

# Trawler Fest<sup>®</sup>

BOAT SHOW – EDUCATIONAL EXPERIENCE – RENDEZVOUS

PassageMaker Magazine 2024  
Modern Navigation Electronics Overview  
**Anacortes, WA – Tuesday May 14th**  
Presented by Jeff Merrill, CPYB

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# A question?

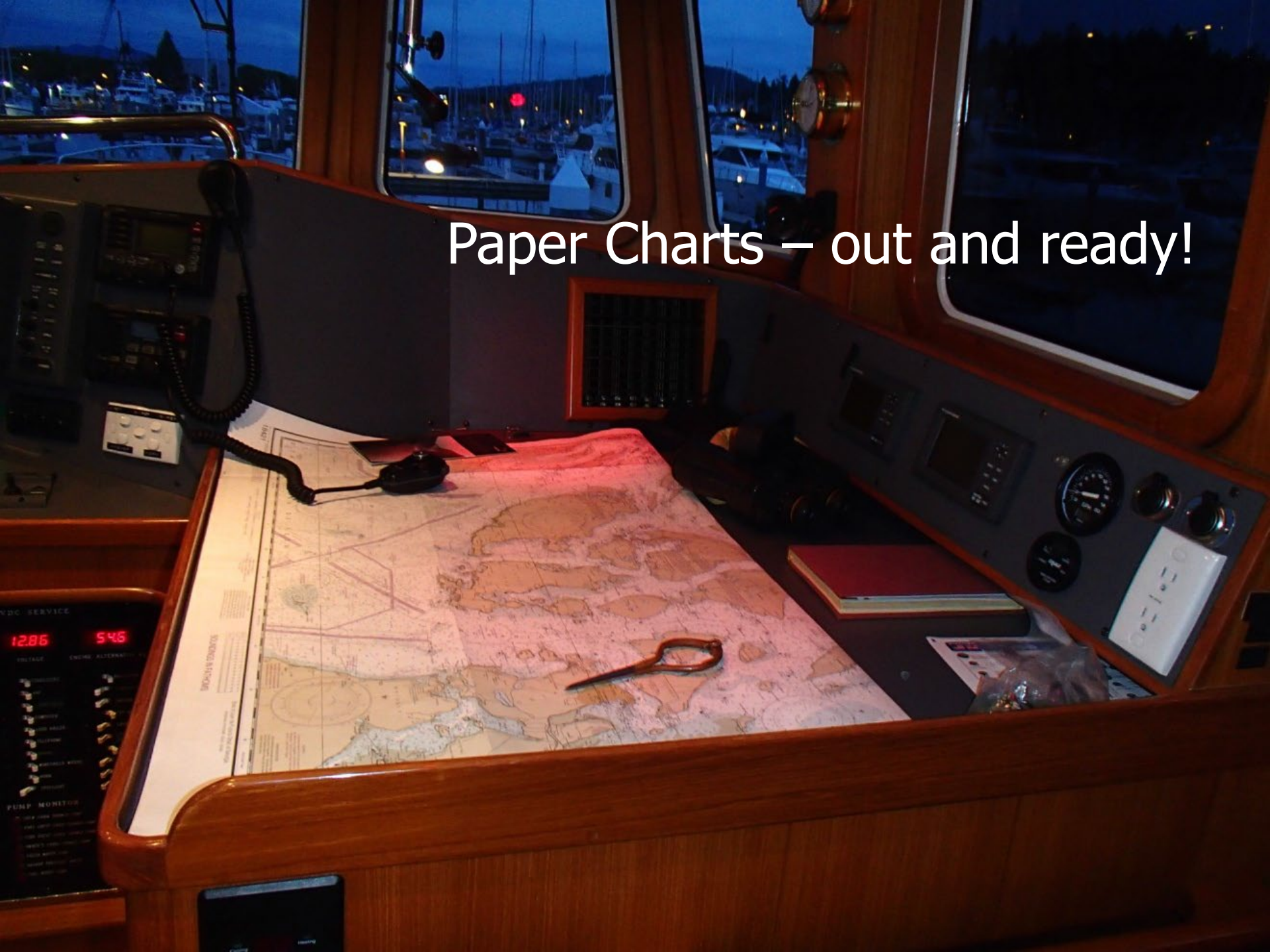
- Anyone have experience with modern navigation electronics?
- Jeff Merrill and Eric Bescoby from JMYS standing in for Bob Sweet



