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**You Need Help...How Do You Get It?
Emergency Communications**



"The art of the sailor is to leave nothing to chance."




International Offshore
Safety at Sea Seminar
US Naval Academy
March 30, 2025

Peter Seidler, Captain, USCG (retired)

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No product endorsements are intended. Any commercial products shown are for illustrative purposes only. Opinions expressed are mine and do not reflect on the USCG, the USNA, US Sailing or any other organization.

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At the end of the day....

EPIRB Saves Seven Lives after Boat was Struck by Lightning



To date over 50,000 people worldwide, in distress situations, have been rescued because they carried a 406 beacon as part of their survival gear.

4

We Want To....

.... Out of "Search and Rescue"

Take the "Search"




5

Where We Are Headed...

- A Framework for Options:
How do you get help & Where does my message go?
- Options
 - Radio
 - Satellite Emergency Devices
 - EPIRB/PLBs
 - COB Beacons
- Distress Comms



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You Need Help... How Do You Get It?

Provide communications which are highly reliable, simple,
problem-free, interoperable, and
as functionally effective as possible

International & National SAR Manuals

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You Need Help...How Do You Get It? A Framework for Decisions

Coverage Area & Range

- Local/On-Scene – Line of Sight
- Long Range
- Global
- Weather Impacts

Usage

- Vessels/Marine
- Individuals
- Any mandated requirements

**Who is Alerted –
Where Does My Message Go?**

- SAR Authorities
- Commercial Service
- 3rd Parties/Other Vessels

Cost

- Equipment Cost
- Subscription Costs
- Free Services

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You Need Help...
How Do You Get It?

Distress Signals Must Be Recognized as Such!



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You Need Help...
How Do You Get It?

You can't be rescued if you can't be seen...
...or heard



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You Need Help...
How Do You Get It?

Lots of Options

<p>Visual Signals</p> <ul style="list-style-type: none"> - flares - lights - whistles 		<p>Radio – VHF-FM, DSC EPIRB & PLBs Cell Phones Satellite SEND – Spot, In Reach, Starlink AIS/COB Beacons Other MOB signals Low Tech Option</p>
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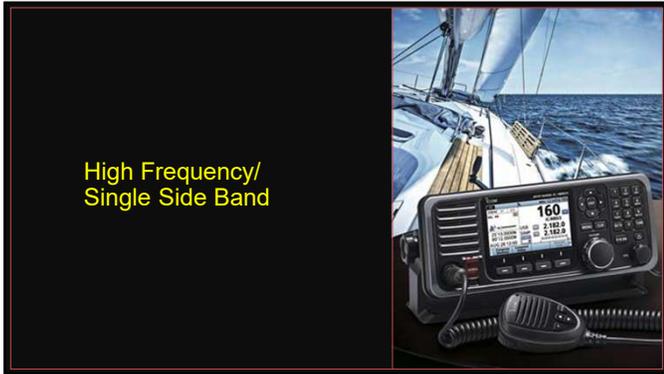
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You Need Help...How Do You Get It?

RADIO



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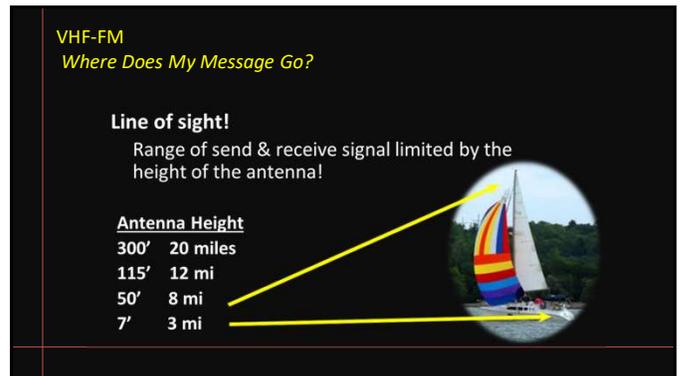
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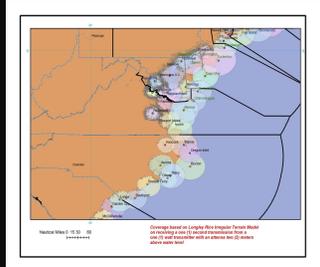


