Illawarra Amateur Radio Society

Propagator March 2026

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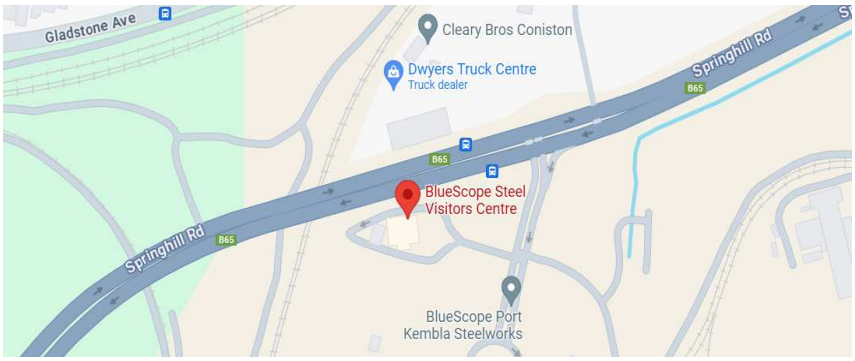
Upcoming Meeting on the 10th March 2026

The next meeting will be at the Blue Scope Steel visitors centre 7.30pm

Blue Scope Northgate entrance off Springhill Road (See website for detailed map)



VK2RUW (Knights Hill)
34.6231° S, 150.6942° E
QF55IJ

AMATEUR RADIO IN THE ILLAWARRA SINCE 1948

VK2RMP (Maddens Plains)
34°15'30.6"S 150°56'47.4"E
QF55LR

VK2AMW

Our last meeting 10th February 2026

Show And Tell

Our first meeting back for 2026, great evening as usual with some interesting show and tell items. My apologies that there weren't any more pictures taken at the last meeting, but someone was bludging 😊

- Tony Stone was first up with his M^2 2m horizontal loop as pictured below. Tony worked ZLs and VK5 so far, which is a great achievement. This was accomplished with 1 loop antenna (they can be setup as a phased array), 100W with a claimed 4dBd antenna gain.

Tony is planning to put up a second loop for a stacked gain of 8dBd, apparently these loop antennas can handle a whopping 1.5kW. Tony is encouraging Simon VK2KU to make a home brew version.

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- Roger VK2VRK shared a new little device with us, a complete small low cost handhelp APRS transciever!

- **Integrated Radio:** Includes a built-in VHF module with adjustable 0.5W/2W output power, operating within the 136-174MHz frequency range.
- **Connectivity:** Features built-in **GPS** and **BDS** (BeiDou Navigation Satellite System) for real-time location tracking, a **Bluetooth** module for connection to apps like APRSdroid, and a **Wi-Fi** module to upload data to APRS servers.
- **Functionality:** Supports multiple modes, including **APRS tracking**, **DIGI** (digipeater/router), **iGate** (gateway to the internet), and messaging.
- **Decoding:** Employs an independent, built-in hardware decoding chip for the AX.25 protocol at 1200BPS rate.
- **Display & Interface:** Equipped with a 1.54-inch OLED display, which is readable even in direct sunlight, and is configured using five physical buttons. No computer software is required for basic configuration.
- **Portability & Power:** Runs on a built-in 3.7V/2500mAh lithium battery, offering around 10 hours of use with GPS and Bluetooth enabled. It charges via USB-C.
- **Data Management:** Records up to 149 received beacons, displaying distance, direction, GPS coordinates, altitude, speed, and heading.
- **Customization:** Supports smart beacons (adjusts transmission rate based on speed and turning angle), time/distance intervals for beacons, and dual SSIDs for APRS and iGate functions

Prices are $147.00 from Aliexpress

For $5 you can earn some good cash, and all monies go to your society, win-win.

As usual see Simon VK2KU, the fella with the coloured balls and big smile

The Snowball number was drawn with no winners, therefore the Snowball has snowballed, who knows, maybe your lucky number will be next ☺.

Next meeting we will be ready to giveaway some more cash.

The Disposables Table

Special thanks to John VK2EJL and Roger VK2VRK who donated some items for the table at the last meeting.

Thanks to John for the light fittings which I am sure will be useful in lighting someone's shack or workbench and Roger for the supply of AR and other Radio magazines.

NEXT Meeting…….

APRS continues ……. With Roger VK2VRK

- **The origins of aprs**
- **How aprs works (the basics) Protocol etc**
- **Radio setup**
- **How fixed nodes work**
- **Trackers (including our balloon launch)**
- **Connecting to devices (smartphones) Bluetooth dongles.**
- **Functions of aprs, messaging across platforms… see below**
- **Live demonstration: we will be doing a live messaging and function test on the night**
- **Possibly Demonstrating direwolf aprs software on a laptop**

We encourage members to bring their handheld aprs radios that are currently working with AMW-3 to the meeting so we can send some packets with node that is setup as a live working station on the night.

Q and A at the end!

Radios will need to be set to Path wide 1-1, wide 2-1 and have a ssid of -8 for the night. If members can bring one radio each only that would be great.

Roger will delve more into setting up your APRS on meeting night

The IARS Flying Gang

The Flying Gang is a volunteer team to support IARS members who are unable to install or repair their antenna systems due to age, injury, or other limitations. Many members are finding it increasingly difficult to stay active on the air—especially when antennas are damaged by storms or when new systems need to be installed. If you need assistance, simply reach out to the team using the email addresses listed below. We'll coordinate with you to provide the help you need.

The flying gang team members, please REACH OUT to anyone of the team below.

Simon VK2XQX, Simon VK2KU, Keith VK2KQB, Adam VK2AEV, Phil VK2CPH, Tony VK2TS, Mal VK2DXM

Or contact us using any one of the emails below.
iars.keithb@gmail.com ; iars.simonr@gmail.com ; simon.ferrie3@det.nsw.edu.au

Other contacts like phone numbers are on the club website at https://www.iars.org.au/?page_id=29

Licensing and upgrades?

The IARS **can help** with obtaining your Foundation, upgrading to Standard or Advanced from *the comfort of your own home,* and its FREE!!! *

We have approved **ACMA** accessors that can offer remote or face to face assessments for the **ACMA**

Please contact Keith VK2KQB at iars.keithb@gmail.com for further information on training and assessments.

Your society supports further learning, please find out more on how we can help you.

The IARS helping Amateur Radio grow in Australia

If you would like to find out more about amateur radio upgrades, here are some handy links to help.

https://www.acma.gov.au/qualifications-operate-amateur-radio

https://www.acma.gov.au/amateur-radio-resources

https://www.acma.gov.au/amateur-radio-accredited-assessors

https://www.acma.gov.au/amateur-radio-licences

https://www.acma.gov.au/technical-details-amateur-radio-licences

https://www.acma.gov.au/amateur-radio-operating-procedures

https://www.acma.gov.au/amateur-radio-call-signs

https://www.acma.gov.au/amateur-class-licence

https://www.acma.gov.au/amateur-radio-related-fees

IARS NETS

1. Saturday Morning, the EAST COAST NET hosted by Steve VK2BGL at 9.30am

You are invited to join Steve every **Saturday at 9.30am** on our **146.850MHz** repeater (linked to 146.675MHz) or **VK2BGL-R** on Echo-link for a very enjoyable morning of general discussions from amateurs who log in from all over the world. This NET is linked to multiple repeater systems including VK2RFS south coast.
Join Steve and everyone for a very enjoyable 2 hours on Saturday morning.

The IARS would also like to thank Doug VK2XLJ and Angelo, VK2NWT who are is always willing to assist whilst Steve is away.

2. **IARS Tuesday evening weekly 80m NET on 3.666MHz at 8.30pm hosted by Mal VK2DXM using VK2AMW.**
   Every Tuesday evening, (expect the second Tuesday of the month) for a great get together on 80m. Signal reports, news and general discussions are the agenda. Normally runs for around 60minutes.

3. **IARS Wednesday evening weekly 6m NET, 8PM on 53.650Mhz with a – 1Mhz offset Hosted by Geri VK2UTE or Simon VK2XQX, (123Hz CTCS tone enabled due to interference) Maddens plains 6m Repeater**
   General discussions about building antennas for 6m, transceivers and what else comes to mind, this net is normally between 30 and 60minutes.

