



# QST63

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Newsletter of The New Zealand Association of Radio Transmitters, Upper Hutt Branch 63, Inc.

## February 2013

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### Presidents Report

Hi Everyone... welcome to 2013, yet another New Year for us all to look forward to no doubt. I hope you all had time over the Christmas/New Year to spend time with family and friends.

Over the December/January period I took the time to reflect back on what the club has accomplished over recent time, and thought that you should celebrate these achievements:

1. 23CM Repeater operating on 1292 MHz
2. D-STAR VHF/UHF Repeaters plus internet Gateway Connection
3. 6M Repeater operating on 53.950 MHz

Some years ago we had paper licences for 23CM, 6M and 10M repeaters so we have two-thirds of our previous projects on line and in daily use. Of course over this time D-STAR came along and this has us well placed in new technologies going forward. As to whether we develop a 10M Repeater is something to think about perhaps over the next year or so, but this must be tempered with the maintenance required at Mt Climie this coming year. It is pleasing to see the maintenance commence over the Christmas/New Year period on the 730 Antenna four dipole arrays, which is projected to be completed no later than May 2013. Once completed then next the maintenance task needs to be planned over the winter period ready for the summer of 2013/2014.

Details of the Jock White Field Day (23/24 February 2013) are detailed in the newsletter - so get involved in this event.

Don't forget that NZART Conference (1-3 June 2013) is on in Masterton - book early to get onsite accommodation. Hope you support Branch 46 as they did for our Conference.

Later this year (December 2013) will be the tenth anniversary of the IRLP Node 6931 on Mt Climie – we must do some type of award or certificate for working the node or ZL2VH club station. If you have any ideas about this please email them through.

One a sad note, ex-NZART President Roy Symon ZL2KH passed away in January 2013 – some you will remember Roy from the Upper Hutt Conference we hosted in 2010. Roy is survived by his wife, five children and five grand children.

Finally, I'm looking for reports of usage on the 6M Repeater - DX, local contacts, mobile reports and the like....

73's...

Mark ZL2UFI  
President

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## Branch 63 Repeater Update

### Beacons 3cm

The G4NNS reverse rdds local oscillator kit has arrived, with construction started. The rdds controller also generates the JT65 and CW id modulation. The other components are relatively straight forward to source, The exception is the antenna.



slotted waveguide antenna

Commercial omni-directional slot antenna's are available but very expensive – over 400 euro's. The plan is to source WR90 waveguide and get the 1.5mm slots accurately machined using a cnc or router. Wonder if anybody knows of a friendly cnc operator locally ?

### 10m

Nothing to report.

### Repeaters

#### 1292 23cm

During the recent storm the 1292 antenna was destroyed – see photo. So 1292 is off air pending replacement. Chris ZL2DX has offered to produce a new set. The arrangement of these antenna's is unknown.

#### 860,5425 Dstar

860 is running at reduced efficiency – suspect is water in the feeder, possibly related to the storm that destroyed the 1292 antenna.

5425 is running on a single dipole whilst 730's antenna's are refurbished. See 730 report below.

#### 730 2m FM

Over Christmas ZL2UFI, ZL2HF, ZL2ACT, ZL2UP, ZL2SET, ZL2DPB and ZL2BRG removed the 730 dipoles and Pole for refurbishment. Neil ZL2TNG is refurbishing the antenna's and phasing harness. In the meantime 730 is running on 5425's 4 dipole stack with 5425 running on a temporary single dipole antenna mounted on the 1292 pole.

#### 6m FM

The 53.950 repeater was installed before Christmas by John ZL2TWS and has a decent amount of activity. Signal reports from near and far would be appreciated !.

Simon ZL2BRG.  
Repeater Trustee.

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## 6 Metre Project Report

Now that the 6 metre project is complete, some of the numbers are now available. The all up price of the asset is;

Repeater	\$ 900
Duplexers	\$ 3313
Total	\$ 4213

During the year, a "6 metre project" was instigated where contributions to the project were acknowledged. Contributions to the project totalled \$ 2500.

