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Federal Communications Commission
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Section-A: VHF-DSC Equipment & Operation: Key Topic-1: Frequency and Bandwidth:

1A1 What are the correct VHF Channels and Frequencies for Calling/Distress, DSC and bridge-to-bridge operations?

A. Ch-16, 156.800 MHz, Ch-70, 156.525 MHz and Ch-13, 156.650 MHz.
B. Ch-06, 156.300 MHz, Ch-16, 156.800 MHz and Ch-13, 156.650 MHz.
C. Ch-08, 156.400 MHz, Ch-70, 156.525 MHz and Ch-16, 156.800 MHz.
D. Ch-06, 156.300 MHz, Ch-12, 156.600 MHz and Ch-13, 156.650 MHz.

1A2 What is the frequency separation between Transmit and Receive frequencies on a duplex channel?

A. 2.8 MHz
B. 4.6 MHz
C. 6.4 MHz
D. 10.7 MHz

1A3 What is the assigned channel spacing for VHF channels?

A. 10 kHz
B. 15 kHz
C. 25 kHz
D. 50 kHz

1A4 What is the allowed frequency tolerance for the DSC carrier frequencies?

A. 10 Hz
B. 20 Hz
C. 5 ppm
D. 10 ppm

1A5 Using a frequency counter with an accuracy of 2 ppm — which of the following are within legal tolerance for the frequencies of 156.800 MHz and 156.525 MHz?

A. 156,798.758 kHz and 156.526.243 kHz.
B. 156,798.735 kHz and 156,526.258 kHz.
C. 156,801.567 kHz and 156,526.476 kHz.
D. 156,798.635 kHz and 156,523.352 kHz

1A6 Using a frequency counter with an accuracy of 5 ppm — which of the following are within legal tolerance for the frequencies of 156.875 MHz and 157.200?

A. 156,873.562 kHz and 157,198.264 kHz.
B. 156,875.774 kHz and 157.199.321 kHz.
C. 156,876.562 kHz and 157,201.355 kHz.
D. 156,873.336 kHz and 157,201.570 kHz.

Answers: 1A1: A 1A2: B 1A3: C 1A4: D 1A5: A 1A6: B

Section-A: VHF-DSC Equipment & Operation: Key Topic-2: Controls and Functions:

2A1 What is the purpose of the USA-INT switch?

A. To provide for simplex operations with European Public Correspondence stations.
B. To provide for duplex operations with U.S. Public Correspondence stations.
C. To change from duplex to simplex operation on designated channels in European waters.
D. To change from duplex to simplex operation on designated channels in U.S. waters.

2A2 What may happen if the USA-INT control is left on INT when in U.S. waters?

A. Your signals will be heard but other station replies will not be heard on certain channels.
B. You will be able to communicate with public correspondence stations on Channel 5.
C. Other stations will not be able to hear your transmissions and you will not hear any signals.
D. You will not be able to operate on channel 13.

2A3 What is the purpose of the Dual Watch function?

A. Allows simultaneous reception on two different channels.
B. To rapidly switch the radio's receiver between two channels.
C. Allows reception and transmission at the same time.
D. It allows you to monitor both sides of a public correspondence station's communication.

2A4 What is the proper adjustment of the squelch control for maximum sensitivity?

A. Maximum clockwise rotation.
B. Maximum counterclockwise rotation.
C. Just below the point where the noise breaks through.
D. The squelch has no effect on the sensitivity.

2A5 Which of the following transmitter power levels are permitted by FCC rules?

A. Low Power: 0.1 W, High Power: 5 W
B. Low Power: 0.5 W, High Power: 25 W
C. Low Power: 1 W, High Power: 25 W
D. Low Power: 5 W, High Power: 50 W

2A6 Which of the following controls is not found on a VHF-DSC transceiver?

A. "Distress"
B. "Cancel"
C. "Squelch"
D. "R.I.T."

Answers: 2A1: D 2A2: A 2A3: B 2A4: C 2A5: C 2A6: D

Section-A: VHF-DSC Equipment & Operation: Key Topic-3: Receiver Technology:

3A1 Which of the following best describes the "Capture effect?"

