

U.S.C.G. Merchant Marine Exam

Master Less than 500-1600 Gross Registered Tons

Q124 Navigation General – Oceans

(Sample Examination)

Choose the best answer to the following Multiple-Choice questions.

1. Which condition(s) is(are) necessary for the formation of dew?

- A. Available nuclei in the air
- B. Moderate winds
- C. Clear skies
- D. A surface warmer than the dew point of the air

Correct answer: C

2. The Brazil Current flows in which general direction?

- A. Northwesterly
- B. Southeasterly
- C. Northerly
- D. Southwesterly

Correct answer: D

3. What is the geographic longitude of a body whose GHA is $232^{\circ}27'$?

- A. $52^{\circ}27'E$
- B. $127^{\circ}33'E$
- C. $61^{\circ}52'W$
- D. $61^{\circ}52'E$

Correct answer: B

4. The expression "first Magnitude" is usually used to refer only to bodies of which magnitude?

- A. 0.5 and greater
- B. 1.0 and greater
- C. 1.25 and greater
- D. 1.5 and greater

Correct answer: D

5. Which is a characteristic of anticyclones?

- A. Gustiness and continuous precipitation
- B. Dry, fair weather
- C. Overcast skies
- D. High winds and cloudiness

Correct answer: B

6. Why is the wind velocity higher in the dangerous semicircle of a tropical cyclone?

- A. The recurvature effect
- B. The direction of circulation and forward motion of the storm
- C. The extension of the low-pressure ridge
- D. The pressure gradient and forward motion of the storm

Correct answer: D

7. What is NOT an advantage of the rhumb line track over a great circle track?

- A. Does not require constant course changes
- B. Negligible increase in distance on east-west courses near the equator
- C. Easily plotted on a Mercator chart
- D. Plots as a straight line on Lambert conformal charts

Correct answer: D

8. The velocity of a rotary tidal current will be decreased when the Moon is at which phase?

- A. New
- B. Full
- C. Perigee
- D. Apogee

Correct answer: D

9. For a well-made and well-maintained sextant, the maximum value of which correction is usually so small that it can be ignored?

- A. Dip correction
- B. Personal correction
- C. Phase
- D. Instrument correction

Correct answer: D

10. When using a recording depth finder in the open ocean, what phenomena is most likely to produce a continuous trace that may not be from the actual ocean bottom?

- A. Echoes from a deep scattering layer
- B. Poor placement of the transducer on the hull
- C. Echoes from schools of fish
- D. Multiple returns reflected from the bottom to the surface and to the bottom again

Correct answer: A

11. When does a current perpendicular to a vessel's track have the greatest effect on the vessel's course made good?

- A. In shallow water
- B. In deep water
- C. At low vessel speeds
- D. At high vessel speeds

Correct answer: C

12. If the gyrocompass error is east, what describes the error and the correction to be made to gyrocompass headings to obtain true headings?
- A. The readings are too high (large numerically), and the amount of the error must be added to the compass to obtain true
 - B. The readings are too high and the amount of the error must be subtracted from the compass to obtain true
 - C. The readings are too low and the amount of the error must be subtracted from the compass to obtain true
 - D. The readings are too low (small numerically) and the amount of the error must be added to the compass to obtain true

Correct answer: D

13. On the pole side of the high-pressure belt in each hemisphere, the pressure diminishes. The winds along these gradients are diverted by the Earth's rotation toward the east. What is the name of these winds?
- A. The southeast trades
 - B. The geostrophic winds
 - C. The northeast trade winds
 - D. The prevailing westerlies

Correct answer: D

14. Which term is given to the dense black cumulonimbus clouds surrounding the eye of a hurricane?
- A. Wall clouds
 - B. Funnel clouds
 - C. Spiral rainbands
 - D. Cyclonic spirals

Correct answer: A

15. Ascending and descending air masses with different temperatures is part of an important heat transmitting process in our atmosphere. Which term is given to this process?
- A. Radiation
 - B. Barometric inversion
 - C. Convection
 - D. Conduction

Correct answer: C

16. You are sailing south on the Intracoastal Waterway (ICW) when you sight a red nun buoy with a yellow square painted on it. Which statement is TRUE?
- A. ICW traffic should not proceed beyond the buoy unless the crossing waterway is clear of all traffic.
 - B. The buoy is off station and should be ignored as a navigational mark.
 - C. You should leave the buoy to port.
 - D. The waterway in that area has shoaled and the available depth of water is less than the project depth.

