



# U.S. NAVAL ACADEMY SAILING PROGRAM



**Offshore**



**Intercollegiate**



**CSNTS**



**P-100**

To ensure safety at sea, the best that science can devise and that naval organization can provide must be regarded only as an aide and never as a substitute for good seamanship, self reliance, and a sense of ultimate responsibility which are the first requisites in a seaman and naval officer

Fleet Admiral Chester W. Nimitz  
Letter to the Pacific Fleet  
1945

# *Navigation 1*

LCDR Neil Covington  
Training Officer, Naval Academy Sailing



# The Navy Sailing Program...

## What We Teach Midshipmen

---

- Leadership and Teamwork
- Watchstanding
- Small boat handling
- Knowledge of and appreciation for the forces of wind and sea
- Relative motion
- Marlinspike seamanship
- Meteorology and oceanography
- Forehandedness and vigilance
- Shipboard organization
- Navy preventative and corrective maintenance systems (3M)
- Navigation (open ocean and coastal piloting)
- Damage control



# Principles & Practice of Basic Navigation

---

- Fix taking
- Fix evaluation
- “Minimum Cyclic Routine”
  - Plot, Label, DR.. Plot, Label, DR.. Plot, Label, DR...
- Situational Awareness & “Gut Feel”
- Watch Captain involvement
- Midshipman Navigator involvement
- Officer in Charge involvement



# Big Misunderstanding...

## The OIC/AOIC

---

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

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

*reside permanently with the OIC*



# Navigation Related Incident Summary

## Summer 2002

---

- Grounding - Coaster's Harbor
- Grounding - Bermuda
- Grounding - Delaware River
- Grounding - Exit of C&D Canal
- Grounding - Coast of Maine
- Grounding - Eastern Bay
- Grounding - Greenbury Point
- Allision with bridge – Newport
- Allision with buoy – Delaware River (motoring)



# Groundings...

## Why Such A Big Deal???

---

- Groundings on the bay
- Groundings in New England
- Congere's Three Bump Rule...
  - First bump - you know you're hosed
  - Second bump the rig comes down
  - Third bump – The keel's in the cabin/boat sinks
- The Navy 44



# The Navy 44...



- Designed and built as a “Sail Training Craft”
- Routinely experience very heavy use
- Spartan comfort...
- Underpins program safety & surety



# What We'll cover

---

- This course teaches the practice of navigation
  - Need to develop proficiency here, in the classroom, so that you can “degrade gracefully” when at sea...
- It doesn't teach tides and currents
- It does not teach the analytical underpinnings
  - That's left to you
  - Read Hobbs, Duttons, or US Sailing's Coastal Navigation Text



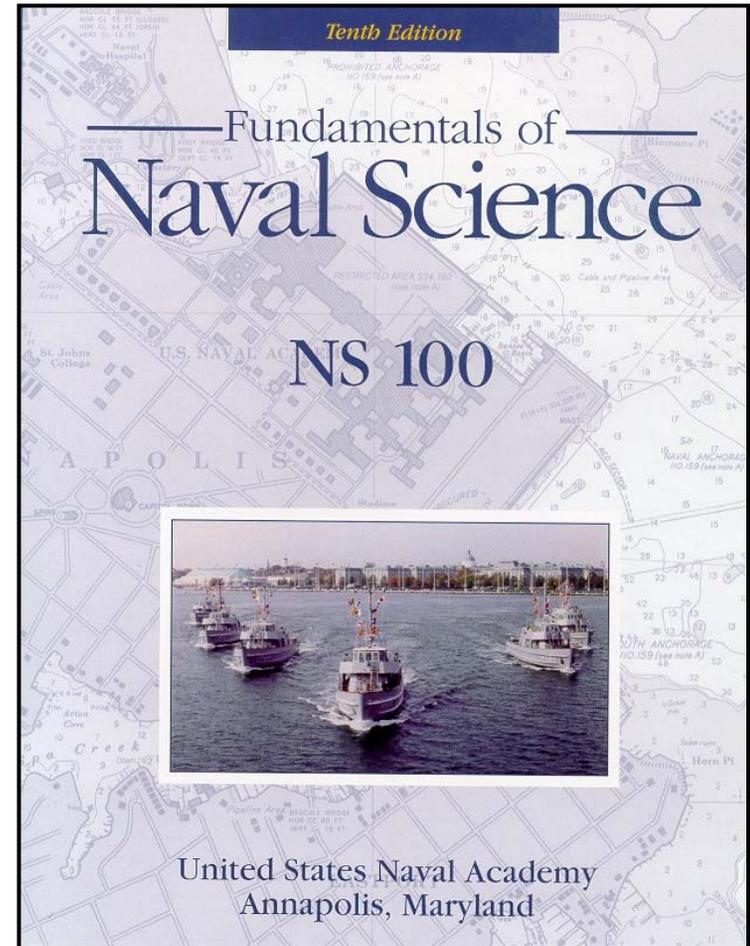
# Midshipmen Text

## The Midshipmen's Text

We teach this to our  
program participants

### Why?

“This is what the  
midshipmen have learned”





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



# Before We Talk About Charts...





# What's In The Average Nav Table?

---

I Bet These Are The Only Navigation Instruments You Find...



Dividers & Compass



# The Other Tools of the Trade...

## Nautical Slide Rule



## Roller Plotter

What Am I Missing???

