

U.S.C.G. Merchant Marine Exam

Master Less than 500-1600 Gross Registered Tons

Q123 Navigation General – Near Coastal

(Sample Examination)

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

1. Atmospheric pressure may be measured with which instrument?

- A. An aneroid barometer
- B. A psychrometer
- C. A thermometer
- D. A refractor

Correct answer: A

2. 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 and the amount of the error must be subtracted from the compass to obtain true
- B. The readings are too high (large numerically) and the amount of the error must be added to 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

3. Which describes the result when you turn on the fast time constant (differentiator) control of a radar?

- A. Only suppresses weak targets to a limited distance from the ship (sea clutter)
- B. Reduces the beam width to provide a map-like presentation for navigation
- C. Enhanced weak target echoes and brighten them on the PPI
- D. Reduced clutter over the entire PPI by shortening the echoes

Correct answer: D

4. The Light List indicates that a light has a nominal range of 20 miles and is 52 feet (16 meters) high. If the visibility is 20 miles and your height of eye is 20 feet (6 meters), at what approximate distance will you sight the light?

- A. 33.0 nm
- B. 20.0 nm
- C. 13.5 nm
- D. 8.5 nm

Correct answer: C

5. Which statement is TRUE concerning equatorial tides?

- A. They occur when the Sun is at minimum declination north or south.
- B. They are used as the basis for the vulgar establishment of the port.
- C. The difference in height between consecutive high or low tides is at a minimum.
- D. They occur when the Moon is at maximum declination north or south.

Correct answer: C

6. Some lights used as aids to marine navigation have a red sector to indicate a danger area. How are the limits of a colored sector of light listed in the Light List?
- A. Bearings given in the Light List are always magnetic
 - B. Geographical positions outlining the area of the sector
 - C. True bearings as observed from a vessel toward the light
 - D. True bearings as observed from the light toward a vessel

Correct answer: C

7. The climate of the northern coast of the Gulf of America is _____.
- A. a warm marine type of climate
 - B. an east coast marine type of climate
 - C. humid and subtropical throughout the year
 - D. variable from warm to subtropical

Correct answer: A

8. Isobars on a weather map are useful in predicting which element of the weather?
- A. The wind velocity
 - B. The temperature
 - C. The relative humidity
 - D. The dew point

Correct answer: A

9. If the current and wind are in opposite directions, what does the sea surface indicate?
- A. The surface indicates a lower wind speed than what really exists
 - B. The surface indicates a greatly reduced wind speed
 - C. The surface does not change, each cancels the other
 - D. The surface indicates a higher wind speed than what really exists

Correct answer: D

10. The path that a vessel is expected to follow, represented on a chart by a line drawn from the point of departure to the point of arrival, is known by which term?
- A. DR plot
 - B. Track line
 - C. Estimated course
 - D. Heading

Correct answer: B

11. Which is TRUE as the temperature of an air mass decreases?
- A. The relative humidity increases
 - B. The specific humidity decreases
 - C. The dew point rises
 - D. The absolute humidity decreases

Correct answer: A

12. Under the IALA cardinal system, a mark with quick white light showing 3 flashes every 10 seconds indicates that the safest water in the area is in which location?
- A. The east side of the mark
 - B. The north side of the mark
 - C. The west side of the mark
 - D. The south side of the mark

Correct answer: A

13. Which term is used to describe the speed at which an ocean wave system advances?
- A. Group velocity
 - B. Wave length
 - C. Wave velocity
 - D. Ripple length

Correct answer: A

14. Of the four light characteristics shown in illustration D019NG below which one does NOT represent a safe water mark of the IALA Buoyage System?
- A. A
 - B. B
 - C. C
 - D. D

Correct answer: A

15. All straight lines represent great circle tracks on a chart based on which projection?
- A. Polyconic projection
 - B. Gnomonic projection
 - C. Orthographic projection
 - D. Mercator projection

