



- QRM -

The Bi-Monthly Magazine
of the
Redcliffe and Districts Radio Club Inc.

ISSN: 1441-9386/ Vol. 10 No. 1

February 2008

Amateur Radio Stations VK4RC & VK4IZ



Charlie looking terrified on the mast at Wamuran

From the Editor

Greetings to all Club members, radio enthusiasts, family supporters and friends.

Welcome to QRM for February 2008. A little late this month, but I have been working very hard preparing for courses to be presented this year. We have already begun these with something close to twenty people who have begun attending the Advanced course on Saturday mornings, and the Foundation course on Sundays. This is a remarkable show of interest. I must admit that I thought perhaps interest in the Foundation licence would “cool down” after an initial surge in response when it first began for us late 2005. But that doesn’t seem to be happening. And we are finding that a pleasing proportion of Foundation licensees are going on to the Advanced licence. We can only hope that this continuing strong interest will be sustained, and that a “revival” in amateur radio may be the result.

I must express my great pleasure in the response to ‘calls’ for more exam Assessors. We have four people who have now joined the assessor team, and this will take the load of those who have been managing this important work up until now. I can assure all those who have responded – you will have exams to conduct in the near future, and your skills and qualifications will not lie idle for long. I also thank very sincerely all those who have assisted me in the coursework and exams to date, especially Ken (VK4FKEN) and Ces (VK4VKC).

There has been a lot going on in recent months both at the clubhouse and at the repeater site. The main activities around the clubhouse have involved the work towards producing wheelchair axis. We thank all those who have volunteered their skills, time and energy, especially John (VK4YJV). At the repeater site many things have been happening (see article this issue), and we thank all those who have been working on this project. We also thank those who have donated equipment to the WICEN caravan, and especially Geary Fawk for donating the caravan, and to Peter (VK4TGV) and his team for renovations.

As well as the report on the repeater, we feature articles by Bill (VK4TWI) and Peter (VK4TGV) to keep our minds ticking over. Bill tells us how, when calamity struck – we can’t all do surface mount – certainly not me! he was able to get his much loved triband HH fixed. The birth (or is it rebirth) of the club fox is described in amusing detail by Peter, who then reports also on how getting a licence and operating in Singapore presents some challenges that many of us may not have had to face here. I’ll never complain again! Before I finish, remember the John Moyle Field Day on 15-16 March. Be part of it – contact Andy (VK4KY) or Club Treasurer Glenn (VK4FZ) for details.

In this Edition

News from VK4RRC	page 3
2007/08 Committee Members & Club Directory	page 4
Forthcoming Events	page 4
Are you listen’n to me?	page 5
The Fox Mark III, is born	page 7
Getting a license, and operating in Singapore	page 8
Celebrations	page 11
R & DRC Crossword No. 21, Contest Calendar	page 12
Corporate sponsors	page 13

DISCLAIMER: While every care has been taken in the preparation of this magazine, neither the Redcliffe & Districts Radio Club Inc., nor its Executive, nor the authors of any articles, nor any of its members can be held responsible in any way whatsoever for consequences arising from the use persons may make of the information published herein. Readers relying on such information do so at their own risk, and are advised to check the accuracy of data and information for themselves, and to take due care.

Congratulations to our Club President (VK4FDRC, soon to be VK4DC) and Ces (VK4VKC, soon to be VK4CES) on the gaining of their Advanced Licences.

News from VK4RRC

by **Peter Schrader** (VK4TGV)

We had a very successful trip up to the repeater site on the 12th of January. Glenn, VK4FZ, Roger, VK4IPE, David, VK4FDRC, Cec, VK4VKC, Charlie, VK4YZ and Corrie, VK4FDKR made themselves available to help out. As a lead up to the working bee some signal degradation had been noticeable leading up to Christmas and after the New Year.

