



Illawarra Amateur Radio Society

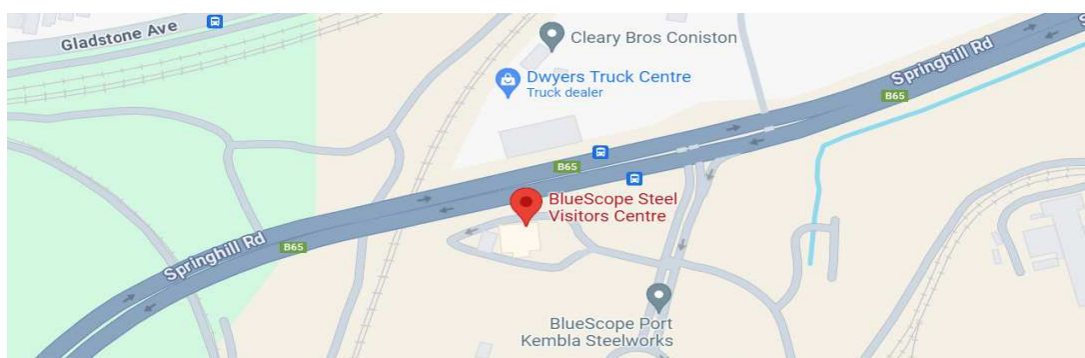
Propagator November 2025

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Upcoming Meeting on the 11th November 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 14th October 2025



What a night! Sure, the auction table looked a bit bare—slim pickings, as they say, but that didn't stop our legendary auctioneer, Simon VK2XQX, from turning the evening into a showstopper! GOOD ON YOU SIMON 😊

With charm, wit, and just the right amount of cheek, he transformed a modest lineup into a full-blown entertainment event.

Almost every item found a new home, and some lucky folks scored absolute bargains (you know who you are 🙄). The light haul? Probably because everyone's saving their treasures for the upcoming Picton Hamfest, which is just around the corner, already buzzing with excitement and attracting a lot of attention!!

All in all, small in size, big on fun!

Thanks to all the helped making it another IARS successful event



[illegible]

Parts, radios, microphones, antennas—anything that might be useful to someone else is welcome!



You're snowball royalty!

NEXT Meeting.....



The IARS Invites you to join us for an evening of fun and entertainment

🎉 Our last Trivia Night was such a hit, we're doing it again at the next meeting!

But this time... there's a seriously cool prize up for grabs: a **NANO VNA** – the latest must-have gadget in the world of Amateur Radio. 📻

Everyone's talking about it, and for good reason, test gear can be pricey, but the NANO VNA is a total game-changer without breaking the bank. Whether you've been eyeing one or already have one and wouldn't mind a backup, now's your chance!

So come along, flex that trivia brain 🧠, and you might just walk away with your very own NANO VNA. Don't miss it!



As always, we'll wrap things up with a good ol' cuppa and a chat with your mates after Trivia – hope you can make it! ☕😊

Don't forget to bring your phone (fully charged!) because we'll be playing on Kahoot! 📱

The IARS Flying Gang



Technical Assistance for IARS Members

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 REACH OUT!!!!!!

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

If you would like to join the Flying Gang team, or if you need help from the team, please 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 assessors 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, we have **RES** accredited facilitators that can help you achieve that Advanced certificate on the wall.

This year the IARS has already assisted in getting 11 new amateurs licenced, is it your turn next?

YES!!

The IARS is helping Amateur Radio grow in Australia!!!

We have exceeded the average of 1 per month!



Australian
Communications
and Media Authority

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 CTCSS 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**

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

- 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 **OK– On 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:

All systems A-OK

* 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, before the year end 2025. (Funding dependant)

HELP !!!!

The IARS kindly asks all standard and advanced license holders for their help of to test our 6m repeater

We have an intermittent issue which seems to only appear during heavy rainstorms. To confirm if the issue is either weather or equipment related, we need the repeater to be used more often, with experiences fed back to us.

Please send your experiences to iars.keithb@gmail.com noting the time of the day, any rain or wind and the signal reports.

We would have welcomed support from Foundation license holders as well, but unfortunately, the 6m band is not available to them. However, upgrading your licence is available through the IARS — simply get in touch with Keith (VK2KQB) for assistance





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

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.elitecommunications.com.au>



<https://littlebirdelectronics.com.au>



ATR
Amateur Transceiver Radio Supplies

<https://amateurradiosupplies.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>

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

Edwin Howard Armstrong

(December 18, 1890 – February 1, 1954)