4. **IARS Thursday evening weekly 10m NET, 8PM on 28.466Mhz +/- for QRM/QRN Hosted by Tony VK2TS**
   General discussions about building antennas for 10m, transceivers and what else comes to mind, this net is normally between 30 and 60minutes.

5. **IARS Friday evening weekly 70cm NET , 8PM on 438.675MHz ** with – 7MHz offset (No CTCSS required) Hosted by Rob VK2XIC (note this has been moved back from Monday to Friday)**
   General discussions keeping the repeaters in work, ***"If we don't use it, we may lose it "***

6. **The Ozzie Pub Net is on Friday 8PM, linked via VK2MT-R which is 146.850Mhz and 146.675Mhz**

IARS REPEATERS

VK2RUW (Knights Hill) VK2RMP (Maddens Plains)

146.675 MHZ >>>>> *linked* <<<<< 146.850 MHZ

Current Repeater STATUS

- **439.675 with a – 7MHz offset, C4FM Enabled. OK – On Air *****
- **147.275 with a + 600kHz offset NO CTCSS, C4FM enabled OK – On Air *****
- **146.850 with a – 600kHz offset (linked to 146.675) NO CTCSS OK– On Air****
- **146.675 with a – 600kHz offset (at Knights Hill, linked to 146.850) NO CTCSS OK– On Air**
- **53.650Mhz with a – 1Mhz offset (123Hz CTCSS tone enabled due to interference) OK– On Air *****
- **438.725Mhz with a -5mHZ offset DMR only, OK – On Air**
- **1296.850Mhz Experimental Beacon/Simplex repeater, Maddens Plains OK – On Air ***
- **Echo-link VK2MT-R via 146.850MHz also linked to 146.675MHz and VK2BGL-L OK**
- **APRS DIGI-PEATER on 145.175MHz OK– On Air**
- **PACKET 2M on 147.575Mhz Temporarily off air**

The IARS welcomes any feedback on our repeater systems.

Please send all your feedback to iars.keithb@gmail.com and it will be passed on to our repeater team.

If the repeaters are silent, why not just give out a call, who knows who may be on the other end of the tower.

Latest Repeater Report:

* Note, this will be changing to 1.293 800 GHz Simplex soon, however, plans are in place for it to become a Full Duplex repeater system during 2026 (Funding dependant)

** 146.850MHz receiver at Maddens Plains is operating off a temporary antenna until the main dipole is repaired/replaced. Please advise if you are having signal difficulties, include your location with a grid square.

*** After the huge windstorms we recently had the Tri-Band antenna number 3, which is 67meters up Maddens Plains tower is leaning at 45degrees with the underneath pointing to Wollongong, therefore all signals into Wollongong will be affected until this is rectified.

Services affected will be RX 52.650MHz, RX 147.875MHz and TX 439.675MHz.

BUY..SWAP..SELL..GIVEAWAY

LOOKING FOR SOMETHING to SWAP, BUY, SELL, an OLD PART

Parts you may need for repairs or some radio gear you no longer need that could go to a new home…….?
Email iars.keithb@gmail.com

Do you need a tube? We have a range of spare electron tubes, new (old stock) in boxes to new out of boxes and even second hand goodies. Send us the part number and we can see if we can help!
Send part number to iars.keithb@gmail.com

Gold coin donation to the club if we have what you want 😊

There will also be more AR magazines to be given away at the next meeting so come along and help yourself to some great reading material

Electronic component and service suppliers

https://jlcpcb.com

https://au.element14.com

https://au.rs-online.com/web/

https://au.mouser.com

https://www.digikey.com.au

https://www.minikits.com.au

https://core-electronics.com.au

https://www.elitecommunications.com.au

https://littlebirdelectronics.com.au

https://amateurradiosupplies.com.au

https://bncom.com.au

YAESU Sales and repairs https://www.vkradio.com.au

https://dxing.com.au

https://www.telcoantennas.com.au

https://www.altronics.com.au

https://www.jaycar.com.au

TWR Technology

ICOM agent carlo.twr@gmail.com

Radio Communications Equipment Supply, Service including radio and antenna installations, support local Wollongong business

If you know of a good supplier of electronic stuff or services 😊, please share it with us so we can all benefit.

Send information to iars.keithb@gmail.com and we will publish it in the next propagator

Share it with us, this could be suggestions, technical ideas, circuit diagrams, IARS community projects, pictures of your latest shack project, in fact
ANYTHING of interest

Let us know by return email iars.keithb@gmail.com
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Angels Don't Play This HAARP? **

The High-frequency Active Auroral Research Program

** **Angels Don't Play This HAARP"** is actually the title of a 1995 book by Dr. Nick Begich and Jeane Manning, which is a key source for conspiracy theories regarding the facility.

Always love a good old conspiracy theory, especially the one that the U.S. government is using HAARP as a weapon to manipulate the weather, destroy the atmosphere, disrupt human mental processes, and interfere with wildlife, really??

No, **The Reality:** HAARP is a legitimate scientific research facility in Gakona, Alaska, operated by the University of Alaska Fairbanks. It uses an array of antennas to study the ionosphere (the upper part of the atmosphere) by creating small, temporary, and controlled heated patches. (Ionosphere, sounds amateur radioish 😊)

Put on your foil hat and let's go for a drive!

- **Purpose:** The goal is to understand how solar particles affect the atmosphere and how this impacts communications, navigation, and radar systems.
- **Misconceptions:** Scientific experts have dismissed claims that HAARP can control the weather, cause earthquakes, or influence minds, noting that the energy it produces is far weaker than natural solar processes.

This place is right up the alley of amateur radio in a sense, radio energy (lots of it), antennas and the ionosphere!

Some History ……..

The **High-frequency Active Auroral Research Program** (**HAARP**) is a University of Alaska Fairbanks program which researches the ionosphere – the highest, ionized part of Earth's atmosphere. The most prominent instrument at HAARP is the Ionospheric Research Instrument (IRI), a high-power radio frequency transmitter facility operating in the high frequency (HF) band. The IRI is used to temporarily excite a limited area of the ionosphere. Other instruments, such as a VHF and a UHF radar, a fluxgate magnetometer (almost sounds like a flux capacitor form Back To The Future 😊) , a digisonde (an ionospheric sounding device), and an induction magnetometer, are used to study the physical processes that occur in the excited region.

Work on the HAARP facility began in 1993. Initially HAARP was jointly funded by the U.S. Air Force, the U.S. Navy, the University of Alaska Fairbanks, and the Defence Advanced Research Projects Agency (DARPA). It was designed and built by BAE Advanced Technologies. Its original purpose was to analyse the ionosphere and investigate the potential for developing ionospheric enhancement technology for radio communications and surveillance. Since 2015 it has been operated by the University of Alaska Fairbanks.

HAARP began operating in 1999 as a 6 × 8 (= 48) antenna array at 0.96 MW, expanding in 2007 to a 12 × 15 (=180) array of 180 antennas with **360 radio transmitters at 9.6 MW**. It covers 14 ha near Gakona, about 250 km northeast of Anchorage. Its beam direction is anywhere within 30° of zenith.

The HAARP project directs a **3.6 MW signal, in the 2.8–10 MHz** region of the HF band, into the ionosphere. The signal may be pulsed or continuous. Effects of the transmission and any recovery period can be examined using associated instrumentation, including VHF and UHF radars, HF receivers, and optical cameras.

According to the HAARP team, this will advance the study of basic natural processes that occur in the ionosphere under the natural but much stronger influence of solar interaction. HAARP also enables studies of how the natural ionosphere affects radio signals.

The insights gleaned at HAARP will enable scientists to develop methods to mitigate these effects to improve the reliability or performance of communication and navigation systems which would have a wide range of both civilian and military uses, such as an increased accuracy of GPS navigation and advances in underwater and underground research and applications. This may lead, among other things, to improved methods for submarine communication or an ability to remotely sense and map the mineral content of the terrestrial subsurface, and perhaps underground complexes, of regions or countries. The current facility lacks range to be used in regions like the oil-rich Middle East, according to one of the researchers involved, but the technology could be put on a mobile platform.

