

The Official Newsletter of the
Auckland VHF Group Inc.
Spectrum 2007



Peter ZL1UPB, David McDonald from JDA, Peter ZL1UKG and Quentin ZL1QF
with Network Analyser and 70 cm antenna under test at the April 16 meeting.



Auckland VHF Group Inc.

Branch 66 NZART

PO Box 10138, Dominion Rd, Auckland 1446

Clubrooms: Hazel Ave, Mt Roskill

<http://www.qsl.net/zl1bq>

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Club Web Page

<http://www.qsl.net/zl1bq>

ATV Interest Group

<http://www.qsl.net/zl1qf/atvug/ATVusers.html>

Club News and Net:

The combined Auckland VHF Group and Auckland Regional Branch News and Net is held on 146.625 MHz and 439.875 MHz at 8.15 pm each Sunday, or after the ZL6A National Broadcast on the last Sunday of the month.

Club meetings are held at the Clubrooms at Hazel Avenue, on the second Monday of each month at 7.30 pm. For other details, listen to the News and Net each Sunday.

Membership of the Auckland VHF Group is via subscription; \$30 within the Auckland free dialling area, and \$25 outside. It is expected that members of the Auckland VHF Group Inc. are also members of NZART, as we are branch number 66 of NZART.

SPECTRUM is the official journal of the Auckland VHF Group Inc.

Opinions expressed are those of the authors and do not necessarily reflect club points of view. The closing date for SPECTRUM articles is the Monday 7 days before the following General Meeting. Articles may be submitted to the Editor.

Coming Events:

May 14th: Remits and elect delegates for conference, review GURL from NZART.

Video/Slide show about the 50th anniversary gathering.

NOTE the change to the SECOND MONDAY of the month.

June 11th: HDTV – visit to Digital Video Technologies (DVT) at 45 Fairfax Ave, Penrose at 19:30

July 9th: Meal & Movie

August 13th: Observatory visit. TBA

November 12th : AGM

December: End of year Bash.

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Contest Calendar:

Hibernation Contest: 9th and 10th June 2007.
All bands from 50 MHz and up.

Contest times are from 1700 to 2300 NZST on Saturday, and from 0700 to 1300 NZST on Sunday.

Pres' doodlings for May.

Hi All, another month is well underway, and yet another is now firmly in the history books. There have been plenty of things going on to keep us busy during the last month, from activities like the recent VHF and Technology Convention, held by the Wellington VHF

Group at their new base in Tawa, to some working activities up at Klondyke.

The VHF Technology convention was well supported, with people attending from as far a



field as Christchurch, Nelson, Hawkes Bay, Auckland and Whangarei, and there were forums on everything from the upgrades to the Air Force Orion aircraft to digital TV, digital modes, repeaters, Amateur Satellites, including KiwiSAT, D-Star and new higher bit rate digital modulation, software defined radio. There was the usual "Wallace" mobile rally, which took participants all around the Tawa, Porirua, Newlands and Churton Park areas (my old stomping ground over 20 years ago), and then to wrap up the evening, the dinner at the Destiny restaurant in Porirua.

On the Sunday, there were more forums, and an oscillator building contest for a few that was held in one of the back rooms, the challenge being to make a crude oscillator, and from the component values that you had work out its approximate frequency, oh, and have it work first time!. A great weekend was had by all, and the weather was most un-Wellington-like, calm, no wind, and fine, but just a little cooler than up this way.

Recently, a small group of us met up at Klondyke on Anzac day to check out a few things and have a look at things up the tower, and check out a few other areas, including batteries. Most things around the site are in good order, but there are a few things that will

need further attention, such as painting a few bits on the tower. We ran out of time up at the site, and only Laurie, ZL1ICU, and I made it up the tower. It was a fine, windless day, and when you're at the top of the tower, about 37m above firmer terror, you can appreciate a calm day...