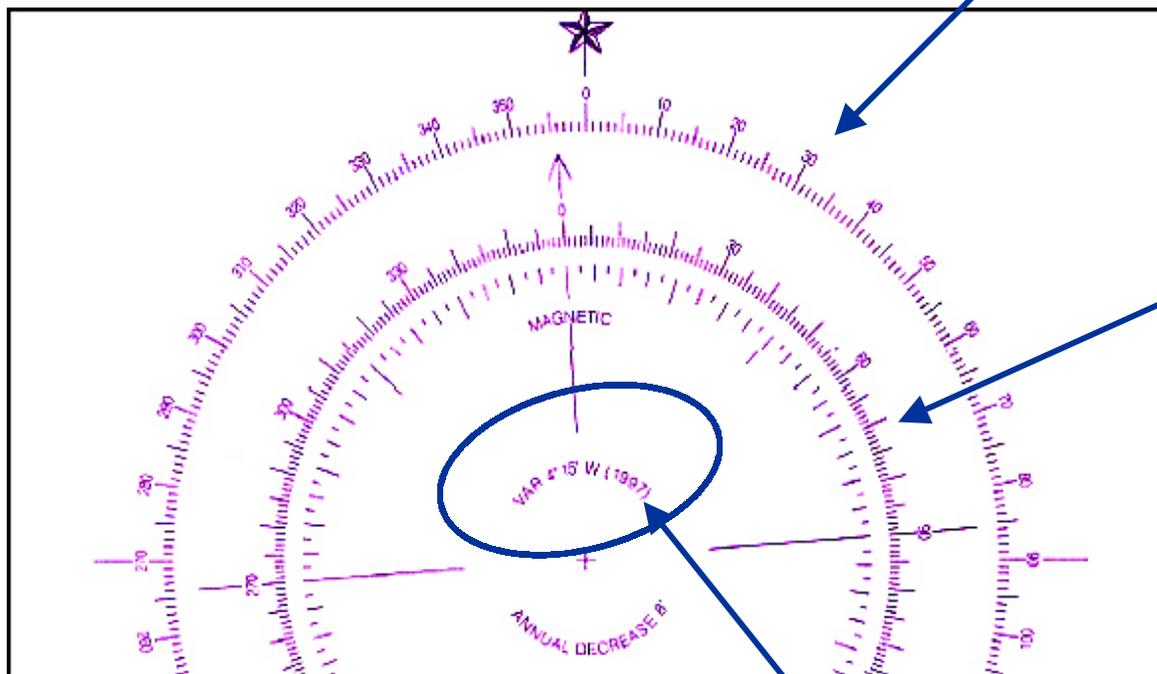




# The Compass Rose...

Degrees True

- Don't use this one...



Degrees Magnetic

- Use this one!!!

Variation...

- What do you need to know?



# The Steering Compass...



**NOTE:**  
**These Are**  
**Not Used For**  
**Navigation!!!**





# The Hand Bearing Compass...



## Key elements:

- Almost Midshipman Proof
- Susceptible to deviation errors
- They come with a Lanyard – Use it!!!

