

# Kilowatter

The voice of the KW Amateur Radio Club

September 2006

Since 1922

## Kitchener-Waterloo Amateur Radio Club

133 Weber St. N. Suite #3-138  
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N2J 3G9

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## MONDAY'S MEETING

Date: Monday September 11th 2006

Time: 7:30pm

Place: RCAF Wing 404 Club. End of Dutton Dr. Waterloo. Off Weber St. N

## UPCOMING EVENTS

<a href="#">VHARA Hamfest 2006</a> Victoria-Haliburton Amateur Radio Association. Saturday, August 26, 2006, Lindsay ON	<a href="#">Barrie Hamfest</a> Barrie Amateur Radio Club Saturday, September 9, 2006, Barrie ON
<a href="#">Brantford Amateur Radio Club Hamfest 2006</a> Brantford Amateur Radio Club Saturday, August 19, 2006, Brantford ON	<a href="#">Hamilton Amateur Radio Club "HAMFEST 2006"</a> Hamilton Amateur Radio Club Saturday, October 14, 2006, Ancaster ON
<a href="#">ONTARIO HAMFEST</a> Burlington Amateur Radio Club Saturday, July 8, 2006, Milton ON	<a href="#">London Amateur Radio Club 29th Annual Fleamarket</a> London Amateur Radio Club Sunday, September 24, 2006, London Ontario ON
<a href="#">York Region Hamfest</a> York Region Amateur Radio Club Starts on Saturday, October 28, 2006, Markham ON	<a href="#">Central Ontario Hamfest &amp; Fleamarket</a> Guelph ARC & Kitchener Waterloo ARC June 9, 2007, Fergus ON

### KWARC Directors 2005-2006

President	Bob Pelling	VE3XNB	885-9995
Vice President			
Past President	Gord Hayward	VE3EOS	744-7205
Treasurer	Al Macdonald	VA3TET	741-0281
Secretary	Ben Sasiela	VE3ST	748-0445
Director	Tedd Doda	VE3TJD	634-5949
Director	Bill Riddell	VE3WFR	571-9875

### The Executive Committee Chairs

Program	vacant		
Technical	Tedd Doda	VE3TJD	634-5949
Packet	Tedd Doda	VE3TJD	634-5949
Database Mgr	Dave Schwartz	VA3DGS	884-3594
Bulletin Editor	Dennis Tabbert	VA3DLT	463-9641
Edu. Co-Ord	Ron Gimbel	VE3DBD	584-2009
Chief Examiner	Vern Stroud	VE3RVS	743-9342
Auto Patch	Ben Sasiela	VE3ST	748-0445
ARES Manager	Larry Gorman	VE3LGN	884-6782
CANWARN Mgr.	Bob Pelling	VE3XNB	885-9995
QSL Manager	Gord Gibson	VE3NQG	893-5148
Inventory	Ben Sasiela	VE3ST	748-0445
Field Day	Bob Pelling	VE3XNB	885-9995
Webmaster	Dennis Tabbert	VA3DLT	463-9641
Bereavement	Marg Cassel	VE3RE	634-5139
Flea Market	Bob Pelling	VE3XNB	885-9995
QCWA Rep	Harold Braun	VE3DWH	884-2388

### KWARC Owned Repeaters/Nodes

Mode	Call	Freq.	PL	patch	Location
Voice	VE3KSR	146.970	131.8		Baden Hill
Voice	VE3RCK	146.865	131.8	Yes	Mannheim
Packet	VE3KSR-0	145.010			Baden Hill
Packet	VE3KWQ	145.090			Waterloo
Voice	VE3IXY	224.340	131.8		Mannheim
IRLP	VE3RBM	444.875	131.8		Mannheim
Echolink	VE3SED	53.370	131.8		Baden Hill
Voice	VE3SED	442.200	131.8		Baden Hill
Special Events		147.510			Kitchener