Coming up over the next months, we have the May meeting, which will be remit night, and election of delegates for conference in June, plus a video and slideshow of the events of the club's 50th anniversary celebrations in October last year, in June, we will hear all about High Definition TV (HDTV), which uses a resolution of 1080x1920 pixels, as opposed to the current standard definition picture of 576x720 pixels. HDTV is sometimes referred to as 1080i, and is likely to be the format that will be used in the future for HDTV broadcasting in New Zealand. (Many monitors currently available that are advertised as HD ready are only able to support 1366x768 pixels, and therefore are not able to correctly display a 1080x1920 picture. Don't be fooled!).

In July, the meeting will be a meal and movie, to be held at a small private cinema that also has a small roast dinner restaurant, complete with logfire to keep us warm. The venue is in the Avondale area, and we will need to know in advance numbers of those attending, for catering purposes.

Also, from the past committee meeting, Daniel, ZL1DFA filled us in on the recent Coromandel adventure race (which was actually held around Kawhia and Raglan), with much of the race information conveyed via packet radio, with field stations transmitting data to a temporary repeater on 10m, which worked very well. Daniel commented that the use of technologies such as packet radio on 10m will require more investigation, especially when the terrain is as rugged as the area where the event was staged. There were also 3 searches during the event, which puts further pressure on radio operators. More operators are needed for these types of events.

It has been noted that the ATV repeater is off the air at the moment, this will be sorted out as soon as we can get in to fix the problem, which is likely to be nothing more than a microcontroller reset. There are ongoing issues

regarding access, and the site owners seem to expect that we may only ever need to gain access during normal business hours, Monday to Friday, the times when we are all at work, not travelling up to repeater sites.

On the repeater front, there are some possible changes in the pipeline for the Brynderwyn site; the Whangarei trustees have suggested some improvements to the National System equipment and its coverage, and in particular improving coverage in the direction of Dargaville and the link back to Klondyke, which would improve the reliability of the Klondyke link north.

As many of you may know, there are still problems with high powered cordless phones operating in the 2m band, and in recent months 2 phones have been traced to specific addresses, but there are at least two more phones that are being investigated. These are operating on 146.260 and 146.265 MHz, (base unit transmit); they are two distinctly different phones with different tone patterns. We're hot on the trail of the .260 phone at the moment, but if you can hear either of these phones, please let me know how strong it is in your area. It is helpful to monitor the phone and determine the times of day when it is used most, as this does reduce the number of hours spent sitting on high spots with a good DF receiver and directional antenna. I spent several hours over the last few weeks on a high spot, only to catch about 15 seconds of transmission, but it was enough to get a rough bearing, until I accidentally pulled out the DC supply connector on my FT817!.

With that, I will wish everybody an enjoyable and productive month; keep warm as we descend into yet another winter.

73, Tim ZL1TN.

From Trevor ZL1UEO

Solar Cycle 24 Prediction

Please refer to the web site

<http://www.sec.noaa.gov/SolarCycle/SC24/>

Hibernation Contest, on Saturday the 9th and Sunday the 10th of June 2007.

This is the weekend FOLLOWING NZART Conference, being held in Palmerston North at Queen's Birthday weekend.

The operating times are:

Saturday 1700 to 2300 NZT and

Sunday 0700 to 1300 NZT.

The rules are available at:

<www.nzart.org.nz/nzart/update/contests/vhfcointestrules.html>

All contest logs should be sent, to arrive within two weeks, to:

Contest Manager

Wellington VHF Group

P.O. Box 12-259

Thorndon

Wellington

CubeSats launched:

Here are some excerpts from an email I received from Ralph Wallio W0RPK

Ian Ashley ZL1AOX

Hi all,

At 0645 UTC April 17, a Dnepr rocket lifted off from Kazakhstan and successfully deployed 7 CubeSats, (along with 7 other satellites from Egypt, Saudi Arabia, and the Ukraine) into orbit.

We offer our special congratulations to Colombia on the successful launch of their first satellite! Thank you for allowing us to be a part of this mission! We hope that you all are able to help us track the satellites. We expect CAPE 1 and Libertad-1 to start beaconing by the time you receive this email, with CP3 and CP4 turning on 2 hours after launch.

We will update the TLE's on our website, www.cubesat.org, as soon as we receive them to ensure accurate tracking.