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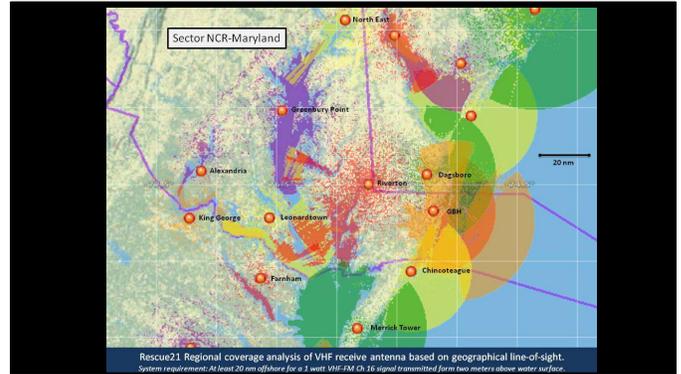
VHF-FM
Where Does My Message Go?

USCG Rescue 21

- Picks up a 1-second distress signal,
- Sent from a 1-watt transmitter,
- Located 2 meters above sea level up to 20 nautical miles out,
- Two remote towers can pick up the call which can be triangulated to generate a "fix."



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VHF-FM
Channels (U.S.)

Radio Channels and their use						
16	9	13	22A (1022)	68, 69, 71, 72, 78A	1-10	81A, 83A
Always monitor. Emergency Calling	Monitoring & calling shore stations	Navigation, bridge to bridge, locks, harbors, VTS	USCG working channel, USCG safety notices	Recreational vessel to vessel communications	Weather	"Mariner Radio Activated Sound Signals (MRASS)
1. All vessels must continuously monitor channel 16 when underway. 2. Dual channel monitoring of 16 and 13 or 9 as appropriate is advised and sometime required in harbors, in Vessel Traffic Service (VTS) control areas, canals, etc.						

Cruising Club of America Coastal and Offshore Communications Guide 2024

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Distress
Communications



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Voice Radio - VHF-FM
DSC

Digital Selective Calling (DSC)

- A single button automatically sends a distress signal on CH 70 to DSC equipped ships, boats & shore stations.
- Indicates identity of calling station & priority or purpose of call and GPS position
- Insure everyone onboard knows how to use it!



<https://navcen.uscg.gov/digital-selective-calling>

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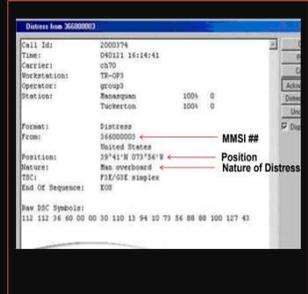
But.... *"...we've received a DSC distress alert with unknown position and unknown nature of distress..."*

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DSC Distress Alert
Where Does My Message Go?

What the Coast Guard sees →

"The Coast Guard urges, in the strongest terms possible, that you take the time to interconnect your GPS and DSC-equipped radio. Doing so may save your life in a distress situation!"



<https://www.navcen.uscg.gov/digital-selective-calling>

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Voice Radio
Emergency Procedure Words

Mayday: There is an **immediate danger** of loss of life or the vessel.

> **Mayday Relay:** Grave, Life-Threatening Issue aboard *another* vessel; you relay the call. After hearing a "Mayday" listen, if no response, you call the CG and relay the message. Log it.

Pan Pan: International urgency signal used when the **safety of a person or the boat is in serious jeopardy, but no immediate danger** exists, but it could escalate into a mayday situation.

Sécurité is a **safety signal** used as a preface to announce a **navigation safety message**.

