The World Below 400 GHz

The Periodical Newsletter of the
WAIKATO VHF GROUP Inc.,
ZL1IS,
PO BOX 606,
Waikato Mail Centre
Hamilton 3240.

NZART
BRANCH 81

www.zl1is.info

November 2015 Issue

WAIKATO VHF GROUP EXECUTIVE

President	Alan Wallace	ZL1AMW	07 843 8738
Vice President	Morris Beale	ZL1ANF	07 884 8416
Secretary	Gavin Petrie	ZL1GWP	07 843 0326
Treasurer	Ian Brown	ZL1TAT	07 847 3709
Projects	Tom Bevan	ZL1THG	07 864 5425
Committee	Phil King	ZL1PK	07 847 1320
Committee	David King	ZL1DGK	07 579 9930
Committee	Neill Ellis	ZL1TAJ	07 576 1999
Committee	Kevin Hampshire	ZL1KRH	07 544 5987
Editor	David King	ZL1DGK	07 579 9930

November General Meeting 2015

The next General Meeting of the Waikato VHF Group will be held on Sunday, 22nd November, 2015 at 1:30pm.
at St. Stephens Church Hall, corner Ohaupo Road & Mahoe Street, HAMILTON.
The "WaiPlenty" 2m network will be monitored for anyone requiring directions, or see website for map.

Waihi North – The lease for the Waihi North repeater site has been renewed.

Subscriptions – Subs are down from previous years. If you know anyone who would like to help financially with the running of our various repeaters, beacons and links, please encourage them to take a look at the following internet pages. A list of licenses that we pay for every year is available at http://zl1is.info/sites.html and sponsorship opportunities are available. Also, information on joining the group can be found at http://zl1is.info/join.html

* * * * * * * * * * *

VHF-UHF-SHF-EHF CONTEST DATES 2016

DX Weekend Contest:
All bands 6 m and up, on Saturday the 6th and Sunday the 7th of February 2016

Low Band Contest:
All bands 6 m up to and including 70 cm, on Saturday the 2nd and Sunday the 3rd of April 2016

Hibernation Contest:
All bands 6 m and up, on Saturday the 11th and Sunday the 12th of June 2016

Brass Monkey Contest:
All bands 6 m and up, on Saturday the 6th and Sunday the 7th of August 2016

Microwave Contest:
All bands 32 cm and up, on Saturday the 1st and Sunday the 2nd of October 2016

VHF Field Day Contest:
All bands 6 m and up, on Saturday the 3th and Sunday the 4th of December 2016

For all contests, the operating periods are 5 pm to 11 pm on the Saturday, and 7 am to 1 pm on the Sunday, NZ local time.

The contest rules are available on the NZART website: http://www.nzart.org.nz/activities/contest-rules/rules-vhf-and-above/

All contest logs should be sent, to arrive within two weeks, to: VHFcontest@nzart.org.nz

Or by mail to: Contest Manager, PO Box 10138, Dominion Road, Auckland 1446.

Stephen Hayman - ZL1TPH

The $4.00 Ham Radio Satellite Antenna

Simple, inexpensive and lots of fun! Here is an easy to make home brew antenna that can get you on the air working satellites or be built for use as a portable hand held antenna to extend the range of your HT.

It's a dual band 2m/70 cm yagi antenna made with common materials and cost very little to make. Also, the antenna is fed with only one coaxial cable and does not use a duplexer.

For many decades radio amateurs have built antennas with wood and wire and have had great success using their home brew creations. This antenna was built in the same tradition and I am pleased to say that I made my first satellite contact using such an antenna.

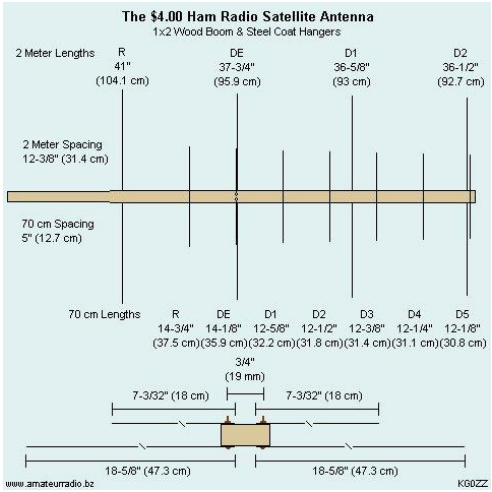
To make this antenna I only needed to buy just a couple of items. Everything else I had on hand. I had to buy the wood for the boom, two 1-1/4" long machine screws (although I bought 4 total) and a package of small wire nuts to place on the ends of the elements just for a bit of safety. Since I already had the screws, coax and connectors I spent less than $4.00 to make this antenna. I have well gotten my money's worth out of it and have thoroughly enjoyed using it!

