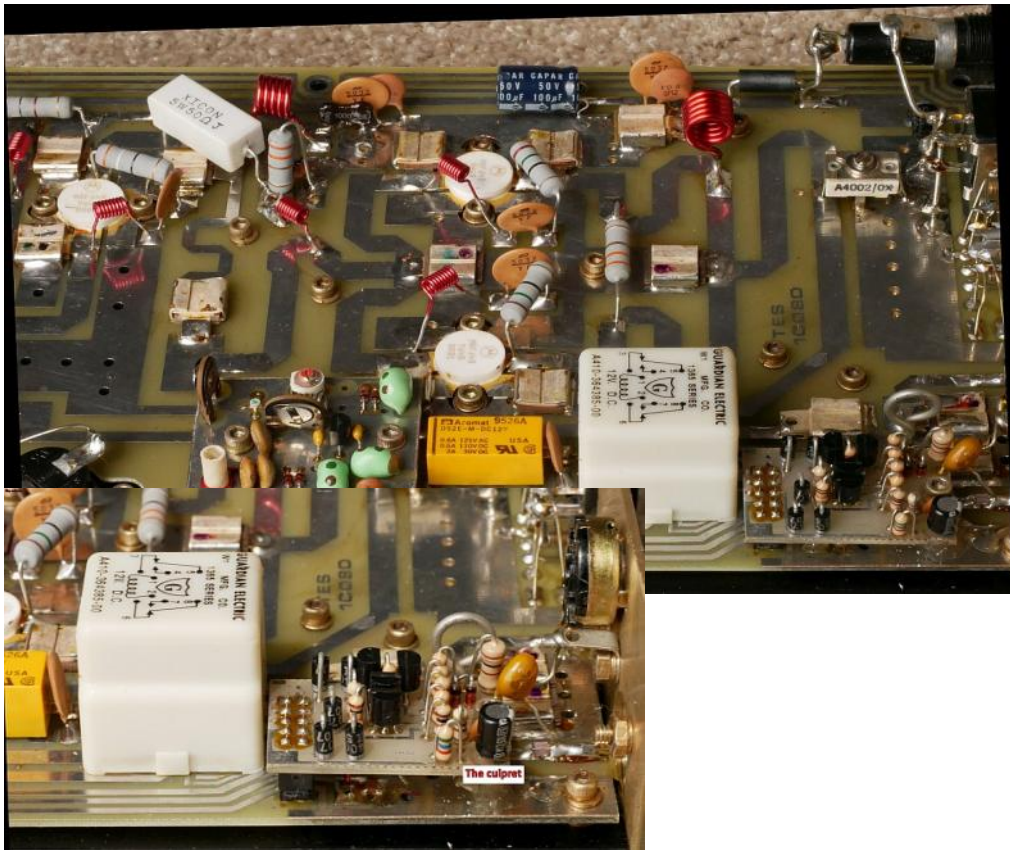


**The Official Newsletter of the
Auckland VHF Group Inc.
Spectrum**



DX Contest is upon you. Time to do the repair that let you down last time you took it out in the field. (A 40c capacitor)

The Meeting and Klondyke Notices — page 3

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Results of the 2021 Field Day Contest — page 7-9

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Auckland VHF Group Inc.

