The Official Newsletter of the

Auckland VHF Group Inc.

Spectrum

Andry Brill explains how AREC is changing to meet the requirements of the Land Search and Rescue and the Emergency organisations where the usual communications are not available.

Auckland VHF Group Inc.
Branch 66 NZART

PO Box 10138, Dominion Rd, Auckland 1446
Clubrooms: 30 Hazel Ave, Mt Roskill

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Club Web Page: http://aucklandvhf.org
ZL1VHD Dstar gateway administrator: Laurie ZL1ICU 634 5130 0274 817463 perma@xtra.co.nz
ZL1VHD Dstar gateway registration URL : http::://zl1vhd.dstar.org.nz

Club News and Net:

The combined Auckland VHF Group and Auckland Regional Branch News and Net are 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 evening.

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 by the 1st of each month. Articles to be submitted to the editor Peter ZL1UKG
spectrum@aucklandvhf.org

Auckland VHF Group (Inc) Branch 66

General Meeting Notice

Monday 8th March 2021 7.30pm

At the North Shore Radio Club

400 East Coast Road, Sunnynook, North Shore

If you are coming please try and be there by 7.30pm.
If you would like to carpool from our Hazel Avenue Clubrooms, please contact Darryl ZL1TCI who will try to arrange it for you.

At the meeting we will be having a look at the AREC and Civil Defence communications set-up and Andy Brill ZL1COP, AREC Northern Manager will be on hand to answer your questions. Tea/Coffee etc will be available after the meeting.

Listen to the Sunday night at 8:15 p.m. to the News and Net on 6625 Repeater for possible cancellation in light of the extension to the COVID-19 Level 3 Lockdown

Coming Events:

•	20 March	Te Puke ARC Market Day from 8:30 am for Vendors and 10:00 am for Buyers. 4 Old Coach Road, Paengaraoa.
*	10 — 11 April	Low Band Contest: 10th and 11th April 2021. All bands 6 m up to and including 70 cm. Operating 1 hour periods are Saturday 5pm (1700) to 11pm (2300) and Sunday 7am (0700) to 1pm (1300). For the full set of rules, etc., please go to: https://www.nzart.org.nz/activities/contests/vhf-and-above-contests
*	15 May	Radio Electronics Group Market Day from 8:30 am for Vendors and 10 am for Buyers. 211 Peacocks Road, Glenfield, Hamilton.

March 2021
Notes from the Committee in the absence of the President's Column

At our February Committee meeting, Treasurer George ZL1TUX presented a very well thought out budget for our 2021 financial year. The Klondyke repeater site continues to dominate our expenditure wish list. Currently the tower painting and re-furbish of the 2 metre antenna bays is deferred until such time as we can get sufficient funds or grants to help pay for this. The other significant item is re-establishing the 2m, 70cm and a new 23cm beacon at the Nihotupu site. These items, along with our normal operating expenses and provision for $2000 depreciation will see us operate at a budgeted loss of $14,569.00 for the 2021 year.

Klondyke – The next most urgent maintenance item on the tower is the replacement of the two existing runs of cable tray and the old wooden mounting blocks. From where the tower tapers in and goes straight up, is a steel ladder. This has been reported to us as in need to refurbishing/ replacement. So far one quote of $13,904.54 including GST has been received for this work and we are trying to get a second quote before authorising this work. The scope of work will require several days on the tower – removing the coax cables, securing them, removing the cable tray and mounting blocks. Replacing the mounting blocks and fitting new cable tray, then re- attaching all the coax cables. Your committee believes this is too much to ask members to do and we are going to get this done professionally.

2m, 70cm and 23cm Beacons. Thanks to some great work by Greg ZL1GSG, we now have these beacons ready to go. (The beacons have been off the air for over three years) Discussion about suitable antennae and polarisation – we will stay with horizontal and the availability of some 70cm stainless steel Yagi antennas has lead to the decision that we will put up Yagi antennas for the 2m and 70cm beacons. Each beacon will have two Yagi's, one facing south and the other facing west. A final decision on the 23cm antenna is still to be made.

We will do this work ourselves, but it will require a cherry picker at the site, possibly on two different occasions, as the condition of the existing coax cables is unknown and an assessment of the pole and fitting a new cross-arm may take some time. We have budgeted $2000 for this work, and your committee are following up on some leads regarding a lower cost cherry picker. Hiring one for two separate days will take up much of the budget! If anyone can help with access to a 13m cherry picker, preferably truck mounted but towable is OK – please let Vaughan ZL1VH know.

