

NERG NEWS

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

DECEMBER 2005

NERG Inc.
PO Box 270
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Victoria 3088
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WHAT'S ON IN DECEMBER

END OF YEAR BBQ:

NERG President, Greg VK3VT, and XYL Denise are hosting the NERG end of year BBQ at their home on Thursday 8th Dec.

It kicks off at 6pm and goes till stumps.

\$8 per head will get you a big feed from the BBQ with salads. Greg also mentioned he may extend his culinary talents with something a little different. There will also be assorted soft drinks and the odd bottle of Red – bring anything special you'd like to drink, and BYO chair if possible. The address is: 1 Noorabil Court, Greensborough.

RSVP to Greg if possible on 9432 0563 so nobody goes hungry.

In other events for December, the weekend of the 10th/11th will see NERG running it's first ever Foundation training and assessment weekend. It's been enthusiastically booked out with another to run in January, but more on that later...

Over the summer period there will be some work on the club room at the Briar Hill Community Hall. The back room is to be emptied this weekend in preparation for painting and relocation of cupboards to the main hall. This will give use a large enough space to hold coffee shop sessions and hold other club activities that don't require the large hall. Since it's our own space we will be able to set things up and leave it the way we like.

Seasons greeting to all! Mark, VK3BYY, News editor

The next regular monthly meeting will be on Thursday 9th February at 7:45pm in the Briar Hill Community Hall, 126 Mountain View Rd, Briar Hill, Melways 21 C3.

DÉJÀ VU

Too much happened during November for a full report, so here is a quick summary:

Various things were discussed at the November NERG meeting, including some news from our Foundation assessor John VK3ZRV on how the new licences will be handled.

Plans are afoot to renovate the back room for NERG's exclusive use. Some fund raising ideas which may help pay for the renovations and other projects were reported on by Don, John and Marks following their attendance at the Banyule Council's recent fund raising workshop. Don't worry – none of them involve sausage sizzles or selling Chocolate ☺.

Greg mentioned there would be a NERG bike ride next year and has a route planned out. Those without two wheels will be able to meet along the way for lunch.

NEXT MEETING:

Thursday 8th December 2005
6:00 PM and goes till stumps.

NERG end-of-year BBQ

at the home of Greg VK3VT
1 Noorabil Crt Greensborough

BYO chair if possible.

\$8:00 per head.

The Contest group has been quiet for a few years but could be back in force. They plan to use the WPX contest as a training event and then move on to the big contests.

A couple of short videos followed the meeting, with a slide show of the fantastic RN6BN antenna farm located in Krasnodar, in Georgia, RUSSIA. The farm features an array of 64 antennas, each of 15 elements in both horizontal and vertical polarization for 144MHz. It's steerable in both elevation and azimuth! Alexander, operator of RN6BN, has so far worked 76 countries on 2m, mostly via moon bounce! More of the station can be seen at: <http://www.73.ru>

The meeting finished with the usual chats over a cuppa and more delicious Margherita Pizzas from Lower Plenty.

November saw great activity and interest in getting our first Foundation training and assessment weekend organised. John VK3ZRV and the committee have been busy and now have 14 candidates enrolled in the weekend and more waiting for January.

Finally, thanks to John VK3ZRV, the 2006 WIA call books have been distributed to all those that ordered.

FOUNDATION WEEKEND

Candidates enthusiastically booked out the NERG's first Foundation training and assessment weekend for the 10th & 11th of December. Candidates enrolled last Thursday night and were introduced to the team. John VK3ZRV ran through the itinerary, and Fred Swainston pointed out the most important sections of the Foundation Manual they'd need to read as homework (those being the Safety, Regulations, Operating Practices, and Interference chapters).

We are very fortunate to have Fred Swainston, VK3DAC, presenting the training sessions on this occasion. Several licence assessors and trainer from other clubs to observe how it should be done and learn from Fred's valuable experience in these early days of the new licence. Fred is a professional trainer and has been heavily involved in developing the Foundation syllabus, examination papers, and training materials with the WIA and ACMA. He has been refining his slide shows and training material since the recent start of the foundation licence and will be using this event to test out his latest changes.

FOUNDATION CLASSES IN JANUARY

NERG will be running a training and assessment weekend for Foundation Licence candidates in the later half of January. The schedule has not been set as yet and will depend on demand.

