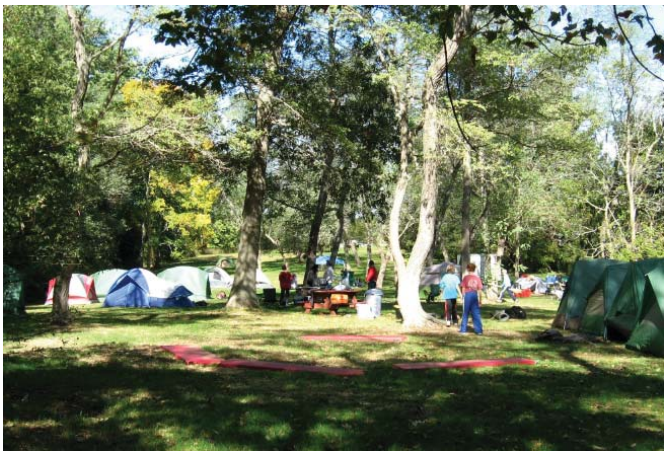
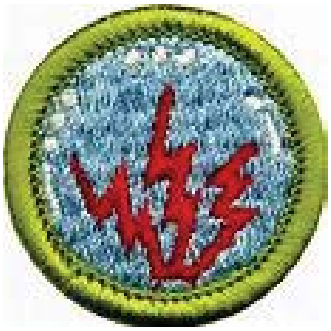
Jamboree On The Air

Welcome to Jamboree On The Air

Jamboree On The Air – JOTA – begins in just a short time from now, October 15th to 17th. While camping at fabulous Glen Farm in Portsmouth, RI, you'll have an opportunity to see, hear, and best of all, use Amateur Radio to talk to other JOTA Scouts around the world.



Camping at Glen Farm

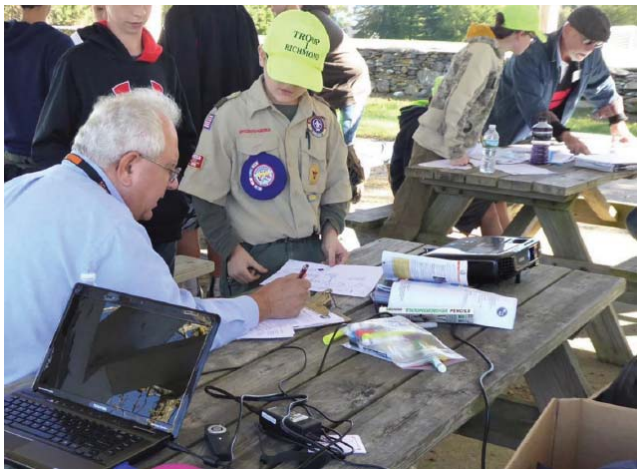


Radio Merit Badge

The Newport County Radio club offers scouts an opportunity to complete Radio Merit Badge, one of the more prestigious, during the JOTA weekend. Earning this merit badge is usually difficult because few scouts can find all of the pieces needed. But you will have everything right there at Glen Farm.

We have prepared four parts that together will allow you to earn the merit badge:

- Requirements that you will learn and complete before you arrive at Glen Farm.
- A short class that will prepare you to operate one of our transmitters and to prepare other requirements.
- Operation of a radio transceiver where you will have an opportunity to talk to other scouts in the US and around the world.
- Review tables where you will meet volunteers who will talk with you and view your drawings to fulfill the remaining requirements.



Volunteers at the Review Tables helping scouts

Requirements to prepare before JOTA

Most of the merit badge requirements will be covered and completed at Glen Farm. However In the following pages are requirements that you should complete before JOTA along with guidelines to help you learn them. The complete requirements are on pages five and six. Those that you should complete before the weekend are marked in magenta.

Begin by writing your name and troop/pack number on each page. Having a folder to keep all of your work in will be very helpful. Finally, bring two pencils and a few colored crayons or markers with you when you come.

Requirement 1a, 1b, 1c

Enter this URL:

www.w1sye.org/

Click the JOTA tab and view the PowerPoint:

RMB Req 1 Radio

Name _____

Troop/Pack _____

Pre-JOTA Requirements

1d The International Radiotelephony Alphabet

Many words sound alike and that can be a problem when radio signals are not ideal. To solve this problem, we use a word alphabet to get through. Review the alphabet below, then learn how to say your name using the example at bottom for an operator named Jim, but use your name instead.

