



The Official Newsletter of the **PAPAKURA RADIO CLUB INC.**

September 2021



Remember ~ Keep 2 metres apart



CONTENTS ...

CONTENTS	2
CLUB ACTIVITY	3
UPCOMING ACTIVITIES	4
DX NEWS	5
CONTESTS	6
PARKER SOLAR PROBE UPDATE	7
RAMBLINGS FROM THE EDITOR'S DESK	8
TECH TIP – SOLAR PANELS - HOW BIG DO I NEED?	14
HEARD ABOUT THE SCENES	15
NETS LIST (REACH OUT AND TOUCH SOMEONE)	19
CLUB CONTACT INFORMATION	20

This Month's Meetings:

All face to face meetings are cancelled until we return to level 2 or lower

Meetings for September.

Meetings will only occur at alert level 2 or lower. We cannot have social meetings at level 4 or 3. This means we will only open the clubrooms on Wednesdays when we are at alert levels 1 or 2 following current government guidelines.

Wed 1 August – ~~General Meeting, Rob ZL1RJS All Star project~~ – On Hold

Wed 8 August – ~~Activity Night~~ – TBC

Wed 15 August – ~~Committee Meeting~~

Wed 22 August – ~~Project Night~~

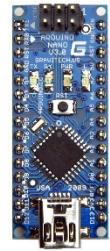
Wed 29 August – ~~AREC Activity~~

CLUB ACTIVITY:

While off to a good start the Arduino training is on hold – We will explore options for on-line training to continue since meeting are likely to remain on hold for some time to come.

UPCOMING PROJECTS:

PROJECT AND ACTIVITY NIGHTS



And we have a DC power distribution project, still in the pipeline. – So, a busy year if we finally get to start it.

Some Lockdown Survival Hints:

Candelight Dinners are Romantic

And a great way to hide the fact you don't know how to rewire a fuse,



Be grateful for essential workers ...

Is not how you show appreciation to your wife.

And when we can eventually order food out



UPCOMING ACTIVITIES:

(ALERT LEVELS PERMITTING)

WEDNESDAY 1 AUGUST – GENERAL MEETING

ALT 690 NET

WEDNESDAY 8 AUGUST – ACTIVITY NIGHT

ALT 690 NET

WEDNESDAY 15 AUGUST – COMMITTEE MEETING

ALT 690 NET

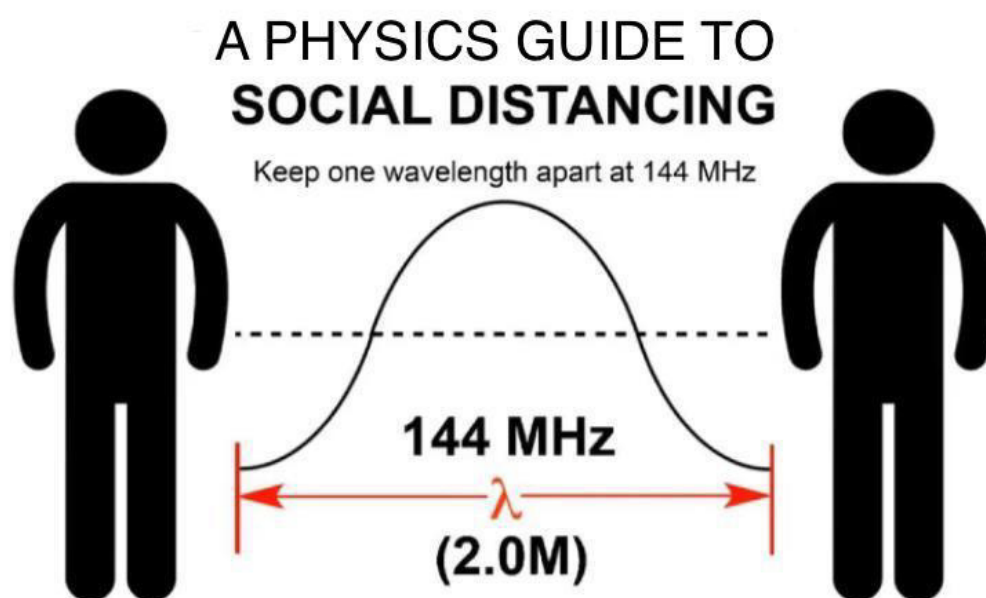
WEDNESDAY 22 AUGUST – PROJECT NIGHT

ALT 690 NET

WEDNESDAY 29 AUGUST – AREC NIGHT

ALT 690 NET

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



More Effective than any mask yet made. A Two Way Radio microphone. No other protection is as powerful. Highly recommended!



DX Calendar August 2021

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
5X3R			SV5/HB9OAU													OY/LB5SH												8Q7CQ				
D4SAL																									5H3MB							
5Z4/AK0SK																5H1P																
												9X2AW																				
OA7/DD5ZZ																																
				HB0/DL5YL HB0/DL5YM																												
A35JP																																
J68HZ																																
VP5MA																																
KC4USV																																

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



Or check them out at [DX News.com](https://www.dxnews.com)



