United States Coast Guard Auxiliary

Your Boat's Radio

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Lesson One – Types of Radios used on Recreational Boats

Two Types of Radios

- Coastal/Inland
  - VHF-FM
  - CB's
  - Cell phones
- Offshore
  - SSB
  - Shortwave Radio/Amateur Radio
  - EPIRB

Coastal/Inland

- VHF-FM Radios – Most common
  - Full-size, fixed mount, 25W, 10-30 miles
  - Portable, 5W, 0-5 miles
  - Range depends on transmitting power & height of antenna
- CB's
  - Short range
  - Non-standardized radio etiquette
  - Bands are crowded
  - Emergency CH9 – USCG does not monitor

Coastal/Inland cont…

- Cell phones
  - Can be used for emergencies if near a tower
  - Dialing 911 slows down rescue effort due to relay of info to USCG
  - GPS could be used to track position

Offshore

- SSB
  - Commonly used for offshore passage (long distances)
  - Range is 25 miles to worldwide, but depends on
    - Time of day
    - Season
    - Frequency
    - Solar activity
  - USCG monitors SSB distress & calling frequency 2182 kHz

Offshore cont…

- Shortwave/Amateur Radio
  - Dedicated SSB frequencies
  - “Hams” monitor for emergency traffic; USCG does not
- EPIRB
  - Portable transmitter transmits at specified frequency
  - Registered by owner
  - Satellites can pinpoint location

Summary

- In this lesson, we learned
  - Types of radios used on Coastal/Inland & Offshore
  - Ranges, power, how they are used
  - Why some are more appropriate for different conditions

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Lesson Two – Functions of Radiotelephones

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Three important communication functions

- Safety messages
- Operation messages
- Commercial messages
- ***No other type of message is permissible!!!***

Safety Messages

- Three types
  - Distress – Use when you face or are witness to grave or imminent danger to life or property and need immediate help
  - Urgency – Use when there is a chance that a dangerous situation may become life threatening
  - Safety – Use to relay important information about weather or safety of navigation

Operations Messages

- Exchange of information about navigation or management of vessels
  - Call to a marina to secure a berth
  - Arrange for boat repairs
  - Exchange information about fishing
  - Scheduling a rendezvous with other vessels
- ***Don't chitchat on your marine radio!!!***

Commercial Messages

- Only for the business for which commercial vessels are concerned
- ***Recreational boats should not use designated radio channels for commercial communications!!!***

Summary

- In this lesson we learned
  - Allowable types of messages
  - When to use them
  - Be concise and clear, no chitchat

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Lesson Three – Licenses

Licenses

- VHF-FM radios, EPIRBs and radar do not require station licenses on most recreational vessels unless
  - Power driven recreational vessels (65ft/20m or longer)
  - Travel to foreign port (for VHF-FM radio)
  - Communicating internationally
- Under some circumstances an operator's permit may be required too

Registration

- VHF-FM radio equipped with DSC should be assigned MMSI by registering with FCC, BoatUS or Sea Tow Services International
  - DSC – digital selective calling
  - MMSI – maritime mobile service identifier
    - Used to identify your boat when you transmit over the radio
- EPIRBs require registration, but no license

Station License

- If you have a SSB radio,
  - a ship station license is required
  - need a VHF-FM radio also
- Need must be shown to FCC, apply with required forms, etc..
  - Recreational boaters will most likely not need to worry about this

Operator's Permit

- Not required if vessel is less than 65ft/20m for VHF-FM radio in domestic or international waters
- If docking in foreign port, restricted radiotelephone operator's permit required

Summary

- In this lesson we learned
  - when a license is required
  - what needs to be registered
  - where to get registered and/or licensed

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Lesson Four – Selecting Your VHF-FM Radio

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Radio Selection

- VHF-FM must meet minimum FCC requirements
- Prices vary
- Functionality differs from manufacturer to another, but consider
  - DSC, Sensitivity, Selectivity, Audio output, Signal strength, Available channels, Type of channel selector and readout & Current used

GMDSS

- Global Maritime Distress & Safety System
  - Relatively new worldwide communications system
  - Allows boaters to send automated digital distress messages containing boater's identity, location, current time & nature of distress
  - Must have DSC capability
    - Radios without can use Ch70 for digital distress calls, then switch to Ch16 (or working another frequency) for voice communications

Sensitivity

- Determines ability to pickup distant signals
- The lesser the voltage needed to reach 20db, the more sensitive
- The more sensitive, the more signals picked up

Selectivity

- Measure of how well a receiver rejects signals from other channels close to channel being used

Audio Output

- Measures the loudness of the radio
- Speaker might be necessary to be heard over engine

