

Portable Radio Fundamentals

(adapted from Virginia RACES)

How to use a portable, hand-held radio effectively in an emergency

1. Objectives: After completing this unit, you will be able to:

- Use a portable radio effectively in an emergency
- Identify radio features and controls
- Using correct operating procedures
- Including standard procedural words and phonetics

2. How do I use a 2-way radio?

- Different makes and models of radios vary, so
- Read the instructions.
- Become familiar with the controls on your radio.
- If you are visually impaired, be sure your radio can be operated effortlessly by touch
- If you are visually impaired, be sure your radio has an accessible manual (such as on icanworkthisthing.com)

3. Portable Radio Anatomy:

A. Power on-off switch

- Is combined with volume control on some models
- Or push-button on others
- First of all, make sure the radio is turned on
- If visually impaired, find out whether there is a tone indicating on or off. Choose a radio with such a feature if possible.
- If visually impaired, make sure you practice turning the radio on and off and making sure you have that down pat.

B. Channel Selector (If your radio has one – Be sure you know):

- Select your channel – learn how to tell what your channel you are on if you are visually impaired.
- Up-down arrows, or
- Rotating knob

C. Volume control

- Adjust volume control until you can hear other users.
- If you have hearing problems, test ahead of time to balance the volume you need against causing disturbance to other communicators.
- Consider using earphones if your unit supports them. Consider this in unit selection.

D. Squelch control (eliminates unwanted background noise)

- Either a concentric ring under the volume control (usually)
- Or a separate knob of its own

- Open until you hear white noise
- Close just until noise disappears

E. Push-to-talk (PTT switch)

- Push to talk
- Let go to listen
- Listen more than you talk
- If somebody seems in control of things, listen to them

F. Speaker microphone

- To speak, press push-to- talk control
- Speak in a normal tone
- To listen, just let go
- Listen more than you talk.

G. Batteries or battery pack

- Use AA or AAA alkaline (in most cases)
- Or a rechargeable pack – if supplied with the radio – make sure the pack is charged
- Carry spare batteries. Batteries drain down when left in a radio, even if the radio is not used.

H. Antenna (flexible or telescoping)

- Extend fully
- Hold vertical for best reception
- Repair or replace if clearly damaged

4. Operating at the incident site

A. 2-way radio is not like a telephone because:

- You can't hear anyone if you are talking
- So no one else can speak when you talk
- If everyone talks, nobody understands
- Which results in Chaos
- So listen more than you talk

B. When do you speak?

- Only if you have to and then keep it short
- The most important thing in using a 2-way radio effectively is...
- Listening, not talking
- If someone seems in control of things, listen to them

C. What is a controlled net?

- An uncontrolled net is where everybody talks as they have need – which works fine when there are few people and low volumes of messages
- In a controlled net, someone takes command to control and manage what is going on. Radio users must call net control to get permission before calling anyone else.
- Use a controlled net when more than four people are on the air.

D. Why use a controlled net? It enables 'control' (the person in charge) to:

- Prioritize resource requests
- Quickly handle multiple situations
- Record what happens

E. Who is in control? It could be anyone, even you. It will usually be the most experienced person available at the time.

F. Control's job is to:

- Maintain radio discipline by:
 1. Setting the example
 2. Prioritizing messages and requests
 3. Handling all radio traffic efficiently
- Track what's going on – record everything that happens
- Report to the emergency response team coordinator or incident commander

G. You must write everything down.

- Because it's likely that you won't remember everything in your head
- Especially when it gets really busy
- Nor can you effectively brief the incident commander from memory
- Or accurately reconstruct what happened some days later
- Visually impaired should consider carrying tape recorder or portable Brailer in jump kit.

