

# Radio

## Merit Badge Workbook



This workbook can help you but you still need to read the merit badge pamphlet.

This Workbook can help you organize your thoughts as you prepare to meet with your merit badge counselor. You still must satisfy your counselor that you can demonstrate each skill and have learned the information. You should use the work space provided for each requirement to keep track of which requirements have been completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers.

If a requirement says that you must take an action using words such as "discuss", "show", "tell", "explain", "demonstrate", "identify", etc, that is what you must do.

Merit Badge Counselors may not require the use of this or any similar workbooks.

No one may add or subtract from the official requirements found in Boy Scout Requirements (Pub. 33216 – SKU 621535).

	The requirements were last issued or revised in 2009	This workbook was updated in <u>October 2016</u> .
Scout's Nar	ne:	Unit:
	Name:	
Comi	http://www.USScouts.Org •  Please submit errors, omissions, comments or suggestion ments or suggestions for changes to the requirements for the	http://www.MeritBadge.Org s about this workbook to: Workbooks@USScouts.Org ne merit badge should be sent to: Merit.Badge@Scouting.Org
. Explain	what radio is.	
Then di	iscuss the following:  The differences between broadcast radio and hobby	radio
<b>u</b> .		

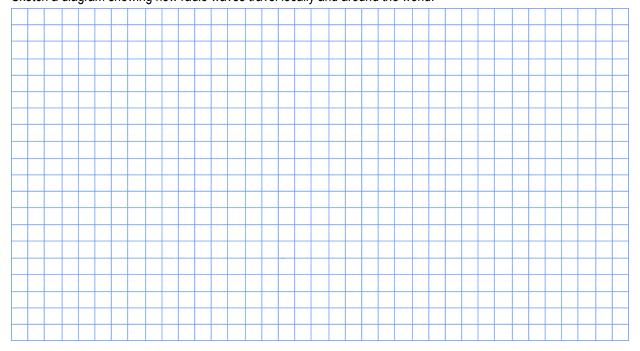
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b.	Scout's Name:
D.	The differences between broadcasting and two-way communications.
C.	Radio call signs and how they are used in broadcast radio and amateur radio.
٠.	That is sail signs and now also, are assumed and amazon radio.
d.	The phonetic alphabet and how it is used to communicate clearly.
d.	The phonetic alphabet and how it is used to communicate clearly.
d.	The phonetic alphabet and how it is used to communicate clearly.

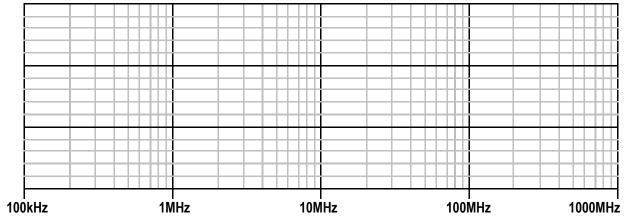
### 2. Do the following:

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



ladio			Scout's Name:
	Explai you lis	n how the bro ten to a short	adcast radio stations, WWV and WWVH can be used to help determine what you will hear when wave radio?
b	. Explai	n the difference	ce between a DX and a local station.
	DX		
	Local		
		ss what the Fe	ederal Communication Commission (FCC) does and how it is different from the International
	FCC:	orini di licationi	
	100.		
	Interna	tional	
	Teleco	mmunication	
	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).



Explain how radio waves carry information.

nclude in your explanation; transceiver, transmitter, receiver, amplifier, and antenna.	

Transceiver:	
Transmitter:	
Receiver:	

Ra	adio																							5	Sco	ut's	Na	ıme	e: _									
	Amplifier	:																																				
	Antenna:																																					
5.						1:tt`	0505		a b	o to 1.	001		hla	ماد	dia	aro	m -	لممد		, ab	- m-	-ti-	منام	ar														
	a.						erer	ice	SD	etw	eer	ı a	DIO	CK	uia	gra	111 6	anu	as	CHE	eme	alic	ula	agra	dIII.													
		BIC	CK	uia	ıgra	um.																																
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	b.	Dra	aw a	a bl	lock	di د	aar	am	∟ for	ar	adi	0 S	tati	on	tha	t in	clu	des	at	ran	SCE	eive	er. a	amı	olifie	er. ı	nic	rop	hoi	ne.	ant	enr	na.	and	d fe	ed	line	— Ә.
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c. Explain the differences between an open circuit, a closed circuit, and a short circuit.

Open circuit:

Closed circuit:

Short circuit:

d. Draw eight schematic symbols.



Explain what three of the represented parts do.

2.

1.

3.

Scout's Name: \_\_\_\_\_

Radio

6.

10	Scours Name:
☐ Visit a rac	lio installation (an amateur radio station, broadcast station, or public communications center, for example) in advance by your counselor.
Discuss what maintain the e	types of equipment you saw in use, how it was used, what types of licenses are required to operate and quipment, and the purpose of the station.
Equipment:	
Licenses:	
Purpose:	
Find out about	t three career opportunities in radio.
	find out the education, training, and experience required for this profession.
Education:	
Training:	
	Visit a rad approved Discuss what maintain the e Equipment:  Licenses:  Purpose:  Find out about 1. 2. 3.