CONTESTS SEPTEMBER 2021

Date-Time	Date-Time	Bands	Contest Name	Mode	Exchange	Sponsor's Website
1 1700	1 2000	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
1 2000	1 2100	3.5	UKEICC 80-Meter Contest	Ph	6-char grid square	ukeicc.com/80m-rules.php
1 2300	3 2300	3.5-28	G3ZQS Memorial Straight Key Contest	CW	RST, SPC, name, mbr or power	fistsna.org/operating.html
2 1700	2 2100	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrrlcontest.no
2 1900	2 2100	1.8-50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
4 0000	4 0359	1.8-28	CWOPs CW Open	CW	Serial, name	cwops.org
4 0000	4 2359	3.5-28	Russian RTTY WW Contest	Dig	RST, 2-letter RU oblast or CQ zone	qrz.ru/contest/detail/93
4 0000	5 2359	3.5-28	All Asian DX Contest, Phone	Ph	RS, 2-digit age	www.jarl.org/English
4 0600	4 0800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
4 1200	4 1559	1.8-28	CWOPs CW Open	CW	Serial, name	cwops.org
4 1300	4 1330	144	Two-Meter Classic Sprint	CW Ph	Serial, 4-char grid square	fwrc.info
4 1300	4 1600	7	AGCW Straight Key Party	CW	RST, serial, class, name	alt.agcw.de/index.php/en
4 1300	5 0400	All	Colorado QSO Party	CW Ph Dig	Name, CO county or SPC	ppraa.org/coq
4 1300	5 1259	1.8-28	IARU Region 1 Field Day, SSB	Ph	RST, serial	darc.de/der-club/referate/conteste
4 1300	5 1300	3.5-28	RSGB SSB Field Day	Ph	RS, serial	www.rsgbcc.org/hf
4 1400	5 1400	145	IARU Region 1 145 MHz Contest	CW Ph Dig	RS(T), serial, 6-char grid	www.iaru-r1.org
4 2000	4 2359	1.8-28	CWOPs CW Open	CW	Serial, name	cwops.org
4 2000	5 2000	3.5	PODXS 070 Club Jay Hudak Memorial	Dig	RST, SPC	www.podxs070.com
5 1000	5 1400	144	WAB 144 MHz QRO Phone	Ph	RS, serial, WAB square or country	wab.intermip.net
5 1800	6 0300	All	Tennessee QSO Party	CW Ph Dig	RS(T), TN county or SPC	tnqp.org/rules
6 1900	6 2030	3.5	RSGB 80-Meter Autumn Series, SSB	Ph	RS, serial	www.rsgbcc.org/hf
6 2300	7 0300	1.8-50	MI QRP Labor Day CW Sprint	CW	RST, SPC, mbr or power	www.miqrp.net/contest
7 0100	7 0300	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqr.blogspot.com
8 1700	8 2000	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
11 0000	11 2359	1.8-VHF	FOC QSO Party	CW	RST, name, mbr (if any)	g4foc.org/qsoparty
11 0000	12 2359	3.5-28	WAE DX Contest, SSB	Ph	RS, serial	darc.de/der-club/referate/conteste
11 0800	12 0600	1.8-28	SARL Field Day Contest	CW Ph Dig	RS(T), # of rigs, category, province	www.sarl.org.za
11 0900	12 1400	7	YB7-DX Contest	Ph	RS, serial	yb7dx.com/rule
11 1200	12 2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
11 1400	11 2200	3.5-28	Ohio State Parks on the Air	Ph	OH park abbreviation or SPC	ospota.org
11 1500	12 0300	3.5-28	Alabama QSO Party	CW Ph	RS(T), AL county or SPC	www.alabamagsoparty.org
11 1500	12 0959	3.5-28	Russian Cup Digital Contest	Dig	Serial, 4-char grid square	qrz.ru/contest/detail/86.html
11 1800	13 0300	50 and up	ARRL September VHF Contest	CW Ph Dig	4-char grid square	www.arrl.org/september-vhf
12 0000	12 0400	3.5-14	North American Sprint, CW	CW	Other's call, your call, serial, name, SPC	ncjweb.com
13 0000	13 0200	1.8-28	4 States QRP Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
15 1900	15 2030	3.5	RSGB 80-Meter Autumn Series, CW	CW	RST, serial	www.rsgbcc.org/hf
16 0030	16 0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
16 1800	16 1959	3.5	BCC QSO Party	CW Ph Dig	RS(T), T-shirt size	bavarian-contest-club.de/contest
17 2100	17 2359	3.5	AGB NEMIGA Contest	CW Ph Dig	RST, serial, mbr (if any)	www.ev5agb.com
18 0000	19 2359	All	Collegiate QSO Party	CW Ph Dig	School name, RS(T), op class	collegiateqso.org
18 0500	19 1100	50-1296	SARL VHF/UHF Digital Contest	Dig	RST, 6-char grid locator	www.sarl.org.za
18 0600	19 2359	10 GHz to light	ARRL 10 GHz and Up Contest	CW Ph Dig	6-char grid	www.arrl.org/10-ghz-up
18 1200	19 1200	3.5-28	Scandinavian Activity Contest, CW	CW	RST, serial	www.sactest.net
18 1400	19 0200	All	Iowa QSO Party	CW Ph Dig	RS(T), IA county or SPC	www.w0yl.com/IAQP
18 1400	19 2000	All	Texas QSO Party	CW Ph Dig	RS(T), TX county or SPC	www.txqp.net
18 1500	18 2100	1.8-28	QRP Afield	CW Ph Dig	RS(T), SPC, power or mbr	newenglandqrp.org
18 1600	18 2300	3.5-144	Wisconsin Parks on the Air	CW Ph	WI park abbreviation or SPC	wipota.com
18 1600	19 0359	3.5-28	New Jersey QSO Party	CW Ph Dig	RS(T), NJ county or SPC	k2td-bcrg.org/njqp/
18 1600	19 2200	All	New Hampshire QSO Party	CW DigPh	RS(T), NH county or SPC	www.w1wqm.org/nhqso
18 1600	19 2359	1.8-144	Washington State Salmon Run	CW Ph Dig	RS(T), WA county or SPC	salmonrun.wwdxc.org
18 1800	18 1959	1.8-50	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
19 0000	19 0400	3.5-14	North American Sprint, RTTY	Dig	Other's call, your call, serial, name, SPC	ncjweb.com
19 1700	19 2059	3.5-28	BARTG Sprint PSK63 Contest	Dig	Serial	bartg.org.uk/wp
19 2300	20 0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
20 1900	20 2300	144	144 MHz Fall Sprint	CW Ph Dig	4-char grid square	svhfs.org
22 0000	22 0200	1.8-50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
23 1900	23 2030	3.5	RSGB 80-Meter Autumn Series, Data	Dig	RST, serial	www.rsgbcc.org/hf
25 0000	26 2359	3.5-28	CQ Worldwide DX Contest, RTTY	Dig	RST, CQ zone (+ state/prov for US/VE)	www.cqwwrtty.com
25 1200	26 1200	1.8-28	Maine QSO Party	CW Ph	RS(T), ME county or SPC	ws1sm.com/MEQP.html
25 1400	25 1800	144, 432	AGCW VHF/UHF Contest	CW	RST, serial, power, 6-char grid	agcw.de/contest/vhf-uhf
25 1400	25 2200	3.5-28	Masonic Lodges on the Air	Ph	Lodge name/number/jurisdiction	cqmorelight.com/rules
27 1900	27 2030	3.5-14	RSGB FT4 Contest Series	Dig	4-char grid square	www.rsgbcc.org/hf
28 1900	28 2300	222	222 MHz Fall Sprint	CW Ph Dig	4-char grid square	svhfs.org
29 2000	29 2100	3.5	UKEICC 80-Meter Contest	CW	6-char grid square	ukeicc.com/80m-rules.php

