

Ham Hum

August 2018



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



Next Meeting

15th Aug, Preparation for Market Day

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

4 August, 2018

After six days with no visible sunspots, a new one appeared on Wednesday, August, 1, with a daily sunspot number of 11. As there was also only one day with a sunspot (also 11) in the previous week, average daily sunspot number for this week was unchanged at 1.6. The new sunspot is small and was given the number AR2717 on Thursday, when the sunspot number again was 11.

Average daily solar flux was down from 68.4 to 68. Average daily planetary A index decreased from 8.1 to 5, while average daily mid-latitude A index went from 8 to 5.1.

According to an August 2 forecast prepared by the US Air Force, predicted solar flux is expected to be 70 on August 3, 72 on August 4 to 9, 71 on August 10, 70 on August 11 to 17, 68 on August 18 to 20, 66 on August 21 to 23, 68 on August 24 through September 6, 70 on September 7 to 13, and 68 on September 14 to 16.

Predicted planetary A index is 8 on August 3, 10 on August 4 and 5, 6 on August 6, 8 on August 7 and 8, 5 on August 9 to 11, 8 on August 12 and 13, 5 on August 14 and 15, then 8 and 12 on August 16 and 17, 5 on August 18 and 19, 20 and 12 on August 20 and 21, 5 on August 22 through September 1, then 10 and 8 on September 2 and 3, 5 on September 4 and 7, 8 on September 8 and 9, 5 on September 10 and 11, 8 and 12 on September 12 and 13, 5 on September 14 and 15 and 20 on September 16.

Reader Max White, M0VNG of Worcester, England sent this about experiments with ionospheric sounding over 50 years ago, both below and above the ionosphere: <https://bit.ly/2LNGrvJ>

Jeff, N8II wrote:

"There has been sporadic E to somewhere every day on 10M in the past week, but today, August 2nd, was absolutely amazing. It all started working MW0EDX, Wales on 15M CW via sporadic E with a good signal at 1815Z. Then I called CQ on 15 CW and DL4KCA answered. He was 589 on 15 CW with a 3 element SteplR; we tried 12M and he was 549 (my antenna 2 el vs 5 el Yagi on 15 and 10), and 549 on 10 CW.

I worked Fred F5NBX, a 10 CW regular just after Joe and tried more CQ's on 10 and 15 to no avail. Then, the big surprise happened at 1905Z when I heard Vlad, R2KW 549 on 10 CW in Kaliningrad in a QSO; one try and I was in his log. Then the following stations answered my CW CQ's: UA3EDQ, RZ3AK, and RQ3A Moscow, RU2K Kaliningrad, and UX7IB and UX2VA in Ukraine all S 2-3.

Then still in 1900Z hour, I had a few western EU stations call on CW from Ger-

many, France, PA0KBN Netherlands (new DXCC band slot since 1/17) and ON4BCN Belgium (new slot). I then found OH0Z Aland Is. who was 549 (new slot)! This was followed by 9A2018CRO Croatia, and more from Italy, Germany, France and England.

The 2000Z hour was relatively quiet with Hristo LZ2HR found at 2010Z and Q5 copy for the next 2 hours! Also on 10 CW I worked one each Spain, Italy, and England in the hour. I was about to QRT for dinner at 2100Z when a few new stations appeared. On SSB Ian MM0TFU called in very weak followed by CW QSO's with OH0Z now 559, Germany, Spain, and Robert S50R Slovenia. Then at 2122-2151Z conditions markedly improved and on SSB I ran 30 European stations all in Germany, England, Spain, France, Italy, Netherlands, Belgium, and Portugal.

The last few minutes were spent chasing DX cluster spots and spotting some stations of my own on CW working ZB2FK Gibraltar (new slot), KL7SB/VP9 Bermuda (new slot), LZ3ZZ, TA1D Istanbul, Turkey (new slot), and MU0FAL Guernsey at 2205Z. After a dinner break at 2246Z, the band seemed to have closed to EU, but VY2CAK on Prince Edward Island was S9+.

In my 47 plus years of operating I had never worked Russia, Kaliningrad, Ukraine, Aland Is., or Turkey on 10M via sporadic E during the summer months; it was an incredible opening!" (When Jeff says "new slot" it refers to the first time working a DXCC country on a particular band, as he explained above.)

Jon Jones, N0JK in Lawrence, Kansas sent this on August 2: "Usually the sporadic E season winds down in August. But so far it has been going strong. A big E opening on 6 meters August 1 from Japan to the southeast states, and N0LL and I had CT1HZE into Kansas August 1. On August 2 Europe was in for hours as far west as the Mississippi River. Why the good conditions? It has also been a great season for NLC (noctilucent clouds). They form at 85 km altitude. The E-layer is 90 - 160 km high. Perhaps the same upper atmosphere conditions keeping NLC going strong may be influencing sporadic E. See Spaceweather.com."