# Basic Navigation – Paper Charts

- Know how to read a paper chart
- Continually cross reference with electronic charts
- Tools – Dividers and Parallels
- Depth – safe waters, shoals, etc.
- Shipping Lanes
- Obstructions, wrecks
- Buoys and aids to navigation
- Organize charts in the order you will use them

Paper Charts – out and ready!





# Pilothouse Tools

- Binoculars “long eyes”
- Night vision (FLIR), hand held monocular
- Barometer
- Clock – local and GMT
- Calculator

# Pilothouse Tools

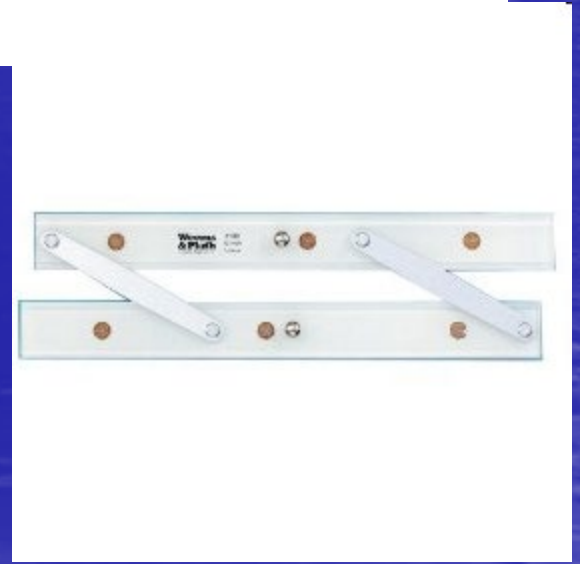
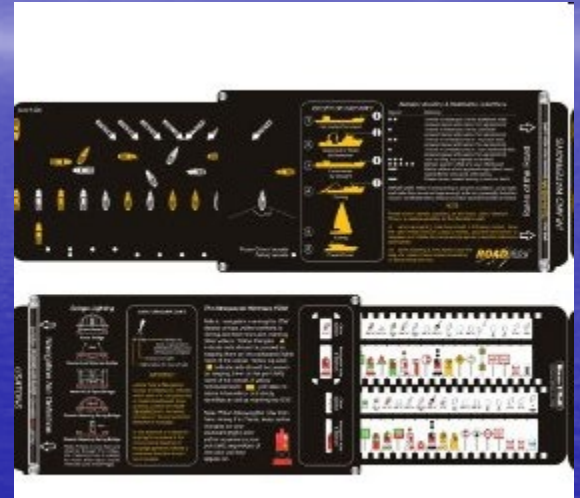
- Closed Circuit TV
- Spot light – built in, hand held
- Chart Guide
- Hand held compass



# Pilothouse Tools

- Binoculars “long eyes”
- Night vision (FLIR), hand held monocular
- Closed Circuit TV
- Spot light – built in, hand held
- Flash light, red lens
- Good pencil & sharpener
- Barometer
- Clock – local and GMT
- Calculator
- Chart Guide
- Hand held compass
- Back up navigation on laptop
- Nav lights “slide rule”

# Navigation Tools





# Ships Log (Where are you?)

- Record your position, departure and arrival plus machinery hours of operation
- Hourly - on the hour - recordings
- Typical details – Lat/Lon, speed, RPM, heading, miles offshore, distance to waypoint, wind and sea conditions