Correct answer: B

16. A HYDROLANT warning would normally be sent for all of the following EXCEPT _____.
- A. Unexploded ordinance in ocean waters at a depth of 78 fathoms (143 meters)
 - B. Extinguishment of Robbins Reef Light in New York City's Upper Bay
 - C. A report of a ship in distress in mid-ocean
 - D. The presence of a large unwieldy tow in congested offshore water

Correct answer: B

17. When would cloud formations be minimal?
- A. When the relative humidity is very high
 - B. When the surface temperature and temperature aloft are equal
 - C. When the surface temperature and temperature aloft differ greatly
 - D. When the barometric pressure is very low

Correct answer: B

18. What does a slow rise in the barometric pressure forecast?

- A. Improving weather conditions
- B. Deteriorating weather conditions
- C. High seas
- D. Rainy weather for the next 48 hours

Correct answer: A

19. What is magnetic dip a measurement of?

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

Correct answer: A

20. What feature(s) of a daymark is (are) used to identify the beacon upon which it is mounted?

- A. Method of construction
- B. Signal characteristics
- C. Size
- D. Color and shape

Correct answer: D

21. A green buoy has a yellow triangle on it. What type of buoy is this?

- A. It is a dual-purpose marker used where the ICW and other waterways coincide
- B. It is a buoy that was set in error and will be replaced with a red nun buoy
- C. This buoy that is off-station and is marked to warn mariners of its wrong position
- D. This is an information or regulatory buoy that has lateral significance

Correct answer: A

22. You are outbound in a channel marked by a range astern. The range line is 273°T . You are steering 090°T and have the range in sight as shown in illustration D047NG below. What action should you take?

- A. Come right to 093°T .
- B. Come left until the range comes in line then alter course to 087°T .
- C. Come right to close the range then when on the range steer 093°T .
- D. Come left until the range comes in line then alter course to 093°T .

Correct answer: C

23. Which of the following describes gyrocompass repeaters which reproduce the indications of the master gyrocompass?

- A. They are accurate only in the Polar regions
- B. They are hand operated
- C. They are accurate electronic servomechanisms
- D. They are accurate only if the vessel is underway

Correct answer: C

24. In the Northern Hemisphere you are caught in the dangerous semicircle of a storm with plenty of sea room available. Which is the best course of action to take?
- A. Put the wind on the vessel's starboard quarter and make as much headway as possible
 - B. Put the wind on the vessel's port bow and make as much headway as possible
 - C. Put the wind on the vessel's port quarter and make as much headway as possible
 - D. Put the wind on the vessel's starboard bow and make as much headway as possible

Correct answer: D

25. Which is the region containing 3/4 of the mass of the atmosphere and to which are confined such phenomena as clouds, storms, precipitation and changing weather conditions?
- A. The tropopause
 - B. The stratosphere
 - C. The troposphere
 - D. The stratopause

Correct answer: C

26. Yesterday your chronometer read 03h 01m 56s at the 1500 GMT time tick. Today your chronometer read 03h 01m 58s at the 1500 GMT time tick. What is the chronometer error?
- A. 03h 01m 58s fast
 - B. +2s
 - C. -2s
 - D. 01m 58s fast

Correct answer: D

27. You wish to measure the distance on a Mercator chart between a point in latitude $43^{\circ}30'N$ and a point in latitude $40^{\circ}30'N$. To measure 30 miles at a time, where should you set the points of the dividers to obtain the most accurate measurement?
- A. $41^{\circ}30'$ and $42^{\circ}00'$
 - B. $41^{\circ}45'$ and $42^{\circ}15'$
 - C. $42^{\circ}00'$ and $42^{\circ}30'$
 - D. $42^{\circ}15'$ and $42^{\circ}45'$

Correct answer: B

28. What does the shoreline on charts generally represent?
- A. The mean high-water line
 - B. The mean low water line
 - C. The mean low water spring line
 - D. The mean tide level

Correct answer: A

29. You are on course $180^{\circ}T$ and take a relative bearing of a lighthouse of 225° . What is the true bearing of the lighthouse?

