



GATEWAY

The Official Magazine of the Gippsland Gate Radio & Electronics Club Inc.

February 2013 From The President

At the February general meeting, Paul VK3TGX will be giving a talk about Slow Scan Television. This is a simple way to use your HF or VHF radio to send and receive still images.

Our Hamfest Sale preparations have now begun, thanks to Wayne VK3ZWC who is our Hamfest coordinator, this year. Table bookings are underway, and some advertising will be done soon. The date for the Hamfest is the 20th of July. Tables book up fast so don't leave it too late. If you are able to help out on the day, please make this known to Wayne at the next meeting.

At the last meeting approval was made by the members to proceed with the redevelopment of VK3RWD, the Warragul-Drouin 70cm repeater. This is a big project that will involve many members. For a repeater to work well there must be good integration between several technical areas. Antennas, towers, receivers, transmitters, filters and microprocessors.



Those in the Club who wish to become involved are going to learn much about these topics. Albert VK3BQO is coordinating this effort and by the time you have read this, the first development meeting has already taken place.

Last Prac night Albert also gave an in-depth lecture about circuit board design using the freely available Design Spark software.

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Event Queue from January 2013

February 15th – Friday Night. General Meeting at the Guide Hall
2000 hrs Slow Scan TV.

March 1st – Friday Night. Prac Night - Peter Pavey Clubrooms
From 1930 hrs come & socialise have a chin wag or a QSO

March 8th – Friday Night. Committee Meeting

March 9th to 11th – Friday Night. Scoresby Steam Festival EMDRC
see www.emdrc.com.au for information

March 15th – Friday Night. General Meeting at the Guide Hall
2000 hrs Talk to be announced.

April 5th – Friday Night. Prac Night - Peter Pavey Clubrooms
From 1930 hrs come & socialise have a chin wag or a QSO

April 19th – Friday Night. General Meeting at the Guide Hall
2000 hrs Talk to be announced.

...Cont from 1 About 12 members attended this talk. If you have a circuit that you would like to turn into a tidy project, give it a go.

Ideas for the Club operation don't just come from the committee. If you have any thoughts about the sorts of activities and training that you would like to see being organised, please come forward with your suggestions. We have a proposal for an antenna field weekend later in the year that is being considered soon. More information will come out about this as we get closer to the event. I'm looking forward to seeing you all at the February Meeting.

Dianne Jackson VK3JDI

VK3RWD repeater project.

With 16 members in attendance, the first meeting of the RWD repeater rebuild group kicked off at the Peter Pavey Clubrooms on the evening of Friday 8th February. Obviously with the amount of interest shown, there was much discussion regarding where, when and how the new repeater was to be built and commissioned.

An offer of equipment from a sister club may mean less work for the project but there will still be lots to build and learn for participants. Some decisions were made whereas others will need to wait until investigations have concluded.

The repeater will operate on RX 433.575 and TX 438.575 MHz will have a 91.5 Hz CTCSS tone to access and probably transmit around 50 watts into a stacked side mount folded dipole array on a mast to be installed by and at Graeme (VK3BXG's) QTH in Drouin.

Other decisions made at the meeting were; that the controller will be as per the VK3RDD system which includes some telemetry and remote control functions along with battery backup and shut down on errors features. Updates will appear in the magazine as things progress. It was great to see such a large interested group.

Albert VK3BQQ

Quiz from ARRL

If there is a unit of measurement beyond volts and amps nearly ubiquitous in ham radio, it would have to be our friend, dB. are you ready?

- 1) What is represented by a negative value of dB?
 - a. Power gain
 - b. Oscillation
 - c. Power loss
 - d. Ratios of imaginary numbers

- 2) What is the reference value for calculating dBW?
 - a. 1 Ohm
 - b. 1 mW
 - c. 1 W
 - d. 1 V

- 3) Which of the following can be used to specify a receiver's noise floor?
 - a. dBuV
 - b. dBV
 - c. dBm
 - d. any of those choices

- 4) What is the abbreviation for "natural logarithms"?
 - a. Ln
 - b. Log(n)
 - c. Ll
 - d. Lnat

- 5) Which of the following represents a power level of 1500 W?
 - a. 1.5 dBm
 - b. 1500 dBW
 - c. 3.1 dBW
 - d. 61.8 dBm

- 6) What must always be included when stating a value of antenna gain?
 - a. Ground conductivity
 - b. Reference antenna gain
 - c. Feed line loss
 - d. Front-to-side ratio

7) If 10 is the base used to calculate log values for dB, what is the base for natural logarithms?