The club now has a very worthwhile asset due to the generosity of it's friends and members

Gavin ZL2ACT  
Treasurer

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## Damage: Mt Climie 1292 Antenna

Recently the weather conditions at Mt Climie were sufficient to cause the 23cm antenna to fail, or in the words of those that saw it on Saturday 5 January 2013, horizontally polarised!

Perhaps it is timely to report that the weather conditions at Mt Clime can be extreme. Measurements taken from Wednesday 2 January 2013 at 1.00 pm until Thursday 3 January 2013 at 12.00 pm showed the highest wind gust some 131.5 km/h and the highest mean wind speed of 75.9 km/h. These measurements were taken on the Rimutaka Hill Road but without doubt Mt Climie would have similar conditions.



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### Inter-Web Link of interest

This newsletter contains a couple of articles about the Raspberry Pi micro computer.

This link is how this remarkable little device came to be.

[http://www.zdnet.com/we-thought-wed-sell-1000-the-inside-story-of-the-raspberry-pi-7000009718/?s\\_cid=e019](http://www.zdnet.com/we-thought-wed-sell-1000-the-inside-story-of-the-raspberry-pi-7000009718/?s_cid=e019)

What can be done if you have the time and patience.

<http://arstechnica.com/information-technology/2012/09/university-builds-cheap-supercomputer-with-raspberry-pi-and-legos/>

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The Raspberry Pi micro pc board  
in service at ZL2ARN

## Background

Right from my latter school days, and then from Licensing in 1960, I have had a keen interest in Amateur Radio and Dxing. The excitement of working a DX station around the other side of the World soon led to a keen desire to understand just how this was made possible, and what was the mechanism that allowed this to happen.

G3NID, Ian, and I have been studying the Long path and Short Path between us for some 15 years now, using the Pactor mode.

## The DXSpider DX Cluster

Some 15 years ago the DXCluster Service was introduced to the Amateur Radio Community. This Service provides a "real time" listing of DX activities around the World.

ZL2ARN has provided an active Server for this Service since its inception. In those early days I used the standard desktop PC. 24/7 operation resulted in a rather hefty power bill throughout those years.

## The Raspberry Pi

In the last few years there has been great development in the micro PC board technology. Now today we have the new and exciting Raspberry Pi micro board measuring just some 85.60mm x 56mm x 21mm, with a little overlap for the SD card and connectors which project over the edges. It weighs 45g. !!!!

*"The Raspberry Pi is a credit-card sized computer that plugs into your TV and a keyboard. It's a capable little PC which can be used for many of the things that your desktop PC does, like spreadsheets, word-processing and games. It also plays high-definition video. We want to see it being used by kids all over the world to learn programming."*

This micro board is ideal for a 24/7 Server as running "bare-foot" it consumes just 3 watts of energy !!!

## Configuring the Raspberry Pi

I have dedicated my Raspberry Pi exclusively to the DXCluster Service and it is running the "Spider" node for this Service.

### **Raspbian "wheezy"**

*"If you're just starting out, **this is the image we recommend you use**. It's a reference root filesystem from Alex and Dom, based on the Raspbian optimised version of Debian, and containing LXDE, Midori, development tools and example source code for multimedia functions."*

This is the image I have installed on my Raspberry Pi.

It is a Debian Linux system and has access to ALL of the Debian Repositories.

The Spider DXCluster Server software was installed and has been running continuously now for some 3 months.

The Apache2 Web Server software has been installed and provides the usual "home page" on Port 80.

A "Multi Router Traffic Grapher" (MRTG) has been installed. This shows in Graphical format the performance of the DXCluster Server at ZL2ARN.

## Links

<http://zl2arn.ath.cx>

<http://zl2arn.ath.cx/mrtg/stats.html>

<http://zl2arn.ath.cx/cgi-bin/spider.cgi>

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## D-STAR: DVAP and the Raspberry Pi

One of the issues with using a DVAP (DV Access Point Dongle) is that it can tie you down if you just don't want to run your PC all the time to have access to the DVAP. Of course a laptop can adequately run the DVAP as well, but perhaps you are looking for a smaller power foot print?

