

Mad Dog Coils “Big Dog” – User Guide

High-quality HF antenna loading coil, developed and hand built in Australia by Marty Nelson VK4KC. The Big Dog is designed and built to be paired with the Chameleon SS25 which is a 25 ft telescopic whip. The coil has greater wall thickness of the threaded riser and end caps to be able to handle the weight and wind loading of the SS25 whip. The 2 inch diameter of the coil is twice that of the 80 and 40 models. It has a BNC socket feed point and adjustable collar that slides up and down the stainless steel wire wrapped former to change the coil impedance.

The top and bottom mounting hardware are 3/8- 24 TPI UNF threaded bolts. The lower end cap also contains the BNC feed-point and banana plug sockets and can be unscrewed after removed the small fastening screw.

Notes:

- The upper end cap must not be unscrewed as there is an internal electrical connection from the coil to the bolt.
- When attaching the coil to antenna whips and tripods, etc, do not over tighten. Generally for stationary portable operation finger-tight is suitable.

Setup

There are two suggested ways the antenna can be mounted.

1. The lower bolt can be connected to a ground spike or a tripod that keeps the coil low to the ground (less than 300mm or about a foot). Multiple ground radial wires (suggest 10 at 4.5 metres) need to be spread out from the ground socket to create a ground plane.

2. Mount the coil on top of a tripod at a height of 1 to 1.5 metres. Multiple ground radial wires (suggest 10 at 4.5 metres) need to be spread out from the ground socket to create a ground plane.

Note: Strong winds can easily cause a tripod to fall over. Care should be taken to anchor or weigh down the tripod to counter the effect of strong winds. A heavy duty tripod is recommended. If the antenna does fall it will most likely be the antenna whip that gets damaged rather than the coil. With wind speeds greater than 30km/hr (18.6 m/hr) care should be taken and recommend that extendable whips be shortened to handle the wind load.

Tuning

Tuning will need to be done each time the coil is setup. With the Chameleon SS25 whip fully extended tuning from the 160 through 40 meter bands is done of moving the collar up and down the coil former. You can also fine tune by moving the whip in an out and ground radial wire placement. A good SWR reading of 1:1.7 or less should be achievable. For the 30 to 10 meters bands, plug the link cable upper banana plug in the coil by-pass socket and move the whip in or out to tune to the desired frequency. Ground radial wire placement will also affect tuning. (See table on next page)

More than one tuning collar can be used. To add or remove a tuning collar first remove the wing nut and washer, expand the collar so it just slides over the bottom or top end cap and then replace the washer and wing nut.

Ground Radial Wires

With my experiments I commonly used three bunches of 3 wires at 4.5 metres (about 17ft) in length. Each bunch soldered to a banana plug. The banana plugs I use can be plugged into each other. The position the wires are placed as well as if they are fully extend or some bunched up will all affect the SWR, Impedance and Reactance. Ideally you want to keep SWR as low as possible, certainly below 1:2, Impedance close to 50 ohms, and reactance as close to 0 as possible. Experiment to get best results for the location you are setup in. (See table on next page)

Bypassing the feed point

There may be times when you do not want to use the feed point and desire to bypass it. To do this you need to make an electrical connection from the collar to the ring terminal banana plug socket on the lower end cap (lower by-pass socket). This will bring the lower bolt into the circuit so that from the lower bolt to the top bolt via the collar you have the coil inductor electrically connected between them, bypassing the feed point.

Tuning using 9 ground radial wires, each at 4.5 meters (17 ft) with SS25 whip								
Band	Coil low to ground				Coil 1.2 meters above ground			
	SWR	Impedance	Reactance	Coil Used	SWR	Impedance	Reactance	Coil Used
160	1.1	44	5	Yes	1.1	52	8	Yes
80	1.0	51	3	Yes	1.3	56	12	Yes
40	1.0	48	2	Yes	1.1	53	7	Yes
30	1.1	47	4	Bypassed	1.2	40	6	Bypassed
20	1.0	45	0	Bypassed	1.1	54	5	Bypassed
17	1.3	61	9	Bypassed	1.0	47	2	Bypassed
15	1.2	41	6	Bypassed	1.1	51	4	Bypassed
12	1.2	43	8	Bypassed	1.2	43	10	Bypassed
10	1.7	64	30	Bypassed	2.0	84	32	Bypassed

Power Rating

SSB: 100 W

CW: 75 W

AM/FM/Digital: 50 W

Internal Electrical Connections

BNC centre pin connected to antenna coil socket

BNC Ground connected to ground socket

Upper former coil wire connected to upper bolt/coupler nut

Design and Construction

There is nothing new about coils. There are many manufacturers providing similar products. I have been working on this particular design using irrigation piping for many years, making many prototypes to perfect the design. I test the coils regularly in the field and have completed over 350 POTA park activations with most of them using Mad Dog Coil products.

The standout features with Mad Dog Coils are:

- Power capability for QRO operation.
- Feed point built into the coil assembly.
- Rigidity and strength.

Specifications

Overall length (including top coupler nut): 390 mm.

Coil diameter: 60 mm.

Coil wire along with top and bottom bolt/nut hardware is 304 grade Stainless Steel.

Number of turns: 100

Weight: 0.87kg

Coil inductance: 137 uH

Warranty

Products manufactured and sold by Mad Dog Coils are warranted for 1 year from the date of purchase. Customer pays for shipping of replacement product.

* Disclaimer *

It should be noted that the Mad Dog Coils should only be used in accordance to our specifications and within our stipulated intended use. All details of intended use are detailed in this document that is shipped with the product. We accept no liabilities for such uses outside of our intended use and stipulations. It is recommended due to the weight of the Big Dog and SS25 telescopic whip that the setup is only used in vertical configuration and not as a dipole or v-dipole.

I hope you get many years of use and enjoyment out of your Mad Dog Coils product.

73' Marty VK4KC the Mad Dog!

