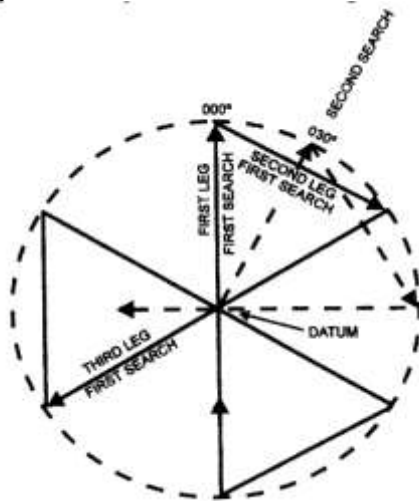## Sector Search (VS)

All Turns - 120° to Starboard
Mark Datum w/Datum Marker Buoy (DMB)
1st leg in direction of Search Object's Drift
Multi-unit Search – 2nd boat 090° to left of 1st boat (2nd boat starts after 1st boat completes 1 leg

Good Visibility
PIW = .1 nautical mile (200 yards)
Boat <5' = .5 nautical mile (1,000 yards)
Boat >-5' – 1.0 nautical mile (2,000 yards)
Same for Expanding Square

Internal Coastal Waterway (ICW)
East Coast – Returning from sea when traveling in a southerly direction

 Marker w/yellow triangle should be passed by keeping it on the right side of boat

 Marker w/yellow square should be passed by keeping it on the left side of boat

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Fire Extinguishers
Ash – Combustible Materials
Boiling – Flammable Liquids
Current - Electrical
**Metals –** Combustible Metals

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Williamson Turn
1. Alter course 060° from original heading
2. When compass reaches the 060° 'mark' turn in opposite direction on reciprocal of original heading

Example:
000° - original heading
060° - 1st turn (Port or Starboard)
180° - Reciprocal of original heading

Expanding Square (SS)

1st leg in direction of Search Object's Drift
All Turns - 90º to Starboard
**Multi-unit Search** – 2nd boat 045º to right of 1st boat
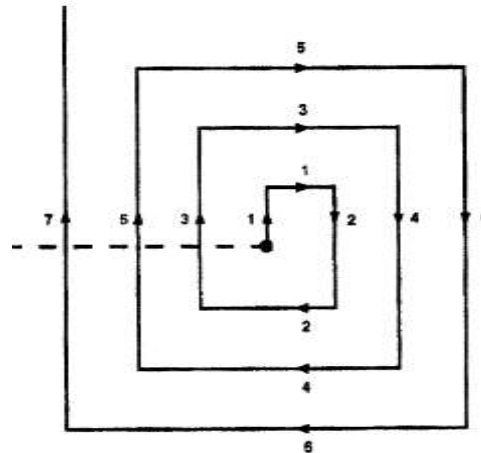
Uncertainty	Knowledge that situation may need monitoring
Alert	May require assistance but, not in immediate danger
Distress	Reasonable certainty that immediate assistance is required

Mayday Vital Information
Location of disabled vessel
Number of people on board (POB)
Nature of distress
Name/radio call sign of vessel
Description of vessel

SAR Organization
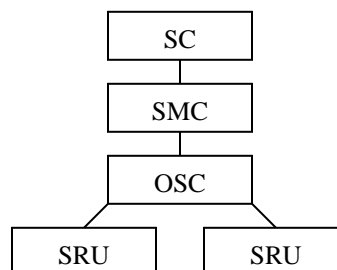
Radio Urgency Calls
Mayday	Grave and imminent danger requires immediate assistance
Pan-Pan	Very urgent message concerning safety of a ship, aircraft, vehicle or person
Securite´	Message on the safety of navigation or weather warnings

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Common Prowords

Proword	Definition
Affirmative	Yes
Break	Separation of text from other portions of message
Correction	An error has been made in transmission
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETR	Estimated Time of Return or Repair
Figures	Numbers
I Spell	Spell next word phonetically
OPS Normal	Operations Normal
Out	No reply expected
Over	Reply expected
Negative	No
Roger	Received transmission
Wait	Must pause for a few seconds
Wait Out	Must pause longer than a few seconds
WILCO	Will comply w/your last

Phonetic Alphabet

Alpha	**N**ovember
Bravo	**O**scar
Charlie	**P**apa
Delta	**Q**uebec
Echo	**R**omeo
Foxtrot	**S**ierra
Golf	**T**ango
Hotel	**U**niform
India	**V**ictor
Juliet	**W**hiskey
Kilo	**X**ray
Lima	**Y**ankee
Mike	**Z**ulu

Compass Correction

Can	Compass
Dead	Deviation
Men	Magnetic
Vote	Variance
Twice @	True
Elections	+ East

Conversions

1 Nautical Mile = 2,025.37 Yards
1 Nautical Mile = 6,076.11 Feet
1 Nautical Mile = 1.15 Statute Mile
1 Meter = 3.3 Feet
1 Gallon = 128 ounces

GAR Model

Risk vs Gain (High, Medium, Low)
Low - Situation is unclear; low probability of results
Medium - Situation that provides immediate and real benefits
High – Situation that provides immediate and real benefits that if ignored could result in the loss of life