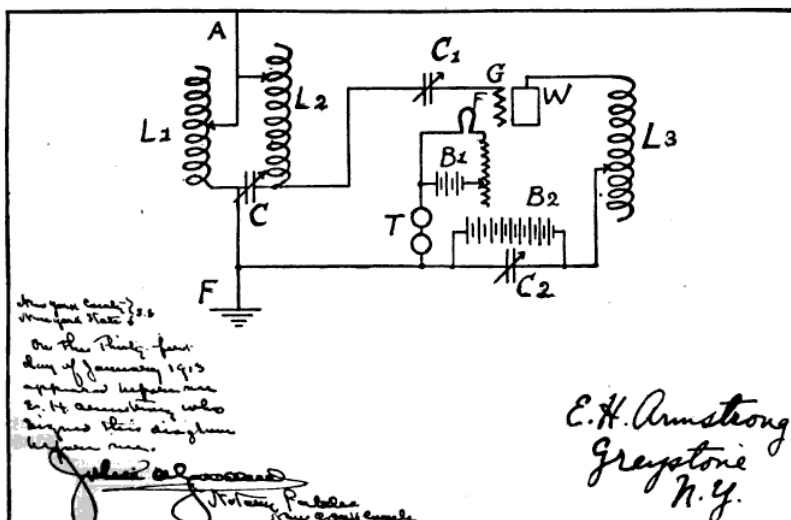
American electrical engineer and inventor who developed FM (frequency modulation) radio and the superheterodyne receiver system.

He held 42 patents and received numerous awards, including the first Medal of Honor awarded by the Institute of Radio Engineers (now IEEE), the French Legion of Honor, the 1941 Franklin Medal and the 1942 Edison Medal. He achieved the rank of major in the U.S. Army Signal Corps during World War I and was often referred to as "Major Armstrong" during his career.^[4] He was inducted into the National Inventors Hall of Fame and included in the International Telecommunication Union's roster of great inventors. He was inducted into the Wireless Hall of Fame posthumously in 2001. Armstrong attended Columbia University, and served as a professor there for most of his life.

Armstrong is also noted for his legal battles with Lee de Forest and David Sarnoff, two other key figures in developing the early radio industry in the United States. The prolonged litigation took a toll on Armstrong's health and finances, which led to a breakdown in his marriage, followed by his suicide in 1954. Thereafter, his estate's legal cases were pursued by his widow, Marion, who won several successful suits and settlements.



THE ORIGINAL DRAWING OF THE FEED-BACK CIRCUIT WHICH LARGELY DETERMINED THE COURT IN ARMSTRONG'S FAVOR



Regenerative circuit

Armstrong began working on his first major invention while still an undergraduate at Columbia. In late 1906, Lee de Forest had invented the three-element (triode) "grid Audion" vacuum-tube. How vacuum tubes worked was not understood at the time. De Forest's initial Audions did not have a high vacuum and developed a blue glow at modest plate voltages; De Forest improved the vacuum for Federal Telegraph.^[46] By 1912, vacuum tube operation was understood, and regenerative circuits using high-vacuum tubes were appreciated. While growing up, Armstrong had experimented with the early temperamental, "gassy" Audions. Spurred by the later discoveries, he developed a keen interest in gaining a detailed scientific understanding of how vacuum tubes worked. In conjunction with Professor Morecroft he used an oscillograph to conduct comprehensive studies

His breakthrough discovery was determining that employing positive feedback (also known as "regeneration") produced amplification hundreds of times greater than previously attained, with the amplified signals now strong enough so that receivers could use loudspeakers instead of headphones. Further investigation revealed that when the feedback was increased beyond a certain level a vacuum-tube would go into oscillation, thus could also be used as a continuous-wave radio transmitter.

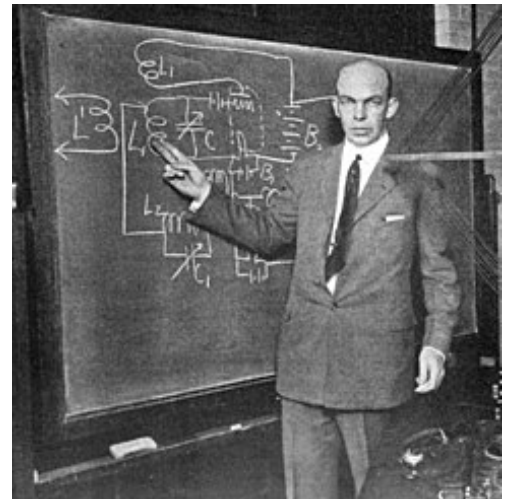
Superheterodyne circuit

Armstrong's most significant accomplishment was the development of a "supersonic heterodyne" – soon shortened to "superheterodyne" – radio receiver circuit.^[3] This circuit made radio receivers more sensitive and selective and is used extensively today. The key feature of the superheterodyne approach is the mixing of the incoming radio signal with a locally generated, different frequency signal within a radio set. That circuit is called the mixer. The result is a fixed, unchanging intermediate frequency, or I.F. signal which is easily amplified and detected by following circuit stages. In 1919, Armstrong filed an application for a US patent of the superheterodyne circuit which was issued the next year. This patent was subsequently sold to Westinghouse.^[24] The patent was challenged, triggering another patent office interference hearing. Armstrong ultimately lost this patent battle; although the outcome was less controversial than that involving the regeneration proceedings.