A - Alpha (AL-fah)
B - Bravo (BRAH-vo)
C - Charlie (Char-lee, SHAR-lee)
D - Delta (DEL-ta)
E - Echo (ECK-oh)
F - Foxtrot (FOKS-trot)
G - Golf (GOLF)
H - Hotel (hoh-TELL, oh-TEL)
I - India (IN-dee-ah)
J - Juliet (JEW-lee-ett)
K - Kilo (KEY-loh)
L - Lima (LEE-mah)
M - Mike (MIKE)
N - November (no-VEM-ber)
O - Oscar (OSS-car)
P - Papa (Pah-pah, pah-PAH)
Q - Quebec (key-BECK)
R - Romeo (ROW-me-oh)
S - Sierra (see-AIR-rah)
T - Tango (TANG-go)
U - Uniform (YOU-nee-form, OO-nee-form)
V - Victor (VIK-tor)
W - Whiskey (WISS-key)
X - X-ray (ECKS-ray)
Y - Yankee (YANG-key)
Z - Zulu (Zoo-loo)

This is how I would send my name:
"My name is Jim, Juliet-India-Mike, Jim."
Now try it with your name and then practice saying it. You can use this page for this requirement.

Requirement 2d The FCC and the ITU

This requirement asks you to become familiar with what the Federal Communications Commission (FCC) and the International Telecommunication Union (ITU) do and why they are important.

There are a great many stations that would like to communicate by radio. In the very early days, radio stations interfered with one another. This bad condition was improved by forming the FCC and the ITU:

- The FCC brings order to these stations, like a traffic cop directing traffic, by controlling the conditions that stations must follow to reduce interference. The FCC is a US agency and controls US stations.
- Other countries have the same need to control inference and so have their own agencies like our FCC. But Radio waves do not stop at borders. What if two countries have different ways of controlling their stations? The ITU makes sure that these many other country agencies are in agreement so that radio communication is possible world-wide.

Requirement 6 Radio Safety

Radio equipment has some obvious hazards, like falling out of a tree while putting up an antenna, and some hazards that are special. This requirement asks you to learn about the safety precautions that will keep you safe from both.

To learn about radio safety, enter this URL:
www.w1sye.org/
Click the JOTA tab and view the PowerPoint:
RMB Req 6 Safety

Name _____

Troop/Pack _____

Pre-JOTA Requirements

Requirement 8

Like most merit badges, this requirement asks you to explore careers related to the badge.

- Find out about three career opportunities in radio.
- Pick one and find out the education, training, and experience required for this profession.

Of all the Radio Merit Badge requirements, this is the only one that we can't support at Glen Farm. This one you must do before you arrive and fill in your choices on the following page, *Radio Careers*.

You can find out about radio careers by:

- Talking to your parents.
- Talking to other adults.
- Going to the library.
- Search the Internet.
- Visiting a radio or TV station.

Requirement 9a1

This requirement asks you why the FCC has an Amateur Radio Service. This comes straight from the FCC rules. The Amateur Radio Service exists to provide:

- Public service
- International goodwill
- Radio experimentation
- A body of skilled communicators.

Requirement 9a2

This requirement asks you to explain the differences among Technician, General, and Amateur Extra licenses.

The Technician license is the entry level license. It is easy to learn the basic information and allows the Technician to operate on some of the amateur bands using some of the different modes of operation.

The Amateur Extra license is the most senior license and its examination is very detailed and requires much more experience and study to master. For this effort the extra class operator is allowed to operate all amateur modes on all amateur frequencies.

The General license falls between the Technician and Amateur Extra license.

The requirement also asks you who administers Amateur Radio Service exams. The FCC no longer administers Amateur Radio Service exams. Today, these exams are administered by radio amateurs known as Volunteer Examiners who are trained and certified for that purpose.

Requirement 9a3 and 9a6 Q Signals

Q signals are three-letter groups that save time by sending a piece of information with just three letters. They can be sent as a statement from you or as a question of the other operator. Requirement 9a3 asks you to explain five Q signals and here are five of the most commonly used ones. You will explain them at the Review Tables.

You will fulfill Requirement 9a6 at the radio stations, but so that you start off like an experienced operator, study them now so that you are familiar with them. You don't need to memorize them because there will be a reminder card at each station.

