



Ottawa Amateur Radio Club

Groundwave

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From the Editor:

December 2012

Almost December now and that means the annual December meeting Trivia Night Contest.

Hope to see you at the meeting.

And a Merry Christmas to all members and their families.

Ian Jeffrey, VE3IGJ, Editor



Check out our Web Page: www.oarc.net

**Next Meeting 7:30 pm, Wednesday, December 12th
in the Colonel By Room at Ottawa City Hall**

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Ottawa Amateur Radio Club

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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.

The Ottawa Amateur Radio Club bulletin "Groundwave" is published and distributed to club members. Publication dates may vary but it is hoped that the bulletin arrives at its destination before the events listed in it have expired. The bulletin is not published for July and August when meetings do not occur. Every effort is made to provide accurate information in the bulletin, however we are all human and mistakes can be made. The OARC accepts no responsibility for any damages that may result from this. The opinions expressed in this bulletin are those of the author.

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.

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.



November Minutes

Meeting Opens

- 2012-11-14 19:32 EST

Guests: Rob, VE3ZZR and Bert, VE2ZAZ

Membership Al is still taking memberships.

Field Trip

- everything went quite well
- we had 12 people there
- we car pooled down in 3 cars, and hopped from repeater to repeater on the way down
- we had the museum to ourselves
- the senior volunteer guiding us was a telegrapher for Newfoundland
- the next day, we went to the hamfest in Markham
- a little bigger than our hamfest here in Carp
- all kinds of goods for sale from muffins and quilts, to old and new ham gear
- most of us left around noon and we were back home for supper

Haves and Wants Brian has some magazines to give away

Show and Tell Mike, VE3FFK, showed an indoor receiver antenna, a cylindrical mesh of copper wire

Current Events

Trivia Night. Dec 12

- annual tradition
- we prepare a bank of ham radio questions, form teams and we answer questions for prizes
- bring a noisemaker for signalling you have an answer
- at the end of the night, your noisemaker can be judged to win prizes too

RAC Winter Contest, Dec. 29

- We have the RAC call sign VA3RAC
- we have 8 people that are interested

Test and Tune Day

- Saturday at Algonquin Collection T110
- Done in conjunction with EMRG in preparation for Tall Pines Car Rally
- bring out something that you want to tune, fix, poke at

Club Project

- Wayne VE3CZO - Battery Keeper
- very low power, uses less power than the

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

self-discharge of the battery

- 1 LED indicates everything you need to know

- we'll provide a kit of parts (pcb, passives, leads, regulator, SMD components)

- costs about \$30. in 4 group sessions

- Dave VE3KL - Transmission Line Experiments

- G5RV Performance with 20m coax for feed-line?

- How to design design and build a tuner? where does it go?

- Build a 4:1 transformer

- does my coax work? how do I find out?

- 6 sessions, about \$50

- Joe - CW Filter

- a really sharp rolloff filter using crystals

- costs unknown

- more details to come

No applications received for this year's Joe Norton Award.

Meeting Topic

Bert VE2ZAZ talks to us about his 24GHz Radio experiments.

50/50 Prize \$17.00 to Glen, VE3XRA

Meeting Closed

- 2012-11-14 21:36

Jean, VE3DNI



mk's Word

It's finally in the sky. I now have a dual-band fan-style loaded quarter wave (what a mouthfull) in the sky for 160 and 80 metres. Along with that is a folding mast that puts the feedpoint up at about 40 ft. As usual, it was dark enough to use a headlamp to work on it all by the time it was finished. If it is still there in April, you'll hear more about it at homebrew night.

Of course it doesn't actually play on 160 or 80 (yet), but for once it resonates low, meaning something needs to get shortened rather than lengthened -so much easier. In this case maybe not so easy. My antenna analyzer goes down to 1.7MHz, and the return loss bridge doesn't go below 5MHz. I will have to see how low the old noise bridge will work. Who knows, I might even have to blow the dust off the gate dip meter. I hate to "cut and try" blindly. The last time I did that, the instrumentation was on one antenna and the pruning was on another. Not a happy ending to that story.

Now I just have to put the station back together underneath it. I'm looking forward to checking in to the pot lid net again.

