

From the Gavel...



We worked the CQ WW Contest SSB contest last month. It is an international 48hr DX event. This was our first chance to test out the monster 80m/40m beam. The 80m band was

wide open with lots of opportunity to work DX. The beam performed better than expected considering it was only up 60ft. With the help of a full KW from the Alpha amp, we were able to break many DX pileups.

We did have an issue with the SWR protection circuit that intermittently cut back the power. The amp was ok until the SWR crept up when tuning across the band. Jerry's brut force approach to fixing the problem was to run out to Radioworld during the contest and buy a Palstar 2KW antenna tuner. This guy just keeps sinking money into the station to the point where it is almost embarrassing. If Radioworld wasn't out of stock, we would have had a Palstar Automatic KW tuner for the second radio as well. Jerry later replaced a bad transmit/receive relay that was causing the problem.

A number of us broke away from the contest long enough to attend the Markham York Region Hamfest. We picked up a bag of 10 high quality Teflon PL-259's and a few barrel-through connectors for the club. Turn out at the Hamfest was excellent.

The second contest position is now functional. All antennas can now be routed to both radio positions. We installed a triplexer to connect the FT-847 to the triband VHF/UHF vertical antenna. We added a foot switch, a Heil headset interface cable and connected the FT-847 to the logging computer. Jerry replaced the associated 17" CRT with a 15" LCD flat screen. All that remains to complete the setup

is a Heil Headset to be purchased at some future date.

During the contest, we hooked up the old Collins amp to this position to test the band pass filters and they worked well. They eliminated all cross band interference between the radios and allowed us to operate two high power stations simultaneously.

During a recent wind storm, the existing Yaesu rotor was damaged. We have had problems with the monster beam slipping in the rotor when windy. We couldn't tighten the rotor clamp enough without breaking it. Jerry tried making a rotor plate extension to prevent the mast from slipping. It worked too well and it damaged the rotor housing when stressed with high winds. As a result Jerry had to climb the tower during the storm to attach ropes to the boom and the roof to prevent the beam from freewheeling. The relay control cables for the 80m beam were damaged as well and will need to be replaced. I am negotiating with Don Guthrie to replace the existing rotor with the used Orion 2300 rotor we purchased and hope to have it installed within the next few weeks.

John VA3XJL now has echo-link up and running in addition to the IRLP. You can now access the repeater from your computer, even at work! We of course encourage you to give it a try.

On a final note, I would like to thank Bob VE3XBB and those who participated in Goblin Patrol this year. Until next month....

73 Rick Brown VE3IMG

This Month

2. Commentary
3. Club Calendar
4. Standing-wave ratio
4. Mississauga ARES SET
7. VE3MIS 2 metre Repeater IRLP and EchoLink
8. The Roving Reporter
10. RAC Application Form

Sunday Brunch

Sunday brunches are held on the first Sunday of each month. Time is 9:30AM at Shopsy's, 6986 Financial Drive Unit 5 Mississauga (at the corner of Mississauga Rd and Derry Rd). All are welcome to come out and have an opportunity to chat in an informal setting.

Club Nets

2 Metre Tuesday Night Phone Net Join in on the chatter starting at 8:30PM every Tuesday on the club repeater. Hosted by various net controllers. 145.430MHz Tone 103.5 Minus (-) offset. Contact our VHF Net Manager, **Lorne (VE3CXT)**, if interested in becoming a net controller.

75 Metre Sunday Night Net Starts at 8:30PM every Sunday. Hosted by various net controllers. Contact our HF Net Manager, **Michael (VE3TKI)**, if interested in becoming a net controller.

Commentary



A lot of things seem to be happening at our club recently. Reading this issue you will find that our IRLP node has been upgraded to an IRLP+EchoLink node. The amount of time that John VA3XJL put into research,

planning and configuring is proof that we are a dedicated club. His able team did learn a lot in the process.

Then there was the SET. A record number of people turned out for the exercise. I would dare say half the club was involved, one way or another. As I sat through the planning meetings, I found the logistics behind setting up the SET mindboggling. It proved to be a great success too. Read about the SET in this issue.

