



OCTOBER 2009

NERG Inc.
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WHAT'S ON IN OCTOBER

NERG NEWS is late off the press this month. Despite this we had a good turnout at the NERG meeting on the usual second Thursday.

We were pleased to have Stephen VK3SN talk about his recent family holiday to A35, the call area covering hundreds of small islands in the Tongatapu group in the Kingdom of Tonga. This tiny nation is renowned for its beautiful coral reefs, friendly locals and occasionally spectacular volcanic activity. Stephen recounted his experiences in obtaining a call sign and working HF from a dipole strung up in palm trees. As usual there were some marvellous photos of tropical islands to make us all jealous on a cold Melbourne night ☺.

October also sees the Ballarat Hamvention, and the open day for the Synchrotron on the same day. More details in this issue.

73, Mark Harrison

VK3BYY, NERG NEWS Editor

THE GAINFULLY UNEMPLOYED GROUP – MEETS NEXT ON TUESDAY 27 OCTOBER

The next meeting on the Group will be at the home of Gerhard VK3EWM and Barbara in Lower Plenty on Tuesday 27th October around 10am onwards. Please RSVP to Gerhard direct or via email to “news at nerg.asn.au”

NEXT MONTH'S NERG MEETING

NERG will hold next month's regular meeting on **Thursday 8th November 2009**, starting 7:45pm at the Briar Hill Community Hall, 126 Mountain View Rd, Briar Hill, MELWAY 21 C3.

NERG COFFEE SHOP NIGHT - 22 OCT.

A quick reminder that the coffee shop session is held every fourth Thursday night at the club rooms from about 7.30pm (enter via far end door).

Members are encouraged to bring along items for discussion – something you've just built or bought, or some thing that needs fixing. You can also have a bash at working come DX!

Tea and coffee is always available and the HF/VHF radios are there to be used.

NERGS TO VISIT THE SYNCHROTRON

Australian Synchrotron has an Open Day on 25 October, 2009. This is a free event; however it is essential to book tickets.

Mike Hewitt VK3KMJ has reserved a few tickets for NERGs for the 10am and 1pm tours and may have some left if you are quick (catch up with us at the next NERG coffee night). Otherwise you can book tickets online at:
<http://synchrotron.eventix.com.au>

NERG NEWS

Incorporated 1985 in Victoria, Australia
Reg No A0006776V - <http://nerg.asn.au>
Affiliated with the Wireless Institute of Australia



Stephen VK3SN operating portable from a tropical paradise in call area A35

Next COFFEE SHOP NIGHT 22nd October

The special Guides Tours have been booked out but there are plenty of Self Guided tours available. Allow an hour and be prepared for a reasonable walk on these tours.



The Australian Synchrotron is the nation's largest stand-alone piece of scientific infrastructure. The synchrotron's light ranges from infrared to hard X-rays and is used to analyse a vast range of materials such as human tissue, plants, proteins, artefacts, minerals and more. By generating new information about materials at the most microscopic level, the synchrotron can help to make life better for everyone.

TROUBLESOME ELECTROLYTICS

Electrolytic capacitors remain one of the biggest causes of faults in electronic equipment. When I was much younger it was common to fix mantel valve radios by replacing a few valves and a few electrolytic capacitors (electros). Valves are rarely a problem these days, but problems with electros are still with us. For example recently I've fixed a Digital TV hard disk recorder, an ADSL modem, a VHS VCR, and a robotic vacuum cleaner charger. All had faulty electrolytic capacitors!

Symptoms:

Symptoms caused by faulty power supply electros typically include incorrect supply voltages and/or high levels of noise on power rails. In the case of the ADSL box mentioned previously, the modem dropped off line on cold mornings. The TV PRV had 14 Volts on the 12 hard disk supply, causing intermittent operation. The VCR had lines running diagonally across the screen. Less common problems may include noise or reduced signal levels in audio and video circuits, and unreliable reset circuits.

