The Barrie Amateur Radio Club

Presents

A Guide For New Amateur Radio Operators

Amateur Radio – a Hobby and a Community Resource

Amateur Radio (also called Ham Radio) is a hobby that enables two people to communicate (have a QSO) with each other via radio. Many different modes are available for use when communicating with other hams, these include: Morse Code (CW), Phone (Voice), Teletype (RTTY), Slow Scan TV, and many digital modes that utilize a computer. Many hams talk only to other hams near them or to those they know (such as other family members who are also hams). Some enjoy talking to people all over the world and some enjoy both. Others enjoy transmitting with very low power (QRP). Many hams enjoy experimenting with electronics. Some may never make a contact over radio with another ham - they simply enjoy building and testing their electronic projects. There are many, many ways to enjoy our hobby.

Public and Community Service

Public Service is another way hams can enjoy their hobby, an example is when the Barrie Amateur Radio Club volunteers to provide safety communications for events such as the motorcycle "Ride for Literacy" around Lake Simcoe, or the "Walk for Dog Guides" where legally blind persons with their guide dogs walk along the Barrie waterfront.

BARC members also try to promote Amateur Radio to youth groups such as Scouts Canada through involvement in events like the Scouts Canada Jamboree on the Air (JOTA). This also provides practice for BARC members in setting up antennas and ham radio stations on short notice and in less than optimum conditions. Amateur Radio Public Service can mean some work but can also be fulfilling and a lot of fun for those taking part. See http://home.tiscali.nl/worldscout/Jota/jota.htm for more info on JOTA.


BARC members with the 14th Barrie and 1st Painswick Scout Troops during JOTA 2007

"Elmer's"

In Amateur Radio, the definition of an "Elmer" is a person who is willing to help somebody else - a guide or mentor. This help may consist of some or all of the following:

1. A demonstration of their ham station
2. Introducing literature pertaining to Amateur Radio to an interested person
3. Helping a fellow ham choose the proper equipment and explain how it works.
4. Helping an interested person learn Morse Code, Amateur Radio electronic theory, or apply for a new license.
5. Assisting with antennas and antenna support construction projects.
6. Teaching new hams how to work DX and what Contesting is all about.
7. Just being there to answer any questions a new ham or prospective ham may have about the hobby.

How does a new ham get this help?

Members of the Barrie Amateur Radio Club will be glad to help you or will put you in contact with another Club member who can help.

There are many hams (Elmer's) in the club willing to be of assistance to a new ham. Club members help each other all the time with many kinds of projects – so don't be afraid to ask.

Check the BARC (Barrie Amateur Radio Club) website for club meeting information at: http://www.barriearc.com/ and drop in, new hams (and new members) are always welcome. With a little experience in the hobby, you too could become a club Elmer and help others just becoming a ham.

Operating Techniques

There are many ways to use Amateur Radio today. All of the various modes available require an operator to be considerate and to think about all the people that are either listening to you or waiting to use the frequency. Listening 90% of the time and talking 10% of the time is a good way to first start, whether you intend to transmit on a local 2-meter repeater or on HF. When transmitting on the HF bands, one must remember - the whole world might be listening to what you say (and possibly forming an opinion of Canadians in general). In the beginning, listen for some time before transmitting to become familiar with common operating methods and frequencies. Conditions on the HF bands are considerably different than on the VHF/UHF bands. You may only be able to hear one side of a conversation on the HF bands, so just because you don't hear anyone at that moment doesn't mean the frequency is clear, ask if the frequency is busy before calling "CQ" or calling another ham. Remember, you might be on the other side sometime, having a conversation with someone when another ham just barges into your conversation by accident. Be respectful to all others on the bands and treat them the same way you would like to be treated. Listening and adjusting to the established ways in amateur radio will allow a new ham to be accepted sooner. Remember, messages of a commercial nature are not allowed on amateur radio. You may not use a repeater phone-patch to call a plumber to fix your plumbing or call a radio station to enter their contest using amateur radio. Do not abuse this rule.

If you want to join a conversation in progress, transmit your call sign between the other stations transmissions. The station that transmits next should acknowledge you. Don't use the word "Break" as this word usually suggests an emergency. All stations should stand by for those that have emergency traffic. This is true whether on HF, VHF, or UHF.

Here I must insert this comment; if you have upgraded from the 11-meter CB band, leave the jargon behind. Most hams find CB lingo distasteful and scowl when it is used. There is no place on the ham bands where this lingo is acceptable. This jargon identifies you as a neophyte and not ready to identify with the ham community. Don't forget to identify with your call at the beginning and end of your transmission and at least every 30 minutes during your communication with another ham.

