Ottawa Amateur Radio Club

# Groundwave

P.O. Box 8873, Ottawa, Ontario, Canada, K1G 3J2



November 2012

*From the Editor:*

I apologize for the lateness of the November issue of the Groundwave. I had a computer meltdown in late October and it has taken quite some time to get things back in operation. A new computer was required and, because I purchased it after the introduction of Windows 8, I was stuck with that OS. So I switched from 32-bit Windows XP to 64-bit Windows 8 (entirely skipping Vista and Windows 7). This resulted in numerous software compatibility issues which have not yet been completely sorted out. Suffice it to say it has been a big job.

Regarding the emailing of the Groundwave, if you are not receiving your copy regularly, verify that your email address on the OARC web site is correct.

Just a reminder that, with the exception of this past month, the deadline for Groundwave submissions is three days after the monthly meeting.

Hope to see you at the meeting.

Ian Jeffrey, VE3IGJ, Editor

*Check out our Web Page:* ***www.oarc.net***

**Next Meeting 7:30 pm, Wednesday, November 14th**
**in the Colonel By Room at Ottawa City Hall**

**In This Issue....**

Ottawa Amateur Radio Club
# Groundwave

November 2012

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*Articles may be submitted for use in this publication provided that they portray events or activities that promote Amateur Radio. Letters and comments are also welcome. Submissions may be made by mail addressed to the Editor care of the OARC, or by e-mail to "ve3igj@rac.ca". Deadline for submissions occurs three days after the regular monthly meeting of the OARC.*

*Please support your local radio organisations. They support you!*

## *Club Information*

**The Ottawa Amateur Radio Club Inc.** is an association of Radio Amateurs devoted to the promotion of interest in Amateur Radio communications in the National Capital Area and to the advancement and achievement of club members.

**Regular Meetings of the OARC Inc.** are held on the second Wednesday of each month (except July and August) in the Honeywell Room which is on the second floor of Ottawa City Hall, formerly Regional Municipality of Ottawa Carleton Headquarters, on Lisgar Street. Meetings commence at approximately 19:30 hours. Further details about each meeting is elsewhere in this publication.

**Executive Meetings of the OARC Inc.** are normally held on the first Wednesday of each month at 19:30 hours. Contact the President to confirm the date, time and place of the next meeting.

**The CAPITAL CITY FM Net** meets every Monday (except some holidays) at 20:00 hours on the club repeater **VE2CRA 146.940(-)** to pass traffic and to make announcements of interest to Amateurs in the National Capital Region.

**The SWAP Net** is a service provided and conducted by Ed Seib, VA3ES. This feature appears on the Capital City FM Net. To list items and make inquiries, got to http://www.ncswapnet.ca. You may reach Ed at 613-738 8924 or e-mail him at va3es@rac.ca.

**The POT-HOLE Net** is a SSB/HF net sponsored by the Ottawa Valley Mobile Radio Club and is conducted every Sunday at 10:00 hours on **3.760 MHz**. All amateurs are welcome to check in.

**The POT-LID CW Net** is an informal slow-speed **CW** net sponsored and conducted by Ed Morgan, VE3GX, and meets every Sunday, except during July and August, at 11:00 hours on **3.620** MHz, to promote interest in CW and CW procedures.

**The QCWA CHAPTER 70 Net** meets every Monday evening at 19:30 hours on repeater VE3MPC **147.150(+).** You do not have to be a QCWA member to participate.

**The Ottawa Valley VHF/UHF SSB Net** is sponsored by the West Carleton ARC. Look for it every Tuesday night (except the first Tuesday of the month) around 21:00 on **144.250,** (roll calls after net on 50.150, 432.150, 222.150, and 1296.100.) Horizontal polarization is preferred.

### *VE3TEN*

Tuning in the beacon so that it makes sense requires you tune to **28.175** on **CW** and read the tone that is there . The spaces between the elements are the higher tone. If that doesn't work, tune to **28.175.28** on **lower sideband** for better results.



Voice (VHF) 146.94/146.34 100Hz CTCSS required
(UHF) 443.300/448.300

VE3TVA Amateur Fast Scan Television Repeater
Currently off the air and looking for a new home.

