

Southern Region, B.S.A.
Yachting Initiative
Program Elements
MARINE RADIO COMMUNICATIONS

Learning Objectives:

As a result of this session the participant should:

1. Be aware of voice radio communication capabilities
2. Be aware of the various licensing requirements and operator permits
3. Be aware of the VHF-FM and other radio communication equipment
4. Be familiar with using a marine radio properly under routine circumstances
5. Be familiar with using a marine radio correctly and expeditiously in an emergency

Resources:

Boating Skills & Seamanship, Eleventh Edition, U.S. Coast guard Auxiliary, Chapter 11
The Squadron Boating Course 2001, The United States Power Squadrons, Section 3
Chapman Piloting Seamanship & Small Boat Handling, 62nd Edition, Hearst Marine Books, Chapter 24

Material and Equipment:

Equipment Items

Overhead Projector, as required by instructor

3 – 4 Hand-held Two-way Radios (2 watts max, up to 14 channels)

Material Items

Provide one copy for each participant:

Radio Communications License, Forms, Fees Handout

Selected Marine Channels Handout

Pronunciation of Letters and Numbers Handout

Radio Usage and Procedure Words Handout

Radio Scenarios Handout

Radiotelephone Station Log Form

Distress Communication Form

Boat Information Data Sheet

Instructor Qualification:

U.S. Coast Guard Auxiliary Trainer presence required for USCGAUX Certificate Program

U.S. Power Squadron Instructor, Council Venturing Trainer or equivalent

Time Allocation: 1.5 Hours

Session Plan:

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Classroom Session (45 Minutes)

1. **Module Introduction.**
 - a. Introduce yourself and each member of the module staff.

 - b. Explain the objectives of this module.

2. **Voice Radio Communications.**
 - a. Explain briefly safety and operational communications for the following:
 1. Safety Messages
 2. Operations Messages
 3. Commercial Messages

 - b. Explain briefly the use of personal and social communications regarding VHF radio.

 - c. Explain briefly the following marine radio basics:
 1. Frequency expressed in kilohertz (KHz) and megahertz (MHz)
 2. Voice Communication (Uses medium, high, very-high frequencies)
 3. Navigational signals (Use low, very-low frequencies)
 4. Radar and Satellites (Use ultra-high, super-high frequencies)

3. **Licensing.**
 - a. Explain briefly the FCC amended rules and canceled requirements for individual licenses for VHF-FM radios on “voluntarily equipped” boats.

 - b. Explain briefly the use of the following:
 1. Ship Station License
 2. Restricted Radiotelephone Operator Permit

 - c. Distribute the handout “Radio Communications License, Forms, Fees”

4. **VHF-FM Radiotelephones.**
 - a. State that marine radios must be FCC compliant, differ in price, basic characteristics and when selecting a radiotelephone check the following characteristics:
 1. Sensitivity
 2. Selectivity
 3. Audio Output
 4. Signal Strength
 5. Available Channels
 6. Channel Selector
 7. Current Usage

 - b. State that small portable VHF-FM radiotelephones and can be used as follows:

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1. Back-up for installed radiotelephone
 2. Communications between dinghy and boat it accompanies
 3. Two-way emergency communications (abandon ship)
- c. Discuss briefly radiotelephone installation, antenna selection/installation, and proper cable installation.
- d. Distribute the handout “Selected Marine Channels”.
5. **Single-Sideband (SSB) Radio.**
- a. Explain briefly single side-band radio communications and licensing.
 - b. Discuss briefly the selection and installation of SSB equipment.
6. **Other Types of Radio Communications Equipment.**
- a. Describe briefly the following types of radio communications equipment:
 1. Citizens Band Radio
 2. Amateur Radio
 3. Cellular Telephones
 4. Satellite Communications
 5. Emergency Position Indication Radio Beacon (EPIRB)
 6. International NAVTEX System (Offshore weather forecasts and advisories)
7. **Operating Rules and Procedures.**
- a. Explain briefly operating rules for a “voluntarily equipped” boat as follows:
 1. When VHF-FM radio on, monitor Channel 16
 2. USCG First District only, recreational boats may alternate watch on Channel 09
 3. Use appropriate working channel once contact is made.
 4. Use phonetic alphabet *only* when absolutely necessary
 5. Use proper procedure words, not superfluous words and phases
 6. Communications Act of 1934, FCC operating rules for divulging information
 - b. Explain briefly using Channel 16 (International distress, safety and calling channel) for the following messages:
 1. “Mayday”
 2. “Pan- Pan”
 3. “Securite”
 - c. Distribute the form “Radiotelephone Station Log” and explain its use.
 - d. Distribute the form “Distress Communication” and the “Boat Information Data Sheet” and explain their use.
 - e. Describe briefly the services provided by the following organizations:
 1. National Weather Service (Marine weather information and forecasts)
 2. Coast Guard (Special safety information)

