



Merit Badge College 2018

Radio



You need to print this form and bring it with you to Merit Badge College.
Highlighted areas are to be completed outside of class.

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 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.

2. Do the following:
 - a. Sketch a diagram showing how radio waves travel locally and around the world.
 - Explain how the broadcast radio stations, WWV and WWVH can be used to help determine what you will hear when you listen to a shortwave radio?
 - b. Explain the difference between a DX and a local station.
 - Discuss what the Federal Communication Commission (FCC) does and how it is different from the International Telecommunication Union.

3. Do the following:
 - a. Draw a chart of the electromagnetic spectrum covering 100 kilohertz (kHz) to 1000 megahertz (MHz).
 - b. Label the MF, HF, VHF, UHF, and microwave portions of the spectrum on your diagram.
 - c. Locate on your chart at least eight radio services such as AM and FM commercial broadcast, citizens band (CB), television, amateur radio (at least four amateur radio bands), and public service (police and fire).

4. Explain how radio waves carry information. Include in your explanation: transceiver, transmitter, amplifier, and antenna.

5. Do the following:
 - a. Explain the differences between a block diagram and a schematic diagram.
 - b. Draw a block diagram for a radio station that includes a transceiver, amplifier, microphone, antenna, and feed line.
 - c. Explain the differences between an open circuit a closed circuit, and a short circuit.
 - d. Draw eight schematic symbols.
 - Explain what three of the represented parts do.
 - Find three electrical components to match to three of these symbols.

6. Explain the safety precautions for working with radio gear, including the concept of grounding for direct current circuits, power outlets, and antenna systems.

7. Visit a radio installation (an amateur radio station, broadcast station, or public communications center, for example) approved in advance by your counselor.
 - Discuss what types of equipment you saw in use,
 - How it was used,
 - What types of licenses are required to operate and maintain the equipment, and
 - The purpose of the station.

8. Find out about three career opportunities in radio.
 - Pick one and find out the education, training, and experience required for this profession.
 - Discuss this with your counselor, and
 - Explain why this profession might interest you.

9. Do **ONE** of the following: (a, b or c)

a. **AMATEUR RADIO**

1. Tell why the FCC has an amateur radio service. Describe some of the activities that amateur radio operators can do on the air, once they have earned an amateur radio license.
2. Using proper call signs, Q signals, and abbreviations, carry on a 10 minute real or simulated radio contact using voice, Morse Code, or digital mode. (Licensed amateur radio operators may substitute five QSL cards as evidence of contacts with amateur radio operators from at least three different call districts.) Properly log the real or simulated ham radio contact and record the signal report.
3. Explain at least five Q signals or amateur radio terms you hear while listening.
4. Explain some of the differences between the Technician, General, and Extra Class license requirements and privileges. Explain who administers amateur radio exams.
5. Explain how you would make an emergency call on voice or Morse code.
6. Explain the differences between handheld transceivers and home "base" transceivers. Explain the uses of mobile amateur radio transceivers and amateur radio repeaters.

b. **BROADCAST RADIO**

1. Prepare a program schedule for radio station "KBSA" of exactly one-half hour, including music, news, commercials, and proper station identification. Record your program on audiotape or in a digital audio format using proper techniques.
2. Listen to and properly log 15 broadcast stations Determine the program format and target audience for five of these stations.
3. Explain **at least eight** terms used in commercial broadcasting, such as segue, cut, fade, continuity, remote, Emergency Alert System, network, cue, dead air, PSA, and playlist.

c. **SHORTWAVE LISTENING**

1. Listen across several shortwave bands for four one-hour periods - at least one period during daylight hours and at least one period at night. Log the stations properly and locate them geographically on a globe.
2. For several major foreign stations (BBC in Great Britain or HCJB in Ecuador, for example), list several frequency bands used by each.
3. Compare your daytime and nighttime logs; note the frequencies on which your selected stations were loudest during each session. Explain the differences in the signal strength from one period to the next.

Scout Name

Address

Troop Number

Counselor Signature

Unit Leader Signature

Date Completed

Counselor: Initial next to the box located to the left of the requirement completed in class. Sign the space that states Counselor Signature.

Scout: Complete the spaces above for Scout Name, Address and Troop Number. Complete all highlighted areas outside of class.

This form replaces the traditional "Blue Card".