



October 2003

NERG Inc.  
PO Box 270  
Greensborough  
Victoria 3088

**WHAT'S ON THIS MONTH -  
THE NERG SWAP MEET**

It's time to give that shack of yours the spring clean and swap all the pink elephants for green ones! That's right, it's time again for the NERG white elephant night!  
The NERG is running a swap-night for it's October meeting (Thursday 9<sup>th</sup> Oct). Not a big affair like Daytona, just a small friendly get together with NERG and WANSARC members invited to bring along their elephants and other wares.

Donations towards the NERG fundraising table will be gratefully accepted!

Don't miss this once a year chance to swap a load of your old junk for a load of completely new load of old junk. If you don't have any junk then it's time you collected some! There are bound to be some real bargains amongst it all, and even a few brand new items, as well as free giveaways.

There is no fee for tables as there won't be any tables (we have loads of floor space though!), and the normal gold coin will be accepted for a bottomless cup of tea or coffee.

To finish off the evening, our President, Greg, is threatening to auction off anything that remaining unsold.

See you around 7.00pm for setup and 7.30 for start of proceedings on Thursday, 9<sup>th</sup> October at **Briar Hill Primary School, Gladstone Rd, Briar Hill, Melway 21-B3.**

**WHAT HAPPENED LAST MONTH?**

The expectation of the many that attended our September meeting was well and truly catered for. We welcomed guests from WANSARC and EMDRC plus a special surprise visit by Russel of the Astronomical society fame.

The night started with a report on committee activity given by Mark, VK3XXX and his invitation to all to take part in the ACA licensing review being currently undertaken. A NERG committee will consider the paper at length then post a report on the "club's" recommendations in this critical review. It was then asked of each member to read and contribute individually as well, should they wish.

# NERG NEWS

Incorporated 1985 in Victoria  
Reg No A0006776V - <http://nerg.asn.au>

AT THE NEW MEETING ROOMS:

## BRIAR HILL PRIMARY SCHOOL

7.00pm setup, starts 7.30 pm,

**Thursday 9<sup>th</sup> October 2003**

## WHITE ELEPHANT SWAP MEET with a difference

(we only have iridescent green elephants!)



Jim Baxter VK3DBQ spoke briefly on what the WIA Vic were doing to promote Amateur participation in this review. Some items on their agenda were attending a public meeting being held by WIA South Australia then hold a similar one here on October 8

Our guest speaker was **Gary Kennedy, VK3KHB** who gave us a most enlightening talk on ATV, as it is today, how it originated and how little is actually required to start off an ATV station. Gary set up a small station in the classroom for us all to see, using a standard portable TV for its display plus a tiny wide angle "spy camera" of matchbox size. It brought back memories to some who had dabbled in ATV and many indicated their interest in participating in constructing their own ATV gear. David VK3THY has kindly accepted the task of co-ordinating our ongoing ATV activities,

Our thanks go to Gary for a wonderful night and to David for our future involvement.

The night closed with an invitation to all to come to next months White Elephant night where they can swap, buy and sell all sorts of pre-loved gear. Our October White Elephant night will culminate in an auction of selected items not previously sold, under the control of our very own auctioneer, Greg VK3VT.

See you there in October,

Don, VK3KDT

## LOOKING AHEAD - NOVEMBER MEETING

Jim Baxter VK3DBQ will talk about DX'ing and using those confusing looking Ionospheric Prediction Graphs to maximise your catch! Jim must have figured it out because he has done remarkably well in DX contests and collecting DXCC certificates!

The November meeting is scheduled for Thursday 13<sup>th</sup> November, usual time and place.

## TUESDAY MORNING TEA GROUP

The NERG morning tea was held on Tuesday 23<sup>rd</sup> September at Dave's place (VK3JMB) with the usual good attendance.

The group meets on the 4<sup>th</sup> Tuesday of each month, so the next NERG morning tea will be on Tuesday the 28<sup>th</sup> October 2003 starting at 10am. The location is yet to be determined, so keep an ear out on the NERG net frequency 146.575 MHz.

