



GATEWAY

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

March 2017



A quiet start

**Arduino Audio
First place to Dianne
Going Solar
And More**

**President's report
- page 3**

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Event Queue

March:

- 17th General Meeting
- 18th-19th John Moyle Memorial Field Day
- 21th Arduino night, 7pm – Note \$4 hall contribution, **To be confirmed**

April:

- 4th Arduino night, 7pm – Note \$4 hall contribution, **To be confirmed**
- 7th Natter Night – Club rooms
- 7th - 9th Antennapalooza - Foster, South Gippsland
- 21st General Meeting

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July:

- 22nd GGREC Hamfest

PRESIDENTS REPORT

Ian Jackson VK3BUF

Before the end of March WIA members are invited to vote for a new Board of Directors. In fact, this should have already happened by now, but the existing Board and the Secretary chose to ignore this valid members call for a meeting to dismiss them.

Fresh candidates for this election have only a scant 250 words to describe who they are and why they should get the job. This is also something of a travesty, as to adequately convey the experience and motivation of a candidate requires at least double that space. This is a contrived strategy that effectively marginalises new candidates for the board.

After two key members of the board had left in disgust, the remainder consists of **Philip Wait, Roger Harrison, Fred Swainston, Robert Broomhead, Ewan McLeod** and assisted by Secretary **James Linton**. Most of these persons are standing again. This is the team that have presided over a WIA that has failed to meet expected levels of governance, allowed financial conflicts of interest to pass unchallenged and have overseen a reduction of nearly 1000 members during their terms. This is not simply an opinion. The five Treasurers and two Directors have quit over the past two years in direct protest of their behaviour substantiate this. It is likely that for the past year the WIA will have to deal with operational losses in excess of \$100,000.

W.C. Fields once wrote that in a democracy, if you don't know who to vote for, then **vote against**. For at this upcoming postal vote for a new Board, I would not presume to tell people who to vote for, but certainly vote **against** the entire team that has plunged the organisation into its present chaos. All WIA members deserve a much higher standard of behaviour and consultation than they have been getting for a very long time.

* * *

The GGREC major field event for the year is coming up early next month. If you want to get into some real Amateur Radio activity, make the trip down to Foster this year. More information about the event is detailed separately further into this edition of Gateway.

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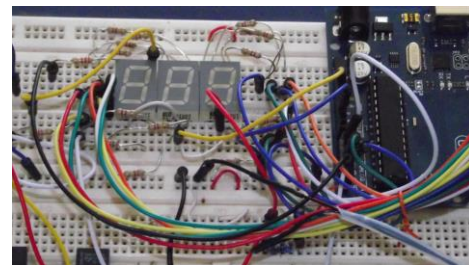
The opportunity to improve the range of the Club's 70 cm repeater VK3RWD looks like becoming a reality. The repeater would move from Graeme VK3BXG's location in Drouin to an area known as 'Seaview', a little east of Mt Worth. At 430 metres above sea level, this would give an awesome boost to the repeaters coverage from West Gippsland to the Eastern parts of Melbourne. It should be great in Cranbourne and coverage should extend south down as far as Philip Island. Graeme is coordinating the planned move. Hopefully we will have more to report next month.



The view to the North from this awesome location

* * *

The Arduino projects have moved into a new phase. On Tuesday nights at the Guide Hall, at roughly two-week intervals we are having round-table sessions (actually large-rectangular) on project developments. It is an opportunity to learn about this powerful method of programming while talking through issues and obstacles that members are working through. Attendance on these nights is \$4 per person, in order to cover hall hire expenses.



* * *

Next month we have our Annual General Meeting where we get to choose five Committee members from a long list of candidates to run our Club for another year. (By long list I really mean that we only have two so far) Please have a think about it and if you have a couple of hours to spare every month or so, we'd love to have your input to keep the GGREC wheels turning. While all positions are available, Graeme, who has been our Treasurer for the past three years will be standing down from that role, so we definitely need someone to fill his shoes. The Club works entirely by volunteer power, so please consider giving it a shot for this year.

* * *

What became of the Rhombic?

At last year's Antennapalooza the high wind shattered a few of the PVC poles we were using as temporary masts on the demonstration Rhombic antenna.

It left a small pile of damaged pipe sections to be disposed of, which Dianne VK3JDI recycled.

This article came out in this week's edition of the Warragul-Drouin gazette.

(They got 'Novice' wrong. Really Di is a Full-Call.)

