

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



Something to do during COVID Level 4 — An Antenna Range  
See Spectrum July 2016 issue for method and results for 2.4 GHz  
Microstrip Patch Antenna arrays. 2 x 2 and 4 x 1 configurations

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A history and current state of 3.4 GHz use — page 13



# 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:	<a href="http://aucklandvhf.org">http://aucklandvhf.org</a>			
ZL1VHD Dstar gateway administrator:	Laurie	ZL1ICU	634 5130 0274 817463	perma@xtra.co.nz
ZL1VHD Dstar gateway registration URL :	<a href="http://zl1vhd.dstar.org.nz">http://zl1vhd.dstar.org.nz</a>			

### 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 13<sup>th</sup> September 2021 7.30pm**

At the Hazel Avenue Clubrooms  
(Located on the left at the end, 30 Hazel Avenue)

### **Meeting topic for September General Meeting**

#### **You will have to entertain yourself**

Unfortunately due to storm and flooding in Kumeu and Lockdown the difficulty of finding speakers prevents us from holding a Teams meeting

#### **Coming Events:**

- From 18 August to 14 September it will be Lock-down Level 4. For the next decision on COVID by the government listen/watch to 14 September News.

## **Minutes of the July General Meeting of the Auckland VHF Group Inc.**

Held on Monday 11 August 2021 at the Clubrooms, Hazel Avenue, Mt. Roskill

Meeting started at: 19:50

**Present:** 15 members as per the Attendance Book

**Visitors:** Jim Yates, Suzie Yates, Fred Tapp

Jim was welcomed to the meeting and gave a short introduction. Has a technician licence in the USA, spent some 10 years on his yacht. Now settled in New Zealand and will study for his amateur licence here.

**Apologies:** ZL1UMK, ZL1TD, ZL1TOW – Basil ZL1TOW attempted to join the meeting using Teams but was unable to do so due to the clubrooms setup not working.

**Minutes of July General Meeting** – as published on page 5 and 6 of the August 2021 issue of Spectrum. Moved the minutes were a true and correct record: ZL1TCI Seconded: ZL1UKG Carried

Matters arising: NIL

**Reports:** NIL

### **Correspondence:**

In – newsletters from North Shore Branch 29, Branch 65 Papakura Radio Club and Musick Point Radio Group Inc. Break-In

### **General Business:**

Amateur Television in the 33cm band. President called for volunteers to set up a small team to get the ATV Repeater project going. There were no volunteers. This project will stay on the back burner until we can get some more interest.

Working Bee Sunday 15 August. ZL1VH asked for a show of hands for those who can attend. About four people.

Lighthouse Weekend. ZL1VH advised that the North Shore Radio Club was activating the TiriTiri Matangi Lighthouse for the weekend. There were two spare beds available in the bunkroom if anyone was interested in going. Simon ZL1THH indicated he would be interested. General Meeting closed at 20:04.

The rest of the evening was given over to individual members' projects and general discussion over a cup of tea and coffee and concluded at 21:30.

## Notice of Proposed Changes to the Auckland VHF Group's Constitution

In accordance with Clause 7 (b) of our Constitution, notice is hereby given that your Committee wish to make amendments to our Constitution. These changes will be presented at our Annual General Meeting in November along with a motion to adopt the amendments. The amendments to our current Constitution are as follows:

### 1. Clause 3 – MEMBERSHIP

As a result of seeking tax exemption status from the Inland Revenue Department, they have advised that our current Clause 3 (p) wording is not acceptable and needs to be replaced with the following:

Current Clause 3(p) No remuneration or other benefit or advantage of whatsoever nature, shall be paid to or received, gained, achieved or derived by any member where that member is able, by virtue of his capacity as such member, to influence in any way the amount of the remuneration or the nature or amount of that benefit or advantage.

New Clause 3 (p) **No member of the organisation or any person associated with a member, shall participate in or materially influence any decision made by the organisation, in respect of the payment to or on behalf of that member or associated person of any income, benefit, or advantage whatsoever. Any such income shall be reasonable and relative to that which would be paid in an arm's length transaction (being open market value).**

### 2. Clause 5 - ANNUAL GENERAL, SPECIAL AND GENERAL MEETINGS

Clause 5 (e) is amended to change the wording ***an audited*** to ***a reviewed*** financial statement and later in the same paragraph to change appoint ***an auditor*** to appoint ***a reviewer***

### 3. Clause 7 – ALTERATION OF THE RULES

Again, as part of the Inland Revenue Department's requirements, Clause 7 (a) is changed:

Current Clause 7 (a): The Constitution of the Group may be altered or added to by a resolution passed at any Annual or Special General Meeting, and then only if the motion is passed with a 75% majority, provided that no amendment shall be made to this constitution which shall have the effect of compromising any exemption from income tax granted by the Commissioner of Inland Revenue.

New Clause 7 (a) : The Constitution of the Group may be altered or added to by a resolution passed at any Annual or Special General Meeting, and then only if the motion is passed with a 75% majority, provided that **no addition or alteration of the objects, personal benefit clause or the winding up clause shall be made which affect the not-for-profit status. The provisions and effect of this clause shall not be removed from this document and shall be included and implied into any document replacing this document.**

Clause 7 (b) is amended by the addition of the words ***or email*** to provide for members who wish to send in their voting form by email. Clause 7 (b) now reads:

A minimum of three months notice shall be given of such a meeting and the notice shall indicate the nature of the rescission, alteration or addition and shall include a voting form which may be presented by any person or by post ***or email*** to be received up to midday on the day of the meeting.