73, Jim VK3DBQ

## ACA REQUESTS COMMENT

Reports of the ACA "road show", meeting with amateurs around the nation, have so far been pleasing. At least some of the concerns about Class licensing and the "No interference" policy have been substantially reduced. It is still important to get our opinions across to the ACA as strongly as possible. Please show strong support for sensible changes by turning up at the ACA amateur regulatory review public meeting in Melbourne next week:

Wednesday 8 October 7.30pm-9.30pm

Australian Institute of Management  
181 Fitzroy Street  
ST KILDA

Public transport:

Light Rail 96 from Spencer Street to Fitzroy Street, or, Tram 16 from Swanston Street to Fitzroy Street

A discount voucher for undercover car parking at the nearby Regal Parking (beneath the George Cinema) at 133 Fitzroy Street, St Kilda, is available from the WIA Victoria website:  
[www.wiavic.org.au/news](http://www.wiavic.org.au/news)

To obtain the discount, please print the voucher and present it on entry of the car park. Please copy and distribute this voucher to others who will be attending the meeting. Be advised that Regal Parking does not accept credit cards.

The ACA will explain the proposed changes to amateur licensing necessary to implement the changes arising out of the World Radiocommunications Conference held in Geneva this year. The ACA representatives will then answer questions from the public.

WIA Victoria has produced a "sign and send" submission for use by individuals wishing to make a submission to the ACA review of amateur regulations.

This proforma submission is designed to help and encourage as many radio amateurs as possible to make a submission.

Should individuals wish to write their own submission, or express additional or different viewpoints, then the proforma submission will be an ideal reference source.

It summarises the main WIA responses points that were decided at the WIA Summit meeting in Sydney on 20 September.

The deadline for submissions is 31 October. Download the submission from:

[http://www.wiavic.org.au/download/wia\\_sub.pdf](http://www.wiavic.org.au/download/wia_sub.pdf)

## POWER LINE COMMUNICATIONS

The ACA has recently released a Fact Sheet and a discussion paper on Powerlines Communications (PLC) equipment and their relationship with current Australian and International regulations and radio frequency emission standards

Whilst low frequency (<500kHz) communications and control systems have been used over power lines for decades, there is renewed enthusiasm in using the existing power grid to provide cheap high speed internet, entertainment, and building automation services to homes and businesses.

While existing systems are EMC compatible, some of the proposed high-speed systems are not compliant when applied to Australian conditions. Many of the overseas systems use signals with components up to 30MHz, and could cause considerable interference to other users of the HF spectrum.

Two big differences exist between PLC in Australia and the USA (where high speed systems are now being used). One is the more relaxed EMR limits set in the US. The other is the fundamentally different power distribution method used in the US, which generally uses balance power feeds over very short distances (e.g. between 10 houses). This greatly reduces the leakage of PLC signals carried by the wires. In Australia however unbalanced power feeds are distributed to hundreds of houses, making much better antennas for stay emissions and would spread the interference over a much larger area. These differences regulations and power distribution techniques are discussed in detail in the ACA discussion paper.

Meanwhile, the ACA is warning off would-be importers of high speed PLC technology unless they meet all the (expensive!) compliance issues as outlined in the ACA's new Fact Sheet on PLC's. For the time being it would appear amateur spectrum is protected against the interference PLC's would produce.

However, be on the lookout for any non-compliant devices that might be imported illegally - Anything connected to the power grid must have a C-tick approval sticker to be legal!

## AUSTRALIAN ARDF CHAMPIONSHIPS

Latest details - to be held near Ballarat this month:

**Date:** Saturday 11th October, 1:30pm

**Location:** Slaty Creek picnic area, 3km south of the Bungaree-Creswick Rd. The turn off into Slaty Creek Rd is approx. 1.5Km before Creswick when coming from Melb.