Branch 66 NZART

PO Box 10138, Dominion Rd, Auckland 1446

Clubrooms: 30 Hazel Ave, Mt Roskill

Office	Name	Call sign	Work / Mobile	E-mail
President	Matthew King	ZL1YOT	022 649 3310	president@aucklandvhf.org
Vice President	Brendon Reid	ZL1XXX	021 970 785	vicepresident@aucklandvhf.org
Secretary	Vaughan Henderson	ZL1VH	021 844 804	secretary@aucklandvhf.org
Treasurer	George Raffles	ZL1TUX	021 735 361	treasurer@aucklandvhf.org
Committee	Greg Storz	ZL1GSG	09 849 2878	greg@aucklandvhf.org
	Darryl Grange	ZL1TCI	021 123 7733	darryl@aucklandvhf.org
	Mark Howie	ZL1UMK	022 047 3240	mark@aucklandvhf.org
AREC Group Leader	Matthew King	ZL1YOT	022 649 3310	mattking@gmail.com
Deputy Group Leader	Currently Vacant			
ZL1BQ Trustee	Matthew King	ZL1YOT	022 649 3310	zl1bq@aucklandvhf.org
Head Repeater Trustee	Vaughan Henderson	ZL1VH	021 844 804	repeatertrustee@aucklandvhf.org
Klondyke Manager	Vaughan Henderson	ZL1VH	021 844 804	6625@aucklandvhf.org
670 Manager	Vaughan Henderson	ZL1VH	021 844 804	670@aucklandvhf.org
690 Manager	Dennis Seymour	ZL1UET	09 278 0381	690@aucklandvhf.org
850 Manager	Vaughan Henderson	ZL1VH	021 844 804	850@aucklandvhf.org
Spectrum Editor	Peter Loveridge	ZL1UKG	09 427 6362	spectrum@aucklandvhf.org
Trading Table	Vaughan Henderson	ZL1VH	021 844 804	tradingtable@aucklandvhf.org
Account Reviewer	Basil Orr	ZL1TOW	021 867 367	
Webmaster	Terry Corin	ZL1BPA	027 697 4686	webmaster@aucklandvhf.org
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

Notice of General Meeting

At the Hazel Avenue Club Rooms
(Located on the left at the end of Hazel Avenue)

**The Auckland VHF Group Meeting will be held on Monday 7 February
at the Clubrooms, 30 Hazel Avenue from 7.30pm onwards**

The presenter for the February General Meeting was not confirmed at time of going to print. If we are unable to get a guest speaker, we will have a selection of videos on amateur radio technology.

Please come along – during the business session we would welcome your input on what you would like to see the club do this year, what meeting topics you would like to come and listen to. Let's know how we can make 2022 an interesting year for the VHF Group.

Working Bee Saturday 05 February (weather permitting)

A Team will visit the Klondyke Tower for a Working Bee to check the link to Taranaki, suspected to be a low power transmitter. We hope to find the problem with the 6625 antennas or coax feedline — whatever is causing the problem.

Auckland is now in a Red Zone with regard to COVID-19
This allows for a maximum of 100 people with Vaccine Passports inside a building

The VHF Group has a QR Code poster at the entrance to identify the location you are entering. It helps to reduce the risk to the greater population by enabling tracking of possible sources of infection. The author has experienced this in a Café and a local Hall in Silverdale. In the Hall we are now recognised and are not asked to display it again. It will probably be the same for the VHF Group.

Coming Events:

- Sat 12 Feb, Garage Sale at 400 East Coast Road from 09:00 to 12:00
Disposal of old ex Navy equipment and other items from Dennis ZL1TAY's house.
- February DX Weekend Contest from 5 to 11 pm Saturday and 7 am to 1 pm Sunday.
- Sat 19 Mar, Te Puke ARC Market at 4 Old Coach Road, Paengaroa from 10 am.
Door Charge \$2.00 per person to help recover costs.
- Sat 21 May, Radio Electronics Group annual new & used equipment Sale at the Glenview Club, 211 Peacockes Road, Hamilton. More details to follow.

Auckland VHF Group President's Column

VHF Group Presidents Report February 2022

We had our first committee meeting of the year a couple of weeks ago. It took us half an hour to all get together on Teams. It was good to see everyone again, but I let the meeting go on for several hours. Next month I will keep things a bit crisper so we can get home to bed on time. (We did process a lot of stuff, though) Vaughan and I are mustering our energy to revisit the Klondyke fundraising project again. It's a nightmare of legalese and conditions, but we will get there, and home by Christmas! (2022)



At home we have been busy haymaking and fishing. Both were very productive (3800 bales and ten big snapper, respectively) so my arms are sore and tired. Then yesterday up in the back paddock bush hills the dogs put up an eight pointer which tangled in a fence. So now we have enough venison to get us through the winter.

