QUA FARC NOVEMBER 2022

Franklin Amateur Radio Club Inc. NZART Branch 10

VOLUME 30 ISSUE 11

President: Gary Landon ZL1WGL
Vice President: Peter Henderson ZL1PX
Secretary: Tom McDonald ZL1TO Ph. 09 238 8580
Committee Members: Mike Jane ZL1UOM, Ted Doell ZL1BQA, Durlene Griffin ZL1ULK, Gary Collins ZL1GAC

Examiners: Tom ZL1TO, Peter ZL1PX

Web page: www.qsl.net/zl1sa/ Webmaster: Peter ZL1PX

MEETINGS: The club meets on the third Tuesday each month, in the clubrooms, 19 Stadium Drive Pukekohe, 7.30 pm. Visitors welcome.

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

SUBSCRIPTIONS: $20.00, family $30.00.

NETS: Every Sunday at 9.00 am on 3.700 MHz (controller ZL1UOM) and 9.30 am on the 146.900 MHz repeater (first log-on becomes controller). Other 2 metre frequencies are 145.775 MHz, 146.625 MHz, and 146.900 simplex if repeaters off air.

Newsletter: Editor Peter ZL1PX pjh@teachlit.com
A copy is sent to members and clubs in the Auckland area. Sent free of obligation by e-mail to anyone interested.

Next Club Meeting

Our next meeting will be Tuesday 15 November at 7.30 PM in the clubrooms at 19 Stadium Drive, Pukekohe. This will be the annual general meeting, followed by the monthly general meeting.

Straight Key Night

Summer CW Straight Key 'saunter' with the emphasis on a simple QSO to exchange RST / Location / Name / Key / Transmitter / Power.
Sunday 11 December. Run time will be 9 PM to 10 PM.
Frequency will be around 3.510 to 3.540 MHz. Maximum power is 100 Watts.
All contacts must be CW-to-CW, using a straight key. Exceptions for disabled operators who cannot use a straight key but no bugs, sideswipers, keyers or keyboards for the rest of us.
Further details here…

Constructors Award

Marlborough Amateur Radio Club recently held a Constructors Award during their October meeting. There were eight entries for the award and these covered widely different areas of the ham radio universe.
Neil ZL4LO created a sculpture which described Ohms law. Grant ZL2BK built an interface to program a C210 repeater controller and a VXR9000 radio. Anthony ZL1VBX made a mini iambic keyer using piano wire. The award was won by Tony ZL2BTU who produced an 80M DSB transceiver with a 128 X 64 OLED display.
More details on Constructors Award here…

Radio Spectrum Management

On Friday 4th November, RSM Business Updates reported…
The International Women's Rugby World Cup is currently underway. Behind the scenes, RSM team are working alongside organisers and broadcasters to ensure the event is a success.
The games are taking place at Auckland and Whangarei venues. Investigators are on site to help identify and resolve any potential radio spectrum issues that may arise.
So far, our Investigators have been busy dealing with interference on match days between the many different users of radio communication devices. This has been greatly assisted by the co-operation of all parties to resolve interference issues.

Good luck Black Ferns!

Minutes of Franklin Amateur Radio Club (Inc) Committee Meeting held at the clubhouse, Stadium Drive, Pukekohe
18 October 2022

President Gary ZL1WGL opened the meeting at 1937 hours.
Attendance: ZL1WGL, ZL1TO, ZL1PX, ZL1BQA, ZL1TZP, ZL1UOM, ZL1LL, Kevin
Apologies:
Received from ZL1ULK, ZL1GAC, ZL1BBZ
accepted. ZL1TO/ZL1PX

Minutes of the August meeting
The September minutes were approved as a true record.
ZL1BQA/ZL1PX

Correspondence :
Inward
From Auckland committee organizing NZART Conference 2026 advising a meeting is to be held 7.30 pm 13 October at Branch 66 clubhouse. ZL1TO and ZL1LL attended the meeting on 13 October – where ZL1VH was appointed Chair, with vacancies for Secretary (perhaps ZL1AOX), Treasurer and committee
Email from Philip ZL1PSH and Tristan Crockett ZL1TC inviting FARC to join an amateur communication channel under auspices of Branch 29. Concerns were raised that too much personal information is requested and there may be dangers installing the application on a device.

With Margaret Logie and John Anderson of Morris Register of New Zealand Auckland Branch setting up a meeting regarding lease application at 34 Ngahere Road. A thank you message to John was emailed on 9 October, following the meeting.
With Bruce M regarding an ICOM-735 available from Miranda. Ted ZL1BQA suggested we can look if it is being given away.
The correspondence report was received. ZL1TO/ZL1PX

Finance:
Income Interest $1.01
Expenditure Power bill to 19 $52.97 paid 2 Sep
The finance report was received : ZL1TO/ZL1UOM

Reports
AREC.

