Radio Merit Badge

Boy Scouts of America

Module 3 – Amateur Radio

2009

Key Topics in This Module

- Why does the FCC have an Amateur Radio Service?
- Amateur Radio Activities
- Logging a Contact
- Q Signals & Abbreviations
- Amateur Radio Licenses
- Emergency Procedures
- Types of Amateur stations
- Repeaters
- NOAA Weather Radio

Why does the FCC have an Amateur Radio Service?

- **Volunteer service** - (community service and disaster help). A Scout does a good turn daily - here's another way.
- **International goodwill** - A great way to talk to people in far away lands.
- **Experimentation** - If you want, you can build your own radio equipment, and many hams build their own antennas. Some hams have come up with new inventions, such as FM, SSB, Packet Radio, Automatic Position Reporting Systems.
- **Communication skills** - Because only one person can talk at a time, you learn how to listen!
- **Self-training** - You can learn by doing.

Amateur Radio Activities

- **DX** Lots of hams like to talk to other hams around the world and collect postcards called QSL cards to prove they did it. It's a great way to have fun and learn about geography.
- **Contests** are held many weekends when you try to contact as many people from a certain place or in a certain way.
- **Public Service** at parades & special events. Ham radio operators are often the best people to help with communication at large community events, from small carnivals all the way to the Tournament of Roses Parade.
- **Disasters** Hams are often called on to help during fires, floods, earthquakes, and other disasters. At these times, telephone lines and cell phone sites are often damaged or overloaded, and ham radio is the only reliable communication.
- **Skywarn** National Weather Service uses Hams to report severe weather .
- **Packet radio** Some hams hook their computers to their radios so they can send electronic messages, sort of like wireless e-mail.
- **Camping** communications are easy even in the backcountry when you need to get help or just let the folks back home know how things are going.
- **Jamboree On The Air** (JOTA) is the third weekend every October when Scouts all over the world talk to each other on ham radio.

Log Book Essentials

- Contact's Name
- Contact's Call
- Contact's QTH (location)
- Frequency
- Mode
- RST Sent (signal report)
- RST Received (signal report)
- Comments

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Q Signals and Amateur Terms

QRM	Man-made interference		QRN	Natural noise or interference
QRP	Low Power (< five watts)		QRS	Slow down Morse code speed
QRT	Quitting - off the air		QSB	Signal is fading
QSL	Acknowledge receipt (card)		QSO	Conversation ("cue-so")
QSY	Change frequency		QTH	Location (think H for Home)

Log	Record of QSOs		CW	Morse code (means Continuous Wave)
DX	Distant (foreign stations)		CQ	Calling any station ("seek you")
OM	Old man (male ham)		YL	Young lady (female ham)
Rig	Radio		Shack	Room the radio is in
HI	Laugh in Morse code		73, 88	Best regards, love and kisses

Amateur Radio License Classes

- **Technician Class**
  - Starter License
  - Simple 35 question Multiple Choice Test
  - All privileges above 30 MHz (VHF, UHF)
  - Mostly Line of Sight (but includes Repeaters and Satellites)
- **General Class**
  - Standard License
  - Additional 35 question Multiple Choice Test
  - Adds HF (Long Distance)
- **Extra Class**
  - Highest Class License
  - Detailed 50 question Radio Theory Test
  - A few more HF frequencies
  - Short Call Sign

Technician Class License

- The Technician Class license is the **entry level** license.
- There is just one 35 question **multiple choice test** on theory, rules, and procedures.
- This license gives **full VHF & UHF use** so you can communicate around town and use repeaters, but you cannot use some of the HF bands which are used for world-wide contacts.
- This merit badge covers about half of the license test!
- Books are available with all the possible questions and answers.
- Practice tests can be found at:
  - QRZ web page:
    - WWW.QRZ.COM

Who Administers Amateur Radio Exams?

- Hams called "Volunteer Examiners" administer the exams for the FCC.
- Exam sessions and free study classes are run by local radio clubs such as:
  - The Warminster Amateur Radio Club
    - www.k3dn.org
  - The Delaware Valley Radio Association
    - www.w2zq.com
- Lots of other information on ham radio can be found at the ARRL web page:
    - www.arrl.org

Emergency Radio Calls

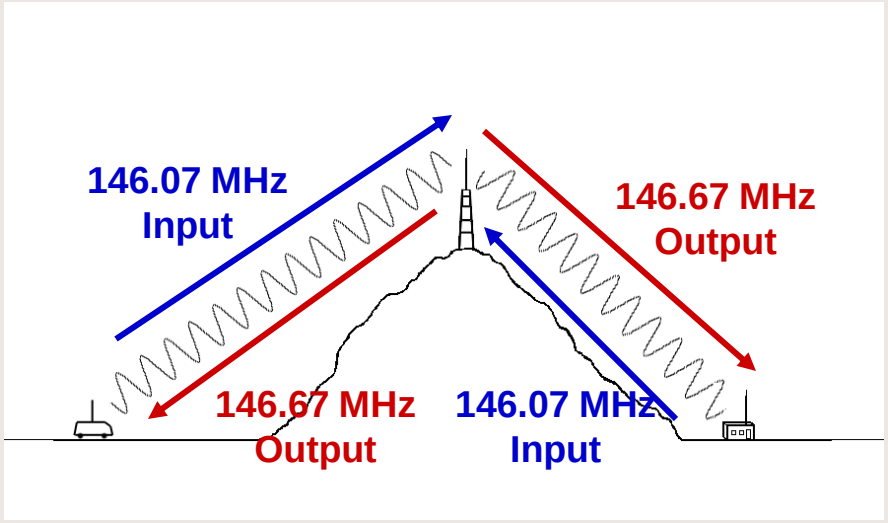
- **Speak clearly and give complete information**, just like when you make a 911 telephone call. Remember to give the correct location of the emergency because the person helping you on the radio may be in another state or even in another country!
- "**MAYDAY**" is the international word for requesting help by radio. However, in the US, **"EMERGENCY**" works too.
- Just because you have a radio doesn't mean someone will be able to hear you. You might have to climb higher up a hill. This is especially true for FRS radios and cell phones, which don't have has much power as ham radios.
- In Morse code you would send **SOS** (di-di-dit dah-dah-dah di-di-dit) and give the same information. The code should be sent slowly.

Ham Radio Station Types

- **Handheld Transceivers (HT):** Small, light, portable, but not much power. Some can fit in your pocket. Using repeaters, they can be quite useful, and they can go on your hike easily.
- **Base Station Transceivers :** Permanent station in a building. More power, easier to use, more features.
- **Mobile Transceivers :** Permanent station in a vehicle. More power. That HT antenna doesn't work well inside a metal car.
- **Repeaters:** Located on high points (Mountains, tall buildings, satellites) to automatically relay signals. Some have connections to the telephone system or the internet.
- **Which kind of radio is best?** It depends on what you want to do. You wouldn't backpack with a heavy base station radio, but that base station radio will let you talk farther when you are at home.

Repeaters

- Receive on one frequency and transmit on another.
- Usually in the VHF and UHF bands
- Allow much longer range for small radios.
- Located on mountains, towers, buildings and in space.



Requirement 9 a (6)

NOAA Weather Radio

- Continuous Weather Forecasts & Warnings
- 162.55, 162.475, 162.40, 162.45, 162.50 MHz
- Essential for boating, hiking and camping.
- Most Ham radios can also receive this.
- Special SAME (Specific Area Alert Encoding) receivers actually turn themselves on when a warning is sent for your county!