



# GATEWAY

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

## **August 2015 From The President**

I'd like to start of this month with a big thank you to everyone the helped make this year's Hamfest such a big success in many ways.

We had a great turnout of amateurs attending the Hamfest, lots of desirable equipment for sale and fantastic support from GGREC Club members.

The event went very smoothly which is a reflection of all the preparation that Wayne and Albert put in since January this year and the help of members on the day.

With Wayne's private workload increasing, he has had to resign from the Committee to focus on his career. I would like to thanks Wayne for his valued contribution to the Committee and for organizing events throughout the year. This means that we now have two vacant position in the committee. We need a Club Secretary and a committee person. So, why can't we fill these position?? Being on the committee means that you can help organize events that you feel that the Club is missing. Being on the committee means that you can help set the direction that the Club will take into the future. Being on the committee will help you with your personal development. Being on the committee means that we can have a Pub night at your favorite pub, or participate in your favorite Contest or go camping to your favorite camping ground. Will I hear you volunteering at the GM??

This month we will have a Committee meeting, Prac night, Foundation exams, five Sunday night Nets on VK3RLP, a general Meeting and we will be using the VK100ANZAC call sign for 7 days, not to mention casual chats on 145.450 MHs and various repeaters. How many events will you participated in??? It's your Club so please get involved to get the most out of it.



*Bruno Tonizzo VK3BFT*

President GGREC Inc.

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## Event Queue

### August:

- 2<sup>nd</sup> Club Net on VK3RLP at 8.00 PM
- 4<sup>th</sup> Committee meeting at clubrooms, 7.30 PM.
- 7<sup>th</sup> Prac night
- 8-9 Foundation course
- 9<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 16<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 21<sup>st</sup> General Meeting featuring Joe VK3YSP, and Julie VK3FOWL on Portable Operating. 8.00 PM
- 22-28<sup>th</sup> VI100ANZAC event
- 23<sup>rd</sup> Club Net on VK3RLP at 8.00 PM
- 29<sup>th</sup> Licence upgrade group commences at Clubrooms 9.00 AM
- 30<sup>th</sup> Club Net on VK3RLP at 8.00 PM

### September:

- 1<sup>st</sup> Committee meeting at clubrooms, 7.30 PM.
- 4<sup>th</sup> Prac night
- 6<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 13<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 18<sup>th</sup> General Meeting, with presentation by Phil VK3VB on SDR aircraft tracking.
- 20<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 27<sup>th</sup> Club Net on VK3RLP at 8.00 PM

### October:

- 2<sup>nd</sup> Prac night
- 3-4 Foundation Course
- 4<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 6<sup>th</sup> Committee meeting at clubrooms, 7.30 PM.
- 11<sup>th</sup> Club Net on VK3RLP at 8.00 PM
- 16<sup>th</sup> General Meeting
- 17-18<sup>th</sup> JOTA
- 25<sup>th</sup> Club Net on VK3RLP at 8.00 PM

## From The Editor

This month I had two items on my bench, Repairing a Rode Podcaster mic that I picked up at our hamfest, The other project that came to mind was a circuit to allow me to connect a super capacitor to a 12V power system (without blowing a pile of fuses and causing other problems.) to allow intermittent high current loads to be handled without crashing the 12V system (because the load in question wanted, say 10A for 20 milliseconds etc). In my case the load was an industrial PC



Ages ago I picked up a 1 Farad super cap at a hamfest, they have proven quite popular with the car audio fraternity who love fitting multi hundred watt sub woofers to their cars. You have probably heard them on the road, the very distinctive boom boom travels a long way. Actually it is a rather interesting exercise to produce low frequencies in such a small environment. Years ago I found it was much easier to produce strong base in a large room (i.e. lounge room) than it was in say a bedroom, a car is even harder, there is really no other option other than brute force. The side effect being the base outside the car is probably better than inside!

In these systems the amplifiers usually live in the car boot, whereas the power supply (battery) is at the other end of the vehicle, so how do you supply lots of amps without any voltage sag. Heavy wires is a good start, however even that is not the whole answer as car batteries themselves are not that good in keeping the volts flat. Pull 100A and watch it sag. So along came super caps, one or more can give you a really smooth 12V. You can even start a car on a few super caps. So how is this relevant to a radio operator? well HF radios are a lot like car audio amps, they need over 20A for a 100W TX signal. And like audio amps, this current varies all over the place, i.e. it is very lumpy.

So unless you want to put out a very poor signal, there is only one option, 13.8V with no sag. Unfortunately Amateur radios are very power sensitive, lose a volt and you lose quite a few watts. In the shack If you have a good power supply next to your radio all is good, However if your shack is like mine, then you have 12V distributed all over the place running all sorts of equipment and in this case the supply tends to be a lot larger and as such not next to the radio, but maybe a meter of two (or more) away. Now super caps have to be one of the worst things possible to power up, they appear as a short circuit for quite a while as they charge up. So how do you 'start' the system without using ridiculously large fuses that then offer no protection, So I started thinking of a soft start circuit that would allow a super cap to be connected into 12V system anywhere, any time without blowing a pile of fuses. The simplest design I came up with was a resistor to limit the charge current in parallel with a diode to allow the cap to dump lots of amps back into the DC bus as required. My first attempt used a 39 ohm 5W resistor, however that was a dismal failure as the cap only got to 10.6V and stopped there, as my super cap has an integral LED volt meter that uses 35mA. So I upped that charge current with 3 resistors in parallel. Normally you would have a bypass relay that kicks in a short time later and reduces the drop to zero. In my mock up I just used a switch. After that the test system worked just fine, the computer started and ran ok.

*Paul VK3TGX*

## Notices:

Dear Colleagues,

Our presenters at the August General Meeting, Joe VK3YSP, and Julie VK3FOWL would like to start a little earlier than our usual 8.00 p.m., so that they (and we) can all have an early night.

They are proposing to commence their presentation at **7.30 pm**, so it would really be appreciated if members could make the effort to be in attendance, and ready on time. Our general business meeting will take place, as usual, after Joe and Julie have departed. Just a reminder that they will be talking about Portable Operations, which given that a portable kit has been the focus of our recent prac nights, should be particularly interesting and relevant.

Hope to see you on the night.

Regards,

Bryan VK3FOAB

Acting Admin. Sec.

