

Capital City Amateur Radio Club

W7TCK

Presents

A Guide For New Amateurs and Members



06/24/2006

Field Day - 2006

Welcome!

You are about to discover that you have chosen a hobby that is only limited by one's imagination. How is that for a blanket statement? Well, it is true. Amateur (Ham) Radio is communication. How you choose to communicate and what you say is up to you (with only a few common sense restrictions).

You will soon be able to make friends with people around the world or even carry on a conversation with astronauts in space. If you are technically inclined, you have opened the door to experimentation, and if you are not, you'll pick up a little "know how" along the way. You'll soon discover that you do not need an electronics degree to get a license; just a willingness to learn.

"What is an Elmer" is probably the first thing that you want to know. That same question was asked recently at a club meeting which I attended. Someone suggested that it was a guy who chased "qwazy wabbits". Simply put, an Elmer is anyone willing to teach you something about Ham Radio. In other words, practically every Ham you meet will, in some way, serve as your Elmer.

You should find that this packet addresses many of the questions that you might have as you are first getting started. At first glance, all of this material may be a bit overwhelming, but just keep in mind that this information will be useful to you, both now and in the years to come.
Enjoy yourself! We know you will.

The Capital City Amateur Radio Club meets at 7:00 on the first non-holiday Monday of each month at the Salvation Army Church at 1905 Henderson, Helena, MT

Our mailing address is:
CCARC
P.O. Box 1112
Helena, MT 59624



President:

Tod Glen (N7WD) – (406) 461-7283

Training:

John Geach (KS7R) – (406) 442-7107

Newsletter Editor:

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CCARC Web Page: www.w7tck.org



Kids' Day 2007

Membership dues are \$20.00 per year and includes the monthly newsletter "W7TCK News" and use of the W7MRI Repeater.

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HOW AMATEUR RADIO FITS IN

The Amateur Radio Service is for individuals who are interested in the technical side of radio and are able to provide emergency communications in disasters, all for the general benefit of the public. It is called "amateur" because it is strictly non-commercial; no business may be transmitted on amateur frequencies. The Amateur Radio Service is a voluntary, disciplined communications service guided by five traditional objectives:

- to provide emergency or public service communications when normal communications are disrupted
- to advance the state of the art
- to improve individual skills in radio operation
- to provide a reserve pool of qualified radio operators and technicians
- to promote international goodwill

Anyone, regardless of age, can qualify for an Amateur Radio license by passing FCC examinations for the three progressive levels of achievement open to new hams: Technician, General, and Amateur Extra. (Note: Two other classes of license, Novice and Advanced, still exist for licenses granted before April 15, 2000. No new licenses for these designations are now being granted.) Exams include tests of applicants understanding of the technical and practical aspects of the Amateur Radio Service. The higher the class, the more difficult the exams and the greater the privileges of the license.

* adapted from "The FCC Rule Book" published by the American Radio Relay League, Newington, CT, copyright 1985, page 1-5.

HOW TO GET STARTED IN HAM RADIO

Buy a Copy of "The ARRL Ham Radio License Manual" ARRL \$24.95

This book is for the beginner. It contains all of the information needed for preparing for the Technician Class license exam, including theory and rules.

FROM:

American Radio Relay League (ARRL), 225 Main Street, Newington, CT 06111
(203) 666-1541

FIND A HAM, who is willing to answer questions about what to study, Morse code, when and where license exams are given, and equipment. You can find a Ham among your friends and neighbors or in the Capital City Amateur Radio Club. Join the club.

START A NOTEBOOK: Get a two-inch ring binder, alphabet separators, plenty of paper. Borrow copies of magazines and make copies of articles of interest.

Write to manufacturers and suppliers asking for catalogs. Make a shopping list.

WRITE EVERYTHING IN THE NOTEBOOK

ORGANIZATIONS

Your Local Ham Club:

Capital City Amateur Radio Club (CCARC)

P.O. Box 1112

Helena, MT 59624

President -

Tod Glen (N7WD) – (406) 461-7283

Training:

John Geach (KS7R) – (406) 442-7107

Meetings are held at 7:00 PM on the 1st non holiday Monday of each month at the Salvation Army Church, 1905 Henderson, Helena, MT. A gather (NET) happens every Tuesday evening at 7:30 local time on the 147.82 (- offset) repeater. Our club repeater is W7MRI on 147.82 Mhz (- offset).

