Name: _____ Date: _____

Visual Bearings Navigation Practical

Visual Bearings Navigation Practical Key

Overarching: Don't erase any DRs. If you think you should erase some portion of the DR based on what we've discussed in class, then point to the section and annotate the chart lightly in pencil with the word "erase."

The following navaids are used throughout:

Holland Point Beacon	The beacon labeled Fl G 2.5s 18ft 5M "1"
Poplar Island Tangent to your position	That edge of the Poplar Island that is tangent
Bloody Point Bar Light	Bloody PT Bar – Fl 6s 54ft 7M HORN
Thomas Point Light	Thomas PT Shoal – Fl 5s 43ft 11M HORN

Initial conditions: You are on the return leg portion of a *Spring CSNTS Overnighter For Prospective Assistant Officers In Charge (AOICs)*. You have been operating on Chart 12266, and have been beating your way up the Bay all morning. It's about 1500 now, and you getting ready to relieve the Navigation Plotter – Just in time to do the chart shift onto Chart 12270, which will take you all the way back to Annapolis Harbor.

The off-going Navigation Plotter has the following to say while turning over:

> "We're steering close-hauled on starboard tack. The helmsman has been able to steer about 355, but we're making some leeway because we're close-hauled. We've been averaging about 6 knots, and my fixes indicate there's not much current running. The Loran C is simulated as Non Operational (The OIC has taped over the display), so we're shooting visual navaids. The OIC directed a fifteen-minute fix interval and I've been shooting Holland Point Beacon, Poplar Island Tangents, and Pier Light, which is well behind us off of Chesapeake Beach. Pier Light's not on the next chart, but you should be able to gain Bloody Point Bar Light right after you shift charts. I've set you up to transfer the 1515 DR forward, since we're now north of Holland Point, and that's where Chart 12270 starts. Oh, by the way, you might want to review the OIC's Standing Orders (attached as enclosure (1) to refresh your memory on what reports he requires personally – He's in the rack for a nap."

You understand, and announce:

"Very well, I relieve you as Navigation Plotter."

You then step topside and announce:

"Attention in the Navigation Party, this is FILL IN YOUR NAME HERE, and I'm the Navigation Plotter. Hand Bearing Compass Operator, look for Bloody Point Bar Light – It should be broad on the starboard bow. Once I shift the Chart, I'll give you an expected gain bearing."

The Hand Bearing Compass Operator acknowledges:

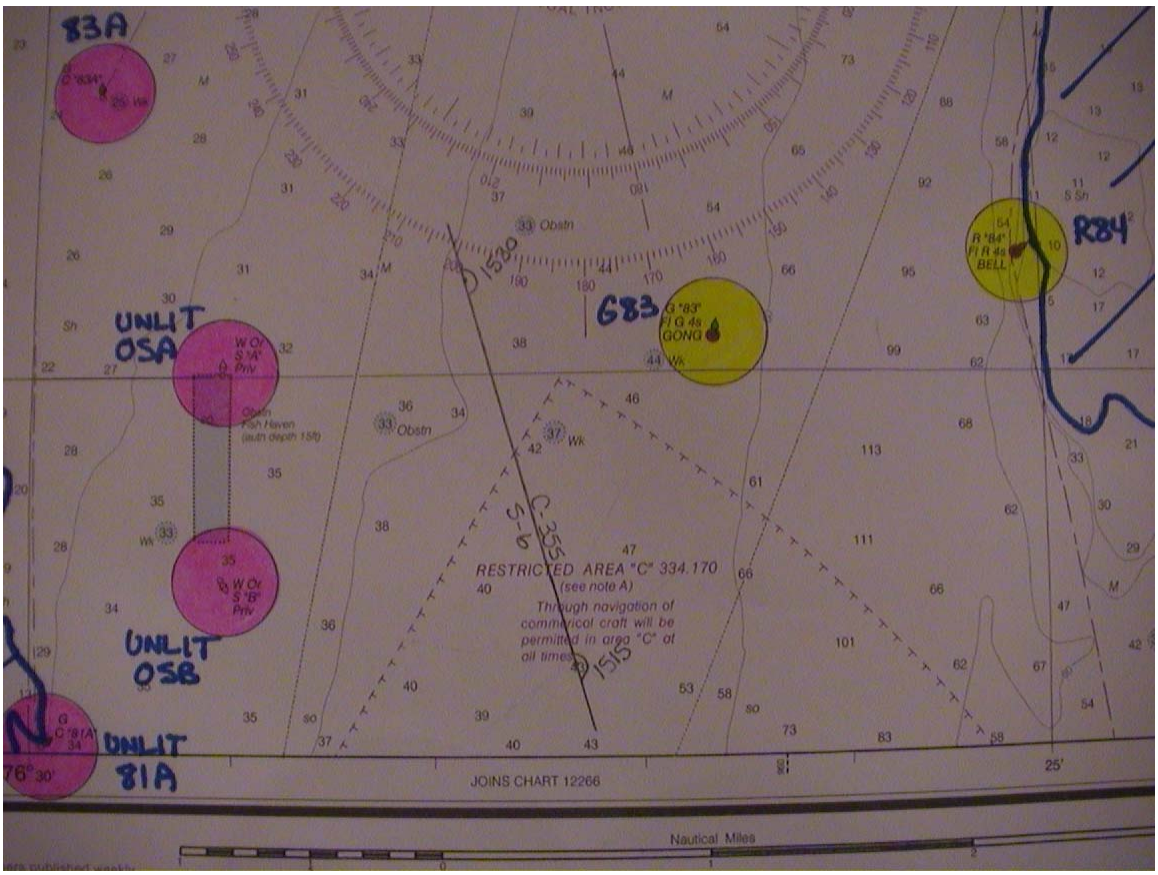
"Look for Bloody Point Bar Light, Aye."

THE PRACTICAL:

You find the following written in the deck log:

1500 Shifted to Chart 12270. Transferred the 1515 DR
Latitude: 38° 43' 55"//Longitude: 76° 27' 20" C-355//S-6.

1. Transfer and properly label the 1515 DR.



(40 Points) POINT BREAKOUT AS FOLLOWS:

(20 Points) PLOTTED CORRECTLY
(5 Points) DR HALF CIRCLE
(5 Points) COURSE//SPEED VECTOR (INTO THE PAST…)
(5 Points) ANNOTATED: 1515
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

2. How should the Latitude and Longitude have been written?

Lat: (5 Points) 38° 43' 55" N Longitude: (10 Points) 076° 27' 20" W

The Hand Bearing Compass Operator peeks down the companionway hatch and asks:

"Navigation Plotter. It's nearly 1515. Report the expected gain bearing for Bloody Point Bar Light."