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

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

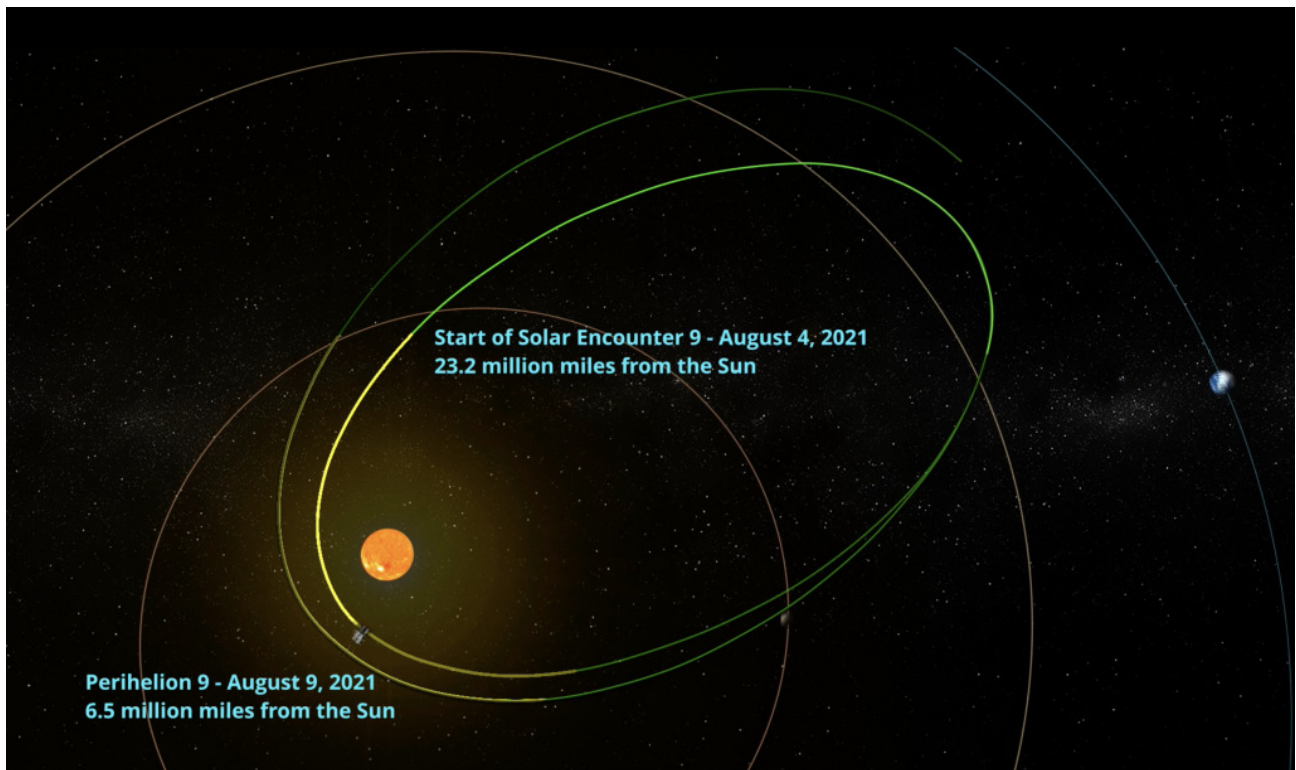
Listings in blue indicate contests sponsored by ARRL or NCJ. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. Data for Contest Corral is maintained on the WA7BNM Contest Calendar at

www.contestcalendar.com

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

SUCCESSFUL NINTH SOLAR FLYBY FOR PARKER SOLAR PROBE.

On Aug. 13, 2021, at 5:50 a.m. EDT, mission controllers at the Johns Hopkins University Applied Physics Laboratory, in Laurel, Maryland, received a “tone one” beacon from Parker Solar Probe, indicating that all systems were healthy and operating normally after the spacecraft’s ninth close approach to the Sun on Aug. 9.



During this close pass by the Sun — called perihelion — Parker Solar Probe matched its own records for spacecraft distance from the Sun and speed, coming to within about 10.4 million kilometres of the Sun’s surface while moving faster than 532,000 kilometres per hour.

“We are getting into the critical phase of the Parker mission and we’re focused on quite a few things during this encounter,” said Nour E. Raouafi, Parker Solar Probe project scientist from APL. “We expect the spacecraft to be flying through the acceleration zone of the perpetual flow of charged particles that make up the solar wind. Solar activity is also picking up, which is promising for studying larger-scale solar wind structures, like coronal mass ejections, and the energetic particles associated with them.

“But you never know what else you’ll find exploring this close to the Sun,” he added, “and that’s always exciting.”

Three years into its seven-year primary mission, Parker Solar Probe remains healthy while traversing a path that will take it directly through the Sun’s outer atmosphere, known as the corona. The Thermal Protection System shielding the spacecraft is already facing temperatures above 1,200 degrees Fahrenheit (650 degrees Celsius). At Parker Solar Probe’s closest approaches, the TPS must withstand temperatures of 2,500 F while keeping the spacecraft and instruments in its shadow operating at about 85 F.

Science data collection for this solar encounter continues through Aug. 15.

RAMBLINGS FROM THE EDITORS DESK

With a heavy heart, I must write this from the confines of a level 4 lockdown, which means that once again the club must close the doors, and all meetings, projects and activities are again on hold. When the lockdown was announced, Ann-Maree and I were already on our way to the lighthouse at Castlepoint for the ILLW event, making use of some overdue annual leave.

Do I know how to pick days or what? Oh well, Maybe 2022 will be kind.

