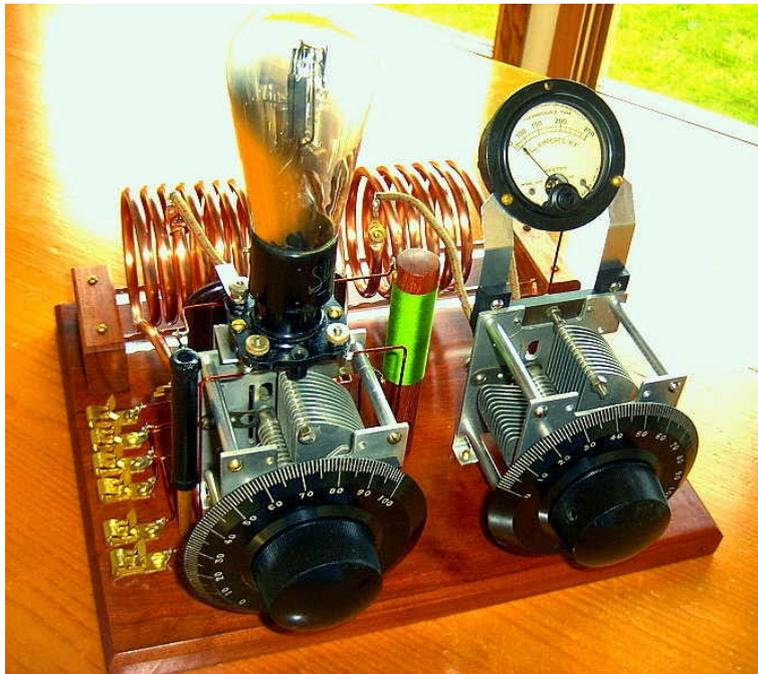


# Ham Hum

August 2015



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



**Next Meeting 19<sup>th</sup> August : 19:30**  
**Market Day debrief &**  
**Speaker**

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## **From the Editor**

Apologies for not getting this out before our Market Day. I've been far too busy searching for obscure computer parts and importing them from the USA or Asia.

Market Day has been and gone for another year. Many thanks to all those who pull it all together every year and keep it all running smoothly. And so soon after running the NZART Conference.

For a couple of you, this will be the last issue of Ham Hum that you will receive. If you haven't renewed your sub, please consider doing so. The membership form is at [http://z11ux.org.nz/img/Membership\\_Form\\_2011.pdf](http://z11ux.org.nz/img/Membership_Form_2011.pdf)

**Next Committee Meetings -  
5<sup>th</sup> August and 2<sup>nd</sup> September**

## **SB PROP ARL ARLP032**

### **ARLP032 Propagation de K7RA**

Solar activity increased somewhat over this week's reporting period, July 30 through August 5, compared to the previous seven days.

Average daily sunspot numbers increased from 47.9 to 70.3, while average daily solar flux was up from 96.4 to 104.5. Average daily mid-latitude and planetary A index remained about the same, both around 10.

At 2348 UTC on August 5, Australia's Space Weather Services issued a geomagnetic disturbance warning. A high speed stream of solar wind from a coronal hole is expected to cause unsettled to active conditions with possibility of magnetic storms over high latitude regions on August 7, then settling down to stable conditions by late August 8.

Earth is entering the debris field from Comet Swift-Tuttle, and the resulting Perseid meteor shower should peak August 12 to 13. This offers the possibility of VHF meteor scatter communication on 6 and 2 meters, and possible enhancement of the ionosphere for upper HF bands as well.

Predicted solar flux for the near term is 115 on August 7, 120 on August 8 and 9, 115 on August 10 and 11, 110 on August 12 and 13, 90 on August 14 and 15, 95 on August 16 to 19, 90 on August 20 and 21, 95 on August 22 and 23, 100 on August 24 and 25, 105 on August 26 to 28 and 100 on August 29 through September 2.