You acknowledge as follows:

3. "Bloody Point Bar Light bears: ____." (Use your 1515 DR Position)

(10 Points) 037° (+/-5°)

The Hand Bearing Compass Operator announces:

"I hold Bloody Point Bar Light, Bearing 037°" (Fill in from 3 above)

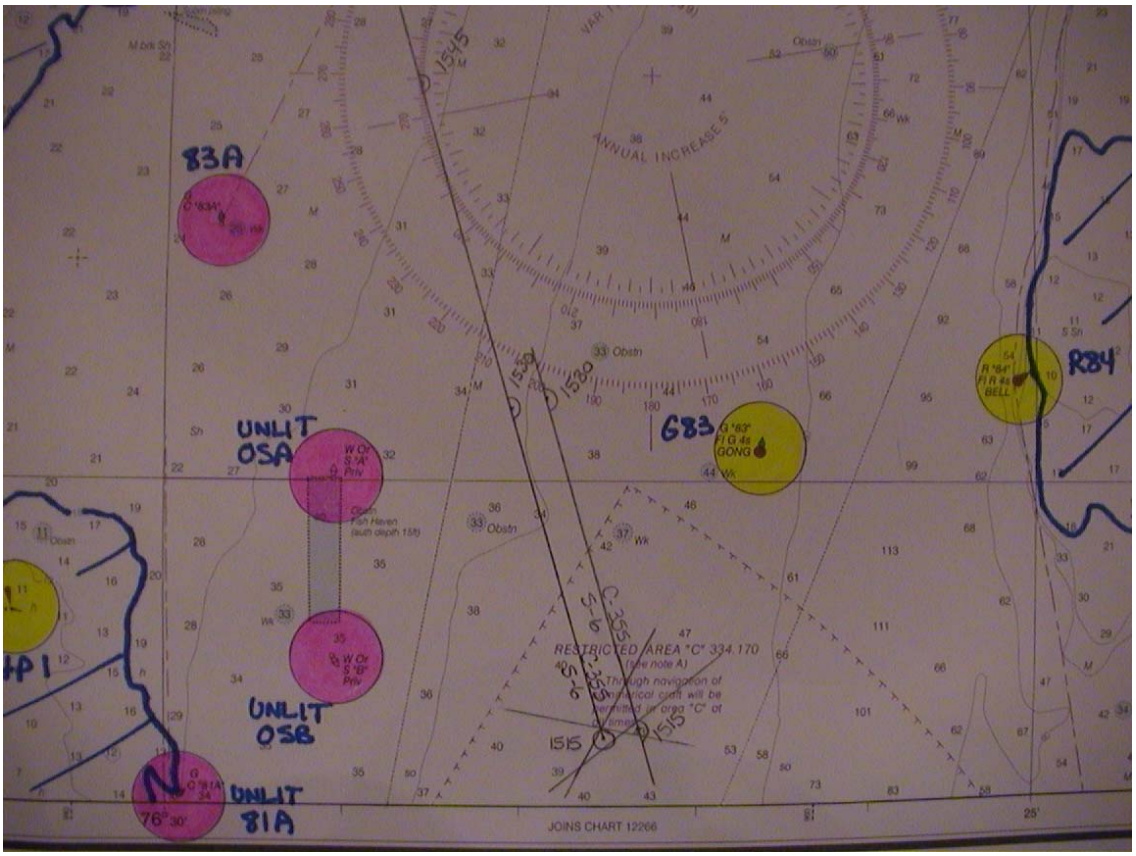
You announce:

"Attention in the Navigation Party. The next round will be at 1515. Shoot Holland Point Beacon, Poplar Island Tangent, and Bloody Point Bar Light"

You break out the U.S. Navy Standard Bearing Book and update it for the 1515 round, but the guy you relieved had the first several entries are already made for you. (See enclosure (2)).

At 1515 you hear the Hand Bearing Compass Operator announce:

"Mark time 1515. Poplar Island Tangent – 062; Holland Point Beacon – 292; Bloody Point Bar Light – 038."



4. What's missing from this report?

(15 Points) THE SOUNDING

LOOK AHEAD… AS THE ROUND STARTS, LOOK AT THE DR AND DETERMINE WHAT THE SOUNDING SHOULD BE. IN THIS CASE, YOU SHOULD EXPECT TO HEAR 40 FEET.

5. What should you do to correct this deficiency?

(15 Points) DIRECT THE HAND BEARING COMPASS OPERATOR TO REPORT SOUNDINGS WITH HIS ROUND OF BEARINGS.

(5 Points) CHECK IT WITH THE CHART.

FOR EXAMPLE: "HAND BEARING COMPASS OPERATOR – REPORT SOUNDINGS AT THE END OF YOUR ROUND." ENSURE YOU RECEIVE AN ACKNOWLEDGEMENT. "REPORT SOUNDINGS AT THE END OF MY ROUND, AYE."

6. Record the Latitude and Longitude of your 1545 DR:

Latitude: (15 Points) 38° 46' 45" N Longitude: (15 Points) 076° 28' 31" W

At 1530 you hear the Hand Bearing Compass Operator announce:

> "Mark time 1530. Poplar Island Tangent – 079; Holland Point Beacon – 260; Bloody Point Bar Light – 048. Sounding 35 feet."

7. You plot the fix and announce:

(15 Points) "SOUNDING CHECKS WITH CHART."

8. What's the problem with these three navaids?

(10 Points) POPLAR ISLAND TANGENT AND HOLLAND POINT BEACON ARE ON NEARLY RECIPROCAL BEARINGS,

POPLAR ISLAND TANGENT BEARS 079, AND HOLLAND POINT BEACON BEARS 260.

(5 Points) THE BEARING TO BLOODY POINT BAR LIGHT IS NOT PERPENDICULAR TO EITHER OF THESE

IF BLOODY POINT BAR LIGHT HAD BEEN ABOUT PERPENDICULAR TO THESE OTHER TWO NAV AIDS (I.E. BEARING ABOUT 350° OR SO), I WOULD HAVE THOUGHT THIS A GOOD TWO LINE OF POSITION FIX, BUT SINCE THE ANGLE IS SHALLOW, TREAT THIS FIX WITH EXTREME SUSPICION!!!

9. Of the three navaids listed, which one's bearing is changing fastest and why?

(10 Points) HOLLAND POINT BEACON

(5 Points) IT'S ON THE BEAM. (NOTE: BUT SO IS POPLAR ISLAND TANGENT.)

(5 Points) AND, IT'S CLOSEST.

WHEN OBJECTS ARE ON THE SAME/NEARLY THE SAME RELATIVE BEARING, THE BEARING TO THOSE WHICH ARE CLOSEST WILL CHANGE FASTER THAN THOSE WHICH ARE MORE DISTANT.

10. What's the problem with the 1600 DR?

(10 Points) IT PLOTS IMMEDIATELY ADJACENT TO SHOAL WATER.