Last year the Club had donated, a 60' Clark Telescopic Mast mounted on a trailer. We are keen to get this into fully operational condition for use in contests, field days, etc. Currently this is being stored at Matthew ZL1YOT's QTH at Kumeu. Some mechanical work (brakes, wheel bearings and hubs) is needed on the trailer to get it back to a road-worthy condition and we would appreciate offers of help with this. If you can help, please let Matthew ZL1YOT know.

Finally – last but not least, at the February Committee Meeting, Dave Dingley ZL1TIA had advised that for health reasons, he was unable to continue as our AREC Group Leader and Matthew ZL1YOT had volunteered to take on this position. The committee ratified this offer and ZL1YOT is now our AREC Group Leader.

The February General Meeting
of the Auckland VHF Group Inc.

Held on Monday 08 February 2021 at the Clubrooms, 30 Hazel Avenue, Mt Roskill

Meeting started at: 19.36 pm

Present: 16 members as per the Attendance Book and ZL1AOX via Teams.
Apologies: ZL1TIA, ZL1BPA, ZL1TOW

Minutes of November General Meeting – as published on page 7 of December 2020 Spectrum.
Moved the minutes were a true and correct record: ZL1TCI Seconded: ZL1TUX
Carried
Matters arising: NIL

Reports:

Finance: ZL1TUX reminded the meeting that subscriptions for 2021 were now due.
Our account reviewer, Basil ZL1TOW had raised some queries regarding the 2020 accounts and the committee will respond to those.

Correspondence:
In – newsletters from North Shore Branch 29 and Branch 88 Musick Point Radio Group.

General Business:

ZL1VH advised of the upcoming "Ham Cram" weekend amateur radio course coming up over the weekend of February 20 and 21.

The VHF/UHF/SHF DX Weekend Contest is the 13th and 14th of February. Anyone interested please contact Greg ZL1GSG.

The Annual Jock White Field Day Contest is on February 27 and 28.

The General Meeting closed at 19.48 and was followed by a presentation from Andy Brill ZL1COP, Deputy northern Area Manager AREC. See March 2021 Spectrum for a report on this part of the meeting.

At the conclusion of the meeting, members enjoyed a cup of tea/coffee and informal chat.

Te Puke Radio Club Market Day

The Te Puke Radio Club, Branch 53 Market Day will be held at the Paengaroa Community Hall, 4 Old Coach Road, Paengaroa (GPS Cordinates: 37.49S 176.24E) on Saturday 20 March
There is Overnight Parking for Motor Homes. For further information & Table Bookings, Contact Syd Rowe ZL1WR at (07) 533-1029 or 0272488664, Email sydrowe@xtra.co.nz.

Radio Electronics Group Inc Annual Equipment Sale, Branch - 89

At Glenview Club Inc. 211 Peacocks Road Glenview, Hamilton
Saturday 15th May Vendors: 8-30am Doors open 10am
Tables $20 Public— $2 Lucky Ticket Entry
Trade display — Refreshments — Door prizes
Plenty of parking Easy access Motor Home Parking

For Vendor registration and enquires Contact Vern ZL1TKG ZL1REGSALE@gmail.com
Or Phone John ZL1PO 021 204 5990

The future development of AREC for the support of Land Search and Rescue

By Andy Brill ZLICOP now AREC Region Manager (North)

REC was first created in 1932 as the Radio Emergency Corps following the Napier 7.1 Earthquake on 03 February 1931 where all landline communication was destroyed. The name was changed to AREC Amateur Radio Emergency Corps. In 1997 the name change was changed to AREC Amateur Radio Communications.

The AREC operates under the auspices of the Land Search Rescue and Civil Defence and other emergency services for emergency, disaster relief and rescue services. In the 21st Century communications equipment has become simpler to operate for the layman, more complex and expensive to maintain and less compatible with traditional amateur systems. Existing Hams are getting older and fewer people are taking up the hobby. Passing written telegram style messages over voice circuits is no longer what the services need.

Today they require person to person voice or the radio messages to be directly into Incident Management data systems. Using new technology and computer literacy will be essential to provide for the Incident Management Team who use systems like SARTrack, CAD systems, email, EMIS etc…. AREC must the structure of their systems and where the information needs to go and what type of information is required. This requires more than message passing.