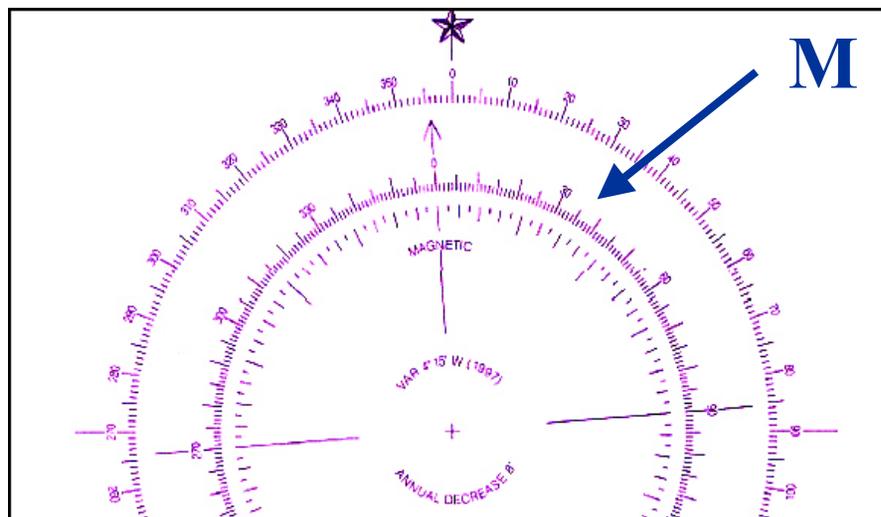




# The Bottom Line...



A



B



C

We assume Deviation = 0

$$\underline{A = B = C}$$

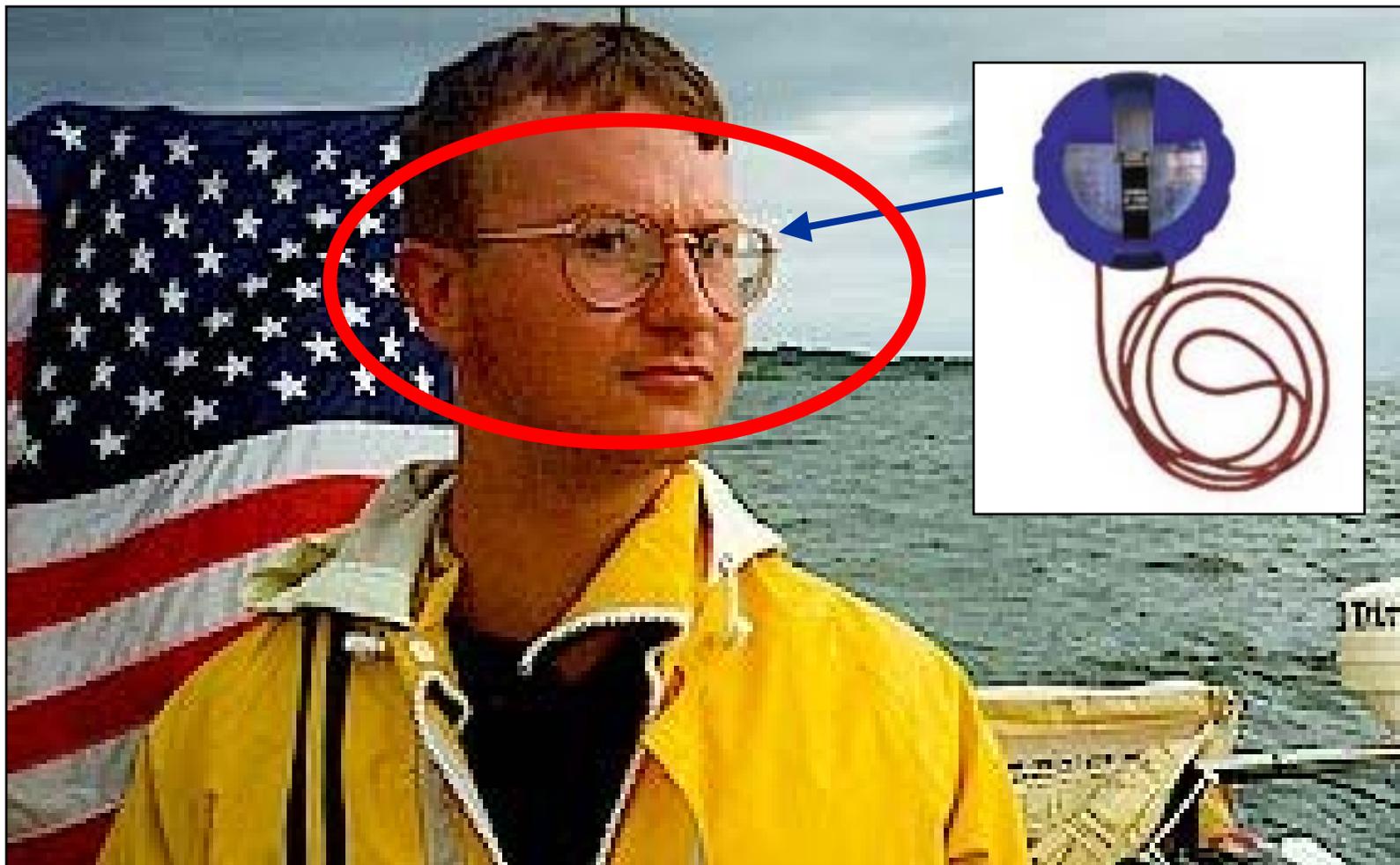


Unless...





# And Unless...





# The Chart...

---

- What must you know?
  - Latitude & Longitude
  - Sounding datum
  - Nav Aids and Nav Hazards
    - Chart 1
  - Is it current?
    - Notice to Mariners



# Latitude & Longitude...

---

- Two scales
  - Degrees, Minutes & Tenths
  - Degrees, Minutes & Seconds

Note: Many errors occur on the chart shift!!!