Construction & Materials

The antenna is made with a 1x2 pine/spruce furring strip for use as a boom and steel coat hangers for antenna elements. I used two trim screws to hold each parasitic element in place and stainless steel #6 machine screws with matching hardware for the driven elements.

Although the dimensions shown in the diagram are for use with steel coat hangers, you can experiment with other materials such as welding rods, stainless steel rods, etc.

The first step was to mark the boom for the elements using a tape measure and a carpenter's square. Some planning ahead of time on paper allowed me to make room for an extra 70 cm director just past the last 2 meter director.



In starting from scratch I began by marking the 2 meter elements on the straightest 1 x 2 x 8' long furring strip that I could find from the lumber yard. An equal spacing of 12-3/8" is what I used for the 2 meter band so that I could add an extra director to give the antenna a little extra gain over a three element yagi and still have a fairly short antenna. That would make the 2 meter yagi antenna length just over three feet long not including the handle.

At first I marked five 2 meter elements on the boom instead of four but after thinking about it I decided that the extra mark was a good spot to cut off the boom. This made the wood boom 50-3/4" (128.9 cm) long.

Starting from the director end of the boom mark the boom as follows. A mark at 1-1/4", 13-5/8", 26", 38-3/8", and 50-3/4" (3.2 cm, 34.6 cm, 66 cm, 97.5 cm & 128.9 cm).

Use a carpenter's square and mark a straight line across the boom at each mark. This will also help to square the coat hanger elements. Cut the boom off at the 50-3/4" (128.9 cm) mark.

Also along each line, mark the center of the boom. Doing this will simplify adding the elements.

Flip the board over, and again starting with the director end of the boom, mark the 70 cm elements as follows. A mark at 1", 6", 11", 16", 21", 26" and 31" (2.5 cm, 15.2 cm, 27.9 cm, 40.6 cm, 53.3 cm, 66 cm & 78.7 cm). After using the square to mark a line across the board, mark the center of the boom along each line.

The next step in preparing the boom is to mark the two holes for the feed-point. The feed-point is located at the 26" (66 cm) mark on the boom. From the center mark on the boom, measure out 3/8" (9.5 mm) in both directions and mark for drilling two holes. The spacing between the two marks should end up being 3/4" (19 mm) apart. If you are using #6 hardware then drill two 9/64" holes through the boom to attach the dipole elements.

Video Instructions
Watch the video below to learn how to make this antenna.
https://youtu.be/Hy_XwvMmIro

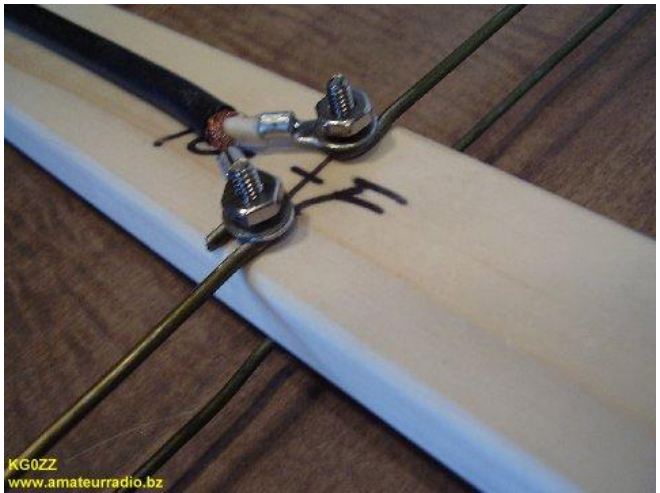
Once the boom is marked and the holes are drilled the handle can then be shaped. At the end for the handle trim a little wood off the edges and/or use some sandpaper to smooth out and form a nice handle. Using 80 grit sandpaper will make short work of this.