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## GGREC Club Repeater VK3RLP - access tone change

Since the repeater VK3RLP has been situated at the clubrooms in Cranbourne, an access tone of 123Hz was required to open the receiver. The frequency 123Hz was decided upon as a good "all round" value with good rejection to noise and intermodulation by a technical repeater group and so a lot of repeater operators went with the suggested best tone. It was not until a later date when some others found that 123Hz was susceptible to certain types of noise and the squelch would open on receivers without the correct tone. There was no blame to put on anybody for getting it wrong, it was simply a matter of, as amateurs we get a little bit smarter the more we test and try things. So it was found that a new and less susceptible frequency of 91.5Hz was put forward as a common frequency in the hope that all repeater operators would use this frequency across the board. That would make it simpler for those programming their radios and having to change the tone when changing repeaters. Great idea but due to a lack of the special software and the required PC to run it on, we have not made the change until now when interference has become too great to ignore. (If you listen to RLP you know what I am talking about) Luckily a combination of several members managed to get all things required to make the change. Ok so now you know why this has been done and hopefully it will make listening a bit easier on the ears when monitoring VK3RLP.

An email has been sent to all members notifying them of this change and suggesting that if you need help to change your radio(s), let the committee know and they will get someone to assist you. We know it can be a bit convoluted at times.

Albert VK3BQO

## Christmas Hamper 2015

It is a tradition that we raffle of a Christmas hamper made up by goodies donated by the Club members.

The Club usually puts in a prize as well.

So, if you are new to the Club and don't know why there is washing basket in the shack, you know that it belongs to Santa and it will leave the Christmas Party with one lucky winner. Donate an item (non-perishable and not past use by date) to the basket at the GM.



The Club is always looking for a venue for the Christmas party, so if you have a big back yard and wouldn't mind hosting the Christmas party this year, please raise your hand tell a committee member ASAP.

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## Need a Name Tags or Access key for the Shack?

If you would like a new name tag or if you want to get into the shack but don't have an access key then please come up and place your name and callsign on the order sheet. We will be taking orders at the August General meeting so make sure you don't miss out. Remember that conditions apply before you qualify for a key!

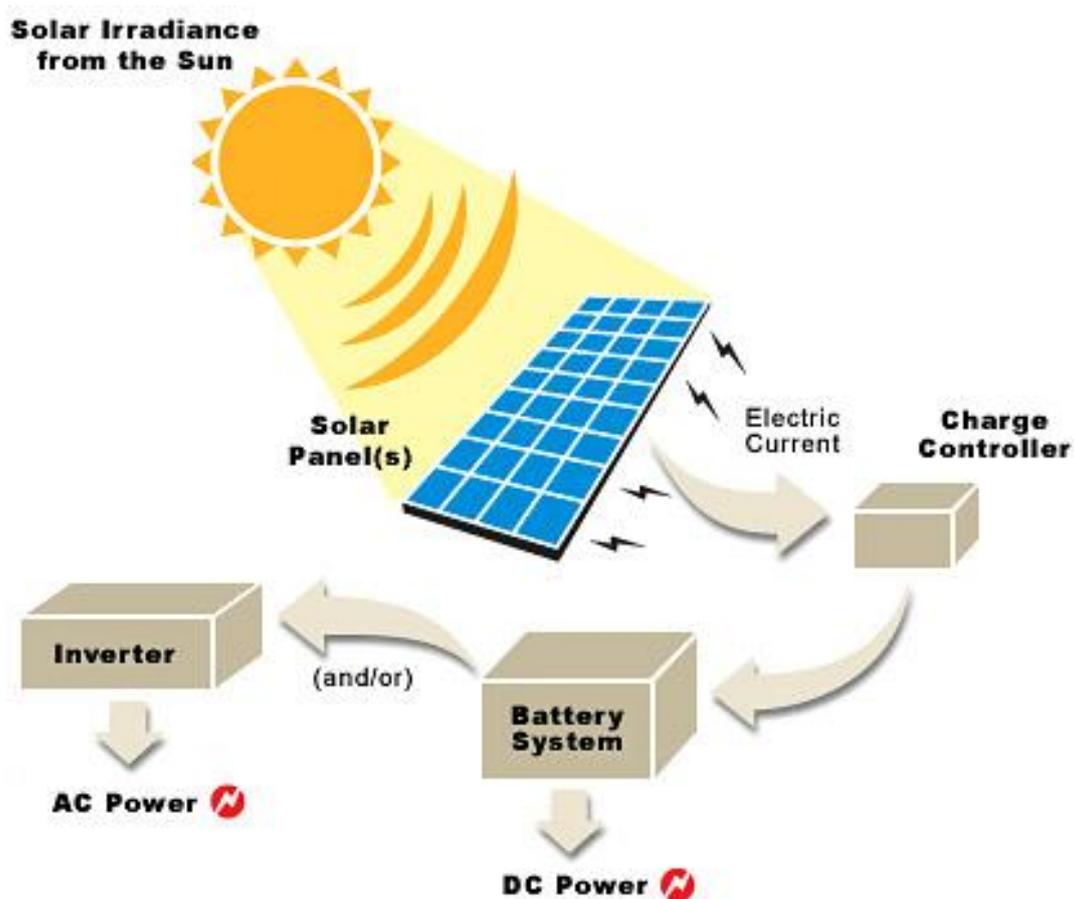


## Jamboree of the Air 2015

2015 marks the 58<sup>th</sup> JOTA and the 19<sup>th</sup> JOTI. The theme for this year is:-  
“*The Earth is Yours* – so take good care of it. “

Guides and Scouts around the world will be attempting to operate the event without using mains electricity.

The idea is that you minimize your carbon foot print by using Solar, wind, batteries etc., demonstrating that “**The Earth Is Yours**”.



As always, GGREC is looking for a Club member to be the JOTA event Coordinator. If you feel that you have what it takes to organize JOTA this year, please let the committee know at the August GM.

This year JOTA/JOTI will be held on the 17<sup>th</sup> and 18<sup>th</sup> of October 2015.

Come on, get involved with your Club!

# Special Event Callsign VK100ANZAC

Don't forget that GGREC members will be using the VK100ANZAC callsign for one week commencing Saturday the 22<sup>nd</sup> August.

We have an enthusiastic team of members ready to hit the Amateur bands using the special event VK100ANZAC callsign. To kick the event off, we will be hosting an afternoon tea for members on Saturday the 22<sup>nd</sup> August starting at approximately 2:00PM. Tea coffee and nibbles will be provided, BYO for anything stronger.

You can participate by bring along your WW1 family photos, medals, memorabilia and stories to share with the rest of the Club members.

I know that from talking to members about this event that they have very strong ties to WWI through their families. F calls can operate as we have full call volunteers happy to work the bands with you.