That's it from here. See you Monday.

Cheers, Matthew King 022 6493310

From: David Wilkins <dfwilkins@outlook.com>

Subject: Clarification? re Tongan HF comms RE: [NZART-Members] Tonga

Date: 17 January 2022 at 2:07:41 PM NZDT

To: "nzart-members@lists.nzart.org.nz" <nzart-members@lists.nzart.org.nz>

Reply-To: nzart-members@lists.nzart.org.nz

Hi all

From what has already been said there are no amateurs in Tonga therefore no amateur frequencies in use. HF on maritime channels is used a lot for comms between islands and with local inter-island shipping. It appears Sat Phone plus maritime HF is what is currently in use.

AS with all disaster scenarios for the first three days or a week people have to rely on their local resources until a dedicated response can be stood up. AREC is more of a local support service in a CDEM context than an international support provider.

As the current HF comms around the Tongan Islands would likely be lowish band and NVIS in nature they may not be able to be monitored in NZ. Could be worth a listen though if anyone has the time. Dave ZL1MR

Trends in Amateur Equipment Sources

People who have looked at **TradeMe** recently will have seen that in the “Electronics & Photography” section have found screeds of small cheap items. You can reduce the items to view by selecting “Used Only” and then “Other Electronics” or “Radio Equipment”. At the time of writing this totalled 396 Other items and 3 Radios of little interest to the Editor. It makes you realise that supporting Radio Clubs when they hold a Market Day is worth while. It is unfortunate they are not just done the road a little way from your house. A recent club notice came from Te Puke Amateur Radio Club for March. It is only 240 km from Auckland. In May the Radio Electronics Group will do the same for 130 km from Auckland.

The Garage Sale at 400 East Coast Road (North Shore Radio Club)
is close by and may have some rare items.

Te Puke Amateur Radio Club

Saturday March 19th 2022

Branch 53 of NZART

(Subject to on the day Covid-19 Restrictions)

Paengaroa Community Hall

4 Old Coach Road, Paengaroa

(GPS Coordinates: 37.49S 176.24E)

Venue opens for Vendors from 06.30am. Sale time 10.00am.

Door Charge \$2.00 per person to help recover costs.

Entry conditions:- Scan in Using QR Code or Paper Sign-In. Vaccination Passport will be required. Masks and Social Distancing to be observed.

Hot Breakfast Available from 07.30am to 11.00am. Price \$12.00

1 Sausage, 3 Rashers Bacon, 2 Eggs, 1/2 Tomato, 2 Pieces Toast, Tea or Coffee.

Also available Savouries, Apple Shortcake, Tea / Coffee.

Klondyke Working Bee 5 February, 2022

A good working bee at Klondyke on Saturday 5th. Several technical issues needed to be attended to. The National System link transmitter to Taranaki had been playing up for some time with reports of the link fading out which suggested a problem with the link transmitter. On arrival at site, the Tait T346 link transmitter was only putting out +13dBm (20mW). Fault turned out to be the transmit oscillator multiplier chain (multiplies up from a 36 MHz crystal) which had drifted out of alignment. A bit of tweaking and powering off/on to check it was stable on the bench, resetting the output power to 12W and back in the rack. On air reports indicate that the link is again running OK.

6625 Repeater is back on the air. Thanks to great work by Harry ZL1BK and Simon ZL1THH, the fault was found to be the in/out port on the 4-way power divider on the North side. Cable ties had let go leaving the LDF5/50 coax feedline free to move around in the wind and had ripped the N-type socket out of the power divider. As a temporary repair until I fix the power divider, the coax feedline has been connected to the top bay of the North 2m antenna. Thanks to a donation of some very good quality cable ties, the coax feedline is again secured in place. Users well north of Klondyke may notice a drop in receive signal level and may need a little more power to get into the repeater. Most other users closer to the repeater will probably not notice much difference.