### 4. Clause 8 – OFFICERS and COMMITTEE

Clause 8 (c) Updates the name of AREC from Amateur Radio ***Emergency Corps*** to Amateur Radio ***Emergency Communications*** and updates the leaders title from ***Section Leader*** to ***AREC Group Leader***.

## 5. Clause 13 – SERVICE ON MEMBERS

This entire clause is quite out of date and has been substantially re-written:

(a) Any notice which by this Constitution or by any regulations made hereunder is required to be served upon a member shall be served by posting the same to his/her last known place of address or occupation by Advice Received Post and the same will be deemed to have been delivered in the ordinary course of post.

(b) Any notice of meeting shall be given to members (where such notice is required to be given) by posting the same by ordinary prepaid post to the Members last known residential or business address and the same will be deemed to have been delivered in the ordinary course of post.

(a) **Every communication with a Member shall generally be by electronic message in clear ACSII text, directed to the email address of the Member as recorded in the records of the Group. Communications may also be sent by post, facsimile, courier or hand delivered as the Committee sees fit.**

(b) **From the Group: Any notice required to be given by or on behalf of the Group under this Constitution shall be in writing and may be served either personally, by electronic mail, or by posting it in a letter addressed to the Member at the address of the Member as held by the Group. If given by post the notice shall be deemed to have been given at the time when the letter containing the same would be delivered in the ordinary course of post.**

(c) **To the Group: Any notice required to be given to the Group under this Constitution shall be in writing and may be given to the Secretary or sent to the Group's registered office by post or any electronic mail address specified by the Group.**

(d) **Notice of Annual or Special General Meetings of the Group will be by post, email, or fax notified no less than fourteen (14) days prior to meeting dates.**

(e) No meeting shall be deemed improperly constituted and no decision reached at any meeting shall be invalid solely on the grounds that due to accident or inadvertence the requisite notice has not been given to any member or members unless the meeting itself determines otherwise.

## Clause 15 – COMMON SEAL

Wording added in clause (a) to state who provides the Common Seal. In Clause (b), how it is to be used is tidied up. The new paragraphs are:

(a) **The Committee shall provide a Common Seal for the Group and may from time to time replace it with a new one.**

(b) **The Secretary shall have custody of the common seal, which shall only be used with the authority of the Committee. Every document to which the common seal is affixed shall be signed by the President. It shall be countersigned by the Secretary and one other member of the Committee.**

## Clause 16 – AMATEUR RADIO EMERGENCY COMMUNICATIONS

The decision by AREC Management in 2019 to change the name of the AREC "Section" to "Group" has caused us a little grief as throughout our Constitution, we are referred to as "The Group" and not as "Branch 66". To clarify this, all references to the AREC Group and Leader are identified with the addition of AREC in front.

(a) The Group may establish a **Group section** of the Amateur Radio Emergency Communications, **hereinafter referred to as "AREC Group"** in accordance with the provisions of clause **9.1 e, f** of the Association's Constitution.

(b) The accounts of any **AREC Group Section** so established shall be included with and **reviewed** with the Group's accounts.

(c) The Group may (subject to regulations made by the Association) make regulations relating to the operation of its **AREC Group Section of the Corps** and define the relationship between the **AREC Group Section** and the Group providing for one or more members of the Group committee to be members of the **AREC Group Section**.

(d) The **AREC Group** Leader shall present an Annual Report to the Annual General Meeting.

Vaughan Henderson      ZL1VH  
Secretary

#### **Footnote:**

Members may be aware that there is a new bill going through Parliament to substantially update the Incorporated Societies Act (1908). We had planned to await until the new bill was law and update our constitution accordingly. However, IRD's requirements for changes before we can obtain tax exempt status means we need to update our constitution sooner than planned. We have two and a half years from the time the new bill becomes law to make any further changes to our constitution.

The key changes introduced by the new bill are:

1. Registration – we will have to re-register the VHF Group and provide in our constitution details of a contact person who the Registrar of Incorporated societies can contact if necessary. We also have to provide details of the officers and committee, how they are appointed and how they are removed from office. Also information on how we settle disputes and how we handle amendments to the constitution.
2. Consent – every person will have to consent to become a member of the Group
3. Membership Minimum – currently 15 people, the reduces to 10. If we drop below ten members, the Registrar may write requiring us to increase our membership.
4. Committees – we will have to have a governing body comprising three people who are members and are qualified to be appointed an officer.
5. Officer's duties – better defined based on the directors duties as per the Companies Act.
6. Financial Reporting – the accounting method to be used will be more clearly defined and will depend on the size of the society. We will still have to file our financial statement.
7. Dispute Resolution – We may have to change the wording of our current constitution to tighten up on how we resolve disputes and grievances between members and the VHF Group.
8. Amalgamation – a simplified process if we need to amalgamate with another similar group.
9. Enforcement – new civil law enforcement provisions will be introduced.
10. Offences – The new legislation will introduce seven criminal offences, covering a range of activities and providing for infringement penalties (fine of up to \$200,000, imprisonment up to 5 years).