Failing electros on PC motherboards causing all sorts of bizarre faults that are often incorrectly blamed on software bugs and viruses. PC's may require several re-boots to get running on cold days, but run OK once warmed up. Or they may crash when running intensive tasks. Trouble reading and writing data to disks is another symptom.

Failure modes:

Electrolytic capacitors contain a liquid electrolyte contained inside an aluminium and plastic case. In the old days the rubber seals around the component leads would shrink or perish, allowing the electrolyte to dry out. The hot interior of a valve radio accelerated the drying. Once this happens the capacitance value falls significantly. Occasionally leakage currents would rise, heating the capacitor to the point where it exploded!

Similar problems still exist with modern capacitors. Bad electros often plague cheap brands although respected manufacturers are not immune either.

The Cause:

Faulty electrolytics usually turn up in switched mode power supplies. These are under enormous stresses from high peak currents and high switching frequencies. Even small losses in these capacitors can cause considerable self-heating. Nearby power supply components such as resistors and heat sinks provide additional heating. The trend to pack ever shrinking circuitry into small unventilated spaces does not help matters! Although these capacitors are usually rated for high temperatures (105°C) and have low Equivalent Series Resistance (ESR), it's not uncommon to find them failing after 2-3 years of continuous service.



Notice the bulge in the top of this capacitor. Originally 1500uF, it now measures less than 500uF.

Repairs:

Locating and replacing fault electros is not difficult. Usually they develop a visible bulge on top of the capacitor (see photo). Sometimes the electrolyte leaks out around the base and is visible on

the circuit board (not to be confused with various glues that some manufacturers use to hold down components). In extreme cases the case splits along the pre-pressed grooves that are put there to prevent catastrophic pressure build up.

Surface mount electros are more likely to ooze foul smelling electrolyte around their base, which has a tendency to corrode nearby PCB tracks, and can even become so conductive it causes short circuits. Locate these visually and by nose!

Removal, cleanup and replacement of the offending electros usually fixes the problem. If one failing electro is found then it's quite likely that all other electros of the same value are also failing. Replace them all! Always replace with capacitors of the same or higher voltage and temperature rating. Low ESR electros must be replaced with similar types (replacing a faulty low ESR electro with a new regular electro may just make things worse!).

Measuring Electros

Sometimes it's necessary to test dubious electrolytics. Capacitors with high values are easy to measure without a capacitance meter.

Using a circuit like the one below, charge the capacitor to a known voltage. Then measure the time it takes for the voltage to discharge to 37.7% of the initial voltage through resistor R2. This discharge time is related to resistance and capacitance by the simple time constant formulae:

$$T = R \times C$$

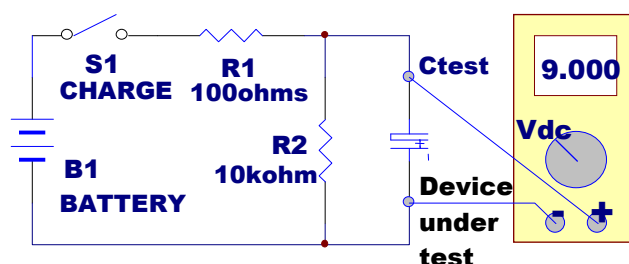
Rearranging the time constant formulae we can calculate the unknown capacitance value from the time T, and resistance R2:

$$C \text{ (Farads)} = T \text{ (seconds)} / R2 \text{ (ohms)}$$

If R2 is 1,000 ohms, then T equals the capacitance in thousands of microfarads. i.e. $C = T \times 1,000 \text{ uF}$. This value R2 is OK for large value capacitors where the discharge time is at least a few seconds.

For easier measurement, choose R2 to give a time constant of around 10 seconds for the capacitor being tested. For instance make R2 = 10k ohm to measure capacitors of around 1,000 uF, making T around 10 seconds:

$$\text{i.e. } C = T \times 100 \text{ uF [where } R2 = 10\text{k]}$$



The table below shows the 37.7% values for various battery voltages.

