



Radio

Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet (book). No one can add or subtract from the Boy Scout Requirements #33215. Merit Badge Workbooks and much more are below: [Online Resources](#).

Send comments to: craig@craiglincoln.com. Requirements revised: 2001, Workbook updated: February 2008.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Ph #: _____

1. Explain what radio is. _____

Include in your explanation: the differences between broadcast radio _____

and hobby radio, _____

and the differences between broadcasting _____

and two-way communicating. _____

Also discuss broadcast radio _____

and amateur radio call signs _____

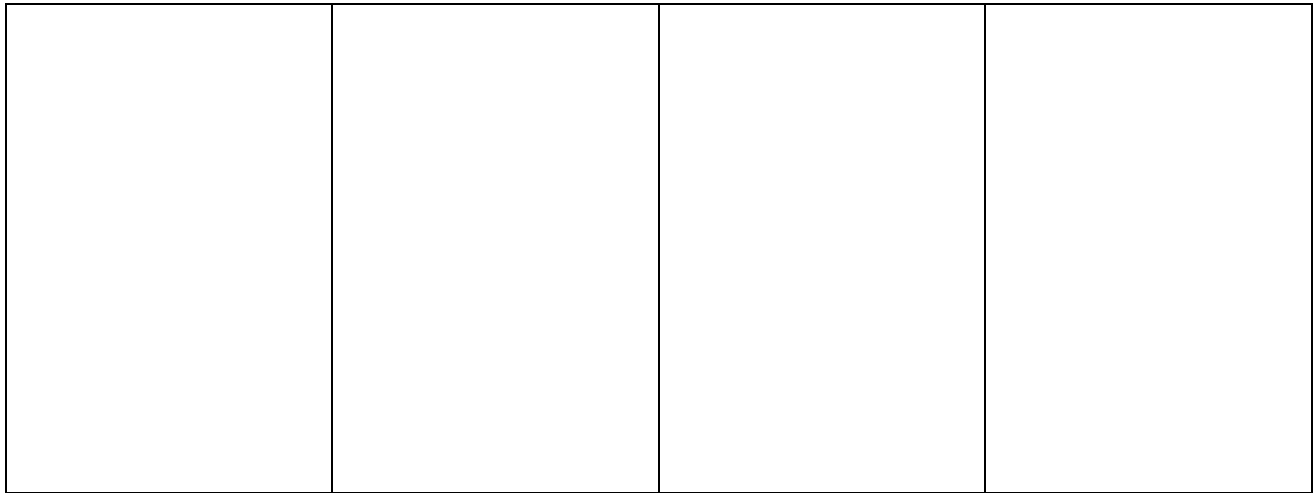
and using phonetics. _____

2. Sketch a diagram showing how radio waves travel locally and around the world.

How do the broadcast radio stations, WWV and WWVH, help determine what you will hear when you listen to a radio?

3. Do the following:

- a. Draw a chart of the electromagnetic spectrum covering 100 kilohertz (kHz) to 1000 megahertz (MHz).
- b. Label the LF, MF, 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, CB, television, amateur radio (at least four ham radio bands), and police.



