

U.S.C.G. Merchant Marine Exam
Second/Third Mate of Unlimited Tonnage
Q113 Navigation General – Near Coastal
(Sample Examination)

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

1. Which is the only cylindrical chart projection widely used for navigation?

- A. Azimuthal
- B. Gnomonic
- C. Mercator
- D. Lambert conformal

Correct answer: C

2. When compared to air temperature, which factor is most useful in predicting fog?

- A. Absolute humidity
- B. Barometric pressure
- C. Dew point
- D. Vapor pressure

Correct answer: C

3. The velocity of the apparent wind can be more than the true wind, and come from the same direction, if certain conditions are present. One condition is that the _____.

- A. true wind must be from dead astern
- B. true wind must be from dead ahead
- C. ship's speed must be less than the true wind velocity
- D. true wind velocity must be faster than the ship's speed

Correct answer: B

4. You are on course $344^{\circ}T$ and take a relative bearing of a lighthouse of 090° . What is the true bearing to the lighthouse?

- A. 016°
- B. 074°
- C. 254°
- D. 270°

Correct answer: B

5. Which term describes a light, feathery deposit of ice by sublimation of water vapor directly into the crystalline form on objects whose temperatures are below freezing?

- A. Snow
- B. Frost
- C. Glaze
- D. Dew

Correct answer: B

6. The owner or Master of a towing vessel must ensure that each person that directs and controls the movement of the vessel knows all of the following EXCEPT _____.
- A. the effects of maneuvering on the vessel and its tow
 - B. the ownership of the vessel(s) being towed
 - C. how to apply variation and deviation to readings from a magnetic compass
 - D. the speed and direction of any current for the area being transited

Correct answer: B

7. To find the specific phase characteristic of a lighthouse on a sound of the United States you would use which reference?
- A. Light List
 - B. American Practical Navigator
 - C. Nautical Chart Catalog
 - D. U.S. Coast Pilot

Correct answer: A

8. Barometer readings in weather reports are given in terms of pressure at which reference location?
- A. Sea level
 - B. The weather station
 - C. Washington, D.C.
 - D. The broadcasting station

Correct answer: A

9. Buoys which only mark the left or right side of the channel will never exhibit a light with which characteristic?
- A. Quick flashing
 - B. Composite group flashing
 - C. Equal interval (isophase)
 - D. Flashing

Correct answer: B

10. The climate of the eastern coast of the Gulf of America _____.
- A. has a Mediterranean type of climate
 - B. varies from warm to subtropical
 - C. has an east coast marine type of climate
 - D. is humid and subtropical throughout the year

Correct answer: B

11. What wind reverses directions seasonally?
- A. Jet stream
 - B. Hooked trades
 - C. Monsoon winds
 - D. Secondary winds

Correct answer: C

12. A ship is on course 195° at a speed of 15 knots. The apparent wind is from 40° on the port bow, speed 30 knots. What are the direction and speed of the true wind?
- A. 068°T, 30 knots
 - B. 127°T, 21 knots
 - C. 263°T, 42 knots
 - D. 292°T, 42 knots

Correct answer: B

13. Your vessel is entering port when you change course and steady up on a range with the lights in line. After a few minutes you observe the range lights as shown in illustration D047NG below. How should your heading be altered?
- A. Left, and when the range lights are in line again, steer to keep them in line fine on the starboard bow
 - B. Right, and when the range lights are in line again, steer to keep them dead ahead
 - C. Left, and when the range lights are in line again, resume your original heading
 - D. Right, and when the range lights are in line again, steer to keep them in line fine on the port bow

Correct answer: A

14. What does a buoy with a composite group-flashing light indicate?
- A. Dredging area
 - B. Fish net area
 - C. Bifurcation (channel junction)
 - D. Anchorage area

Correct answer: C

15. You have replaced the chart paper in the course recorder. Which statement is TRUE?
- A. Test the electrical gain to the thermograph pens
 - B. Set the zone pen to the far right of the paper
 - C. Adjust the chart paper to indicate GMT
 - D. Line the course pen up on 0 degree mark