We then had to plan a return to a lockdown venue. With family in Hamilton, who could accommodate us, we parked the motorhome in the driveway and tried to get a handle on what would happen. We could have stayed in the relative safety of the motorhome, and enjoyed the potential benefits of being south of the Auckland region, which, we could all see, was going to have an extended lockdown, or return to Auckland to be better equipped for the extended lockdown, that seemed likely.



Eventually, we chose the latter option, and with teary farewells, said goodbye to family members that we knew we would not see for some time, and who would find the lockdown very difficult, and returned home to work on some now urgent tasks, and settle into a long lockdown. With hindsight, it's easy to see that this was the right decision, even with extended level 4, the benefits of being at home, and working with the resources here, will allow us to do more, and be more connected, than trying to live out of a single room home for what looks to be a very long time. On the positive side, a lot of my work can be done from my office at home, and this makes me one of the lucky ones, who keeps getting paid at full rate, Sadly there are many for whom this will not be the case, and for even more, the businesses they work for will not be able to survive this second lockdown, Many will find life very different when the dust finally settles. No doubt, this will, as time progresses cause tensions and worry, at least as concerning, and in some cases even more concerning, than the virus at the heart of the issue. I will not stoop the platitudes, but remind all of us, that as this goes on, we will all experience a lot of tensions, and remembering that despite all we share in common, it's our differences that make us who we are, Try to accept that not everyone will share your opinion, and the reasons for their tensions may not be obvious to you, So – Compassion can go a long way; or to put it in terms of Ham Ethics, Listen more than talk, Don't preach or pontificate, and enjoy the common ground, We are a unique community, let's be in the lead by showing that we can care for one and other in the uncertain times.



How we handle this lockdown will define us as a community, this is a different lockdown, and fatigue is setting in much quicker, and like it or not, the virus is not going away, so this will not be our last lockdown.

Since we will not be able to meet it will be necessary to make some new contact arrangements, so, until further notice, I will be running a net on the 690 repeater every Wednesday evening at 7:30 for those who would normally catch up at the clubrooms. This is in addition to the morning 690 morning net

that is on every morning at 8:30 am Monday to Saturday. On Sundays, we have the Club net on VHF at 8:30 and the HF net at 9:15 3.755Mhz. in addition, I try to maintain a listening watch on 146.475 MHz and 147.457 Mhz simplex if anyone is feeling like a QSO, or has any questions about the club or newsletter. (remembering I do work during weekdays), I may not be free to respond immediately, but if I'm free I'll respond, and my phone number is on the back page, along with those of the entire committee.

I also note that Backyards on the Air is also being re-established in Christchurch, (with the high noise I have on 80- metres, I doubt a portable set will hear anyone) but maybe we can arrange something similar, for Auckland south

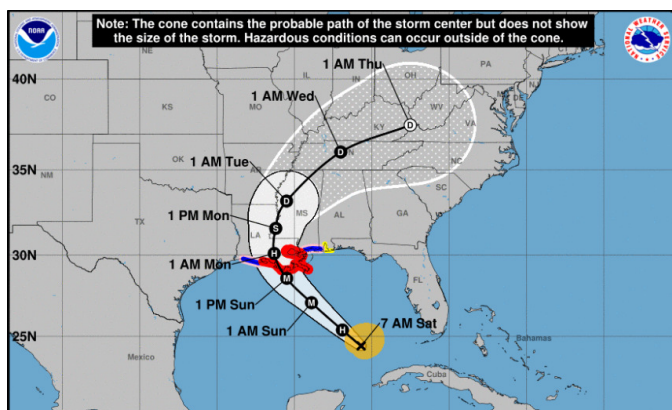
CQ CQ CQ

Since we're all stuck at home, Christchurch amateur radio operators are holding a "backyards on the air (BOTA)" tomorrow Sunday 1-3pm. All welcome, especially you closet SDR and scanner listeners!

On the 2 meter band, expect to see some FM SSTV on 144.45, locals across canterbury on 144.5 FM as well as the usual repeaters. There may even be some SSB on 144.2. The 70 cm band may also see some SSTV activity on 432.5.

HF bands will no doubt be active if you are equipped to listen.

I especially like the idea of some SSTV transmissions, so watch out for some creative ideas in Auckland, as we try to figure out what we can do to break some of the boredom. If anyone has any ideas, yell out to one of the committee members, Let's see what crazy ideas we can come up with.



But to put things back into perspective, I also note that 14.325 & 7.268 MHz are activating a Hurricane net as I type this to monitor the progress of Hurricane IDA into the Gulf of Mexico and Florida in the USA – so remember to keep these frequencies free for their use.

Of course, listening is potentially helpful too. But with the bands being as strange as they have been, propagation might be a little difficult to anticipate.

I guess what I'm trying to say is that with all the challenges we have ahead, we have two main advantages, a hobby in which anything can happen, and an ability to continue to keep in touch and support one and other as the fatigue sets in.

Sharing stories of things we can do to keep our minds active can help those who have time to kill while being supportive and positive can also help those who are working extra hours and managing all the extra work problems that come with raised alert levels, They too serve who work from home.

We have many weeks ahead of us, and only together will we make it through. But we have been here before, and we made the most of our frequencies, Let's try and make this one even better

No matter where you go ... There you are "Buckaroo Banzai"



73 De ZL1NWX

TECH- TIPS CORNER

Solar Panels

In the last few newsletters, I talked about batteries and assumed that charging would occur from a battery charger or power supply, and hopefully, you now know power supplies are not the best things to use.

But what if it's going to be recharged from a solar system, surely that is not a problem, all you need is enough current for a recharge. Maybe... But let's look at some of the most common issues, and then let's look at the charge time values

Types of panels

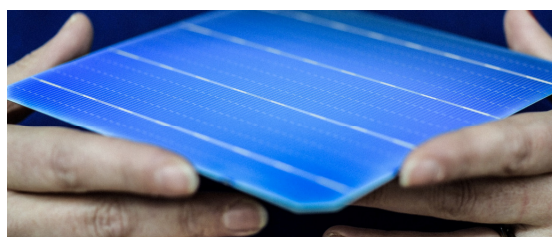
Most of the solar panel options currently available fit in one of three types: monocrystalline, polycrystalline (also known as multi-crystalline), and thin-film. These solar panels vary in how they're made, appearance, performance, costs, and the installations each are best suited for.