NOTE: IF I TAKE ANOTHER FIX AT THE SAME FIX INTERVAL, I WON'T BE EASILY ABLE TO GET TWO FIXES BEFORE ENTERING SHOAL WATER. THIS IS PARTICULARILY IMPORTANT IN THIS CASE, SINCE SOUNDINGS WILL NOT ALERT YOU TO IMPENDING GROUNDING – OBSERVE THAT THEY CHANGE FROM ABOUT 20 FEET CHARTED TO 4 FEET CHARTED ALMOST INSTANTANEOUSLY. NAVIGATE WITH EXTREME CAUTION!!!

11. If you want to stay on this course much longer, what should you do about the fix interval and why?

(10 Points) REDUCE THE FIX INTERVAL!!!

(10 Points) THE SOP REQUIRES THE FIX INTERVAL BE REDUCED WHEN APPROACHING A NAVIGATION HAZARD.

SEE SOP SECTION 208.4. IT STATES: "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 NAVIGATION HAZARD AT CURRENT SPEED." IF YOU REDUCE THE FIX INTERVAL NOW, YOU CAN SHOOT TEN-MINUTE ROUNDS, WHICH IS ACHIEAVABLE. IF YOU WAIT UNTIL 1545, YOU'LL BE IN SEVEN-MINUTE ROUNDS, WHICH IS CHALLENGING.

At 1545 you hear the Hand Bearing Compass Operator announce:

> "Mark time 1545. Bloody Point Bar Light – 062, Poplar Island Tangent – 097, Holland Point Beacon – 227. Sounding 30 feet."

12. You plot the fix and announce:

(15 Points) "SOUNDING CHECKS WITH CHART."

The AOIC calls you topside and tells you he wants to stay on this course for a few more minutes.

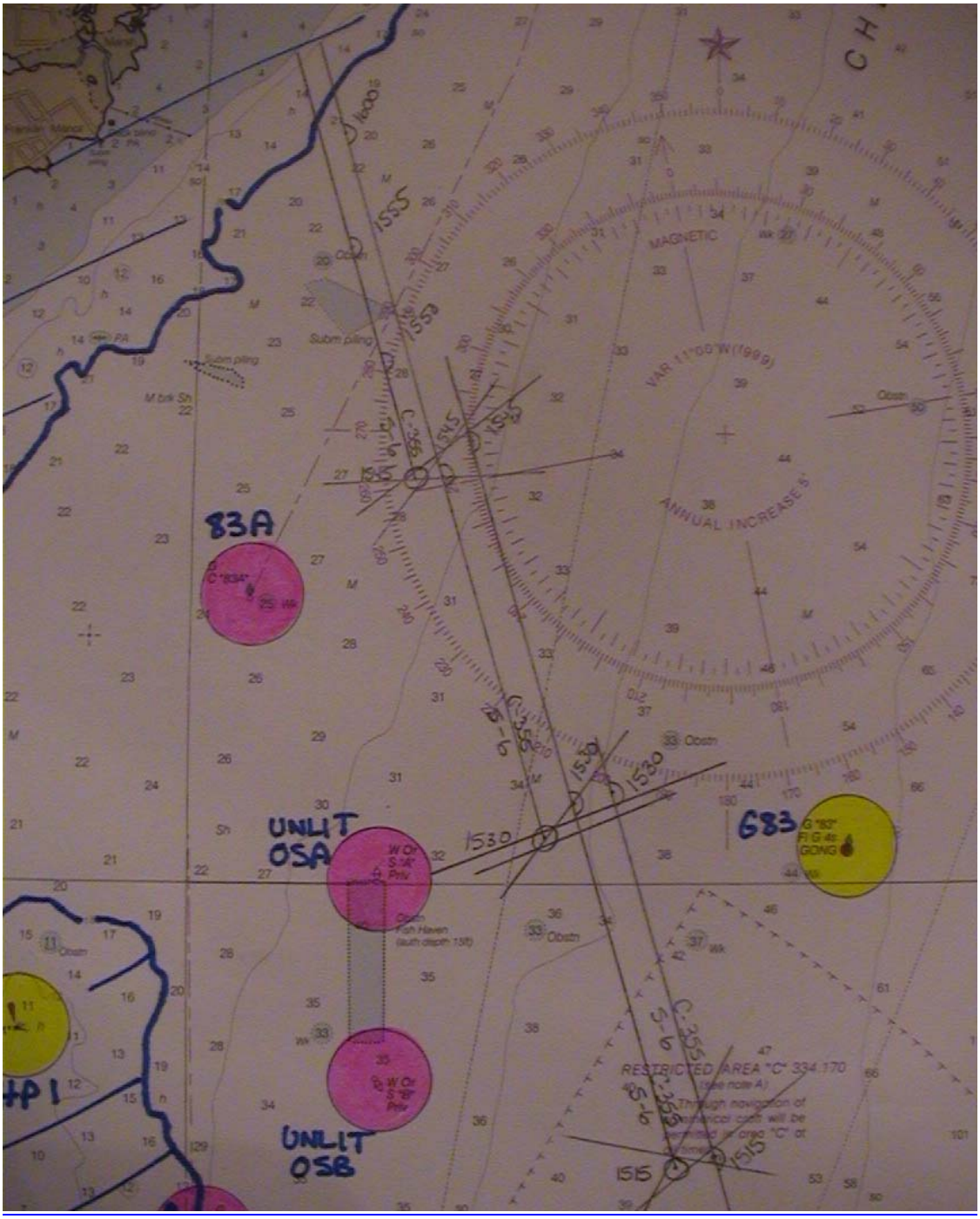
13. You agree, but respond we must tack by:

(15 Points) 1600

AT THE LATEST!!! NOTE THE WATER DEPTH ALONG THE TRACK GOES FROM 14 FEET TO 4 FEET WITH NO COUNTOUR GRADIENT.

He tells you to shift to a 5 minute fix interval to get as close as possible before tacking.

Franklin Pt
Marsh
Manor
Obstn
Obstn
Subm piling
Subm piling
M brk Sh
MAGNETI
VAR 11°0
ANNUA
1600
1555
1550
1545
1545
83A



14. Is this shift in fix interval within his purview?

(20 Points) NO

NOTE: FIX INTERVAL IS DEFINED BY THE OIC, AND SHOULD BE SEEN AS THE **MAXIMUM INTERVAL BETWEEN FIXES**. YOU CAN ALWAYS TAKE MORE FIXES!!!