- A. 135°
- B. 180°
- C. 045°
- D. 270°

Correct answer: C

30. Which is most commonly associated with fog?

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

Correct answer: D

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

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

Correct answer: D

32. The approximate distance to a storm center can be determined by noting the hourly rate of fall of the barometer. If the rate of fall is 0.08 - 0.12 inches, what is the approximate distance to the storm center?

- A. 50 to 80 miles
- B. 80 to 100 miles
- C. 100 to 150 miles
- D. 150 to 250 miles

Correct answer: B

33. Temperature and moisture characteristics are modified in a warm or cold air mass due to which factor?

- A. The heterogeneous nature of the air mass
- B. Upper-level atmospheric changes
- C. Movement of the air mass
- D. Pressure changes in the air mass

Correct answer: C

34. Two beacons form a range in the direction of $221.5^{\circ}T$. The range is seen in line from your vessel bearing 223° per gyrocompass. The variation in the area is $4^{\circ}E$. What is the error of your gyrocompass?

- A. $1.5^{\circ}W$
- B. $2.5^{\circ}W$
- C. $5.5^{\circ}W$
- D. $2.5^{\circ}E$

Correct answer: A

35. Which is a characteristic of anticyclones?

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

Correct answer: D

36. Which aid is NOT marked on a chart with a magenta circle?

- A. Aero light
- B. Radio beacon
- C. Radar transponder beacon
- D. Radar station

Correct answer: A

37. You swung ship and compared the magnetic compass against the gyrocompass to find deviation. Gyro error is 2°W. The variation is 8°W. Find the deviation on a magnetic compass heading of 210°.

NP-0113	
HEADING	
PSC	PGC
030.5°	024°
061.5°	054°
092.0°	084°
122.5°	114°
152.0°	144°
181.0°	174°
210.0°	204°
239.5°	234°
269.0°	264°
298.0°	294°
327.5°	324°
358.5°	354°

- A. 0.0°
- B. 0.5°W
- C. 0.5°E
- D. 1.0°E

Correct answer: A

38. Which clouds are described as uniform, grayish-white cloud sheets that cover large portions of the sky, and are responsible for a large percentage of the precipitation in the temperate latitudes?

- A. cirrostratus
- B. cirrocumulus
- C. altocumulus
- D. altostratus

Correct answer: D

39. Barometers are calibrated at which standard temperature?

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

Correct answer: B

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

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

Correct answer: D

41. 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

42. Your present weather is sunny with a steady barometer. A low swell approaches your vessel from the south with crests passing at relatively long periods of about four per minute. What does this usually indicate?

- A. A hurricane about 100 miles south of your vessel and heading in your direction
- B. A tropical cyclone south of your vessel
- C. A warm front from the south
- D. An extra-tropical cyclone

Correct answer: B

43. When do the prevailing westerlies of the Southern Hemisphere blow 17-27 knots?

- A. During spring only
- B. During the summer months only
- C. All year long
- D. During the winter only

Correct answer: C

44. 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. Overcast skies with rising temperature
- C. Clear skies with warm temperatures
- D. Thundershowers

Correct answer: D

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Illustrations: 5

45. The average height of the surface of the sea for all stages of the tide over a 19 year period is known by which term?
- A. Mean sea level
 - B. Half-tide level
 - C. Mean low water
 - D. Mean high water

Correct answer: A

46. As the South Equatorial Current approaches the east coast of Africa, it divides with the main part flowing south to form which current?
- A. Agulhas Current
 - B. Madagascar Current
 - C. Benguela Current
 - D. Canary Current

Correct answer: A

47. To make sure of getting the full advantage of a favorable current, you should reach an entrance or strait at which time in relation to the predicted time of the favorable current?
- A. At the predicted time
 - B. One hour after
 - C. 30 minutes before
 - D. 30 minutes before flood, one hour after an ebb

Correct answer: C

48. In the U.S. Aids to Navigation System, what do red and green horizontally-banded buoys mark?
- A. Junctions or bifurcations
 - B. Fishing grounds
 - C. General anchorage areas
 - D. Channels for shallow draft vessels