Correct answer: C

17. A syphon cell is a part of which instrument?

- A. A barograph
- B. A hygrometer
- C. A maximum thermometer
- D. A thermograph

Correct answer: A

18. The range of tide is the _____.

- A. duration of time between the high and low tide
- B. distance the tide moves out from the shore
- C. difference between the heights of high and low tide
- D. maximum depth of the water at high tide

Correct answer: C

19. Which is TRUE of an alternating light?

- A. It is used as a replacement for another light
- B. It shows a light with varying lengths of the lighted period
- C. It marks an alternate lesser used channel
- D. It shows a light that changes color

Correct answer: D

20. A sidereal day is shorter than a solar day. What is the reason for this difference?

- A. The use of different reference points
- B. The precession of the equinoxes
- C. Irregularities in the daily rotational rate of the Sun
- D. The space motion of the solar system

Correct answer: A

21. Which is TRUE of Raster-scan chart data?

- A. It is a digitized "picture" of a chart in one format and one layer
- B. It is the only format recognized by IMO/IHO
- C. It is organized into many separate files
- D. It is composed of files that are smaller than vector files

Correct answer: A

22. What is the geographic longitude of a body whose GHA is $215^{\circ}15'$?

- A. $35^{\circ}15'W$
- B. $35^{\circ}15'E$
- C. $144^{\circ}45'W$
- D. $144^{\circ}45'E$

Correct answer: D

23. At about GMT 1436, on 3 December, the lower limb of the Moon is observed with a sextant having an index error of 2.5' on the arc. The height of eye is 32 feet. The sextant altitude (hs) is 3°38.8'. What is the observed altitude?

- A. Ho 4°18.6'
- B. Ho 4°29.1'
- C. Ho 4°36.3'
- D. Ho 4°42.2'

Correct answer: B

24. While steering a course of 150°T, you wish to observe a body for a latitude check. What would the azimuth have to be?

- A. 240°T
- B. 000°T
- C. 150°T
- D. 090°T

Correct answer: B

25. While proceeding up a channel on course 010° per gyrocompass, you notice a pair of range lights in alignment with the masts of your vessel when viewed forward. A check of the chart shows the range to be 009°T and the variation to be 15°W. If the ship's course is 026°psc, what is the deviation for the present heading?

- A. 2°W
- B. 2°E
- C. 1°W
- D. 1°E

Correct answer: A

26. You are steering 173°T, and a light is picked up dead ahead at a distance of 13.9 miles at 0054. You change course to pass the light 4.5 miles off abeam to port. If you are making 21 knots, what is your ETA at the position 4.5 miles off the light?

- A. 0125
- B. 0134
- C. 0131
- D. 0122

Correct answer: C

27. Where would you expect to find channels marked with the IALA-A Buoyage System?

- A. Republic of Korea
- B. Australia
- C. the Philippines
- D. Chile

Correct answer: B

28. Buoys are marked with reflective material to assist in their detection by searchlight. Which statement is TRUE?

- A. A safe-water buoy will display red and white vertical stripes of reflective material.
- B. A special-purpose mark will display either red or green reflective material to agree with its shape.
- C. All reflective material is white because it is the most visible at night.
- D. A preferred-channel buoy displays either red or green reflective material to agree with the top band of color.

Correct answer: D

29. Cyclones tend to move _____.

- A. perpendicular to the line of the cold front
- B. parallel to the isobars in their warm sectors
- C. perpendicular to the isobars in their warm sectors
- D. parallel to the line of the cold front

Correct answer: B

30. All straight lines represent great circle tracks on a chart based on which projection?

- A. Mercator projection
- B. Gnomonic projection
- C. Polyconic projection
- D. Orthographic projection

Correct answer: B

31. A pilot chart does NOT contain information about which item?

- A. Magnetic variation
- B. Average limits of field ice
- C. Average wind conditions
- D. Tidal currents

Correct answer: D

32. If you were sailing in the North Pacific and were interested in the ice and iceberg limits, where could you find this information?