IRLP Node 2040 146.94/146.34 (VE2CRA/VE3RC)
(Code 411 for info) (Code 204 for activity)
(Code 88 for time)
For further information please contact the Repeater Chair.

Note: The IRLP link is not connected to ECHOLINK. Please do not try to connect using the alpha keys on your keypad. It just confuses the operator.
Note: The IRLP link is disabled during the Capital City Net each Monday. It is disabled from 2000 to 2145 Mondays except for May to August when the link is disabled from 2000 to 2020.

Ottawa Amateur Radio Club
Groundwave

November 2012

## October Minutes

**Meeting Opens**
- 2012-10-10 19:31 EST

**Guests**
- Michael VE3IPC - Section manager for ON east

**Membership**
- Al VE3ZTU is taking renewals and new memberships

**Recent Events**

**Portable Station Demo**
- about 10 stations setup
- 20 visitors dropped by
- demonstrations of new antennas and radios
- CW, phone, digital and satellite stations
- Daniel, DF8UO, was visiting from Germany, made his first HF contact from Canada

**Current Events**

**November Sweepstakes**
- CW: Nov 3-5
- Phone: Nov 17-19
- 2100 UTC Friday through to 0259UTC Monday
- Ontario has been split up into 4 sections

**RAC Winter Contest**
- Dec 29
- running from the Diefenbunker again
- running 2 transmitters, alternating CW and phone on various bands
- we can fit 5-6 people in the shack to operate and log
- others can hang out in the lounge while waiting for mic time

**Field Trip**
- Hammond Museum of Radio
- leaving Nov 2nd, about 7am
- spending the night in Toronto
- on next day, then going to York Region Amateur Radio Hamfest

**EMRG**
- There's an exercise happening this Sunday

## Dates to Remember

**2012**

| | |
|---|---|
| Sep. 8 | Hamfest |
| Sep. 30 | Membership Renewal Deadline |
| Nov. 1 | Joe Norton Award Subm. Due |
| Dec. 29 | RAC Winter Contest |

**2013**

| | |
|---|---|
| Feb. 9, 10 | Canada Ski Marathon |
| Apr. 10 | Homebrew Night |
| Jun. 12 | OARC AGM and Elections |
| Jun. 22, 23 | Field Day |
| Jul. 1 | RAC Canada Day Contest |

**Meeting Speaker**

Martin Gillen ,VA3SIE, spoke on operating portable, SOTA and FYBO.

**50/50**
- $18.00 to Dave VE3TLY

**Meeting Closed**
- 2012-10-10 21:15 EST

Jean Richard

Some corrections/additions to the September minutes.

The Diefenbunker radio group is moving forward with plans to install a 60' fixed tower and tri-bander for use by the amateur station at the museum. It will soon be seeking approval for the project from the Diefenbunker board. The OARC has three members who volunteer with the radio group at the museum.

Ottawa has a new consultation process concerning the proposed installation of new amateur radio towers. The policy came into force last April.

The "Interesting Contact" should have read:
- VE3TLY had a QSO with VE3ZRK via VE2CRA while hill-topping near Blue Sea Lake, about 80km north of the repeater.

## mk's Word

Novemburrr, and time to get the antennas going.
Work on the house (as opposed to housework) is finally finished, so it is time to get antennas back into the sky. The first up is the kitchen J-pole, a simple one afternoon job that, for once, only took an afternoon. It is only up about 5m above ground, just high enough to require pruning a few branches to keep it out of the leaves, but it is a bit higher than it was last year. I doubt that it will change things. Next up will be the HF loop, which will likely be a wire around the trees in the back yard, although the plan is to put up a wooden mast on the back of the house to hold up the compact loop that is still under construction. I'm still not sure about the mechanics of the mast, but as long as it doesn't pull any walls down, it should be manageable. Like most projects, I just have to get it started. Last, and least, the television antenna needs work. Even (especially?) without hockey, chances are good that there will be something that I will want to watch over the w
inter months. The trick there will be to put it some place where the preamp won't see too much RF from the important antennas up there.

