

Review

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The M0CVO HW-42HP

A multi-band off centre fed dipole

MULTI-BAND. Nigel, M0CVO has built up a reputation over the past few years for making and selling cost-effective HF antennas. I featured his HW-20HP off-centre fed dipole in an earlier issue of *RadCom* and was quite impressed. In fact, the antenna was left up here at my QTH for an extended test and worked well on all bands from 20m to 10m, although you do need an ATU for 17m.

I think my log says it all really with contacts into ZL, VK, and VE7 on CW during the recent Commonwealth Contest, plus DX confirmations over the past year from Amsterdam Island (FT5ZM), China (BG2AUE), Burundi (9U4U) and Burkina Faso (XT2TT) among others. I have been very happy with its performance. And the antenna isn't really even in an ideal position – it is mounted as an inverted V about 8.5m high at the top of a 10m fibreglass fishing pole, hidden in a tree to keep it as stealthy as possible.

So when I was offered the chance to test M0CVO's HW-42HP off centre fed dipole I was eager to try it.

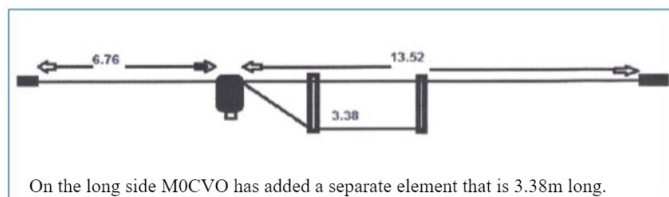
MORE BANDS. This new antenna is designed to operate on all bands from 40m (7MHz) to 6m (50MHz). M0CVO claims it will operate on 40, 30, 20, 17, 15, 12 and 10m without an ATU (SWR <3:1) plus 6m with an ATU. Nigel says it is also possible to operate on both 80m (3.5MHz) and 60m (5MHz) via a good ATU, although the performance will be down.

The antenna is designed to handle 400W key down (CW) or 500W PEP (SSB).

The starting point of the antenna is the classic off centre fed dipole. The overall length of the antenna is 20.28m or 66ft, with a feed point 1/3 of the way along. This gives two legs of 13.52m and 6.76m and a feed point impedance of around 200-300Ω.

A 4:1 balun of M0CVO's design is added at the feed point to bring the impedance to something closer to the 50Ω required to match to coaxial cable, such as RG8 or RG213.

This classic OCFD design would



On the long side M0CVO has added a separate element that is 3.38m long.



The starting point of the antenna is the classic off centre fed dipole.

ordinarily allow low SWR operation on 40m, 20m and 10m, but then Nigel has added a twist.

On the long side of the antenna he has added a separate element that is 3.38m long and connects to the feed point. This element is supported about 60cm under the main wire by two pieces of white 22mm PVC conduit of the type found in DIY and hardware stores. It is because of this length that the antenna has to be shipped by Parcel Force as it exceeds the length the Post Office will accept.

The antenna may be mounted horizontally, as a sloper or as an inverted V. And, if space is at a premium, M0CVO says it may also be 'bent' to fit in, with no loss in performance.

The balun is fitted inside a flame retardant ABS plastic box with a tongue and groove fitting to prevent ingress of both dust and water. It has the obligatory S0239 socket on the bottom with stainless steel screw lugs fitted to the sides whereby the grey insulated wire elements (supplied) connect to the balun inside. The wires are doubled back on themselves, secured by cable ties and then attached to the box via keyring-type retaining rings that take the weight off the connections. This is simple

and effective. In the HW-20 version I have been using for the past couple of years I have had to repair one of

the connections at the feed point, but this was due to the antenna whipping around in the gales that seem to hit the UK with ever-increasing regularity. The repair was a simple solder job and took less than 15 minutes.

The far ends of the HW-42HP antenna elements are connected to two plastic dog bone insulators. Heat shrink tubing is used on all joints and the quality of workmanship is good, considering the low price of the antenna.

I tested the balun by placing a 200Ω resistor across the terminals and measuring the SWR with an MFJ-269 analyser. I measured 1.4:1/1.5:1 across the whole 3-30MHz range, which suggests that the impedance transformation is not quite 4:1. This is not uncommon and I have seen other so-called 4:1 baluns that behave in a similar fashion.

I mounted the antenna on the pole used for the HW20, with its apex at about 8.5m with the ends coming down as an inverted V – the longest element ending at about 2m high. Nigel suggests that the end of the second shorter lower element (where it is attached to the white tubing support) can be tied with nylon fishing line to the end of the antenna to keep it taut. I would agree with that idea, otherwise it can tend to fold back on itself.

