

# WANSARC NEWS

Incorporated in Victoria, 1985 Registration Number: A0007611S

The monthly magazine of the

Western & Northern Suburbs Amateur Radio Club Melbourne, Australia



[www.wansarc.org.au](http://www.wansarc.org.au)

146.450 MHz FM

**VK3AWS**

28.470 MHz USB

Volume No: 43

Issue 01

January

2012



**No Club Meeting in January - Come to the Family Day instead...**

January Sunday 22nd

Rotunda 6, Bundoora Park

**More on Page 2**



What a view, Melbourne skyline from Williamstown beach, taken by John VK3FMPB.  
Just inspires setting up portable, packing a seafood lunch and a few cold ales...

Summer VHF-UHF Field Day will be held over the weekend of January 14/15

More information under contests section at <http://www.wia.org.au>

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# WANSARC Family Fun Day

Rotunda 6, Bundoora Park

January Sunday 22nd

It's on again at the same venue as last year

Gear will be setup from sunrise and

Cooking of food well in progress by 11.00 am

All Soft drinks, Food, Nibbles & Salads are all club supplied (to financial club members) so just turn up!

**VK3AWS**

active the whole day, call and / or be talked in, on

**146.450 MHz FM**

*If you only come to one WANSARC meeting this year – this is it!!!*

*Bring along your chair, shade if you want extra, a hat, sunscreen and anything else you want on hand*

You can find Bundoora Park in the Melway ® Ref: **Map 19, F4 Bundoora Park, 1069 Plenty Road, Bundoora 3083**

*As you enter the park from Plenty Road, turn right into River Red Gum Avenue and follow it until you come to the first right turn into Playground Drive. Continue down Playground Drive and it's the only and last rotunda, (No.6) just look for the wire antennas and other club members, if you have 146.450 MHz going we can even "call out" to you as we see you approaching, for the rest that remember – it's the same place as last year, which puts it at Melway ® Map square 19 F 4.*

Look at the red arrow near the bottom of this map to find WANSARC BBQ



# Centre Victoria RadioFest No. 5

## Sunday 12 February - Kyneton Racecourse

### THE BIGGEST RADIO EVENT IN VICTORIA

The place to pick up a bargain at the Traders Hall supported by all the major traders or at the second-hand market place whether it be at the tables or carboot lots.

Socialise, see, learn and enjoy. This is a family friendly event where you can have a picnic and relax.



### Check out this great program

- ✓ Australia's first look at home-brewing a DVB-S ATV Transmitter. The poor man's entry into the enthralling world of digital television by Ross Pittard VK3CE
- ✓ The ZL6QU Super Station at Quartz Hill by its Chair of Committee 1997-2011 and avid contester, Brian Miller VK3MI/ ZL1AZE
- ✓ Tracking down that interference! An interesting insight delivered on this very important activity from Mark Tell of the ACMA

### DISPLAYS AND ACTIVITIES

- EmComm ready to serve in our name
- F-Troop photo call of Foundation licensees
- Bendigo District Astronomical Society
- Scout radio display
- Historical radio on show
- CQ Awards QSL checking with VK3PA
- Special interest group meetings

More details listen to the VK1WIA broadcast or check out the website

The program advertised reflects what is proposed at this time and may be subject to change.

### Second-hand market and car-boot sales

Bookings of tables and car-boot space close soon. These are low cost and include one entry ticket. An application form and conditions on the website (see below) or contact Tony Hambling VK3VTH 0423 635 152

**Catering:** Hot and cold food and drinks will be catered by the Kyneton CFA Auxiliary. Hot breakfast is available from 9am. Free tea and coffee available all day. Or bring your own lunch to enjoy in picnic style.

**Entry tickets \$10:** On sale from 9am with the gates opening at 10am. Free entry to children aged under 13. No pets or alcohol. The venue is mostly under cover suited for all weather.

**Door prizes:** Entry tickets will be drawn for the winners of available door prizes.

**Venue:** Kyneton Racecourse, Campaspe Place (off Beauchamp St), Kyneton, Only 50 minutes from Melbourne and an hour from Ballarat and Bendigo. Plenty of free parking.

**Info and talk-in:** Mt Macedon 2m repeater VK3RMM 147.250MHz from 7.30am to 10.30am on the day.

**Email:** [radiofest@amateurradio.com.au](mailto:radiofest@amateurradio.com.au)

**Website:** [radiofest.amateurradio.com.au](http://radiofest.amateurradio.com.au)

Don't miss this major event and great social occasion for everyone with an interest in radio communications. Ready to help you maximise your participation are volunteers from **Amateur Radio Victoria** and the **Central Goldfields Amateur Radio Club**.

## Around the Shack

### LAST CLUB MEETING

Last meeting for the year was a social evening at the clubrooms. Trevor **VK3ATX** was BBQ Master chef.



It was time to snap up a bargain as the "Mad Minute Auction" took place for the final time in 2011, with Mark **VK3PI** bringing down some more goodies for members to secure with as little as loose change.



All proceeds went to the club and Mark auctioned each item for a minute to secure the best possible outcome for the club.



Also 3 Lucky Dip boxes were sold, containing a plethora of handy bits and pieces for the amateur radio enthusiast, including brand new components.

Starting price for the boxes was \$10 each but they had much more than \$10 worth of goodies inside.

A number of pre-loved magazines were also sold in bundles of 10, at \$2 each bundle.

BBQ was kept busy with food cooked up and consumed, the smell of the BBQ permeated throughout room, many passersby looked up and wished they were part of the WANSARC crowd. The lake makes a great backdrop view as you much away...



Mick **VK3CH** also completed the 24GHz ATV transmitters earlier in the week and had the two 24GHz dishes on display. The view of the lake via 24GHz... ↓





Goods on offer being inspected ↓



Frank VK3ZO marking the club chairs ↑

More funds for the club ↓



Chilling out... ↓



### NEW ZEALAND HAMS GET HIGHER POWER

The long awaited new General Class regulations include a doubling of output from 500w to 1 kilowatt PEP, but retains the probation period before full privileges are available.

It puts New Zealander's in line with their counterparts and allows them to use the alternative ZM prefixes during recognised contests and as control stations at special events.

The bands between 5 MHz and 25 MHz are not permitted for three months with a new licensee expected to have logged 50 contacts. In accordance with Article 25 of the International Radio Regulations, radio amateurs are encouraged to prepare for, and meet, communication needs in support of disaster relief.

New Zealand only has one licence grade after the failure of its Novice Licence, and is still considering whether it should introduce a Foundation Licence.

The WIA is studying the New Zealand regulations, particularly in relation to new power output that now greatly differs from the 400w PEP maximum allowed to be generally used in Australia.

The gazette may be read at <http://www.rsm.govt.nz/cms/pdf-library/licensing/radiocommunications-regulations-general-user-radio-licence-for-amateur-radio-operators-notice-2011-issue176-7900.pdf/view>

As soon as it became available, the WIA provided the ACMA with a copy of the amended New Zealand amateur General User Radio Licence, pointing out that many Australian amateurs would seek to rely on the New Zealand decision and also again expressing concern at the long delay that had occurred in the consideration of our own submission.

On 15 October 2010 the WIA had lodged a submission with the Australian regulator, the ACMA, seeking a power increase for Advanced licensees on the amateur primary allocations on a case by case basis.

The WIA argument and proposal was fully set out in the Comment in the November 2010 issue of Amateur Radio magazine.

After that, at the request of the ACMA, the WIA provided further information.

Representatives of the WIA met with ACMA staff from the Licensing Development Section of the Infrastructure Regulation Branch on the 16th May 2011 to clarify certain aspects of the submission and the additional information that had been provided.

As soon as it became available, the WIA provided the ACMA with a copy of the amended New Zealand amateur General User Radio Licence, pointing out that many Australian amateurs would seek to rely on the New Zealand decision and also again expressing concern at the long delay that had occurred in the consideration of its submission.

The ACMA has told the WIA that the delay is regretted, but that it was committed to resolving the issue, taking into account the New Zealand decision. ~ARV & WIA News

### ROBOT GUARDS TO PATROL PRISONS

ROBOT guards with sensors to detect abnormal behaviour will soon begin patrolling South Korean prisons to ease the burden on their human counterparts, researchers said.

A group of scientists has developed the robot warders under a one billion won (\$US850,000) project organised by the Ministry of Knowledge Economy.