100kHz 1MHz 10MHz 100MHz 1000MHz

d. Discuss why some radio stations are called DX _____

and others are called local. _____

Explain who the FCC _____

and ITU are. _____

4. Explain how radio waves carry information. _____

Include in your explanation: transceiver, _____

transmitter, _____

amplifier, _____

and antenna. _____

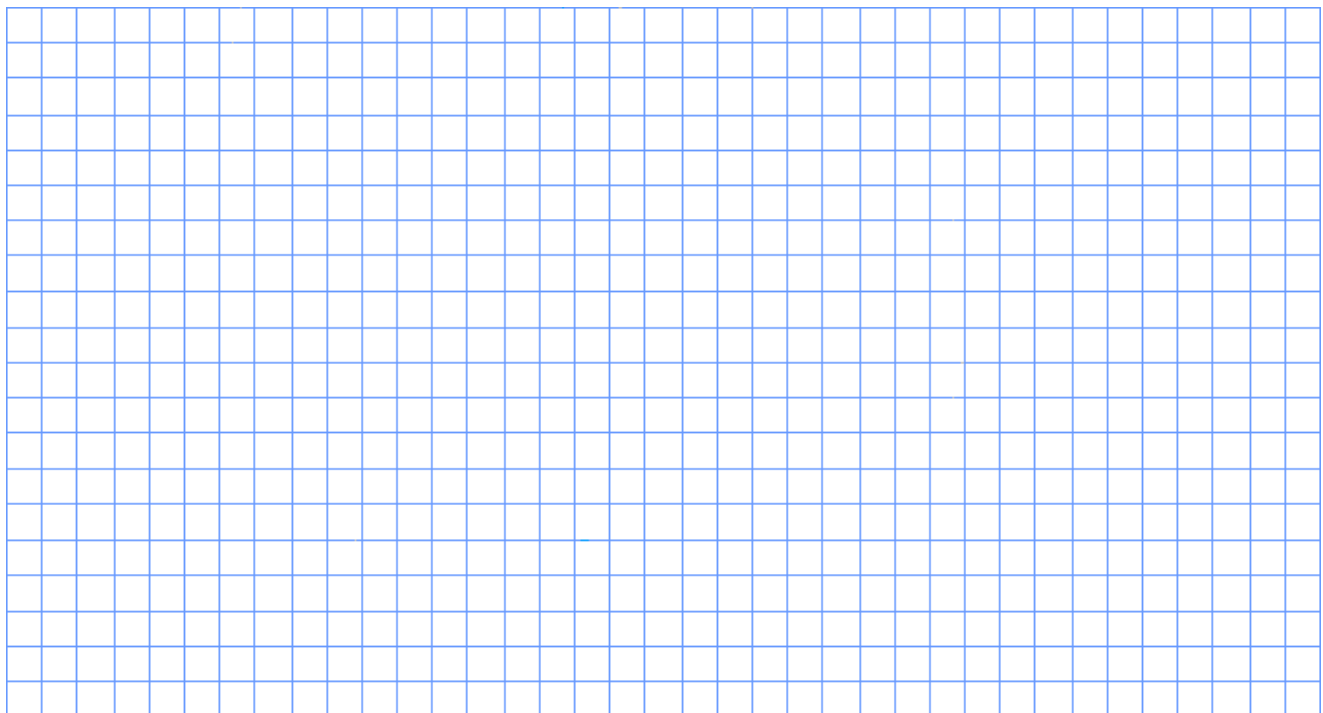
5. Learn the safety precautions for working with radio gear, particularly DC and RF grounding. _____

6. Do the following:

a. Explain the differences between a block diagram _____

and a schematic diagram. _____

b. Draw a block diagram that includes a transceiver, amplifier, microphone, antenna, and feedline.