Radio	Scout's Name:
Experience:	
Discuss this wit	th your counselor, and explain why this profession might interest you.
	following: (a OR b OR c )
	EUR 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.

9.

Radio		Scout's Name:								
	<u> </u>	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.								
		1.								
		2.								

Radio		Scout's Name:
	Explain who ad	ministers amateur radio exams.
;	5. Explain how you	u would make an emergency call on voice or Morse code.
,	6. Explain the diffe	propose between handhold transcoivers and home "base" transcoivers
,		erences between handheld transceivers and home "base" transceivers.
	Handheld	
	Base	
		s of mobile amateur radio transceivers and amateur radio repeaters.
	Transceivers:	
	Repeaters:	
	: <del> -</del>	

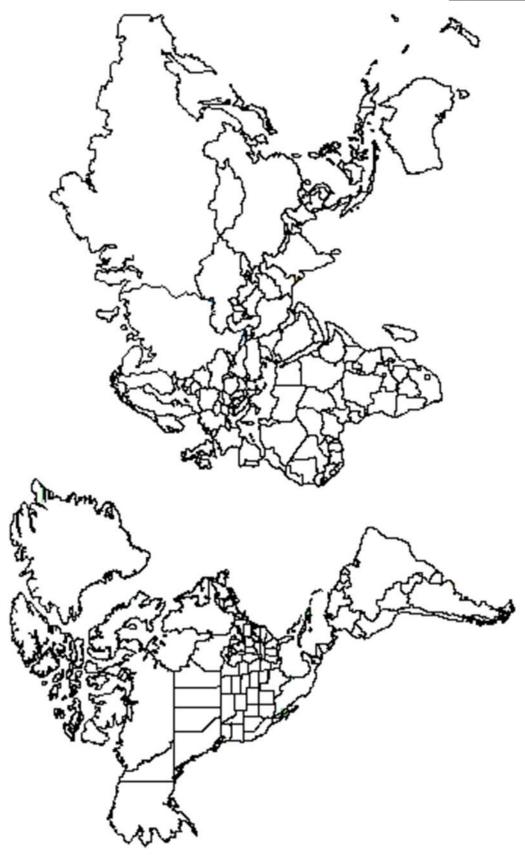
Radio					Scout's Name:						
	BROADO	CAST RADIO									
	<u> </u>	Prepare a prograr commercials, and	pare a program schedule for radio station "KBSA" of exactly one-half hour, including music, news, nmercials, and proper station identification								
					nat using proper techniques.						
	۷.		erly log 15 broadcast sta	ilions.							
		Call sign 1.	Freq.								
		2.									
		3.									
		4.									
		5.									
		6.									
		7.									
		8.									
		9.									
		10.									
		11.									
		12.									
		13.									
		14.									
		15.									
		Determine the pro	gram format and target a	audience for five o	of these stations.						
		Call Sign	Program F	ormat	Target Audience						
		1.									
		2.									
		3.									
		4.									

$\Box$	 :~	

Scout's Name:	
Scoul's Name.	

•	Expi	ain at least eig ergency Alert S	int terms used in commercial broadcasting, such as segue, cut, rade, continuity, remote, system, network, cue, dead air, PSA, and playlist.
		Segue:	
		Cut:	
		F. J.	
	Ш	Fade:	
		Continuity:	
		·	
		Remote:	
		_	
	Ш	Emergency Alert	
		System:	
	П	Network:	
	_		
		Cue:	
	Ш	Dead Air:	
		PSA:	
		1 07 1.	
		Playlist:	

Radio		Scout's Name:
□ c.	SHORT	WAVE LISTENING
	<u> </u>	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.
		(Note: You may want to use the map on the next page if a globe isn't available)
	2	For according to the state of ADDC in Creek Pritain on HC ID in Foundary for example), liet coveral
	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.
		Explain the unierences in the signal strength from one period to the hext.



Requirement resources can be found here:

http://www.meritbadge.org/wiki/index.php/Radio#Requirement resources

#### Important excerpts from the Guide To Advancement - 2015, No. 33088 (SKU-620573)

#### [1.0.0.0] — Introduction

The current edition of the *Guide to Advancement* is the official source for administering advancement in all Boy Scouts of America programs: Cub Scouting, Boy Scouting, Venturing, and Sea Scouts. It replaces any previous BSA advancement manuals and previous editions of the *Guide to Advancement*.

#### [Page 2, and 5.0.1.4] — Policy on Unauthorized Changes to Advancement Program

No council, committee, district, unit, or individual has the authority to add to, or subtract from, advancement requirements. There are limited exceptions relating only to youth members with special needs. For details see section 10, "Advancement for Members With Special Needs".

#### [Page 2] — The "Guide to Safe Scouting" Applies

Policies and procedures outlined in the *Guide to Safe Scouting*, No. 34416, apply to all BSA activities, including those related to advancement and Eagle Scout service projects.