Initially Peter, VK4TAA lead a team up the mountain to investigate and found a multitude of problems, the main one being the 2m/70cm duplexer female connectors were not crimped correctly (my bad). Martin reported I used the incorrect jaws when crimping the original female N in-line sockets, and perhaps the weight of the cables contributed to the partial failure of the common connector which plugged into the lightning arrestor. As a precaution the 70cm and 2m repeater radios were swapped out and taken to Martin's (VK4JVC) place for a checkup. Additionally a strange noise was observed blurring from the 70 cm repeater, after some discussion Martin fitted a 91.5 Hz CTCSS card to the Unilab repeater radio. A spare dual band was pressed into service and temporarily tied to the shed.

Saturday morning, the 12th the repeater radios were duly picked up from Martin's place and transported to our now familiar meeting place at Wamuran. Upon arrival two teams were formed to replace the large Diamond antenna with a smaller dual band Nagoya and the other to swap out the repeater equipment.

The key issue we found that was that the PL259<->N adapter had unscrewed itself from the high gain Diamond SO-239 antenna connector. No wonder both repeaters were down in signal strength!

Roger, David and I took the opportunity to really clean up the repeater shed which after some years of many hands and turned into a bit of a rubbish bin. One of the old ugly rack frames was removed and the shiny new rack placed in situ.

The newly terminated 2m/70cm duplexer was installed and the associated feed cabling from the cavity filter is now supported with cable ties.

Starting from the top of the rack there is, 3RU Phillips 814 2m RX, 4RU Phillips 2m 815 TX, 4RU blanking panel, 3 RU 70cm duplexer, 2RU Unilab KL450 70cm RX/TX Repeater, 4RU Unilab Power Supply/Battery Charger (thanks to Roger) and 3RU power strip.

The new Nagoya high gain vertical had a Voltage Standing Wave Ratio of 2.3 at 146.925 MHz, so we put up the antenna which was in use over the last few weeks, which has a of 1.2 at 146.925 and 1.2 at 438.325. We swept the LMR450 feedline with a MFJ analyzer, with and without a dummy load, all good.

We also installed a revenue compliant electricity meter profiling consumption at 30 minute intervals. From this we will have an idea of what sort of power the shed is using, so that we can talk about giving some consideration to the current occupant for electricity costs.

----- **Continued page 6**

2007/08 COMMITTEE MEMBERS & CLUB DIRECTORY

President	David Close VK4FDRC	Phone: 3862 8700
1st Vice President	Charlie Strong VK4YZ	Phone: 5495 1565
2nd Vice President	Roger Wilson VK4IPE	Phone: 3385 7624
Secretary	Peter Richardson VK4TAA	Phone: 3261 4225
Treasurer	Glenn Wood VK4FZ	Phone: 3351 4295

Meetings: EVERY MONDAY with regular guest speakers and ongoing projects
Time: 1930hrs (local)

WHERE: Redcliffe and Districts Radio Club clubhouse - Cnr Klingner Rd & Macfarlane St, Kippa Ring

Clubhouse: Open every Monday evening 1930hrs (local) INCLUDING PUBLIC HOLIDAYS

2nd Monday of each month : General Members Discussion Meeting

CLUB NETS: Sunday evenings at 1900K 2m on 146.925MHz Redcliffe repeater VK4RRC and 1945K 80m 3.618 MHz ± QRM VK4RC Net control : 27 MHz, channel 20, 27.205 MHz LSB, Thursday at 8pm

REDCLIFFE and DISTRICTS RADIO CLUB Inc.
PO Box 20, WOODY POINT QLD 4019
WEBSITE: <http://vk4rc.we.net.au>

EXAMS: Alan VK4KZ, Ces VK4
NET_1: Sunday 1900K 146.925
NET_2: Sunday 1945K 3.618
REPEATERS: VK4RRC VR 146.925, 438.325

Contributions to Editor QRM - Alan Jenner VK4KZ

15 Spoonbill Drive Elimbah QLD 4516
Mobile: 0407 130 677

Phone (H): 5497 4634

Email (H) alan.jenner@bigpond.com

The Editor thanks all contributors to QRM. Where possible, authors of non-submitted articles are contacted for permission to publish in QRM, and/or their authorship acknowledged. This magazine is not for sale and is distributed free to members of the Redcliffe and Districts Radio Club Inc. and other interested persons, libraries and clubs. ©2001

