Weather, Comms & Emergencies

Never overestimate your abilities while underestimating the weather

Seamanship

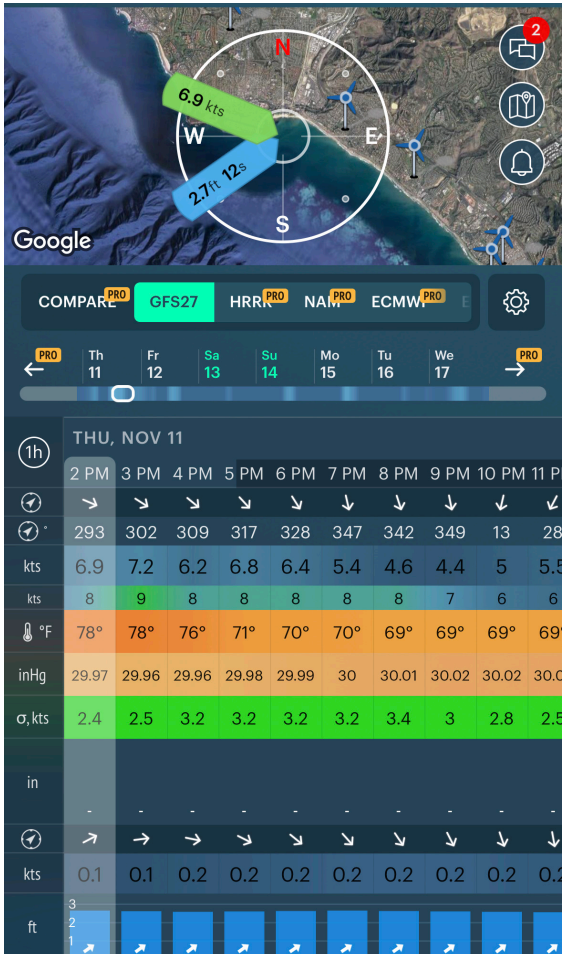
- "Skill in sailing, navigating, or working a ship.
- Collection of skills acquired in the course of an *ongoing continuing education* at the campus of the sea
- A mark of good seamanship is the ability to handle situations that arise when things on board don't go according to plan"

Coastal Cruising Made Easy, pg. 127

Marine Weather

Check early, check often!

- Windy app tells me wind speed (hourly) & direction
- barometric pressure (likelihood of rain!)
- wave direction and height,
- tidal flow and direction (ebb and flood,; caused by forces of the moon and the sun)



Wind:

- Causes waves
  - height affected by wind strength, duration and fetch (distance over open water)
  - current affects wave height and shape
  - know how to estimate wind strength based on wave characteristics!
    - 5 knots - wavelets “popple” against the hull
    - 10 knots - scattered whitecaps
    - 15 knots - waves forming (vs swells); often have breaking tops
    - 20 knots - wind begins to kick up spray; you should probably remain ashore!!

Small Craft Advisory: wind or sea conditions might prove hazardous
Gale warning: winds form 34 to 37 knots

Have basic understanding of **barometric pressure** - low vs high;
Low brings warmer, less dense air; High brings cooler, denser air.

Lows hold more moisture, often meaning rain!

Look at the clouds - more solid, lower hanging clouds which cover the sky indicate rain is coming.

If you are on the water and see bad weather approaching, prepare early!