- a. e
- b. π
- c. Boltzmann's constant
- d. Avogadro's number

8) Which is larger: 10 dBm or -30 dBW?

- a. 10 dBm
- b. -30 dBW
- c. They are equal
- d. These two values are not directly comparable

9) Which of the following is another way of expressing SWR?

- a. Nepers
- b. h parameters
- c. ERP
- d. Return Loss

10) When making power comparisons in dB between signal levels measured in volts, what must be kept the same for all measurements?

- a. Current
- b. Frequency
- c. Impedance
- d. Resolution

Bonus Question: The dB is named for what famous inventor?



Answers: 1 C, 2 C, 3 D, 4 A, 5 D, 6 B, 7 A, 8 A, 9 D, 10 C, Bonus -The Bel , a unit of sound intensity -- is named for Alexander Graham Bell who invented the first practical telephone.

Do you have the power?

No this is not a motivational chat, it is just a comment on recent observations about AC power access to the home. My work has required me to examine the power infrastructure in places where there are serious issues affecting the types of electrical equipment that can be used in the home and why sometimes it is not good enough.

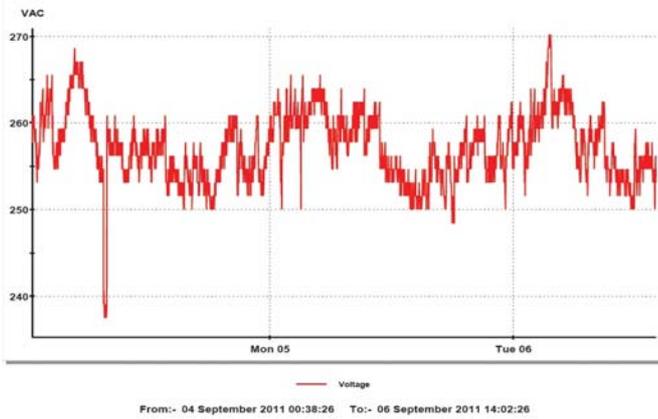
VOLTAGE MEASUREMENTS

Originally our AC supply was 240V nominal, with +6% and -10% tolerance, which meant we should have voltage up to 254V and down to 216V. If it was frequently outside that range at the home, there were legitimate grounds for complaint. About 2002 the nominal voltage was changed from 240V down to 230V to help bring us into line with international standards, however, (surprise, surprise!) the tolerances also changed at the same time. They are now +10% and -6%, or 253V and 216V. So this meant that nothing really changed. If you were to put some meter probes into a power point, you still ought to read around 240V most of the time.

Lots of places don't have this pretty power supply at their house. Many homes are running over voltage and don't notice it. Or perhaps they do notice it in other ways. Do light globes last only a few months instead of a few years? Has a heating element in an oven or cooktop died after only a year or so of use? These can be symptoms that the mains is too high. It will bounce around quite a lot throughout the day, but at night, it may climb to 260V-270V in some places. Lots of appliances around the home will die at these levels. Switchmode power supplies in PC's and TV's don't like it. Capacitors dry out from the extra heat losses causing them to fail one day after they fall out of warranty. Most appliances now have protective MOV's in them (Metal Oxide Varistors) which absorb energy at 275V+. These go bang if the volts are too high. (they literally sound like handguns going off. Very exciting)

To try and get to the bottom of this issue I modified some data-loggers designed for measuring temperature in freight. I replaced the thermistor with a simple interface that can connect to the AC supply at only a couple of milliamps. Once primed via a USB port on a PC, the logger is left inside a power outlet for a week or so. It can take samples each minute for 11 days, then returned to a PC to generate a graph showing exactly what has been going on.





The image (left) shows a segment of a recording session taken at Philip Island last year where the mains bounced between 250 and 270V. The data logger tells a vivid story. Note the brief dip to 240 volts. This site had a generator which ran for 20 minutes on Sunday mornings as a test. At least it was generating the right voltage.