If you are interested in either training or assessments, please contact us via email at <contact@nerg.asn.au>, or call John Weir on 9431 0667

FORTHCOMING NERG MEETINGS

December 8 : NERG End of Year BBQ at the home of Greg VK3VT.

January: Time off for meeting organiser and news editor ☺
Expect some ad-hoc working bees at the hall!

February 9, 2006: A tentative booking for NERG member Stephen Warrillow VK3SN with a slide show from his recent ski trip across the High Plains. He may also throw in something on emergency medicine as practiced in a large hospital.

MANNA GUM FESTIVAL

NERG were present in force at the inaugural Manna Gum Festival on Sunday 4th December at Poulter Reserve, Greensborough.

The NERG tent was right in the middle of the event and held photographic displays and videos along with a working amateur station. Handouts on becoming an amateur were given out to many interested visitors.

The festival had a strong community feel and displayed the interests and services provided by many community groups.



NERGs (left to right) Greg VK3VT, John VK3BIZ, John VK3ZRV, Stephen VK3SN, and Don VK3KDT

Music (and radio waves) filled the air, and when things got quiet there was plenty of live entertainment and good food to keep everyone busy.

Don VK3KDT and John VK3ZRV put a lot of effort into getting everything set up, and were ably assisted by Greg VK3VT, Doug VK3JDO, Stephen VK3SN, John VK3BIZ, Gerhard VK3EWM and many others that dropped in. Don thanks all involved and is pleased with the public's response.

THE GAINFULLY UNEMPLOYED GROUP

The NERG gainfully unemployed met at the QTH of Greg, NERG President and man of many call signs. It was truly a great day, good coffee (and tea), lots good food and enter the chocolate man, George arrived at first with three big blocks of chocolate. So good and real hard to resist! For lunch we had a special treat of spicy raps.

Those present were Dave, VK3JMB, Jim, VK3KE, Ernie, VK3FM, Gerhard, VK3EWM, Steve, VK3JSE, John, VK3ZRV and George, VK3MKK. Many thanks to Greg and Denise for having us.

The first meeting next year will on Tuesday 28th February 2006, at a venue to be advised.

Jim VK3KE

Listen out on the NERG chat channel on 146.575 MHz during the day for directions and current DX conditions!

USEFUL INTERNET SITES ON PROPAGATION, SOLAR WEATHER & IOTA

Compiled by Peter Forbes, VK3QI

The following web sites provide all the information needed by the avid DXer including propagation conditions and forecasts, QSL addresses, news of upcoming DXpeditions and more...

IPS – the Ionospheric Prediction Service:

www.ips.gov.au/HF_Systems

More charts and graphs on HF propagation than you'll know what to do with!

Solar Terrestrial Activity Report:

www.dxlc.com/solar

Graphs of solar activity, coronal & sunspot images.

Today's Space Weather from NOAA:

www.sec.noaa.gov/today.html

including 3-day Solar-Geophysical Forecast.

27 Day Forecast from NOAA for hams

www.wm7d.net/hamradio/solar/27d_forecast.shtml

Flux, A & K index 27 day forecast.

Space Weather. Com:

www.spaceweather.com

Comprehensive Sun-Earth environment resource.

Announced DX operations:

cpcug.org/user/wfeidt/Misc/adxo.html

list of special event DX stations around the world.

DX summit:

oh2aq.kolumbus.com/dxs

DX spots.

DXSCAPE - Japanese Cluster:

www.dxscape.com

DX cluster from Japan.

HF conditions Live:

hfradio.org/propatation.html

Propagation Resource Centre (NW7US).

RSGB IOTA site:

www.rsgbiota.org

News and information on Islands-On-The-Air.

GEOALERT from Kangaroo Tabor Software:

www.taborsoft.com/gawiz

Software for monitoring geophysical parameters.

World wide callbooks:

cpcug.org/user/wfeidt/#callbook

links to callbooks and callsign databases everywhere.

Ionospheric data archives at NOAA:

www.ngdc.noaa.gov/stp/IONO/ionohome.html

Ionospheric Data Archived at NGDC (NOAA).

Real time propagation monitor

<http://folk.uio.no/tomvs/realtime/monitor1.htm>

Spots, Announcements, Plots, etc.