Signal Strength

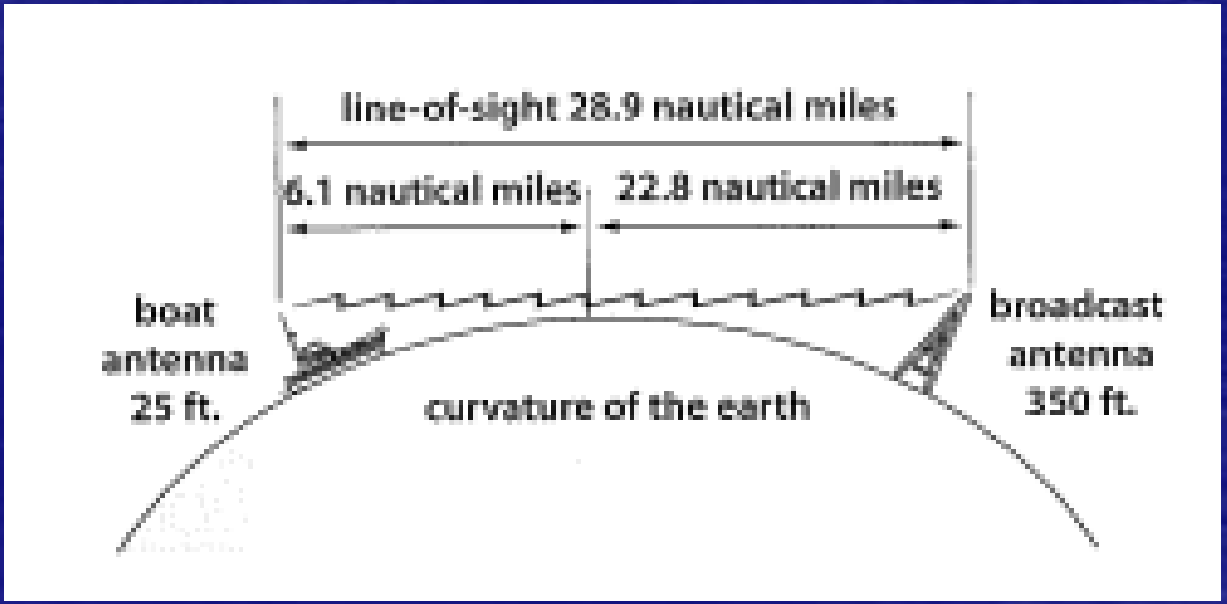
- Must be able to transmit on 1W of power
  - Good enough for short distances
  - Mandatory to use in harbor
- Usually max power is
  - 25W for fixed mount
  - 5W for handheld
- Best to evaluate signal strength before buying

Signal Suppression

- Radio with stronger signal “steps on” radio with weaker signal (when on same channel)
- Best to limit to lowest power to decrease signal distance
  - Avoids suppression of important communications from another nearby vessel

Line-of-Sight Transmission

- VHF-FM is “line-of-sight” system - Reaches only slightly beyond antenna’s horizon, but is usually sufficient for most marine comms
- Antenna
  - height
  - reaches
  - farther than
  - power output



VHF Communication Range

Range in nautical miles as a function of transmitting and receiving antenna heights					
	Receiving Antenna Height				
Transmitting Antenna Height	5ft	10ft	25ft	100ft	250ft
5ft	5	7	9	15	23
10ft	9	10	11	18	25
30ft	10	12	13	20	28
60ft	12	14	15	21	30

Available Channels

- US & International “channels” may have different frequencies
  - If your radio supports both, use the US channel designated by an “A”
    - For example, Ch22 is used by USCG referred to as Ch22A

Channel Selector

- During transmission to another vessel or coastal station
  - Will be necessary to switch from “calling channel” to “working channel”

Power Usage

- Amount of current radio uses is extremely important
  - “amp draw” – measure of power radio uses to transmit/receive
  - Determines how much drain is on the battery