### Other Area Repeaters/Nodes

Mode	Call	Freq.	PL	patch	Location
Voice	VE3ERC	444.700	N		Elmira
Voice	VE3KFM	442.000	Y	open	Kitchener
Voice	VE3RND	145.330	Y		Plattsville
Voice	VE3SWR	146.790	N		Cambridge
IRLP	VE3WFM	147.090	N		Waterloo
Voice	VE3WWW	146.835	N		U of W
Voice	VE3RSS	147.030	N	members	Acton
ULR Link	VE3BHR	447.075	Y		Baden Hill
Voice	VE3RKL	443.850	N		Guelph
Voice	VE3ZMG	145.210	N	open	Guelph
Packet	VE3VIQ	145.570			Guelph
TCP/IP	VE3MKY	145.570			Guelph
TCP/IP	VE3UOW	145.570			U of W B
Voice	VE3BAY	442.350	Y		Kitchener

## Your Opinion Wanted On The Restructuring Amateur Radio in Canada

RAC has formed a committee to look into and make recommendations on the restructuring of the certification process for Amateur Radio operators.

As in the case of Great Britain, Canada's hams are aging. The solution in Britain was to introduce a new class of licence: the Foundation License.

This licence certification process is based on practical knowledge with the intent of having new operators on the air quickly, and with sufficient knowledge to operate proficiently, safely and avoid interference problems. Theoretical concepts are minimized in the preparation for this class of licence. A mandatory 10 to 12 hour preparation course is required with a short multiple choice test at the end.

This produced over 4000 new operators in the first year, with one-quarter of these under the age of 21. The privileges granted with this new certificate are operating up to 10 watts power limit, access to all UK ham bands and modes except 10 metres, and a distinctive call sign

The same thing has occurred in Australia. Since the introduction of the foundation license in October 2005, over 250 new licenses have been issued. Here, Foundation Licence holders are not allowed on 20 metres, but may operate from 80 m to 70 cm at up to 10 W of power in AM, FM, CW and SSB.

The foundation license is just the first level of a three-tiered certification process in both these countries.

For members of KWARC who also are RAC members, this may not be news. Information on the Foundation Licence and the experiences of the UK and Australia has appeared on the pages of the last three issues TCA .

Is it time for a change in Canada? That is what you get to tell the committee.

An on-line survey is being conducted by the Restructuring of Amateur Radio in Canada Committee. It takes about 10 minutes to complete and can be accessed from the RAC website's Regulatory Info/Restructuring in Canada page :

( <http://www.rac.ca/regulatory/restructuring.htm> )

You are asked to use MS Internet Explorer to access and complete the survey.

In this part of the website, you will also find a copy of TCA articles on restructuring, a powerpoint presentation on the topic, and links to the UK and Australian websites.

## [Boatanchor Rehabilitation Gord Hayward VE3EOS](#)



### . Boatanchor Rehabilitation - The R390A Project

Last year, I described some of the smaller rehabilitation projects that I have done. Now I'll start a multi-part series on the best tube rig ever built, the Collins R-390A. It was designed for the US military and is still one of the ones liked by intercept operators although it's been replaced by solid state receivers. I've heard that the static electricity in the dryness of 'Desert Storm' was such a problem for the semiconductors that they dug out some R390A's and pressed them into service.

I got mine from one of the AMer's in Buffalo and it was in great shape, but still needed work to get it into excellent running order. When I brought it home I started with the usual basic stuff before plugging it in - replace the two wire power cord with a grounded one and replace the fuses. Then the overall inspection. The headphone jack was somewhat corroded so it got replaced.

The next replacement was the power supply filters. Electrolytics are always suspect and the web documents identified the ones made by General Instruments as being particularly bad, with a habit of exploding. Sure enough mine were GI. The good news was the two units were octal plugins. The purists open the old cans and cook out the guts to put new capacitors inside. I'm not so fanatic so rather than using a torch to get the ukkumpukky out (that's the official name for the black goo in the electrolytic cans), I used two new octal plug bases and let the new capacitors hang out. They are quite a bit smaller than the older types so fit wasn't a problem.