- Use latitude for distance measurement



# Sounding Datum...

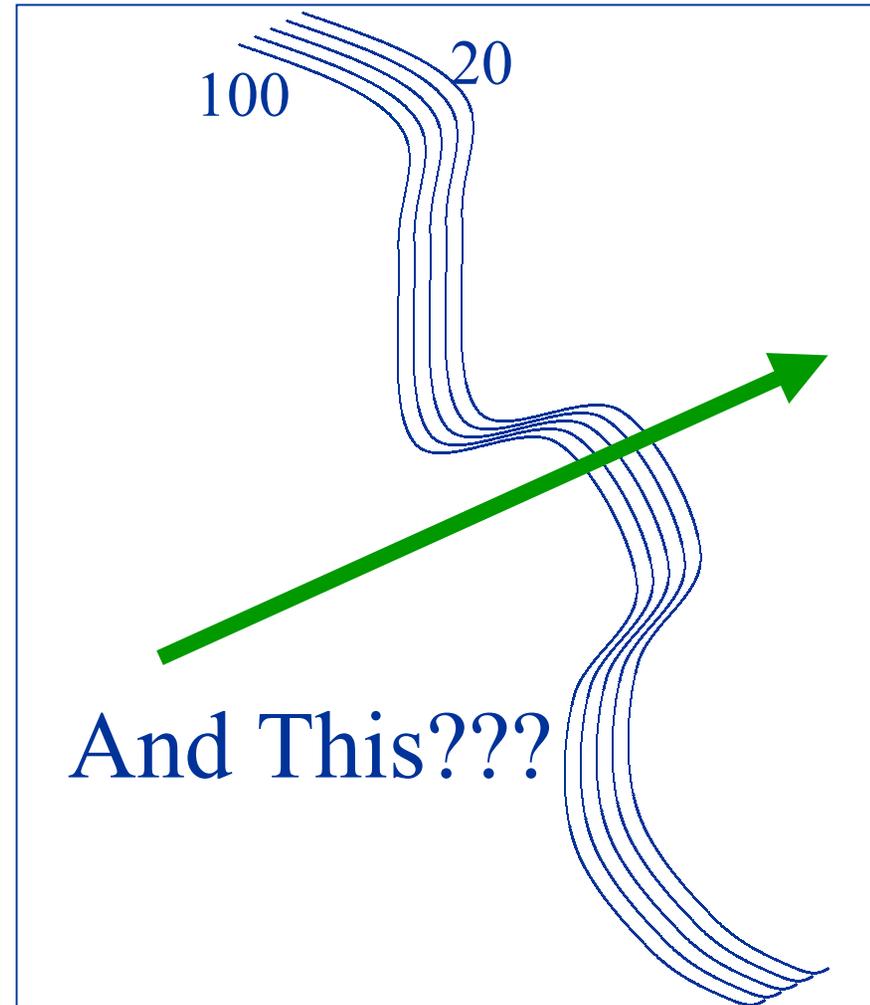
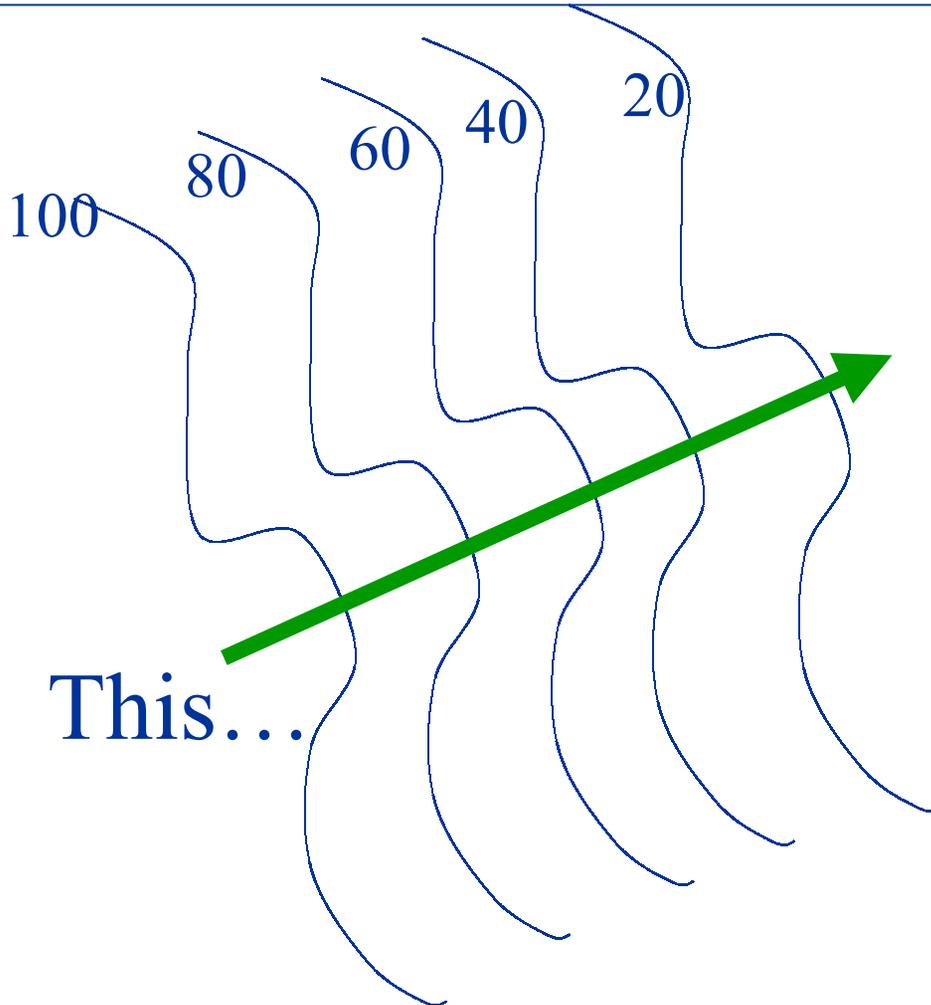
- Fathoms, Feet or Meters???



7' 6"