Head for shore

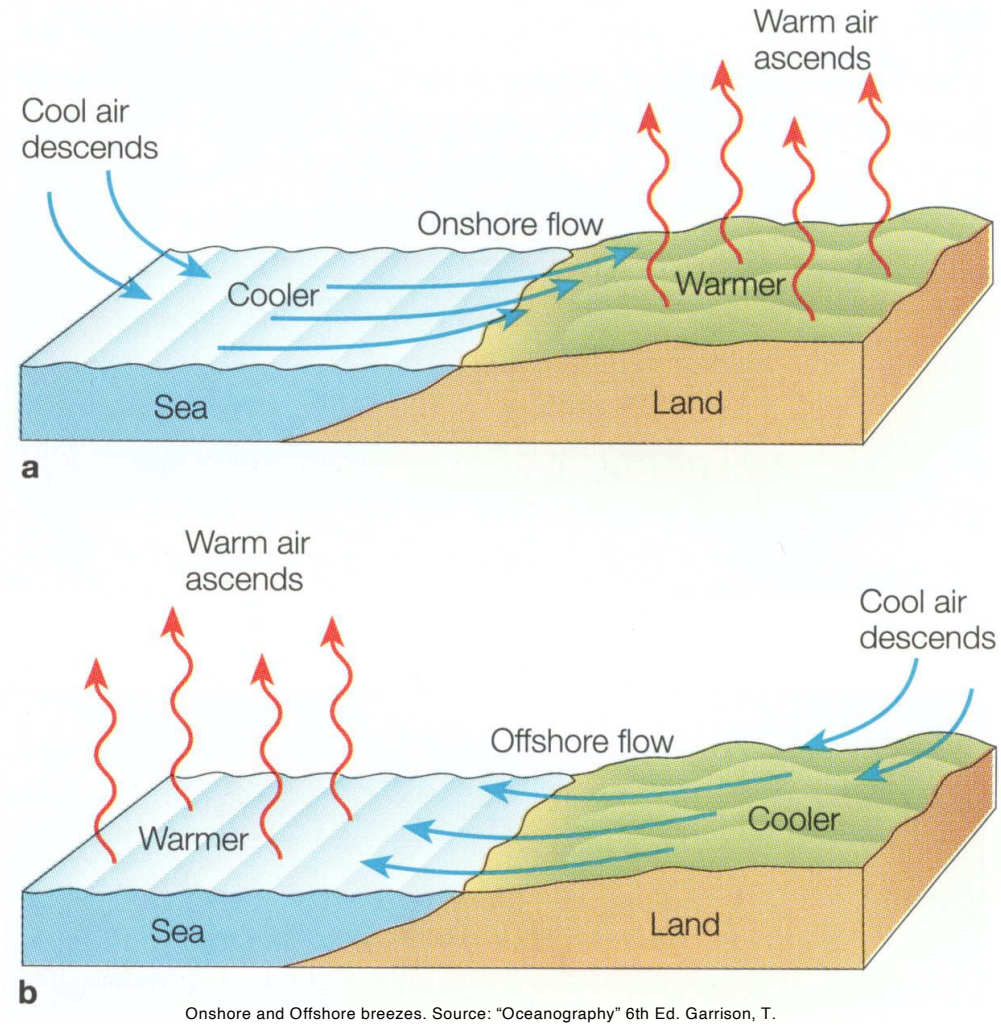
Check weather via radio, close hatches, secure loose items, think about safety (tethers? Jacklines?), put on foul weather gear etc.

Wind

Sea Breeze/Land Breeze:

- Sun heats the land, which in turn heats the air above it.
- Hot air rises; Air over the ocean is cooler and blows ashore to fill the space of the hot air that rose higher.
- These winds are called **onshore winds**
- After the sun sets the land begins to cool. If the air over land becomes cooler than the air over the water the winds shift and blow **offshore.**

- **What do you see off Dana Point??**



Onshore and Offshore breezes. Source: "Oceanography" 6th Ed. Garrison, T.

- **Sea breezes from the west and northwesterly direction are the most common and consistent winds in Southern California.**
- They are the trade winds, which blow off the Pacific Ocean as result of high pressure circulating offshore. They usually begin to blow in the late morning hours and increase into the late afternoon.
- This pattern changes when low-pressure disturbances encounter the west coast or when high pressure builds up inland and blows offshore in a northeasterly direction. (Santa Ana winds)

Wind is also largely responsible for changes in water temperature. West and northwesterly winds usually cause cooler water temperatures. South and southwesterly winds usually help warm the water temperatures in Southern California.

