

Broadband 50- MHz Antenna

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I just want a little privacy- sad Shrek (or something similar to that thing to avoid me a copyright problem). So I am. I decided to install plastic net for clementine flowers at my desk on the backyard. The clementine flowers are perfect do masking me when preparing BBQ, reading a book or just do experiments with antennas and home- brew radios. However it seems to me no sense to install just a net for clementine flowers without putting an antenna to this one. The net with flowers should perfect masking an antenna on it. The sizes of the net allow install there just antenna for 10 or 6 meter Band. I have chosen an antenna for 6 meters.

So the band for new antenna was defined. But design of the antenna was still unclear. MMANA helped me. With this free software I simulated an antenna that fit my flower net in dimension and satisfied me for electrical parameters. **Figure 1** shows design of the antenna. **Figure 2** shows Z of the antenna at 3 meters height above the real ground, the height what the antenna was installed.

Figure 3 shows SWR of the antenna at 3 meters height above the real ground. **Figure 4** shows DD of the antenna at 3 meters height above the real ground. The antenna has rather broad pass band so I called it a **Broadband 50 MHz antenna**.

When schematic of the antenna was created, net for flowers was bought, there were arisen some questions about stuff for building of the antenna. I have a roll of black insulated stranded 18- AWG wire that was used for electrical purposes. This wire would be going for forming antenna.

Another question was- what should I use for the central insulator. I have a big junk box with some stuff related to radio and electronics. I try to keep lots things with that surplus because newer knows what you need in the future for your home- brew project. Inside of the box I found a cuplug from forgotten connector. The cuplug was ideal form for central insulator. Bleeding resistor and antenna wires with coaxial cable was placed inside of the cuplug then this one was filled with an epoxy.

