



---

# *Navigation 3*

Skipper/XO Training

2006



# Course Overview...



- ✓ The Chart
  - Primary emphasis on chart preparation

- ✓ The Fix
  - Visual & Electronic
  - Accuracy and errors

- ✓ The DR
  - The most important thing on the chart

- Making landfall
  - The Navigation Brief
- Navigation Party
  - Organization, procedures & philosophy
- Navigation Practical



# The Fix...



---

– What interval is required?

- Hourly?
- Half hourly?
- Fifteen minutes?
- Ten Minutes?
- Five Minutes?

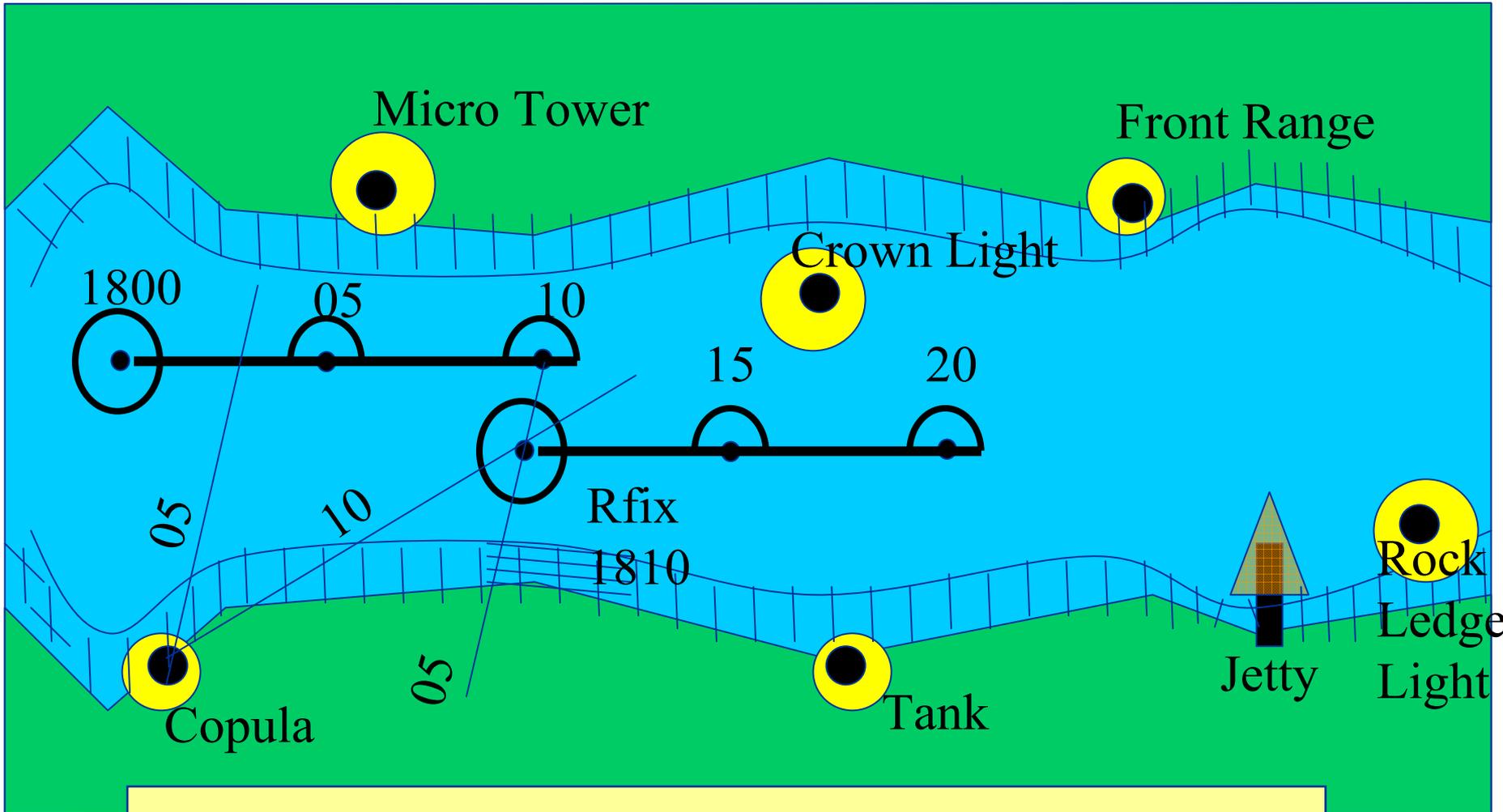
– It depends

- However, it should be obvious when looking at the chart when it changes – and why

– The Skipper determines Fix Interval!