Forthcoming Events

- General business meeting, 2nd Monday of month
- Foxhunts, 4th Monday of each month
- Wednesday activities – mornings 9.00am each fortnight – next 20th February, 17th March
Contact Ken (VK4FKEN) **32832564** for further information or to offer suggestions for activities.
- Trivia Nights every Wednesday evening on 70 cm repeater, 7.15pm for check-ins
- ***** **John Moyle Field Day, 15-16th March**

Are you listen'n to me?

by **Bill Isdale** VK4 TWI isdales@bigpond.com

There is often a great deal of effort put in to siting and equipping repeater stations. Usually they are kept in very good order by dedicated people who are quick to notice any deterioration and to tweak the repeater to deliver its best. This is certainly the case with the 2 meter repeated of the Redcliffe Radio Club. Purring away on 146.925, it announces its presence, gives the weather report and allows operators to keep in touch across town or across the world via the link into the Internet.

It is of no use, though, if it cannot hear you and how do you know that it can't? That's one of those unknown unknowns.

My trusty Yaesu VX5R handheld is my constant companion while out for a walk and it seemed to be working perfectly, as always, receiving well and showing the bars of a full output on the display screen when transmitting; but no-one was answering my, increasingly plaintive, calls. With no indication of any technical fault I was left to contemplate which particular social faux pas had rendered me inaudible. The possibilities were endless.

Resolving on a positive approach, I found my RF Wattmeter and connected the radio up to it. The result was surprising; on 6 m the output power was about 1.5 watts, on 2 m the power was too low to measure and on 70 cms the meter showed 5 watts, a little above the 4.5 watts claimed by the manufacturer. Given the likely margin of error in my uncalibrated test rig, it seemed that 70 cm output was normal but there was a problem on the lower frequencies.

Reference to the circuit diagram suggested, at least to me, a power amplifier failure and the tiny surface mounted components mocked my big clumsy hands. I had no idea whether the power failure had been sudden or gradual as the repeater might have been covering up a gradual reduction in power from my transmitter since as long as it could detect my signal, it would have dutifully boosted and retransmitted it. A test transmission to a receiver close by revealed what sounded to be a normal signal, it was just at a very low level.

Since my major use of this radio is on 2m, possibly explaining the failure, it was a case of repair or replace. Realising how much I like this little radio for its broadband receiver and triband transmission capabilities, I looked about for a repairer.

A search on the internet revealed RF Repairs at Wyong, that Mecca for amateur radio, and their simple requirements; send them the radio with a description of the fault. It was with a sense of relief that I wrote out a brief letter and posted the patient off to Wyong. How fitting a place to send an amateur radio.


I was pleasantly surprised to receive an e-mail only 2 days later saying that the cost of the repair would be all of \$88, including return by registered post and that if I agreed to the quote it could be in the post tomorrow. I responded and was able to pay by Pay-Pal or various other means. In the event, the radio was back to me within a week of when I sent it away. The Repair Report enclosed explained that a defective diode and capacitor in the RF band pass filter had been replaced. The radio had been tested on all bands and passed.

I was delighted with the excellent service and the very reasonable cost of getting this radio back in service. With modern micro-sized components, not all of us can realistically expect to be able to repair our own gear and it is great to be able to keep equipment in service. There are other repairers about and I am sure that they have lots of satisfied customers too. These skilled professionals are a great resource that we have access to and they can help us to stay in touch.

From page 3 (cont)

Roger installed an AC UPS which should provide mains filtering and a short backup time of about 10 minutes, at the time it shuts down with expired batteries the repeater batteries will take over. A new 70cm battery was installed by Roger a week after our visit.

Special mention must go to Charlie for spending about 90 minutes up the pole while we played around! We tried a new method of replacing the antenna alleviating the need to use the pivot point, it made the process much faster.