Away from the station, I'm looking forward to the OARC field trip. I don't know which part interests me more, the museum tour or the flea market. Since I am behind the scenes at Carp, I don't get to do much rag chewing there, or any shopping, so this will be my one chance for a typical non-working flea market. Since I am getting a ride in a full car, I won't be able to bring home any boat anchors. That is probably a good thing.
I have heard great things for many years about the Hammond museum, and am looking forward to finally seeing it in person. Pictures on the web just aren't enough any more, although I expect I will fill my own camera anyway.

A week after that is the EMRG / OARC "test and tune" session prior to the Tall Pines car rally. There hasn't been a test and tune session in town in decades, so I'm curious to see what happens there. Keep an eye on the EMRG and OARC websites for updates about that one.

Then comes the rally itself. Like the Ski Marathon only with (slightly) less predictable weather and a few fewer operators. Not everybody's kind of operation, but a good exercise, and well appreciated by both participants and your fellow volunteers. The rally crowd, like the ski crowd still doesn't quite get why non rally people would volunteer to brave the late November weather for a sport that isn't their own, but those of us who do it, get it. Like the marathon, they are always looking for volunteers, so give it some thought.

That's about all from here. Now, where did I leave my parka last May?

73 mk VE3FFK

## Mind over Matter

1. While sitting down, lift your right foot off the floor and make clockwise circles.
2. Now, while doing this, draw the number "6" in the air with your right hand.
3. Your foot will now be rotating counter-clockwise!!

# Understanding Solar Indices

By Ken Larson, KJ6RZ

The ions in the ionosphere are too massive to respond to the rapid oscillations of a radio wave and thus have little affect on radio wave propagation. However, the free electrons are over 20,000 times lighter than the ions and do respond to radio wave oscillations.

Three major bands of ionization (called the D, E, and F layers) occur in ionosphere. The F layer (the highest layer) is the one primarily responsible for long distance HF communications.

The free electrons in the F layer, 140 to 200 miles above the Earth, interact with radio waves causing them to bent back toward the Earth's surface. The electrons react easier with low frequency radio waves than with higher frequency signals. As a result, a relative thin F layer will bend low frequency radio waves back to Earth. Long distance communications on the amateur radio low frequency 160 meter (1.8 MHz), 80 meter (3.5 MHz) and 40 meter (7 MHz) bands is possible at night when ionization in the F layer is low. The free electrons do not react as easily with the rapid oscillations of higher frequency radio waves. Thus a higher density of free electrons are required to bend radio waves in the 30 meter (10 MHz) and 20 meter (14 MHz) amateur bands back to Earth. Long distance communications on these bands are typically possible during the day and early evening hours when ionization levels in the F layer are high to moderate. Even higher densities of electrons are needed to bend radio waves in the 17 meter (18 MHz), 15 meter (21 MHz), 12 meter (24.9 MHz), and 10 meter (28 MHz) bands back to Earth. Long distance communications is generally possible on these bands only during the day light hours when ionization in the F layer is greatest. Very high levels of ionization are required to bend signals in the 6 meter (50 MHz) band back to Earth. Ionization in the F layer is never high enough to bend 2 meter (144 MHz), 1.25 meter (222 MHz), 70 cm (420 MHz), and higher frequency waves back to Earth. These radio waves travel through the ionosphere and into outer space. Frequencies in the 2 meter and above amateur bands are thus required for Earth satellite communications since they pass through the ionosphere. Terrestrial communications on these bands are confined to line of sight and repeater operation.

Recombination occurs more quickly in the E layer than in the F layer because the atmosphere at the altitude of the E layer (60 to 70 miles above the Earth) is more dense. Thus the E layer typically exists only during the day light hours. The E layer bends low frequency signals, in the 160 through 40 meter amateur bands, back to Earth during the day, providing short range day time communications on these bands. The electron density in the E layer is not sufficient to bend radio waves above 20 meters (14 MHz) back to Earth.

Recombination occurs very quickly in the D layer which is about 30 to 55 miles above the Earth's surface. The D layer only exists during the day and is not sufficiently dense to bend HF radio waves back to Earth. The primary affect of the D layer is to absorb energy from low frequency radio waves, particularly radio waves in the 160 through 40 meter amateur bands. The 160 and 80 meter bands will typically be dead during the day because of D layer absorption.

