

***87.5 TO 108.0 MHz TUNED BAND II
CIRCULAR / MIXED ANTENNA***



1. INTRODUCTION



Please read this manual carefully. To avoid harmful interference to other users of the electromagnetic spectrum, do not power up the antenna until it is properly installed.

1.1. General Information

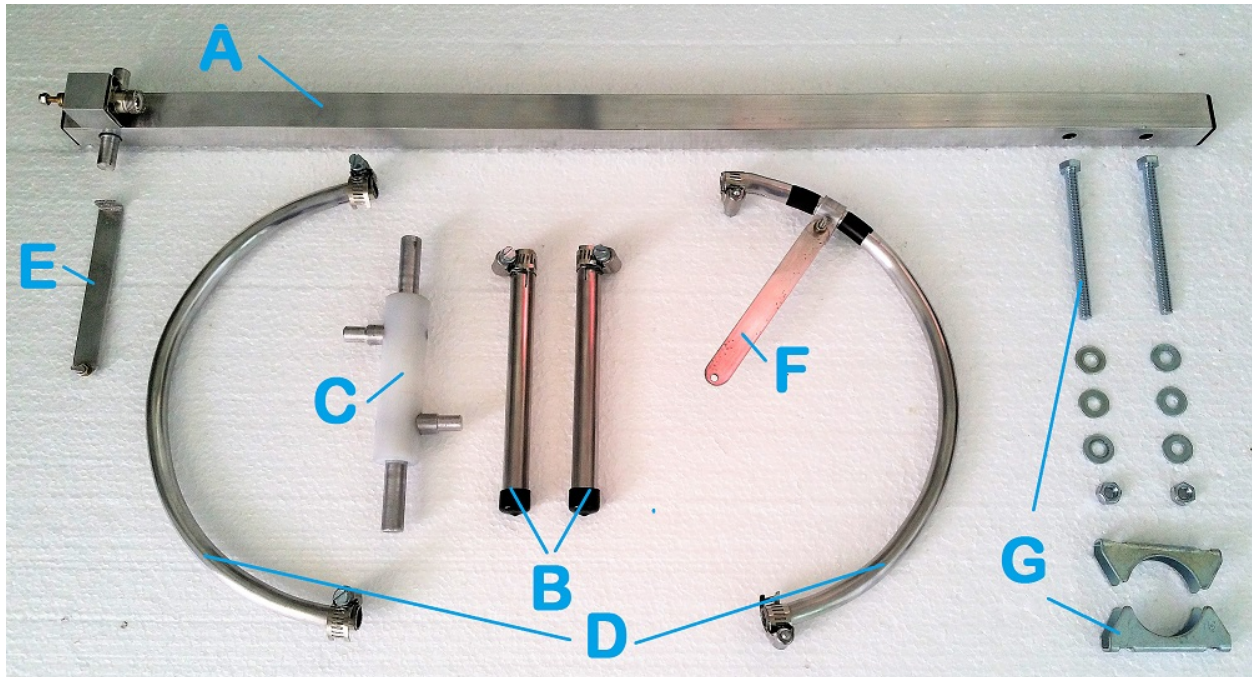
The antenna is the most important part of the transmission system and must be correctly installed before any transmission equipment is connected.

1.2. Unpacking and checking

The package should contain the following:

- A. Boom
- B. 2 x Vertical Dipole Sections and 2 x Tube Clips
- C. Teflon Support Insulator and Horizontal and Vertical Dipole Pegs
- D. 2 x Horizontal Dipole Sections and 4 x Tube Clips
- E. Feed Point Section 1
- F. Feed Point Section 2 clamped to 1 Horizontal Dipole Section
- G. Mounting Clamp

Also a mast clamp is included not shown in the image below



Verify that the parts are there and are in good condition and have not been damaged during transport. In case of loss or damage please contact at info@aareff.com

1.3. Warranty

This product can only be installed and serviced by suitably qualified personnel. If difficulties arise during the installation please contact us by email at info@aareff.com

1.4. User Safety Responsibility

You are responsible for selecting the correct antenna for your application, installing it properly and ensuring the system maintenance.

1.5. Installation Near To Power Lines



Following is a list of precautions to follow when installing the antenna if placement of antenna and cables is anywhere near power lines

- Erect antenna on pole, mast or tower as far away as possible from the power lines.
- Avoid crossing antenna cables under electrical power lines
- Do not attach antennas to towers, poles or similar structures carrying electrical power lines.
- If you are not experienced in installation of antennas, have experienced persons assist you
- During installation, tie off antenna with a rope so if it falls it can be diverted away from the power lines.
- Avoid fastening antennas, especially self-supporting types, to old chimneys or to any chimney not designed to take such stress. Forces created by a strong wind may be sufficient to topple both chimney and antenna.
- Make sure antennas have been properly grounded and provided with other necessary lightning protection

1.6. Radio Frequency Radiation to Personnel



Under no circumstances should the antenna be mounted and used at ground level or within a few meters of personnel.