We patted ourselves on the back, believing the setup looks quite professional now and finished off the day with a traditional slug in a rug. **(Pictures page 10)** 

----- 00000000000000000000 -----

----- Club second hand market -----

Do you have any radio gear, components, bits and pieces you would like to sell or swap. You can advertise in QRM for free. Please call, email or send details to the QRM Editor, Alan (VK4KZ). Similarly if you want something you think someone might have, you can also advertise in QRM. Your Club is there working for you. For current items for sale/wanted, see below.

DONATIONS WANTED

Donations to the Club for emergency communications gear:

I am pleased to report that there have been some generous donations of equipment for the radio room WICEN fitout. The club now has sufficient equipment to begin the fitout, but still are always looking for more W, U and A band Phillips FM92's if they are sitting in a box doing nothing. The club is also looking for Codan 8525, 7727 or Wagner HF radio's ready to be recrystalled to the WICEN 5MHz frequencies.

Peter Schrader,
VK4TGV/9V1PS

Bevan McAleer (VK4BCM) has a friend who has some gear for sale from a deceased estate. He can be contacted by email: <mcaleerb@wbs.net.au>

A very warm welcome is extended from all Club members to new members Adam Jaroszuk (VK4IM), Gary, Anita, Lauren and Shaun Kelly, Doug McDonald (VK4FADM) and Chris Parr (VK4ANI).

The Fox Mark III, is born

by **Peter Schrader** (VK4 TGV)

Over the last few years I have been a member of the club, I have noticed strange happenings every third Monday night. People come wandering into the club with sniffers, sprouting mini-yagis, diecast boxes and headphones. Then they disappear again to go and chase a fox?

I also noticed the fox was getting sicker and sicker. A solution came to mind whilst partaking in APRS (see future article) experiments. The company I purchase APRS controllers from also produces a fully programmable fox controller. This is available as a kit (<http://www.byonics.com>) for about US\$38 (plus shipping). I contacted my supplier of APRS radios and discovered that they can be easily re-programmed for the fox frequency, 145.300. So how hard could it be? Connect the fox controller (Picon) and the Maxon radio together, give it some power and we have a fox. Famous last words, again this experience of mine is a lesson to make me take my time when putting things together.

After getting endorsement from the membership I went ahead and ordered the kits and radios from the respective suppliers and began planning the enclosure. The kits arrived from the US within 1 week, and these were handed to David (VK4FDRC) for assembly which happened nice and quick. It was David's intention for him to build a companion unit for himself, for his personal use and as a backup for the club.

The radios arrived and I quickly proved the concept works by utilising a cable I had made sometime ago for my APRS equipment. Initially the musical tones produced by the controller were cute, but I would imagine it would get on the fox hunter's nerves after a while! Fortunately the Picon (controller board) offers an easy method of field programming using the DTMF keypad of a radio. Using my handheld we were quickly able to program the morse code ident, change the beep tones and alter the speed of the beeps. All within 5 minutes, how easy is that! We also noted that the controller is able to be configured for IRAU usage, in that in proper contests there can be up to 8 different foxes to find, each transmitting in its own timeslot, with its own ident.

Next challenge, packaging it up into a rugged weatherproof enclosure. My thinking was to use standard PVC plumbing and fittings, of which I happened to have a bit left over from my renovations. I used a short piece of 100 mm PVC, and glue on end cap, and a screw on end cap. I mounted the battery and Maxon radio on a piece of plywood, appropriately shaped to provide an interference fit to the inside of the pipe, mounted the LED, power switch, start push button and antenna connector on the glued on end cap, ran some fly leads to the controller board and viola the fox is born. After rectifying a small wiring error the fox was successfully commissioned and will be very shortly be pressed into service.



MAINTAINING REPEATER RADIO EQUIPMENT

The Redcliffe and Districts Radio Club's VHF and UHF repeaters are available for all amateurs to use, and all are welcome to use them, however, the radio equipment must be maintained and upgraded from time to time. If you would like to make a donation towards this upkeep, it may be forwarded to: The Secretary, Redcliffe and District Radio Club Inc, PO Box 20, Woody Point, QLD, 4019.