Tides and Currents

Flood tide = incoming

Ebb tide = going out

No current flowing = Slack tide

(period between flood and ebb)

Set = direction current is flowing

Drift = speed of the current

Other Weather Considerations

Fog

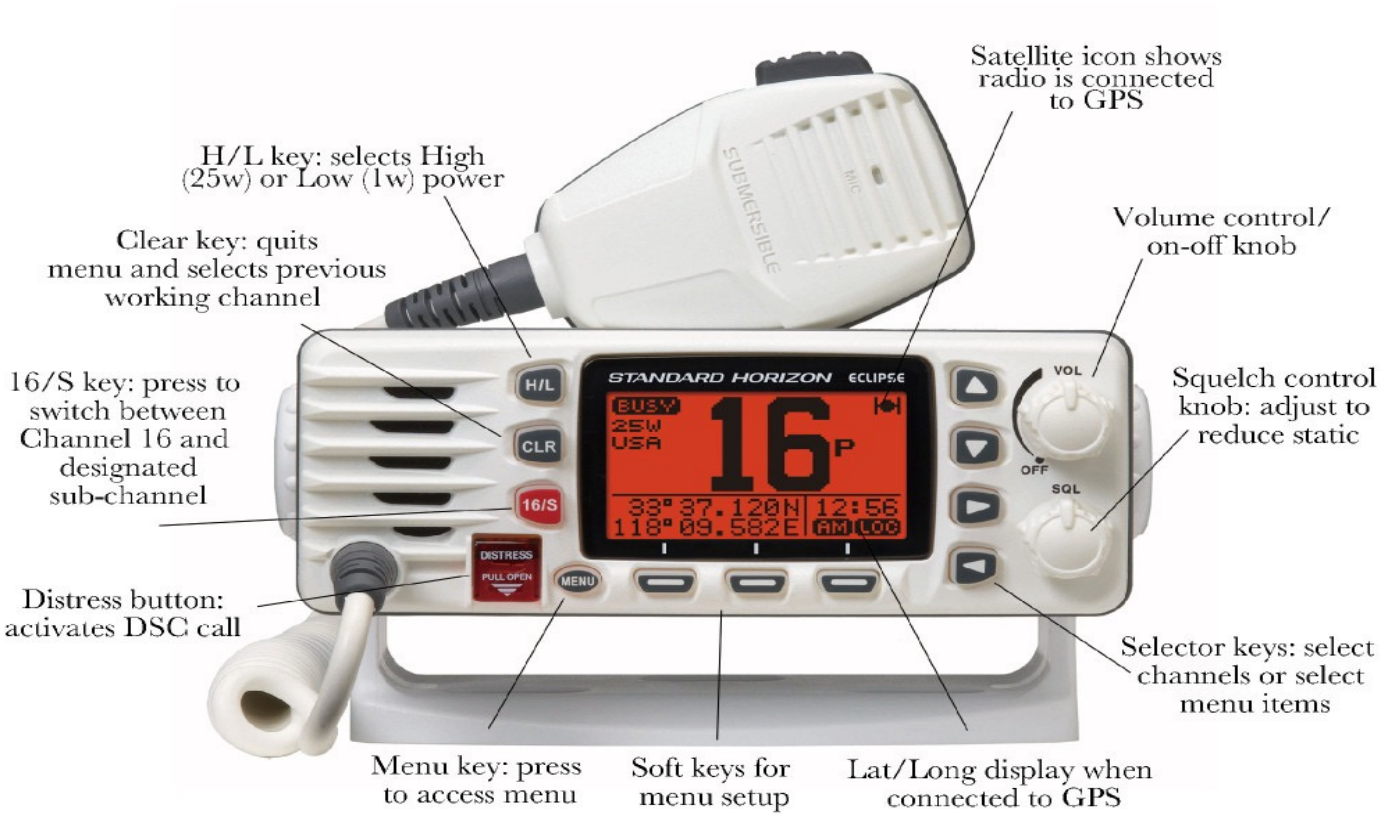
- Often occurs when it is hot and humid ashore and water is cool

- If you are surrounded by fog you must sound your air horn:
  - If you are underway, One long blast (4-6 secs) followed by two short blasts (1 sec @) **every 2 mins**

Be vigilantly attentive to avoid collision with another vessel or hazard!