Four coat hangers will have to be straightened to make the 2 meter elements. If you don't want to straighten all of the coat hangers to make the 70 cm elements then you'll need at least seven more coat hangers. Straighten the coat hangers and cut to the size shown in the diagram.

After cutting the directors and reflectors use a marking pen and mark the center of each element.

Cut the coat hanger wire for the driven elements a couple of inches longer than needed. Bend a loop in one end of the coat hanger wire large enough to wrap around the machine screw. Then measuring from the end of the loop to the end of the element, cut the dipole half to the length shown in the diagram. After making the four dipole halves use sandpaper or a file to remove any enamel or vinyl coating from the ends of the coat hanger elements where the leads are attached to the two halves of the dipole elements. The enamel coating on the parasitic elements does not need to be removed.

The dipole elements are mounted to the boom using #6 stainless steel hardware. A flat washer is first placed on a #6 x 32 x 1-1/4" machine screw. Next goes on the 2 meter element, then the assembly is placed through the hole in the boom. On the opposite side the 70 cm element is placed over the machine screw, then the coaxial cable connection, followed by a flat washer, split lock washer and a nut.

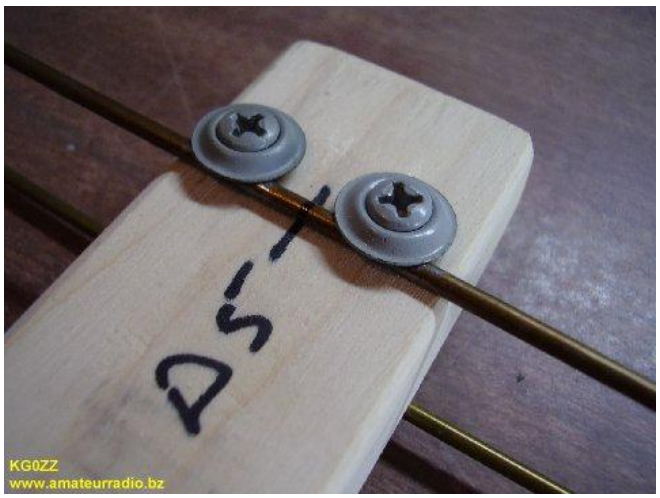


If you cannot get the leads from the coaxial cable to stretch straight across the feed-point then use the shortest length possible. The leads can be connected using crimp on ring connectors or by wrapping the coaxial cable leads

directly around the machine screws between two flat washers.

To mount the reflectors and directors to the boom I used some 3/4" long self tapping trim screws. You may instead use any screws with a large head or a screw with a flat washer.

Line up the center mark on the parasitic elements with the center marks on the boom then fasten each element using two screws. You may pre-drill two partial holes 1/8" from the line on the boom for the screws that hold the elements to the boom.



Add a plastic wire nut (twist on wire connector) to each end of all the elements.

The coaxial cable feeds the dipole driven elements at a 90 degree angle. The cable is run along the boom and brought back past the 2 meter reflector then secured with either a plastic tie or vinyl tape. The antenna will not work properly if the cable is allowed to hang down near any of the elements.

Tuning the Antenna

If the antenna is built as shown then it should not need much tuning if any. Tuning is of course by adjusting the lengths of the dipole elements making them either shorter or longer as needed. Check the antenna outdoors with an SWR meter or analyzer. If you notice a big problem then most likely it is the connection at the antenna feed-point or possibly the UHF connector (PL-259 or BNC connector).

Parts List

- 1 each 1 x 2 x 8' Pine/spruce furring strip.
- 8 to 11 each Steel coat hangers.
- 18 each Screws with large pan head (or screws and flat washers).
- 25-pack Plastic wire nuts
- 2 each #6 x 32 x 1-1/4" Stainless steel machine screws.

- 2 each #6 Stainless steel nuts.
- 2 each #6 Stainless steel split lock washers.
- 4 each #6 Stainless steel flat washers.
- 2 each #6 Crimp on ring connectors.
- 4 to 12 feet 50 ohm Coaxial cable with UHF or BNC connector.

(Zed Zed's Workbench)