

Ham Hum

September 2018



The official newsletter of
The Hamilton Amateur Radio Club (Inc.)
Branch 12 of NZART - ZL1UX
Active in Hamilton since 1923



Next Meeting

19th Sept, Post Market Day review

15th Sept, Market Day

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From the Editor

Branch 12 Market Day

The next annual Market Day is to be held on

15th September, 2018,

at the Waikato Table Tennis Stadium,

Edgecumbe Street,

Hamilton.

Don't miss out!

Propagation de K7RA

1 September, 2018

We just saw 15 straight days with visible sunspots, but it ended on Wednesday, August 29 with a sunspot number of zero. There were also no sunspots seen on Thursday, the following day.

According to Spaceweather.com, in 2018 so far we've seen 134 days (55 percent) with no sunspots. For all of last year, in 2017 there were 104 days (28 percent overall) with no sunspots. During the last solar minimum, there were 528 days with no sunspots in 2008-2009, or about 72.2 percent of the days over the entire two years with no activity.

The past reporting week (August 23 to 29) saw the average daily sunspot number rise to 17.7, from 13 over the prior week. Average daily solar flux rose from 67.5 to 70.6. Average daily planetary A index rose from 10.1 to 19.9, while average mid-latitude A index rose from 10.4 to 13.4.

For HF operations, we want to see high solar flux and sunspot numbers, and low A index, a measure of geomagnetic instability. On Sunday, August 26 we saw high A index numbers from an unexpected crack, opening in Earth's magnetic field. Solar wind spewed forth and the planetary A index rose to 76. During this period the planetary K index (a component of the A index) rose to 7 over a six hour period. Seven is a big K index number.

The middle latitude A index for the day was 34. But Alaska felt the full force of the geomagnetic storm, with an A index in Fairbanks (the College A index) of 90, a very high number. The College A index hasn't been that high since September 8, 2017 when it reached 110.

Spaceweather.com reported new sunspot group 2720 is the first large spot of the next solar cycle, cycle 25. The magnetic polarity is reversed from the polarity of sunspots in cycle 24.

K9LA, Carl Luetzelshwab noted that the latest spot was not a high latitude event, which would be expected for a new cycle spot. Carl said there was a new spot possibly from the new cycle on April 10, but it was very short duration. Way back on December 20, 2016 the first spot from the new cycle appeared.

Predicted solar flux is 68 on August 31 through September 7, 67 on September 8 and 9, 68 on September 10 and 11, 69 on September 12, 70 on September 13 to 22, 69 on September 23 to 25, 67 and 68 on September 26 and 27, 67 on September 28 through October 6, then 68, 68 and 69 on October 7 to 9, and 70 on October 10 to 14.

Predicted planetary A index is 5 on August 31 through September 2, 8 on Septem-

ber 3 and 4, 5, 5, and 8 on September 5 to 7, 5 on September 8 to 10, then 15 on September 11 and 12, 12 on September 13 and 14, then 10, 12 and 8 on September 15 to 17, 5 on September 18 to 21, then 12, 18, 12, 10, 8 and 5 on September 22 to 27, 8 on September 28 and 29, 5 on September 30 through October 3, 8 on October 4, 5 on October 5 to 7, then 18 on October 8, 15 on October 9 and 10, 12 on October 11, 10 on October 12 and 13, and 8 on October 14.

Geomagnetic activity forecast for the period August 31 to September 26, 2018 from F. K. Janda, OK1HH.

"Geomagnetic field will be:

Quiet on September 2, 9, 17, 26

Quiet to unsettled on September 5 and 6, 10, 18, 24 and 25 Quiet to active on August 31, September 1, 8, 13 to 16, 18 to 20, Unsettled to active on September 3 and 4, 7, 11 and 12, 23, Active to disturbed on September 21 to 22

Solar wind will intensify on September (10 and 11,) 14 to 17, (21,) 22 to 24, (25)

Remarks:

- Parenthesis means lower probability of activity enhancement.
- Reliability of predictions remains low.

Comment:

I was asking around why no one (actually, myself, though I hesitated) foresaw an immediate massive disturbance roughly one week ago. The answer is simple. In the analysis I neglected the freshest evolution on the Sun, especially the development in the active area 2720, which was much closer to the southern prick of north coronal polar hole than the previously dominant group 2719.

F. K. Janda, OK1HH"

Interesting article on the possible transition to cycle 25:

<https://bit.ly/2wt0WEe>

I found a possible source of confusion in the fourth paragraph of that article, "the transition period from Solar Cycle 24 to Solar Cycle 25 was deep and profound" should say Cycle 23 to Cycle 24. I believe we are currently about to enter the transition to Cycle 25.