The robots - 1.5m high and running on four wheels - will mostly be used at night.

They can connect prisoners with officers through a remote conversation function, according to the Asian Forum for



Corrections (AFC), a South Korea-based group of researchers in criminality and prison policies.

It pioneered the project with the justice ministry's co-operation.

The robots' sensors will enable them to detect abnormalities such as suicidal behaviour and violence and report it to officers in charge. Professor Lee Baik-Chul of Kyonggi University, who led the design process and heads the AFC, said it was intended to let human guards focus more on correction and rehabilitation efforts. "As we're almost done with creating its key operating system, we are now working on refining its details to make it look more friendly to inmates," Prof Lee was quoted by Yonhap news agency as saying.

Three robots will be tested at a correctional facility in the south-eastern city of Pohang next March when development is completed.

South Korea aims to be a world leader in robotics. It has already designed models to teach English in schools, stand guard on the border with North Korea, fight taekwondo bouts, act in plays and clean a home.

~Internet

### TURN ON THE SERVER, IT'S COLD INSIDE

To satisfy our ever-growing need for computing power, many technology companies have moved their work to data centres with tens of thousands of power-gobbling servers. Concentrated in one place, the servers produce enormous heat. The additional power needed for cooling them — up to half of the power used to run them — is the steep environmental price we have paid to move data to the cloud.

Researchers, however, have come up with an intriguing option for that wasted heat: putting it to good use in people's homes.

Two researchers at the University of Virginia and four at Microsoft Research explored this possibility in a paper presented this year at the Usenix Workshop on Hot Topics in Cloud Computing.

The paper looks at how the servers — though still operated by their companies — could be placed inside homes and used as a source of heat. The authors call the concept the "data furnace".

They acknowledge that it is more likely that data furnaces, if adopted, would be placed first in basements of office and apartment buildings, not in individual homes. But as a "thought-provoking exercise", the authors give homes the bulk of their attention. If a home has a broadband internet connection, it can serve as a micro data centre.

One, two or three cabinets filled with servers could be installed where the furnace sits and connected with the existing circulation fan and ductwork. Each cabinet could have slots for, say, 40 motherboards — each one counting as a server. In the coldest climate, about 110 motherboards could keep a home as toasty as a conventional furnace does. The rest of the year, the servers would still run, but the heat generated would be vented to the outside, as harmless as a clothes dryer's. The researchers suggest that only if the local temperature reached 95 degrees Fahrenheit (35 degrees Celsius) or above would the machines need to be shut down to avoid overheating. (Of course, adding a new outside vent on the side of the house could give some homeowners pause.)

According to the researchers' calculations, a conventional data centre must invest about \$US400 a year to run each server, or about \$US16,000 for a cabinet filled with 40 of them. (This includes the costs of building a bricks-and-mortar centre and of cooling the machines.)

Having homes host the machines could reduce the need for a company to build new data centres. And the company's cost to operate the same cabinet in a home would be less than \$US3600 a year — and leave a smaller carbon footprint, too. The company's data centre could thus cover the homeowner's electricity costs for the servers and still come out way ahead financially.

The machines would remain under the remote control of the company's centralised data centre, and their workings would remain opaque. Network traffic and data would have to be encrypted. Sensors would warn if the cabinet was opened. If a server failed, its tasks would be automatically reassigned to another — in cloud computing, software is built with the expectation that an individual machine can break at any time.

A data furnace would be best suited for computing tasks that aren't time-sensitive and can be broken into chunks performed by thousands of machines — say, for scientific research.

The idea awaits one big-name internet company to give it a try — and to be willing to give prospective users enough financial incentive so they'll consent to have servers take the place of their furnaces in the basement.

I asked Kamin Whitehouse, an assistant professor of computer science at the University of Virginia and a co-author of the research paper, how the computer science world had reacted to the idea. "We've gotten a very strong response, more than I usually get after publishing a scientific paper," he said. "We heard from several people who are already heating their homes with computer systems, which shows that it works. Our contribution is to show that the data furnace also has lower cost and lower energy than a conventional data centre."

Winston Saunders, a physicist who serves as an alternate board member of the Green Grid, a non-profit industry group that promotes environmentally friendly data centres, read the data furnace paper and is enthusiastic about the concept. Saunders is director of data centre power initiatives at Intel, but spoke on behalf of the Green Grid. "I've got a little house in the middle of the Oregon mountains," he said. "I have baseboard electric heaters in it right now that cost me a fortune to run.

What if I had a 'baseboard data centre'? It would just sit there and produce the same amount of heat with the same amount of electricity.

But it would also do computing, such as decoding DNA, analysing protein structures or finding a cure for cancer."

IBM Research-Zurich is designing water-cooled servers whose waste heat can be carried in pipes to nearby buildings.

Next year, it plans to demonstrate the technology with SuperMUC, a supercomputer under construction in Munich that will be more powerful than 110,000 PCs.

Many cities in Europe already have insulated pipes in place for centralised "district heating". Heat generated by data centres is beginning to be distributed to neighbouring homes and commercial buildings — in Helsinki, for example.

But for the rest of us, without such pipes near our homes, the computing would need to be done under our own roof to put the heat to good use.

If tech companies with data centres like the economics of home-based data furnaces, they could offer heating for homeowners at an irresistible price: free.

~The New York Times

### WEIRD AND WONDERFUL ~ '73

Why do we say 73 at the end of a QSO?

It's not, as some think, the legacy of an archaic code; rather it is a very, very special number and needs to be celebrated regularly.

Why is 73 so special?

Spell it out and you'll find it has 12 letters in its name.

Indeed this is the smallest integer to do so.

Read on and see why this is significant.

The mirror of 73 is 37 and this is the 12th prime number,

73 is the 21st prime number and guess what multiplies to make 21? Yep, 7 & 3!

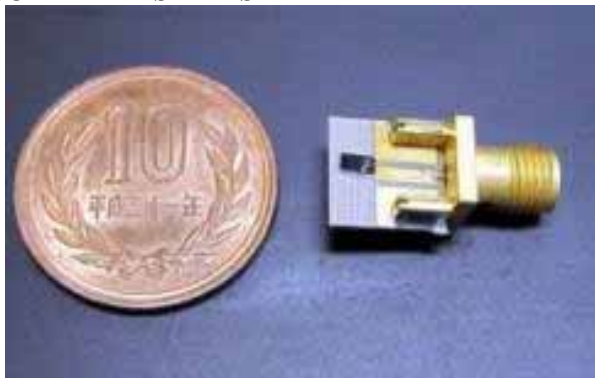
To make 73 even more interesting it is a palindrome in binary — 1001001 which is the same backwards or forwards.

Of the 7 digits used to represent 73 in binary, 3 are ones.

So you think it's coincidence that we wind up our QSO's with 73? No — let's celebrate that unique number - 73 for now!

~Geoff, VK4ZPP (WIA News)

## RECORD DATA SPEEDS AT TERAHERTZ



The Japan-based semiconductor maker ROHM with a team from Osaka University, have made a chip that has achieved a wireless data transmission speed of 1.5 gigabits per second.

This is a record breaker as the world's first TeraHertz wireless communication via a small semiconductor device.

Even higher transmission speeds of up to 30 Gbps may be possible in the future as the company hopes to start mass-producing the chip in three to four years.

The breakthrough, as described by DailyTech, involves the use of a micro-antenna that integrates the oscillation device and the detection element onto the semiconductor base plate.

ROHM is a semi-conductor and electronic parts supplier based in Kyoto, Japan and one of the top 25 semiconductor firms in the world by sales.

Research into TeraHertz or sub-millimeter technology is receiving increasing world attention and devices exploiting the waveband including for medical and security scanners are set to become increasingly important. *~ARV Website*

### VK100ARV WRAP-UP

The month long DXCC-list activation of the special callsign to mark the Centenary of Amateur Radio Victoria is over with some 5,000 QSOs in its logbook.

Award Manager Tony Hambling VK3VTH said it was all over for another 100 years. Nothing but positive feedback has been received from the Amateur Radio Community in general across the 30 days of operation.

The correct mix of bands and modes and the fact that the station was on the air at most times to suit VK and DX stations attracted many positive comments.

VK100ARV operated in many diverse locations, including in Gippsland, Brisbane Ranges, Mildura, Swan Hill and metropolitan Melbourne, often in severe weather conditions.