Correct answer: A

49. You are underway on course 160°T at 10 knots. The current is 210°T at 0.9 knots. What is the speed being made good?
- A. 10.7 knots
 - B. 11.0 knots
 - C. 11.6 knots
 - D. 12.3 knots

Correct answer: A

50. What does the symbol shown in illustration D033NG below indicate on a chart?
- A. A can buoy with a rotating white light
 - B. A sunken vessel marked by a buoy
 - C. A red and white can buoy
 - D. A safe water beacon

Correct answer: D

51. If you were sailing in the North Pacific and were interested in the ice and iceberg limits, where could you find this information?
- A. Pilot Chart
 - B. Notice to Mariners
 - C. Coast Pilot
 - D. None of the above

Correct answer: A

52. You desire to make good a true course of 279° . The variation is 8°W , magnetic compass deviation is 3°E , and gyrocompass error is 1°E . A north-northwesterly wind produces 3° leeway. What is the course to steer per standard magnetic compass (psc) to make the true course good?
- A. 287°psc
 - B. 290°psc
 - C. 281°psc
 - D. 284°psc

Correct answer: A

53. You are steering 115°T , and a light is picked up dead ahead at a distance of 16.7 miles at 0522. You change course to pass the light 3.5 miles off abeam to port. If you are making 12 knots, what is your ETA at the position 3.5 miles off the light?
- A. 0644
 - B. 0647
 - C. 0650
 - D. 0653

Correct answer: A

54. While on a course of 321°T , a light bears 7° on the starboard bow at a distance of 9.7 miles. What course should you steer to pass 3.5 miles abeam of the light leaving it to starboard?
- A. 303°T
 - B. 297°T
 - C. 300°T
 - D. 307°T

Correct answer: D

55. Which type of cloud is hail most likely to fall from?
- A. Altocumulus
 - B. Nimbostratus
 - C. Cumulus
 - D. Cumulonimbus

Correct answer: D

56. How are you informed of defects or changes in aids to navigation?

- A. Local Notice to Mariners
- B. Weekly Notice to Mariners
- C. Marine Safety Information Website
- D. All of the above

Correct answer: D

57. Which radar control shortens all echoes on the display and reduces clutter caused by rain or snow?

- A. The brilliance control
- B. The sensitivity time control (sea clutter control)
- C. The fast time constant (differentiator)
- D. The receiver gain control

Correct answer: C

58. While navigating in fog off a coastline of steep cliffs, you hear the echo of the ships fog horn 6 seconds after the signal was sounded. What is the distance to the shore?

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

Correct answer: C

59. What is the reference datum mean high water used to measure?

- A. Soundings in European waters
- B. Both heights and soundings worldwide
- C. Soundings on the east coast of the United States
- D. Heights of topographical features in the United States

Correct answer: D

60. 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

61. Which is TRUE of the tides in Boston Harbor?

- A. The tides have a greater range than the tides in Gulf Coast ports
- B. The tides have their variations caused by the changing declination of the Moon
- C. The tides are diurnal in nature
- D. All of the above

Correct answer: A

62. Which is TRUE of a dead reckoning (DR) plot?

- A. It must be plotted using magnetic courses
- B. It ignores the effect of surface currents
- C. It is most useful when in sight of land
- D. It may be started at an assumed position

Correct answer: B

63. In which months will the North Equatorial Countercurrent be strongest?

- A. April and May
- B. January and February
- C. July and August
- D. October and November

Correct answer: C

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

Correct answer: B

65. 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

66. What is the average speed of the movement of a hurricane following the recurvature of its track?

- A. Over 60 knots
- B. 20 to 30 knots
- C. 40 to 50 knots
- D. 5 to 10 knots

Correct answer: B

67. Your vessel is participating in the Voluntary Observing Ship Program, you are preparing WS Form B-80 as seen in illustration D041NG below. The sky is overcast, and the anemometer indicates that the apparent wind is from 144° relative at 8 knots. You are on course 162° T at 15 knots. How should you encode group Nddff?

- A. 01615
- B. 83322
- C. 91521
- D. 81408

Correct answer: B

68. Chart information details to be used in ECDIS should be the latest edition of information originated by a government-authorized hydrographic office and conform to the standards of which organization?