Underage recruits by year



1 in 5 underage soldiers discharged within a month



**AUSTRALIAN LABOR PARTY**  
Anti-Conscription Campaign Committee.

**“VOTE NO MUM**

they'll take **DAD** next”

**VOTE**  
 **NO**

Authorised by  
B. Mulvogue,  
Trades Hall, Melb.

Fraser & Jackson, Printers,  
34-5 Queen St.

Dear Colleagues,

As you will all be aware, we have the VK100ANZAC callsign for the period 22-28 August 2015. A team of GGREC and EMDRC members will operate the callsign during that time.

If you have been chasing the series of ANZAC centenary calls, but for some reason have missed out on this one, now is the chance to catch up.

### Calling Frequencies for 2015 ANZAC Commemoration

Band	Digital	CW	SSB
160m	1805kHz	1825kHz	1850kHz
80m	3.630MHz	3.530MHz	3.585MHz
40m	7.040 MHz	7.010 MHz	7.095 MHz
30m	10.145 MHz	10.110 MHz	10.120 MHz
20m	14.095 MHz	14.010 MHz	14.250 MHz
17m	18.095 MHz	18.105 MHz	18.115 MHz
15m	21.095 MHz	21.105 MHz	21.250 MHz
12m	24.925 MHz	24.895 MHz	24.935 MHz
10m	28.055 MHz	28.025 MHz	28.450 MHz
6m	50.225 MHz	50.500 MHz	51.150 MHz
2m	145.000 MHz	144.050 MHz	144.150 MHz

Even if you don't have HF capabilities, you may be able to take part on 2 metres. Other bands and modes are by arrangement.

So mark the dates on your calendar and in your diary, so that you'll be ready when the event rolls around. And keep your eyes and ears peeled for further updates.

Cheers,

Bryan VK3FOAB

Acting Admin. Sec.

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## Photo's

Club photo's can be found in the 'Gallery' section of the club's website:-

<http://ggrec.org.au/gallery/>

Also my photo's can be found at :-

<http://vk3tgx.hamshack.org/>



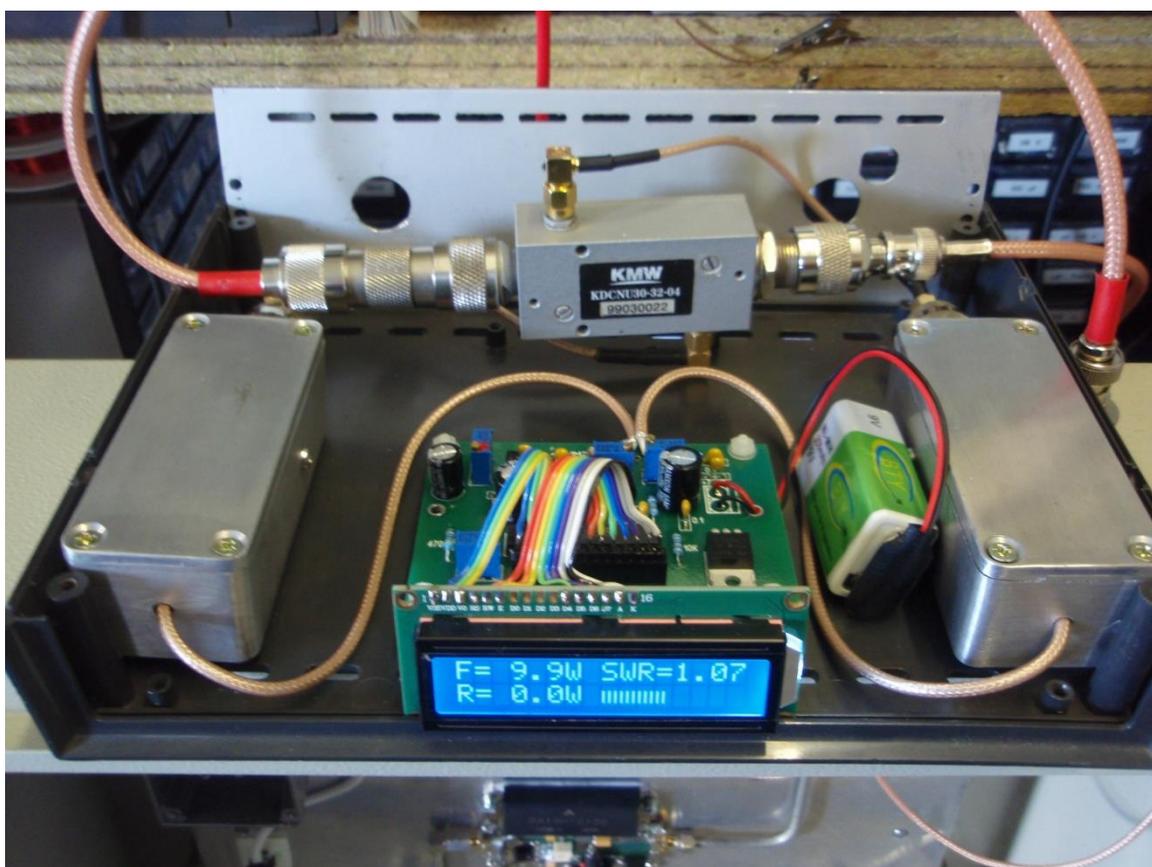
# GGREC Beacon Project Part 3

Or, “are they still working” ?

One of the concerns I had with this project was how were we going to maintain the beacons after they were installed and up and running. Yes, it’s one thing to build something and “get it on the air”, and as amateurs that’s pretty much what we do but not having the luxury of having the beacons next to us in the shack meant we had to look at things a little bit differently.

Yes, there will be some onsite monitoring of the beacons that will shut them down if a problem arises. Parameters like the power supply rails ( there 3 of them ), forward and reflected power and even the overheating of the power amplifiers will be monitored but we needed more, we needed to plan ahead and establish some “ base lines ” if we were to take a responsible approach to this project.

That is where this little side project comes in, a Microwave Power and SWR meter.