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Voice Radio
The Distress Call

Yacht Sunshine F/V Northern Belle

AUDIO CLIP

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Voice Radio
The Distress Call

EMERGENCY RADIO CALL PROCEDURES

1. MAKE SURE RADIO IS ON
2. ON DSC RADIOS, LIFT COVER AND PRESS DISTRESS BUTTON FOR 5 SECONDS AND RELEASE
3. VERIFY RADIO HAS SWITCHED TO CHANNEL 16 AND GO TO STEP 5
4. ON NON-DSC RADIOS, CHANGE TO CHANNEL 16
5. PRESS AND HOLD TRANSMIT BUTTON
6. CLEARLY SAY: "MAYDAY MAYDAY MAYDAY"
7. ALSO GIVE: VESSEL NAME AND/OR DESCRIPTION
 POSITION AND/OR LOCATION
 NATURE OF EMERGENCY
 NUMBER OF PEOPLE ON BOARD
8. RELEASE TRANSMIT BUTTON
9. WAIT 30 SECONDS – IF NO RESPONSE, REPEAT "MAYDAY" CALL.

HAVE ALL PERSONS PUT ON LIFE JACKETS

* International boat calls are an offense and subject to prosecution.

www.uscgboating.org

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**Emergency Position Indicating Radio Beacon
Personal Locator Beacon**

These are all functionally the same!

24 Hours

48 Hours

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Cospas-Sarsat System

- 3 Active Satellite Constellations
 - LEOSAR (Low Earth Orbiting)
 - MEOSAR (Mid-Earth Orbiting)
 - GEOSAR (Geo-Stationary)
- Can locate a PLB within 3 minutes, 95% of the time, with 100-meter accuracy
- Over 50,000 Lives Saved Since 1982

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EPIRB/PLB

Global Coverage
Direct to SAR agencies

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"Next Generation" EPIRB/PLB

- Combines the global alerting capability of the EPIRB and the PLB...
- With the local alerting of AIS
- Includes homing signal and strobe &
- "return link" functionality

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Next Generation EPIRB/PLB

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EPIRB/PLB
Where Does My Message Go?

For anyone travelling internationally, location data and other relevant information from an activated U.S. registered beacon will be routed not only to the MCC here in the U.S., but also to the to Mission Control Center and the Rescue Coordination Center nearest the distress...

Note however that specific search and rescue resources vary from country to country and are affected by economic circumstance, so do your research in advance when planning a trip into remote areas of the world.

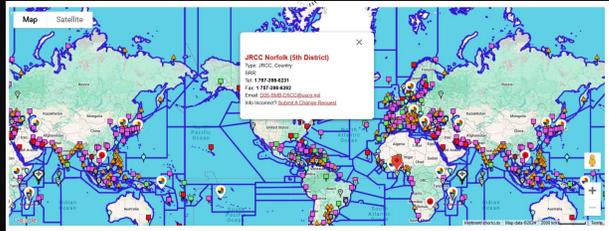
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Search and Rescue Contacts
 Find Rescue Coordination Centres Worldwide

Canada 

Ministère des Pêches et des Océans / Fisheries and Oceans
 Canada / Canada
 Coast Guard / Gardie côtière

www.SARCONTACTS.INFO



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**SUPPORT SEARCH AND RESCUE!
 REGISTER YOUR BEACON!**

"A GPS-equipped EPIRB takes a lot of the search out of search and rescue... That and an updated EPIRB registration are the two best ways to ensure the quickest possible rescue."
<https://www.cospas-sarsat.int/en/>

You are **REQUIRED** to register your EPIRB with your local authority



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EPIRB Activation

- Category I EPIRB - Automatic Float Free or manually deployed
- Category II EPIRB - Manually deployed

	Category I	Category II
EPiRBs have different categories that define which type of bracket the EPIRB uses	✓	✗
Bracket automatically deploys EPIRB when vessel sinks allowing it to float free	✓	✗
Contains a Hydrostatic Release Unit (HRU)	✓	✗
Built-in deactivation water sensor to prevent false alarms	✓	✓
Manual activation of beacon	✓	✓
Protects EPIRB from outside environment	✓	✗
Recommended mounting inside in protected environment	✗	✓