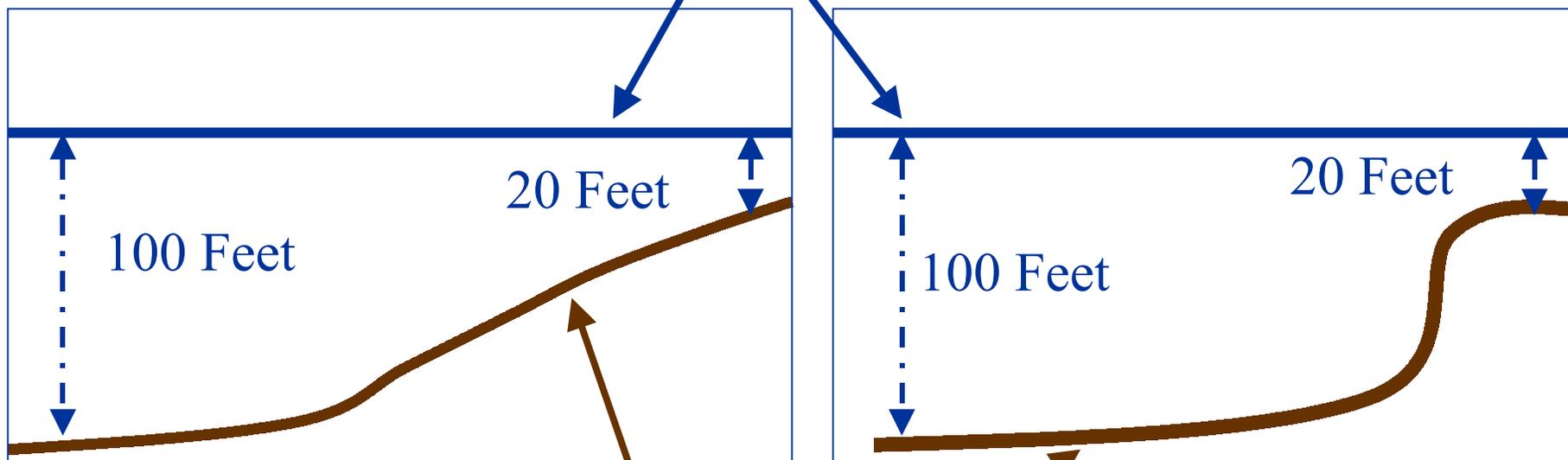
# What's The Difference Between...