MMANA file may be downloaded at: http://www.antentop.org/022/50_MHz_022.htm

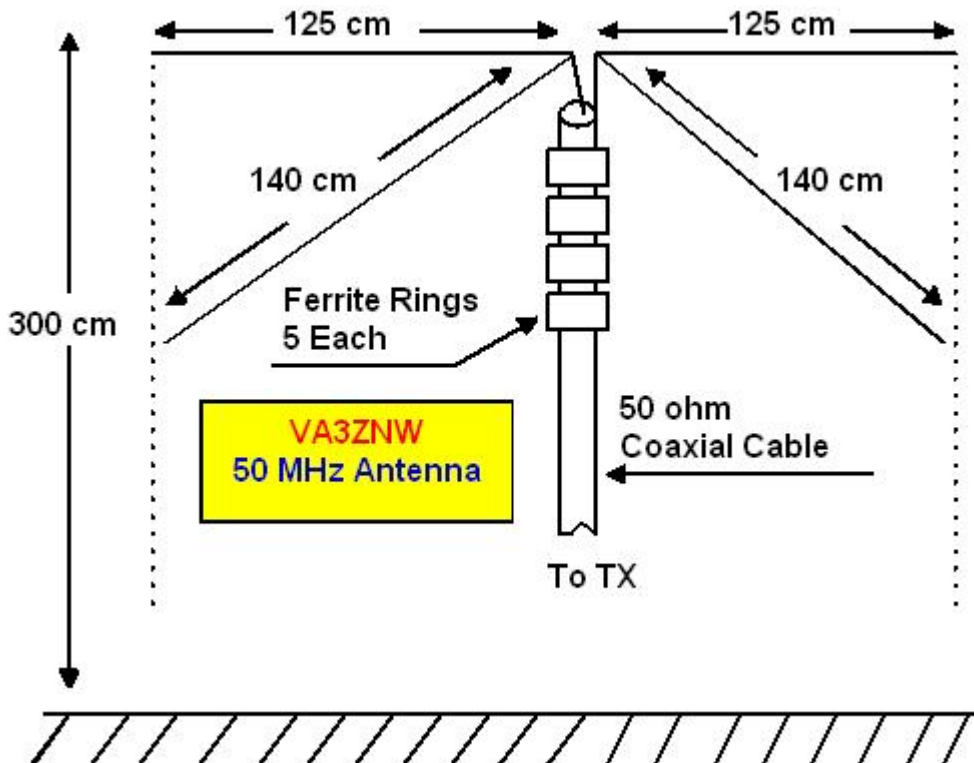


Figure 1 Schematic of the Broadband 50 MHz antenna

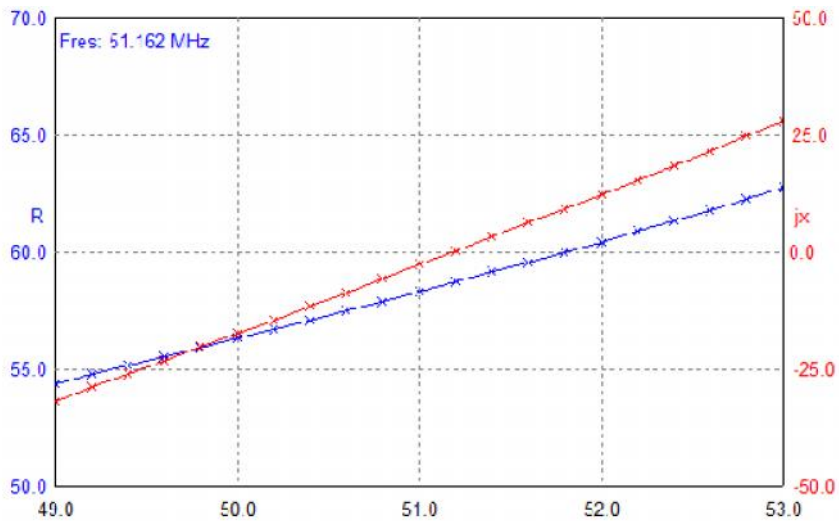


Figure 2 Z of the 50 MHz antenna at 3 meters height above the real ground

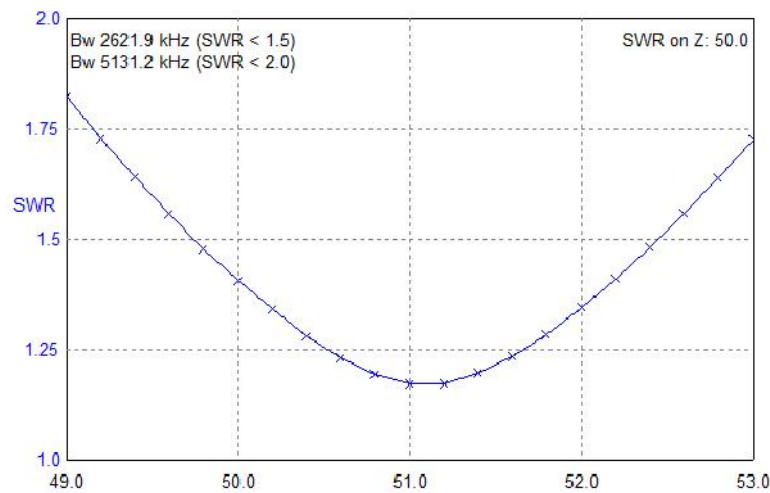


Figure 3 SWR of the 50 MHz antenna at 3 meters height above the real ground

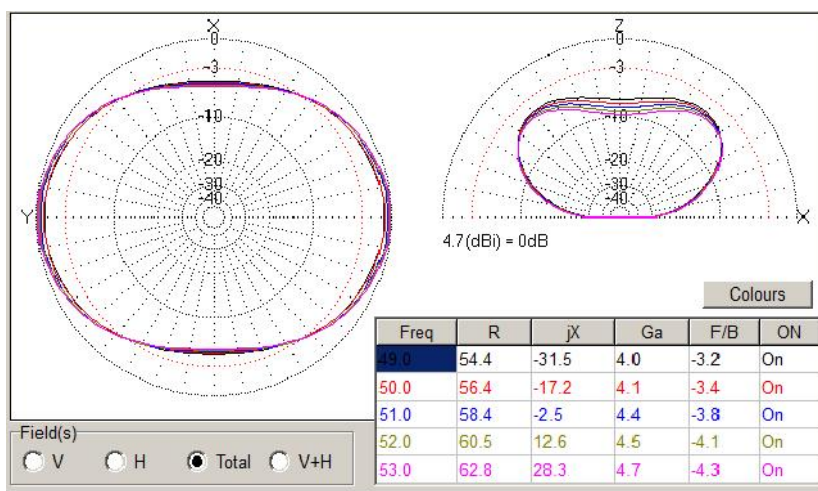


Figure 4 DD of the 50 MHz antenna at 3 meters height above the real ground

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I used an automotive epoxy that I have bought in [Canadian Tire shop](#) several years ago. It was weather and electrical proof one as I remembered but I lost label from the epoxy and cannot tell the type of it. RF choke was formed by five ferrite rings that fit the cable by inner diameter. I bought the ferrites at one of Ham-fest several years ago and I do not know what type is it. However it is possible use almost any type of ferrite rings to make an RF choke on the coaxial cable.



Photo 1 Cuplug



Photo 2 Cuplug before filling with epoxy

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Photo 3 Ready Central insulator