Beyond that I was very daunted by the apparent task of cleaning and aligning the set. There are about 200 parts in the tuning gear box and about 100 electrical alignment points. Fortunately there's a wealth of information on the web so I started reading (I'm still reading!). There were ominous warnings in the readings - the coupling capacitor between an IF stage and the mechanical filters was tight in its voltage rating. If it fails the usual symptom is the set goes dead as the B+ voltage burns out the mechanical filter coils, one by one as the operator switches the bandwidth. Expensive if you can still get them. Without any testing I went into the IF and replaced it and a few other capacitors with much higher rated units (630 volts should be enough).

The last inspection was the gear train. There was a lot of grey goo that has solidified over the years sticking in the teeth and the motion was sticky and stiff. Sharp tools scratch brass gears leaving burrs that also bind so the tool of choice was the wooden tooth pick. I cleaned the gears one tooth at a time (that's why the wooden sticks are called tooth picks) and finished with paper towels wet with a small amount of light oil. After a few evenings of this the motion was smooth, not too stiff and the gears were a shiny brass colour. There are alignment marks on the cams to set their position at a dial setting of 7.000 MHz and now that the gears were clean I could see them. All were good except the right hand one, so I loosened its collar and set it to the mark. You are probably asking yourself 'Why that many gears?' The tuning is accomplished by moving slugs in coils rather than variable capacitors. This makes the set very frequency stable but also means that many stages must be moved simultaneously. Its impressive to watch so many slugs move in concert as the tuning knob is turned and I was lucky - none of the slugs were stuck. Unsticking them is a real pain.

Now that the preliminary checks were done it was time to turn it on. I plugged it into a variac and brought the voltage up slowly. Too fast is hard on the filaments and some of the tubes are hard to replace. Later I added a thermistor surge protector in series with the AC line to bring the power up slowly. On the AM broadcast band there was music - it was alive. The set was running but the signals weren't strong, there was no AGC action, lots of hum from the noise limiter and two of the HF bands were completely dead. More work to do.

## Cabot Head Lighthouse Aug. 2006



Well another lighthouse contest, has come and gone. This year was a bit more organized, than last year. We chose to go up to the lighthouse on the Sunday night. That way we could take time to get things sorted out.

The trip was a relaxing trip. Things had been quiet that day, at the lighthouse. , So that worked to our advantage.

Monday morning, the antenna went up., with the help of Guy, the site manager. Later Greg, VE3NXB from Red Bay, came up and with the help of an antenna tuner, we worked among others, VC2W we found that, the antenna worked better north and south. After testing the antenna during the week on 20 m and 40 m, we where to go on Friday night.

The week went, not too bad, our friends the flies were as vicious as ever. On Wednesday, we went to Tobermory, to meet the ferry. Our family was coming over from the Island

After we had supper we headed back to lighthouse, in time for a power failure. Our family headed home to Kitchener All of that in a rain storm. We had very little rain, but it did keep the flies down. for the rest of the week.

I forgot to mention, that our resident bat was also there.

Friday night came, and the contest was under way. The first contact was with St Pierre... Saturday morning brought Scabbard Is... Special event stations, made their voices heard. Sunday morning, brought a lighthouse in Scotland. And the Tesla station as well as a new IOTA.

In fact one Maritime mobile station, gave out 3 lighthouses.

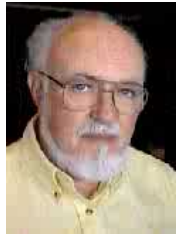
All went well, this year. The results showed that the contacts were up. 64 contacts, 27 lighthouse Total points 454 this was a definite improvement.

All in all it was a good year, the antenna designed by Bill VE3ETK worked well. So now I have a 20/40 m antenna, made out of 450 ohm ladder line.

So now the plans are under way for next year.