Where the voltage is consistently over the 253V threshold, you can report this as a fault to your power provider. But be warned, if you just ring up the company, they can come around and pop some probes in your outlet during the afternoon when volts are low, then tell you that there is no problem and charge a few hundred dollars for the callout.

I made up a couple of these data logger units which I have occasionally posted around Australia to different clients. This has provided the essential proof for power companies to take notice. In the case of the Phillip Island reading, the complaint worked and the Power Company shifted a voltage tapping at a nearby transformer to bring the voltage down to a safer value.

Why is the voltage so high? Well there are two reasons...an obvious one and a conspiratorial one. Firstly, they like to guard against low voltage situations, so they plot the worst-case voltage drop at the worst time of day and try to set that level to around 240V. This has the side-effect that at other times of the day, particularly at night, where there is little cooking and industrial activity, the voltage can rise to absurd levels and shorten the life of your lighting and your appliances. The second reason is money. Say motors and lighting at a given location draw an average of 10kw. When the mains is lifted to 260V, they are charging you for 11.3Kw instead. That's 13% extra trade for no effort by the power company. They may deny this is the reason, but they would hardly be disappointed in selling all that extra power.

(I still keep a couple of these voltage monitors around. If any GGREC members think they have problems, let me know and perhaps I can help with a log session.)

POWER LINE RESISTANCE

There will always be some resistance between your appliances and the power station. Most of this will be between your house and the transformer on the power pole nearby. Beyond the local transformer line voltages are much higher, so the effects of line resistance are greatly reduced. We are fortunate in Australia in that our infrastructure means we have many pole transformers, close to our homes to help reduce losses.

Take a look at this link taken by a friend to see what power infrastructure is like in Vietnam : http://www.youtube.com/watch?v=rYzsGl_ls-g It will increase your appreciation for what we have here)

The resistance generally comes from thin cables, or long cables, or long-thin cables (duh) from the pole to your power outlet. If you are not drawing much power, the voltage may be fine, but as soon as you place a large load on the circuit, you can drop a lot of voltage across this resistance. Light globes will dim, electric motors may not start. Cables will get warm from energy that you are paying for. Essentially, low resistance is good, high resistance is bad. There will be a certain resistance in the line from the pole to your switchboard, then more resistance from the switchboard to your power outlets. It became topical when some people wanted to run some machinery like a lathe or air compressor in their garage, but found that it would not work. It can be hard to convince people that the problem is not in the equipment, but in their cables. I built a test box to resolve this issue and it has become a useful tool.

This box has an AVR microprocessor, an LCD display and a couple of electric kettle elements. When you plug this into a power outlet and turn it on, it takes a voltage reading, then activates 3.8kw of heating elements for 1 second and measures line voltage again. The display then shows both the loaded and unloaded values. The voltage drop shows how good the power is at the present location and acts as a guide on what loads are possible. If you are close to your electrical switchboard, the power could be good and it may only record a drop of 5-6 Volts. After shifting the tester to the far end of the house, or to the garage and it is not uncommon to see a 20V drop! The display also shows 5 letters which is an encrypted version of the same information. This is present so that if the unit is sent away and somebody is reading display values to you remotely, they can't bullshit with falsely favourable readings.



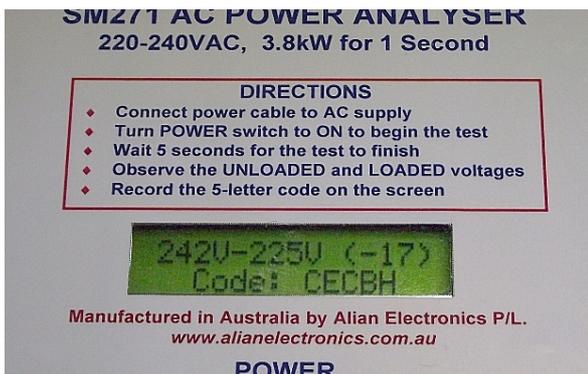
It is possible to plug these values into a calculator to provide an Effective Series Resistance measurement in ohms. The lower the ohms value, the better the supply quality.

For this tester, this is the formula for calculating total power line resistance:

$$ZX = (\text{Unloaded voltage} - \text{Loaded voltage}) / (3800 / \text{Loaded voltage})$$

By moving the tester to different locations around a property, you can work out where the closest good quality cable is and work out what may be needed to perform a cabling upgrade.

