

DX Commander Rapide 7m antenna kit



The antenna kit as it comes out of the box.



The finished antenna is very lightweight and not too obtrusive.

The DX Commander Rapide is the latest antenna from Callum McCormick, M0MCX. Callum has built up quite a reputation for his no-nonsense vertical ground plane antennas.

These vertical ground plane antennas don't use ununs, baluns, coils or other devices, yet give low SWR figures and good performance on the bands they are designed for. The Rapide is designed to work on the 30, 20, 15, 17, 15, 12 and 10m bands. It also offers a low SWR on 6m as a bonus.

So what's its secret? The DX Commander uses multiple quarter wave elements fed against the ground or actually an extensive radial field (supplied). Callum has done extensive work on the design to ensure that there is no adverse interaction between the elements. The result is you get a no-tune multiband antenna, capable of taking the full legal limit in a lightweight package.

The antenna kit

The antenna kit, and I do mean kit, arrives in a study cardboard box. Inside

is a 7m fibreglass fishing pole, two machined aluminium plates, three white ultra-high-molecular-weight polyethylene (UHMWPE) plates, a 100m reel of wire and a bag of miscellaneous connectors and fittings.

The antenna runs up to six vertical elements on the 7m pole with a single feedpoint and as Callum says, "It is similar in concept to a fan-dipole, but with the fan turned through 90 degrees on its axis with one side of the fan placed vertically".

If you are the sort of person who likes tinkering with antennas, you'll love it! If, however, you are a fit-and-forget amateur you may not. Expect to spend a good day making up the antenna, including measuring, cutting and soldering.

Assembling the antenna

The kit doesn't come with instructions. For this, you need to go to the DX Commander's website and download the appropriate guide. Callum says he can supply instructions with the kit if requested at the time of order. Can I also recommend that you view the appropriate DX Commander YouTube video as it will make the whole job a lot easier.

The first job is to extend the pole, twisting the sections to make it



Callum recommends supporting the antenna on two chairs while you build it.



A close-up of the driven base plate in position.



The elements are threaded through the polyethylene plastic plates.



The driven and ground plates with wingnuts and driven elements attached.

rigid. Callum then recommends that you tape these joints with either self-amalgamating or PVC electrical tape to stop the sections from collapsing.

You then unscrew the bottom of the pole and add the ground plate, plus push the driven plate down the pole and secure it with the supplied hose clamps, using rubber/PVC tubing to prevent cracking. A third clamp is placed just above the first joint. You don't have to overdo the clamps – just enough to stop them moving around.

At this point you can add the SO-239 feed point socket and the stainless steel bolts to the bottom plates using a 10mm spanner. Again, don't over-tighten these as you might strip the threads. I then added a stainless steel washer and wingnut to each bolt. I found it easier to do this now so that it is easier to add the elements when needed.

Callum recommends that you lay the extended pole out on two garden chairs or similar. This makes it a lot easier to build the antenna and attach the elements.

Now you are ready to start the build proper.

You are given a cutting chart for the various wire elements. These have to be soldered to the forked connectors that connect to the base. You also have to fold over the final 2.5-3cm of each wire to make a loop. These can be fixed using the supplied heat-shrink tubing or by using PVC insulating tape. I recommend the latter at first as it is cheap and allows you to easily make adjustments.

The next stage is to fit each element to the pole. This involves fastening the elements to the correct position on the driven plate and threading it through the white plastic plate. To finish, you have to add a loop to the element and then make up a shock-cord extension that holds the wire in tension. The DX Commander uses plastic carabiners that you thread onto the 4mm shock cord. These can be quite fiddly to fit but you soon get used to it. I found that the cleaner the cut on the cord the easier it was to fit the carabiner.

Once fitted, you can then stretch and attach the carabiner to the appropriate white plate. Note: make sure you use the elastic shock cord – at my first attempt I used the non-elastic paracord, which looks identical! This is strictly for use as guylines.

It is important to get each element's tension correct, otherwise, they will move in the wind, affecting the SWR.

The only tricky part of the assembly is the 30m element, which goes up to the end of the pole, through the metal loop on the end and then back down the pole, being secured with a small piece of PVC aquarium tubing.

You also have to add a small loop to the 30m element to which an elastic shock cord is attached to equalise the tension around the pole.

There is a way to get the antenna to work on 40 metres instead of 30 metres. But the element lengths for each band will be slightly different so I didn't try it. The instructions fully explain how



The elements are kept under tension by using elastic shock cord.

to do this, which also involves adding a coil to the 40m element.

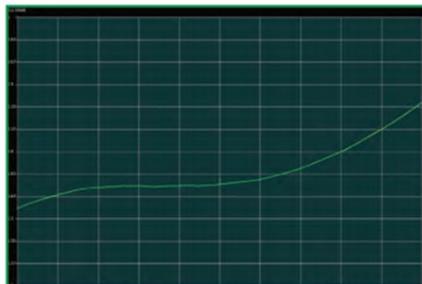
Radials

Once the antenna was built I had to measure and cut 20 x 3.2m lengths of the wire to use as ground radials. These were then soldered in batches of four to the supplied fork connectors. The observant among you will have noticed that