As a part of our community outreach efforts, the HAARP facility publishes transmission notices prior to research operations. These notices are targeted at the amateur radio, amateur radio astronomer, and shortwave listener communities, providing some transmission details such as frequency and timing for those interested in listening to HAARP radio transmissions. Below are links to current and past transmission notices for HAARP research campaigns and system tests.

When does HAARP transmit, check out this link https://haarp.gi.alaska.edu/transmissions

Amateur radio operators that are interested in reporting potential reception of HAARP signals are welcome to submit their reports to our website at: https://haarp.gi.alaska.edu/form/reception-reports

Benefits of the HAARP Project for Radio Hams

Participation in Experiments

Hams are often invited to monitor and participate in HAARP's experiments. This can include tasks like monitoring signal quality, recording reception reports, and even assisting in data collection. This participation can be both educational and exciting for radio enthusiasts.

Enhanced Understanding of the Ionosphere

HAARP's research focuses on the ionosphere, which is crucial for radio wave propagation. By participating in HAARP projects, hams can gain a deeper understanding of how the ionosphere affects radio communications, which can improve their own amateur radio operations.

Access to Advanced Equipment and Data

HAARP's facilities and data can provide hams with access to advanced equipment and research findings that are not typically available to the general public. This can be invaluable for those interested in the technical aspects of radio communication.

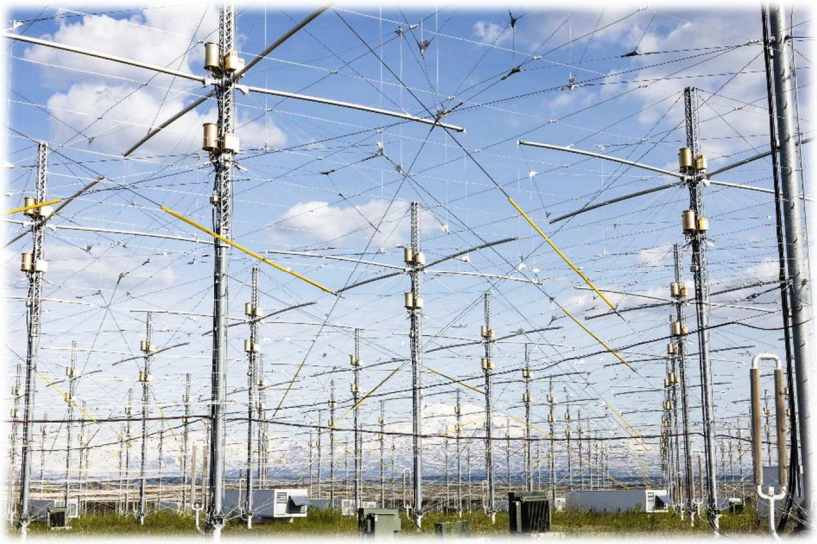
Collaboration with Scientists

Hams have the opportunity to collaborate with scientists and researchers from around the world. This collaboration can lead to new insights and advancements in radio communication technology.

Recognition and QSL Cards

Hams who participate in HAARP experiments may receive special QSL cards as recognition for their contributions. These cards are collectible and serve as a memento of their involvement in scientific research.

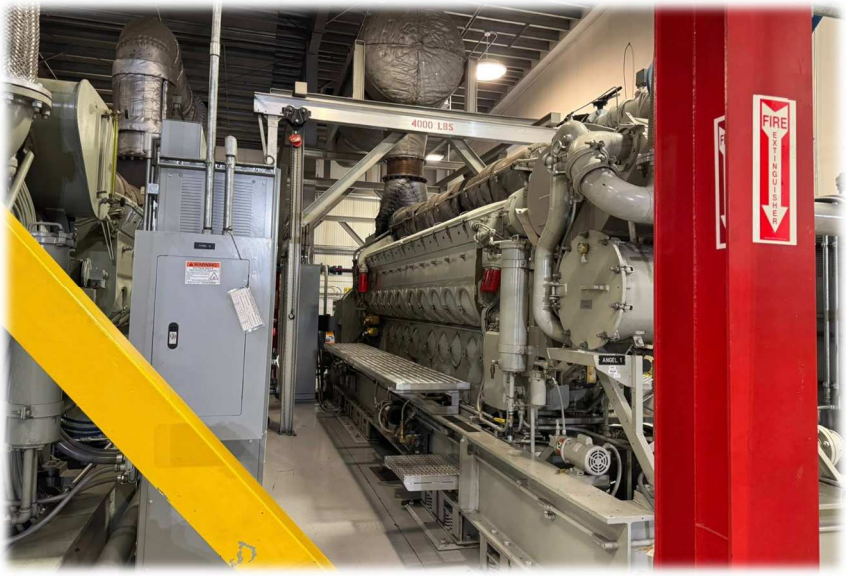
Overall, the HAARP project offers radio amateurs a unique opportunity to engage with cutting-edge research, enhance their knowledge, and contribute to scientific advancements in radio communication.



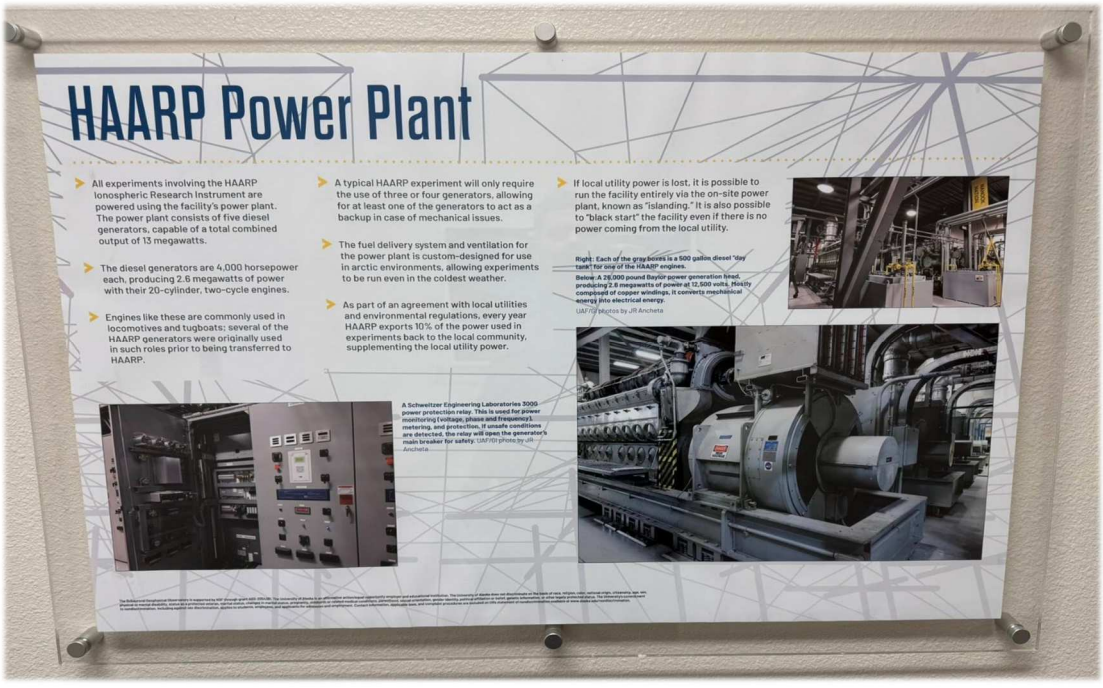
Antenna Array

“One” Transmitter module room

Transmitter coils (one module)



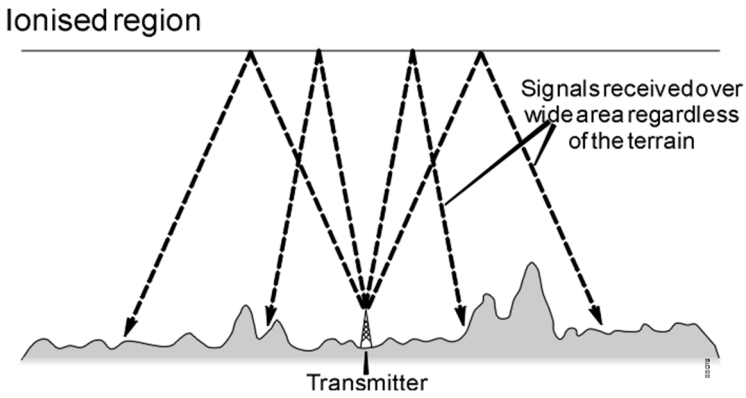
Power Generators



BACK TO BASICS NVIS

Near Vertical Incidence Skywave – propagation with a difference.