A. The receiver will accept all signals near the operating frequency.
B. The receiver will reject all but the weakest signal.
C. The receiver will reject all but the strongest signal.
D. The receiver will modulate an adjacent transmitter.

3A2 Which of the following may be adjusted in a FM ratio detector for improved signal-to-noise?

A. The diode detector
B. Input signal to the two diodes
C. Input voltage to the transistor
D. Ratio Arm balance control bridge

3A3 What is the function of a properly adjusted limiter circuit?

A. Maintains a constant output amplitude with a varying input amplitude.
B. Limits the level of RF output power in the final amplifier stage.
C. Limits the modulation input amplitude while amplifying the modulation output.
D. Controls the DC input voltage excursions of the final amplifier stage.

3A4 Which of the following are true about SINAD measurements?

A. SINAD is the product of the signal and noise divided by the sum of the noise and distortion.
B. SINAD is the sum of the signal, noise and distortion divided by the sum of the noise and distortion.
C. SINAD is the sum of the noise and distortion divided by the sum of the signal, noise and distortion.
D. SINAD is the product of the noise and distortion divided by the sum of the signal and noise.

3A5 What would be considered a normal sensitivity for 10 db of quieting in a VHF marine receiver?

A. 0.1 microvolt
B. 1 microvolt
C. 5 microvolts
D. 10 microvolts

3A6 What is meant by "full quieting" in a FM VHF receiver?

A. Adjusting the squelch control to eliminate background noise.
B. The rapid decrease in SINAD and noise with increasing signal level.
C. The received signal is strong enough to completely quiet the receiver background noise.
D. The rapid improvement in SINAD and decrease in noise with decreasing signal level.

Answers: 3A1: C 3A2: D 3A3: A 3A4: B 3A5: B 3A6: C

Section-A: VHF-DSC Equipment & Operation: Key Topic-4: Receiver Faults-1:

4A1 What condition may prevent a VHF radio receiver from staying tuned to the desired channel?

A. The local oscillator frequency is beating against the incoming signal to produce an Intermediate Frequency (IF).
B. The output signal of the Phase Locked Loop (PLL) circuit in the frequency synthesizer has become unlocked.
C. The discriminator circuit is alternately developing positive and negative voltages at the modulation frequency.
D. The ratio detector circuit is producing a variable output that deviates across the receiver's dynamic range.

4A2 What fault may exist if a VHF radio receiver fails to produce audible output from the speaker and the squelch control has no effect?

A. A component in the RF amplifier stage has failed or the signal from a preceding stage is grounded.
B. The Local Oscillator stage is no longer supplying a signal to the mixer stage at the correct frequency.
C. The AF amplifier may be defective or the transmitter Push-To-Talk circuit may be activated.
D. The mixer stage is no longer producing an output signal on the correct Intermediate Frequency (IF).

4A3 What is indicated if a VHF radio fails to receive nearby stations and a voltmeter connected between the positive side of a radio's DC line and ground reads zero line voltage? The fuse in the VHF radio also reads zero when checked with an ohmmeter.

A. The antenna may be defective or water intrusion has affected antenna system performance.
B. The coaxial transmission line may be open, shorted, or a connector has become intermittent.
C. A fault in the discriminator circuit is producing zero output voltage during peak modulation.
D. A "crowbar" circuit has prevented an over current condition that might damage the radio.

4A4 What fault may exist if a VHF radio receiver fails to produce audible output from the speaker and the squelch control has no effect?

A. The AF amplifier may be defective or the transmitter Push-To-Talk circuit may be activated.
B. A component in the RF amplifier stage has failed or the signal from a preceding stage is grounded.
C. The Local Oscillator stage is no longer supplying a signal to the mixer stage at the correct frequency.
D. The mixer stage is no longer producing an output signal on the correct Intermediate Frequency (IF).