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3. Canadian Government Agencies (Equivalent to the U.S. Government Agencies)

f. Explain the procedure if the FCC believes a rule violation has occurred.

Radio Laboratory Session (45 Minutes)

1. Radio Laboratory Preparation.

a. Distribute the handouts “Pronunciation of Letters and Numbers” and “Radio Usage and Procedure Words” and discuss the contents of both handouts.

b. Distribute the hand-held two-way radios to the crews, explain how they work, select which channel will be use as “Channel 16”, and allow some time for equipment familiarization.

c. Explain the ‘Routine Radio Check Procedure’ and allow the crew practice it with another crew.

d. Distribute handout “Radio Scenarios”.

2. Calling Another Station.

a. Explain the procedure for calling another station or boat using the “Procedure Words” handout.

b. Have both crews practice with a Scenario 1, then have crew 1 requesting weather and harbor information and crew 2 respond using an impromptu dialog.

3. Distress, Urgency and Safety Calls.

a. Distribute the “Distress Communication Form”, “Boat Information Data Sheet” and discuss the contents of both.

b. Have crew 1 fill out the “Boat Information Data Sheet” with either actual or imaginary information.

c. Have crew 1 execute a ‘Distress Message’ per Scenario 2, have the crew 2 act as the emergency response element.

d. Have crew 2 execute ‘Urgency (Pan) Message’ as their boat has lost power in a shipping lane, and have crew 1 act as the urgency response element.

e. Have crew 1 execute a ‘Security Message’ using the following message:
“A log approximately 20 feet is adrift off Haines Point in the Potomac River”.

f. Have crew 2 execute a ‘Security Message’ using the following message:
“Fishing boat wreck is adrift in the Pamlico River channel off Core Point”.

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RADIO COMMUNICATIONS LICENSE, FORMS, FEES HANDOUT

Ship Station License

- Source of FCC Form 506 if not available from marine radio dealer

Federal Communications Commission
Forms Distribution Center
2803 52nd Avenue
Hyattsville, Maryland 20781

- New, modification and/or renewal license (FCC Form 506, Fee \$75)

Federal Communications Commission
Marine Ship Service
P.O. Box 358275
Pittsburgh, Pennsylvania 15251-5275

- Renewal of license only (FCC Form 405B, Fee \$75)

Federal Communications Commission
405B Station Renewal
P.O. Box 358290
Pittsburgh, Pennsylvania 15251-5290

- Restricted Radiotelephone Operator Permit (FCC Form 753, Fee \$45)

Federal Communications Commission
Restricted Permit
P.O. Box 358295
Pittsburgh, Pennsylvania 15251-5295

Note: Federal Communications Commission License Fees are subject to change. Confirm the fee amount prior to filing the application.

