

The Official Newsletter of the

PAPAKURA RADIO CLUB INC.





Summer in Auckland - Surprise around every corner





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This Month's Meeting: AGM

Wednesday 3rd of February at 7:30pm will be the first general meeting for 2021.

Following General Business, Gavin ZL1nux will be sharing stories of our Jock White Field-day setups, and the plans for 2021 – There are trophy's to defend beside the Americas cup this summer.

Car boot equipment sale

In addition to the Jock-White Field-day on the 27th & 28th of Feb, we are having a car boot sale, and a club equipment sale on Saturday the 20th of Feb between 9am and 1pm. Sellers are requested to be parked on-site for setting up by 8:30am we will not be charging for a park (table) but hope to operate a cafeteria to hep club funds. Volunteers will be required to help park vehicles, set up shade for the coffee drinkers, and man the cafeteria. We also need sellers and buyers, so help spread the word.

Not only a chance to score a bargain, or move some clutter from the garage, but also a great social event.

CLUB ACTIVITY:

Just a reminder Meeting Minutes and Financial statement are sent to financial members as a separate attachment. This is to de-clutter the newsletter

Note that as confirmed at the AGM, Subsections for the 2020/2021 year have been increased to 25 dollars for an individual member and \$40.00 for a family. Those who had already paid early, received a discount[©], this better reflects the costs to maintain the club. But it is also a reminder to us all, that we should be seeking to bring new people into the hobby, to secure the future of the club and hobby.

And ... Yes it's the polite way to remind you your subs are now due We are sending reminders to those we have identified as overdue – To bank by bank transfer –see the back page of this newsletter

We will be sending email reminders to those who are overdue as a last chance follow up.

UPCOMING PROJECTS:

PROJECT AND ACTIVITY NIGHTS

We have started a series on using the Nano-VNA, last week we checked out using a PC to make reading the screen easier, and looked at a few key features, This will be an on-going activity to learn how to use the very powerful tools, Next project night we are looking at some antennas to determin resonance (we may also need to make a few adapter leads)



We will also, later, be building some satellite antenna designs for working off the ISS or other satellites. ALSO a station of Portable VFH/UHF dual band antenna

We will be building some HF antennas for Drury, and planning some long wire 5 band antennas for Home Stealth use over upcoming project nights, these will include some experimental stealth and portable designs suitable for AREC, SOTA or POTA type activities, as well as general field or Home use.

And we have a DC power distribution project, in the pipeline. - So a busy year

UPCOMING ACTIVITIES:

WEDNESDAY 3 FEBRUARY – GENERAL MEETING WEDNESDAY 10 FEBRUARY – PROJECT NIGHT – NANO VNA - ANTENNA TESTS WEDNESDAY 17 FEBRUARY – COMMITTEE MEETING WEDNESDAY 24 FEBRUARY – ACTIVITY NIGHT – JWFD SCHEDULING & READYNESS

PLEASE LISTEN FOR UPDATES ON THE SUNDAY MORNING CLUB NETS (SEE LAST PAGE FOR FREQUENCIES AND TIMES)





AREC MESSAGE HANDLING EXERCISE - 2021

January saw the Papakura club members involved, at fairly short notice, in a message handling exercise with the North shore teams. This involved some unusual choices of channels, differing from the national AREC frequency plan, and used HF, VHF and UHF frequencies, as well as a couple of PRS simplex frequencies, with channels all over the band, and challenges to get messages from south Auckland sites over to the North Shore, it was clearly going to require relay operations to pass messages.

The Franklin & Papakura teams decided to work together to create a relay station at Papakura, and this was also a chance to test out the STSP 6875 repeater, and as I had never set it up, and having a van, which really needed to be used, we decided to trial it as a rapid deployment exercise on redoubt road. Totara Park would be a good off the road site, but what if we needed to set it up when the gates were closed? To make the test something we could replicate, we decided to park on the roadside between Murphy's road, and Hilltop road. The grass was wide enough to be safe and sheltered, but high enough to be accessible ... we hoped. With a link back to Papakura, the messages could then be relayed from the clubrooms to the North Shore message base.

Saturday morning was a trip down to the clubrooms, one repeater, one battery and one antenna loaded, the van headed off to redoubt road via mill road, and 20 minutes later we were looking at a bag of antenna parts and figuring out how the antenna went together. Apart from one mistake with a pole that would not work in the middle (it needed to at the bottom, the antenna was erected single handed, and tied to a fence (I considered connecting to the van (and could have done so easily, but wanted to use the van to secure a guy, meaning no need for pegs in the rock hard ground.

By 9:30 the repeater was connected and working and Tom ZL1TO made a call almost immediately, before I could even advise base it was up, then one by one message after message started passing over the repeater. Ian ZL1AOX, Dave ZL1MR, and plenty of Franklin calls, and a few from the west too. As I did not want to create interference or de-sensitise the receiver, I did not pass messages, but did make a couple of HF contacts, but the bands were not very kind, 80 metres was almost dead, and 40 was hard work, UHF was very quiet, and while I had DMR, the network was not used, for the exercise.



While not required, and despite the cloudy day, I deployed the solar panels, and even without much sun, we managed to keep the batteries fully charged, and no RF noise was evident, another positive for the trial. These left me free to trial the van facilities, and drink plenty of coffee, proving that I could have stayed on site for several days, if we had really been required. In addition with radios that could operate in reverse, if the repeater fell over, I could manually become the repeater, and pass messages to Papakura relay station

But as it was only a trial, the site was dismantled right after last message at noon, Reloaded, Back to the clubrooms and in storage at 12:30 - So proof that if we ever needed to, we could set up a repeater at short notice and provide services for AREC use; and a nice day out it was too. Big shout out to all involved

| | Papakura Radio Club Inc. | Page 4 | February 2021 |
|------|--|--------|---------------|
| 1960 | | | > 2020 |
| 1700 | Name of the second s | | |

DX Calendar February 2021

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 5 17 | 7 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|----|--------------------------|----|----|-----|----|----|----|----|----|----|----|----|----|-----|----|------|------|----|----|----|----|----------|------|-----------|----|-----|-----|
| | | | V | P8D | OI | | | | | | | | | 5VI | DE | | | | | | | | | | | PJ7 | 'AA |
| | | | | | | | | | | | | | | | | | | | | | | <u>Z</u> | ZF2H | <u>3J</u> | | | |
| | 3A/F5RBB 3A/F4FRL Monaco | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>JW/LB2PG</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>RI01ANT</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | JX2US | | | | | | | | | | | | | | | | | | | | | | | | | | |

3A/F5RBB 3A/F4FRL Monaco

Patrice 3A/F5RBB and his wife Mireille 3A/F4FRL will be active from Monaco, 24 January - 2 March 2021.