6m Repeater has been removed for repair. Receiver is "deaf". The cable to the antenna was swept with a VNA and no problems noted. The 6m antenna is a folded dipole with a reflector and one side of the reflector element has come off. Repair of this antenna will be scheduled for a future visit.

Richard ZL1BNQ has re-installed the remote HF equipment. However the UHF Yagi on the link back to Hillsborough has disintegrated and the coax feedline fallen off. We were able to substitute another 7-element Yagi ex the old data repeater to reinstate the UHF link. Testing has shown up some minor issues which will require a site visit to resolve, so for now the remote HF system is turned off.

Riggers still have four lengths of the new cable tray to fit at the top of the tower. They have been moving the coax cables across onto the new cable tray and they have gone up the tower. We still have some work to do tying down loose coax cables. Thanks to Harry ZL1BK and Simon ZL1THH who spent time up the tower in quite windy conditions and tied down the worst of the loose coax cables.

My thanks to all those who turned out to help: Simon ZL1SWW, Keith ZL1BQE, Denis ZL1UET, Harry ZL1BK, Simon ZL1THH. Richard ZL1BNQ and Ian ZL1IRC who re-installed the remote HF equipment.

Vaughan Henderson ZL1VH

Results of the 2021 Field Day Contest – 4/5 December

VHF-UHF-SHF-EHF Contests, as administered by the Auckland VHF Group Inc;
on behalf of all VHF groups, including all New Zealand radio amateurs and supported by NZART.

Overall Winner

Station	Points
ZL1EW	1970
ZL4AA	1728
ZL1GSG	1534
ZL3DC	425
ZL1DI	361
ZL2MF/p	342
ZL2VS	330
ZL4R	198
ZL4A	156
ZL2BAY	50

Greatest DX

	Stations	Distance
6m	ZL1EW – VK4UV	2296 km
2m	ZL4AA – ZL3RC	453 km
70cm	ZL4AA – ZL3RC	453 km
32cm	ZL1EW - ZL1GSG	30 km
23cm	ZL4AA – ZL3MH	288 km
12cm	ZL2VS – ZL3DC	31 km
9cm	ZL1EW - ZL1GSG	30 km
6cm	ZL1EW - ZL1GSG	30 km
3cm	ZL1EW - ZL1GSG	30 km
1.2cm	ZL1EW - ZL1GSG	30 km

Band winner 6 m (50MHz)

Station	Points
ZL1EW	155
ZL4AA	131
ZL4AS	76
ZL3DC	74
ZL2VS	31

Band winner 2 m (144MHz)

Station	Points
ZL4AA	800
ZL1DI	361
ZL1EW 237	
ZL2MF/p	228
ZL4RO	198
ZL1GSG	197
ZL3DC	86
ZL2VS	40
ZL4AS	35
ZL2BAY	25

Band winner 70 cm (432MHz)

Station	Points
ZL4AA	286
ZL1EW	246
ZL2MF/p	114
ZL1GSG	88
ZL3DC	58
ZL2VS	57
ZL4AS	45
ZL2BAY	5

Band winner 32 cm (925MHz)

Station	Points
ZL1EW	49

ZL1GSG 49

Band winner 23 cm (1296MHz)

Station	Points
ZL4AA	511
ZL1EW	468
ZL1GSG	390
ZL2VS	86
ZL3D	67
ZL2BAY	20

Band winner 12 cm (2400MHz)

Station	Points
ZL3DC	140
ZL2VS	116

Band winner 9 cm (3400MHz)

Station	Points
ZL1EW	221
ZL1GSG	216

Band winner 6 cm (5760MHz)

Station	Points
ZL1GSG 216	
ZL1EW 216	

Band winner 3 cm (10368MHz)

Station	Points
ZL1EW 216	
ZL1GSG 216	

Band winner 1.2 cm (24048MHz)

Station	Points
ZL1 GSG	162
ZL1EW	162

Active Stations (53 in total)