VHF

Typical VHF Radio



VHF Radio

- VHF (Very High Frequency) radios
  - Provide two-way communication and have a range of 5 to 30 miles.
  - The most important safety item onboard your boat, and are far more reliable than a cell phone, with its limited on-water range and dropped calls.
  - In coastal or inland waters, a VHF radio is generally the fastest link to rescuing agencies like the Coast Guard, a towing service or the harbormaster.
  - Other uses include conversing with other boaters, listening to weather information and alerts, calling the race committee or communicating with a lock or bridge operator.

What’s My Range?

- VHF signals travel in a straight line and so antenna height is the key factor in determining range
- For example, two sailboats each with an antenna on the masthead might be able to converse with each other at 20 – 25 miles apart
- Another factor in determining range is transmitter power which is legally limited to 25 Watts for fixed mount and 6 Watts for hand-held
- VHF radios have two settings – low and high power. Use low power as default setting

Digital Selective Calling (DSC)

- Digital Selective Calling (DSC) – Part of international protocol of safety procedures in Global Maritime Distress Safety System (GMDSS)
- All fixed mount VHF Radios include DSC
- Functions like a coastal EPIRB - sends out a distress signal at the push of a button
- If radio hooked up to plotter or GPS and you have acquired a Marine Mobile Service Identity (MMSI) number (can obtain from Boat US at boatus.com/mmsi) then it will also broadcast your boat's name, position and other information for rescuers

Do’s and Don’ts of VHF Radio Use

- Important to use procedure or “prowords” and use them correctly
- VHF radio is an operational service intended for commercial inter-ship and ship-to-shore communication
- It is not a social networking facility for recreational boaters
- When using VHF radio, you are broadcasting to everyone within your antenna’s line of sight

Do’s and Don’ts of VHF Radio Use

- Don’t use Channel 16 for anything but the briefest of calls
- To make a call on Channel 16
  - Key the microphone and slowly and clearly – Say the name of the boat you’re calling three times, followed by your boat’s name three times, followed by the channel you want to switch to.
- It is illegal to call the Coast Guard and ask for a radio check
- If you want a radio check, go to Channel 9 or use Sea Tow’s automated radio check service which uses one of Channels 24, 26, 27 or 28, depending on the location.

Handheld is a good back up

- Since Fixed Mount VHF is hooked up to boat batteries, will not function if batteries are dead
- Hand Held is a good back up
- Limited to 6 Watts of Power

Emergency Calls on Channel 16

- MayDay – Only use this when vessel and/or crew is in grave danger (collision, fire, flooding, severe grounding, injury to crew, etc)
- Pan-Pan Pan – stands for Possible Assistance Needed. Use for an emergency that is not life threatening
- Securite – This means important safety or navigational information follows