Graphic Courtesy ACR

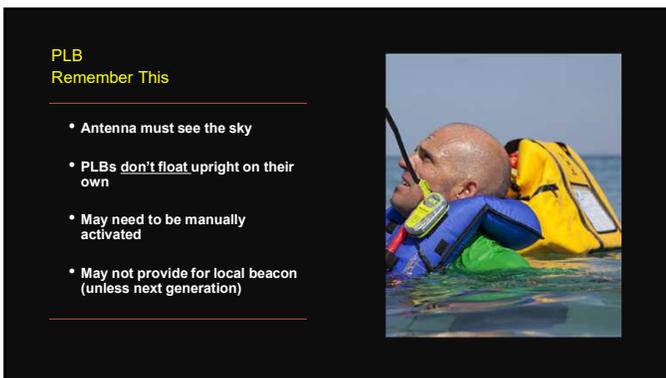
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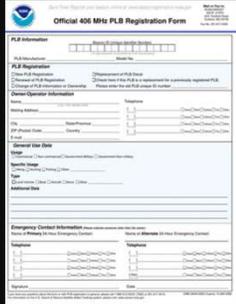


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**GMDSS - Global Maritime Distress System
Puts It All Together**

The goal of GMDSS is to virtually guarantee that vessels will be able to communicate with an onshore station at any time, from any location, in case of distress or to exchange safety-related information.

Mandatory for larger merchant and passenger vessels....



**But these are the guys who may be able to help you
in the middle of the ocean!**

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You Need Help...How Do You Get It?
A Few More Options...

↘

- Cell Phones
- Satellite
- SEND – Spot, In Reach, Starlink
- Other MOB signals
- Low Tech Option

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Cell/SAT Phones
Using cell or SAT Phone to call for help

- Do you have rescue # programmed into phone?
- Do you have rescue # programmed into phone?
- Have the "pin"?!
- But, consider...
 - Power?
 - Only 2 parties "on the line"
 - No DF capability
 - Requires subscription - \$\$
 - Cell phone range if offshore 15 miles? Maybe
 - Does someone hear the ring/vibrate?

Global Coverage – maybe
3rd Party Commercial Service \$\$

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Cell Phone Into Satellite Phone?

Global Coverage – maybe
3rd Party Commercial Service \$\$

AT&T and AST SpaceMobile Announce Definitive Commercial Agreement

Starlink & T-Mobile No More Dead Zones

Text anywhere with satellite

iPhone

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More Satellite Options

INMARSAT-C DISTRESS COMMUNICATION

CES 2025: Garmin To Showcase New SOS Satellite Communicator

STARLINK MARITIME

SPOT X™

Global Coverage – maybe
3rd Party Commercial Service \$\$

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AIS Automatic Identification System

See and Be Seen

The Convention for the Safety Of Life At Sea (SOLAS) requires all vessels of 300 GT and above engaged on international voyages and all passenger ships, irrespective of size, to carry AIS onboard.

Primary Purpose = Collision Avoidance/Situational Awareness

Other Uses = Vessel Traffic Control, COB, SAR

Increasing number of smaller commercial and recreational vessels are transmitting AIS




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AIS

- Automatic broadcasts via VHF frequencies
- Vessel MMSI, status (anchor, underway) Lat-long, heading, speed, rate of turn Calculates CPA, TCPA
- May include name, time to port, draft, size, type of cargo
- Connects to chart plotter or standalone display
- Virtually unlimited capacity of vessels

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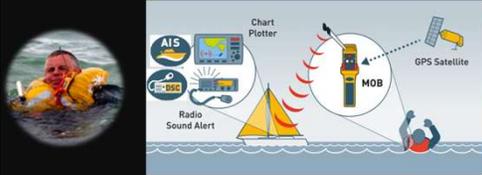
Crew Overboard Alerting COB AIS Beacons





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Crew Overboard Alerting COB AIS Beacons



AIS is local/line of sight + DSC Extends alert range

Next Gen = AIS/PLB Global Alert!