4A5 What condition may prevent a VHF radio receiver from receiving a weak signal?

A. The local oscillator frequency is beating against the incoming signal to produce an Intermediate Frequency (IF).
B. The output signal of the Phase Locked Loop (PLL) circuit in the frequency synthesizer has become unlocked.
C. The output signal of an AF amplifier stage is greater than the input signal.
D. The weak RF signal has been suppressed at the limiter stage of the received by capture effect.

4A6 Which of the following is the best test procedure to isolate the source of distortion in the audio output of a receiver?

A. Use an oscilloscope to visually display AC signals on the output of each AF amplifier stage.
B. Use a spectrum analyzer to visually display the amplitude and frequency of each AF amplifier stage input.
C. Use a signal generator to inject a 1 KHz signal into the first AF amplifier stage and evaluate audio output.
D. Use a digital voltmeter to measure transistor bias voltages in each AF amplifier stage.

Answers: 4A1: B 4A2: C 4A3: D 4A4: A 4A5: D 4A6: A

Section-A: VHF-DSC Equipment & Operation: Key Topic-5: Receiver Faults-2:

5A1 What condition may cause a significant loss in VHF receiver sensitivity?

A. A reading of 9.6 when a voltmeter is connected between the positive side of the radio's DC line and ground.
B. The presence of a -90dbm signal measured at the 2nd IF output with the receiver tuned to the desired input frequency.
C. An internal signal that is very weak in comparison to the desired signal at the output of the second IF stage.
D. Replacing (75 ohm) RG-59/U coaxial transmission line with a (50 ohm) RG-8/U or LMR-400 Ultraflex cable.

5A2 Which of the following test procedures may be used to determine a VHF receiver's minimum discernible signal?

A. Connect an oscilliscope to the antenna input and observe the amplitude of minimum signal voltage plotted on the display's vertical axis as a function of time on the horizontal axis.
B. Set a signal generator to the frequency of the VHF receiver, adjust the output signal to near zero, and increase the signal level until an audio voltmeter connected to the AF output point indicates a 3-dB increase.
C. Connect a spectrum analyzer to the antenna input and apply the maximum amount of attentuation to detect minimum signal level plotted on the display's vertical axis as a function of frequency on the horizontal axis.
D. Connect a 156.3 Mhz signal generator to the antenna input, set the VHF receiver to channel 06 and measure dynamic range using an oscilliscope.

5A3 Which of the following procedures may be used in many U.S. ports as a quick field test to determine if a shipboard VHF receiver is operating properly?

A. Tune the VHF receiver to 158.6 MHz and listen for local U.S. Coast Guard announcements or radio traffic from other vessels.
B. Set the VHF radio to a simplex channel, key the transmitter, and monitor the quality of the transmitted signal with the internal receiver.
C. Tune the VHF radio to 162.550 MHz, 162.400 MHz or 162.475 MHz and listen for broadcasts from the National Oceanic and Atmospheric Administration.
D. Connect appropriate test equipment to the radio and measure signal levels at the output of the receiver's RF amplifier stage.

5A4 What ohmmeter reading may indicate a faulty component in a VHF receiver?

A. Low resistance across a diode in one direction, high resistance when test leads are reversed.
B. Zero ohms across an in-line fuse in a DC power circuit.
C. Infinite ohms across a ceramic bypass capacitor in a transistor amplifier circuit.
D. A transistor indicates low resistance between emitter and base when test leads are reversed across them.

5A5 What condition may indicate a VHF receiver fault?

A. The same voltage reading between each lead of a 100K-ohm resistor and ground in a bias circuit.
B. A "click" is heard when an ohmmeter set to R X 1 is touched across loudspeaker terminals.
C. A voltage drop across the leads of a 47K ohm resistor in an intermediate frequency amplifier stage.
D. The presence of an AC signal on the output of an audio frequency amplifier stage.

5A6 What condition may cause noisy operation of a VHF receiver?