The major types of solar panels

Solar Panel Type	Advantages	Disadvantages
Monocrystalline	<ul style="list-style-type: none">• High efficiency/performance• Aesthetics	Higher Costs
Polycrystalline	<ul style="list-style-type: none">• Lower Cost	Lower efficiency/performance
Thin-film	<ul style="list-style-type: none">• Portable & Flexible• Lightweight• Aesthetics	Lowest Efficiency / Performance

Thin film is used in situations where fittings are not practical, and aesthetic is the dominant concern, such as in marine situations where they can be glued to a boats surface structures, Many are strong enough to walk on, But they are the most expensive, and least efficient.

To build a monocrystalline or polycrystalline panel, wafers are assembled into rows and columns to form a rectangle, covered with a glass sheet, and framed together. While both of these types of solar panels have cells made from silicon, monocrystalline and polycrystalline panels vary in the composition of the silicon itself. Monocrystalline solar cells are cut from a single, pure crystal of silicon. Alternatively, polycrystalline solar cells are composed of fragments of silicon crystals that are melted together in a mould before being cut into wafers.



What do different solar panel types look like?

The differences in materials and production cause differences in appearance between each type of solar panel:

Monocrystalline solar panels

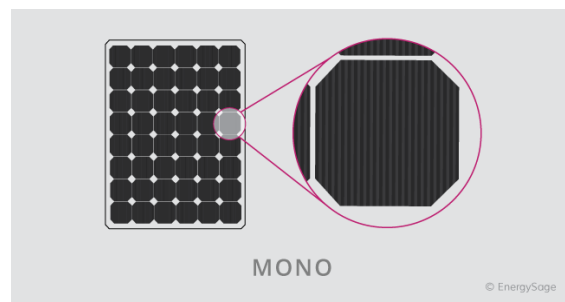
What do different solar panel types look like?

The differences in materials and production cause differences in appearance between each type of solar panel:

Monocrystalline solar panels

If you see a solar panel with black cells, it's most likely a monocrystalline panel. These cells appear black because of how light interacts with the pure silicon crystal.

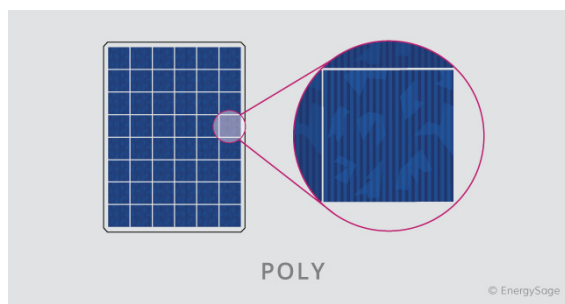
While the solar cells themselves are black, monocrystalline solar panels have a variety of colours for their back sheets and frames. The back sheet of the solar panel will most often be black, silver or white, while the metal frames are typically black or silver.



Polycrystalline solar panels

Unlike monocrystalline solar cells, polycrystalline solar cells tend to have a bluish hue to them due to the light reflecting off the silicon fragments in the cell in a different way than it reflects off a pure monocrystalline silicon wafer.

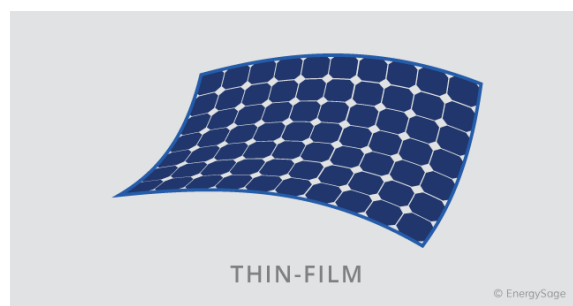
Similarly to monocrystalline, polycrystalline panels have different colours for back sheets and frames. Most often, the frames of polycrystalline panels are silver, and the back sheets are either silver or white.



Some modern Polycrystalline panels are now manufactured to perform almost as well as the monocrystalline panels ... almost.

Thin-film solar panels

The biggest differentiating aesthetic factor when it comes to thin-film solar panels is how thin and low-profile the technology is. As their name suggests, thin-film panels are often slimmer than other panel types. This is because the cells within the panels are roughly 350 times thinner than the crystalline wafers used in monocrystalline and polycrystalline solar panels.



It's important to keep in mind that while the thin-film cells themselves may be much thinner than traditional solar cells, an entire thin-film panel may be similar in thickness to a monocrystalline or polycrystalline solar panel if it includes a thick frame. There are adhesive thin-film solar panels that lie as-close-as-possible to the surface of a roof, but there are more durable thin-film panels that have frames up to 50 millimetres thick.

As far as colour goes, thin-film solar panels can come in both blue and black hues, depending on what they're made from.

Monocrystalline and polycrystalline solar panels

Of all panel types, monocrystalline typically have the highest efficiencies and power capacity. Monocrystalline solar panels can reach efficiencies higher than 20%, while polycrystalline solar panels usually have efficiencies between 15 - 17%.

Monocrystalline solar panels tend to generate more power than other types of panels not only because of their efficiency but because they have come in higher wattage modules as well. Most monocrystalline solar panels come with more than 300 watts (W) of power capacity, some now even exceeding 400 W. Polycrystalline solar panels, on the other hand, tend to have lower wattages.

This doesn't mean that monocrystalline and polycrystalline solar panels aren't physically the same size both types of solar panels tend to come with 60 silicon cells each, with 72 or 96 cell variants (usually for large-scale installations). But even with the same number of cells, monocrystalline panels are capable of producing more electricity.