# What's The Difference Between...

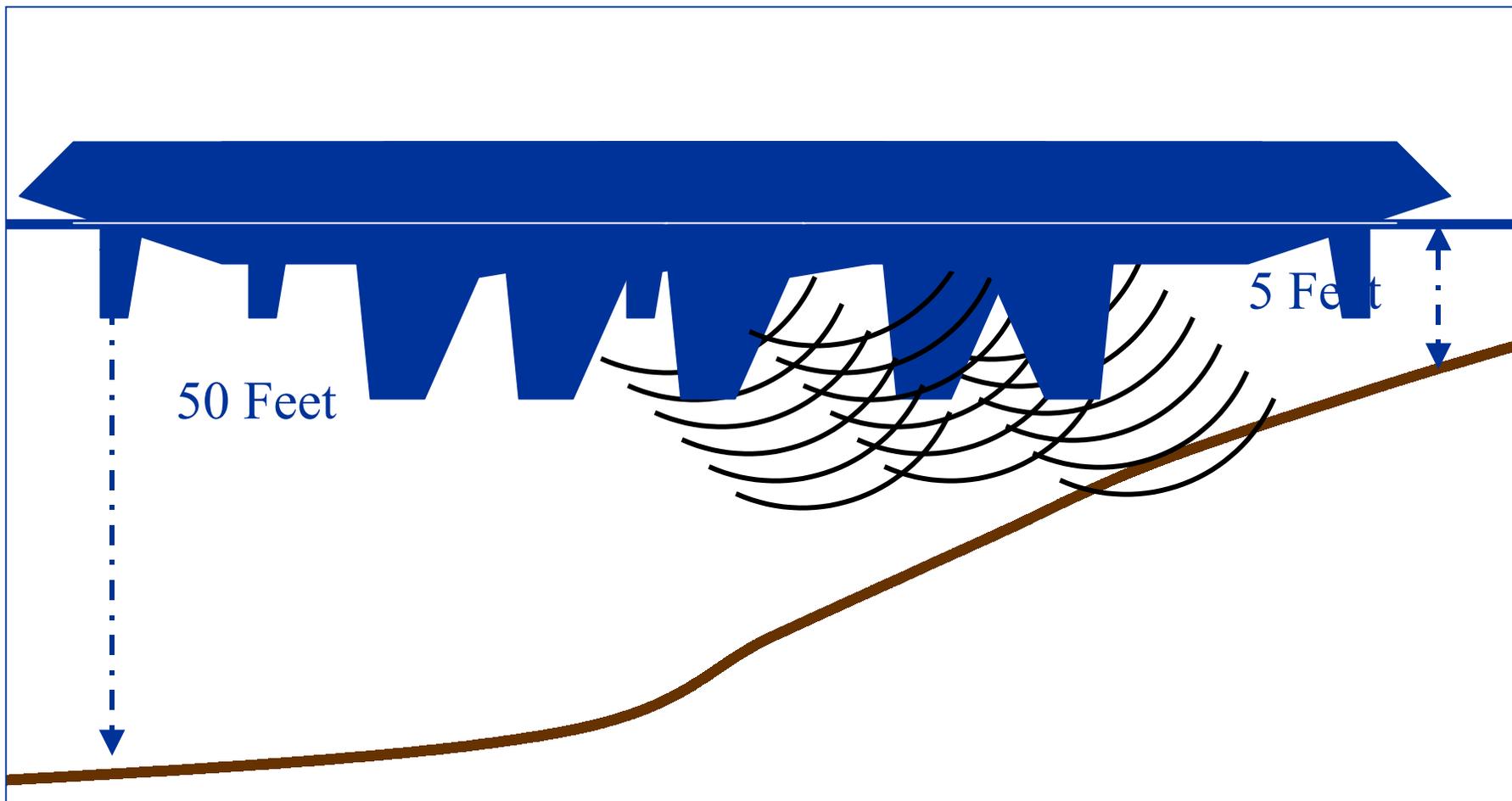
Water Surface



Bottom Contours



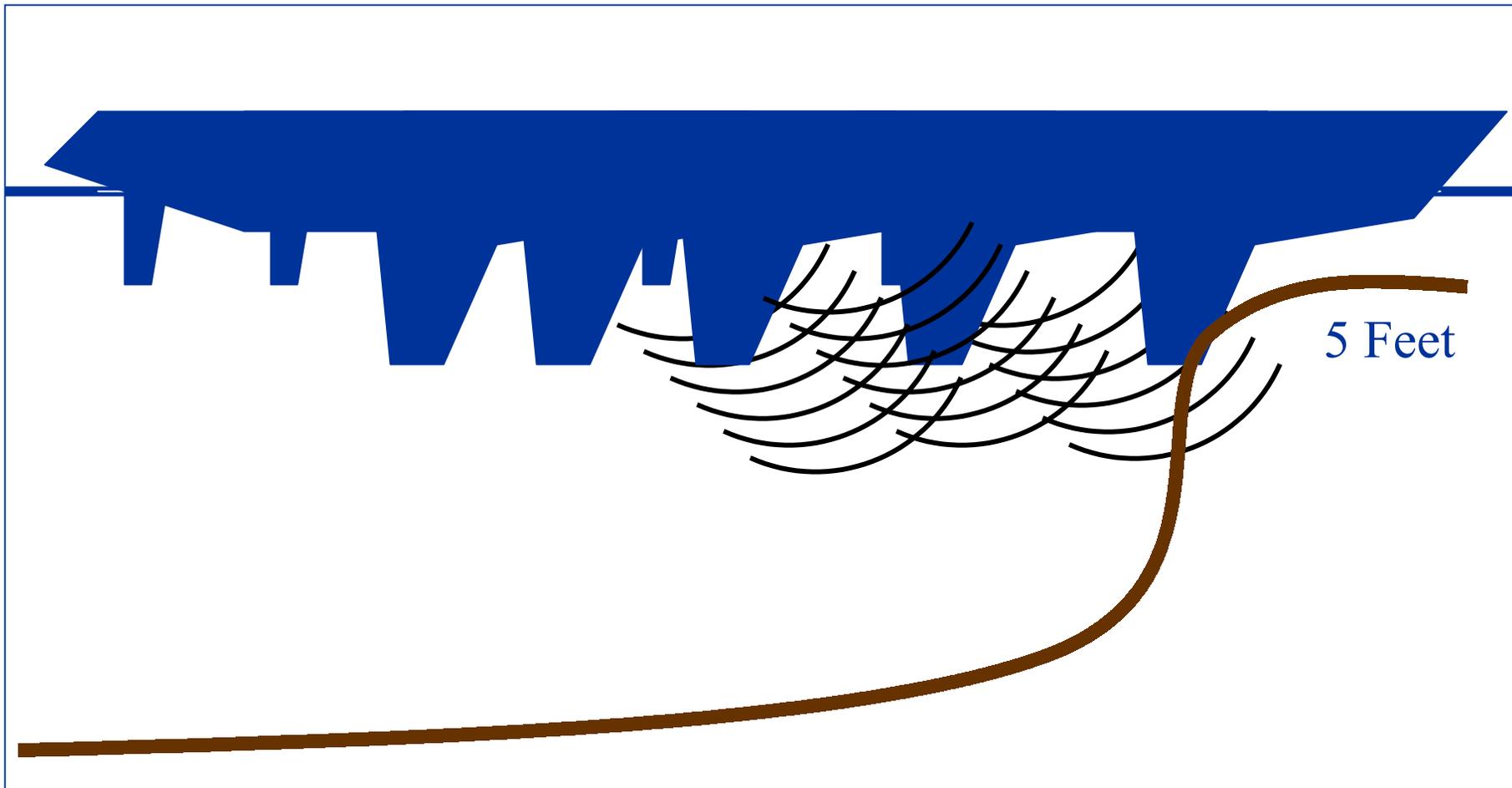
# What's The Difference Between...



**Time To React...**



# What's The Difference Between...



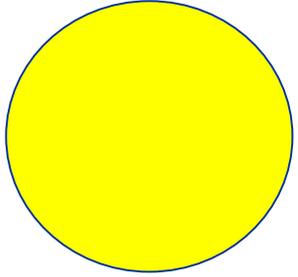
**No Time To React...**





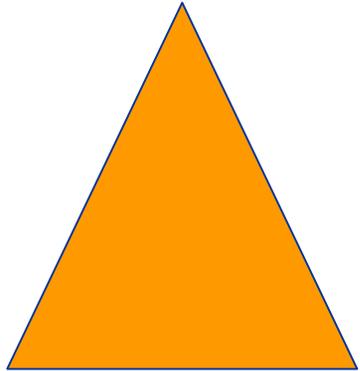
# Identifying Nav Aids & Nav Hazards...

---



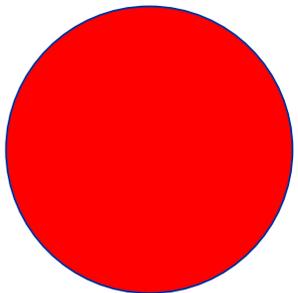
## Visual Aids To Navigation

- Highly visible to naked eye, or binoculars
- Lighthouses, towers, etc



## Electronic Aids To Navigation

- Highly visible on radar
- Jetty, Bridges, land masses



## Hazards To Navigation

- Find these or they will find you!!!