I'm writing this just after coming home from the Test and Tune session held in anticipation of next week-end's Rally of the Tall Pines. There are enough people from around here participating in that event to make it worthwhile to get together to check radios, amplifiers, antennas and cables, and to help out with installing Powerpoles, RF connectors, etc. Most things were working, with the exception of one SWR analyzer, which was fixed in the process. It seemed that most people were both checking their own gear and helping fix someone else's. It all went well enough that I expect there will be another session in the week or two prior to the Ski Marathon.

For some people the Pines rally is the start of their season. I'm looking forward to it. Let's spin the dial and see what weather we will get: Snow, fog, rain, freezing rain, clear and dusty, or all of the above? By the time you read this, you will already have started to hear the stories. Although I don't get to see the cars zoom past (either on their wheels or otherwise), I prefer to operate as "headquarters" from the comfort of a heated building and a real chair, even if I have to keep track an ear on three different nets at once.

Being December, end of the year and all, I guess now is as good a time as any to say THANK YOU to those

hams who, put time, effort or even just money back into amateur radio in any number of ways, big and small. You make it more and better tomorrow than it was yesterday. dah dididah

73 Enjoy the holidays
mk

VE6JY's 80-meter, 4-element Yagi !!



Christmas is coming so you had better get your order in soon for one of these as Santa' doesn't have a lot of room on the sleigh.

There are currently about 26 towers, including the two 4 square arrays, on this 30 Ha (80 Acres) antenna farm—ranging from 15 m (50 feet) to 60 m (200 feet) high.

Check out Don Moman's (VE6JY) web site at

<http://alfaradio.ca/ve6jy.html/ve6jy-siteinfo.html>.



A Note on *Understanding Solar Indices* Article From Last Month

Dave Conn, VE3KL

The November 2012 Ground Wave contained an informative article by Ken Larson, KJ6RZ, on Solar Indices. If you are interested in the ionosphere, it is worth while to perform some measurements or do some calculations to gain a solid working knowledge about HF propagation.

Hams do not “usually” have access to the experimental apparatus, such as radar sets, to perform these experiments so we rely on the publications of MUF, K, and other parameters to help us predict the performance of HF bands. However, we can make simple calculations to gain insight into this very complex subject. In this note, I present a simple problem that makes a lot of simplifications about the F2 layer. The solution of this problem will give you a good understanding of **Critical Frequency (Fc)**, and **Maximum Useable Frequency (MUF)** that are used to make predictions about our HF bands. All you need is a simple scientific hand calculator for this problem.

Let's consider the F layer where the **maximum** electron density at the height of the solar cycle is known from measurements. We will ignore the effects of the Earth's magnetic field or any other complicating factor such as the thermal speed of electrons.

Assume a simple model for the F2 layer where the electron density is zero at some height H1 and rises linearly to a maximum density at height H2 and then decreases linearly to zero at height H3. The electron density equals 500 thousand electrons per cubic centimeter at H2.

A uniformly plane wave travels straight up towards the F2 layer. What is the highest frequency for this wave to be totally reflected by the F2 layer? What is the MUF for a take-off angle relative to the horizon of 25 degrees? What is a plasma?

A good way to solve the problem is to search the Internet using key words like ionosphere, ionosonde, critical frequency, Langmuir waves and F2 layer. During your travels through the sites that you visit you will learn a vast amount about the ionosphere. Don't spend much time on the D layer. It is extremely interesting as a subject by itself but won't help here.

The next time that you make a single hop HF contact just as the band is opening or closing (RST 339) you will be able to estimate Fc, MUF and electron density and check them against propagation programs. Essentially, your radio has become an ionospheric laboratory if you pay attention to the actual conditions. What fun!

The solution will be posted in the January 2013 Ground Wave after people have solved the problem and sent in their solutions to the editor. Please feel free to contact dave@ve3kl.com to discuss this problem at any time. This simple calculation is just one of many that can easily demonstrate most of the simple ideas about propagation using ideal models.

A prize (electrons in a box) will be given to the first person who gets the answer. The prize will be awarded to the winner at an OARC meeting.





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December 2012

Rod Newkirk, W9BRD/VA3ZBB (SK)

From the ARRL web site with editing

Rod Newkirk, W9BRD/VA3ZBB, of Ottawa, Ontario, Canada -- who penned the *QST* column "How's DX?" from 1947-1978 -- passed away on



Monday, November 19 after a long illness. Newkirk was credited with coining the term "Elmer," as well as for his humorous take on DX in his column, especially with limericks in his DX Hoggery and Poetry Depreciation Society and the accompanying cartoons of Jeeves by Phil "Gil" Gildersleeve, W1CJD (SK).