Correct answer: C

16. On a chart, the characteristic of the light on a lighthouse is shown as flashing white with a red sector. Which is TRUE of the red sector?
- A. It indicates a danger area
 - B. It is used to identify the characteristics of the light
 - C. It indicates the limits of the navigable channel
 - D. It serves no significant purpose

Correct answer: A

17. What is a system of reservoirs and connecting tubes in a gyro compass called?
- A. The spider element
 - B. The gyrotron
 - C. The mercury ballistics
 - D. The rotor

Correct answer: C

18. Which symbol represents a 10-fathom curve?

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

Correct answer: B

19. Prevailing winds between 30°N and 60°N latitude are from which direction?

- A. West
- B. East
- C. South
- D. North

Correct answer: A

20. You are using a radar in which your own ship is shown at the center, and the heading flash always points to 0°. If bearings are measured in relation to the flash, what type of bearings are produced?

- A. Relative
- B. Magnetic
- C. Compass
- D. True

Correct answer: A

21. In the North Sea area, you sight a buoy with a quick light showing 3 flashes every 10 seconds. Which topmark in illustration D030NG below would be fitted to this buoy under the IALA Buoyage Systems?

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

Correct answer: D

22. Which is TRUE as the temperature of an air mass decreases?

- A. The relative humidity increases
- B. The absolute humidity decreases
- C. The specific humidity decreases
- D. The dew point rises

Correct answer: A

23. You take a bearing of 142° and 259° of two objects. Which bearing of a third object will give the best fix?

- A. 234°
- B. 238°
- C. 201°
- D. 081°

Correct answer: C

24. What is the standard atmospheric pressure in millibars?

- A. 760.0
- B. 938.9
- C. 1000.0
- D. 1013.2

Correct answer: D

25. Which instrument is designed to maintain a continuous record of atmospheric pressure?

- A. A mercurial barometer
- B. A thermograph
- C. A barograph
- D. An aneroid barometer

Correct answer: C

26. When trying to sight a lighthouse you notice a glare from a town in the background. How does this affect the range at which the light may be sighted?

- A. Increased slightly due to extra lighting
- B. Considerably reduced and difficult to distinguish
- C. Increased if the light is red or green due to contrast with the glare
- D. Unchanged

Correct answer: B

27. Where would you expect to find climatological and meteorological tables for the Gulf Coast area?

- A. In any Coast Pilot volume
- B. In the publication entitled Radio Aids to Navigation
- C. Only at the National Weather Service office
- D. In the back of Coast Pilot #5

Correct answer: D

28. An orange and white buoy with a rectangle on it displays what information?

- A. distances
- B. locations
- C. directions
- D. All of the above

Correct answer: D

29. Which is TRUE concerning the flow of air around an anticyclone in the Southern Hemisphere?

- A. Air flows in a counterclockwise and inward direction
- B. Air flows in a clockwise and inward direction
- C. Air flows in a clockwise and outward direction
- D. Air flows in a counterclockwise and outward direction

Correct answer: D

30. In the IALA Buoyage System, what do buoys with alternating red and green horizontal bands indicate?

- A. Spoil grounds
- B. The preferred channel
- C. Fishing areas
- D. An isolated danger

Correct answer: B

31. The spin axis of a gyroscope tends to remain fixed in space in the direction in which it is started. How does this gyroscope become north seeking so that it can be used as a compass?

- A. By taking advantage of the property of gyroscopic inertia
- B. The rotation of the Earth (Earth rate) automatically aligns the gyroscope with north, except for speed errors
- C. By starting the compass with the spin axis in a north/south position
- D. By mechanically or electrically applying forces to precess the gyroscope

Correct answer: D

32. Which scale is considered a harbor chart?

- A. not more than 1:25,000
- B. 1:35,000
- C. not less than 1:500,000
- D. 1:150,000

Correct answer: B

33. A storm's track is characterized by all of the following except _____.

- A. the speed at which the storm is moving
- B. the direction in which the storm is moving
- C. the direction the storm has come from
- D. the path taken by the storm

Correct answer: A

34. Which radar control is used to reduce sea return at close ranges?

- A. Gain control
- B. Pulse length control
- C. Sensitivity time control
- D. Fast time constant

Correct answer: C

35. You are in a buoyed channel at night and pass a lighted buoy with an irregular characteristic. Who should you report this to?