Three amateur stations from Franklin provided safety communications for the WRC rally at Te Akau North on Friday 30 September. One car rolled in front of Checkpoint Bravo – with no injury – and there was no need to stop the stage. Weather on our stage was continuous overcast with periods of low cloud and light drizzle. The road surface was in very good condition, and there was no dust on account of the moisture. When Gary drove out through the stage it was obvious that rain had been quite localised with some slushy patches. A thank you message for our AREC contribution at WRC has been forwarded by Richard ZL1BNQ.

General Business
The committee had a discussion of our interest in Ngahere Road with John Anderson of Morris Register of New Zealand – Auckland Branch on 4 October.
A thank you message has been sent to John.

The meeting agreed to send a supportive email to the Senior Community Lease Advisor at Auckland Council, before the advertised closing date for submissions.

Re lease of 34 Ngahere Road, Pukekohe

Franklin Amateur Radio Club has asked that I write to support the application of Morris Register of New Zealand Auckland Branch for continuation of its lease at Ngahere Road.

As you will know, the radio club is also interested in having our clubhouse shifted to a spot in Ngahere Road, and we are confident that we would have good neighbours in the Morris club.

This is an open message.

Yours faithfully

Tom McDonald
Secretary – Franklin Amateur Radio Club Inc

Gary ZL1WGL commented that with AGM next month, new life members have not been given a certificate. A name badge would be appropriate.

That the club procure appropriate name badges for presentation at the next meeting.
ZL1PX / ZL1TZP

The meeting closed at 2000 hours.

Then followed 10 minute talks by three members. Peter ZL1PX spoke about the CW QRS net. Ted ZL1BQA described and explained work he has been doing with diplexers. Tom ZL1TO showed photographs from the WRC car rally.

November Committee Meeting
Franklin Amateur Radio Club Committee did not meet Tuesday 1 November due to four apologies and a failure to make quorum.

Has it got enough battery power?

Bob ZL1BBZ ponders how to fit an HF rig to his new EV while taking his first trip to QTH of Peter ZL1PX.

Space Talk
Peter ZL1PX

Russian cosmonaut Maxim Suraev, flight engineer, conducts a radio session from the International Space Station, January 16, 2010.

Just how do astronauts talk to Houston? Do they use a radio like ours? Is it an off the shelf model with loads of options like a waterfall, live recording and Internet capability? Can it also do CW, SSB, FM, AM and digital modes? With these and other questions buzzing in my head, and an article to write for QUA, I approached Google to see what I could find.

I got so far and then not much further. There is a lot of information on two NASA networks – Near Space Network (NPN) and Deep Space Network (DSN). Near Space Network is a mix of ground stations and satellite relay stations around the planet. NSN operates to provide traffic services as far as 2,000,000 miles from earth. I guess all current manned space missions would operate in this network.

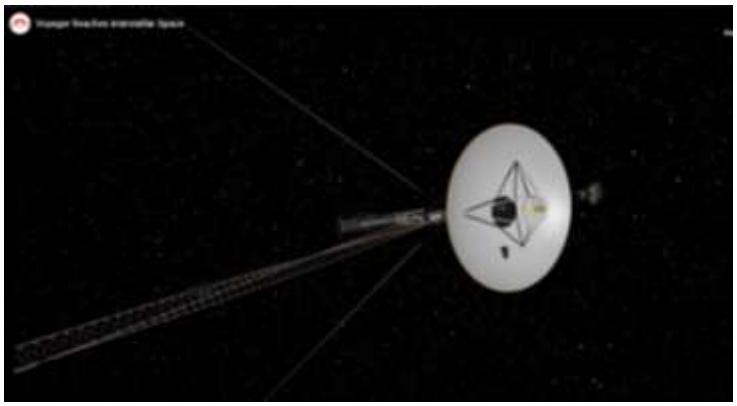
Dongara complex – part of Near Space Network - tracks Earth orbiting satellites, providing telemetry, tracking and control (TT&C) services.

Near Space Network is run from NASA's Goddard Space Flight Center in Greenbelt, Maryland. There are over 13 ground stations in NSN and also the Tracking and Data Relay Satellite (TDRS) system. NASA's Artemis moon mission will communicate through NSN.

Deep Space Network handles traffic from further afield and would include the majority of missions that are currently underway, such as the Mars mission of Perseverance Rover, I found a podcast that told me NASA Deep Space Network consists of three large antenna complexes around the globe - Goldstone (USA), Canberra (Australia) and Madrid (Spain). Each of these complexes has at least one 70 metre antenna and three or four 34 metre antennas.