At least then it is easier to show a client what is happening, so they don't suspect you want to do a \$3000 cable upgrade only because you want to own a bigger boat.



Ok, so perhaps you are part of a minority who will never want run a welder or air compressor in your bedroom, and you never look at the brightness surge of your lounge room lighting to let you know when your kitchen kettle has boiled and clicked off. There are other reasons why power line resistance can affect you.

Lots of people now have Solar Panels on their roof and a matching grid connect inverter. The voltage drop issues described here can have an effect upon your household voltages on a sunny day in the reverse direction. The inverters perfectly synchronise to the mains frequency ok, but like a battery charger, your home inverter can't make energy flow into the grid without applying a voltage that is slightly higher than the grid. So if you have a long cable to the house and the tester says you are going to drop 15 Volts when you consume 3.8kw, then when your inverter tries to shove 3-4kw of energy the other way, it stands to reason that it must lift the voltage of your switchboard by about 15 Volts to achieve the reverse flow. If the mains voltage at the pole is already quite high, say 260V (because your neighbours have inverters too) then your inverter may ratchet your switchboard up to 275V.

Where pole transformers are small and supply cables are long, this is proving to be a big headache for the power companies, because some inverters are burning out on sunny days. They are putting the rest of your domestic appliances at risk too. Because you 'own' the inverter, property damage bills cannot be passed on to the power companies.

So it is easy to be blasé about your home infrastructure, but there is a lot going on, some of these effects are only just beginning to surface. It is a legal minefield too. Even if you don't have a solar array, if you get over-voltage damage in your house, power companies may shrug and say, "Not our fault. If you want to pursue damages, make a civil claim against your neighbours with solar inverters". Without definitive information, it can be impossible to prove who is at fault, with very expensive damages that must be paid by someone.

If not understanding the technology frightens you, then understanding it better can make you feel even worse. Just thinking about it makes me want to move to the back of a cave and put a blanket over my head.

Have a nice day.

Ian VK3BUF

Solar Strom wipes out 15-10 meter Bands

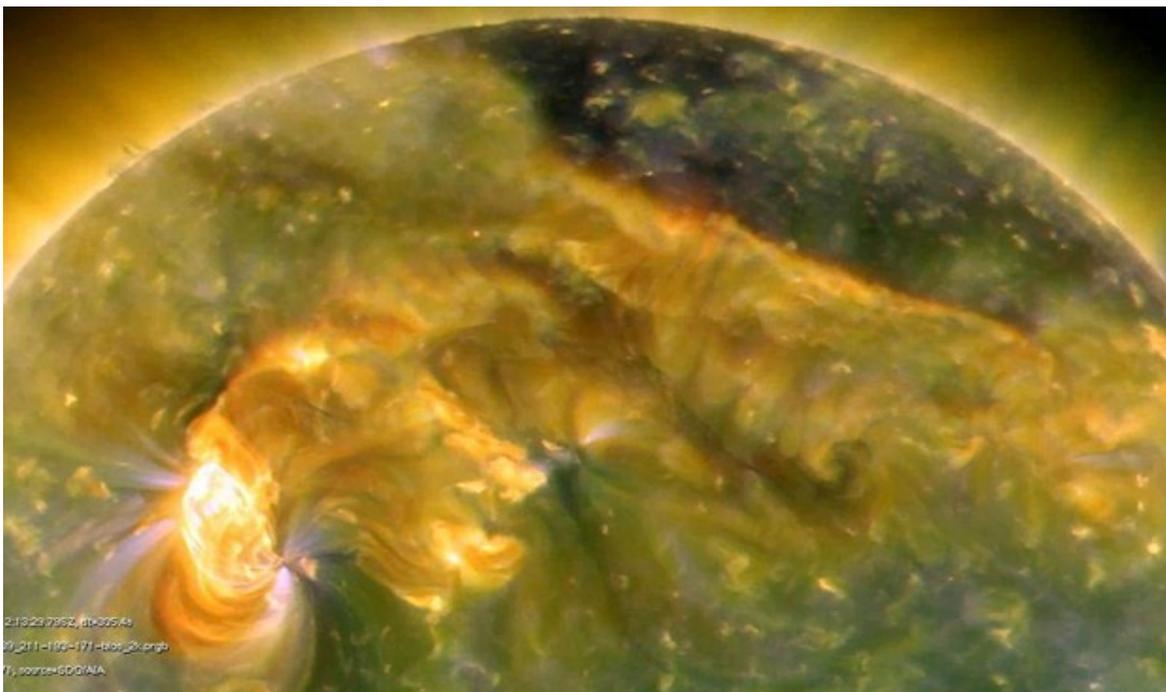
On 2 February a spot on the sun erupted into a solar flare that was particularly loud with RF, with a roaring sound it completely drowned out radio communication on the Earth between 21 MHz and 28 MHz.