Although most early radio receivers used regeneration Armstrong approached RCA's David Sarnoff, whom he had known since giving a demonstration of his regeneration receiver in 1913, about the corporation offering superheterodynes as a superior offering to the general public. (The ongoing patent dispute was not a hindrance, because extensive cross-licensing agreements signed in 1920 and 1921 between RCA, Westinghouse and AT&T meant that Armstrong could freely use the Lévy patent.) Superheterodyne sets were initially thought to be prohibitively complicated and expensive as the initial designs required multiple tuning knobs and used nine vacuum tubes. In conjunction with RCA engineers, Armstrong developed a simpler, less costly design. RCA introduced its superheterodyne Radiola sets in the US market in early 1924, and they were an immediate success, dramatically increasing the corporation's profits. These sets were considered so valuable that RCA would not license the superheterodyne to other US companies until 1930.

Super-regeneration circuit

The regeneration legal battle had one serendipitous outcome for Armstrong. While he was preparing apparatus to counteract a claim made by a patent attorney, he "accidentally ran into the phenomenon of super-regeneration", where, by rapidly "quenching" the vacuum-tube oscillations, he was able to achieve even greater levels of amplification. A year later, in 1922, Armstrong sold his super-regeneration patent to RCA for \$200,000 plus 60,000 shares of corporation stock, which was later increased to 80,000 shares in payment for consulting services. This made Armstrong RCA's largest shareholder, and he noted that "The sale of that invention was to net me more than the sale of the regenerative circuit and the superheterodyne combined". RCA envisioned selling a line of super-regenerative receivers until superheterodyne sets could be perfected for general sales, but it turned out the circuit was not selective enough to make it practical for broadcast receivers.



Wide-band FM radio

"Static" interference – extraneous noises caused by sources such as thunderstorms and electrical equipment – bedeviled early radio communication using amplitude modulation and perplexed numerous inventors attempting to eliminate it. Many ideas for static elimination were investigated, with little success. In the mid-1920s, Armstrong began researching a solution. He initially, and unsuccessfully, attempted to resolve the problem by modifying the characteristics of AM transmissions.

One approach used frequency modulation (FM) transmissions. Instead of varying the strength of the carrier wave as with AM, the frequency of the carrier was changed to represent the audio signal. In 1922 John Renshaw Carson of AT&T, inventor of Single-sideband modulation (SSB), had published a detailed mathematical analysis which showed that FM transmissions did not provide any improvement over AM. Although the **Carson bandwidth rule** for FM is important today, Carson's review turned out to be incomplete, as it analyzed only (what is now known as) "narrow-band" FM.

In early 1928 Armstrong began researching the capabilities of FM. Although there were others involved in FM research at this time, he knew of an RCA project to see if FM shortwave transmissions were less susceptible to fading than AM. In 1931 the RCA engineers constructed a successful FM shortwave link transmitting the Schmeling–Stribling fight broadcast from California to Hawaii, and noted at the time that the signals seemed to be less affected by static. The project made little further progress.

Working in secret in the basement laboratory of Columbia's Philosophy Hall, Armstrong developed "wide-band" FM, in the process discovering significant advantages over the earlier "narrow-band" FM transmissions. In a "wide-band" FM system, the deviations of the carrier frequency are made to be much larger than the frequency of the audio signal which can be shown to provide better noise rejection. He was granted five US patents covering the basic features of the new system on December 26, 1933. Initially, the primary claim was that his FM system was effective at filtering out the noise produced in receivers, by vacuum tubes.

Armstrong had a standing agreement to give RCA the right of first refusal to his patents. In 1934 he presented his new system to RCA president Sarnoff. Sarnoff was somewhat taken aback by its complexity, as he had hoped it would be possible to eliminate static merely by adding a simple device to existing receivers. From May 1934 until October 1935 Armstrong conducted field tests of his FM technology from an RCA laboratory located on the 85th floor of the Empire State Building in New York City. An antenna attached to the building's spire transmitted signals for distances up to 80 miles (130 km). These tests helped demonstrate FM's static-reduction and high-fidelity capabilities. RCA, which was heavily invested in perfecting TV broadcasting, chose not to invest in FM, and instructed Armstrong to remove his equipment.

In June 1936, Armstrong gave a formal presentation of his new system at the US Federal Communications Commission (FCC) headquarters. For comparison, he played a jazz record using a conventional AM radio, then switched to an FM transmission. A United Press correspondent was present, and recounted in a wire service report that: "if the audience of 500 engineers had shut their eyes they would have believed the jazz band was in the same room. There were no extraneous sounds." Moreover, "Several engineers said after the demonstration that they consider Dr. Armstrong's invention one of the most important radio developments since the first earphone crystal sets were introduced." Armstrong was quoted as saying he could "visualize a time not far distant when the use of ultra-high frequency wave bands will play the leading role in all broadcasting", although the article noted that "A switchover to the ultra-high frequency system would mean the junking of present broadcasting equipment and present receivers in homes, eventually causing the expenditure of billions of dollars."

