

# BREAKOUT

The Newsletter of the Hastings and  
Napier Amateur Radio Clubs

Hastings Branch 13 NZART – Napier Branch 25 NZART

Volume 17, Issue 3 March 2017



Hastings Br  
13  
Club Calls  
**ZL2AS**  
**ZL2QS**

Napier Br 25  
Club Calls  
**ZL2GT**  
**ZL2G**

**IRLP**  
Node  
6793  
147.250

**Branch  
Nets**  
9.00 AM  
Sunday  
Morning  
3615 kHz  
439.175 MHz

**Editor**  
John Newson  
ZL2VAF



*Peter 2LF operating the ZL2GT station on the Jock White Field Day*

<http://www.zl2gt.nz/>

<http://groups.yahoo.com/group/zl2as/>

**Emergency Call-in Frequencies: 3615khz and 670 repeater**



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**Club Nights: Fourth Wednesday each month at 7.30 pm Pakowhai Hall, Pakowhai Road, Pakowhai**

## From THE COMMANDER (Branch 13)

I've had it tough over the last few days.....I've come out of retirement and put myself back into the work force for a few weeks, oh well I guess the money will off set some of what I've spent in my early retirement.

On the 4th March last I travelled with 2VM and 2DW to the Paengaroa Junk Sale. As is usual the Team put on a great breakfast, which was welcome after our journey and then it was sale time. I thought the tables were a bit light this year as were the buyers.....but it was nice to catch up with old friends and faces.

I note that the final round of the on air "ZL Summer Sprint" event has been and gone and Xenia ZL4YL topped the list of winners, well done Xenia. Alice ZL2EM was in there too, giving the event a thrash.

Please note that our next meeting (on 22 March) WILL NOT be at the Pakowhai Hall, instead Blue ZL3TT is hosting us at his work place, Weldwell, for a look around.

Please meet at the venue, 64 Thames Street, Napier, at 7-30pm. Please wear proper clothing and no open shoes. There will be no formal meeting on this occasion unless there is something urgent to be brought up.

Our van trip is on schedule for Saturday 25 March to Avalon to visit the "Rescue Control Centre" (where your Emergency Locator Beacons send their signals to when you send them off) and the Maritime Op's Centre. A few years ago we saw the Tx "business" end of the HF Marine service equipment on Highway 5, so this time we can see the "other end". \$35 per head and bookings to Rob ZL2US, ph 8786381. Depart Pakowhai (from ZL2US house) at 5am. Historically these "out visits" are good value and this one should be no exception.

I note that Phil ZL2RO did well again this year as a Home Station in the JWFD event in Late February. We await the final result.

Looking forward to seeing you on Wednesday 22 March.

73, Rob (ZL2US) (Br 13/HBARC, Hastings, President)



*BR13/HBARC, Hastings, office bearers,  
Peter Keong ZL2PW (Treasurer),  
Rob Leicester ZL2US (President),  
David Walker ZL2DW (Secretary).*

## **NAPIER BRANCH 25**

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**Committee Meetings:** 7:30 pm, 3rd Tuesday of January, March, May, July, September, November

**Club Calls:** **ZL2GT, ZL2G**

**Club Web Site:** <http://www.zl2gt.nz/>

**Club Nights:** First Wednesday each month (except January) 7.30pm at the Club Rooms: 123 Latham Street Napier

## **Napier Amateur Radio Club**

These months seem to race by when you are retired. I was told this but found it hard to believe, I'm a believer now.

Continuing on the 2 Metre P.A. Saga, the parts duly arrived and repairs were completed, PA ran perfectly for 4 hours then proceeded to plazma weld the output components, due to a capacitor in the LPF failing. Fortunately, the new power fet survived, so I fitted the output board from the old pallet to the new device, and then proceeded to replace all the bypass capacitors and all the LPF components, removed a redundant relay from the output circuit and replaced the cable and connector to the outside world. The PA has now been running for a couple of weeks without incident. Whew!

A big shout out and THANK YOU for all the painting volunteers that completed the final coat to the Club Rooms, still a bit to do on the soffits and the window surrounds, but a great step forward.

The Jock White was contested from Tait's beach by the usual stalwarts, and some newcomers showed up to observe and operate, some gear failure mean't that not the whole period was covered, so results may be down a bit.

Our 2 Metre beacon license application has been reviewed and happily the frequency has been changed to 144.263 Mhz, I can now proceed to finishing this project. Next VHF summer season, should now prove better for having the 6 Meter and 2 metre beacons operating in a part of the bands that the DX will look at, as well as providing reliable signals to check your own equipment, home brewing etc.