Time/Distance

$\frac{60\text{Distance}}{\text{Speed Time}}$

Example:
60 D ÷ S = T
60 D ÷ T = S
S x T ÷ 60 = D

Towing (Inland)

Masthead Lights (White)

2 in a row -- something in tow

3 in a row -- very long tow

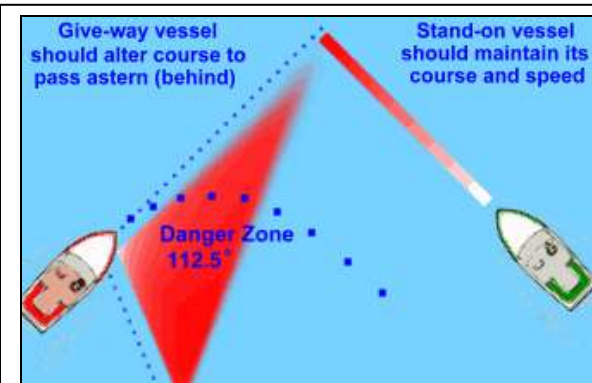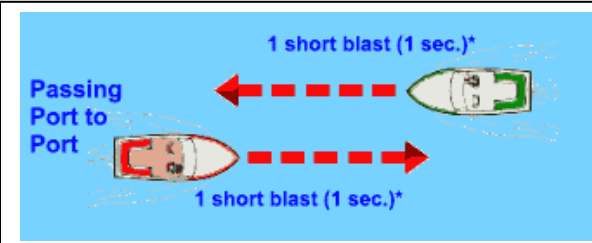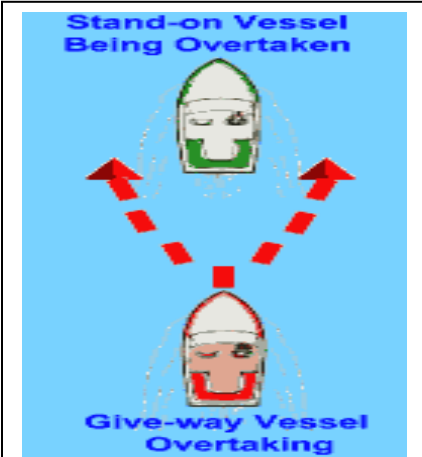**Pushed Ahead or on Hip**
Tug - Yellow/Yellow pushy fellow

Order of Precedence

Our	Overtaking
Navy	Not Under Command
Requires	Restricted in Ability to Maneuver
Canned	Constrained by Draft
Fish	Fishing
Served	Sailing
Promptly @	Power
Seven	Seaplanes

Sound Signals

1 Short = 1 second
1 Prolong = 4 to 6 seconds

1 Short	Altering Course to Starboard
2 Short	Altering Course to Port
3 Short	Operating Astern Propulsion
4 Short	Pilot Vessel
5 Short	Danger Signal
5 or More Short	Man Overboard
1 Prolong	Leaving a Dock or Entering a Bend, Narrow Channel or Fairway

Power Vessel – Restricted Visibility

Making way	1 Prolong (Intervals of 2 Minutes)
Stopped Making no-way	2 Prolong Intervals of 2 Minutes (2 seconds between)

Miscellaneous Formulas

Anchoring over a Wreck
$A^2 + B^2 = C$
A = Distance from Wreck
B = Depth of Water
C = Amount of Anchor Rode to Deploy

Buoyancy Calculation
(80% of Body is Water)
(15% of Body is Fat)
200 lbs * 80% = 160 lbs
200 lbs – 160 lbs = 40 lbs
200 lbs * 15% = 30 lbs
40 lbs – 30 lbs = 10 lbs

Fish's Weight
G = Girth
L = Length {nose to tail}
W = Approx. Weight of Fish
$G^2 * L = W/800$

Diameter of Transducer Cone
200KBeam = Depth/3
(21'/3 = 7' diameter circle)
50K Beam = 1:1 relationship
(21' of water = 21' diameter circle)

Premix Ratios
50:1-128/50 = 2.5oz/gallon

Boat Capacity
LOA * Beam/15

Safe Towing Speed
WLL = Water Line Length of vessel
√ of WLL * 1.34 less 10%
$\sqrt{36} = 6 * 1.34 = 8.04 – 10\% = 7.2$ knots

Converting Decimal Degrees to dd°mm'ss" or dd°mm.mm'
Example: 39.122N
Formula =   0.122 * 60 = 7.32
**   0.32 * 60 = 19**
(39° 7.32'N or 39° 7' 19" N)

Beaufort Scale

Knots	Description	Specs for Sea
0 – 1	Calm	Sea Like Mirror
1 – 3	Light Air	Ripples on Water w/o Foam
4-6	Light Breeze	Small Wavelets; short but pronounced
7 – 10	Gentle Breeze	Large Wavelets; crests begin to break
11 - 16	Moderate Breeze	Small waves; becoming larger
17-21	Fresh Breeze	Moderate waves
22 – 27	Strong Breeze	Large waves; white foam

Phil Walmsley, Coxswain 05NR 01-04
(Updated January 2019)