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First prize for a first sculpture attempt. Dianne Jackson of Drouin won best craft exhibit at the Berwick Show for her PVC pipe alpaca sculpture.

First place for novice Dianne

The inability to locate an alpaca garden sculpture led Drouin resident Dianne Jackson to create her own - and win Berwick Show's best craft exhibit.

Ms Jackson will also join a professional art show.

The alpaca sculpture, created using scrap PVC pipe, was Ms Jackson's first attempt at sculpture. "I made it for fun," she said. "Really it was just chance."

Impressed by metal sculptures at the local art markets, Ms Jackson sought an alpaca garden sculpture to join the real alpacas on her property.

However, she found it an impossible task.

Ms Jackson decided to utilise broken PVC pipe to make her own sculpture.

She cut the pieces to size, scrapped edges and riveted large pieces together before securing the remainder with screws.

The fun project was undertaken at nights and took about two months. "I was so happy with how it turned out, he's just so pretty," said Ms Jackson.

Encouraged by a friend, Ms Jackson entered the Berwick Show and took out the Ian Donaldson Memorial Trophy for best craft exhibit.

"I couldn't believe it," she said. "He won first prize for the category and also won the best overall exhibit. It was just a lovely surprise."

Stopped at a friend's house on their way home from Berwick Show, Ms Jackson was approached by curator of an arts show keen on having the sculpture included.

"To be judged against real artwork from real artists will be a real lot of fun," said Ms Jackson. "It's so nice to be asked to display him."

However, Ms Jackson doesn't harbour any desire to create future alpaca sculptures, stating "I can't imagine me doing any others".



A Message from the Coordinator, Chris VK3QB

Hello members!

Planning for the 2017 Antennapalooza has been quietly chugging away in the background. As many will be aware we're trying a different location this year. The event is just 4 weeks away now, so mark it in your diary (8-9 April).

A local dairy farmer in Foster, South Gippsland has kindly offered us the use of one of his paddocks. It's about 5 acres and provides good camping sites as well as plenty of opportunities for erecting antennas and spreading out. As in previous years we'll have a central pavilion tent for presentations, a basic camp kitchen with a BBQ and tables, a shared fire with loads of firewood and a port-a-loo. We'll arrange fresh drinking water and milk for coffee, but other than that please make sure you bring whatever you'll need, be it a caravan, tent, swag, food etc. There is no access to mains power so please ensure you have adequate 12v power capacity and/or solar panels. If you intend to run a generator please limit its use to day-time hours and be mindful of noise (both ambient and electrical) as part of the theme is to take advantage of the low HF electrical noise in the area. The site is just 4km south of the township of Foster, so its an easy drive to town for supplies or some take-away food.

A little closer to the date, we'll issue an information sheet with the final presentation schedule as well as detailed directions for finding the site. Presentations include portable operation, SOTA and WWFF awards, WIA award system and hopefully some demonstrations on WSPR, including a popular WSPR kit made by club members. It's also great that well known Parks chaser Paul VK5PAS will be making the trip across from Adelaide to join the event. Marc VK3OHM has kindly offered to give an update on his SARK110 (Antenna Analyser) presentation which has been very popular in previous years. Those wishing to activate a SOTA peak can make a fairly short drive to one of three peaks all nearby. Combine that with activating Wilsons Prom National Park just 20 minutes away.

Or simply bunker down at the camp site and catch up with friends, make new friends and discuss whatever radio topics interest you. As in previous years we'll conduct some informal experiments on the Saturday evening.

Come for the weekend or come for a day - it's sure to be a lot of fun and maybe you'll pick up some hints and tips for your own operations. If you have any questions or maybe want to present to the group, please contact me. I look forward to seeing as many members as possible here at Foster next month.

More details can be viewed on the event website: <http://antennapalooza.org.au/>

Very 73,

Chris VK3QB
vk3qb@hotmail.com
0429 187 593

Notice Board

EQUIPMENT SALE

GGREC member Ian Benson VK3KSZ, has some equipment for sale. Some equipment has already been sold following the email, but two interesting items remain

Details are:

Kenwood TM-2570A 2M FM transceiver, approx 50 Watt.

(Good receiver, good TX audio, shown here in 145.450. Great shack rig)
Comes with mobile bracket & original box \$80



Tokyo HL-35 2 Metre band AM/FM/SSB Power Amp \$ 45.00



To buy either of these items, call Ian VK3BUF on 5625 2545 who is assisting in the sale.