# Chart Up To Date???

## Query The Notice To Mariners Database

Notice to Mariners - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Netsite: [http://pollux.nss.nima.mil/untm/untm\\_options.html?class\\_flag=N](http://pollux.nss.nima.mil/untm/untm_options.html?class_flag=N) What's Related

Counties and Re Instant Message Members WebMail Connections BizJournal SmartUpdate Mktplace

## UNITED STATES OF AMERICA

### Notice to Mariners

---

**Note**

The US Notice to Mariners corrects NIMA and NOS charts using information collected from many sources, among them the US Coast Guard Local Notices published by the several Coast Guard districts. From all sources the US Notice to Mariners will contain only those chart corrections of interest to *ocean going vessels*.

**View/Download the NTM**

Notices to Mariners are available for online review or download, as well as the special paragraphs from the last released NTM 01. For a specific data set, [Query the NTM Database](#) below.

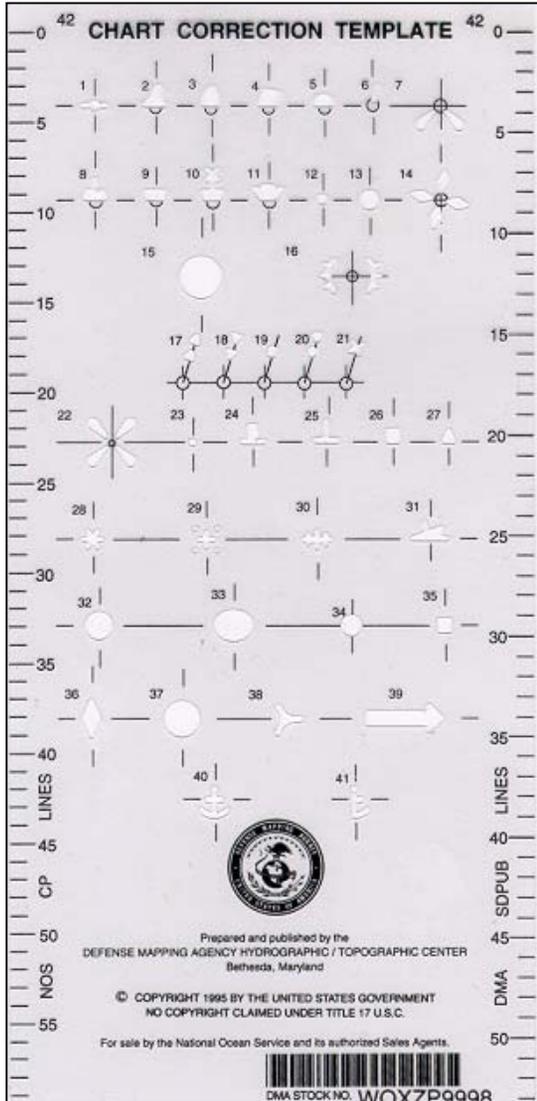
Notice Number	Notice Date
---------------	-------------

Document: Done

Start | Exploring... | Microsoft... | Notice... | Microsoft... | NetWare Br... | 11:23 PM



# Making The Chart Corrections...



## Chart Correction Template



# The Chart Prep Checklist...

## Navy Sailing Chart Preparation Checklist

Chart Number \_\_\_\_\_

1. Note the chart's sounding datum (X the appropriate box).

Fathoms \_\_\_\_\_ Feet \_\_\_\_\_ Meters \_\_\_\_\_

2. Box the Sounding Datum. Highlight this in Orange and verify that it's visible after the chart is folded for use. If not - annotate it where it can best be seen.

3. Enter the vessel's draft (i.e., 7.5 feet)

- Use the same units as the chart's sounding datum

4. Round up \_\_\_\_\_

5. Define Your Risk Factor: \_\_\_\_\_

- Knowledgeable Crew/Racing Risk Factor = 1
- Novice Crew/Training Risk Factor = 2 or 3

6. Calculate minimum sounding line as follows:

- Multiply the number from Block 4 by the Risk Factor defined in Block 5

\_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_

(i.e., For a CSNTS Cruise: 8 feet times 2 = 16 ft)

6. Review the chart for actual sounding datum. Choose one based on Block 6 above (if required, round up): \_\_\_\_\_

7. Highlight this sounding line with a dark blue marker. Pay particular attention to the rate of change of depth, and mark the chart accordingly.

8. Visual Nav Aids: Carefully review the chart, and identify visual nav aids:

- Circle, highlight in yellow, and label ABC (where ABC is an easily spoken, unmistakable noun name)

9. Nav hazards: Carefully review the chart, and identify unlighted buoys and other nav hazards.

- Circle, highlight in pink, and label UNLIT ABC/NAVHAZARD ABC.

10. Radar Nav Aids: Carefully review the chart, and identify radar nav aids.

- Triangle, highlight in orange, and label ABC
- Pay particular attention for RACON buoys. These should have a circle and a triangle, and be labeled RACON ABC

11. Track: Draw and label the track.

- The track can be drawn down the center of the deep draft channel to alert the watchsection to the expected location of merchant traffic.

12. Shoal Water: Using the blue line defined in 7 above, slash the shoal water areas in blue, and double slash those areas where soundings won't provide meaningful backup.