The new coordinators, Bob VE3XBB and Michael VE3TKI, of the Goblin Patrol on Halloween did a great job. We had a few students of the Basic Course come out to participate this year. What a nice way to get introduced to the hobby!

If you ever met Asim VE3XAP in the last month or so, he surely mentioned the giant antenna at our club station. It is a Force 12 Magnum. Can you imagine a Yagi antenna for 80m? You have to see it to believe it. Michael, VE3TKI is convinced he saw aircraft tire marks on the new antenna. Going by its size, pilots will have a tough time avoiding it!

All said and done, just two months into the new Ham year, we are having a great time. Old man winter will be here soon and that can only mean more airtime for us all.

Enjoy!

Thomas VA3TMB

Executive Directors

President:
1st Vice President:
2nd Vice President:
Treasurer
Secretary
Past President

Rick Brown VE3IMG
Asim Zaidi VE3XAP
William Bressette VE3WPJ
Scott Gregory VA3NMI
Dan Goodier VE3NI
Dave Harford VA3DFH

Club Managers

Membership Manager
Education Manager
House / Visitor Host Manager
Newsletter Editor
Researcher
Net Managers HF Net
VHF Net:
Repeater Manager
Assistant
Club Station Manager
Assistant
Assistant
Assistant
Assistant
Field Day Manager 1
Field Day Manager 2
Assistant - Documentation
Assistant - Logging
Assistant - Refreshments
Assistant - Press and Publications
FSV Manager
Assistant
Programs Manager
Assistant
Webmaster Manager (Source Code and DB)
Assistant
Assistant
Legal Consultant
Public Information & Media Relations Manager
Photography
Assistant
Education Basic Theory Courses
Advanced Theory Courses
Advanced Theory Courses
Advanced Theory Courses
CW Courses
CW Courses

Dave Harford VA3DFH
Earle Laycock VE3XEL
Murray Yewer, VE3JMY
Thomas Bernard VA3TMB
Kim Cheong VE3KTC
Michael Brickell VE3TKI
Lorne Jackson VE3CXT
Michael Brickell VE3TKI
Dave Harford VA3DFH
John Lorenc VA3XJL
Bryan Jay VA3BLJ
Bob Boyer VE3XBB
Lorne Jackson VE3CXT
John Duffy VE3DRZ
Asim Zaidi VE3XAP
Tony Champion VA3QC
Robin Stubbs VE3VVS
William Bressette VE3WPJ
Stefan Bejusca VA3OBR
Rick Brown VE3IMG
Asim Zaidi VE3XAP
Alex Malikov VE3MA
Bryan Jay VA3BLJ
Lorne Jackson VE3CXT
Thomas Godden VE3TWG
Tony Champion VA3QC
Jody Levine VE3ION
John Duffy VE3DRZ
Reg Vertolli VA3JQA
Dave Stubbs VA3BHF
William Bressette VE3WPJ
Thomas Bernard VA3TMB
Lorne Jackson VE3CXT
Dave Harford VA3DFH
Dan Goodier VE3NI
Rick Brown VE3IMG
Lorne Jackson VE3CXT
Tony Champion VA3QC
Reg Vertolli VA3JQA
Dan Goodier VE3NI
Earle Laycock VE3XEL
Bob Hawkins VE3AGC
Jody Levine VE3ION
Basil Burgess VE3JEB
Michael Brickell VE3TKI
Thomas Bernard VA3TMB
Basil Burgess VE3JEB
Earle Laycock VE3XEL
Frank Lamb VE3HTX
Earle Laycock VE3XEL

Audit Committee

Auditors Coordinator

Basil Burgess VE3JEB

Public Service

ARES Emergency Coordinator
Past Coordinator & AEC
Assistant EC - 1st Day
Assistant EC - 2nd Day
Assistant EC - 3rd Day
Assistant EC - 1st Night
Assistant EC - 2nd Night
Assistant EC - 3rd Night
CANWARN Manager
Special Events / Walks Manager