**Note:** To get to the Bungaree-Creswick you have to leave the freeway at the Wallace turnoff. Melway: 509 A11, map at: <http://members.optusnet.com.au/bmp/auschamp.jpg> ,

**Band:** 2m 145.300MHz, Standard 5 Transmitter ARDF

**Start time:** 1:30pm Registration from 1:00pm

**Course Setter:** Mark Diggins, VK3JMD

**Cost:** Adults: \$16 (VicARDF/WIA members: \$12)

Juniors: \$12 (VicARDF/WIA members: \$8)

SportID stick hire: \$5

**Registration:** Go to the web site to register online:

<http://www.ardf.org.au> (go to Local Events Area), or simply send an email to: [brucep@netspace.net.au](mailto:brucep@netspace.net.au)

- mention if you need to hire a sniffer (directional receiver).

All competitors will be required to sign an indemnity form.

Bring something for a BBQ afterwards

Competitors hoping to compete in the Australian team at the IARU Region 3 ARDF Championships, also to be held in Ballarat starting 28 November, are strongly encouraged to compete in the Australian Championships so we can select the Australian teams. There are currently vacancies in all age categories, particularly in the junior categories, so everyone is welcome to try out.

For more on ARDF, visit the Victorian ARDF Group web site at:

<http://www.ardf.org.au>

Cheers, Bruce VK3TJN

## VICTORIAN ARDF GROUP NEWS

This group is made up of people interested in the many flavours of hidden transmitter hunting, with particular emphasis on the orienteering version run according to international ARDF rules.

Last month the group held it's AGM and reported that the group had a good year with more events held than ever before. Quite a number of these were in conjunction with orienteering events. This year also saw the introduction of fox-or-ing, an easier competition that is a great direction finding skill building exercise for beginners, as well as being a lot of fun.

The group also affiliated successfully with both the WIA as a radio club, and the VOA as an orienteering club. Affiliations with these organisations bring mutually exclusive benefits to the ARDF group and the parent organisations. Affiliation with the WIA means we can participate and run the IARU region 3 championships on behalf of the WIA, and bring new members to amateur radio and the WIA from the orienteering side. The affiliation with the VOA means we can help run orienteering events and we get benefits of affiliation with this huge outdoor activity organisation.

The other major activity of the committee this year has been the organisation of the upcoming IARU Region 3 championships to be held here in Victoria next month.

The 2003/4 committee was re-elected without change:

Greg Williams VK3VT \* - President  
Mark Diggins VK3JMB - Vice President  
Bruce Paterson VK3TJN - Secretary  
John Longayroux VK3ZJH - Treasurer

General Committee:

Bryan Ackerly VK3YNG - (Equipment Officer)  
Ian Stirling VK3MZ  
Adam Scammell VK3YDF - (Web Site)  
Jack Bramham VK3WW - (WIA ARDF Coordinator)  
Ewen Templeton VK3OW \*

(\* You can see here that NERG is not loosing its traditional strong interest in foxhunting! ).

The group plans to run a busy ARDF program in 2003/2004. As well as regular ARDF style events, many Fox-or-ing events will be held in conjunction with the VOA orienteering events to promote ARDF and amateur radio in general. We will also host some orienteering events (which are likely to be of great benefit financially to the group).

For more information on ARDF in Victoria, see the web page at:

<http://www.ardf.org.au> ,

or talk to Greg, VK3VT (contact details on the back of this issue)

## BALLARAT (BARG) HAMVENTION 2003

To be held on the 2nd of November (Note the week earlier as advertised elsewhere!!!!).

The BARG Hamvention will be held at the Ballarat Showgrounds, on the corner of Creswick Road and Howitt Street Wendouree, on the first weekend of November, this is the same location as previous years. Easy access to the Wool Pavilion via White Street. Free parking inside the grounds.

The entrance fee is \$5.00. (under 15 free)

Trestles hire is \$18.00 for the first trestle with 2 free admissions, then \$15 per trestle after, with 1 free admission. (Bookings Essential)

There will be free tea and coffee all day.

WHATS ON?

Sunday - This is the main part of the hamvention, with the doors open at 10:00 am. There will be Trade displays from Icom, Strictly Ham and many more.

The usual and popular pre-loved equipment displays and sales. (You may never know what you may find!!)

There is free Tea and Coffee all day, as well as Fast Food available, (hotdogs, sandwiches, drinks etc) from the kiosk.