Staying Within the Law

Amateur Radio is a "self-policed" hobby, don't be offended if someone advises you on the air that you are not operating within Industry Canada rules and regulations, learn what regulation you are breaking and correct your operating habits. Common problems with newly licensed hams (especially those from a CB radio background) include: swearing on the air, making racial references, or telling "off-color" jokes over the air. One common equipment operating problem is using much more transmitter power than is required, so that you are interfering with others on another repeater using the same frequency that is located a distance away. On HF, using too much power or having the microphone gain set too high can cause splatter on frequencies above and below your operating frequency, which can interfere with many other hams carrying on a QSO – not a good way to start your new hobby.

Repeaters

Repeaters are devices that enable hams to talk greater distances than they could normally when using two radios directly. A repeater is usually used only on VHF and UHF and is placed on a mountaintop or tall building so it can cover a larger area, this way a person can talk to somebody else on the other side of a mountain or located far outside the city. Without the repeater they would not be able to communicate. Of course, repeaters are not always needed to communicate on VHF/UHF, many hams use simplex (transmit and receive on the same frequency) to talk with each other every day. This is a preferred method for most hams when possible. Most hams make contact on a repeater and then move to a simplex frequency to finish their conversation if possible. Many new hams start out with a radio that operates on the 2-meter VHF band. They can use a handheld, mobile, or base station radio to talk to other hams. Any of these radios have the ability to be used on repeater frequencies. You can find a complete listing for repeaters in southern Ontario at: http://www.wnysorc.org/repeaterlist.html

Here is an example of repeater frequency and offset:
VE3RAG, Barrie: the repeater transmits on 147.000 MHz and it listens on 147.600 MHz
VE3LSR, Edgar: the repeater transmits on 146.850 MHz and it listens on 146.250 MHz
VE3TTB, Edgar: the repeater transmits on 145.190 MHz and it listens on 144.590 MHz
VE3KES, Barrie: the repeater transmits on 147.150 MHz and it listens on 147.750 MHz
As an example, for the VE3RAG repeater, you would set the receive frequency of your radio to 147.000 MHz and your transmit frequency will be 147.600 MHz with a plus (+) offset (set automatically by your transceiver when you press the "push to talk" in duplex mode). In this case the repeater frequency would be written as: 147.000+ to indicate what the repeaters transmit frequency is and the direction of the offset.

Repeaters are NOT PUBLIC DOMAIN. Repeaters are installed and maintained by individuals or a group to support a particular purpose or activity and for the common interests of their owners. The money and equipment to support these activities are either from the repeater owner or from donations or membership dues. When you operate on them, you are actually operating through someone else's duly licensed and coordinated station.
Volunteers maintain repeaters and they do not get paid for this job. It would be a nice gesture to say thanks and tell them you appreciate their efforts.
More info on repeaters can be found at: http://www3.sympatico.ca/alduncan/ham/Repeater_Basics.pdf

Digital Radio - Combining Amateur Radio and the Internet

Voice Over Internet Protocol (VoIP)

There are several Internet based Amateur Radio applications using **VoIP**. Two of these are the Internet Radio Linking Project (**IRLP**), and **EchoLink**. You can find more about IRLP at: http://www.irlp.net/ and about EchoLink at: http://www.echolink.org/ .
In effect, IRLP allows the linking of amateur radio repeaters to the Internet on a worldwide basis. Utilizing a series of control codes through a touch-tone microphone, an Amateur can "bring-up" any one (or more) of the hundreds of other IRLP enabled repeaters throughout the world. In addition, "reflectors" exist which may be thought of as full-time party lines, which include many international participants at any particular moment. One repeater in the Barrie area offering IRLP is VE3LSR(2) on 147.315+.
EchoLink allows individual users to connect to others either through an EchoLink enabled repeater, or through a computer connected to the internet and running EchoLink software. One such repeater in the Barrie area is VE3KES on 147.150+.

Packet Radio

Packet radio is a particular digital mode of Amateur Radio communications which corresponds to computer telecommunications. The telephone modem is replaced by a "magic" box called a terminal node controller (TNC); the telephone is replaced by an amateur radio transceiver, and the phone system is replaced by the "free" amateur radio waves. Packet radio takes any data stream sent from a computer and sends that via radio to another amateur radio station similarly equipped. Packet radio is so named because it sends the data in small bursts, or packets.
This radio network provides:
1. Packet Bulletin Board Systems (BBS) to store and relay personal messages and bulletins; Keyboard-to-Keyboard connection for direct chat between amateur stations.
2. DX Packet Cluster systems to announce band openings and DX stations heard by others on HF bands.
3. ARES/NTS and Emergency Communications for life and safety messages.
4. E-mail forwarding on HF and VHF through WinLink2000 (http://www.winlink.org/)
5. Networking and computer file transfer.
6. Satellite Communications for worldwide station-to-station links.
You can find out more on Packet Radio at: http://www.tapr.org/packetradio.html