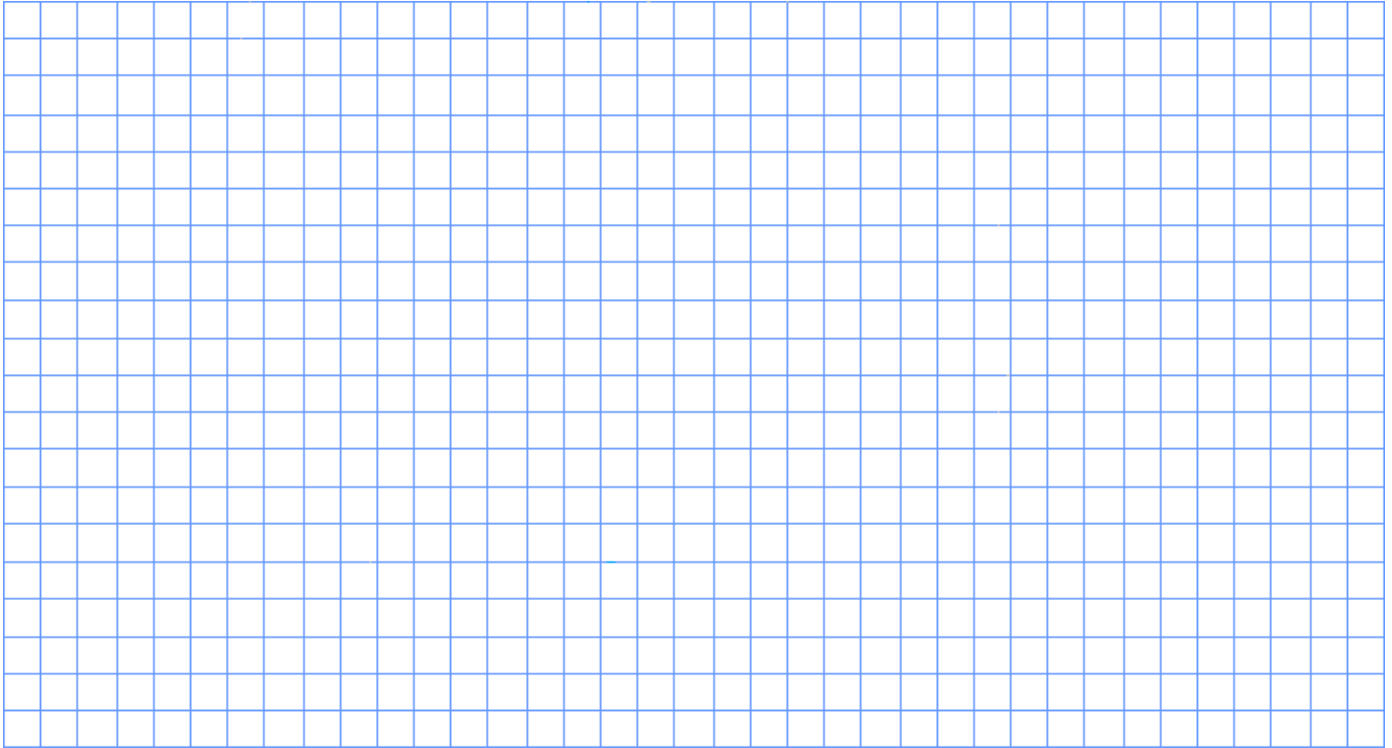


c. Explain the differences between an open circuit, _____

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.

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

a. Amateur radio

1. Describe some of the activities that amateur radio operators can do on the air, once they have earned an amateur radio license. _____

2. Carry on a 10 minute real or simulated radio contact using voice or Morse Code; use proper call signs, Q signals, and abbreviations. (Licensed ham 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 Technician Class license requirements and privileges. _____

Explain who gives amateur radio exams. _____

5. Explain how you would make an emergency call on voice or Morse code. _____

Tell why the FCC has an amateur radio service. _____

6. Explain handheld transceivers _____

versus home "base" stations. _____

Explain about mobile amateur radios _____

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 audio tape using proper techniques.

2. Listen to and properly log 15 broadcast stations; determine for five of these their transmitting power and general areas served.

3. Explain at least eight terms used in commercial broadcasting, such as

segue, _____

cut, _____

and fade. _____

4. Discuss the educational and licensing requirements and career opportunities in broadcast radio. _____

c. Short-wave listening

1. Listen across several short-wave bands for two 4-hour periods, one in the early morning and the other in the early evening. 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 morning and evening logs, noting the frequencies on which your major foreign stations were loudest during each session. Explain the differences in signal strength from one period to the next. _____

4. Discuss the purpose _____

 of and careers in short-wave communications. _____

8. Visit a radio installation approved in advance by your counselor (ham radio station, broadcast station, or public service communications center, for example). Discuss what types of equipment you saw in use, _____

how it was used, _____

what types of license are required to operate and maintain the equipment, _____

 and the purpose of the station. _____

Online Resources *(Use any Internet resource with caution and only with your parent's or guardian's permission.)*

- Merit Badge Workbooks:** usscouts.org -or- meritbadge.org ► **Merit Badge Books:** www.scoutstuff.org
 Boy Scouts of America: <http://www.scouting.org/> ► [Requirements](#) ► [Intro to Merit Badges](#) ► [Guide to Safe Scouting](#)
 Over 50 links are here: <http://meritbadge.org/index.php?title=Radio>