# The Lure of Today's Amateur Radio

Written by K1AKS using various sources, (some word for word) 12-15-11

So just what is that attracts nearly 750,000 US citizens and over two million worldwide to Amateur Radio. What void in people's lives is satisfied through Amateur Radio participation?

Today Amateur Radio continues to be vibrant with something for everyone who is interested in radio communications. While many hams simply enjoy talking to friends, others pursue specialized interests such as building projects, designing links to the internet, emergency communications, Morse code and activities that involve the out-doors.

**Developing face-to-face friendships** – Have you ever heard the phrase "In this world we are not alone" … A comment you will hear often is that Amateur Radio provides friendships that last a life time" Stories abound of hams earning their license as young as 6 years old and others who enjoy the hobby well into their 90's. Then there is the mentor, teacher or friend in Amateur Radio usually referred to as an "Elmer". An Elmer provides newcomers with the "need to know" and guidance to the many aspects of the hobby. There are ham-fests, club meetings and swap meets all geared toward being a support group to the newcomer and experienced alike. Amateur Radio has a rich history and is well known for the generosity of its fellowship in mentoring those who wish to learn.

Radio clubs hold regularly scheduled meetings and other activities where you get to hob-knob with other hams. There are clubs all throughout the country that offer the opportunity to take part in a wide range of activities and some clubs choose to specialize in specific areas of interests. The local club is the gathering point for operator activity, training, broadening of horizons and just having fun! By joining a club you will have at your fingertips a ready resource of knowledge, experience and friendships that can last a lifetime.

**Developing on the air friendships –** As you gain in experience, you will begin to hang with a certain group of people that you enjoy speaking with on the air. After establishing a rapport with one or more of these people, you will likely suggest setting up a schedule to meet on a simplex frequency or a repeater to further strengthen your friendship. Repeaters are automated relay stations, are used on VHF and higher frequencies to increase signal range. Repeaters are usually located on top of a mountain, hill or tall building that allow operators to communicate over many square miles using a low power hand-held transmitters. Repeaters can also be linked together into other Amateur Radio bands, phone or even the Internet. Amateur Radio operators use their transceivers to make contacts with individual hams as well as participating in round table discussion groups or "rag chew sessions" on the air. Some join in regularly scheduled on-air meetings with other Amateur Radio operators, called"nets" (as in "networks") which are moderated by a station referred to as the "Net Control Station." Nets allow operators to learn procedures for emergencies operations, be an informal round table, be topical, or cover specific interests shared by a group.

**The need to feel that you are giving back to society** - Most of us lead busy lives. With the many constraints associated with raising a family, a job, etc. we don't always have the discretionary time to give to a worthy cause. Sure, we can always toss a few bucks to our favorite charities, but there is another sustaining and basic instinct that we all have, which is to help others. Participation in public service activities might be the thing for you. With Amateur Radio you have the freedom to participate at whatever level you wish and satisfy that basic need to help in a way that perhaps others can't - But more on this a bit later.

**Mixture of new and old technology -** In years past, Amateur Radio had been allowed to languish. It was not uncommon for people to refer to Amateur Radio in the context of the past by saying "my grandfather's neighbor was a ham" or "Ham radio? Is that still around?" Luckily, in the past few years there has been resurgence in part due by embracing new technologies ehile still preserving the old that is Amateur Radio. The hobby is no longer perceived as just sitting in one's basement making contacts and using Morse code and collecting contact cards (QSLs). Although that aspect of the hobby is still practiced it is not the only part of the hobby's activity. For many years, demonstrating a proficiency in Morse code was a requirement to obtain an amateur license. Following changes in international regulations in 2003, the requirement for Morse code in the US was removed allowing more people to enter the hobby than ever before.

**Experimentation** - Although its origins can be traced to the mid 1800s, Amateur Radio, as practiced today, did not begin until the early 1900s. As with radio in general, the birth of Amateur Radio was strongly associated with various amateur experimenters and hobbyists and to a large part, the need to discover. This experimentation commonly called "hand-building" or "home-brewing" has an appeal that is still powerful today. This extends to both transmitter-receivers and antenna systems. Throughout its history, Amateur Radio enthusiasts have made significant contributions to science, engineering, industry and social services. Research by Amateur Radio operators has founded new industries, help built economies, empowered nations, and saved lives in times of emergency.