Automatic Position Reporting System (APRS™)

APRS™, first introduced by Bob Bruninga, WB4APR, in 1990, is a specialized subset of the packet radio concept. It has been developed as a tactical tool to allow the tracking and display of position and status information of both fixed and moving radio stations.. For example, in a civic parade, it can show the position (and speed) of the LEAD car, the MAYOR'S vehicle, FIRST AID and FIRE units, the LAST vehicle, etc. In a Search & Rescue situation, it can show the INCIDENT COMMAND location, individual SEARCH TEAM positions and the areas that they have covered, CONTAINMENT points, etc. These locations and status information then can be transmitted and superimposed on city, street, or topographic maps and displayed on multiple computer screens.
More info on APRS is at: http://web.ew.usna.edu/~bruninga/index.html

Reciprocal Operating Agreements

Canada has a reciprocal agreement with the United States. This agreement allows us to use our radio transceivers in the U.S. and U.S. citizens can use their radio equipment in Canada.
The amateur station shall be operated in accordance with the laws and regulations of the country in which the station is temporarily located. Canadian amateurs operating in the U.S. have the same privileges as they have in Canada, limited by U.S. band edges and mode restrictions in accordance with the Code of Federal Regulations (FCC).
Refer to Industry Canada document RIC-3 for more information.

Tuning your radio

One thing that is very irritating to hams is someone tuning or testing their radio on the air without checking to see if the frequency is in use. Using a dummy load is the proper way to tune up or test your radio or amplifier equipment. When tuning up on the air, your HF transmitter can cause interference on the band.

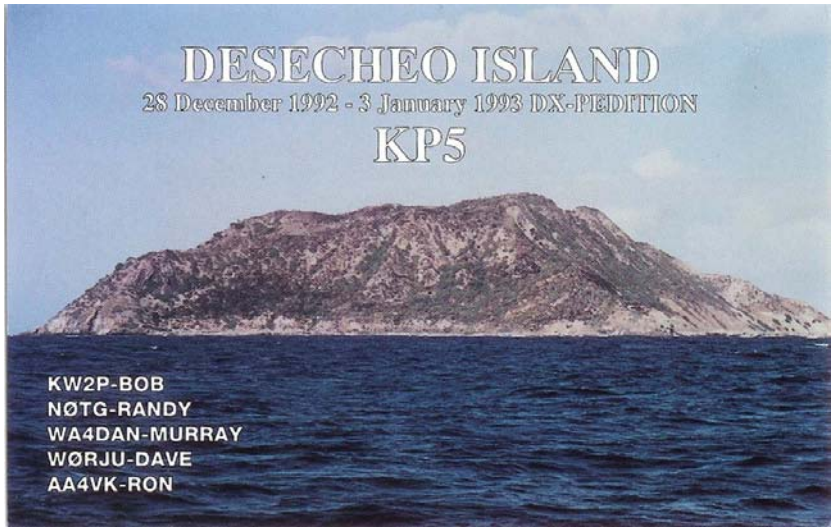
DX'ing and Contesting

The DX bug often bites the new ham quickly while operating on HF and lots of rare and exciting QSO's can be made with hams all over the world. Many contacts can be made with modest power and humble antennas. A typical transceiver power of 100 watts is sufficient to "work the world" on HF, but remember that a good antenna is much more valuable than more transmitter power is. Be mindful of changes in propagation and sunspot activity. One day you might not be able to communicate with fellow hams in the eastern or western ends of Canada on a particular band, the next day you will be able to communicate with hams all over the world. When learned, patience and operating skill are huge advantages and are requirements to work DX successfully. Spending most of your time listening for and answering DX stations calling CQ, rather than you sitting on a frequency and calling DX stations, can make you a more successful DX'er. When listening for a DX station, one should start at one end of the listening range on the band and slowly tune through the range looking for a DX station. Depending on conditions, this may take a considerable amount of time. Listen for a signal hiding behind a stronger signal. Many DX stations are not able to afford the expensive equipment we use. They may be using low power and small wire antennas so their weak signals are often hard to find.
To make it easier for us to hear the DX station, the DX station may work "split". This means this person will transmit on one frequency and listen on several different frequencies. His listen frequencies are those of his choosing and usually 5 – 10 KHz above his transmit frequency. Listening carefully to what the DX station says will help you to determine where he is listening. If you call on his frequency and he is working split, you will cause interference on his transmit frequency. This in turn can make others irritated and can result in "on the air" conflicts.
Most DX'ers collect cards from the stations they work. This is called QSLing and the cards received from a DX station will confirm that you have worked that station. Awards are given for working over 100 different countries.