Thin-film solar panels

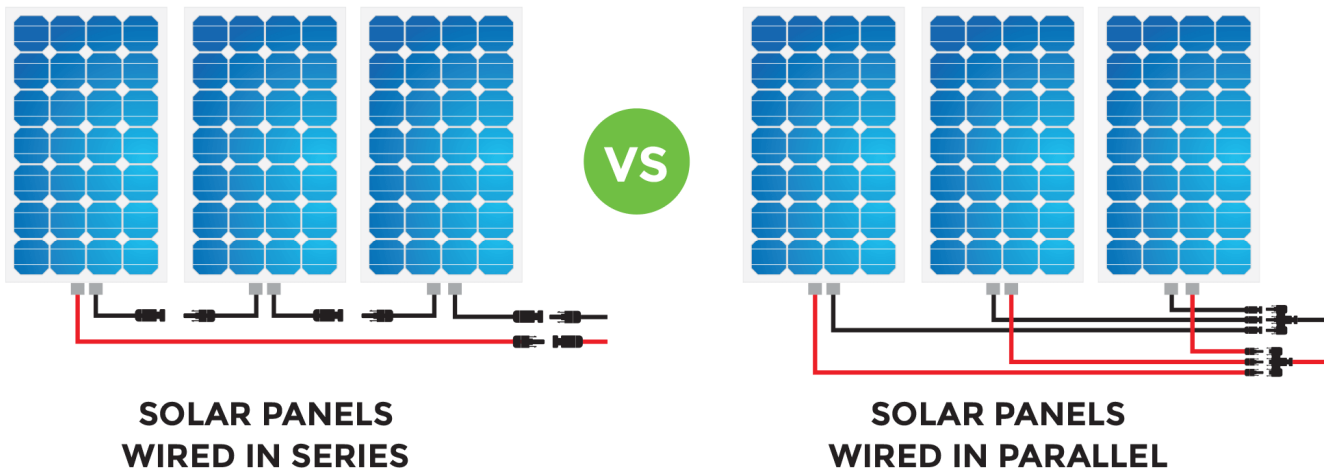
Thin-film solar panels tend to have lower efficiencies and power capacities than monocrystalline or polycrystalline varieties. Efficiencies will vary based on the specific material used in the cells, but they usually have efficiencies closer to 11%.

Unlike monocrystalline and polycrystalline solar panels that come in standardized 60, 72 and 96 cell variants, thin-film technology does not come in uniform sizes. As such, the power capacity from one thin-film panel to another will largely depend on its physical size. Generally speaking, the power capacity per square foot of monocrystalline or polycrystalline solar panels will exceed thin-film panel technology.

In Parallel or series?

Logic would dictate that panels would be installed in parallel (once the battery voltage is exceeded) to allow the highest currents, and in the case of a PWM controller, this is universally true, MPPT controllers however can take advantage of higher voltages to charge a system longer. So if the two panels are in series, the controller will get voltage to charge the battery early and maintain it later, allowing for a longer charge period... Better Right?





If the panels are the same size - then yes, Maybe ... but if they are not the same size, then don't do it, the smaller panel will only drag the larger panel down.

The answer, however, gets a little more complicated, and it's not only about the panels, but also the light on them is equal. If the illumination on the panels is equal, then raising the voltage, and passing the current through both panels will mean a longer charge time, but with less current at the peak of the charge cycle. this may in some cases mean better battery charging. But if one panel is in shadow, while the other is in light, then the lack of electrons in the dark panel, will make it resistive. This will limit the current, and prevent charging. For this reason, fixed installations are normally where panels in series are considered, while mobile or transportable structures tend to stick to panels in parallel.

Or just get a single larger panel. with the right size wiring and connectors from day 1... and don't forget the connector must also be able to handle the higher current too.

Not just any panel will do it, No matter who puts a brand name on it.

It might recharge a flat battery in a week, But it will maintain a battery in a lockdown

I hope you're remembering to keep your car battery charged while it's parked up.





So what size solar array will I need for my battery?

Let's assume that we have a 100 Amp Hour battery, and we have discharged it to a safe 50% level (see last months article on Peukerts law to see how this can be calculated), we would assume that we would need to deliver 50 amps in 1 hour (not smart) or 1 amp for 50 hours, or some balance in between.

We have to consider the worst-case (solstice), which for most of NZ of 8 Hours and 35 minutes of light, but the panels will not normally track to the sun, so we assume a safe time of 6 charging hours. We need to find the current for a 6-hour recharge

First, we need to adjust the battery size to compensate for the internal resistance, A rule of thumb is 20% so $100\text{Ah} + 20\%$ gives us 120Amp Hours for the calculation of charge current

If we charged at 5 amps, getting to 120Ah would take 24 hours, so 50% would take 12 hours

IF we charged at 10 amps, getting to 120Ah would take 12 hours, so 50% would take 6 hours, So our solar panels will need to deliver 10 amps to the batteries. If the panels deliver a full load voltage of 18 Volts, then we would need 180 Watts of solar to 50% charge a 100Amp Hour Battery. It would take a minimum of 360 watts of solar panels to fully charge the one battery from 100% discharge.

Adding more battery capacity will not change these calculations, as the parallel batteries would discharge to a lower percentage and having more solar available will not overcharge the battery as the controller will manage this. And since the electrochemistry of tan LED and a Solar Panel are very close, they prevent reverse direction current discharging the battery into the solar panel. But if the load increased, then the panel size must also be increased to cope.

Hopefully, this will be of benefit to someone, and maybe next month we might move away from batteries to another topic.

But until then 73

SEEN OR HEARD AROUND THE SCENES

SILENT KEY

Dear All,

It is with great sadness I have to report the passing of Ann Walker, ZL1BFB.

As most of you know, Ann was the absolute rock of the Memorial Radio Station at Musick Point, driving across town nearly every Wednesday and many Sundays, since the station closed in 1993.

Ann and her late husband Ian were founders of the Club when Ian retired as radio Inspector in 1993, and she was no stranger to the Station well before it closed. She said herself on the occasion of her last visit, that Musick Point was 'her life'. Indeed it has been, and we are all in her debt.

Farewell Ann, you will be sorely missed. Our sympathies go out to her family in Auckland and Australia.

Here is a link to the facebook page the family have set up for Ann. You can post your tribute there, it is a public page.

<https://www.facebook.com/groups/353404696264737/?ref=share>

There is to be an on-line “Zoom” funeral for Ann on Tuesday 31 August commencing at 3PM New Zealand time. The link below gives the details and the Zoom link.