Predicted planetary A index is 23, 15 and 24 on August 7 to 9, then 20, 12 and 8 on August 10 to 12, then 5 on August 13 to 17, then 12, 10, 8 and 12 on August 18 to 21, then 10, 5 and 8 on August 22 to 24, 5 on August 25 and 26, then 12, 18, 25, 12 and 10 on August 27 to 31, then 8, 5, 12, 18 and 8 on September 1 to 5, and 5 on September 6 to 13.

OK1MGW predicts geomagnetic activity will be active to disturbed August 7 and 8, quiet to active August 9, quiet to unsettled August 10 and 11, mostly quiet August

12 and 13, quiet on August 14 and 15, quiet to unsettled August 16 and 17, quiet to active August 18, quiet to unsettled August 19 to 22, mostly quiet August 23, quiet to unsettled August 24, quiet to active August 25 and 26, active to disturbed August 27, quiet August 28, quiet to unsettled August 29 and 30, mostly quiet August 31 and September 1, and quiet to active September 2.

OK1MGW expects increases in solar wind on August 7 to 9 and 25 to 28.

Average daily sunspot numbers for July 2015 were 68.5. This is down from 77.4 in June and 83 in May.

For our three-month moving averages, the peak for the current cycle was in 2014, when the averages centered on February and March were 146.4 and 148.2. The three-month moving averages for the remainder of 2014 were all above 100. The averages centered on January through June 2015 were 98.2, 78.1, 68.2, 72.4, 77.7, and 76.3. So the last figure, centered on June averages all the daily sunspot numbers from May 1 through July 31.

We had no reports from readers, except K7HV in Seattle mentioned to me that he observes reliable paths to Europe on 20 meters after local sunset.

N2EIO, David Jennings of Ladys Island, South Carolina (between Charleston and Savannah, Georgia) asked about how to use the numbers we report in this bulletin, and we like to see the solar flux and the sunspot numbers high, and the geomagnetic A and K index low. At the bottom of this bulletin are some resources, including a link to the K9LA web site. From there you can download W6ELprop for doing your own predictions from your location. So if we see that the predicted solar flux is around 110, W6ELprop says from his location at 32.44 degrees north, 80.64 degrees west a path to Hungary for today on 20 meters would be best around 2100 to 0100 UTC, with another possible opening around 0430 to 0530 UTC. 40 meters would be best around 0000 UTC to 0500 UTC.

Checking paths to Costa Rica, 40 meters should be open all day and night, with strongest signals from 0030 to 1030 UTC, and 20 meters having the best path at 2130 to 0700 UTC. Check out the projections from your location.

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

the 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/>.

My own archives of the NOAA/USAF daily 45 day forecast for solar flux and planetary A index are in downloadable spreadsheet format at <http://bit.ly/1VOqf9B> and <http://bit.ly/1DcpaC5> .

Click on "Download this file" to download the archive and ignore the security warning about file format. Pop-up blockers may suppress download. I've had better luck with Firefox than IE.

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 30 through August 5 were 83, 71, 70, 51, 62, 68, and 87, with a mean of 70.3. 10.7 cm flux was 102, 100.7, 102.9, 101.5, 105.6, 106.8, and 112.2, with a mean of 104.5. Estimated planetary A indices were 12, 14, 10, 11, 6, 7, and 6, with a mean of 9.4. Estimated mid-latitude A indices were 12, 16, 9, 13, 9, 9, and 7, with a mean of 10.7.

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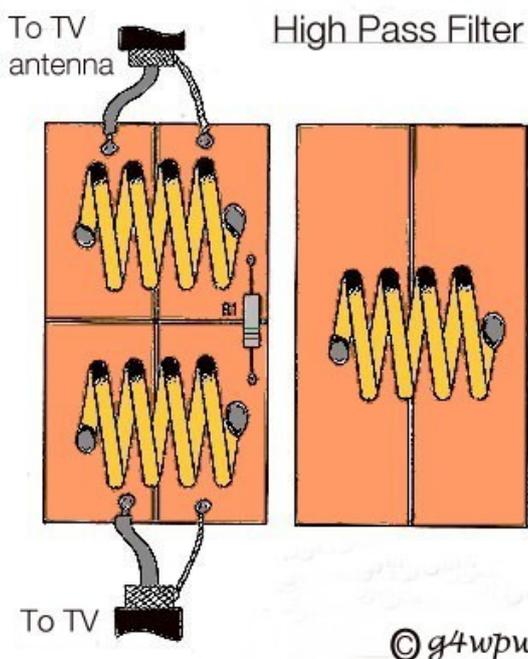
## T.V.I. FILTERS