One solution is to run the DVAP via a lower power computer such as the Raspberry Pi or a Beaglebone. The Raspberry Pi is probably better known to many of you now that it has become available in larger numbers from the second half of 2012. Many members of the club are now owners of a Raspberry Pi.

The Raspberry Pi is a very small single circuit board that contains a CPU (ARM Processor), 256MB RAM (now revision B boards have 512MB), SD Card Reader and various ports for attaching keyboards, mice, a monitor and the like. It runs from a 5 volt USB styled wall charger and as such has many uses. I was on the 10-12 week waiting list in early April 2012 and received my Raspberry Pi in early August 2012. My reason for purchasing one was to try it out for myself and see what uses I could put it to.



**Figure 1: Raspberry Pi - bare circuit board showing the various component sockets.**

Raspberry Pi Model B ver.2: Broadcom BCM2835 700MHz ARM1176JZFS processor with FPU and Videocore 4 GPU GPU, 512MB RAM, Boots from SD card, running a version of Linux. 10/100 BaseT Ethernet socket, HDMI and composite video output, sound output.

To make it as easy as possible for myself, I also ordered the wall charger, see-through case (for mounting the Raspberry Pi circuit board) and an SD Card with the latest version of Debian OS (Operating System) for the Raspberry Pi called Wheezy (this together with a network connection, keyboard, mouse and HDMI cable (I already had all of these) gave me a working computer for about NZD\$80.00 odd).

Debian is a form of Linux and the Raspberry Pi boots in no time at all, to either a command line or a GUI (Graphic User Interface) similar to Windows. Having been familiar with Linux (Centos) on the IRLP Node, I quickly had it booted and was surfing the internet in no time. I then used the Raspberry Pi for a week or two before other projects took over and it sat unused on the work bench since for next couple of months.

Other hams have also brought these low cost computers and Gordon ZL2ARN had already done the DVAP to Raspberry Pi project but I thought I'd explain how easy this can be. Apart from the download of the image file, I guess the whole process took about ten minutes.

Over the Christmas/New Year period, as the weather wasn't the best I took the opportunity to find out more about this integration of the Raspberry Pi to the DVAP. One of the many Yahoo Groups I have subscribed to had a message from a user about what was required, by way of a PDF guide or How to. This guide also pointed to a link to download a disc image of the required operating system and applications for both the Raspberry Pi and DVAP software.

The PDF is easy reading and includes screen shots displaying the changes required to personalise the DVAP software to your callsign and the like. The disc image is a compressed file of about 650MB which expands out to about 3.8GB (the PDF explains to uncompress the image and using a Windows PC to write the image to a 4GB SD Card).

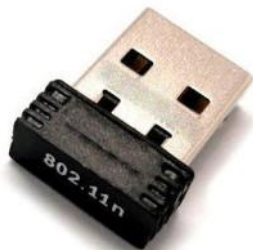
After having set-up the DVAP software the Raspberry can then be run in 'headless' mode (meaning no keyboard, mouse or monitor is required to be plugged in) with the linking/unlinking all controlled from the radio, as per normal DVAP operation. The only connection to the Raspberry Pi is the power supply, Ethernet cable and the DVAP.

In normal operation the Raspberry Pi can be left turned on and connected to your modem/router 24/7 - allowing you to link or unlink when required. I have used my UHF DVAP and the ICOM ID-31A for this purpose and it operates very well.

The PDF explains that the author used a WiFi Dongle (instead of a wired Ethernet cable) to connect to the internet which stirs up some interesting ideas for a mobile version when outside the range of a D-STAR Repeater.