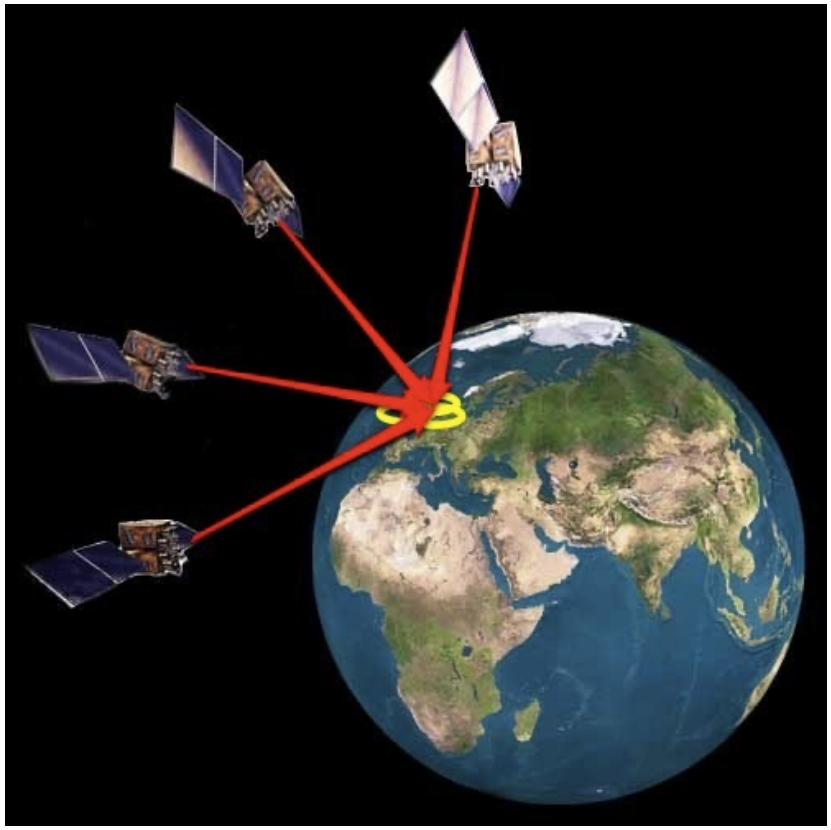
GPS

What is GPS & how does it work?

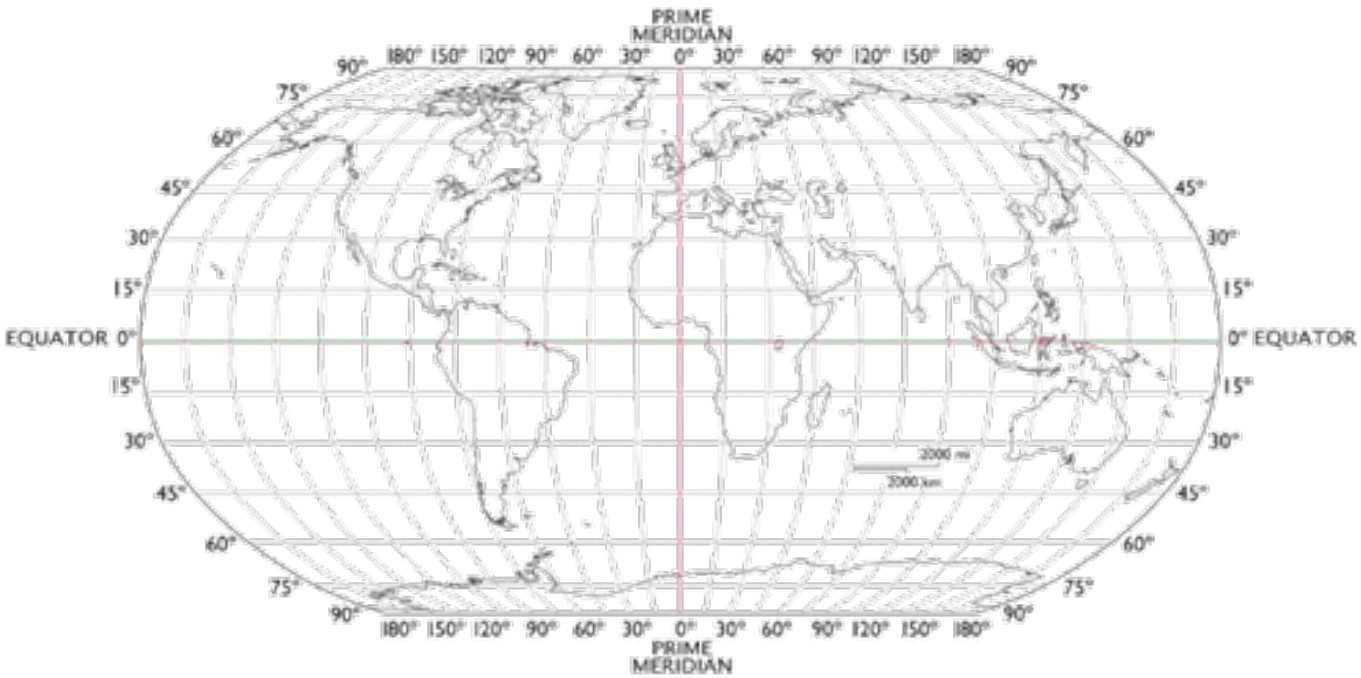
- The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 31 satellites placed into orbit by the US Department of Defense. Positioned so that a minimum of 6 satellites is always in view anywhere on Earth's surface.