diagrams and photo's by g4wpx

The High pass filter is for insertion into the lead from the TV antenna to the TV. The insertion loss of this filter is very low, it is of the ( braid breaker ) type for HF and VHF/UHF frequencies.

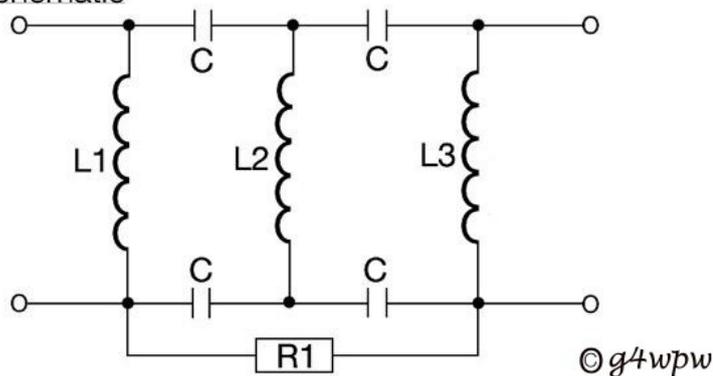
The Filter comprises of a 1 inch by 2 inch double sided copper clad printed circuit board. The Upper side of the board has a " cross " pattern cut into the copper and

the underside has a single cut lengthways as seen on the diagrams. The 3 coils consist of 4 turns of 18 swg enamel wire a quarter of an inch in diameter spread to half inch length, 2 soldered on the upper side of the board and the remaining coil soldered on the underside. R1 is a 1meg ohm or above 1/4 watt resistor soldered as shown this is the static discharge path. ( I used a 4.7 meg ohm.) 2 short lengths of TV antenna cable ( about 6 inches each ) are connected as shown to the upper side of the board ( the braids are on the same side and the center core's are on the same side THIS IS IMPORTANT ) TV antenna coaxial male plug can be fitted on the end of one cable and a female plug to the end of the other cable this makes connection and removal easy.



L1 and L3 are on the upper side of the board L2 on the underside C is the capacitance of the copper "plate's" between both sides of the board approx 2pf for each capacitor.