Note that Spaceweather.com has a gallery of images devoted to NLC:

http://spaceweathergallery.com/nlc_gallery.html

Frantisek Janda, OK1HH sent the following from Ondrejov in the Czech Republic. See his bio on QRZ.com for more about him.

"Geomagnetic activity forecast for the period August 3 to 29, 2018.

Geomagnetic field will be:

Quiet on August 5, 10 and 11, 15, 23-24

Quiet to unsettled on August 14, 16, 22

Quiet to active on August 3 and 4, 6 to 9, 12, 25 to 29 Unsettled to active on August 12, 17 to 19, 21 Active to disturbed on August (13,) 20

Solar wind will intensify on August (16 to 19,) 20 to 22, 28 to 30

Remarks:

- Parenthesis means lower probability of activity enhancement.

- Reliability of predictions remains low."

Dr. Tamitha Skov sent this, followed by her video for this week:

"Dear Tad,

Last week I mentioned traveling was always an adventure and this trip has been no exception. After being unable to connect to the television in my hotel room (I tried with two separate computers), I settled for shooting my forecast using my mobile phone camera in a way it was never intended. The result has been an unconventional video to say the least. I almost didn't post it, as it's not up to my usual standards, but I figured you would forgive the imperfections in favor of the content.

Additionally, I apologize for getting this newsletter out to you a little late this week. Spotty internet connection while on the road has prevented me from sending it out until today. However, being mobile in Europe this week has given me the chance to reflect on how deeply entrenched space exploration is in our global culture. In fact, while in Amsterdam I came across an art installation showing an astronaut impossibly balancing between a chair and a flower pot (see <https://bit.ly/2LRDII2>). The Joseph Klibansky installation, called "Self-Portrait of a Dreamer," succinctly captures our culture's dreamy fascination with space and its intersection with objects in our more ordinary lives.

As I stared up at this massive structure, the symbolism began to sink in. I realized we are a lot like that dreamy astronaut, striving to blend our understanding of space with its impacts on our everyday world. I also realized that just like the astronaut, we too will one day soon strike a perfect balance.

This week's forecast brings us an Earth-directed stealthy solar storm followed by a small pocket of fast wind that will likely have little effect, but could bring subtle aurora to high latitudes. Even though GPS users might experience glitchy reception near aurora, users at low latitudes should enjoy better than normal reception due to the light impact of the storm. The Sun also has two bright regions rotating into Earth-view this week that should help keep amateur radio propagation near marginal levels, so there is some good news for everyone.

Cheers, Tamitha"

https://youtu.be/MTI5ETzb4_4

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](http://k9la.us/). 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://arrl.org/bulletins>.

Sunspot numbers for July 26 through August 1, 2018 were 0, 0, 0, 0, 0, 0, and 11, with a mean of 1.6. 10.7 cm flux was 66.2, 66.6, 67.9, 68, 68.3, 68.9, and 70.2, with a mean of 68. Estimated planetary A indices were 4, 4, 5, 5, 5, 6, and 6, with a mean of 5. Estimated mid-latitude A indices were 6, 4, 6, 5, 5, 5, and 5, with a mean of 5.1.



BIRDS-2 constellation CubeSats transported to ISS for August deployment

The second generation of CubeSats in the BIRDS constellation now is on board the International Space Station (ISS) and set for deployment in early August using the Japan Aerospace Exploration Agency (JAXA) module's remote manipulator arm.

The June 29 SpaceX Falcon 9 launch carried the **BIRDS-2** CubeSats, MAYA-1, BHUTAN-1, and UiTMSAT-1, built by students from Malaysia, Bhutan, and the Philippines at the hosting Kyushu Institute of Technology in Japan. All CubeSats have identical designs and utilize the same frequencies. While independently made, operation and control of the three CubeSats will be shared by three teams after the spacecraft are released into space. All three CubeSats will transmit a CW beacon on 437.375 MHz. They will be operational for 6 months.

"The three will form a constellation, orbiting the Earth from different places. This will provide the countries more opportunities to make measurements and run experiments than just with using one CubeSat, explained Joel Joseph Marciano, Jr., manager of the PHL-Microsat program in the Philippines. The primary mission of BIRDS-2 CubeSat constellation is to provide digital message relay service to the Amateur Radio community by means of an onboard APRS digipeater on a frequency of 145.825 MHz.