## **Ann Walker ZL1BFB – Silent key**

Sadly, Ann died in Auckland on 26 August, age 83, following a short battle with cancer. For those who did not know her: Ann was a founding member of the Suburban Amateur Radio Group, now known as the Musick Point Radio Group. Ann originally held the callsign ZL1TRH and after her husband Ian ZL1BFB became a SK in 2010, was able to keep his callsign. Ian and Ann were instrumental in saving the Auckland Radio ZLD receiving station at Musick Point from re-use by the local Iwi, and retaining it as a radio station, although now only operating on the amateur radio bands. Ann, as Secretary of the Group was a mainstay at Musick Point up until a few months before her death and she will be sorely missed by all of us who knew her. Both Ian and Ann were members of the Auckland VHF Group and after Ian's passing, Ann attended our monthly meetings as often as possible.

The family held a funeral service for Ann using Zoom. If you would like to watch this, a link to the recording can be found here, via Facebook: <https://www.facebook.com/groups/353404696264737/?ref=share>

The September issue of the Musick Point Radio contains more information and a number of tributes to Ann: <https://mail.google.com/mail/u/0?ui=2&ik=900a879a95&attid=0.1&permmsgid=msg-f:1709840037483325359&th=17ba927478ef27af&view=att&disp=inline>

On behalf of all our members the Auckland VHF Group would like to convey our sincere condolences both to Ann's family, and also to the members of the Musick Point Group who will be feeling a great sense of loss at her passing. Rest in peace Ann.





## TRANSMITTER

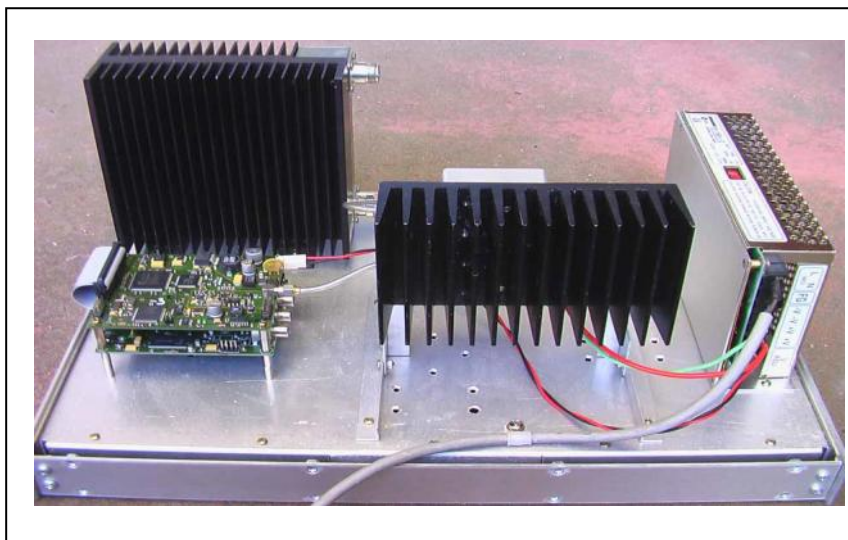
The photograph shows the prototype transmitter mounted on a 19" Rack tray. The modules are:

Left front: DVB-S double-deck exciter stack, consisting of MPEG encoder (lower deck) and DVB-S modulator (upper deck).

Middle: 8 Watt (DVB-S mean power), 30 dB gain, power amplifier.

Right: 12.5 V DC power supply

Left rear: combined 30 dB attenuator and 100 W dummy load. This will be replaced by a bandpass output filter.



## EXCITER AND POWER AMPLIFIER PERFORMANCE

The exciter drive output is programmable between 15 pre-set output levels. Similarly, the power amplifier gain/linearity is programmable by selectable resistors. With suitable adjustment of gain/linearity and drive, the MOSFET module produced a saturated CW output of more than 20 Watts, suitable for a simple beacon but not linear enough for a phase and amplitude modulated signal such as DVB-S. During a meticulous series of adjustments of gain/linearity and drive, a "sweet spot" was discovered, with the MOSFET module producing 8 Watts (mean power) of DVB-S. The third-order intermodulation products were 30 dB down. This level of intermodulation suggests excellent in-band signal purity.

Unfortunately, no combination of gain/linearity and drive could be found that ensured compliance with RSM Special Condition No.7 for emissions below 915 MHz. A bandpass output filter will be required between the power amplifier and the antenna.

## 921 MHz DIGITAL TV RECEPTION

Thoughts will soon turn to digital TV reception in this band. There don't appear to be any ready-made digital TV receivers, or set-top boxes that tune to 921 MHz. Please tell the Amateur TV community if you find any.

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Here are some suggestions for constructing an up-converter (for DVB-S reception) and/or a down-converter (for DVB-T reception)

## DVB-S RECEIVERS

DVB-S set-top boxes are cheap and plentiful, but there are three catches: Their usual input tuning range is 950 to 2150 MHz, which excludes 921 MHz. They are designed to be preceded by a high gain satellite down converter. They have little, or no, input selectivity.

An up-converter, with a low-noise input stage, and plenty of input selectivity, is required.

## DVB-T RECEIVERS

Their usual input tuning range is 470 to 860 MHz, which excludes 921 MHz. They are designed to be directly connected to a conventional UHF antenna. They do include input selectivity.