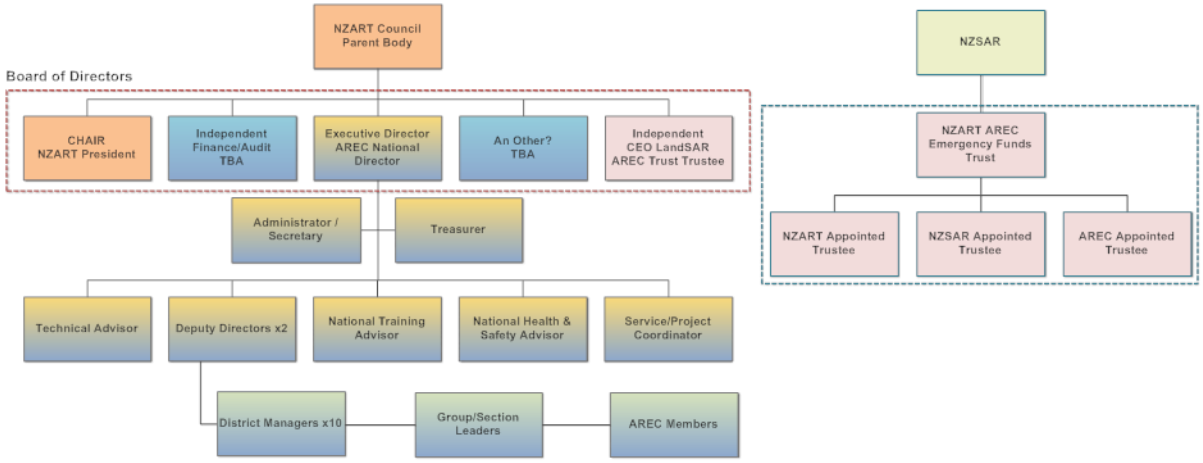
AREC has a new leadership and management structure with financial support from the Government. It started at $65k per annum but how to use it for training resulted in it being suspended. Financial management has now improved and payments of $1.5m with people in full time roles in Management, Accounting, Training Advisor, Health and safety systems, Funding for various meetings, PPE for volunteers using Blackwood as the supplier.

Finance System (Xero) Accounting systems now setup and management now in place

General Ledger	COA/Cost Centres
Accounts Payable	Automation
Accounts Receivable	A Membership System is TBA

The AREC rules and the NZART Constitution could be reviewed to allow for members to be AREC only without the technical radio knowledge and subject the normal fees.

AREC Structure



Finance System (Xero) Accounting systems now setup and management now in place

* General Ledger
* Accounts Payable
* Accounts Receivable
* COA/Cost Centres
* Automation

A Membership System is TBA

The AREC rules and the NZART Constitution could be reviewed to allow for members to be AREC only without the technical radio knowledge and subject the normal fees.

* **Membership** – need to encourage new members with skills capability and enthusiasm – not necessarily licenced amateurs or NZART transmitting members
* **Training** – give new members the new skills
* **Practice** – provide opportunities for practice – exercises, activities, events
* **Local organization**. – Better communication between members. Share information, resources, capabilities opportunities for activities.
* **Work together** rather than as individual units.
* **Identify people** with key skills – leadership, admin, training, technical. Share the load.

This was followed by some discussion as to how this could be realised. For non-technical members PRS type radios might be used rather than the more expensive and complex Amateur frequency requirements.

This summary of the presentation has been written from notes made by the editor and a copy of the Powerpoint supplied by Andy Brill.

Antenna Testing Notes
(NZART Br05 Christchurch -Jan 2021)

"For something so simple, it ends up being remarkably complicated to actually do well"

The setup we used to attempt to measure antenna Horizontal Radiation Patterns (HRP) was

Transmit Signal Generator at 0dBm (1mW) – we used a Marconi 2022 Generator
Vertical ground-plane based antenna mounted low to the ground (5/8 whip with 3 radials)

Receive Spectrum Analyser
Coax of known loss
Reference dipole
Vertical 48mmOD pipe fitted onto a plate and axle arrangement - the flat plate had a 360° graticule engraved onto Perspex plastic
Pointer attached to pole so that when the pole was rotated the pointer indicated the bearing on the Perspex plate

