PRODUCT REVIEW

STEVE NICHOLS
7, QUEBEC CLOSE
CRINGLEFORD
NORWICH NR4 6XU
EMAIL STEVE@INFOTECHCOMMS.CO.UK
TEL 01603-508380

GOKYA

Maldol MFB-300 HF Vertical antenna

Steve Nichols reviews the new Maldol MFB-300 all-band HF vertical.

WIDEST BAND AERIAL? The Japanese-made Maldol MFB-300 HF vertical is the latest antenna on the market to offer extremely wide-band performance, with a specified frequency range of 1.0-60 MHz. There are very few antennas that can claim to work well across such a range and I was keen to see how it would perform. The benefits to a newly-licensed amateur, or one with very restricted space for antennas, are obvious.

The Maldol gives you access to all of the HF bands, plus 6m, and apparently all without the need for an ATU. This is the second such antenna *RadCom* has tested over the past few months, the other being the Comet CHA-250B (*RadCom Dec 2006* p 26).

Only 7m tall, the manufacturer's datasheet shows that it can handle 200W PEP. The VSWR is said to be less than 2.0:1 "when operating when an antenna tuner" which I thought was odd – any antenna can be less than 2:1 through an ATU.

WHAT'S IN THE BOX? The antenna arrived in a box weighing 4.1kg measuring just under six feet (180cm) long by four inches (10cm) by six inches (15cm) – it should easily fit in a standard car should you need to transport it.

On opening the box I was struck by the quality of the antenna, complete with its four white fibre-glass mast section with stainless-steel and alloy fittings. Other fittings appeared to be nickel-plated brass.

Included with the antenna was a quantity of rope. According to the instructions this appeared to be for three guys when all four mast sections are in use. You have the choice of using three or four although you are warned that with three "the receiving frequency will be a little bit down(less)" [sic].

PUTTING IT TOGETHER. The antenna is supplied with a small Allen key for the matching unit fixings, plus a small roll of self-amalgamating tape for the electrical connections. The white fibreglass mast appears to contain a copper radiator that can be heard rattling in the tube.

Assembly was reasonably straightforward, but I did make more use of the diagrams than the text, which was very confusing. Once I had worked out what was supposed to go where it was all quite easy and I didn't end up with any spare nuts and washers, which is always a good sign.

Construction took a little over an hour and once complete I bolted on the lower part of the fibreglass whip and mated it to my two section tilt-over mast. My intention was to put the lower section on the mast first, screw the other sections together and mount these on once the antenna was in place. This worked, although the fibreglass is very whippy – I would urge you to use the guys as suggested in the manual.

HOW DOES IT WORK? As you can see from the photographs, there is a PL259 T-piece screwed into the bottom of the sealed matching unit. Your co-ax connects to the other side of the T, and the supplied PL259 patch lead goes from the centre of the T to the bottom of the radiating element. The matching unit has fins, as if to dissipate heat. The measured DC resistance across the matching unit was virtually zero ohms, so whatever the matching network is it is not simply a 50Ω resistor.

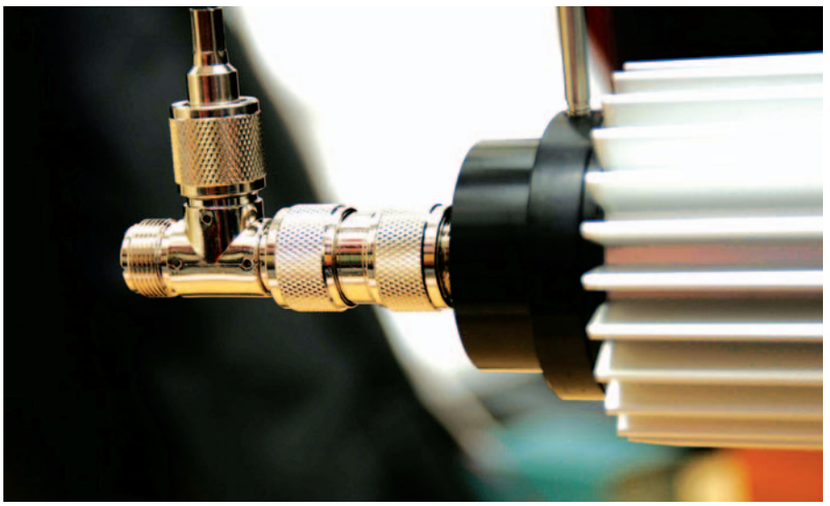
The proof of the pudding, as they say, is in the eating, and I reserved further judgement until the vertical was mounted on my 30-foot mast!

In another part of the poorly-translated English instructions it said that the SWR is "less than 20", although a supplied graph of the VSWR suggested it would be less than 2.0 across most of the range, with two peaks of about 2.5:1. I think Maldol should have someone take a closer look at

The Maldol MBF-300 is of high quality construction with fibreglass elements and machined interconnecting sections. The supplied patch lead connects between the element's SO239 socket and the T-piece on the matching section.