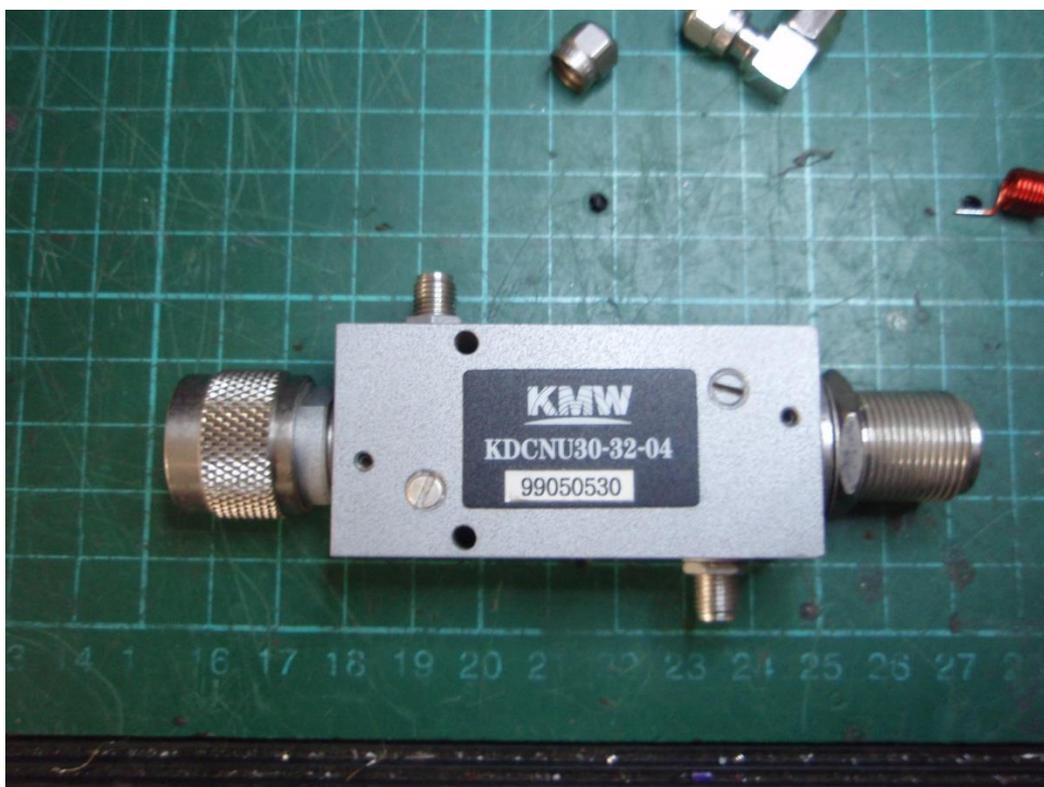
The whole idea behind this meter was to measure and record certain parameters when the beacons are first installed onsite. These parameters would be forward power, reflected power and of course VSWR. Then, every 6 to 12 months afterwards we could travel to site with this meter and recheck and record these measurements again. From

these readings we will be able to compare and see any issues or deterioration of the P.A.'s, feedlines and antennas. Depending on the severity of the deterioration a decision could be made on whether to shut the beacons down to effect repairs immediately or leave it running and schedule repairs. Hopefully we would see no change in any of the readings and not have to worry about things for another 6 to 12 months.... Where's Murphy, is he looking over shoulders yet ?

## What's in a SWR/Power meter ?

I looked in the usual places and found Microwave ( we are talking 13cm as well as 23 cm ) SWR/Power meters were either not available or if they were they were pretty expensive... Not a good start to this idea....

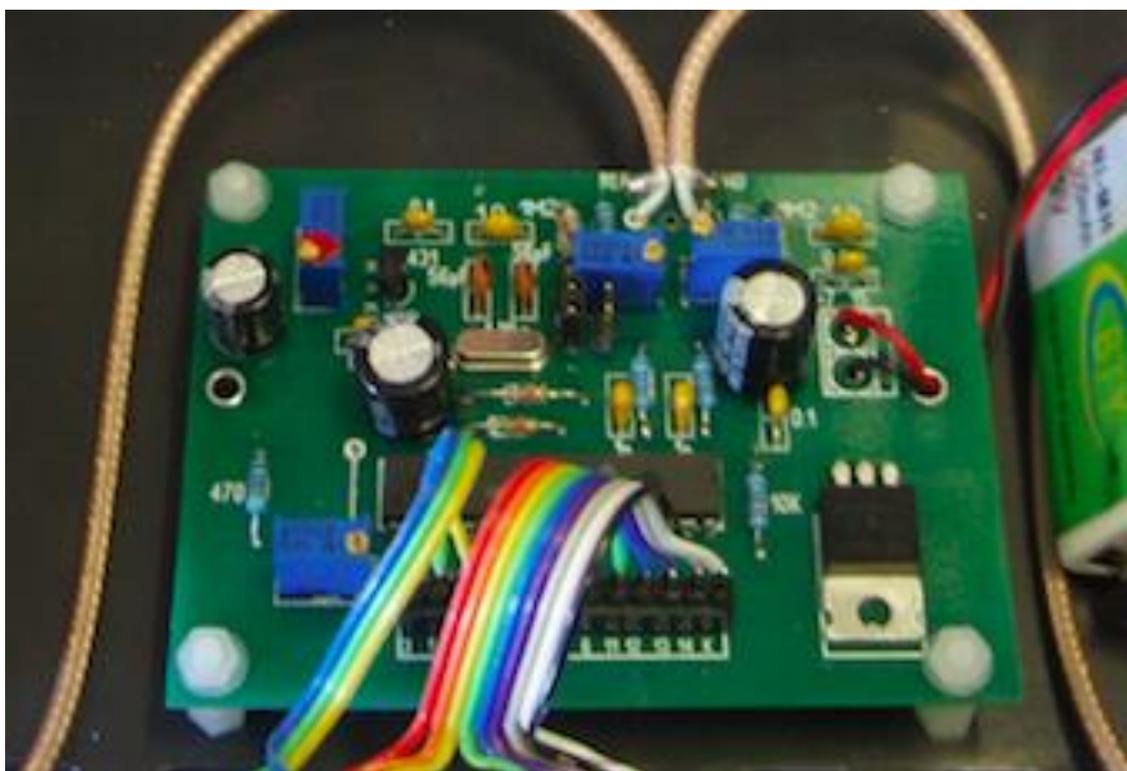
As I was purchasing the directional couplers to monitor the beacon power amps, and with 2 of them in my hot little hand, I thought " hang on, maybe I can use one of these to build a SWR/Power meter "... Without thinking any further I purchased another 2 couplers for myself, " in for a penny in for a pound " I thought, it was worth a try !



These directional couplers have 4 connections on them, 2 main ports for the "RF power" through the coupler and a "Forward" and a "Reflected" power port. After some discussions with the seller and some quick measurements at home I found that both the forward and reflected ports gave me an output that was 28 dB below the power ports at both 23 and 13 cms. Ok, that meant that if we ran 10 watts of RF through the coupler ( either way ) we would get 10 milliwatts of RF from both ports. A simple detector on the output of these 2 ports would then give me a varying D.C. voltage dependant on the level of RF power going through the coupler. A metering circuit measuring these D.C.

voltages would then give me forward and reflected readings on the meter, sounded too easy....