VK4UV, ZL1AKW, ZL1AVZ, ZL1BK, ZL1BOM, ZL1BRL, ZL1DI, ZL1EW, ZL1GSG, ZL1HI, ZL1IU, ZL1PR, ZL1RQ, ZL1TBG, ZL1TX, ZL1UET
ZL2ADL, ZL2ALW, ZL2BAY, ZL2CHAR, ZL2MF, ZL2TC, ZL2WB, ZL2VL, ZL2VS, ZL2WHO
ZL3CU, ZL3DC, ZL3JJ, ZL3LM, ZL3MH, ZL3NW, ZL3OC, ZL3OZ, ZL3RC, ZL3RIK, ZL3RJ, ZL3TLA
ZL4AA, ZL4AS, ZL4AX, ZL4BC, ZL4DC, ZL4ES, ZL4FM, ZL4KT, ZL4KX, ZL4LV, ZL4QD, ZL4RO, ZL4SA, ZL4SY, ZL4TH, ZL4UC

Operator Comments

- Didn't end up going out portable like planned so operated from home
 - Weather was mild and overcast setting up on Saturday however become wet and windy on Sunday. Luckily, we packed up slightly early before the weather really turned nasty. Band conditions were poor. Had plenty of teething problems with bad antenna connections, water getting into coax, and power amplifier switching issues, but got going reasonably well eventually.
 - I was portable, at Taupae A very windy night but managed to survive through it. Pity we could not hear the Auckland or South Island stations. Will probably go there again, but be more prepared
 - Great fun on the Sunday apart from being rained on.
- Very disappointing again not to work any stations from the Waikato or further south than Tauranga! Where are all the club station entries?
- Weather up on the mountain where I was, warm and sunny, I was back in Timaru for about ¾ of an hour and the rain started.
 - Another glorious morning up at Pukematekeo with 8 bands activated.
 - Had a really fun time on the Sunday, quite a few new call signs on. Saturday was average and quite quiet. Highlight was Working Alan ZL1RQ on 23 cm followed by Peter ZL1TX.

I have bad batteries and limped along with saggy voltages. Rained later on just the contest was finishing.

Thanks to all that participated

Simon, ZL1SWW

Greg, ZL1GSG

Serious set-up outdoors with 7 Bands



Handicap from trees in the back yard



Greg ZL1GSG with Design and Built excellence





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

AREC News:

The next Auckland AREC Meeting will be held at 1930 hours on Thursday 17 February 2022 at Branch 29 North Shore Radio Club, 400 East Coast Road, Sunnynook.

Please note this is a change of date and location from that shown in the November minutes.

Michelle Millan is the new Police District Search & Rescue Assistant Coordinator for the Tāmaki Makaurau District. This is a new non-operational role funded by NZ SAR to assist and support the Police District SAR Coordinator – a key part of the role is building relationships partner agencies. She will be joining us at this meeting to talk about her role and learn about AREC and what we can offer. A good turnout would be appreciated please.

Regards, **Soren Low**

Auckland Deputy District Manager

ZL1SKL / ZK1EXD

Mobile +64 21 813 541 Email:

newsletter@arec.nz



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 <input type="checkbox"/>	Cheque <input type="checkbox"/>	Internet deposit <input type="checkbox"/>
Invoice/Statement required		<i>Please Advise Treasurer</i>		
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, 2 nd Monday of the month or to the Committee meeting the 4 th Tuesday of the month.			
Privacy	Unsubscribe from Email Notifications <input type="checkbox"/>		Do Not disclose contact Information <input type="checkbox"/>	

