Illawarra Amateur Radio Society

Propagator March 2025

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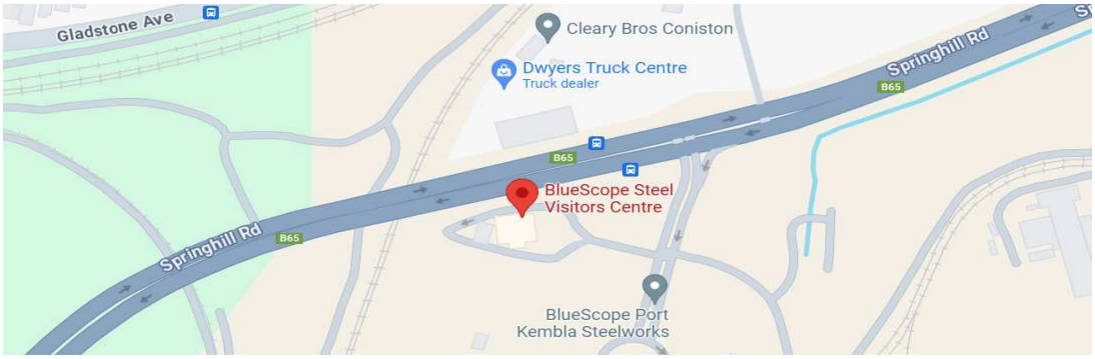
Upcoming Meeting on the 11th March 2025

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

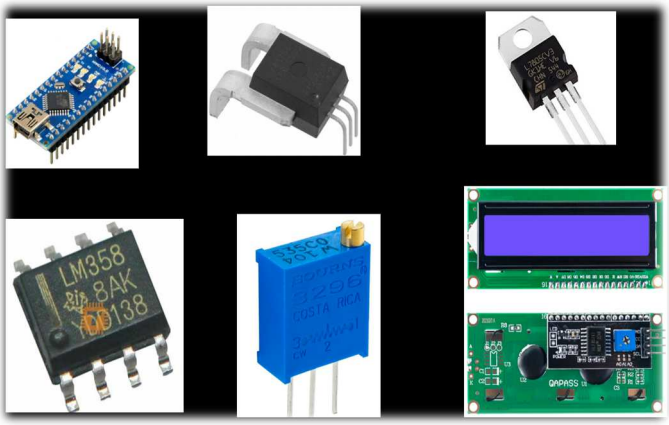
Our last meeting 11th February 2025

Projects 101 with Simon VK2KU

A very big thanks to Simon who shared the latest project coming form the IARS Project Corner.
A awesome “Smart Power Board” for your shack.
Remember these IARS projects have full support and documentation, including access to PCB’s.
Contact Simon VK2KU the IARS Project manager for more info at
Iars.simonr@gmail.com

Enter 2024 design.....

- 10 way expander design.
- Hall effect current transducer. ACS758-100B (Bi-Directional).
- Voltage divider.
- Atmel 328p (Arduino Nano).
- 16x2 LCD Display (i2c).
  - OLED interface onboard for future design.
- Designed in Eagle CAD
- Manufactured by JLCPCB (China)
  - First time using the co-ordinates and pick and place files, to automate the board building. All SMD components placed at build time.



IARS members enjoying an evening filled with technical bliss 😊

Thanks to everyone that attended the meeting, looking forward to the next one.

If you would like to have more information about this project and others, please feel free to contact Simon who will be more than happy to help.

iars.simonr@gmail.com

NEXT MEETING !!!

MARITIME MYSTERY?

Although it may not be 100% amateur radio related, Ned VK2AGV always has interesting stories with a technical twist. Ned has promised that this will be a very interesting journey down mystery lane.

See you there !!

Disposables Table

Please bring along the stuff you forgot to take to the auction, someone will give it a new home

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 winner drawn was Bruce VK2ZPN

Congratulations Bruce you have some extra cash to buy some more Radios.

A big thank you to Dennis VK2VCC who donated $55.00 of his winnings in the December 2024 Snowball back to the IARS.

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.

This year the IARS has already assisted in getting **two** new amateurs licenced, is it your turn next?

Congratulations to Oliver and Terry, *we don't have their call signs yet but please welcome them on board the bus when you hear them on air.* Looks like 2025 is off to a good start growing the amateur radio community

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. **NEW !!!! >>>>>> IARS Friday evening weekly 70cm NET , 8PM on 438.225 with – 5MHz offset (No CTCSS required) Hosted by Rob VK2XIC**
   General discussions keeping the repeaters in work, ***"If we don't use it, we may lose it "***

IARS REPEATERS

VK2RUW (Knights Hill) **VK2RMP (Maddens Plains)**

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

Current Repeater STATUS

- **438.225 with a - 5MHz offset. OK**
- **146.975 with a -600kHz offset NO CTCSS, C4FM enabled OK**
- **146.850 with a – 600kHz offset (linked to 146.675) NO CTCSS OK**
- **146.675 with a – 600kHz offset (linked to 146.850) NO CTCSS OK**
- **53.650Mhz with a – 1Mhz offset (123Hz CTCSS tone enabled due to interference) -OK**
- **438.725Mhz with a -5mHZ offset DMR only, OK**
- **1296.850Mhz Experimental Beacon with simplex repeater function, located Maddens Plains – OK**
- **Echo-link VK2MT-R via 146.850MHz also linked to 146.675MHz and VK2BGL-L – OK**
- **APRS DIGI-PEATER on 145.175MHz - OK**
- **PACKET 2M on 147.575Mhz - OK**

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.