Dan Goodier VE3NI
Sean Conlin VA3MED
Michael Brickell VE3TKI
John Duffy VE3DRZ
Bob Boyer VE3XBB
Sean Conlin VA3MED
Dave Harford VA3DFH
Lorne Jackson VE3CXT
Peter Mosher VA3PKM
Bob Boyer VE3XBB

CLUB CALENDAR FOR 2008 - 2009

November, 2008

02 Sun Sunday Brunch - Shopsy's
06 Thu Exec Meeting
11 Tue VHF/UHF - 2 Meter Net
13 Thu Club Meeting
15 Sat ARRL Sweepstakes
16 Sun HF - 75/80 Meter Net
17 Mon Basic Class 9
18 Tue VHF/UHF - 2 Meter Net
20 Thu Radio Night at Club Station
21 Fri CQ WW DX Contest
23 Sun HF - 75/80 Meter Net
24 Mon Basic Class 10
25 Tue VHF/UHF - 2 Meter Net
27 Thu Club Meeting
30 Sun HF - 75/80 Meter Net

December, 2008

01 Mon Basic Class 11
02 Tue VHF/UHF - 2 Meter Net
04 Thu Exec Meeting
05 Fri ARRL 160 Meter Contest
07 Sun Sunday Brunch - Shopsy's
07 Sun HF - 75/80 Meter Net
08 Mon Basic Class 12
09 Tue VHF/UHF - 2 Meter Net
11 Thu Club Meeting
12 Fri ARRL 10 meter Contest
14 Sun HF - 75/80 Meter Net
15 Mon Basic Class 13
16 Tue VHF/UHF - 2 Meter Net
18 Thu Radio Night at Club Station
21 Sun HF - 75/80 Meter Net
23 Tue VHF/UHF - 2 Meter Net
25 Thu Christmas - NO Club Meeting
26 Fri RAC Canada Winter Contest
28 Sun HF - 75/80 Meter Net
30 Tue VHF/UHF - 2 Meter Net

Provisional Schedule Below...

January, 2009

01 Thu Exec Meeting
04 Sun Sunday Brunch - Shopsy's
05 Mon Advanced Class 0
08 Thu Club Meeting
15 Thu Radio Night at Club Station
22 Thu Club Meeting
29 Thu ARES Meeting

February, 2009

01 Sun Sunday Brunch - Shopsy's
05 Thu Exec Meeting
12 Thu Club Meeting
19 Thu Radio Night at Club Station
26 Thu Club Meeting

March, 2009

01 Sun Sunday Brunch - Shopsy's
05 Thu Exec Meeting
12 Thu Club Meeting
19 Thu Radio Night at Club Station
26 Thu Club Meeting

April, 2009

02 Thu Exec Meeting
05 Sun Sunday Brunch - Shopsy's
09 Thu Club Meeting - Church not available
16 Thu Radio Night at Club Station
23 Thu Club Meeting
30 Thu ARES Meeting

May, 2009

03 Sun Sunday Brunch - Shopsy's
07 Thu Exec Meeting
14 Thu Club Meeting
21 Thu Radio Night at Club Station
28 Thu Club Meeting

NOTES

1. Meetings start 7:30PM at St. Thomas A Becket Church Hall, 3535 South Common Court unless otherwise noted.
2. Brunch is at 9:30AM unless otherwise noted.
3. Classes are from 7:00PM - 9:00PM at Meals On Wheels at 2445 Dunwin Drive

Visit our website: <http://www.marc.on.ca> for any updates of the calendar.

Standing-wave ratio by Olivier Cauvin

http://searchcio-midmarket.techtargget.com/sDefinition/0.,sid183_gci852555,00.html

DEFINITION - Standing-wave ratio (SWR) is a mathematical expression of the non-uniformity of an electromagnetic field (EM field) on a transmission line such as coaxial cable. Usually, SWR is defined as the ratio of the maximum radio-frequency (RF) voltage to the minimum RF voltage along the line. This is also known as the voltage standing-wave ratio (VSWR). The SWR can also be defined as the ratio of the maximum RF current to the minimum RF current on the line (current standing-wave ratio or ISWR). For most practical purposes, ISWR is the same as VSWR.