**Contesting, -** There is a basic instinct in all of us to compete. Perhaps it is in sports or maybe your job. It is important to all of us to feel that we have accomplished something noteworthy in our lives. Contesting (also known as radiosport) helps to feed that competitive spirit. Contesting by an individual or a team, is where one seeks to contact as many other Amateur Radio stations as possible in a given period of time. Rules for each competition vary and define the, the mode of communication that may be used, and the specific information that must be exchanged. The contacts made during the contest contribute to a score by which stations are ranked. Over time, the number and variety of radio contests has increased, and many Amateur Radio operators today pursue this sport as their primary Amateur Radio activity. Contest sponsors publish the results in magazines and on web sites.

**Earning awards and collecting QSL confirmations –** Another popular form is self-competition. Amateur awards, commonly called "chasing wall paper" or certificates that one can hang on the wall of the radio shack are forms of this activity.. Amateur Radio operating award are earned by an operator for "working" or making contact with other stations. Awards are sponsored by national societies, radio enthusiast magazines, or Amateur Radio organizations. The aim is to promote activity on Amateur Radio frequencies. Each award has its own set of rules and objectives. Some of the more popular awards require the operator to make contacted with a certain number of countries, Maidenhead grid square or counties. Usually, the first, second and third place finishers are the recipient of a certificate, wooden plaque, or a small trophy as recognition for their accomplishment. Most operating awards require that the applicant submit proof, such of the contacts by submitting QSL (contact) cards or entry in verifiable database to satisfy the requirements of the award. There are thousands of operating awards available. Some of the more popular awards are the Worked All States (WAS) and the Worked All Counties (WAC). The most prestigious award by far is DXCC program, initially requiring amateurs to contact 100 of the more than 300 recognized countries and territories in the world. There are DXCC awards for contacting 100 countries per each band. Other popular awards include contacting remote islands, US counties, and lighthouses. Many awards are available for contacting amateurs in a particular country, region or city.

**Giving Back** - I mentioned a while back that it is a very natural need to feel you are giving something back to society. This can be at a very personal level by becoming a mentor to a new ham or as we like to call them "Elmers" (Don't ask. We really aren't 100% sure of why we call them by that name, but for whatever reason it stuck.)

At another level is to serve your community in a more general approach called Public Service and there are a number of ways to serve your community in this vein. Public Service can be broken it to two general categories. (1) Providing support communications for non-profit organizations such as a walk or bike-a-thon; (2) Training for an emergency through the Amateur Radio Emergency Service (ARES ®) when your community needs you. Most hams who feel the need to give back, do both. Each complement each other. ARES helps by provide the ready manpower and the activity help provide on-the-air training in what is the nearest thing to an actual emergency.

**ARES – Amateur Radio Emergency Service** - ARES consists of licensed amateurs who voluntarily provide communications services for the public good. Public service communication is a traditional responsibility of the Amateur Radio Service. Amateur Radio's public service disaster work is organized and implemented principally through the Amateur Radio Emergency Service (ARES) and the National Traffic System (NTS), both sponsored by ARRL. It is no coincidence that Part 97 of the FCC's Rules and Regulations states "Recognition and enhancement of the value of the amateur service to the public as a voluntary non-commercial communication service, particularly with respect to providing emergency communications."

Amateur Radio operators belonging to ARES have responded to local and regional disasters throughout its 77 year history (1935) and participated in emergency and relief operations various organizations and individuals related to relief efforts, including the attacks on September 11, 2001 as well as numerous hurricanes, tornado, floods and other natural disasters.

When regular communications channels fail or don't exist, trained Amateur Radio operators are asked to provide emergency communication services. Each case is different, requiring different solutions. Whether it is disaster intelligence reporting during an event or providing a much needed communication link between a town's emergency operation centers (EOC) to a State EOC or beyond, ARES can provide that critical backup communication capability.

Most emergencies occur at the local level, so initial training and skill development takes place working with your local area Emergency Coordinator (EC). The EC is the key contact between the ARES member, ARES Leadership and served agencies The EC is in charge of all ARES activities in a specific geographical area. The proper use of personnel, equipment and facilities is their responsibility. The EC relies on the people in his area and the equipment and resources available to provide meaningful support services. Some operators like working primarily from home while others may want to experience working in the field, possibly at an Emergency operation center or other government facility.

Hams regularly participate in local Amateur Radio Emergency Services (ARES) training, practicing their skills transmitting vital information as they would in a disaster situation. ARES groups routinely offer communications and operational expertise to organizations like the March of Dimes, National Cancer Society and the American Diabetes Association for walk and bike-a-thons. These non profit fundraising drives provide good training for future emergencies by testing radio equipment, antenna systems and verifying repeater system coverage, all while benefiting a good cause.