Getting a license, and operating in Singapore

by **Peter Schrader** (VK4 TGV)

Most readers will know I travel to Singapore for work on a regular basis, in fact I am almost considered a resident, having an address, mobile phone and bank account in Singapore now. Having to spend extended periods away in Singapore makes me crave a HF fix, Echolink just does not do for me I'm afraid. Not withstanding, I truly enjoy making contact with club members via Echolink while away, it just does not have the same "excitement" as securing a difficult HF contact.

So what to do? Get a license, stupid, easier said than done. First stage, join the local club, which is known as the Singapore Amateur Radio Transmitting Society (SARTS, <http://www.sarts.org.sg>). The members gave me some valuable advice on how to obtain a Singapore license. Next stage is to obtain permission from the property owner to erect antenna and operate apparatus from their property. Fortunately my Singapore landlord is a good guy, and rather likes me as I keep his property in good condition. With the letter from him obtained, I began the battle with the Infocom Development Authority (IDA), which is the local version of ACMA. The IDA offer a web based application system, which unfortunately for me did not work. So after many emails to and from the IDA, and some help from Ian (SARTS Secretary, 9V1WD) the application was finally approved. I was finally the owner of a shiny new callsign, 9V1PS.

However, that is not the end of the story. Every station in Singapore must be inspected, every year, and 50 Singapore dollars is required for each and every radio. And, each radio must be compliant to IDA specifications. So, absolutely no 6 metre capability, and your 2 metre radio must be 144 to 146 MHz only (European allocation). Fortunately I had decided to utilise my trusty Kenwood TS130S and MFJ949 balanced tuner, which limited my operating to 80 to 10 metres. So with my letter from the IDA in hand, I organised my station inspection. The inspector duly turned up at the nominated time and from a worksheet determined my output and reflected power on the bands I nominated.

160 and 80 metres is out of the question here for me, my apartment is on the 12th floor, and has no balconies. So, yagis, quads, ¼ wavelength verticals, full wave loops, doublets and dipoles are out of the question. Just remember how lucky we are in Australia, most of us have a backyard with a few trees, in Singapore there is no such thing as a backyard unless you have mega-bucks, literally. And we can have as many radios as we please, and do not have to tolerate a yearly inspection, ah freedom, a privilege I think we Australians take for granted sometimes (Are you reading this Mark, VK4DGG? That freedom does not necessarily include having to own 40 guns!).

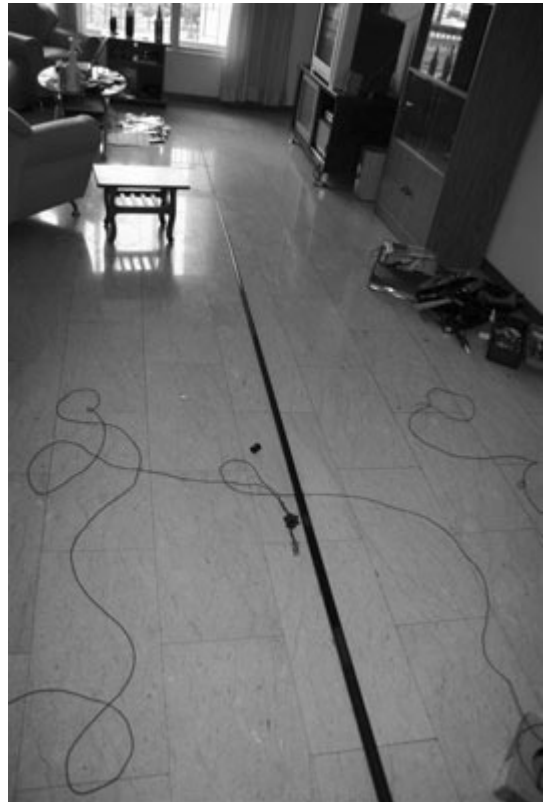
My antenna is a telescopic squid pole, to which I taped a wire along its length, dangling about 3 metre of wire off the end. The counterpoise is a bit of wire arranged around the skirting board of the bedroom. At the feedpoint is a 1:1 current balun, that is a toroid with as many turns of coax through as possible (see Andy's, VK4KY, tech talk on baluns). The theory here is to avoid having RF transmitted from the coax feedline. Unfortunately due the nature of the counterpoise, it is unavoidable from having RF inside the room. That's OK for me, I ain't having any children! I stick the squid pole out of the window and balance it on the concrete edge, trying to get the vertical bit of the wire as far away from the building as possible. So I have a bit of height, combined with both horizontal and vertical polarisation, unfortunately I cannot say I have the best efficiency.