Under ideal conditions, the RF voltage on a signal transmission line is the same at all points on the line, neglecting power losses caused by electrical resistance in the line wires and imperfections in the dielectric material separating the line conductors. The ideal VSWR is therefore 1:1. (Often the SWR value is written simply in terms of the first number, or numerator, of the ratio because the second number, or denominator, is always 1.) When the VSWR is 1, the ISWR is also 1. This optimum condition can exist only when the load (such as an antenna or a wireless receiver), into which RF power is delivered, has an impedance identical to the impedance of the transmission line. This means that the load resistance must be the same as the characteristic impedance of the transmission line, and the load must contain no reactance (that is, the load must be free of inductance or capacitance). In any other situation, the voltage and current fluctuate at various points along the line, and the SWR is not 1.

When the line and load impedances are identical and the SWR is 1, all of the RF power that reaches a load from a transmission line is utilized by that load. When the load is an antenna, the utilization takes the form of EM-field radiation. If the load is a communications receiver or terminal, the signal power is converted into some other form, such as an audio-visual display. If the impedance of the load is not identical to the impedance of the transmission line, the load does not absorb all the RF power (called forward power) that reaches it. Instead, some of the RF power is sent back toward the signal

source when the signal reaches the point where the line is connected to the load. This is known as reflected power or reverse power.

The presence of reflected power, along with the forward power, sets up a pattern of voltage maxima (loops) and minima (nodes) on the transmission line. The same thing happens with the distribution of current. The SWR is the ratio of the RF voltage at a loop to the RF voltage at a node, or the ratio of the RF current at a loop to the RF current at a node. In theory, there is no limit to how high this ratio can get. The worst cases (highest SWR values) occur when there is no load connected to the end of the line. This condition, known as an unterminated transmission line, is manifested when the end of the line is either short-circuited or left open. In theory, the SWR is infinite in either of these cases; in practice, it is limited by line losses, but can exceed 100. This can give rise to extreme voltages and currents at certain points on the line.

The SWR on a transmission line is mathematically related to (but not the same as) the ratio of reflected power to forward power. In general, the higher the ratio of reflected power to forward power, the greater is the SWR. The converse is also true. When the SWR on a transmission line is high, the power loss in the line is greater than the loss that occurs when the SWR is 1. This exaggerated loss, known as SWR loss, can be significant, especially when the SWR exceeds 2 and the transmission line has significant loss to begin with. For this reason, RF engineers strive to minimize the SWR on communications transmission lines. A high SWR can have other undesirable effects, too, such as transmission-line overheating or breakdown of the dielectric material separating the line conductors.

In some situations, such as those encountered at relatively low RF frequencies, low RF power levels, and short lengths of low-loss transmission line, a moderately high SWR does not produce significant SWR loss or line overheating, and can therefore be tolerated.

MISSISSAUGA ARES EMERGENCY PREPAREDNESS EXERCISE

By Michael Brickell VE3TKI, Mississauga ARES

On Saturday October 4, 2008, the Mississauga ARES group participated in an annual amateur radio simulated emergency test (SET). A total of 25 Mississauga ARES members participated in the SET.

The SET was organized by a number of amateur radio emergency services (ARES) groups that form the GTA West ARES organization (Mississauga, Brampton-Caledon, Georgetown, Oakville, Burlington), in order to test ARES' ability to send and receive messages via amateur radio in an emergency.

For the SET, the Mississauga ARES group operated amateur radio equipment located at the following locations in Mississauga:

- Credit Valley Hospital, VHF/UHF (local area voice) and packet (local area data)
- Canadian Red Cross Ontario Zone Office (6700 Cancross Crescent), 3 stations consisting of HF (long distance voice), VHF/UHF (local area voice), and packet (local area data).
- Canadian Red Cross Meals on Wheels Office (2445 Dunwin Drive)
- Region of Peel Alternate Emergency Operations Centre (Region Works Building, 3515 Wolfdale Road, Mississauga)
- City of Mississauga Fire Station at Creditview Rd and Burnamthorpe Rd
- A site simulating a station located at Trillium Hospital

- Two locations acting as liaison stations to transfer messages to and from the other ARES groups outside Mississauga
- A net control site which coordinates message handling between the sites.