- A. Notice to Mariners
- B. Coast Pilot
- C. Pilot Chart
- D. None of the above

Correct answer: C

33. The dew point is reached when which condition occurs?

- A. The air becomes saturated with water vapor
- B. The relative humidity reaches 50%
- C. The temperature of the air equals the temperature of the seawater
- D. The atmospheric pressure is 14.7 lbs. per square inch

Correct answer: A

34. Where is the West Wind Drift located?

- A. On each side of the Equatorial Current
- B. In the North Atlantic between Greenland and Europe
- C. In the South Pacific near 5°S
- D. Near 60°S

Correct answer: D

35. Which term is given to the angle that is measured westward from the first point of Aries to the hour circle of the body along the celestial equator?

- A. Greenwich sidereal angle
- B. Local sidereal time
- C. Sidereal hour angle
- D. Azimuth angle

Correct answer: C

36. What is magnetic dip a measurement of?

- A. The angle between the lubber's line and true north
- B. The angle between the compass heading and the magnetic heading
- C. The angle between the geographic pole and the magnetic pole
- D. The angle between the horizontal and the magnetic line of force

Correct answer: D

37. You are underway in an area where the charted depth is 8 fathoms. You compute the height of tide to be -4.0 feet. The draft of your vessel is 5.0 feet (1.52 meters). You determine the depth of the water beneath your keel to be _____.

- A. 39 feet (11.9 meters)
- B. 43 feet (13.1 meters)
- C. 47 feet (14.3 meters)
- D. 57 feet (17.4 meters)

Correct answer: A

38. Which is TRUE concerning a first magnitude star?

- A. It is 2.5 times as bright as a second magnitude star
- B. It is 3 times as bright as a second magnitude star
- C. It is 5 times as bright as a second magnitude star
- D. It is 10 times as bright as a second magnitude star

Correct answer: A

39. If several navigational lights are visible at the same time, each one may be positively identified by checking all of the following EXCEPT what against the Light List?

- A. Period
- B. Rhythm
- C. Color
- D. Intensity

Correct answer: D

40. Which is TRUE when a high-pressure system is centered north of your vessel in the Northern Hemisphere?

- A. The winds should be from the southwest at your position
- B. You should experience hot, moist, clear weather
- C. The winds should be brisk
- D. The wind direction is generally easterly

Correct answer: D

41. Under the IALA cardinal system, what does a mark with a quick white light showing 6 flashes followed by one long flash indicate in relation to the location of the safest water?

- A. Safe water is on the south side of the mark
- B. Safe water is on the east side of the mark
- C. Safe water is on the north side of the mark
- D. Safe water is on the west side of the mark

Correct answer: A

42. Which clouds are described as high clouds, composed of small white flakes or scaly globular masses, and often banded together to form a "mackerel sky"?

- A. Cumulonimbus
- B. Altostratus
- C. Cirrocumulus
- D. Cirrus

Correct answer: C

43. Which condition exists at the summer solstice in the Northern Hemisphere?

- A. The Northern Hemisphere is having short days and long nights.
- B. The Southern Hemisphere is having winter.
- C. The north polar regions are in continual darkness.
- D. The Sun shines equally on both hemispheres.

Correct answer: B

44. The true course between two points is 057°. Your gyrocompass has an error of 3° east and you make an allowance of 1° leeway for a north-northwest wind. Which gyro course should be steered to make the true course good?

- A. 059°pgc
- B. 053°pgc
- C. 056°pgc
- D. 060°pgc

Correct answer: B

45. Your vessel is located at position I on the weather map in illustration D013NG below. You should experience which weather condition?

- A. Steady precipitation
- B. Clear skies with warm temperatures
- C. Overcast skies with rising temperature
- D. Thundershowers

Correct answer: D

46. You swung ship and compared the magnetic compass against the gyrocompass to find deviation. Gyro error is 2°E. The variation is 8°W. Find the deviation on a gyro heading of 037°.

| NP-0124 | | |
|---------|---|------|
| HEADING | | |
| PSC | | PGC |
| 030.5° | - | 020° |
| 061.5° | - | 050° |
| 092.0° | - | 080° |
| 122.5° | - | 110° |
| 152.0° | - | 140° |
| 181.0° | - | 170° |
| 210.0° | - | 200° |
| 239.5° | - | 230° |
| 269.0° | - | 260° |
| 298.0° | - | 290° |
| 327.5° | - | 320° |
| 358.5° | - | 350° |