QRM – I am (are you?) bothered by other stations.

QRN – I am (are you?) bothered by static.

QSB – Your (Is my?) signal is fading.

QSL – I (Can you?) confirm your (my) message.

QTH – My (What is your?) location is...

Name _____

Troop/Pack _____

Radio Careers

Requirement 8, Careers, Worksheet

BSA has added career exploration to most of their merit badges. Requirement 8 asks you to explore your possible interest in a radio career. First, find out about three radio careers by talking to adults, going to the library, conducting an Internet search, or any other means that you may have.

Using the information that you have discovered, fill in the boxes below. You only need the details for one of these careers. Write that information in the bottom box.

Name _____

Troop/Pack _____

First Career

Career name: _____

What do people in this career do? _____

_____

_____

_____

Second Career

Career name: _____

What do people in this career do? _____

_____

_____

_____

Radio Career That I Investigated

Career Name: _____ Annual salary: From-_____To-_____

Education and/or licenses required: _____

_____

What do people in this career do: _____

_____

Why did you choose this career to investigate? _____

_____

Radio Merit Badge Requirements

Requirement 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.

Requirement 2

Do the following:

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

b. Explain how the radio stations WWV and WWVH can be used to help determine what you can expect to hear when you listen to a shortwave radio.

c. Explain the difference between a distant (DX) and a local station.

d. Discuss what the Federal Communications Commission (FCC) does and how it is different from the International Telecommunication Union.

Requirement 3

Do the following:

a. Draw a chart of the electromagnetic spectrum covering 300 kilohertz (kHz) to 3000 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).

Requirement 4

Explain how radio waves carry information.

Include in your explanation: transceiver, transmitter, receiver, amplifier, and antenna.

Requirement 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. Discuss how information is sent when using amplitude modulation (AM), frequency modulation (FM), continuous wave (CW) Morse Code transmission, single sideband (SSB) transmission, and digital transmission.

d. Explain how NOAA Weather Radio (NWR) can alert you to danger.

e. Explain how cellular telephones work. Identify their benefits and limitations in an emergency.

Requirement 6

Explain the safety precautions for working with radio gear.

Including the concept of grounding for direct current circuits, power outlets, and antenna systems.

Requirement 7

Visit a radio installation

An amateur radio station, broadcast station, or public service 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.

Requirement 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.

Name

Troop/Pack

Radio Merit Badge Requirements

Name _____

Troop/Pack _____

Requirement 9

Amateur Radio

a. Tell why the FCC has an amateur radio service. Describe activities that amateur radio operators can do on the air, once they have earned an amateur radio license.

b. Explain differences between the Technician, General, and Extra Class license requirements and privileges. Explain who administers amateur radio exams.

c. Explain at least five Q signals or amateur radio terms.

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

e. Explain the differences between handheld transceivers and home "base" transceivers. Explain the uses of mobile amateur radio transceivers and amateur radio repeaters.

f. Using proper call signs, Q signals, and abbreviations, carry on a 10-minute real or simulated amateur radio contact using voice, Morse code, or digital mode. (Licensed amateur radio operators may substitute five QSL cards as evidence of contacts with five amateur radio operators. Properly log the real or simulated ham radio contact, and record the signal report.)

Explanation of the requirements

In the list of Merit Badge Requirements above, those colored magenta are the requirements that you are expected to complete before the JOTA weekend. You are entirely welcome to work toward Radio Merit Badge if you have not, but you will need more time after the weekend to finish.

Explanation of the following pages

The following pages are prepared for you to make the sketches for requirements 2A, 3, and 5b that will be completed during the JOTA weekend. Put all nine pages in a folder of some kind and bring everything with you to the weekend.

Name _____ Troop/Pack _____

The Radio Electromagnetic Spectrum

Radio Merit Badge Requirement 3

300 MHz 1000 MHz

30 MHz 300 MHz

3 MHz 30 MHz

0.54 MHz 3 MHz

Name _____ Troop/Pack _____

A Simple Block Diagram

Radio Merit Badge
Requirement 5b

Label these:

- **Transceiver**
- **Amplifier**
- **Microphone**
- **Antenna**
- **Feed line**

Name _____ Troop/Pack _____

How radio waves travel

Radio Merit Badge
Requirement 2a