And what we found …
It turns out that the biggest problem measuring antennas is that we are not in free space. Generally the diagrams published for antennas are free space patterns – which turns out to be rather difficult to emulate.
So the first issue is to find use as much space as you can. We had a range that at the Canterbury show grounds that was about 60m long (Transmit to Receive). Just as important (perhaps more important) is what surrounds the antenna test range. Everything causes a reflection, trees, buildings, vehicles, everything.
Reflections cause problems resolving the patterns – if you consider a reflection to one side at say 90° - as the antenna is rotated to the 90° position it will receive the signal from the reflection – which might be bigger than say the 90° null of the antenna might have been.
If the reflection was 60m out to the side, the path length from Tx to reflection to Rx is only 1.4 x the length of the main path (Tx to Rx) – so it is quite easy for the reflection signal to be better than -10dB w.r.t to the direct signal. If the null in the antenna pattern is really 20dB – the 10dB reflection will mask it and make the plotted pattern look much worse than it really is.

We had problems with a building behind the transmit antennas – which just added to the reflection problems. Buildings act as a large reflector, but large reflectors often do not reliably reflect just in one direction. In fact they often have all sorts of odd-ball reflections.

What to do better (1) ….
To minimise the reflections use a directive antenna at the transmitter. Some of the professional test ranges use a corner reflector because
1. They have a very well –defined front to back ratio
2. They have one main lobe, a small rear lobe and almost no other side lobes
The corner reflector could be made using some very lightweight materials – it does not have to be rugged, so light-weight aluminium and a wooden frame may suffice.
By using a corner reflector, you avoid illuminating anywhere apart from down the range towards the receive antenna being tested – which makes the

Antenna height matters (a lot)
We opted to use a very low transmit antenna to minimise the effects of ground reflections (our antennas were mounted about 500mm above ground). It probably helped but …. Not enough.
To “calibrate” the range, we used a reference dipole at the height we were planning to test the antennas at. I think we were just very lucky, but taking into account the Tx and Rx feeder losses, gain of the Tx antenna etc., the calculated path loss, the level we measured on the spectrum analyser was within about 2dB of the calculated level - which then generated a great deal of confidence.
However … when we put our first test antenna up – we needed to put it much higher on the pole than the reference antenna and the levels were wildly out – like a gain of 6dB or more for a simple dipole.

So if you can – either
1. Keep all the antennas being tested at the same height as the reference
2. Do a height run for each antenna to find the 1st maximum – which is not always easy

The second is technically more accurate – but can be really hard to actually do with a temporary set-up. Does it matter? If you want to measure gain – then yes. (And hams always want to compare the gain of their antennas. ☺)

Don't mix polarisation …

We did not really consider the fact that testing yagis with a metal support pole and a vertical transmit antenna was going to be a problem. We managed to use a small offset boom but it did affect the patterns …

For some of the yagis we 'had' to mount them horizontally (there was no vertical mount option that would work). However, a lesser known fact is that antenna cross polar isolation varies with azimuth for directive antennas.

What this means is – when the horizontal antenna is pointed directly at the transmit test antenna the expected cross-polar loss is achieved (say 15 to 25 dB depending on the antenna type). But as the antenna is rotated to 90° the cross polar discrimination reduces to 0dB. For this example, this will progressively exaggerate the side lobes by 15 to 25 dB as the antenna is rotated.

What to do better (2) …

Don't (under any circumstances) test the antenna cross-polar (vertical to horizontal or horizontal to vertical). The pattern response will be a mess (at best). Make sure you have a good antenna mount/ attachment method – we used a cross clamp plate with 2 sets of U-bolts at 90°
Make sure the antennas

What went well …

1. For the plots we completed with the correct polarisation – we achieved some really good results. Surprisingly some of the best plots were of the club 6m yagi project antennas (H Polarisation). These yagis were tested at about 2.5 to 3m agl, and we used a 4 element yagi for the transmit antenna as well. I think this demonstrates that a directive transmit antenna helps avoid the effects of reflections from other objects.

2. With a reference dipole at the same height – we were able to get some good results for antenna gain (good meaning sensible and reasonable for the antenna type)

3. It turned out to be a good club activity with wide interest and good participation (include a BBQ as part of the event)

4. We used Excel to produce the graphs – It would have been better to have used a log scale for the gain – but Excel will not allow negative numbers for the axis in logarithmic scale mode.

5. A good "brains trust team" to get the thing off the ground. It is too easy to overlook something if you don't have a technically capable team. A mix of skills – some RF, some mechanical (for mounts, measuring scale etc), good 'stage' management to manage facilities, people and spectators – they are all vital to a good outcome. We had an excellent team of contributors at Br05 – missing any one of them would have reduced the success factor.