- GPS satellites circle the earth twice a day (at 12,500 miles from Earth's surface) in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location.

How is Position Determined?



What does GPS provide?



Understanding Latitude and Longitude

- Latitude (shown as a horizontal line) is the angular distance, in degrees, minutes, and seconds of a point north or south of the Equator. Lines of latitude are often referred to as parallels.

- Longitude (shown as a vertical line) is the angular distance, in degrees, minutes, and seconds, of a point east or west of the Prime (Greenwich) Meridian. Lines of longitude are often referred to as meridians.

Minutes & Seconds

- For precision purposes, degrees of longitude and latitude have been divided into minutes (') and seconds ("). There are 60 minutes in each degree. Each minute is divided into 60 seconds. Seconds can be further divided into tenths, hundredths, or even thousandths.

- For Example: Avalon Bay Light “2”, is located at 33 degrees, 20 minutes, and 54 seconds north of the equator (written as N 33 20.9), and 118 degrees, 19 minutes and 24 seconds west of the Prime Meridian (written as W 118 19.4).

What can you do with GPS?

- Set a MOB (Man Over Board) point or quickly set a waypoint at your current position – this could potentially be a life saving action. You should know how to set one and also be able to read off lat and long to give to Coast Guard if needed.

  - MOB – hold down MOB button
  - Set a waypoint at current position – hold down enter button

Using your VHF Radio

- Know your phonetic alphabet!
- Know your numbers
- Emergency Calls - 3 int'l types
- Know your channels - choose the appropriate one for use

SAIL **VHF User Guide**

PHONETIC ALPHABET

Sound these out slowly and clearly

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

NUMBERS

Pronounce numbers slowly and clearly.

0 Zero
1 One
2 Two
3 Tree
4 Fo-wer
5 Fife
6 Six
7 Seven
8 Eight
9 Niner

When transmitting numbers, say each digit separately, eg "one-six" instead of "sixteen." For a decimal point, as in a lat/long figure, say "decimal" not "point." "Four eight decimal three two north," etc.

USING THE JARGON

Over: means you have finished talking and expect a reply.

Out: means you have terminated your transmission and don't expect a reply. Do not say "Over and Out."

Roger: means "I understand."

Wilco: means "will comply." You don't need to say "Roger" as well.

Affirmative/Negative: you can use these instead of Yes and No.

Say Again: use this when you need a word or phrase repeated.

I Spell: use before spelling out a word phonetically.

Figures: use before saying numbers, e.g "figures one one zero."

WHAT'S MY RANGE?

Because a VHF signal travels in a straight line, antenna height is the determining factor in its range. Two sailboats, each with an antenna at its masthead, might be able to converse with each other at 20 to 25 miles apart before the earth's curvature blocks the signal.

Another factor in determining range is transmitter power. Whether handheld or fixed-mount, VHFs have two power settings—usually 1 watt and 5 watts for handhelds, and 1w/25w for fixed sets.

While a handheld at its 1w low power setting won't be heard much more than a mile or two away, selecting high power will get you a range of up to five miles. A fixed set with a masthead antenna will have a low-power range of up to 10 miles. Transmitting at the low power setting allows other boats to use the same channel.

USING YOUR VHF RADIO

Select your calling channel—9 or 16. Wait 20 seconds to ensure it is not already in use. Key the microphone and, slowly and clearly, say the name of the boat you're calling three times, followed by your boat's name, also three times, followed by the channel you want to switch to: "*Peligroso*, *Peligroso*, *Peligroso*, this is *Liability*, *Liability*, *Liability*, channel six-eight, over."

Release the mic and wait 20 or 30 seconds for *Peligroso* to acknowledge before repeating your transmission. If you don't get a reply after the third try, wait a few minutes before trying again. When *Peligroso* replies, switch to the working channel you've chosen.

Having established contact and switched channels, now you can shorten things up. "*Peligroso*, this is *Liability*, over." Or even "*Peligroso*, *Liability*, over."

Always say the other boat's name before your own. At the end of the conversation, simply say "*Liability* out." Never over and out, or farewell, or see ya later.