HF Contests

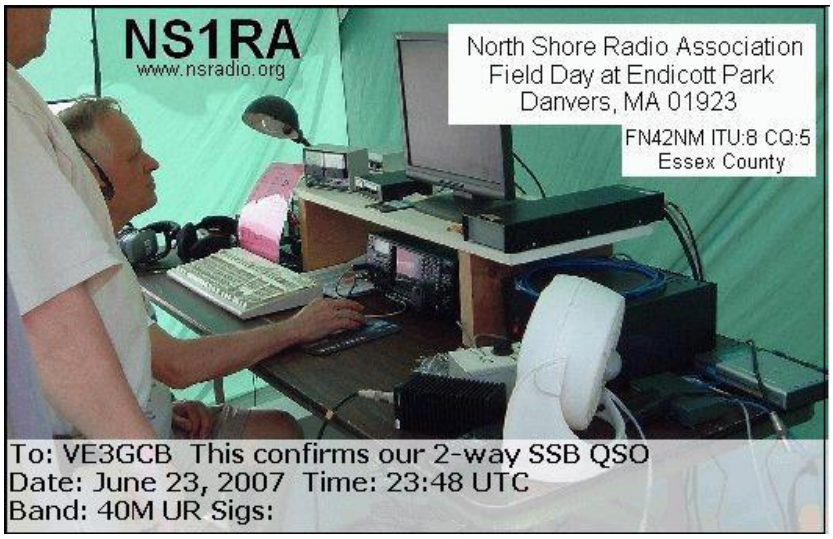
There are many contests held on the HF bands, the object being to work as many other stations as you can within a specified time limit. Each contest has specific rules and requirements – these can be found online. See http://www.ng3k.com/Contest/ and http://www.hornucopia.com/contestcal/perpetualcal.php

QSL Cards



This QSL card was from the DX-Expedition to Desecheo Island near Puerto Rico in 1992

QSL cards can be sent through the mail, or they can be electronically sent over the internet using a service such as eQSL (http://www.eqsl.cc/qslcard/index.cfm).



This is an example of an electronic QSL card received through eQSL

National Amateur Radio Organizations

The Canadian national organization is RAC or Radio Amateurs of Canada. It publishes a magazine called "TCA - The Canadian Amateur" and offers several useful services to its members, such as:

- An outgoing QSL Bureau – mails your QSL cards to hams in other countries.
- Amateur Radio liability insurance – every member is automatically covered by a 5 million dollar policy while taking part in ham radio activities.

- Members and non-members can use the RAC email redirection service allowing you to have an email address of callsign@rac.ca

It is important to support your national Amateur Radio Organization since it is also the Amateur's voice in interfacing with Industry Canada and the International Telecommunications Union (ITU).
You can find out more about RAC at: http://www.rac.ca/

The American national organization is the ARRL or Amateur Radio Relay League. Their membership can receive a large well written monthly magazine called QST Magazine.
The ARRL website is at: http://www.arrl.org/ and you can view the index of the latest QST issue at: http://www.arrl.org/qst/

The Fox Hunt or Hidden Transmitter Hunt

This can be an entertaining and competitive part of ham radio for all ages, where someone hides with a handheld and everyone else tries to find him by using radio direction finding techniques on his transmissions. An automated transmitter can also be hidden somewhere and then activated at a later time.
Read more about fox hunting and RDF at: http://www3.sympatico.ca/alduncan/ham/RDFing.pdf

The hunt for the hidden transmitter is on

Two happy winners of a fox hunt

ARES

The Amateur Radio Emergency Service (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes. Every licensed amateur, regardless of membership in RAC, ARRL or any other local or national organization, is eligible for membership in the ARES. The only qualification, other than possession of an Amateur Radio license, is a sincere desire to serve. Because ARES is an amateur service, only Amateurs are eligible for membership. The possession of emergency-powered equipment is desirable, but is not a requirement for membership. Registration form http://www.rac.ca/fieldorg/aresreg3.html
See http://www.rac.ca/fieldorg/racares.htm and http://www.arrl.org/FandES/field/pscm/sec1-ch1.html for more information on ARES.

AMSAT - Amateur Radio via Satellite

To learn more about communicating through orbiting satellites, go to http://www.amsat.org/amsat-new/
Amateur Radio satellites often use frequencies in the 2M and 70cm ham bands. 145.800 to 146.000 and 435.000 to 438.000 are designated as satellite uplink/downlink frequencies, please don't use voice here.