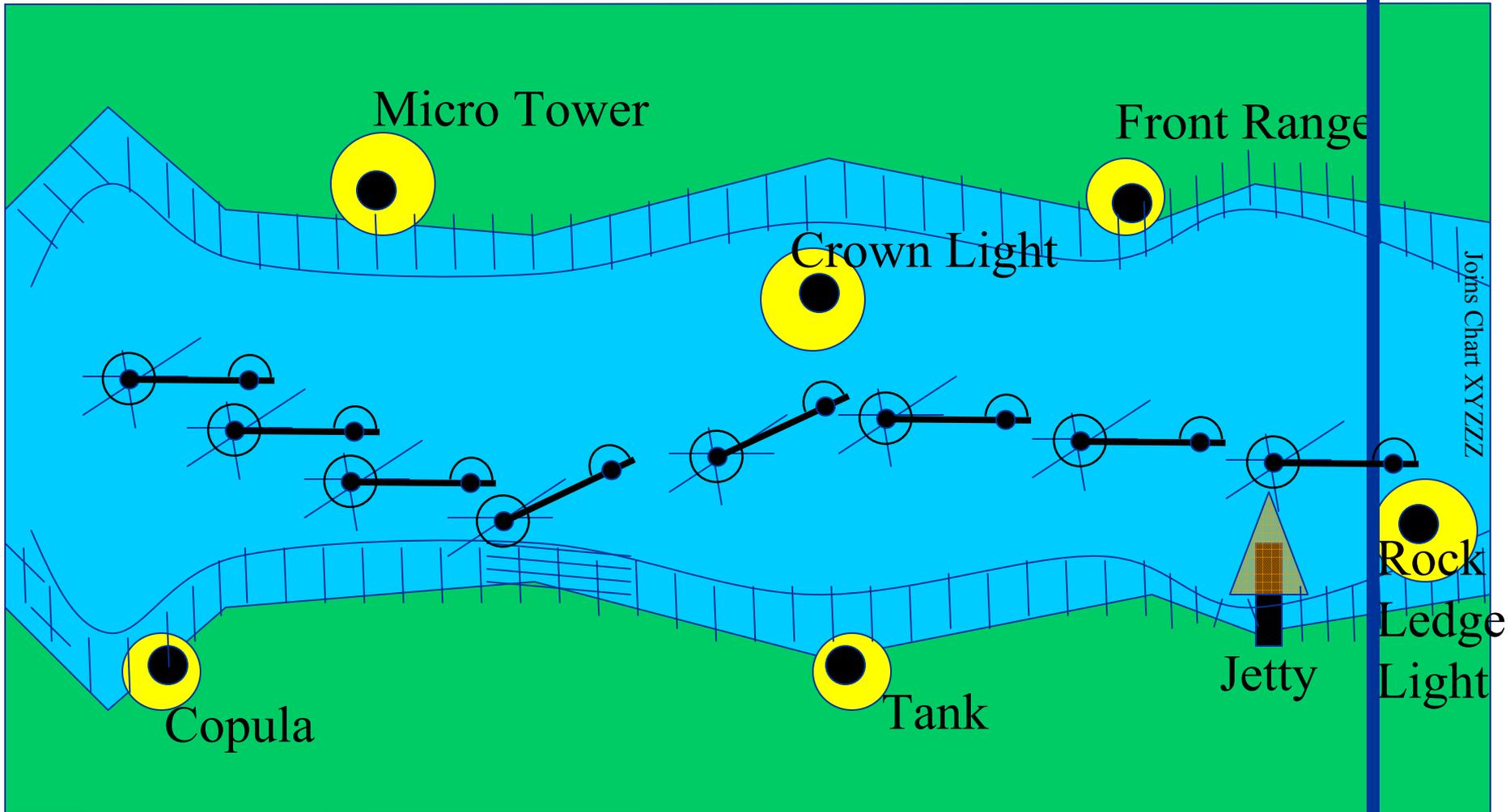
# Running Fixes



**Sounding – Checks With Chart**



# The Chart Shift





# Making Landfall...

---



## The Chart Shift

- Many navigation mistakes occur at the chart shift point
- Skipper should approve Chart Shift – as follows:

“Officer in Charge, my DR holds us leaving this chart in 30 minutes. Recommend shifting to chart 12224”

“Very well. Shift to Chart 12224.”

“Shift to Chart 12224, Aye.”



# How Do You Do The Shift???

---

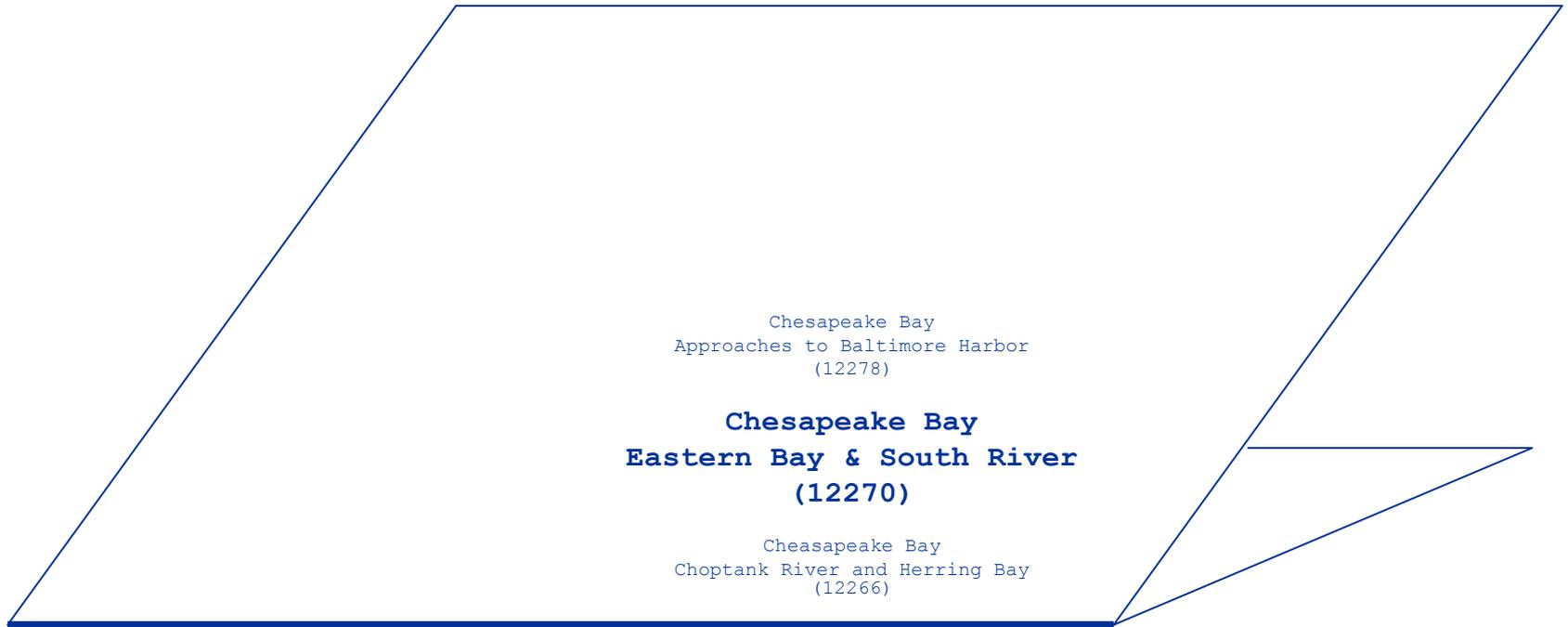


What should you look for personally to make sure this is done correctly?

- The **back** of the current chart – Make sure the number matches what you calculated when warm, dry and rested!!!
- The chart is **ready** for use
  - The Chart Prep Checklist
- Remember this???