VHF CHANNELS & THEIR USE

There are 88 channels, of which most are reserved for specific commercial and operations purposes.

Channel 16 is reserved for initial ship-to-ship or ship-to-coast contact, and for distress calling. All vessels are required to monitor it.

Channel 06 is reserved for safety messages and operations.

Channel 09 is a general calling channel. You can use this for radio checks.

Channel 13 is a ship-to-ship working and calling channel. It's also used to communicate with bridge and lock keepers. It's important to select low power when using this channel.

Channel 22A is reserved for Coast Guard communications. DO NOT call for radio checks on this channel.

Channel 70 is reserved for DSC safety calling.

Channels 68, 69, 71, 72 are for general communications between all types of vessel.

EMERGENCY CALLS ON CHANNEL 16

MAYDAY Only use this when vessel and/or crew is in grave danger (collision, fire, flooding, severe grounding, injury to crew, etc.). "MAYDAY, MAYDAY, MAYDAY. This is Boatname, Boatname, Boatname. My position is (lat/long from GPS)." Then explain nature of distress clearly and concisely, e.g. "We are sinking." If no acknowledgement, repeat at intervals.

PAN-PAN PAN stands for Possible Assistance Needed, pronounced "pahn-pahn." Use for an emergency that isn't life-threatening. "PAN-PAN, PAN-PAN, PAN-PAN. This is Boatname, Boatname, Boatname." Explain nature of emergency as in Mayday call, and why you may be in need of assistance.

SECURITE Pronounced "say-cure-it-ay," this means important safety or navigational information follows. "SECURITE, SECURITE, SECURITE; all stations, all stations, all stations." Then describe the nature of the information you want to convey: for example, to alert other traffic that you are becalmed and engineless in a shipping lane. Same procedure as for Mayday and PAN-PAN calls.

*Before sending a distress or emergency call, make sure you are transmitting on high power (25w).

Handling Emergencies

- Have a Contingency Plan!
    - Calling for assistance:
        - USCG channel 16
        - 911
        - SeaTow
        - other vessels, family & friends

Running aground

- Stop the boat!
  - Drop the sails / put the engine in neutral
- Check for injuries to persons and vessel
- Check tide table - tide ebbing or flooding??
- Can you get off the ground?
- Is your rudder free?
- Do you know what other hazards may lie around you? Check your chart!!

CALL FOR HELP! — We have a contract with SeaTow for just this reason

Other emergencies

Do you have a leak?

- Is everyone on board aware of the problem?
- Is the bilge pump working? Prepare to operate the manual bilge pump!
- Locate the leak! Can you plug it? Can you stop it another way?
- Assess your situation!
  - Can you get to shallow water?
    - Have you called for help?

Steering failure?

- Attach the manual tiller - remember it steers opposite from the helm!!
- Have you lost your rudder?
- Is it an auto pilot issue?

Fouled prop?

- Stop the engine if it's running
- Look for potential causes topside (line overboard, trailing pot, seaweed)
- Try to look under the boat
- Attempt to free the prop

Other emergencies, continued

Rigging Failure?

- Running rigging can be managed
- Standing rigging is far more serious!
- Stabilize the rigging as best you can and head for port
- **Review page 140**

Fire aboard?

- Get crew upwind of fire with safety gear on!
- Grab fire extinguishers and bucket w/rope
- Gather emergency flares and floats
- Grab handheld radio and cell phones
- Attempt to extinguish the fire

Fire Aboard

One of the most serious dangers on a boat

Act quickly!

Danger of Fire aboard comes primarily from:

- Diesel/gasoline
- Propane/alcohol (used for cooking)
- Faulty wiring (electrical)

Man Overboard Review

- Y,T,P,S,C:
  - Yell
  - Throw
  - Point
  - Set (GPS Coordinates)
  - Call (Radio)

- Stop the boat - turn into the wind
- Motoring or Sailing rescue?
- Concentric circles around the MOB
- Retrieve the crew member and TIE THEM TO THE BOAT
- Rig the block/tackle and halyard for crew recovery

What if you're the person in the water?

- Make noise
  - Keep your eye on the boat
    - Try to preserve body heat