Requirement 1

1. Explain what radio is. Then discuss the following:
   a. The differences between broadcast radio and hobby radio.
   b. The differences between broadcasting and two-way communications.
   c. Radio station call signs and how they are used in broadcast radio and amateur radio.
   d. The phonetic alphabet and how it is used to communicate clearly.

Radio uses electromagnetic waves that are sent through the air to communicate and send messages between stations. Radio waves are much like light waves, only the radio “waves” are much longer than the waves we can see as visible light. Radio waves are emitted from an antenna whenever an electric current is sent back-and-forth through the antenna at a very fast rate, usually many thousands or many millions of back-and-forth cycles each second! The rate, or frequency, of the electric current cycles through the antenna determines the frequency of the radio wave cycles.

A Comparison of the Electromagnetic Spectrum of Waves, from Radio Waves to Visible Light to Gamma Rays

Related fun Links from HamRadioSchool.com:

   Video: Radio Wave Polarization with a Light Bulb!

   Video: See a Radio Antenna’s Power with a Light Bulb!

Radio waves can carry messages in different ways. The radio waves can be turned on and off in patterns, such as Morse Code patterns. The on-off patterns of Morse Code represent letters, numbers, and punctuation, so that a message can be sent. Radio waves can also change in power (amplitude) or frequency to encode the sounds picked up by a
microphone. A voice or music may be transmitted by radio waves in this way. The way that a message is encoded into a radio wave is called the modulation method, or the mode of transmission.

Audio: Hear sounds of different modes of transmission! [From HamRadioSchool.com]

Broadcasting is the one-way transmission of radio signals for many people to receive and hear all at once, without a radio message coming back from any of those people. The AM and FM radio stations that you may listen to in a car are broadcast stations. Hobby radio is usually two-way communication between people and using much lower power levels than broadcast radio stations. Amateur radio, or “ham radio,” is hobby radio that people use to communicate with one another in back-and-forth, two-way conversation. Police and fire officers also use two-way communication by radio to stay in touch with one another, and airplanes, boats, and spacecraft also use two-way radio communications.

A call sign is a special name for a radio station that is used to identify the station from all others in its radio transmissions. In the US, all radio stations that must have a license must also have a call sign. Broadcast station call signs are usually 3 or 4 letter names, such as WABC or WGN. Ham radio call signs have different formats that include a number that tells the region of the country in which the station was licensed. Ham call signs look like these: K2BSA, WØSTU, W1AW, KF5CLZ, KB4SA.

A phonetic alphabet uses special words to identify a call sign letter. Radio communications are sometimes noisy and unclear. Many letters of the alphabet sound similar, such as C, D, E, G, P, T, and Z. To help receiving stations understand a call sign in noisy conditions, a phonetic alphabet may be used by transmitting operators. So, the call sign K2BSA would be transmitted as “Kilo, Two, Bravo, Sierra, Alpha.”

The standard phonetic alphabet used by radio operators is listed below along with a link to a HamRadioSchool.com sound recording of the entire phonetic alphabet. Audio: Hear the Phonetic Alphabet [From HamRadioSchool.com]

|-----------|----------|-------------|-----------|---------|-------------|---------|----------|---------|-----------|----------|---------|---------|-------------|---------|---------|-------------|---------|-----------|----------|-----------|---------|-----------|---------|

The International Telecommunications Union Standard Phonetic Alphabet

You can learn more about amateur radio, on-air procedures, phonetics, and more in the HamRadioSchool.com Technician License Course book and web site!