Gordon Gibson VE3RGG

May 1, 2006

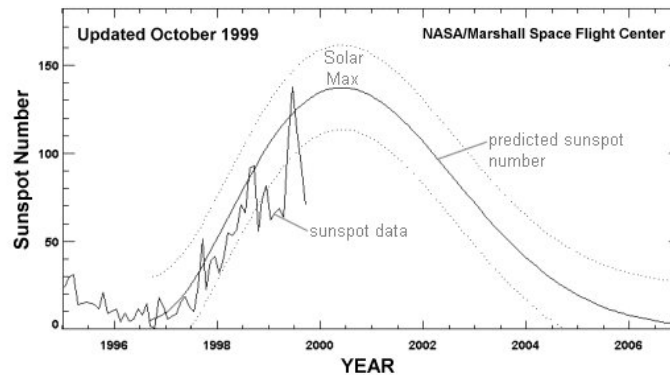


# A DX Propagation Primer, or, how your signal gets from you to another ham.

## Part 2 Compiled by VE3ETK

In June we covered the basic situations involving the Sun's radiations and how they ionize the various layers of our atmosphere, and in turn how that affects HF DX. This month we will cover other factors that can affect how our signals reach around the world.

We left off discussing the 11 year sunspot cycle. A bit more on that before we move on.

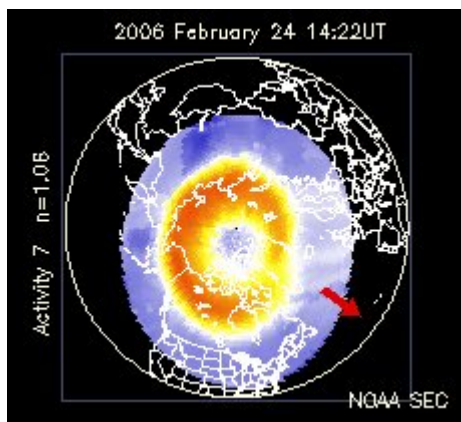


You can see from this chart the small variations due to the Sun's 28 day rotation, as well as the rise and fall over a number of years. Although this chart indicates that the 11 year dip is yet to come, all indications are showing we are on the way back up. – Good News!

**DISTURBANCES:** Most of the disturbances to propagation come from solar flares and coronal mass ejections (CMEs). The solar flares that affect propagation are called X-ray flares due to their wavelength being in the 1 to 8 Angstrom range. X-ray flares are classified as C (the smallest), M (medium size), and X (the biggest). Class C flares usually have minimal impact to propagation. Class M and X flares can have a progressively adverse impact to propagation. These are termed **Geomagnetic** and **Solar Radiation** storms.

The electromagnetic radiation from a class X flare in the 1 to 8 Angstrom range can cause the loss of all propagation on the sunlit side of Earth due to increased D region absorption. Additionally, big class X flares can emit very energetic protons that are guided into the polar cap by Earth's magnetic field. This can result in a polar cap absorption event (PCA), with high D-region absorption on paths passing through the polar areas of Earth.

A CME is an explosive ejection of a large amount of solar matter, and can cause the average solar wind speed to take a dramatic jump upward--kind of like a shock wave heading toward Earth. If the polarity of the sun's magnetic field is southward when the shock wave hits Earth's magnetic field, the shock wave couples into Earth's magnetic field and can cause large variations in Earth's magnetic field. This is seen as an increase in the A and K indices. (See the drawings for Solar Flares from June's article).



In this drawing, you can see the effect of ionization to the polar cap (often called Northern Lights), which causes a serious loss of signals beamed to the North. Depending on the strength of the ionization the Northern Lights can sometimes be seen well into the middle latitudes, and the effect on radio transmission will be very severe. Crackling and sizzling sounds in your headphones can be an indication of this form of ionization.