Dues: \$20.00 per year - includes use of club 2 meter repeater. Special rates for Juniors, and family members. You do not need a license to be a member.

National organization of Hams:

American Radio Relay League (ARRL)

225 Main Street

Newington, CT 06111

(860) 594-0200

Dues: \$39.00 per year - includes QST magazine and lots more. This is THE major national association.

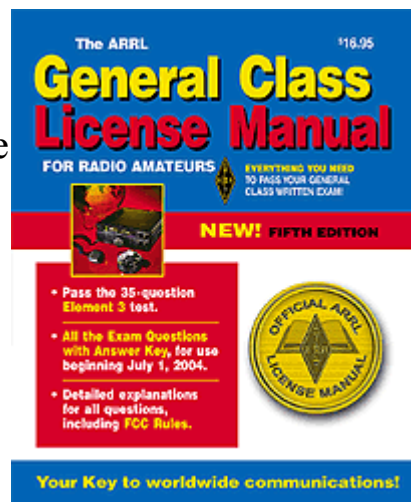
THINGS TO BUY AND READ

(in order, the first is most important):

""The ARRL Ham Radio License Manual""

This is a book for the beginner, and prepares you for the Technician Class license written examination.

ARRL, \$24.95



Morse Code Training Tapes

These are available from most stores which sell Ham equipment. There are many fine tapes produced by ARRL, AMECO, Gordon West and others. Several members of the Capital City Amateur Radio Club can provide Morse Code resources. Even though the Morse Code is no longer a requirement to attain an Amateur Radio license, many individuals are willing to share how enjoyable it is.

The FCC Rule Book

The rules and regulations for Hams

ARRL, \$12.95

The ARRL Operating Manual

How to operate a Ham radio station, contests, operating hints, packet radio, repeaters, and other topics of interest to the new or experienced Ham.

ARRL, \$29.95

The ARRL Handbook

Eventually, you will want a copy of the ARRL Handbook. This is the greatest applied electronics and communications reference of all time.

ARRL, \$44.95

General Class License Manual - to upgrade to the next step above Technician Class

ARRL, \$19.95

Magazines:

QST - Included in ARRL membership, every Ham should belong

CQ and sister publications **CQ VHF** and **CQ Contest** - a comprehensive monthly look at broad based information and special interest aspects of Amateur Radio

73 - High quality slick magazine, popular mix of articles

Worldradio - Newspaper format, up-to-date info, DX and International News, Public Service, Humor

W7TCK News – Monthly newsletter included with CCARC membership

Simple Radio station:

- transceiver
- coaxial cables, RG 58U, with PL-259 connectors
- low pass filter
- Morse code key
- dipole antenna, consisting of a balun, copper wire, end insulators, and rope
- SWR meter
- headphones
- log book
- station clock set to Universal Coordinated Time (UTC), a simple digital clock with date will do
- pencil and paper
- ring binder notebook
- simple VOM (volt-ohm-milliammeter)
- soldering iron or gun
- QSL cards - homemade will do to start
- Check WANT ADS in QST and AUTO-CALL to get a feel for fair prices for used equipment. Ask at CCARC meetings if anyone is selling equipment. There are many Ham Fests (swap meets) in the area throughout the year.



The Not So Simple Shack of CCARC member K7JM

“Elmers”

In Amateur Radio the definition of an “Elmer” is a person who is willing to help somebody else, a guide or mentor.

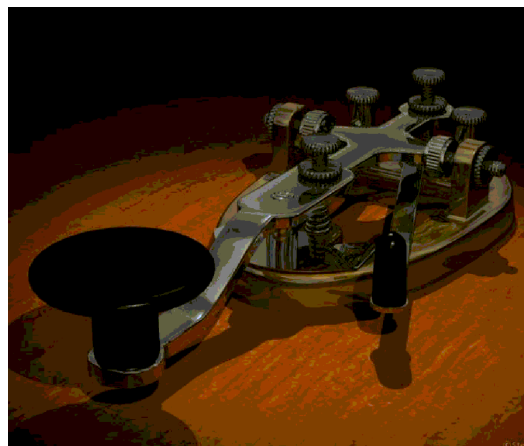
This help may consist of some or all of the following:

1. A demonstration of his ham station
2. Introducing literature pertaining to Amateur Radio to an interested person
3. Help a fellow ham choose the proper equipment and explain how it works
4. Helping an interested person learn Morse Code, amateur electronic theory, and 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.