- A. The harbor master
- B. The Coast Guard
- C. The Corps of Engineers
- D. The National Ocean Service

Correct answer: B

36. Your ship is proceeding on course $320^{\circ}T$ at a speed of 25 knots. The apparent wind is from 30° off the starboard bow, speed 32 knots. What is the relative direction, true direction and speed of the true wind?
- A. Relative 80° , true $060^{\circ}T$, 15.2 knots
 - B. Relative 40° , true $080^{\circ}T$, 16.4 knots
 - C. Relative 80° , true $040^{\circ}T$, 16.2 knots
 - D. Relative 60° , true $040^{\circ}T$, 18.6 knots

Correct answer: C

37. When within 300 miles of a named tropical storm or hurricane, it is standard practice to send weather reports at which time interval?
- A. Every 3 hours
 - B. Every 8 hours
 - C. Every hour
 - D. Every 6 hours

Correct answer: A

38. The chart indicates the variation was $3^{\circ}45'W$ in 1988, and the annual change is decreasing $6'$. If you use the chart in 1991 how much variation should you apply?
- A. $3^{\circ}27'W$
 - B. $3^{\circ}27'E$
 - C. $4^{\circ}03'W$
 - D. $4^{\circ}03'E$

Correct answer: A

39. In illustration D051NG below, why was the position labeled "E" plotted?
- A. A dead reckoning position is plotted within a half-hour of each course change
 - B. The vessel's position was fixed at 1145
 - C. A dead reckoning position is plotted for each speed change
 - D. The position is a running fix

Correct answer: C

40. A List of Lights entry (L FI) is a single flashing light which shows a long flash of not less than which duration?
- A. 1.0 second duration
 - B. 1.5 seconds duration
 - C. 2.0 seconds duration
 - D. 3.0 seconds duration

Correct answer: C

41. You will find daily information about the duration of slack water in a port on the Atlantic Coast in which publication?
- A. Sailing Directions
 - B. Tidal Current Tables
 - C. Tide Tables
 - D. American Practical Navigator

Correct answer: B

42. The apparent wind's speed can be zero, but only when two conditions are present. One condition is that the true _____.
- A. wind's speed equals the ship's speed
 - B. wind must be on the beam
 - C. wind must be from dead ahead
 - D. wind's speed must be zero

Correct answer: A

43. You are underway on course 050°T and your maximum speed is 12 knots. The eye of a hurricane bears 080°T, 100 miles from your position. The hurricane is moving towards 265°T at 22 knots. What course should you steer at 12 knots to have the maximum CPA?
- A. 219°
 - B. 208°
 - C. 190°
 - D. 199°

Correct answer: B

44. Which towing vessel(s) is/are exempt from carrying radar?
- A. A vessel used solely in a limited area, such as a barge fleeting area
 - B. A vessel exempted, in writing, by the Captain of the Port
 - C. A vessel used solely for pollution response or assistance towing
 - D. All of the above

Correct answer: D

45. The shoreline shown on nautical charts of areas affected by large tidal fluctuations is usually the line of mean _____.
- A. lower low water
 - B. high water
 - C. low water
 - D. tide level

Correct answer: B

46. In the Northern Hemisphere, an observer at point II in illustration D014NG below, should experience a wind shift from what direction?
- A. northeast, clockwise to west-southwest
 - B. east, counterclockwise to south-southwest
 - C. northeast, counterclockwise to northwest
 - D. southwest, clockwise to northwest

Correct answer: D

47. What is the approximate geographic range of Southwest Ledge Light, Connecticut, if your height of eye is 32 feet (9.8 meters)? Refer to "Reprints from the LIGHT LISTS AND COAST PILOTS".
- A. 15.5nm
 - B. 13.4nm
 - C. 8.7nm
 - D. 6.9nm