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*

2021-04-13, Donations for Repeater Licences and Klondyke Refurbishment

Frequency + Operation	Location	Donation	Donor Name
53.725 Repeater	Klondyke Road	\$50.00	Gwynne Rowe
144.253 Beacon	Nihotupu		Waiting for Antenna
144.575 Digipeater	Whitford		
145.625 Data Rptr	Klondyke Road		
145.650 D-Star Rptr	Klondyke Road		
146.625 Repeater	Klondyke Road	\$50.00	David Wilkins
146.700 Repeater	Ruaotuwheua	\$50.00	Dennis Thornton
146.900 Repeater	Mt Puketutu	\$50.00	David Wilkins
432.253 Beacon	Nihotupu		Stability testing
438.175 D-Star Rptr	Klondyke Road		
438.450 Repeater	Klondyke Road		
438.500 Repeater	North Head		
439.850 Kaimai Link	Klondyke Road	\$50.00	George Marr
439.875 Nat System Rptr	Klondyke Road	\$50.00	Soren Low
439.900 Egmont Link	Klondyke Road		
439.950 Brynderwyn Link	Klondyke Road	\$50.00	Kylie Peterson
1291.900 Repeater	217 Glenfield Rd	\$50.00	Michael Sheffield
DMR Rptr (Waitakere)	Quinns Rd	\$50.00	Auckland Area AREC
		\$450.00	

2021-04-13, Donations for Refurbishment

Auckland Branch	\$100.00
Manukau Radio Club	\$100.00
Brenton Faithfull, ZL1BBF	\$50.00
Papakura Radio Club	\$500.00
Ann Walker ZL1BFB	\$100.00
Soren Low ZL1SLK	\$100.00
	\$950.00

Total
SPECTRUM <http://aucklandvhf.org> **13** **\$1,400.00**

Vol 59 February 2022

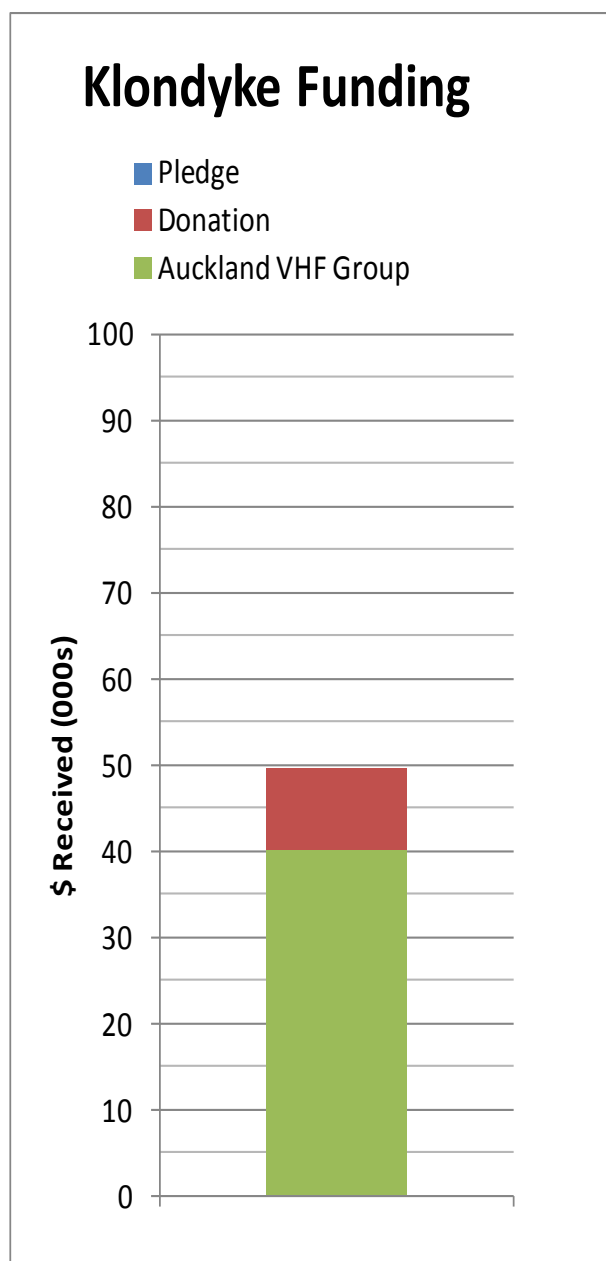
Klondyke Tower Donations towards Maintenance

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	
Anne Walker ZL1BFB	50.00	
Martyn Seay ZL3CK	100.00	
Yuri Muzyka ZL1GYM	50.00	
Dave Dingley ZL1TIA	205.00	

Tower	63,245.00	Other	27268.25
GST	9,486.75		
Total	72,731.75	Total	27,268.25
Auckland VHF Group	40,000.00		40.00

Total	9699.00	-
Percent	9.70	0.00



TRADING TABLE

Currently our Trading Table is only open on meeting nights.