How does a new ham get this help? Maybe you have a friend or neighbor that is a ham. Ask that person the questions you are thinking about. If not, you might want to turn to the Capital City Amateur Radio Club. There are many hams (Elmers) in the club that are willing to help you out. Club members help each other all the time with many kinds of projects.

Operating Techniques

There are many ways to use Amateur Radio today. All of the modes require a person to be considerate and 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 start, whether you intend to transmit on a local 2-meter repeater or HF. When transmitting on the HF bands, one must remember, the whole world might be listening to what you say. Listen for some time before transmitting. Conditions of 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. Ask several times 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 commercial nature are not allowed on Amateur Radio. You may not call a plumber to fix your plumbing or call a radio station to enter their contest using Amateur Radio. Do not abuse this rule.



CW (Morse Code) is alive and well

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 who 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 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. Talk as if you are talking on the telephone.

Don't forget to sign your call every 10 minutes.

Repeaters

Repeaters are devices that enable hams to talk longer distances than they could normally by using two radios directly. A repeater is usually placed on a mountaintop so it can cover more area. This way a person can talk to somebody else on the other side of the mountain. Without the repeater they would not be able to communicate. Many digital modes are available by using a repeater. Of course, repeaters are not always needed to communicate on 2-meters. Many use simplex (transmit and receive on the same frequency) to talk with each other everyday. 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.

Many new hams start out with a radio that operates on the 2-meter band. They can use a handheld, mobile, or base station radio to talk to other hams. All of these

radios have provisions built in so they will operate on frequencies corresponding with the repeaters.

Here is an example of repeater frequency and offset:

W7MRI: The repeater's transmit frequency is 147.82 MHz and it listens on 147.22 MHz.

As an example for the W7MRI repeater, you would set the receive frequency of your radio to 147.820 MHz and your transmit frequency to 147.220 Mhz, a minus (-) offset. This allows your radio to receive the transmit frequency of the repeater.

Repeaters are NOT PUBLIC DOMAIN. Repeaters are installed by individuals or a group to support a particular purpose or activity and for the common interest of their owners. 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 his job. It would be a nice gesture to say thanks and tell them you appreciate their efforts. Above all, don't call one of these members and demand they fix a repeater that is not working. They more than likely know about the problem anyway. By becoming a member of the Capital City Amateur Radio Club, your dues help maintain the W7MRI repeater. If you are not a member, please consider it.

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**. Both of these protocols are supported in Lewis and Clark County.

In effect, IRLP allows the linking of Amateur Radio repeaters to the Internet on a worldwide basis. Utilizing a series of control tones, 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.

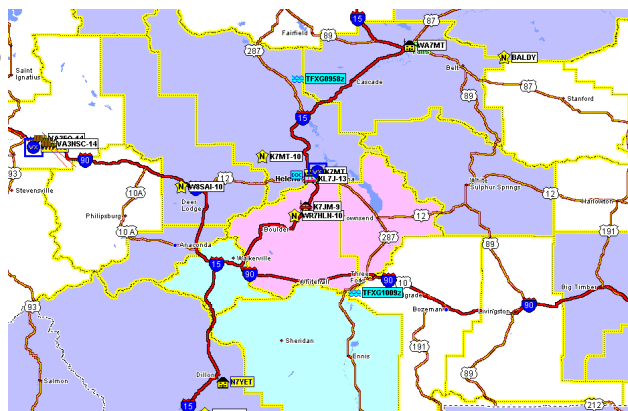
Ask an Elmer the specifics to operate on IRLP or Echolink.

Automatic Position Reporting System (APRStm)

APRStm, 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 assets. For example, in a parade, it can show the position (and speed) of the LEAD car, the MAYOR'S vehicle, 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.

APRS differs from traditional packet in several important ways:

1. APRS uses an unconnected (no handshaking) protocol; It is not error-free
2. APRS activities are primarily local in nature
- 3.
4. APRS sometimes uses Digipeaters to augment local coverage
5. APRS can use the Internet to allow remote viewing of local conditions
6. APRS traffic is limited to position (GPS), status, and very short messages
7. APRS has a special category for weather reporting stations
8. APRS (in the USA) shares one National frequency (144.390 MHz simplex).



APRS Map of Helena Area

While the APRS concepts are beautifully simple, the application of APRS concepts to local situations can be beautifully complex. That complexity can be fascinating and any licensed Amateur can participate.

