The Ramsey DA25 for SIGINT Applications

Prerequisite Reading

Download the *Ramsey Electronics DA25 Discone Antenna* PDF (353k) manual at:
http://www.ramseyelectronics.com/downloads/manuals/DA25.pdf

Introduction

The *Ramsey Electronics DA25 Discone Antenna* is a beautiful (and cheap) broadband microwave antenna which can be used for omnidirectional transmitting or receiving of frequencies between 450 and 2500 MHz. This means that the antenna is ideal for Signal Intelligence (SIGINT) applications in our favorite bands – the 900 and 2400 MHz cordless phone bands!

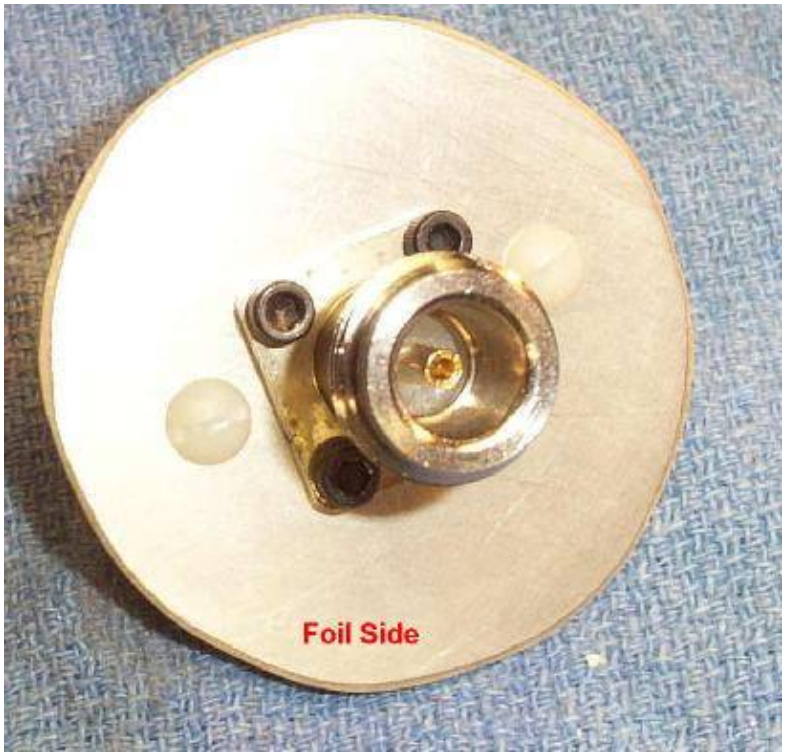
Although the antenna works fine out–of–the–box, there are a few tweaks one may want to perform to increase the antenna's performance and usability.

Overview of the two major components of the DA25 antenna. The large "cone" is actually part of a 3 quart tin−plated funnel and the top "disk" is actually a 7−1/2 inch tin−plated pie plate. You'll notice that I cut the pie plate's sloping edge off, leaving a flat disk 7−1/2 inches in diameter. The funnel cone is 1−1/2 inches diameter on the narrow end (top), 9 inches diameter on the wide end (bottom), and 6−1/2 inches high.

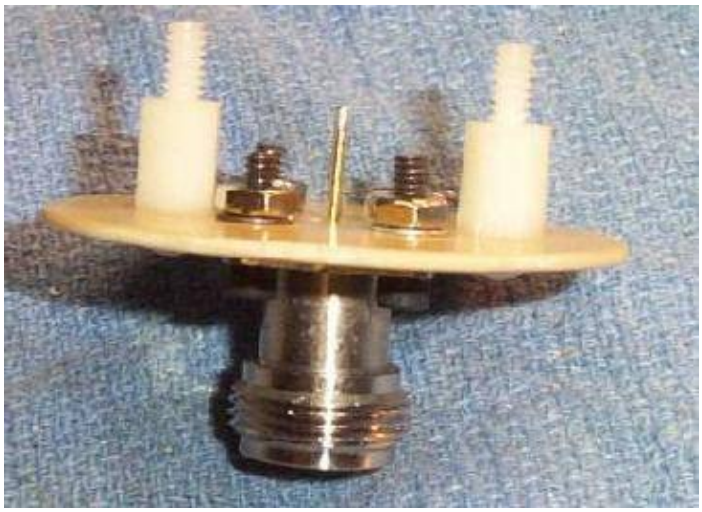
Overview of the antenna's mounting hardware. The support disk (DCA2 in the manual) is a 2" diameter piece of 1/16", single−sided FR4 PC board with three holes drilled for mounting the nylon hardware, which is used to support the top disk.

The center hole is for passing the center conductor of the coaxial cable, which connects to the top disk. When soldered correctly, the coax's shield (ground) will be connected to the cone section of the antenna (via the support disk), and the coax's center conductor will connect to the top disk. The nylon hardware prevents the two sections from shorting together. The modification here is to replace the direct, soldered coax connection with a N–connector jack.

Also shown, is the new N–connector that will be mounted to the antenna. This will allow one to quickly disconnect the coaxial cable connection to the antenna. The N–connectors shown where pulled from old satellite gear. A suitable N–connector jack is available from *Surplus Sales of Nebraska*, http://www.surplussales.com, part number (CRF)SL203.