**Figure 2: Raspberry Pi – running on ZL2VH Gateway. From the top (going clockwise) is the DVAP (red Box) connected via USB to the Pi, the network cable (beige), power supply (black) and SD Card (blue).**



The next project was to find a suitable USB WiFi Dongle that the Raspberry can address and produce a small car mounted version of this installation. I found a seller on Trademe selling a Raspberry Pi Kit which included a suitable USB WiFi Dongle (how they have enough antenna showing to get a signal is anyone's guess?). This WiFi dongle just fits in the USB socket and only just protrudes out about 5mm or so. It lights up blue when connected or in use.

A quick request and I had the item in 24 hours for \$20.00 freight included.

**Figure 3: WiFi USB Dongle**

The drivers are included in the software build and after configuring the software with your SSID Name and Network password you are all good to go.

For the required 5V power a cigarette lighter USB adaptor plug from the car's 12V DC supply will work, these are readily available from Trademe or Dick Smiths as many people now use them for powering their smart phones or iPods.

As for an internet connection I use my iPhone 4S with WiFi tethering to provide the required access, by running the iPhone as a WiFi hotspot this way you'll never be out of range of D-STAR (as long as you have internet coverage).

I have previously proved this with my first VHF DVAP a year or so ago, but using a Windows laptop. I was able to go mobile in Upper Hutt and have a QSO with another ham in the USA bypassing the Mt Climie Gateway/D-STAR repeaters. This proved correct when I was able to use the Raspberry Pi and work John ZL2TWS all the way from work to home over the Haywards Road (SH 58) via the Mt Climie VHF 5425 Repeater without a single break in transmission. I could not detect any lag or break as I no doubt transferred from one cell tower to another. The bandwidth consumed also seems small but I have no real measurements of this.

Link to the SD Card image file:

<http://www.westernstar.co.uk/html/downloads.html>

You need to download the version DVAP+ircDDB+VNC - an 'Autostart' Raspberry PI image for DVAP (Debian Wheezy HF 16-12-2012 with ircDDB Gateway 15-01-2013 and Repeater 11-01-2013). This is a large file of about 830MB that expands out to the required 3.8GB image for the SD card.

In order to assist any other members of the club you can supply me with an SD Card and I can write the image for you (minimum is 4GB but probably 8GB is better – Class 4 or above is best).

#### **IRLP Version:**

When writing this article, the inventor of IRLP Dave Cameron VE7LTD has completed an initial prototype IRLP Node running on a Raspberry Pi. He has released a How to guide on the IRLP Node Owners list outlining what modifications are required to v3.0 of the IRLP Board, the GPIO to Parallel Port cable (a USB sound card is also required) and of course the required software update to run Debian/Raspberry Pi as an IRLP Node.

Early indications are that this might become a semi-production product if sufficient interest exists, but it will be an experimental process.

This new approach will allow all sorts of possible applications at repeater sites with internet access, with the ability to run a low power computer (and no moving parts to fail such as a hard drive) with direct connection to repeater doing away with the link radio.

Mark ZL2UFI

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## Wallaceville Hill Climb – 3 February 2013

A hot but dry day at the Wallaceville Hill Climb, and thankfully no real mishaps! We were on site at 7.30 am for our own briefing and this was followed up with a drivers briefing at 8.00 am. The road was closed at 8.30 am and racing was due to commence at 9.00 am but the race timing gear proved a problem. This problem was resolved with replacement parts and the first to two practice runs took place.

The cars were divided into two groups one of seventeen and another of sixteen. Each car took between 60-65 seconds to complete the 1.6 kilometre course. Once this was completed each vehicle then did a further three timed runs with best run counting for the winners.

All racing was completed at 2.20 pm and we were stood down at 2.30 pm.

Communications was via 146.500 MHz FM (simplex) and proved good on the day. A debrief later at the Branch 63 clubrooms has suggested perhaps that the STSP Repeater might assist, especially to coverage further down the Upper Hutt side of the Wallaceville Hill Road where communications were not as good. This test will be completed over the next few months.

I have the following members to thank for assistance with the event:

ZL2ARN, ZL2BRG, ZL2OLY, ZL2SET, ZL2SFM, ZL2UFI, ZL2UX, ZL2UDF, and ZL2UGL.

Mark ZL2UFI

