Ham Hum

November 2015

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

Hamilton Amateur Radio Club Inc.
Serving the Hamilton Community for over 90 Years
ZL1UX

Next Meeting 18th November : 19:30

Robin Holdsworth on capacitors and dielectrics

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From the Editor

As you can see on Page 10, November is Bridge to Bridge month. Mike (ZL2MGS) will be looking for people to help on Saturday & Sunday with a mix of locations from Cambridge to Taupiri. A 2m radio, batteries and an aerial on a stick (to help reach the STSP if you are on the water) is all you'll need. It's all about recording boat numbers as they speed by, or float by if they have problems. Let Mike know if you'd like to spend some time by the river.

While this next bit isn't related to Hamilton Branch 12, it may be relevant to those that use the various local repeaters. The Waikato VHF Group (Branch 81) operate and maintain a number of repeaters around the Waikato and BOP. If you would like to sponsor a repeater, or join Br 81, please visit http://zl1is.info/sites.html or http://zl1is.info/join.html I understand you can ask Gavin (ZL1GWP) about this if you want to.

SB PROP ARL ARLP044
ARLP044 Propagation de K7RA

Solar flux and sunspot numbers barely budged last week. Average daily sunspot numbers went from 75 in the previous seven days to 77.6 in the week ending October 28. Average daily solar flux went from 118.2 to 110.9.

Predicted solar flux is 110 on October 30, 105 on October 31 and November 1, 100 on November 2, 95 on November 3-4, 90 on November 5, 85 on November 6-8, 90 on November 9, 95 on November 10-11, then 100, 105 and 110 on November 12-14, 115 on November 15-16, then 120, 115 and 110 on November 17-19, and 105 on November 20-24. Flux values then drop to 85 on November 30 through December 5, and next rise above 100 a few days later.

Predicted planetary A index is 12 on October 30-31, 8 on November 1-2, 45 on November 3-4, then 20, 15 and 12 on November 5-7, then 20, 25, 20 and 10 on November 8-11, and 8, 12 and 20 on November 12-14, 5, 8 and 12 on November 15-17, then down to 5 on November 18-21.

Geomagnetic conditions remain unsettled, then on November 30 through December 2 planetary A index is predicted to rise to 50, 40, and 25, an echo of the high values on November 3-5. In fact, this activity would be from the same area of the Sun a whole solar rotation later, which takes about 27-28 days.

Here is a geomagnetic outlook from Petr Kolman, OK1MGW of the Czech Propagation Interest Group.

He expects the geomagnetic field to be quiet to unsettled October 30, quiet to active October 31 through November 3, active to disturbed November 4-5, quiet to unsettled November 6, quiet to active November 7-9, quiet to unsettled November 10, quiet to active November 11-13, mostly quiet November 14, quiet November 15 -16, mostly quiet November 17-24 and quiet to unsettled November 25.

Petr predicts increased solar wind on November 1-5 and 11-13.

Dave Bono, K6OAK of Fremont, California sent this space weather story from the web:

http://wapo.st/1LExZWi

Jon Jones, N0JK of Lawrence, Kansas wrote this:

"Remarkably good conditions on 10 meters during the CQ WW SSB contest last weekend. The higher solar flux and generally quiet geomagnetic field helped north-

ern paths. A CME impact on October 24 sparked no geomagnetic storming. Spaceweather.com noted 'Solar wind speeds abruptly jumped to more than 500 km/s as the CME passed by. The shockwave rattled Earth's magnetic field and caused electrical currents to flow through the ground of Norway's Lofoten islands. However, that's about all that happened. A full-fledged geomagnetic storm did not erupt, and few auroras have been reported. Why was the CME so ineffective? Its internal magnetic field did not connect to Earth's magnetic field; the mismatch mitigated the CME's impact.'

"JAs were well over S-9 Saturday afternoon of the contest to eastern Kansas. Europeans were very loud Sunday morning. The opening Sunday morning extended deep into Europe and even Asia. I worked Cyprus (P33W) and Crete (SV9GPV) for new ones with just 5 watts while mobile on 10."

Jeff Hartley, N8II of Shepherdstown, Kentucky sent this report:

"October 19 began a very noticeable increase in the HF MUF with not much happening on 12 and 10 meters before then. I worked G3KML running 2 watts on both 12 and 10 meters in and out of the noise that day, but many other signals were S9.

"Besides many German and Dutch stations on 10 meter phone on the October 20, I was called by RA1WP and R2DEV both S9.

"The K index climbed to 3 at 1500Z on the October 21, but the UK was still booming in here on 10 meters from 1339-1413Z. The first good northern European opening on 10 meters occurred on October 23 with loud EW, SM, and OH stations logged.