HOWEVER, IN THIS CASE THE AOIC'S CLEARLY STATED GOAL WAS TO RUN AS FAR IN SHORE AS POSSIBLE BEFORE TACKING, WHICH NECESSITATED A REDUCTION IN THE FIX INTERVAL TO COMPLY WITH THE WRITTEN REQUIREMENTS, BUT VIOLATES THE SPIRIT OF THE REQUIREMENT!!! SINCE THIS ACTION ASSUMES ADDITIONAL RISK, THE OIC SHOULD HAVE HAD A SAY IN THIS DECISION. HAD THE OIC BEEN FOREHANDED, THIS MIGHT HAVE BEEN ACCOMPLISHED BY NIGHT ORDER ENTRY, OR BY VERBAL DIRECTION DURING TURNOVER PRIOR TO HIS GOING TO THE RACK. FOR EXAMPLE:

> "SINCE THE WINDS ARE ON THE NOSE, REDUCE THE FIX INTERVAL AS REQUIRED WHEN THE BAY NARROWS TO PRECLUDE SHORT TACKING UP THE BAY ALL AFTERNOON. IF YOU CAN'T FIX THE BOAT'S POSITION – FOR ANY REASON – ESPECIALLY WHEN IN A REDUCED FIX INTERVAL, TACK IMMEDIATELY AND HEAD BACK TO DEEP WATER. THEN INFORM ME."

IF THIS WASN'T DONE, WAKE HIM UP AND LET HIM VOTE!!!

At 1550 you hear the Hand Bearing Compass Operator announce:

> "Mark time 1550. Bloody Point Bar Light – 067; Poplar Island Tangent – 103; Holland Point Beacon – 220. Sounding 28 feet."

15. You plot the fix and announce:

(15 Points) "SOUNDING CHECKS WITH CHART."

At 1555 you hear the Hand Bearing Compass Operator announce:

> "Mark time 1555. Bloody Point Bar Light – 072; Poplar Island Tangent – 108; Holland Point Beacon – 214. Sounding 22 feet."

16. You plot the fix and announce:

(15 Points) "SOUNDING CHECKS WITH CHART."

You hear: "Ready about. Helms Alee." You look at your watch and its 1557.

You then hear:

"Navigator: Steady on course 080."

17. You reply:

(10 Points) "STEADY ON COURSE 080, NAVIGATOR AYE."

18. Now that we're opening the beach you recommend that the fix interval be shifted back to 15 minutes. The AOIC concurs.

(10 POINTS) DID YOU REMEMBER THE 1600 DR???

SIX RULES OF DR - EVERY HOUR ON THE HOUR.

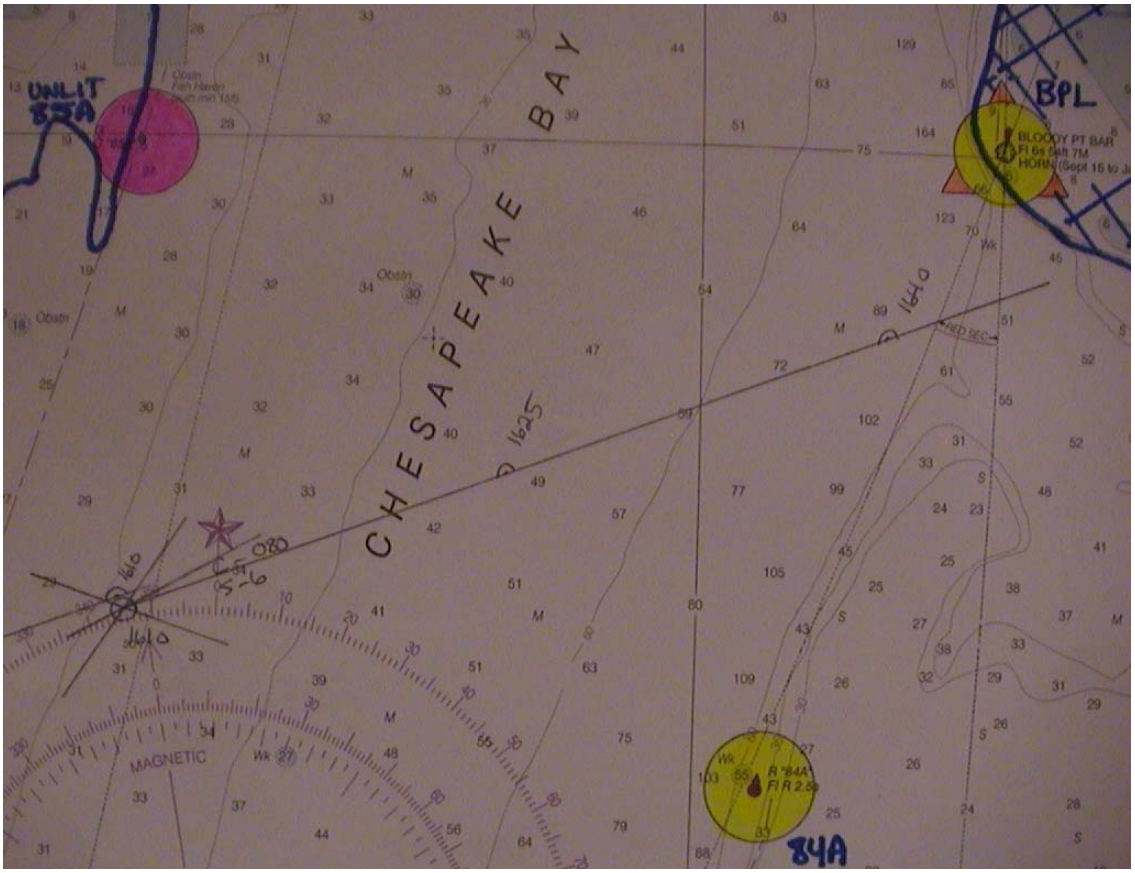
You announce:

19. "Attention in the Navigation Party. Shift to a fifteen minute fix interval. The next fix will be at time:

(10 Points) 1610

At 1610 you hear the Hand Bearing Compass Operator announce:

"Mark time 1610. Bloody Point Bar Light – 072; Poplar Island Tangent – 118; Holland Point Beacon – 224. Sounding 30 feet."



At 1615 the Hand Bearing Compass Operator announces:

> "I believe I hold Thomas Point Light, Bearing - 020."

20. You plot this LOP and announce:

> "Attention in the Navigation Party. The next round will be at 1625. Shoot Bloody Point Bar Light, Poplar Island Tangent, Holland Point Beacon and Thomas Point Light. Assuming Thomas Point cuts, we'll gain Thomas Point and drop Holland Point Beacon. We'll then shoot another round at 1630 to get back into shooting fifteens on the quarter hour. Carry on."