Any donations to help us maintain our great repeater system will be greatly appreciated. Please check our banking details on our website at www.iars.org.au under the Contact details page. As reference of the donation please add your Call sign and the words "Repeater Donation"

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

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Latest Repeater Report:

The dangers of a missing Neutral on a three phase 415Volt system.

The IARS had the unfortunate situation of experiencing firsthand what can happen during a storm at the Maddens Plains repeater site. After calls from our members advising that there were no communications from any of our repeaters at the Maddens site, we assumed "Power Failure" immediately. Simple fix, right?

Keith VK2KQB and Simon VK2KU went up the site on the Saturday morning the 18th January to see what the go was. Expecting to just reset a tripped circuit breaker, we found more than we bargained for when attempting to reset the tripped circuit breaker. **BANG!!!** Was the response after resetting the circuit breakers feeding the 19"racks full of gear. Further investigation with a multi-meter plugged into the 240Volts socket (all equipment unplugged) indicated a fluctuating voltage of between 200 and 390Volts AC, yikes!

The reason for the odd electrical burning smell and the fireworks. There was not much we could do but to notify Endeavor Energy of the situation and leave the site, equipment left unplugged. After many hours of finally getting into contact with the right people, the problem was fixed Saturday evening around 11pm.

Sunday morning had Simon VK2XQX and Keith VK2KQB attended the site again hoping to resurrect any faulty equipment. The good news is that our two trusty Motorola Linear Power Supplies, only popped some input fuses.

After replacing the fuses it was all systems back on line, unfortunately the same could not be said about the other racks, which had various switch-mode power supplies and battery chargers all destroyed and would require replacement. (luckily, they were not ours 😊)

Old stuff can still be very reliable and useful, even though they may weight a few tonnes 😊

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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

Looking for offers of a fully operational 200Watt standard output YAESU FT1000
Haven't used for a while and instead of collecting dust it is looking for a new home.
Realistic offers only to vk2kqb@gmail.com

Electronic component and service suppliers

Need a quick PCB in a hurry to put that latest project on, JLCPCB

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.wagneronline.com.au

https://littlebirdelectronics.com.au

ATR
Amateur Transreceiver Radio Supplies

https://amateurradiosupplies.com.au

https://www.elitecommunications.com.au/mobile-communications-category/communication-equipment/amateur-radio/amateur-radio-accessories/

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

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.

got an idea

Tech corner

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

If you have some IARS related pictures or information that we can put on the IARS *website*, *please let us know and we can get that happening.*

Tip of the Month :

Brining out that old scope you have in storage and using it to measure RF output power, and check the wavform at the same time.

If the transmitter frequency is within the bandwidth of the scope, it's easy.

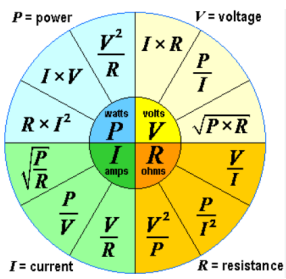
Connect the scope probe across a 50 Ohm dummy load and measure the voltage. Then power equals the voltage squared divided by the resistance when you're operating CW. Even up to 50Watts at 50 Ohms is 50Volts, will be ok if the scope probe is set to 10:1. For higher power readings you can use a voltage divider.

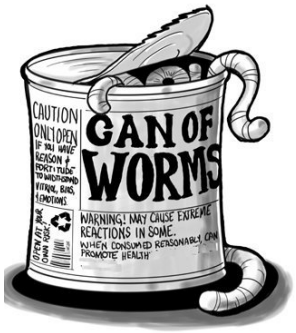
When operating SSB the peak power is equal to the peak voltage squared divided by the resistance.

If the transmitter frequency is beyond the bandwidth response of the scope you can rectify the signal, then measure the voltage. Don't forget to convert if you need the RMS power.

This can be handy when measuring low power and your power meter does not have the resolution to effectively indicate the correct power.

In fact, having a 50 Ohm impedance in the line with your scope, many RF measurements can be calculated with ease.





Resonant *Vs* Non-Resonant Antennas

Shall we 😉 ?

Being a newbie to amateur radio (approx. 9 years), I have always heard the chatter among amateurs about resonant and non-resonant antennas and how inefficient and problematic non- resonant antennas are, is that fact?

After all, we always want to have what's best, searching for that extra "S point" or QSO from afar, I thought it best to do more research.
If using a non-resonant antenna will put you on the back foot you wouldn't want to use one.
The information below is a compilation of many hours of research and speaking to some well-seasoned hams, but we will leave it up to the individual to decide.

Antenna Efficiency does not have that much to do with resonance.