Another mission of the BIRDS-2 CubeSat constellation is to demonstrate a store-and-forward system, investigating technical challenges through experiments on appropriate data format, multiple access scheme, and file-handling protocol while



complying with limited operational time and power constraints.

The BIRDS-2 CubeSat store-and-forward system will collect data from remote ground sensors, store it onboard, and download it to the

BIRDS-2 ground station network, begun last year during the BIRDS-1 CubeSat constellation project.

The CubeSats will carry two identical cameras with different lenses to capture images with varying resolution. The cameras will also be used to capture a minimum-resolution video from space for experimental purpose.

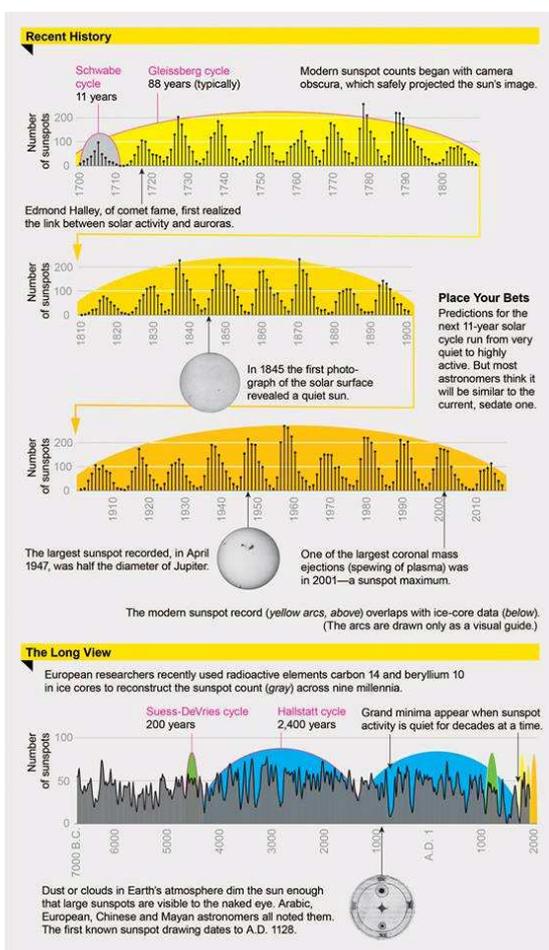
The CubeSats will also carry magnetic field sensors to measure the magnetic field in space and compare it with that measured on ground. Additional experiments will use the BIRDS-2 CubeSat constellation to enhance research and experiment in single latch-up event detection, magnetic field measurements, and flight testing of a newly designed GPS chip to demonstrate its low-power operation capabilities in space. Students will also explore a passive attitude stabilization mechanism. All measurements and image data will be made available on the BIRDS-2 project website.

BIRDS-2 aims to promote awareness of Amateur Radio communication and Ama-

teur Satellites among the general public and students, especially in the participating nations.

<http://www.amsat.org>

Sunspot Cycle more intricate than previously thought



Scientific American magazine reports sunspot cycles are not just every 11 years but also every 88, 200, and 2,400 years

The sun's pockmarked surface is always shifting. Sunspots and solar flares rise and fall every 11 years, a cycle associated with regular reversal of the star's magnetic field.

Huge quantities of plasma—known as coronal mass ejections—fly into space, which can disrupt satellites and other electronic signals if they reach Earth. More solar activity during the cycle also amplifies auroras and warms Earth's temperatures slightly.

Careful study has shown that longer periodicities exist, too. The Gleissberg cycle, first identified in 1862, strengthens and weakens the 11-year cycle over the course of a century. One paper posts that the Gleissberg pattern is caused by a slow swaying of the sun's magnetic pole. The Suess-DeVries cycle lasts about 200 years, whereas the Hallstatt cycle runs on the order of 2,400

years.