HAMFEST

The 2017 GGREC Hamfest Sale will happen this year on Saturday, July 22

If you are interested in setting up a table of your own it is recommended to book early as tables usually finish up in demand.

This year the bookings are being taken by Dianne VK3JDI. Tables must be booked and paid for in advance of the event. You can send an email to Dianne via hamfest@ggrec.org.au or call 5625 2545.

The GGREC Website carries all the latest information on table bookings

Repeaters and Beacons for GGREC

For several years now, the responsibility of overseeing the maintenance and upgrading of the Club's repeaters has fallen into the job description of a position called club "Repeater Officer"; a title which was born out of the major upgrade work which took place a while ago. As the person with this title, I undertook a fair percentage of the physical work and project managed the remainder. I suppose in that role one becomes aware of the requirements of different repeaters and the logistics behind keeping them on the air. It was a great learning curve working on existing equipment and co designing and building new processor based controllers for two of the Club's repeaters.

Recently the need has been seen to evaluate some of the older equipment being used with the view of modernizing it. At the same time the Club's 70cm repeater at Drouin (VK3RWD) was suffering a loss of use probably due to its limited coverage. During a field day operation, it came to light that a better location may be available for use by that repeater. The relocation of that equipment is now being project managed by Graeme Brown (VK3BXG).

Over the last year my personal life has and will be dictating my responsibilities from now on and so seeing that others are stepping up to take over the work required on the Club's repeater system, I can now relinquish the position and will take a back seat in this area.

All issues regarding the Club's repeaters and beacons are now best directed to the Club Committee.

Albert VK3BQO

Arduino Nights

Hi guys,

I have selected some dates for the Arduino sessions up to the end of the financial year.

Although it would be hard to take suggestions and make changes for individual requirements, can I get a consensus from everyone if they are ok with the proposed dates.

Are there any glaring mistakes.

I have not included the Tuesday after Easter Monday for obvious reasons.

The next session would be

February 21; then

March 7

March 21

April 4

~~April 18 cancelled due to Easter~~

May 2

May 16

May 30

June 6

June 20

We need to firm these dates for the Guide Hall hire so I will be looking for any changes to be made by this Sunday evening at the latest so we can discuss it with the Guides.

Keep in mind that participants will need to pay \$4 on each night to pay for the hall hire please so mark that in your diaries as well.

Regards

Albert VK3BQO

- Repeated from the last mag for your convenience.

From The Editor

And now for something completely different – well almost. (Sorry ladies, still electronics)

Whilst surfing the web etc. for information on various subjects, I ran across a pile of information on the very first microprocessor, the Intel 4004 and its 35th Anniversary, all about the first 4 bit micro that was originally designed exclusively to power the Busicom 141-PF printing calculator. The designers later convincing Intel management that this device should be sold widely as a general purpose device.

See <http://www.intel.com/content/www/us/en/history/museum-story-of-intel-4004.html>

Or https://www.youtube.com/watch?v=hugZii_eX30 for a talk by Federico Faggin at UC Berkeley 19/02/2014 "Microelectronics & Microprocessors: The Early Years", around 1969.



Whilst browsing around this subject, and calculators etc., I found 3 interesting video's on the early days of the Japanese electronics industry, starting shortly after the war. It's rather interesting seeing where Sharp, Sony, & Casio etc. came from, and how little they had.

Whilst watching the third about the calculator wars, I had to pause it and go diving through my collections to dig up my 'Casio Mini' that apparently created quite a stir in its day for being so incredibly cheap.

A Videohistory of Japan's Electronic Industry

Birth of The Transistor: A video history of Japan's electronic industry. (Part 1)

<https://www.youtube.com/watch?v=ihkRwArnc1k>

Circuits in stone: A video history of Japan's electronic industry (Part 2)