Due to the skill and experience of the operators who managed to have about 5000 contacts in the activation period offering something of interest.

There were numerous television transmissions including the world's first Digital TV QSO Party hosted by Peter Cossins VK3BFG.

Portable operation in public parks (great public exposure), National Parks activations, DX operations in many modes, VK Contacts on most bands and modes and of course club participation on all levels.

The first contact under VK100ARV was made by the Scout Radio Electronics Service Unit with Alex McDonald VK4TE. Signal was hard copy however Greg Lipschitz VK3LLL did a sterling job in getting the QSO in the log. It was Terry Murphy VK3UP who concluded with Grant Taylor VK3HP.

Centenary Award applications are now beginning to arrive, along with a few Keith Roget Memorial National Park Award applications.

The QSL Cards are being printed and the final part of the operation will commence. Thanks to Jim Linton VK3PC for working behind the scenes to produce the Centenary Award and the revised National Parks Certificates and of course the QSL cards.

The Amateur Radio Victoria Centenary Council would like to sincerely thank the Scouts Radio and Electronics Unit, Peter Fraser VK3ZPF, the membership of WANSARC, Michael Ampt VK3CH, Keith Proctor VK3FT, Luke Steele VK3HJ, Peter Cossins VK3BFG, Terry Murphy VK3UP, Michele Grant VK3FEAT, Jim Linton VK3PC, Stephen Ireland VK3SIR, The VK3RML SSTV Group, Peter Freeman VK3PF, Joe Walsh VK3XH, Tony Hambling VK3VTH, the membership of the Sunraysia Radio Group and Noel Ferguson VK3FI.

Without their strong support and dedication VK100ARV would not have been possible. *~ARV Website*

### FEARS OF WOODPECKER RETURN ARE DASHED

An early warning radar system focused on Europe has a range of up to 6,000 kilometres, but unlike early Woodpecker over the horizon radar this uses VHF.

The Russian Woodpecker was a notorious Soviet signal on the shortwave bands worldwide between July 1976 and December 1989.

The new radar system network protects Russia from missile attacks, and covers all of Europe and the Atlantic. The station at Kaliningrad has been in test mode but about to be fully deployed. Russian President Dmitry Medvedev attended the station's opening at the westernmost region bordering on Europe.

It was announced that the radar warning station is not aimed against the West, but included in the system of measures to provide missile defence systems in Europe.

The VHF system operating at about 150 to 200 MHz is directed westward looking over Europe. It was understood to be a reply to NATO's creation of the European Missile Defence system.

Apart from Kaliningrad two other radar stations exist in Lehtusi, that covers the North Atlantic, and one in Armavir looking to the south and south-westerly. *~ARV Website*

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A businessman is driving out of Melbourne one Friday evening along the Ring road.

He runs into a traffic jam but after about ten minutes sitting still, he's beginning to think 'hey, this is worse than usual'.

He sees a policeman wandering between the lines of cars, so winds down his window and calls him over to ask what's going on ahead.

'It's a Richmond fan,' says the policeman. 'He's feeling really depressed because his team failed to do anything this season after all the mouthing off he's been doing since last year. He also says that he's got no friends, all his family hate him, he lives in Sunshine and he's never had a job.

He's threatening to douse himself in petrol and set himself on fire in the middle of the road.

I've had a long chat with him, and now I'm taking up a collection for him.'

The businessman is impressed.

'Wow, that's really good of you,' he says.

How much have you collected for him so far?'

'Well,' says the policeman, 'About 20 litres so far, but a lot of people are still siphoning.'

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**This guy calls in to complain that he gets an "Access Denied" message every time he logs in. It turned out he was typing his user name and password in capital letters.**

**Tech Support:**

**"OK, let's try once more, but use lower-case letters."**

**Customer:**

**"Uh, I only have capital letters on my keyboard."**

## WANSARC CHRISTMAS DINNER

The club Christmas dinner was held at Darebin RSL this year. Around 25 members attended with a presentation by Amateur Radio Victoria Treasurer, Ross Pittard, **VK3CE**.



Ross gave a presentation on the history of ARV through its 100 years and the services it offers and the range of resources, library and communications infrastructure of repeaters throughout VK3.



The usual banter and catching up was done over food and drinks. The club raffle run by Graeme **VK3NE**, was drawn to the usual allegations of "rigged!" Like playing poker with five aces... The raffle winners were Alex **VK3XLC** (a few times), Frank **VK3ZO**, Dallas **VK3EB**, Ian **VK3QL** (a few times), Ray **VK3KEL**, Pam **VK3NK**, Dave **VK3DTS** and Urey **VK3ATA**. Thanks to Trevor **VK3ATX** for organising the dinner at the RSL. Thanks also to Ross, **VK3CE**, who drove all the way and back from Bendigo to give his presentation to us on ARV, well done!

## SPELL CHECKER - POEM

I halve a spelling checker,  
It came with my pea see.  
It plainly marks four my revue  
Mistakes I dew knot sea.

Eye strike a key and type a word  
And weight four it two say  
Weather eye am wrong oar write  
It shows me strait aweigh.

As soon as a mist ache is maid  
It nose bee fore two long  
And eye can put the era rite  
Its rarely ever wrong.

I've scent this massage threw it,  
And I'm shore your pleased too no  
Its letter prefect in every weigh;  
My checker tolled me sew.

## Rabbit Test



The Los Angeles Police Department (LAPD), The FBI, and the CIA are all trying to prove that they are the best at apprehending criminals. The President decides to give them a test. He releases a rabbit into a forest and each of them has to catch it.

The CIA goes in.  
They place animal informants throughout the forest.  
They question all plant and mineral witnesses.  
After three months of extensive investigations they conclude that rabbits do not exist.

The FBI goes in.  
After two weeks with no leads they burn the forest, killing everything in it, including the rabbit, and they make no apologies.  
The rabbit had it coming.

The LAPD goes in.  
They come out two hours later with a badly beaten bear.  
The bear is yelling: "Okay! Okay! I'm a rabbit! I'm a rabbit!"

## NEW ZEALAND MAY INTRODUCE A PRACTICAL TEST

Consideration is being given to three parts of the amateur radio licence in New Zealand being made a practical element in addition to the normal sit down multichoice paper.

The IARU national society, the NZART is consulting widely with the exam supervisors before the matter can be put to the membership as a whole.

Being considered at this stage for a practical test are Sections 23, 24 and 25. They cover general operating, standard procedures, callsign exchanges, repeater linking, understanding terminology such as pileups, split working, receiver and transmitter controls and the Q code.

It will take some months before the proposal is considered, and if agreed all NZART branches will discuss and vote on a remit.

~ARV News

## AMATEUR STATION INSPECTION PROCESS

The WIA and staff from the ACMA have agreed on the steps to be undertaken leading up to and during the course of a licensed amateur station inspection. The process is a balance between operational efficiency of ACMA staff and the individual rights and obligations of an amateur operator.

It should be noted that Radio Inspectors acting under the Radio communications Act (the Act) do not generally have automatic rights, other than common law rights, to enter an individual property unless permission is granted by the property occupier. However, in emergency situations the Act provides that Inspectors may enter premises to stop actual interference to certain safety, police and fire services. Circumstances where radio equipment may be seized are also specified in the Act. In the conduct of an investigation Inspectors may make a sworn statement and apply to the Court for a "Search Warrant" from a Magistrate. Generally there has to be sufficient evidence to form a reasonable belief that there has been one or more of significant breaches of the Act in order to obtain a warrant. An Inspector can execute the warrant at any time specified on the warrant and station operators should provide all necessary assistance to enable the warrant to be executed.

In contrast amateur station inspections are normally a routine activity, often with an educational objective. Ordinarily, an Inspector will arrange a mutually convenient time by telephone with a licensee to inspect the licensee's amateur station. If the licensee is aged under 18, the appointment shall be made through a parent or guardian or other appropriate adult person in the position of a parent, subject to entry authorised in emergency situations (as referred above). If the licensee is aged under 18, the inspection shall be carried out in the presence of the parent or guardian or other appropriate adult person. In some cases, where an Inspector is working in a particular area, it may be convenient to visit amateurs in the area to undertake station inspections and in such cases it may not be possible to make an appointment by telephone.