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SELECTED MARINE CHANNELS HANDOUT

Channel Number	Frequency (MHz) <u>Transmit</u>	Frequency (MHz) <u>Receive</u>	<u>Communications Purpose</u>
06	156.000	156.000	Intership safety communications (mandatory).
09	156.450	156.450	Commercial and recreational intership and coast-to-coast (commercial docks, marina, and some clubs); also used by recreational boaters as alternate calling channel . This is also used at some locks and bridges.
12	156.600	156.00	Port Operations – traffic advisory – also USCG secondary working channel.
13	156.650	156.650	Navigational – ship’s bridge to ship’s bridge (1 watt only). Available to all vessels and is required on passenger and commercial vessels (including many tugs), as well as all power-driven vessels more than 20 meters (65.5 ft.) in length.
14	156.700	156.700	Port Operations (intership and ship-to-coast).
16	156.800	156.800	Distress Safety and Calling (mandatory). All distress calls should be made on Channel 16.
22A	157.100	157.100	Coast Guard Liaison and Maritime Safety Information Broadcast; used for communications with USCG ship, coast and aircraft stations after first establishing communications on Channel 16.
24	157.250	161.850	Public telephone (Marine Operator); also Channels 25, 27, 84, 85, 86, 87, 88.
26	157.300	161.900	Public telephone (Marine Operator) (first priority).
28	157.400	162.000	Public telephone (Marine Operator) (first priority).
65A	156.275	156.275	Port Operations (intership and ship-to-coast); also Channels 20A*, 66A, 73, 74, 77* (* = intership only).
67	156.375	156.375	Commercial intership all areas, plus recreational intership (Puget Sound and Strait of Juan de Fuca). In the Lower Mississippi River, use limited to navigational bridge-to-bridge navigational purposes (1 watt).
68	156.425	156.425	Recreational intership and ship-to-coast (marinas, yacht clubs, etc.).
69	156.475	156.475	Recreational intership and ship-to-coast.
70	156.525	156.525	Distress and safety calling, and general purpose calling; may only be used by vessels equipped with Digital Selective Calling (DSC) .

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71	156.575	156.575	Recreational intership and ship-to-coast.
72	156.625	156.625	Recreational intership only.
78A	156.925	156.925	Recreational intership and ship-to-coast.
79A	156.975	156.975	Commercial intership and ship-to-coast.
			Recreational intership (Great Lakes only).
80A	157.025	157.025	Commercial intership and ship-to-coast.
			Recreational intership (Great Lakes only).
WX1		162.550	Weather broadcast (receive only).
WX2		162.400	Weather broadcast (receive only).
WX3		162.475	Weather broadcast (receive only).

Note: Designated "A" channels are accessible only on U.S. frequencies, not international.
 Recreational channels are working channels for recreational boats only.
 Channel 88 only for use in the Great Lakes, St. Lawrence Seaway, and Puget Sound and its approaches.
 Channel 5 is available only in the Houston and New Orleans areas.
 Channel 20 is used only for ship to-coast messages.
 Channel 77 is limited to intership communications to and from pilot boats.

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PRONUNCIATION OF LETTERS AND NUMBERS HANDOUT

THE PHONETIC ALPHABET

Letter	Phonetic Equivalent	Pronunciation
A	ALFA	AL FAH
B	BRAVO	BRAH VOH
C	CHARLIE	CHAR LEE
D	DELTA	DELL TAH
E	ECHO	ECK OH
F	FOXTROT	FOKS TROT
G	GOLF	GOLF
H	HOTEL	HO TELL
I	INDIA	IN DEE AH
J	JULIETT	JEW LEE ETT
K	KILO	KEY LOH
L	LIMA	LEE MAH
M	MIKE	MIKE
N	NOVEMBER	NO VEM BER
O	OSCAR	OSS CAH
P	PAPA	PAH PAH
Q	QUEBEC	KEH BECK
R	ROMEO	ROW ME OH
S	SIERRA	SEE AIR RAH
T	TANGO	TAN GO
U	UNIFORM	YOU NEE FORM
V	VICTOR	VIK TAH
W	WHISKEY	WISS KEY
X	XRAY	ECKS RAY
Y	YANKEE	YANG KEY
Z	ZULU	ZOO LOO