Richard Smart ZL4FZ

For a view of English operation and techniques, have a listen to the ICQ Podcast Episode 344.

Tim Kirby, GW4VXE talks about his experiences and what he's learned. Podcast 344 is quite long - over two hours and the interview with Tim Kirby starts at about 1 hour and 16 minutes into the podcast.

The link to the podcast is here: https://www.icqpodcast.com/download-the-show/2021/2/14/icq-podcast-episode-344-joy-of-vhf-and-above

The UK Microwave Group had an entertaining talk by Kent WA5VJB/G8EMY last night, broadcast courtesy of the BATC streamer. The video is now available for viewing on the UKuG YouTube channel here (thanks to G8GTZ and G6JYB for editing):

https://www.youtube.com/watch?v=q_WKp0Dg74c

RADIO SPECTRUM MANAGEMENT

Beware the illegal two-way radio

Two-way radios (also known as walkie talkies) are easily bought online but some overseas models are illegal in New Zealand.

Illegal radios are often cheap and typically sold by overseas retailers with a package of pre-programmed frequencies or fully programmable options. For example radio brand names such as Baofeng, Pofung and Wouxun are in most cases illegal to own or operate. These radios do not meet the required technical standards and can be easily programmed to operate on channels which the public are not authorised to use. There have been examples of these radios being used on emergency services and public safety communication channels which can have very serious consequences.

What happens if I'm caught?

In October 2018, the Radiocommunications Regulations (Prohibited Equipment – Unrestricted Two Way Radio) Notice 2018 was introduced to prohibit the import, sale, and distribution of unrestricted two-way radio equipment, other than by a permitted person. Breaching these regulations could lead to prosecution and fines of up to $200,000.

Where can I find more information?

Radio Spectrum Management Website **https://www.rsm.govt.nz/**
By phone: In New Zealand, call us on **0508 RSM INFO** (0508 776 463)
From overseas, call +**64 3 962 2603**
By Email: **info@rsm.govt.nz** Service centre

These links were found by Vaughan ZL1VH

Amateur Radio Emergency Communication.
Volunteers in radio communications.
Using our resources to help the community.

INFORMATION

The Auckland VHF Group has an AREC Group that works closely with Auckland Council Emergency Management. They provide advice, resources and manpower to assist in times of need.

The AREC section is headed by Group Leader Matthew King ZL1YOT.

From time to time the VHF Group has training sessions and exercises. Members also assist with sports events, parades and other community activities. For further information about AREC please see the NZART web site: http://www.nzart.org.nz/arec/

JOIN BRANCH 66 AREC

All members of the Auckland VHF Group are encouraged to join the AREC section. Your contribution, large or small is appreciated by all involved. For further information about joining Branch 66 AREC contact the Group Leader:

Matthew King ZL1YOT 022-6493310 mattking@gmail.com

The Deputy Leader position is currently vacant

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AREC News:

AUCKLAND VHF GROUP (INC)

SUPPORT THE EFFORTS OF THE VHF GROUP THROUGH YOUR SUBSCRIPTION

SUBSCRIPTIONS FOR 2021

THE SUBS GO TOWARDS;

- Maintenance and on-going improvements to beacons, repeaters and linking systems for the national system, including the Klondyke repeater site.
- Providing on-time and free access to spectrum magazine as soon as it is available.
- Providing facilities for good speakers and lecturers at our general meetings.
- Discounted access to our trading table goodies.
- Access to test equipment and technical help when needed.

FULL MEMBERSHIP **$55.00**

ASSOCIATE MEMBERSHIP **$50.00**

FAMILY MEMBERSHIP ADDITIONAL **$20:00**

SEE ATTACHED MEMBERSHIP RENEWAL FORM (next page)

REMEMBER TO KEEP US INFORMED OF YOUR EMAIL ADDRESS!

OTHERWISE WE CANNOT SEND YOU SPECTRUM!

Thought for the month:

"The most difficult thing is the decision to act. The rest is merely tenacity."

AUCKLAND VHF GROUP INC.