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Other Crew Overboard Alarms

Just a few...

<https://www.boatus.com/expert-advice/expert-advice-archive/2020/april/5-man-overboard-safety-devices-tested>

FEATURES	ACR OLAS FloatOn	ACR OLAS Tag	CrewWatcher	Fell Marine MOB+	Sea-Tags
Engine cutoff				X	
Wristband		X		X	X
Fob	X		X	X	
Pairing capacity	6	6	5	4	Unlimited
Water-activated			X		
Strobe on fob	X				
ADDITIONAL FEATURES	Fob can be used as a flashlight	Solo Mode will automatically text emergency contact with GPS coordinates if wearer is separated from boat	Triggers increasingly loud voice alarm and strobe flashing on smart device, even when in silent mode	Hard wired. Device requires skipper to use every time but can manually override at startup	Ability to contact emergency services directly from the app
PRICE	\$139.95	\$85	\$89.99	\$199.99	\$82

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**The Low-Tech Option...
Float Plan**

"Especially because he did file that float plan, it was a huge portion of the success of this mission..."
-- Florida News 2020

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Communication Obligations

If you hear a MAYDAY call

- > **Pause**
 - Does anyone else respond?
 - Did the CG hear?
- > **Respond**
 - If no one responds, answer
 - Nature of distress, position, POB, vsI description
- > **Can you help?**
 - Proceed to scene?
 - Standby
 - Relay communications

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Communication Obligations

Legal Requirements

I Have a Radio.
Do I have to Use it?

Yes!

In general, any [US] vessel equipped with a VHF marine radiotelephone (whether voluntarily or required to) must maintain a radio watch (46 CFR 80.310)

Recreational vsb: Ch 16 or 9 or0
if DSC 16 or 70

“Best Practice”

Maintain fulltime comms watches on not just VHF but on the satellite systems that are in use.

All crew understand how the comms systems work.

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Communication Obligations

To log or not?

- No legal requirement for US recreational vessels
- But, it's a good idea!
- **Records the pertinent info about the distress**
 - Helps for relaying
 - Documents for recall later



Distress Logging:

- Receipt of call
- Relayed to??
- Your ability to respond or reasons you cannot
- Actions taken

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**Safety at Sea
Distress Communications
Hands-On
Scenario - Medical**

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You are the master of a 45' sailing vessel "RED" with 4 persons on board. You are underway under sail, in position 36 55.10N 075 35.00W approximately 20 miles east of Cape Henry, VA.

Weather: Winds NE at 12-15 kts Seas 3'-5'
Clear with 12nm visibility

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At approximately 0200 a 35Y/O female crewmember falls down the companionway while going below. You hear her call out and come out of your bunk to investigate.

She is found sitting on the deck, conscious and alert and complaining of left-sided chest pain and a bruised & scraped left elbow.

She remembers the fall and thinks "she slipped" on the wet ladder. She denies hitting her head when she fell.



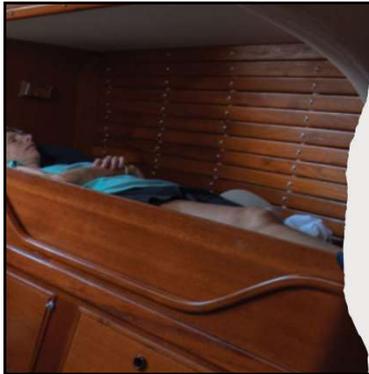
61

After an initial assessment that determined the injured crew member was conscious, breathing and alert. You find the following & record it:

- 35 YO Female, awake, alert in some distress from pain
- Left elbow is sore to movement and appears bruised with an abrasion and minor bleeding
- Respirations are shallow with pain when breathing in
- Mental state is anxious
- WHAT OTHER INFORMATION MIGHT YOU WANT TO KNOW?



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The crewmember is lying in a bunk, favoring her left side with an ice pack on her elbow. You have given her 2 500mg Tylenol tablets for pain.

Approximately 30 minutes after the injury she begins having increasing difficulty breathing. You find her pale. You take her pulse and find it is fast at 110.