PETER VK3DU GETS 300 COUNTRIES

The word is out that Peter VK3DU has 301 DX countries confirmed and another three more worked.

That's a really great achievement; you have to watch the quiet one, hi hi!

The WIA 2006 callbook lists 335 regions, so 300 is excellent work when you consider many of remaining 32 countries are the really rare ones that are only activated by special expeditions every decades or so!

From Jim VK3KE

WEB SITE OF THE MONTH

 VK/ZL VHF-UHF Propagation Logger

 VK/ZL HF Propagation Logger

www.vklogger.com The VK/ZL VHF-UHF and HF Propagation Logger web site is a collection of DX cluster type lists, discussion forums, message boards, DX forecasts, and contest/expedition calendars. All useful stuff for active the DX'er. There is a particularly good list of beacons that is constantly updated and includes 'last heard' reports.

Includes current VK & ZL Grid Squares competition standings.

2005 AMATEUR RADIO EVENTS

Dec 26 -Jan 15 Ross Hull Contest
VHF-UHF, Microwave, and Digital Modes sections.

FINAL FOXHUNT FOR 2005

Hello, all hunters! The final hunt of the year approaches, and we, the BLN team, would like all to attend.

When: Friday 9/12/05, 8pm.

Start: Melways Ref: 23 F11. Parking off Ringwood-Warrandyte Road, south side of Yarra River, near roundabout.

Finish: Warrandyte - we won't be more specific; it might give a few things away :-).

As Graham always says, "BLN suppers are legendary", so come, and be well fed! We have some very interesting spots planned, too - be prepared to work for your supper... Hee hee.

Numbers, please? No excuses, now!!! Christmas Cheerios, HIC!, BLN team.

RSVP via the news list at melb-fox@lists.id.oz.au (you'll need to subscribe first at:

<http://lists.id.oz.au/wws/info/melb-fox>)

Permitted frequencies and emission modes for Amateur Advanced, Standard, and Foundation licences.

Information derived from the Radiocommunications Licence Conditions (Amateur Licence) Determination No. 1 of 1997, amended 19 October 2005

Band	Advanced Licence		Standard Licence		Foundation Licence	
	Frequency band	Max. band width	Frequency band	Max. band width	Frequency band	Allowed Modes
160m	1.800 -1.875 MHz	8 kHz				
80m	3.500 -3.700 MHz	8 kHz	3.500 -3.700 MHz	8 kHz	3.500 -3.700 MHz	CW,AM,SSB
80m (DX)	3.776 -3.800 MHz	8 kHz				
40m	7.000 -7.300 MHz	8 kHz	7.000 -7.300 MHz	8 kHz	7.000 -7.300 MHz	CW,AM,SSB
30m	10.100 -10.150 MHz	8 kHz				
20m	14.000 -14.350 MHz	8 kHz	14.000 -14.350 MHz	8 kHz		
17m	18.068 -18.168 MHz	8 kHz				
15m	21.000 -21.450 MHz	8 kHz	21.000 -21.450 MHz	8 kHz	21.000 -21.450 MHz	CW,AM,SSB
12m	24.890 -24.990 MHz	8 kHz				
10m	28.000 -29.700 MHz	16 kHz	28.000 -29.700 MHz	16 kHz	28.000 -29.700 MHz	CW, AM, SSB, FM, PM
6m (DX)	50.000 -52.000 MHz	100 kHz				
6m	50.000 -54.000 MHz	100 kHz	52.000 -54.000 MHz	16 kHz		
2m	144.000 -148.000 MHz	100 kHz	144.000 -148.000 MHz	16 kHz	144.000 -148.000 MHz	CW, AM, SSB, FM, PM
70cm [#1]	420.000 -450.000 MHz	Any	430.000 - 450.000 MHz	16 kHz	430.000 -450.000 MHz	CW, AM, SSB, FM, PM
23cm	1.240 -1.300 GHz	Any	1.240 -1.300 GHz	16 kHz		
13cm	2.300 -2.302 GHz	Any				
"	2.400 -2.450 GHz	Any	2.400 -2.450 GHz	16 kHz		
9cm	3.300 -3.425 GHz	Any				
"	3.425 -3.4425 GHz [#2]	Any				
"	3.4425 -3.475 GHz [#3]	Any				
"	3.475 -3.4925 GHz [#2]	Any				
"	3.4925 -3.5425 GHz	Any				
"	3.5425 -3.575 GHz [#3]	Any				
"	3.575 -3.600 GHz	Any				
6cm	5.650 -5.850 GHz	Any	5.650 -5.850 GHz	16 kHz		
3cm	10.000 -10.500 GHz	Any				
1.25cm	24.000 -24.250 GHz	Any				
6.4mm	47.000 -47.200 GHz	Any				
3.8mm	76.000 -81.000 GHz	Any				
2.4mm	122.250 -123.000 GHz	Any				
2.1mm	134.000 -141.000 GHz	Any				
1.2mm	241.000 -250.000 GHz	Any				