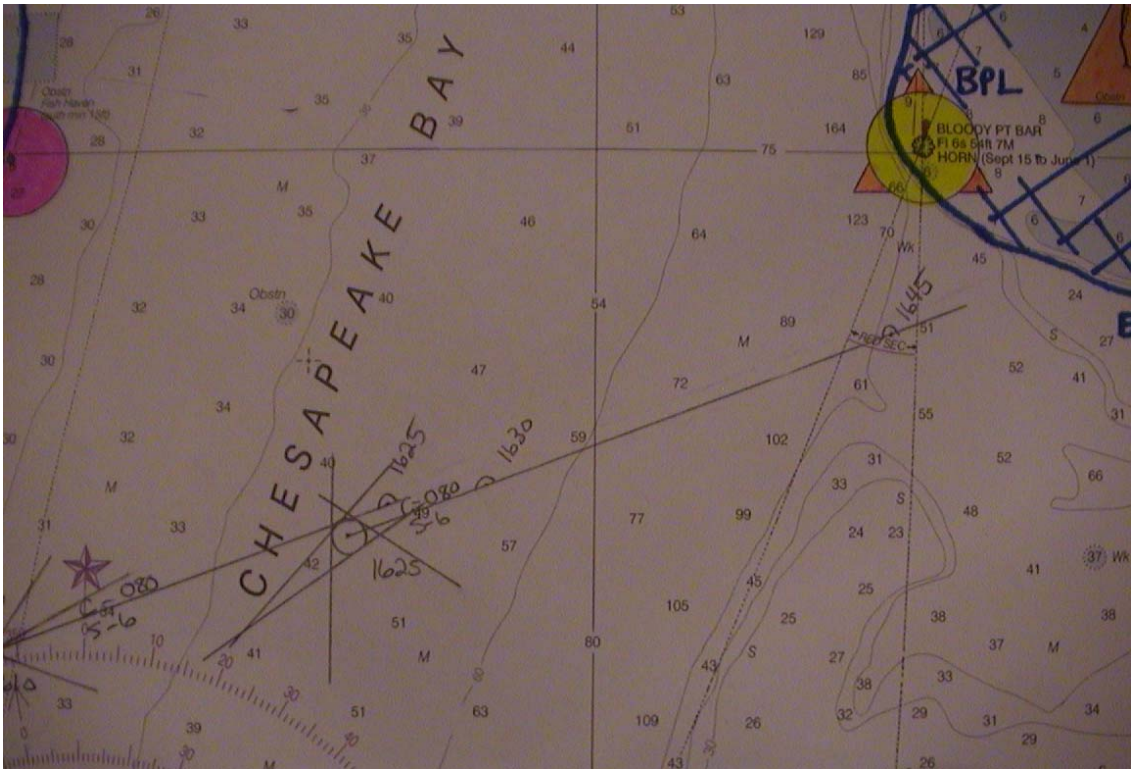
(10 POINTS) DID YOU REMEMBER THE 1615 DR???

SIX RULES OF DR – AT THE TIME OF EVERY SINGLE LINE OF POSITION.

(5 Points) DID YOU MAKE THE GYRO RECORD BOOK ENTRY???

At 1625 you hear the Hand Bearing Compass Operator announce:

> "Mark time 1625. Bloody Point Bar Light – 065; Poplar Island Tangent – 133; Holland Point Beacon – 232;.Thomas Point Light – 011. Sounding 30 feet."



21. You plot the fix and announce:

(15 Points) "SOUNDING DOES NOT CHECK WITH CHART!!! WAKE AND INFORM THE OIC."

ALSO, DIRECT THE HAND BEARING COMPASS OPERATOR TO COMMENCE TAKING CONTINUOUS SOUNDINGS, AND GET ANOTHER FIX. IF IN DOUBT AS TO YOUR POSITION, TACK IN THE DIRECTION OF DEEP WATER.

Since Thomas Point cut, you announce:

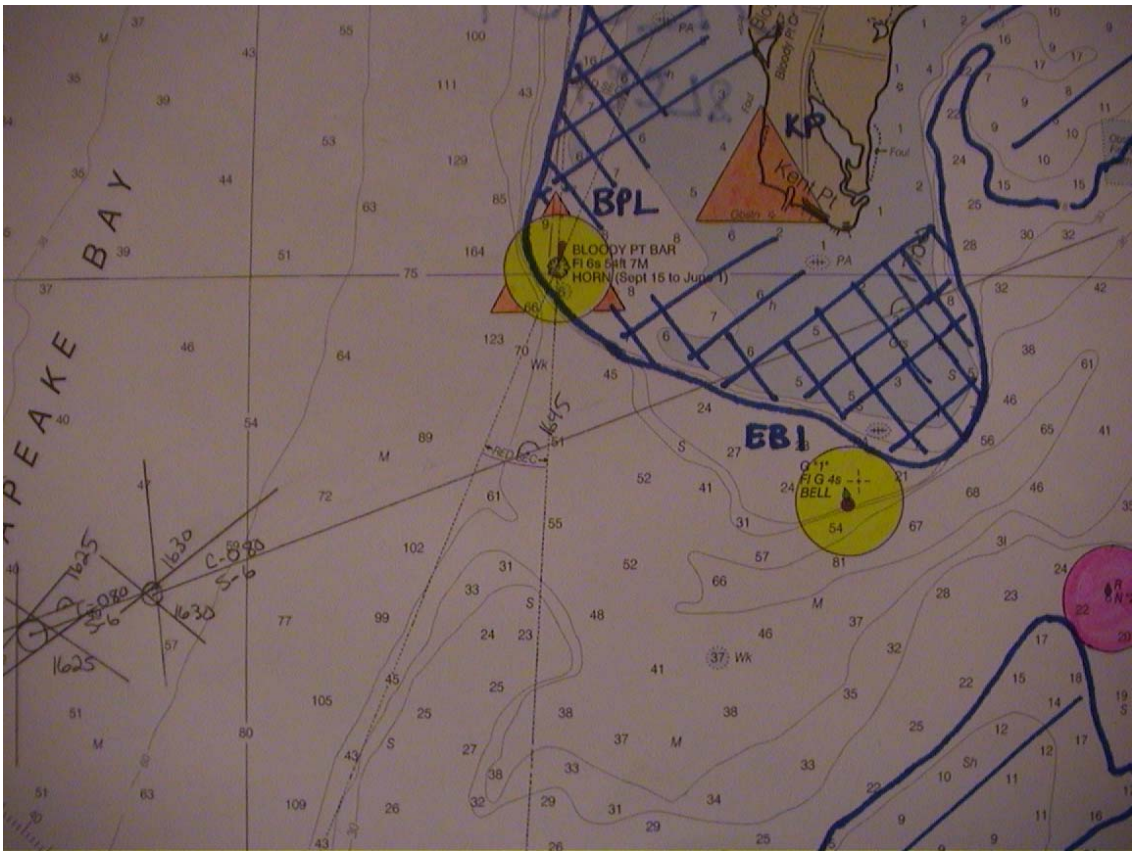
22. "Attention in the Navigation Party.

(15 Points) "THE NEXT FIX WILL BE AT 1630. GAIN THOMAS POINT LIGHT, DROP HOLLAND POINT BEACON. SHOOT BLOODY POINT BAR LIGHT, POPLAR ISLAND TANGENT AND THOMAS POINT LIGHT."