The Showgrounds also host the local Trash & Trivia Market on this day, so more fun and activities for the entire family. (Give's the X/YL something else to do!)

FOR INFORMATION AND BOOKINGS CONTACT

Hamvention Cord: Ian McDonald VK3AXH  
Ph: 03-, E-Mail: [vk3axh@barg.org.au](mailto:vk3axh@barg.org.au)

Publicity Officer: Doug Raper VK3VBA  
Ph: 03-53323565

Packet: [VK3VBA@VK3BML](mailto:VK3VBA@VK3BML)

E-Mail: [vk3vba@barg.org.au](mailto:vk3vba@barg.org.au)

## LAST CHANCE FOR ATV KITS

Inspired by ATV demonstration last month? **Gary Kennedy, VK3KHB showed just how easy it is to get yourself on TV.**

However, you need to get your orders in quickly to reap the benefits of the WANSARC/NERG bulk purchase of converters, kits and parts.

The basic requirements to transmit ATV are:

- A video source (small camera, camcorder, VCR, or computer with TV out)
- Transmitter (exciter/modulator + power amplifier)
- Antenna (depending on location, short to long beam)

You can choose 70cm AM for simplex transmissions, or 23cm FM for simplex and repeater input. For simplex work you may need a need a better antenna, depending on location.

The following is a summary of basic kits and prices (subject to some discounts depending on quantity ordered):

### 430MHz AM Video transmitter kit

—produces 100mW, kit includes plated PCB, all onboard components.

Complete kit without crystal **\$48.50** Crystal for either 426.250 MHz or 444.250MHz **\$29.90**

(Note 444.250MHz is the output of the ATV repeater).

### 1250MHz FM video transmitter kit

—up to 50mW output. Complete kit includes PCB and all on board components. Complete kit **\$40.00**

### Audio/subcarrier kit

—consists of audio pre-emphasis, preamplifier, subcarrier oscillator—suitable for microphone or line input levels. 5.5MHz IF used for 430/1250MHz transmitters.

Complete kit 5.5MHz **\$35.00**

### Linear amplifiers

according to the latest web information the availability of power amplifier kits is to be clarified in the near future.

More information can be found Mark VK5EME's Minikits web site at [www.minikits.com.au](http://www.minikits.com.au).

Check out the minikits web site for receive converters and other goodies too.

Once you decide on what you would like to order, then talk to us at the October NERG meeting, or contact David VK3THY. No money will be required at this stage, as the intention is to obtain a total quantity list of kits required by both WANSARC and NERG members.

## 2003 EVENTS

- Oct 9th** NERG Meeting - 7.45pm - White Elephant night
- Oct 11** Australian ARDF championships - Championships - Ballarat, Saturday.
- Oct 12<sup>th</sup>** Special event station VI3BVS - To commemorate the 200th anniversary of Victoria's first European settlement. This WIA Victoria station will be mounted at Sorrento on the Mornington Peninsula. A commemorative QSL card will be available. QSL via VK3WI or through the bureau.
- Oct 11-12<sup>th</sup>** Oceania DX contest weekend - CW. info: octest@nzart.org.nz
- Oct 13-27<sup>th</sup>** VK9XYL DXPedition to Christmas Island OC-002 ops VK3DYL, VE3YL and VK4SJ
- Oct 18-19** JOTA - Jamboree On The Air & JOTI (internet) Scouts and Guides on the air.
- Oct 28<sup>th</sup>** NERG Tuesday morning tea group Contact Jim VK3DBQ for location.
- Oct 27<sup>th</sup>-Nov10** VK3CYL DXPedition Cocos Keeling OC-003 ops VK3DYL, VE3YL and VK4SJ
- Nov 1-2** Spring Field Day, 24 hours from 0100z (0400z for VK6). 6 and 24 hours categories.
- Nov 2** Ballarat Hamfest (BARG) 10am Sunday, Showgrounds off White street, Wendouree. \$5 entry. Food. Free tea/coffee.
- Nov 13th** NERG Meeting - Ionospheric Prediction Graphs for better DX'ing by Jim VK3DBQ
- Oct 25<sup>th</sup>** NERG Tuesday morning tea group Contact Jim VK3DBQ for location.
- Nov 28-Dec 3** The 5th IARU Region 3 ARDF Championships Mt Helen Campus, Victoria University, Ballarat. Info: www.ardf.org.au (2m event 30th Nov, 80m event 2nd Dec.)
- Dec 6-7** ZL VHF Field Day - 1600 to 2200 on the Saturday, and 0800 to 1400 on the Sunday, NZT or NZDT
- Dec 11th** NERG Christmas BBQ
- Dec 26-Jan 18** Ross Hull Memorial VHF/UHF Contest