# Navigation Electronics Instruments to know

- Depth Sounder



# Navigation Electronics Instruments to know

VHF – 16,

How to talk and switch  
channels

# Navigation Electronics Instruments to know

## Digital Compass

Autopilot rate gain

Satellite



# Navigation Electronics Instruments to know

## Radar

- Targets
- Rings
- Distance
- CPA

# Navigation Electronics Instruments to know

**GPS**

Latitude and Longitude



# Navigation Electronics Instruments to know

## Chart Plotter

Waypoints

Routes

Chart and Radar overlay

# Navigation Electronics Instruments to know

- Autopilot modes:
- Auto
- Standby
- Nav



# Navigation Electronics Instruments to know

- AIS – ship tracking

# Navigation Electronics Instruments to know

- **Autopilot** modes: Auto, Standby and Nav
- **Radar** – Targets, Rings, Distance, CPA
- **VHF** – 16, how to talk and switch channels
- **Chart Plotter** – Waypoints, Routes
- **GPS** – Latitude/Longitude
- **Depth** Sounder
- **AIS** – ship tracking
- **Features:**
- **Chart and Radar overlay**
- **How to Dim**
- **How to Mute (Alarms)**
- **Waypoints / Route**



# VHF (Very High Frequency)

Primary source for ship to ship communications.



# VHF Communications

- VHF radio – Ship to Ship (line of sight)
- Hi vs. Lo settings (close range or far away)
- Weather channel on VHF (Channel 3 or 4)
- Radio check (Channel 27)
- Channel 22A “Twenty Two Alpha” – USCG communications to a boat
- Working channels –switch to 68, 69, 71, 72, 78
- MOB – Latitude/Longitude distress signal
- Fog horn, Hailer