In March 1991, *QST* Associate Editor Jim Cain, K1TN, profiled Newkirk in "How's Rod?" in the pages of *QST*. "Newkirk wrote 'How's DX?' through the Korean War, through the Fabulous '50s, the Vietnam war, incentive licensing and the W9WNV DXpedition controversy," Cain wrote. "While six American presidents moved in and out of the White House, 'How's DX?' documented the rise of SSB in Amateur Radio and DXing, saw the birth of DX lists and nets and the growing number of 2 meter spotting groups."

The term "Elmer" -- meaning someone who provides personal guidance and assistance to would-be hams -- first appeared in *QST* in Newkirk's March 1971 "How's DX?" column, where he wrote that "[too frequently one hears a sad story in this little nutshell: 'Oh, I almost got a ticket, too, but Elmer, W9XYZ, moved away and I kind of lost interest.' Sure, the guy could have burned through on his own, maybe, but he, like others, wound up an almost-ham. No more Elmer. We need those Elmers. All the Elmers, including the ham who took the most time and trouble to give *you* a push toward your license, are the birds who keep this great game young and fresh." Newkirk was probably not trying to coin a term at the time, but the

name stuck, becoming a general term for the mentors Newkirk called "the unsung fathers of ham radio."

First licensed in 1937 as W9BRD at 14, Newkirk was involved with radio all his life. After graduating from high school, he became a civilian radio operator in Washington, DC with station WAR; when World War II broke out, he joined the US Army as a member of the Army Signal Corps where he served in Florida, Papua-New Guinea and the Philippines. He remembered these times in his first *QST* article, "Christmas, 1944," which recounted a "heart-warming yarn involving the combination of the Amateur and the Christmas Spirit in far-off Hollandia."

After a stint as a radio operator with the Illinois State Police, Newkirk moved to Connecticut in 1947 where he worked at ARRL Headquarters as a W1AW Station Operator with a new call sign, W1VMW. It was while Newkirk was in Newington that then-ARRL Communications Manager Ed Handy, W1BDI, asked Newkirk to take over the "How's DX?" from Byron Goodman, W1JPE. A few years later, Newkirk returned to his home state of Illinois to go to college. While in Illinois, he regained his W9BRD call sign and resumed his job with the Illinois State Police. He continued to write "How's DX?" from Illinois. Newkirk's last "How's DX?" column was published in February 1978. Newkirk retired from the State Police in 1986. In 1984, he was inducted into the CQ DX Hall of Fame as its 23th member, and in 2002, he was the 87th inductee into the CQ Hall of Fame.

Newkirk was a former member of the ARRL and a member of the Radio Amateurs of Canada, the Ottawa Amateur Radio Club, the Ottawa Valley Mobile Radio Club, FISTS, the Morse Telegraph Club and the Quarter Century Wireless Association and QCWA Chapter 70. In May 2007, he was presented with the QCWA "70 Years Licensed" Golden Certificate and lapel pin, and in May 2010, with the QCWA Century Certificate.

In 1997, Newkirk married Betty, VE3ZBB, and moved to Canada, where he got the matching Canadian call sign VA3ZBB.



IRLP/EchoLink Weather Net

Trivia Night

In what is now an annual tradition for the December meeting, Trivia Night will be held on December 12 and just the way you like it - loud and crazy. So form your teams, and make a noisemaker!

For the benefit of new members, this means that, instead of listening to a speaker, you will be challenged to answer a broad range of questions related to Amateur Radio, à la Reach for the Top. As per usual, you can either play individually, or else form teams of any manageable size (max 4 players). Don't forget to come up with a goofy radio-related name for your team (how about "One Antenna with Three Radials"?). Prizes will be given to teams who answer the most questions correctly and to runners-up. Each individual or team will need to bring a noisemaker of some kind, in order to signal the moderator when you have a right answer. Your noisemaker could be as primitive as a boy scout whistle or as complex as a buzzer circuit. The more homebrew it is, the better; that way you can enter it in the mini homebrew contest afterwards. If you forget your noisemaker, don't worry—one will be assigned to you.

The evening promises to be great fun as always.