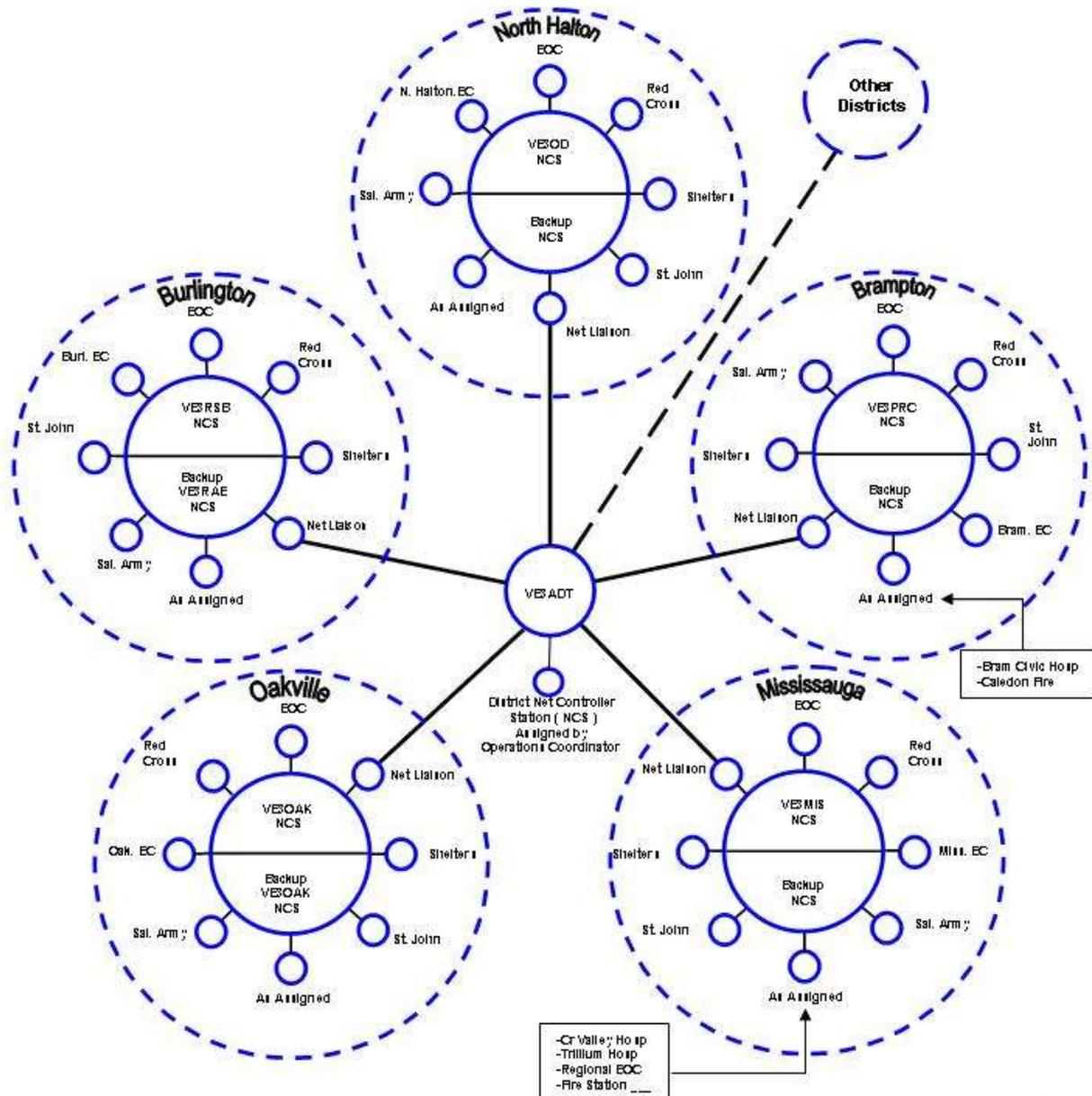
The GTA West Repeater Network diagram shows conceptually how the various stations were linked.