I looked around and found a fellow amateur in Russia selling a circuit board and a preprogrammed PIC microcontroller for \$ 15 AU that did just what I wanted, it read 2 dc voltages from a " directional coupler / detector " and sent an output to an LCD screen showing forward power and reflected Power. It also, with calculations in the microcontroller, showed SWR as well. All in real-time, very nice.

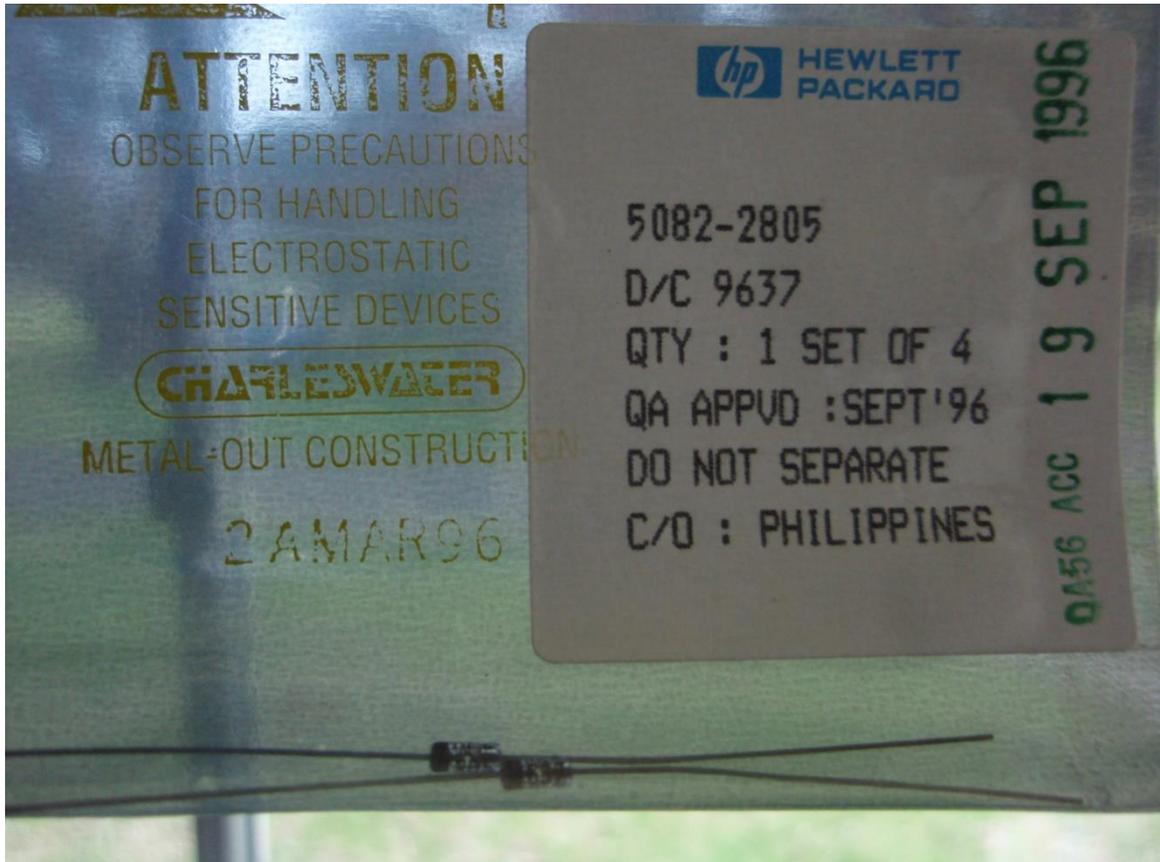


A board was quickly procured and I populated it with all of the required components. A display was added and the board was tested, so far so good !

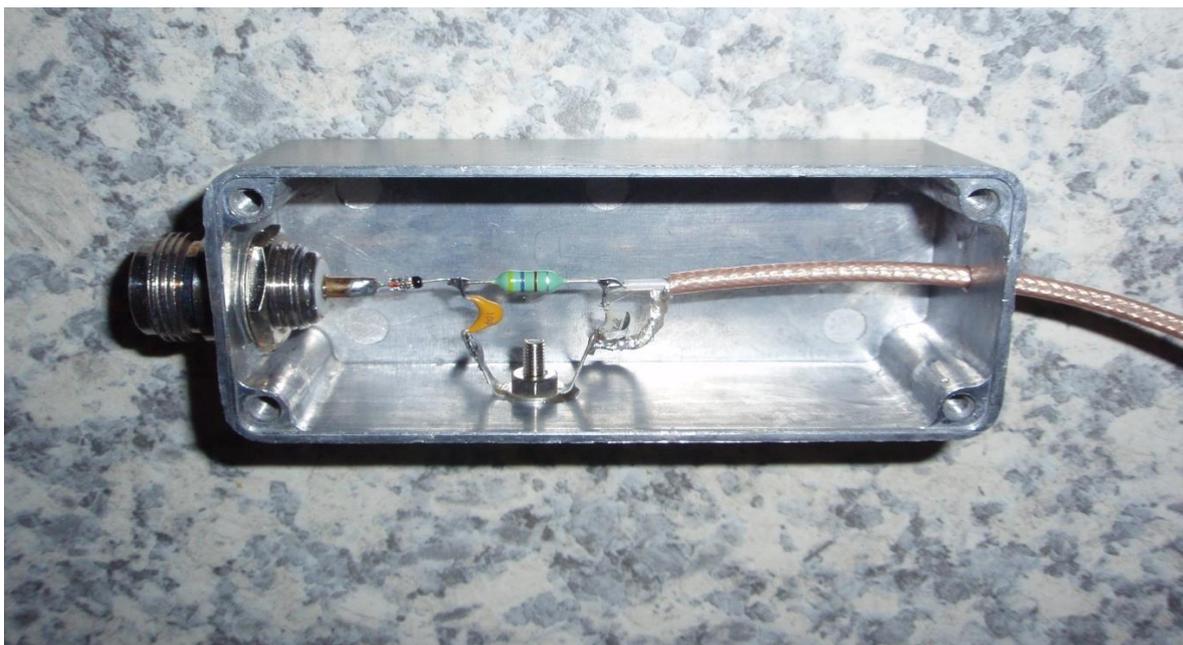
This was 2 parts of the puzzle completed, now for the last piece, the detectors.

A bit of research showed plenty of information on HF, VHF and even UHF detectors but for microwave ? not much at all... There were a few titbits of information but nothing like I was doing so with a lot of studying I came up with the following thoughts.

