NAVIGATION

1. Seamanship Knowledge

- **Charts and Publications**
  - *Coast Pilot 7* by NOAA (National Oceanic Atmospheric Administration)
  - Notice to Mariners
  - *Light List* by USCG https://navcen.uscg.gov/pdf/lightLists/LightList_V6_2019.pdf
  - Chart One
- **Tides and Currents**
  - Tide Tables
  - Current Tables
  - Canadian Current Atlas
    - Annual Current Tables
  - Ports and Passes
- **Aids to Navigation**
  - Buoys
  - Day Marks
  - Ranges
  - Information and Regulatory Markers
  - Lights
- **Cruising Guides**
  - Waggoner Cruising Guide
  - Blue Latitude Press Cruising Guides
    - San Juan Islands
    - Gulf Islands
- **Weather**
  - NOAA & Canadian weather radio (WX channels)
  - NOAA OPC
  - Internet APPs, Windy, Wunderground, etc.
- **Marlinspike Seamanship- common knots used on a boat:**
  - Cleat Hitch
  - Bowline
  - Round Turn and two half hitches
  - Clove Hitch
  - Figure 8 (stopper)

2. Navigation

- **Latitude & Longitude**
- **North and its Variations**
  - True North
  - Variation
  - Magnetic
  - Deviation
  - Compass
  - (*TVMDCAW: True Virgins Make Dull Company at Weddings)*

- **Charting Tools**

    - Parallel Rules
    - Dividers
    - Pencil
    - Calculator
- **Piloting**
    - Chart Datum
    - Compass Rose
        - Variation
    - Abbreviations and symbols- Chart One
    - Laying a course using Magnetic Rose
    - Distance Using Latitude (one nautical mile = one minute of latitude
    - Dead Reckoning
    - Running Fix
    - Address of 60D ST 60 x Distance = Speed x Time

3. Electronic Piloting: Chart Plotter & Radar

- **What a chart plotter offers:**
    - Ensure a "Fix" is acquired
    - Find function to "Find Ship"
    - Range in and range out
    - Move Cursor around the screen
    - Use "Go To" function for single waypoint
    - Set up "Data" boxes
    - COG (course over ground)
    - SOG (speed over ground)
    - Vessel position latitude and longitude
    - Split screen (radar, sonar, chart plotter)
    - Brightness control
    - Sea talk capability with speed/depth/auto pilot
- **Radar: *Start-up***
    - Turn on scanner
    - Warm up time needed
    - Standby to transmit (TX)
    - Adjust gain manually
    - Adjust rain mode manually
    - Adjust turning manually
    - Harbor/offshore mode
- **Radar: *Using***
    - Range in and range out
    - EBL (electronic bearing line)
    - VRM (variable range marker)
    - Target tracking
- **Navionics APP**

4. Rules of the Road (COLREGS- *International Maritime Organization*)

- **Rule #2- Responsibility**
- **Rule #5- Look out Rule**
- **Rule #6- Safe Speed**
- **Rule #7- Risk of Collision**
- **Rule #9- Narrow Channels**
- **Rule #13- Overtaking**
- **Rule #14- Head on Situation**
- **Rule #15- Crossing Situations**
- **Rule #16- Give Way Vessels**
- **Rule #17- Stand-on Vessels**
- **Rule #18- Pecking Order**
    - Not under command
    - Restricted by ability to maneuver
    - Constrained by draft
    - Fishing Vessels
    - Sailboats
    - Powerboats
    - Seaplanes
- **Rules #21 thru 35- Lights and Shapes**
- **Rules#27e- Driver's Flags**
    - Alpha flag
    - Diver down flag
- **Rule #34- Maneuvering Sound Signals**
    - Short blast (1 second)
    - Prolonged blast (4-6 seconds)
    - Once short blast- altering course to starboard
    - Two short blasts- altering course to port
    - Three blasts- operating astern propulsion (in reverse)
    - Five blasts- danger signal
- **Rule #35- Sound Signals in Reduced Visibility**
    - Every two minutes
    - Power vessels
        - -- Under way
        - -- -- Not under way
    - Sailing vessels _ . .
    - Tug and Tow _ . . .
- **Rule #37- Signals to Attract Attention (Distress Signals)**

5. Safety and Emergency Procedures

- **Nine Items the Coast Guard Requires**
    1. Type 1,2,3 or 5 PFDs (Personal Flotation Device)
    2. Type 4 throwable device
    3. Fire extinguishers (usually 3 type BC)
    4. Daytime distress signals (smoke)
    5. Nighttime distress signals (aerial or red roman candle type)
    6. Navigation lights