Foundation emission Modes: 80, 40, 15 m = CW(manual only), AM, SSB; 10m, 2m, 70cm = CW(manual only), AM, SSB, FM, PM

Standard and Advanced emission modes: any mode that is within the allowed bandwidth and falls entirely within the frequency allocation.

Preferred modes and bandwidths of transmissions are also determined by the WIA's recommended band plan and apply in all bands according to "Gentlemen's agreements". See the band plans in the current WIA callbook or download from the WIA web site at

<http://www.wia.org.au/bandplans/Australian Amateur Band Plan 2005-10.pdf>

NOTE #1: Area Frequency Exclusions for 70cm band:

NSW, ACT and Jervis Bay Territory: 421.83125-421.99375 MHz, 425.25625-425.59375 MHz, 428.83125-428.99375 MHz

Melbourne Area: 420.00-420.75 MHz, 421.25-424.75 MHz, 425.25-430.00 MHz

Perth Area: 420 -430 MHz

Sydney Area: 421.25-421.75 MHz, 428.25-428.75 MHz.

Notes #2 & #3 See the Radiocommunications Licence Conditions (Amateur Licence) Determination No. 1 of 1997 for geographical areas where operation of an amateur station in this band prohibited (sections 15A and 15B respectively).

A WIDEBAND RETURN LOSS BRIDGE

By Paul McMahon VK3DIP

While every Ham has heard of and used a VSWR (or just SWR) meter or bridge the number of Hams who know about or have used a Return Loss Bridge or RLB is surprisingly small. Surprising because a RLB is a very simple but powerful tool that is used extensively in the professional/commercial side of radio work, at least as much as a VSWR meter. Put very simply a RLB gives a relative measure of the amount of power returned (or reflected and lost) from a load, to that power offered to or incident on that load. Return Loss is usually measured in dB and for example a Return Loss of 20dB means that the reflected power is 20dB down on the total power incident. So a return loss of 20dB indicates a reasonably good match. For those that want to think in terms of VSWR, a 20 dB return loss is equivalent to about a 1.2:1 VSWR. Tables and formula to convert between each of these measurements is easily findable in books like the ARRL handbook or a simple search on the internet so I won't go into it further here, suffice to say the bigger the absolute value of the Return Loss the better is the match, and the less power is being lost to reflections.

There are many designs for RLB's available in places like the ARRL handbook and on the web and the only claim to any sort of originality here is the combination of components, the layout, and perhaps the construction of the balun, used. The RLB presented here is relatively simple to build, costs very little, helps to prevent interference on the bands, and the prototype gives good results measured on all the Ham bands up to at least 70cm. The RLB here consists of four resistors, a homemade balun, some connectors, a few bits of PCB, some short lengths of coax, and a box.

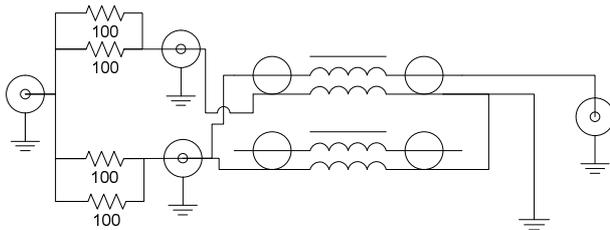


Fig 1. the RLB circuit.