Small variations occur daily in the ultraviolet energy received from the sun. On days when relatively high energy levels are received, ionization in the F layer will increase and long distance HF communications will improve. Also, the highest usable HF frequency will increase. For example, the 15 meter band (21 MHz) my be usable for communications with Australia. On low energy level days, the F layer is not as heavily ionized, the highest usable HF frequency decreases, and long distance HF communications deteriorates. During a low energy level day the 15 meter band may be dead with 20 meters (14 MHz) being the highest usable frequency band.

In addition to daily variations, the amount of ultraviolet energy received varies over an 11 year cycle in accordance with sunspot activity on the sun's surface. During a sunspot minimum there will be few if any sunspots visible on the sun's surface, ultraviolet energy from the sun will be at its lowest level, and the 20 through 10 meter amateur bands may be unusable for months at a time due to low F layer ionization. Over the following several years sunspots will gradually appear and increase in number reaching a maximum approximately 5½

(Continued from page 5)
years after the sunspot minimum. At the sunspot maximum over 200 sunspots are typically visible. Ultraviolet energy from the sun will be at its highest level during a sunspot maximum and reliable HF communications on the 160 through 10 meter amateur radio bands will be possible on a regular basis. The sunspots will then begin decreasing, causing a deterioration in long distance HF communications, until the next sunspot minimum is reached.

The amount of energy received from the sun is measured daily in terms of the solar flux. The solar flux can vary from as low as 50 to as high as 300. During a sunspot maximum, solar flux values will typically exceed 200 resulting in excellent long distance HF communications on the 20 through 10 meter amateur bands. Solar flux values will range from 50 to 80 during sunspot minimums yielding poor long distance communications with 40 meters (7 MHz) typically being the highest usable frequency band.

An increase in solar flux values for a period of several days generally indicates an improvement in long distance HF communications during that time period. For example, the highest usable frequency will generally increase and HF communications improve if the solar flux has been running about 110 and then jumps to around 130 for several days. In contrast, the highest usable frequency will decrease and HF communications deteriorate if the solar flux instead falls to 90.

**Solar Flux Expected Band Conditions**

50 - 70 Bands above 40 meters unusable
70 - 90 Poor to fair propagation on 20 meters and below
90 - 120 Fair conditions up through 15 meters
120 - 150 Fair to good conditions on all bands up through 10 meters
150 - 200 Excellent conditions through 10 meters with openings on 6 meters
> 200 Reliable communications on all bands through 6 meters

The sun is continuously ejecting large quantities of changed particles (atoms stripped of their electrons) into space. Some of these particles eventually arrive at the Earth and interact with the Earth's geomagnetic field. The amount of charged particles ejected by the sun varies from day to day and also with the 11 year sunspot cycle. The amount of particles arriving from the sun increases as the cycle approaches the sunspot maximum. Small numbers of particles arriving from the sun have relatively little affect on the Earth's geomagnetic field. Under these conditions the geomagnetic field is considered to be quite. Large numbers of charged particles can cause considerable disturbances in the geomagnetic field. A disturbed geomagnetic field is called a geomagnetic storm.

For any given solar flux value, HF communications will improve when the geomagnetic field is quiet, and worsen during a geomagnetic storm. A geomagnetic storm cause the F layer to become unstable, fragment, and even seem to disappear. Storm conditions are more severe in the regions around the Earth's magnet poles since the charged particles from the sun are drawn to the poles by the Earth's magnetic field. As a result, signal paths that traverse the polar regions will be more affected by a geomagnetic storm than signal paths that cross the equator.