The radio operators at each location were given sealed envelopes to be opened at specific times during the SET. The envelopes contained instructions to send specific messages to other locations, for example from Credit Valley Hospital to Brampton Civic Hospital. The operators were then to make up a standard radiogram and then transmit the message. In this particular case the message would first be sent to the liaison station for Mississauga ARES who would then pass it on through the district net control station (shown as VE3ADT in the centre of the Network diagram) to the Brampton ARES liaison station. That station would then transmit the message to the Civic Hospital operators. In a real situation the Civic Hospital operators would then pass the message to the specified recipient.

Roughly 50 messages were successfully passed between the various locations, in a 3 hour period. Both voice and packet radio was used to send and receive messages. Overall we were very pleased with the results of the SET and it was very beneficial in helping us to identify areas that we need to improve upon.

GTA West Repeater Network

Version 1.1



NOTES:

1. For local events only, activate a local network or combine adjacent local networks into one.
2. For large events, the EC in the primary affected area will be the Operations Coordinator.
3. For large events, each local network should assign a net liaison to monitor local and District NCS frequencies. One of the Net Liaisons, assigned by the Operations Coordinator, will serve as the District NCS on VE3ADT.
4. The District NCS will direct traffic, to be passed on adjacent frequencies then return to the local network frequency.
5. Where possible, remove CTCSS input tone requirements from all repeaters during any incident.

VE3MIS 2 metre Repeater IRLP and EchoLink – Part 1, How to Use It

By John Lorenc, VA3XJL

IRLP node: 2998, EchoLink node: 404792

With assistance from several club members (Thomas / VA3TMB, Michael / VE3TKI, William / VE3WPJ, Lorne / VE3CXT, Scott / VA3NMI, Dan / VE3NI, Dave / VA3MLR) we now have a very much working IRLP and EchoLink node connected to the VE3MIS 2 metre repeater. Thank you all for your help and support!

I shall be providing two articles on the subject of IRLP and EchoLink that are both installed to work separately (IRLP-IRLP and EchoLink-EchoLink – no crossovers) with the VE3MIS 2 metre repeater. The first article, presented this month, will provide the ‘how to use it’ information as this is what I am sure all of the readers want to do right away. Next month, I’ll provide a little bit more information as to what is under the hood.

In the mean time, additional information may be found at www.irlp.net and www.echolink.org/

How to use it?

IRLP:

To initiate an IRLP connection from the VE3MIS 2 metre repeater, key up and announce your call sign and intent to use IRLP, for example:

“VA3XJL for the IRLP Link”

and while keyed up, press the keypad with the node number of the IRLP node you wish to connect to, for example VE3RAK repeater (detailed node information is available at www.irlp.net/status.html and in the ARRL Repeater Directory) :

2450

Wait for the repeater you are connecting to announce itself with “... connected”. When transmitting, key up and wait a

few seconds before speaking so there is no loss of your leading words.

From another repeater, follow the same procedure as above with exception of the node number to which you wish to connect, which for example is **2998** (VE3MIS).

At end of your QSO, be sure to press **73** on your keypad to end the session and make the node available for use to a fellow ham operator.

EchoLink

Follow the above procedure replacing IRLP with Echo when keying up the VE3MIS 2 meter repeater and prefixing the EchoLink node number with the # key, for example to connect to the VE3RAK repeater via EchoLink, key (detailed EchoLink node information is available at www.echolink.org/links.jsp and in the EchoLink software):