<https://sites.google.com/view/annveronicawalker/>

73 to all.

Martyn Seay ZL3CK

WELCOME BACK BORIS,

Nice to hear ZL1TBE is back on the repeaters, let's hope you don't have any more issues for a while and enjoy the hobby with plenty of contacts.

We should all be able to follow his lead and get something up and running



LED MATERIAL SHINES UNDER STRAIN

Smartphones, laptops, and lighting applications rely on light-emitting diodes (LEDs) to shine bright. But the brighter these LED technologies shine, the more inefficient they become, releasing more energy as heat instead of light.

But a team led by researchers at Lawrence Berkeley National Laboratory (Berkeley Lab) and UC Berkeley has demonstrated an approach for achieving near 100% light-emission efficiency at all brightness levels, A figure that would bring an LED light from around 30% to closer to 50% conversion of electricity to light.



Their approach focuses on stretching or compressing a thin semiconductor film in a way that favourably changes its electronic structure.

The team identified just how the semiconductor's electronic structure dictated interaction among the energetic particles within the material. Those particles sometimes collide and annihilate each other, losing energy as heat instead of emitting light in the process. Changing the material's electronic structure reduced the likelihood of annihilation and led to a near-perfect conversion of energy to light, even at high brightness.

The Berkeley team's discovery was made using a single, 3-atom-thick layer of a type of semiconductor material, called a transition metal dichalcogenide, that was subjected to mechanical strain. These thin materials have a unique crystal structure that gives rise to unique electronic and optical properties: When their atoms are excited either by passing an electric current or shining light, energetic particles called excitons are created.

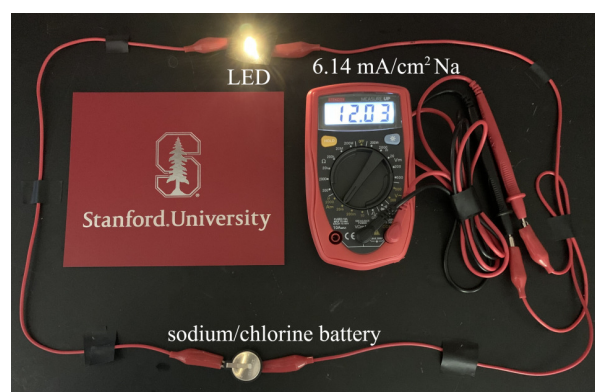
Excitons can release their energy either by emitting light or heat. The efficiency with which excitons emit light as opposed to heat is an important metric that determines the ultimate performance of LEDs. But achieving high performance requires precisely the right conditions.

Future work by the Berkeley Lab team will focus on using the material to fabricate actual LED devices for further testing of the technology's high efficiency under increasing brightness.

RESEARCHERS MAKE RECHARGEABLE BATTERIES THAT STORE SIX TIMES MORE CHARGE

An international team of researchers led by Stanford University have developed rechargeable batteries that can store up to six times more charge than ones that are currently commercially available.

The advance, detailed in a new paper published Aug. 25 in the journal *Nature*, could accelerate the use of rechargeable batteries and puts battery researchers one step closer toward achieving two top stated goals of their field: creating a high-performance rechargeable battery that could enable cellphones to be charged only once a week instead of daily and electric vehicles that can travel six times farther without a recharge.



The new so-called alkali metal-chlorine batteries, developed by a team of researchers led by Stanford chemistry Professor Hongjie Dai and doctoral candidate Guanzhou Zhu, relies on the back-and-forth chemical conversion of sodium chloride (Na/Cl_2) or lithium chloride (Li/Cl_2) to chlorine.

When electrons travel from one side of a rechargeable battery to the other, recharging reverts the chemistry back to its original state to await another use.

The reason no one had yet created a high-performance rechargeable sodium-chlorine or lithium-chlorine battery is that chlorine is too reactive and challenging to convert back to a chloride molecule with high efficiency. In the few cases where others were able to achieve a certain degree of rechargeability, the battery performance proved poor.

The big breakthrough came when the team formed the electrode using an advanced porous carbon material. The carbon material has a nanosphere structure filled with many ultra-tiny pores. In practice, these hollow spheres act like a sponge, sopping up copious amounts of otherwise touchy chlorine molecules and storing them for later conversion to salt inside the micropores.

"The chlorine molecule is being trapped and protected in the tiny pores of the carbon nanospheres when the battery is charged," Zhu explained. "Then, when the battery needs to be drained or discharged, we can discharge the battery and convert chlorine to make NaCl —table salt—and repeat this process over many cycles. We can cycle up to 200 times currently and there's still room for improvement."

The result is a step toward the brass ring of battery design—high energy density. The researchers have so far achieved 1,200 milliamp hours per gram of positive electrode material, while the capacity of a commercial lithium-ion battery today is up to 200 milliamp hours per gram. "Ours has at least six times higher in terms of capacity," Zhu said.

The researchers envision their batteries one day being used in situations where frequent recharging is not practical or desirable, such as in satellites or remote sensors. Many otherwise usable satellites are now floating in orbit, obsolete due to their dead batteries. Future satellites equipped with long-lived rechargeable batteries could be fitted with solar chargers, extending their usefulness many times over.

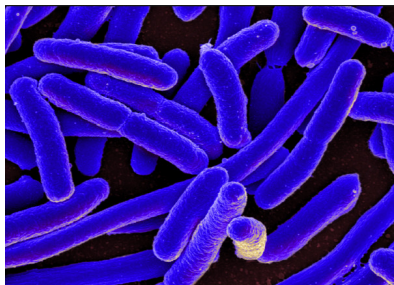
For now, though, the working prototype they've developed might still be suitable for use in small everyday electronics like hearing aids or remote controls. For consumer electronics or electrical vehicles, much more work remains to engineer the battery structure, increase the energy density, scale up the batteries and increase the number of cycles.

BACTERIA MIGHT RECOVER PRECIOUS METALS FROM OLD BATTERIES FOR USE IN NEW ONES

Many countries have shifted to promoting electric vehicles (EVs) as an alternative to fossil-fuel-powered vehicles. However, the production of batteries for these EVs requires the use of precious metals, the mining operations for which are thought to cause serious harm to the environment. In response to this, a scientist has put forward the use of bacteria to recover precious metals from used batteries.