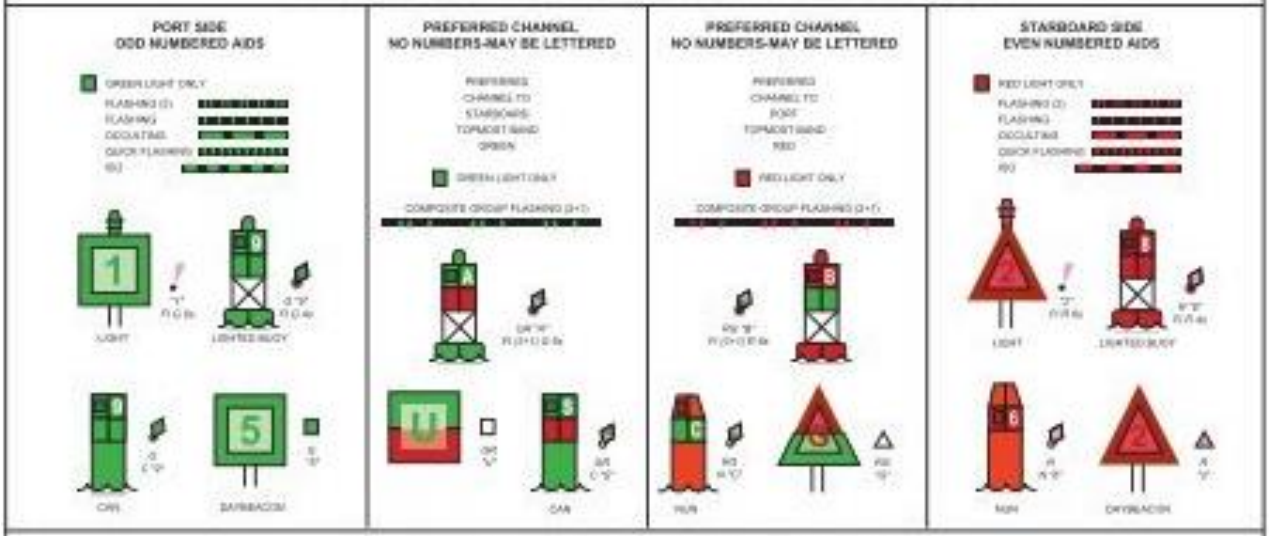
7. Registration or Documentation
8. Sound making device (air horn)
9. Marine sanitation device

- **VHF Procedures**
  - Use channel 16 for hailing other stations
    - ***"May Day"*** Life threatening emergency
    - ***"Pan Pan"*** Non-life threatening emergency
    - ***"Securite"*** Informational Call (i.e. Deadhead, navigation hazard)
    - Hail other station three times and give your boat name twice.
    - Switch to "working channel" to continue conversation
  - Other important channels
    - Working channels
    - Vessel Traffic
    - Bridge to bridge
    - Weather channels 2 & 3 Canada, 4 is NOAA (WX function)
  - Practice skills
    - Negotiate passage with another vessel
- **Float Plan**
  - Don't file with Coast Guard
  - File with Friends, family or charter company