<https://www.youtube.com/watch?v=uGRNXmWng3M>

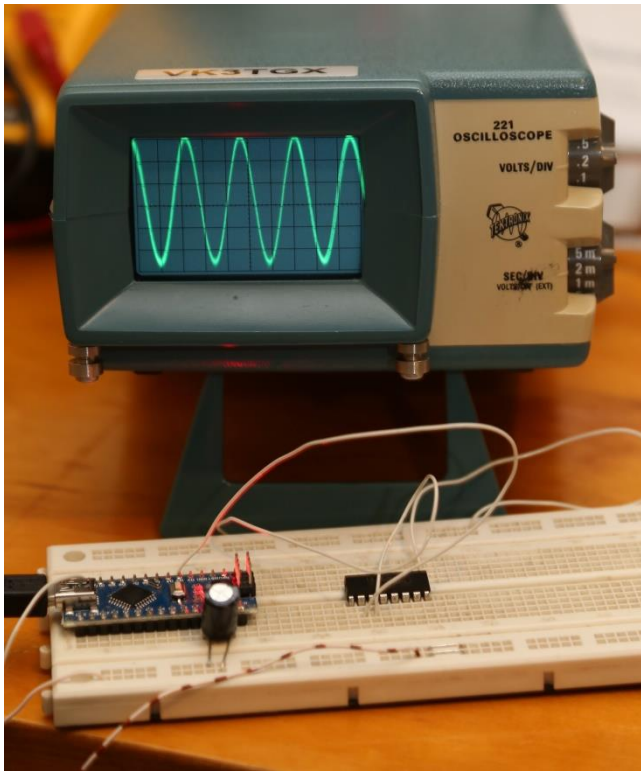
The Calculator Wars: A video history of Japan's electronic industry (Part 3)

<https://www.youtube.com/watch?v=ansXGewduN4&t=12s>



Paul VK3TGX

Arduino Audio



And now for some audio from your Arduino. A while ago I mentioned a shortcoming with the analogue output from the Uno, it's done with "Pulse Width Modulation", the Uno puts out a 490Hz square wave, the duty cycle is what gets changed with the '`analogWrite();`' command.

If all you want to do is dim a LED, or move the needle on a panel meter, fine, however if you wanted to generate faster changing analogue signals there is a problem, there is no point changing the level faster than 500Hz, as your changes will be lost.

I wanted to generate AC waveforms, audio. To do this the PWM has to be at least twice as fast as the signal you are trying to generate (preferably much higher). After doing some reading, it turns out the Arduino environment was setting the PWM timer to use an x64 prescaler, i.e. it could

run 64 times faster! Unfortunately the Arduino language provides no access to the pre-scaler, you have to directly access the micro's registers yourself. After some reading it turns out not to be that hard, however familiarity with 'C' and the Atmel registers etc. is handy.

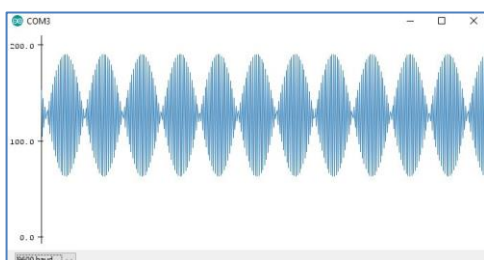
`'TCCR2B = _BV(CS20);'` ups the PWM from 490Hz to 31KHz – much better.

`_BV(CS20)` command makes 'TCCR2B' (the register responsible for the pre-scaler) have only the 'CS20' bit set, prescaler=X1.

Next, I generated a sinewave lookup table, using Microsoft Excel 2010, and then sequenced that through the '`analogWrite();`' command – We have a sine wave – Picture 1, Then I got a little bit more ambitious and generated two sine waves and added them together before sending them to the PWM function, this produced the second picture – A mess you say, not really, as it is a DTMF '1'. Now all I need is a keypad and I'll have a full DTMF generator – for IRLP access etc.



As an alternative I tried the Arduino's '`sin(rad)`' function, however the resultant waveform was horrible, it more resembled a triangle wave with the peaks squashed.



During my fiddling, I accidentally generated this signal, it looks like some sideband modulation – weird.

If I actually wanted it again, it'd take me a month of Sundays!