What is NVIS, this has been covered before but there has been a renewed interest.



Near vertical incidence skywave, or **NVIS**, is a skywave radio-wave propagation path that provides usable signals in the medium distances range — usually 0–650 km. It is used for military and paramilitary communications, broadcasting and by radio amateurs for nearby contacts circumventing line-of-sight barriers. The radio waves travel near-vertically upwards into the ionosphere, where they are refracted back down and can be received within a circular region up to 650 km (400 miles) from the transmitter. If the frequency is too high (that is, above the critical frequency of the ionospheric F layer), refraction is insufficient to return the signal to earth and if it is too low, absorption in the ionospheric D layer may reduce the signal strength.

There is no fundamental difference between NVIS and conventional skywave propagation; the practical distinction arises solely from different desirable radiation patterns of the antennas (near vertical for NVIS, near horizontal for conventional long-range skywave propagation).

Frequencies and propagation

The most reliable frequencies for NVIS communications are between 1.8 MHz and 8 MHz. Above 8 MHz, the probability of success begins to decrease, dropping to near zero at 30 MHz. Usable frequencies are dictated by local ionospheric conditions, which have a strong systematic dependence on geographical location. Common bands used in amateur radio at mid-latitudes are 3.5 MHz at night and 7 MHz during daylight, with experimental use of 5 MHz frequencies. During winter nights at the bottom of the sunspot cycle, the 1.8 MHz band may be required.

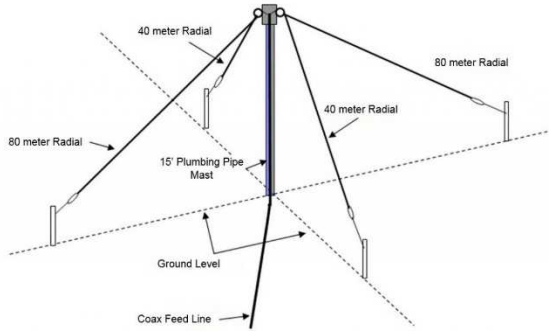
Optimum NVIS frequencies tend to be higher towards the tropics and lower towards the arctic regions. They are also higher during high sunspot activity years. The usable frequencies change from day to night, because sunlight causes the lowest layer of the ionosphere, called the D layer, to increase, causing attenuation of low frequencies during the day while the maximum usable frequency (MUF) which is the critical frequency of the F layer rises with greater sunlight.

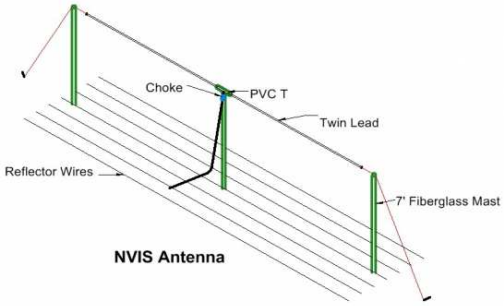
Real-time maps of the critical frequency are available. Use of a frequency about 15% below the critical frequency should provide reliable NVIS service. This is sometimes referred to as the optimum working frequency or FOT.

NVIS is most useful in mountainous areas where line-of-sight propagation is ineffective, or when the communication distance is beyond the 80 km range of groundwave (or the terrain is so rugged and barren that groundwave is not effective), and less than the 500–2,400 km range of lower-angle sky-wave propagation.

Direction finding of the NVIS sender is more difficult than for ground-wave communication (i.e. VHF or UHF). For broadcasters, NVIS allows coverage of an entire medium-sized country at much lower cost than with VHF (FM), and daytime coverage, similar to mediumwave (AM broadcast) nighttime coverage at lower cost and often with less interference.

NVIS Antennas





An NVIS antenna configuration is a horizontally polarized (parallel with the surface of the earth) radiating element that is from 1/ 20 th wavelength (λ) to 1 /4 wave above the ground. The optimum height of such an antenna is about 1 /4 wavelength, and high angle radiation declines only slightly for heights up to about 3 /8 wave. That proximity to the ground forces the majority of the radiation to go straight up, causing NVIS propagation to occur.

The overall efficiency of the antenna can be increased by placing a ground wire, slightly longer than the antenna, parallel to and directly underneath the antenna. A single ground wire can provide antenna gain in the 3–6 dB range. This is a reflector element used to form a 2-element Yagi beam antenna.

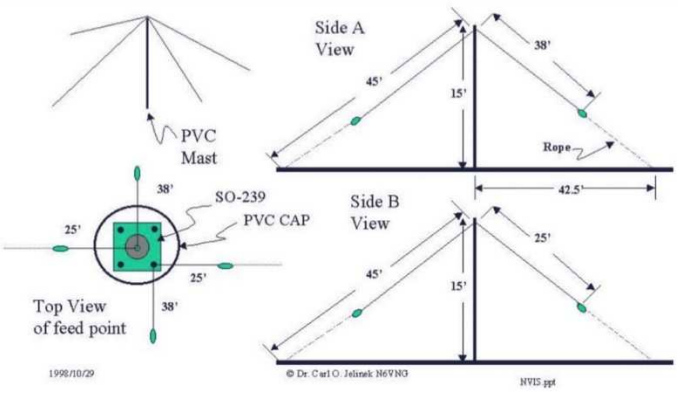
The wire length for the reflector element is 5% longer than the dipole-driven element positioned above it. The dipole is located at a distance of 0.15 wavelengths above the reflector element. The reflector wire is hung between two insulators and doesn't make contact with any other objects. It can be mounted a few inches above the ground or at a maximum height of 10 feet (or 3 meters) above the soil. This height allows for convenient lawn mowing without any disruptions. Essentially, this antenna consists of a 2-element beam that is oriented vertically.

Another source indicates 2 dB for a single wire and nearly 4 dB for multiple ground wires. Ground wires are more necessary when using lower dipoles over poor soils as without them considerable energy goes into heat and not the radio waves.

Depending on the specific requirements, various antennas (i.e. Sloper, T2FD, Dipole) can be used for NVIS communication, with horizontal dipoles or inverted V dipoles at about 1 /5 wavelength above ground giving the best results on transmit and at about 1 /6 wavelength on receive, according to military sources and an extensive study by Dutch researchers. Very low antennas are far more inferior on both transmit and receive, where noise and signal are attenuated.

Significant increases in communication will obviously be realized when both the transmitting station and the receiving station use NVIS configuration for their antennas. In particular, for low profile operations, NVIS antennas are a good option.

For broadcasting, typical antennas consist of a dipole about 1 /4 wavelength above ground, or arrays of such dipoles. Up to 16 dipoles can be used, allowing strong signals with relatively low power by concentrating the signal in a smaller receiving area. Limiting the coverage may be dictated by licensing, language, or political considerations. Arrays of dipoles can be used to "slew" the pattern so that the transmitter need not be in the centre of the coverage footprint. Broadcast NVIS antennas usually use an extensive ground screen to increase gain and stabilize the pattern and feed impedance with changing ground moisture.



Handy On Line Calculators

Send us your favourite handy calculator link so we can post it here!