The key to this circuit was going to be the diode that rectified the RF ( an RF AC signal ) to the required DC level required by the metering circuit. Back to the books which showed an IN5711 Schottky ( hot carrier ) diode would do what we needed to do, that is, rectify A.C. to D.C. at 2400 MHz and below. Some N.O.S. " famous " matched IN5711's were procured and a detector was built based on what I had seen previously during my research.

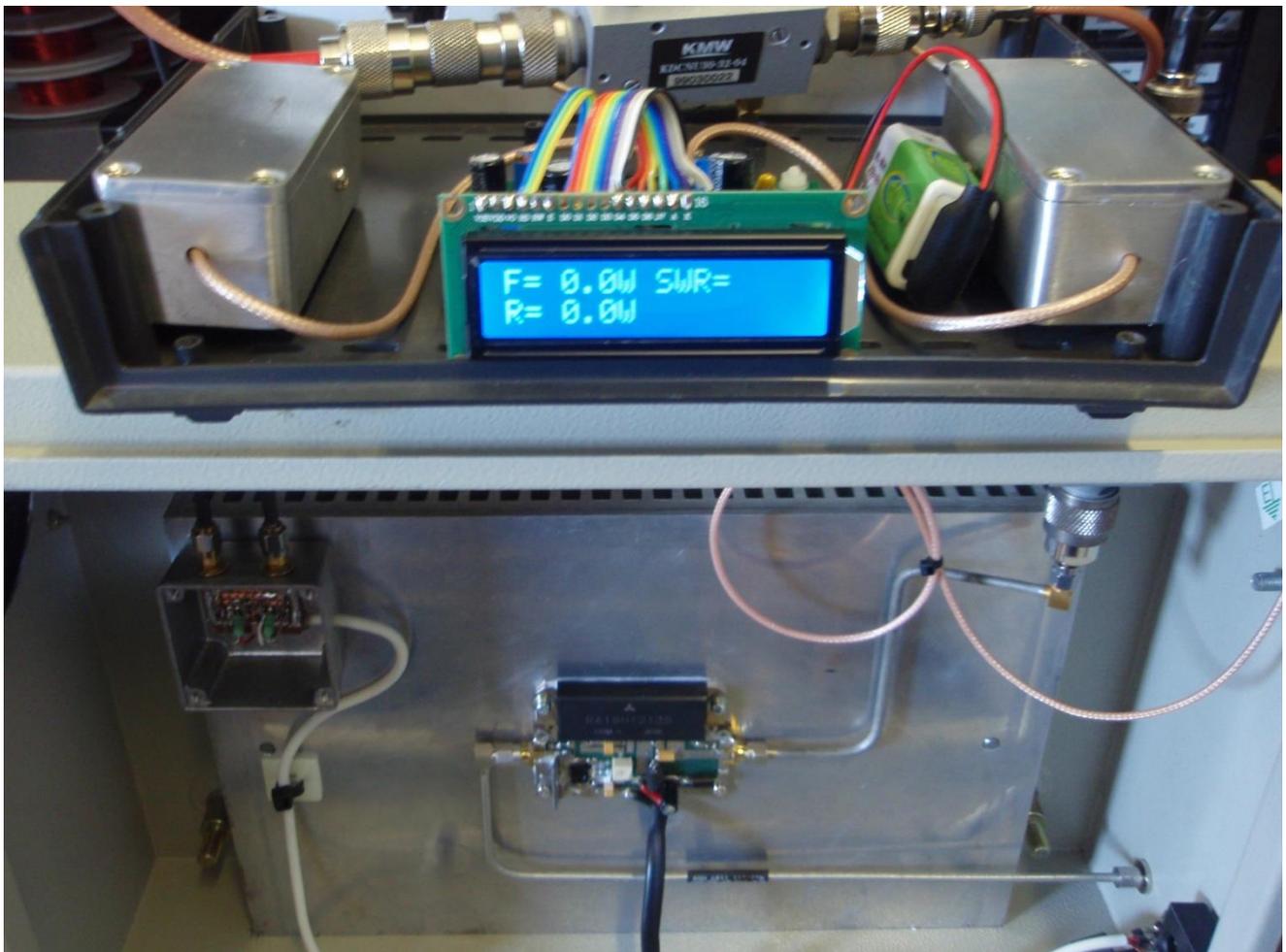


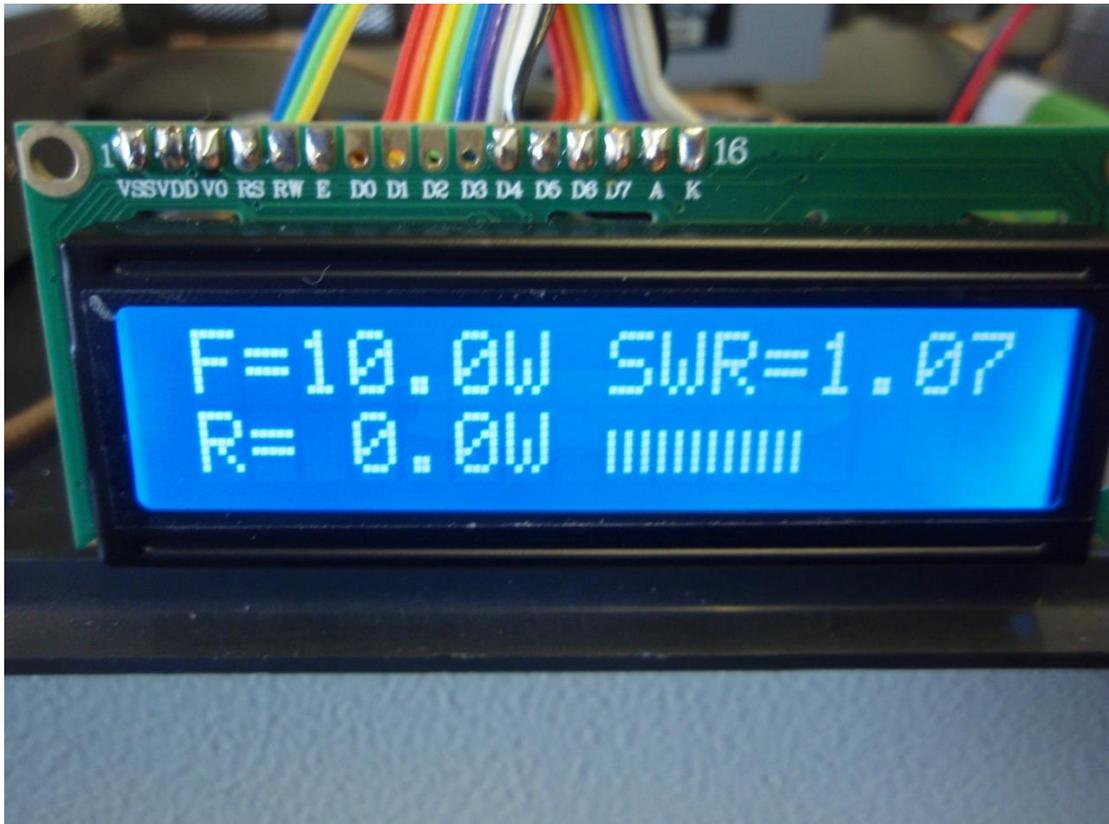
I will need to add some improvements for protection of the diode but below is what I have come up with so far which works extremely well. With 10 watts of RF through the directional coupler, and 10 mW into the detector I get 7.5 Volts D.C. into the metering circuit.