This was my confirmation of the launch and so I was able to start tracking these satellites using the pre launch Keplerian elements. From Ralph W0RPK webpage I had the frequencies used by the satellites.

I set up my system to initially auto-track and auto-tune the 70cm receiver. On my first pass at around 0920Z on the 17th April, I did not

hear any signals, but the max elevation was only 5 degrees.

The next pass at 10:53z had a maximum elevation of 66 degrees, and at 10:56 I decoded 4 of the 5 packets sent from the Colombian satellite Libertad-1 shown below. It consists of an identification and then telemetry

```
[10:56:13] 5K3L>5K3USA,BEACON <UI
C>:A11O44C33I22P25R14_LIBERTAD_1COL_B:2_AA
[10:56:16] 5K3L>5K3USA,BEACON <UI
C>:A11O44C33I22P25R14_LIBERTAD_1COL_B:2_AA
[10:56:18] 5K3L>5K3USA,BEACON <UI
C>:A11O44C33I22P25R14_LIBERTAD_1COL_B:2_AA
[10:56:20] 5K3L>5K3USA,BEACON <UI
C>:A11O44C33I22P25R14_LIBERTAD_1COL_B:2_AA
```

I also copied another satellite called Cape-1 from the California Polytechnic State University (USA)

This transmitted CW and some 9600 bps telemetry which sounded like a series of N's. (Nobody has managed to decode the 9600 telemetry yet!), but the CW is readable. I was unable to find another of the Cubesats which should have been audible. The data was sent off and I received this in reply.

Ralph Wallio, W0RPK wrote:

Ian –

Well Done! To my knowledge you have provided the first telemetry report for this CubeSat launch.

Your report is posted on my web page and has been forwarded to the LIBERTAD-1 team via 5k3l.colombia@gmail.com.

The next few days were interesting, as the small satellites drifted apart and new Keplerian elements were posted but each satellite was only identified by a number. With 7 to pick from it made it quite difficult to find/track them. As well, I found that the Libertad-1 transmissions were only once every 10 minutes and the clock is not accurate so one couldn't plan on hearing this satellite at a known time. Since then I have regularly copied Cape-1 but this has a battery or BCR problem and was off air for a few days, and CP-4 which has 1200 baud FSK and CW. The 1200 baud is very difficult to decode as it is not the normal AFSK

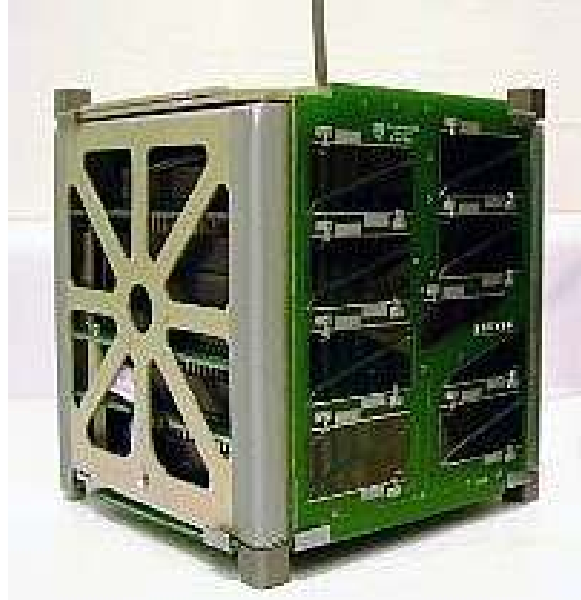
used by packet, but FSK so is tuned using USB on the receiver, and the tuning has to be fairly well spot on frequency for the packets to be decoded.