Ideally this antenna should be mounted 20 meters high and clear of any surrounding objects to get maximum range and more importantly to reduce risk of radio frequency radiation to personnel. When mounted at 20 meters in height off ground and using 800 watts of transmitter power, power flux density measurements made at ground level

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directly under the antenna show less than 2 W/m². Several European countries use a value for the power flux density of 10 W/m² as a basis for considering whether or not an area is safe. The issue of radio frequency radiation limits is a contentious one and work in this field is continuing worldwide.

1.7. Electromagnetic Compatibility

When writing this manual there was no EU directive regarding the EMC compatibility of Band II VHF broadcast antennas, however in our view there are some potential EMC compatibility issues that need to be addressed when installing this antenna system. On completion of the antenna installation check;

- All the cables entering the connectors are tight and properly crimped or soldered
- All the connectors are screwed in tight and sound.
- PVC insulation tape and/or self amalgamating tape are wrapped around all the connectors to stop water entering the connector and the inside of the body of the cable.

If any cables are loose or there are bad connections this can cause some non-linear resistance, diode action or some small arcing. When this happens it creates EMC disturbance (arcing and crackling sound) across a wide frequency spectrum.

1.8. Intended Use

This antenna is intended for use with an FM broadcasting transmitter up to 800 watts at a permanently pre-defined location with a license or authorisation from the radio spectrum regulator of your country.

2. SPECIFICATION AND DESIGN

Gain	-0.8 dBi at tuned frequency
Frequency	Tuned to order between 87.5 and 108 MHz
Bandwidth	0.5 MHz for SWR of 1.5
SWR	1.2 Max at tuned frequency
Max Power	800 Watts
Construction	Aluminium and Teflon
Connector	UHF/SO-239 or N-Type
Input Z	50 ohm unbalanced
Polarisation	Mixed / Circular
Weight	2Kg

The design uses a half a horizontal dipole and half a vertical dipole, collectively this produces horizontal and vertical polarisation mixed together know as mixed or circular polarisation. There are no coils or capacitors in this design. Every connection is direct metal to metal. The power is only limited by the RF connector which is around 800 watts. All parts of the antenna have a solid connection to ground making it safer to use in areas with storms and lightning.

3. TOOLS AND OTHER ITEMS NEEDED

- PVC insulation tape and/or Self Amalgamating Tape
- 13mm Spanner or Socket and Wrench
- 7mm Spanner or Socket and Wrench
- 5.5mm Spanner or Socket and Wrench
- Flat Screwdriver
- Mounting mast or pole with a diameter of 40mm or less
- Antenna 50 ohm feeder cable, normally this is LMR400

4. ASSEMBLING THE ANTENNA

Using the parts in section 1.2 of this user manual to assemble the antenna as shown in the image of the next page.

Points G and H

The horizontal dipole sections should be pushed in to the boom section at points G and H. Make sure they are pushed in all the way. Tighten the tube clips, but not fully, the tubes should still move at this stage.

Points B and C

The vertical dipole sections should be fitted to the Teflon insulator and the tube clips full tightend at points B and C. These should be tight and vertical dipole sections should not be loose or wobbling.