SWR READINGS. Once erected (and fed with about 30m of RG213 with a 10-turn choke balun at the base of the pole) it was time to take some SWR readings. The table shows the results, but as you can see it was below 3:1 at all frequencies of interest

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and therefore within the range of internal ATUs. The actual SWR at the feed point is no doubt higher, but a length of coax (and its inherent losses) will result in an apparent lower SWR figure at the rig end. Your figures will no doubt be different with your installation.

The overall design has been designed to work on as many bands as possible and this it does remarkably well.

PERFORMANCE. So how does it perform? On back to back tests with dedicated dipoles it was usually equal to or no worse than one S-point down on just about every band. On HF it performed almost identically to the HW-20 OCFD it replaced.

In this installation it was quite a quiet antenna (especially on 21MHz and higher), no doubt helped by getting it as far away from the house as possible and feeding it with a choke balun. It certainly isn't a compromise antenna – I've seen plenty of antennas that offer a 1:1 match, but are deaf on receive and poor radiators. This one is 'lively' and each band was very accessible. A long list of countries worked isn't going to tell you much, but it offers multi-band dipole-like performance in a single antenna and could be a boon for amateurs without too much space.

But what of that design, some credit for which should go to Martin, G6VMR, who assisted in its design. A closer examination shows that the 13.52/6.76m legs gives an OCFD for 40, 20m and 10m. The addition of another leg 3.38m long appears to give a second OCFD with a total length of 10.14m and fed at the one

SWR Results

6.298MHz – 1:1
7.000MHz – 2.4:1
7.200MHz – 2.5:1
10.100MHz – 2.2:1
10.150MHz – 2.3:1
14.000MHz – 1.8:1
14.350MHz – 1.2:1
18.068MHz – 2.3:1
18.158MHz – 2.1:1
21.000MHz – 2.0:1
21.450MHz – 1.6:1
24.890MHz – 1.7:1
24.990MHz – 1.9:1
28.000MHz – 2.2:1
29.000MHz – 1.6:1
29.700MHz – 1.4:1
50.000MHz – 2.2:1
51.000MHz – 1.7:1
52.000MHz – 2.6:1
70.000MHz – 3.6:1
70.500MHz – 3.5:1

third/two thirds point. In other words, an OCFD for 20m.

But life is not that simple – what you actually appear to get is a more complex arrangement that Nigel has obviously optimised to give the best (low) SWR results across as many bands as possible.

What the design did show (and this was backed up by my antenna model in MMANA-GAL) is that although the website suggests that the antenna could be used on 3.5MHz (80m) and 5MHz (60m), the SWR is very high on those bands, probably outside of the range of most internal ATUs. The performance is likely to be disappointing anyway as it is too short.

Overall then, the HW-42HP offers effective multi-band performance in a single package at a reasonable price. The antenna costs £56.95 from www.m0cvoantennas.com and our thanks to Nigel (07921 639 978) for supplying the review model.

RSGB Antenna File

The Radio Society of Great Britain (RSGB) has been promoting antenna experimentation for 100 years and publishing much of the work in its monthly journal. The RSGB Journal RadCom has therefore developed a reputation for producing some of the best material on antennas published anywhere. This book is a compilation of some of the best articles about antennas that have been published by the RSGB.

The RSGB Antenna File covers all parts of the spectrum from HF to UHF - and even LF and microwave frequencies. From simple wire dipoles to more complex multi-band and multi-element arrays, RSGB Antenna File contains dozens of 'how to' constructional articles, complemented by many features explaining how antennas work, facts about feed lines, antenna matching, earthing and much more besides. The doublet, Moxon and 'Super Moxon', cubical quad, 'low noise' and 'long' Yagis, log periodic, loaded dipole, horizontal loop, magnetic loop, delta loop and J-pole are just some of the antenna designs featured in this book.

The RSGB Antenna File reproduces the articles and is broken down into five logical sections. HF Antennas is the first and largest section and this is followed by a section covering VHF, UHF and Microwave Antennas. Antenna experimentation is though much more than this, so readers will also find sections on Feeders and Baluns and ATUs and Antenna Matching. There is even a section of the less easily defined antenna article called Miscellaneous Antenna Articles.

In short, there are nearly 120 antenna articles here crammed into 288 pages with information on antennas of all types that will be of interest to all antenna experimenters everywhere.

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