The latest from Dr. Skov:

"Dear Tad,

It comes as no surprise that I have mixed feelings about the collision of Space Weather and terrestrial weather this past week.

On the one hand, aurora photographers got an unforgettable show over the weekend, with aurora views that rivaled the best from the biggest solar storms of this

solar cycle. Indeed, the pictures are mesmerizing. On the other hand, however, I find myself squirming when I return to the moment I realized this solar storm was going to be worse than my worst-case predictions. The radio communications blackouts and poor GPS reception were painful to watch unfold during the largest hurricane to threaten Hawaii in more than 25 years.

In the end, everyone seems to agree that Hurricane Lane was a close call. Luckily, it didn't make landfall, but its slow speed and intensity was enough to cause massive flooding on the big island, leaving some people stranded and without the comforts of home. Had the situation been worse, amateur radio operators would have been a life line of communications, while GPS-enabled search and rescue drones would have done life-saving reconnaissance. Thank goodness that was not necessary. I remember last year when Hurricane Irma hit Puerto Rico, a set of extreme Space Weather events made amateur radio communications and satellite phones nearly inoperable for a week. We dodged a bullet this time. But we cannot count on that.

With hurricanes and cyclones on the rise, there is little doubt that a 'perfect storm,' in which Space Weather exacerbates an already bad situation, will return sooner than we think.

In this week's forecast, I do my best to highlight the beauty of this recent solar storm, but also the danger. As the weather quiets down again and things return to "business as usual," I hope the memory of this perfect storm remains. It may not be all that often that Space Weather and Earth weather conspire like this, but when they do, we need to be sure we're ready.

Cheers, Tamitha"

If you would like to make a comment or have a tip for our readers, email the author at k7ra@arrl.net.

For more information concerning radio propagation, see the ARRL Technical Information Service at <http://arrl.org/propagation-of-rf-signals>.

For an explanation of numbers used in this bulletin, see <http://arrl.org/the-sun-the-earth-the-ionosphere>.

An archive of past propagation bulletins is at <http://arrl.org/w1aw-bulletins-archive-propagation>. More good information and tutorials on propagation are at <http://k9la.us/>.

Monthly propagation charts between four USA regions and twelve overseas locations are at <http://arrl.org/propagation>.

Instructions for starting or ending email distribution of ARRL bulletins are at <http://>

arrrl.org/bulletins.

Sunspot numbers for August 23 through 29, 2018 were 15, 29, 31, 26, 12, 11, and 0, with a mean of 17.7. 10.7 cm flux was 69.5, 72.4, 71.6, 71.1, 69.6, 69.8, and 70.5, with a mean of 70.6. Estimated planetary A indices were 5, 5, 11, 76, 26, 10, and 6, with a mean of 19.9. Estimated mid-latitude A indices were 5, 7, 12, 34, 20, 9, and 7, with a mean of 13.4.



We Might Be About to Enter a Brand New 11-Year Solar Cycle, Earlier Than Predicted

What's up with the Sun? As [we've said previous](#), what the Sun *isn't* doing is the big news of 2018 in solar astronomy.

Now, the Sun sent us another curveball this past weekend, with the strange tale of growing sunspot AR 2720.

We're currently headed towards a solar minimum, forecasted to arrive in 2019 as [the Sun](#) switches over from Solar Cycle 24 to Solar Cycle 25.

The Sun goes through 11-year cycles, during which solar activity increases and ebbs in a somewhat predictable fashion. Tracking this activity goes all the way back to the start of the first solar cycle in 1755.

Today, simple sketching and counting of sunspot numbers has given way to ground and space-based operations that monitor the Sun around the clock.

As a technology dependent society, it's important to know what the Sun is doing. Solar flares can spell a bad day for GPS, satellites, and astronauts currently in space.

Even airline crew and passengers get a markedly higher dose of radiation during solar storms, especially during polar-crossing, trans-oceanic flights. And an event such as the [1859 Carrington Super-flare](#) would wreak havoc today.

As it comes to a close, Solar Cycle 24 is now the most scrutinized period in solar astronomy... but it has been anything but normal.

First, the transition period from Solar Cycle 23 to Solar Cycle 24 was deep and profound, the deepest in over a century. 2008 featured 268 spotless days, and when Cycle 24 finally arrived it was sputtering and lackluster at best, only producing a few notable sunspots.