Where to from here, get on air of course! Eventually I'd like to replace the TS130/MFJ tuner combo with a Icom IC718 and AH4 tuner. When funds permit I will be doing this, as I am getting a sore finger from continually having to retune. Operating is possible from 40 to 10 metres, my initial contact was with a fellow SARTS member on 20m, thanks to David, 9V1RH. David is an Aussie who has retired to Singapore with his wife, keep an ear out for David on 80 metres, he has quite an impressive antenna setup at his place. The installation of his big wire antenna is possible as he is the secretary of the building management committee, so any complaints about his antenna go straight to him, and into the round filing cabinet on the floor, HI HI.

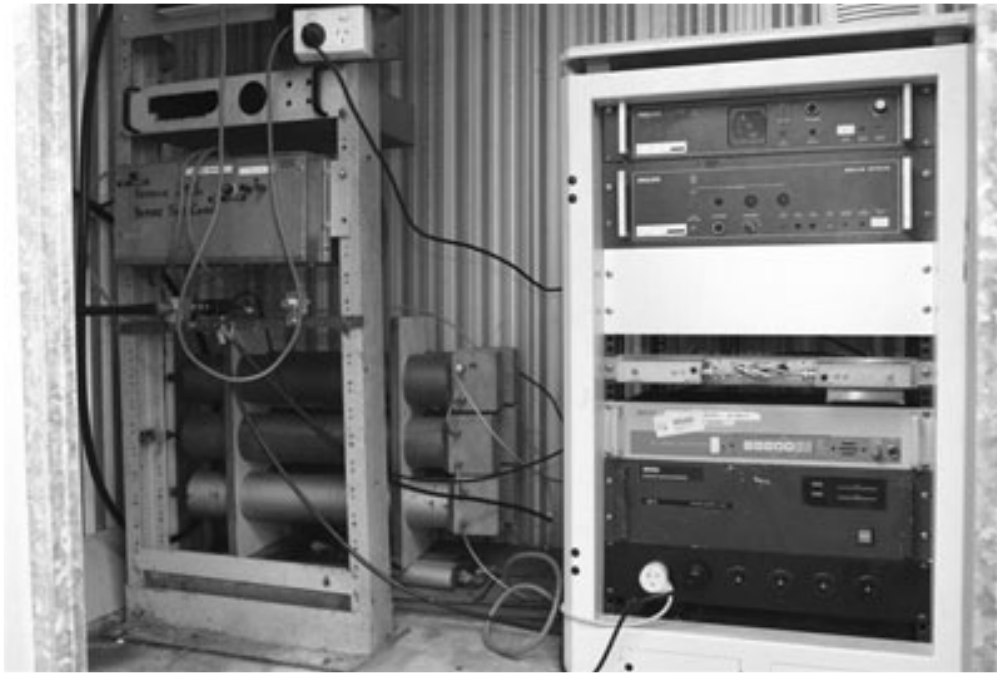
Initial contacts were on PSK31, 20 metres. Voice DX contacts are very difficult here due to the atmospheric conditions, especially in the Monsoon. None the less, I will be active most nights after work, but on weekends I like to wait until dark, so my stealth antenna arrangement is not detected! So keep a listen out for the 9V1 call, I will sure be listening for any VK calls. Bring on the sunspots!!!