Ladder line calculator www.smrcc.org.uk/tools/OpenWire.htm

Cavity Filter designer https://www.changpuak.ch/electronics/Coaxial_Tank_VHF_Filter_Designer.php

Cavity resonance calculator https://learnemc.com/ext/calculators/cavity_resonance/index.html

COAX LOSS Calculator https://kv5r.com/ham-radio/coax-loss-calculator/

Impedance ….. https://www.omnicalculator.com/physics/rlc-impedance

Wavelength …. https://www.omnicalculator.com/physics/wavelength

PI attenuator values …… https://www.omnicalculator.com/other/pi-attenuator

Xc …… https://www.omnicalculator.com/physics/capacitive-reactance

XL …… https://www.omnicalculator.com/physics/inductive-reactance

Cut Off ….. https://www.omnicalculator.com/physics/cutoff-frequency

VSWR ……. https://www.omnicalculator.com/physics/vswr-voltage-standing-wave-ratio

LM317 Regulator resistor selector ….. https://www.omnicalculator.com/other/lm317

Resistor Colour code calculator….. https://www.digikey.com.au/en/resources/conversion-calculators/conversion-calculator-resistor-color-code

Resistor Heat rise ……. https://calculator.academy/resistor-heat-calculator/

Volt Drop Calculator AC and DC …….. https://www.rapidtables.com/calc/wire/voltage-drop-calculator.html

Helix antenna calculator ……. https://sgcderek.github.io/tools/helix-calc.html

Parabolic dish calculator ……. https://www.everythingrf.com/rf-calculators/parabolic-reflector-antenna-gain

We are looking for more handy on-line calculators, if you have one that isn't listed above, please share with us so that more amateur radio enthusiasts can benefit ☺

OR

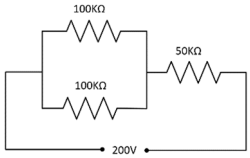
If you have any links to handy hints or information, please send it to us!

How many of these can you still answer correctly?

Question 1. If a transformer with a 240 volt 1 amp input to the primary is only producing 10 volts at 20 amps in the secondary its efficiency is:

a) 83%
b) 1.14%
c) 98%
d) 0.83%

Question 2. The voltage across the 50 kilohms resistor is:

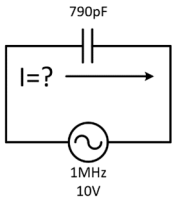


a) 100 volts
b) 200 volts
c) 300 volts
d) 500 volts

Question 3. Sulphation in a lead-acid cell is caused by:

a) discharging the cell below a specific gravity of between 1.15 to 1.17
b) discharging the cell to 1.95 volts
c) adding water to the electrolyte
d) charging the cell to a specific gravity between 1.22 to 1.27

Question 4. In this diagram, the capacitive reactance is approximately:



a) 0.01Ω
b) 200Ω
c) 50Ω
d) 0Ω

Question 5. A capacitance of .001 microfarads is the same as:

a) 10 picofarads
b) 100 picofarads
c) 1000 picofarads
d) 10,000 picofarads

Question 6. One nanofarad equals to:

a) 10^{13} farad
b) 10^{-6} farad
c) 10^{-9} farad
d) 10^{-12} farad

Answers next propagator 😊

Answers to the last propagator questions … Q1 = A ; Q2 = D; Q3 = D ; Q4 = D; Q5 = A ; Q6 = A

How well did you do, will you still pass the Amateur Radio test?

BLAST FROM THE Past

OLD PROPAGATOR MEMORIES

The PROPAGATOR

Illawarra Amateur Radio Society Inc.

The monthly newsletter of the Illawarra Amateur Radio Society Inc.
Registered by Australia Post publication number :- NBH - 1491.

Meetings are held on the second Tuesday each month (except January) at 7.30 pm in the State Emergency Services building in Montague St, Nth Wollongong.

Visitors are most welcome.

VOLUME 92, NUMBER 2 FEBRUARY 1992

EDITORIAL RAMBLINGS

Greetings and welcome to 1992 from the Committee and friends at the Illawarra Amateur Radio Society (Incorporated)! Our hardworking Committee has by the time you read this already had its first meeting of the new year and is planning more new and inventive things to do. This includes a program until August (after the AGM!!!), and also some activities beyond that as well.

Inside, you will find the results of an issue which we've had nine weeks to write, but in the usual style has been thrown together in the last couple of days.

One of our Repeater Chairmen is having a birthday on February meeting night, so be sure to come along and wish him the best. Also come along and meet some new faces - Keith VK2OB was busy last year with lots of new Amateurs joining the Society.

****

PROGRAMME

The Committee came up with the following as a tentative program for the year up to the AGM and beyond:

FEBRUARY: Ian O'Toole VK2ZIO of the Castle Hill Military Radio Collection will be speaking. See inside. Also Gosford.

MARCH: Do-it-yourself antenna instruction night. Everyone is welcome (encouraged) to give a couple of minutes talk about any antenna projects they have.

APRIL: Someone from the WIA to talk on spread spectrum communication.

MAY: Society auction night, only if enough people have stuff to sell. Otherwise wait until November.

JUNE: Another practical night.

JULY: AGM & elections

AUGUST: Col Christiansen again.

144-MHz Stop-Band TVI Filters†

Got TVI from your vhf transmitter? A high-pass filter won't help. Use a stop-band filter to notch out the beast!

The use of band-reject filters at the TV receiver is an attractive solution in the case of interference from 70-, 144- and 432-MHz transmissions, where TV reception may be on frequencies higher *or lower* than that of the amateur transmitter.

Even a simple series-tuned resonant circuit across the TV feed line can help and may sometimes attenuate strong local signals by 30 to 45 dB. A rather more elegant stop-band design for reducing strong signals is the "bridged-T" filter, which when correctly adjusted can provide a tunable, sharp, symmetrical null, even within the frequency band used for TV reception. Band-rejection filters of high Q can also be made using single or double stubs fashioned from coaxial cable.

Jan Martin Noedling, LA8AK, points out, however, that the technique of using stop-band filters to cure TVI caused by 144-MHz transmissions still receives relatively little coverage in most of the handbooks. Recently he encountered a problem of severe TVI when working "aurora" with 100 watts of output power on cw. For such transmissions his beam antenna needed to be directed virtually straight at a house some 33 feet (10 meters) distant, where his signals blanketed the TV receiver and blocked reception.

The Norwegian radio and TV interference investigation team found his equipment to be reasonably good; an article in the Dutch *Electron* (no. 11, 1978) encouraged him to try the use of stop-band filters tuned to 144 MHz and installed in the neighbor's TV feed line. See Fig. 1. The filter is capable of providing 50 to 60 dB of attenuation over all or part of the 144-MHz band. The parallel resonant circuit (L2-C2) is tuned to the center of the required rejection band by squeezing, pulling or bending turns. The series-resonant circuits (L1-C1 and L3-C3) are trimmed for maximum attenuation at the upper and lower frequency limits. The filter was aligned using a test circuit incorporating a 3-dB pad (see Fig. 2), tuning the resonant circuits to the frequencies shown in Table 1. A stable generator should be used for alignment. The pad is needed to prevent "short-circuiting" the signal generator output, as this can cause false indications. This simple arrangement cured LA8AK's TVI problems completely. ARR-1

†Adapted from an item of the same title in the column by Pat Hawker, G3VA, "Technical Topics," *Radio Communication* (RSGB), March 1979, p. 232.

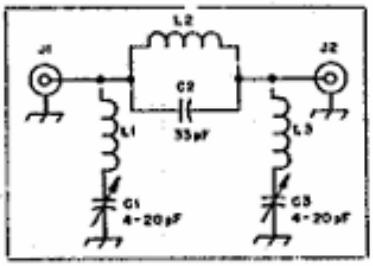


Fig. 1 — The 144-MHz stop-band filter. L1 and L3 are 10 turns of no. 16 AWG wire with a 3/16-inch inside diameter. L2 is two turns of no. 16 AWG wire with a 5/16-inch inside diameter. See text regarding length adjustment of inductors. C1 and C3 are trimmer capacitors. J1 and J2 are BNC jacks, soldered to the pc-board foil.

Circuit-board etching pattern for the 144-MHz stop-band filter. Black represents copper. The pattern is shown at actual size from the foil side of the circuit board.

Table 1

Resonant Circuit Frequencies

These are frequencies to which the resonant circuits of the filter should be tuned, for maximum attenuation in different segments of the 2-meter band.