P O Box 10138, Dominion Rd, Auckland 1446,
30 Hazel Avenue, Mount Roskill, Auckland,
Web: http:\\www.aucklandvhf.org
NEW ZEALAND

NAME				
Mr/Mrs/ Miss/Ms	Christian or given		Surname	
Address			Date:(dd/mm/yy)	
			Phone: (home)	
			Phone: (work)	
Email			Phone (Cell)	
Occupation:			Callsign:	
NZART Member	Yes/No		Branch assigned	
AREC Member	Yes/No		Branch assigned	
Family Member 1	(Name)	(Call)	(Email)	(Mobile #)
Family Member 2	(Name)	(Call)	(Email)	(Mobile #)
Family Member 3	(Name)	(Call)	(Email)	(Mobile #)

Category			To pay
Membership	Full	$55.00	$
New/Renewal/Change	Associate	$50.00	$
Receipt #	Family (per member)	$20.00	$
Donations	Klondyke Refurbishment		$
Auckland/Brynderwyn/ Klondyke/670/690	Repeater Maintenance		$
	Data/D-Star		$
	Beacon/Repeater/Links/ Licences		$
	Other		$
		Total	$

Payment (Mark One →)	Cash ☐	Cheque ☐	Internet deposit ☐
Invoice/Statement required	*Please Advise Treasurer*		

Internet	To account **ASB 12-3011-0830580-00**. Account name is: **Auckland VHF Group Inc**. Include your **Name/Callsign** for us to track. Note: this form needs to be sent to us to update records. Email to: **treasurer@aucklandvhf.org.**	
Post	The Treasurer, Auckland VHF Group Inc., PO Box 10138,Dominion Road, Auckland 1446.	
In Person	Bring this form and payment to the next club meeting, 2nd Monday of the month or to the Committee meeting the 4th Tuesday of the month.	
Privacy	Unsubscribe from Email Notifications ☐	Do Not disclose contact Information ☐

Membership Renewal Form 2020-2021_v5_2020-09-08.pdf

The Auckland VHF Group Inc Branch 66 NZART

*gratefully acknowledges the sponsorship of Branch 66 Beacons, Repeaters and Fixed Links license fees and the Group's repeater operations by the following radio amateurs and NZART Branches for **2021***

Repeater frequency and name	**Repeater location**	**Sponsorship advised for 2020**	**Amount** paid
53.725 Repeater	Klondyke Road		$
14**4.253** Beacon	Nihotupu	**Stability testing**	
14**5.625** Data Rptr	Klondyke Road	Not operating	
14**5.650** D-Star repeater	Klondyke Road		$
14**6.625** Repeater	Klondyke Road	David Wilkins	$50
14**6.70**0 Repeater	Ruaotuwhenua	Dennis Thornton	$50
14**6.90**0 Repeater	Mt Puketutu Radio	David Wilkins	$50
43**2.253** Beacon	Nihotupu	**Stability testing**	
43**8.175** D-Star repeater	Klondyke Road		$
43**8.50**0 Repeater	North Head	Not operating	
43**9.850 Link Tx to Kaimai**	Klondyke Road	George Marr	$50
43**9.875** Ak Nat Sys Rptr	Klondyke Road		$
43**9.900 Link Tx to Egmont**	Klondyke Road	Kylie Peterson	$50
43**9.950 Link Tx to Brynderwyn**	Klondyke Road		$
1291.900 Repeater	217 Glenfield Rd		$
		Total Sponsorship	**$250**

NZART Inc: Branch/Personal donations	
Papakura Radio Club	$500
Auckland Branch	$100
Manukau Radio Club	$100
Donations	**$950**