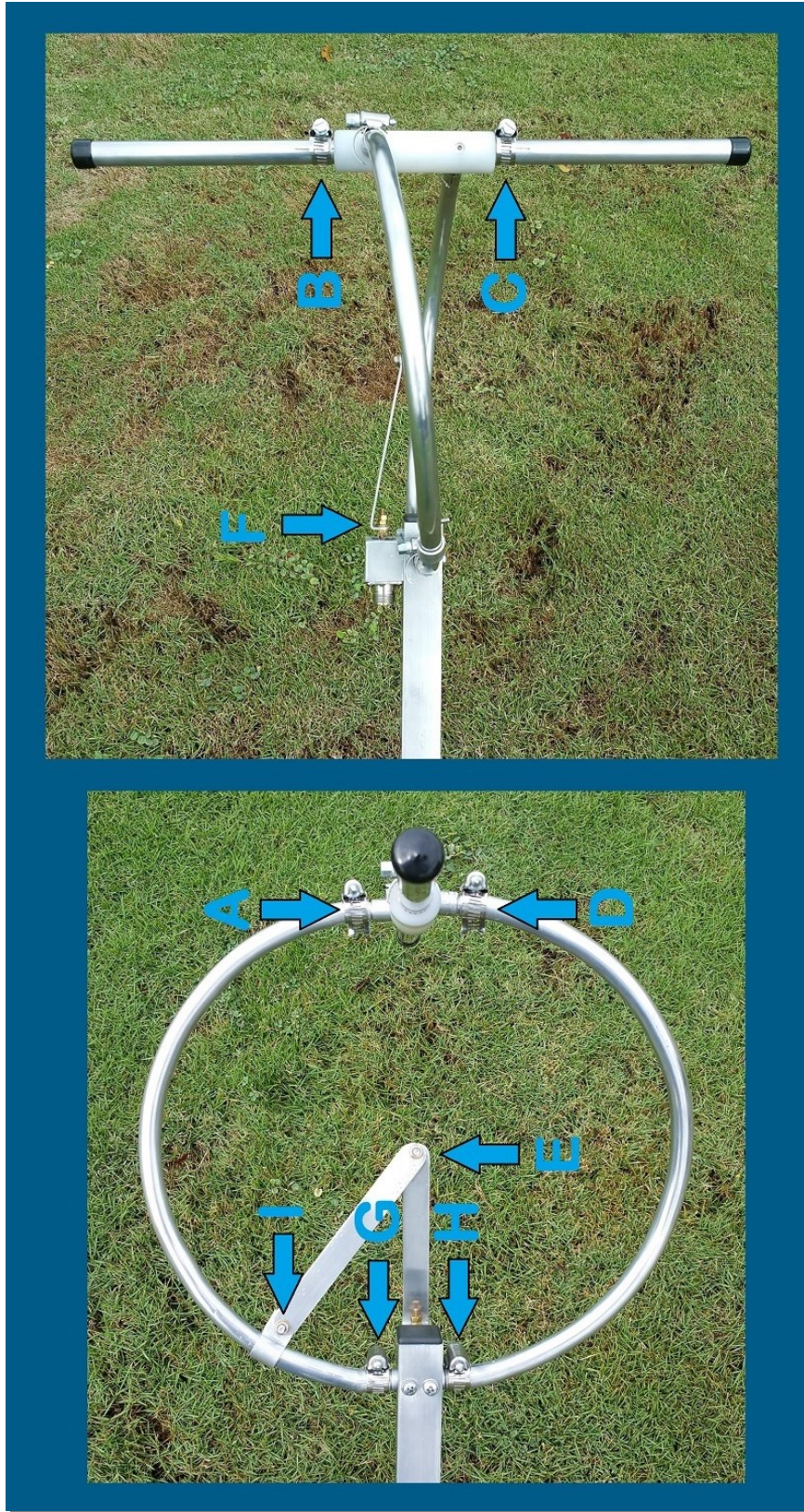
Points A and D

The teflon insulator with the vertical dipole sections should now be connected to horizontal dipole sections and points A and D. Tighten the tube clips, but not fully, the tubes should still move at this stage.

Point F

Connect feed point section 1 to the brass socket section on the boom. There are 2 x M4 brass nuts to hold this in place. Tighten but not fully yet, allow a little movement.

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Point E

Connect feed point section 1 to feed point section 2 using the M3 nut and screw. Again tighten but not fully yet, allow a little movement.

Okay the antenna is now assembled in loose form, if it is really loose and floppy, tighten all the screws a little more, but it still needs to move a little.

Move the sections so that the horizontal sections are really horizontal and the vertical sections are at exactly 90 degrees to the horizontal sections which should be perfectly vertical. When you have done this and it all looks to be orientated correctly with vertical and horizontal sections at 90 degrees to each other, then start to tighten up the tube clips really tight so that horizontal dipole sections cannot move.

At point F there are 2 brass nuts, the first one should tighten the feed point section so that it doesn't move. The second brass nut should tighten on to the first brass nut to make sure that does not move and stays locked in place, this is a lock nut.

The M3 nuts are screws at point E and I should be real tight, these feed point sections may carry 800W, so good tight connections are needed.

5. CONNECTING THE ANTENNA



An incorrect antenna installation can cause RF burns and levels of RF exposure above the recommended limits for personnel

Under NO CIRCUMSTANCES should the antenna be mounted and used at ground level or within a few meters of personnel.

Ensure that all antenna connections to the transmitter or power amplifier are sound, this is important as poor connections and soldered joints can cause RF burns to personnel, severe noise to the transmission and excessive RF bandwidth

6. MAINTENANCE

Because antennas are passive devices maintenance requirements are low, however don't accept low as being none existent, some periodic inspections are required.

Antenna Inspection List;

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- Check antenna is still rigid and tight on tower, mast or pole and vertical tubes are still exactly vertical as opposed to twisted and slanted.
- The PVC tape insulation or self amalgamating tape still covers all the connectors properly and the connectors remain tight.
- The antenna feeder cable (normally LMR400) continues to be held rigid to the boom, tower, mast or pole.

Always following a heavy storm or extreme weather condition an inspection should be done and as shown in the table below.

WEEK	ENVIRONMENTS		
	Heavy Duty Tower	Light Duty Tower	Building Roof
13			✓
26		✓	✓
39			✓
52	✓	✓	✓

6. LEGAL ADVICE

We sell this equipment to professionals and organizations in good faith it will be used correctly and legally. Most countries in the world require licensing for this antenna to be used with a transmitter. It is the customer's responsibility to check relevant laws, directives, regulations and licensing requirements before putting this product into service with an antenna system. You, the customer or user agree to defend, indemnify and hold harmless Aareff Systems Limited, its employees and agents, from and against any claims, actions or demands, including without limitation legal and accounting fees, alleging or resulting from improper or unlawful use of this equipment.



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