Scenes from the Singapore shack



Pictures from Wamuran RRC repeater



AMATEUR RADIO THEORY COURSES AT REDCLIFFE

If you would like to get your amateur license, upgrade, or do a refresher course, you can study for the theory, regulations and practical for Foundation, Standard or Advanced at Redcliffe Radio Club. See Alan VK4KZ, Glenn VK4FZ, or anyone from the Executive. You don't have to be a Club member to participate. Special courses will also be arranged to prepare people for the Foundation License. Please let one of the above know if you wish to attend one of these. There may be limits to class sizes.

My contact details (Alan VK4KZ) are under "Contributions to Editor QRM", page 4 of this magazine. If you do contact me, please keep in touch, to make sure I don't forget (which unfortunately I am sometimes inclined to do). The dates for future courses are not known at this stage but will depend on demand at the time.

----- Geary Fawk -----

All club members wish Geary a speedy recovery and return to good health

----- WIA Membership -----

Please let the Secretary, Peter know if you have recently become a member of WIA. WIA membership of our Club members is important because we are able to derive insurance benefits. If you are not in WIA, please consider this seriously – it is our representative body.

CELEBRATIONS (*January/February*)

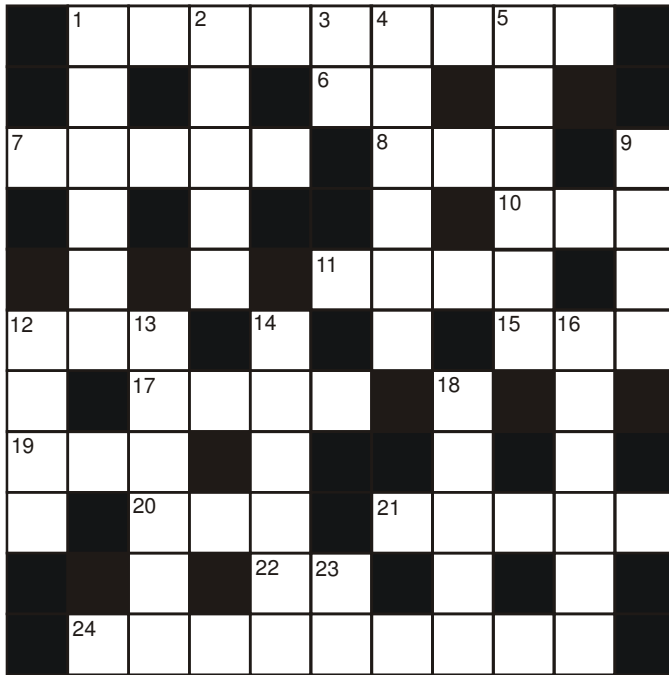
Birthdays: Margaret Haig (VK4MH), 27th January
Endah McDonald (XYL, VK4KET), 31st January
George Down (VK4XY), 6th February
Bill (Jnr), Eleanor, & James Isdale (triple harmonics, VK4TWI), 12th February
Vicki Bondarenko (XYL, VK4TSB), 18th February
Kerrod Atfield (VK4TKA), 24th February

Celebrations: Bill (VK4TWI) & Anne Isdale, 6th January

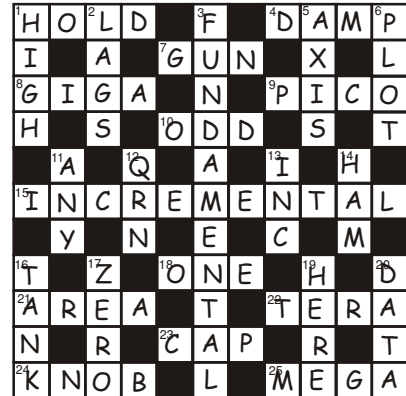
Congratulations and best wishes to all above.

Apologies to anyone who has been left out. If you are not the on Celebrations List, please give Asst Secretary Celia your details as soon as possible. Celia is currently updating the list.