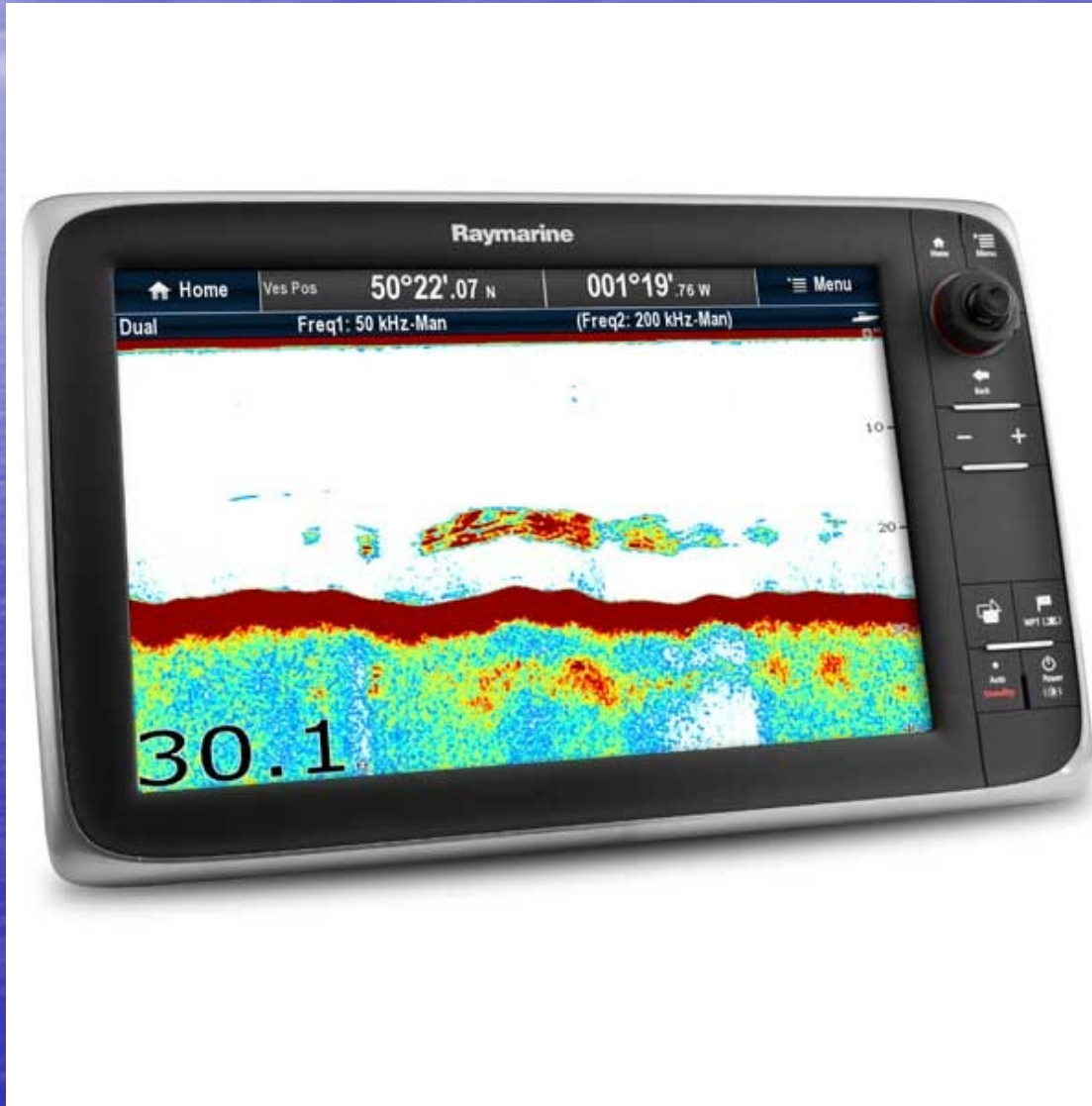
# VHF – calling for Help

- This is like 9-1-1. Captain should make the call
- **“Mayday Mayday Mayday”** (Broadcast if you are in imminent danger and need immediate assistance)
- The USCG will ask... **“Your coordinates?”**  
**“How many souls are aboard?”**  
**“Describe your boat colors”**
- All crew will be asked to put on life jackets



# Depth Sounder

Fish Finder shows bottom contours



# Depth

- If you don't have water under the keel...
- What does your boat draw?
- Set transducer to measure from keel
- Someday you will run aground (Tow Boat US/ Vessel Assist). Back off, wait for tides

# GPS – Global Positioning System

Knowing your **Latitude and Longitude** is a key navigational development, surely much easier and more accurate than a sextant – **revolutionary development** – has allowed cruising to become more mainstream





# AIS (Automatic Identification System)

- Integrates a VHF transceiver with GPS coordinates and navigation sensors to “exchange” information between ships
- Details like ships name, length, speed, heading, destination – and **time to closest possible approach**
- Very helpful, **don't forget Radar blips** that are also targets without AIS





48° 16'  
123° 15'  
Hdg 2

AIS target (Variable range, 6 - 12 miles average.)



# AIS details





# RADAR



- "Charts are legend, GPS is theory, Radar is TRUTH!" Author unknown
- Radar rings help with distance (Zoom in and Zoom out frequently)
- Targets – **ARPA** – Auto Radar Plotting Aids