- A. 1.0°W
- B. 1.5°W
- C. 1.5°E
- D. 2.0°E

Correct answer: A

47. A great circle crosses the equator at 17°W. It will also cross the equator at what other longitude?

- A. 173°W
- B. 17°E
- C. 163°E
- D. 117°W

Correct answer: C

48. What weather change accompanies the passage of a cold front in the Northern Hemisphere?

- A. Steady dropping of barometric pressure
- B. A line of cumulonimbus clouds
- C. Wind shift from northeast clockwise to southwest
- D. Steady precipitation, gradually increasing in intensity

Correct answer: B

49. Which is most commonly associated with fog?

- A. An anticyclone
- B. A low-pressure area
- C. A cold front in the spring
- D. A warm front at night

Correct answer: D

50. You are running parallel to the coast and plotting running fixes using bearings of the same object. You are making more speed than assumed for the running fix. In relation to the position indicated by the fix you will be _____.

- A. farther from the coast
- B. on the track line ahead of the fix
- C. closer to the coast
- D. on the track line behind the fix

Correct answer: A

51. Coral atolls, or a chain of islands at right angles to the radar beam, may show as a long line rather than as individual targets. What causes this distortion?

- A. Limitations on range resolution
- B. The pulse length of the radar
- C. The effects of beam width
- D. The multiple-target resolution factor

Correct answer: C

52. The navigational triangle uses parts of two systems of coordinates, one of which is the celestial equator system, which is the other system?

- A. Ecliptic system
- B. Astronomical system
- C. Horizon system
- D. Terrestrial system

Correct answer: C

53. Your vessel has changed course and is heading 285°T, you are on the charted range and it appears as in illustration D048NG below.

After several minutes the range appears as in illustration D047NG below and your heading is still 285°T. What does this indicate?

- A. A north-setting current
- B. A course made good to the left of the DR track
- C. Leeway caused by a NE'ly wind
- D. A south-setting current

Correct answer: A

54. Which is the dividing meridian between zone descriptions -4 and -5?

- A. 75°00'E
- B. 60°00'W
- C. 60°00'E
- D. 67°30'E

Correct answer: D

55. Which term defines the ocean bottom that extends from the shoreline out to an area where there is a marked change in slope to a greater depth?

- A. Abyssal plain
- B. Borderland
- C. Offshore terrace
- D. Continental shelf

Correct answer: D

56. Which is TRUE concerning Spring tides?

- A. Spring Tides only occur in the spring of the year
- B. Spring Tides are always unpredictable
- C. Spring Tides have lows lower than normal and highs higher than normal
- D. Spring Tides have lows higher than normal and highs lower than normal

Correct answer: C

57. A HYDROLANT warning would normally be sent for all of the following EXCEPT _____.

- A. The presence of a large unwieldy tow in congested offshore water
- B. A report of a ship in distress in mid-ocean
- C. Unexploded ordinance in ocean waters at a depth of 78 fathoms (143 meters)
- D. Extinguishment of Robbins Reef Light in New York City's Upper Bay

Correct answer: D

58. Which statement about the Flinders bar of the magnetic compass is CORRECT?

- A. It compensates for error caused by the heeling of a vessel in rough seas
- B. It is only needed in equatorial waters if the vessel is on a cardinal heading
- C. It compensates for quadrantal deviation in horizontal hard iron
- D. It compensates for the error caused by the vertical component of the Earth's magnetic field

Correct answer: D

59. A NAVAREA warning carries the following number; 1986/87 (11). Which statement is TRUE?

- A. The warning was issued in 1986; the 87th sequentially numbered warning and broadcast 11 times.
- B. The subject of this warning first appeared in 1986; this warning is in 1987 and is the eleventh on this topic.
- C. This warning is valid in 1986 and 1987 and is the eleventh two-year warning.
- D. This is warning number 1986 issued in 1987, and it affects sub-region 11.

Correct answer: D

60. If a sound signal is emitted from the oscillator of a fathometer, and two seconds elapse before the returning signal is picked up, what depth of water is indicated?