"The CQWW phone conditions were surprisingly good considering the SFI being just above 100. I moved to 10 meters Saturday at 1220Z about 50 minutes past sunrise just as it was opening to Europe with 9A, OK, I, SP, and EA stations the first to come through. At 1250Z Germany was loud and I started to run EU stations. VU2PAI called at 1252Z with a S9 signal.

"Scandinavian signals were also loud at that time. The first 10 meter Russian was a RA1 at 1303Z, but I never managed to work many Russians on 10 the whole weekend despite some spotty loud signals. Six EA6 stations were logged on 10, by far the best activity from the Balearic Islands in a contest for me. Northern Europe was spotty with a gap from 1320-1346Z with none logged, but central and western Europe were loud.

"Stations all over Europe except for northern Scandinavia and just a couple of UK were logged between 1400-1500Z. Just after 1500Z northern Europe faded. In the afternoon signals to the south were generally quite good except for stations from Puerto Rico (closer) who were skipping over my area. On Sunday, 10 me-

ters was spotty for a good part of early and mid-morning. At 1250Z, only a few very southern Europeans were workable, TK, A7, and HZ were logged. I was not able to run stations well until about 1520Z when there was a tremendous opening to northern Europe and Germany. By 1700Z, there were still many loud mainly southern Europeans, but I was not able to run many.

"I operated very sparingly on the low bands. Several have mentioned that 160 was poor which it certainly was around 0100Z Sunday. 75 was in pretty good shape to Europe Friday evening around 0200-0300Z, but about 1/3 of the stations I could hear, could not hear me.

"40 had good propagation around 0130-0200Z too, but was a sea of QRM. At 0000Z Sunday, 40 was not nearly as good to Europe and you could barely tell there was a contest on 75 meters at 0100Z, with very weak Europeans except for EA and also heard some good strength signals from Zone 33 (EF8, CN).

20 meters featured some good propagation to Europe at the start to EI, LX, OK, I, LZ, UR, EA, and F as well as TF and OH8 and a few Zone 18 Asiatic Russians. From AF, Zone 33 was very loud and ZS and D4 were also logged. Skip went long early to the south with the northern 2/3 of Zone 8 gone into the skip zone by around 0020Z. 20 was open to South America, but some signals were very fluttery and weaker than what they might have been another night. Whenever the band was open well to Europe, it was very crowded. Signals were pretty loud most of the day with the strongest European signals around sunrise and again from 1800-2000Z.

"Both afternoons VU2s were in at S9 in the 1800Z hour.

"15 as well was extremely crowded when open to Europe. Sunday morning the band was open very well to all of Europe before 1145Z. A92 Bahrain and Kazakhstan answered my CQs with loud signals as well as northern Europe and Russians from Zones 16 and 17. At 1900Z, the western European big guns were still loud. The northern Caribbean also was skipping over me more than expected, but skip was short at 1900Z Sunday allowing even VP9 to be logged. JAs were loud at 2000Z which is 0500 JST Sunday. Sunday seemed to be the better day on 15."

Jim Smith, K3RTU of Aston, Pennsylvania wrote on October 26:

"Been quite a while since I last wrote you about my backpack QRP activities! This Summer was so stinking hot that I didn't get out very much, especially during July and August, but with the cool down in September and October here in southeast Pennsylvania, I've been quite active. I've been out two to four times a week to my favourite state park. Last week the 'Gods of Propagation' were pretty good to me, but today was spectacular!

"I managed to work 3DA0NJ in Swaziland southeast Africa with my Icom IC-703

running 10 watts SSB and Buddistick vertical. I think I was the first one to answer his CQ at about 1939 UTC on 18.129 MHz. I only received a 2x2 signal report from Nico, but after a few tries he got all my info. Nico is a very patient man with darn good ears and a very big antenna to say the least. I follow your propagation predictions religiously and they have really been helpful as today's results prove. Now that the temperature is cooling down I hope that the propagation continues to warm up even though we are on the downside of the solar cycle!"

As you can see from this week's reports, even with the solar cycle downturn, there is still lots of great propagation.

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 web page 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 the download.

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 October 22 through 28 were 94, 91, 74, 63, 72, 78, and 71, with a mean of 77.6. 10.7 cm flux was 120.5, 114.9, 106.3, 106.4, 106.2, 110.1, and 112.2, with a mean of 110.9. Estimated planetary A indices were 6, 7, 11, 8, 3, 4, and 3, with a mean of 6. Estimated mid-latitude A indices were 4, 5, 10, 7, 2, 3, and 1, with a mean of 4.6.