Filter Schematic



### **BASIC PRINCIPLE'S**

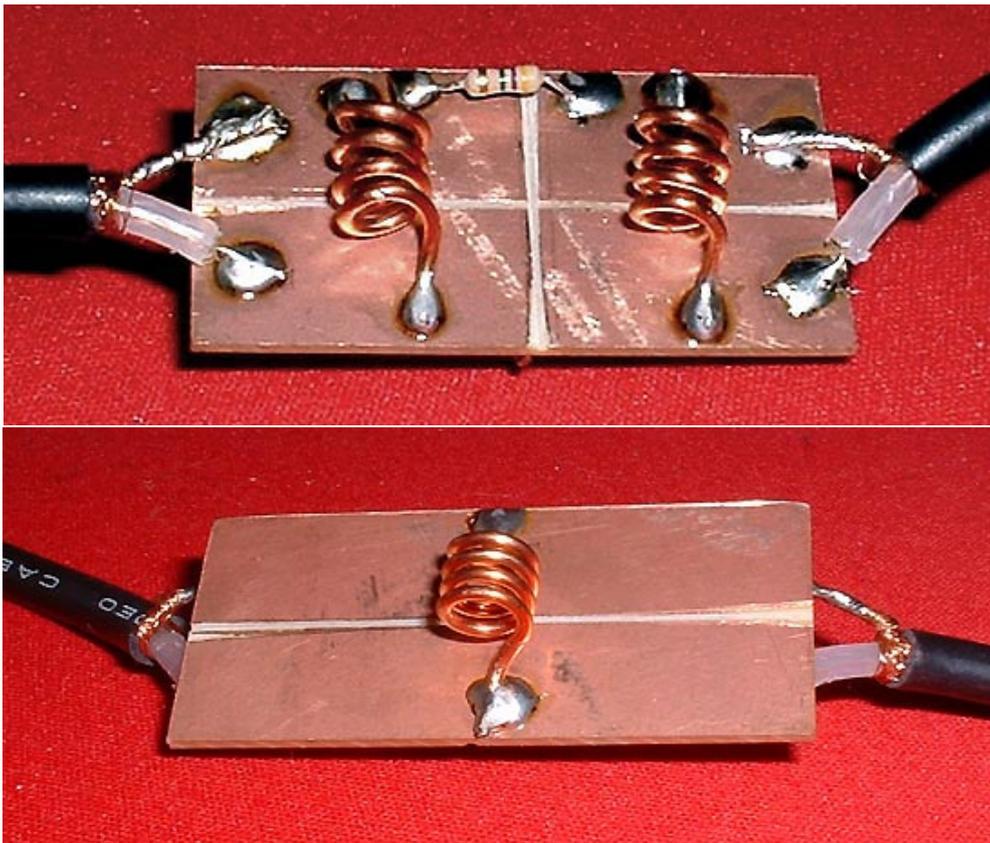
This combined braid-breaker and high pass filter prevents HF signal currents from flowing down the inner and outer of the TV antenna coax cable. L1,L2,L3 have a low reactance to HF and VHF signals, thereby by-passing ( shorting ) the interfering currents.

The capacitors have high reactance to HF/VHF signals, effectively blocking these "interfering" signals from the TV receiver.

At the TV receive frequencies the conditions are reversed, the capacitors presenting a low impedance path to the TV received signals enabling them to pass, and L1,L2,L3 presents a high impedance at this frequency thereby having no effect on the received TV signals.

R1 is for static discharge of the outer screen of the TV antenna coax.

Below are two pictures of the finished filter.



FARADAY LOOP FILTERS.( Braid Breaker )

Faraday loop

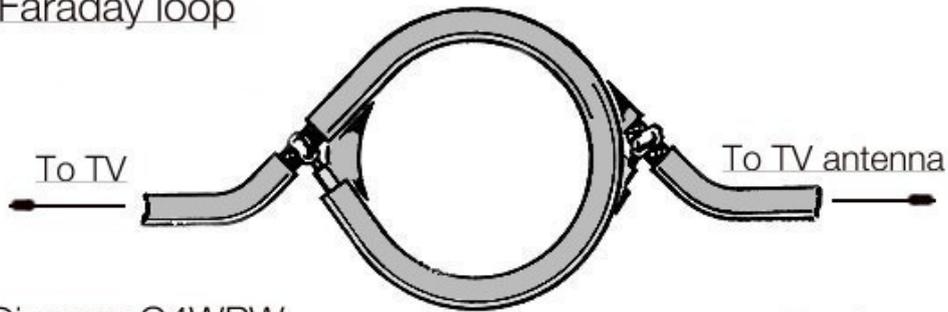
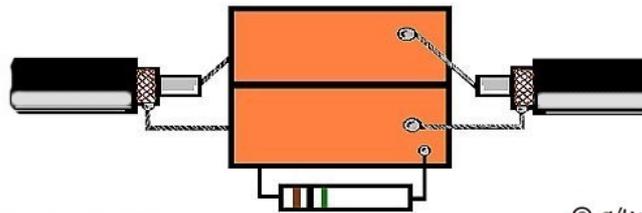


Diagram G4WPW

© g4wpw

The Faraday loop filter comprises of 2 loops of the TV antenna coax 2.5 inch diameter, tape'd side by side, The TV antenna feeder is cut and each loop is soldered to its own braid as shown above. The loss on this type of filter is high and should only be used in a good TV signal area.