Summary

- In this lesson, we learned
  - What to look for when buying a radio
  - GMDSS

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Lesson Five – Installation

Installation & Maintenance

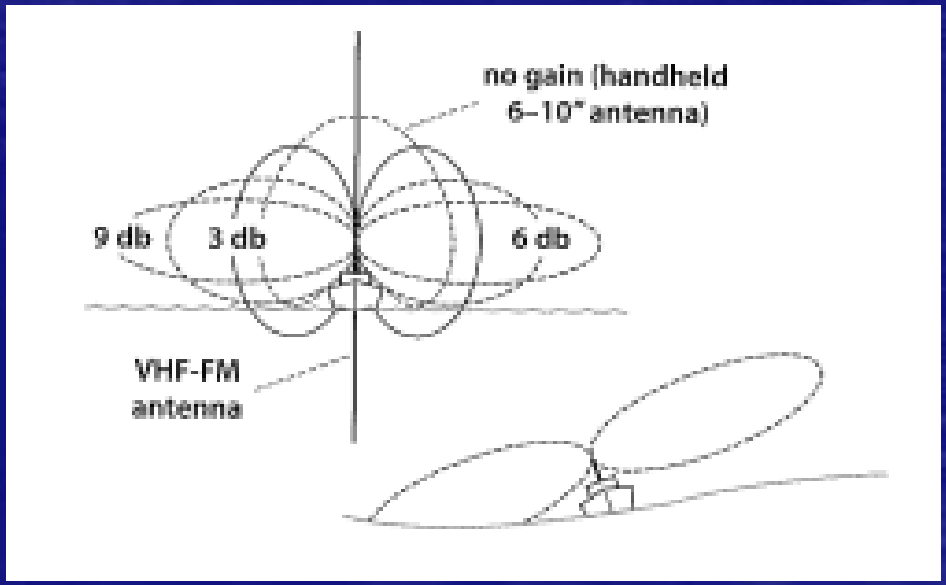
- You can install your radio
- You cannot repair or adjust your radio
  - Only FCC-licensed General Class commercial operators can make these repairs or adjustments
- Improper power or antenna connections can impair performance or cause equipment damage

Radio Antenna

- Use a good quality antenna appropriate for your radio (designed for VHF-FM or SSB radio)
- Should be placed as high as possible
- Gain – measure of antenna's effectiveness
  - Higher the gain, the farther to communicate

Summary

- In this lesson, we learned
  - Who can install, repair and adjust your radio
  - Why a good antenna is important



Lesson Six – Operating Your Radio

- Check that your radio is setup
  - to use only 1W
  - USA/International switch is in USA position
- Do not
  - Send false distress and emergency signals
  - Use obscene, indecent or profane language
  - Use radio when your boat is on land

Operating Your Radio cont…

- Speak slowly and clearly
- Think through your responses before responding
- Learn and practice correct radio usage techniques
- Listen to selected channel before using
- Shift to working frequency after contact made (unless in emergency situation)

Operating Your Radio cont…

Type of Message	Suitable Channels	Note
Distress, Urgency, Safety & Calling	16	
Boater Calling Channel	9	
Intership Safety	6	
Coast Guard Liaison	21A, 22A	
Noncommercial	68,69,71,72,78A	Working channels for rec. boats only; other channels reserved for working vessels
Navigational	13	
Maritime Control	17	

Operating Your Radio cont…

Type of Message	Suitable Channels	Notes
Public Correspondence (Marine Operator)	24,25,26,27,28,84,85,86, 87,88*	* Only for Great Lakes, St Lawrence Seaway, Puget Sound and its approaches
Digital Selective Calling	70	
Weather	WX1, WX2, WX3	Receive only
Port Operations	1,5*,11,12,14,20**,63,65,6 6,73,74,77***	* Only Houston & New Orleans areas; ** only ship-to-coast messages; *** limited to intership communications to and from pilot boats

Rules

- Know the FCC rules
- If FCC believes you have violated a rule
  - Written notice may be sent covering technical radio standard required to be fixed
- If FCC finds you willfully or repeatedly violated the rules or Federal Communications Act
  - License may be revoked
  - Fined or prison time

Summary

- In this lesson, we learned
  - What settings to check
  - Proper use of radio
  - Channels used and for what purpose
  - What happens if a rule a violated

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Lesson Seven – Calling Another Station

Proper Radio Etiquette

- Calling another station
  - Turn on Radio, checking that it is on low power
  - Choose channel (CH16) and listen for a few moments that frequency is not in use
  - Press microphone button, speak directly into microphone while holding 2-4 inches away
  - Say the name of the vessel or station followed by your vessel's name
    - E.g. "Sunrise, this is Sundown"

Proper Radio Etiquette cont…

- No unnecessary words – **Think, then speak**!
- After calling station, release microphone button and wait for station's response
  - Only transmitting or receiving can be done at a time
  - Do not call same station for more than 30s at a time
  - If no reply, wait 2 minutes before calling again
  - After 3 attempts, wait 15 minutes

Proper Radio Etiquette cont…

- When other station answers,
  - Immediately switch to working channel
  - Send your message, use these words at the end
    - “Over” if expecting a response
    - “Out” if not expecting a response – usually when conversation is complete (e.g. “Sunrise out”)
  - Keep all communication brief
  - When communication is over, switch back to working channel