13. Fold and label: Fold and label the chart as follows:

- Fold the chart in fourths
- Label the corner with the fold with the chart's noun name in large letters. Immediately above/below list the next chart along the north/southbound track

14. Verify Currency: Immediately prior to use, verify the chart is up to date by querying the NIMA Notice To Mariners Database at:

[http://pollux.nss.nima.mil/untm/untm\\_j\\_options.html?class\\_flag=N](http://pollux.nss.nima.mil/untm/untm_j_options.html?class_flag=N)

Latest Chart Edition \_\_\_\_\_ On-hand Chart Edition \_\_\_\_\_

Latest Notice To Mariners \_\_\_\_\_

CHART UPDATED THROUGH NOTICE TO MARINERS \_\_\_\_\_ / \_\_\_\_\_  
Number Date

Submitted: \_\_\_\_\_ Reviewed: \_\_\_\_\_  
Midshipman Navigator AOIC/Navigator

Approved: \_\_\_\_\_  
Officer In Charge





# Should We Label A Track???

---

- Sailboats don't move in straight lines...
- Previews where are we're going
- It's proof that you thought it through...
- It tells you how much you've deviated from the game plan that was developed while warm, dry and comfortable
- Where are the merchants???



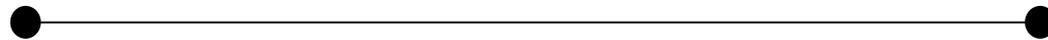
# How Do We Label A Track???

---

A

TR 090 M

B

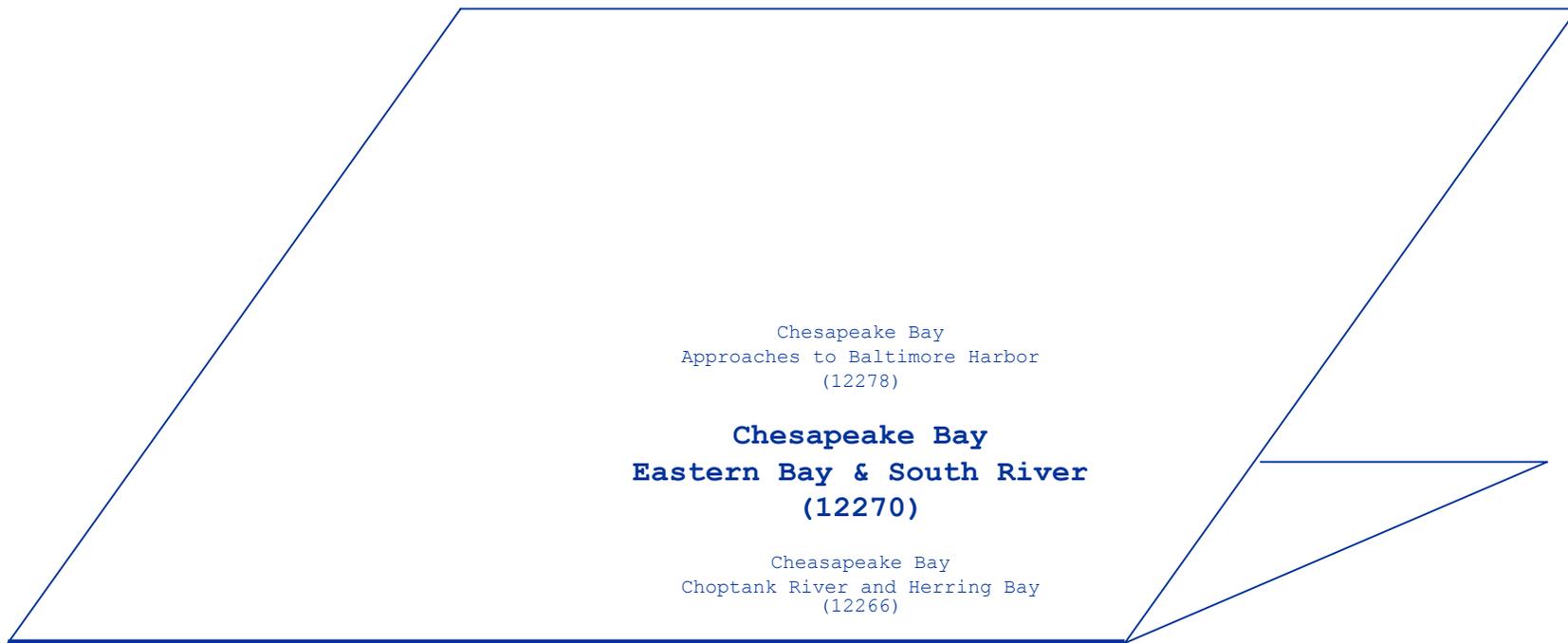


SOA 7



# 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)



# Next Class...

---

- For Homework
  - Work on your charts with chart prep checklist
  - Study the two handouts
    - Lines of Position and Fixes
    - Dead Reckoning and Current Sailing



# Next Class...

---

- ✓ The Chart
  - Primary emphasis on chart preparation
- The Fix
  - Visual & Electronic
  - Accuracy and errors
- The DR
  - The most important thing on the chart
- Navigation Party
  - Organization, procedures & philosophy
- Making landfall
  - The Navigation Brief



# What is available...

## OIC/AOIC Navigation Kits

Price:

\$30 (w/o tote)

\$60 (w/ tote)



Roller Plotter



NaviTote



Speed Wheel



Compass & Divider Set