FM radar

During World War II, Armstrong turned his attention to investigations of continuous-wave FM radar funded by government contracts. Armstrong hoped that the interference fighting characteristic of wide-band FM and a narrow receiver bandwidth to reduce noise would increase range. Primary development took place at Armstrong's Alpine, NJ laboratory. A duplicate set of equipment was sent to the U.S. Army's Evans Signal Laboratory. The results of his investigations were inconclusive, the war ended, and the project was dropped by the Army.

Under the name Project Diana, the Evans staff took up the possibility of bouncing radar signals off the moon. Calculations showed that standard pulsed radar like the stock SCR-271 would not do the job; higher average power, much wider transmitter pulses, and very narrow receiver bandwidth would be required. They realized that the Armstrong equipment could be modified to accomplish the task. The FM modulator of the transmitter was disabled and the transmitter keyed to produce quarter-second CW pulses. The narrow-band (57 Hz) receiver, which tracked the transmitter frequency, got an incremental tuning control to compensate for the possible 300 Hz Doppler shift on the lunar echoes. They achieved success on January 10, 1946.

Legacy

It was not until the 1960s that FM stations in the United States started to challenge the popularity of the AM band, helped by the development of FM stereo by General Electric, followed by the FCC's FM Non-Duplication Rule, which limited large-city broadcasters with AM and FM licenses to simulcasting on those two frequencies for only half of their broadcast hours. Armstrong's FM system was also used for communications between NASA and the Apollo program astronauts.

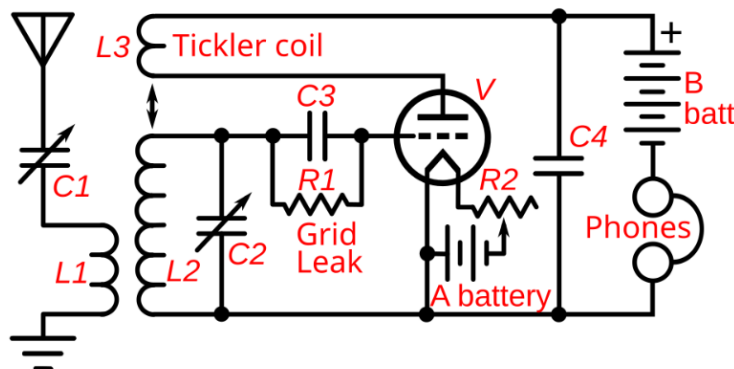
A US Postage Stamp was released in his honour in 1983 in a series commemorating American Inventors.

Armstrong has been called "the most prolific and influential inventor in radio history". The superheterodyne process is still extensively used by radio equipment. Eighty years after its invention, FM technology has started to be supplemented, and in some cases replaced, by more efficient digital technologies. The introduction of digital television eliminated the FM audio channel that had been used by analogue television, HD Radio has added digital sub-channels to FM band stations, and, in Europe and Pacific Asia, Digital Audio Broadcasting bands have been created that will, in some cases, eliminate existing FM stations altogether. However, FM broadcasting is still used internationally, and remains the dominant system employed for audio broadcasting services.

Armstrong Hall at Columbia was named in his honour. The hall, located at the northeast corner of Broadway and 112th Street, was originally an apartment house but was converted to research space after being purchased by the university. It is currently home to the Goddard Institute for Space Studies, a research institute dedicated to atmospheric and climate science that is jointly operated by Columbia and the National Aeronautics and Space Administration. A storefront in a corner of the building houses Tom's Restaurant, a longtime neighbourhood fixture that inspired Susanne Vega's song "Tom's Diner" and was used for establishing shots for the fictional "Monk's diner" in the "Seinfeld" television series.

A second Armstrong Hall, also named for the inventor, is located at the United States Army Communications and Electronics Life Cycle Management Command (CECOM-LCMC) Headquarters at Aberdeen Proving Ground, Maryland.

In 2005, Armstrong's regenerative feedback circuit and superheterodyne and FM circuits were inducted into the Technology Hall of Fame, an honour given to "products and innovations that have had an enduring impact on the development of audio technology."



Single vacuum tube Armstrong regenerative receiver circuit, invented in 1913 by American engineer Edwin Armstrong

The full story from this extract can be found here https://en.wikipedia.org/wiki/Edwin_Howard_Armstrong#Further_reading

Catalyst enhances zinc–air battery performance



Engineers from Monash University have unveiled a breakthrough catalyst that could supercharge next-generation batteries, offering more power, longer life and lower costs.