They will be active on 20 and 15m, SSB, Digital modes. QSL via home calls.

RI01ANT Antarctica

Alex, RX6A will be active as RI01ANT from Antarctica, 25 December 2020 - 30 May 2021. He is planning to operate from Progress and Vostok Base Stations. He will operate on HF Bands. He will be active as RX6A/MM 7 - 25 December 2020. QSL via RX6A (home call).



JX2US Jan Mayen

Erik, LA2US will be active as JX2US from Jan Mayen Island, IOTA EU - 022, October 2020 - March 2021. He will operate on HF Bands, CW, FT8. He will focus on 160, 80, 40 and 30m

5VDE Togo

Daniel, HB9EHD planning to be active as 5VDE from Togo. He will operate on 40 and 20m, FT8 and QO-100.



Click on the link (CTRL + Click for some PDF readers) in the PDF versions for information on the Expeditions



Or check them out at DX News.com

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CONTESTS 2021

| Det | Start - Finish | | Panda | Contect Name | Mada | Evolution | Sponeor'e Webeite | | |
|-----|----------------|----|------------------|--------------|---|--------------|---|------------------------------------|--|
| Dat | e-mine | Da | le-nime | Danus | Contest Name | wode | Excitative | Sponsor's website | |
| 1 | 0000 | 1 | 0100 | 3.5-14 | K1USN Slow Speed Test | CW | Name, SPC, 20 WPM max | www.k1usn.com/sst.html | |
| 1 | 2000 | 1 | 2130 | 3.5 | Championship, SSB | Ph | RS, serial | www.rsgbcc.org/hf | |
| 2 | 0100 | 2 | 0159 | 1.8-50 | Worldwide Sideband Activity Contest | Ph | RS, age group (OM, YL, or youth) | wwsac.com/rules.html | |
| 2 | 0200 | 2 | 0400 | 3.5-28 | ARS Spartan Sprint | CW | RST, SPC, power | arsgrp.blogspot.com | |
| 2 | 1700 | 2 | 1900 | 3.5-14 | RTTY OPS Weeksprint | Dia | Other station's call, your call, serial, name | rttvops.wordpress.com | |
| 3 | 1300 | 3 | 1400 | 1.8-28 | CWops Mini-CWT Test | CŴ | Name, mbr or SPC | cwops.org/cwops-tests | |
| 3 | 1700 | 3 | 2000 | 144 | VHF-UHF FT8 Activity Contest | Dig | 4-char grid square | ft8activity.eu/index.php/en | |
| 3 | 1900 | 3 | 2000 | 1.8-28 | CWops Mini-CWT Test | CŴ | Name, mbr or SPC | cwops.org/cwops-tests | |
| 3 | 2000 | 3 | 2100 | 3.5 | UKEICC 80-Meter Contest | Ph | 6-char grid square | ukeicc.com/80m-rules.php | |
| 4 | 0300 | 4 | 0400 | 1.8-28 | CWops Mini-CWT Test | CW | Name, mbr or SPC | cwops.org/cwops-tests | |
| 4 | 1800 | 4 | 2200 | 28 | NRAU 10-Meter Activity Contest | CW Ph Dig | RS(T), 6-char grid square | nrrlcontest.no/index.php | |
| 4 | 2000 | 4 | 2200 | 1.8-50 | SKCC Sprint Europe | CW | RST, SPC, name, mbr or "none" | www.skccgroup.com | |
| 5 | 0145 | 5 | 0215 | 1.8-21 | NCCC RTTY Sprint | Dia | Serial, name, QTH | www.ncccsprint.com | |
| 5 | 0230 | 5 | 0300 | 1.8-21 | NCCC Sprint | CŴ | Serial, name, QTH | www.ncccsprint.com | |
| 6 | 0000 | 7 | 2359 | 1.8-UHF | Vermont QSO Party | CW Ph Dia | RS(T), county or SPC | www.ranv.org/vtgso.html | |
| - | 0004 | - | 0050 | | 10-10 International | 0 | N | | |
| 6 | 0001 | 1 | 2359 | 28 | Winter Contest, SSB | Pn | Name, mbr or "0," SPC | www.ten-ten.org | |
| 6 | 0300 | 6 | 1200 | 1.8-28 | EurAsia HF Championship | CW Ph | RS(T), 6-char grid square | www.eurasia-contest.com | |
| 6 | 1200 | 7 | 1200 | 1.8 | KCJ Topband Contest | CW | RST, JA Prefecture/District or continent | www.kcj-cw.com/e index.htm | |
| 6 | 1200 | 7 | 1200 | 3.5-28, | F9AA Cup, CW | CW | RST, serial | www.site.urc.asso.fr | |
| 6 | 1200 | 7 | 2250 | 2 5 29 | Movico PTTV International Contest | Dia | DST VE state or sorial | www.rttu force my | |
| 6 | 1400 | 6 | 2359 | 1 0.00 | Minnocota OSO Party | CW/ Ph Dia | Name county or SPC | www.tuy.titie.titik | |
| 6 | 1400 | 6 | 2009 | 1.0-20 | EVPO Winter OPP Sprint | CW Ph Dig | DS(T) SPC name newer temporature | arizonacograione anne 1and1.com | |
| 6 | 1600 | 6 | 1000 | 2.5.00 | EICTC Caturday Cariat | CW | Det CDC nome mbr or "0" | fictors org | |
| 0 | 1600 | 0 | 1000 | 3.3-20 | FISTS Saturdy Sprint | CW | RST, SPC, Hallie, Hibi of U | ilisisila.org | |
| 0 | 1600 | 0 | 1900 | 3.5 | Pritich Columbia OSO Porty | CW/ Dh Dig | DS(T) VE7 District or SDC | an.agcw.ue/index.php/en | |
| 0 | 1000 | 1 | 2339 | 1.0-20 | Bhush Columbia QSO Party | GW PILDig | Other station's call your call | orcauxcc.org/bcqp rules.num | |
| 6 | 2300 | 7 | 0300 | 3.5-14 | North American Sprint, CW | CW | serial, name, SPC | ncjweb.com | |
| 8 | 1300 | 12 | 2359 | no WARC | ARRL School Club Roundup | CW Ph | RS(T), class (I/C/S), SPC | www.arrl.org/school-club-roundup | |
| 10 | 0130 | 10 | 0330 | 3.5-14 | NAQCC CW Sprint | CW | RST, SPC, mbr or power | naqcc.info | |