© g4wpw

Above is the modern version of the braid breaker type of filter it comprises of a 1 inch square of double side'd copper PCB with a saw cut down the center, the TV antenna feeder is connected as shown on the above diagram, the board is cut the same on both sides, and the coax connections are the same on both sides I have found the insertion loss to be much lower than the Faraday loop. it is also a good idea to fit a 1 meg ohm resistor between both braid connections of the PCB as a static discharge path.AS WITH THE FIRST FILTER A COIL CAN ALSO BE ADDED ON EITHER SIDE



<http://www.dxzone.com/cgi-bin/dir/jump2.cgi?ID=31216>

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## You Can Talk to the ISS With Nothing But a Ham Radio

You've just got to time it right.



Adrian Lane of Gloucestershire, England, [got in touch with the International Space Station the other day](#). Thanks to impeccable timing and a prime location under the ISS's path above the Earth, Lane was able to have a brief conversation with space station's crew via ham radio. It must be surreal to have a casual chat with humans who are floating up there in the void, but technologically, it's really not even that

hard.

The use of amateur-grade ham radio as a means to talk to Earth from spaces [goes back decades](#) to when astronaut Owen Garriott brought a handheld ham radio with him as part of the Shuttle Amateur Radio Experiment (SAREX) and used it to chat with students and other amateur radio while careening around the Earth at 17,000 mph.

Since then, the SAREX project has evolved into [Amateur Radio on the International Space Station](#) (ARISS), which maintains a ham radio station on the ISS that astronauts can use to chat with radio (and space) enthusiasts back here on the blue marble. There are two ways to get in touch. ARISS will [schedule astronaut chat-time](#) for schools or other educational organizations, but you can also just try your luck. Ham-licensed astronauts on the ISS can spend their downtime at the station's ham setup just chatting with Earthlings at random, and if you time it right, you could make contact.

Whether you'd be so lucky depends on a number of factors, like whether the astronauts are awake at the time, and whether they're busy doing other important space-work. That, and you just have to be in range. Not only does the ISS criss-cross the spinning globe in its orbit, [its also moving insanely fast](#) at a speed of nearly 5 miles per second. Those two factors combined make windows of communication with the ISS rare and fleeting for any particular point on Earth.

During his four-minute window, Adrian Lane managed to chat with the astronauts on the space station for a brief 50 seconds. The conversation was brief and unremarkable. [According to The Telegraph](#), he asked what space was like and they responded that it was dark; the outer-space equivalent of talking about the weather. "I was buzzing," [Lane said](#). "It's not every day you get to talk to some guy out in space." And the fact that just about anyone with a ham radio can give it a shot is nothing short of incredible.

You can find more technical details about the process on [the website for the ARISS](#). And if you're going to try it out, good luck!

-Eric Limer (Popular Mechanics)

## Student CubeSat will have SSB/CW transponder

A student CubeSat project **Nayif-1** is expected to launch this year, it will provide an amateur radio linear transponder for SSB/CW communications

Nayif-1 is an educational single CubeSat project with the goal of providing an actual space project for Emirati University students. Additionally it is intended to enthuse and educate young people about radio, space physics and electronics.



The 1U CubeSat is a collaboration between the Mohammed Bin Rashid Space Center and the American University of Sharjah both in the United Arab Emirates.

The spacecraft will only require simple ground station antennas and an SDR dongle receiver. This will make it uncomplicated for schools and colleges to use with their students.

It is anticipated Nayif-1 will be launched into an elliptical, sun synchronous, Low Earth Orbit (LEO) about 400 by 750 km. In such an orbit the satellite passes over the Emirates at least twice a day. This would allow the morning passes to be used for educational purposes and the evening passes for Amateur Radio communications.

The student team will develop and operate a special ground station for this spacecraft. They will also be developing a unique "Dashboard" to display the received telemetry data and greetings messages in Arabic.

Nayif-1 will incorporate a novel autonomous attitude determination and control system. This will be the first flight of this system. Additionally it will carry a UHF to VHF linear transponder (FUNcube-5) that will have up to 0.5 watt output and which can be used by Radio Amateurs worldwide for SSB and CW communications.