- A. 1048 fathoms
- B. 1248 fathoms
- C. 824 fathoms
- D. 1648 fathoms

Correct answer: C

61. Which statement about gyrocompass error is TRUE?

- A. Any error shown by a gyro repeater will be the same as the error of the master compass.
- B. The amount of the error and the sign will generally be the same on all headings.
- C. Any error will remain constant unless the compass is stopped and restarted.
- D. The sign (E or W) of the error will change with different headings of the ship.

Correct answer: B

62. Which publication lists Class I and II private aids to navigation in or along navigable waters of the United States?

- A. Sailing Directions
- B. Aids to Navigation Manual
- C. List of Private Aids
- D. Light List

Correct answer: D

63. Under the IALA Buoyage System, which topmark shown in illustration D023NG below will be displayed on a safe watermark?

- A. A
- B. B
- C. C
- D. D

Correct answer: A

64. You are on course 042°T. To check the course of your vessel you should observe a celestial body on which bearing?

- A. 090°
- B. 132°
- C. 180°
- D. 222°

Correct answer: B

65. Barometers are calibrated at which standard temperature?

- A. 0°F
- B. 32°F
- C. 60°F
- D. 70°F

Correct answer: B

66. You are steering a southerly course, and you note that the chart predicts an easterly current. Without considering wind, how may you allow for the set?

- A. Decrease your speed
- B. Head your vessel slightly to the right
- C. Increase your speed
- D. Head your vessel slightly to the left

Correct answer: B

67. When a dual-purpose marking is used, how should the mariner following the Intracoastal Waterway be guided?

- A. By the shape of the yellow mark
- B. By the shape of the aid
- C. By the color of the top band
- D. By the color of the aid

Correct answer: A

68. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ship's foghorn 6 seconds after the signal was sounded. What is the distance to the shore?