THE KEY HERE IS TO CONDUCT A BRIEF TO ENSURE THE NAVIGATION PARTY UNDERSTANDS WHAT JUST HAPPENED, **AND WHAT YOU EXPECT**. IN THIS CASE WE SHIFTED NAV AIDS, BUT IT'S ALSO USEFUL TO BRIEF WHEN SHIFTING THE ORDER FOR SHOOTING NAV AIDS IN THE ROUND.

At 1630 you hear the Hand Bearing Compass Operator announce:

"Mark time 1630. Bloody Point Bar Light – 063; Poplar Island Tangent – 139;.Thomas Point Light – 005. Sounding 55 Feet."



23. You plot the fix and announce:

(15 Points) "SOUNDING CHECKS WITH CHART."

24. Record the Latitude and Longitude of your 1700 DR:

Latitude: (15 Points) 38° 49' 48" N Longitude: (15 Points) 076° 21' 59" W

25. What's wrong with this DR – in other words, what should have been done to ensure no DR plots in shoal water?

(15 Points) THE FIX INTERVAL SHOULD HAVE BEEN REDUCED **PROACTIVELY** BY THE NAVIGATOR TO ENSURE NO DR PLOTS IN SHOAL WATER.

IN THIS CASE, THE DR PLOTTED IN SHOAL WATER - THAT SHOULD NEVER HAPPEN. IF IT DOES, IT MEANS YOU'RE LAGGING THE PROBLEM. **IF IT DOES HAPPEN, IMMEDIATELY TELL SUPERVISORY PERSONNEL, AND MAKE A RECOMMENDATION.** DON'T MAKE THEM HAVE TO COME BELOW AND LOOK AT THE CHART. FOR EXAMPLE: "MY 1700 DR HOLDS US ENTERING SHOAL WATER.

WE HAVE 15 MINUTES OF GOOD WATER ON THIS COURSE. RECOMMEND REDUCING THE FIX INTERVAL, AND TACKING BY 1650." OR…"WE NEED TO TACK OR REVERSE COURSE - NOW!!!"

26. At 1640 you hear "Ready About. Helms Alee."

You then hear:

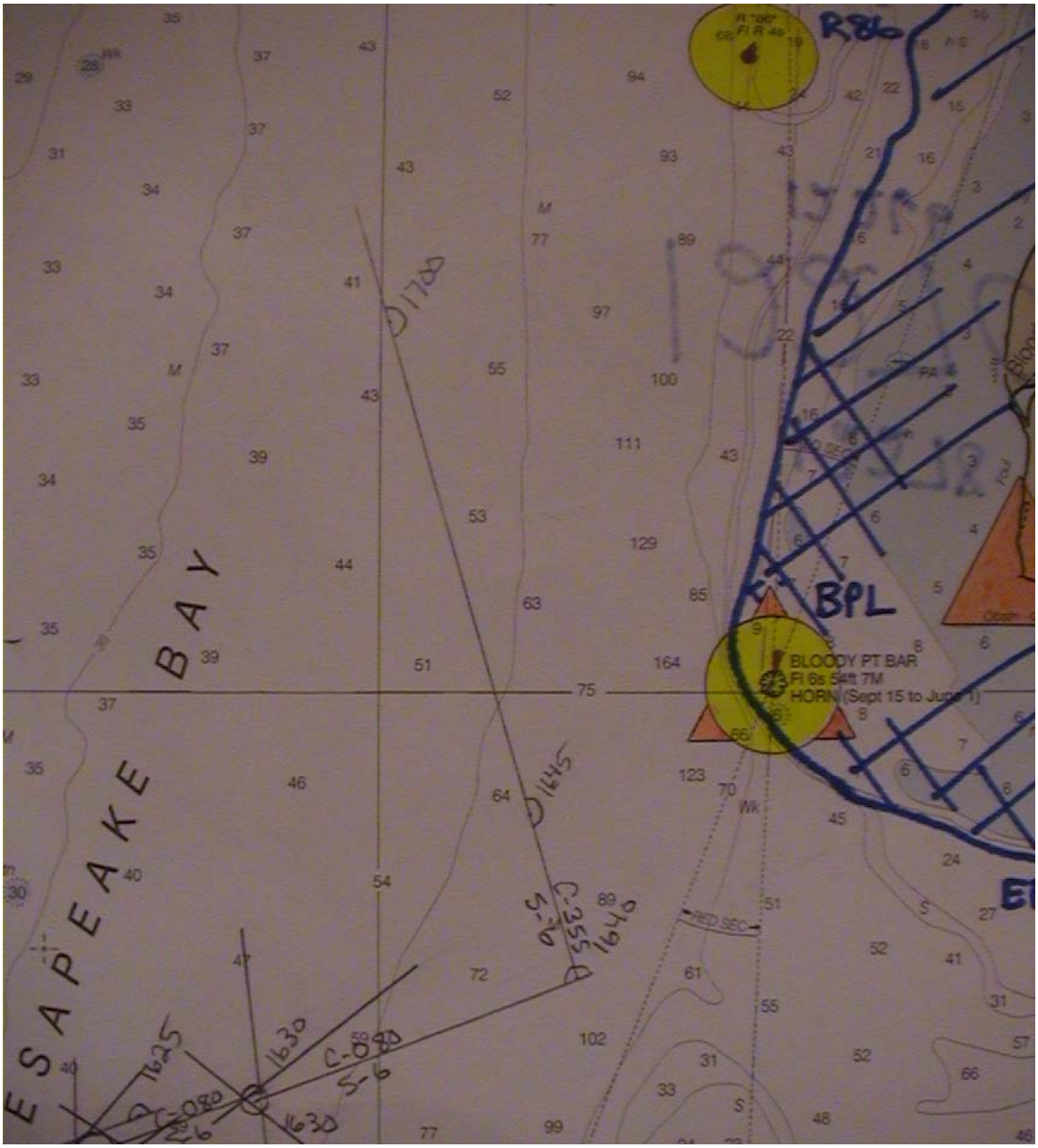
"Navigator. Steady on course 355."