It has been agreed that the following steps will be taken in such cases when an Inspector has been unable to make an appointment:

1. The ACMA staff will select the licensee(s) to be visited by the proximity of their station(s) to other work in an area;
2. The ACMA staff will ascertain the age of each licensee to be visited;
3. If the licensee is aged under 18, contact shall be made through a parent or guardian or other adult person in the position of a parent;
4. Upon arrival the Inspector shall identify himself and display his or her identification card. The WIA advises that the licensee should note the name(s) of the Inspector(s);

5. The Inspector shall request permission to enter and to inspect the station. If it is not convenient to do so the inspector should advise the licensee that the inspection may take place at another time more convenient to both the ACMA and the licensee.

6. The ACMA staff shall always ensure that if the licensee is aged under 18 any inspection is carried out at all times in the presence of a parent or guardian or other adult person (subject to entry authorised in emergency situations).

7. The licensee shall assist the Inspector in the conduct of the inspection and possible testing of equipment.

At the conclusion of the inspection, and if there are any irregularities, the Inspector may hand an Advice or Warning Notice to the Licensee identifying any irregularities and recommending any action to be undertaken by the licensee.

All amateur licensees should be aware of and must operate their station in accordance with the Act and the licence conditions relating to the type of licence held. It is expected that ACMA staff and Amateur operators will work co-operatively in accordance with the above procedure and always bear in mind the individual rights of the licensee.

~ Michael Owen - VK3KI

## PROPOSED AMATEUR MF ALLOCATION

Dale Hughes VK1DSH reports that the proposal to allocate a part of the medium frequency band to the amateur service at the World Radio Conference in 2012 received a boost this week with the release of the Asia-Pacific Common Proposals that were developed at the 5th Meeting of the APT Conference Preparatory Group for WRC-12 (APG2012-5) 29 August 2011 - 3 September 2011, Busan, Republic of Korea. During this meeting the various nations of the Asia-Pacific region discussed many of issues that will be addressed at WRC12 and attempted to come to a regional consensus position.

The proposal of interest to the amateur service is "to consider an allocation of about 15 kHz in parts of the band 415–526.5 kHz to the amateur service on a secondary basis, taking into account the need to protect existing services" and this proposal was supported by a comfortable margin of Asia-Pacific administrations responding to the voting request.

The successful development of a regional position supporting an amateur MF allocation increases the chances that the proposal will be accepted at WRC-12.

An approved Asia-Pacific Common Proposal must:

- a) be supported by at least one quarter (25%) of all the APT Members, and
- b) the proposal is not opposed by more than 50% of the number of Members who support it.

The Asia Pacific Telecommunity (APT) covers 38 member countries and is one of a number of regional Intergovernmental Organizations which operate in conjunction with telecom service providers, manufacturers of communications equipment, and research and development organizations active in the field of communication, information and innovation technologies. The APT was founded in 1979 on the joint initiatives of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the International Telecommunication Union (ITU).

The amateur radio service is represented at the APT meetings by delegates from the International Amateur Radio Union Region 3 and by members of national amateur radio organisations who are part of delegations from each national administration.

Dale Hughes was a member of the Australian delegation to the Busan meeting and the earlier meeting in Hong Kong in December 2010, nominated and paid for by the WIA.

Dale will be representing the amateur service as a member of the Australian delegation to WRC-12, again nominated by the WIA.

~ Michael Owen - VK3KI

# WANSARC NET

**TUESDAY NIGHT 7.30PM START**

## 146.450 MHz FM

NET CONTROL STATION

# VK3AWS

### ACMA TO PERMIT HIGHER POWER FOR ADVANCED LICENSEES ON TRIAL BASIS

The ACMA has advised the WIA that it intends to accede to the WIA's request that advanced licensees may apply for a variation of their licence to permit higher power from a fixed location on a trial basis from 1 March 2012. The ACMA has stressed to the WIA that it remains concerned about the risk of interference from the use of higher power. At the end of 12 months the position will be reviewed by the ACMA.

The ACMA has adopted this approach to enable any particular difficulties to be identified and satisfactory solutions found to, in the words of the ACMA, "enable the trial to progress to appropriate ongoing arrangements from early 2013" The ACMA will publish the changes to the licence process and forms setting out the further information needed for an application for higher power before 1 March 2012.

While the details are still subject to discussion, the following principles will be applied:

Transmitter power outputs up to 1,000 watts PEP may be permitted, though the emission modes to which this limit will apply are still subject to consideration. It should be noted that lower power limits may be specified in some cases.

The higher power limits will only be permitted on the amateur HF bands where the amateur service is the primary service. The WIA has requested that the band 7100 to 7200 kHz be also included, and this is being considered,

Higher power will not be permitted in certain areas that will be identified by the ACMA on its website.

Licensees will continue to be obliged to comply with the EME requirements.

For the period of the trial, licensees permitted to use higher power will be encouraged to keep a full log of all transmissions on bands where the higher power is permitted, noting in each case the power in fact used.

The WIA's original request is fully set out in the November 2010 issue of the WIA's magazine Amateur Radio. This is a preliminary announcement and further details will be published as they become available before March and after the Christmas break. The WIA anticipates working closely with the ACMA on this issue. ~ Michael Owen - VK3KI



### MIDLIFE CRISIS FOR EMAIL, 40

It is 40 years since American computer engineer Ray Tomlinson put the @ into email addresses, triggering a communications revolution that would forever change the way we correspond. Yet

email now faces a mid-life crisis as young people turn to newer forms of communication, such as Facebook and Twitter.

Internal messaging systems have existed since the 1960s but in 1971 Tomlinson was helping build ARPANET for the US Department of Defence and laying the foundations of the modern internet. Tomlinson needed an easy way to send electronic messages between the various computers hooked up to ARPANET. He chose @ - generally referred to as the "at" symbol - to designate that a message was intended for a specific user "at" a specific organisation. The email protocol continued to develop but, for the next 20 years, it was restricted to academic and military use.

The internet was opened up for commercial use in the 1990s and email went mainstream - driven by the rise of internet service providers such as OzEmail and the birth of free webmail services such as Hotmail, Yahoo! and, later, Gmail. Businesses also embraced email, helped by the rise of the BlackBerry and smartphones.

Email had several advantages over existing forms of communication such as phone calls, letters and faxes. Email is fast, cheap, convenient and asynchronous - the latter meaning that, unlike a phone call, the receiver can deal with it when it suits them. Emails are also easier to store, search and archive than reams of paper or ephemeral phone calls that go in one ear and out the other.

The convenience of email meant it wasn't long before we struck email overload. Today there are an estimated 2 billion email users worldwide, together sending about 300 billion emails a day, according to monitoring service Pingdom. About 90 per cent of these emails are junk mail known as "spam". It's a problem that cuts to the very heart of email's shortcomings and has driven many in search of alternatives.

Email's greatest strength is also its greatest weakness: anyone can send an email to anyone, practically free. To make matters worse, email wasn't initially designed with security in mind, so it's easy for people to fake their sender details. It's little surprise email caught the eye of scammers - letting them contact people with bogus offers that are too good to be true.

Meanwhile, other spam is designed to trick you into clicking on a link to install malicious software that steals passwords and other sensitive information.

Imagine how much junk you would get in your home letterbox if advertisers weren't constrained by printing and delivery costs. Now imagine they ignored "No junk mail" stickers and there was no way to stop them sending it. You would spend all day sorting through junk mail in search of real letters, unless someone was prepared to do it for you. And, thus, another industry was born: spam filtering.

Today, most webmail services offer very accurate spam filtering, as does most desktop anti-virus software. These help weed out the junk from genuine messages. Spammers have not been defeated but, increasingly, accurate filtering is making spam seem less of a burden.

But the damage has already been done and people are looking elsewhere. Efforts to reinvent email, such as Google Wave, have stumbled, but social networking sites may hold the answer.

One of the best ways to combat spam is to only accept messages from people you know. This mentality has driven many people to embrace services such as Skype, Windows Live Messenger, Facebook and Twitter as alternatives to email, especially as most non-work messages are sent to family and friends who are probably also using these other services.

Social networking services such as Facebook and Twitter were originally conceived as platforms for sharing content but both integrate with SMS and feature built-in internal messaging platforms users have embraced quickly.

Facebook has about 800 million active users, of whom more than half log in daily. Together they send 4 billion internal Facebook messages every day.