- A. 1100 yards
- B. 900 yards
- C. 1000 yards
- D. 1200 yards

Correct answer: A

69. The winds of the "roaring forties" are strongest near which latitude?

- A. 50°S
- B. 40°N
- C. 50°N
- D. 40°S

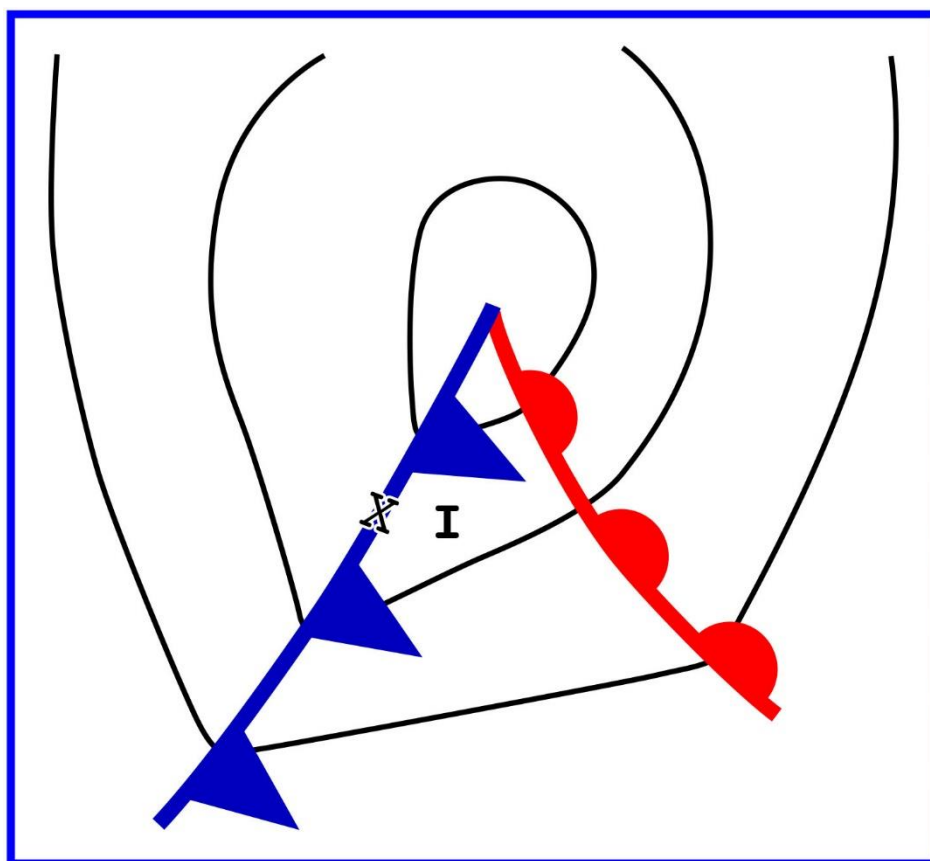
Correct answer: A

70. You take a bearing of 086° of a lighthouse. What bearing of another object would give the best fix?

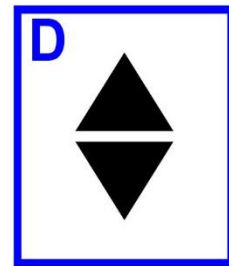
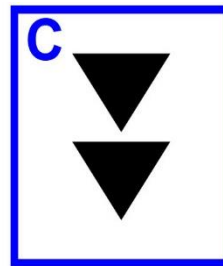
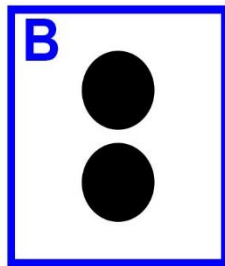
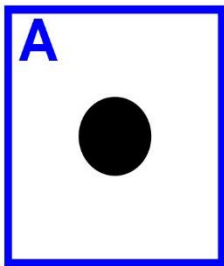
- A. 000°
- B. 066°
- C. 112°
- D. 271°