Next meeting on the 5th of April, Dave ZL2DW will present a "techo talk" subject to be decided. This was supposed to be me talking on simple test equipment for the shack, but I will be absent due to getting a new hip so will present that at a later time.

Best 73  
Dave ZL2MQ

## WELDWELL NZ VISIT

**Upcoming Branch 13 visit..... in lieu of our normal Pakowhai Hall venue meeting.  
(64 Thames St, Napier)  
7-30pm, 22 March, 2017**

Well this is just a heads up to all hams from Napier and Hastings to join me to visit my work place, all are welcome including wives if they so wish.

Just a wee bit about my work history with the company. I first started with Weldwell way back in 1972 as a very young guy of 18 years, after I had finished an apprenticeship in the food industry.

Back then we did not have all the safety factors that we now have as we went to work in bare feet or jandals and we worked a lot harder than we do today as now we work smarter.

Back in 1947 our founder and CEO at the time was Wolf Nuttal, who passed away last year, and he set up Weldwell in a small house at the top of Shakespeare Road, Napier and it was not until the 1960s that he moved the company to Sales Street, Napier.

In 1967 the electrode factory was opened and started to make the first welding electrodes in New Zealand under the Phillips brand, as Phillips had a 33% share in the company. Now just a point of interest, this now makes the factory 50 years old but now it's a lot bigger than it was way back then and it just so happens that February was the month that the first rods were made.

Most of the machines came from Germany pre war and they are still being used today and this you will see if you come along to the factory visit and you will be shown how they work but due to safety reasons and the fact that the visit is outside working hours no machines will be running, but I'm sure you will get a very good idea of how it's all done.

We did some math's the other day and worked out that we have made over 2 billion rods in the last 50 years, good going I think as welding has changed a lot over those years and we cover all aspects of the welding industry.

I look forward to seeing you there and if you have friends that would like to see how welding rods are made they will be welcome as well.

Just for your own safety I ask that you wear a closed in shoe or boot and no loose clothing, we don't want you getting it caught on anything.

The visit will start at 7.30pm with a short induction and meeting in the canteen. It should only take just over an hour or so to see through the factory unless someone asks too many questions, which I'm sure I will be able to answer as I have worked in all parts of the factory and have a very good knowledge of the place.

Please understand that there are some things that I am not permitted to tell you but we will work on that at the time.

So where is Weldwell, Pandora on the corner of Thames Street and Severn Street. You are asked to park in the car park at the front of the factory on Thames Street for your own safety as this road is very busy, even at night, with lots of trucks using the road. Don't park over the road in head office car park as this is a tow away place.

73 Blue ZL3TT.





*A couple of machines which Blue will tell us about on our Weldwell visiting night*



## Antenna things errata

In my article about antennas last month, I made a mistake. David ZL2DW, a professional radio engineer and myself, a radio amateur and retired motor mechanic, have been in discussion about my following comments;

### Feed point impedance

For Yagi antennas, the feed point of the driven element changes from a dipole at 75 ohms downwards as additional elements are added. This is why often VHF beams of more than 4 elements use a folded driven element. A folded dipole impedance is 300 ohms, and the addition of the other elements brings this down closer to 50-75 ohms.

In my discussion with David, I put forward the following from Radio-Electronics.com "However folded dipoles find more uses when a dipole is incorporated in another RF antenna design with other elements nearby. The issue is that incorporating a dipole into an antenna such as a Yagi where elements are closely coupled reduces the feed impedance. If a simple dipole was used, then the feed impedance levels of less than 20  $\Omega$  can easily be experienced. Using a folded dipole enables the impedance to be increased by a factor of four or whatever is required by having multiple wires in the folded dipole.

David has put forward the matching proposed by K7MEM at k7mem.com which shows a matching stub or external balun. (Have a look at the K7MEM web site for details)

Two seemingly opposing opinions but with further investigation it seems David is correct and I'm only partly correct.

The impedance does drop with the addition of parasitic elements, but not by 250 ohms. With the addition of 3, 4 or more elements the impedance will drop to something like 200 ohms and this is usually compensated for by the addition of a 4:1 balun of some sort. This is proposed by K7MEM. So if you are building a multi element Yagi some form of impedance matching is definitely required. A 4:1 balun of some sort either a wire wound balun or coaxial stub for coax feeds.

Sorry for the mis-information and thanks to David for pointing my mistake out.  
ZL2CC Mike S Mather.