Correct answer: A

48. Which term is given to a radar display which is oriented, so that north is always at the top of the screen?
- A. Relative display
 - B. Composite display
 - C. Unstabilized display
 - D. Stabilized display

Correct answer: D

49. What is the approximate geographic range of Fenwick Island Light, Delaware, if your height of eye is 42 feet (12.8 meters)? Refer to "Reprints from the LIGHT LISTS AND COAST PILOTS".
- A. 15.4 nm
 - B. 18.3 nm
 - C. 13.1 nm
 - D. 10.3 nm

Correct answer: B

50. The Light List indicates that a dayboard is a type MR. You should take which action?
- A. Check to enter the correct channel at this junction daymark
 - B. Look for the other dayboard forming the range
 - C. Leave it on either side
 - D. Look for an all red daymark

Correct answer: C

51. Which type of weather could you expect soon after seeing "hook" or "comma" shaped cirrus clouds?
- A. Clearing with the approach of a cold front
 - B. Continuing fog and rain
 - C. The formation of a tropical depression
 - D. Rain with the approach of a warm front

Correct answer: D

52. How can you follow the approach of a dangerous cyclonic storm?
- A. By a newspaper, a weather map, a weather fax, or a weather forecast
 - B. Utilizing the National Weather Service Observing Handbook No.1, Marine Surface Observations
 - C. Review the Coast Pilot or Sailing Directions
 - D. By monitoring the change in the sea temperature

Correct answer: A

53. Which of the symbols shown in illustration D018NG below represents a warm front?
- A. A
 - B. B
 - C. C
 - D. D

Correct answer: C

54. The symbol which appears beside a light on a chart reads "Gp Fl R (2) 10 sec 160 ft 19M". Which characteristic describes the light?
- A. It is visible 10 miles.
 - B. It has a radar reflector.
 - C. Its distinguishing number is "19M".
 - D. None of the above

Correct answer: D

55. Mean lower low water is the reference plane used for which measurements?
- A. The heights above water for lights, mountains, etc.
 - B. The water depths on the U.S. east coast only
 - C. All vertical measurements
 - D. The soundings on the U.S. east and west coasts

Correct answer: D

56. You are sailing south on the Intracoastal Waterway (ICW) when you sight a red nun buoy with a yellow triangle painted on it. Which statement is TRUE?
- A. The yellow triangle identifies a sharp turn (over 60°) in the channel.
 - B. Geometric symbols such as squares and triangles replace letters and numbers on ICW aids to navigation.
 - C. This is an information or regulatory buoy that also has lateral significance.
 - D. The ICW and another waterway coincide in this geographical area.

Correct answer: D

57. In which country would you expect the channels to be marked with the IALA-B Buoyage System?
- A. Morocco
 - B. Peru
 - C. Poland
 - D. Saudi Arabia

Correct answer: B

58. 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 high vessel speeds
- D. At low vessel speeds

Correct answer: D

59. The magnetic compass magnets are acted on by the horizontal component of the Earth's total magnetic force. Where is this magnetic force the GREATEST?

- A. At the magnetic prime vertical meridian
- B. At the south magnetic pole
- C. At the magnetic equator
- D. At the north magnetic pole

Correct answer: C

60. Your vessel is on a course of $311^{\circ}T$ at 21 knots.

At 1957 a light bears $337.5^{\circ}T$, and at 2018 the light bears $356^{\circ}T$.

At what time and at what distance off will your vessel be when abeam of the light?

- A. 2039, 7.4 miles
- B. 2043, 10.3 miles
- C. 2027, 5.2 miles
- D. 2033, 6.8 miles

Correct answer: A

61. You are steaming eastward in the North Atlantic in an extratropical cyclonic storm and the wind is dead ahead. According to the law of Buys Ballot, where does the center of the low pressure lie?

- A. To the north
- B. Directly ahead of you
- C. To the south
- D. Astern of you

Correct answer: C

62. Which term is given to that half of the hurricane to the right-hand side of its track (as you face the same direction that the storm is moving) in the Northern Hemisphere?