# How Do You Fold A Chart?





# How's It Labeled?



Chesapeake Bay  
Approaches To Baltimore Harbor  
(12278)

**Chesapeake Bay**  
**Eastern Bay & South River**  
**(12270)**

Chesapeake Bay  
Choptank River & Herring Bay  
(12266)



# How Do You Do The Shift???

---

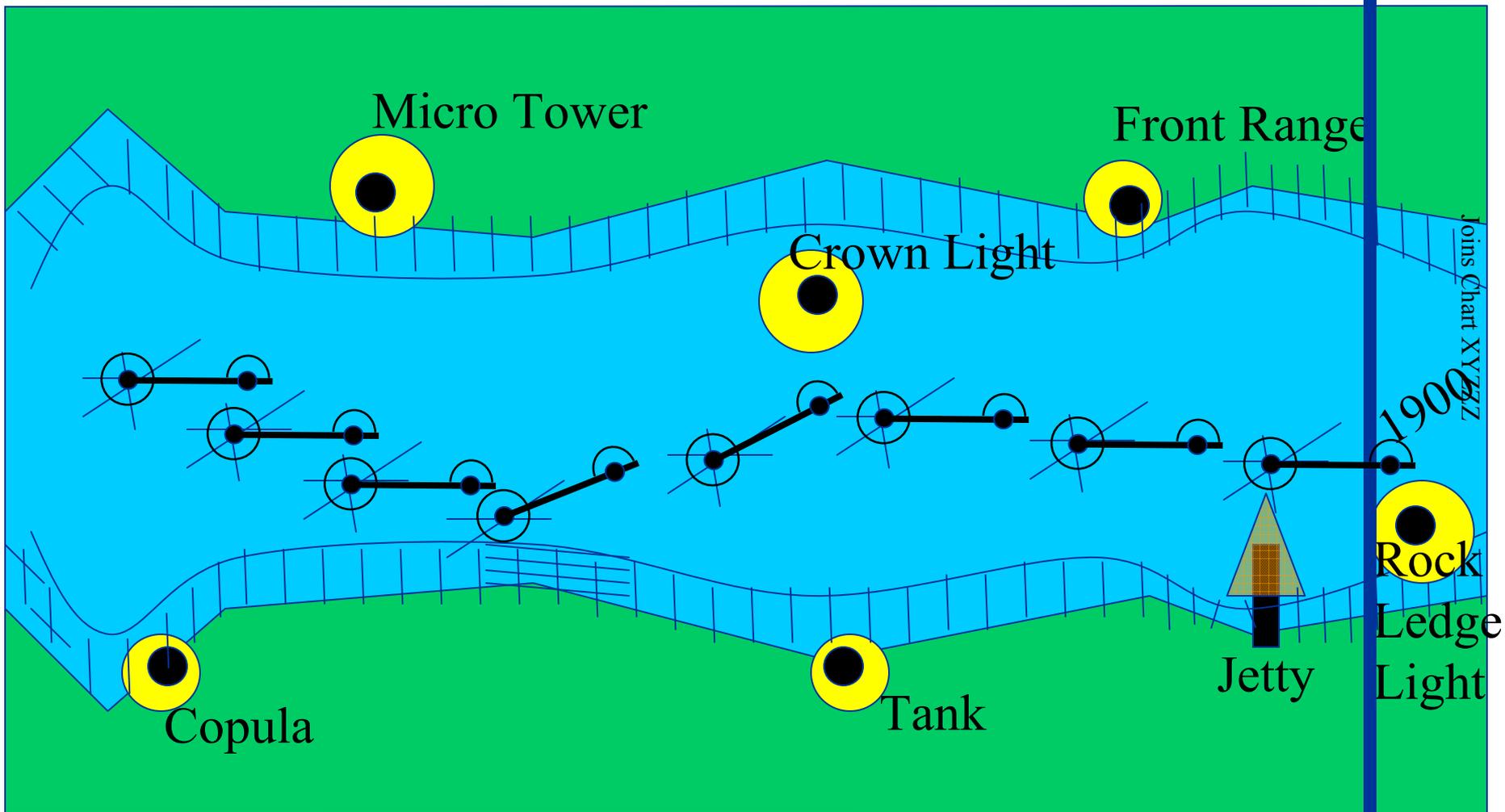


What should the plotter do?

- Determine the Latitude and Longitude of the **DR** that will be advanced onto the new chart
- Write it in the log
- “Shifted to chart 12224. Advanced DR position  $34^{\circ}17.8'N$   $074^{\circ}16.4'W$ ”
- Check you didn't make a transcription error
- Plot this DR position on the new chart
- See the homework problem