| 10 | 1700 | 10 | 2000 | 432 | VHF-UHF FT8 Activity Contest | Dig | 4-char grid square | ft8activity.eu/index.php/en | |
| 10 | 2000 | 10 | 2130 | 3.5 | RSGB 80-Meter Club Championship Data | Dig | RST, serial | www.rsgbcc.org/hf | |
| 13 | 0000 | 14 | 2359 | 3.5-28 | CO WW RTTY WPX Contest | Dig | RST. serial | www.cgwpxrtty.com | |
| 13 | 1000 | 14 | 1000 | 1.8-28 | SABL Field Day Contest | CW Ph Dia | RS(T), # of transmitters, category, QTH | www.sarl.org.za | |
| 13 | 1100 | 13 | 1300 | 7.14 | Asia-Pacific Spring Sprint CW | CW | BST serial | isfc.org/apsprint/aprule txt | |
| 13 | 1200 | 14 | 1200 | 1.8-28 | Dutch PACC Contest | CW Ph | BS(T), province or serial | pacc.veron.nl | |
| 13 | 1200 | 14 | 2359 | 1.8-50 | SKCC Weekend Sprintathon | CW | RST. SPC, name, mbr or "none" | www.skccgroup.com | |
| 13 | 1400 | 15 | 0200 | All | YLRL YL-OM Contest | CW Ph Dia | Serial, RS(T), SPC | virl.org/wp/vi-om-contest | |
| 13 | 1500 | 14 | 1500 | 1.8-28 | OMISS QSO Party | Ph | RS, SPC, mbr or "none" | omiss.net/Facelift/gsoparty.php | |
| 13 | 1900 | 13 | 2059 | 18-28 | Feld Hell Sprint | Dia | BST name mbr QTH grid | sites google.com/site/feldhellclub | |
| 13 | 1900 | 13 | 2300 | 1.8 | BSGB 1.8-MHz Contest | CW | RST, serial, district code (if UK/EI) | www.rsabcc.org/hf | |
| 13 | 2300 | 14 | 2300 | 1.8-14 | AWA AM QSO Party | Ph | Name, SPC | antiquewireless.org/homepage | |
| 14 | 0000 | 14 | 2359 | 1.8-7 | PODXS 070 Club Valentine Sprint | Dig | Name, OM/YL, SPC | www.podxs070.com | |
| 14 | 1300 | 14 | 1700 | 3.5, 7 | Balkan HF Contest | CW Ph | RS(T), serial | arabih.ba | |
| 15 | 0100 | 15 | 0259 | 3.5-14 | CQC Winter QSO Party | CW | RST, SPC | coloradogrpclub.org/contests | |
| 15 | 0100 | 15 | 0300 | 1.8-28 | 4 States QRP Group | CW Ph | BS(T), SPC, mbr or power | www.4sgrp.com | |
| 15 | 2000 | 15 | 2120 | 25 | Second Sunday Sprint | Dia | A obsr grid square | www.regbee.org/bf | |
| 17 | 1000 | 17 | 2030 | 3.5 | ACCW Somi Automatic Kay Evening | CW | PST sorial 2 digit year first used a bug | alt arow do/index php/op | |
| 20 | 0000 | 01 | 2030 | 10.00 | AGOV Semi-Automatic Rey Evening | CW | MA/E, DET CD Mon MA/E, DET power | ait.agcw.de/index.php/en | |
| 20 | 10000 | 21 | 2339 | 1.0-20 | Puncion DSK WWW Contest | Dia | W/VE. HOT, SP. NOT-W/VE. HOT, power | www.arn.org/arn-ux | |
| 20 | 2100 | 21 | 2200 | 2.5.00 | EISTS Sunday Sprint | CW | DET EDC nome mbr or "0" | fictore ord | |
| 21 | 2100 | 21 | 2300 | 1 0 00 | Plup for the Pagen ODD Contest | CIM | DOT ODC mbr or power | arpoontoot com/nigrup | |
| 21 | 2300 | 24 | 0100 | 1.0-20 | SKCC Seriet | CW | PST SPC, mbr or power | dipcontest.com/pigrun | |
| 24 | 2000 | 24 | 2100 | 1.0-50 | LIKEICC 90 Motor Contact | CW | AST, SPC, Italite, Itibli of Hole | ukaina com/90m rulas php | |
| 24 | 2000 | 24 | 2100 | 0.0 | BSGB 80-Meter Club | OW | o-chai yhu squale | ukeice.com/ouri-rules.prip | |
| 25 | 2000 | 25 | 2130 | 3.5 | Championship, CW | CW | RST, serial | www.rsgbcc.org/hf | |
| 20 | 2200 | 20 | 1000 | 2 5 00 | DEE Contest CCD | Ph | PS department or parial | www.cq1ou.com | |
| 21 | 10000 | 28 | 1800 | 3.5-28 | HEF CONTROL | Ph | HS, department or serial | concours.r-e-i.org/regiements | |
| 21 | 1200 | 28 | 1200 | 3.5-28 | FIN DX Contest | Dig | HSI, SP or serial | europeannaciup.wordpress.com | |
| 21 | 1300 | 28 | 1300 | 3.5-28 | UBA DX Contest, CW | CW | HST, serial, province (IFON) | www.upa.be/en | |
| 21 | 1500 | 28 | 0159 | 1.8-50 | South Carolina QSO Party | CW Ph Dig | HS(1), county or SPC | scqso.com | |
| 21 | 1800 | 28 | 0559 | 3.5-28 | North American QSO Party, HTTY | Dig | Name, SPC | www.ncjweb.com | |
| 21 | 1800 | 28 | 0559 | 3.5-28 | NA Collegiate Championship, RTTY | Dig | Name, SPC | www.w9smc.com/nacc | |
| 20 | 1400 | 3 | 1700 | 1.0-144 | Lish Speed Click OW Contract | CW | DOT mbr co "hill " | www.classicexchange.org | |
| 28 | 1400 | 28 | 1/00 | 3.5-28 | High Speed Club CW Contest | CW | HS1, MDP OF "NM" | www.nignspeedclub.org | |
| 00 | 1 1 0 0 0 | | I II III III III | 1 1 5-1/1/ | North Carolina (ISC) Party | IL WY Ph Dia | COUNTY OF SPC. | ncdsonarty ord/rilles | |

Also 13-14 VHF-UHF-SHF-EHF Contest see <u>https://www.nzart.org.nz/activities/contests/vhf-and-above-contests</u> And 27-28 – Jock White Field Day See <u>https://www.nzart.org.nz/activities/contests/jwfd</u> for details

All dates and Times are in UTC and are not adjusted for local time

Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state.

Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. Data for Contest Corral is maintained on the WA7BNM Contest Calendar at **www.contestcalendar.com**

Check for updates and a downloadable PDF version online at www.arrl.org/contests.

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▶ 2020

RAMBLINGS FROM THE EDITORS DESK

As we wrapped up 2020 it was not, so much, with sorrow at its passing, as much as wondering what 2021 might bring, and after only 30 days I have come to the conclusion that any April fool's day prank this year cannot hold a candle to January 2021, The world went mad, Vaccines became available, then not, then delayed, then limited to the country of production, ports are still only unloading Christmas stock for stores, then metal piles burnt in Papakura, riots broke out in most of the world, the super contagious version of Covid-19 escaped quarantine, and no-one seemed able to catch it, but sharks surprised plenty of swimmers, and caught a few and the solar cycle that had started with such promise just stalled and fell back to the mid 70's. In sort 2020 just carried on into the next year.





In short 2021 has managed to out weird 2020, and it's only getting started. So it's not surprising that plans for 2021 are going to be hard to make, and difficult to maintain. Forget New Year resolutions, we can't even plan a calendar with any certainty. But in spite of that we need to remember that against all odds, we are still able to get out and make the most of our summer, and that is exactly the best thing we can do for our health and wellbeing. Most oiof us have watched the ups and downs of the Americas cup, or hit the beach, or taken a holiday, and so we should. In the same manner we are busy making February plans, many of which are in this newsletter.

We have a general meeting on Wednesday, learning to use the Nano-VNA (including the newer model) on our project and activity nights, the Car boot sale on Saturday the 20th and of course, a Jock White Field-Day trophy to defend. February is going to be a busy month. And while we can gather enjoy the hobby; we should make the most of it. Freedoms, as we should have come to learn last year, should not be taken for granted.

I know I'm not perfect, I have more than my share of mistakes, I have made plenty of those, but each one taught me what not to do, and now I seem to make less of them. I'm not the best operator, I know so many who can run rings around me, but i know them, and learn from them. They are my guides and mentors, even if they don't know it.

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suspended by the same authority that supposedly ensures them for all us. But no matter what 2021 may throw at us, we have our radio links, microphones and power supplies, and that

Based on the UN convention of rights, we are given 4

But as we have seen, they are also easily removed, or

(Animals are better protected they get 5)

should mean we can continue (zoom optional) to stay in touch and continue to enjoy our great hobby.

After a few years now, of collecting materials and building up a shack, I have had the wonderful opportunity to start the tasks of repairing and re-arranging my antennas after two freak accidents managed to take by ordered arrangements and leave me with a band hole or two to address. So antennas will be on my mind in 2021

And it's that note that got me thinking. As you know my income comes from education, and developing training resources. Recently I was asked to look into the some training for radio industry, and RSM asked us to look at content for ARC's (Radio Certifiers) and as I looked at the outlines, it made me realise just how many skills go into the creation of a ham. Most of would not think of ourselves as trained technical people, and if you just look at the exam or training, then I would have to agree, But what about

the skills that we have that are not classroom, but life based, antennas, feeders, measurement, analysis and interpretation, operating procedures, the skills to make our own cables, leads, antennas and even equipment and of course our understanding of the spectrum and interference.

Yes we purchase a lot of our gear, Watch YouTube videos to learn how to set something, or discuss it with half a dozen others before we do the right thing, and there is some evidence, with reasons, to suggest that the skill level of the average ham is not as high as it once was. But to compare 1920's skills and tech with 2020 skills and tech is a very hard ask, and maybe not really fair, and the world and the skill-sets required are very different. But are we keeping our skills up? Maybe that is a better question.

I am sometimes asked, Why? Why do you take radios and activate parks? Why help provide comms for car Rallies? Why set up a repeater on a roadside? Why go out and do a field day? And it's a good question. Is it fun? - Well yes it is, sometimes ... Is it required? No not at all. Is it a sense of community? Maybe a little. Is it to wear High Viz jackets and feel important - No way, and if that ever happen, please shoot me immediately. So why? ... It is definitely hard to define, but I can say that one big reason it to keep my skills up. I am not the best, brightest, or most active Ham out there, But I can set up a station with no power, Build test and tune an antenna and get on air. Not always the best signal, but I get there, I can pass and receive a message, and keep may station running.

I can operate from a tent, and van, a camper, a car, Handheld or base radio, HF, VHF and UHF. And I work a contest for hours and keep myself and my team fed and watered. I know that if it all went pear shaped, I could do something

Papakura Radio Club Inc.

EXPECTING THE IIN







2020

February 2021

I now can even set up one of the portable AREC repeaters at the clubrooms. I may not be the fastest, the most efficient or the best, but I can pull my weight if needed. In short each little exercise, each event, each time I put together an piece of kit, Tune an antenna, learn to programme a new radio, I am learning and up-skilling. I am not paying for a course, getting a student loan, or compelled to full time study, I get no certificate of completion or diploma on the wall, other than my GURL. It's my hobby, and it's fun, I get to enjoy your company, and on rare occasions I get to share in the rewards that come to the team for an award or challenge completion. But mostly it keeps my mind active and my body moving.

You may not feel ready for a AREC operator, or manage a Jock white station, You may feel that you would struggle, but that's the point. If we want to get the most out of the hobby, we need to stretch ourselves and so something a little uncomfortable. But we get to give it a go with others who are willing to support and train us.