Now, the transition from Cycle 24 to 25 is on track to top that, with 132 spotless

days on the Earthward face of Sol already as of August 29th or 55 percent of the time, leaving some [solar astronomers](#) to propose that if the trend continues, Solar Cycle 25 may be missing in action all together...

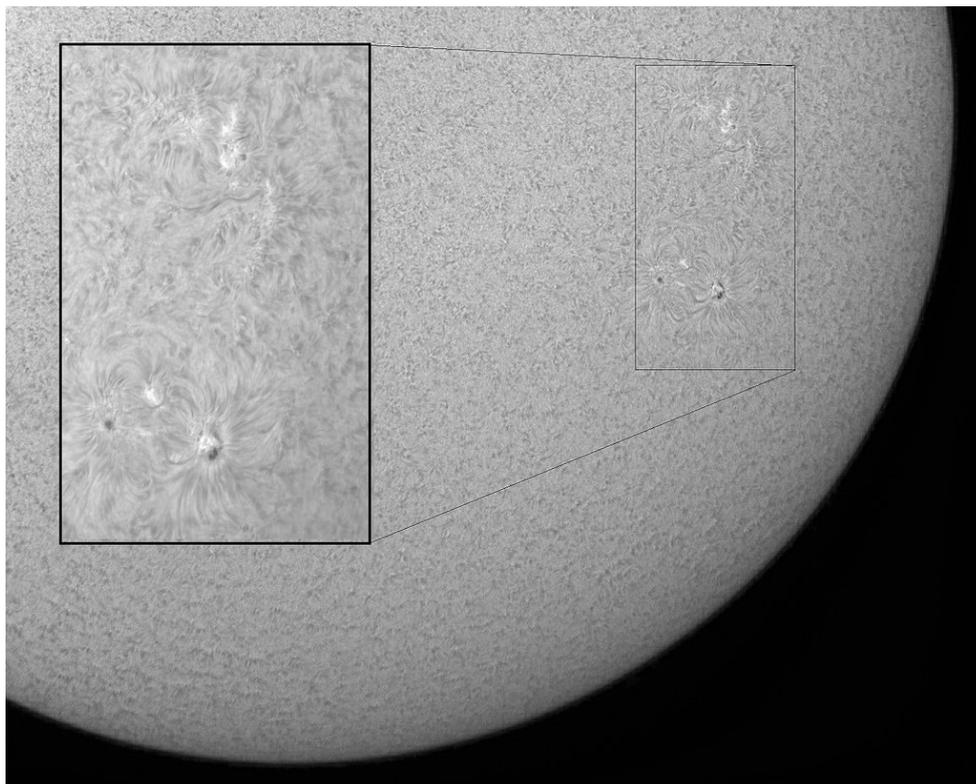
Or will it?

The growth of active sunspot region AR 2720 defied the overall trend for 2018 before it rotated around the solar limb and out of view, begging the question: has Solar Cycle 25 arrived?

As a huge ball of gas, the Sun does not rotate uniformly, but instead, spins on its axis once every 34 days near its poles, and 25 days near the solar equator.

Two factors come into play when identifying that a new solar cycle is indeed underway: the appearance of new sunspots at relatively high solar latitudes, and the reversal of the Sun's magnetic field.

The first factor can be seen observationally in white light over the span of a solar cycle, and was first identified by Richard Carrington in 1861 and later refined by Gustav Spörer, in a law that now bears his name.