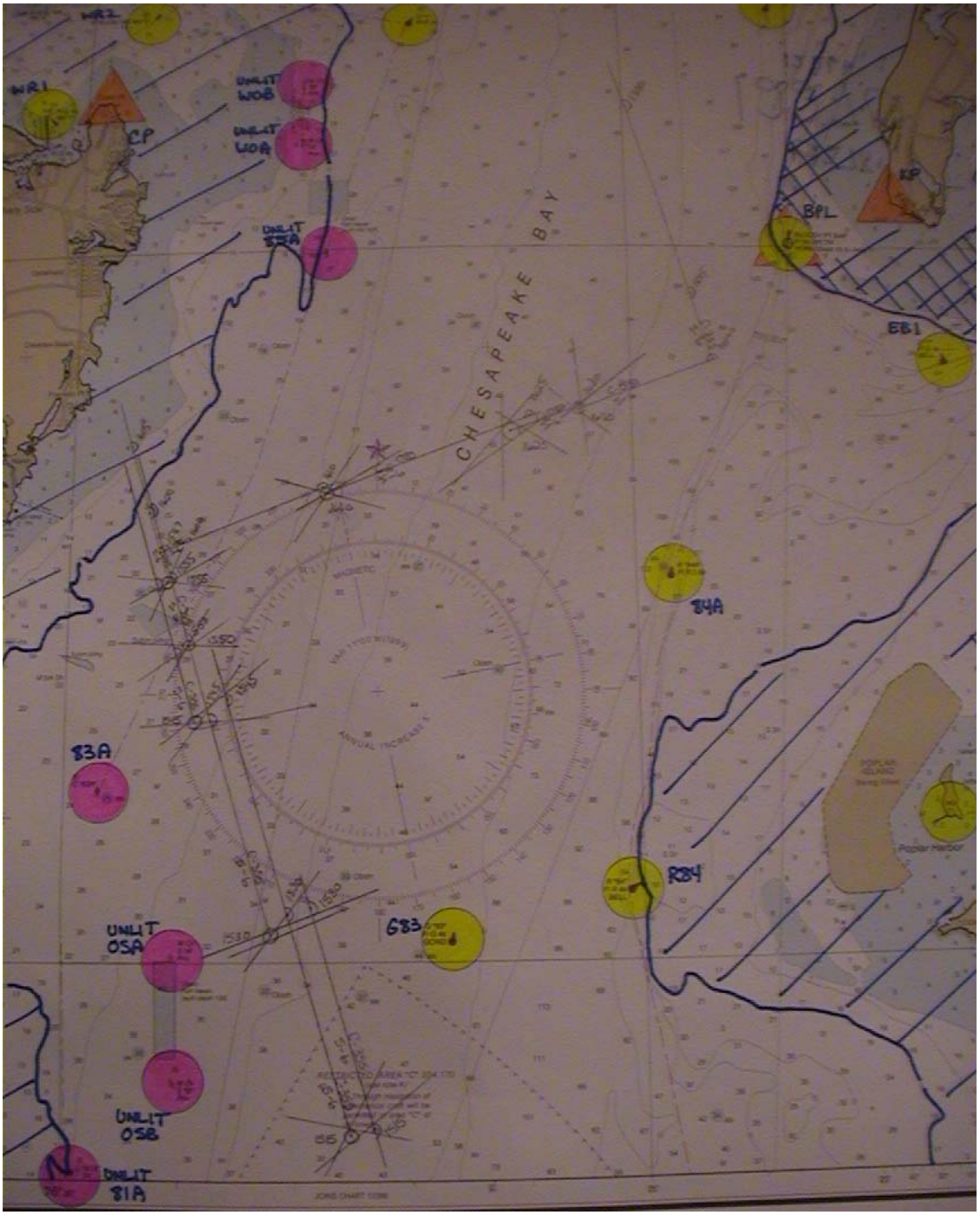
(15 Points) DID YOU REMEMBER THE 1640 DR???

SIX RULES OF DR – AT THE TIME OF EVERY COURSE CHANGE.

You respond:

"Steady on course 355, Navigator Aye."


R86
BPL
BLOODY PT BAR
Fl 6s 54ft 7M
HORN (Sept 15 to June 1)
BAY
ESAPEAKE
1700
1645
1640
1630
1625
C-080
S-6
RED SEC



27. Record the Latitude and Longitude of your new 1700 DR:

Latitude: (15 Points) 38° 50’ 59” N Longitude: (15 Points) 076° 25’ 00” W

The lookout reports that he sees a large merchant of the starboard bow. The merchant appears to be Southbound, and looks to be in the vicinity of WR87. The AOIC tells you to hail him, and report that we’ll remain clear of his track.

You acknowledge: "Hail the southbound merchant, Navigator Aye."

28. What channel(s) would you select to transmit VHF?

(5 Points) CHANNEL 13 – PRIMARY //(5 Points) CHANNEL 16 – BACKUP

FOR INLAND WATERS, THE HAILING CHANNEL IS CHANNEL 13. IN INTERNATIONAL WATERS IT'S CHANNEL 16. HOWEVER, ALL SHIPS CONTINUALLY MONITOR CHANNEL 16, SO IT CAN AND SHOULD BE USED AS A BACKUP IF YOU GET NO REPLY ON CHANNEL 13.

29. What would you say after you key the mike?

(10 Points) "SOUTHBOUND MERCHANT IN THE VICINITY OF BUOY WR87, THIS IS THE BLUE HULLED SAILING VESSEL OFF YOUR STARBOARD BOW, CHANNEL 13 OVER."

NOTE: COMMON DEFICIENCIES:

1. NAVY SLOOP IS MEANINGLESS TO ALL BUT THE BEST INFORMED BAY PILOTS. ON THE OPEN OCEAN, FEW WILL EVEN KNOW WHAT A SLOOP IS. USE BOAT COLOR AND "SAILING VESSEL" OR "SAILBOAT."

2. MANY OF YOU LSTED YOUR INTENTION TO REMAIN CLEAR IN THE CALL UP. WAIT FOR THE MERCHANT TO ACKNOWLEDGE, THEN MAKE PASSING ARRANGEMENTS. FOR EXAMPLE,

"BLUE HULLED SAILING VESSEL, THIS IS THE NISSAN ROVER, ROGER OVER."

"NISSAN ROVER, THIS IS SAILING VESSEL INTREPID. RECOMMEND A STARBOARD TO STARBOARD PASSAGE, I'LL REMAIN CLEAR OF YOR TRACK, OVER."

"ROGER, CAP'N. TWO WHISTLES, OUT."

ALSO, IF YOU REACH AN AGREEMENT BY RADIO, LOG IT IN THE DECK LOG!!!!