A. An output signal that is larger than the input signal in an audio frequency amplifier stage.
B. A defective potentiometer in the audio frequency amplifier stage.
C. Low bias voltage to an intermediate frequency amplifier stage.
D. An open winding in a secondary of a coupling transformer in the audio frequency amplifier stage.

Answers: 5A1: A 5A2: B 5A3: C 5A4: D 5A5: A 5A6: B

Section-A: VHF-DSC Equipment & Operation: Key Topic-6: Transmitter Technology:

6A1 What is the maximum allowable deviation of a marine VHF transmitter?

A. 12 kHz
B. 10 kHz
C. 7.5 kHz
D. 5 kHz

6A2 What is the modulation index?

A. The maximum carrier deviation divided by the maximum modulation frequency.
B. The maximum modulation frequency divided by the maximum carrier frequency.
C. The maximum carrier deviation multiplied by the maximum carrier frequency.
D. The maximum carrier deviation divided by the amount of pre-emphasis.

6A3 How is pre-emphasis used in an FM transceiver?

A. The lower modulation frequencies are boosted before transmitting by 3 db per octave and reduced by the same amount at the receiver.
B. The higher modulation frequencies are boosted before transmitting by 6 db per octave and reduced by the same amount at the receiver.
C. The lower modulation frequencies are boosted before transmitting by 6 db per octave and reduced by the same amount at the receiver.
D. The higher modulation frequencies are boosted before transmitting by 3 db per octave and reduced by the same amount at the receiver.

6A4 A modulation index set to less than 1 to 1 may result in what?

A. Excessive deviation
B. Unstable signal excursions
C. Unusually low level transmit audio
D. Unusually high pitch audio response

6A5 What is the most common type of emission for shipboard VHF-DSC transceivers?

A. F1B
B. J3B
C. G3E
D. H3E

6A6 How many sidebands does a VHF FM transmitter have?

A. One
B. Two
C. One to four
D. Many

Answers: 6A1: D 6A2: A 6A3: B 6A4: C 6A5: C 6A6: D

Section-A: VHF-DSC Equipment & Operation: Key Topic-7: Transmitter Faults-1:

7A1 What condition may be indicated if a VHF radio is unable to contact nearby stations and an inline wattmeter indicates power outputs of 1 watt (LOW power) mode and 8.5 watts (HIGH power) mode with +12.8 vdc applied to the radio's DC line?

A. The AF Power Amplifier (PA) may be malfunctioning when the transmitter operates in the high power mode.
B. Negative feedback in the PA stage may be preventing high amplitude oscillations in the high power mode.
C. The transmitter output is low in the high power mode but it is still functioning within FCC specifications.
D. The transmitter output will increase in the high power mode with modulation between 75 and 100 percent.

7A2 Antenna system matching can be analyzed by determining the Standing Wave Ratio (SWR). Which of the following is the best test procedure to measure the SWR of a marine VHF antenna system?

A. Insert an in-line RF Power meter between the VHF radio and an artificial antenna, set the radio to any channel, key the microphone, and read the measured value.
B. Insert a SWR meter between the VHF transmitter and the coaxial transmission line connected to the antenna, set the radio to channel 16, and conduct a "RADIO CHECK" with a nearby U.S. Coast Guard station or vessel.
C. Insert an in-line RF Power meter between the VHF radio and the coaxial transmission line disconnected from the antenna, activate the Push-To-Talk (PTT) circuit, and read the forward and reflected values.
D. Insert a SWR meter between the VHF radio and the coaxial transmission line connected to the antenna, set the radio to an unused channel, activate the Push-To-Talk (PTT) circuit, and read the measured value.

7A3 A mismatched antenna system can degrade marine VHF radio performance. Antenna system matching can be analyzed by determining the Standing Wave Ratio (SWR). Which of the following is the best test procedure to determine the VHF antenna system SWR?