A launch is planned for late 2015 on a SpaceX Falcon 9.

IARU coordinated frequencies for NAYIF-1:

- 145.940 MHz 1200 bps BPSK FUNcube beacon
- 500 mW inverting SSB/CW linear transponder
  - 435.045-435.015 MHz Uplink
  - 145.960-145.990 MHz Downlink

Follow Nayif-1 on Twitter <https://twitter.com/Nayifone>

Nayif-1 <http://amsat-uk.org/satellites/communications/nayif-1/>



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levels.

*It deserves our full support  
if we are to continue to have  
the frequencies and operating privileges  
we currently enjoy.*

**The Association  
is what you and I make it.**

## Upcoming Happenings & Events

| <i>Date</i>        | <i>Happenings &amp; Events</i>    |
|--------------------|-----------------------------------|
| <b>1-2 August</b>  | <b>NZART Brass Monkey Contest</b> |
| 3rd August         | HF Net, 3.575 MHz, 19:30          |
| 4th August         | VHF Net, 146.525 MHz, 20:00       |
| <b>7th August</b>  | <b>NZART HQ-Infoline</b>          |
| <b>8th August</b>  | <b>Hamilton Market Day</b>        |
| 10th August        | HF Net, 3.575 MHz, 19:30          |
| 11th August        | VHF Net, 146.525 MHz, 20:00       |
| 17th August        | HF Net, 3.575 MHz, 19:30          |
| 18th August        | VHF Net, 146.525 MHz, 20:00       |
| <b>19th August</b> | <b>Club General Meeting</b>       |
| <b>21st August</b> | <b>NZART HQ-Infoline</b>          |
| 24th August        | HF Net, 3.575 MHz, 19:30          |
| 25th August        | VHF Net, 146.525 MHz, 20:00       |
| <b>30th August</b> | <b>NZART Official Broadcast</b>   |
| 31st August        | HF Net, 3.575 MHz, 19:30          |
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**4th September—NZART HQ-Infoline**  
**16th September—Club General Meeting**  
**18th September—NZART HQ-Infoline**  
**27th September—NZART Official Broadcast**  
**2nd October—NZART HQ-Infoline**  
**3-4 October—NZART Microwave Contest**  
**16th October—NZART HQ-Infoline**  
**25th October—NZART Official Broadcast**  
**5-6 December—NZART Field Day Contest**  
**6-7 February 2016—NZART DX Weekend Contest**  
**27-28 February 2016—NZART Jock White Memorial Field Days Contest**  
**2-3 April 2016—NZART Low Band Contest**  
**21-22 May 2016—NZART Sangster Shield Contest**  
**4-5 June 2016—NZART Hibernation Contest**  
**2-3 July 2016—NZART Memorial Contest**

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

| <u>Club Information</u>  |   |
|--------------------------|---|
| <b>Contacts :-</b>       |   |
| <b>Business Meeting:</b> | 1930 First Wednesday of each month except January<br>88 Seddon Road, Hamilton |
| <b>General Meeting:</b>  | 1930 Third Wednesday of each month (except Jan)<br>88 Seddon Road, Hamilton   |
| <b>Homepage:</b>         | <a href="http://www.z1ux.org.nz">http://www.z1ux.org.nz</a>                   |
| <b>eMail:</b>            | <a href="mailto:branch.12@nzart.org.nz">branch.12@nzart.org.nz</a>            |
| <b>HF Net:</b>           | 3.575MHz LSB 1930 Mondays   |
| <b>VHF Net:</b>          | 146.525MHz simplex 2000 Tuesdays  |
| <b>2m Repeater:</b>      | 145.325MHz -600kHz split  |
| <b>STSP</b>              | 146.675MHz -600kHz split  |
| <b>Repeaters:</b>        | 438.725MHz -5 MHz split   |
| <b>ATV Repeater:</b>     | Off air pending channel changes   |



*Cover Photo: A radio for the Bruce Kelly  
1929 QSO Party [http://  
www.amateurradio.com/building-for-the-bk/](http://www.amateurradio.com/building-for-the-bk/)*

|        |  |
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