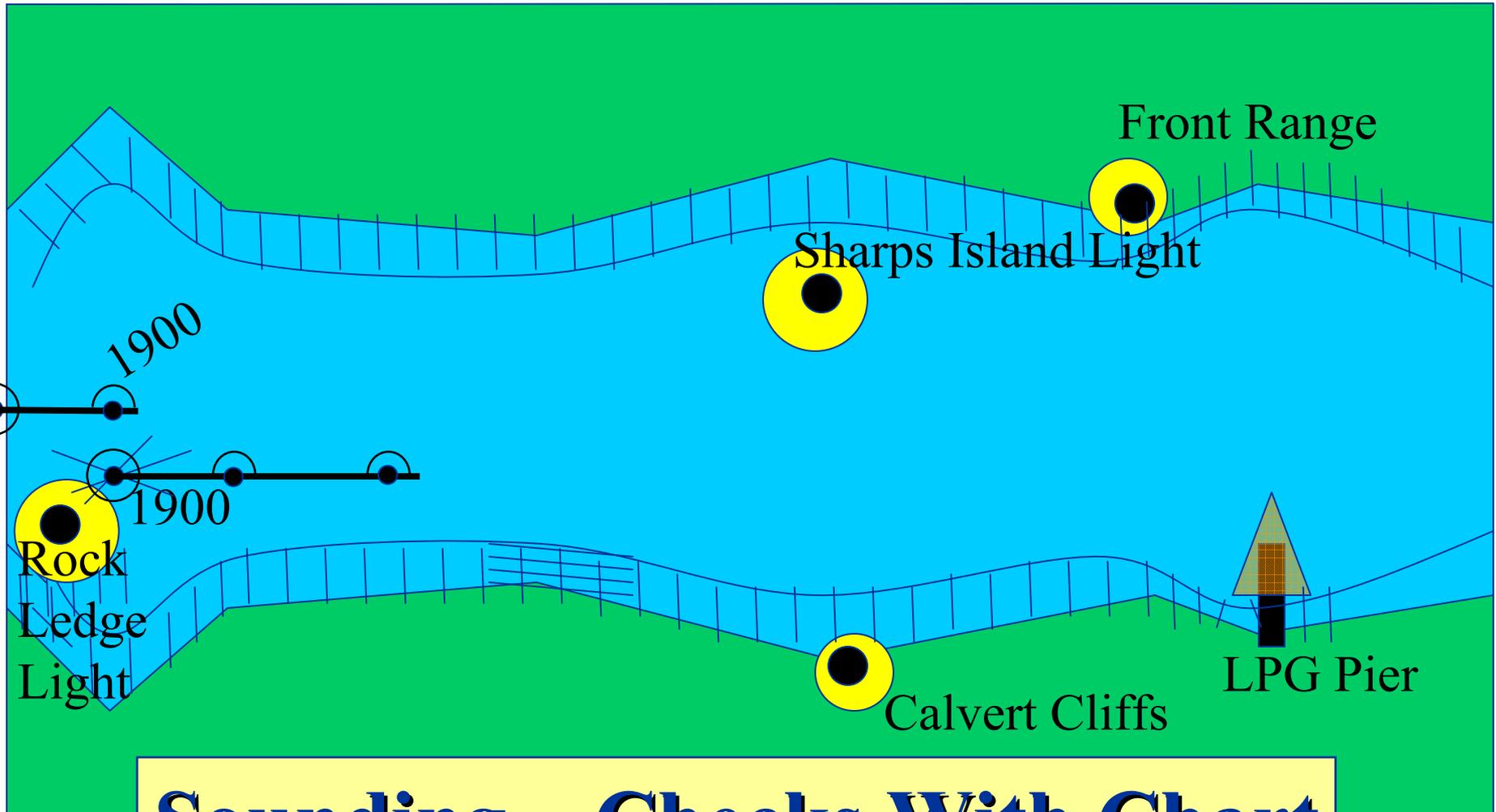
# The Chart Shift







# The Chart Shift



**Sounding – Checks With Chart**



# How Do You Do The Shift???



## What should the plotter do?

- Fix the vessel's position at OR BEFORE the time of the advanced DR
- Compare and contrast those two posits
- Sounding???
- Does this make sense?
- DR
  - Minimum cyclic routine: Plot Label DR
  - Six rules of DR
    - Don't plot a fix on the new chart without something to compare it to



# How Do You Do The Shift???

---



## What should the plotter do?

- Invite Watch Captain and Skipper/XO to check the shift.
- “Officer in charge. Shifted to Chart 12224. Fixed the ship’s position at time 1240 by Loran C, checks with DR. Request you lay below to check the chart.”
- Check it – and not in a perfunctory manner



# How Do You Do The Shift???



Check it – and not in a perfunctory manner

- What do I mean by that?
  - Check the log entry – It's your logbook!!!
  - Compare what's written to the displayed data
  - Break out the dividers and plot it - yourself
  - Or, shoot a round – yourself
  - Then initial the log book





# Caution!!!



When you make the chart shift **UPDATE YOUR INSTRUMENTATION** to match the chart exactly:

- Open Ocean Charts are often in Degrees, Minutes and Tenths
- Piloting Charts are often in Degrees, Minutes and Seconds
- Sounding datum – fathoms, feet or meters???
- Tell everyone the new “No go sounding”
- Make sure they acknowledge



# The Offshore Yacht Log

---



- Record of your CSNTS cruise
- Two parts
  - Position and observation Log
  - Narrative Log
- Duty of the navigation watch officer to maintain





# Offshore Yacht Log: Narrative Log



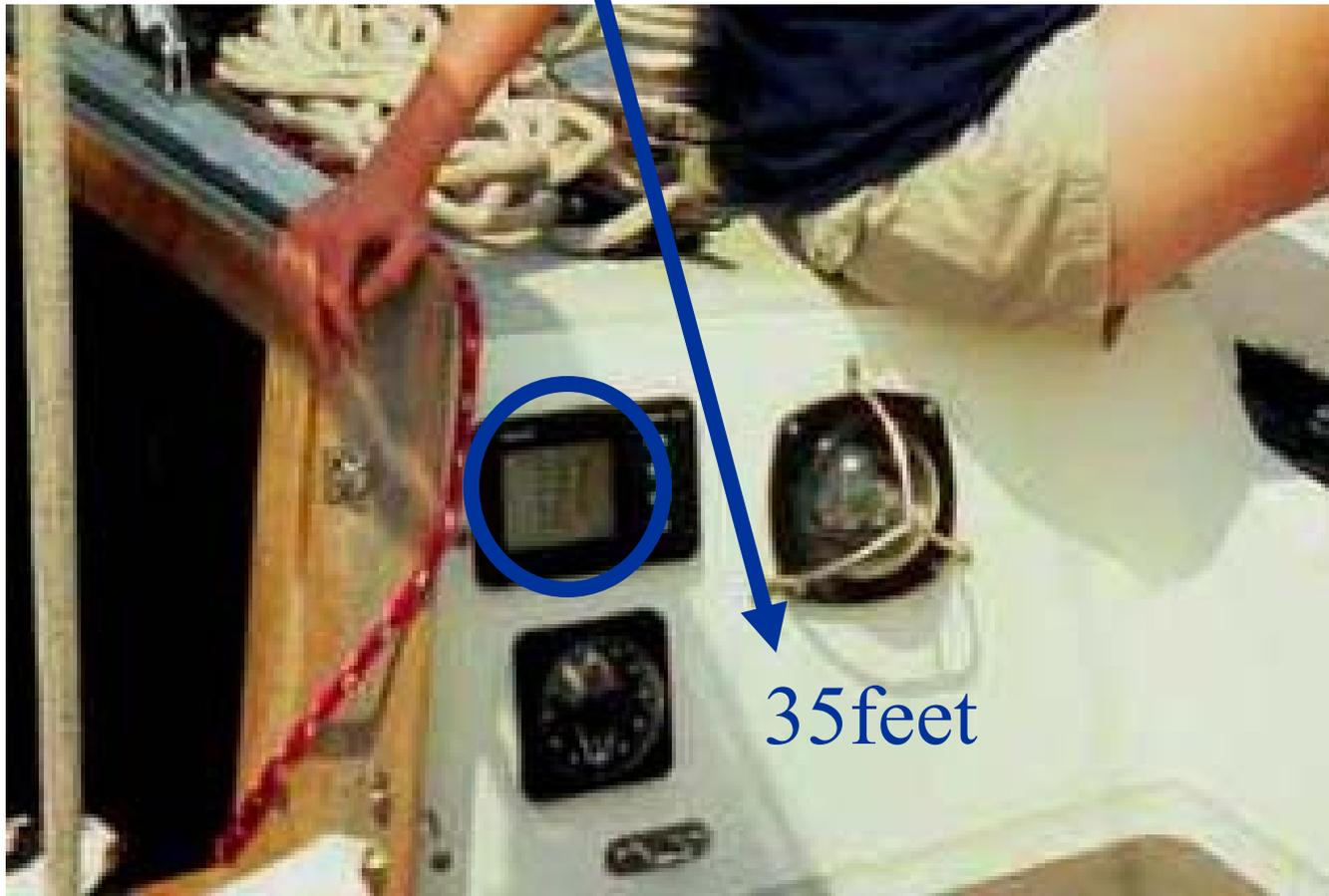
<u>Time</u>	<u>Narrative Comments</u>
0600	Blue Watch team properly relieved by Gold Watch team
0610	Doused #1 Jib, raised #3 Jib
0630	Shifted from chart 12222 to chart 12245
0635	Increased fix intervals to every 5 minutes
0700	Encountered patchy fog, visibility 4 nm