For more details about Digital Radio, see the following websites:

www.qsl.net/k7skw/packet/index.htm

www.tapr.org/tapr/html/pktdf.html

www.nwaprs.org

www.irlp.net

Agreements

The United States has a reciprocal agreement with Canada. This agreement allows us to use our radios in Canada and Canadians can use their radios in the U.S.

When we identify our radio transmissions in British Columbia, we must sign our call followed by “Portable VE7”.

Tuning your radio

One thing that is very irritating to hams is someone tuning or testing their radio on the air. 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 transmitter emits a tone that can cause interference on the band. If you tune up on the air, make sure the frequency is clear and identify with your call sign.

DX'ing and Contesting

The DX bug often bites the new ham quickly while operating on 10 meter CW. Lots of rare and exciting contacts can be made on this band as all the other HF bands. Many contacts can be made with modest power and humble antennas. Be mindful of changes in propagation and sunspot activity. One day you might not be able to communicate with fellow hams in the U.S. The next day you will be able to communicate with hams all over the world. When learned, patients and

operating skills are huge advantages and required when working DX successfully. Spending most of your time listening makes you a successful DX'er. When listening for a DX station, one should start at one end of the listening range and slowly tune through the range listening for a DX station. Depending on conditions, this may take considerable amount of time. Listen for a signal hiding behind a stronger signal. Many DX stations may work split. This means this person will transmit on one frequency and listen on several different frequencies. His listening 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 makes others irritated and then results 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. Many other awards are available for those that are interested. DX websites are shown below:

www.qrz.com

www.oh2aq.kolumbus.xom/dxs

www.dxc.ve7cc.net

Contesting

Contesting is the act of making as many contacts with other amateurs as possible during a given period of time via Amateur Radio. Contesting is the challenge of competing against other amateurs, whether here or all over the world. There are many kinds of contests from Field Day to ARRL International DX contest. Field Day is a competition among amateurs of the U.S. and Canada. It is aimed at sharpening our skills for operating and setting up equipment in times of need. The CCARC participates in this contest every year in late June. If you are interested in contests, contact the Capital City Amateur Radio Club and ask members about it.



Winter Field Day - 2006

Rag Chewing

Rag Chewing is the art of carrying on an interesting conversation with other hams. This aspect of our hobby has been honed into a fine art by hams. Most of them probably assemble on 75-meter phone, but they can be found on most bands. Subjects are limitless. Many rag-chewers gather in groups (nets), taking turns with their assertions and opinions. Much can be learned from listening to and taking part in these chats. Opinions on the quality of various amateur products, methods of antenna construction and performance, new electronic data, weather info, and DX opportunities can ve very useful information. Even DX'ers can be found rag chewing now and then. Many hams set schedules with each other to rag-chew.

Try to resist the temptation to editorialize. Nothing sounds worse that some blowhard that has all the answers, regardless of the question.

Conflicts

If you ever become involved in or hear an, 'on the air' conflict or argument, keep your comments to yourself. Making comments, even if you are correct, just drags you into the conflict. There are a few hams that get into a conflict on purpose and want nothing more than to involve you. This is a game with them, something like those people that create viruses to be placed on the Internet. Do not insert you opinion about somebody's bad conduct. It only adds to the problem. Ignoring them is the best policy. If they don't have someone to argue with, the argument is over!

Some new hams slip into their old, comfortable terminology from the CB radio. One might have heard other hams berate someone for using terms such as “standing by on the side”, “roger that”, or “10-4”. Hams do not use the 10-code but no one is served by making somebody feel foolish on the air. Hams should lead by example and not by “dragging others over the coals” on the air.

Listen to other hams on the radio and don't be afraid to ask questions. By listening you can avoid conflicts. Most hams remember all to well what it was like to press that PTT switch for the first time. We are all human.

Emergency Services

Helping others in time of need is one of the most important goals we as amateurs take upon ourselves. The ARES group (Amateur Radio Emergency Service) is part of and supported by the Capital City Amateur Radio Club in Lewis and Clark County. ARES is utilized during times of natural disaster, search and rescue operations, and public activities (such as forest fire communications, assisting Red-Cross during floods, and providing communications for the Governor's Cup Marathon).

Conclusion

This brochure is a combination of several club's and individual works from around the country. Many thanks to the Ham community. The Amateur Radio Operators at the Capital City Amateur Radio Club hope this is a help to you. Please, don't hesitate to ask questions and remember that one of the best teachers is “Involvement”. 73 from all of us at the Capital City Amateur Radio Club