Collected from AR magazine, WIA Vic, Vic ARDF Group

## SPRING VHF-UHF FIELD DAY 2003

via John Martin (VK3KWA), contest manager

The Spring VHF-UHF Field Day will take place on the weekend of November 1 and 2, 2003. Logs will be due on November 24 and entrants are also invited to include any comments or suggestions about the rules.

Duration: 0100 UTC Saturday to 0100 UTC Sunday.  
(in VK6 only: 0400 UTC Sat to 0400 UTC Sun)

Sections:

- Portable station, single operator, 24 hours.
- Portable station, single operator, 6 hours.
- Portable station, multiple operator, 24 hours.
- Portable station, multiple operator, 6 hours.
- Home station, 24 hours.

Exchange: RS (or RST) reports, a serial number, and your four-digit Maidenhead locator.

Scoring is based on number of grid squares you work from, number of grid squares contacted, number of contacts, and band multipliers.

The rules should be up on the WIA federal and state web sites shortly, and also in October AR magazine.

(This field day encourages amateurs to get out of the shack and polish their portable skills. It's also a good chance to set a few distance records and hunt rare grid squares for other certificates! If you are a home station it makes interesting listening).

## STEAM COOLED VACUUM TUBES???

True to amateur principles, some of the discussions on the local repeater are actually educational! Recently the "drive-time" discussion took a right-turn into the subject of steam-cooled valves.

Were they pulling our legs? Can hot steam really keep something cool? After all steam has to be at least 100°C and can be a lot hotter than that under pressure!

Now traditionally we use radiated, convection, forced air, or circulating water systems to cool Power Output transmitting valves, so steam "cooling" may sound a bit unlikely.

Actually steam cooling is probably a bit of a misnomer - it really refers to cooling a valve by boiling water with the excess heat thereby turning it into steam.

Now you won't find too many steam cooled mantle radios - this steam cooling stuff is for really serious power tubes, like the 1 Megawatt final of a broadcast station, or the power converters in power stations.

This is serious stuff indeed - with tetrodes running kilowatts just to heat the filaments, and anodes needing to dissipate hundreds of kilowatts in heat!



Eimac 4CM400,000A tetrode with boiler casing. Note the water inlet and steam outlet pipe flanges at the top of the kettle jacket. At nearly 1 meter tall and 77kg this is one mean tube!

Vapor-phase cooling, as it is correctly named, has several advantages over water-cooling systems. Most important is exploiting the latent heat of evaporation of water.

Raising the temperature of one gram of water from 40°C to 70°C (as in a circulated water cooling system) requires 30 calories of energy. However, transforming one gram of water at 100°C to steam vapor (just over 100°C) requires 540 calories!

Thus a vapor-cooling system will remove nearly twenty times as much energy as in a water-cooled system. Power densities as high as 135 Watts per square centimeter of effective internal anode surface have been attained through vapor cooling. The table below compares cooling methods:

Method	Heat removal per cm <sup>2</sup> of effective internal anode area
Forced Air:	50 Watts/cm <sup>2</sup>
Circulating Water:	100 Watts/cm <sup>2</sup>
Vapour phase:	135 Watts/cm <sup>2</sup>
Multiphase cooling:	2,500 Watts/cm <sup>2</sup>

Although vapour phase cooling doesn't look much better than circulating water in this table, it doesn't require the noisy pumps and complicated plumbing found in circulated water systems. The vapour phase water flow rate is some 20 times lower and usually uses thermo syphoning for silent operation. The lack of pumps alone can save \$15,000 (US) per year in the running costs of a typical 100kWatt transmitter.