Ionosondes, the “Fish Finders” of the Ionosphere, and How Ham Radio Can Help Advance Ionospheric Science

An ionosonde is a portmanteau for "ionospheric sounder," instruments managed by educational, government, military and scientific agencies around the world to monitor and measure the ionosphere. You can think of Ionosondes as "fish finders" that find, instead of schools of fish, regions of electrons and electrically charged atoms and molecules in the upper atmosphere.

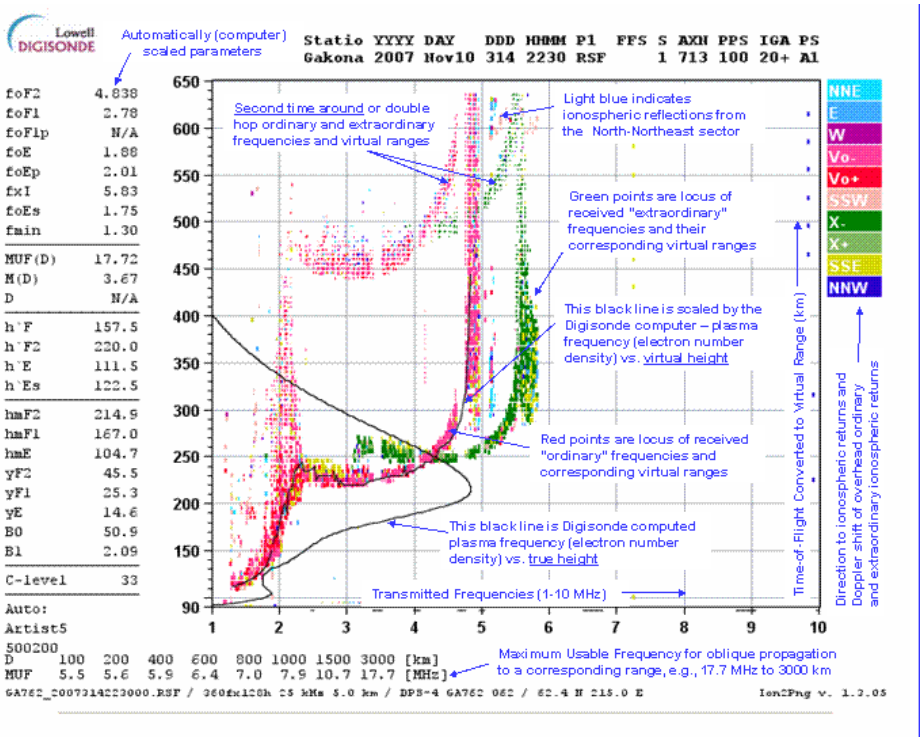
The first ionosondes were invented in the 1920s, grew in sophistication during the 1930s, and were used by both sides during WWII to identify the best shortwave communication frequencies. A thorough history of ionosondes written in 1998 by Dr.Klaus Bibl is downloaded in PDF from the Annals of Geophysics Website here:

http://www.annalsofgeophysics.eu/index.php/annals/article/download/3810/3874
Ionosonde systems incorporate a transmitter tunable from as low as 500-kHz to as high at 40-MHz (1.6 to 12-MHz sweeps are a more typical range), antennas usually pointed straight up, and a receiver that tracks the transmitter listening for echoes reflected back to earth. It is, in other words, a radar system.

Prior Page—One of the four crossed-loop receive antennas used at the now-decommissioned ionosonde site in ***Lerwick, Shetland Islands*** *(http://www.ukssdc.ac.uk/ionosondes/lersite.html)*

Ionospheric weather, like tropospheric weather closer to earth, is in constant flux. The global ionosonde network is periodically mapping the ionosphere measuring the highest frequency reflected back to earth (this is Fc, the critical frequency) and at what height above earth that occurs (which reveals which ionospheric layer is in play). The critical frequency is proportional to charged particle density in each ionospheric layer. Signals at frequencies above Fc at the F2 layer (highest ionospheric layer) continue off into space instead of coming back to earth. Here is an example (see Page 7) of an ionosonde ionogram (vertical axis is km above ground, horizontal axis is frequency in MHz):

Knowing the critical frequency at various points around the world enables calculation of MUF (Maximum Usable Frequency) for shortwave radio broadcast and two-way radio communication in those regions. A useful rule of thumb is the MUF will be around three times the Fc. So, for a Fc of 6.2-MHz the MUF for signals transiting that region of the ionosphere would be around 18.7-MHz. In such conditions, the amateur 17-meter band, centered on 18.1-MHz, would be a great choice for long



distance communication, as would the 20-meter band (14-MHz). The 15-meter band (21 MHz), on the other hand, would likely be 'dead' for paths across that region.