There are lots of things you can do, SOTA, POTA, assist AREC with a rally (one on the 28th coming up) maybe join the JWFD group at the clubrooms for an hour, maybe stay longer. Maybe just join for the setup. Come along to an activity night and learn to tune an antenna,



maybe come and build one, and it you make a dummy load; it can join all the ones I made. Don't be afraid to make a mistake, everyone who has ever made anything has made more than one.

Be the awesome you already are, You are already doing what most do not do, You're a Ham. Now enjoy it.

73 - Catch you on air. Gavin ZL1NUX







"You need to incorporate some stretching into your fitness routine, so I glued all of your snacks to the ceiling!"

Papakura Radio Club Inc.

NANO-VNA

The **Vector Network Analyser** is an essential piece of test equipment that no RF engineer should be without. If you have previously worked with Electronics at low frequencies, you may consider a good DMM or Oscilloscope your best friend. RF Engineers would gladly trade *both-the scope* for a good VNA!

A good VNA is an expensive bit of kit. Many years ago, a good one would probably cost you as much as a fairly nice house. Nowadays, you can pick up something really good for the price of a nice car.

Luckily, there are cheap alternatives now, such as the NanoVNA. It doesn't hold a candle to the performance of a instrument grade piece of kit, but for the price, and used with care, it's not too bad.

So, what does it do...

A VNA is designed to inject a known frequency and amplitude source signal into a RF port and measure the **relative** amplitude and phase of this signal when received at a number at one, or more of its ports.

That sounds pretty complex, but it's really not. An analogy might help. Say you are standing at one end of a dark train tunnel and want to know something about what is inside. We will assume that you don't want to go in, because, well, you're scared of the dark and don't want to be hit by a train.

You have a great idea! What happens if I shout into the tunnel and have a friend listen at the other end. We might be able to work out the length from the volume and delay (you were careful to synchronise watches) of the received sound. Perhaps, we can detect a difference between the high and low pitch sounds. Maybe there is some material in there that is absorbing the high pitch noises, or closed service tunnel that has created a resonance. You have just measured the 'thru' characteristics of this tunnel. In VNA parlance, we will call this a S21 measurement, meaning we have made a measurement of a signal at port 2(your friend) of a signal injected at port 1(your voice).

Now, you do the same, but this time listen to the echo of your shout reflect back to you. Perhaps there is a blockage, somewhere in the tunnel that is reflecting your voice. If hear the echo, back at the same volume, you might reasonably that none of the sound could have reached the other end. Congratulations, you have just measured the reflection of the tunnel. Using the same nomenclature as before, we can call this S11. i.e a measurement of what you heard at port 1, when you shouted into port 1.

The whole set of all possible combinations of shouting and listening at each entrance is what we call the S-Parameters of the tunnel.

So S11 is similar to what an SWR meter can do, But S21 is something like an inline power meter at the end of the cable might do, (But more). So this is already so much more information than an SWR meter, not to dismiss the SWR meter, after all it tells us fwd to reverse power at one end of the feeder, but the VNA can do much, much, more.

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Later (when we test antennas) we will compare it to a stand-alone antenna analyser, but the costs alone give the VNA a huge edge over say an MFJ 213 or 259 analyser and even their 223 VNA

Its less than \$NZ 100.00

Now, the astute, might have noticed that I casually dropped in the word **relative** before. This is important, to accurately map our tunnels, we need to know the exact details of what we yelled into the entrances. When we do this with our VNA, instead of randomly bellowing into the tunnel, let's just sing a single note and compare the amplitude and time of the received signal. With just a single tone, we can't accurately measure the time (with only a single frequency measurement), but we can record the phase difference. We can now repeat this for every frequency we are interested in.

There are a number of ways to plot this data. The most basic being just a rectangular plot of frequency on the X axis and Amplitude on the Y. Commonly we will scale the Y axis to be a logarithmic (normally dB) scale.

The next most common is the Smith Chart.





These look complex, but ignore the funny lines for now. This is just a polar plot with our received signal plotted as an amplitude and phase. The outside circle represents a situation where we have received a signal of equal amplitude to the transmitted signal. The centre of the plot shows where the received signal is near zero.

Both plots shown are useful. The rectangular plot is makes it very easy to see how a network performs at different frequencies. The smith chart is very useful for impedance

matching, but is not needed for many simpler use cases.

The NanoVNA

The NanoVNA has generated a fair amount of interest over the past couple of months and after a few days playing with it I can see why. Number 1, it's cheap. I only paid well under \$100.00 for my model. Secondly, it actually works fairly well and has a reasonable frequency range.

Features

- S11 and S21 measurements. Sometimes called a 2 port, non-reversing VNA.
- 50KHz to 900MHz Range (best accuracy up-to 300MHz.)
- Touchscreen control
- Multiple plot views.
- PC control and export of Touchstone files. An industry standard VNA file format.

I made a nice case for my unit. You can find the model on thingyverse. 3-d Printing awesomeness

There are a few missing features, but you probably won't need these and can work normally work around them.

Missing Features

- 101 sweep points only. No way to change this currently, so on a wideband sweep, you can easily miss narrowband features. *There is now some beta software that specifically addresses this.*
- No output power sweep. Useful for characterising non-linear devices.
- Slow sweep speed. About 10ms per point. The basic professional VNA is about 100x faster. Believe me fast sweeps are a really helpful.
- Time Domain Reflectometry. You can do this in post-processing . Lots of *professional VNAs* charge extra for this feature.
- No De-Embedding (99.9% of people will never need this.)
- Limited PC software, and you can have issues with compatibility (I like VNA Saver Its free)
- Limited frequency range. Some people will miss it not covering 915MHz and even more will miss 2.4GHz. (The Later models have this range) But up to Ham UHF is still pretty cool
- The cal kit and cables that come with the kit are pretty cheap and nasty. That said, *most* pro VNAs don't include cables or cal kits at all. These generally cost extra, and aren't cheap.
- Calibration assumes 'ideal' calibration standards. Professional kits come with correction coefficients that allow more accurate calibration. Probably not a problem for most people working below 900MHz.

That's really just nitpicking though. For the price, there is a lot of bang for buck here. For general radio HAM bands, this thing is great.

In the next month I hope to present some guidance on how to configure your channels for S11 or S21 as well showing some examples of using this VNA

OR ... CHECK OUT <u>HTTPS://NANOVNA.COM/?PAGE_ID=21</u> OR ... COME ALONG ON WEDNESDAY NIGHTS AND PLAY WITH ONE



BREAKING NEWS -

It seems that there might be a package for android tablets to control the VNA too, Ian IRC is testing one. Listen out for updates.