While zinc–air batteries are currently used in small devices like hearing aids, this opens the door to rechargeable, high-power applications, moving the technology closer to real-world, grid-scale and transport uses.

Using a clever heat treatment, researchers turned a 3D material into ultra-thin carbon sheets and added individual cobalt and iron atoms, creating a catalyst that makes the battery's oxygen reactions much faster and more efficient.

Lead authors Saeed Askari and Dr Parama Banerjee, from the Department of Chemical and Biological Engineering, said it outperformed standard commercial catalysts made from expensive metals like platinum and ruthenium.

“By engineering cobalt and iron as individual atoms on a carbon framework, we achieved record-breaking performance in zinc–air batteries, showing what is possible when catalysts are designed with atomic precision,” Askari said.

“Our advanced simulations revealed that the cobalt–iron atom pairs, combined with nitrogen dopants, enhance charge transfer and optimise reaction kinetics, solving one of the biggest bottlenecks for rechargeable zinc–air batteries.”

Banerjee said the principles behind this design could also be applied to other clean energy technologies including fuel cells, water splitting and CO₂ conversion.

“Running a rechargeable zinc–air battery continuously for more than two months is a milestone for the field. It demonstrates that this technology is ready to move beyond the laboratory and into practical applications,” Banerjee said.

“These catalysts not only solve a key bottleneck for zinc–air batteries, but their design principles can be applied across the energy landscape — from fuel cells to water splitting — offering broad impact for clean energy.”

The research findings have been published in the [*Chemical Engineering Journal*](#)

THE INFAMOUS DRIVEWAY OF VK2KQB



Okay, it's not *technically* on-topic... but we can't miss the chance to give a big shoutout to one of the IARS legends

Ned McIntosh, VK2AGV!

Whenever Ned takes the stage, we know we're in for a treat. No matter what the topic is, his presentations are packed with fascinating info, laughs, and the kind of energy that keeps us all hooked (and occasionally runs a little over time... but hey, that's just because there's so *much good stuff* to cover!).

Ned, you always turn a regular evening into something special – and we love it!

How did this story begin? Well, it all started with Keith (VK2KQB) and his *daily battle*, reversing down a driveway so tricky it could qualify as an Olympic sport.

Picture it: one hand gripping the steering wheel, the other holding the mic, radio locked on 146.850MHz, and every morning, like clockwork, Ned chiming in with commentary that made it sound like Keith was escaping a jungle temple in a 1980s action movie.

Before long, Ned had mentally penned an entire thriller—starring Keith, his car, and *that* driveway. Seriously, if you heard it on the radio, you'd think Keith lived on the edge of a cliff haunted by ghosts and guarded by snakes.

So buckle up, dear reader. Dive into this tale and decide for yourself—would *you* dare visit Keith's QTH? 😊

Keith's Driveway by Ned VK2AGV

Keith's driveway is truly a marvel of complexity, with a multitude of different environments to thoroughly test his new 4WD and ensure it is fully roadworthy and fit-for-purpose before he gets to the main road that leads to his workplace in Unanderra.

First, Keith's wife has lots of horses, so she stacks 30 tonnes of horse-tack on pallets in front of Keith's 4WD every morning. He has to use a forklift to move all this stuff out of the way before he can get to the vehicle, which is so big it can't be turned around on its own and needs a turntable to reverse its direction so he can begin his drive to work.

Once the horse-tack is out of the way, Keith then raises steam in the mighty 4WD, a process that can take nearly an hour to ensure the massive triple-acting V8 compound, Turbo-Encabulator-equipped behemoth, complete with a full set of aftermarket nover-trunnions, is well up-to-temperature before he actually engages the transmission, selecting "D" for "destruction".

Keith then faces the first part of his driveway, the steep-walled "Canyon of Despair", cut through a three-thousand foot tall granite mountain, giving an intensely claustrophobic experience. The sound of his exhaust reverberates back and forth in the canyon.

Once he has successfully traversed this he enters the "Tunnel Of Doom", where rotting limestone and decaying bricks threaten to break lose and block the road, or damage the vehicle - or both. Keith drives as fast as possible through this, the loud exhaust booming and echoing through the dank tunnel. After he exits, a huge plume of black exhaust is sucked out, looking like a napalm bomb that has just detonated. A group of environmentalists are gathered at the tunnel exit and as he surges past Keith gives them the finger.

Keith then enters the "Plain of Jars", a flat, almost desert-like area covered with glass jars in various states of breakage, where a tribe of gorillas lives and routinely attacks anything that moves. However Keith, from his years in South Africa, know exactly how to handle gorillas so he asks the head-gorilla what is the formula for series or parallel resonance. This immediately causes confusion amongst the gorillas and he takes advantage of this to accelerate past them.

With this out of the way Keith encounters the "Bridge Of Death", guarded by a family of trolls, the leader of whom demands all who wish to pass must answer three questions, and if they get a wrong answer, or don't know the answer, then they are thrown into the abyss beneath the bridge.