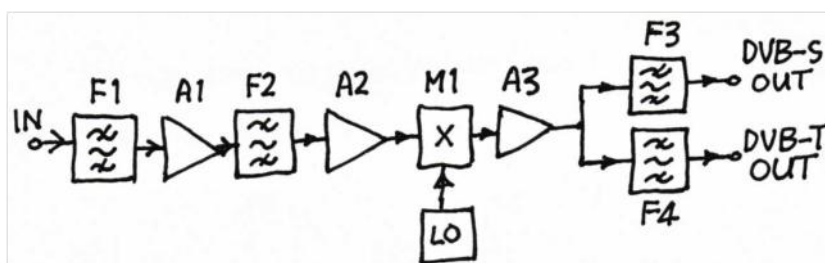
In future, the upper limit of their tuning range may be reduced, with the World-wide clearance of DVB-T channels above 700 MHz. A down-converter, with a low-noise input stage, and some input selectivity, is required.

## THE SPECTRUM NEIGHBOURS

Up-converters or down-converters, having a Digital TV input band of 917 to 925 MHz, need to resist the high power emissions below 915 MHz and above 935 MHz, typically Cellphone base stations with e.i.r.p.s between 38 dBW (6.3 kW) and 45 dBW (31.6 kW):

Spark 870 to 885 MHz, 2 Degrees 935 to 944.8 MHz and Vodafone 944.8 to 960 MHz. Three test licences are also active: Spark 825 to 840 MHz, 2 Degrees 890 to 899.8 MHz and Vodafone 899.8 to 915 MHz. The nearest Cellsite is 250 metres from my home. It has a licensed e.i.r.p. of 38 dBW (6.3 kW). Ouch.

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## UP- and DOWN-CONVERTERS

Figure 1 is the block diagram of a frequency converter offering both up- (for DVB-S reception) and down- (for DVB-T reception) conversion. The signal flow is from left to right.

F1 (Filter number 1) is intended to pass 917 to 925 MHz and reject everything below 917 MHz and above 925 MHz. Low insertion loss is desirable.

A1 (Amplifier number 1) should have a low Noise Figure and sufficient gain to overcome the insertion loss of F2 and the noise contribution of A2.

F2 (Filter number 2) increases the selectivity. It can have a higher insertion loss than F1 if A1 has sufficient gain.

A2 (Amplifier number 2) overcomes the insertion loss of M1 (Mixer number 1) and provides a broadband 50 ohm termination for any reverse direction energy coming out of the mixer.

M1 (Mixer number 1) mixes the incoming ATV signal with the Local Oscillator (LO), to produce the wanted output frequency. It works best when terminated by 50 ohms on all three ports. A level 7 (+7 dBm oscillator drive) double-balanced mixer, rated to 1,500 MHz, is recommended.

A3 (Amplifier number 3) provides a broadband 50 ohm termination for the output of M1 and acts as a buffer for the output filters F3 and/or F4.

## LOCAL OSCILLATOR (LO) FREQUENCY SELECTION

The Local Oscillator frequency should be such as to convert a centre frequency of 921 MHz to somewhere within the input tuning range of the DVB-S and/or DVB-T tuners. In theory, high-side injection is possible, but the LO frequency would need to be in the region of about 1.6 GHz to 1.9 GHz.

In theory, low-side injection is possible, with the minimum LO frequency being about 60 MHz. Once again there is a down-side. A low LO frequency reduces the filtering of feed-through that can be provided by F3 and F4. Similarly, LO frequencies that are near to a fraction of 921 MHz can produce in-band spurious output signals.

A much higher LO frequency, such as 383 MHz, appears to be a suitable compromise. M1 creates two outputs, centred on 538 MHz (Freeview DVB-T Channel 29) and 1304 MHz.

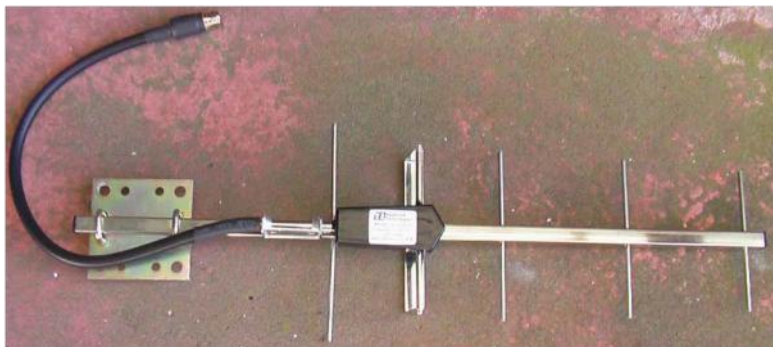
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(within the DVB-S tuning range), when 383 MHz is mixed with a transmission centred on 921 MHz. With this choice of LO frequency, filter F3 is tuned to 1304 MHz and filter F4 is tuned to 538 MHz. It may be necessary to move the LO frequency up, or down, by 8 MHz, to avoid leakage from a nearby high power Freeview DVB-T Channel 29 transmitter. F3 and F4 will also require minor re-tunes.

## ANTENNAS

The coverage tests of the repeater required two 921 MHz antennas, one at the licensed transmitter location and a relatively compact one for the mobile test vehicle. Unfortunately, there be dragons out there.

Many Uda-Yagi type antenna designs promise to extend your cellphone range by claiming wide bandwidth, typically 800 MHz to 960 MHz, together with unbelievably high gain across the entire bandwidth. Dr. Lawson points out the impossibility of the majority of these claims in Reference 1.



More modest claims are made by the makers of the HyperLink HG909Y, a 5-element Uda-Yagi type antenna, centred on our GURL frequency band. The maker's claims passed Lawson's test.