For today's young social networking users, having grown up with the convenience of SMS and instant messaging, traditional email is often seen as too formal, cumbersome and slow, just as those who grew up with email might view the fax machine or handwritten letter. Of course, all these older technologies still coexist, they just serve different roles.

It seems email is destined to be mixed into a new social concept of a unified inbox - combining voice, video and text from various sources to the point where the message is all-important but the delivery method is invisible and irrelevant. At that point, Ray Tomlinson's @ symbol won't die but, rather, fade away as it is assimilated into this new way of communicating with the world.

*~Internet*

### **'NEW' GOODS SCANDAL**

Selling used goods as new appears to be endemic in the electronics retailing industry, with Harvey Norman and JB Hi-Fi stores also regularly engaging in the practice, former staff and customers say.

Harvey Norman said today that following reports from this website it would contact franchisees to "remind" them that they must adhere to the law.

Revelations from customers and former staff at Dick Smith and other major retailers, published on this website yesterday, has sparked an investigation by NSW Fair Trading, which today said it would be working with other states to take the probe to a national scale.

Most major electronics retailers have generous returns policies, but feedback from customers and staff suggest that returns are often not marked as such and the goods are re-sold as new. It is illegal to sell used goods without informing customers and retailers face fines of up to \$1.1 million for each offence.

Numerous customers have reported buying "new" goods only to find the previous owners' account details, photos, pirated movies, porn and other content still loaded on to the device. Others have seen noticeable marks on the product or customer details filled out on the warranty card.

One former Harvey Norman staff member who claims to have worked at four Harvey Norman stores in Sydney over 10 years claims to have put returned items on the shelf on a daily basis.

"Software was the most common, we didn't have a shrink wrapping machine out the back for nothing," the former staffer said.

"If a laptop was returned and I knew it wasn't faulty, a factory restore and quick wipe down of the screen and it was back ready for sale in an hour. Dealing with suppliers for RA's [return authorisations] was such a pain in the ass that this was an accepted practise from more than 10 franchisees I worked for over this period."

The source said staff were given shrink wrapping machines, air compressors, isopropyl alcohol wipes and heat guns to enable them to ensure returned goods looked new.

"When was the last time you walked into a HN store and saw a table of goods marked 'returned and discounted?', " the source, who claims to have left the company on good terms, said.

"The franchisee just puts it straight back on the shelf at full price because he knows he can get away with it."

On the Whirlpool discussion forum, a hotbed of Australian technology enthusiasts, a different ex-Harvey Norman employee confirmed that "throwing used goods back on the shelf was common practice".

"If it looked in good condition and could be passed off as new, no problem! some shrink wrap and you would never know," they wrote.

Several customers have reported buying goods from Harvey Norman only to find they had been used.

One said they bought a router and found it "had the default admin password changed, and had someone else's settings stored".

Another said they bought an Ariston washing machine from Harvey Norman but when they unpacked the box "soapy water and a large cockroach emerged". The customer said that during the five year warranty period the product had to be repaired six times.

Laptop computers regularly appear in customer reports of being sold used goods. One customer said they bought a \$4000 laptop from Harvey Norman that had obviously been used, while the same person bought a digital camera from Dick Smith only to find someone else's photos on it.

Yesterday, Harvey Norman's general manager for computers, Ben McIntosh, said there were "strict procedures" in place to ensure that franchisees did not sell used products as new. Told of the comments from former staff, he said it sounded like "a very unhappy ex-staff member" but he would "absolutely follow this up". "In light of this story coming to air I have already and will continue to remind our franchise network that they must adhere to the strict rules, which is law," said McIntosh.

A former JB Hi-Fi manager, who spoke on condition of anonymity, said it was "standard practice" to pass off returned goods as new if they were in a saleable condition.

"Not a lot of packaging is actually sealed. If it is, you send it back. Otherwise you just put it back in the box and back on the shelf," he said.

"My mother purchased a Sony MP3 player from JB Hi-Fi two years ago. When I connected it to the computer, I realised that it was filled with pornographic imagery, hip-hop music and videos of cars performing burn-outs."

Many more reports from customers who have been duped by the big electronics retailers appear on the Whirlpool forum. The practice seems to have been going on for quite some time, according to one former Dick Smith staffer who left in 2001.

"I suffered probably the worst thing I've ever seen. a manager demanded I illegally copy a software driver disk so that a refurb product could be given to a customer as new," he said.

"I refused to do so (he did not have the skills to complete it) and he actually slapped me across the face; this went to head office and he got a slap on the wrists but nothing more."

Gary Dooley, who bought a Nokia mobile phone for his 13-year-old son from Dick Smith that appeared to be in its original wrapping, took it home to find its memory card was filled with hardcore pornography. "They said it was nothing to do with them. Totally washed their hands with me and I had to deal with Nokia," he said.

JB Hi-Fi has been approached for comment, while Bing Lee and The Good Guys both declined to comment. Dick Smith has not commented since saying yesterday that selling old gear as new was a "one-off occurrence".

Retravision's incoming CEO Paul Holt said: "If a product is returned, it goes back not just to us but the manufacturer."

Fair Trading is encouraging people who feel they've been duped to call it on 13 32 20. Its investigation is looking into whether the practice is "widespread and systemic".

"Retailers who sell used goods as new and do not disclose this to consumers face fines of up to \$1.1 million for each offence," a Fair Trading spokesman said.

"So that we can address this issue thoroughly, NSW Fair Trading will work with other states and territories as part of a national approach to ensuring the ongoing compliance and effectiveness of the Australian Consumer laws as it applies to reconditioned or returned goods being sold by electronics retailers."

Fair Trading said it had already addressed the related issue of consumers being offered repaired or refurbished goods as replacements when they return defective products. Consumer laws now require traders to disclose this and consumers have the option to only accept new goods or parts.

Consumer group Choice said retailers selling seconds must mark them as such and those who get home to find a product they

bought has been used should take it back to the retailer as soon as possible.

"Demand a new one and specify that you don't want a refurbished product. Also contact the Office of Fair Trading - the more evidence they have on this type of activity, the greater their ability to investigate dodgy retailers who are knowingly undertaking this kind of practice," Choice spokeswoman Ingrid Just said.

### MT HOTHAM REPEATER IN SERVICE

The Albury Wodonga Amateur Radio Club, after some years and a lot of hard work, has got the VK3RHO 2-metre repeater back on air. The enthusiasm behind the project came at a cost including some refurbishment, sourcing power and site fees.

The Albury Wodonga Amateur Radio Club is to be congratulated in its efforts which now fills a missing gap in the repeater network in the north-east of Victoria. It covers a wide area of the High Plains and will be useful during the annual roof-run which is a WICEN event. If you live in the area give it a try with 147.650 MHz in and 147.050 MHz out. ~ARV

### EU THREAT TO AMATEUR RADIO KITS

Thilo DL9KCE, reports a threat to amateur radio kits and modified equipment arising from changes to the EMC directive.

Currently amateur radio kits and modified equipment are specifically excluded from the directive but under the proposed changes they would be fully subjected to the EMC directive. The resulting high compliance costs could make it uneconomic to develop and sell kits so killing off the kit market.

If radio amateurs wished to modify equipment it appears they would also incur additional costs and bureaucratic hassle.

IARU Region 1 will respond to it with a letter soon. ~WIA News

### 50TH ANNIVERSARY OF OSCAR 1

The world of Amateur Radio is celebrating the 50th anniversary of the orbiting of the first ever ham radio satellite known simply as OSCAR, an acronym for the words Orbiting Satellite Carrying Amateur Radio.

For those not around back then, OSCAR, now called by many as Oscar One was carried into space at 2041 GMT, December 12th 1961. It was carried aloft by the Discoverer 36 launching vehicle from Vandenberg Air Force Base in California.

After launch the satellite went into a North-South orbit transmitting Morse on a frequency between 144.990 and 145.008. It's said to have had a tremendous signal strength on any direct, overhead pass. ~WIA News

### INSECTS MAY HELP IN RESCUES

FLYING insects could soon be used in search and rescue missions to help locate survivors of earthquakes and other disasters, scientists say.

Tiny cameras and microphones mounted on beetles might help the emergency services find victims trapped or buried beneath rubble.

The researchers are aiming to power tiny "backpacks" of sensors by "scavenging" energy generated from the insects' wing movements to create a lasting power source.