Here are some details of the Libertad-1:

Local Time (Colombia) of Launch: 1:46 a.m.
Place of Launch: Cosmodrome of Baikonur, Kazakhstan
Time of separation from the rocket after launch: 16 minutes
Parameters of the Orbit:
LTAN: 22:30 UTC
Period: 1 hour 39 minutes
Perigee: 659.56 Km
Apogee: 787.5 Km
Eccentricity: 0.0090
Speed of insertion of the picosatellite: 7.5 Km/sec
Type of Orbit: LEO. Low Earth Orbit
Inclination: 98 Degrees
Technical data of Libertad 1:
Mass: 995 gr
Dimensions: 10 x 10 x 10 cm
Radio Frequencies (IARU) :
Downlink: 437.405 MHz
Uplink: 145.825 MHz
Power of transmission: Downlink: 400 mW
Type of batteries: Lithium Ion: 2 batteries of 7.2 V, 950 mA)
Consumption of current: Stand by: 5 mA
Consumption of current: In transmission: 135 mA
License of the ground station "Rodrigo Noguera Laborde": 5k3USA
License of the Picosatellite: 5K3L

Power of transmission: Uplink: Max: 35 W
Maximum Current of the batteries: 1.9 A

The planned lifetime for Libertad-1 is about 52 days, but today 28th April) the signals are much weaker than at launch. There are no solar cells to charge the battery.



Libertad-1

PolySat CP4 and Cape-1 have also been tracked and data copied.

For more /latest information refer to Ralph Wallio's website at

<http://showcase.netins.net/web/wallio/CubeSat.htm>

June Meeting Monday 11th June at 1930

Visit to Digital Video Technologies

For over eight years the team at DVT has specialised in working with Production, Film and Visual Effects companies. With carefully integrated solutions and by providing comprehensive training and support, DVT has grown to become New Zealand's leading supplier of Production, Editing and Visual Effects systems.

With a wealth of experience and knowledge integrating systems in a wide range of applications, they can help to tailor a solution that is right for you. As fully authorised suppliers of such industry leaders as Sony, Panasonic, Matrox, Pinnacle, Adobe, HP, Apple, Alias and Discreet to name just a few, we can help you steer through the myriad of options.

Stuart Barnaby from DVT will give an informative talk on the basics of HDTV (High Definition TeleVision).

We are visiting their site because of the logistics of moving heavy and expensive TV equipment and you will be able to view true 1080i HDTV, so that when you purchase that new TV you will be informed...

July Meeting 9th at 18:30 for dinner at 19:00 followed by a movie "Enigma Code"

Venue is in the Avondale area. More details next month.

Cost will be \$20.00 per head and this includes a full traditional roast dinner and the movie.

Please advise Laurie ZL1ICU so that numbers will be known for the catering.

Experience a log fire and cooking from an old range cooker. This is a BYO function as well.

More details at the next meeting on the 14th May.



An Enigma Machine

Trading Table – May 2007

New from December:

ATF-55143 - Low Noise Enhancement Mode Pseudomorphic HEMT in a Surface Mount Plastic Package (SOT-343) (4 lead SC-70). Ideal for systems in the 450 MHz to 6 GHz frequency range. Spec: 2 GHz; 2.7V, 10ma (Typ). 24.2 dBm output 3rd order intercept. 14.4 dBm output power at 1 dB gain compression. 0.6 dB noise figure. 17.7 dB associated gain. \$2.50 each
Packet of 5 for \$10.00

Full Spec sheet available on request.

SMD RESISTORS – 10 per pack. 1206 Format.

Values in stock: 2E7, 4E7, 56, 68, 100, 180, 680, 820 Ohms.

10 per packet.
50c per packet
10 per packet.
50c per packet

SMD CAPACITORS – 10 per pack. 1206 Format. (50v)

Values in stock: 5E6pf, 10pf, 22pf, 33pf, 100pf, 1200pf, 2200pf, 4700pf, 100nf.

SMD CAPACITORS – 10 per pack. 0603 Format. (50v)

Values in stock: E68pf, 1.2pf 1.8pf 2.2pf 6.8pf 8.2pf.

10 per packet.
50c per packet
5 per packet
\$2.00 per packet.

TRANSISTOR MPSA77, PNP Darlington, TO92, Max V_{ceo} = -60v, Max V_{cbo} = -60v, Max V_{ebo} = -10v, Max I_c – continuous = -1.2A

RG178 50 ohm coaxial cable, (1.8mm O/all diameter, Brown colour). Cut to your nearest meter of length. (ie. 1.5meters will be cut to 2 meters, etc.)