You can see the IN5711 diode soldered to the pin on the N connector. After the diode is a 0.1 uF capacitor that is charged by the diode when it is conducting. Following the capacitor is an inductor to “smooth” the resulting D.C. from the diode and capacitor and after the inductor is a small 2.2 puff capacitor to clean up any RF on the D.C. line out. Rough and crude but extremely workable. The diode has a breakdown voltage of 70 volts so a hit nearby from lightning will probably take it out. Who owns an MFJ or similar antenna analyser ? This is why you should always short the antenna before connecting it as any static build up on the antenna will destroy the shottky diodes in the front end of the analyser...

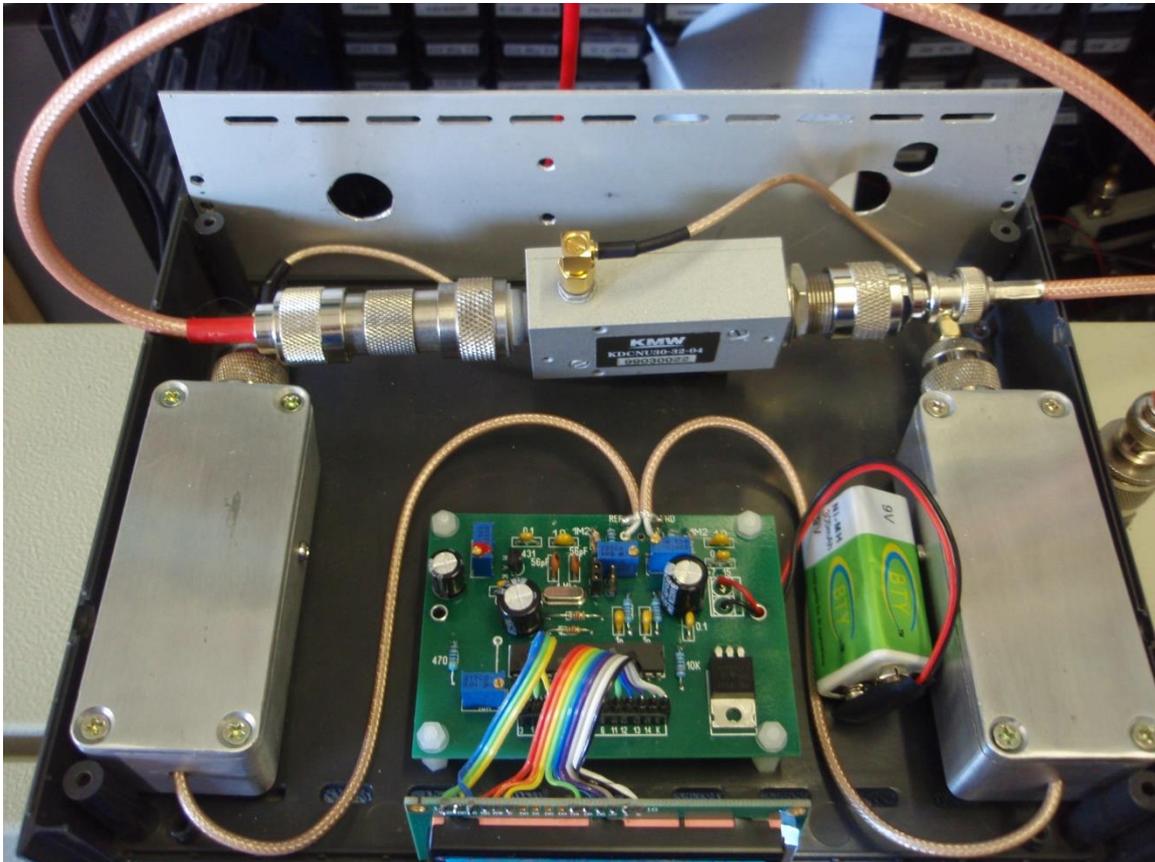
Here are some pictures of the working ( but not completed ) 23 and 13 cm SWR/Power meter in action.







You will notice on the picture above that the reverse power is at 10 watts and the forward power is at 0 watts. This is because I reversed the RF power connections on the directional coupler and ran the RF " backwards " through it. This is how I calibrated both the forward and reflected detector metering circuits to give an accurate SWR. The meter only calculates an SWR up to 9.99:1 before it over ranges.



The battery is only temporary, it was being used for testing only.

2 last points to consider. I initially had 90 degree N connectors either side of the directional coupler with them exiting through the backing plate of the case ( see holes in back plate ). I also had a female to female N adapter as well a male to female N adapter to get the connections well past and outside the back of the case. I had a mixture of silver plated fittings as well as some "cheap" chrome plated fittings to make all of this up. When I first started to test the meter I found I was losing 2 watts through the coupler and the SWR was reading 1.3:1. Hmmmm, something wrong here... After some investigation I found that the chrome plated N connectors were just not cutting it at these microwave frequencies. After I removed these fittings the power came up and the SWR dropped to 1.07:1, a much more realistic figure considering the meter is being tested into a dummy load/power meter rated up to 8 GHz ! I also measured 250 milliwatts insertion loss through the meter so I am confident that it will represent the actual performance of the power amps and feedlines/antennas reasonably accurately. I am now going to mount the directional coupler outside on the back of the meter to keep the amount of connectors to an absolute minimum. Another interesting point is that as I started to test with some good quality RG 58 Benelec test leads I found they were not good enough as the RG58 started to heat up at these frequencies, you could feel it in the coax. Time to hook up some RG400 test leads, and after testing they were as cool as a cucumber now.