Page 8—Annotated ionogram from Wikipedia (en.wikipedia.org/wiki/Ionogram)

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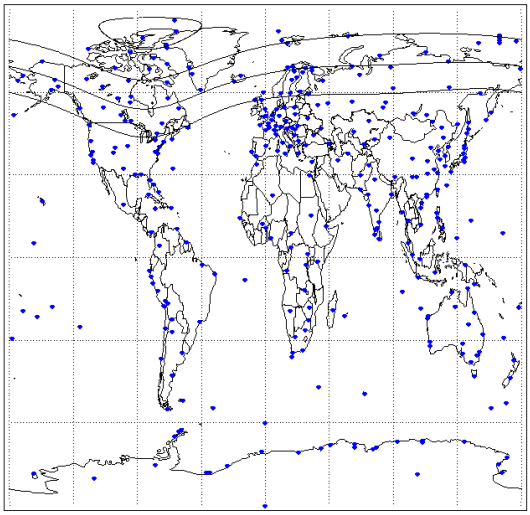
Q: why is the MUF so much higher than the Fc? A: radio waves propagated over long distances are refracted (bent) back to earth at acute angles, not 'bounced' back to earth like a handball off a wall. Less ionization is needed for refraction at low angles than for a return of a signal transmitted straight up.

(In addition to electron density profiles, ionosondes can measure Doppler shifts and polarization of ionospheric echoes. Why hams should care about ordinary and extraordinary waves and the polarization of ionospheric propagated signals will be the topic of a future WØLFA Blog post.)

How many ionosondes are in regular operation around the world and are reporting their data publicly? Best I can tell, it's something around one hundred. The UK Solar System Data Centre has an interactive map (reproduced left) with data on each site, more info at www.ukssdc.ac.uk/wdcc1/ionosondes/world.html.



A hundred ionosondes (+/-) is 'not nothing,' however, the world's a big place, and there are large ionospheric regions going unmapped by the ionosonde network. That's where ham radio comes to the party.

The number of amateur radio operators communicating long distances over shortwave on any given day vastly outnumbers active ionosondes by orders of magnitude. Two of the most popular ham activities are contesting, making as many contacts with as many other hams in as many countries as possible in a given period, typically over a weekend, and DXing, contacting as many countries as possible in one's lifetime during or outside of contests, the more obscure and hard-to-contact, the better.

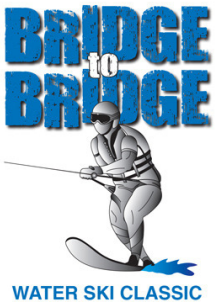
"Contesters" and "DXers," which are not mutually exclusive groups, tend to be very knowledgeable about radio propagation from their own extensive observations. Knowing what bands to operate on and at what times given the current state of the ionosphere can give a contester a winning edge or help a DXer snag an elusive country.

Hams have developed several innovative tools to collect, correlate and analyze the large number of ionospheric observations taking place on the ham bands every day. Every successful contact, a "QSO' in ham-speak, is a data point. The American Radio Relay League's Logbook of the World database is closing in on a billion QSO records from over 80,000 contributors! More data = better science.

-Bill AA7XT

AREC—Bridge to Bridge

The annual Bridge-to-Bridge ski race event is to be held on the weekend of 28-29th November.



This is our major AREC activity for the year and we need our member's assistance. If you, or any other amateur operators you know of would like to participate on either or both days - we especially need operators for the long race on Sunday - please contact Mike Sanders, AREC Section Leader (contact details are on page 2).

Potential operators don't need to be a Branch 12 member.

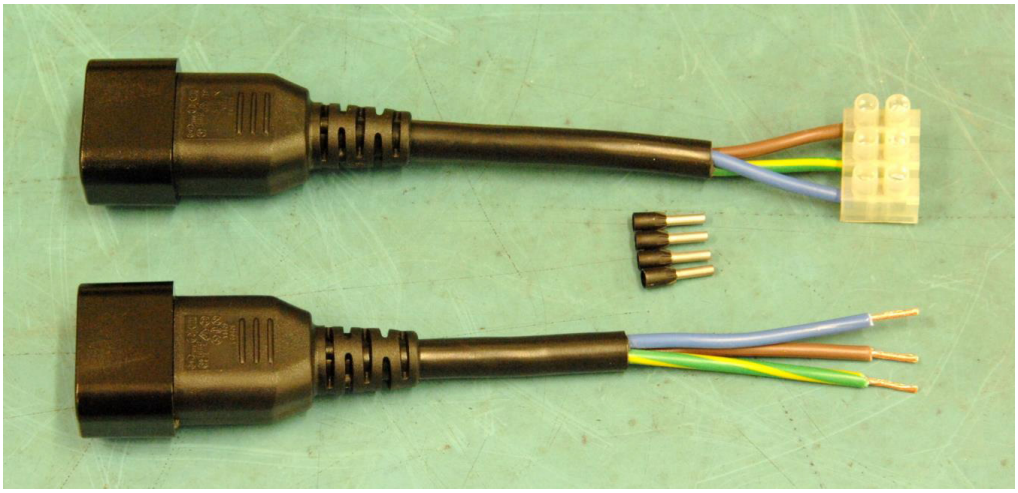
A handheld/mobile rig with enough battery to last the day and