"As a broadcast engineer that worked with many radio stations, I can tell you that resonance is not important to antenna efficiency. In fact, most of the antennas I worked with were not self-resonant, the most efficient ones were not resonant"

Rf Engineer PBS America

If you can add the correct reactance using capacitors and inductors at the antenna feed point, you can match almost anything to a 50-ohm transmission line with very high efficiency and have a very effective and efficient radiator.

Rf Engineer Australia

Resonance is matching your 50 ohm transmitter to an antenna that is possibly not 50 ohms and affect SWR is needed to be reasonably low, more so to protect your equipment and reduce feedline losses.

Efficiency of antennas is related to the radiation resistance, ground losses, trap losses and other losses into nearby obstructions. In a nutshell, ANY antenna that is less than 1/2 wavelength long at the frequency of interest will start to have serious efficiency losses.

A vertical antenna is 1/4 wavelength long - the other 1/4 wave is the ground plane and because these are imperfect, a full 1/4 wave vertical - even with an excellent ground plane will only be about 55% efficient. On the other hand, a simple 1/2 wave dipole, 1/2 wave above ground and with no nearby obstructions can approach 94% efficiency.

If you want an efficient antenna you should try for a 1/2 wavelength (or longer) antenna. Anything shorter than that will be less efficient.

Resonance is defined as the point where the antenna exhibits no reactance. The half wavelength doublet generally exhibits resonance at the center point at a single frequency which is nominally 75 Ohm, not 50.

That assumes the antenna is pulled taut, so the antenna is like a straight line at constant height above ground. However, the same half wavelength antenna will present resonant conditions at odd multiples of the fundamental frequency.

Take for example, an 80-meter antenna cut to 3875 kHz, will exhibit resonance at about 38 meters in length at its center point. However, if you check the 3rd harmonic of 3872.5 kHz (11, 615.5 kHz) you will discover that it presents a resistive nominal 100 Ohms with no reactance, a second resonance. The 5th and 7th harmonics will similarly present higher resistance values with no reactance.

Unfortunately, the 3rd harmonic of 3872.5 kHz does not fall in an amateur band. The next band down is 30 Meters and the next higher band is 20 Meters. Thus, the antenna will not be resonant in either of those bands, naturally.

If you check the doublet impedance at the even harmonic frequencies, you will find really obtuse complex impedances of several hundred to several thousand ohms resistive and reactive.

The 31.1 meter long doublet, called the Flat-Top by amateurs, was a novel solution to multiband single antenna operation. It is only resonant on 20 Meters. On 80, 40, 15 and 10 Meters the feed point impedances are all complex Z's with significant levels of reactance.

The high additional loss in transmission lines like coax are averted using 600 Ohm Open Wire Line or 450 Ohm Ladder Line. A nominal 26 meters (85Ft) feet of Open Wire or Ladder Line results in about 1 dB loss total on the Open Wire Line and a tolerable 2 dB if using Ladder Line. If you used coax, your losses will be hideous with the Flat-Top, ranging from 8 to 13 dB on all bands except 20 Meters.

Resonance and efficiency are not correlated. Resonant antennas are easier to feed but apart from that all you need to do is to get electrons moving at the right frequency to couple energy into space without losses.

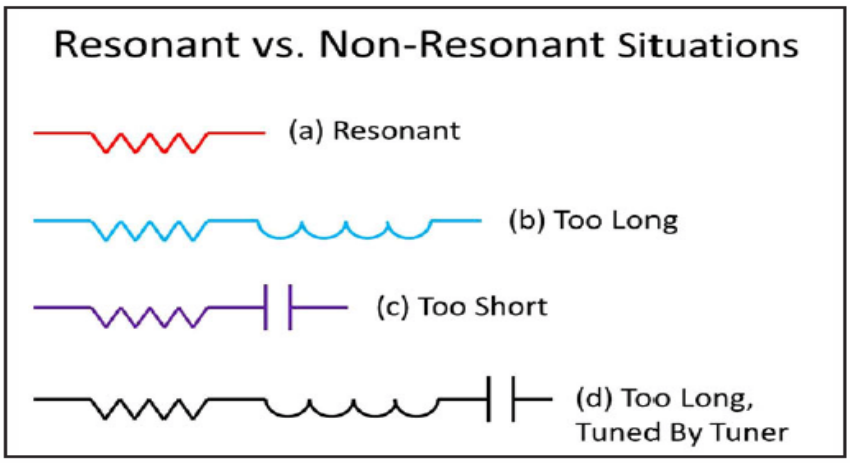
Let's look at the technical nitty gritty

- **First**, we need to understand that **'resonant'** only means that the capacitive and inductive reactance's cancel each other. **That's it. Nothing more.**
  Resonant **does NOT necessarily mean a low SWR**. An antenna can be resonant yet have a resistive component from a fraction of an ohm to infinity. If you look at a Smith chart, resonance occurs anywhere on the horizontal line (which is pure resistance).

- **Secondly,** there is a pervasive notion that resonant antennas are always better and that is simply not the case.
  There are many non-resonant antennas which will easily outperform their resonant counterparts. Many people claim to be using only resonant antennas yet when questioned what antennas they are using, it turns out that they are unknowingly using one or more non-resonant antennas.