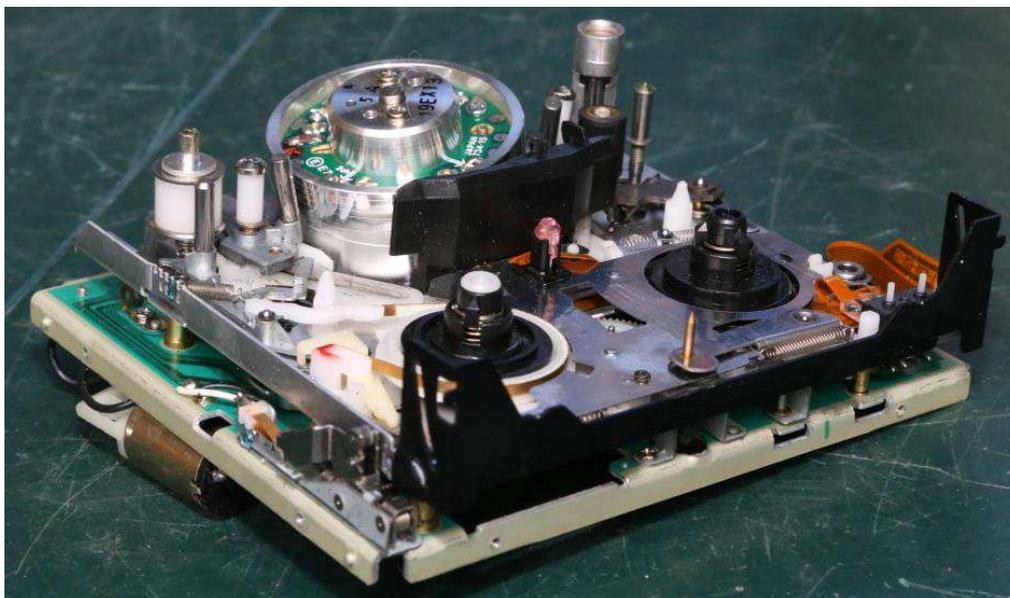
Read the Scientific American article at <https://www.scientificamerican.com/article/the-sunspot-cycle-is-more-intricate-than-previously-thought/>

Camcorder Repairs?

Years ago I bought an 8mm Sanyo camcorder. At the time there were two competing formats, VHSC & 8mm, As the VHS option only had a runtime of 20 minutes, I went for the new boy on the block, 8mm. Unfortunately that particular Sanyo camcorder was a bit of a lemon, it barely got out of its warranty period without dying big time.

At the time of its first failure I took it back and persuaded them to fix it, unfortunately that fix was rather short lived, so 6 months later I had basically given up on it and upgraded to a Phillips SVHS (as in full size VHS) camcorder. (It turned out these were made by JVC)

Now many years later, I still have a box of old tapes that I would like to view again, so when Graeme VK3XTA had a cleanout, which included 2x 8mm camcorders, I



grabbed them both.

So now I had two Sanyo's & one Sony, surely between them all I should be able to view my old tapes. Unfortunately it was not going to be that easy, as they all seemed to have the same kind of fault, lots of noise and litter in their pictures and mechanisms that were reluctant to obey basic commands like, eject/open, etc. so I can insert a tape. (Retrieval was much harder!)

I ended up pulling the 'new' Sanyo to pieces, it was a bit of a nightmare to disassemble, but I eventually got the rather sticky transport out.

Quite a lot of the bearings were so stiff it wasn't funny, however what sealed this one's fate was part of the metalwork not being able to move, had instead bent, and to make it worse, it (and many other stiff joints) were buried deep between the basic two layers of the transport making it all but impossible to gain access for repair's to proceed.

Here is a close-up, the bent bit is just to the side of that brass post. How on earth does one get that out so it can be straightened, and what are the tolerances that it has to comply with, for the transport to work?