# Antennas for new DXers and contesters

By Mike S Mather ZL2CC

## Introduction

When you look through the magazines and talk to other hams about DXing and contesting, you always think about tall towers and big beam antennas. Erecting a tower and big mono band beam can be very expensive, labour intensive and takes much paperwork with the local council. However, many HF operators have simple wire antennas and still work the DX. Wire antennas are less expensive to make, are fun to erect and can give outstanding results.

There are many articles in plenty of ham radio publications including the ARRL Handbook and RSGB publications showing many proven designs for home brewing. I've built many wire antennas especially dipoles for various frequencies from 160m to 10m and more recently loops for 80m and 40m. The standard dipole antenna is by far the most versatile and easiest to build and set up and they work well. Remember the dipole is the standard by which all other antennas are compared. The term dBd refers to the gain compared to a dipole. A dipole will provide thousands of contacts and at a fraction of the cost of a tower and Yagi. Particularly for the lower bands of 40m and 80m for which Yagi antennas get a bit big for most NZ house and sections.

## The dipole

The basic dipole antenna in the horizontal or 'inverted V' configuration is a 'balanced' antenna system. Single band dipoles are very simple to build and erect plus they require no ground system to work. Use the tried and true formula for calculating the overall length of the dipole and trim to suit. Formula is Total length =  $468/\text{freq}$  in MHz. However, this gives results in "feet" which is an old Imperial measurement. I always use Total Length =  $300/\text{freq}$  in MHz. This always gives a length 10% too long and that is good. Its easier to trip back an antenna by cutting some off than having to add more wire..

The term 'high and clear' is seldom the case for a real antenna. In the real world they usually end up mounted low and close to trees, houses, power lines etc. that will detune them. Having the wire a little too long means you can trim it in length to suit the situation. Use an antenna analyser to set up the antenna. Remember if the dipole is moved or raised/lowered then the resonant frequency will change and the length will need to be adjusted. For portable use leave it long and double back the excess

Remember your antenna basic theory? You'll recall that an antennas resonant frequency depends on its overall length. Usually corresponding to a low SWR. If you find that the antenna resonates at a frequency too high, you will need to add wire to each leg. Messy. If the antenna resonates at too low a frequency, you will need to shorten the legs. Much easier and less stressful.

Unless a dipole is located at least a half wavelength above the ground, the radiation will be a little bit omni directional (all directions) but with a strong preference to broadside.

## Inverted V antenna

By mounting a dipole in an inverted V configuration a more pronounced omni directional pattern will result. There is an advantage with an inverted V in that only one high support if required but the ends should be kept well above touching height. The ends will have high voltages present when transmitting that can surprise a person or animal that touches them.

## Balun

Both the dipole and inverted V antennas can be fed with coax satisfactorily but a balun will help with the radiation patterns. A simple balun (Balanced to un-balanced transformer) can be made with a coil of coax at the antenna connection. Use about 6 to 8 turns coiled at about 150mm diameter. There are references for coax baluns on the internet and many ham radio publications.

## Off Centre Fed Dipole (OCF)

The OCF dipole also known as the Windom antenna is a multi-band antenna that depending on its dimensions will operate well on 80m, 40m and 20m without an external matching unit. The original Windom antenna was fed with a single wire feeder but they will work fed with coax and the use of an ATU will allow multi-band operation. The balun at the feed point for these antennas should be a 1:4 or 1:6 current transformer not a coil of coax. While a Windom antenna is easy to build it is best to build one from a published design. This will ensure it will work first time and be less stressful. They are also available from various manufacturers but its not so much fun and in my view not in the spirit of ham radio.

The offset feed point of these antennas can be useful in some situations where the short leg can go towards the front of the house and the long leg to the rear. Remember, as with a wire dipole the legs can be bent and even drooped downwards if necessary.

## Shack RF ground

Any antenna designed as 'balanced' antenna will not be actually balanced in the real world. Therefore there will be common mode currents on the feed line whether twin feeder or coax. While the balun will help here, it is also important that a good RF earth is present in the shack.

A minimum earth system for the shack would be to use a single 'bus bar' and connect all and each radio item directly to the bus bar with heavy electrical cable or braid. Then connect the bus bar to at least one, 2 metre ground rod via either a copper strap of 20mm x 3mm or very heavy electrical cable, as short as practicable. I consider this the minimum and it will help with stray RF in and around the shack, provide quieter receive and will help with TVI when the XYL is watching Shortland Street!

## Summing up

Trees, while being a nuisance in tangling up the antenna wires when trying to erect a wire antenna, can also be your saviour. They make good supports. Not ideal when in full leaf and wet but better than nothing.