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SWR Results

10.100MHz 1.1:1	24.890MHz 1.2:1
10.120MHz 1.1:1	24.910MHz 1.3:1
10.130MHz 1.1:1	24.930MHz 1.3:1
10.140MHz 1.2:1	24.950MHz 1.3:1
10.150MHz 1.2:1	24.970MHz 1.3:1
	24.990MHz 1.3:1
14.000MHz 1.3:1	
14.100MHz 1.2:1	28.000MHz 1.6:1
14.200MHz 1.2:1	28.250MHz 1.2:1
14.300MHz 1.6:1	28.500MHz 1.6:1
14.350MHz 1.7:1	28.750MHz 2.0:1
18.068MHz 1.8:1	29.500MHz 1.8:1
18.100MHz 1.7:1	29.600MHz 1.8:1
18.120MHz 1.7:1	29.700MHz 1.5:1
18.168MHz 1.5:1	
	50.000MHz 1.6:1
21.000MHz 2.5:1	51.000MHz 1.7:1
21.100MHz 1.9:1	52.000MHz 2.3:1
21.200MHz 1.3:1	
21.300MHz 1.1:1	
21.400MHz 1.2:1	
21:450MHz 1.3:1	



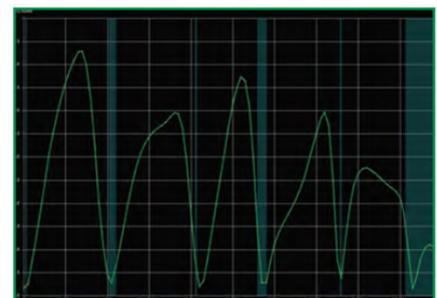
The SWR remains fairly flat across 6 metres.



On 17m the SWR good have been improved by making the element a little longer.



A scan using my nanoVNA shows a low SWR across 30 metres.



A nanoVNA scan across the whole range shows a low SWR on all bands.

there are actually six connectors on the base. Callum recommends you retain the final 12.8m (4 x 3.2m) of wire until you are happy that the antenna is working properly and you don't need any extra wire. Only then should you make up the final radial set.

It is then a case of sitting the antenna on its base and adding the guylines to stop it from falling over. You can use the supplied paracord to guy the finished antenna, but I had some Poundland fluorescent nylon guylines sitting around so I used them. You'll need to supply your own metal guys so make sure you get these before you start.

I then fitted the prepared radials by connecting them to the wing nuts and bolts previously fitted to the base. The end result looks very good and is very lightweight. So could you use it as a portable antenna? Yes, probably, but you would have to fix the fishing pole joints and also fit the wire elements each time you deployed it.

SWR testing

I was pleasantly surprised by the SWR test results. All bands from 30m – 10m were either good enough to work without an ATU, or would be perfectly within the range of a rig's auto ATU. My only concern was 12 metres, which was a little short and put the low SWR point a little high. I cut another length of wire and by cutting and testing, cutting and testing I managed to get the SWR down to 1.3:1 across the band.

Using my nanoVNA, I could see that for a perfect result I really needed to make the 17m element a little longer, but as the SWR was below 2:1 across the band I let it go.

I suggest that you allow plenty of time to do the setting up as it will pay dividends later.

Performance

The antenna was tested over a five-day period, often against my existing commercial 132ft end fed half wave antenna.

On 30m (which is a CW/data-mode band rather than SSB), the antenna performed well, offering a low SWR without the use of an antenna tuning unit. I easily worked a couple of SOTA stations in Switzerland and Germany on CW. On FT8 I worked DK7ZT, DH0GBC and DL2OAM (Germany), IZ8EYN (Italy), SQ8AA (Poland), MM7DXC (Scotland) and HA7TM (Hungary), all around lunchtime. I also worked A61R (United Arab Emirates) around 1625UTC one afternoon.

I think it is a solid performer on 30m and it was interesting to have a dedicated antenna for the band as it outperformed my 132ft EFHW by 1-2 S-points.

On 20m the antenna also proved to be a competent performer, also usually outperforming my existing 132ft commercial EFHW antenna by 1-2 S points. Noise-wise, it was a little worse, perhaps 1-2 S-points, but this was to be expected as verticals are notoriously noisy.

I worked SOTA station DF1AKR/P on DM/BW-066 (Großer Hundskopf) via SSB on my first call. QRP station Luca, IZ2XAO via CW was three S-points louder on the DX Commander.

On 20m FT8, I logged quite a few Indonesian stations, but wasn't able to work one. On 20m FT4 I worked 8N8OLP, the Japan Tokyo Olympics and Paralympics Commemorative station at -4dB on my first call. I was very pleased with that one!

I went on to work European Russia, Hungary, Romania, Italy and Slovenia in quick succession.

Seventeen metres was being largely dominated by Sporadic-E signals, although Chile and Indonesia were spotted on FT8 via F2-layer propagation. I managed to work Nan, JA4KX (Japan) at 6dB SNR with 50W of FT4. I also worked Vlad, UW5EJX/MM on board a tanker. I'm not sure of his actual location.

The 21MHz band and higher were mostly open to Sporadic-E contacts during the test period and the DX Commander worked well. On the 10m band FT8 I worked Johannes, 5T5PA (Mauritania) for a new one, along with a host of Europeans.

It will be interesting to see how it performs in the Autumn when 10m hopefully opens up to F2-layer propagation.

Summary

I think the DX Commander Rapide is a great antenna. It is lightweight and gets you on to at least seven bands. It is also simple to use and easy to fix – no coils, traps, baluns and other elements to worry about.

Just look at the antenna reviews on eham.net – it's five stars all the way.

If you are planning a permanent installation it is probably worth prepping your site very carefully. I would cut the grass as short as you possibly can and use wire staples to stretch out the radials. By springtime they will probably have vanished into the lawn – and away from the lawnmower blade!

The DX Commander Rapide antenna costs £179 and is available from www.m0mcx.co.uk. Our thanks to Callum for the supply of the antenna.