Much more detailed descriptions of how a RLB works can be found in the literature etc. mentioned above, for our purposes here however the only things to note is that an RLB is basically a resistive bridge network and that the single most important thing to do is to ensure that by itself the bridge is balanced, or is symmetrical electrically. Put another way great care needs to be taken that the only difference between the reference termination and the unknown side of the bridge is the unknown itself. For example many RLB designs terminate one side of the bridge directly with a soldered in 50 Ohm resistor. While this is fine at low frequencies, as the frequency goes up the differences in impedance between that soldered in resistor and say an exactly equal value resistor but connected via a BNC plug and socket starts to make a difference. The design here for this reason uses connectors to bring out both the reference and unknown ports. Similarly many designs get over the need for a balanced detector by just using a simple diode arrangement directly across the bridge and neglecting the inaccuracies caused by the small voltage drop across the reference. The design here instead uses a 1:1 balun that means we can use a normal unbalanced tuned receiver as the detector which means measurements can be made at much lower power levels, and there is much less likelihood of getting misleading results caused by the signals of say the local broadcast station being detected by the diode rather than the actual test signal.

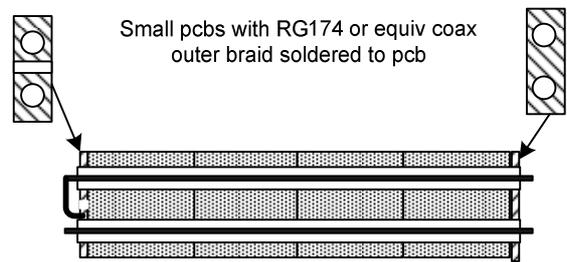
The circuit of the RLB is shown in Figure 1.

As can be seen the four 100 Ohm resistors are used in two parallel pairs to give 50 Ohms each. I used 1% surface mount resistors to minimise lead inductances etc.

The signal source is connected on the left, and the calibrated receiver or similar detector is connected on the right. The two ports in the middle are interchangeably the unknown and reference ports. The 1:1 balun used as indicated in the circuit is a little bit different to what you would normally see and needs a bit more explanation.

There are commonly two types of baluns used by Amateurs called choke/current baluns or transformer/voltage baluns. I don't want to get into the relative merits of each, as there are lots of opinions on this in the Amateur literature, suffice to say here I have used a configuration that is a bit of both. If you just look at the top half of the balun it can be seen to be a conventional ferrite choke type, ie. A short length of coax with ferrite beads along its length. The problem with just this by itself is that while the impedance of the current path on the coax outer surrounded by ferrite back to earth is quite high it is not infinite and it is only across one side of the bridge. Thus to balance this high impedance we have on the other side of the bridge an identical high impedance to earth formed by an identical piece of coax and ferrite. Note only the outer is actually used on this second piece of coax. The voltage or transformer action balun bit can be more easily seen if we forget about the fact that we are using coax and as I am using standard two hole (ie figure 8 style) ferrite balun formers think of it as simply three (one turn) windings on a transformer connected as per a normal one to one balun.

The actual balun is made using four "balun" formers taped together with short lengths of thin coax through the holes soldered onto small bits of PCB at each end as shown in figure 2.



4 balun formers end to end & taped

Fig. 2 balun construction.

The rest of the construction uses another small bit of PCB to hold the resistors as per Figure 3.



Fig 3. Resistor board.

With the whole lot assembled in a small diecast aluminium.

VK3DIP Return Loss Bridge

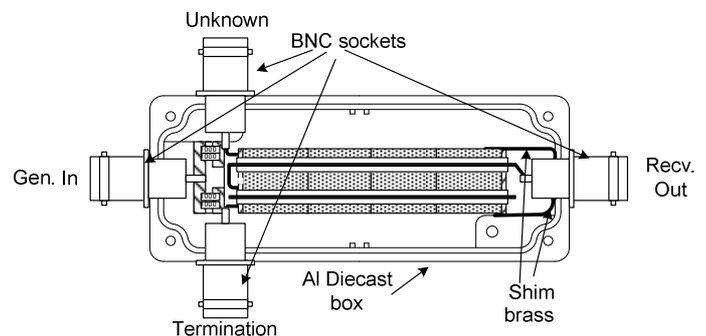


Figure 4 fitting it together.

For those interested in duplicating the prototype I got the resistors, and ferrite balun formers from Rockby Electronics, and the 36x90x30 box from DSE (Cat H2230). The scraps of PCB, connectors, and coax came from the junk box.