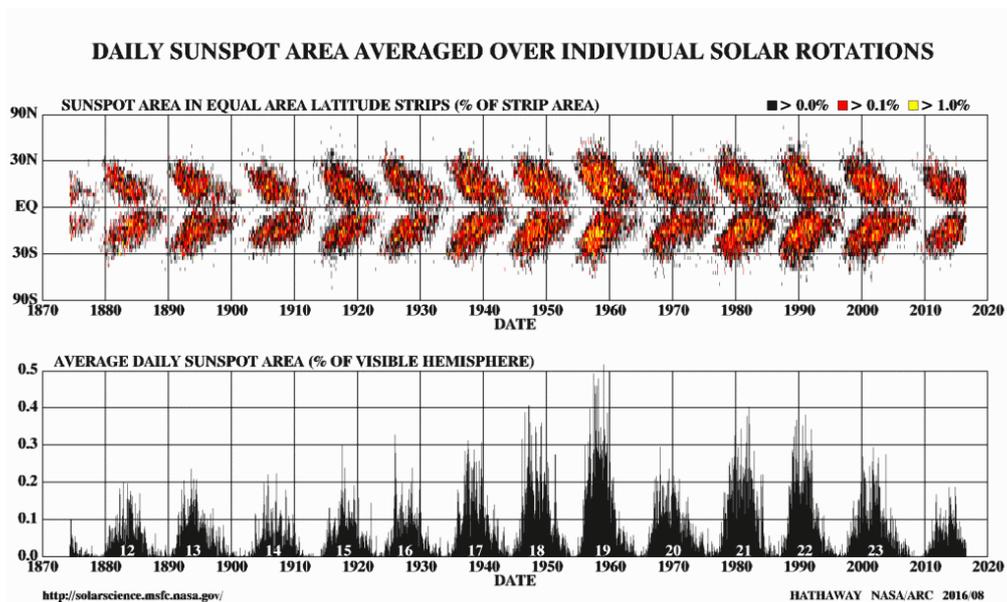


Chart out the appearance of sunspots over time by latitude, Spörer noticed, and you get a tidy 'butterfly graph' depicting the 11-year solar cycle from minimum to maximum.

The second piece of the puzzle had to wait for the arrival of 20th century technology for astronomers to uncover it.

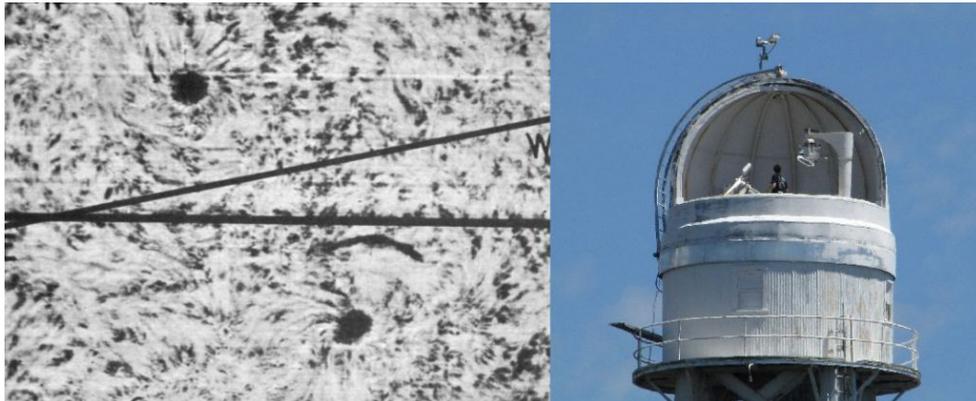
It was known throughout the 19th century that there was a magnetic component to the Sun, as displayed by the electromagnetic havoc and enhanced auroral activity that solar storms could induce on Earth.

In 1908, George Ellery Hale - a pioneer in American astronomy - [used the newly installed 60-foot \(18 metre\) solar tower telescope](#) at the Mount Wilson Observatory to note that spicule swirls around sunspot pairs rotated in opposite directions, much like metal fibers on a sheet of paper in the presence of a magnetic field in high school science class.

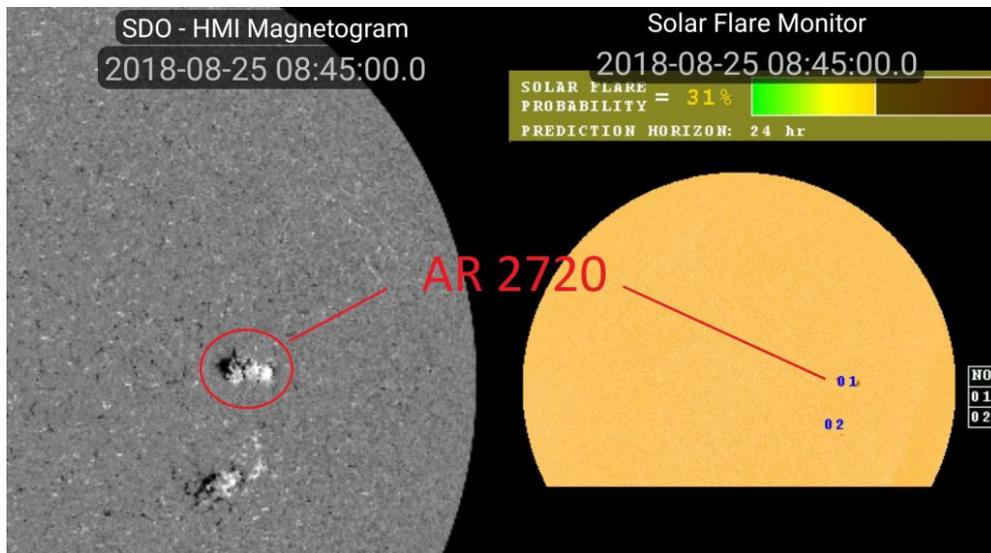
Hale used the 9 meter (30 foot) Littrow spectrograph attached to the solar tower telescope to exploit what's known as the Zeeman effect - where a sunspot spectrum shows either a split or a broadening, evidence of its polarity - to deduce the magnetic field of the given spot.

