QUA FARC

October 2026

Franklin Amateur Radio Club Inc.
NZART Branch 10

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www.facebook.com/groups/1728559367541681/

Committee meets on the first Tuesday of each month (excepting January) at 7.30 pm in the clubrooms.

Subscriptions: Individual $30, Family $40, due December
See club secretary for bank account number

Nets: HF Sunday 9 am, 3.700 MHz (Mike ZL1UOM); VHF Sunday 9.30 am, 146.900 MHz (Steve ZL1TZP); DMR on TalkGroup 5301, Wednesday 7.30 pm (Steve ZL1TZP)

Meetings: Club meetings are on the third Tuesday each month in the clubrooms, 19 Stadium Drive, Pukekohe, at 7.30 pm. Visitors welcome.

NEXT MEETING

The next general meeting is to be held Tuesday 20 October At the Chairman's discretion we may delay the start so as to let visitors see the radio shack in operation, then follow with the talk, and end up with formal business.

The talk will be by Steve ZL1SPR who will be showing some developments in digital radio – particularly the program *QSO-One* which is a free application for AllStarLink, EchoLink, IAX Direct, DMR (BrandMeister and TGIF), System Fusion, and M17 on Android and Windows. It is a free, cross-platform VoIP client for amateur radio operators that connects over the internet without hardware, Raspberry Pis, or physical radios. For access, QSO One **r**equires a free account and a valid amateur radio callsign.

MOTAT LIVE MORSE DEMO: 20 September 2026
Contributed by Peter Henderson ZL1PX
The Event

MOTAT (Museum of Transport and Technology) in Western Springs, Auckland, hold annual 'Live Demo' days in September. This marries the museum's static displays of obsolete technology with those still capable of operating that technology.

Purpose of the Demo

I wanted to show real Morse code in action. Hearing the code connects visitors to radio history. It shows old technology still works and delights. Even more than this, I wanted to create a hands-on rather than a watching-only experience.

Setup and Environment

We located our demo in an open room in MOTAT's Telecommunications Centre. Our equipment was a 2 meter transceiver with Morse capability and a practice sounder. As the room had wide doors open to an outside roadway, dots and dashes could be heard across a wide area. We had an identical station in another building 60 meters away.

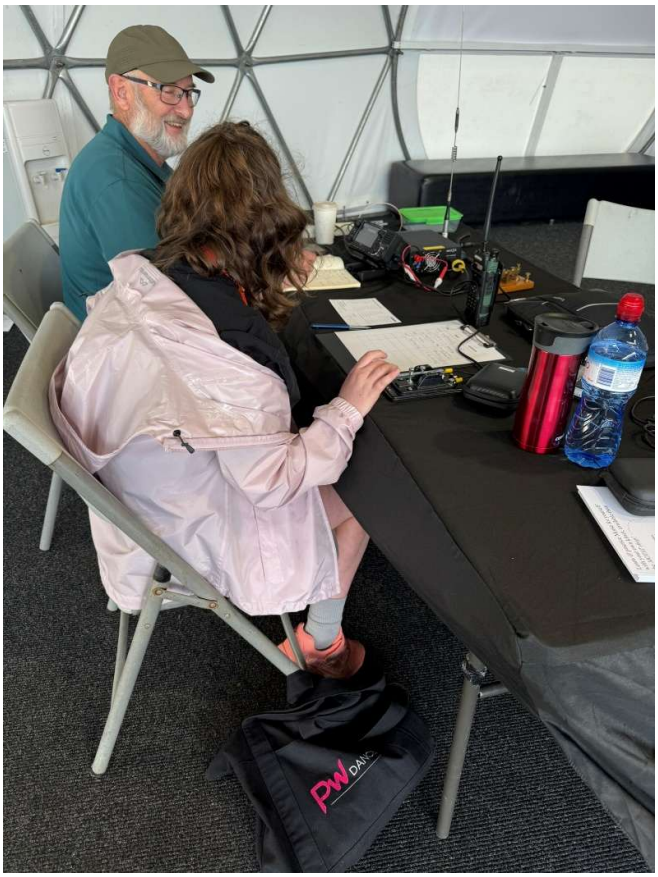
Human Interaction

As family groups arrived we invited them to send their name in Morse code over the radio and hear it transmitted back to them. Most younger family members took up the challenge. We took them through a few learning steps to ensure their experience would be satisfying. First, they wrote their name on a card and translated that into dots and dashes in the space below their name. Next, they spent a few minutes practicing with a Morse key and sounder. Finally, we opened a contact with the second demo station and asked our Morse learner to key their name 'live' on air.