PRONUNCIATION OF NUMBERS

0	ZERO	ZERO
1	ONE	WUN
2	TWO	TOO
3	THREE	THUH REE
4	FOUR	FO WER
5	FIVE	FI YIV
6	SIX	SIX
7	SEVEN	SEVEN
8	EIGHT	ATE
9	NINE	NINER

RADIO USAGE AND PROCEDURE WORDS HANDOUT

RADIO USAGE CAVEATS

1. Do not send false distress & emergency messages.
2. No obscenity, indecency or profanity.
3. Observe the confidentiality of others' messages (except in emergency situations or broadcasts of general use).
4. Do not use our radio when the boat is on land.
5. Listen on your selected channel before transmitting your message.
6. Shift to a working channel immediately after contact has been made on the calling channel (except in an emergency situation).
7. Learn and practice the correct radio usage techniques and language. Rehearse your message (to yourself) **BEFORE** making the transmission.
8. Think through your responses **BEFORE** responding. (Responses **DON'T** have to be given immediately. You can simply say **WAIT**. Think through your response and then respond.)
9. Speak slowly and distinctly.

PROCEDURE WORDS (PROWORDS)

Procedure Word	Meaning
• OUT	This is the end of my transmission to you. No answer is required or expected.
• OVER	This is the end of my transmission and a response is expected. Go ahead, transmit. Omit when it is clearly not needed.
• ROGER	I received your last transmission ok.
• WILCO	Your last message has been received, understood, and will comply.
• THIS IS	This transmission is from the station whose name and call sign follows immediately.
• FIGURES	Figures or numbers follow. ("Vessel length is FIGURES two three feet.")
• SPEAK SLOWER	Your transmission is difficult to understand. Speak slower.
• SAY AGAIN	Repeat.
• WORDS TWICE	It is difficult to understand you. Give each phrase twice.
• I SPELL	I shall spell the next word phonetically. Used when a proper name is important in the message. (I SPELL Mike, Alfa, Romeo, Tango, Hotel, Alfa.)
• WAIT	I must pause for a few seconds,; stand by for further transmission.
• WAIT OUT	I must pause for longer than a few seconds. I will call you back,.
• AFFIRMATIVE	You are correct, or what you have transmitted is correct.
• NEGATIVE	No.

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DISTRESS COMMUNICATION FORM

Instructions: Complete this form now (except for item 6 through 9) and post near your radiotelephone for use if you are in distress.

SPEAK: SLOWLY – CLEARLY – CALMLY

1. Make certain your radio is turned on.
2. Select **VHF-FM Channel 16** or for your **SSB** frequency **2182 kHz**.
3. Press microphone button and say: **MAYDAY – MAYDAY – MAYDAY**.
4. Say **THIS IS** _____, _____, _____, _____.
(Boat Name) Boat Name) (Boat Name), (Boat Call Sign)
5. Say: **MAYDAY;** _____
(Boat Name)
6. *TELL WHERE YOU ARE:*
(What navigational aids or landmarks are you near? What direction and distance are you from a landmark? What is your latitude and longitude? What are your electronic coordinates, if equipment available?)
7. *STATE THE NATURE OF YOUR DISTRESS.*
8. *GIVE NUMBER OF PEOPLE ABOARD AND CONDITIONS OF ANY INJURED.*
9. *ESTIMATE CURRENT SEAWORTHINESS OF YOUR BOAT.*
10. *BRIEFLY DESCRIBE YOUR BOAT:*
State Registration Number: _____
Type of Boat: _____; Length: _____ feet;
Draft: _____ feet; Number of Masts: _____; Hull color: _____;
Trim Color: _____; Hull Material: _____; Number of Engine(s):

Other Pertinent Information
_____;
11. Say: **I WILL BE LISTENING ON CHANNEL 16 Or SSB Frequency 2182**
(Cross Out Which Does Not Apply)
12. End message by saying: **THIS IS** _____ **OVER.**
(Boat Name)
13. Release microphone button and listen. Someone should answer. If they do not, repeat call, beginning at item 3. If there is still not answer, switch to another channel and begin at item 3 again.