#### [7.0.3.1] — The Buddy System and Certifying Completion

A youth member must not meet one-on-one with an adult. Sessions with counselors must take place where others can view the interaction, or the Scout must have a buddy: a friend, parent, guardian, brother, sister, or other relative—or better yet, another Scout working on the same badge—along with him attending the session. If merit badge counseling or instruction includes any Web-based interaction, it must be conducted in accordance with the BSA Social Media Guidelines (<a href="http://www.scouting.org/Marketing/Resources/SocialMedia">http://www.scouting.org/Marketing/Resources/SocialMedia</a>). For example, always copy one or more authorized adults on email messages between counselors and Scouts.

When the Scout meets with the counselor, he should bring any required projects. If these cannot be transported, he should present evidence, such as photographs or adult verification. His unit leader, for example, might state that a satisfactory bridge or tower has been built for the Pioneering merit badge, or that meals were prepared for Cooking. If there are questions that requirements were met, a counselor may confirm with adults involved. Once satisfied, the counselor signs the blue card using the date upon which the Scout completed the requirements, or in the case of partials, initials the individual requirements passed.

Note that from time to time, it may be appropriate for a requirement that has been met for one badge to also count for another. See "Fulfilling More Than One

#### [7.0.3.2] — Group Instruction

Requirement With a Single Activity," 4.2.3.6.

It is acceptable—and sometimes desirable—for merit badges to be taught in group settings. This often occurs at camp and merit badge midways, fairs, clinics, or similar events. Interactive group discussions can support learning. The method can also be attractive to "guest experts" assisting registered and approved counselors. Slide shows, skits, demonstrations, panels, and various other techniques can also be employed, but as any teacher can attest, not everyone will learn all the material

There must be attention to each individual's projects and his fulfillment of *all* requirements. We must know that every Scout —actually and *personally*— completed them. If, for example, a requirement uses words like "show," "demonstrate," or "discuss," then every Scout must do that. It is unacceptable to award badges on the basis of sitting in classrooms *watching* demonstrations, or remaining silent during discussions.

It is sometimes reported that Scouts who have received merit badges through group instructional settings have not fulfilled all the requirements. To offer a quality merit badge program, council and district advancement committees should ensure the following are in place for all group instructional events.

- A culture is established for merit badge group instructional events that partial completions are acceptable expected results.
- A guide or information sheet is distributed in advance of events that promotes the acceptability of partials, explains how merit badges can be finished after
  events, lists merit badge prerequisites, and provides other helpful information that will establish realistic expectations for the number of merit badges that can be
  earned at an event.
- Merit badge counselors are known to be registered and approved.
- Any guest experts or guest speakers, or others assisting who are not registered and approved as merit badge counselors, do not accept the responsibilities of, or behave as, merit badge counselors, either at a group instructional event or at any other time. Their service is temporary, not ongoing.
- Counselors agree to sign off only requirements that Scouts have actually and personally completed.
- Counselors agree not to assume prerequisites have been completed without some level of evidence that the work has been done. Pictures and letters from other merit badge counselors or unit leaders are the best form of prerequisite documentation when the actual work done cannot be brought to the camp or site of the merit badge event.
- There is a mechanism for unit leaders or others to report concerns to a council advancement committee on summer camp merit badge programs, group
  instructional events, and any other merit badge counseling issues—especially in instances where it is believed BSA procedures are not followed. See
  "Reporting Merit Badge Counseling Concerns," 11.1.0.0.
- There must be attention to each individual's projects and his fulfillment of all requirements. We must know that every Scout—actually and personally—completed them.

It is permissible for guest speakers, guest experts, or others who are not merit badge counselors to assist in the counseling process. Those providing such assistance must be under the direction of a registered and approved counselor who is readily available onsite, and provides personal supervision to assure all applicable BSA policies and procedures—including those related to BSA Youth Protection—are in place and followed.

#### [7.0.3.3] — Partial Completions

A Scout need not pass all the requirements of one merit badge with the same counselor. It may be that due to timing or location issues, etc., he must meet with a different counselor to finish the badge. The Application for Merit Badge has a place to record what has been finished—a "partial." In the center section on the reverse of the blue card, the counselor initials for each requirement passed. In the case of a partial completion, the counselor does not retain his or her portion of the card. A subsequent counselor may choose not to accept partial work, but this should be rare. A Scout, if he believes he is being treated unfairly, may work with his unit leader to find another counselor. An example for the use of a signed partial would be to take it to camp as proof of prerequisites. Partials have no expiration except the Scout's 18th birthday. Units, districts, or councils shall not establish other expiration dates for partial merit badges.

#### [7.0.4.8] — Unofficial Worksheets and Learning Aids

Worksheets and other materials that may be of assistance in earning merit badges are available from a variety of places including unofficial sources on the Internet and even troop libraries. Use of these aids is permissible as long as the materials can be correlated with the current requirements that Scouts must fulfill. Completing "worksheets" may suffice where a requirement calls for something in writing, but this would not work for a requirement where the Scout must discuss, tell, show, or demonstrate, etc. Note that Scouts shall not be required to use these learning aids in order to complete a merit badge.