Results

Not every young learner took to this task easily but most managed to key their name successfully. There were big smiles when they recognized the dots and dashes coming back. One young learner, Lily, struggled to send the letter L

(dit dah dit dit) making it sound like an A (dit dah) and an I (dit dit). She was overjoyed when she finally succeeded in making it understood. To celebrate her success, she visited the second station to repeat the experience. Salamasina, another young learner, described hearing her name in dots and dashes as 'Awesome!' Young Brent, created perfect copy on his first attempt.



My Own Feelings

What felt especially satisfying for me was the reaction of parents. They were grateful to us for providing the experience. The challenge was getting learners to leave a space after every character and to not leave spaces within a character. Overall, it felt good to showcase ham radio to young minds in the hope they might one day join the amateur radio fraternity.

The Outcome

We helped approximately 20 MOTAT visitors at this demo. MOTAT staff kindly provided free lunch and coffee and expressed the hope we would return. I would definitely do this again and am seeking CW operators who will help me make a return visit.

Thanks

My thanks go to Tom ZL1TO, Lynette ZL1LL, Steve ZL1SPR, Deb ZL1DEB and John ZL1KLF for driving 100 plus km, hauling gear, smiling all day and doing all the things that made this a class act. Well done folks!

At right: John ZL1KLF shows a young learner how to send her name in Morse at MOTAT

At the second morse venue our Morse activity shared space where:

- Replacement parts for old telephones were being made on a 3D printer.
- Lissajous figures were displayed on an oscilloscope.
- Morse code was sent by Bluetooth.
- Telegrams were prepared on a paper tape punch, read to a Telex machine and printed.

At right: Lynnette holds an inland telegram that she generated.



RADIO CURIOSITIES OF THE SOLAR SYSTEM

Your Editor has been reading ***The Secret Lives of Planets*** by Paul Murdin. This has inspired the article that follows. It was the coincidence of the 11.9 year orbit of Jupiter about the Sun and the matching solar cycle that got me thinking. Then the metallic behaviour of hydrogen, deep inside Jupiter and the dynamo effect on Jupiter's magnetic field and radio transmissions really got me going.

Amateur radio operators spend most of their time thinking about the ionosphere, solar flux, geomagnetic storms, and the vagaries of HF propagation. But the radio universe is much larger than Earth's atmospheric shell. Across the solar system, planets, moons, and even the Sun's own orbital wobble generate electromagnetic phenomena that are as strange as they are scientifically revealing. Understanding these curiosities doesn't just deepen our appreciation of radio physics — it connects our day-to-day operating experience with the broader dynamics of the solar system.

This article explores four major themes: the solar cycle and its radio consequences; the Sun's barycentric motion and its long-period cycles; the exotic metallic-hydrogen engines that drive planetary magnetic fields; and the lightning-driven radio emissions of planets with thick atmospheres. Together, they form a picture of a solar system that is constantly broadcasting.

The Solar Cycle: The Master Oscillator of Amateur Radio

For radio amateurs, the 11-year solar cycle is the most familiar cosmic rhythm. Driven by the Sun's magnetic dynamo, the cycle modulates sunspot numbers, solar flux, and the strength of the solar wind — all of which directly affect HF propagation.