Paul VK3TGX

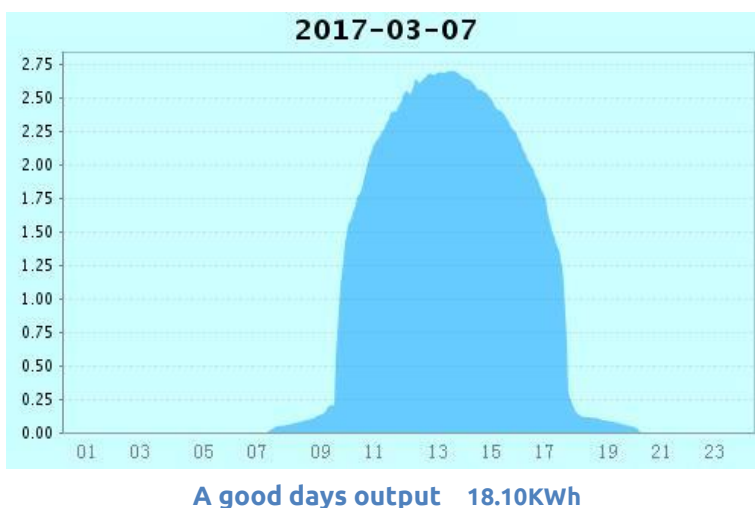
Going Solar



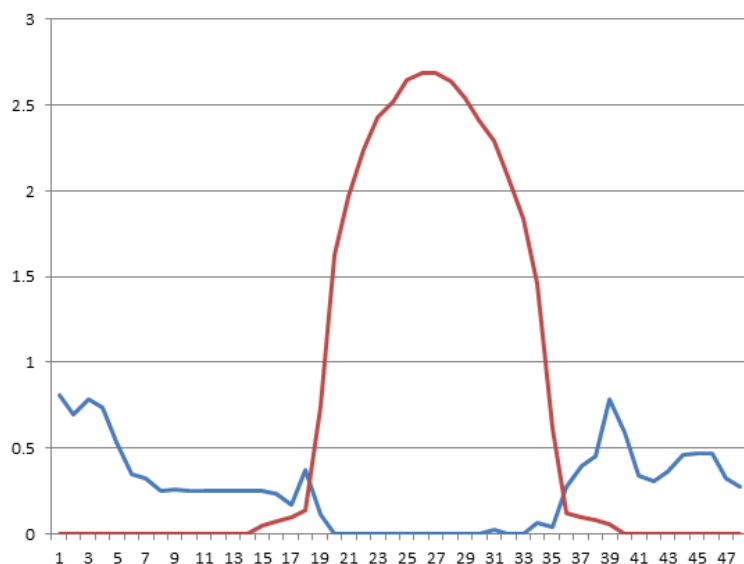
For a long time I have been pestered by cold callers trying to sell various solar power systems to me. However after reading all about it on some very informative websites, and hearing of the impending close of the old Hazelwood power station and all that entails, I thought it was a good time to have something installed.



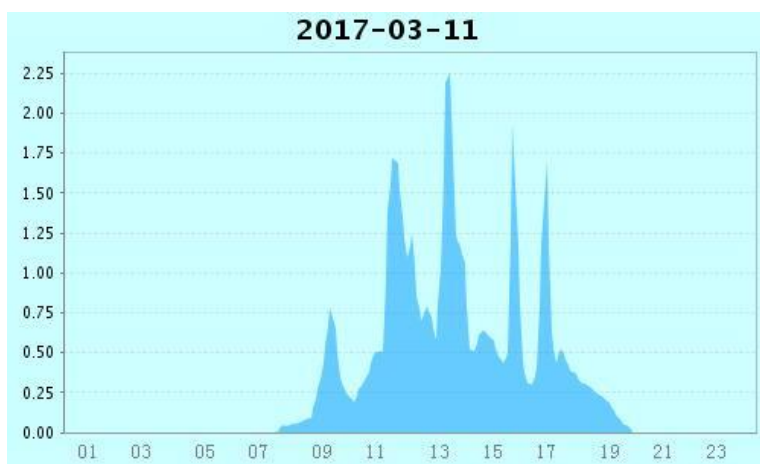
This system was sold as a 3KW unit, however it will probably only touch that mark occasionally, I could add an extra panel or two, but that would only increase the system cost, a limiting factor in my case. It would better be described as a 2.5KW system. According to our last power bill, we averaged about 10.5KWh a day, and on a sunny day the system puts out about 16KWh, so it is generating more than we normally use.