This antenna, with has a claimed gain of +9 dBi, and +/-45 degree H-plane beamwidth looked as if it would be suitable for both the 400 mW 921 MHz CW test transmitter and the mobile test receiver. Reference 2 describes an accurate method of testing antenna gain and beamwidth. This test requires two identical antennas. Six HG909Y antennas were available on Trade Me. Problem solved. Two were purchased. The measured gain at 921 MHz was 8.8 dBi. The four remaining antennas quickly sold when the word got out.

The antenna boom and elements are made of stainless steel. The 400 mm RG-213/U "tail" is terminated in a Female N connector. Unfortunately, the total package is spoiled by the use of plated steel mounting hardware.

## REFERENCES

1. Yagi Antenna Design. Dr. James L. Lawson. ISBN: 0-87259-041-0
2. Accurate VHF/UHF Antenna Testing. Q-Bit. April 2004, Pages 5 to 8 and 14 to 15.

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## 50 Years Ago in Spectrum

September 1971 Spectrum – A bumper technical issue as will be seen below. The visit to the Warworth Earth Satellite Station site on 6 September was a great success with some 50 members visiting and were shown around the station by Mr. John Morgan and his team.

“Stickybeak” who produces a regular column in Spectrum bemoaned the lack of activity despite good VHF band conditions. He also noted that more stations were appearing on FM – President Doug ZL1TFY heard for the first time and ZL1TFE working Harry ZL1BHV (ex ZL1TGQ) in Taupo. He concluded that the FM bug seemed to be catching on!

Graham Bender ZL1AHQ published a design for “A Phase Locked 2 Metre Receiver of High Performance” The technical requirements to be met by the design included a wide dynamic range, single conversion to 10.7 MHz, choice of IF bandwidths of 7kc (7kHz) plus 30kc (30kHz) using 8 pole CF filters, dual-gate RF amp with delayed AGC applied, double balanced J-Fet mixer, phase-locked injection oscillation and a choice of SSB, FM and AM reception. The article ran to 6 pages in Spectrum with circuit diagrams and technical descriptions. Graham also reported on some of the design issues, noting that after many experiments to obtain a suitably stable injection signal on 133.3 MHz or 154.7 MHz, a suitable choice of VFO and crystal frequencies was found with the crystal on 43.333 MHz multiplied by 3 to 130 MHz and mixed with a VFO tuning 24.7 to 28.7 MHz. The entire design used transistors – not an I.C. in sight! The measured performance of the design met most of the design criteria with a dynamic range from less than 0.1uV to in excess of 100mV and no sign of front-end desensitisation or cross modulation with a 100mV signal.

Mac Allison ZL1TAA contributed a short article on a link-phase modulator using a 6U8 or 6CX8 tube from an original design by Ian Brown ZL1TAT. Mac noted that the advantage of the circuit when producing FM modulation, was that the deviation produced was constant, whereas the deviation produced by modulating the crystal frequency varied, depending on the crystal used due to the different types of cut.

Part Three of a seven-part series on the Waikato VHF Group’s F.M. Repeater was presented by Ian Brown ZL1TAT. The I.F. filter network and I.F. amplifier circuit and design details. The I.F. Filter used a C-F Networks model 10.7-25 filter and to get the required stop-band rejection each end of the filter was fed through a relatively high-Q transformer network which nicely took care of any detectable spurious responses lying outside the passband of the filter. The first stage of the I.F. amplifier used a CA3012 as a limiting type amplifier followed by a CA3042 4-stage cascode differential amplifier operating as the output stage of the IF amplifier. This fed a Foster-Seely discriminator with the audio output coupled to an emitter follower amplifier which provided the high impedance load required by the discriminator while presenting a low output impedance to feed the audio squelch circuit. Alignment details for the I.F. amplifier were given, along with the circuit diagrams, internal circuits for the CA3012 and CA3042 I.C.’s and the pc board layouts.

The final technical article was from Ralph ZL1TFE on the design and construction of a “Superior Antenna for 70cm -The LPY”. The 13-element LPY antenna used a 1” duralloy tube with PVC mounting blocks, grooved to seat the elements which were held in place using stainless steel clips. The cutting dimensions for the hard drawn aluminium elements and element spacing details (all given in inches) were given along with advice that “infinite care should be taken in adhering exactly to the dimensions given – small errors multiply at this frequency. The article concluded with details of the coaxial balun to match the 204 Ohm feed-point impedance and information on stacking four of the antennas for a possible EME array.

The Radio Spectrum Management staff are currently reviewing the spectrum currently available to Amateur operators. Members of the VHF-UHF Experimenters Mail Box have been discussing what frequencies they want to keep. In supporting the submission a description of current activity will support their case. The background is taken from a presentation some years ago. (Editor)

This background might include some useful information for demonstrating amateur activity over the years on the band. Feel free to add to it if you have additional information or corrections etc.

In ZL, we first got 3.3 to 3.9 GHz in the post-war 1949 allocations - as a result of the 1947 international conference in Atlantic City. There was no reported activity on the band here in ZL for some time. Then, in 1961, the band was reduced to 3.3 to 3.5 GHz, along with some other microwave band changes, most notably the gaining of 21-22 GHz. The latter band was reallocated as 24.0 to 24.25 GHz in January 1973.

Around 2004, we lost even more 3GHz spectrum with the band being reduced to its present limits, 3.3 GHz to 3.410 GHz.