  For example, many people use a 5/8 wave vertical for VHF or UHF because it has gain (directed toward the horizon) over a 1/4 wave vertical. However, a 5/8 wave antenna is not resonant and requires an impedance matching network (the exact same function as a trans match (tuner)) which is often built into the base of the antenna in order to provide an approximate 50 ohm resistive load to the transmitter. If it were true that a resonant antenna is always best, a 1/4 wave antenna would always outperform a 5/8 - yet it can be easily observed that that isn't the case.

- **Thirdly**, in addition to the example noted above, there are MANY non-resonant antenna designs which will easily outperform their resonant counterparts >>>> Loops and longwires of non-resonant lengths will easily outperform a resonant half-wave dipole (with a more complex radiation pattern of course) and in the case of loops, can have a significantly lower noise floor - improving the signal-to-noise ratio even further. *The key is understanding how to efficiently feed such antennas.*
  Antennas fed directly with coax (without using a trans match - at the antenna end) are not always best and in fact can be inferior solutions in some cases. When it comes to efficient low-loss feedlines, the fact is that coax is not always your friend unless you can match at the antenna feed point. Commercial radio antennas always have the matching unit at the feed point when fed with coaxial transmission line.



The resonant antenna looks just like a resistor. If the dipole is a half-wave above ground the resistor is 70 ohms. But it is not an ordinary resistor that turns the current passing through it into heat. This resistor turns the current into electromagnetic waves that radiate outward to distant places and allow us to communicate with one another.

There is a little bit of ordinary resistor in it – the resistance of the wire from which the dipole is made. But we almost always use large enough wire, or even aluminium tubing, to make this resistance very small compared to the radiation resistance. So we can neglect it in our present discussion. The usual dipole is 99 percent efficient or better.

Suppose the dipole is too long for the frequency. Now it looks like Figure (b), the same radiating resistor as before but with an inductor in series. This inductor's reactance increases rapidly as the antenna is lengthened and can be much more than 70 ohms.

The total series impedance is now higher than 70 ohms. To get the same radiated power – the same current through the resistor as before – we have to apply a higher RF voltage. Our 50 ohm transmitter may not be able to do this but let's suppose we have an RF generator that can do it.

The resistor radiates exactly as before because it carries the same current as before. The inductor produces a magnetic field during one-half of the RF cycle. On the other half-cycle, the field collapses and returns the energy to the circuit. There is no loss, so the efficiency of the too-long antenna is just as good as that of the resonant antenna.

If the antenna is too short for the frequency, then there is a capacitive reactance in series with resistor, Figure (c). If we apply enough RF voltage to get the same current through the resistor, the result is the same. Only this time the capacitor charges during a half-cycle of the RF and discharges during the other half-cycle.

No power is used and, again, the non-resonant antenna radiates just as well, and with the same efficiency, as a resonant antenna does.

If the inductive or capacitive reactance is too high for our transmitter to drive the antenna, we use a tuner to reduce the reactance to zero. In the case of the too-long antenna of Figure (b), the tuner adds an equal capacitive reactance as shown in Figure (d). The current in the inductor lags the current in the resistor by 90-degrees.

The current in the capacitor leads the resistor current by 90-degrees. So these two currents are 180-degrees apart.

If we make the two reactance's equal, then the two currents cancel and our transmitter sees just the resistor, it can drive it just as though it was a resonant antenna. The inductor is still there and so is the capacitor that the tuner added. Current flows through both but there is no loss in either.

As long as the length of the antenna is at least a half-wavelength at its lowest intended frequency, its efficiency is well over **90%,** just like a resonant dipole. The problem is getting power to it—coax is very lossy (due to dielectric heating) unless terminated into its characteristic impedance, and this effect is what leads many hams to erroneously believe that non-resonant antennas are inefficient. But the problem isn't non-resonance, it's high SWR on coax.

There is another pervasive notion, that a resonant antenna apparently has the desirable effect of reducing the ratio of out of band interference to wanted signals that are within the frequency band of interest. This isn't a function of the resonant frequency of the antenna, it's a function of the resonant frequency of the antenna ***system*** including any matching. Match the antenna to the feedline and it will reduce out of band noise.

One last point - The quote from chapter two of the ARRL Antenna Book:

"Please recognize that an antenna need not be resonant in order to be an effective radiator.
There is in fact nothing magic about having a resonant antenna, provided of course that you can devise some efficient means to feed the antenna.
Many amateurs use non-resonant (even random-length) antennas fed with open-wire transmission lines and antenna tuners. They radiate signals just as well as those using coaxial cable and resonant antennas, and as a bonus they usually can use these antenna systems on multiple frequency bands."

*Propagator Next Month >> "How to make your own **low cost** but effective homebrew ladder line"*

Hidden hazards of flame retardants in battery enclosures

Battery Safety Requires Smart Thinking

By Rebecca Fuoco, Green Science Policy Institute

As dangerous lithium-ion battery fires are on the rise, regulators and manufacturers are scrambling for solutions.

