

Media Guide to Amateur Radio

Reporting on technical topics can be difficult, and as journalists, you want to get things right. It is in this spirit that we offer this media guide to amateur radio. Below is a brief introduction to amateur radio, definitions of some of the commonly-used terms used in amateur radio, and suggestions on their usage.

What is amateur radio?

Amateur radio is a hobby enjoyed by more than 700,000 people in the United States and approximately 2 million people around the world. Radio amateurs enjoy communicating with one another using two-way radios and experimenting with antennas and electronic circuits. Although it is often characterized as a “dying hobby” or “your grandfather’s hobby,” it is alive and well, here in the U.S. and around the world.

All kinds of people are radio amateurs, also known as “hams.” Hams are young, old, men, women, boys, and girls. Kids as young as seven years old have gotten amateur radio licenses and many hams are active into their 80s and beyond. You never know who you’ll run into on the amateur radio bands: young and old, teachers and students, engineers and scientists, doctors and nurses, mechanics and technicians, kings and entertainers. People from all walks of life are radio amateurs.

In addition to being a hobby, amateur radio is also a service. In fact, the official name for amateur radio is the Amateur Radio Service.

The regulations governing the Amateur Radio Service (Title 47CFR, Chapter I, Subchapter D, Part 97) note that there are five purposes for amateur radio:

1. Provide emergency and public-service communications.
2. Advance the state of the “radio art.”
3. Improve the communication and technical skills of radio amateurs.
4. Provide the nation with a pool of “trained operators, technicians, and electronics experts.”
5. Enhance international good will.

All of these things are what radio amateurs have been doing for more than 100 years.

To become a radio amateur, one must pass a test. Once they pass this test, the Federal Communications Commission (FCC) issues them a license. There are three license classes in the U.S.: Technician, General, and Amateur Extra. The exams for these licenses become increasingly more difficult, but the licenses issued upon passing the exams give the radio amateur more operating privileges.

What amateur radio is not

There are a number of personal radio services in the United States, besides amateur radio, including:

- CB (Citizens Band) – CB uses 40 channels around 27 MHz and is used for local chat, trucking, and hobbyist use. No license is required, but users are restricted to 4 watts output power for AM transmissions and 12 watts PEP for single-sideband transmissions. There are also restrictions on how high a CB antenna can be.
- MURS (Multi-Use Radio Service) – MURS is similar to CB, except that it uses VHF frequencies. No license is required. Power output is limited to 2 watts, on five channels. It is used for short-range, business, and hobbyist communications.
- FRS (Family Radio Service) – FRS allows users to communicate with low-power handheld radios and is intended to allow families to communicate with one another over short dis-

tances. No license is required. Output power is limited to 2 watts and the radios must be equipped with fixed, non-removable antennas.

- GMRS (General Mobile Radio Service) – GMRS is similar to FRS in that it also uses UHF frequencies and is intended for family use. A license is required to use a GMRS radio, but all that is required to obtain a license is to fill out an application and pay a licensing fee. The license permits GMRS users to use radios with up to 50 watts of output power and set up repeaters, which makes GMRS a more effective and reliable way to communicate when compared to FRS.

All of these services require the user to use radios that have been “type accepted” by the FCC for use in that service. Radio amateurs, on the other hand, are encouraged to experiment with their own radio and antenna designs and may use transmitters with an output power as high as 1,500 W.

Terminology and usage

Amateur Extra Class

Often referred to as simply “Extra Class,” this is the highest of the three classes of amateur radio licenses. To obtain an Amateur Extra Class license, applicants must pass a difficult test with 50 multiple-choice questions. After passing the test, Amateur Extra Class licensees have all the operating privileges afforded to radio amateurs.

Amateur Radio Digital Communications (ARDC)

A California-based foundation with roots in amateur radio and the technology of internet communication. Its mission is to support, promote, and enhance digital communication and broader communication science and technology, to promote amateur radio, scientific research, experimentation, education, development, open access, and innovation in information and communication technology. Website: ardc.net.