Battery	37.7%
1.5V	0.57V
5V	1.89V
9V	3.39V
12V	4.52V
13.8V	5.2V

The input resistance of the voltmeter should be at least one hundred times that of R2. Since most digital meters have a 10 Meg ohm input impedance, R2 should be limited to 100k ohms, which in turn limits this method to measuring values down to about 47uF.

Be warned this method is not particularly accurate. Leakage resistance in faulty electrolytic capacitors can discharge the capacitor more quickly, leading to lower measured values, however leakage is also an indication of failing capacitors, which is what we are trying to detect!

In case you are wondering, the 100 ohm resistor, R1, is to limit the inrush current when charging the capacitor. High impedance sources like a 9 volt battery won't have this problem; however some bench-top power supplies could damage some capacitors.

Mark Harrison VK3BYY

BALLARAT 2009 HAMVENTION SUNDAY OCT 25TH

Ballarat Amateur Radio Group

--- New Location ---

Ballarat Greyhound Racing Track located Corner of Sutton and Rubicon Streets, Redan. All under cover.

Food and Drinks available.

Hamvention opens 10.00am

Traders entry from 8.00am.

Entry Fee \$6.00. All information see www.barg.org.au or contact via email hamvention@barg.org.au

NEW ROAD RULES FOR MOBILE PHONES AND VISUAL NAVIGATION DEVICES

From 9 November 2009, there will be some important changes to the Victorian road safety rules about using mobile phones and visual display units. While these don't appear to affect any rules regarding the legal use of two-way radios whilst driving, some amateur radio equipment is starting to look a lot like a mobile phones or GPS navigator, so it's probably best not to use them whilst mobile and avoid attracting too much attention.

The follow notes regarding phones and visual display devices and other rule changes can be found on the Vic Roads web site at: www.roadrules.vicroads.vic.gov.au

Mobile phones

Using a mobile phone to make or receive a phone call while driving is prohibited except if the phone:

- * is secured in a commercially designed holder fixed to the vehicle,

or

- * can be operated by the driver without touching any part of the phone.

All other functions (including video calls, texting and emailing) are prohibited.

Holding the phone (whether or not engaged in a phone call) is also prohibited. Holding includes resting the mobile on the driver's lap.

Learner and P1 drivers are not permitted to use a mobile phone at all while driving.

Visual display units

A driver must not drive a vehicle that has a television receiver or a visual display unit operating if any part of the screen is visible to the driver or is likely to distract another driver.

A driver can use a driver's aid such as a navigation device but it must be an integrated part of the vehicle design, or secured in a commercially designed holder, which is fixed to the vehicle.

Exemptions

The rule relating to securing visual display units does not apply to motorcycles.

What you have to do

Don't use your mobile phone or your driver's aid when you are driving, unless it is within a commercially designed holder fixed to your vehicle.

Road safety reasons

Using a mobile phone or a visual display unit as you drive is distracting and creates dangerous situations that could be fatal.

The risk of being involved in a crash increases by as much as four times, when using a mobile phone as you drive, and if you are texting the risk of crashing increases to 23 times.

GGREC NEWS BROADCASTS RETURN

The Gippsland Gate Radio and Electronics Club Inc. (GGREC) has recommenced its News Broadcast service for members and listeners.

Broadcasts are currently scheduled fortnightly with the next on Wednesday 28th October at 8pm AEDST.

Broadcasts are transmitted from the GGREC club rooms at Cranbourne with the callsign VK3 on 145.450MHz FM and 3.670MHz LSB + QRM.

Members and the general amateur community are welcome to listen and call back, and are encouraged to submit news articles and items of interest via email to news@ggrec.org.au

Recordings of the most recent broadcasts can be found at <http://www.ggrec.org.au/broadcasts.php>

From Steve VK3EGD, GGREC Secretary www.ggrec.org.au

GET READY FOR THE SPRING VHF-UHF FIELD DAY! 28/29 NOV.