The second point to consider is Linearity. The meter has only been spot checked at 2 frequencies, 1.296 GHz and 2.403 GHz and the calibrations carried out at these frequencies. I know the directional coupler is accurate ( 28 dB down ) at both of these frequencies and the calibration of the metering circuits will be "accurate" as well. The only variable here now is the linearity of the detectors across 23 and 13 cms. What this means is, is the DC output of the detector the same with an identical level of RF input it at both 23 cm and 13 cm ? After testing it's within 6% so again I'm happy with that. These HP diodes are after all rated beyond 10 GHz !

If you decide to do something like this ( and it doesn't have to be microwave ) then the linearity ( and frequency response ) of the detectors and the directional coupler/s are a primary consideration of the design of your circuit.

Next month we will cover the P.A.'s and some of the protection on them for the GGREC beacon project, until then,

Cheers and 73

Rob VK3BRS

# RESPONSIBLE SERVING OF ALCOHOL

Ian VK3BUF



From the department of information that may be useful someday, I wanted to find out how hard it was to move beer around by small helicopter. It turns out to be quite a lot.

It was hard, work but it could get a 1.6kg payload off the ground and move it around via a 2.4GHz transmitter.

As to how much the cans get shaken up....well that's another story.

If you care to follow this You Tube link you can see for yourself what happens

<https://www.youtube.com/watch?v=wGLpuKdPW1I>

Next time I'll try to use light beer instead.



# General Meeting Minutes 17/07/2015

**Start time:** 8:10 pm.

**Location:** Club rooms.

**Chairperson:** Bruno

**Minute Taker:** Bryan

**Present:** As per attendance sheet

**Visitors:** Nil.

**Apologies:** As per attendance sheet.

## **Correspondence received:**

1. Breakout magazine for June 2015 from NZ.
2. Email from Ian VK3BUF re. 2/70 beam antennas imported from China.
3. WIA News No. 6 for June 2015.
4. NERG News re. Ambulance Victoria presentation on 9 July.
5. Email from Steve Ireland re. WIA Repeater Directory entries.
6. Emails re. imminent expiry of hamradioisfun.org.au domain name.
7. Reminder email from City of Casey re. Ageing Positively Festival.
8. Email from NERG re. "From Morse to Magnetron" display, 2-30 July in Geelong.

## **Correspondence sent:**

1. Breakout magazine for June 2015 from NZ.
2. NERG News re. Ambulance Victoria presentation on 9 July.
3. Email from NERG re. "From Morse to Magnetron" display, 2-30 July in Geelong.

## **Treasurer's report:**

Graeme presented the Treasurer's report for the period 16 June-15 July 2015, and circulated a copy for the meeting to examine. Members wishing to obtain a personal copy should contact the Treasurer direct.

**Read:** Graeme VK3BXG   **Moved:** Bruno VK3BFT   **Seconded:** Ian VK3BUF   **Carried:** yes

**New Callsigns:** nil

## **Previous Minutes:**

**Read:** as distributed in the club magazine.

## **Business arising from the previous minutes:**

1. Thanks to Dave VK3XMF for taking the minutes at the last meeting.
2. Club Net – a reminder to members that the Club Net is conducted at 8.00 pm local on Sundays.
3. Thanks to Albert VK3BQO for coordinating bandplan response to WIA.
4. Members were advised that the next open day for the Synchrotron in Clayton will be held in October.

5. Antenna photos – the meeting at which the photos were displayed went well. It was suggested that it may be possible to repeat the event in a few months, and then compile a calendar from those images gathered from both meetings.
6. Hamfest report: We will be starting to set up at 7.00 am local. The BBQ is organised, but help will be required with selling gear. Kitchen cleaning will be important. We need to be out of the hall smartly after the Hamfest wraps up, as the Blue Light Disco will be staged that evening. Members are asked to bring their handhelds, set on 145.450 and on low power for comms on the day.

#### **New business:**

1. Wayne VK3XF advised that on account of expanded duties at his work, he will have to back off on Committee work.
2. Beacons: No work has been carried out in recent weeks, but we met the deadline for the completion and testing of the beacons, and have received the money from the WIA. Hopefully, in 2-3 weeks, they will be fitted up at the site.
3. Repeaters: IRLP may soon be back on the air. Other repeaters are working well.
4. A study group will be starting on Saturday mornings (commencement date to be advised.) If people are available to mentor the group, that would be good. If there is sufficient interest, a roster may be established.
5. The Committee is working in the background to line-up all our lists – email, membership, awards etc. We need to have a single repository for this information, with the master copy residing with the Treasurer, so that it could be updated as required.
6. Foundation & licence courses: The next Foundation course will be conducted at the clubrooms on 8/9 August.
7. Changes to the LCD: The LCD under which we all operate has been revised, and is available from the WIA website. There have not been any major changes, but it is best to check so that you are up to date with what changes have been made.
8. 2/70 antenna orders: Those members who have ordered the Chinese 2/70 antennas from Ian VK3BUF can collect them tonight.
9. Home Brew Award: Owing to delays in developing the rules for this award, it may be best to put it off until early next year.
10. Lengths of wire: Albert VK3BQO has a variety of lengths of wire available, if anyone can make use of them.
11. Michael VK3GHM advised that the Kidney Car Rally will be commencing in 2 weeks. They will be utilising APRS, so their progress can be tracked. The callsign in use will be VK3KKR.
12. JOTA: Keep your diaries clear, as JOTA is fast approaching. The JOTA Jamboree will be in Queensland. Just a reminder that much of the activity last year on JOTA took place on D-star repeaters.
13. VK3REC will be off the air for most of August. It is not clear at this stage what will replace it while repairs are being undertaken.
14. VI100ANZAC will be conducted from 22-28 August. If you are interested in participating, talk to Bruno.

**Meeting closed:** 8:55 pm

**Next Committee Meeting:** 04/08/2015

**Next Prac Night:** 07/08/2015

**Next General Meeting:** 21/08/2015



# 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	Bruno Tonizzo	VK3BFT	Repeater Officer	Albert Hubbard	VK3BQO
Admin Sec	Bryan Simm	VK3FOAB	Web Master	Mark Clohesy	VK3PKT
Treasurer	Graeme Brown	VK3BXG	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Rob Streater	VK3BRS	Property Officer	Bruno Tonizzo	VK3BFT
General 2	Wayne Cooke	VK3XF	Secretary	Vacant	

## Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.  
 6m Repeater Cockatoo VK3RDD In 52.575MHz, Out 53.575MHz CTCSS 91.5Hz  
 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](mailto:editor@ggrec.org.au) or [vk3tgx@gmail.com](mailto:vk3tgx@gmail.com)  
 All other Club correspondence to: [secretary@ggrec.org.au](mailto:secretary@ggrec.org.au)  
 or via Snail Mail : PO Box 1098, Cranbourne 3977  
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