Hale showed that the Sun actually reverses its robust magnetic field every solar cycle, and the reversal period of 22 years whereas the same hemisphere returns to the same cycle is known as the Hale Cycle.

Likewise, sunspot pairs in the northern or southern hemisphere of the Sun show up as reversed in opposition to each other on [magnetograms](#), showing spatial movement of the magnetic fields within the sunspot group, with one dark segment (south polarity, moving inward) and one bright segment (north polarity, moving outward).



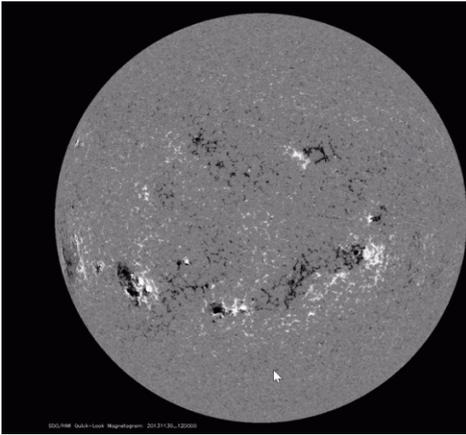
Remember that swirling action that Hale noted? Well, looking at the [magnetogram](#) of a given sunspot, you see either the bright spot leading or trailing the group versus solar rotation, and this flips when the Sun's poles reverse every solar cycle.



Horace Babcock built and installed the first true magnetogram imager on the 150-foot (45 metres) solar telescope on 1957, allowing him to take the first true magnetogram TV image of the Sun, which took the device about an hour to produce.

Today, you can see the very latest magnetogram image of the Sun with the flick of a smartphone, courtesy of the Solar Heliospheric Observatory (SOHO) and NASA's Space Weather App.

Which brings us back to the curious case of sunspot active region 2720. It was indeed [showing a bright leading edge](#) matching its southern counterpart (such mixing isn't uncommon around the time the solar cycle flips) a strike in the 'for' category, but its latitude is still pretty low, a strike against.



Another anomalous spot [seen this past April](#) also seems to have belonged to the next solar cycle.

One thing is for certain: the Sun is a fascinating subject of study, and will continue to surprise.

Keep those solar filters handy, watch those magnetograms online, and we'll see what AR 2720 does when it comes back 'round the solar limb in about 12 days.

WAIPLENTY NETWORK

Some excellent news from Ian (ZL1TAT) -

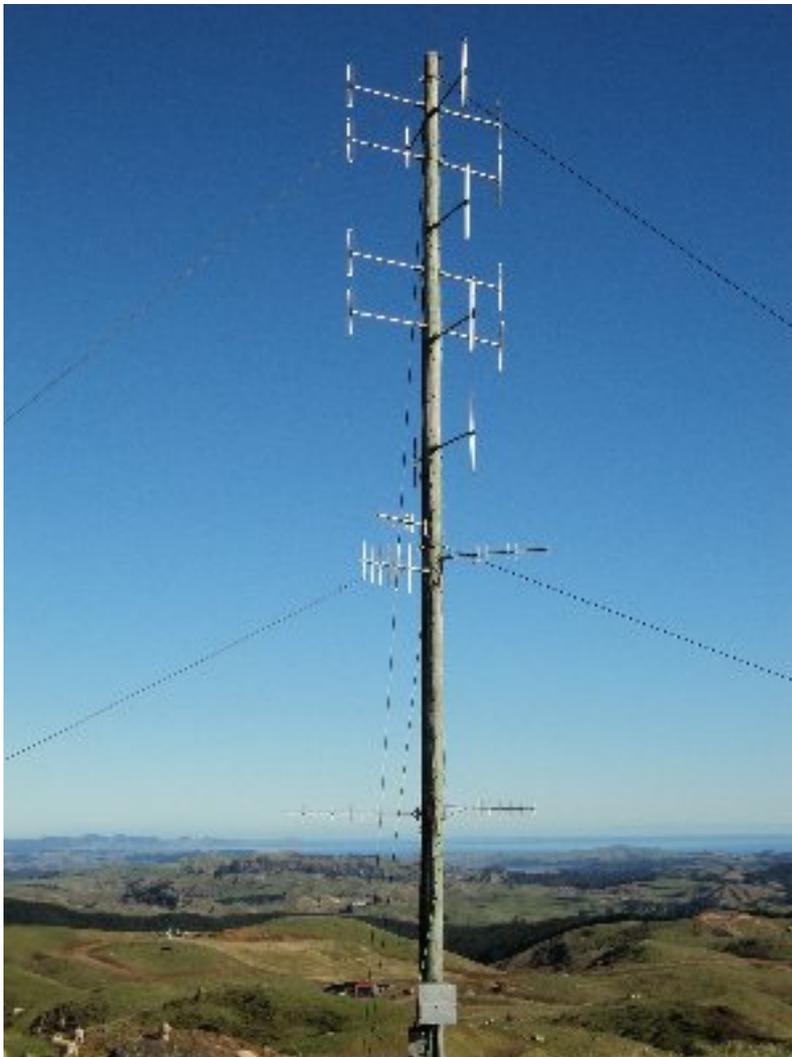
I received a phone call from Russell ZL1RWR on Friday 17 August inquiring after the serial number of our Icom repeater stolen from Te Uku in December 2016. Upon being told, he advised "that's the one I'm holding in my hands!"