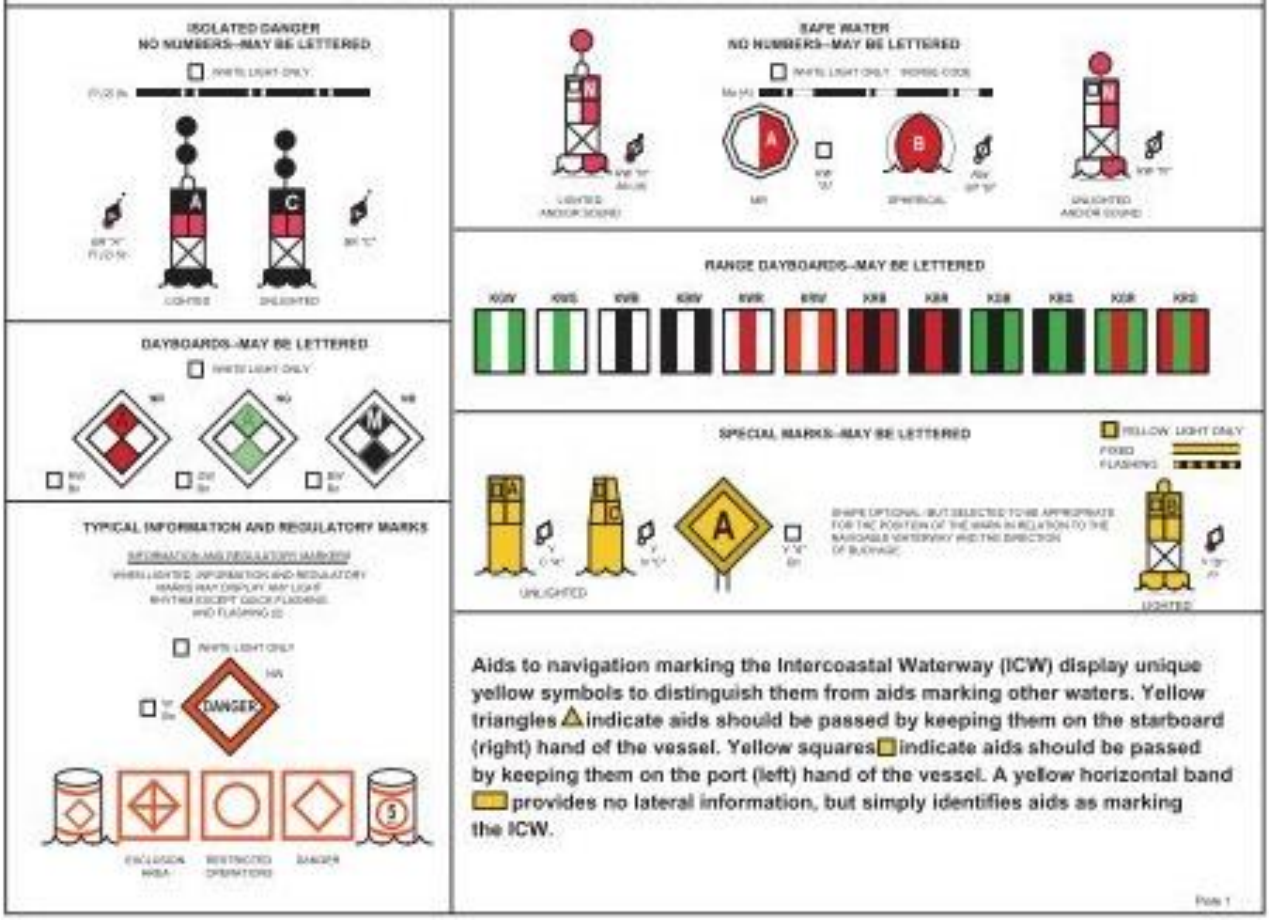
U.S. AIDS TO NAVIGATION SYSTEM

on navigable waters except Western Rivers

LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD



AIDS TO NAVIGATION HAVING NO LATERAL SIsignificance



Aids to navigation marking the Intercoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles △ indicate aids should be passed by keeping them on the starboard (right) hand of the vessel. Yellow squares □ indicate aids should be passed by keeping them on the port (left) hand of the vessel. A yellow horizontal band ▭ provides no lateral information, but simply identifies aids as marking the ICW.

Calculating Speed
Distance, Speed and/or Time

Distance is measured in **Nautical Miles**
Speed is measured in **Knots** *(Nautical Miles per Hour)*
Time is in **Hours and Minutes**

Method #1
Using Minutes

$$\frac{60 \times D}{S \times T}$$

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

If you travel at 3 knots for 1½ hours you will travel a distance of 4.5 nautical miles

$D = \frac{3 \times 90}{60}$ (1.5 hours = 90 minutes)

D = 4.5 nautical miles

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

If you travel 4.5 nautical miles in 90 minutes your speed is 3 Knots

$S = \frac{60 \times 4.5}{90}$

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

If you cover 4.5 nautical miles at 3 knots and it will take you **90 Minutes**

$T = \frac{60 \times 4.5}{3}$

T = 90 minutes

Method #2
Using Hours

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

Distance = Speed x Time

If you travel at 3 knots for 1½ hours you will travel a distance of 4.5 nautical miles