GEEKY RADIO NEWS

SOLAR FLARES TEACH US HOW TO BUILD A BETTER ROCKET.

The device would apply magnetic fields to cause particles of plasma, electrically charged gas also known as the fourth state of matter, to shoot out the back of a rocket and, because of the conservation of momentum, propel the craft forward. Current space-proven plasma thrusters use electric fields to propel the particles.

The new concept would accelerate the particles using magnetic reconnection, a process found throughout the universe, including the surface of the sun, in which magnetic field lines converge, suddenly separate, and then join together again, producing lots of energy. Reconnection also occurs inside doughnut-shaped fusion devices known as tokamaks.

During its operation, this tokamak produces magnetic bubbles called plasmoids that move at around 20 kilometers per second, which is a lot like thrust.



Fusion, the power that drives the sun and stars, combines light elements in the form of plasma -- the hot, charged state of matter composed of free electrons and atomic nuclei that represents 99% of the visible universe -- to generate massive amounts of energy. Scientists are seeking to replicate fusion on Earth for a virtually inexhaustible supply of power

to generate electricity.

Current plasma thrusters that use electric fields to propel the particles can only produce low specific impulse, or speed. But computer simulations performed on PPPL computers and the National Energy Research Scientific Computing Center, a DOE Office of Science User Facility at Lawrence Berkeley National Laboratory in Berkeley, California, showed that the new plasma thruster concept can generate exhaust with velocities of hundreds of kilometers per second, 10 times faster than those of other thrusters.

That faster velocity at the beginning of a spacecraft's journey could bring the outer planets within reach of astronauts.

Elon may be in for some competition.



GAME-CHANGER IN FUTURE SOLAR TECHNOLOGY: NEW PEROVSKITE SOLAR MODULES WITH GREATER SIZE, POWER AND STABILITY



- Perovskites are projected to be a game-changer in future solar technology but currently suffer from a short operational lifespan and drops in efficiency when scaled up to a larger size
- Scientists have improved the stability and efficiency of solar cell modules by mixing the precursor materials with ammonium chloride during fabrication
- The perovskite active layer in the improved solar modules are thicker and have larger grains, with fewer defects
- Both 5 x 5 cm^2 and 10 x 10 cm^2 perovskite modules maintained high efficiencies for over 1000 hours

Researchers from the Okinawa Institute of Science and Technology Graduate University (OIST) have created perovskite solar modules with improved stability and efficiency by using a new fabrication technique that reduced defects. Their findings were published on the 25th of January 2021, in *Advanced Energy Materials*.

Perovskites are one of the most promising materials for the next-generation of solar technology, soaring from efficiencies of 3.8% to 25.5% in slightly over a decade. Perovskite solar cells are cheap to produce and have the potential to be flexible, increasing their versatility. But two obstacles still block the way to commercialization: their lack of long-term stability and difficulties with upscaling.

Perovskite material is fragile and prone to decomposition, which means the solar cells struggle to maintain high efficiency over a long time And although small-sized perovskite solar cells have a high efficiency and perform almost as well as their silicon counterparts, once scaled up to larger solar modules, the efficiency drops.

In a functional solar device, the perovskite layer lies in the center, sandwiched between two transport layers and two electrodes. As the active perovskite layer absorbs sunlight, it generates charge carriers which then flow to the electrodes via the transport layers and produce a current.

However, pinholes in the perovskite layer and defects at the boundaries between individual perovskite grains can disrupt the flow of charge carriers from the perovskite layer to the transport layers, reducing efficiency. Humidity and oxygen can also start to degrade the perovskite layer at these defect sites, shortening the lifespan of the device.

This work was supported by the OIST Technology Development and Innovation Center's Proof-of-Concept Program. These results are a promising step forward in the quest to produce commercial-sized solar modules with efficiency and stability to match their silicon counterparts.

In the next stage of their research, the team plans to optimize their technique further by fabricating the perovskite solar modules using vapor-based methods, rather than by using solution, and are now trying to scale up to $15 \times 15 \text{ cm}^2$ modules.

How one physicist is unraveling the mathematics of knitting

Physicist Elisabetta Matsumoto is an avid knitter and has been since taking up the hobby as a child. During graduate school at the University of Pennsylvania in 2009, Matsumoto came across an unusually knotty stitch while knitting a pattern for a Japanese red dragon. That got her thinking about the geometry of stitches and, eventually, led her to study the mathematics of knitting.



There are a hundred or so basic stitches, Matsumoto says. By varying stitch combinations, a knitter can alter the elasticity, mechanical strength and 3-D structure of the resulting fabric. Yarn on its own isn't very elastic. But when knitted, the yarn gives rise to fabric that can stretch by more than twice its length while the yarn itself barely stretches.

Matsumoto, now at the Georgia Institute of Technology in Atlanta, is teasing out the mathematical rules that dictate how stitches impart such unique properties to fabrics. She hopes to develop a catalog of stitch types, their combinations and the resulting fabric properties. Knitters, scientists and manufacturers could all benefit from a dictionary of knits.

Making tiny changes, such as altering a couple of crossings in a knot, could have a huge impact on the mechanics of the textile. For instance, a fabric made of just one stitch type, such as a knit or purl, tends to curl at the edges. But combine the two stitch types together in alternating rows or columns, and the fabric lays flat. And despite looking nearly identical, the fabrics have varying degrees of stretchiness, Matsumoto and grad student Shashank Markande reported in July in the Bridges 2020 Conference Proceedings.

Matsumoto's team is now training a computer to think like a knitter. Using yarn properties, mathematical stitch details and final knitted structures as inputs, a program can predict mechanical properties of fabrics. These predictions could someday help tailor materials for specific applications — from scaffolds for growing human tissue to wearable smart clothing and perhaps solve knotty problems of everyday life.

Space station detectors found the source of weird 'blue jet' lightning

Scientists have finally gotten a clear view of the spark that sets off an exotic type of lightning called a blue jet.



Blue jets zip upward from thunderclouds into the stratosphere, reaching altitudes up to about 50 kilometers in less than a second. Whereas ordinary lightning excites a medley of gases in the lower atmosphere to glow white, blue jets excite mostly stratospheric nitrogen to create their signature blue hue.