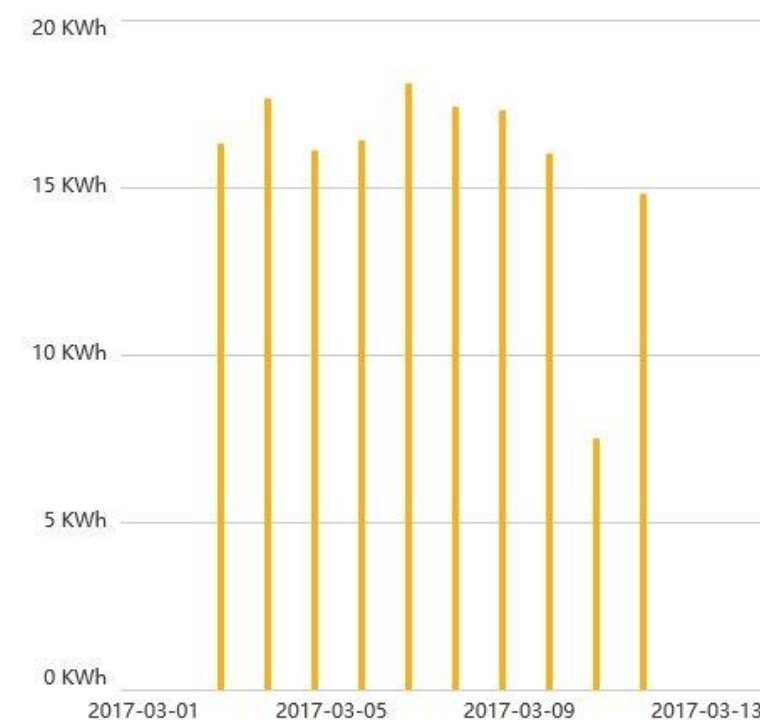
On the surface that looks good, bye-bye power bills, but it's not that simple. If you can perfectly align your usage to the power produced, then yes, no bill, but that's almost impossible. For most people the peak output occurs when you are at work, with probably the fridge as the only load. By the time you get home and crank up the air conditioner etc. it will probably be down to a few hundred watts if you're lucky. All the excess gets sold back to the power company at 5 cents a KWh, then you get to buy it back from



Usage (Blue) versus generated (Red)



A not so good day, only 7.50KWh today



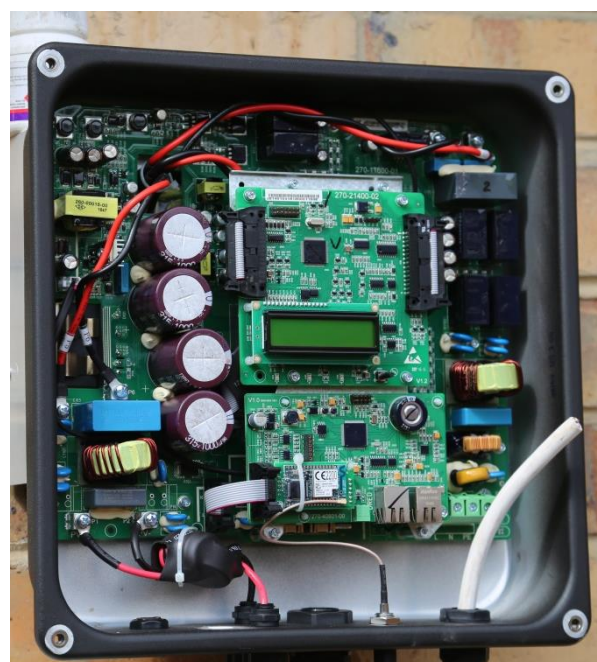
them when you get home at 27c KWh. I did hear of some talk about the government upping the rate to 11cents; however I'm not holding my breath on that one. So best case is you pay it off in 4-5 years, worst case it never happens.

As you can see in the second graph (achieved with a lot of pain) the solar system nullified any power drawn from the street. The blue data was from my smart meter, unfortunately it is not yet programmed to register power sent back to

the grid. I'm awaiting it's re-programming.

The only solution to poor pay in tariffs is battery storage, with something like a Tesla Powerwall 2 Home Battery, however these can add \$10,000 to the bill, and I have doubts the units will be ok in 10 years. Tesla says the batteries are good for 5000 cycles, 15 years before end of life at 80% capacity, but how many electronics products do you know of that will run for 10 years without dying? Even if you want to fix one, after several years, what's the bet the components will be unavailable.