NEW – Printed Circuit Board. Thanks to a generous donation from N.Z.'s last circuit board production company (now closed down), we have a large quantity of single sided fibreglass printed circuit board material in sizes ranging from 1200 x 600 down to smaller pieces. There's some double sided board as well. Come along to our May meeting if you want some – prices can be negotiated!

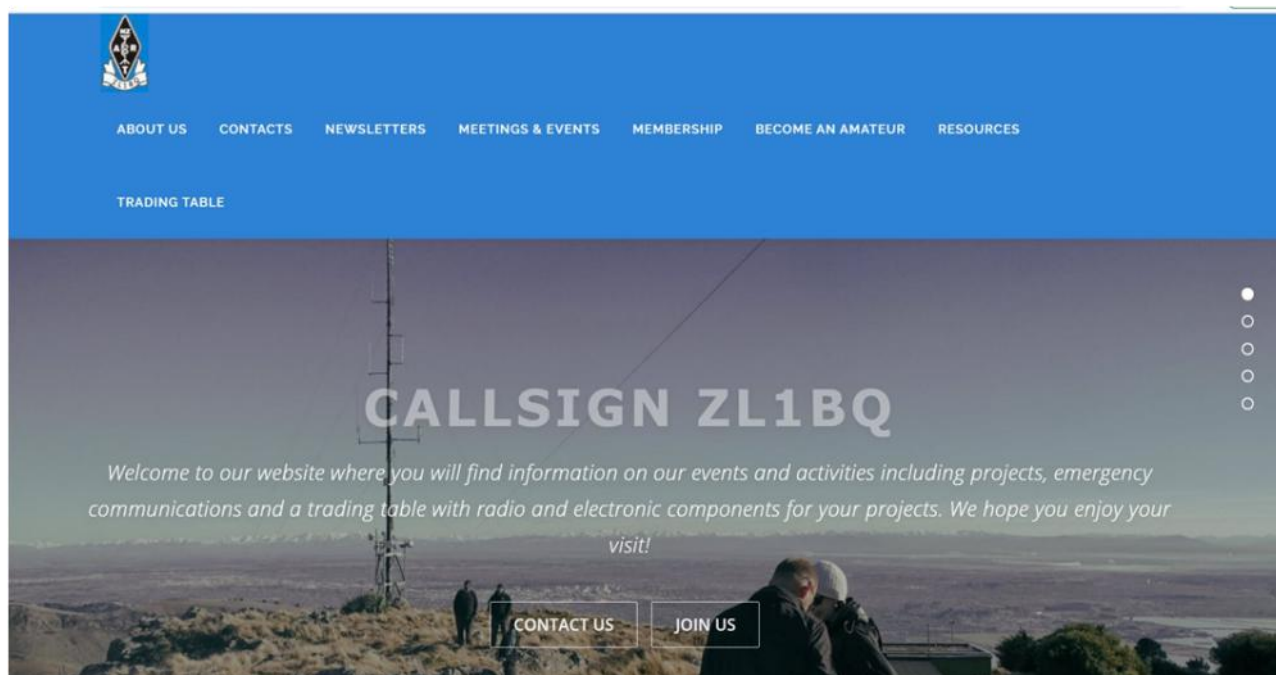
NEW – RG58C/U 50 Ohm Coaxial Cable. Thanks to a bulk purchase we are able to offer this good quality coax at a competitive price. The cable has tinned centre conductor and screen braid making it resistant to long term corrosion. The price is \$2.00 per metre with a discount for purchases of 20m or more. See Vaughan ZL1VH on meeting nights to get this 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.

We also 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.



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	\$2.00 each
	Limited quantity	