

# THE WORLD BELOW

## 400 GHz

The Periodical Newsletter of the  
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NZART  
BRANCH 81

[www.zl1is.info](http://www.zl1is.info)

**AUGUST 2009 ISSUE**

### WAIKATO VHF GROUP EXECUTIVE

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## General Meeting August 2009

A General Meeting of the Waikato VHF Group will be held on  
Sunday 30<sup>th</sup> August, 2009 at 1:30pm.

The venue will be the Te Puke Amateur Radio Club, State Highway 2, Te Puke.

The speaker for this meeting will be Gary Ertel,  
of "Data Over Radio Ltd",  
who will be speaking on

**"Email over radio, and IP radio Connections in the commercial world"**

## News item from August 2009 Committee meeting

Rangitoto (OTO) Digipeater: New radio equipment was installed in early June.

Kaimai National System Node: The node has an intermittent problem and will be removed in the next week or so for repair. Due to its intermittent nature, it is not known how long it will be off air.

IRLP on Te Aroha 695: This system also has an intermittent problem, where from time to time, the audio from the UHF link receiver does not reach the 695 VHF transmitter. This problem is being investigated.

SRD's (Short Range Devices) proposal from MED: A submission on MED's proposal to allow increased power for these devices was sent to FMTAG, opposing any increase.

Group Constitution: Revision still in progress. Will be ready for next AGM.

Interference on 695: Additional filtering has been installed prior to the receiver input, which we are hoping may have reduced the noise that appeared when the wind blows from a NE direction.

### Hospitalisations

Two of the VHF Group's repeaters have recently had brief stays in hospital. Our **Kaimai National System '485 node** was removed on 9 August to investigate a transmitter problem, which turned out to be a failed transistor in one of the push-push doubler stages (the un-failed transistor in the same stage had kept the transmitter going, at reduced performance). While this gear was out of service, several other issues in both the transmitter and receiver were sorted out, before this equipment was returned to site on 18 August.

Our **Hamilton National System '9975 repeater** was removed on 13 August to repair a fault which had developed in its duplexer. This was returned to the site the following day, but remained stand-alone until the Kaimai node went back in on the 18<sup>th</sup>.

The **Te Aroha linking matrix** which interconnects '695 (and '840 should we require) with the **IRLP access** link was removed on 10 August for another attempt to trap the cause of incoming IRLP traffic intermittently not getting to '695. Through earlier remote diagnosis, we'd narrowed the fault to a particular area within this reasonably complex piece of equipment, but it never faulted either during a site visit, or when it was brought down. The last time it was removed for examination, it never played up on the bench, then operated for five months back on site before playing up again! It was third time lucky, and this unit has now been repaired and currently awaits its return to Mt Te Aroha.

Thanks to Ian ZL1TAT for the surgery, plus Gavin ZL1GWP and Phil ZL1PK for transportation.

### Hamilton Market day

The Hamilton Amateur Radio Club Market day, was held on the 15<sup>th</sup> August at the usual Claudelands venue. However, there was considerable evidence of demolition all around the venue. The scribe, along with Tom ZL1THG and Gavin ZL1GWP manned the Waikato VHF Group tables. There were many visitors to the stand, with one as far away as Martinborough

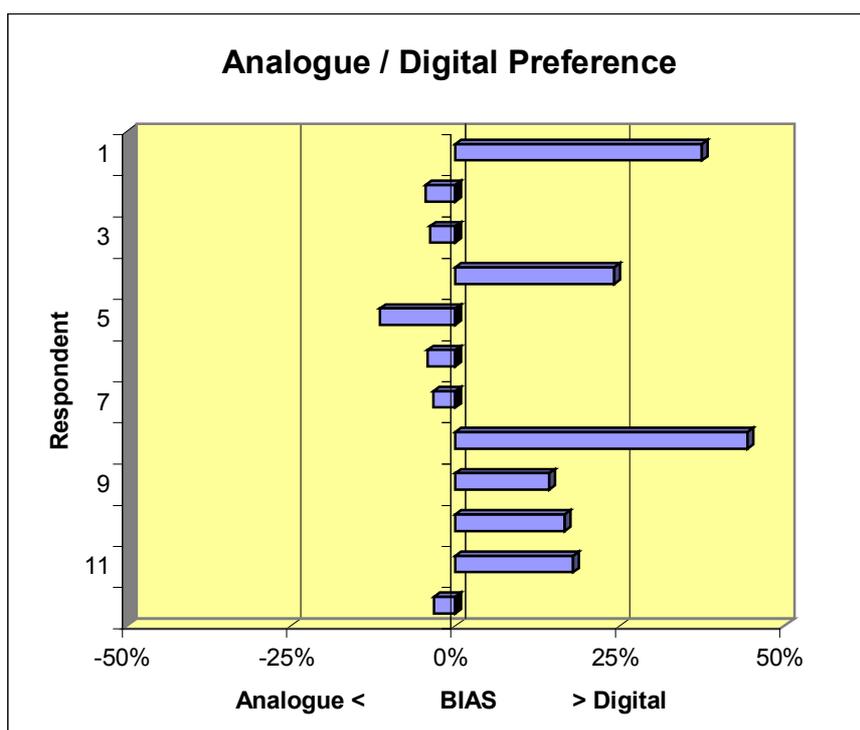
Peter Dalliessi, who previously ran Radio Engineering in Dunedin many years ago, has moved into a resthome in Cambridge and the scribe has spent many enjoyable mornings and afternoons with him, sorting out suitable material for both this Market day, and future ones as well.