The hope is that the bugs can then be released into collapsed buildings or other areas that are too dangerous for human rescue teams to enter.

Professor Khalil Najafi, who is developing the new technology in the United States, said the insects' kinetic energy would act as a battery for the equipment.

"Through energy scavenging, we could potentially power cameras, microphones, and other sensors and communication equipment that an insect could carry aboard a tiny backpack," Professor Najafi said.

"We could send these 'bugged' bugs into dangerous or enclosed environments where we would not want humans to go."

The "hybrid insect" technology is being designed by a team of electrical and computer engineers at the University of Michigan. The investigation is being funded by the US government-run Defence Advanced Research Projects Agency.

Researchers have already developed a device able to generate power from the wing motion of a green June beetle during tethered flight.

By mounting a miniature generator on each wing of the insect, scientists expect to be able to create enough power to operate on-board cameras or microphones - allowing the bug to "gather vital information from hazardous environments".

The researchers hope the beetles will be ready for test flights next year. ~Internet

### ANOTHER SET TOP BOX THAT GETS VK3RTV

Digicrystal STD 2500p set top box / PVR tunes to VK3RTV.

~John VK3DQ

### FOUNDATION TRAINING 2012 WEEKEND COURSES

March 24th & 25th, April 28th & 29th, July 21st & 22nd, September 22nd & 23rd, November 17th & 18th

Courses are held at the Amateur Radio Victoria office 40G Victory Blvd, Ashburton.

Contact Barry Robinson VK3PV via [foundation@amateurradio.com.au](mailto:foundation@amateurradio.com.au) or 0428 516 001



### THE EUROPEAN EMC DIRECTIVE

The Radio Society of Great Britain has given its reassurance that radio amateurs have nothing to fear from the re-draft Electromagnetic Compatibility (EMC) directive.

It had been reported that amateur radio kits and modified equipment could be affected by the changes to EMC exposure limits laws.

However the RSGB said that has been done is to move certain clauses around to make the structure of the Directive a little more logical.

The basic elements as applicable to equipment of interest to radio amateurs are unchanged by these drafting changes.

The RSGB undertook to watch for further amendments to make sure that the interests of the Amateur Radio Services are protected. ~ARV News

### CHINA TURNS ON NEW GPS

A satellite system offering new location, timing and navigation data to China and surrounding areas is now available, in opposition to the US government-run Global Positioning System (GPS).



The move should make China's military less dependent on foreign technology. Beijing plans to send a further six satellites into space to extend the system to most parts of Asia.

Going after the automotive, telecommunications, fishing and other industries it intends to expanded the network to 35 satellites by 2020.

What is now promised to civilian users is positioning information correct to the nearest 10 metres, measure speeds within 0.2 metres per second, and provide clock synchronisation signals accurate to 0.02 millionths of a second.

The new Chinese system is compatible and interoperable with the world's other navigation systems. ~ARV News

# VK3CH BACK ON HF

After the wind bent the vertical to bits a new method of getting back on HF was needed and Trevor **VK3ATX** knew just the trick. A length of 1.2mm steel wire was used to go from the rear yard to a tree down the end of the street, very close to the river.

First job was to ask the houses at the end of the street their OK and they said yes, as they know the "antenna house" very well. Plus they throw very good parties, complete with live band in their yard, with the whole street invited to join in, which we do...

A high tree near the river embankment was chosen, with Google Earth indicating a straight run of around 62 meters, of which 56.6 meters is wire, 14 meters above ground level.

Yellow line is run of wire taken from Google Earth view ↓



Trevor rigged nylon ropes and a pulley system to a fibreglass pole, mounted half way up a tree in **VK3CH** rear yard, top pole 14 meters above ground, with long wire into a coax socket with earth and radial wires soldered to a small strip of steel plate.



Pole mounted more than half way up the tree by Trevor ↑

The wire is very hard to see unless you know exactly where to look. Doubt that any non hams will even know it's there.

The rear three nylon ropes are guys. The wire going off to the right is the wire antenna, with feed down to ATU just visible.



Feed leaving VK3CH ↑

At the end of the street, rope also gives insulation from tree, the black nylon rope can be seen but the wire is nearly invisible ↓



Another view of the feed leaving off the pole down the rear lane, once again the black nylon rope (going towards the left) can be seen then the wire is so thin you can hardly tell it's there ↓



Every band from 80 to 6 meters tunes to VSWR of 1:1.2 or better. This is matching done via the external AH-4 ATU up in the tree. Counterpoise wires were added for each WARC band to 6 meters. First contacts on 40 meters was Portland and Warrnambool 9/20+ Listening and QSO to 80 and 40 meter AM net stations were far better than with the old vertical mast, noise floor is a little lower.

Trevor also insisted on proper copper rod earths, one for counterpoise ground and another in the front yard for radio earth grounding to reduce noise pick up.



Many thanks to Trevor for all his hard work and determination...

That would have been the end of it, but Mick would not leave things alone! After having a proper read of the IC-9100 manual it was realized that the radio has its own in built ATU, that unlike the AH-4, covers 160 meters. *I had actually forgotten this!* The specifications for the AH-4 ATU actually says that it will NOT tune 160 meters, but it can be tricked with a coil. But using a coil on a long wire does not work as I found out the hard way after lowering the pole and putting a coil between the AH-4 and wire end. Then nothing worked with a matched VSWR!!! So the antenna coax was swapped to output No 2 and tried out with the AH-4 still in-line. All bands tunned except 160 meters or 6 meters. It was time to take a risk - time to take out the AH-4. So the pole was lowered and a bracket made up that had a PL259 socket soldered to it along with a soldered point for the red counterpoise wires, that was attached to the pole. All the connections and coax socket were the liberally covered with sealant. Which was just as well as it was put up Christmas Eve and all the solid rain and hail the very next day would have gone into the coax otherwise. ↓



Coax feed point, all covered in sealant. ↓ (since removed)



Counterpoises (red) run along the rear yard to along the side of house to the front yard - not ideal, but all the space we have. By the time the wires reach here, only three runs, for 160 meters and 80 meters, are left. ↓



The radial wire lengths for each band are;

Band	Counterpoise Radial Wire Length
160 meters Low Band Edge	38.5 meters
160 meters High Band Edge	36.6 meters
80 meters	19.3 meters
40 meters	10.0 meters
30 meters	7.0 meters
20 meters	5.1 meters
17 meters	3.9 meters
15 meters	3.3 meters
12 meters	2.8 meters
10 meters	2.0 meters
6 meters	1.35 meters

Coax from the radio to antenna is 9913 which is total overkill for HF but absolutely minimal losses for the 25 meter length run. At 1.8MHz loss is 0.13dB, up at 54MHz loss is 0.75dB. VSWR of 1:1.5 represents 4% loss on top of your coax losses. The pole was put up again a bit higher and another test was done. But alas still no good - in fact even worse! The internal ATU matched 80, 30, 15 and 10 meters. But now 160, 40, 17, 12 and 6 meters was unable to be tuned at all. Emailing Trevor to inform him of my "improvements" to his work, he was not pleased! So after that the pole was lowered and the AH-4 ATU put back. This involved removing all the generous amounts of sealant put on only days before...! I was told that internal ATU's in radios are not as good as remotely located matching at the end of the wire antenna. After putting the pole back up VSWR tests gave 1:1.2 for all the HF bands again, except 160 meters. Running a single counterpoise outside the rear land under the antenna still did not give 160 meters. Then the ground wire was just wrapped around the tree and then ALL HF bands were matched OK. Mast with AH-4 reinstalled ↓ The final installation, job finished.



Counterpoise radials were reconnected and ALL HF bands had a VSWR of 1:1.2 except 160 meters, which refused to tune up at all. What's that about "...if it isn't broke don't fix it...?" With long wire working, time to fix the counterpoise problem. During testing it was noticed that the black earth cable going down the tree, that was 14 meters long to the stake sometimes got 160 meters but not all the other HF bands.

So it was decided to take off all the counterpoise wires and just have the 14 meters of single wire going down the tree.

What was happening now is the AH-4 tuner was acting as both a balun and a match to an off centre fed dipole.

56.6 meters of wire on the "hot" side and 14.0 meters of wire on the "ground" side but as the wire was hanging down the dipole now has both a horizontal and vertical component of radiation.