Blue jets have been observed from the ground and aircraft for years, but it's hard to tell how they form without getting high above the clouds. Now, instruments on the International Space Station have spotted a blue jet emerge from an extremely brief, bright burst of electricity near the top of a thundercloud, researchers report online January 20 in *Nature*.

Understanding blue jets and other upper-atmosphere phenomena related to thunderstorms, is important because these events can affect how radio waves travel through the air — potentially impacting communication technologies.

Cameras and light-sensing instruments called photometers on the space station observed the blue jet in a storm over the Pacific Ocean, near the island of Nauru, in February 2019. The spark that generated the blue jet may have been a special kind of short-range electric discharge inside the thundercloud. Normal lightning bolts are formed by discharges between oppositely charged regions of a cloud — or a cloud and the ground — many kilometers apart. But turbulent mixing high in a cloud may bring oppositely charged regions within about a kilometer of each other, creating very short but powerful bursts of electric current. Researchers have seen evidence of such high-energy, short-range discharges in pulses of radio waves from thunderstorms detected by ground-based antennas.

NEW SUNSPOT CYCLE COULD BE AMONG STRONGEST ON RECORD ???

The article below, by Laura Snider, was originally published in NCAR & UCAR News

In direct contradiction to the official forecast [from NOAA's Space Weather Prediction Center, the U.S. government's official source for space weather forecasts, watches, warnings, and alerts], a team of scientists led by the National Center for Atmospheric Research in Boulder, Colorado is predicting that the sunspot cycle that started this fall could be one of the strongest since record-keeping began [in 1755].

In a new article published November 24, 2020, in the peer-reviewed journal Solar Physics, the research team predicts that Sunspot Cycle 25 will peak with a maximum sunspot number somewhere between approximately 210 and 260, which would put the new cycle in the company of the top few ever observed.

The cycle that just ended, Sunspot Cycle 24, peaked with a sunspot number of 116, and the consensus forecast from a panel of experts convened by NASA and the National Oceanic and Atmospheric Administration (NOAA) is predicting that Sunspot Cycle 25 will be similarly weak. The panel predicts a peak sunspot number of 115.

If the new NCAR-led forecast is borne out, it would lend support to the research team's unorthodox theory – detailed in a series of papers published over the last decade – that the sun has overlapping 22-year magnetic cycles that interact to produce the well-known, approximately 11-year sunspot cycle as a byproduct. The 22-year cycles repeat like clockwork and could be a key to finally making accurate predictions of the timing and nature of sunspot cycles, as well as many of the effects they produce, according to the study's authors.

The Article: Overlapping Magnetic Activity Cycles and the Sunspot Number: Forecasting Sunspot Cycle 25 Amplitude points out that the anomaly comes from a method of measurement based less on

statistical averaging, and more of direct measurement and computer modelling

If correct, then our understanding of solar cycles will require another serious re-think. Naturally when two groups of scientists disagree, it's hard to make any accurate predictions, but this is exactly the kind of scientific debate that science should encourage, and given the choice between another minimum or a strong cycle, I hope this new study is right, But it's too early to tell.

Let's have this discussion again in about 5 years...

Still, pick your side & cross your fingers







Papakura Radio Club Inc.

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February 2021

SEEN OR HEARD AROUND THE SCENES

NEW STEALTH ANTENNA SPOTTED

We can't all have a big antenna, and the 64:1 five band end fed wire might be one of the stealthiest, but we spotted this one recently, and that means another club member, who lives in a block of flats is now up on HF

So listen out for contacts, Cycle 25 is still struggling to get up to speed, but there are still plenty of contacts out there

CONFERENCE 2021

The upcoming conference and AGM will be held in Napier at Queens Birthday weekend in 2021, Mark calendar now to prevent double bookings

EASAT-2 AND HADES LAUNCH DELAYED, PROBABLY TO MARCH (01/05/2020)

The space broker Alba Orbital has reported the delay in the launch of its cluster-3 of picosatellites, scheduled for January 14, 2021 and which includes the AMSAT-EA EASAT-2 and Hades satellites.

This delay, attributable to Momentus , will mean that it should probably be postponed to March, coinciding with Starlink's mission that same month , also with SpaceX . Apart from the AMSAT-EA satellites, many others integrated in the Alba Orbital pod are also affected, among them the DelfiPQ , from the University of Delft , as well as other Europeans and Israel.

The satellites EASAT-2 and HADES were developed by the Spanish National Amateur Radio Society in cooperation with the European University of Madrid. The spacecraft will be launched into a sunsynchronous orbit with an altitude of \sim 550 km. Both satellites are based on the PocketQube 1.5P architecture (7.5 x 5 x 5 cm). In addition to the transponder, the EASAT-2 and HADES satellites are equipped with a camera capable of transmitting SSTV (Robot-36). The launch is planned for late 2020 or early 2021 onboard Falcon 9 from the US Air Force Base at Cape Canaveral.

EASAT-2 frequency: Uplink: 145.875 MHz (no tone); Downlink: 436.666 MHz;

HADES frequency: Uplink: 145.925 MHz (no tone); Downlink: 436.888 MHz;

So still Some Waiting Required.







1960

CAR BOOT SALE - PAPAKURA 2021

Saturday the 20th of February in the carpark, we will be holding a car boot sale, there is no charge for buyers or sellers. A cafeteria will be operating and Papakura will be selling some of its collected stock.

A great chance to clear the garage of all the stuff you don't need, so you can have some room for the stuff you find that you think you just might need.

Make sure you pass the word around.





I WALK AROUND LIKE I'M OK BUT DEEP DOWN I WANNA BUY MORE RADIOS





Papakura Radio Club Inc.