D=3x1.5

D=4.5

Speed = Distance / Time

If you travel 4.5 nautical miles in 1.5 Hours your speed is 3 Knots

S=4.5/1.5

S=3

Time = Distance / Speed

If you cover 4.5 nautical miles at 3 knots and it will take you 1.5 hours

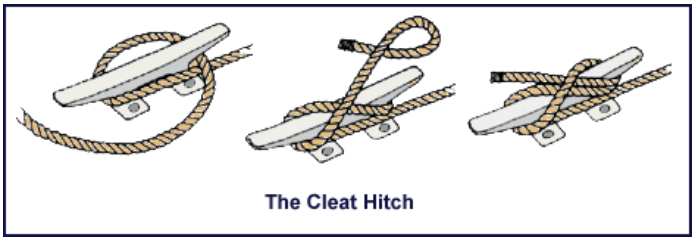
T=4.5/3

T=1.5

If you need time in minutes multiply time by 60 . . . 1.5x60=90 minutes

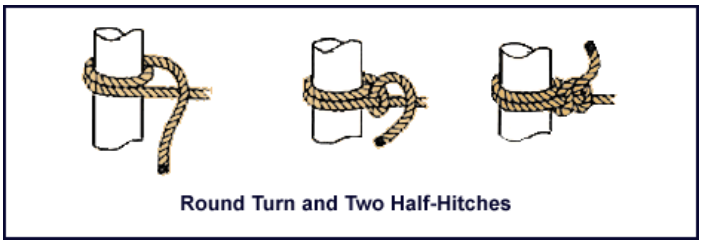
Boat knots

Cleat Hitch:

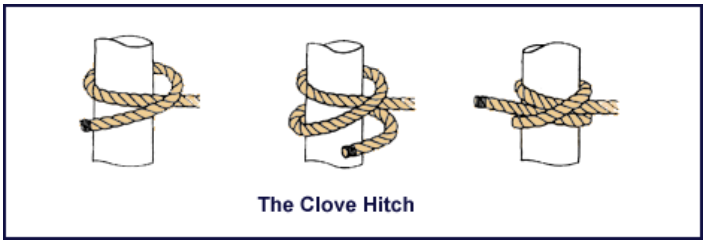


Bowline:

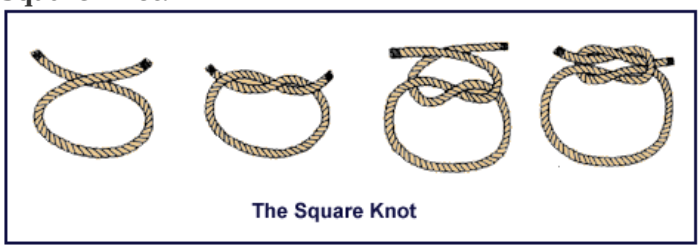
Round Turn & 2 Half Hitches:



Clove Hitch:



Square Knot:



Close Quarters Powerboat Handling

This powerboat handling certification course that is designed to provide the skills necessary to maneuver a powerboat confidently, competently and safely in tight spaces. Successful completion of the program indicates the student has demonstrated competence in handling either a twin or single inboard in close quarters in light wind and or currents. Core program elements include basic and advanced docking and undocking maneuvers, situational assessment and planning, crew communication and passenger safety.

Prerequisite: None.

Certification Requirements:

- Successfully pass one of the following Recreational Power Boat Association courses: 1101 - Single Inboard or 1102 - Twin Inboard
- Demonstrate competence in the items listed below:

Ashore/Anchored Knowledge

- Power Vessel Theory
- Pre-departure planning and passenger safety briefing
- Pre-departure and post-cruise vessel check
- Crew communication and safety
- Correct use of a VHF Radio, including checking current weather
- Launch and use the dinghy
- Show understanding of onboard resource materials (Waggoner, tide tables, etc.)

Maneuvering Skills

- Develop and execute a vessel departure plan with due consideration for wind, current, traffic and any special circumstances
- Crew communication/briefing and assignment of duties including proper sequence for casting off dock lines and fender placement/usage
- Demonstrate two methods for centering helm/wheel
- Pivot/turn vessel 360 degrees in tight quarters
- If available, use of thruster(s)
- Back down a narrow channel in a straight line
- Dock bow and stern first in a protected slip (touch and no touch)
- Dock bow and stern first at a facing pier (fuel dock) both port and starboard to
- Dock Stern first at a facing pier using a stern line
- Depart a facing pier using a spring line
- Develop a docking plan including crew assignments and duties, desired dock line sequence, and due consideration for elements
- Secure vessel in a slip properly (make fast) including correct placement of fenders and use of spring lines and bow & stern lines
- Perform "Post Cruise" check to secure vessel and equipment properly including flemishing dock lines

Underway Skills

- Demonstrate an ability to read charts and safely navigate tidal waters
- Choose an anchorage and successfully anchor
- Demonstrate use of a stern-tie line
- Demonstrate procedure to moor to a buoy
- Demonstrate a working knowledge of the Navigation Rules
- Demonstrate proper line handling skills and tie demonstrate usage of the common nautical knots
- Demonstrate a high level of situational awareness
- Create a route taking into account tides and currents
- Competently monitor and communicate using the VHF radio