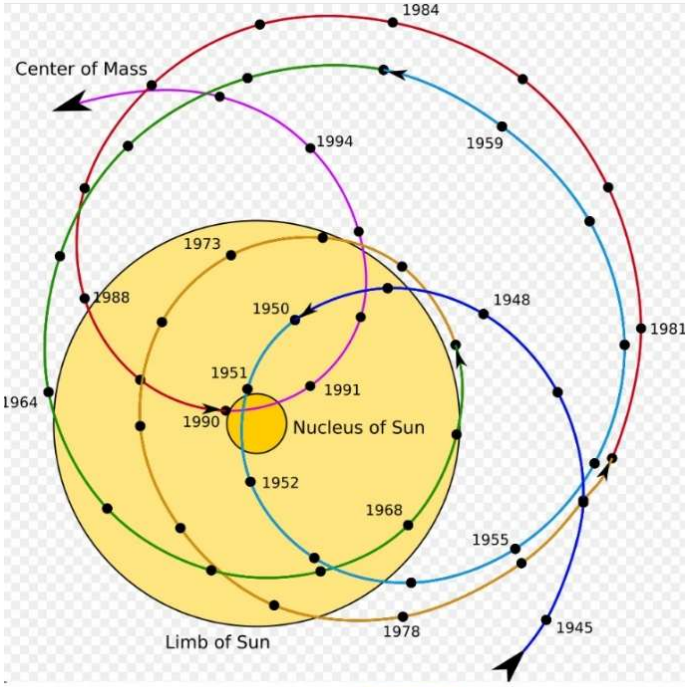
During solar maximum, the Sun's magnetic field becomes tangled and intense. Sunspots proliferate, ultraviolet output increases, and the ionosphere becomes richly ionised. The F-layer thickens, MUFs rise, and 10 metres opens like a dream. DX becomes effortless, and even modest antennas perform beyond expectations.

Solar minimum is the opposite: a quiet Sun, low flux, and a thin ionosphere. HF bands become sluggish, long-path propagation weakens, and geomagnetic storms — though less frequent — can be more disruptive because the Earth's magnetosphere is less shielded.

What's less widely appreciated is that the solar cycle is not perfectly periodic. Individual cycles vary from 9 to 14 years, and their amplitudes differ dramatically. Some researchers have proposed that planetary gravitational influences — especially from Jupiter and Saturn — may weakly modulate the cycle. While the mainstream view holds that the solar dynamo is internally driven, the idea of external "nudging" remains an intriguing possibility, especially when considering the Sun's barycentric motion.

The Sun's Barycentric Dance: A Hidden Long-Period Radio Influence

Although we think of the Sun as the centre of the solar system, it actually orbits the solar system's barycentre — the true centre of mass. Because Jupiter is so massive, the barycentre often lies outside the Sun's surface. As the giant planets move, the barycentre shifts, and the Sun traces a looping, spirograph-like path around it.



Apparent motion of the Solar System barycentre with respect to the Sun

This motion has several consequences:

1. Angular momentum exchange. The Sun's barycentric motion subtly alters the distribution of angular momentum within the solar system. Some researchers have suggested that this may influence the solar dynamo, potentially contributing to long-period variations such as the Gleissberg cycle (~80–100 years).

2. Magnetic field modulation

The Sun's motion through the barycentric frame may slightly modulate the geometry of its magnetic field. While the effect is small, it is measurable in long-term solar magnetic records.

3. Radio emissions from the heliosphere

The solar wind — a magnetised plasma — fills the heliosphere with low-frequency radio emissions. As the Sun's barycentric motion changes the solar wind's large-scale structure, the heliospheric radio environment subtly shifts. These frequencies are far below the amateur bands, but they are detectable by spacecraft such as Voyager and Parker Solar Probe.

For amateur radio operators, the barycentric cycles matter because they may contribute to long-term patterns in solar activity. While the evidence is still debated, the idea that HF propagation might be influenced by the orbital choreography of the giant planets is irresistible.

Metallic Hydrogen and the Planetary Dynamos

Several planets — Jupiter, Saturn, Uranus, and Neptune — generate enormous magnetic fields. These fields produce radio emissions detectable from Earth with specialised equipment, and they shape the plasma environment of the outer solar system.

The key lies in metallic hydrogen. So what is metallic hydrogen? Under extreme pressure — millions of atmospheres — hydrogen behaves like a metal, allowing electrical conduction. In Jupiter and Saturn, vast layers of metallic hydrogen rotate rapidly, generating colossal magnetic fields through dynamo action.