Unfortunately, one common strategy may cause serious health harm and not work to slow or stop the fires. A new viewpoint in *Environmental Science & Technology* explains that adding flame retardants to the plastic cases surrounding these batteries has no proven fire-safety benefit. The scientists further warn that the types of flame retardants widely used in electronics enclosures are linked to cancer and other health harms and can end up in children's toys, food containers and other products made from recycled plastic.

"The use of flame retardants in plastic battery enclosures has no demonstrated benefit and poses threats that can last generations," said lead author Lydia Jahl, a scientist at the Green Science Policy Institute. "For example, toxic flame retardants migrate out of plastics into the air and drop into house dust, which we inadvertently breathe and ingest. When those flame-retarded plastics are recycled years later, additional people will be exposed from products made with the recycled plastic."

Lithium-ion batteries power electric cars, e-bikes, and an increasing array of portable electronics like smartphones and earbuds. As their usage expands, standards are being adopted to mitigate their serious fire risks. For example, "flame ratings" for plastic enclosures are common requirements that are met by adding chemical flame retardants. However, there is no publicly available research demonstrating that this use of flame retardants curbs battery fires under real-world conditions. Flame retardants in plastics likely cannot slow or stop the highly energetic fires from a lithium-ion battery in thermal runaway.

"Trying to stop thermal runaway fires by adding flame retardants to plastic is like adding a screen door to a submarine. It's a futile effort against an overwhelming force," said distinguished fire scientist Dr Vyto Babrauskas.

The flame retardants widely used for this purpose are organo-halogens and organo-phosphates linked to cancer as well as neurological, reproductive, and immune harm. Young children and pregnant women are the most vulnerable. The authors illustrate how people may be exposed to these harmful chemicals during battery manufacturing, use of the original product (eg, earbuds or an e-bike), disposal and recycling, and the use of recycled products (eg, the infamous black plastic spatula or sushi tray).

This would not be the first time that the use of flame retardants to meet flammability standards has resulted in health harm without proven fire-safety benefits.

For example, an unfortunate long-time California furniture flammability standard did not reduce fire deaths. Meanwhile, one of the flame retardants most commonly used to meet that standard was linked to the loss of three to five IQ points among US children and a 300% increase in the risk of dying from cancer.

Since that standard was updated a decade ago to be met without flame retardants, furniture fires have remained minimal or even decreased.

"The best solution for both public health and fire safety is to prevent battery fires from occurring in the first place," said co-author Arlene Blum, Executive Director of the Green Science Policy Institute. "Strategies like improving battery management systems and stopping the use of faulty batteries can prevent dangerous thermal runaway fires.

This would save lives both from fires as well as from cancer and the many other health harms linked to flame retardants."

New Kid on the Block, the YAESU FTX-1F

The new Yaesu FTX-1F HF/50/144/430MHz All Mode QRP Portable Transceiver is being hailed as the replacement for the popular FT-817/FT-818 portable transceivers.

The FTX-1F takes full advantage of state-of-the-art SDR technology and provides 6W of output power with its 5670mAh Lithium-ion battery pack, enabling an impressive 9-hours of stand-alone SSB operating time on the HF bands and up to 8-hours of operating time on the VHF/UHF bands, FM mode (based on a 6-6-48 duty cycle). Up to 10W of power output is available when using an external DC power supply. The FTX-1F is a true, all around HF/50/144/430MHz All Mode portable field Transceiver that is sure to be a hit for Amateur operators that like to participate in activities such as Field Day, POTA and SOTA.

Preliminary features and Specifications of the new FTX-1F Include:

- **Operating Modes:** SSB, CW, AM, FM and C4FM digital modes.
- **SDR Technology and 3DSS** (3-Dimensional Spectrum Stream).
- **Touchscreen Display:** 4.3 in. High-Resolution, Full colour.
- **2 Independent Receiver Circuits:** Provides true simultaneous dual-band operation, whether in the same band or in different bands. For example: SSB communication on HF bands simultaneously with C4FM digital communication on VHF/UHF bands (*HF+V, HF+U, V+V, U+U, V+U, U+V).
- **2 Speakers:** Ensure clear and powerful audio output.
- **Optional Automatic Antenna Tuner:** (Sold Separately) Can be attached to the rear of the transceiver with the 5670mAh high-capacity Li-ion battery pack.
- **Optional Cooling-fan:** (Sold Separately) Which is necessary for comfortable FT8 operation, can also be combined with the optional antenna tuner. (All-in-one rear panel design).
- **RF Front-end and Low Noise Reference Oscillator:** Enables Phenomenal Multi-Signal Receiving characteristics.
- **Effective QRM Rejection:** via High-speed 32-bit IF DSP (YAESU's renowned interference reduction systems: SHIFT / WIDTH / NOTCH / CONTROUR / APF / DNR / NB).
- **WiRES-X** Compatible.
- **PMG (Primary Memory Group) function: R**egister and monitor up to 5 frequently used frequencies.
- **MAG (Memory Auto Grouping) function:** Enables Memory Channels to be categorized in each band that can be quickly recalled by band groups (HF/VHF/UHF/AIR/OTHERS).
- **USB Ports:** Supports CAT operation, audio input/output and TX control.