When amateur radio astronomer Thomas Ashcraft, who works with Nasa's [Radio JOVE project](#) listened to a recording of it he said, "It's interesting to hear the voices get swallowed up as the solar wave passes through."

The sun is entering a period of high activity as it enters the solar maximum, the peak of an 11-year solar cycle. The Sun has been relatively quiet for the last few months, producing few large solar flares or coronal mass ejections - which occur when the sun throws off charged particles at millions of kilometres per hour.

The radio burst that happened on 2 February accelerated electrons to high energies. This electron stream created plasma and radio waves in the sun's atmosphere, which travelled to Earth and disrupted some communications. The event was a fairly good-sized surge.

We have seen a few this year that were larger, but this one was still quite strong. Of course, the events of the recent solar cycle are entirely dwarfed by certain past solar outbursts, like the 1859 Carrington event, which caused widespread havoc and even set telegraph stations on fire.



General Meeting of 18th January 2013

Location:	Guide Hall Cranbourne
Start Time:	Meeting commenced at 2010
Chairperson:	President Dianne VK3JDI
Minutes taken:	Secretary VK3BXG
Present and Guests:	As per attendance sheet.
Apologies:	As per attendance sheet
New Callsign:	Leigh VK3FACB

Correspondence received:

A.R Magazine, EMDRC news letter, Wansarc news e-mail link, Nerg news e-mail link, WIA Eastern Zone regarding the VK3RWD acquisition.

Correspondence out:

Hand delivered to WIA Eastern Zone regarding the GGREC request for VK3RWD repeater.

Cranbourne Hall committee to request the hall hire for 20th July 2013. Telephone call to Hall Committee confirming the hall hire for 20th July.

Treasurers Report:

Income total \$442.61, expenses total \$562.26 loss of \$119.65.

Bendigo Investment account \$9221.31, Bendigo cheque account \$3400.23, quick books \$2629.76 difference being unrepresented cheques.

Moved Ian, VK3BUF, seconded Leigh VK3FACB, all in favour, carried.

Minutes from September general meeting:

as per January Gateways, moved Dianne VK3JDI. All in favour.

Business from the Previous Minutes.

Non executive committee members list is now up on the web-site Dianne VK3JDI reports.

Hamfest Date confirmation is Saturday 20th July 2013 Dianne VK3JDI reports.

The Six meter rig is now tested and working properly and will be put back into service at the club shack, Dianne VK3JDI reports and will power up with the shack power.

French Island tour as a day tour for members was proposed by Dianne VK3JDI. Cost would be \$50 per head for any interested member to see Pat VK3OZ.

Disposal of the tilt-over mast, Dianne VK3JDI reports than a mention was placed in the January club magazine for mention for disposal. Dianne proposed that it be put up for sale; – all in favour by unanimous decision. At the February general meeting it will go to the highest tender. An offer of \$50 has already been placed.

Secretary name-change notice proposal has been given two clear months. Ian VK3BUF spoke regarding the new Corporate Affairs regulations requiring the

organisation's secretary also to be their public officer. This would mean a constant change in our public officer if it followed this rule.

Ian's proposal now was that the public officer to be known as, or name change to "secretary" and the secretary name change to become the "Administration-secretary". Agreement was unanimous.

[VK3RWD repeater](#) licence transfer Albert [VK3BQO](#) spoke at length on his feasibility study of the project but stated that it must go to the members for a majority vote, firstly if the members want the repeater and are prepared to work on it, and secondly by a majority agreement to spend the money to reinstall it. A maximum of \$2,000 is estimated is all that will be needed. Albert [VK3BQO](#) proposed that \$2,000 be made available for the [VK3RWD](#) repeater. Seconded Michael [VK3GHM](#), all in favour, carried.