Time to get ready for this year's VHF-UHF field day, held on the weekend 28/29 November.

The VHF-UHF Field Days provide VHF-UHF operators with the opportunity to "head for the hills" and see how far they can work.

The Field Days has sections for single and multiple operators, with 24 and 8 hour sections. There is also a separate Home Station section.

The scoring is based on grid locator squares. Each new square worked gives quite a boost to the score, and this encourages the entrants to operate from locations in grid squares that normally don't have a great amount of amateur activity.

There are no mode restrictions, except that all contacts must be simplex – no repeaters, Internet, or satellites allowed. There is plenty of FM activity, but one feature of the Field Days is a high level of SSB activity.

Stations can do very well with modest antennas and equipment from a good hilltop. Operating mobile from more than one grid square can also improve scores.

See the WIA web Contests page for more details:

<http://www.wia.org.au/members/contests/vhfuhf/>

NERG DATES FOR REMAINDER OF 2009

NERG has the Briar Hill hall reserved exclusively for our activities over the next few months. Access to the club room is also available at other times via special arrangement with the Secretary.

22 Oct	Coffee Night
12 Nov	NERG meeting
26 Nov	Coffee Night
10 Dec	NERG meeting
11 Feb	NERG meeting
25 Feb	Coffee Night
11 Mar	NERG meeting
25 Mar	Coffee Night

ARDF & FOXHUNTING EVENTS

The Victorian Amateur Radio Direction Finding Group has the following events listed in their calendar. Many RadiO (a simplified form of orienteering involving radio direction finding) and ARDF events are held together with conventional orienteering events.

Friday night mobile transmitter hunts normally run on the 3rd Friday night of each month.

Updates and further details from www.ardf.org.au

Type	Date	Event	Map
RadiO	Sun, 25 Oct	Braeside Park	88 E8
Inter	Thu, 29 Oct	Region 3 ARDF Championships, Thailand	
FoxHunt	Fri, 20 Nov	Fox hunt	
FoxHunt	Fri, 11 Dec	Fox hunt	



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2009 AMATEUR RADIO EVENTS

H = Hamfest, A = ARDF/RadiO/Foxhunt, C = Contest,
M= Meeting, S = Special event, G = General, W = WICEN

FoxHunt = Friday night or weekend daylight mobile hunt.

RadiO = a simplified direction finding competition usually held at an orienteering event. **BushO** = Bush orienteering event. Check the ARDF web site for updates and further details at: www.ardf.org.au

October 2009

- H Oct 11 Shepparton Hamfest, Orr Street, Shep. 10am.
- S Oct 17-18 Jamboree On The Air (JOTA)
- H Oct 25 Ballarat 2009 Hamvention, Ballarat Greyhound Racing Track located Corner of Sutton and Rubicon Streets, Redan. 10.00am www.barg.org.au.

November 2009

- C Nov 7-8 ARRL Sweepstakes – CW ##
- C Nov 21-22 ARRL Sweepstakes - Phone ##
- C Nov 28-29 Spring VHF-UHF Field day. Later in the month than in past years. Details at: www.wia.org.au

February 2010

- H Feb 14 Centre Victorian Radiofest #3, Kyneton Racecourse, www.AmateurRadio.com.au
- H Feb 28 Wyong Field Day, NSW

April 2010

- S Apr 2-5 WIA 100 Midland ARC Radio Electronic & Astronomy Expo. Of amateur and vintage radio & Astronomy. See www.marc.org.au
- C Apr 30-May 6 FM CQ Repeater Contest, open to all amateurs. Westlakes Amateur Radio Club www.westlakesarc.org.au

July 2010

- H Jul 17 10am-2pm HAMFEST Gippsland Gate Radio & Electronics Club

for ARRL contest details <http://www.arrl.org/contests/>

NOTE: always confirm details closer to the posted dates!
UTC dates may be used for International events.

Dates gathered from WIA, AR Vic, ARRL, various clubs, VK Contest Club www.vkcc.com, and Banyule City calendars.