And, if the receiver front end has anything to do with the award-winning receivers in the FTDX-10 and FT710, this one will leave the competition speechless. www.sherweng.com/table.html

www.sherweng.com/documents/TermsExplainedSherwoodTableofReceiverPerformance-RevF.pdf

Only problem, you will have to wait to get your hands on one of these, according to Yaesu dealers, there is a huge waiting list ☹

Handy On Line Calculators

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

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

New >>> 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 ☺

How many of these can you still answer correctly?

Q1 : The purpose of limiting in an FM receiver is to:

(a) provide extra sensitivity to receive far away signals
(b) provide detector overload
(c) provide AGC system overload
(d) eliminate amplitude variations before demodulation

Q2 : A suitable detector for reception of FM repeater signals is the:

(a) limiter
(b) discriminator
(c) product detector
(d) varactor reactance modulator

Q3 : In a single sideband transceiver, the receiver beat frequency oscillator could be used in the transmitter section as the:

(a) heterodyne oscillator
(b) carrier insertion oscillator
(c) IF gain control oscillator
(d) side-tone generator for CW monitoring

Q4 : Rejection of the image frequency in a superheterodyne receiver depends on the:

(a) frequency of the BFO
(b) gain of the IF stage
(c) AGC stage selectivity
(d) RF stage selectivity

Q5 : In VHF receivers a first IF of 10.7 MHz is commonly used. This is done to:

(a) provide a high degree of adjacent channel selectivity
(b) reduce noise generated in the receiver
(c) achieve the high gain required
(d) provide an adequate degree of image rejection

Q6 : To enable an AM receiver to resolve CW signals, it is necessary to add a:

(a) CW key system
(b) narrow band filter before the detector
(c) beat frequency oscillator
(d) more efficient noise limiter

Answers next propagator ☺

Answers to the last propagator questions … Q1 = B ; Q2 = A ; Q3 = C ; Q4 = B ; Q5 = A ; Q6 = A (typo as Q34)

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

MAR

THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

P.O. BOX 1838 WOLLONGONG N.S.W. 2500

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Woonona 2517

SECRETAR

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7 Risley Road
Figtree 2525

EDITOR

Kieran Kennedy, VK2DAN
166 Osborne Parade
Warilla 2528

MONTHLY MEETING- Second Monday of each month, 7.30pm at:-

The Congregational Hall, Coombe St. Wollongong.

CLUB STATION- VK2AMN

CLUB REPEATERS- VK2RAW, Channel 5 2 metres.
VK2RUW, Channel 1 70 centimetres.

MONTHLY BROADCAST- 7.15pm EAST on the Sunday preceeding the meeting night. IARS Broadcast frequency:-
Repeater Ch5 or Simplex Ch40
Relay on 28.460 MHz & UHF repeater Ch1

CLUB NETS- 6 Metres 8.30am Sundays - 52.525 MHz FM.
10 Metres 8.00pm Sundays - 28.460 MHz USB.

NEXT MEETING:- 10 - MAR - 80

This coming meeting we are privileged to have JOHN MILTON VK2AQM Dist. Radio Inspector Wollongong as our guest speaker.

Members are reminded that the coming meeting will be the annual general meeting. Nominations for office bearers will be invited for the following positions:-
President
Vice President
Secretary
Treasurer
Committee members

See you at the meeting.....
EDITOR.

WIA NOTES

THE CASE OF THE LOST MEMBERSHIP

Somebody from the Wollongong Area has paid his WIA Subscriptions to Melbourne - but unfortunately he did not include his renewal notice or any other form of identification.

Payment of $22 was made using a Money Order drawn at the Wollongong Post Office.

If you paid your subscription with a Money Order please contact Geoff Cuthbert at the meeting and I can check your Money Order number against that received in Melbourne.

QSL INFORMATION

"The attention of users of the facilities of the VK2 QSL Bureau is again drawn to the following points:-

1. Cards that contain more than F I V E words of a personal nature on the back of the card do not comply with postal regulations and will be returned to the sender.

2. Please show the call sign of the station to whom the card is being sent on the back of the card as well as on the front. This greatly assists in sorting and any cards that are received at the Bureau after March 1st, 1980 that do not comply with this request will be returned to the sender.

3. Any Amateur who feels that there may be come cards at the Bureau for him and he does not have any delivery arrangements already made may check by sending the Bureau one only 9 inch x 4 inch self addressed envelope with a stamp of the current letter rate (at the moment 20 cents) affixed thereto, to the Bureau, will have it returned to him within 7 days with any cards held or advise of no cards or that there are additional cards which would not fit the envelope.

   The correct address of the QSL Bureau is:-

   Wireless Institute of Australia (NSW Division)
   VK2 Q.S.L. Bureau
   C/- Hunter Branch
   C/- Post Office
   TERALBA NSW 2284

   The current bureau costs are 2 cents per card either inwards or outwards if the Amateur is not a member of the Institute.

G.B.CUTHBERT VK2ZHU

CONGRATULATIONS to Faye and Darrell H/ AN VK2BLS on the birth of their first child, 8lb 11oz baby boy.