- A. The windward side
- B. The safe semicircle
- C. The dangerous semicircle
- D. The leeward side

Correct answer: C

63. Which may cause above-normal tides near the center of a hurricane?

- A. High barometric pressure
- B. Torrential rains
- C. Storm surge
- D. The jet stream

Correct answer: C

64. Which refers to the period at high or low tide during which there is no change in the height of the water?

- A. Range of the tide
- B. Reversing of the tide
- C. Plane of the tide
- D. Stand of the tide

Correct answer: D

65. Which is TRUE of an aneroid barometer?

- A. An instrument in which the pressure of the air is measured
- B. An instrument used to measure the speed of wind
- C. An instrument that tells which direction a storm is coming from
- D. An instrument that is used to measure the height of waves

Correct answer: A

66. Which is a characteristic of warm air masses?

- A. Stratiform clouds
- B. Turbulence within the mass
- C. Good visibility
- D. Heavy precipitation

Correct answer: A

67. You are approaching Chatham Strait from the south in foggy weather. You have Coronation Island and Hazy Islands on the radar. Suddenly the radar malfunctions. You then resort to using whistle echoes to determine your distance off Coronation Island. Your stopwatch reads 16.3 seconds for the echo to be heard. How far are you off Coronation Island?

- A. 1.0 mile
- B. 1.5 miles
- C. 2.0 miles
- D. 2.5 miles

Correct answer: B

68. Which is TRUE when navigating a vessel?

- A. You should assume a wreck buoy is directly over the wreck
- B. You should never rely on a floating aid to maintain its exact position
- C. You can always rely on a buoy to show proper light characteristics
- D. You can always rely on a buoy to be on station

Correct answer: B

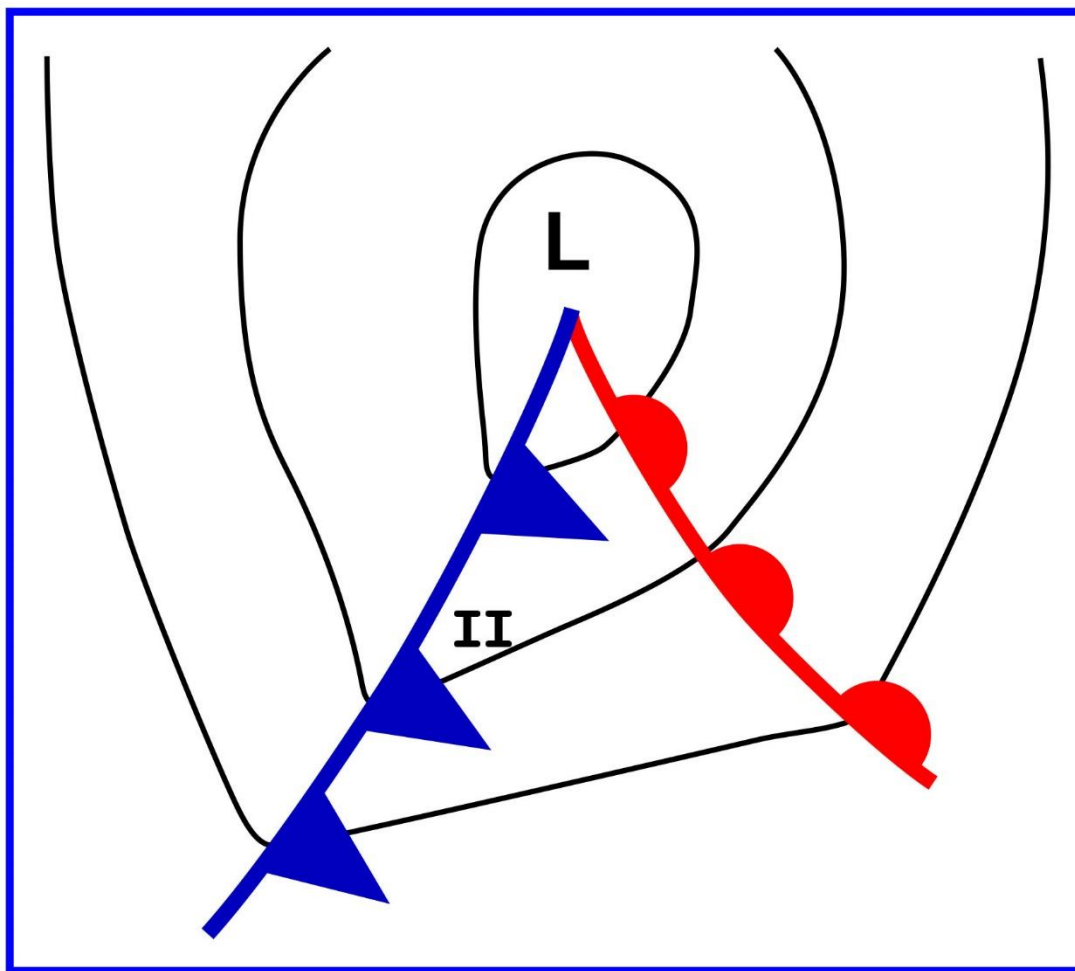
69. Your vessel is proceeding up a channel, and you see a pair of range lights that are in line dead ahead. The chart indicates that the direction of this pair of lights is 178°T , and the variation is 9°W . If the heading of your vessel at the time of the sighting is 180° per standard magnetic compass, what is the deviation?
- A. 2°E
 - B. 2°W
 - C. 7°E
 - D. 7°W