Current as at 30/01/2021

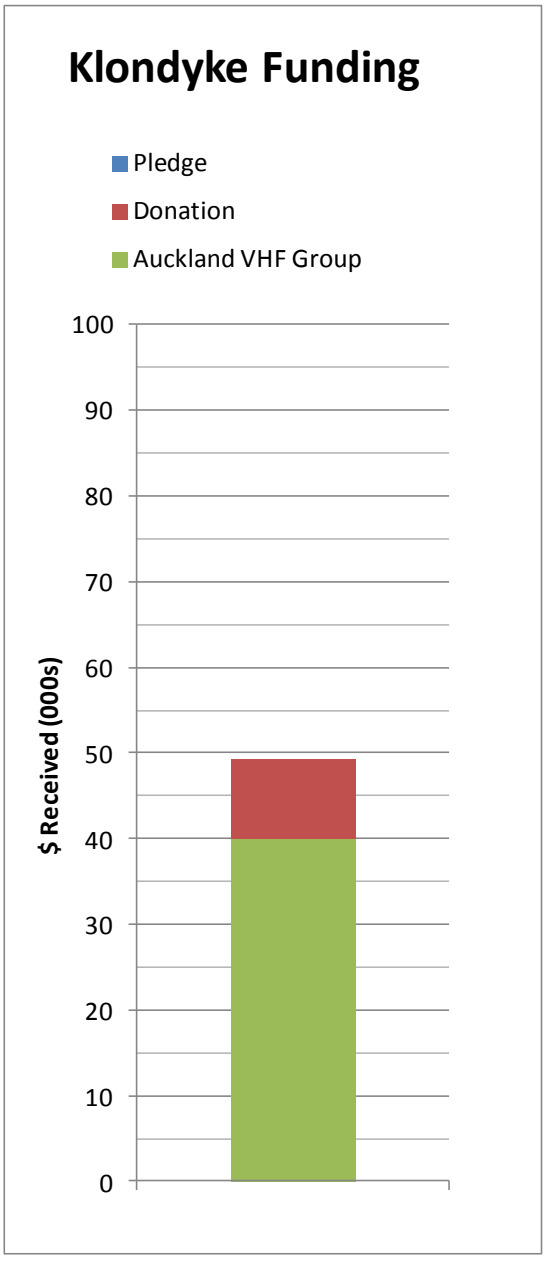
The Auckland VHF Group, Branch 66, would like to thank all those who came forward to sponsor the licence fee for our Beacons, Repeaters or Fixed Links for the year 2021 or donate towards the Group's repeater Operations.

Klondyke Tower
Donations towards Maintenance

Target **100,000**

Name	Donation	Pledge
Donations 2018 - 2020	8444.00	
Margaret Dingley ZL1AYV	100.00	
David Dingley ZL1TIA	100.00	
Jennie Dingley, ZL1TDB	100.00	
Yuri Muzyka ZL1GYM	50.00	
Martyn Seay ZL3CK	500.00	
Total	9294.00	-
Percent	9.29	0.00

Tower	63,245.00	Other	27,268.25
GST	9,486.75		
Total	72,731.75	Total	27,268.25
Auckland VHF Group	40,000.00		40.00



TRADING TABLE

Currently our Trading Table is only open on meeting nights.

We have heaps of parts from dismantled commercial analog TV gear – transmitters, filters, circulators, patch panels, power supplies. Too much to list individually, so come along to the clubrooms and have a look.

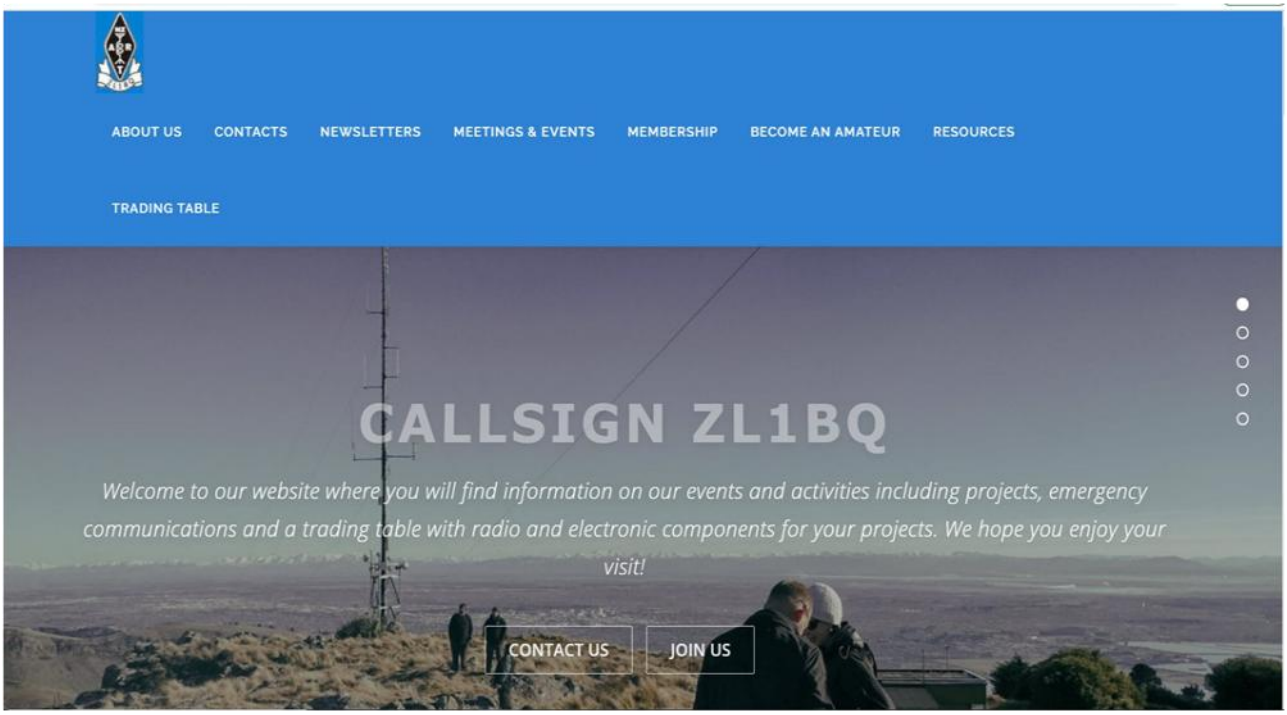
New – RG58C/U 50 Ohm Coaxial Cable. Thanks to a bulk purchase we are able to offer this good quality coax at a competitive price. The cable has tinned centre conductor and screen braid making it resistant to long term corrosion.