In fact 14 meters is a quarter of 56 meters so the "feed" is at a quarter of the way in. The mast was raised another 1.5 meters up. Looking on the internet of course many suggestions were given with way too much maths and theory to print here.

Back to the radio and the following results were found;

Band	MHz		VSWR
160 meters	1.8	MF	1 : 1.3
80 meters	3.6	HF	1 : 1.4
40 meters	7	HF	1 : 1.1
30 meters	10.12	HF	1 : 1.2
20 meters	14	HF	1 : 1.1
17 meters	18.12	HF	1 : 1.1
15 meters	21	HF	1 : 1.1
12 meters	24.94	HF	1 : 1.1
10 meters	28	HF	1 : 1.3
6 meters	52	VHF	1 : 1.4

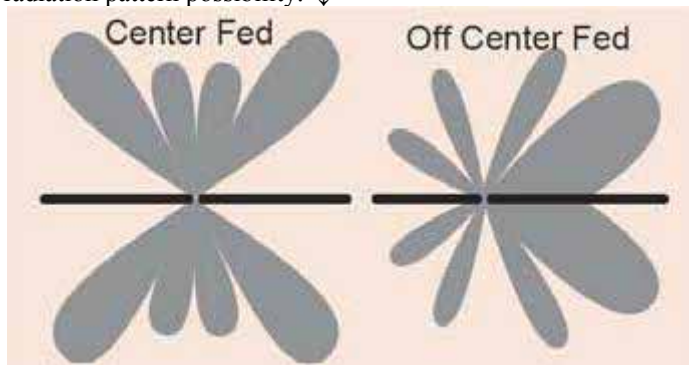
Both upper, centre and lower frequencies were VSWR tested and the worst VSWR result found is displayed above.

10 HF bands all matched using one long wire - not bad at all...

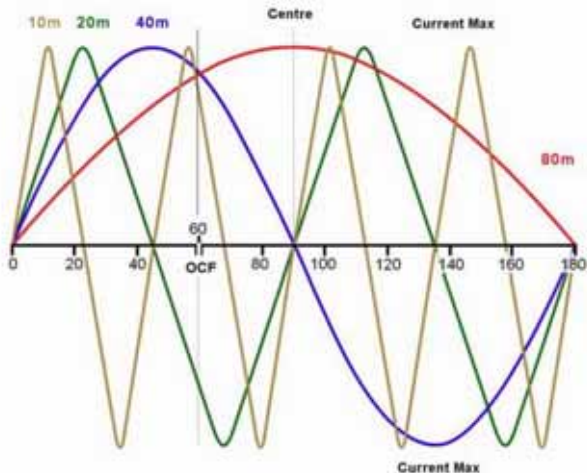
It was now time to leave it well alone!

The now spare counterpoise wire system will be kept for another HF project, possibly a helical vertical up on the roof, but as the long wire has involved a solid week of work going up and down ladders more times than I care to remember, so it's a job for later.

Looking at Off Centre Fed Dipoles on the web found this kind of radiation pattern possibility. ↓



The different bands will end up much like this ↓



The Icom AH-4 ATU manual says...

*"The AH-4 provides reliable matching of frequencies from 3.5 MHz to 54 MHz when using at least a 7 m (23 ft) antenna; or 7 MHz to 54 MHz when using the AH-2b ANTENNA ELEMENT.*

*The built-in 8-bit microprocessor chooses the lowest SWR condition from more than 1,040,000 different LC (coil/capacitor) combinations.*

*The LC combinations of 45 previously-used frequencies are automatically memorized in the AH-4. Once a frequency is memorized, the AH-4 tunes on that frequency in less than 1 sec. Note that the AH-4 does not memorize a frequency which is normally tuned within 2.5 sec. Memories are retained only when the power is on."*

The AH-4 is a wide-range antenna tuner capable of matching a 50 ohm feed line to an antenna feed impedance in the range of 10 to 5,000 ohms. The tuner is designed to operate with up to 120 watts of power. It incorporates 22 relays that switch combinations of inductance and capacitance to achieve tuning – typically within 1 to 3 seconds.

The AH-4 is enclosed in a weatherproof housing and is capable of being permanently installed outdoors. It interfaces to the radio with the coaxial feed line and a 4-conductor control cable. The cable carries the 12 volt power and ground, and the KEY and START control lines. The peak current demand is less than one amp, but typically requires less than 300 ma for operation.

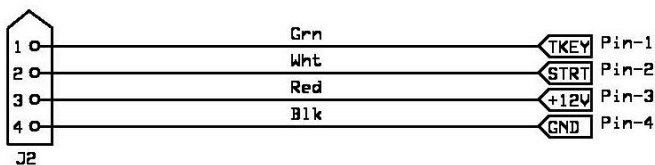
The tuner consists of a microprocessor control system, a power divider, impedance and power measurement circuitry, and the matching network. The RF can be switched between straight thru (power off state or disengaged state); through the power divider network, measurement circuitry, and tuning network (tuning mode); or just thru the tuning network (normal operation).



- During tune the radio always sees a low SWR, typically 1.1:1 or less. This is because the RF is switched to a 10:1 power divider during the tune operation. Only approximately 350 mill watts of power is used during tuning. 50 ohm resistors swamp the remaining power so that the radio never sees a high SWR.

- The tuning relays are never switched under power. This results in long relay life since you don't have to worry about arcing while tuning.

- The microprocessor is shut off except when tuning. This means that you won't hear digital noise from the AH-4 while listening.



Icom AH-4 Interface Cable Diagram ↑

The AH-4 interfaces to the radio with a two-wire connection.

A START signal is issued by the radio to start the tuning operation. A KEY signal from the tuner indicates when: the tuning has started; the tuning has failed; or the tuning has been completed. The tuning operations works as follows:

1. A tuning operation is requested by the radio – the radio asserts the START line.
2. The AH-4 microprocessor is reset and begins running its program after approximately 300 ms. When the AH-4 is ready, it asserts the KEY line (AH-4 routes the RF through the power divider, measurement circuitry and tuning network).
3. The KEY signal causes the radio to transmit a carrier at about 10 watts of output power.
4. The AH-4 verifies that the power is between 5 and 15 watts. If not, the AH-4 aborts the tuning operation.
5. If the power is between 5 and 15 watts, the AH-4 begins the tuning operation.
6. Approximately 250 ms after the AH-4 starts tuning, the radio removes the START signal.
7. When tuning has been achieved, the AH-4 removes the KEY signal and switches the RF to pass only through the tuning network. The microprocessor is then halted. The radio stops transmitting when the KEY signal is removed.
8. If the AH-4 was unable to achieve tuning, it removes the KEY signal for 20 ms, asserts it again, waits 200 ms, then finally removes the KEY signal. This causes the radio to indicate a “not tuned” condition.
9. If the band is changed on the radio, the tuner is reset. This causes the tuning network to be removed from the circuit.

Results with the long wire are good.

Noise levels especially on the lower bands is less than with the old vertical antenna which is to be expected.

VK3RHF repeater on both 10 meters and 6 meters is heard 9+.

Tuning across 10 meters VK4 and VK5 stations copied fine.

On 40 meters a station in Bairnsdale heard 9+10, with all stations in Bendigo and VK2 heard perfectly in the middle of the day.

First HF contact was with Roy VK3GB of FAMPARC in Frankston on 7.075 with 5 by 9 both ways for at least half an hour. Roy dropped power from 100 watts to 25 watts and his signal was still the same. With my signal dropped to 25 watts he still had a copy even down to 5 watts but the noise was much worse of course.

Most of the stations on the AM 160 meter Net are good copy. The wire is directional of course, but with multiple lobes it's not too much of a problem.

Single "counterpoise" 14 meter wire ↑  
(the other part of Off Centre Fed Dipole) hanging down the tree



The mast up the tree with AH-4 indicated by red arrow ↑  
Black "ground side" wire is visible, the end is 1.5 meters above the ground. This will stop the rabbit getting zapped with RF.