A. Insert a directional wattmeter between the VHF transmitter and the coaxial transmission line connected to the antenna, activate the Push-To-Talk (PTT) circuit, observe the measured values of forward and reflected power.
B. Insert a SWR meter between the VHF transmitter and the coaxial transmission line disconnected from the antenna, set the radio to an unused channel, activate the Push-To-Talk circuit, and read the measured value.
C. Insert a directional wattmeter between the VHF radio and an artificial antenna, set the radio to any channel, key the microphone, and read the values of forward and reflected power.
D. Insert an in-line RF Power meter between the VHF transmitter and the coaxial transmission line connected to a 50 ohm load, activate the Push-To-Talk (PTT) circuit, observe the measured value of reflected power.

7A4 What may be indicated if a VHF radio operates normally but the transmitter produces nearly zero RF output in the high power mode on all marine channels?

A. The antenna system is presenting a Standing Wave Ratio (SWR) of 1.5 to 1.0 on the desired frequency.
B. The SWR protection circuit in the transmitter has engaged to prevent damage to the Power Amplifier.
C. A "crowbar" circuit in the power supply has prevented an over current condition that might damage the radio.
D. A 50-ohm impedance in the antenna system is preventing the transmitter from achieving full power output.

7A5 What condition may indicate voltage controlled oscillator failure in the synthesizer of a VHF transmitter?

A. Low transmitter power output in the high power mode.
B. An out-of-lock condition in the Phased Locked-Loop circuit.
C. Excessive deviation in the frequency modulated output signal.
D. A constant transmitter power output at various modulation levels.

7A6 What condition may exist if a VHF radio is operational in receive mode but unable to transmit?

A. Excessive bias is being applied to switching transistors in the transmitter output stage.
B. The solid-state antenna relay is no longer functioning properly.
C. A component in the Push-To-Talk (PTT) circuit has failed.
D. The SWR protection circuit has engaged to prevent transmission.

Answers: 7A1: C 7A2: D 7A3: A 7A4: B 7A5: B 7A6: C

Section-A: VHF-DSC Equipment & Operation: Key Topic-8: Transmitter Faults-2:

8A1 What condition may be indicated if a VHF radio cannot contact nearby stations on any channel, an inline wattmeter indicates 25 watts output (HIGH power mode), and no modulation is heard when the transmitted signal is monitored with an external receiver?

A. A fault in the transmitter's Push-To-Talk circuit is causing the loss of audio.
B. There is an open connection in the microphone cable or connector.
C. The microphone's Automatic Gain Control (AGC) has malfunctioned.
D. Degenerative feedback applied to the AF amplifier exceeds specifications.

8A2 What condition may be indicated if a VHF radio cannot contact nearby stations, an inline wattmeter indicates less than 1 watt output (HIGH power mode), and nominal voltage (e.g., 12.8 vdc) is applied to the VHF radio power input line?

A. The RF power applied to the input of the Power Amplifier (PA) stage is excessive.
B. There is an open connection between the radio's PA stage and the antenna connector.
C. The bias voltage applied to the Power Amplifier (PA) stage may be insufficient.
D. A defective capacitor is blocking DC voltage from appearing at the antenna connector.

8A3 A spectrum analyzer (SPECAN) can be a useful test instrument to troubleshoot a marine VHF radio. Which of the following is the best procedure to evaluate the input/output stages of a marine VHF transmitter?

A. Connect the radio to the SPECAN through an in-line attenuator, apply maximum attentuation and set the radio to HIGH power. Use an inductive probe to evaluate signals at the input/output of AF transmitter stages.
B. Connect the radio to the SPECAN through an in-line attenuator, apply maximum attentuation and switch the radio to HIGH power. Use an inductive probe to evaluate signals at the input/output of RF transmitter stages.
C. Connect the radio to the SPECAN through an in-line attenuator, apply minimum attentuation and switch the radio to LOW power. Use an inductive probe to evaluate signals at the input/output of AF transmitter stages.
D. Connect the radio to the SPECAN through an in-line attenuator, apply maximum attentuation and switch the radio to LOW power. Use an inductive probe to evaluate signals at the input/output of RF transmitter stages.

8A4 Which in-line RF power reading indicates the proper operation of a VHF marine transmitter?