Circuit	144 to 144.5 MHz	144 to 146 MHz	146 to 148 MHz
L1-C1	144 MHz	144 MHz	146 MHz
L2-C2	144.25 MHz	145 MHz	147 MHz
L3-C3	144.5 MHz	146 MHz	148 MHz

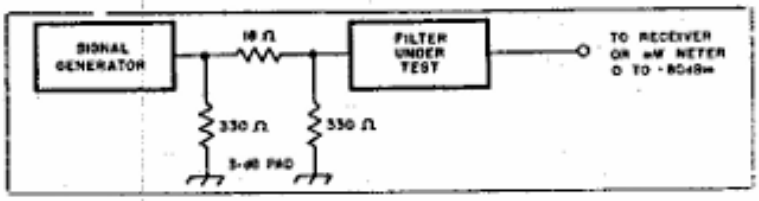


Fig. 2 — The recommended filter test circuit. See text.

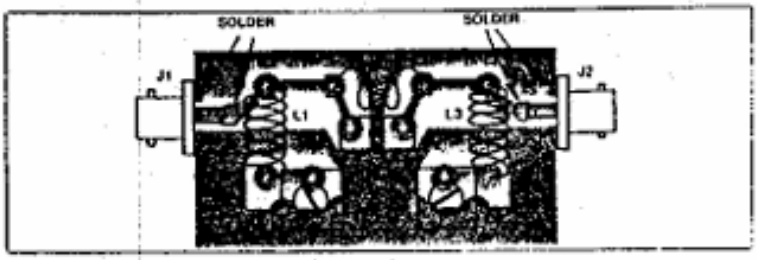


Fig. 3 — Parts-placement guide for the filter. The shaded area represents an X-ray view of the copper pattern. The two BNC connectors are each soldered to the board in three places as shown.

POST BOX - All mail can be sent to "THE ILLAWARRA AMATEUR RADIO SOCIETY" at PO Box 1838, Wollongong, 2500.

REPEATERS - VK2RUW - 29.620 Voice Mt Murray/Knights Hill
- VK2RAW - 146.850 Voice Mt Murray
- VK2RIL - 147.275 Voice/RTTY Sublime Pt
- VK2RAW - 147.575 Packet Mt Murray
- VK2RUW - 438.225 Voice Knights Hill
(Off air) - VK2RIL - 438.725 Voice/RTTY Sublime Pt

BROADCASTS - The Wireless Institute of Australia, N.S.W Division broadcast is relayed to 29.620 MHz and 146.850 MHz at 10.45am and 7.15pm each Sunday. Callbacks after the broadcast. RTTY broadcast in the week before the Club meeting, Sunday evening, 8:45pm on 147.275 MHz, relayed onto 3.618 MHz +/- QRM and 28.620 MHz, with callbacks immediately after.

NEWS LETTER - The "PROPAGATOR" is published each month to reach all financial members in the week preceding the Club meeting. Articles and letters are always welcome. Commercial advertising $40 per quarter page per year, member's classifieds free for one issue. See Graham VK2GID for details.

MEMBERSHIP - $15.00 P.A, concessions $12.00 P.A, expiring immediately after the Annual General Meeting in July.

STORE - The Club store is open at each meeting, and sells all sorts of hard to get knick-knacks that you might need.

LAWRENCE HARGRAVE AWARD - VK stations require 10 contacts with IARS members. Overseas stations require 5 contacts. One contact with the Club station VK2AMW is suitable. Details of contacts are to be sent to the Club secretary.

********** COMMITTEE **********

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VICE PRESIDENT	-VK2GID - Graham Denney (042) 286732	
SECRETARY	-VK2KCV - Pat Kennedy (042) 673199	
ASSIST SEC	-VK2GPJ - Pat Jordan	
TREASURER	-VK2TKE - Ken Goodhew	
ASSIST TREAS	-VK2SRB - Robert Bonella	
COMMITTEE	-VK2DSH - Dale Hughes	-VK2GPJ - Pat Jordan
	-VK2XCC - Ray Ball	
ASSOCIATES	-VK2KWG - Ken Grimm	-VK2MT - Rob McKnight
	-VK2XGJ - John Simons (042) 614828	
	-VK2XLA - Graeme East	-VK2KVH - Vic Hee
	-VK2URB - Robert Bonella	- Ron Hanks
REPEATER PRES	-VK2MT - Rob McKnight	
REPEATER COMM	-VK2TKE - Ken Goodhew and others	
QSL CARDS	-VK2JBS - Bill Stone	-VK2GID - Graham Denney
PUBLICITY	-VK2KWG - Ken Grimm	
BROADCAST	-VK2TKE - Ken Goodhew and others	
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CANTEEN	- Ron Hanks	
STORE & TOWER	-VK2KVH - Vic Hee	
DOTC LIASON	-VK2OB - Keith Curle	
LIFE MEMBERS	-VK2ALU - Lyle Patison	-VK2CAG - Graeme Dowse
	-VK2OB - Keith Curle	

Will share more oldies next month.

To read more information about this old propagator and others, use the link below

https://www.iars.org.au/wp-content/uploads/2020/09/1992-02-February.pdf

Keith's Shack by Ned VK2AGV

Thus we arrive at the final whisper of the Keith's QTH saga—the closing page of a chronicle stitched together from intrigue, misdirection, and clues smuggled out during the infamous morning commute on 146.850MHz. What began as an unassuming escape from the Forgotten Valley became a pilgrimage to the clandestine radio laboratory atop the hill. Now, we unveil the last chapter, drawn from the endlessly spiralling imagination of our resident word-wizard, the one and only Ned VK2AGV. Within this lair: chairs masquerading as antennas, power supplies that shall not be named, and other unspeakable contraptions bubbling away in the cauldron of an electrical engineer's den. What is real, what is myth? Only the signals know…

Those who have followed the series of articles about Keith's facilities will not be surprised to learn his shack also is designed and built in accordance with the engineering principles and operational capabilities displayed by his backyard.

Keith's shack has been expertly designed to look like a room in his house, but in fact it is an entirely separate structure in and of itself, proofed against bushfire and small-yield tactical nuclear weapons. There is an entrance inside the house, and also a concealed entrance via a tunnel from his garage which is very useful when he needs to make a discrete disappearance from the house for diverse purposes, or to use "the facilities".

Entrance to the shack from inside the house is via a nondescript-looking door at the side of the sunken "conversation-pit" in the centre of the large living-room. It looks like a door to a storage cupboard, but this is deliberately designed to deceive a casual observer as, once you pass through the short passageway, you enter the large and comfortable shack proper, and before you is laid out an operating-position the like of which you have probably never seen or even envisaged before.

The ergonomics of Keith's shack are impressive and as functional as the flight-deck of a large airliner. It follows then the layout is very similar, with an array of five monitor-screens horizontally on a console in front of two well-upholstered and fully-adjustable chairs in the operating-positions, with a sloping overhead panel of switches, circuit-breakers and "set-and-forget" controls for things like ambient lighting, climate-control, background music and audio from remotely-mounted microphones placed throughout the property.

Separating the two chairs is a small pedestal on which are mounted all the various controls for antenna-switching, rotators, and the hydraulically extending and retracting telescopic antenna-masts, all arranged so an operator in either chair can access them easily. The latter take the form of levers set in quadrants, marked "Raise" and "Lower", and resemble the thrust-levers on a heavy jet. Towards the rear of this pedestal are controls for the UHF and VHF rigs dedicated to the local repeaters, as these are only occasionally adjusted but need to be close-at-hand if a change is needed.

Above the five monitor-screens is a wide but fairly flat panel housing the remote antenna-switching and diplexing controls, and things which might need to be accessed several times during an operating-session. Several annunciator-lights display the status of Wifi-connectivity and Bluetooth connections to remote systems, as well as operating-modes of remote receivers, SDRs etc, but mostly this panel is a set of small

knobs and push-buttons, the latter illuminated when active. Dimmer-knobs at either end allow adjustment to suit the ambient lighting, which is also able to be dimmed via the overhead-panel. Controls for CCTV and surveillance cameras are also found here. (If you have ever seen a Honeywell autopilot control-panel, this one looks very similar by design, but it's a bit wider.) Immediately to the left of the left operator's chair is a small extendible table for holding a plate of snacks, complete with a drink-holder, and an identical facility is provided to the right side of the right operator's chair. In this way the necessary creature comforts are well catered for during long DX-sessions or rag-chewing on the local repeaters with friends. Comfort for the operators is uppermost in Keith's mind.