Keith knows the answer to the first two (the questions never change from one day to the next) and he cleverly confuses the troll by querying the third question, whereupon the troll admits he doesn't know,

is catapulted into the abyss, and Keith drives on.

Ferrite Mix Selection Guidelines

Which mix is best for a certain application or frequency range and there is a lot of misinformation on the internet and elsewhere regarding the selection of proper mix for a given application.

Material Types

There are two basic ferrite material groups: (1) Those having a permeability range from 20 to 850 μ are of the Nickel Zinc (NiZn) class (mix 43, 52, 61), and (2) those having initial permeabilities above 850 μ are usually of the Manganese Zinc (MnZn) class (Mix 31, 73, 75).

The NiZn ferrite cores (mix 43, 52, 61) have low permeability, exhibit high volume resistivity, moderate temperature stability and high 'Q' factors for the 500 KHz to 100 MHz frequency range. They are well suited for low power, high inductance resonant circuits. Their low permeability factors also make them useful for wide band transformer applications. Nickel-zinc ferrites have a higher resistivity and are used at frequencies from 2 MHz to several hundred megahertz. The exception is common mode inductors where the impedance of NiZn material is recommended from 70 MHz to several hundred GHz.

The MnZn ferrite cores (Mix 31, 73, 75) have high permeabilities above 800 μ , have fairly low volume resistivity and moderate saturation flux density. They offer high 'Q' factors for the 1 KHz to 1 MHz frequency range. Cores from this group of materials are widely used for switched mode power conversion transformers operating in the 20 KHz to 100 KHz frequency range. These cores are also very useful for the attenuation of unwanted RF noise signals in the frequency range of 2 MHz to 250 MHz. Manganese-zinc ferrites are generally used in inductor applications where the operating frequency is less than 5 MHz. The exception is common mode inductors where the impedance of MnZn material makes it the best choice up to 10

What's Different between Mixes?

The "Mix" is the chemical formula of the iron oxide. Ferrite is a ceramic consisting of iron oxide and generally either of two types:

- Manganese-zinc (MnZn) available as Mix #31, #75 and #77 (and others) – work well for common mode chokes
- Nickel-Zinc (NiZn) available as Mix #43, #52, #61, (and others) – generally preferred material for baluns/ununs

Mix 31, 43, 52, 61, 73, 75 and 77 for most applications from RFI/EMI common mode suppression, multi-ratio toroid baluns and ununs and sleeve baluns for line isolation. Each mix number has a measurable permeability and suggested frequency range for certain applications.

The table below gives our recommended applications for various mixes and effective frequency ranges

Mix #	Material	Initial Permeability	RFI/EMI Common Mode Suppression Range	Tuned Circuits – Coil	Wide Band Transformer
31 (1)	MnZn	1500	1-300 MHz	–	1:1 only, <300 MHz
43 (2)	NiZn	800	25-300 MHz	< 10 MHz	3-60 MHz
52 (6)	NiZn	250	200-1000 MHz	< 20 MHz	1-60 MHz
61 (3)	NiZn	125	200-1000 MHz	<100 MHz	1-300 MHz
73 (7)	MnzN	2500	< 50 MHz	< 2 MHz	<10 MHz
75/J (4)	MnZn	5000	150 KHz – 10 MHz	< .75 MHz	.1-10 MHz

Notes

- (1) Mix 31 excellent for 1-10 MHz common mode suppression, then about same as 43 up to 250 MHz, NOT recommended for multi-ratio impedance transformers (baluns/ununs) due to material characteristics and power handling capability – ok for ham radio 1:1 feed line choke applications. Curie temperature >130 C. Mix 31 is available in TOROIDS, SLIP ON BEADS, and SNAP ON SPLIT BEADS
- (2) Mix 43 excellent for common mode chokes from 25-300 MHz, Use Mix 31 below 10 MHz for higher choking impedance. Curie temperature >130 C.. Mix 43 is available in TOROIDS, and SLIP ON BEADS
- (3) Mix 61 will withstand high power in multi ratio (2:1, 4:1, 9:1) impedance transformers (baluns/ununs). Curie temperature > 300 C. Mix 61 is available in TOROIDS, SLIP ON BEADS, and SNAP ON SPLIT BEADS
- (4) Mix 75 (also known as Mix J) is a high permeability MnZn ferrite intended for a range of broadband and pulse transformer applications and common-mode inductor designs. Excellent for common mode suppression on AM broadcast frequencies from 500 KHz-1.8 MHz. Also very useful for medical instrument transducer isolation, inverter assemblies, inductive motors and control units. Curie temperature >140 C. Mix 75 is available in TOROIDS, SLIP ON BEADS, and SNAP ON SPLIT BEADS

- Optimized to solve low-frequency EMI issues between 150 kHz and 10 MHz
- Suppresses common-mode noise up to 30 MHz
- Replaces expensive line filters to mitigate conducted noise
- Split core performance closely resemble solid cores, allowing seamless transitions from test to production

(6) The Jerry Sevick, W2FMI broadband transformers (baluns/ununs) used a permeability of 250 (Mix 52) and the F240-52 ring toroids are ideal for replicating his designs.