Radio consequences of planetary dynamos

- Jupiter: The strongest planetary magnetic field in the solar system. It produces intense 22 MHz radio bursts, some triggered by Io's volcanic plasma interacting with Jupiter's magnetosphere. These bursts are strong enough to be detected by amateur radio astronomers using modest equipment.
- Saturn: Its magnetic field is weaker but remarkably symmetrical. Saturn emits radiation at wavelengths between 10 and 300 kilometres, especially during auroral events.
- Uranus and Neptune: Their magnetic fields are tilted and offset from their centres, producing complex radio signatures. Voyager 2 detected strong bursts during flybys.

Metallic hydrogen dynamos are not just exotic physics — they are radio engines. They turn planetary rotation into electromagnetic broadcasts, filling the solar system with signals.

Lightning Worlds: Radio from Planetary Storms

Lightning is a natural radio transmitter. On Earth, lightning produces broadband RF noise across HF and VLF bands. The same is true on other planets. Lightning-driven radio emissions remind us that atmospheres are electrically alive. Every storm is a transmitter.

Jupiter's storms are monstrous, with lightning bolts up to 1000 times more energetic than Earth's. These produce powerful radio emissions detectable by spacecraft and, in some cases, by large amateur radio arrays.

Saturn's "storm alley" generates lightning bursts that produce Saturn Electrostatic Discharges (SEDs), intense radio pulses observed by Cassini.

On Venus lightning remains debated, but multiple missions have detected VLF bursts consistent with electrical storms.

Dust storms on Mars may generate static electricity and weak radio emissions, though nothing like the gas giants.

So the Solar System is alive with radio. For amateur radio operators, the solar system is more than a backdrop — it is a dynamic, electromagnetic environment. The Sun's magnetic cycle shapes our HF bands. The Sun's barycentric motion may contribute to long-term solar variability. Metallic hydrogen dynamos turn giant planets into radio beacons. Lightning storms on distant worlds crackle across the spectrum.

We operate radios on Earth, but we live in a solar system that is constantly transmitting.

VISIT BY ELECTION CANDIDATE – an editorial comment

Last week I was asked by a local candidate, in the general election, if he could visit us at our meeting next week. I said yes.

New Zealand Association of Radio Transmitters (NZART) aligns itself with the global standards of the International Amateur Radio Union (IARU). Under the widely accepted framework "Ethics and Operating Procedures for the Radio Amateur", discussing religion, politics, or commercial business is strictly prohibited on the airwaves. And we avoid those topics when we get together as amateurs.

While the historic Radio Amateur's Code, drafted in 1928, outlines personal traits like being Considerate, Loyal, Progressive, Friendly, Balanced, and Patriotic, modern operating standards specifically bar controversial subjects to keep the amateur radio service inclusive and universally accessible.

We are expected to avoid:

- Politics: Expressing political opinions or debating government policies.
- Religion: Preaching, discussing religious doctrine, or making faith-based commentary.
- Business: Direct commercial transactions or advertising services (amateur radio is explicitly for non-pecuniary, personal interest).
- Derogatory Remarks: Any speech targeting ethnic, racial, religious, political, or gender-based groups.

I work on the understanding that there are occasions when as amateurs we do need to deal with politicians. One such example is negotiations for the club lease, which are eventually decided by elected representatives on the Local Board. It is also to the advantage of amateur radio that central government representatives know about our work. On the international scene there are several high profile politicians (one aspiring to be US President in the mid 60's) and monarchs (Jordan and Spain) who have been amateurs. And those of us who have spoken with spacemen on the international space station have had no political issues – as they were not raised.

Members will be well aware of a disagreement I had with a former member, who publicly representing amateur radio, had distributed written material with internet links to material that was very derogatory of their political adversaries. That was a painful episode. So please, everyone, work within the amateur code, being respectful to all, next Tuesday.

And an aside. I have also been approached by another election candidate who has several teenagers in mind who could well be interested pursuing amateur radio as a hobby.

ANNUAL GENERAL MEETING

The annual general meeting will be held on Tuesday November 17. There will be the usual round of reports and election of officers for the next 12 months. Do think of making yourself available for committee work as indications are that one or two long serving members are ready to retire from the committee.