The NERG Inc. RegNo A0006776V <http://nerg.asn.au>

The North Eastern Radio Group, Inc. is an amateur radio club devoted to encouraging members and others to enjoy the hobby of amateur radio. It tries not to hang on ceremony and endless reporting but rather participate in the fun aspects of this fascinating hobby.

Membership Fees (due in August):

Full: \$30 Family: \$40 Concession: \$20

Send to: NERG Treasurer, PO box 270, Greensborough, Vic., 3088

Committee

President	Greg Williams	VK3VT	9432 0563
Secretary	John Weir	VK3XD	9431 0667
Treasurer	Marg Baxter	VK3VOJ	9467 1253
Assistant	Jim Baxter	VK3KE	
Committee	Betsy King	VK3HBK	
	David Aston	VK3UQ	0411-877-051
	Peter Cosway	VK3DU	9379 3626
	Don Haslam	VK3KDT	0409 024 597
News/Repeaters	Mark Harrison	VK3BYY	9435 3043

Meetings

Main Meeting: 2nd Thursday of each month at 7.45 PM (ex Dec & Jan)
Coffee Shop nights: 4th Tuesday each month.
Briar Hill Community Hall, 126 Mountain View Road, Briar Hill
(Near Sherbourne Road intersection) Melway map ref 21-C3

Classes & Exams

NERG occasionally runs classes and exams for Amateur licences

Callsigns and Repeaters (25km North East of Melbourne)

Club call - VK3CNE <http://www.nerg.asn.au/vk3cne>

6m repeater VK3RMH FM 52.550 MHz in 53.550 MHz out

70cm rpt. VK3RMH FM 433.325 MHz in 438.325 MHz out

with 70cm IRLP node 6350, EchoLink node 140587

6m beacon VK3RMH CW 10 Watts H 50.2950 MHz

10m beacon VK3RMH CW 20 Watts V 28.2565 MHz

Packet Radio VK3CNE 2m 144.700 MHz, 1200 bps

VK3CNE-1 for mail,BBS; VK3CNE-7 for the DX Cluster. Occasionally

home to the Scout Radio & Electronics Group repeater:

2m VK3RSR FM 146.375 MHz in 146.975 MHz out

NETS

NERG NETS run on 146.575 MHz FM Simplex (8.30 – 9.30 pm Thursdays).

Please join the discussions. Also used as a general Net frequency.

WEB Sites: <http://nerg.asn.au> and <http://www.qsl.net/vk3rmh>

NERG NEWS submissions and comments invited:

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email: news@nerg.asn.au



NERG

North-East Radio Group VK3CNE

NERG Incorporated 1985
BOX 270 GREENSBOROUGH VIC 3088

STAMP

Next Meeting: 7.45 pm Thursday 10th November 2009

2009 CALENDAR (NERG ACTIVITIES IN BOLD TYPE)

Oct 8	NERG Meeting.
Oct 11	Shepparton and District Amateur Radio Club Hamfest, St. Augustine's Hall, Orr St, Shepparton
Oct 15	NERG Net – 146.575MHz FM 8.30-9.30pm
Oct 16	Friday Night Hidden Transmitter foxhunt
Oct 22	NERG coffee night meeting
Oct 25	Ballarat 2009 Hamvention, Greyhound Racing Track located Corner of Sutton & Rubicon Streets, Redan. 10.00am. www.barg.org.au .
Oct 27	NERG Tuesday Lunch Group – at Ernie's QTH.
Oct 29	NERG Net – 146.575MHz FM 8.30-9.30pm
Nov 5	NERG Net – 146.575MHz FM 8.30-9.30pm
Nov 12	NERG meeting
Nov 19	NERG Net – 146.575MHz FM 8.30-9.30pm
Nov 20	Friday Night Hidden Transmitter foxhunt
Nov 24	NERG Tuesday Lunch Group
Nov 26	NERG coffee night meeting