Meantime ZL activity on the band had commenced in the early 1970s with the use of wide band polaplexer systems based around the 100mW CV237 reflex klystron that had become available from local and overseas sources. The Govt Stores Board auctions were the local source of these. I bought a number of them in conjunction with another Christchurch amateur, the late Duncan Yeates ZL2AFE/3 and Rod, ZL3NW (then ZL3TAL) in conjunction with Doug Rickerby, ZL3TCM and George, ZL3TCN, built up the first two amateur systems including plaster casting moulds to manufacture a pair 3 ft dia. fiberglass dishes. The first contact on the band took place on 3 October 1970 over the magnificent distance of 30m! (testing across a school yard). In May 1971 the distance was extended to 8km, then out to 40 km in August 1971 and 88km in November 1971.

Rods gear was used on DX Day contest in 1973 and VHF field Day contest in 1974. It had occasional use at other times when experimenting. The WN VHF group, spearheaded by Murray Willis, ZL2THW (now ZL1HI), soon followed suit and Murray wrote up the construction of their systems (very similar to Rods design) in BI, along with details of their record breaking contact of 232km from Egmont to Hawkins Hill on 12 August 1974. (Murrays article in Dec 1975 BI wrongly credits ZL30J with the dish feed design - it was designed by Rod, ZL3NW, based on telurometer dish feeds).

Then they did it again on 2/2/ 1975 from Mt. Ruapehu to Mt Murchison in the South Island, a distance of 383 km, which gave them both the ZL and world records.

One or two more wide band systems were built and used from then on by other keen amateurs around ZL but apart from bursts of activity around contest times, when portable systems were hauled up useful hilltops, nothing much happened of note until 1983. (additional data covering activity in this period -1975 to 1983- welcomed).

Then on 6 March, 1983, the record distance was extended out to 547km by John ZL2AQE and Peter ZL2ARW. Peter was at Te Paki Trig about 12 km south of Cape Reinga and John was at Mt. Egmont. Both stations were using solid state gear as by this time wide band gear had had its day. Power levels were in the order of a watt or two, running NBFM. The 1983 record distance was to stand for nearly 30 years. Despite light activity on the band around contests etc plus the odd

DX expedition to remote hill tops by a handful of keen amateurs, (details for activity, 1983 to 2013, are needed ) no significant distance contacts were achieved until New Year's Day 2013, when Steve Hayman, ZL1TPH, portable at Cape Reinga, worked the late Ted Barnes, ZL2IP/p, on Egmont, a distance of 551km, just a few km over the 547km FM record distance that had stood since 1983. SSB was used for this contact.

Internationally, two years earlier, Steve, ZL1TPH/p at Cape Reinga worked VK9NA/p on Norfolk Island, a distance of 748km, on 17 January, 2011 using SSB.

Since 2013, although there has been an increase of activity on 3.3GHz, to date there has not been any EME activity recorded in ZL.

Increased terrestrial activity has tended to again peak around contest times due to the need for stations to go portable to achieve any significant distances on 3.3 GHz. And there have been some considerable distances achieved over the last few years. There are probably around 10(?) stations able to activate a 3.3 GHz station at present in ZL. I leave it to others to carry on the story from 2013 to where we are now in 2021.

73 Dave ZL3FJ

Further Emails listing additional 3.4 GHz users. It shows that there is still activity worth saving. The short emails below show that the users are under way via NZART to put in a submission. (Collected by the Editor)

I have had a reply from NZART and a submission is in the works. The new ALOs, Richard ZL2FY and Stuart ZL2TW, are keen to get any input that anyone has on this topic so get in touch with them directly.

This came from Richard Harkett, ZL2FY.

Good Dave

Think we could safely add Kevin the RF man who's down in Hamilton. He has 3.4 gear. I remember it as it had low conversion gain and was in a large diecast box.

Incidentally I lost a lot of gear when Ted down in Nakki passed away. But I was not worried as me and Ted had some fun over the years. One was a 3.4 with a Toshiba PA. I've had 4 tranverters over the years. All different types with 20 watt PAs. And good preamps also. And still have a spare Ionica PA. 3.4 is a good band.

Steve

**From:** zlvhfcontest@groups.io [mailto:zlvhfcontest@groups.io] **On Behalf Of** Stephen Hayman  
**Sent:** Monday, August 23, 2021 04:22  
**To:** zlvhfcontest@groups.io  
**Cc:** zl2fy@outlook.com  
**Subject:** Re: [zlvhfcontest] 3.3 GHz - where we came from

As of now I have two Dave. But have loaned one out to Nick up north. So that is two in use, currently. Now in the greater Auckland area, which does include Warkworth now, I can vouch for another four stations currently active. I'll give you there callsign if you wish - as worked them recently. So that equates to six working stations that I know of up here. And by saying up here, means north of the Bombays. Steve

On 22 August 2021 at 21:12 Dave Brown <2c39a@silverbears.nz> wrote:

Have had confirmation from Doug ZL2TAR, that he did run a 3.3GHz ATV setup some years ago. So that's another band use we can chalk up. It would be useful to know how many operational 3 GHz setups we have around the country as of now. Don't all put your hands up at once!

Propagation experimentation is another aspect we can mention - details of past and proposed experimental contacts with that aspect in mind would be handy. I'm not aware of anyone else that would be doing the sort of analysis that Rex VK7MO has done on several occasions (and bands) in this regard but it's an aspect we should give more prominence as it could be to advantage to show we are doing more than just stretching out workable distances for the heck of it without figuring out how.