At the top of this "instrument-panel" five large curved LCD TV/monitor screens are arranged, on which he can display any number of TV stations (terrestrial and satellite) as well as images from the several CCTV and steerable auto-sensing surveillance cameras mounted at strategic points on his property. Thus he can be keeping an eye on what's happening outside even during a long-night session of working rare DX or investigating weak-signal propagation. He can also monitor current events, news broadcasts etc so he is fully "boffed-up" on what's going on in the world.

A few feet behind the left-side operating position are standard 19-inch racks full of transmitter and receiver interfacing hardware, as well as VHF and UHF transceivers. His multiple receivers (pride of place being taken by the Watkins Johnson WJ-8711A all-mode, general-coverage, HF receiver) are mounted here and they can be operated directly from the front-panel if desired but are mostly operated remotely by computer keyboards that slide out on extending tables under the "instrument-panel" very much like the Airbus A380 aircraft, which in fact inspired Keith to adopt this layout for his shack. Old-school amateurs will tell you the best piece of equipment you should have in your shack is your HF receiver and Keith has taken this rule firmly to heart with this installation. All his computers run Linux Mint with the Cinnamon desktop.

Keith's several HF transmitters (Marconi Marine Conqueror HS, Challenger, Globespan and Oceanspan models, all modified to radiate on the amateur-bands) are behind the right operator's chair, together with his linear amplifier. As these require manual adjustment for every frequency-change, they are mounted a little further back to allow room for an operator to stand in front of them, make the necessary adjustments then resume their seat. As these transmitters always include an antenna-switching and earthing unit at the top, these connect directly to the feed-lines for the HF arrays in the backyard, as described in a previous article.

The entire shack is maintained at a comfortable 20 degrees via a solar-powered climate-control system with a diesel genset backup, which can power his whole home for a week on a single tank of diesel. 85kW of solar-panels, a 3-tonne LiFePO4 backup battery and eleven 3kW pure sine-wave inverters ensure adequate 240VAC at all times whilst ensuring "graceful-degradation" in the event of a failure of one or more units or modules.

By clever design and extensive use of solar-passivation techniques throughout his entire domicile, the load put on the climate-control system is surprisingly light at most times of the year. Dark Blue Axminster carpet covers the shack-floor and the walls are covered with anechoic acoustic-tiles. The outside windows are fixed and cannot be opened and are backed with images of a normal room to deceive any inquisitive people who might manage to peer into them. The curtains are remotely-controlled.

Keith is renowned throughout the amateur radio community in Australia and further afield for the diversity of modes he uses:- CW, RTTY, HF TOR, AM, SSB, FT8, Whisper, Tropospheric, Backscatter – he uses them all, and due to the amount of equipment at hand he can operate multiple modes simultaneously, especially if he has a "second-operator" with him. It can truly be said "there are few threads in the seamless robe of amateur radio that have not, at some time or other, passed through the eye of the Bradshaw needle." But then again, with a shack like this, how could we expect anything less?

If you are privileged enough to be invited to visit or operate in Keith's shack, you are in for the experience of a lifetime, and amateur-radio will never be quite the same afterwards.

Thanks for the morning entertainment Ned, want more weird and wonderful things, tune in every morning on 146.850Mhz at around 6.30am for some interesting takes on life!

News & Upcoming contests

The latest *AR* magazine is FREE to all WIA members. Join the WIA today!

Although alternative organisations may be out there, the WIA remains the longest-running, properly structured, and most versatile recognised amateur radio body. Join the WIA today and support the organisation that continues to *lead and represent* our hobby for less than $2 per week. (Cup of coffee costs more these days!)

The inside scoop of the latest AR edition

maker ▲ electronics ▲ wireless ▲ projects ▲ on-air ▲ news

AMATEUR Radio

Serving Australian radio amateurs since 1933

The Journal of the Wireless Institute of Australia

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Columns

Technical

General

Best wishes for 2026 from the Publications Committee

Our cover: *keen contesters, l-r: Greg VK2OX, Michelle VK2AYL, Catherine VK7GH/VK7C, Kev VK6LW/VK6T.*

NEXT ISSUE: Foundation focus

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from Phil Fitzherbert.

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $6.00 each (including postage within Australia) to members.

Photostat copies
If back issues are unavailable, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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Commonwealth Contest

Commonwealth Contest

Contest Manager

Details go here

Contest Introduction

The Commonwealth Contest (CC) is the oldest DX contest in Amateur Radio. Since 1931, the Radio Society of Great Britain (RSGB) has been the organiser and adjudicator of this annual 24-hour event. The CC includes Amateurs in all 56 countries and the numerous territories that make up the Commonwealth of Nations.
It promotes contacts between stations in the Commonwealth Countries and Territories. Click here Link for background information.
If you have any queries about these rules, please email hf.query@rsgbcc.org

More information link >>> https://www.wia.org.au/members/contests/commonwealthcontest/

John Moyle Memorial Field Day

John Moyle Memorial Field Day

Contest Manager

Diane Main VK4DI
Alan Shannon VK4SN

NEW ALL BAND rules from 18/1/2026
All files below for download.

Contest Introduction

The Field Day is held over the 3rd full weekend in March and run from UTC 0100 on the Saturday to 0059 on the Sunday. All stations are welcome to participate, but DX stations can only claim points for contacts with VK, ZL and P2 stations. All VK, ZL and P2 stations can claim points for all contacts, with any station in the world, if valid serial numbers are exchanged.

Link for more information >>> https://www.wia.org.au/members/contests/johnmoyle/

PLEASE NOTE!!!! Changes to the John Moyle Memorial Field Day Contest Rules

Reasons for the new rules. The rules have been updated after considering all feedback regarding vhf and above frequencies with discussions with the contest director and managers. Due to the short time left to add the JMMFD to the vklogchecker site we believe we have the most equitable outcome to suit all operators. We can look at this as a trial run and any changes can be discussed re next year.

Link to the new rules >>>> https://www.wia.org.au/members/contests/johnmoyle/documents/JMMFD_2026_RULES.pdf

Illawarra Amateur Radio Society

John Moyle Field day weekend 2026

If you would like to be part of a winning team this year(hopefully), then you are invited to the WIA, 2026 John Moyle Field day weekend at our remote shack in Bundanoon, yes the pressure is ON!

The IARS PALACE VK2AMW (last year pictures)





When: 14th & 15st March 2026 (Saturday and Sunday) : Camping on site with Dunny 😊
Where : See map below (Penrose – Bundanoon) on Penrose road as you pass the school, Turn left into Koolilabah Lane (IARS sign). Drive all the way down to the sign IARS on the second last gate which will be on the right-hand side at the dead end.

Things to bring with you if you camping : Drinking water, food for the time you are there, fresh clothes, tent and whatever creature comforts you require.
There will be a main radio setup in the shack for the **VK2AMW** station but you can bring your own equipment with if you like. We only ask that if you are using your own equipment, please don't cause interference during the contest.

Mid South Coast Amateur Radio Club Inc.

www.mscarc.org.au

VK2RMU – 146.700 Mhz & 438.125 Mhz – Club Callsign VK2HQ

&

IARS Illawarra Amateur Radio Society

Amateur Radio in Wollongong since 1948

Invite you to a

Joint picnic/day out

WHEN : 18th April 2026

TIME : From 09H30 till whenever

WHERE : Fitzroy Falls Reservoir Area

WHAT TO BRING : Lunch, refreshments, portable gear and fox hunting gear.

The club will be offering soft drinks for a gold coin donation

There are gas BBQ's, Hot Water and toilet facilities

For more information please contact

David VK2LDW
mscarcinc@gmail.com

Keith VK2KQB
Iars.keithb@gmail.com

23cm Fun day on the 23^{rd} of EVERY MONTH !!

If you are interested in 23cm or higher communications, the local IARS members are getting together with the MSCARC members on the 23^{rd} of every month to have a fun day around the Illawarra area.