Coventry University researcher Sebastien Farnaud is proposing that bioleaching, a process that utilizes microbes that oxidize metal as part of their metabolism, can be used to recover these precious metals. He points out that the method, also known as biomining, has been used for decades in the mining industry to extract valuable metals from ores.

He added that bioleaching had been utilized in recent times to clean up and recover materials from electronic waste such as solar panels and printed circuit boards of computers. Bioleaching also saw use in materials recovery in contaminated water and uranium dumps.



The researcher elaborated that most recycled batteries end up being melted have their metals extracted. However, Farnaud noted that not all of the metals used in manufacturing the batteries are recovered. Battery recycling was often done in large commercial facilities that are expensive to build and operate. These facilities also necessitated the use of sophisticated equipment to treat the harmful emissions from the smelting process.

Farnaud ultimately concluded: “Rather than remaining an afterthought, recycling can become both the beginning and end of an EV battery’s life cycle with bioleaching, producing high-quality raw materials for new batteries at a low environmental cost.”

Of course, the next step is to find the bacteria that can recover lithium. The one metal that cannot yet be recovered. Lithium is an essential component of EV batteries, but it cannot be found everywhere. Most of the world’s lithium lies under the Atacama Desert in the South American nation of Chile. However, lithium mining driven by EV demand threatens the local people and ecosystems.

Aside from land-based mining, deep-sea lithium is also an option – but not without its risks. Mining for this precious metal underwater could also damage deep-sea ecosystems. Thus, EV makers now have to find a reliable source for their raw materials and keep import costs low at the same time.

On the other hand, electronic waste rich in precious metals is piling up at landfills in some of the world’s poorest regions. This is set to increase as 2.5 million tons of this kind of waste are added with each passing year. Farnaud puts forward a challenge: “Instead of mining new sources of these metals, why not reuse what’s already out there?”



There are 10 times more bacterial cells than human cells in my body.



When I reflect on this, I have an identity crisis.



But then I realize if there are more bacteria than there are of me, my problems are really their problems.



So I let them deal with it. _____



SOME NETS – FOR WHEN YOU ARE LOOKING FOR SOME COMPANY

Day	Time (Local)	Freq (MHz)	Group
Sunday	08:00	3.750	Southern Net
	09:00	3.700	Bch 10. Franklin.
	09:00	3.755	Bch 65. Papakura.
	16:00	7.125	SPAM Net (AM Mode)
	19:00	146.625	YL Net
	20:00	3.710	Bch 42. Titahi Bay
	21:30	3.595	Duran WIA Net.
Monday	19:30	3.757	Bch 12. Hamilton
	20:00	3.540	CW Practice Net
	<i>updated</i> 20:00	3.605	Br 80. Hibiscus Coast
	<i>updated</i> 20:00	Nat System	W.A.R.O
	20:30	3.870	O.T.C (Old Timers Club)
Tuesday	09:00	7.096	Ex Post Office Techs
	21:00	1.850	160m Net _ Ron ZL4JMF
	19:30	3.690	QRP ZL2BH
	20:00	3.581	CW improvers Net
Wednesday	20:00	3.660	Geek Net
	20:00	3.645	Bch 02. Auckland
	20:00	3.745	Bch 84. Bay of Islands
	20:30	146.525	W.R.S.C
Thursday	09:00	7.096	Ex Post Office Techs
	19:30	3.690	QRP ZL2BH
	20:00	3.540	CW Practice Net
	20:00	3.615	Bch 89. REG Net
	20:30	3.696	ZL10A
	20:30	3.666	LF Net ZL2CA
	20:00	3.690	ZL QRP SSB Net
Friday	20:00	3.850	SPAM (AM Mode)
	20:30	3.650	W.S.R.C.
	20:30	3.560	Digital Modes Net
Saturday	10:30	28.530	10-10 Down Under
	19:30	3.650	Christian Fellowship
	20:00	3.760	???
	20:30	3.600	Ch 62. Reefton/Buller
Daily or Other	07:30	3.696	ZL20A
	08:30	3.730	ZL3RP
	15:00	14.300	Pacific Seafarers
	17:30	3.760	Home Brew
	05:00 Zulu	14.183	ANZA DX Net
	18:00	7.115	VK7OB
	19:30	3.720	ZL1MO
	18:30	3.766	ZL3LE
	08:30/20:00	3.730	ZL3RP
	20:30	3.725	ZL2HN / ZL4RF
	21:00	3.677	Counties Net ZL2MA
	21:00	3.535	New Zealand Net (CW)

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

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

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

Papakura Radio Club Inc.
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Westpac 03-0399-0019896-00
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Club email: zl1vk.club@gmail.com

Elected Officers

President	ZL1NUX	Gavin Denby	021 459 192
Vice President	ZL1BNQ	Richard Gamble	021 729 270
Secretary	ZL1AOX	Ian Ashley	021 198 1810
Treasurer	ZL1MR	David Wilkins	021 185 7903
Committee	ZL1RJS	Rob Stokes	021 307 005
	ZL1IRC	Ian Clifford	021 082 48400
	ZL1ASN	Rolly Adams	021 042 7760
	ZL1DK	David Karrasch	021 560 180
	ZL1RIC	Ricky Hodge	027 533 8155
AREC Section Leader	ZL1BNQ	Richard Gamble	021 729 270
CD Liaison	ZL1AOX	Ian Ashley	021 198 1810
Newsletter Editor	ZL1NUX	Gavin Denby	021 459 192
Hall Custodian	ZL1AOX	Ian Ashley	021 198 1810
Newsletter.	Contact: zl1nux@outlook.com		

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

Meetings

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

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

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

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

AREC Meetings are on the 5th Wednesday night, also starting at 7.30 pm

AGM: Held in November

Subscription: Full membership and newsletter \$25.00

Family Membership and newsletter \$40.00

Bank Account number: 03-0399-0019896-00

Working Bees As required.

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

ZL1VK Club Nets

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

3.755 MHz Sunday at 9.15 am. Controller ZL1BNQ Richard Gamble. (Linked to 146.675 & 438.775)