- A. International Maritime Organization
- B. NASA
- C. US Coast Guard
- D. International Hydrographic Organization

Correct answer: D

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

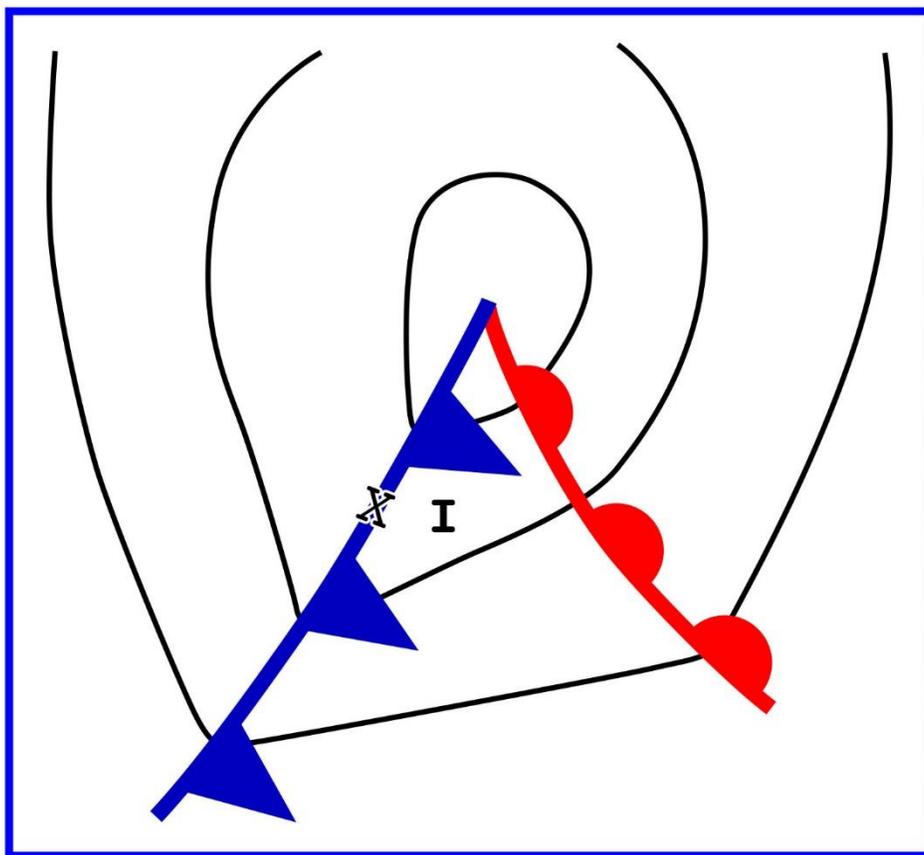
Correct answer: C

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

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

Correct answer: C

D013NG



D019NG

A  FI (2)

B  Occ

C  L FI 10s

D  Morse "A"

D033NG



RW
“A”