Correct answer: C

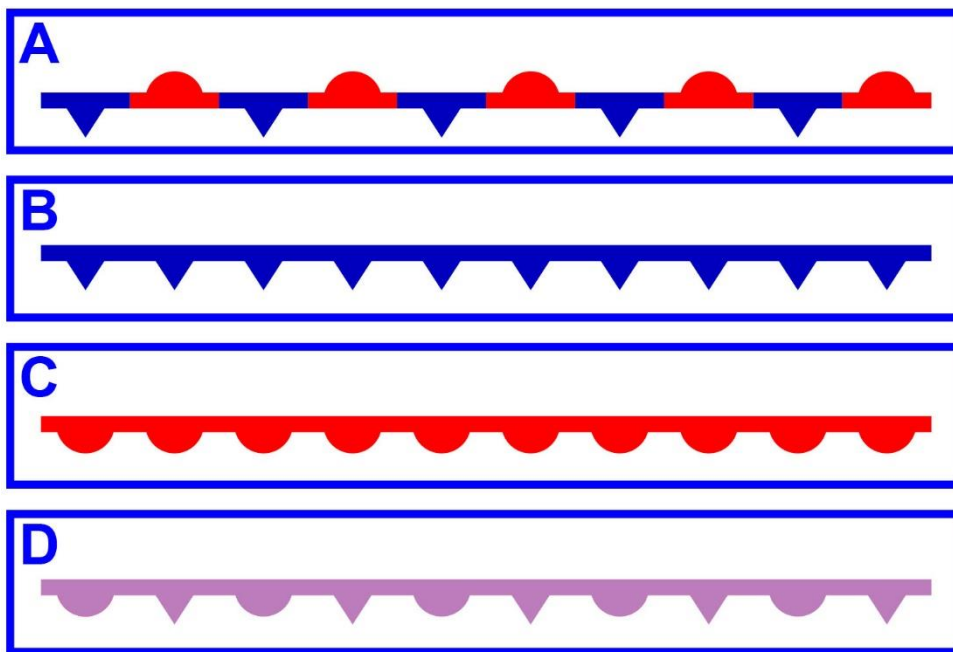
70. You are running parallel to the coast and take a running fix using bearings of the same object. Which is TRUE if you are making less speed than used for the running fix, in relation to the position indicated by the fix?
- A. Your vessel will be on the track line ahead of the fix
 - B. Your vessel will be on the track line behind the fix
 - C. Your vessel will be farther from the coast
 - D. Your vessel will be closer to the coast