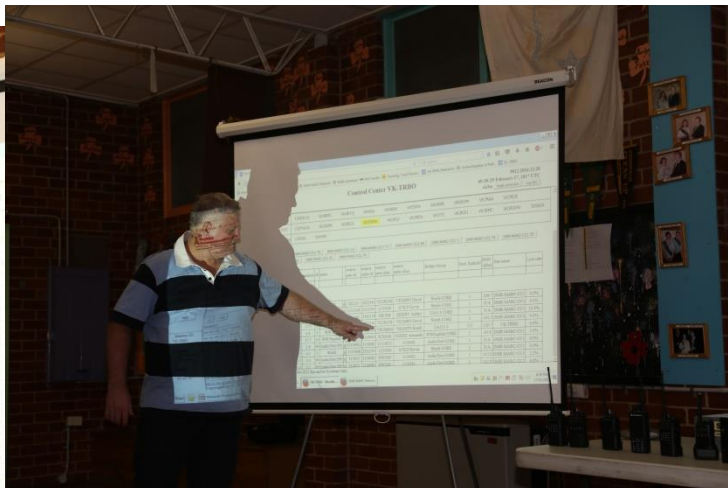
The last graph is what's been generated since installation.



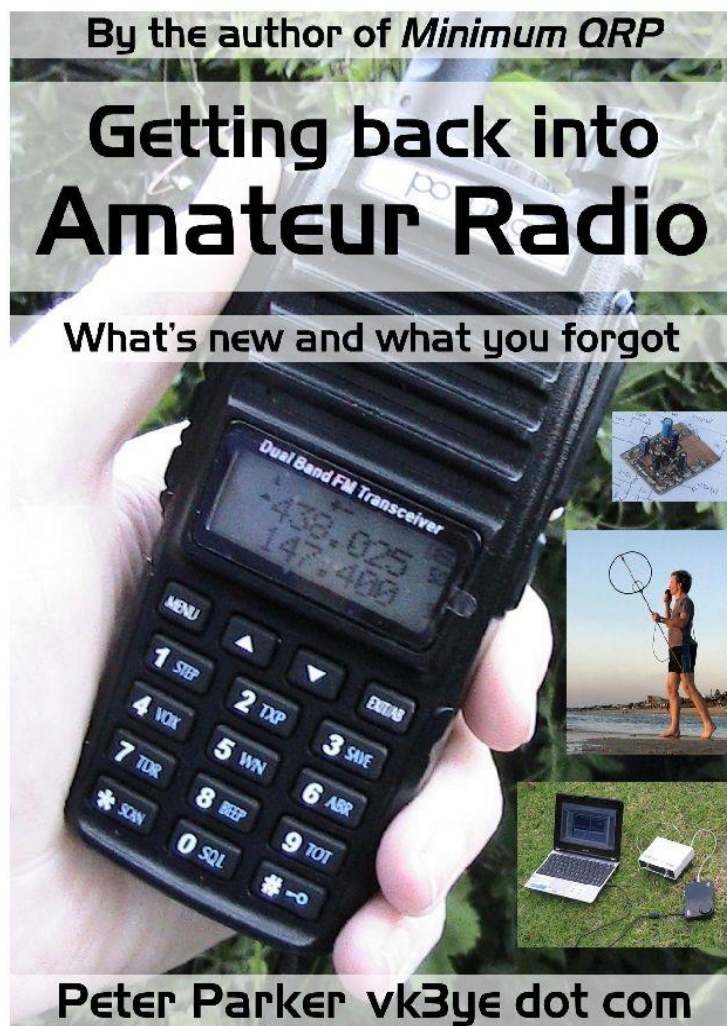
The insides of my inverter (Mid install)



Digital Repeater Talk



Extracts from *Getting back into Amateur Radio*



Item 1: What's changed in radio - equipment

Amateurs continue to be inspired by waves of surplus or cheap equipment. Sixty years ago it was heavy war surplus gear. Then there was VHF AM and then FM gear as commercial users moved to higher frequencies, narrower bandwidths and trunked systems. Later we benefited from satellite or microwave cast-offs. More recently we've had the global marketplace that is eBay, and the availability of modern yet cheap equipment.

If you haven't looked at new transceiver prices lately you're in for a pleasant surprise. It's a buyers' paradise compared to 30 years ago.

Back then transceivers only covered the HF bands and cost maybe a month's wage. All-mode rigs for 50, 144 and 432 MHz were separate units and cost a similar amount each. A 160 metre to 70 cm station could have easily cost three months' pay, and we haven't even counted the accessories yet.

Today an all-mode 160 metre to 70 cm transceiver can be yours for maybe two weeks' income. And a basic 100 watt HF-only transceiver is down to a week's average wage.

VHF/UHF handheld prices have plunged even more. A 2m/70cm handheld was an expensive luxury in the 1980s and early 1990s. Today the cheapest eBay handhelds from China cost under \$US50. They may lack the quality control of the established brands but their presence in the market has improved affordability for all models.