CANWARN

CANWARN is a volunteer organization of ham radio operators who report severe weather when they see it to Environment Canada. What they do is called ground-truthing. They confirm on the ground what satellites and radars see in the atmosphere.
When Environment Canada's weather centres issue severe weather watches or warnings, they alert the CANWARN volunteers at the organization's regional stations in the affected areas. The volunteers contact other CANWARN members on ham radio, tell them a watch or warning has been issued and ask them to report signs of approaching severe weather. These include lightning, hail, cumulonimbus clouds or as they are known in the trade CBs, and funnel clouds, which if they touch down are then called tornadoes. See http://www.on.ec.gc.ca/canwarn/home-e.html
CANWARN is organized in local networks. When CANWARN members spot severe weather, they send their reports to the CANWARN network controller who forwards them to Environment Canada's severe weather office in Toronto using either a special telephone line or the CANWARN web page. At the weather office, the severe weather meteorologist combines the data from the satellites and radar with the information from the ground to refine the forecast or prepare a severe weather watch or warning.
See http://emoares.org/canwarn.shtml for more info and repeater frequencies used for CANWARN.

Field Day

Field Day is an annual Amateur Radio exercise sponsored by the ARRL on the fourth full weekend in June, which encourages emergency communications preparedness. It typically is the largest single emergency preparedness exercise in the country. Points are awarded for each contact made by a Field Day station, which increases participation by making it a contest for the highest score.
In times of crisis and natural disasters, Amateur Radio is often used as a means of emergency communication when wireline, cell phones and other conventional means of communications fail. Unlike commercial systems, Amateur radio is not as dependent on terrestrial facilities that can fail. It is dispersed throughout a community without "choke points" such as cellular telephone sites that can be overloaded.
Amateur radio operators are experienced in improvising antennas and power sources, and most equipment today can be powered by an automobile battery. Annual "Field Days" are held in many countries to practice these emergency improvisational skills. Amateur radio operators can use hundreds of frequencies and can quickly establish networks tying disparate agencies together to enhance interoperability.
See http://www.arrl.org/contests/announcements/fd/ for more info.

BARC Field Day 2006

Generators to power the radio equipment

Where to get your ham station equipment?

Although you can buy new equipment at area stores such as:
Durham Radio (website: http://www.durhamradio.com/home.php)
Radio World (website: http://www.radioworld.ca/)
Maple Leaf Communications (website: http://www.mapleleafcom.com/)

You can also find excellent deals at area Hamfests (Amateur Radio flea markets). The Barrie and Orillia Amateur Radio Clubs hold a Hamfest each year in September, see:
http://www.barriearc.com/Hamfest/hamfest.htm for information and pictures of this event.
Many other clubs sponsor hamfests in Ontario and elsewhere, a complete listing can be found on the RAC website at: http://rac.eton.ca/events/upcoming.php

Check out http://www3.sympatico.ca/alduncan/ham/parts_stores.htm for where to buy electronic parts.

Another option to find used equipment is on the Ontario Swap Shop: http://www.ontarioswapshop.com/
And the Lake Simcoe Repeater Association swap shop: http://www.alslinkwith.com/ve3lsr/swap.htm

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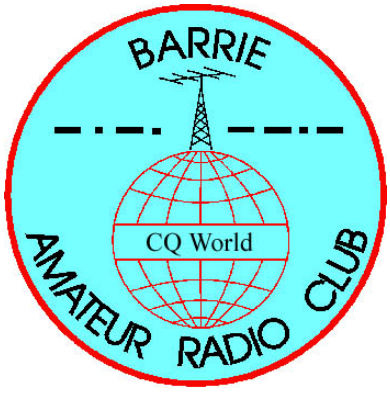
The mission of the Barrie Amateur Radio Club is to develop and foster an interest in amateur radio in our community, to develop an independent network of people and facilities to promote public safety and assist in times of disaster, and to provide a forum for Amateurs to congregate and exchange ideas and information.
The club participates in community events whenever possible.
BARC meetings are held on the 2nd Tuesday of each month, except December. Listen on the club repeater VE3RAG 147.000+
Club webpage: http://www.barriearc.com/
Club email: hamradio@barriearc.com



This booklet is based on the one from the Mt. Baker Amateur Radio Club in Washington State, written by K7SKW & K7ZC (http://www.qsl.net/k7skw/NewHamInfo.htm)
It was rewritten and expanded by Al Duncan VE3RRD for the Barrie Amateur Radio Club (20 Dec 2007)