H. Control log:

- Write down (record) names of staff or officials for whom you send messages
- Make a line entry for each item on a log in case the person wanders off before you get a reply or you need to get more information and helps eliminate duplicate requests for the same resources or information. If visually impaired and using a recorder, leave space or find some way of indicating position. Practice ahead of time.
- List in chronological order:
 1. Who has a problem or information
 2. Situation update and tasks assigned, such as: Problem identification and location; Progress of evacuation; Resources available, assigned, out of service, or in transition; Personnel safety and accountability
- Used for briefing team leader and incident commander. Also becomes part of official record

I. Your job as a volunteer who is an occasional radio user is to:

- Participate in training exercises
- Learn and use correct procedure
- Listen to the radio all the time
- Pay attention to instructions
- Be brief when you talk on the radio

J. Participating in a controlled net

- Respond only to 'control' – get permission before contacting anyone
- Answer promptly
- Monitor the radio continuously
- Answer immediately if called
- Don't leave the air without checking out to avoid wasting control's time looking for you

K. User names and unit Ids. Identify yourself by your:

- Location and assignment – such as ‘shelter basement’
- This enables ‘control’ to manage resources or tasks without regard to who is at any location so that events can be logged easily
- Use your unit ID consistently
- Contact ‘control’ or others by theirs. You might say ‘Control, this is shelter basement; over’.
- Control acknowledges ‘shelter basement go ahead.’ Or ‘shelter basement wait (or stand by)’.
- If you get the go-ahead, speak, but briefly
- Listen for your ID at all times

L. To call someone else, the following procedures should be followed in a controlled net. In an uncontrolled net, the initial call to control is omitted:

- ‘Control this is shelter basement, over’.
- ‘Shelter basement; go ahead.’
- ‘Permission to call shelter supply’.
- ‘Call your party’.
- ‘Shelter supply, this is shelter basement’.

M. Acknowledge calls correctly. When you hear a call to you, reply:

- This is (perhaps shelter basement); go ahead.’
- If you are in no position to take the call, then id and ask the calling station to wait. Get back to the caller at the first possible opportunity.

5. Basic Radio Operating Practices – The ABC’s – Accuracy+Brevity=Clarity

A. General operation

- Idle chatter has no place in a controlled net.
- Establish initial contact with ‘control’ by stating your unit ID only (‘control this is shelter basement; over’)
- Wait for ‘control’ to recognize you before transmitting any further (‘shelter basement; go ahead.’)
- If you speak further without being recognized, you may double over someone who then must repeat their message
- Think before you speak and keep your transmissions short
- Stop transmitting if you stop talking – release push-to-talk control, otherwise you make dead air so than no one else can speak
- Don’t call repeatedly: If net control doesn’t answer you, wait for pending traffic to finish before trying again.
- If your call is truly urgent, do it despite our advice.
- Wait a few seconds before pushing to talk and between phrases so others can break in.
- It is OK to interrupt, IF you have important information – that’s why you leave gaps between transmissions
- When necessary to interrupt, speak only long enough to ID and say why.
- Such as, ‘team north leader; info’
- Use no 10-codes or jargon

- Use plain language, avoiding technical terminology or jargon unless it is deemed operationally necessary.
- Use short simple phrases to make recording easier
- Clarify
- Repeat critical information
- Confirm Correct
- Wait for acknowledgement before speaking; don't take up air time with a long transmission until you are certain that you have the other operator's attention.
- Acknowledge transmissions to you to avoid having to repeat the message since control with then know you are ready to continue with your assignment, releasing the frequency. Ex: 'Shelter basement acknowledging message from shelter supply. Out.'
- Answer questions directly: do not explain.
- If amplifying information is vital to ensure that traffic is fully understood, be brief.
- Let 'control' or the requester ask for details.
- Ask who a message is for if you don't know.
- Let their parties (incident personnel who are not part of the communication team) speak directly to each other.
- Wait a fraction of a second after pushing the talk button and before speaking. (Avoids clipping off first syllable as radio changes from receive state to transmit.)
- Don't speak louder in a noisy environment. If you speak louder than is needed for normal speech, the radio will distort your voice, reducing, rather than increasing, intelligibility.
- Instead:
 1. Use earphone or headset
 2. Turn down volume
 3. Shield microphone from the wind
 4. Speak across the microphone
 5. Use a normal speaking voice