# The Fatho...



Write the NEW “No Go Sounding” In Grease Pencil Here





# The Nav Brief

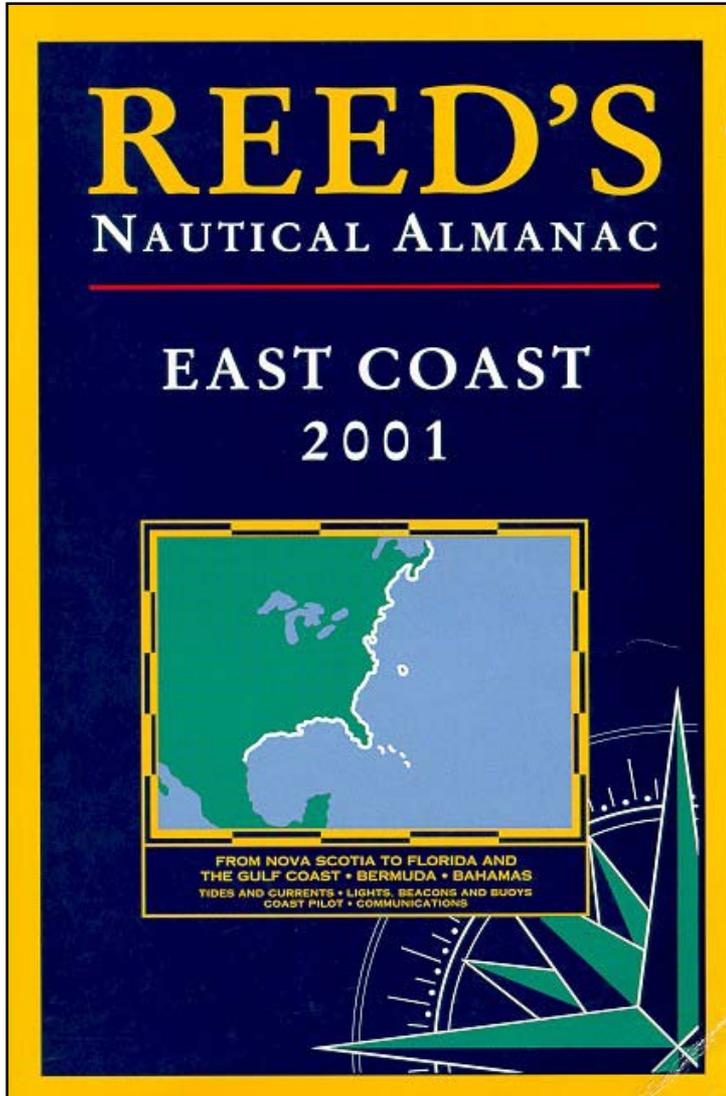


## Break out & use the Navigation Brief Checklist

- This checklist was derived from those used in the fleet, but was modified for use in the Navy Sailing Program
- Who is responsible for the busy work?
- What do you read to make sure you know what you need to know?



# What Pub should you use?

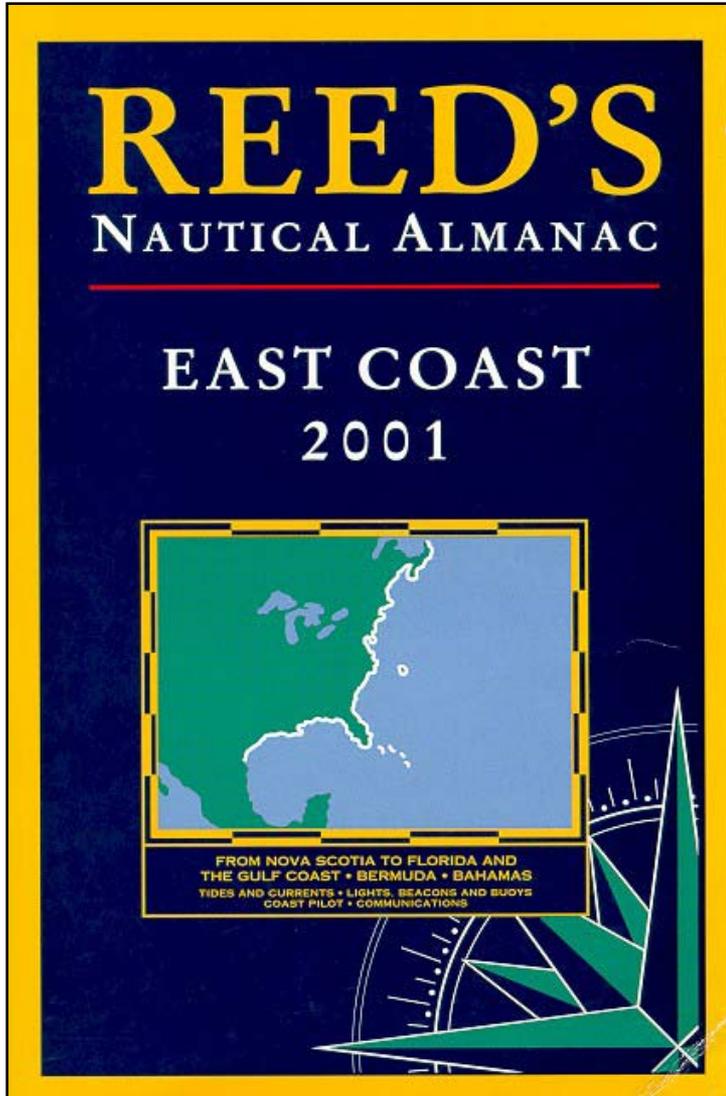


## Truly one stop shopping

- Chapter 1 – The Coast Pilot
- Chapter 2 – Tides
- Chapter 3 – Currents
- Chapter 4 - Resources