ZL3FJ

**From:** zlvhfcontest@groups.io [mailto:zlvhfcontest@groups.io] **On Behalf Of** Stephen Hayman  
**Sent:** Saturday, August 14, 2021 08:52  
**To:** zlvhfcontest@groups.io  
**Subject:** Re: [zlvhfcontest] 3.3 GHz - where we came from

Agree,

An ATV segment is important, more so these days with 23 cm becoming restricted and 12 cm and 5 cm noised up. And I read also somewhere 3 cm is going to get the chop along the way. You mentioned that also.

With these defence licenses amidst the bands probably what happened with the recent NZART fiasco whereby the defence forces had a number of channels in 5 MHz or the 60 MHz band and basically our usage could not be renewed. All it took was Bob Vernal to ask the defence forces if he could have permission to delete them, which was granted and then we got the band back. I guess that is what occurred but we never got a proper story from NZART. So in other words the defence were not using those channels. .

Now I have just looked in SMART or a search from 3300 to 3410, which is the segment under review and there is only one licence. Its the WLVHG 3400.275 beacon. Now to the RSM or powers to be, that's all they see. Hence asking for submissions on current or past usage in New Zealand.

Now which leads to the questioned being asked has there ever been ATV in New Zealand on 9 cm. We are asking some of the old hands involved in ATV over the years and so far it doesn't look like it. But there could have been.

Cheers Steve

On 13 August 2021 at 22:52 Tim Moore <vk4tim@iinet.net.au> wrote:

Steve,

I'd say that the 2m licence that defence have is, as much as anything securing a foothold in case it is required should we be involved in a war, and the spectrum required for military communications. I'm assuming, I really don't know, but any use from them would be most likely spread spectrum.

In VK yes the ACMA withdrew amateur access above 3400 and reallocated to NBN fixed wireless in regional areas and IMT in populated areas. That was the reason for the move to 3398 MHz. The 9cm band used to be 3300 to 3600, then amateurs lost access to 3400 to 3575, but retained 3300 to 3400 and 3575 to 3600, but as of 28 March 2020, lost access to 3575 to 3600 in major urban areas. In some regional (rural) areas amateurs can still use 3575 to 3600, which is the segment where I had my wide band digital links.

I just wish my 9cm gear would go down below 3400, but due to the SAW filters in the gear they don't, it's a nice quiet band, and I'm sure that if Telstra were monitoring the band before their allocation took effect, the presence of at least one of my links would have been quite obvious to them. I turned off late in the afternoon of the last day that we could use it, and now knocking big holes on 5720 and 5780 MHz.

As I said there's more to microwave band usage than the 1 or 2 MHz of narrowband segments.

Hoping that the 3300 to at least 3400 can be retained for all, I'm hoping that the defence use of the band for radars etc is the thing that helps us keep access to the band.

73 Tim.

Hi Nick and others,

I still remember thinking my 3.4 was crook with this crazy noise coming out. Could hear it from the 1296 station about 20 feet away! For the guys, Nick and I were having a 3.4 GHz contact and I said to him that I thought the signal would be stronger than it was. Nick says "hang on a few minutes". I went off to work 1296 while waiting. Then came this god awful noise from the 3.4 transverter. Turns out Nick fired up the chainsaw to cut down a ponga right in front of his dish while having the mike keyed! Needless to say the signal was "strength 10!" eh Nick! Hehe..

Anyway, 3.4 activity here in AKL is Greg ZL1GSG, Harry ZL1BK & myself ZL1SWW along with the others who have already been mentioned. Wayne in WLG has one and wonder if Ian ZL2IAH who was a good mate of Ted's has one of the ones Ted had? I think Ian got / moved Ted's big dish.

Great band and a shame if we lost it.

Hi All,

I have 3.4Ghz all set to go just need someone to talk to. Its one of those shinny German boxes and a Stealth 20w amp with a G4DDK preamp.

Roger ZL3RC.





## **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](mailto:mattking@gmail.com)

The Deputy Leader position is currently vacant

\*\*\*\*\*

**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			\$
			<b>Total</b>	\$
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: <a href="mailto:treasurer@aucklandvhf.org">treasurer@aucklandvhf.org</a> .			
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 <sup>nd</sup> Monday of the month or to the Committee meeting the 4 <sup>th</sup> 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	Ruaotuhenua	\$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		
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
		<b>\$400.00</b>	