R & DRC Crossword No. 21 (Solution next QRM)



R & DRC Crossword No. 20 solution



ACROSS

- 1 Converts AC to DC
- 6 Normally open
- 7 Begin
- 8 Coordinated universal time
- 10 Unrefined metal
- 11 Structural member usually timber
- 12 Principal meeting (abbrev)
- 15 Age
- 17 Burden
- 19 Frequency component of modulated carrier (abbrev)
- 20 Water below 0°C
- 21 Positive electrode
- 22 Higher direction
- 24 Semiconductor

DOWN (cont)

- 1 Operational limitation
- 2 Non linear path
- 3 Indium (chemical symbol)
- 4 84.8MHz is the ----- harmonic of 21.4MHz
- 5 Put into coded form
- 9 BJT current gain
- 12 Capable
- 13 Transportable
- 14 Place where relics are stored and displayed
- 16 By chance
- 18 One hundredth (prefix)
- 23 Final power amplifier (abbrev)

© aj&jh

----- **Contest Calendar** -----

CQWW 160m (SSB)	23/24 Feb	ARRL Intl DX (SSB)	1-2 March
RSGB Comwith (CW)	8-9 March	John Moyle Field Day (all modes)	15-16 March
BARTG RTTY	22-24 March	CQWW WPX (SSB)	29-30 March
SP DX (CW/SSB)	5-6-April	EA WW RTTY	5-6 April
Japan & Yuri Gagarin Intl DX (CW)	12-13 April	Holy Land Intl & YU DX (CW/SSB)	19,19-20 April
Harry Angel Sprint (CW/SSB)	26 April	Helvetia (CW/SSB)	28-29 April
SP DX RTTY	28-29 April		

These advertisers support us - please support them

Platinum
**PAINTERS
& DECORATORS**

PH: 1300 739 859 Fax: 3264 1566
Mobile: 0433 339 733 BSA # 702280

"PETER RIMMER"
ppainter@bigpond.net.au

ALCHEMET Pty Ltd
3 Ceccato Drive, Murrumba Downs, Qld, 4503

Doug McDonald (VK4KET)

Ph: 07 3480 5861 Mob: 0407 915 111
Alchemet@smartchat.net.au
Engineering, chemistry, geology, metallurgy

**engineering
& sheetmetal**

Greg Nagg

Phone 07 5438 0466 Fax 07 5438 0477 ABN 25 010 799 229
Shed 1/7 Sydal St Caloundra Q 4551 PO Box 3749 Caloundra Q 4551

BESTEEL FRAMES Pty Ltd
The Professionals in Steel Framing
David Sharples BSc (Hons), C Eng, MIE

Mobile: 0412 753 562
PO Box 4050, Caloundra MC, Qld 4551
14 Daniel Street, Caloundra, Qld, 4551
Factory: Ph (07) 5492 8244 Fax (07) 5491 7488

Email: admin@besteelframes.com.au Web site www.besteelframes.com.au

Coates Hire
Lot 102, South Pine Road, Brendale
Ph: 3205 3677

*When you want the Hire Advantage...
Think Coates*

DENTURES

New dentures	David Close VK4FDRC
Repairs	2 Waterford Place
Relines	Bridgeman Downs 4035
Mouthguards	3862 8700
Health Funds	<i>also at</i>
Veterans Affairs	Sandgate 113 Brighton Rd Shop 6 Laurel's Arcade 3869 3361

Amoru Fashion



Ladies Tailoring
Dress Making
Alterations
Repairs
Shop 1, Upper Level
Kippa Ring Village
Ph: 3889 3534

ANIMALS PRO SHOP
*Lawrie (Animal) Hill
Pro Shop Manager*



'For all your Bowling needs'

Caboolture Bowl
207 Morayfield Road
Morayfield, Qld, 4506
Ph (07) 5495 6000
Fax (07) 5495 6091
Mobile 0403 352 501
E-Mail: animal@microed.com.au

BRAD FRANCIS VK4FAAF



we.net.au
AUSTRALIAN INTERNET SERVICE PROVIDER

For all your internet requirements

Stewart Bondarenko
Mobile Phone: 0407 590 295



ELECTRICAL CONTRACTOR

A.B.N. 40 522 827 173
Contractors License # 11783