Vapour phase system can also use much smaller condensing radiators as they run at a much higher temperature differential to the air that cools them. They only need to convert the steam back to water of about 70 C, whereas the hot circulated water must be cooled to around 30 C - close to the air temperature cooling it.

Now if you are worried about all that water in contact with an anode running at 10's of kilovolts, don't be. The leakage current through clean water is small compared to the anode current, and resistive heating of the cooling water is negligible compared to the anode dissipation! They do however have to run the water through Pyrex tubes for several feet to avoid high voltage flashover between the anode and the grounded plumbing system!

The multiphase cooling uses high flow rate water that circulates through narrow channels embedded in the anode. The water boils on contact with the anode, thus removing heat, but is quickly flushed away by the fast flowing water. The incoming cooling water condenses the steam bubbles produced before leaving the tube. Tubes using this method (such as the higher powered Eimac 4CM500,000G) can remove more heat, but at the expense of additional pumps.

The Eimac 4CM400,000A is an example of a water-vapour cooled power tetrode designed for very-high power broadcast service to 110 MHz. Typically it is used in AM & SSB broadcast transmitters, producing 500kW in the range 3-30 MHz.

Note the "boiler" casing enclosing the anode. The large pipe fittings at the top of the tube connect to the water supply and water/steam removal plumbing. The hook at the top is for lifting this 77 kg monster!

The tube has a thoriated-tungsten mesh filament mounted on water-cooled supports.

Maximum anode dissipation is 400 kilowatts steady state.

Large diameter coaxial terminals are used for the control grid and the RF filament

terminals. Cooling water is pumped through the Filament power connectors and internal filament supports via special couplings with threaded clamping rings.

The 4CM400,000AG uses a specially designed screen grid to provide improved efficiency in shortwave broadcast service.

In comparison, the higher-powered 4CM500,000G is a multiphase cooled tube, but is actually slightly smaller in size and weight due to the more efficient cooling.

#### EIMAC 4CM400,000A SPECIFICATIONS:

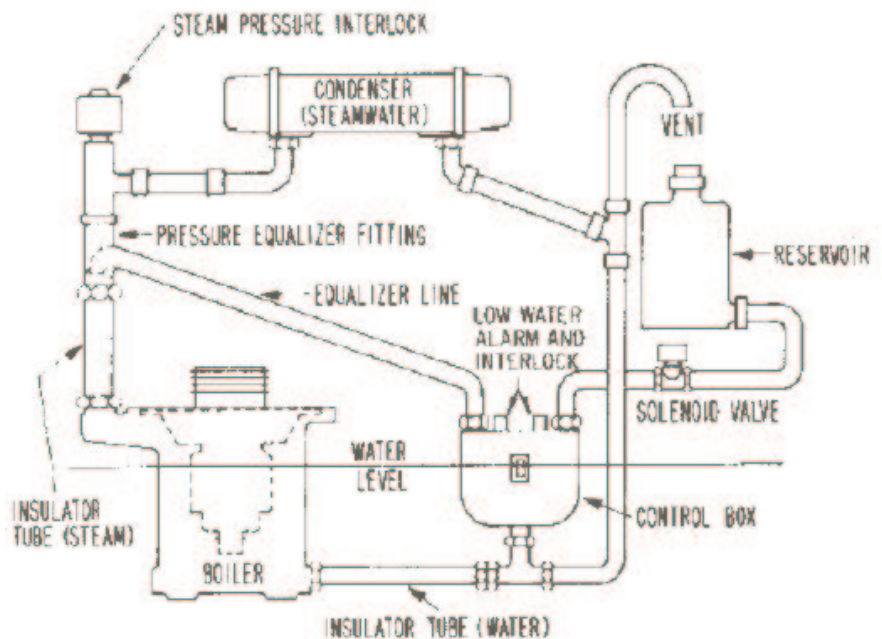
Plate Dissipation (Max.)	400,000 Watts
Screen Dissipation (Max.)	7,500 Watts
Grid Dissipation (Max.)	2,000 Watts
Frequency for Max. Ratings (CW)	110 MHz
Maximum Useful Frequency (CW)	210 MHz
Cooling	Vapour and Water
Filament Voltage	16.3 volts
Filament Current	600 amperes
Filament type	Thoriated Tungsten Mesh
Plate Voltage	20 kV (typ)
Plate Current	59 Amps (typ)
RF drive	2.5 kW
RF output power	600 - 1,000 kW (typ)
Anode Core Temperature	200°C max
Length	18.25 in; 46.36 cm
Diameter	17.03 in; 43.26 cm
Weight (approximate)	170 lb; 77.3 kg