# Distance Rings – calculate distances





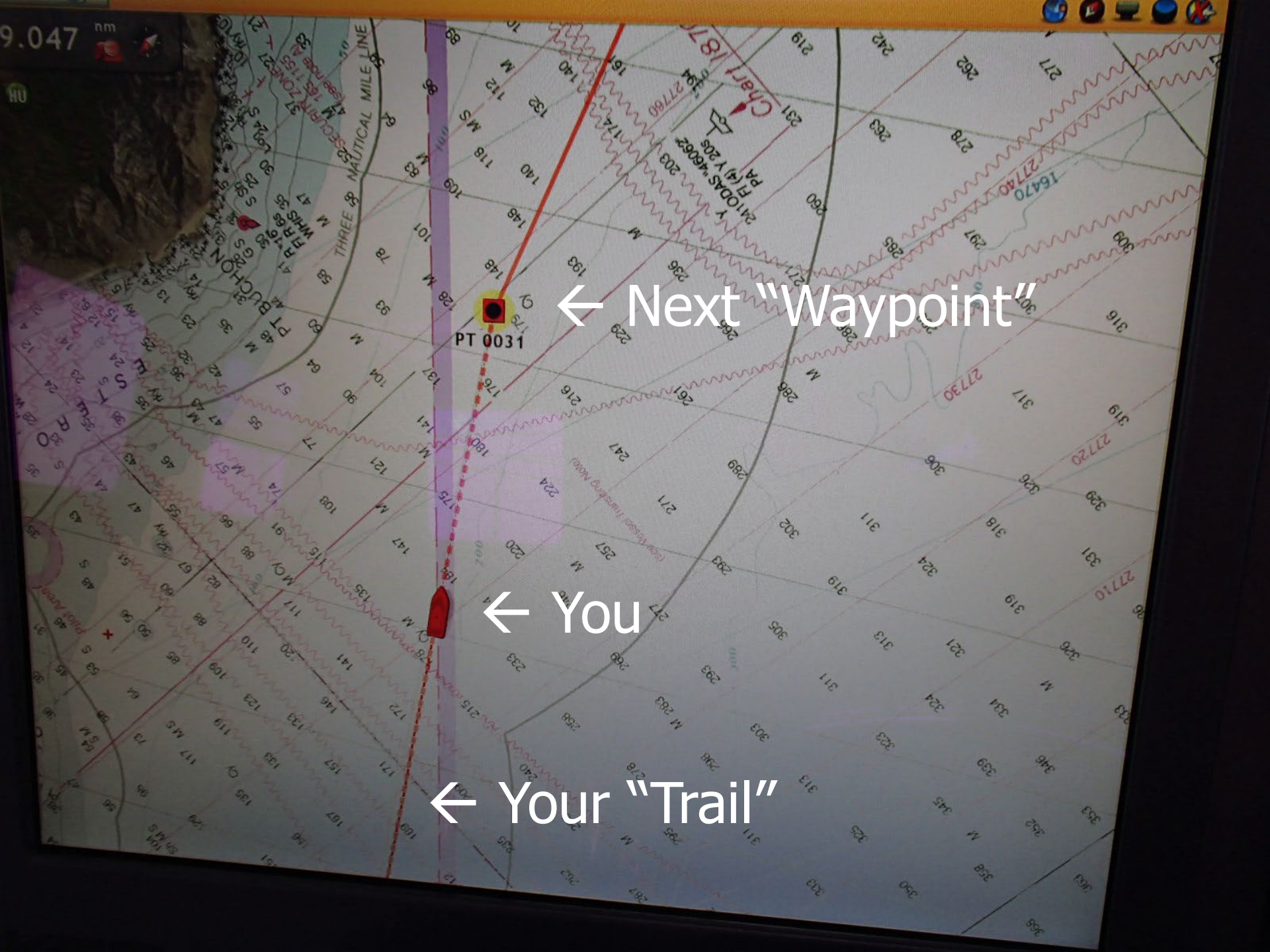
# **Plotting:** (Paper and Electronic Charts)

- Hourly pencil Lat/Lon on Paper Chart
- Paper Charts are a reliable back up if you lose electronic navigation plotting
- **Electronic charts are not fool proof...**



# Chart Plotting – Electronic Chart features

- Set up **Waypoints** (GPS coordinates)
- Create a **Route** (connect Waypoints)
- Can save **Routes**, also pre-program trips
- Move Cursor and “Go-to” it on Chart
- Connect **Autopilot to Navigate the Route**
- Leave a “bread crumb” trail
- Can overlay Chart and Radar
- Center Boat on Screen