(7) Mix 73 only available in small bead size, for larger inside diameter requirements, use mix 75 or 77

General comment on frequency ranges and application use

When selecting a mix to use for tuned circuits or broadband transformers, the frequency range should allow for operation in the INDUCTIVE range of the ferrite mix frequency curve. For best results use the proper mix with RESISTIVE dominate range for RFI/EMI suppression at the fundamental RFI frequency.

Mix 31 is only appropriate for 1:1 impedance transformers and for RFI suppression from 1-300 MHz and should not be used for <1:1 or > 1:1 impedance transformers as the material resistivity is high over 5 MHz. We have experienced excellent RFI common mode suppression under 5 MHz with mix 75 and mix 77 using multi-turn toroidal topology.

You can purchase ferrites in Australia through MiniKits >>>> <https://www.minikits.com.au/ferrite-cores>

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. A 120 watts 21.1 MHz frequency shift keyed radioteletype transmitter has a duty cycle of:

- a) 1
b) 2
c) 3
d) 4

Question 2. The sensitivity of a meter with a full scale deflection (FSD) of 300 V and an internal resistance of 300,000 ohms is:

- a) 100 ohms/volt
b) 300 ohms/volt
c) 1,000 ohms/volt
d) 3,000 ohms/volt

Question 3. An unterminated long wire "V" beam antenna has a radiation pattern which is:

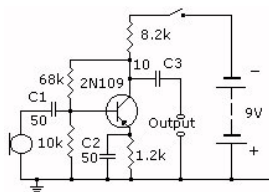
- a) omnidirectional
- b) bidirectional
- c) dependent on the ionosphere
- d) unidirectional

Question 4. A semiconductor has:

- a) very high resistance
- b) high conductivity
- c) less conductivity than an insulator
- d) greater conductivity than an insulator

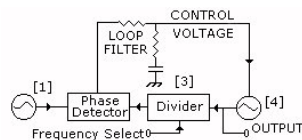
Question 5. In this audio amplifier C3 acts as a:

- a) low-pass filter element
- b) coupling capacitor
- c) bypass capacitor
- d) high-pass filter element



Question 6. This block diagram represents a:

- a) balanced modulator
- b) discriminator
- c) PLL synthesizer
- d) triple conversion superheterodyne receiver

Answers next propagator 

Answers to the last propagator questions ... Q1 = C ; Q2 = B; Q3 = D ; Q4 = C; Q5 = C ; Q6 = D

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



OLD PROPAGATOR MEMORIES

THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

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

IARS is a Member Club of the Wireless Institute of Australia

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Warilla 2528

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

The Congregational Hall, Coombe St. Wollongong.

CLUB STATION- VK2AMW

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.

AUCTION:

THIS MONTH'S MEETING-

There will be an auction, so bring along that piece of gear that you have been thinking of selling.

CONDITIONS OF AUCTION:

1. No useless junk (only good junk please)
2. Reserve prices may be set by seller.
3. A commission of 10% paid to club. (Max. limit \$10.00 comm.)

COMING SOCIAL EVENT;

The committee is organizing a bar-b-que outing at Sadleback Mountain on Sunday 16-Dec-79.
Cooking facilities will be provided. (BYO)

NEXT MEETING- 12-Nov-79.



BLUE MOUNTAINS AMATEUR RADIO CLUB
VK2AUX/VK2NCM

President: Steve Leatheam VK2BGL
Secretary: Debbie Leatheam

P.O. Box 54,
SPRINGWOOD. 2777.

26th August, 1979

The Secretary,

The Illawarra A.R.S.

Dear Fellow Amateurs,

The Blue Mountains Amateur Radio Club is having its Annual Field Day this year on Sunday, November 25th, at the Springwood High School.

We would like to take this opportunity to extend an invitation to all the members of your club to bring their family for an enjoyable outing on this day. A programme of the events has been enclosed, and we would further draw your attention to the various competitions in which you can take part: Homebrew competition
QSL Card competition
Auction.

Items for these events may be submitted beforehand, or presented upon Registration on the day. Registration will cost \$2.00 for OM's and \$1.00 for students; family 'extras' are free. A range of food and drinks will be on sale, or there is room for a picnic lunch.

Registrations will open at 0900 Hours. For any further information regarding our Field Day, please contact the Secretary, P.O. Box 54 Springwood.