Correct answer: D

D014NG

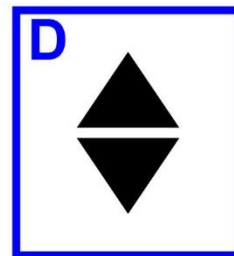
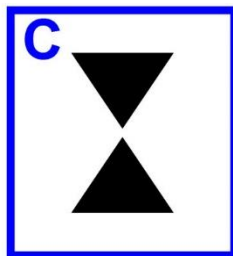
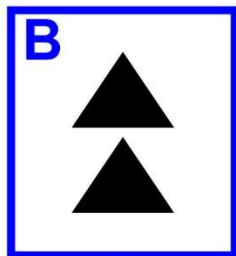
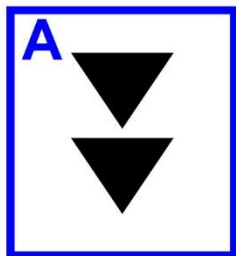


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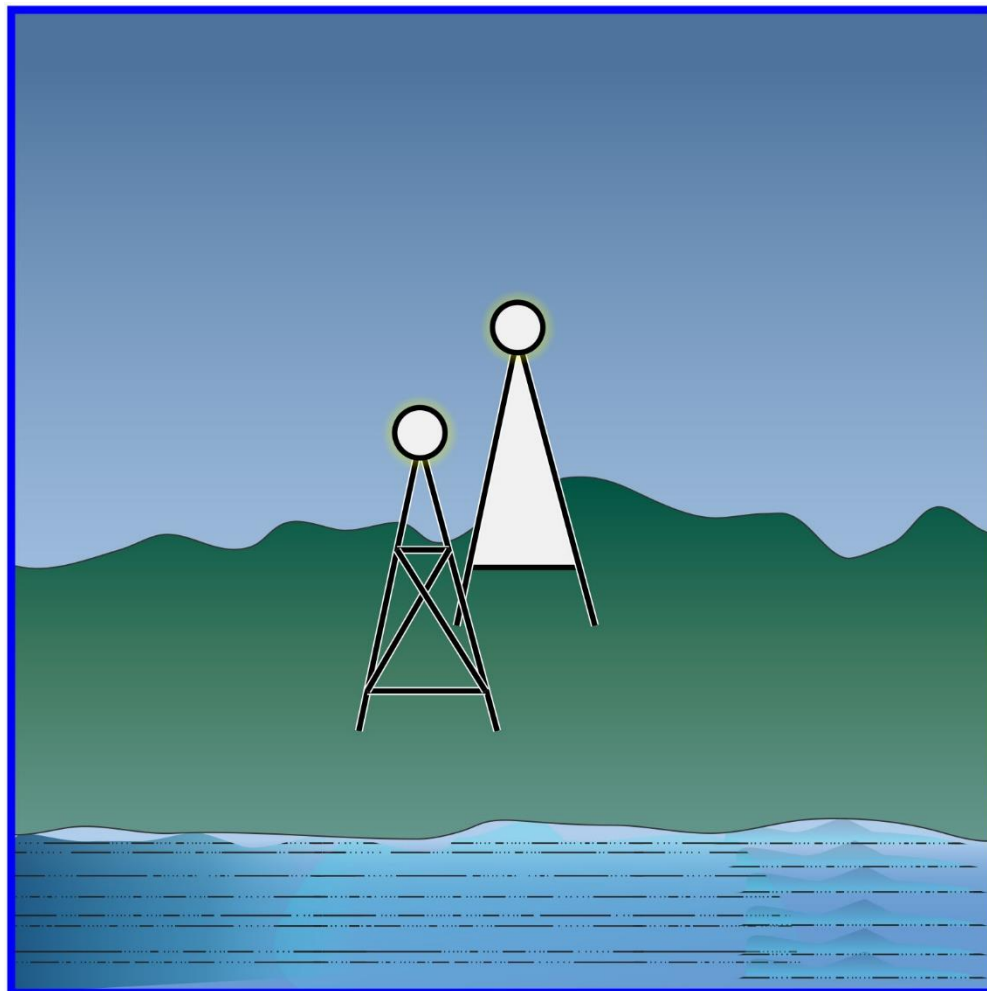
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D047NG



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