A chain of coincidences led to that call. Russell's son knows a storage facility owner, who inquired if "some radio equipment remaining unclaimed in one of his sheds might interest him, otherwise he'd throw it out, because "the previous renter hadn't paid for ages and seemed to have disappeared off the face of the earth". All efforts to contact the renter had failed, including following up with an "employer" he listed as his place of work - they'd never heard of him! Inside that storage shed were several items of radio equipment, and one of those turned out to be our VHF Group's missing Icom FR5000 repeater, along with items identified as belonged to

TeamTalk. Police were advised, and uplifted all items, then a week later I was contacted by them to arrange return of our repeater equipment. Had it not been for this VHF Group Life member's son knowing that storage shed owner, our missing equipment might still be languishing there hidden from us.

After the break-in at Te Uku was discovered on 11 January 2017, I compiled a list of missing equipment with photos and serial numbers provided by its various owners. Through that period, I was in frequent contact with Chorus, Police and a Private Investigator engaged by Chorus. The suspected perpetrator was arrested,

however failed to appear in Hamilton District Court when summoned on 22 March 2017, and Police subsequently found that 27 year old had skipped NZ by using another of his several aliases. Much of the equipment stolen was sold on eBay (several items were sold more than once!), with most according to Police's forensic examination of the alleged perpetrator's five computers, sold to buyers in the USA. Two items were sold into Australia, and have since been recovered after NZ Police had search



warrants executed on their behalf over there. Throughout that time, several people continued to monitor eBay and TradeMe, but our VHF Group's Icom repeater was never seen being offered for sale, - we now know why, it was hidden away in a storage shed in Hamilton after the renter had escaped from NZ. They say good things come to those who wait, and we've been waiting!

Reinstatement of Te Uku '5675 is awaiting installation of a replacement antenna feeder in conjunction with other commercial rigging work to be carried out there later this year. It will be a nice Christmas present to have it back on the air?



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5th October—NZART Infoline
6-7 October—NZART Microwave Contest
17th October—Club Meeting
19th October—NZART Infoline
28th October—NZART Official Broadcast
9-11 November—Bridge to Bridge (AREC)
1-2 December—NZART Field Day Contest
23-24 February 2019—NZART Jock White Field Days Contest
18-19 May 2019—NZART Sangster Shield Contest
6-7 July 2019—NZART Memorial Contest

For more information on any of the above please contact myself or any committee member.

Club Information



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88 Seddon Road, Hamilton

General Meeting: 1930 Third Wednesday of each month (except Jan)
88 Seddon Road, Hamilton

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eMail: branch.12@nzart.org.nz

HF Net: **3.580 temporarily** (3.575MHz LSB)1930 Mondays

VHF Net: 146.525MHz simplex 2000 Tuesdays

2m Repeater: 145.325MHz -600kHz split
STSP 146.675MHz -600kHz split

Repeaters: 438.725MHz -5 MHz split

ATV Repeater: Off air pending channel changes

Cover Photo: Testing of a solar-powered FT-8900 cross-band VHF/UHF station for deployment to a village that may not have grid power for months

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