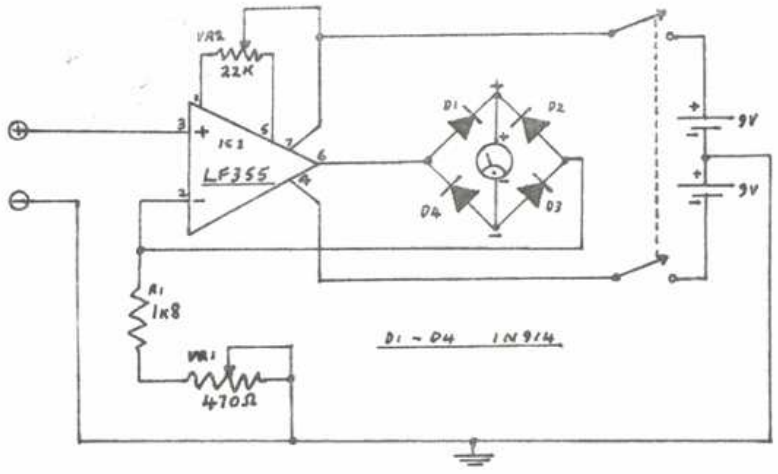
Ed. & the gang.

VOLTAGE TREND METER.

The advantages of a digital multimeter are sufficiently well known that they do not need to be repeated here. However there are situations where it is useful to determine whether the quantity being measured is increasing or decreasing, particularly if it is subject to sudden fluctuations. An Op-amp connected as an AC amplifier is particularly suited to this task. Most simple DVMs contain an LSI chip with an input sensitivity of 200mV and an extremely high input impedance. A suitable op-amp is the LF 355 used as a voltage-current converter, which has an input impedance of 10^{12}OHMS. The circuit shown is designed for an input voltage of 200mV and a current through the meter of 100uA. For other input voltage and/or output currents the trimmer VR1 and R1 should be altered accordingly. The op-amp requires two supply voltages (positive and negative) between 5 and 18V. In view of the nominal current consumption of the circuit (several milliamps), these can easily be provided by two 9 volt batteries.

The calibration procedure is quite straightforward. With the in-put shorted, VR2 is adjusted for a meter reading of zero volts. A 200mV signal is then fed to the input, and VR1 adjusted for the corresponding reading on the meter. If the meter has a scale of e.g. 0-3/30, then by calibrating the meter to read '2' for a maximum reading (200mV in) on the DVM, an overload of 300mV can be obtained. In the above case, with a constant current of 100uA, the value of R1 should be increased to 2k7. The circuit functions in a similar fashion for both current and resistance measurements. The DVM is simply connected in parallel with the analogue meter.

H. EHRLICH (Germany)



A 20 WATT DUMMY LOAD FOR $4-00

Brian VK2AXI

You will need –

1 x 50 gram coffee tin (75mm diameter, 65mm high)	– $0-80 (full of coffee)
20 x 1000 ohm 1 watt resistors	– $2-00 approx.
1 x coaxial socket	– $1-00 approx.
Nuts and bolts to mount socket	– $0-20 approx.
	$4-00

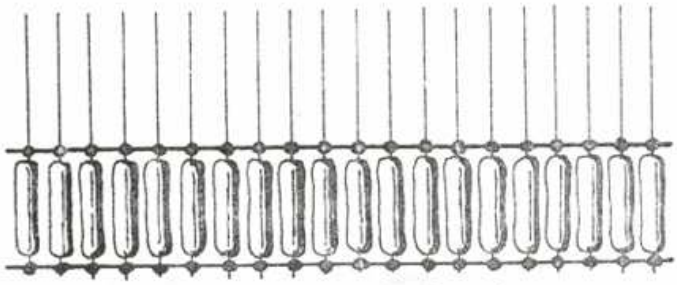
Assembly:

1. Drink the coffee (about 20 cups!)
2. Mount the coaxial socket on the lid of the tin, with about 2 cm of stiff wire soldered to the centre conductor.
3. Lay out the resistors, as shown in the diagram, on two pieces of copper wire about 11 cm long, and solder. Clip the resistor leads off one side only.
4. Bend the 11 cm wires into a circle, and solder the ends together. Stand the circle on the lid, and solder it to the lid in several places.
5. Bend the uncut resistor leads towards the centre of the circle. Solder them to the centre conductor from the socket.
6. Press the lid back into the tin.

Performance:

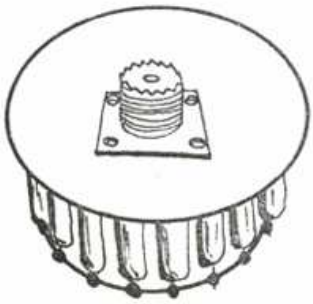
When connected to a 50 ohm line, the dummy load showed an S.W.R. of 1.2:1 at 146 MHz. It can dissipate 20 watts continuously. It has survived levels of around 80 watts for 5 seconds, followed by 55 seconds of cooling off.

It appears to be ideal for use with typical 2 metre FM transmitters with about 10 watts output, and also for novice transmitters (remember that 20 watts PEP is only 15 watts average).