#### Further reading:

- "The care and feeding of power grid tubes", Eimac at: [www.cpii.com/eimac/](http://www.cpii.com/eimac/) (see chapter 6).
- Also, Transmitting tubes: <http://www.broadcast.de>

***p.s. Computer enthusiasts sometimes cool their over-clocked CPU's with all manner of fans, circulating water systems, and Peltier effect coolers. I wonder if any have thought of using steam yet ?***

by Mark VK3BYY



**The NERG Inc.** Reg No 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 each 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	Mark Beacham	VK3XXX	0417-597399
Treasurer	Marg Baxter	VK3VOJ	9467 1253
Committee	Betsy King	VK3HBK	
	Peter Cosway	VK3DU	9379 3626
	John Weir	VK3ZRV	
Social Sec.	Don Haslam	VK3KDT	0409 024597
Repeaters	Mark Harrison	VK3BYY	9435 3043

**Meetings**

2nd Thursday of each month at 7.45 PM (excepting Dec. & Jan.)  
Briar Hill Primary School, Gladstone Rd, Briar Hill (off Sherbourne)  
(Melway map ref 21-B1)

**Classes**

NERG occasionally runs classes and exams for Amateur license candidates.

**Callsigns and Repeaters (25km North East of Melbourne)**

Club call - VK3CNE <http://www.qsl.net/vk3cne>

6m rpt VK3RMH FM 52.550 MHz in 53.550 MHz out

70cm rpt VK3RMH FM 433.325 MHz in 438.325 MHz out

IRLP node 6350

6m beacon VK3RMH CW 10 Watts 50.295 MHz – Intermittent

10m bec'n VK3RMH CW 20Watts 28.2565 MHz

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. NERGs often monitor this frequency and the 70cm VK3RMH repeater.

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

**NERG NEWS submissions and comments invited:**

*editor:* Mark Harrison VK3BYY

*ph:* 9435-3043 hm (between 7.30-9.30 p.m. please)

*post:* 266 Nell Street West, Watsonia, 3087

*email:* [vk3byy@nerg.asn.au](mailto:vk3byy@nerg.asn.au)



**NERG**

North – East Radio Group VK3CNE  
Incorporated 1985  
BOX 270 GREENSBOROUGH VIC 3088

---

## NERG MEETING - at the BRIAR HILL PRIMARY SCHOOL !

**7:30 PM Thursday 9<sup>th</sup> October 2003**

**This Month – Pink Elephant swap night**

---

**2003 CALENDAR (NERG ACTIVITIES IN BOLD)**

<b>Oct 9<sup>th</sup></b>	<b>NERG Meeting - 7.45pm - White Elephant night</b>
Oct 11 <sup>th</sup>	Australian ARDF Championships - Ballarat - Saturday
<b>Oct 28<sup>th</sup></b>	<b>NERG Tuesday morning tea group - location to be announced.</b>
Nov 2 <sup>nd</sup>	BARG Hamvention, 10AM Sunday. Ballarat Showgrounds, via White Street.
<b>Nov 13<sup>th</sup></b>	<b>NERG Meeting - Ionospheric Prediction Graphs for better DX'ing by Jim VK3DBQ</b>
Nov 28 - Dec 3	5 <sup>th</sup> IARU Region3 ARDF Championships - Ballarat (2m event Sunday 30 <sup>th</sup> Nov, 80m event Tuesday 2 <sup>nd</sup> Dec.)
<b>Dec 11<sup>th</sup></b>	<b>NERG Christmas BBQ</b>