← Next "Waypoint"

← You

← Your "Trail"



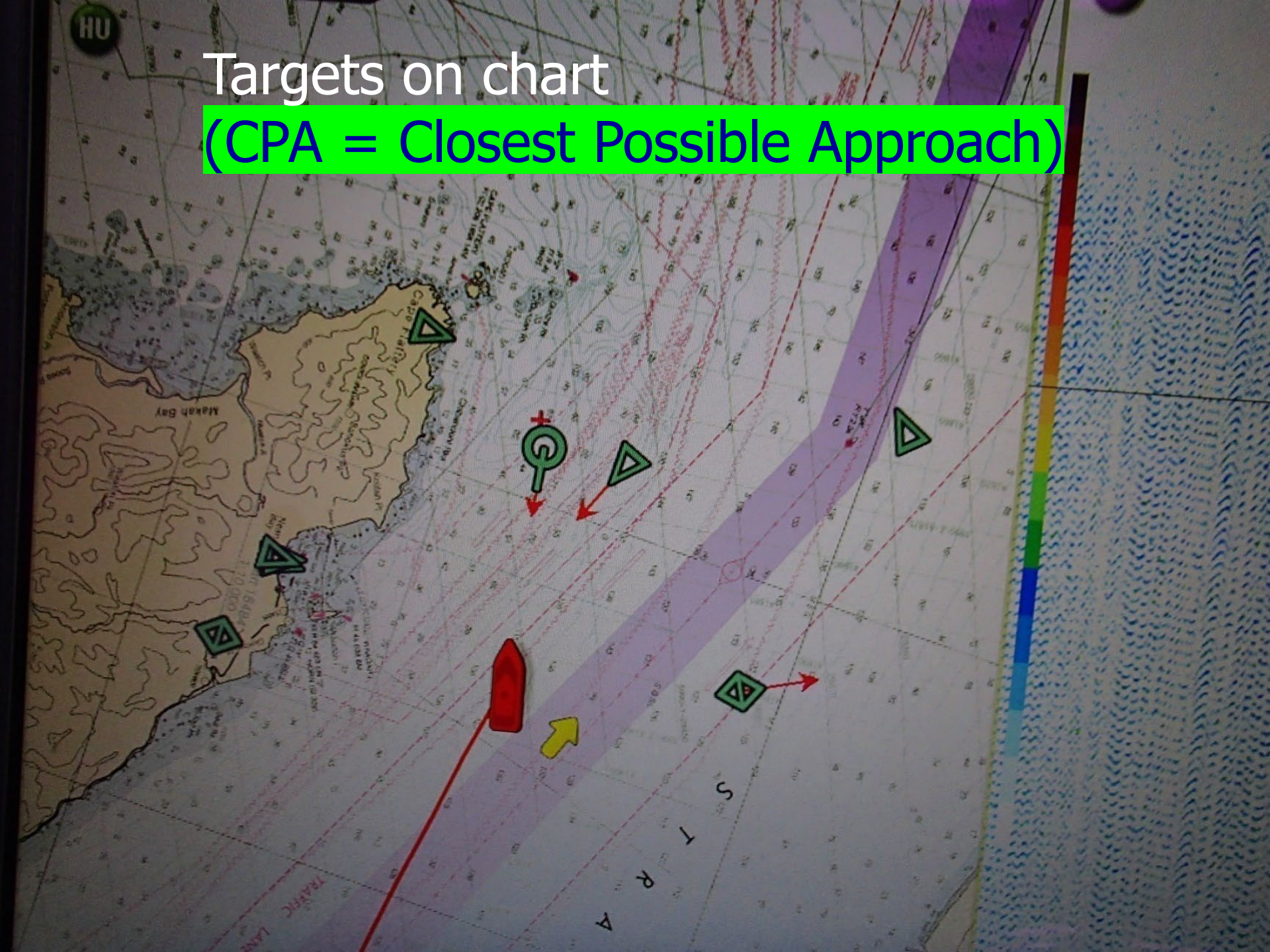
# “Bread Crumb Trail”