\$2.50 per meter.

RG178B/U (Belden 83265) 50 ohm coaxial cable in cut (75mm) lengths. Ideal for those “interboard” connections. Stripped and Pre-tinned ready for connection. 10 lengths per packet.

\$1.00 per packet

PL259 Plugs – the old favourite: Still in stock. Sorry no reducers – yet!

\$2.50 each

Moving Coil Meters - 500 μ A movement with back lighting via separate terminals. Two scales 0 – 30 and 0 – 100, plus a battery “replace/good” indication. Scale can be removed/reversed for different uses. A very versatile meter.

\$3.00 each

Integrated Circuits

ZSM560 under voltage monitor IC's. 4.6 volt threshold for 5 volt systems. Spec sheet available on request. \$2.00 per packet
Packet of 5

HEF4060B SMD IC's. and HEF4060BT 14-stage ripple-carry binary counter/divider and oscillator. Spec sheets available on request.

\$1.00 each

74HC74D SMD IC's Dual D-type flip-flop with set and reset; positive- edge trigger. Spec sheets available on request.

\$1.00 each

LM393D IC's (SO8 package) and LM393DT Low Power Dual Voltage Comparators. Wide single supply voltage range or dual supplies: +2V to +36V or +/- 1V to +/- 18V. Spec sheets available on request.

\$0.50 each

74LS38N IC's Quad 2-Input NAND Buffer with Open-Collector Outputs. Still in original RS packets.

\$1.00 each

Limited stock left of the following:

- GPS Patch Antenna:** GPS Patch antenna mounted in waterproof white plastic housing. Comes with 10m of RG174 coax and SMA plug. Antenna has a pre-amp inside. These are brand new. \$25.00 each
- GPS Receivers** – 12 channel GPS receivers in plastic dome mounting with DB9 Connector. RS232 output on pins 2,3 and 5 and power +ve 6-12V on pin 6. NMEA output sentences. \$120.00 each
- GPS Patch Antenna** – with Macom SO8 preamp 26dB @ 1.575 GHz, 1.15 dB NF. It still has 20dB gain @ 1.3GHz but the noise figure is rising a bit. Fitted with 3m of RG174 cable and MCX connector. No housing/case for patch antenna. \$10.00 each
- GPS Patch Antenna** – as above but in plastic case. Fitted with about 3m RG58 coax cable and SMA connector. \$20.00 each

Mail Order accepted. Please forward your mail orders to Auckland VHF Group, PO Box 10138, Dominion Road, Auckland. Or Email to john.dunn@clear.net.nz.

Please Note: For mail orders please add \$5.00 for packing and postage.

Estate of Irving Spackman

Maker	Model	Description	Price
ICOM	2A	2m Hand held + manual + rptr kit	
ICOM	4E	70cm Hand held + manual + rptr kit	
ICOM	IC-22S	Crystal channel mobile 10W	
IEL	Power	13.8V @ 10A	
Kenwood	TH-D7A	Dual band Hand held + manual	
Kenwood	TM 221A	2m mobile 50W	
Kenwood	TM 255A	2m multimode	
Kenwood	TM 851A	70cm multimode	
Kenwood	TR 7930	2m Mobile + mounting bracket	
Lurich	Power	13.8V @ 7A	
Misc	Load	25W to 500 MHz SO-239	
Sabtronics	8100	Frequency counter 100 MHz	
TAPR	PSK-1	300 bps + manual	
TAPR	PSK-1	1200 bps + manual	
TAPR	Tiny-2	1200 bps + manual	
TAPR	Tiny-2	1200 bps + manual	
TAPR	Tiny-2	1200 bps + manual	
TAPR	Tiny-2	9600 bps + manual	
Uniden	UBC 100XL	16 channel Hand held scanner	
Yaesu	709-R	70cm Hand held + extended manual	
Yaesu	FT 817	HF-UHF multimode 5W	
Yaesu	G-250	Rotator controller	

The above items will be taken to Hamilton for the sale on the 12th May. Prices will be marked. Sale is based on first-in first served, as is, where is.