A sub-committee will need to be formed Albert reports and suggested to meet every second Friday every second month – that is February, April June. Those interested to be on the sub-committee are invited to send their interest to repeaters@ggrec.org.au.

New Business.

[Hamfest](#) date and venue have been fixed for this year and a coordinator is needed Dianne [VK3JDI](#) reports. Although absent this evening, I reported that Wayne [VK3ZWC](#) had expressed an interest.

[AGM](#), Dianne [VK3JDI](#) reports she and Ian [VK3BUF](#) will be away for the AGM. Dianne will be retiring as president but Ian will accept nominations to do another year as treasurer and reports that the books will be closed a week earlier this year.

[Foundation Course](#), I [VK3BXC](#) reported was going to be conducted, (tomorrow) Saturday 19th and suggested perhaps I set the first Saturday of each odd month as a course date.

[February talk](#), Dianne [VK3JDI](#) suggested it be on slow scan TV with a demonstration for the general meeting. A speaker will need to be requested. Paul [VK3TGX](#) volunteered.

[Birthday Invitation](#) was extended to all members by Russ [VK3MWR](#) on the occasion of his 80th birthday celebration to be held at the Cuckoo Restaurant at Olinda on 2nd March 2013.

[The Koo Wee Rup plaque](#) Dianne [VK3JDI](#) reports, has been presented to the Koo Wee Rup Historical Society for installation in their museum and some of their members are now interested in trying to locate the exact position of the radio site.

[Kyneton Hamfest](#) Brian [VK3BSN](#) reports will be in February.

Meeting Closed at 2100hrs.

Next Meeting 15th February 2013

Talk on circuit board design by Ian [VK3BUF](#) and Albert [VK3BQO](#).



Club Information

Meetings 2000 on third Friday of the month at the Cranbourne Guide Grant Street Cranbourne, Prac nights first Friday in the Peter Pavey Clubrooms Cranbourne 1930 Visitors are always welcome to attend

Office bearers

President	Dianne Jackson	VK3JDI	Repeater Officer	Albert Hubbard	VK3BQO
Admin Sec	Graeme Brown	VK3BXG	Web Master	Stephen Harding	VK3EGD
Treasurer	Ian Jackson	VK3BUF	Magazine Editor	Mark Clohesy	VK3FWSP
General 1	Michael Van Den Acker	VK3GHM	Property Officer	Bruno Tonizzo	VK3BFT
General 2	Mark Clohesy	VK3FWSP	Secretary	Ian Jackson	VK3BUF

Call in Frequencies, Beacons and Repeaters

- The Club Station **VK3BJA** operates from the Cranbourne Clubrooms.
- 6m Repeater Cockatoo **VK3RDD** : Freq. In **52.575 MHz**, Out **53.575 MHz**
The 6m Repeater requires CTCSS tone access of **91.5 Hz**
- 70cm Repeater Cranbourne **VK3RLP** In **434.475 MHz** Out **439.475 MHz**
The 70cm Repeater requires CTCSS tone access of **123 Hz**
The 70cm Repeater supports Remote Internet access (IRLP) Node **6794**.
 - Simplex VHF - **145.450 MHz FM**
 - Simplex UHF - **438.850 MHz FM**
- **VK3RLP Beacons** **1296.542 MHz** & **2043.532 MHz**

Membership Fee Schedule

Standard Member rate \$37.00 Junior Member rate \$22.00

Pension Member rate \$22.00 Extra Family Member \$17.00

- Fees can be paid by EFT to **BSB 633000** - Account **146016746**.
 - Always identify your EFT payments.
- Membership Fee's Are Due at each April Annual General Meeting.

Magazine Articles to editor@ggrec.org.au or pockets@twistedsouls.com

All other Club correspondence to: secretary@ggrec.org.au

or via Snail Mail : PO Box 1098, Cranbourne 3977

GGREC Web Site & Archive may be viewed at: www.ggrec.org.au

The deadline for magazine items is the Tenth day of each month.

Commercial Advertising is \$10 full A4 Page or \$5 ½ A4 Page per edition

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The Club cannot be held responsible for incorrect information published.