B. Prowords:

- Use prowords correctly:
 1. Prowords help expedite radio messages and reduce copying errors.
 2. They are effective only if everyone understands and uses them correctly.
- The Basic Four Prowords which should be used by everyone who uses a 2-way radio.
 1. This is – used to identify who is calling
 2. Over – means 'I have finished speaking and it's now your turn.' Leaves no doubt whose turn it is
 3. Go Ahead – means 'I'm ready to copy'.
 4. Out – means 'I am finished and expect no reply'. Tells everyone the contact has ended. Using over and out together is unnecessary. Use either one or the other.
 5. The station who initiates the contact always terminates it.

- More prowords
 1. Copy – means ‘OK, received and understood
 2. Affirmative or Negative. Use instead of yes or no because their sounds are distinctive and meaning clear, even under noisy operating conditions.
 3. Say again – used to request a word or phrase be repeated from the last known word – such as “Say again all after <known word>”
 4. Correction – I made an error and am transmitting again from after the last correct word.
 5. Correct? – Am I correct?
 6. Correct (Affirmative) – You are correct.
 7. Wait – Cease transmission until told to ‘go ahead’ by control. Ex: ‘Fourth floor acknowledged, wait. Evac Chair make your call.’ ‘Stand by’ is sometimes used.
 8. I spell – I will spell the word
 9. Figure (s) Numbers to follow
 10. Initial – Single letter follows
 11. Mixed group – following group contains both numbers and letters.
- Speak slowly and distinctly.

C. International Telecommunications Union (ITU) standard phonetic alphabet.

A – Alpha	J – Juliet	S – Sierra
B – Bravo	K – Kilo	T – Tango
C – Charlie	L – Lima	U – Uniform
D – Delta	M – Mike	V – Victor
E – Echo	N – November	W – Whiskey
F – Foxtrot	O – Oscar	X – Xray
G – Golf	P – Papa	Y – Yankee
H – Hotel	Q – Quebec	Z – Zulu
I – India	R – Romeo	

6. Neighborhood/home security operations.

Neighborhood watch nets or home communications nets will operate on the same general principles.

A. Home:

For the most part home communications will be only a few people operating from different rooms in order to keep in touch while one or more members of the household are performing disaster related tasks.

- Here you can use names as well as locations. ‘Mom in kitchen. Gas is turned off’.
- Keep in touch even for simple tasks such as checking on the dog
- During power-outages at night, blind or visually-impaired members of the household become especially valuable because they are used to operating without sight (or are less sight-dependent).
- Make sure that all members of the family can find and use whatever communications equipment is available.
- Develop a disaster plan.

- Know the types of disasters most likely to occur in your area.
- Practice.
- Get whatever training is available, such as disaster planning from Red Cross and communications training from ARES (Amateur Radio Emergency Service) or REACT (Radio Emergency Associated Communication Teams). Local hospitals may also provide training opportunities.

B. Neighborhood:

The degree of formal organization of a neighborhood security operation will depend upon the size of the group. The same principles as apply to incident site and family operation apply.

- The group should make its existence known to local disaster relief agencies such as County Emergency Management, local hospitals, Red Cross, ARES, Radio Amateur Civil Emergency Service (RACES), REACT, Voluntary Organizations Active in Disaster (VOAD), National Emergency Response Team (NERT) or whoever may be active in your area. Find out.
- The group should maintain the capabilities through battery or generator and whatever means of radio communication is necessary to communicate with one or more of the above groups during disasters. Don't count on your cell phone. This may be your lifeline to the outside world. Solicit their aid in setting up. They are there to help.
- Practice
- Consider joining a volunteer organization.