# What Pub should you use?

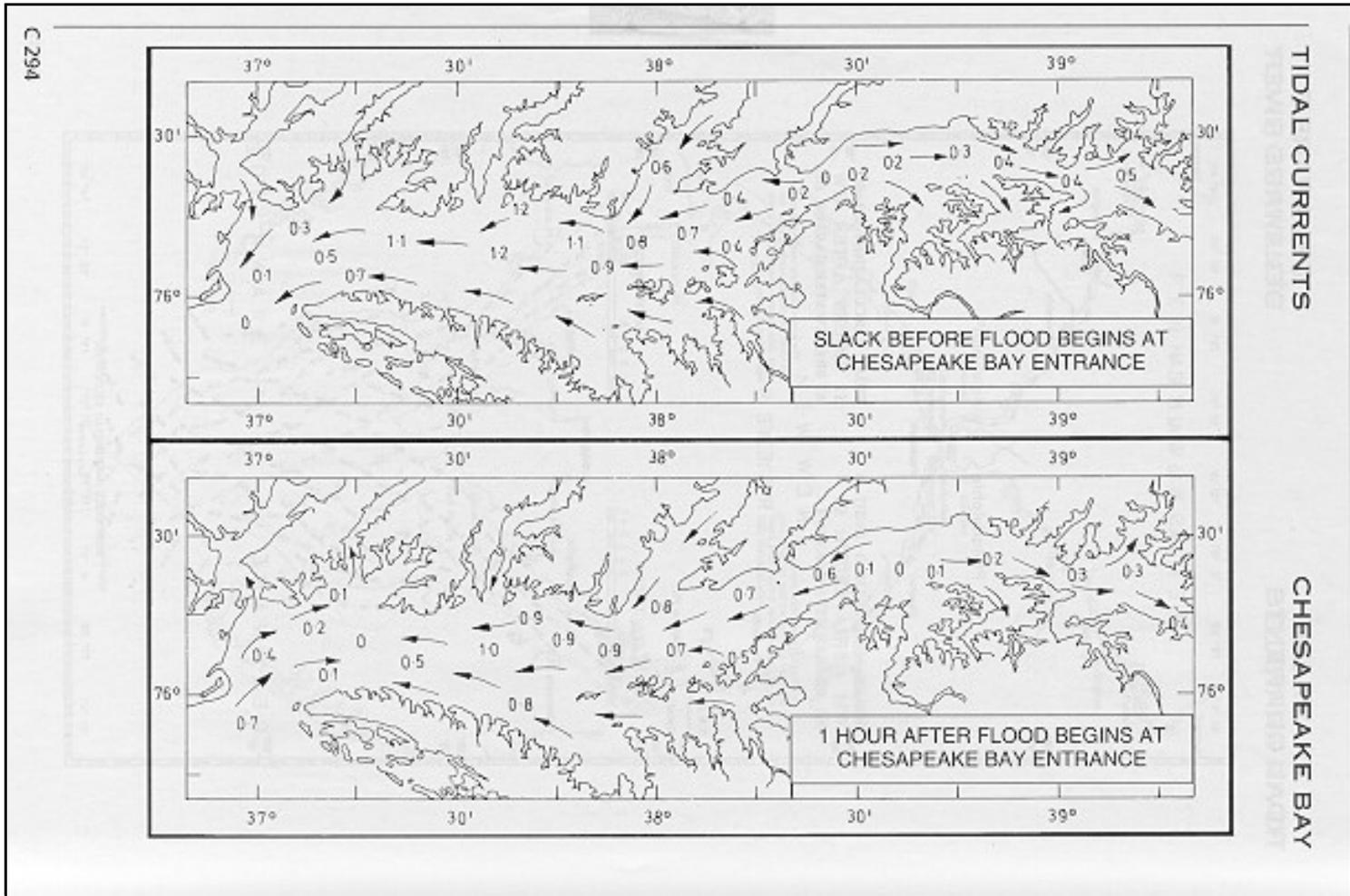


## Tides & Currents

- We haven't talked about it in this course, but Reed's presents the material in an easily understood format



# Reed's Tides & Currents





# What Pub should you use?



## United States Coast Pilot 2

Atlantic Coast:  
Cape Cod to Sandy Hook

30th Edition



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service

It's essentially Reed's  
Chapter 1



# What Pub should you use?



PUB. 940

## FLEET GUIDE



### ATLANTIC

2000



Second Edition

\*\* CD-ROM  
INCLUDED \*\*

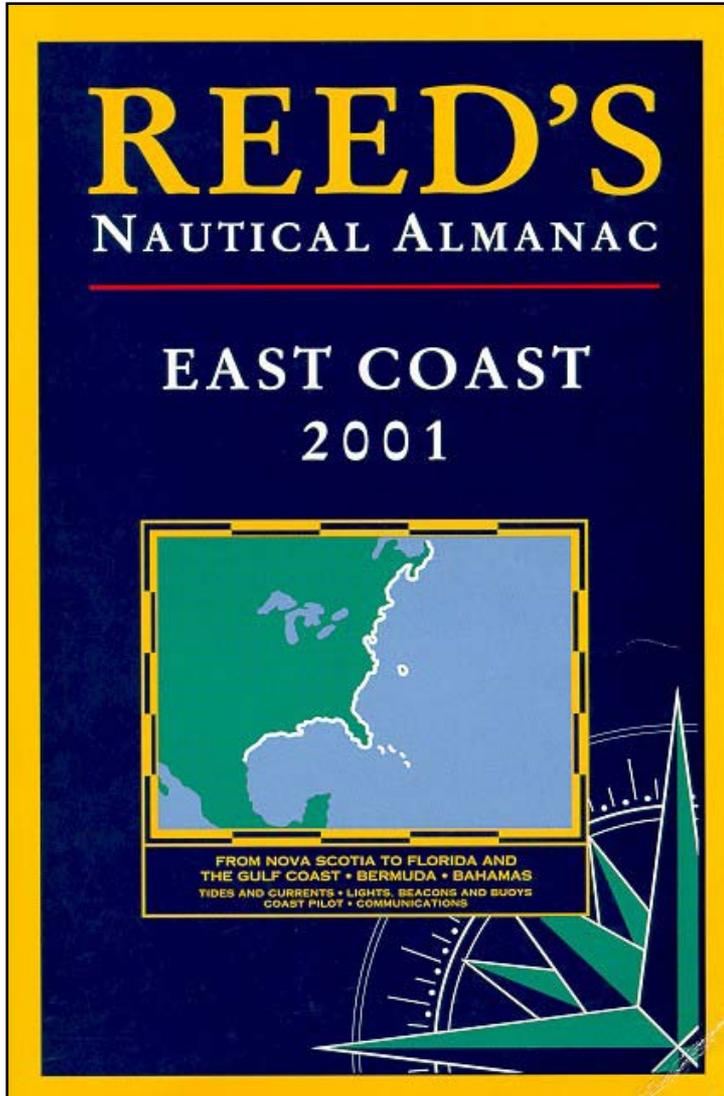
NSN 7642014413588  
NIMA REF. NO. FG PUB940ATL