The finned matching section attaches to the bottom of the aerial via two sturdy stand-offs.

The SO239 T-piece feed puts the finned matching section in parallel with the radiating element.



the translation as it is confusing.

The test was completed with all four sections. No guys were used as the test period was quite short.

SWR MEASUREMENTS. Once installed with the base at about 25 feet, tests showed the SWR to be less than 1.5 to 1 across 80m and less than 1.2:1 on 40m (7 MHz) to 15m (21MHz). On 12m (24 MHz) it rose to 2.5:1 and on 10m (28 MHz) it was back to 1:1.2 across the band.

Finally, on 6m (50 MHz) it was back to 1.2:1. I decided it was best to do a full scan with my MFJ-269 antenna analyser. This confirmed my readings and also showed SWR minima at 7.3 MHz and 18 MHz. Even at 145MHz the SWR was still just 1.6:1.

BUT HOW DID IT PERFORM? The day the antenna was erected was just 24 hours after a large solar flare. The X-9 class flare, associated with sunspot 930, caused the A index to rise to 18 by the time the antenna was up with the K index at 5 – not good conditions for HF dxing.

I didn't test the Maldol on 1.8MHz – despite an SWR of 2.5:1 it was not a good performer, with signal strengths in the S1-S2 region. Given that a quarter-wave Top Band vertical would be more than 130 feet long, this antenna is obviously a compromise. It was however a reasonable receive antenna on medium wave, outperforming a random wire by many S points.

The 80m band was not in good shape. The band noise was S4 on the vertical and a number of European stations were heard at an average of about S5. A number of G stations were received at around S5-7. GM3MOU was the loudest station received at S9 on 3.789MHz.

A QSO with GM0CME in Scotland and 2E0TSW in Northampton resulted in reports of S4 on the vertical, with news that my signal was virtually unreadable compared with my reference dipole. The next morning though KB7UP Ken was just audible from South Dakota on 3.795 MHz on the Maldol and was barely better on the dipole.

Overall, in comparison with my half-wave dipole on 80m, UK stations were down about 12-24db (two to four S-points). This was probably due to verticals being notoriously bad at radiating the high angle signals needed for NVIS working, although the received signal-to-noise ratio was similar to the dipole, as the Maldol is uncharacteristically a relatively quiet antenna.

On 40m the performance was better as the radiating element was now much electrically much longer than on 80m. In fact, it was quite lively and sometimes roughly equal to a dipole at similar height and never more than three S-points (18dB) worse. As I said earlier the antenna showed a dip at 7.3 MHz, which may show that it is naturally more resonant at these frequencies and might explain the better performance.

It was a similar story on 30m (10MHz), providing solid 599 CW contacts around Europe at least equal to my MFJ 1786 magnetic loop.

Twenty metres (14MHz) was just closing on the first afternoon of the tests, but QSOs with ZS were possible, although again signal strengths were down 2-3 S–points compared with a reference dipole.

It was a similar story on 17m (18MHz). RTTY stations were worked on the lower part of the band, but were weaker than the reference dipole again.

Tests on shortwave broadcast stations just above 15 metres (21 MHz) showed that, as the physics would predict, the performance improves as the frequency is increased. A religious station on 21.452MHz was exactly the same on the Maldol and a 40m dipole (used as three half waves on 21 MHz).

Ten metres was not open during the period of the test, but a ground wave comparison with another local amateur showed that it works quite well on the band and could be useful once the sunspot count increases over the next few years.

I even tried it on 2m and was able to access my local repeater GB3NB with similar signal strengths to those I normally get on my 2m/70cm vertical, although the manual says nothing about being able to use it on 145MHz.

CONCLUSION. Any antenna that covers this many frequencies is obviously a compromise. Conventional wisdom has it that any antenna under a quarter wave in length will not be a great performer. As the antenna is only 7m long this means that it really only starts to approach the performance of a conventional quarter-wave vertical once the operating frequency exceeds about 10 MHz. The tests showed this quite well. However, I was quite impressed with its performance on 40m where it seemed quite lively. Initial tests on 10m also showed that it may be useful under Sporadic-E conditions or when the solar flux allows trans-continental contacts once again.

If you are severely limited for space and only have room for one antenna this may be it. You will make contacts and have fun, and its wide TX/RX range means it is ideally suited to shortwave listeners too. But do guy it to prevent premature snapping and don't expect to achieve DXCC easily, especially on the low bands.

For occasional contacts on 80m, especially CW and PSK 31 it will work, but head higher in frequency if you want to make the most of it.

Our thanks to Martin Lynch and Sons for providing the antenna for review. The Maldol MFB-300 costs £259.95 plus postage.