Yes, I almost forgot about coaxial cable. It is one of main part of any antenna system. It is perfect if you have a roll of good coaxial cable that you may use for your antenna. But I am not. I have just several lengths of coaxial cables that I have bought at ham flea market. At some visual checking some of the cables went to my garbage bin. Others were checked with help of MFJ-259B and 50- Ohm Dummy Load (Huber + Suhner, 50- Ohm, 25 – Watt, 0- 2 GHz, was bought by me at e-bay for some small money). **Figure 5** shows the schematic of the test.



Photo 4 Huber + Suhner, 50- Ohm, 25 – Watt, 0- 2 GH Dummy Load

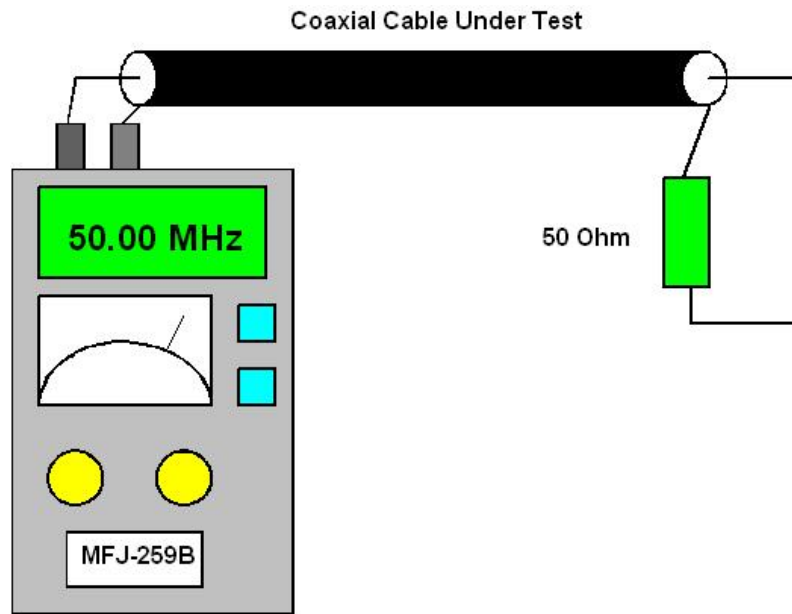


Figure 5 Schematic of the Test Procedure for the Used Coaxial Cable

Used length of coaxial cable was connected to analyzer MFJ-259B and to 50- Ohm dummy load. Then it was checked SWR and Z in the range 2- 145 MHz. SWR should be 1.0:1.0 and Z should be 50 Ohm in the frequencies range if... if the coaxial cable is good. However what I discovered with some lengths of coaxial cable- it was increasing SWR beginning from 30- 40- MHz.

The system coaxial cable + termination load shows not 50 Ohm impedance. It was impedance higher the 50 Ohm plus lots of reactivity component. Of course such coaxial cable cannot be used for 50- MHz antenna system... Anyway I managed to found two good lengths of coaxial cable with satisfied electrical parameters.