You decide that her injuries are more serious than first thought and decide to seek assistance.

Is a PAN PAN or a MAYDAY situation?

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You decide to initiate a MAYDAY call to request immediate medical assistance/evacuation.

Would you activate your VHF-FM DSC distress alert?
Why or Why not?

Would you activate your EPIRB?
Why or Why not?

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Demonstrate a proper initial MAYDAY call for this situation.

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Remember the framework...

<p>Coverage Area & Range</p> <ul style="list-style-type: none"> ➤ Local/On-Scene – Line of Sight ➤ Long Range ➤ Global ➤ Weather Impacts 	<p>Usage</p> <ul style="list-style-type: none"> ➤ Vessels/Marine ➤ Individuals ➤ Any mandated requirements
<p>Who is Alerted – Where Does My Message go?</p> <ul style="list-style-type: none"> ➤ SAR Authorities ➤ Commercial Service ➤ 3rd Parties/Other Vessels 	<p>Cost</p> <ul style="list-style-type: none"> ➤ Equipment Cost ➤ Subscription Costs ➤ Free Services

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Advice from the CG

- Have the right gear & know how to use it
- Ensure DSC Radios, EPIRBs & PLBs are registered
- Ensure gear works properly
- Ensure fresh batteries
- Operate gear properly
- Speak slowly and clearly (yelling into the microphone doesn't make the signal go further)




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You Need Help...How Do You Get It?

- Bays, Rivers, Sounds, & Coastal to 20 miles
 - VHF-FM & Cell Phones
 - EPIRB/PLB
 - AIS COB Beacons
- 20-100+ miles offshore
 - EPIRB/PLB
 - MF/HF
 - Satellite systems
 - AIS COB Beacons

Key Take Away....
Once you are more than 20 miles from shore you need more than VHF and cell phones!

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You Need Help... How Do You Get It?

Lots of Options

Visual Signals
 COB Beacons
 Radio
 EPIRB

Cell Phones
 Satellite
 SEND – Spot, In Reach, Starlink
 Other COB signals
 Low Tech Option

Pick the method that is easiest for the rescuer & most likely to succeed. It may be multiple methods!

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Carter Bacon, Owner and Captain of s/v Solution

"When you have good reason to believe the loss of your vessel is probable, do not delay in preparing for the worst, whether that means calling for outside help, or preparing to enter a life raft. Delay simply means allowing unknown factors a chance to make things worse and bring on a crisis."

THE SINKING OF THE YACHT SOLUTION
 INCIDENT REPORT CONDUCTED UNDER THE AEGIS OF US SAILING, THE BERMUDA RACE ORGANIZING COMMITTEE, AND THE CRUISING CLUB OF AMERICA, February 2025

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VIDEO CLIP

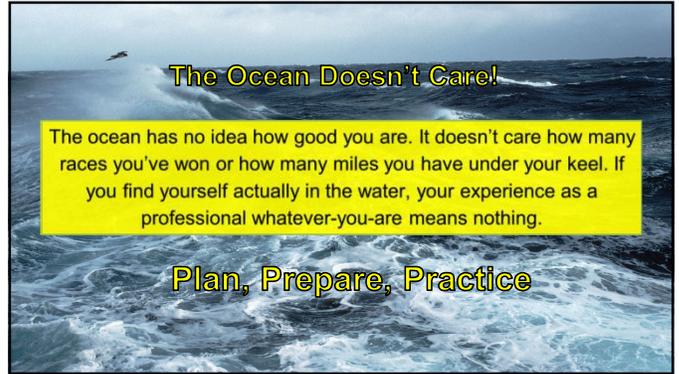
October 2024, after Hurricane Milton
 30 miles off Longboat Key in the Gulf of Mexico