Extra Credit:

Explain the nomenclature associated with the navaids we've been using:

Holland Point Beacon The beacon labeled Fl G 2.5s 18ft 5M "1"

(5 POINTS)

FL	SINGLE FLASHING
G	GREEN LIGHT
2.5S	PERIOD OF LIGHT, 2.5 SECONDS BETWEEN FLASHES
18 FT	ELEVATION IN FEET – 18 FEET TALL
5M	CHARTED RANGE IS 5 NAUTICAL MILES
“1”	LABELED WITH THE NUMBER 1

Bloody Point Bar Light Bloody PT Bar – Fl 6s 54ft 7M HORN

(5 POINTS)

FL	SINGLE FLASHING
--	SINCE THERE’S NO COLOR CODE, IT’S A WHITE LIGHT
6S	PERIOD OF LIGHT, 6 SECONDS BETWEEN FLASHES
54 FT	ELEVATION IN FEET – 54 FEET TALL
7M	CHARTED RANGE IS 7 NAUTICAL MILES
HORN	IT HAS A HORN
BLOODY PT BAR	NAME OF LIGHTHOUSE

Thomas Point Light Thomas PT Shoal – Fl 5s 43ft 11M HORN

(5 POINTS)

FL	SINGLE FLASHING
--	SINCE THERE’S NO COLOR CODE, IT’S A WHITE LIGHT
5S	PERIOD OF LIGHT, 5 SECONDS BETWEEN FLASHES
43 FT	ELEVATION IN FEET – 43 FEET TALL
11M	CHARTED RANGE IS 11 NAUTICAL MILES
HORN	IT HAS A HORN
THOMAS PT	NAME OF LIGHT HOUSE

CHART WORK KEY

CHART PREPARATION

CHART COMPLIES WITH CHART PREP CHECKLIST, WITH SPECIFIC EMPHASIS ON:

SOUNDINGS
(20 Points) MIMIMUM SOUNDING LINE DRAWN APPROPRIATELY
(20 Points) AREAS WHERE NO SOUNDING DATUM BACKUP IS AVAILABLE

NOTE: MANY OF YOU CHOSE A LIGHT BLUE COLOR. IT WORKS ON THIS CHART, BUT I RECOMMEND YOU CHOOSE A DARK BLUE COLOR. THERE ARE MANY CHARTS WHOSE NAVY 44 NAVAGABLE WATERS ARE COMPLETELY SHADED IN BLUE, AND THE LIGHT BLUE COLOR WON'T WORK.

VISUAL NAV AIDS
(20 Points) VISUAL NAV AIDS CIRCLED, HIGHLIGHTED AND LABELED

NAV HAZARDS
(20 Points) NAV HAZARDS CIRCLED, HIGHLIGHTED AND LABELED

RADAR NAV AIDS
(20 Points) RADAR NAV AIDS TRIANGLED, HIGHLIGHTED AND LABELED

FOLD AND LABEL
(5 Points) CHART FOLDED AND LABELED APPROPRIATELY

PLOT, LABEL DR…

THE BIGGEST DEFICIENCY NOTED WAS CONSTRUCTION OF A THREE LINE OF POSITION FIX. THE LOPS **SHOULD NOT BE OBVIOUS** – IN FACT, THEY SHOULD BE INVISIBLE IF YOU STEP AWAY FROM THE CHART. TO ACCOMPLISH THIS, LIGHTLY DRAG YOUR PENCIL ALONG THE ROLLER PLOTTER AS YOU PLOT THE LOPS. THEN, EVALUATE THE TRIANGLE THUS FORMED TO DETERMINE THE FIX POSIITON. PUT A BOLD DOT ON THE CHART WHERE YOU THINK WE WERE. THEN CIRCLE IT, AND DRAW THE DR COURSE//SPEED VECTOR – DARKLY.

REMEMBER, WHEN YOU WANT TO KNOW WHERE YOU ARE YOU 'LL OFTEN BE TOPSIDE LOOKING DOWN THE COMPANIONWAY HATCH. YOU'RE IN THE SUN, AND THE CHART TABLE'S IN THE SHADE. WHAT DO YOU SEE? A SHARP, OBVIOUS DR C//S VECTOR??? OR, MORE LIKELY, A MYRIAD OF BOLD DARK CONSTRUCTION LINES POINTING TO ALL POINTS OF THE COMPASS???

1515 DR – NOTE: THESE POINTS ARE ACCOUNTED FOR IN WRITTEN

(20 Points) PLOTTED CORRECTLY
(5 Points) DR HALF CIRCLE
(5 Points) COURSE//SPEED VECTOR (INTO THE PAST…)
(5 Points) ANNOTATED: 1515
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1515 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 15 MINUTE INTERVALS
(5 Points) ANNOTATED: 1515
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1530 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 15 MINUTE INTERVALS
(5 Points) ANNOTATED: 1530
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1545 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 5 MINUTE INTERVALS
(5 Points) ANNOTATED: 1545
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1550 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 5 MINUTE INTERVALS
(5 Points) ANNOTATED: 1550
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1555 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 5 MINUTE INTERVALS
(5 Points) ANNOTATED: 1555
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6

1557 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1555 FIX
(5 Points) DR HALF CIRCLE
(5 Points) NEW COURSE//SPEED VECTOR
(5 Points) ANNOTATED: 1557
(5 Points) ANNOTATED: C – 080
(5 Points) ANNOTATED: S – 6
(5 Points) ANNOTATED "ERASE" PAST 1557 DR

1600 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1557 DR
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1600

1610 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1600 DR
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1610

1610 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 15 MINUTE INTERVALS
(5 Points) ANNOTATED: 1610
(5 Points) ANNOTATED: C – 080
(5 Points) ANNOTATED: S – 6

1615 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1610 FIX
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1615
(5 Points) SINGLE LINE OF POSITION PLOTTED
(5 Points) SINGLE LINE OF POSITION ANNOTATED: 1615

1625 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1610 FIX
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1615

1625 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 5 MINUTE INTERVALS
(5 Points) ANNOTATED: 1625
(5 Points) ANNOTATED: C – 080
(5 Points) ANNOTATED: S – 6

1630 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1625 FIX
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1630

1630 FIX

(5 Points) THREE LINES OF POSITION // LIGHTLY DRAWN
(5 Points) DOT WITH FIX CIRCLE
(5 Points) COURSE//SPEED VECTOR
(5 Points) DR TWO FIX INTERVALS AHEAD, AT 15 MINUTE INTERVALS
(5 Points) ANNOTATED: 1630
(5 Points) ANNOTATED: C – 080
(5 Points) ANNOTATED: S – 6

1640 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1630 FIX
(5 Points) DR HALF CIRCLE
(5 Points) NEW COURSE//SPEED VECTOR
(5 Points) ANNOTATED: 1640
(5 Points) ANNOTATED: C – 355
(5 Points) ANNOTATED: S – 6
(5 Points) ANNOTATED "ERASE" PAST 1640 DR

1645 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1640 DR
(5 Points) DR HALF CIRCLE
(5 Points) NEW COURSE//SPEED VECTOR
(5 Points) ANNOTATED: 1645

1700 DR

(5 Points) PLOTTED AT THE CORRECT DISTANCE FROM THE 1645 DR
(5 Points) DR HALF CIRCLE
(5 Points) ANNOTATED: 1700

U.S. NAVY STANDARD BEARING BOOK

TABULAR DATA FILLED IN PER ATTACHED KEY
EACH BOX – 5 POINTS
SOUNDING DATUM – UNITS??? – 30 POINTS