SOME NETS - FOR WHEN YOU ARE LOOKING FOR COMPANY

| Day | Time (Local) | Freq (MHz) | Group |
|----------------|--------------|------------|-------------------------|
| Sunday | 08:00 | 3.750 | Southern Net |
| | 09:00 | 3.700 | Bch 10. Franklin. |
| | 09:00 | 3.755 | Bch 65. Papakura. |
| | 16:00 | 7.125 | SPAM Net (AM Mode) |
| | 19:00 | 146.625 | YL Net |
| | 20:00 | 3.710 | Bch 42. Titahi Bay |
| | 21:30 | 3.595 | Duran WIA Net. |
| | 21:30 | 3.595 | VK2WI |
| | | | |
| Monday | 19:30 | 3.757 | Bch 12. Hamilton |
| | 20.00 | 3.540 | CW Practice Net |
| updated | 20:00 | 3.605 | Br 80. Hibiscus Coast |
| updated | 20:00 | Nat System | W.A.R.O |
| | 20:30 | 3.870 | O.T.C (Old Timers Club) |
| | | | |
| Tuesday | 09:00 | 7.096 | Ex Post Office Techs |
| | 21:00 | 1.850 | 160m Net _ Ron ZL4JMF |
| | 19:30 | 3.690 | QRP ZL2BH |
| | 20:00 | 3.581 | CW improvers Net |
| | | | |
| Wednesday | 20:00 | 3.660 | Geek Net |
| | 20:00 | 3.645 | Bch 02. Auckland |
| | 20:00 | 3.745 | Bch 84. Bay of Islands |
| | 20:30 | 146.525 | W.R.S.C |
| Thursday | 00.00 | 7.00/ | Ex Deat Office Techo |
| Thursday | 10:20 | 7.096 | |
| | 19:30 | 3.090 | QRP ZLZBH |
| | 20.00 | 2.615 | Peb 90 DEC |
| | 20.00 | 2 606 | |
| | 20.30 | 3.666 | |
| | 20:00 | 3.600 | |
| | 20.00 | 3.070 | |
| Friday | 20.00 | 3 850 | SPAM (AM Mode) |
| Thady | 20:30 | 3 650 | W S R C |
| | 20:30 | 3.560 | Digital Modes Net |
| | | | |
| Saturday | 10:30 | 28.530 | 10-10 Down Under |
| | 19:30 | 3.650 | Christian Fellowship |
| | 20:00 | 3.760 | ??? |
| | 20:30 | 3.600 | Ch 62. Reefton/Buller |
| | | | |
| Daily or Other | 07:30 | 3.696 | ZL2OA |
| | 08:30 | 3.730 | ZL3RP |
| | 15:00 | 14.300 | Pacific Seafarers |
| | 17:30 | 3.760 | Home Brew |
| | 17:30 | 14.183 | ANZA DX Net |
| | 18:00 | 7.115 | VK7OB |
| | 19:30 | 3.720 | ZL1MO |
| | 18:30 | 3.766 | ZL3LE |
| | 08:30/20:00 | 3.730 | ZL3RP |
| | 20:30 | 3.725 | ZL2HN / ZL4RF |
| | 21:00 | 3.677 | Counties Net ZL2MA |

This is designed to be a living list, Please update whenever you are able:

| Also: Calling Frequencies: | Daily | Sunset-Sunrise | 3580 USB | NZ FSQCall |
|----------------------------|-------|----------------|----------|-----------------------|
| Courtesy of Murray ZL1BPU | Daily | Sunrise-Sunset | 7105 USB | NZ FSQCall |
| | Daily | 24/7 | 7104 USB | International FSQCall |

I'm told the last of these sees some amazing DX, especially around sunset.

Papakura Radio Club Inc. Branch 65 NZART Club Directory 2017 Wellington Park, 1 Great South Road. PO BOX 72-397 Papakura 2244 PHONE 09 296 5244 Westpac 03-0399-0019896-00 Club website: <u>http://www.qsl.net/zl1vk</u> Club email: zl1vk.club@gmail.com

| Little Officers | | | | | | | |
|---------------------|--------------------------------------|-----------------------|----------------|-------------|--|--|--|
| President | ZL1NUX | Gavin Denby | Ph 09 299 3415 | 021 1046946 | | | |
| Vice President | ZL1BNQ | Richard Gamble | Ph 09 5371238 | 021 729270 | | | |
| Secretary | ZL1AOX | Ian Ashley | Ph 09 2981810 | 021 1981810 | | | |
| Treasurer | ZL1MR | David Wilkins | Ph 09 2999346 | 021 1857903 | | | |
| Committee | ZL1RJS | Rob Stokes | Ph 09 2961152 | 021 307005 | | | |
| | ZL1IRC | Ian Clifford | Ph | 021 8248400 | | | |
| | ZL1ASN | Rolly Adams | Ph 09 2966107 | 021 0427760 | | | |
| | ZL1DK | David Karrasch | Ph 09 296 8264 | 021 560180 | | | |
| | ZL1RIC | Ricky Hodge | | 021 666421 | | | |
| AREC Section Leader | ZL1BNQ | Richard Gamble | Ph 09 5371238 | 021 729270 | | | |
| CD Liaison | ZL1AOX | Ian Ashley | Ph 09 2981810 | 021 1981810 | | | |
| Newsletter Editor | ZL1NUX | Gavin Denby | Ph 09 299 3415 | 021 459 192 | | | |
| Hall Custodian | ZL1AOX | Ian Ashley | Ph 09 2981810 | 021 1981810 | | | |
| Newsletter. | sletter. Contact: zl1nux@outlook.com | | | | | | |

Our newsletter is published monthly and normally distributed just prior to the club meeting. Please forward articles etc to editor Wednesday 1 week prior to the general meeting. Do notify any change of address. Including E-Mail Address.

Meetings

Flocted Officers

General Meetings are held at the Club rooms on the 1st Wednesday of each month, starting at 7.30pm. Look at your calendar and mark these nights. The speaker follows the General Meeting.

Project Evenings are on the 4th Wednesday of each month.

Committee Meetings are held on 3rd Wednesday of each month at 7.30pm, unless advised.

Activity Nights are held on the 2nd Wednesday starting at 7.30pm.

AREC Meetings are on the 5th Wednesday night, also starting at 7.30pm **AGM:** Held in November

Subscription: Full membership and newsletter\$25.00Family Membership and newsletter\$40.00Bank Account number: 03-0399-0019896-00

Working Bees As required.

Branch 65 21 Award: For contacts with ZL1VK (5 Points) and 8 Papakura Radio Club Members (2 Points each) after January 2011. Total 21 Points. Cost \$5-00. Certified list and \$5-00 to Secretary, Papakura Radio Club. Address above.

ZL1VK Club Nets

146.900 MHz Sunday at 8.30am. Controller ZL1NUX, Gavin Denby. If the repeater is not available, listen 146.475 simplex.

3.755 MHz Sunday at 9.00am. Controller ZL1BNQ Richard Gamble. (Linked to 146.675 & 438.775)