Calls

- Public Correspondence Calls
- Ship-to-ship Calls through a Coast Station
- Shore-to-ship Calls
- Limited Coast Stations

Routine Radio Check

- Make request on local calling channel with request “Request a radio check”
- Once you have a response, switch to working channel
- If no response, you radio may not be transmitting or some other problem

Summary

- In this lesson, we learned
  - Proper radio etiquette
    - Always ***THINK BEFORE YOU SPEAK!!!***
  - Types of calls
  - How to do routine radio checks

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Lesson Eight – Procedure Words

Procedure Words

- Procedure words (Prowords) are shorthand to make communications more efficient and reduce transmission time
- “Over”, “Out” already discussed
- “Roger” – I received your last transmission okay”
- “Figures” – Figures or numbers to follow
- “Speak slower” – Speak slower

Procedure Words

- “Say again” – say again
- “Words twice” – difficulty is understanding, give each phrase twice
- “I Spell” – word to be spelled phonetically
- “Wait” – pausing for a few seconds; standby
- “Wait out” – pausing longer for a few seconds, will call back
- “Affirmative”, “Negative” – Yes you are correct, no

Summary

- In this lesson, we learned
  - Why to use prowords
  - What they are
  - How to use them

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Lesson Nine – Distress, Emergency & Safety

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Help!!!

- If your vessel is in distress, you may use any means in addition to your radio to get help
  - Flares, flags, lights, smoke, horn, whistle
- 3 spoken emergency signals indicate degree of severity of emergency
  - Distress
  - Urgency
  - Safety

Distress Signal

- Distress signal “Mayday” precedes distress message about grave or imminent danger, requesting immediate help
- Distress signal has priority over other signals
- Should be sent/received on Ch16

After initial contact

- Broadcast following message slowly and distinctly
  - “Mayday, Mayday, Mayday”
  - “This is <name of vessel>, <name of vessel>, <name of vessel>, <call sign>”
  - “Mayday”
  - “<name of vessel>”
  - “<position of vessel>”

After initial contact cont…

- Broadcast following message slowly and distinctly cont…
  - **"<nature of distress>"**
  - **"<kind of help needed>"**
  - **"<other pertinent information>" – length, tonnage of vessel; # of people on board; # of people needing help**
  - **When finished, "I will be listening on CH16"**
  - **End message, "This is <name of vessel>, <call sign>, over"**

Acknowledging Distress Message

- If you hear unanswered distress message, you must answer on CH16
- After acknowledging receipt of distress message,
  - wait a short time – there may be others in a better position to help and should acknowledge receipt
  - If not interfering, contact vessel with assistance you can provide

Acknowledging Distress Message cont…

- If vessel is in your area, you are obligated to give assistance
- Contact Coast Guard about distress and relay distress message if needed
- If Coast Guard is unreachable, contact nearest marine operator
- If a station interferes, vessel in distress or station in control of distress may impose silence “Seelonce Mayday”

Afterwards

- After distress communications have ceased or silence is no longer necessary
  - “Mayday, to all stations, to all stations, to all stations, this is <name and call sign of vessel in distress>, <time>, <name of vessel in distress>, Seelonce Feenee.”

Urgency Signal

- Urgency signal “Pan-Pan” used when safety of vessel or person is in jeopardy
- Sent on Ch16 also when
  - Loss of person overboard, only when help is needed
  - Repeating an urgent storm warning from auth. Shore station
  - Loss of steering power in a shipping lane

Sending Urgency Call

- “Pan-pan, pan-pan, pan-pan”
- “To all stations, This is <name of vessel>, <name of vessel>, <name of vessel>, <call sign>”
- “<urgency message>, <position and description of your vessel>”
- “This is <name of vessel>, <call sign>, over”

Safety Signal

- Safety signal “securite” used for safety of navigation or important weather warning
- Most initiated by Coast Guard announced on Ch9, Ch16 and usually Ch22A or another working channel
- If you have one, announce on Ch16 and a working channel

Sending Safety Signal

- “Securite, securite, securite”
- “This is <name of vessel>, <call sign>”
- “shift to <working channel> for safety message”
- “This is <name of vessel>, <call sign>, Out”
- Now switch to working channel

Sending Safety Signal cont…

- “Securite, securite, securite”
- “This is <name of vessel>, <call sign>”
- “<description of safety concern>”
- “This is <name of vessel>, <call sign>, Out”

- May skippers prefer to contact Coast Guard for them to announce Securite call

Summary

- In this lesson, we learned
  - Types of signals
  - When to use them
  - How to use them

The End