Correct answer: A

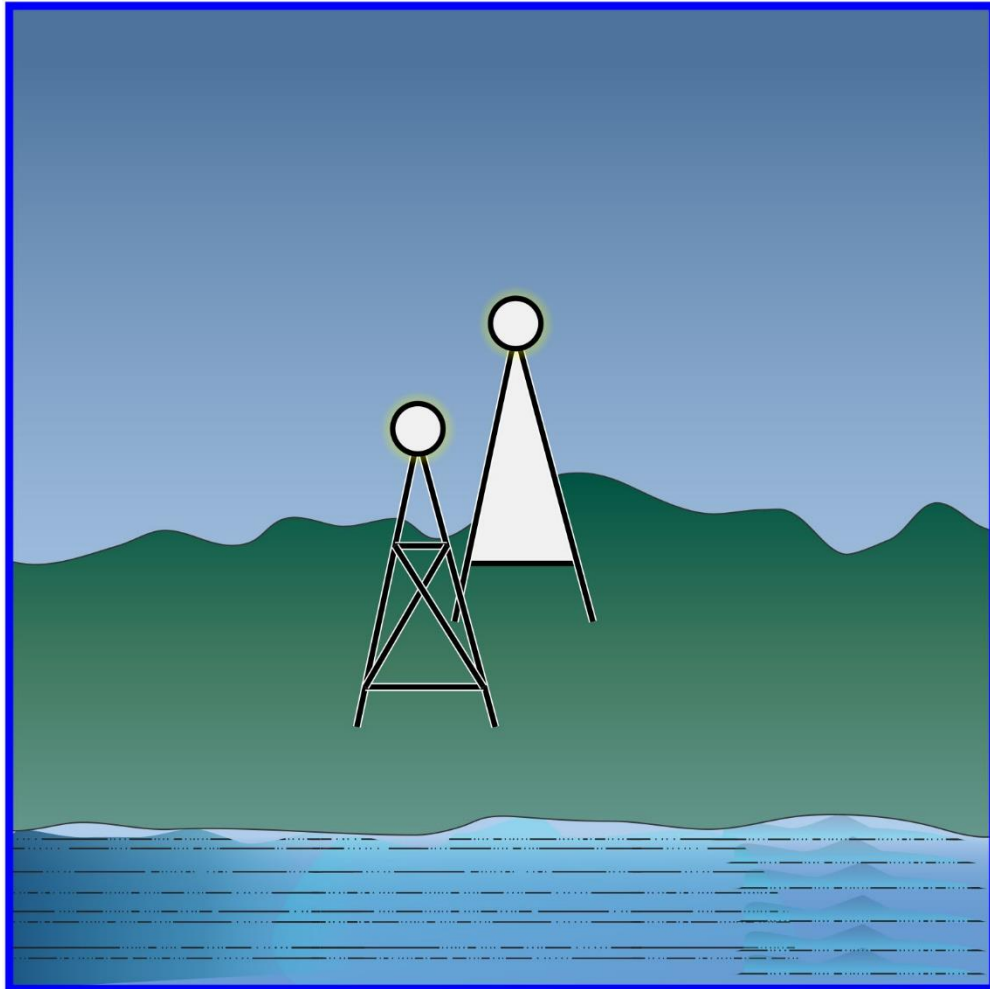
D013NG



D023NG

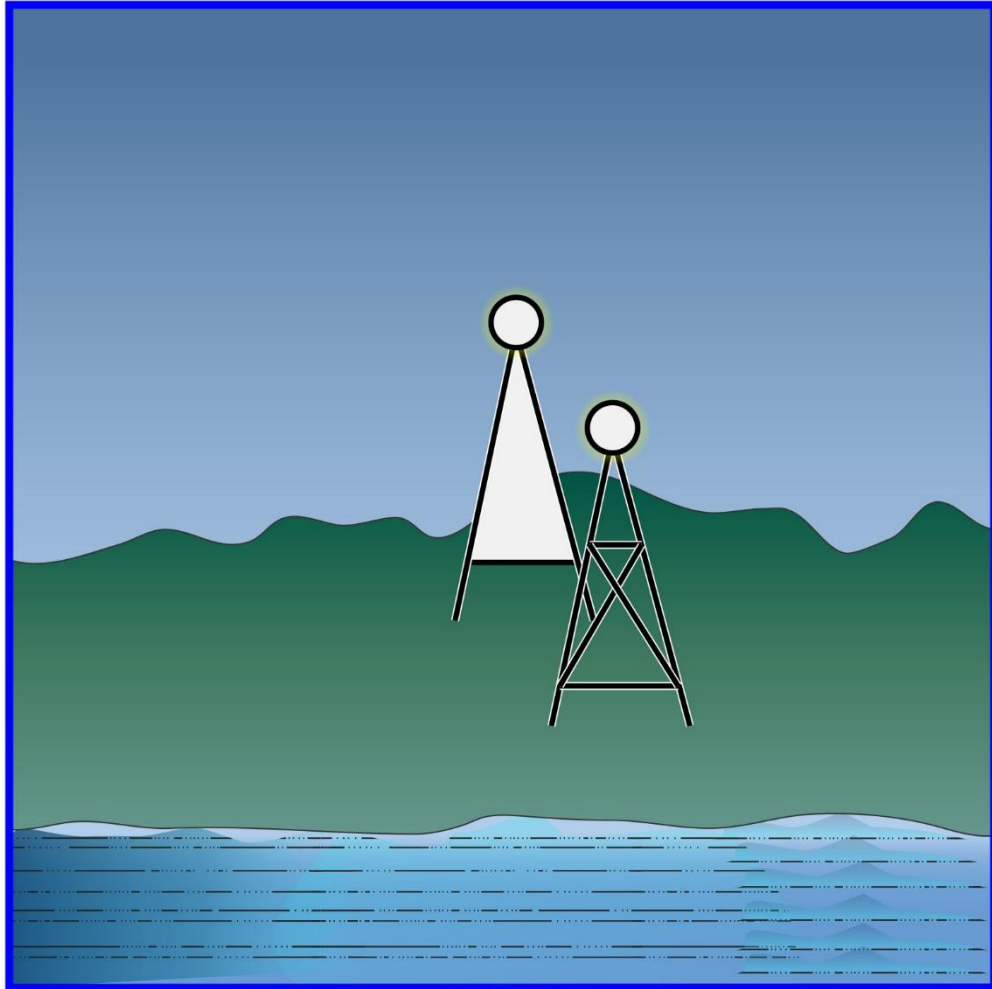


D047NG



Adapted for testing purposes only from BOWDITCH, The American Practical Navigator,
An Epitome of Navigation, 2002 Bicentennial Edition
Copyright © 2002 by The National Imagery and Mapping Agency, U. S. Government
Further reproduction prohibited without permission

D048NG



Adapted for testing purposes only from BOWDITCH, The American Practical Navigator,
An Epitome of Navigation, 2002 Bicentennial Edition
Copyright © 2002 by The National Imagery and Mapping Agency, U. S. Government
Further reproduction prohibited without permission