It would be helpful if reports could be ready for publishing with QUA around 10 November.

Written nominations close on 4 November, with nominations allowed from the floor where there have not been written nominations.

FRANKLIN POSITIVE AGEING EXPO

This event was held on Friday 9 October. Our club had one of the 90 tables allocated to exhibitors. It seemed that visitor attendance was down on normal. Perhaps warnings of road closure on part of Ward Street and advice that parking would be in short supply may have put some visitors off. The organisers did well by keeping exhibitors supplied with cups of tea and eats delivered to their tables.

As usual, we did meet several old-timers from the club as they circulated through the displays.

JOTA SURPRISES

From Peter Henderson ZL1PX

I had a surprising JOTA (Jamboree on the air) experience this year.

On the morning of Sunday 18 October, Bruce Whitehead ZL1SRX, logged on to the 2M net. He informed us he would do Jamboree on the Air with girl guides and scouts between 10 and 2. If we were able, could we talk with the Pukekohe guides and scouts. He would call CQ on the Bombay repeater.

I answered Bruce's first call around 10.05AM. Girl Guide Natalya gave me the phonetic names for the spelling of her name. She told me she was aged eleven. Next came Regan, also eleven. Following them were Amber, Claire, Harper, Quinn and Emily taking me almost to midday.



After lunch, eleven more scouts and guides called me with their phonetic names. Then the channel went dead. Thinking, they had finished I dialed up Scout DMR talk group Scout TAC 1 on my trusty Anytone. Another surprise. At the moment I joined the talk group, Greg Barton ZL2GBX called CQ from a JOTA event in Blenheim. So now I spoke with Brook who was a Venturer Scout and loved campfires. I also spent radio time with Jake in the Blenheim scout group.

As they do sometimes, DMR Scout TAC 1 went dead – or was my Anytone misconfigured? Not a worry. Pukekohe scouts and guides were again saying hello and their name in phonetics on 2M. I now talked with Ngaomi, Finn, Axel, Hannah, Mya and Fletch.

For me JOTA should really be about scouts talking to scouts. However, this is not easy to arrange. In the three years I did JOTA with Franklin Club, we achieved this only by accident when DMR contacts came up during an afternoon shift at the clubhouse in 2024.

All in all, I enjoyed the day talking with youngsters. They have such huge energy for everything they do. See you all at JOTA next year.

WESTERN SUBURBS USED EQUIPMENT SALE

The next significant radio club sale is coming up on Saturday 14 November. The venue is Rosebank Primary School at 217 Rosebank Road in Avondale. For those who are looking for new gear, then ICOM agents RWB Ltd will be present.



PAPAKURA OPEN DAY

Papakura Radio Club held an open day on 17 October. There have been reports that the displays and radio activities all went well. As with the Positive Ageing Expo the number of visitors may not have been up to expectations.



THE SMITH CHART

Why is the Smith Chart one of the scariest charts in electrical engineering?

An engineering Smith chart is basically a graphical calculator for RF circuits and transmission lines; a graphical tool that lets an RF engineer see what is happening to impedance and signal reflections instead of calculating everything with equations.

In layman's terms:
It helps you see how a radio signal behaves when it travels through a coax cable, antenna, or other RF circuit.
Instead of doing lots of complex calculations, you can plot a point and move around the chart to find things such as:

- impedance (resistance + reactance)
- SWR
- reflection coefficient
- how a transmission line changes the impedance seen by the radio
- where to place an impedance-matching component
- The chart is essentially a map of all possible impedances.

For example, if your antenna is 50 Ω, it sits at the centre of the chart because a 50 Ω system is perfectly matched. As the antenna becomes mismatched, the point moves away from the centre, and the chart lets you visualize how bad the mismatch is and how it can be corrected.

If you're familiar with SWR and NanoVNA, the Smith chart is particularly useful because a NanoVNA can plot your measured antenna impedance directly on one.

You'll find a great explanation on this YouTube video: https://www.youtube.com/watch?v=GK2pZ_oVU1o

Source: *Communicator* – magazine of Surry Amateur Radio Communications September-October 2026