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BOAT INFORMATION DATA SHEET

When asking for assistance for the Coast Guard or State or Local Authority, you may be asked to furnish the following details. Fill out this list as completely as possible; post it alongside your transmitter with the Distress Communications Form.

1. Identification

Boat Name: _____

State Registration or Documentation Number: _____

Home Port: _____

2. Description of Boat Requiring Assistance

Power/Sail: _____; Inboard: _____; Outboard: _____; I/O: _____

Type of Boat:

(Sloop, Fishing, Ski/combination etc.) _____

Manufacturer/Class: _____ Length: _____ Draft: _____

Hull Markings (Color, Trim, etc.): _____

3. Survival Gear Aboard

PFDs _____ Flares _____ Flashlight _____ Raft _____ Dingy or Tender _____

Anchor _____ Spotlight _____ Auxiliary Power _____ Horn _____

4. Electronic Equipment

Radio(s) VHF _____ MF _____ HF _____ CB Radio _____ Cell Phone _____

VHF Channels Available: _____

MF Frequencies Available: _____

Radar _____ Depth Finder _____ Loran _____ GPS _____ Direction Finder _____

EPIRB (121.5/243 MHz) _____ (156.8/156.75 MHz) _____ (406 MHz) _____

5. Boat Owner/Operator

Name: _____

Address: _____

Telephone: _____ - _____ - _____

Is owner an experienced boater: Yes: _____; No: _____

Be prepared to describe weather, water, wave conditions, water depth, etc.

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RADIO SCENARIO HANDOUT

Scenario 1

Several friends are fishing in the Gulf/Atlantic/Pacific approximately ten miles off shore. They are in two different vessels and are at least five miles apart. The name of one vessel is Easy Living, the name of the second vessel is Short Stuff. The time is around 1500 hours and all have decided to head toward the marina. Short Stuff has engine problems and needs a tow. Short Stuff must hail the other vessel and request a tow.

Short Stuff: (On Channel 16) “Easy Living, this is Short Stuff, Over”

Easy Living: (On Channel 16) “Short Stuff, this is Easy Living, Over”

Short Stuff: “Please switch and answer Channel 68”. (Time given for switch)

Short Stuff: (On Channel 68) Easy Living, this is Short Stuff, Over”

Easy Living: (On Channel 68) Short Stuff, this is Easy Living, Over”

Short Stuff: “Easy Living this is Short Stuff, I’ve got engine problems and am going to need a tow. Can you assist? Over”

Easy Living: “Short Stuff, this is Easy Living, I certainly can, what is your location? Over”

Short Stuff: “Easy Living this is Short Stuff. (Location can be lat/long or some landmark). I say again (repeat location). Over”

Easy Living: “Short Stuff, this is Easy Living. I read back (repeats location given by Short Stuff) Over”.

Short Stuff: “Easy Living, this is Short Stuff. That is correct. Over”

Easy Living: “Short Stuff this is Easy Living. We are on our way. Our ETA is approximately one hour. Please tie a towel or T-shirt onto your antennae so we can spot you easily. Continue to monitor Channel 68. Over’

Short Stuff: “Easy Living this is Short Stuff. Wilco. Out.”

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Scenario 2

A one massed sailboat with the name “Explorer” is taking on water. The Skipper is fairly certain they hit a submerged object such as a cargo container. They are 30 miles off shore and taking on water fast. They can stay afloat one hour at best. There are three persons on board (POB), the Skipper and two crew members. One of the crew members has a severe cut to the head being thrown forward when the vessel hit the submerged object. The vessel is white in color and is 30 feet in length. The Mayday call is heard and responded to by a nearby vessel named “Good Times”.

The vessel in distress should follow the Marine Distress Communication. In addition, the vessel responding to the Mayday should confirm all information, remind the vessel in distress that all occupants should have on their PFD's, and to stay with their vessel. While the United States Coast Guard or Coast Guard Auxiliary will have probably already picked up on the distress call, nevertheless, the responding vessel should try to contact the Coast Guard and let them know that they are assisting the vessel in distress.