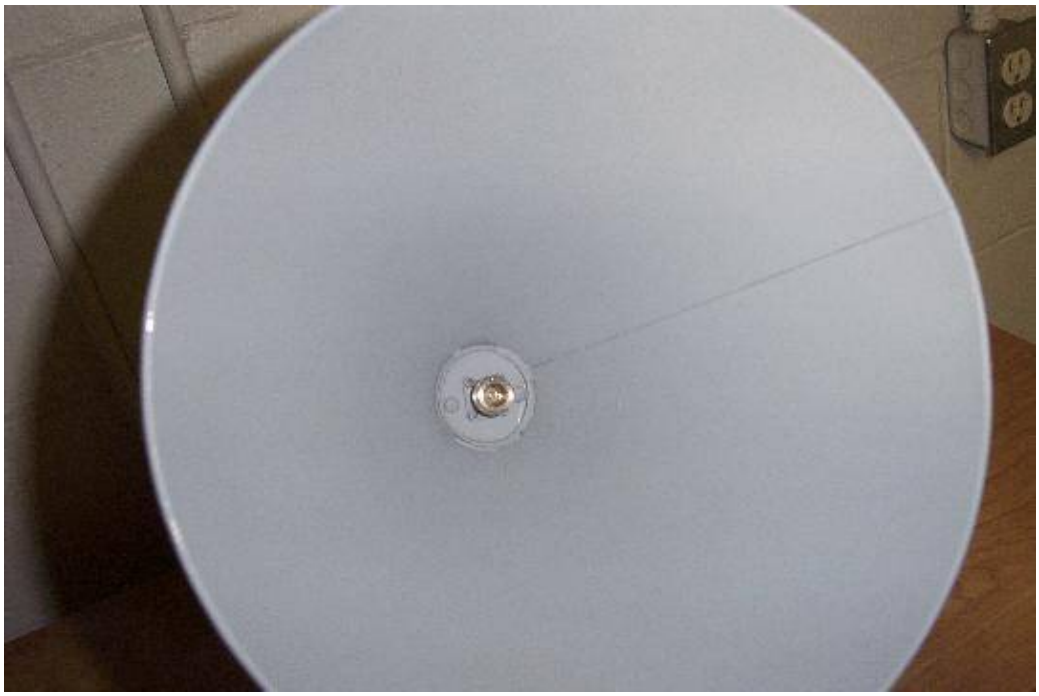


This is the new 2" diameter support piece. It's also made from a 2" diameter piece of 1/16", single–sided FR4 PC board material. Four 7/64" holes where drilled for mounting the N–connector, with the center hole being 11/64" in diameter. The new holes for the nylon mounted hardware where made off to the sides. They don't line up with the pre–punched holes in the top disk, so you'll have to drill them out.



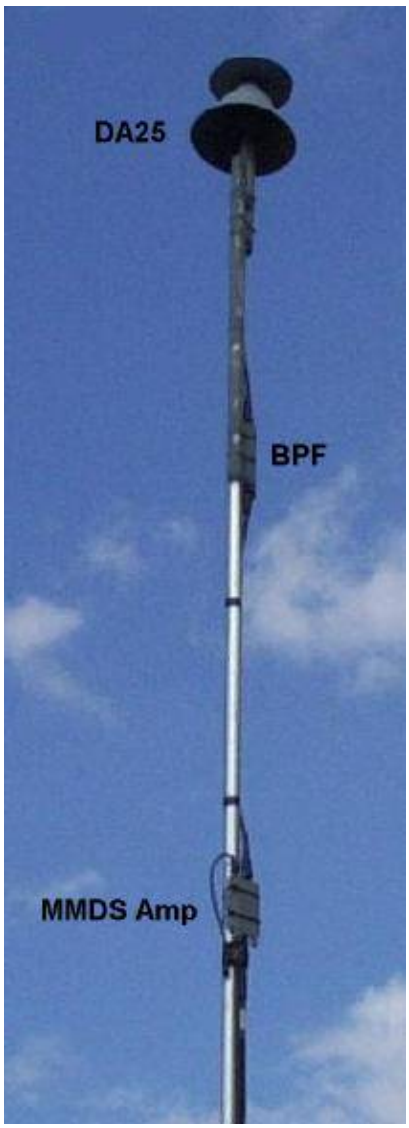
These are better pictures of the new support disk, the N–connector, and its mounting hardware (4–40). Use stainless–steel mounting hardware, if you can find it.

The completed antenna. Paint the antenna a light gray not only to keep it from rusting, but also to hide it when in an urban area. You don't want the camel humpers to see your SIGINT setup. Also, you may wish to epoxy a PVC coupler ring to the inside of the cone (as shown in the DA25's manual). Then you can mount the antenna on a short PVC mast to get it away from any metal objects, which can effect the antenna's performance.



View of the support disk and N–connector from the bottom of the antenna. Be sure to solder the support disk *completely* around the outside of the cone.

Closeup view of the cone, top disk, and support hardware. Note the piece of tape on the top disk to prevent the N–connector's mounting hardware from ever touching the top disk.



Examples of the DA25 in operation. The picture on the left is just a test setup with a homebrew portable PVC mast system. The picture on the right is of a working 2.4 GHz SIGINT receive setup. The DA25 (on a 10 foot pole) feeds a commercial 2.45 GHz Band Pass Filter (BPF) and a surplus MMDS (wireless cable TV) receive pre−amplifier. More details on this particular setup will be in the upcoming GBPPR 'Zine issues.