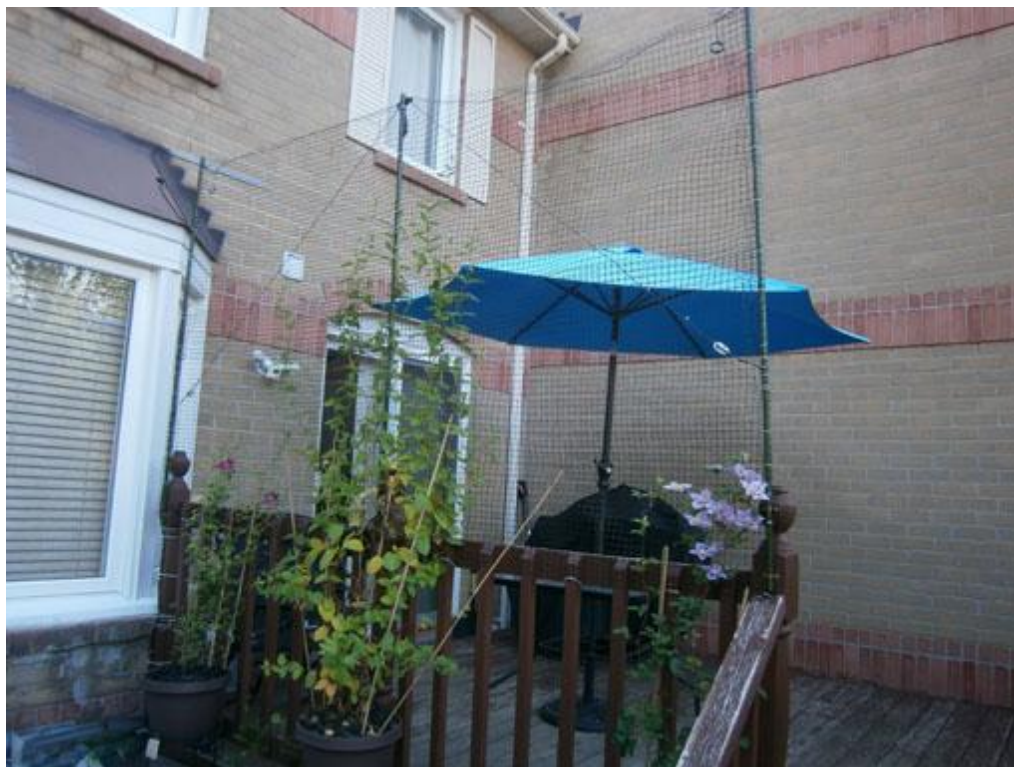


Photo 5 Antenna on the net

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So the antenna was assembled on the net for flowers. Antenna wires were taken in 10 cm longer then simulated by MMANA. It allowed do tuning of the antenna. I did not cut the wires. Horizontal wires were formed in a small roll the slope wires were adjusted in length on the end insulators.

The tuning was very simple. I use my trusty MFJ-259B. Shortened the wires, check the SWR shortened or lengthened the wires again...

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If you want you may simulate the tuning in MMANA to understand what part of the antenna wires you need shortened/ lengthened. However the practical way as well gives good result. I tried reach SWR 1:1 at the 51.0 MHz. However you may move the SWR in any frequency band you want. **Table 1** shows SWR in the antenna. SWR was measured by SWR- meter of the IC- 7410 the same data were showed by JANA HJ- 8017A SWR meter.

Table 1

SWR of the 50- MHz antenna

SWR was measured by SWR- meter of the IC- 7410. The same data were showed by SWR meter JANA HJ- 8017A. Coaxial cable from transceiver to the antenna has 8 meter length.

MHZ	50	51	52	53	54
SWR	1.2:1	1:1	1.2:1	1.5:1	1.7:1

Antenna was tested with ICOM- 7410. The antenna shows near 2 – S units over quarter wave vertical antenna (http://www.antentop.org/022/Low_profile_022.htm). The antenna gives strong receiving of VE3UBL 50- MHz beacon located at 30 km away from me. With help of the antenna I have received lots US 50- MHz beacons I made local QSOs and QSOs with USA stations.

So the antenna works well it is easy to build and to tune. I may recommend try the antenna to those who want use the 50- MHz band.

73! de VA3ZNW



Photo 7 Insulator at the end of a slope wire



Photo 6 Roll of wires in horizontal wire