Looking forward to seeing you in November,

Cheers,

Steve Leatheam.
(for Field Day Committee)



 **KENWOOD**

<u>KENWOOD</u>	TL120 - Linear Amplifier 3-30MHZ.....	\$234.00
<u>KENWOOD</u>	TS520S - H.F. Transceiver.....	\$650.00
<u>KENWOOD</u>	TS820S - H.F. c/w Digital Display (1 only).	\$890.00
<u>KENWOOD</u>	TS120V - H.F. Mobile 10 Watt Output.....	\$600.00
<u>KENWOOD</u>	TS120S - H.F. Mobile 100 Watt Output.....	\$730.00
<u>KENWOOD</u>	AT200 - Antenna Tuner-SWR.....	\$160.00
<u>KENWOOD</u>	AT120 - Antenna Tuner-SWR.....	\$96.00
<u>KENWOOD</u>	RD300 - Dummy Load 300 Watt to 150 MHZ (1 KW Peak).....	\$79.00
<u>KENWOOD</u>	MC501C - New Economy Base Station Microphone.....	\$29.00

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/2020/09/1979-11-November.pdf>



NEWS



<https://www.wia.org.au/newsevents/news/2025/index.php?month=9>



Another great read for all Amateur radio enthusiasts

www.wia.org.au

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AMATEUR **Radio**

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Just *what* is S9 on your S-meter?

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AMATEUR

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Radio

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radio amateurs
since 1933

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Amateur radio adventures on islands

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Our cover: The allure of amateur radio from an island! Photo from Cocos Keeling Islands Visitor Center; "Australia's last unspoilt paradise."

NEXT ISSUE: Outdoor, Offshore, On-the-air

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.

Join the WIA and show your support for the hobby. While membership may cost a little more than other organisations, the value and support they provide make it well worth it.

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

WIA AGM to be held in Albury in 2026

Date : 02 / 08 / 2025

Author : Peter Clee - VK8ZZ

The date for the 2026 AGM has been finalised by the Board of the Wireless Institute of Australia.

The AGM is to be held in conjunction with the **VK SUMMIT** being conducted by the Albury Wodonga Amateur Radio Club [Link](#)

More details about the Annual General Meeting will be issued later this year.

So save the date for the VK SUMMIT to be held over the weekend of 2nd and 3rd May 2026 including the WIA Annual General Meeting.

More details about the VK SUMMIT will be issued by the Albury Wodonga Amateur Radio Club in the next few months.

Peter Clee
WIA Secretary



2026

AGM

Upcoming Contests

VHF UHF Field Days

Contest Manager

Roger Harrison VK2ZRH. Dateline: 5 March 2025

LOGS FOR THE WINTER FIELD DAY ARE DUE FOR LODGING BY SUNDAY 6TH JULY. DON'T DELAY!

At right: The Summerland Amateur Radio Club regularly deploys a serious Field Day station at Vista Point in northern NSW, near the Queensland border.

WHAT'S NEW

Results for the 2025 Summer event are posted below under Files for Download. The tables are set out in a similar format to those over recent years, kindly prepared by Peter Forbes VK3QI.

The logs were all processed through the **VK Contest Log Checker** (www.vklogchecker.com). Thanks to Alan Shannon VK4SN, WIA Contest Committee Chairman, and Peter Forbes VK3QI.



Spring 2025 - 0100 UTC Saturday 22 November through 0059 UTC Sunday 23 November (0400 / 0359 in VK6).

Link for further reading <https://www.wia.org.au/members/contests/vhfuhf/>



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

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



<https://ararm.org/status.html>

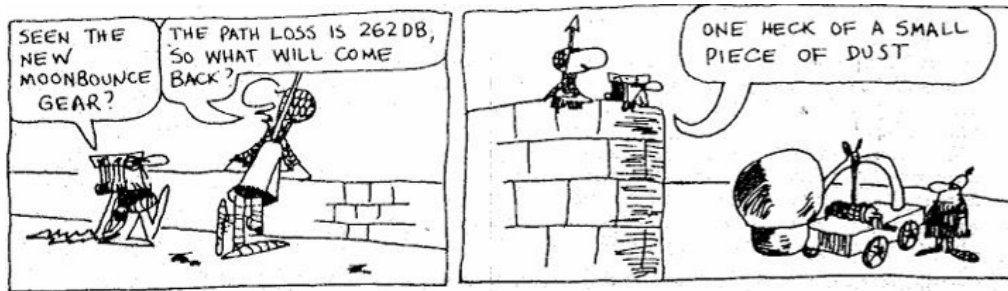
[illegible]

- **November 2025** : Amateur Radio Trivia with Kahoot – Prize will be a Nano-VNA 😊
- **December 2025** : Christmas dinner Pizza Night
- **January 2026** : No Meeting
- **February 2026** : Presentation Roger VK2VRK
- **March** : SMD Soldering workshop

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 November 7.30pm,

73

Keith VK2KQB
IARS Secretary

IARS, Amateur Radio in the Illawarra since 1948