USCG Video

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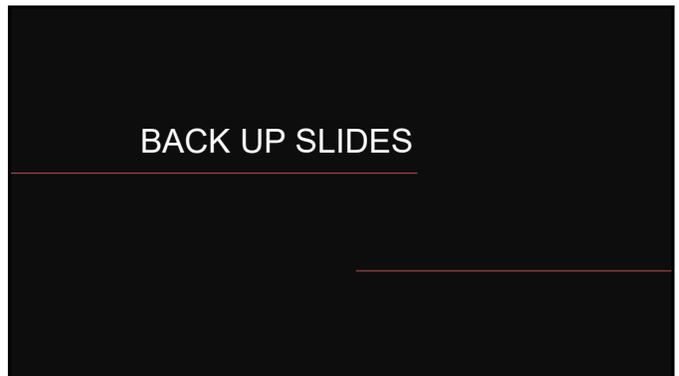
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Who Am I?

Peter Seidler, Captain, US Coast Guard (retired)

30+ years USCG
 Commanding Officer, USCGC MAUI
 Commanding Officer, USCGC PT ROBERTS
 USCGC DECISIVE, Deck Watch Officer, Maritime Law Enforcement Boarding Officer
 Other Experience Afloat: CGC EAGLE, CGC INGHAM, CGC UNIMAK
 Shiphandling/Seamanship Instructor, USCG Academy
 Graduate National Search & Rescue School
 CG JAG Officer/Law Specialist
 Guest Lecturer: US Naval Justice School, Naval War College

Presenter (13 years) Newport News Mariners Museum Safety at Sea Seminars
 Presenter USNA Safety at Sea Seminar (2022, 2023, 2024, 2025) - USCG SAR, Comms

Education: B.S. USCG Academy
 M.S. Rensselaer Polytechnic Institute
 J.D. University of Miami School of Law

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Emergency Communications Summary	Use	Who Is Alerted?	Coverage - Range		Notes
			Global/Satellite	Local/Line of Sight	
Radio (VHF/HF) w/DSC	vessel	SAR agencies, on-scene	No	Yes	HF longer range
Cell Phone	person	3 rd party	No	Yes	2-way; limited by cell coverage; cost
Satellite Hot Spot	person	3 rd party	Yes	No	2-way; limited by sat coverage; cost
Satellite Messenger	person	3 rd party	Yes	No	2-way; limited by sat coverage; cost
ELT	aircraft	SAR agencies	Yes	Yes	homing signal
PLB	person	SAR agencies	Yes	Yes	all US PLBs have homing capability
Next Gen PLB w/AIS/Homing	person	SAR agencies & on-scene	Yes	Yes	return link message
EPIRB	vessel	SAR agencies & on-scene	Yes	Yes	all US EPIRBs have homing capability
Next Gen EPIRB w/AIS/Homing	vessel	SAR agencies & on-scene	Yes	Yes	return link message
AIS MOB Beacon	person	on-scene	No	Yes	
AIS MOB w/ DSC	person	on-scene	No	Yes	sounds VHF alert

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When to Ask For Help

Questions to ask:

- What is going on?
- How bad is it?
- How bad could it get?
- Can I handle it?
- What if I can't?
- Situations change



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When to Ask For Help

- Medical Emergency
- Catastrophic Damage
 - Flooding
 - Loss of control
- Virtually ANY Fire
- Crew Overboard (in most cases)
- Loss of situational awareness
 - Safe harbor?
 - Location?
- When you just don't know what to do



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When to Ask For Help

Consider this...

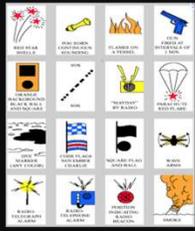
- What if flooding shorts out batteries?
- Fires can reflash
- Medical conditions change

CALL EARLY !
You can always cancel or be put on a communications schedule to check on your condition

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You Need Help...How Do You Get It? Recognized Distress Signals