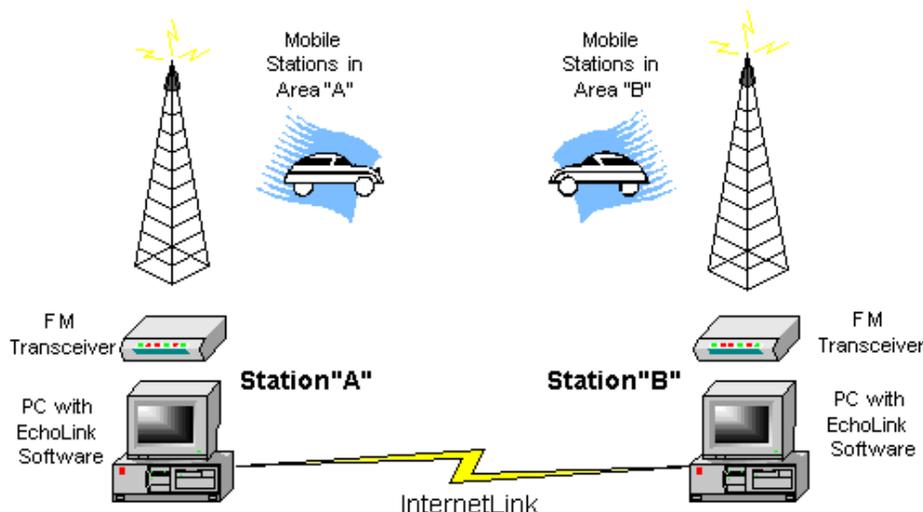
#2068

In general, when connecting through EchoLink enabled repeaters, prefix node numbers with the # key. Remember to end you QSO with **73** to disconnect.

There can certainly be a debate about the merits of IRLP vs. EchoLink and I shall not engage in this debate. However, it is helpful to know that with EchoLink, a licensed amateur radio operator can communicate via the Internet with any other EchoLink node (computer or radio) using the Microsoft Windows EchoLink software (<http://www.echolink.org/>) for Intel PC systems and EchoMac (<http://www.dxzone.com/cgi-bin/dir/jump2.cgi?ID=11301>) for Apple Macintosh systems. There may be a Linux client out there as well, but I have not looked for it.

I will leave you with this diagram from www.echolink.org for now and provide more details on how this works next month.

Linking Example



The Roving Reporter

The Roving Reporter recently interviewed Murray Yewer VE3JMY. Those of us who participated in the Field day know Murray as the ever present helping hand. There are rumours that he often was at two places at once.

RR: How did you become interested in amateur radio?

VE3JMY: My uncle was a ham, and my father worked for Radio Speakers of Canada, a manufacturer of speakers, so the magic of radio was in the family. I started out building a couple of crystal radios as a kid. Later, I was impressed that hams would send Christmas messages for people using autopatches on HF.

I was licensed in 1991, having taken the basic course from Dan Henderson at T. L. Kennedy High School in Mississauga. I got my advanced qualifications years later through the club's course.

RR: How did you become a member of the club?

VE3JMY: Well I was a member of various clubs. I belonged to the Oakville club for a while, then visited the Peel club, and finally ended up at the Mississauga club.

RR: What do you have as a station?

VE3JMY: I have a radio room in the basement of my home. In 1982 I had picked up a US Army radio receiver, an R-174-URR, and I built a power supply for it with a ham in Burlington. I have an old Heathkit HW-8 and a MFJ-9020, twenty meter CW transceiver. My current HF radio is a Kenwood TS570S and I also have portable and handheld radios. For antennas I have a Cushcraft R-7000

for HF, and a V-2000 for 2m/70cm/6m. Also, I have a G5RV, which originally zigzagged around the roof to make up the length. In addition, I have some Isotrons, which I am not using at the moment.

I use a hard copy handwritten log.

RR: What areas of amateur radio interest you?

VE3JMY: I am interested in participating in ARES. I am a member of the FISTS CW club, and I also enjoy collecting certificates from various special event stations. I have about 50 so far. I have the Worked All Mississauga award on the wall; and was the first to get it in the club. At one time I was a member of IPARN (Inter-Provincial Amateur Radio Network). With IPARN you could use the Anik satellite to make contacts across the country. I was first to receive a certificate from IPARN for 100 qsos.

One of my memorable qsos was my first CW contact with someone in Sheboygan, Wisconsin, the home of Jack Benny.

In future I would like to contact other hams in the southern hemisphere, in the south Pacific in particular.