The price is $2.00 per metre and we will offer a discount for purchases of 20m or more. See Vaughan ZL1VH on meeting nights to get the quality coax cable.

The Trading Table is now on line. Navigate your way to our new look web site at https://aucklandvhf.org/ and click on TRADING TABLE (the most right hand tab.

Wait a few seconds and the on-line version of the Trading Table will pop up. From here you can browse the various sections, dig deeper to look at what's available and even place your order online.

If you prefer to just look at the Trading Table List, just hover your mouse pointer over the TRADING TABLE and a pull down list will appear. From this you can access the full trading Table list and download it in .PDF form.



Recent Additions to our Trading Table Stock

Electrolytic Capacitors SMD (Packed in bags of 10 for 50c):
10uF 16V electrolytic 47uF 16V electrolytic 100uF 16V electrolytic

Resistors:
50 Ohm 0.4W +/-1% tolerance. 10 for 50c
0.25 Ohm 5W wire wound
0.27 Ohm 3W Wire wound vertical pcb mount

Siemens Gas Surge Voltage Protection Tubes:
SVP Tube type B13-A230. 230V D.C. minimum strike voltage. $1.00 for 10
2-electrode type with wire leads, pre-bent for 10mm hole spacing.

ETAL P1200 600:600 Ohm line matching transformer $3.00 each

Quartz Crystal: 6.000 MHz HC49SMD package marked CQ6.0000 $1.00 each

BNC plugs 50 ohm R/Angle for RG58 coax (solder/clamp type) $2.50 each

Relays:
12V coil, DPDT 1A non-latching (EB2-12NU) SMD package $2.00 each
12V coil, DPDT 1A 2-coil latching (EB2-12TNU) SMD package $2.00 each

LED Holder panel mount 5mm Kingbright nylon in bags of 50 $3.00 per bag

Lacing Twine black plastic, in 10m rolls. $1.00 each

Ceramic feed-thru insulators, 500V rating, solder in. 50c bag of 10

Semiconductors:

RURP30120	1200V 30A ultrafast switching diode	$1.00 each
1SS55	Silicon switching diode. 70V 100mA DO-35	10/$1.00
2N5777	NPN Light detector, Photo-darlington 45V TO-92	$0.50 each
2N6027	Programmable Unijunction Transistor 40V 300mW	$0.10 each
2N6122	NPN TO220 60V 4A 40W GP amplifier	$0.50 each
2N6292	NPN TO220 70V 40W GP amplifier	$0.50 each
2N6609	PNP TO3 140V 16A 150W audio/driver	$1.00 each
BUK457-500B	Power MOSFET 500V 9A 150W TO-220	$2.00 each
SGP15N60	NPN IGBT 15A 600V fast switch TO-220	$1.00 each
SGP20N60	NPN IGBT 20A 600V fast switch TO-220	$1.00 each
UDN2965W-2	Dual high power stepper motor driver. 20 to 50V out at 4A SIP package.	$1.00 each

LM3909N	LED driver/flasher. 8-pin plastic DIL package.	$0.5each
LM3911N	Temperature Controller IC. 8-pin plastic DIL package.	$10 .00 each
LM3914N	LED Bar-graph driver. 18-pin DIP plastic package.	$5.00 each
PIC16C54B	8-Bit CMOS Microcontroller. 18 pin SOIC SMD package Limited quantity	$2.00 each

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ZL1VHD Dstar gateway registration URL : http://zl1vhd.dstar.org.nz