**2021-04-13, Donations for Refurbishment**

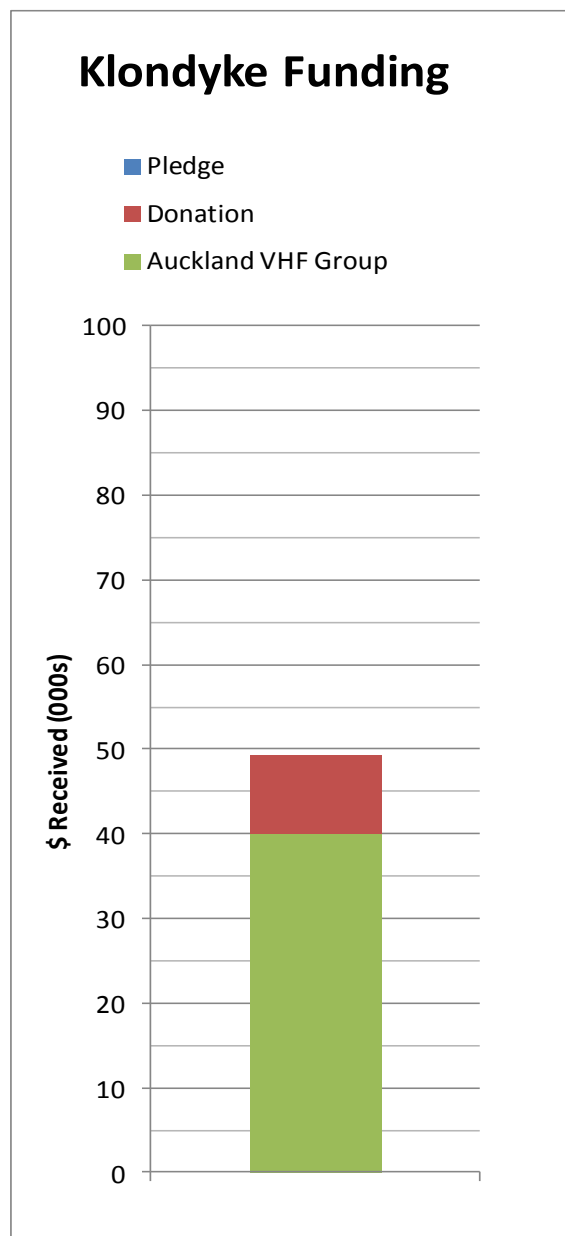
Auckland Branch	\$100.00
Manukau Radio Club	\$100.00
Brenton Faithfull, ZL1BBF	\$50.00
Papakura Radio Club	\$500.00
Ann Walker ZL1BFB	\$100.00
Soren Low ZL1SLK	\$100.00
	<b>\$950.00</b>

**Total \$1,350.00**

**Klondyke Tower  
Donations towards Maintenance**

**Target 100,000**

Name	Donation	Pledge	Tower	Other
Donations 2018 - 2020	8444.00		63,245.00	
			GST	
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			
Martyn Seay ZL3CK \$100				
			Total 72,731.75	Total
			Auckland VHF Group 40,000.00	40.00



Total	9394.00	-
Percent	9.39	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!

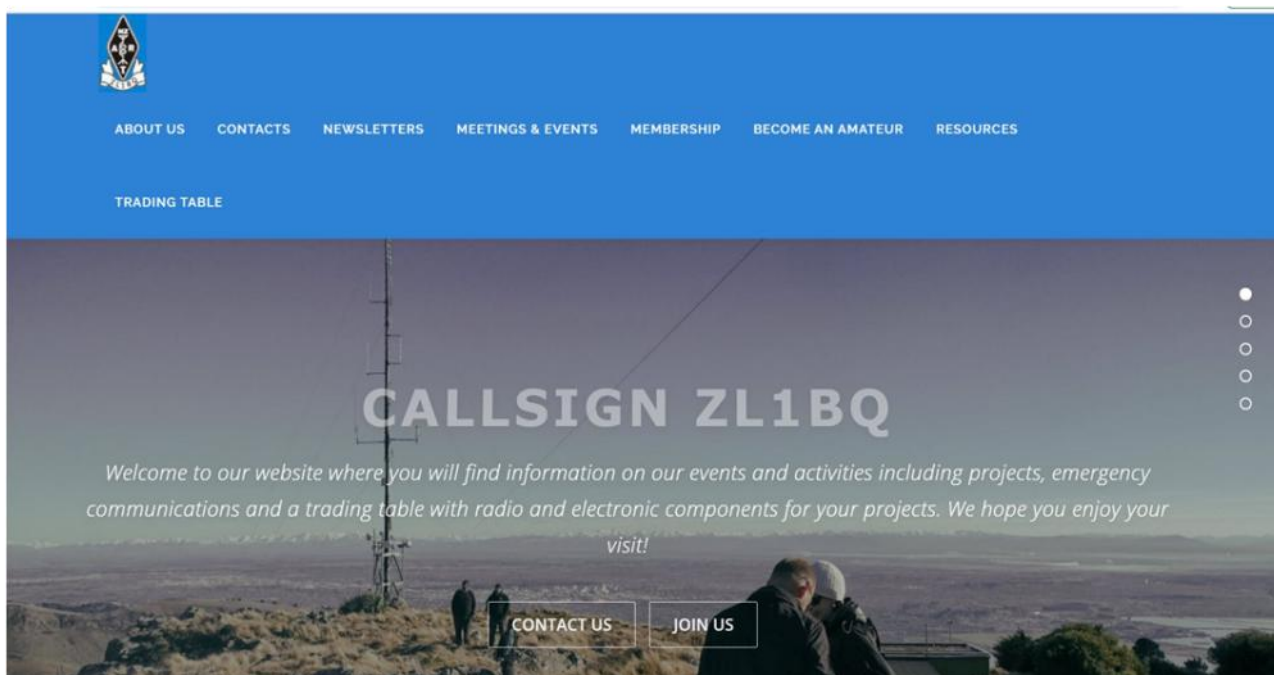
**NEW** – RG58C/U 50 Ohm Coaxial Cable. Thanks to a bulk purchase we are able to offer this good quality coax at a competitive price. The cable has tinned centre conductor and screen braid making it resistant to long term corrosion. The price is \$2.00 per metre with a discount for purchases of 20m or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