**RACES – Radio Amateur Civil Emergency Service** - is an organization that may be activated by government authority in times of a national emergency should all other Amateur Radio activities be suspended. The last time Amateur Radio activities were suspended was during World War II. In daily practice, most Amateur Radio operators enrolled with their local government for possible operations under the RACES rules are also members of the ARES. ARES provides emergency communications in the conventional Amateur Radio Service without the need for an emergency declaration from the government.

**And of course, there is the enjoyment of just pure operating –**

**Ragchew** is what hams like to do to pass the time of day and night. Two or more hams who have become close friends get together in what is called a 'schet" or schedule on some out of the way frequency where they won't be bothered and talk as if they were face to face. Many of these conversations which hams call QSO's can be both educational and quite funny. Many QSO's take on an air of good natured ribbing between friends that can be hilarious. Amateur Radio is very much a fraternal hobby.

**Amateur Radio operators use various modes of transmission to communicate**. These include digital and non-digital voice modes alike such as amplitude modulation (AM), a "legacy" mode pursued by many vintage equipment Amateur Radio enthusiasts and aficionados of vacuum tube technology. Frequency Modulation (FM), and Single-Sideband (SSB) which have been widely used since the first half of the twentieth century. Voice transmissions are most common, with some, such as frequency modulation (FM) offering high quality audio, and others, such as single sideband (SSB) which offers a more reliable communications, at the sacrifice of audio quality.

**Another popular mode of communications is that of Continuous Wave (CW).** Continuous-Wave or Carrier Wave is still popular among Amateur Radio operators. The term "CW" and "Morse code" are often used interchangeably; despite there are distinctions between the two. It is the wireless extension of land line (wire based) developed by Samuel Morse and was the predominant real time long-distance communication method of the 19th century. Morse code may be sent through wires, sound, or light. A signal is keyed to turn on and off by a simple switch called a keyer or paddle to a transmitter. A series of the dots and dashes make up Morse code characters, when put together form words, numbers Procedural signals called prosigns and Q signals and punctuation. Q signals are accepted abbreviations for common terms which permit conversation even when the operators speak different languages.

Morse code has been in use for more than 160 years — longer than any other electrical coding system. Amateur Radio operators had used Morse code exclusively until around 1920 when voice-capable radio transmitters became commonly available. Morse code was used by Abraham Lincoln during the Civil War to communicate directly with his field commanders through a rather extensive northern railroad system that was not as available to the south.

Though computer-based (digital) modes and methods have largely replaced CW for commercial and military applications, many Amateur Radio operators still enjoy using the CW mode, particularly on the shortwave bands which has the advantage of being heard over long distance, especially when signals are marginal and bandwidth is restricted.

Although the traditional telegraph key (straight key) is still used by many amateurs, the use of mechanical semi-automatic keyers (known as "bugs") and of fully-automatic electronic keyers is prevalent today. Computer software is also frequently employed to produce and decode Morse code radio signals.

Operators skilled in Morse code can often understand ("copy") code in their heads at rates in excess of 40 WPM. The record set by Ted R. McElroy in 1939 for Morse copying was 75.2 words per minute. Operators who can copy high speed code claim they are "hearing" phrases and sentences rather than individual letters, characters, or even words. In some countries such as the US, certain portions of the Amateur Radio bands are reserved Morse code signals only.

**Modern personal computers** have encouraged a blend of new and old digital modes.

- Radio-teletype (RTTY) is a traditional mode which previously required cumbersome mechanical equipment, but now be accomplished with a small computer interface.
- Hams led in the development of packet radio in the 1970s, which employed TCP/IP protocol as well as other high-speed multimedia and TCP/IP modes.
- Other specialized digital modes such as PSK31 allow for real-time, low-power communications on the shortwave bands.
- Echolink using Voice over IP technology has enabled amateurs to communicate through locally Internet-connected repeaters and radio nodes.
- IRLP connections have allowed linking of repeaters to provide a greater coverage area.
- Automatic link establishment (ALE) enables continuous Amateur Radio networks to operate on the high frequency bands with global coverage.
- Other modes such as FSK441 using specialized software are used for weak signal modes including meteor scatter and moon-bounce communications. Tracking tactical information using the Automatic Packet Reporting System (APRS) which can also be integrated with GPS
- One of the newest digital technologies is that of D-STAR (Digital Smart Technologies for Amateur Radio) is a digital voice and data protocol, developed specifically for Amateur Radio which provides the capable of linking repeaters together locally and through the Internet for routing of traffic which allows Amateur Radio operators to link both, data streams or voice simultaneously.

