

## **SkyMast S-M4 Gain Omni Antenna for Mt. Climie 438.600 MHz D-Star**

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On Thursday 28 February 2013 a new omni gain antenna was installed at Mt Climie. The ICOM ID-31A D-Star handheld radio had been released in late 2012 with many local operators purchasing them around the greater Wellington region. These UHF D-Star users requested improved coverage when using these radios.

The originally built coaxial collinear antenna was a low gain but very effective antenna. Over time water ingress into the feeder connector and cable required a replacement antenna to be built or purchased. A temporary single dipole antenna could not be sourced so that the coaxial antenna could be serviced in a timely manor.

SkyMasts Antennas Ltd from Northampton, UK supply antennas ready made that would ideally suit the adverse weather conditions at Mt. Climie. Their rugged construction, 160km/hr wind loading and connector-less encapsulated phasing harness was essential in the extreme weather conditions experienced at Mt Climie. Anything less than a rugged designed would soon fail as we have experienced in the past. These failures prove very frustrating. A good solution was required.

SkyMasts offered the S-M4, 5.7dBd Omni, 8.7dBd Gain beam 4 dipole stack in a ready made kitset form. We needed to supply a vertical pipe to SkyMast specifications and fit the dipoles to the correct spacing. The recommendation was anywhere from 470mm to 540mm; a closer spacing means a wider vertical beam but slightly less gain.

The dipole spacing was set at 525mm. The lower vertical pattern fills in the valley areas with enough signal for portable and mobile stations.

Stainless Steel cap screws used to clamp the alloy dipole castings were treated with anti corrosive "UniSeal" grease supplied by Electropar New Zealand.

The vertical dipole pipe was then side mounted to the Mt. Climie mast (76 mm diameter) using stainless steel pipe clamps and stainless steel 10mm treaded rods.

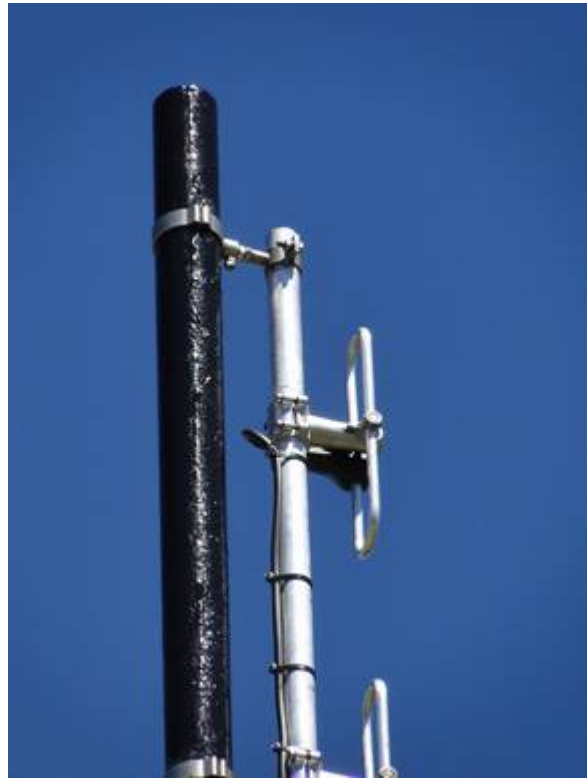
Return loss of -20dB to -15dB across the 433 to 439 MHz bandwidth was measured. The antenna is feed from the D-Star RP-4000V repeater via an 8 cavity duplexer and LDF-550 coax cable.

On air results were very good with portable stations being able to use their radios on two power settings lower than normal. Mobiles experienced less "R2D2" during contacts. An example of the down tilt was evident with Mark ZL2UFI comfortably using the repeater from the Branch 63 clubrooms and home QTH using low power on his ID-31A. This is a good result as both locations were very difficult to work on anything other than high power and standing in the "right" place. Other examples were from Malcolm ZL2UDF also with an ID-31A. He was able to operate from a non-line of site location next to the Eastern Hutt Valley hills. Graham ZL2ABN reported increased performance on State Highway 1 from Johnsonville to Porirua and "full house" from his home QTH where the signal was previously just S-9. Morrie ZL2ADP reports S-9 up from S-5 from Carterton in the Wairarapa. Neil ZL2TNG reports S-7 up from S-3 from Raumat South on the Kapiti Coast. Ken ZL2TKY reports no errors and trouble free operation where previously he could only work the repeater during wet weather days from Eldson in Porirua. Chris ZL2DX also from the Wairarapa reports better than usual mobile operation over the Rimutaka Hill road.

Overall, the reports and examples have shown a great improvement better signals all round.

Special thanks to SkyMasts for their prompt contract negotiations and very cost efficient service. Upon delivery club members were impressed with the design, construction and excellent build quality. These antennas are built to last.

Pictures below show the finished 4 dipole stack and the pipe clamp mounting method.



The following pictures show the encapsulated phasing harness and a close up of a single dipole construction.



References:

- 1) <http://www.skymasts.com/>
- 2) <http://www.zl2vh.org.nz/repeaters.php>