an aerial attached to something to give a little bit of height to help reach the repeater is all that is needed.

-ZL2MGS

“Safe Death leads” by VK3TGX

How many times have you found the need to power up an item of 240V equipment, but it does not have a power cord? If you are like me, that is nothing un-



usual. I.e. you are building a power supply and you need to check out a few transformers to find out their output voltages etc.

Usually you reach out for a death lead. (A 240V plug and lead with bare ends) Now if you have a clean work bench with just the item needing power, and your lead, usually all is well. However that is rarely (never) the case, the death lead ends up being one of many leads on the bench, then add in other distractions like walking away and coming back tomorrow, then the chance of mixing up the leads becomes a real possibility, followed by a ‘boot’ from the lead that you thought you had just unplugged!

Well here is a possible solution. These are IEC sockets with very short leads, scavenged from old computer equipment etc. To use them, just connect them to whatever needs power, then when you are happy with the connections, then and

only then connect an IEC power lead, plug in and switch on.

If you need to alter the wiring, pull out the IEC lead from one of these and it is now completely safe. It does not matter if you mixed up the leads etc, if you pull the lead from the adapter; it is now safe to work on. If you only ever wire up etc. with no lead attached, you are should be safe. – No more death lead woes

Also in the picture, between the two adapters are some 'boot lace ferrules' they are slipped over the bare lead ends, then crimped into place, very handy for a lead that will see many connect/disconnects, avoiding having the individual wire strands becoming a mashed up mess. It is **NEVER** a good idea to tin wire ends intended for screw terminals as the solder will eventually flow and leave the joint loose, and dangerous. Yes these are only for temporary use, but why get yourself into bad habits, that will bite you one day.

Other equipment worthy of consideration for this type of work are earth leakage breakers (Safety switches) and isolation transformers.

-VK3TGX

Upcoming Happenings & Events

Date	*Happenings & Events*
2nd November	HF Net, 3.575 MHz, 19:30
3rd November	VHF Net, 146.525 MHz, 20:00
6th November	**NZART HQ-Infoline**
9th November	HF Net, 3.575 MHz, 19:30
10th November	VHF Net, 146.525 MHz, 20:00
9th November	HF Net, 3.575 MHz, 19:30
10th November	VHF Net, 146.525 MHz, 20:00
18th November	**Club General Meeting**
20th November	**NZART HQ-Infoline**
23rd November	HF Net, 3.575 MHz, 19:30
24th November	VHF Net, 146.525 MHz, 20:00
27th-29th November	**Bridge to Bridge Ski Race (AREC)**
29th November	**NZART Official Broadcast**
30th November	HF Net, 3.575 MHz, 19:30

4th December—NZART HQ-Infoline

5th December—Annual club end-of-year BBQ

5-6 December—NZART Field Day Contest

16th December—No meeting, replaced by BBQ on 5th

20th December—NZART Official Broadcast

31st January—NO Official Broadcast in January

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

16th July 2016—WIA VK/ZL Trans-Tasman Low-Band Contest

6-7 August 2016—NZART Brass Monkey Contest

1-2 October 2016—NZART Microwave Contest

5th November 2016—NZART Straight Key Night

3-4 December 2016—NZART Field Day Contest

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

Club Information

Contacts :-	
Business Meeting:	1930 First Wednesday of each month except January 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:	3.575MHz LSB 1930 Mondays
VHF Net:	146.525MHz simplex 2000 Tuesdays
2m Repeater:	145.325MHz -600kHz split
STSP Repeaters:	146.675MHz -600kHz split 438.725MHz -5 MHz split
ATV Repeater:	Off air pending channel changes

Cover Photo: Grantham St Boatramp during a previous years Bridge to Bridge—photo from eventfinder.co.nz

Sender	Hamilton Amateur Radio Club (Inc) PO Box 606 Hamilton 3240