The condition of the geomagnetic field is measured in terms of A and K values in accordance with the following table:

| A | K | Geomagnetic Field |
|---|---|---|
| 0 - 3 | 0 | Quiet |
| 4 - 6 | 1 | Quiet to unsettled |
| 7 - 14 | 2 | Unsettled |
| 15 - 47 | 3-4 | Active |
| 48 - 79 | 5 | Minor storm |
| 80 - 131 | 6 | Major storm |
| 132 - 207 | 7 | Severe storm |
| 208 - 400 | 8-9 | Very major storm |

The occurrences of solar flares also increases with increasing sunspot activity. A solar flare creates a burst of additional EUV energy and also ejects large quantities of charged particles into space. The EUV energy reaches the Earth in about 8 minutes creating what is know as a Sudden Ionospheric Disturbance (SID). The burst of EUV increases the ionization levels in the D, E, and F layers. The increased F layer ionization may help the propagation of high frequency signals (15 meters and above). However, the increased ionization in the D and E levels may result in the complete absorption of radio signals in the 160 through 40 meter bands

and seriously degrade propagation at 30 and 20 meters. A SID may last from a few minutes to several hours, with conditions gradually returning to normal. The charged particles from the flare will arrive at the Earth in 20 to 40 hours. The particles will generally create a geomagnetic storm on their arrival.

Improved HF band conditions are thus indicated by higher than normal solar flux values and low A and K values.

Mid latitude solar indices (solar flux, A, and K values) are broadcast at 20 minutes after the hour by radio station WWV on 5, 10, 15, and 20 MHz. They are also available on the Internet at www.qrz.com and in the K7VVV Solar Updates that are posted regularly on the ARRLWeb at www.arrl.org. The K7VVV updates are very good and provide links to other web sites for more information on solar indices and HF propagation. A good discussion of solar indices is also provided in the September 2002 QST magazine.

K7VVV reports that the solar flux mean for December 26 through January 1 was 117.1 while the planetary A index mean was 17.1. The average daily solar flux for the past six year is shown in the table below:

| **Year** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** |
|---|---|---|---|---|---|---|
| Solar Flux | 81 | 117.9 | 153.7 | 179.6 | 181.6 | 179.5 |

This is an interesting chart since it indicates that the current sunspot maximum, as measured by solar flux values, was reached in 2001. Moreover, solar activity has remained near this peak for the last 3 years!

Ken Larson, KJ6RZ

Assumed to be written in 2003

It is interesting to see the subsequent numbers:

| **Year** | **2003** | **2004** | **2005** | **2006** | **2007** | **to 2008-07** |
|---|---|---|---|---|---|---|
| Solar Flux | 128.4 | 106.4 | 91.7 | 80.3 | 73.0 | 69.5 |

## IS " D-STAR " A 'FALLING-STAR' ?

Although the ICOM new digital transceiver, the D-STAR, has been on the market for several years now (since 2004), the cost has not dropped significantly. It is still at least twice as expensive as the popular FM analog VHF/UHF transceivers.

To date there is only one manufacturer - ICOM. Other manufacturers have been watching to see if the new digital format is going to be worth their while entering the market.

To those who have already purchased a digital model, you have to judge for yourself if the cost was justified. How often do you actually use (or need) the digital format? How many amateurs are currently using it? Do you feel as if you have been 'talked into purchasing an expensive digital HT in order to justify the purchase and installation of a digital repeater? Do the benefits of going digital justify the costs?

Yes, the digital format is superior to the analog format; but then again the old BETA format of the home video tape recorder was much superior to the VHS format but eventually the BETA format went the way of the DO-DO bird. Is this the future of digital VHF? So far the ICOM digital transceivers are not leaping off the shelves and are selling more slowly than ICOM had anticipated.

Many amateurs are recognizing that the clarity of the signals are superior to the analog format but are also recognizing that the digital ICOM transceivers have only added portable IRLP capabilities; the D-Star rigs are considered by many amateurs to be little more than portable IRLP devices. Yes, the digital format is better in several ways over the analog format but will it eventually disappear the way the BETA recorders did?

Only time will tell.

The Editor
“The Resonator (Gap)”
The Seaway Valley Amateur Radio Club Newsletter

# Directors Report

## NE Ontario Regional Directors Report

I would like to start this month's report highlighting those Amateurs who have stepped up to be Assistant Directors. Due to the size of North East Ontario I will never be able to visit all the corners of the region. That is why I rely on the AD's to represent RAC across the region. One long time AD has decided to take a bit of a hiatus and I especially want to thank Roy Brockelbank, VE3FOD for his assistance and help over the last 5 years. Thank you Roy. I also want to thank Dave Hayes, VE3JX for stepping in and being the AD for the SSM area. I also wish to say congratulations to another AD, Al Boyd, VE3AJB who recently received an Accolade from his employer the OPP. In a press release the OPP states in part, "Manitoulin Island Ontario Provincial Police's longest-serving full-time member has been recognized with an OPP Accolade award for his dedication to the service. The Accolade award recognizes an individual whose actions and behaviours demonstrate and/or exceed commitment to the OPP and their communities". Having met Al and his family I can also attest he is very deserving of this award. Congratulations Al.