RR: What are your other interests?

VE3JMY: My wife Darlene and I enjoy visiting with our three grandchildren and we also enjoy a round of golf.

How many hams does it take to change a lightbulb?

One to change the light bulb and a second to post that the light bulb has been changed (the first does not have regular email access).

Fourteen to share similar experiences of changing light bulbs and how the light bulb could have been changed differently.

Seven to caution about the dangers of changing light bulbs.

Seven more to point out spelling or grammar errors in the posts about changing light bulbs.

Five to flame the spell checkers. Three to correct spelling/grammar flames.

Six to argue over whether it's "lightbulb" or "light bulb"... another six to condemn those six as stupid.

Fifteen to claim experience in the lighting industry and give correct spelling.

One to post the old joke about "Hams don't change light bulbs, they redesign the circuit to use LED's".

Two to post that "LED's" is incorrect grammar, and that the plural form of LED is LEDs.

Three to post that the "LED's" / LEDs postings are Off Topic as the current discussion is about light bulbs.

Nineteen to post that this group is not about light bulbs or LEDs and to please take this discussion to a lightbulb (or light bulb or LED) forum / mailing list / chatroom / whatever.

Eleven to defend the posting to the group saying that we all use light bulbs and therefore the posts are relevant to this group.

Two to say "I'm having to change lightbulbs tomorrow at work therefore it is relevant to ME".

Thirty-six to debate which method of changing light bulbs is superior, where to buy the best light bulbs, what brand of lightbulbs work best for this technique and what brands are faulty.

Seven to post URLs where one can see examples of different light bulbs.

Four to post that the URLs were posted incorrectly and then post the corrected URL (bracketed inside < and characters so that word wrap does not break the URLs).

Three to post about links they found from the URLs that are relevant to this group which makes light bulbs relevant to this group.

Thirteen to link all postings to date, quote them in their entirety including all headers, trailers and signatures, and add "Me too". Another four that again quote the above "all postings" and add "Me three".

Five to post to the group that they are quitting the list because they cannot handle the light bulb controversy.

Four to ask "didn't we go through this already a short time ago?"

Thirteen to say "Google is your friend", or "Do a Google search on light bulbs before posting questions about light bulbs"

Three to tell a funny story about their spouse/cat/dog/parrot/whatever and a light bulb.

Neil WA6KLA posts and says "I have 20 file cabinets of light bulb manuals here, let me pull the correct one out for you and give you the Motorola part number."

AND

One group lurker to respond to the original post 6 months from now and start it all over again.

RAC MEMBERSHIP APPLICATION/SUBSCRIPTION TO TCA MAGAZINE

Please enter applicable choice(s) →

COMBINATION PACKAGE: 1 year RAC membership; (includes \$44.95 subscription for TCA) @ \$49.95 *	
1 year RAC membership only; no subscription to TCA @ \$44.95 *	
1 year TCA subscription; no membership to RAC @ \$44.95 * +	
Family membership; price per extra family member @ \$20.00 per year (one TCA per family) * (Does not apply to simple subscriptions.) (\$20.00 x)	
GST: 5%	
*Taxes applicable: 5% GST, 15% HST (NB,NS,NL) not included in the above amounts + Ontario PST of 8% applicable to TCA subscription without membership. PST (if applicable): 8%	

CONTACT INFORMATION

Name: Call sign:	
Address:	
City/Town:	
Province:	Postal Code:
Family Member Name	Family Member Call sign:
If you enter something on line above, a charge of \$20.00 will be added to your membership	
Email:	Phone #:

DONATION OPTIONS

Donation to the RAC Foundation enclosed	\$
Donation to the Defence of Amateur Radio Fund enclosed	\$
Donation to the Youth Education Programme enclosed	\$
Grand Total:	\$

PAYMENT OPTIONS (Cheque or)

Visa/MasterCard No:
Card Expiry Date (MM/YY):
Name on credit card:

Mail to:

Radio Amateurs of Canada Inc.
720 Belfast Road, Suite 217
Ottawa, ON K1G 0Z5