The SHF team are even looking at 13cm fun day on the 13^{th} of every month, for more information please contact the SHF organiser Rob Heyer VK2XIC at **vk2xic@gmail.com**

Amateur radio news from around the world!

Use these handy links if you would like to see what is going on around the amateur radio world.

Radio Society of Great Britain https://rsgb.org/main

American Radio league https://www.arrl.org

Amateur Radio Germany https://www.darc.de/der-club/referate/ausland/english-version/

South African Radio League www.sarl.org.za

Italian Amateur Radio https://www.ari.it

Amateur radio France https://www.radioamateurs-france.fr

Amateur radio Russia https://srr.ru/sbory24_6/

Amateur Radio Japan https://www.jarl.org/English/

DX ATLAS DOWNLOAD https://dxatlas.com/Download.asp

https://daily.hamweekly.com

Communications Satellites

Status information and latest updates >>> https://www.amsat.org/two-way-satellites/

https://amsat-uk.org/satellites/frequencies-of-active-satellites/

https://ararm.org/status.html

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

PICTON HAMFEST

Is back on Sunday the 31st May 2026"More information to follow!!!

Upcoming IARS meeting presentations …….

Please note the changes to the meeting schedule.

There isn't a general or committee meeting every month, but that doesn't mean we skip the fun! "
Even when there's no official meeting scheduled, we still get together every month except January.

(See the schedule below — presentation topics may change.)

Doors open at 6:30pm, giving you time to settle in, but presentations and general meetings kick off after 7:30pm. The Snowball draw happens every month, except January when there are no gatherings.
Members are very welcome to arrive from 6:30pm to enjoy a cuppa and catch up with friends in the foyer before things get underway.
We need to wrap up and be out by approximately 9:30pm, so please lend a hand on your way out by popping empty cups in the correct bin and straightening your chair or putting it back if you have moved it.

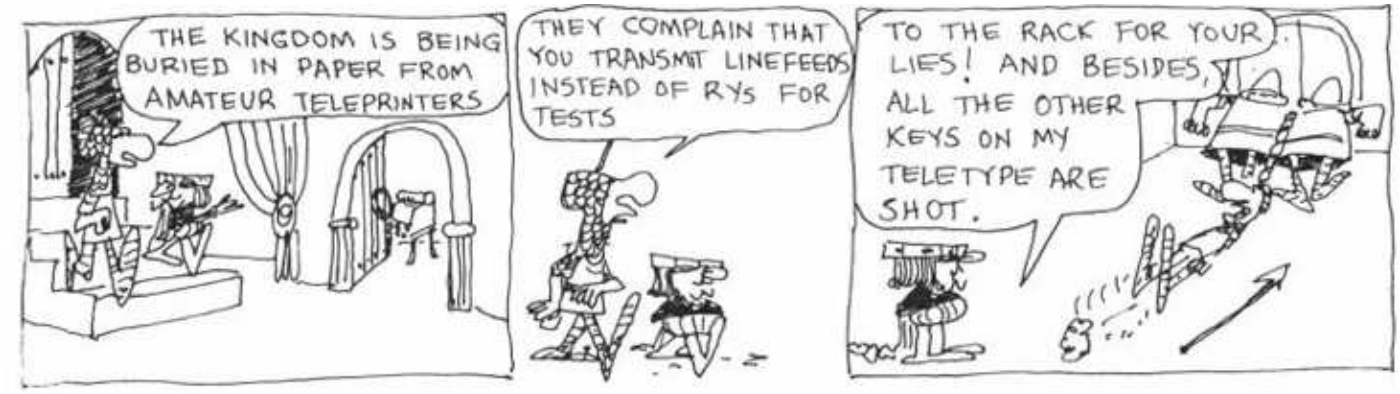
Please Note: IMPORTANT INFORMATION!
While you may feel inspired to channel your inner barista and make yourself an espresso using the coffee machine in the BlueScope foyer, we kindly ask that you refrain from doing so.
At our last meeting, an attempt to make a barista-style coffee unfortunately resulted in damage to the machine. The Visitors Centre team has since politely requested that we do not use the coffee machine.
Thank you for your understanding and cooperation.

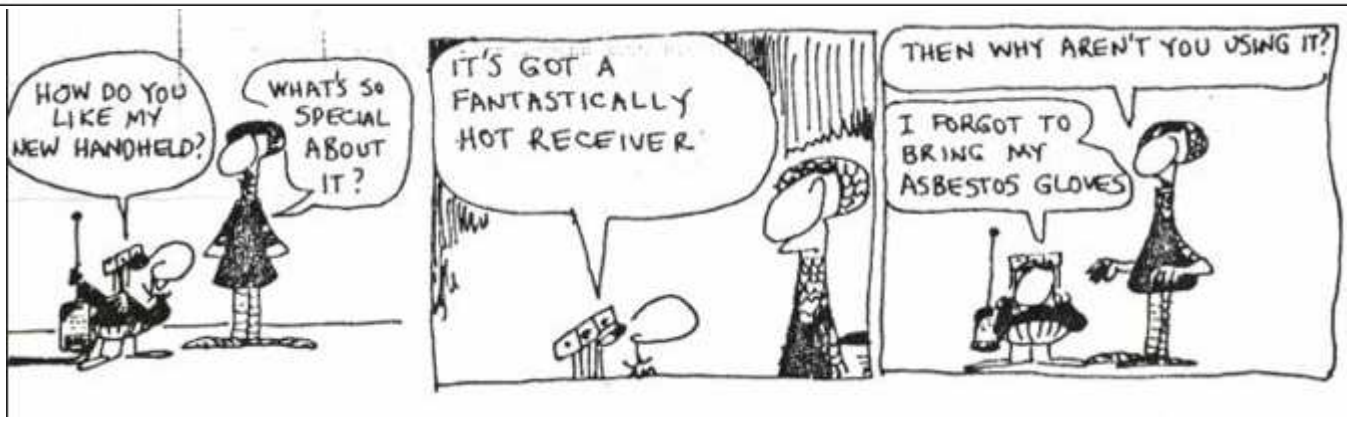
- **April 2026** : No committee meeting, doors open 6.30pm. General meeting starts 7.30pm
  Presentation after the general meeting is Project Mania with Simon VK2KU
- **May 2026** : Committee meeting at 6.30pm. No General meeting
  IARS Trivia with Ka-Hoot starts at 7.30pm, prizes for the top two contenders FFF
- **June 2026** : No Committee meeting, doors still open 6.30pm, General meeting starts 7.30pm
  7.30pm, Ned VK2AGV, Secret presentation .. We know how good these are 😊
- **July 2026** : No committee or general meeting. Doors open 6.30pm.
  SMD Soldering workshop hands on, Keith VK2KQB
- **August 2026** : Doors open 6.30pm **AGM** starts at 7.30pm with new committee members elected.
- **September 2026** : No committee or general meeting. Doors open 6.30pm
  7.30pm, Show And Tell, bring along your project to share with us
- **October 2026** : No committee meeting, doors open 6.30pm. General meeting starts 7.30pm
  Presentation starts after general meeting. Topic TBA
- **November 2026** : Committee meeting at 6.30pm. No General meeting.
  IARS Annual Auction with Simon VK2XQX. Doors open at 6.30pm for sellers for looking to sell their gear. Equipment must be booked in before the auction starts at 7.30pm. Please NO latecomers.
- **December** : No committee or general meeting. Doors open 6.30pm 
  IARS year end Christmas function

Fun Corner

Please send in your funnies to iars.keithb@gmail.com

Thanks to all that sent in funnies.





The **IARS needs YOUR input and support,** any technical items, amateur radio news, any projects you would like to share, in fact any AR related goings on are welcomed.

Feedback is also very important for us as it helps maintain a good read, if you would like to see more of something, or would like to see a subject added. Please let us know iars.keithb@gmail.com

That's all for now, hopefully catch you all at the

Blue Scope visitors centre on the 10th March from 6.30pm,

73

Keith VK2KQB

IARS Secretary

IARS, Amateur Radio in the Illawarra since 1948

Next Propagator and meeting will be for April 2026