The RAC Directors and Executive will be having our annual Strategic Planning sessions this month. This is where we determine where RAC should be going. But the most important part of this is to hear from YOU. Yes the membership, do you have ideas on the future or RAC as it is your organisation. If you have a comment please send me an email.

RAC has asked for and received legal advice on the Distracted Driving Legislation standing now that the Ontario Government has been suspended. We were advised this will have no effect on the status of the legislation and our five year extension remains. However I still suggest that you use caution when operating mobile.

As mentioned in last month's report the ARRL Sweepstakes goes this month with the CW portion on November 3rd to the 5th and the Phone test going on the 17th to the 19th. Now that Ontario has 4 sections and few contesters the sections ONN and ONE will be much sought after. Even if you're not a contester this is a great way to work some new states or get that last province you need in the log. I don't have room here to list all the rules so here is a link to the ARRL site: http://www.arrl.org/sweepstakes

If I was operating QRP here is what I would send when responding to VA3RAC: "VA3RAC 001 Q VE3XT 70 ONN". It translates as I am working VA3RAC, he is my first QSO and I am running QRP, my callsign is VE3XT, I was first licensed in 1970 and my section is Ontario North". Hope to work you in this one.

If you have any questions or concerns please email me at ve3xt@rac.ca.

Bill VE3XT
North East Ontario Regional Director, RAC

# Bob Nash to Hall of Fame

The Board of Trustees of the Canadian Amateur Radio Hall of Fame is pleased to appoint Robert Nash VE3KZ of Milton, ON to the Hall of Fame. Bob will be presented with this award at a meeting to be arranged in Toronto in early 2013, at which time a more detailed summary of his contributions to amateur radio will be published in The Canadian Amateur magazine.

Nominations for the Hall of Fame must be submitted by Sept. 30th annually. The appointment is to recognize an amateur for outstanding achievement for sustained service to amateur radio in Canada, or amateur radio at large. The Board of Trustees consists of an amateur radio representative from each province of Canada.

Radio Amateurs of Canada congratulates Bob Nash on this award.

Ed Frazer VE7EF
Chair, Board of Trustees
Canadian Amateur Radio Hall of Fame

# 2012-2013 Membership Application/Renewal

Ottawa Amateur Radio Club Inc., Box 8873, Ottawa, Ontario K1G 3J2

☐Single $25 ($20 after Feb 1, 2013)
☐Family $30
☐Junior $15 (under 18 years of age)
☐New Ham - Free (if licensed in current Membership year)
☐Emailed *Groundwave* ☐Mailed *Groundwave* (add $10.00)

**Please Note: Membership year is September 1, 2012 to August 31, 2013.**

Family Name: _____ First Name/Initials: _____

Address: _____

City: _____ Prov: _____ Post Code: _____

Home Phone: _____ Work Phone: _____

E-mail address: _____ (For *Groundwave* mailing)

Callsign(s): _____
Qualifications: ☐ Basic ☐ Advanced ☐ Morse Code
Year Licensed: _____ RAC Member? Yes ☐

**Other Family Members**

Name: _____ Callsign(s): _____
Qualifications: ☐ Basic ☐ Advanced ☐ Morse Code
Year Licensed: _____ RAC Member? Yes ☐

Interests: _____

Comments/Suggestions: _____

All members who are in good standing on or before the December General Meeting will be eligible for a free one-time name badge. Members who wish a second or replacement badge may purchase one at the Club Price (approx $7.50 plus tax). Ordered badges will be available in January.

Do you want an **OARC NAME TAG?** Yes ☐ Second or Replacement Yes ☐

ORDER DETAILS - As to appear on badge:

First Name _____ Call Sign _____