ED. NO. 002

Read this to ensure you don't do something stupid in a Navy controlled port like:

- Newport
- New London
- Boston

# Again – This one Pub covers every day of the passage



## Truly one stop shopping

- Chapter 1 – The Coast Pilot
- Chapter 2 – Tides
- Chapter 3 – Currents
- Chapter 4 - Resources



# The Nav Brief

## When, Where, Why & How



- When?
  - Early. Typically late afternoon on the day prior to arrival
- Where?
  - In the cockpit
  - Caution: The only time you should allow the chart topside
- Why?
  - There's always one stupid question
- How?



Too Late...



Review The Forecast...



# How???



- 
- Wake everyone up
  - Review the Watch Quarter & Station Bill
    - SOP, Appendix
  - USE THE CHECKLIST



# What Do The Skipper/XO Need To Know?

---



You should be able to sketch the key elements of the chart from memory

- Pay particular attention to expected nav aids, nav hazards and courses to steer (memorize the dots)

If you're mentally challenged, and after several days off shore you may be...

- Make a gouge
  - You can copy (and better laminate) sections of the chart, pages from Reed's and/or the Fleet Guide
- Write notes to yourself on the reverse





# The Navigation Party





# The Crew...

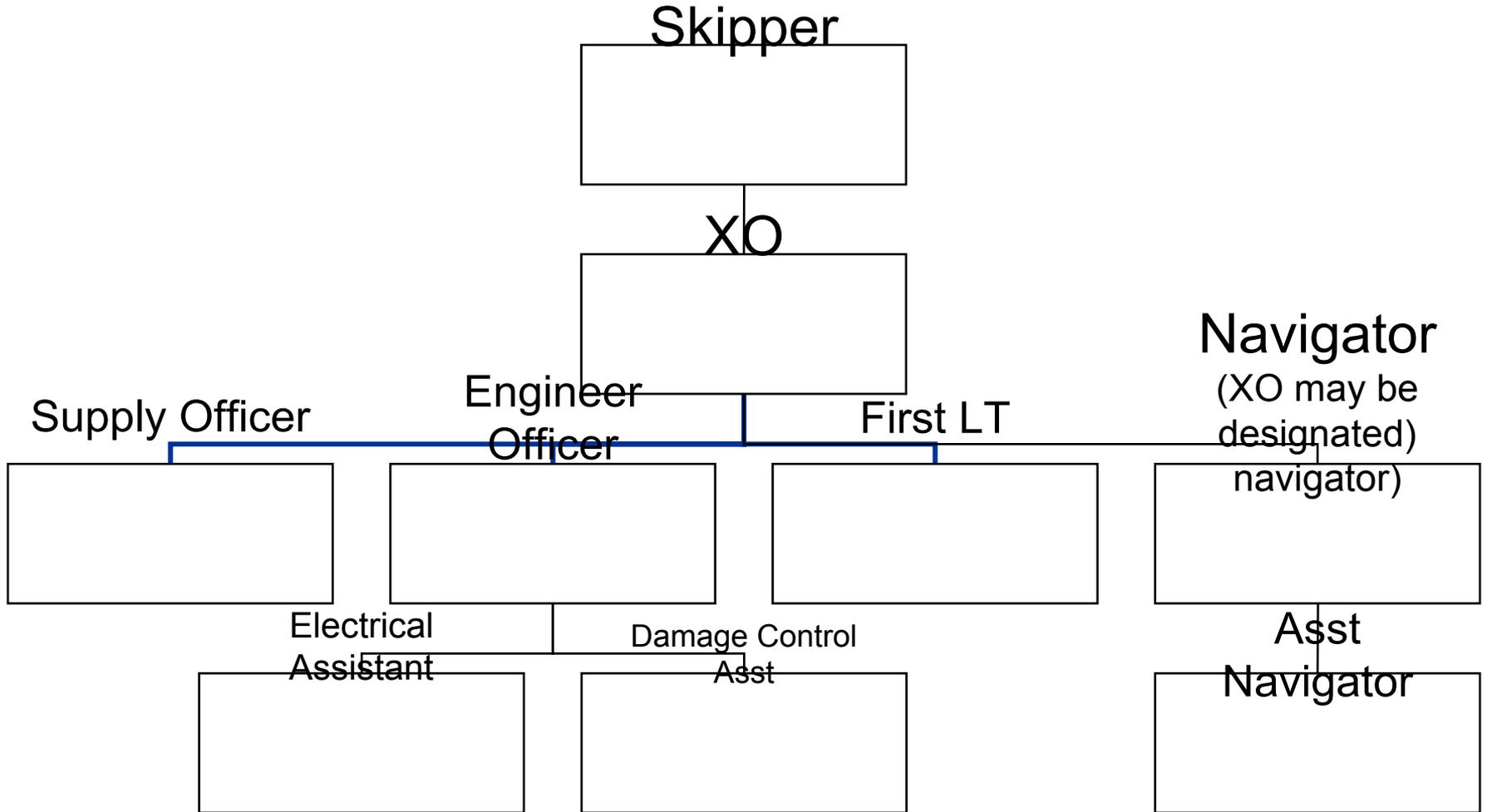
---



- Skipper
- XO
- Watch Section 1 – 4 Third Class Midshipmen
- Watch Section 2 – 4 Third Class Midshipmen



# The Crew...





# The Skipper/XO...

---



The safe and proper navigation of Sail Training Craft (STC) is, at all times, the responsibility of the assigned Skipper.