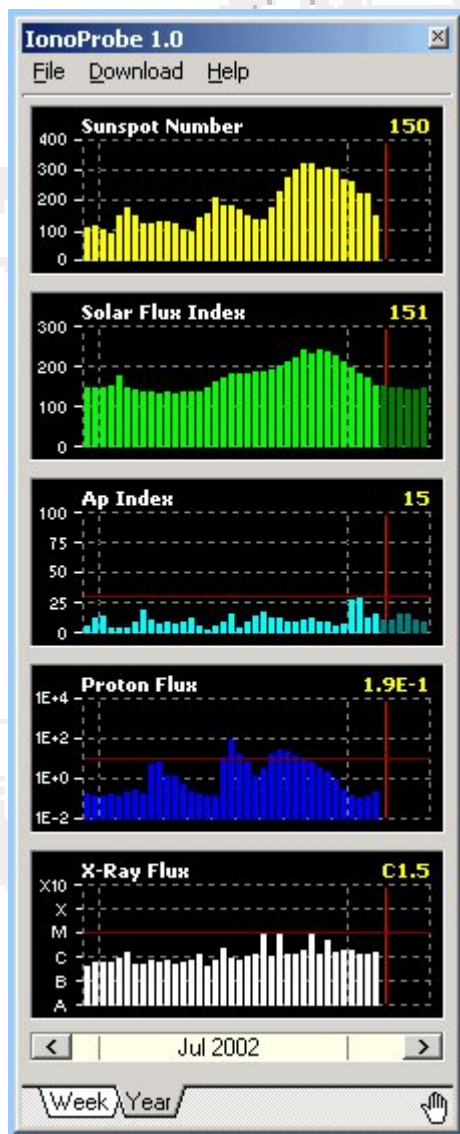
In addition to auroral activity, these variations to the magnetic field can cause electrons spiraling around magnetic field lines to be lost into the *magnetotail*. And so, maximum usable frequencies (MUFs) decrease, and return only after the magnetic field returns to normal and the process of ionization replenishes lost electrons. Most of the time, elevated A and K indices reduce MUFs, while the Solar Flux index is also a measure of flare activity. It does not tell the effects of the shock wave, but is a quick indicator of active flares. Values below 150 are acceptable. Proton Flux numbers are a similar indicator for proton activity, and values below 1E+1 are acceptable. The electromagnetic radiation from a big flare traveling at the speed of light can cause short-term radio blackouts on the sunlit side of Earth within about 10 minutes of eruption. On the other hand, the energetic particles ejected from a flare can take up to several hours to reach Earth, and the shock wave from a CME can take up to several days to reach Earth, thus giving us some warning of impending disruptions.

**TOOLS** to determine the elements that can disturb at dollars you can purchase amateur, VE3NEA.

from the drawing, it discussed here.

**SUMMARY: Sun Spots** atmosphere so our signals pass through and reflect the above, but if which can cause a variety with our signals

The bad effects do not there is no other Ham rare station on the other



status of the Sun Spot numbers and the various our transmissions can be found on the internet <http://www.radiopropagation.org/>, or for a few Ionoprobe, which was written by a fellow Ionoprobe information can be found at <http://www.dxatlas.com/IonoProbe/>. As you can see provides graphic information on all the factors

are good because they ionize the upper can bounce back to Earth far away, rather than disappear into outer space. **A and K** values they rise too high it indicates **Solar Flares** of nasty things to happen that block or interfere

happen all that often, and when the DX is open Radio experience that can match catching a side of Earth.

## *Tech Report for September 2006*



Greetings:

I sure hope that everyone is having a great Summer! We still have some time before the cold "stuff" hits, so make sure to get your new antennas up while the weather is good.

The equipment at most of the sites survived pretty well during the few thunder storms that we experienced. VE3IXY, our 220 Mhz machine locked up and needed a reset of the controller. For some strange reason, VE3RBM and VE3RCK lost power and were off for a day, but came back up. We are still looking into this.

Now that most holidays are over with, the tech committee will be doing some deep thought on what to do with VE3RCK's antenna. We just got the new door codes which will allow us to find the problem (coax or antenna).

On a personal note, I finally installed the W5GI ([www.w5gi.com](http://www.w5gi.com)) "Mystery" antenna at my Baden location. What a fantastic antenna! I have been using it on 75, 40, and 20 meters with excellent results. If you are looking for an 80 through 10 HF antenna, have a look at his website. It's very easy to make and is about the same size as a G5RV.

The Wednesday Night VE3KSR Net (every Wednesday night starting at 7:30 PM on VE3KSR - 146.970) is going strong. Lots of great conversations and topics pop up. Drop in and say hello!

That's it for this month.

Best 73,

Tedd, VE3TJD

Tech Chairman for the KWARC.