- This is a very useful feature
- Shows where you have been – good if you need to retreat
- Keep tides/depths in mind when using same trail
- Helps orientation, especially at night
- Also works with anchoring alerts



Targets on chart

(CPA = Closest Possible Approach)





# Autopilot



# Autopilot settings

- “Hands Free” much easier than steering
- “A” Autopilot – Digital compass course
- “N” Navigate – Route to next Waypoint
- “S” Standby – Hand steer



# What's Up? Electronic Navigation

- Radar and Chart can be **Course Up**, **Heading Up** or **North Up**
- If your boat is heading North, it's easy
- When heading South, it's confusing
- Know how to change the screen orientation so that it is logical to you



# Plotter and Radar – Heading Up

NAVnet control panel with various buttons and a joystick. The panel includes buttons for "SCROLLING", "OUT RANGE", "IN", "MENU", "DISP", "CANCEL", "CTRL", "DATA VOL", "CURSOR", "POWER STEER", "PILOT", "NAV", "STANDBY", "PILOT OFF", "PILOT ON", "ADJUST", "ALARM", "1001 AUTOPILOT".

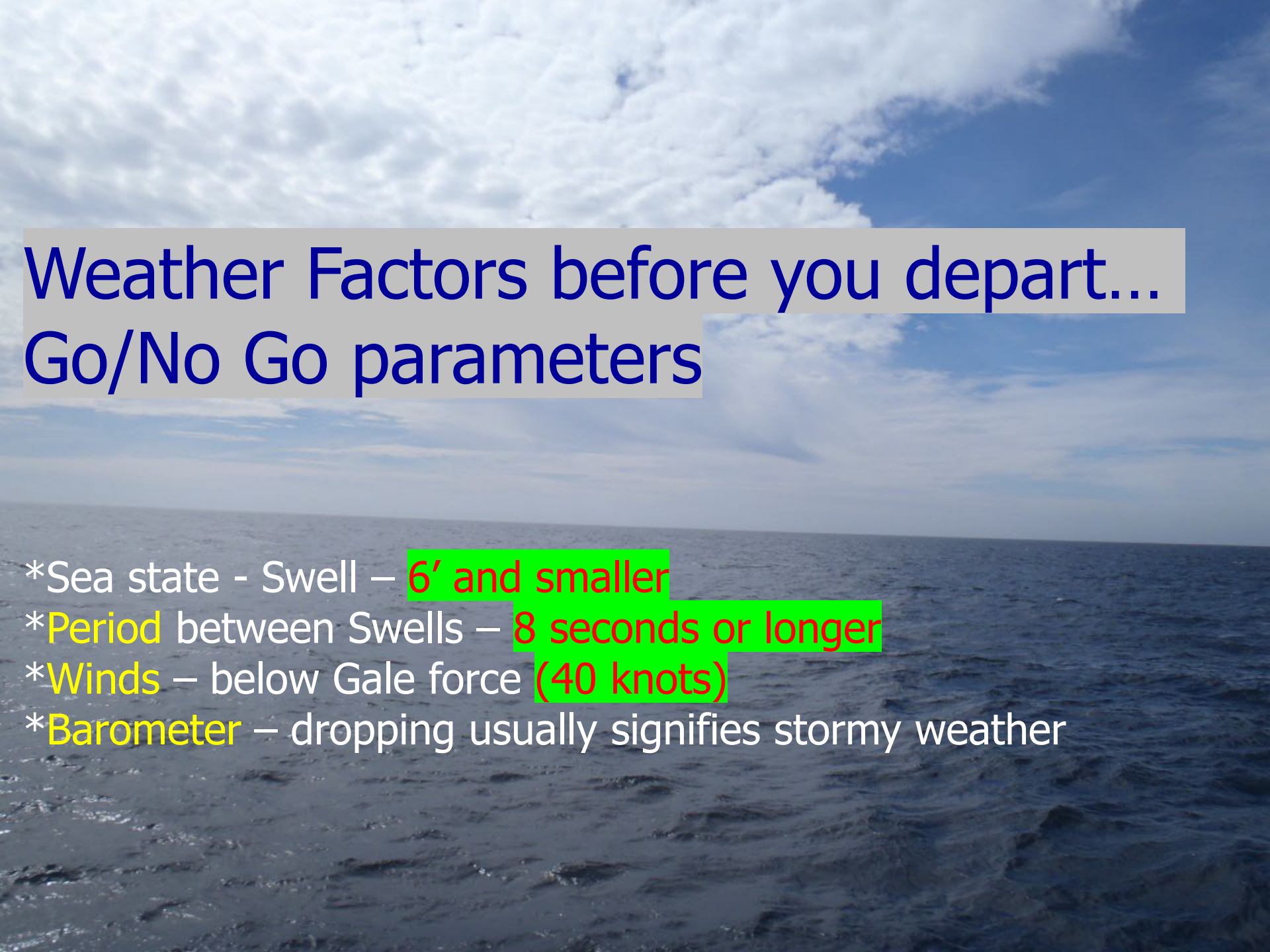
ComNav MARINE control panel with a digital display and various buttons. The panel includes buttons for "REVERSE", "MASTER", "1001 AUTOPILOT", "START", "STOP", "Station Enabled", "Check System".

