antenna analyser.

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Warning Electrocution Hazard

When installing this antenna be sure not to come into contact with overhead electrical power lines which may not be insulated. Contact with uninsulated overhead powerlines whilst installing or operating this antenna may lead to ***serious injury*** or ***death***. DO NOT INSTALL this antenna in a location where mechanical failure of the support or antenna may allow the antenna or support structure to fall onto or come into contact with overhead electrical power lines.

Check the supplied parts.

Locate all the components and check that all hardware has been supplied with your antenna. If any item is missing please contact RippleTech Electronics for a replacement item, info@rippletech.com.au or contact your local agent or supplier.

Assembling the antenna.

Layout the antenna on the ground. Measure the length of the antenna and adjust to the lengths given in Table 1 – Typical Radiating Element Lengths**.** These values should be used as guidance only. The higher the antenna is installed the longer the elements needs to be.

When installed in an inverted vee configuration the length of the antenna will slightly shorter.

Wrap the wire ends over the end thimbles and temporarily secure in place. Raise the antenna to height and check the VSWR prior to trimming the antenna. Once the VSWR is dipped at the desired point, by wrapping more wire in a coil at the end of the antenna, then and only then, cut the antenna to length, leaving around 15 – 20 cm excess as a safety excess which can be wound around the element wire without any performance degradation.

Typical Activity	Resonant Frequency (MHz)	Typical Upper Frequency (MHz)	Typical lower Frequency (MHz)	Length
CW Dxing & Rag-chewing	3.550 MHz	3.650 MHz	3.500 MHz	20.25 m, (66’ 6” ft/in)
Phone Ragchewing	3.600 MHz	3.700 MHz	3.500 MHz	20.0 m, (65’ 7” ft/in)
Phone DX/Chat Compromise	3.700 MHz	3.800 MHz	3.600 MHz	19.4 m, (64’ 4” ft/in)
Phone DXing	3.800 MHz	3.650 MHz	3.850 MHz	19.1 m, (62’ 6” ft/in)

Table 1 – Typical Radiating Element Lengths

Normally, a good match can be achieved by altering the radiating element length.

If difficulties are encountered use an antenna analyser to measure the input impedance of the antenna. This is best achieved using a ½ wavelength feeder cable or RG-58 or RG-8 (RG213). Refer to Table 2 - 1/2 Wavelength Feeder Cable Lengths (Velocity Factor 0.66), which details the length of cable required for the intended use of your antenna. Using a ½ wavelength (or full wavelength) of cable ensures that the antenna analyser readout is correct for both magnitude and phase of the input impedance, i.e. the real and imaginary components are correct.

Once the correct length of wire for your installation has been determined you may then trim the radiating element to the correct length, to achieve the best VSWR. Use the supplied cable ties to neatly hold the radiating element in place around the thimble. Alternatively, the wire may simply be left in position, secured in place by cable ties, so that the

antenna may be tuned for another frequency in the future, or if the tower antenna configuration is altered, the 80m sloper can be re-tuned. Refer to Figure 1 - Wrapping Excess Cable Method, for guidance on the wrapping method most appropriate. Use the supplied heatshrink to cover the cable ties and wrapped cable to secure everything in place and create a strong, secure and neat installation.

Note for good performance, the VSWR of the 80m dipole does not need to be better than 2.0:1. A suitable ATU can be used to provide an acceptable match for your transceiver or amplifier and the radiation pattern and efficiency of the antenna will not be noticeably degraded. However, with time and persistence a good wide-band VSWR, less than 1.5:1 can be achieved.

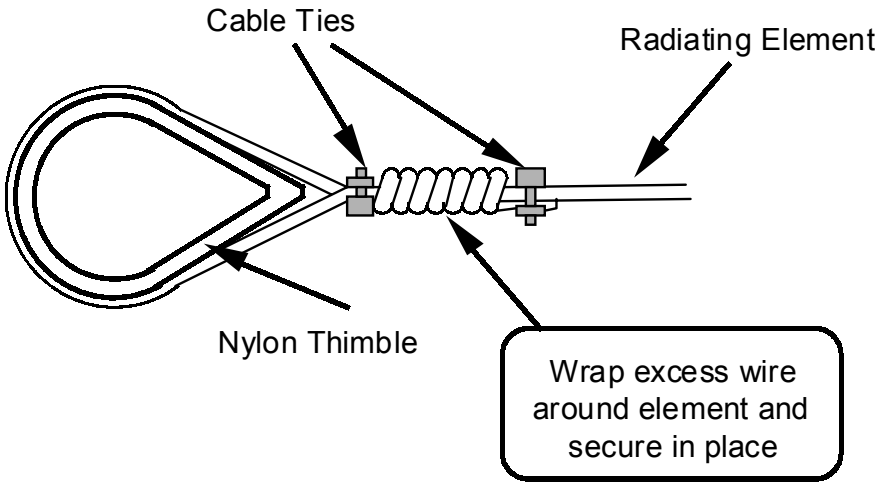

Figure 1 - Wrapping Excess Cable Method

Alter the configuration of the radiating element to achieve the best VSWR. This may involve raising or lowering the feed point, the length of the radiating element, or a combination of both.