Try to erect the antenna as high up as practicable and keep it clear of roofs etc if possible.

If using coax use good quality new coax. RG-213 preferably but if small diameter coax must be used buy the best quality available with a good screen. Not the cheap CB type that will let you down.

Beg, steal or borrow a good quality antenna analyzer. There was a description of a home brew analyzer in Break-In some time ago. I have one of these and they are good. Build your own like a real ham, you won't regret it.

Like the speaker of an audio system, the antenna is the single most important item of the ham system. Time spent on planning and installing your antenna will pay dividends in the number of DX contacts.

Finally, think safety always! Keep clear of power lines and use personal safety equipment. You can't work that illusive DX from a hospital bed or worse still, the grave.

Take a look at the following web site for useful information.  
[www.chem.hawaii.edu/uham/antennas.html](http://www.chem.hawaii.edu/uham/antennas.html)

**See you in the pileups Mike ZL2CC**



## HANDY DAY TO DAY CONVERSION CALCULATORS

[http://www.digikey.co.nz/en/resources/online-conversion-calculators?WT.v\\_sub=7567679](http://www.digikey.co.nz/en/resources/online-conversion-calculators?WT.v_sub=7567679)

## Jock White Field Day Contest 25 and 26 February 2017

Participants: Stan ZL2ST, John ZL2QM, Peter ZL2LF, Paul ZL2HB and on Sunday only the undersigned. The Napier ARC call sign ZL2GT was used.

Stan ZL2ST and John ZL2QM did some preparation at the contest group's customary Tangoio site the Friday before. Decisions were made regarding antenna location and positioning. John, the group's antenna man, having done the necessary calculations involving the height of 'E' and 'F' layers and distance of the targets decided on the required angles of radiation. The (amazing) spud gun needed to be fired only once to get the line over the chosen (enormous) pine tree.

On Saturday, at the appropriate time the two antenna's were erected as follows: One 80m near vertical delta loop, apex at the aforementioned pine tree, feed point somewhere along the base. By pulling the loop through it's supports the feed point could be moved and the radiation pattern changed.

And the 40m near horizontal delta loop suspended from the club's telescopic poles and a nearby barn with a high angle radiation pattern was again designed to reach both north and south.

Setting up of the tent, tables and chairs, generator, rigs, computers and all other paraphernalia was completed by 3pm and the show was under-way.

Several mishaps (of course) slowed things down in the beginning, the Club's Yeasu FT1000MP went 'pop' and could not be brought back to life and a trip back into Napier was needed to pick up it's sister which then went well. So 40m was off to a slow start. 80m went better, propagation was not too bad and most if not all field stations were worked most 1 hour periods. Some home stations were worked as well and it was noted that Phil ZL2RO was clocking up a respectable score.

Propagation was not good on 40m, fluctuating considerably and presumably other stations gave up on forty some of the time. A problem arose from what most likely was the second harmonic from the 80m station interfering with 40m reception. This was particularly bad when 80m CW was being transmitted. Some testing confirmed that the interference was from antenna to antenna. Future events will greatly benefit from a 7MHz filter at the output of the 80m transmitter.

Logging was done with the N1MM software which makes the job a lot easier especially when working CW, as the CQ call can be automated including repeat calling. The operator needs to be able to receive at about 20 wpm but this quickly becomes routine as only numbers are to be copied.

The computer will take care of all transmissions including QRZ, QSL, TNX etc., just push a button.

So, four operators took turns at manning the two stations. Paul, being totally new at contesting was 'thrown in at the deep end', did a fair bit and found it hard work. Also, the adrenalin overload makes unwinding and getting some sleep during the 6 hour break not straightforward.

Each station worked phone the first half hour and CW the second. Choices are: pick a frequency and call CQ (pile-up) or trawl the band and work other stations calling CQ. A strategy is to alternate between these two modes, the hard bit is deciding when to change.

Three pm on Sunday it was all over. The point score was respectable but most likely not a winner this year thanks to the 40m rig breaking down. But the exercise proved once again that the boys can set up and operate a totally stand alone emergency amateur radio station if needed.

Packing up and clearing the site took an hour and a bit. Thanks for a great show, flying the flag for the Napier ARC to Stan ZL2ST, John 2QM, Peter 2LF and Paul 2HB.

Karl Matthys ZL1TJ



*John 2QM and  
Paul 2HB*



*Stan 2ST*

*Pau 2HBI and  
Stan 2ST*



40m delta loop  
antenna