**Other Earth bound pursuits**

- Amateur Radio direction finding also known as fox hunts is where a group of hams using as little as their handheld radios learn how to hunt down a transmitted signal.
- DX communications enjoying the “hunt” for contact with far away countries and learning about other cultures.
- Fast scan amateur television has gained popularity as hobbyists adapt inexpensive consumer video electronics like camcorders and video cards in computers.
- Severe weather spotting through the National Weather Service’s SKYWARN program.
- Low Power (QRP) operation the pursuit of making contacts worldwide with under 5 watts of power, maximizing signal strength through the design and development of antenna systems.

**Outer space pursuits**

- Communication satellites called OSCARs (Orbiting Satellite Carrying Amateur Radio) some by which can be accessed, using only a hand-held transceiver (HT) under the right conditions only using the factory "rubber duck" antenna
- Hams also use the moon, the Aurora Borealis and the ionized trails of meteors to reflector radio signals back to earth.
- Often Hams are able to make contact with the International Space Station. Many astronauts and cosmonauts have earned their Amateur Radio license and participate in the ARRL's ARISS, Amateur Radio aboard the International Space Station program.

**Assume I don't have a license yet, what do I have to do to get started?**

You have two options, self education or formal classroom instruction.

There is a wealth of on line services to get you started. The American Radio Relay League (ARRL) publishes excellent ham radio license study guides for all classes of ham licenses to help you learn the things you'll need to pass your exam and have fun with Amateur Radio. They are highly recommended and contain ALL of the study material including the exact questions and answers as they will appear on the exam! You **don't** need a background in electronics although it does help for the higher classes of licenses. Children are licensed all the time and so can you!

If formal classroom instruction works best for you, many people started by contacting a local Amateur Radio club. Clubs often provide information about licensing, local operating practices and technical advice. Some even provide classroom instruction Newcomers can also study independently by purchasing books or other materials, sometimes with the help of a mentor, teacher or friend. Remember that "Elmer" thing I mentioned in the beginning? Others contact the ARRL or one of the local Section Managers of the ARRL.

In all countries that license citizens to use Amateur Radio, operators are required to pass a licensing exam to demonstrate key concepts in the areas of technical knowledge, operating competence and awareness of legal and regulatory requirements.

In the United States hams are granted progressive operating privileges as you up through the three sequential levels of licensing exams (Technician Class, General Class and Amateur Extra Class). Each level is progressively more challenging and grants more privileges in terms of frequency availability, power output, permitted experimentation, and distinctive call signs. Upon licensing, the FCC issues a unique call sign. The holder of a call sign uses it on the air to legally identify as the operator or station during any and all radio communications. There is no requirement that you have to complete all three licensing levels, but it is strongly encouraged that you do.

Getting started in ham radio does not have to be an expensive proposition by any means, especially for those who are interested in learning how to do it themselves. Many newly licensed hams get started in Amateur Radio on the VHF, or "two meter" band by simply purchasing a readily available hand-held "HT" portable radio, and communicating via the many repeaters that are installed and active throughout the US and the world. Beginner Technician class licensees have access to this band, and most start out there before branching out to other frequencies and modes

You have likely recognized noticed that there are an incredible number of communication modes available and should not be surprised to learn that the equipment available to amateur operators for communicating via all these modes is extensive. Locate a ham radio store in your area or on line. Hams have since the early days have made terrific use of surplus and home-made and store bought equipment that continues today.

**Lastly, we need to discuss what Amateur Radio is and is not.**

**What Amateur Radio is -** Amateur Radio is both a hobby and a service in which participants; use various types of equipment and capabilities on certain protected groups of frequencies (bands) to communicate with other radio amateurs for public service work, recreation and self-training. Licensed Amateur Radio operators enjoy worldwide wireless communications with each other and are able to support their communities with emergency and disaster relief communications when called upon all the while increasing their personal knowledge of electronics radio theory and emergency service protocols

**What Amateur Radio is not -** Amateur Radio cannot is not be used for commercial or business communications. A good rule of thumb is that there cannot be any financial compensation directly or indirectly associated with the use of Amateur Radio except in certain very limited circumstances that are called out in FCC Rules and Regulations – Part 97.113. The term " amateur", reflects the principle that Amateur Radio and its skilled operators are committed to helping communities without financial compensation; whereas commercial radio operates for profit.

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