Thanks to Peter's generosity, we have raised extra funds for the VHF group

## ANALOGUE / DIGITAL RADIO COMPARISON

During the presentation on Digital Mobile Radio at our 21 June 2009 meeting in Hamilton, Ian ZL1TAT played a series of sound files comparing analogue FM transmissions against various formats of digital mobile radio transmissions. The audience was invited to participate in this evaluation by recording their individual scores for each of nine comparisons played. Digital formats included D-STAR, NXDN, and MotoTRBO, operating under a range of signal strengths from strong to very weak, while stationary and moving with significant flutter. Playback of the weak and fluttery mobile signals revealed all expected noise on analogue and various decoding artefacts on digital, providing a 'real-world' evaluation of conditions found near outer limits of a radio coverage area. Each of the twelve anonymous voting forms were subsequently analysed and results averaged.

Our audience gave the analogue transmissions an overall score of 46.5%, and digital 50.5%, revealing a 4% preference of the digital signals compared with analogue over a range of signal strengths, good to poor. Half those voting were between 3.2 and 11.4% in favour of analogue, while those favouring digital voted between 14.3 and 44.4% in favour of that mode. The distribution of individual scores is shown in the chart below, where a bias towards analogue is left of the centre line, and digital to the right.



Narrow-band digital mobile-radio signals reveal a slightly unnatural and 'metallic' sound (caused by the Vocoder's digitising the audio into a low rate digital stream at the transmitting end, and subsequent decoding at the receiving end), which it appears people adjust to quite quickly. It might have been expected that our audience comprised of amateur radio operators would be more tolerant of noisy and disrupted signals than another audience of general radio users. However, their bias came out very similar to that obtained in similar evaluations done with an audience of non-amateur operators.

## General

There has been some progress on the Beacon matters from the last newsletter. The Waikato VHF Group Beacon frequency allocation has been shifted up by 4 kHz. The new frequencies are XXX.260 MHz. A generous donation has been made by Stephen ZL1TPH to cover the cost of replacement crystals.

At higher frequencies the shift of a few kHz is reduced by the multiplication factor. (Eg If using a 108 MHz crystal for a 1296 MHz Beacon, then the crystal frequency is multiplied by 12). This means the crystal possibly be within alignment tolerances

However at lower frequencies, the multiplying factor may only x2, so a replacement crystal may be needed. If the crystal is pulled too far, this may result in low output, and instability.

At this time the Auckland 23cm Beacon has had a notice in FMTAG notes, saying that the plan is to have this beacon on 1296.253 MHz. No other information is available on whether the other frequencies will be changed.

There are a number of submissions appearing the NZART website. [www.nzart.org.nz/](http://www.nzart.org.nz/)

One is in regard to a shift from the existing (very noisy) 2424 MHz narrowband 12 cm allocation, to an allocation around 2400 MHz. This is currently in the FMTAG section of the NZART website. FMTAG is currently asking for further submissions.

Another submission that has recently appeared is with respect to the CH39 ATV allocation. The RSM section of the MED has posted a discussion document with questions about the CH39 allocation. Comments should be made to the [alo@nzart.org.nz](mailto:alo@nzart.org.nz) ASAP.

## New Zealand 10 GHz record

3cm 10368MHz Internal Record. ZL1TPH/p-ZL2IP/p 04/01/2009 55B 551 km

Confirmed as a new New Zealand record and a milestone record. It is to date the longest terrestrial distance contact at 551kms made on the 3cm microwave band in New Zealand.

ZL1TPH/p operated from Cape Reinga at 175 M ASL.

ZL2IP/p operated from North Egmont at 960 M ASL.

The actual frequency used was 10368.1 MHz and the signal path used a Tropospheric Duct.

Congratulations to all concerned. There has been a lot of hard work at testing at intermediate distances (~ 300 km) over several years.

There is someone from Europe, who now lives in the South Island who has an advanced 10 GHz station. I am sure that further attempts will also include him.

## Waikato VHF Group Website

[www.zl1is.info/](http://www.zl1is.info/)

The Waikato VHF Group website at [www.zl1is.info/](http://www.zl1is.info/) has undergone recent updating and is well worth a visit. Membership forms can be also be downloaded and printed, if you wish to rejoin or join up new members.