Janice Neelands, VA3PAX

I just want to let you know about a fairly new net on Saturday nights called the Weather Radio Listeners Newsletter Net. It is hosted by Gordon Maybee, VA3WXA, out of Toronto. It begins at 8pm Atlantic, 7pm Eastern on IRLP Reflector 9034 and if you have a computer, Echolink node 223557. It has information about Weather Radio and also CANWARN. It will also include weather warnings across Canada and power outages. We are trying to make this a Cross Canada Net to include all provinces and territories. We are looking for stations from Québec to participate as we do not have any stations checking in from there yet.



We are looking for stations who are interested in weather to take part. If you have a weather station, you can report your findings at your QTH or if you have any local severe weather going on, you can report on that.

For more information about the net, go to the Maritime Amateur website <http://www.maritimeamateur.ca/> and click on CANWARN. Once there, click on CANWARN news where you will find articles on this net. Here is the direct link: <http://www.freewebs.com/ve1jbl/canwarnnews.htm>

Any questions, please let me know. Thanks for reading, Hope to hear you on the net.

James (Jim) Langille, VE1JBL

Common sense in neither.



Vacuum Nanoelectronics

Vacuum Nanoelectronics: Back to the future?—Gate insulated nanoscale vacuum channel transistor

Jin-Woo Han, Jae Sub Oh, and M. Meyyappan¹

From APPLIED PHYSICS LETTERS 100, 213505 (2012)

Early electronics centered around the vacuum tube used to amplify, switch, or modulate electrical signals. It has been many decades since the vacuum tubes have been replaced by solid-state devices such as the metal-oxide-semiconductor field-effect transistor (MOSFET) and diode. Nevertheless, the vacuum tubes are still used in niche applications such as premier sound systems and high-power radio base stations. The transition from the vacuum tube to the solid-state device was not driven by the superiority of the semiconductor as a carrier transport medium but by the ease of fabrication, low cost, low-power consumption, lightness, long lifetime, and ideal form factor for integrated circuits (ICs). The vacuum tubes were fabricated by mechanical machining and used as discrete components, whereas modern solid-state devices are batch processed in assembling the integrated circuits. The vacuum device is more robust than solid-state devices in extreme environments involving high temperature and exposure to various radiations. The critical tradeoff is that the vacuum tubes yield higher frequency/power output but consume more energy than the MOSFET. The vacuum is intrinsically superior to the solid as carrier transport medium since it allows ballistic transport while the carriers suffer from optical and acoustic phonon scattering in semiconductors. The velocity of electrons in vacuum is theoretically 3×10^{10} cm/s, but is limited to about 5×10^7 cm/s in semiconductors. As the cathodes of vacuum tubes need to be heated for thermionic emission of electrons, the energy for heating adversely overwhelms the energy required for field emission. The vacuum device is, therefore, not suitable for low power devices. For high power amplification (e.g., >50 W), however, the solid state device needs a complex circuit architecture including many transistors, microstrips, and thermal management systems.

The advantages of both devices can be achieved together if the macroscale vacuum tube is miniaturized to the nanometer scale. The nano vacuum tubes can provide

high frequency/ power output while satisfying the metrics of lightness, cost, lifetime, and stability at harsh conditions. More importantly, further downscaling can allow a cold cathode because the electric field itself is strong enough to emit electrons. Also, an ultimate downscaling in conjunction with low work function materials may decrease the turn-on gate and drain voltages to less than 1V, thus enabling these devices to be competitive with modern semiconductor technology. These benefits can be attained by the use of matured IC technology to fabricate nanoscale vacuum tubes and facilitate circuit integration.

See the full paper at:

<http://scitation.aip.org/getpdf/servlet/GetPDFServlet?file-type=pdf&id=APPLAB00010000002121350500001&idtype=cvips&doi=10.1063/1.4717751&prog=normal&bypassSSO=1>

Christmas Eve—Ham Radio Satellite to Flash Morse Code

On Christmas Eve (Dec. 24) the Japanese students who built FITSAT-1 are planning to activate the satellite's LED optical array and flash a message in Morse Code to Earth. The Morse message may be visible with the unaided eye.

According to Takushi Tanaka JA6AVG, the students plan to start testing the optical system at the end of November.

The FITSAT-1 CubeSat was developed by students at the Fukuoka Institute of Technology (FIT) in Japan. It has a CW beacon on 437.250 MHz and a data link on 437.445 MHz, there is also a 5.8 GHz data downlink.

Further FITSAT-1 information at <http://www.fit.ac.jp/~tanaka/fitsat.shtml>

CubeSats deployed from International Space Station http://www.uk.amsat.org/?page_id=10967

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 _____