- Slowly raising and lowering outstretched arms
- Continuous sounding of foghorn
- Red flares (night) and Orange smoke flares (day)
- SOS by Morse Code (... ___ ...) by horn, flashlight, automatic flashing light
- Three of anything... 3 fires, 3 whistles, 3 piles of brush
- Square Flag and Ball (often sold as an orange flag with black ball and circle on it)
- Radiotelephone Voice Call/ Digital Selective Calling (DSC) and other automatic alerts
- EPIRBs, PLBs, ELTs
- White Strobe Light (Inland Waters only)
- So... *Don't use strobe as anchor light Inland.*
- *But... You will see white strobes marking fishing gear in International Waters*



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You Need Help...How Do You Get It? Visual



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VHF-FM MMSI

- MMSI = Maritime Mobile Service Identity
- Unique numerical identifier for YOUR boat
- Contains description of your vessel
- Transmitted digitally from your radio
- DSC distress features will not work without one
- Obtain at: <http://www.boatus.com/mmsi/>
- Also Sea Tow, Power Squadron, Shine Micro
- If sail international get from FCC
- Free

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VHF-FM USE ON LAND
 Generally prohibited with an exception...

The FCC permits the limited use of portable marine VHF radio transmitters by persons on shore in areas adjacent to the water for communications relating to the operational and business needs of the associated vessel to provide flexibility in the use of marine radio equipment in a manner that furthers maritime safety.

47 CFR 80.115(a)(2)



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Summary of Marine Communications
 How far? What type? How much?

Name	Cost	Range	Type of Comms
HH VHF	\$100-\$300	3-20	Voice
Fixed VHF	\$100-\$500	20-60	Voice
AIS	\$500	25	Vessel Data
EPIRB/PLB	\$250-\$700	Worldwide	Mayday
HF SSB	\$2000-\$3000	25-4000	Voice, Data
Sat Telephone	\$500-\$1500	~Worldwide	Voice, Data
SEND Device	\$100-\$400	~Worldwide	Data, position
COB Beasons	\$300	~2	Data, position
Inmarsat M	\$3000-\$6000	~Worldwide	Voice, Data

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Handheld VHF-FM Marine Radio

Range:	3 miles (another boat) to 20 miles (CG tower)
Cost:	\$100 to \$300
Best Uses:	Cockpit safety, ship to dinghy, small boats (kayaks, inflatables). Autonomous from ship's systems. Strongly consider models with DSC and GPS built-in.
Limitations:	Some uses are illegal but handy, short range, few chat channels



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HF, SSB or Single Sideband Radios

Range:	50-4,000 miles
Cost:	\$2,000 to \$3,000 plus installation
Best Uses:	Long distance ship to ship and ship to shore Coast Guard monitors 4 bands Rugged, marinized designs.
Limitations:	Learning curve Complicated installation Time sensitive High current draw when transmitting.

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U.S. Coast Guard updates to four-digit VHF channel numbers

New VHF marine radios are now displaying four-digit channel numbers in place of the older two-digit channel number ending with the letter "A", to better harmonized U.S. use of VHF maritime mobile band with international use of the band.

**If it had an "A" it is now 4 digits....
22A = 1022, etc**
(Coast Guard Liaison and Maritime Safety Information Broadcasts, Broadcasts)



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What if ??? Backup Comms

What if...

- > Your batteries die?
- > Storm conditions/dismasting take off radio antenna?
- > Capsize?
- > The "captain" falls overboard
- > ??



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Case Study Putting it all together....

S/V Rainedancer transiting from Galapagos to Marquesas, approx. 2400nm...
hits whale... sinks in 15 min...
4 POB abandon to liferaft & dinghy

- > VHF-FM MAYDAY
- > EPIRB activated (no return link)
- > IRIDIUM-GO/Cell Phone Hotspot (power?)
- > SPOT
- > AIS Transponder




- EPIRB: Peruvian & US Coast Guard - broadcast to other vessels, M/V diversion
- SPOT: transmitted position and distress alert
- IRIDIUM GO: text to friend on boat 90 mi behind & to brother who then contacted the other boat by WHATSAPP via STARLINK & relayed MAYDAY & posn to other boats in area
- AIS beacon used when rescue vsls are close
- Rescue by S/V within 10 hours with M/V & other S/Vs standing by

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