National Maritime Center

Keep 'em Safe, Keep 'em Sailing



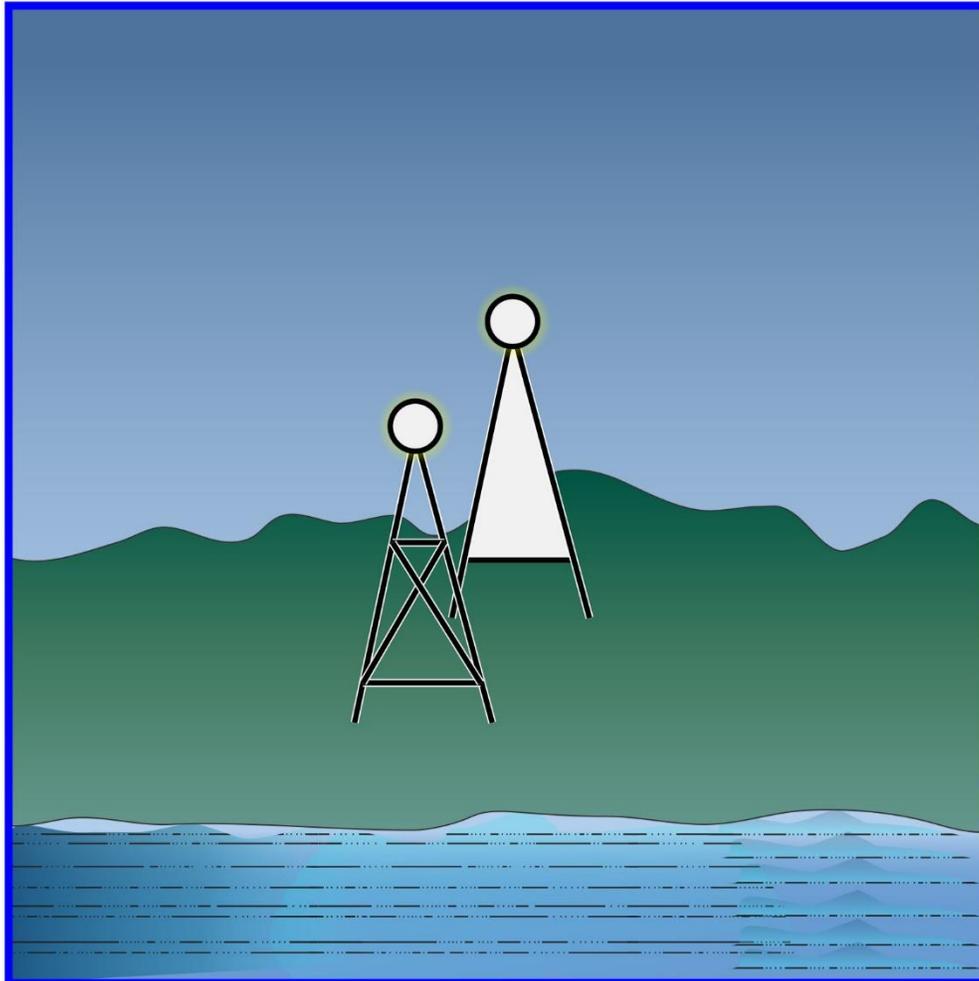
D041NG

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WEATHER REPORT FOR IMMEDIATE TRANSMISSION						
NO.	SHIP NAME	DATE SENT (UTC)	TIME SENT (UTC)	STA. CALLED	FREQUENCY	
ADDRESSES						
U.S. Coast Guard: No address needed, start with BBXX indicator and ship's call sign.						
INMARSAT Standard A: Select—Coast Earth Station (CES), routine priority, duplex telex channel, and initiate call. When GA + is received, select 41 +. Upon receipt of answerback, NWS OBS MHTS, send the weather report starting with the BBXX indicator and ship's call sign. End the report with 5 periods. Try to limit INMARSAT call time to 30 seconds. Standard C: To establish special access code 41, see manufacturers recommended instructions for set-up, or the Mariners Weather Log Summer, 1994, or later editions.						
U.S. commercial and foreign radio stations: To: OBS METEO _____ (get address from "Radio Stations Accepting. . . ."). Start with BBXX indicator and ship's call sign and combine the remaining numbers into 10-character groups.						
INDICATOR	CALL SIGN	YYGG _i w	99L _a L _a L _a	Q _c L _o L _o L _o L _o	i _R i _x hVV	Nddff
BBXX			99		4	
00fff	1s _n TTT	2s _n T _d T _d T _d	4PPPP	5appp	7wwW ₁ W ₂	8N _h C _L C _M C _H
222D _s v _s	0s _T T _w T _w T _w	2P _w P _w H _w H _w	3d _{w1} d _{w1} d _{w2} d _{w2}	4P _{w1} P _{w1} H _{w1} H _{w1}	5P _{w2} P _{w2} H _{w2} H _{w2}	6I _s E _s E _s R _s
8S _w T _b T _b T _b	ICE	c _i S _i b _i D _i z _i	PLAIN LANGUAGE			TRANSMITTED BY
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