American Radio Relay League (ARRL)

An organization, based in Newington, CT is a membership-based non profit corporation with more than 100,000 members around the world. Its mission is to promote and protect the art, science, and enjoyment of amateur radio, and to develop the next generation of radio amateurs. Website: arrl.org.

broadcasting vs. transmitting

Radio amateurs transmit. They do not broadcast. Broadcasts are defined as transmissions meant for the general public, and radio amateurs may not engage in any form of broadcasting (Part 97.113(b)).

call sign

A unique identifier issued to each radio amateur by the FCC. Whenever they transmit, radio amateurs must identify with their call sign. As a result, radio amateurs are often better known by their call signs than their names. When referring to a particular radio amateur, you should include their call sign.

contesting

A competitive, on-the-air event during which amateur radio operators try to make as many contacts (or QSOs) as possible during a specified time. During a contest, radio amateurs send and receive small amounts of information called the “exchange.” Contesting can also be referred to as radiosport.

digital mode

A mode of communication that involves sending and receiving digital information over the air.

emcomm

Short form of *emergency communications*.

Field Day

An annual event, sponsored by the American Radio Relay League, held on the last full weekend in June. It is an event that combines public service, emergency preparedness, community outreach, and technical skills all in a single event. On Field Day, more than 31,000 radio amateurs throughout North America set up temporary amateur radio stations in public places to improve their operating skills, show off amateur radio technology, and demonstrate how radio amateurs serve their communities and their nations. “Field Day” is always capitalized.

A similar event, called Winter Field Day (WFD), is held on the fourth full weekend in January. This event is sponsored by the Winter Field Day Association, website: winterfieldday.org.

fox hunting (see radio direction finding)**General Class**

The second of three classes of amateur radio licenses. To obtain a General Class license, applicants must pass a test with 35 multiple-choice questions that is somewhat more difficult than the Technician Class license test. After passing the test, General Class licensees can operate on more frequencies than Technician Class licensees.

ham radio

“Ham radio” is a nickname for amateur radio. There are many theories about how amateur radio came to be known as ham radio, but the most sensible explanation comes from the days when all radio communication was in Morse code. Many men (and women, too) made their livings as professional telegraphers, and they were proud of how well they could send Morse code. They chided the amateur radio telegraphers as being “ham-fisted operators,” meaning that their sending was awkward and inefficient. Along the way, this got shortened to “ham operators,” and the hobby became known as “ham radio.”

Whether or not this story is true, the “ham” in ham radio is definitely not an acronym, and should never be spelled HAM. Nor should the hobby be referred to as simply “ham” without the word radio.

HF

Short for High Frequency. HF is the frequency range between 3 MHz and 30 MHz.

International Amateur Radio Union (IARU)

The International Amateur Radio Union (IARU) is the worldwide federation of national amateur radio organizations. The membership of the IARU consists of more than 160 member-societies in as many countries and separate territories. Website: iaru.org.

mode

In amateur radio, mode refers to the type of modulation and operating techniques that a radio amateur uses to transmit and receive information. Examples of modes include:

- CW (Continuous Wave). By keying a transmitter on and off, radio amateurs send and receive Morse code.
- SSB (Single Sideband). SSB is a form of amplitude modulation and is the most common voice mode on HF.
- FM (Frequency Modulation). Radio amateurs use FM for local voice communication on the VHF and UHF bands, especially through repeaters.
- Digital modes. There are many different digital modes, including radioteletype (RTTY), PSK31, FT8, FT4, and packet radio. Radio amateurs that operate digital modes use a computer sound card or dedicated hardware to encode/decode data as audio tones.

Radio amateurs choose which mode to operate based on band conditions, available equipment, and the communication that they are trying to make. Each mode has different characteristics, including bandwidth, noise immunity, power efficiency, and the type of information it can carry (voice, text, data, images). For example, a weak-signal digital mode like FT8 can complete contacts under conditions where SSB voice wouldn't get through.

radio direction finding

An amateur radio activity in which participants try to find a hidden transmitter. The skills that radio amateurs acquire during this activity are useful when trying to find sources of interference or intentional jamming, but most often, participants do this just for fun.

repeater

An amateur station that simultaneously retransmits the signal of another amateur station on a different frequency. Repeater stations are often located on tall buildings or towers, thereby extending the range of VHF and UHF radios.

Technician Class

The first of three classes of amateur radio license, and the class of license that most beginners start with. To obtain a Technician Class license, applicants must pass a test with 35 multiple-choice questions that covers basic electricity and electronics, electrical and RF safety, operating procedures, and rules and regulations.

UHF

Short for Ultra High Frequency. UHF is the frequency range between 300 MHz and 3000 MHz.

VHF

Short for Very High Frequency. VHF is the frequency range between 30 MHz and 300 MHz.

For more information

For more information about amateur radio, contact:

- Dan Romanchik, KB6NU, cwgeek@kb6nu.com, 734-431-4968
- Rebecca Key, KO4KVG, rek990@gmail.com