The Skipper shall delegate navigational authority to the embarked midshipmen whenever possible in order to enhance their training; however, ultimate responsibility will

*reside permanently with the Skipper*



# The Skipper/XO...

---



The Skipper is responsible directly to DNAS  
for compliance with directives  
contained in the applicable OORDER  
and will serve as Safety Officer  
during underway watchstanding



# The Skipper/XO...

---



The XO is responsible directly to the Skipper for compliance with applicable directives, and together with the Skipper will fulfill the role of Safety Officer during underway watchstanding



# XO



- 
- Assigned as Navigator
  - See SOP, Page 2-7

## As Navigator...

- Report to the Skipper
- Ensure all required charts, navigation instruments and references are prepared and aboard prior to getting underway
- Create a Navigation Plan prior to getting underway and measure progress underway with respect to the plan



# XO



## As Navigator...

- Ensure the watch teams maintain an accurate plot of the boat's position by all available means (visual, celestial and electronic)
- Train and supervise watch team navigators in the principles of visual, celestial and electronic navigation
- Train the Midshipmen Navigator & ANAV



# Youngsters

---



- Midshipman Navigator & Assistant Navigator
- Assign your best third class midshipmen to these roles
- Assign your XO to be his shadow!!!



# The Watch Section



## On Deck...

- Skipper or XO (act as Watch Captains)
- Helm
- Navigation Plotter
- Lookout
- Crew

**Note:**  
**The Watch Captain cannot  
serve as Navigation Plotter  
Or  
Lookout!!!**



# The Watch Captain...



## Overarching concepts...

- The key supervisory position in the conduct of the watch.
- Has overall responsibility for the safe operation of the STC, the efficient performance of the watch and the progress of the daily routine.
- Relieves LAST!!!



# The Watch Captain...



## Duties and Responsibilities...

- Remain attentive to external conditions at all times; anticipate and respond to changes early (Navigation hazards nearby)
- Train the watch team
- Supervise the watch team navigator

*And much, much more...*



# The Navigation Plotter...



## Overarching concepts...

- The Navigation Plotter shall be a distinct station in the watch rotation. The Watch Captain may assign the Navigation Plotter for the duration of the watch, or may rotate the position among watch team members (not to include the Watch Captain).

**The Skipper must ensure the crew understands the rotation policy prior to getting underway.**



# The Navigation Plotter...

---



## Overarching concepts...

- In no case shall an STC go for more than one hour without fixing its position.
- In piloting waters, the Navigation Plotter shall plot a fix at an interval that does not exceed half the time it would take the STC to reach the nearest navigational hazard at current speed.



# The Navigation Plotter...



## Duties and Responsibilities...

- The Navigation Plotter Serves as the Watch Team Navigator
- Fix the position of the STC in accordance with the fix interval established by the Skipper.
- Maintain the navigation plot adhering to the six rules of DR.
- DR two fix intervals ahead to ensure the boat is not standing into danger
- Make course-to-steer recommendations to the helmsman



# The Navigation Plotter...



## Duties and Responsibilities (continued)...

- Monitor HF/VHF radios and advise the Watch Captain of pertinent radio traffic
- Maintain a radar watch (if warranted)
- Maintain The Offshore Yacht Log...

Printed Neatly In **BLACK INK**

*And much, much more...*



# The Helmsman...

---



## Duties and Responsibilities...

- Maintain a good lookout
- Maintain the ordered course. Inform the Watch Captain and Watch Team Navigator if unable to maintain the ordered course.
- Monitor sail trim

*And much, much more...*



# The Lookout...



## Duties and Responsibilities...

- Reports to the Watch Captain
- Maintain a proper lookout – See COLREGS
- Report all contacts to the Helmsman

*And...*

***Not Much More!!!***



# Watch Relief...



## Watch relief...

- Prior to relieving the watch the oncoming watchstanders shall:
  - Review the navigation plot with emphasis on current position, expected navigation aids and hazards and desired course.
- Determine the following once topside:
  - Identity and location of all visible and expected nav aids/hazards



# How you get in trouble...

---





# The Six Rules Of Deduced Reckoning

---



1. Every hour on the hour
2. At the time of every course change
3. At the time of every speed change
4. At the time of obtaining a single line of position
5. At the time of obtaining a fix or running fix
6. A new course line shall be drawn from each fix or running fix as soon as it is determined

**YOU MUST KNOW THESE!!!**

***You Must Know How To Apply These!!!***



# Uncertainty...



- Any time you aren't sure where you are – what do you do??
  - One average guy calls for the chart to be brought topside
  - No, No, No...
  - Another average guy goes below to look at the chart
  - No, No, No...
  - Turn around and go back down your track
  - Figure it out, then turn back around



# A Few More **No No Nos...**



## Buoy Hopping

- Fully crewed yacht whose mission it is to teach Navigation

## Play “Follow the leader”

- Never turnover navigational responsibility to an external agent
- Don't misunderstand – This doesn't mean ignore local knowledge

## Drive at night without your headlights on

- DR always, always ahead of the boat



# A Few More No No Nos...



## Go Faster Than Your Team Can Support

- Fully crewed yacht
- How well are they trained???

However...

**Your job is to push them...**

**But make sure you have a safety net!!!**



# Practical Exam...



## Most frequently noted errors

---

- The Chart Shift - Advancing the DR
- The three Line Of Position Fix
  - The LOPs are construction lines...
- The DR
  - Bold and obvious
- Six Rules of DR
  - Know and apply
  - The single line of position
- Latitude and Longitude
  - Determining latitude and longitude
  - Logging it:  $38^{\circ} 14' 46''$  N       $076^{\circ} 38' 14''$  W



# People...

---



- Key to success, And **Failure**



# Homework

---



- Read the SOP, Chapter 2
- Read the SOP, Appendices A & B
- Read, study and think about the Incident Report
- Prepare for the Nav Practical



# Study Guide

---



- 6 rules of DR
- Visual Fix
- Electronic Fix
- Fix intervals
- Running Fix
- Set and Drift
- Speed-Time-Distance
- Conversion (decimal to sec, yds to NM, etc)
- Chart abbreviations and notation