Deep Space Network Communication Complex at Canberra with 70 metre dish in foreground

NASA has spaced these complexes equally around the planet so they can recover messages from spacecraft in any orbit or on any trajectory. In addition, for spacecraft that are a long way from Earth, DSN has the capability to focus two, three or more antennas on a distant spacecraft and combine incoming signals into one stronger signal. This is called arraying. Some arraying is needed when messages arrive from the two Voyager spacecraft which have now left our solar system and are more than 12 billion miles away from Earth.



Voyager 1 - currently in inter-stellar space – after more than 40 years travel

I understand NASA is a busy organisation - so busy there may be 40 or more spacecraft to coordinate. Resource management is a must. NASA assigns a Mission Interface Manager (MIM) right at the start of the planning for each mission. This person liaises with that mission's designers to ensure the radios on that spacecraft comply with DSN requirements and the network can meet the schedule and other demands of that mission.

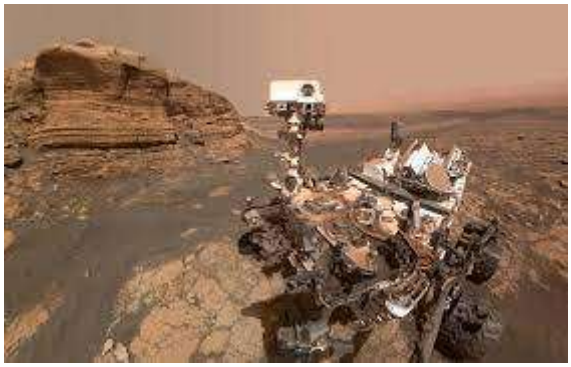
NASA doesn't say this anywhere, but I pick up that most communication from spacecraft is not voice information but data concerning the machinery needed to fly and maintain the spacecraft. All this data is routed through central processing points at Goddard (NSN) and Pasadena (DSN). At this point I understand the data is what is called 'Level Zero' data and is sent on to the specific control centre for the spacecraft where it can be interpreted and understood within the protocols needed for control of that spacecraft. Perhaps less than .1 per cent of this data will be audio.

So now to the question 'do astronauts use radios like ours?'

Most NASA antennas, being parabolic reflectors on moving spacecraft, are not like ours. However, I did find that the small focus point opposite the 'dish', where the signal is fed and where the dish is focused, is likely to be a half-wave dipole.

TDRSM – Tracking and relay satellite launched December 2002 with parabolic reflector antennas

Google and NASA both remain largely silent on what kind of transceiver an astronaut might use. When I typed 'space transceiver' into NASA, nothing was found. When a similar phrase goes into Google, a company named L3Harris offers me an Electra Lite Mars UHF Transceiver unit which operates at frequencies of between 435 and 450 MHz tuneable in 56 kHz steps. The L3Harris Corporation tell me this set is fitted on the Perseverance Rover which landed at Jezero Crater on Mars in February 2020. RF transmission power is 8.5 watts; voltage requirements are 22 to 36 volts DC.



Mars Perseverance Rover takes a selfie in Jezero Crater, March, 2021.

More details on this rig are given at the company website here, but this looks like a low power UHF band transceiver to me, just like the UHF Icom I use for the National System. The three antenna sockets look similar to the one socket on my Icom. However, there are some major differences when I look at the specs.

1. It has the ability to operate at temperatures as low as minus 45 °C. My Icom is only rated for minus 10.
2. It offers Doppler ranging to allow easy computation of velocity data – an important piece of data when about to land on a distant planet
3. It uses digital rather than analog modulation, using Phase Shift Keying to transmit data more efficiently.
4. Components and circuitry are radiation 'hardened' – a feature not needed on Earth.
5. It is sudden shock tested to withstand 2,000 gs – to survive take-off and landing.
6. It can withstand random vibrations up to 7.9 grms in 3 axis.
7. It can be configured as duplex, similar to a computer doing Zoom or Skype, with both transmit and receive happening at the same time.

Electra Lite Mars UHF Transceiver - with familiar looking antenna sockets

L3Harris say this equipment is also installed on the Mars Orbiter satellite which allows for quick relay of data and images back to earth at speeds of 2 megabit per second. My Netflix subscription requires 5 megabits per second, so this rig won't live stream from Mars. However, for still pictures, 2 megabits per second would deliver a 5 megabyte picture back to earth in around 20 minutes. Of course, due to the immense distance, there is some delay before radios on Earth would see this transmission – somewhere between 4 and 25 minutes depending on the position of Mars in relation to us.

I don’t intend this article as definitive on space radios. It is just my snapshot of what info is available out there. I know there are astronauts who are hams and they take their radios with them into space and we can hear them sometimes in that short window of a few minutes as they pass overheard. Maybe the next time you talk to one of them, you can ask them to show you what rig they use in their role as astronaut and we might gain more information than there is about right now. Or maybe NASA will help me when they see this article.