Normally, a good match can be achieved by altering the radiating element length. However, if a good match cannot be achieved, altering the height of the antenna or configuring the antenna as an inverted Vee may assist. If difficulties are encountered use an antenna analyser to measure the input impedance of the antenna.

Frequency (MHz)	Cable Length (m)	Cable Length (ft & inches)	
3.50	28.00	91	10
3.55	27.61	90	7
3.60	27.23	89	4
3.65	26.85	88	1
3.70	26.49	86	11
3.75	26.14	85	9
3.80	25.79	84	7
3.85	25.46	83	6
3.90	25.13	82	5
3.95	24.81	81	5
4.00	24.50	80	5

Table 2 - 1/2 Wavelength Feeder Cable Lengths (Velocity Factor 0.66)

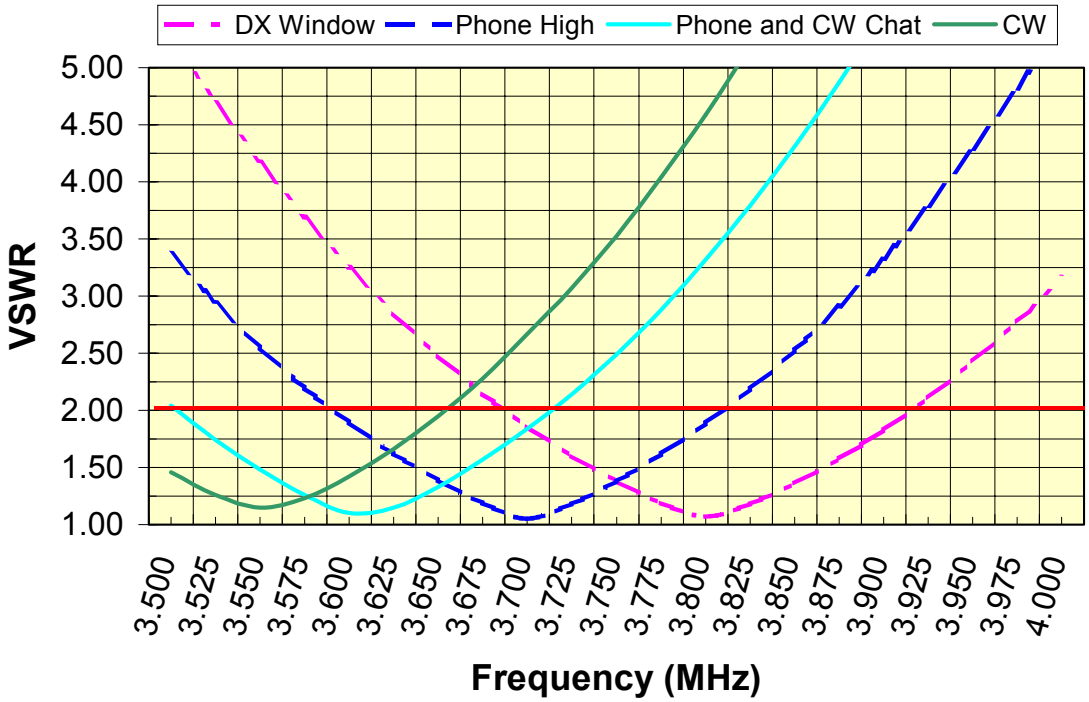

Figure 2 – Typical TZ-80-1 VSWR Plot

Specifications

Type	Wire Dipole.
Frequency Range	Adjustable 3.500 to 3.800 MHz.
Bandwidth	80m 150 kHz (2.0 : 1 VSWR limit).
Input Impedance	Nominally 50 ohm.
Radiation polarisation	Horizontal mounting
Gain	0 dBd, 17m
Directivity	Up to 2.14 dBi.
Front to Back	Not Applicable.
Power Handling	1000 Watts PEP
Total Weight	2.5 kg.
Overall Length	21.0 m
Wind Survival	150 km/h