A. 25 watts forward/1.5 watts reflected.
B. 25 watts forward/25 watts reflected.
C. 27.5 watts forward/1.5 watts reflected.
D. 2.5 watts forward/1.5 watts reflected.

8A5 What condition may cause distortion in the modulator stage of a marine VHF transmitter?

A. The reactance modulator may be out of alignment.
B. The excessive use of pre-emphasis on audio signals above 25 kHz.
C. A defective varactor diode in the transmitter's voltage controlled oscillator.
D. Transmitter modulation in excess of 150%.

8A6 What terms are used to describe a device used to test the RF power output of a marine VHF transmitter without emitting a signal on the air?

A. Dummy load, artificial antenna.
B. Phantom Antenna, dummy load.
C. Isotropic suppressor, artificial antenna.
D. Artificial attenuator, dummy load.

Answers: 8A1: B 8A2: C 8A3: D 8A4: A 8A5: D 8A6: A

Section-A: VHF-DSC Equipment & Operation: Key Topic-9: Digital Selective Calling:

9A1 What is the correct frequency shift and sub-carrier for VHF-DSC?

A. 1300-2100 Hz, sub-carrier 1700 Hz.
B. 1500-2300 Hz, sub-carrier 1900 Hz.
C. 1200-2600 Hz, sub-carrier 1900 Hz.
D. 1500-2300 Hz, sub-carrier 1700 Hz.

9A2 What is the correct modulation rate and index of modulation for VHF-DSC?

A. 800 baud, 3.0 +/- 10%
B. 1200 baud, 2.0 +/- 10%
C. 1500 baud, 2.0 +/- 5%
D. 1800 baud, 3.0 +/- 5%

9A3 How might a DSC radio check be accomplished with a coast station?

A. Enter the station's MMSI, and press the button under the red plastic cover for 5 seconds.
B. Select DSC menu item TEST, enter the Coast Station's FCC call letters, and send the test call.
C. Select DSC menu item TEST, enter the Coast Station's MMSI number, and send the test.
D. Select DSC menu ALL SHIPS, and send the test message.

9A4 You attempt to program a new MMSI into a VHF radio with an existing MMSI. The radio will not accept the entry. What is the best course of action to correct this problem?

A. You must RESET the DSC memory by holding down two buttons as described in the user manual.
B. You can never change a number, once one is already programmed.
C. Re-register the old MMSI with the new owner and make no programming changes to the radio.
D. Contact the manufacturer for action to clear the MMSI memory and accept the new number.

9A5 What is the time diversity reception interval for a VHF-DSC call?

A. 33-1/3 milliseconds
B. 40.5 milliseconds
C. 66-2/3 milliseconds
D. 91 milliseconds

9A6 What might a voltmeter indicate when testing a DSC circuit for an outgoing message data stream?

A. Steady reading of 12 volts DC.
B. Fluctuating reading from 0 to 2 volts DC.
C. There will be an absence of voltage.
D. Voltage swing from -12 VDC to + 12 VDC.

Answers: 9A1: A 9A2: B 9A3: C 9A4: D 9A5: A 9A6: B

Section-A: VHF-DSC Equipment & Operation: Key Topic-10: Antenna Systems:

10A1 It becomes necessary to construct a temporary VHF marine antenna. What should be the approximate length of the antenna?

A. 10 inches
B. 12 inches
C. 15 inches
D. 18 inches

10A2 Which of the following best describes a VHF collinear array?

A. An antenna with phased elements, omni directional radiation pattern, offering up to 9 db gain.
B. The cascade filters in the VHF radio's IF section.
C. A shoreside directional VHF yagi antenna.
D. A depth sounder phased array transducer.

10A3 A masthead antenna with a base loading coil appears shorted to an ohmmeter check. What might this indicate?

A. Positive proof of shorted coaxial cable plugs.
B. May be normal for a well working shunt fed antenna system.
C. Immediately repair both upper and lower PL-259s.
D. No VHF antenna should measure a short circuit.