Thrustmaster control panel with two joysticks. The panel includes buttons for "START", "STOP", "Station Enabled", "Check System".



# Weather or not...

- Nav/Comm equipment is a luxury for operations
- The weather is the controlling factor for all cruisers
- Chris Parker seminar



# Weather Factors before you depart... Go/No Go parameters

- \*Sea state - Swell – 6' and smaller
- \*Period between Swells – 8 seconds or longer
- \*Winds – below Gale force (40 knots)
- \*Barometer – dropping usually signifies stormy weather



# Weather Websites

[www.noaa.gov](http://www.noaa.gov) – National Weather service

[www.buoyweather.com](http://www.buoyweather.com) – Sea State

[www.sailflow.com](http://www.sailflow.com) – Wind speed and direction

[www.darksky.com](http://www.darksky.com) – Local weather

[www.intellicast.com](http://www.intellicast.com) – Weather

[www.stormsurf.com](http://www.stormsurf.com) – Weather

# Weather Forecasts Underway:

- \*IridiumGo (with Predict Wind offshore app)
- \*Satellite Radio – XM/Sirius forecast service
- \*VHF – channel 3 and 4
- \*Professional Weather Routers – **Chris Parker**
- \*Internet, if you have it aboard



# Rough Weather Suggestions

- Anticipate and prepare, sometimes you have to go through it...it won't last forever
- **Change course and/or reduce speed** to make it a more comfortable ride
- **Head back the way you came?**

# Garmin inReach

- \*Two Way Texting
- \*Subscription you can turn on/off.





# Iridium Go

Text, talk, email and download weather  
max plan \$140/Mo.

Antenna box – connects to satellite –  
Wi-Fi signal to apps on phone.

Cell phone boosters

Mobile hot spots

The internet aboard?



The image features a dark blue background with a view of Earth from space. A complex network of white lines and glowing nodes is overlaid on the planet, representing a satellite constellation. A large, stylized white 'X' logo is positioned in the upper center. The word 'STARLINK' is written in white, uppercase letters across the middle of the network visualization.

STARLINK

# Safety electronics

Man-overboard

Distress calling

What else?



# Personal Locator Beacons



Float Sleeves

Neck Lanyard

Wrist Lanyard

Questions?

Thank you!