Such low prices are now seen on HF as well. At the time of writing the Bitx40 prebuilt 7 MHz SSB transceiver module is available for \$US59. Solder a few wires and be on the air in an hour. The cheapest Morse transceiver kits go for under \$US10 but their low output power and crystal control makes achieving contacts 'challenging', to put it politely.

Online purchasing and payment systems have further cut prices. Thirty years ago most large cities had several radio shops but are now lucky to have one. Instead, a great deal of amateur gear is available online from both domestic and overseas suppliers. Online suppliers have lower overheads and prices but you need to weigh this up against support provided by local dealers.

Warranties have lengthened on the established brands. At one time HF transceivers were guaranteed for 12 months only. Now warranties as long as five years are offered. This, coupled with lower prices, makes buying new gear more attractive than it used to be.

Enjoyed the read? There's more in '*Getting back into Amateur Radio*' by Peter Parker VK3YE. It's available as an ebook through Amazon for \$6.99. Search the title on Amazon, like 'VK3YE Radio Books' on Facebook or visit vk3ye.com for more details.

General Meeting Minutes

Date : 17-2-2017

Start time : 22:14

Location : Club rooms.

Chairperson : Ian Jackson 3buf

Minute Taker : Michael Van den Acker 3ghm

Present : As per attendance sheet

Visitors: Peter & Jan Brennan

Apologies : As per attendance sheet.

New Callsigns : Nil

Correspondence received : From hall hire and Casey council.
RDD renewal. WIA insurance renewal – public liability.

Correspondence sent : Letter sent to Mayor of Casey

Treasurer's report : As tabled

Read & Moved : Graeme 3bxg **Seconded :** Mark 3pkt **Carried :** Yes

Previous Minutes : As per Gateway magazine

Moved : Michael 3ghm **Seconded :** Mike 3kto **Carried :** Yes

Business arising from the previous minutes :

Further Arduino nights have been booked in the guide hall. \$4 each per attendee.

Antennapalooza is coming on well. We have a website and events are being planned. Marque from scouts has been booked - \$200 for the hire.

Working bee for the shack has been booked for April 22nd.

Bruno – 70cm repeater has been repaired but has 100Hz intermittent hum. It is on the bench to try and resolve this issue.

Morning 70cm chats 10am – Seem to be going well.

New business :

Rob our Prac organiser has resigned due to work commitments. So if someone would like to be prac coordinator please contact the committee. Rob can still help if available.

David Rolf – March deep space communication talk.

Dr Chris Heart – April talk on CNC machining for medical and dental repairs.

Hamfest Sale. Dianne will take the table bookings. We still need a coordinator. If you are interested please contact the committee. Hamfest date is the 22nd July.

Meeting closed : 22:34 pm

Next Committee Meeting : 1st Tuesday of the month

Next Prac Night : 1st Friday of the month

Next General Meeting : 3rd Friday of the month



Club Information



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

Office bearers

President	Ian Jackson	VK3BUF	Web Master	Mark Clohesy	VK3PKT
Admin Sec	Michael Van DenAcker	VK3GHM	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Graeme Brown	VK3BXG	Property Officer	Bruno Tonizzo	VK3BFT
General 1	Rob Streater	VK3BRS	Secretary	Ian Jackson	VK3BUF
General 2	Max Hill	VK3TMK			

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater VK3RDD – Currently de-commissioned until further notice - *sorry*
70cm Repeater Cranbourne VK3RLP In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RLP Repeater supports Remote Internet access (IRLP), Node 6794.
70cm Repeater Drouin VK3RWD In 433.575MHz Out 438.575Mhz CTCSS 91.5Hz
Simplex VHF - 145.450MHz FM • Simplex UHF - 438.850MHz FM
VK3RLP Beacons 1296.532MHz & 2403.532MHz

Membership Fee Schedule

Pension Member rate \$25.00 Extra Family Member \$20.00
Standard Member rate \$40.00 Junior Member rate \$25.00
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 vk3tgx@gmail.com Cut off, 10th
All other Club correspondence to: secretary@ggrec.org.au
or via Snail Mail : GGREC, C/O Ian Jackson, 408 Old Sale Rd, Drouin West 3818
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Website errors, contact web master via email webmaster@ggrec.org.au
Facebook Page www.facebook.com/GippslandGate