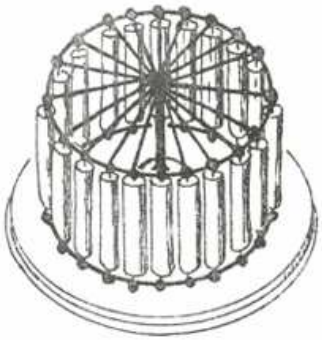


Resistors ready to bend into circle and mount on lid. (Approximately full size).

Top view of lid



Bottom view of lid



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/2020/09/1980-03-March.pdf

Latest AR Radio magazine

In this edition……

Advocacy Education Support

SINCE 1910

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

AMATEUR Radio

Serving Australian radio amateurs since 1933

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Production deadlines
All articles, columns, Hamads, and advertising bookings for Volume 93, No. 2 – **7 March 2025**.

Columns

General

Technical

Our cover: Marty VK4KC, rocking the BOTA (Beachs on the Air) at Bullcock Beach, Qld. Inset, Bob's Nose at Flinders Island, SA.

NEXT ISSUE: DX then and now

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 $8.00 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.

Not a WIA member? Why not join? Support our hobby

Besides receiving the AR magazine free every two months, having an organisation that is 100% dedicated to support the amateur radio community in Australia is a must. The amount of work and effort that WIA does is immense, and not often fully understood by everyone. For under $8 per month or *$2 per week, the value is truly worth it.

*(less than a cup of coffee these days)

Use this link and check out WIA Member benefits, information and WIA services under the "For Members" Tab at https://www.wia.org.au/

Upcoming Contests …………………………….

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

John Moyle Memorial Field Day

John Moyle Memorial Field Day

Contest Manager

Denis Johnstone VK4AE / VK3ZUX
vk4ae@wia.org.au
Phone : (07) 4723 4229

Contest Introduction

Welcome to the 2025 John Moyle Memorial Field Day.

The next John Moyle FD will be held over the weekend of the 15th-16th March 2025 and will run from UTC 0100 on the Saturday to 0059 on the Sunday.

The aim is to encourage and provide familiarization with portable and field operation, and provide training for emergency situations. The rules are therefore specifically designed and focused to encourage field operations. This contest is a Field Day Contest and not another contest where very powerful home stations operate under one call to amass huge scores,

More information here >>> https://www.wia.org.au/members/contests/johnmoyle/

Don't forget the IARS John Moyle Field Day Weekend at PENROSE, details below

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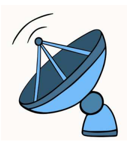

23cm Fun day on the 23rd of EVERY MONTH !!

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

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

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Illawarra Amateur Radio Society

John Moyle Field day weekend 2025

If you would like to be part of a winning team this year, then you are invited to the WIA, 2025 John Moyle Field day weekend at our remote shack in Bundanoon, yes the pressure is ON!

The IARS PALACE VK2AMW

When: **15th & 16st March 2025 (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.

IARS outing planned in MAY

Join us and the MSCARC for a great day out and about

Pencil the date in your diary for the Saturday the 3rd May 2025

AR NEWS

World Amateur Radio Day

Date : 02 / 02 / 2025
Author : IARU Region 3 Secretary

World Amateur Radio Day

Every April 18, radio amateurs worldwide take to the airwaves in celebration of World Amateur Radio Day. It was on this day in 1925 that the International Amateur Radio Union was formed in Paris. 2025 will celebrate 100 years.

Amateur Radio experimenters were the first to discover that the short wave spectrum — far from being a wasteland — could support worldwide propagation. In the rush to use these shorter wavelengths, Amateur Radio was "in grave danger of being pushed aside," the IARU's history has noted. Amateur Radio pioneers met in Paris in 1925 and created the IARU to support Amateur Radio worldwide.

For more information >>> https://www.wia.org.au/newsevents/news/2025/20250202-1/index.php

Declaration of Election

Date : 07 / 01 / 2024
Author : WIA Returning Officer - John Marshall

DECLARATION of ELECTION OF DIRECTORS

Clause 14 of the Constitution of the WIRELESS INSTITUTE OF AUSTRALIA (WIA) specifies the way in which Directors of the WIA are to be elected to that position.

Three (3) directors will retire at the conclusion of the next Annual General Meeting which will be held in May 2024, namely Lee Moyle VK3GK, Steven Green VK2TSG and Chris Dimitrijevic VK3FY. Each retiring director was eligible for re-nomination.

A call for nominations for the position of Directors of the WIA was made in the WIA National News Broadcast and in Amateur Radio Magazine in accordance with the Election Regulations.

More information see link >>> https://www.wia.org.au/newsevents/news/2024/20240107-1/index.php

Upcoming meeting presentations .....

- **March 2025** : Maritime mystery with Ned, VK2AGV. We all know Ned has some really good stories and this is another one of those interesting ones, I promised Ned we would not divulge. Come along and learn the truth.
- **April 2025** : Roger VK2VRK, portable comms. The easy way 😊
- **May 2025** : **Show and Tell,** Bring along your latest project to share with everyone at the meeting
- **June 2025** : Surface mount soldering and reworking "HANDS ON" workshop. Lets do it!

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 11th March 7.30pm,

73

Keith VK2KQB

IARS Secretary

IARS, Amateur Radio in the Illawarra since 1948