The prototype was tested for directivity, which here is simply a measure of the difference between the balanced and maximally unbalanced states of an open and or a short on the unknown port. The result should be infinite but in practice a result over 40db is good enough. The results obtained from the test setup shown in Figure 5.

are shown in Figure 6. For interest these results were obtained using two identical cheap coax Ethernet terminators.

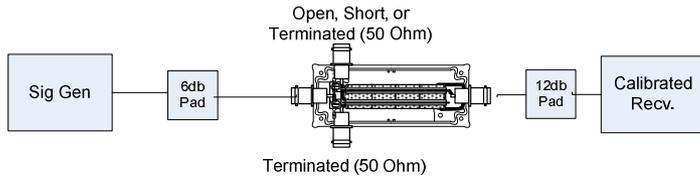


Figure 5. The test setup. The pads minimise effects of varying impedances of the signal generator and receiver with frequency.

Perhaps, if there is interest, in a subsequent article I can discuss some of the uses this RLB can be put too.

Note: The testing done here was with my own far from Lab standard equipment at a relatively small number of discrete frequencies. If any NERG has access to a Lab standard Spectrum Analyser with Tracking generator I would be interested in a more accurate/complete swept response. 73 Paul VK3DIP

Note –This article will be available in PDF format from the

NERG web site with additional photos (www.nerg.asn.au)

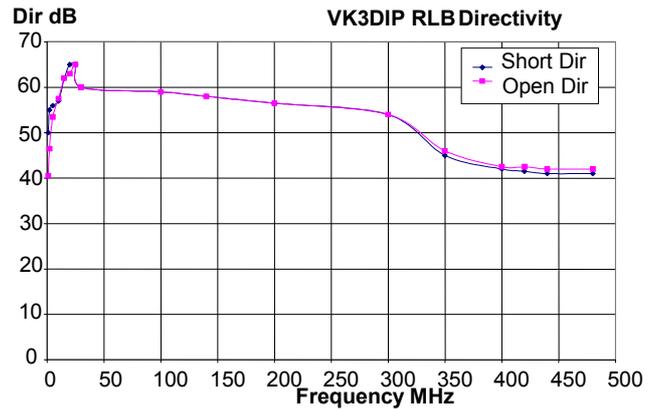


Figure 6. Measured directivity of the prototype showing usable directivity up to at least 70cm.

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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 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	John Weir	VK3ZRV	9431 0667
Treasurer	Marg Baxter	VK3VOJ	9467 1253
Committee	Betsy King	VK3HBK	
	David Aston	VK3THY	
	Peter Cosway	VK3DU	9379 3626
Repeaters	Mark Harrison	VK3BYY	9435 3043

Meetings

2nd Thursday of each month at 7.45 PM (excepting Dec. & Jan.)
Briar Hill Community Hall, 126 Mountain View Road, Briar Hill
(Near Sherbourne Road intersection) Melway map ref 21-C3

Classes

NERG occasionally runs classes and exams for Amateur licenses

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, EchoLink node 140587
6m beacon VK3RMH CW 10 Watts 50.295 MHz -Off air
10m bec'n VK3RMH CW 20Watts 28.2565 MHz

Packet Radio VK3CNE2m 144.700 MHz, 1200 bps
VK3CNE-1 for mail etc; 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. 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:

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NERG

North-East Radio Group VK3CNE

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STAMP

**NEXT MEETING:
6 PM Thursday 8th December 2005
End of Year BBQ at President Greg's QTH**

2005 CALENDAR (NERG ACTIVITIES IN BOLD TYPE)

Dec 4 **Manna Gum Community Festival - 3:30-8:30pm Poulter Reserve, Greensborough**
Dec 8 **NERG end of year BBQ, VK3VT's QTH, 6:00pm, \$8/head, BYO chair.**
Dec 9 End of Year Friday night foxhunt
Dec 26 - Jan 15 Ross Hull Contest

2006 Calendar

Jan **No NERG Meeting**
Jan **Foundation class and exams - actual date to be set.**
Feb 9 **NERG Meeting - 7:45pm - Guest speaker Stephen Warrillow, QRP in the snow.**
Mar 18/19 **John Moyle Field Day**