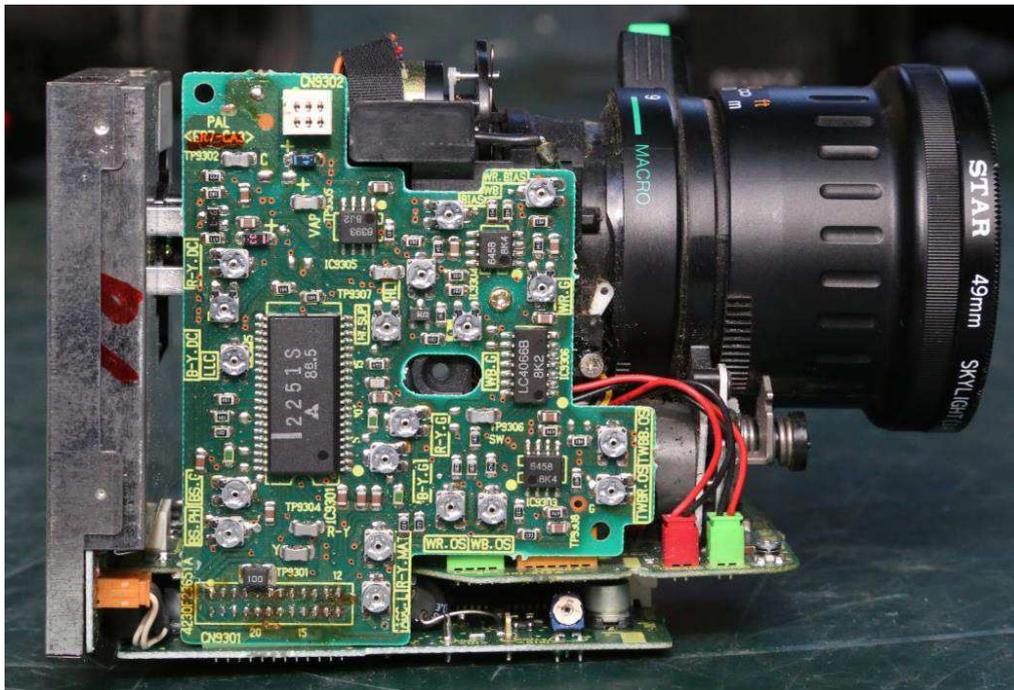


Apart from that, just look at how many leavers etc. are in there that may need attention. At this

point I threw in the towel on that one. Next came the 'new' Sony, it seemed to be mainly suffering power supply faults, however on pulling it apart, I could see where someone had had a go at changing several surface mount capacitors near the power supply module, one of them all but falling off. So I carefully soldered it back into place, however I soon smelled the dreaded 'nappy shit' odour as my iron hit leaked capacitor electrolyte on the PCB. I then knew this one was also a gonner, that stuff is corrosive & conductive, and worse of all, can easily permeate through circuit boards creating faults all over the place by resistively linking circuits together that normally would remain isolated from each other. After getting the soldering good enough I had a look with my oscilloscope, the main rails looked good, but there was still heaps of what looked like switching noise (lack of filtering?) in the eyepiece monitor. So was it an electrolyte spill coupling a power supply switching converter into a video line? It kind of looked so.

The other symptom I had seen in this unit was the servo control systems associated with the head drum, instead of spinning it up at 300 RPM, it would sit there and just jitter back and forward. If I tried hard, I could manually get enough spin up on it that the control circuits could take over and bring it up to operational speed, but that was

far from the last problem, as the tape supply and take-up systems would then not



function, so overall another write-off.

Whilst working on the Sanyo, I noticed an image fault in the viewfinder, a 10mm CRT based B&W screen. On its associated board, one of the trim pots was able to fix the fault, but boy did I have to move it quite a way from its original factory position.

Now looking at the camera assembly, look at all those trim pots, if all of these are also off by a similar margin to the eyepiece monitor, boy do I have some work cut out for me. What's the chance I can get a copy of the alignment procedure from Sanyo, and then not need some special test jig, or test equipment – ZERO!

For a bit of fun I was able to get the eyepiece monitor to work, 5V was about right as a supply then all I needed was some composite video. One catch though, the picture was upside down to compensate for the mirror in the camera's eyepiece. It didn't take too long to identify the vertical deflection coil wires and flip the picture over.

So what can someone do with a 10mm CRT display? I had it displaying live TV courtesy of a digital set top box, but boy, this has to be the smallest picture I've

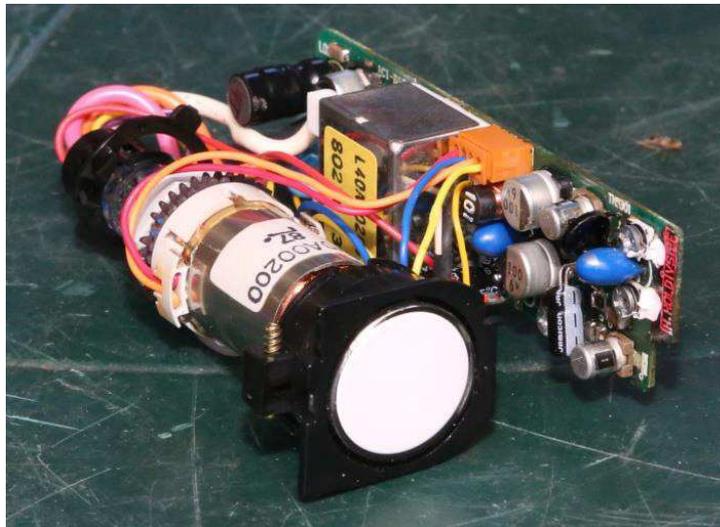
ever tried to view.

So it will probably just live in my curio cabinet till I have an idea for another crazy project.

Any ideas anyone?

And yes, it can be driven by an Arduino.

-VK3TGX



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7th September—NZART Infoline
15th September—Hamilton Market Day
19th September—Club Meeting
21st September—NZART Infoline
6-7 October—NZART Microwave Contest
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.

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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

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