~Mick VK3CH

## DOT-DASH-DISS: THE GENTLEMAN HACKER'S 1903

A century ago, one of the world's first hackers used Morse code insults to disrupt a public demo of Marconi's wireless telegraph. LATE one June afternoon in 1903 a hush fell across an expectant audience in the Royal Institution's celebrated lecture theatre in London. Before the crowd, the physicist John Ambrose Fleming was adjusting arcane apparatus as he prepared to demonstrate an emerging technological wonder: a long-range wireless communication system developed by his boss, the Italian radio pioneer Guglielmo Marconi. The aim was to showcase publicly for the first time that Morse code messages could be sent wirelessly over long distances. Around 300 miles away, Marconi was preparing to send a signal to London from a clifftop station in Poldhu, Cornwall, UK.

Yet before the demonstration could begin, the apparatus in the lecture theatre began to tap out a message. At first, it spelled out just one word repeated over and over. Then it changed into a facetious poem accusing Marconi of "diddling the public". Their demonstration had been hacked - and this was more than 100 years before the mischief playing out on the internet today. Who was the Royal Institution hacker? How did the cheeky messages get there? And why?

It had all started in 1887 when Heinrich Hertz proved the existence of the electromagnetic waves predicted by James Clerk Maxwell in 1865. Discharging a capacitor into two separated electrodes, Hertz ionised the air in the gap between them, creating a spark. Miraculously, another spark zipped between two electrodes a few metres away: an electromagnetic wave from the first spark had induced a current between the second electrode pair. It meant long and short bursts of energy - "Hertzian waves" - could be broadcast to represent the dots and dashes of Morse code. Wireless telegraphy was born, and Marconi and his company were at the vanguard. Marconi claimed that his wireless messages could be sent privately over great distances. "I can tune my instruments so that no other instrument that is not similarly tuned can tap my messages," Marconi boasted to London's *St James Gazette* in February 1903.

That things would not go smoothly for Marconi and Fleming at the Royal Institution that day in June was soon apparent. Minutes before Fleming was due to receive Marconi's Morse messages from Cornwall, the hush was broken by a rhythmic ticking noise sputtering from the theatre's brass projection lantern, used to display the lecturer's slides. To the untrained ear, it sounded like a projector on the blink. But Arthur Blok, Fleming's assistant, quickly recognised the tippity-tap of a human hand keying a message in Morse. Someone, Blok reasoned, was beaming powerful wireless pulses into the theatre and they were strong enough to interfere with the projector's electric arc discharge lamp.

Mentally decoding the missive, Blok realised it was spelling one facetious word, over and over: "Rats". A glance at the output of the nearby Morse printer confirmed this. The incoming Morse then got more personal, mocking Marconi: "There was a young fellow of Italy, who diddled the public quite prettily," it trilled. Further rude epithets - apposite lines from Shakespeare - followed.

The stream of invective ceased moments before Marconi's signals from Poldhu arrived. The demo continued, but the damage was done: if somebody could intrude on the wireless frequency in such a way, it was clearly nowhere near as secure as Marconi claimed. And it was likely that they could eavesdrop on supposedly private messages too.

Marconi would have been peeved, to say the least, but he did not respond directly to the insults in public. He had no truck with sceptics and naysayers: "I will not demonstrate to any man who throws doubt upon the system," he said at the time. Fleming, however, fired off a fuming letter to *The Times* of London. He dubbed the hack "scientific hooliganism", and "an outrage against the traditions of the Royal Institution". He asked the newspaper's readers to help him find the culprit.

He didn't have to wait long. Four days later a gleeful letter confessing to the hack was printed by *The Times*. The writer justified his actions on the grounds of the security holes it revealed for the public good. Its author was Nevil Maskelyne, a mustachioed 39-year-old British music hall magician. Maskelyne came from an inventive family - his father came up with the coin-activated "spend-a-penny" locks in pay toilets. Maskelyne, however, was more interested in wireless technology, so taught himself the principles. He would use Morse code in "mind-reading" magic tricks to secretly communicate with a stooge. He worked out how to use a spark-gap transmitter to remotely ignite gunpowder. And in 1900, Maskelyne sent wireless messages between a ground station and a balloon 10 miles away. But, as author Sungook Hong relates in the book *Wireless*, his ambitions were frustrated by Marconi's broad patents, leaving him embittered towards the Italian. Maskelyne would soon find a way to vent his spleen.

One of the big losers from Marconi's technology looked likely to be the wired telegraphy industry. Telegraphy companies owned expensive land and sea cable networks, and operated flotillas of ships with expert crews to lay and service their submarine cables. Marconi presented a wireless threat to their wired hegemony, and they were in no mood to roll over.

The Eastern Telegraph Company ran the communications hub of the British Empire from the seaside hamlet of Porthcurno, west Cornwall, where its submarine cables led to Indonesia, India, Africa, South America and Australia. Following Marconi's feat of transatlantic wireless messaging on 12 December 1901, ETC hired Maskelyne to undertake extended spying operations.

Maskelyne built a 50-metre radio mast (the remnants of which still exist) on the cliffs west of Porthcurno to see if he could eavesdrop on messages the Marconi Company was beaming to vessels as part of its highly successful ship-to-shore messaging business. Writing in the journal *The Electrician* on 7 November 1902, Maskelyne gleefully revealed the lack of security. "I received Marconi messages with a 25-foot collecting circuit [aerial] raised on a scaffold pole. When eventually the mast was erected the problem was not interception but how to deal with the enormous excess of energy."

It wasn't supposed to be this easy. Marconi had patented a technology for tuning a wireless transmitter to broadcast on a precise wavelength. This tuning, Marconi claimed, meant confidential channels could be set up. Anyone who tunes in to a radio station will know that's not true, but it wasn't nearly so obvious back then. Maskelyne showed that by using an untuned broadband receiver he could listen in.

Having established interception was possible, Maskelyne wanted to draw more attention to the technology's flaws, as well as showing interference could happen. So he staged his Royal Institution hack by setting up a simple transmitter and Morse key at his father's nearby West End music hall.

The facetious messages he sent could easily have been jumbled with those Marconi himself sent from Cornwall, ruining both had they arrived simultaneously. Instead, they drew attention to a legitimate flaw in the technology - and the only damage done was to the egos of Marconi and Fleming.

Fleming continued to bluster for weeks in the newspapers about Maskelyne's assault being an insult to science. Maskelyne countered that Fleming should focus on the facts. "I would remind Professor Fleming that abuse is no argument," he replied. In the present day, many hackers end up highlighting flawed technologies and security lapses just like Maskelyne.

A little mischief has always had its virtues.

~*New Scientist*



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## WANSARC VK3AWS

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### WANSARC CLUB PROFILE

#### History

The Western and Northern Suburbs Amateur Radio Club (**WANSARC**) was first formed in 1969 and since then has served the needs and interests of amateur radio operators, short wave listeners and those interested in hobby radio and electronics. The club is not gender specific, having both female and male members. Members come from all walks of life with a mix of experience, young and mature, novice and technical. The most important aspect of the club is the willingness of all members to share their knowledge for the benefit of others. Members mainly reside in the west and north of Melbourne; however membership is encouraged from all interested. **WANSARC** is an affiliated club of **The Wireless Institute of Australia**.

#### Meetings

Meetings held at the **Ern Rose Memorial Pavilion, SEAVER GROVE, RESERVOIR** (Melway Map 18 D5) on the **1st Friday of each month** (excluding January) commencing at **7.30pm local time**. Talk in on **146.450MHz FM**—call club station **VK3AWS**.

#### Benefits

Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of likeminded radio and electronics enthusiasts, excellent club facilities and environment plus an informative monthly newsletter for members to post articles, news, classifieds for all radio, test equipment, etc, featuring Amateur Radio news from WANSARC, ARV, WIA, ACMA, Melbourne Clubs, VK and Worldwide.

#### Club Nets

**146.450MHz FM** each Tuesday evening commencing 7.30pm local time.

**Website:** [www.wansarc.org.au](http://www.wansarc.org.au)

**Postal:** **WANSARC PO Box 336 RESERVOIR 3073**

***A proud tradition of supporting hobby radio and electronics enthusiasts since 1969***

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While we strive to be accurate, no responsibility taken for errors, omissions, or other perceived deficiencies, in respect of information contained in technical or other articles.

Any dates, times and locations given for upcoming events should always be checked with a reliable source closer to the event – coming up on the **WANSARC Tuesday evening NET** on **146.450 MHz** starting at **07:30 pm Local** is recommended to discuss and confirm information and any dates.

The club website has current information on planned events and scheduled meeting dates. **WANSARC News** written with Word™ 2007, published with Adobe Acrobat™ 10.