10A4 What is the most common type of coax connector used on VHF transceivers?

A. "N"
B. "BNC"
C. "UHF"
D. "TNC"

10A5 What type of coaxial cable would be most appropriate for a long transmission line run?

A. "RG-58/U"
B. "RG-59/U"
C. "RG-8/U"
D. "RG-174/U"

10A6 What is a disadvantage when using high gain VHF antennas?

A. Poor horizontal radiation pattern.
B. Very high radiation pattern.
C. Very low radiation pattern.
D. Signal dropout in severe weather on small craft.

Answers: 10A1: D 10A2: A 10A3: B 10A4: C 10A5: C 10A6: D

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Ops: Key Topic-11: Frequencies and Bandwidth:

11B1 What is the assigned bandwidth and channel spacing for J3E voice transmissions?

A. 170 Hz and 300 Hz
B. 300 Hz and 500 Hz
C. 2.8 kHz and 3.0 kHz
D. 3.1 kHz and 4.0 kHz

11B2 What is the assigned bandwidth and channel spacing for J2B SITOR (NBDP) transmissions?

A. 3.1 kHz and 4.0 kHz
B. 2.8 kHz and 3.0 kHz
C. 170 Hz and 300 Hz
D. 300 Hz and 500 Hz

11B3 What is the allowable frequency tolerance for GMDSS MF-HF transmitters?

A. 10 Hz
B. 15 Hz
C. 20 Hz
D. 30 Hz

11B4 Using a frequency counter with an accuracy of 2 ppm which of the following are within legal tolerance for the frequencies of 2182.0 kHz and 4125.0 kHz? The counter has a display resolution of 1 Hz.

A. 2181.991 kHz and 4125.004 kHz
B. 2182.006 kHz and 4124.995 kHz
C. 2182.010 kHz and 4124.992 kHz
D. 2181.990 kHz and 4125.009 kHz

11B5 Which of the following are assigned frequencies for Digital Selective Calling?

A. 2182 kHz, 4177.5 kHz, 6312 kHz, 8376.5 kHz, 12577 kHz, 16420 kHz.
B. 2187.5 kHz, 4207.5 kHz, 6312 kHz, 8414.5 kHz, 12577 kHz, 16804.5 kHz.
C. 2187.5 kHz, 4207.5 kHz, 6268 kHz, 8414.5 kHz, 12520 kHz, 16420. kHz.
D. 2174.5 kHz, 4125 kHz, 6312 kHz, 8291 kHz, 12577 kHz, 16804.5 kHz

11B6 What are the assigned frequencies for VOICE and SITOR (NBDP) follow on communications?

A. VOICE: 2182 kHz, 4125 kHz, 6312 kHz, SITOR (NBDP) 4177.5 kHz, 8376.5 kHz, 12520 kHz
B. VOICE: 8291 kHz, 12577 kHz, 16420 kHz, SITOR (NBDP) 4125 kHz, 6268 kHz, 8376.5 kHz
C. VOICE: 4125 kHz, 8291 kHz, 16420 kHz, SITOR (NBDP) 2174.5 kHz, 6268 kHz, 12520 kHz
D. VOICE: 6215 kHz, 8414.5 kHz, 12290 kHz, SITOR (NBDP) 6268 kHz, 8291 kHz, 12520 kHz

Answers: 11B1: C 11B2: D 11B3: A 11B4: B 11B5: B 11B6: C

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Ops: Key Topic-12: Controls, Functions and Displays:

12B1 What is the purpose of the "R.I.T." control on a MF/HF transceiver?

A. Make slight adjustments to the transmit frequency.
B. Make slight adjustments in the receiver frequency.
C. Select the proper transmitter emissions.
D. Select the proper paired duplex channel.

12B2 What is the function of the "TUNE" button on a MF/HF transceiver?

A. To tune in a new ITU channel.
B. To tune the frequency of the receiver.
C. To tune the antenna to the transmit frequency.
D. To tune the frequency of the AF amplifier.

12B3 What is the purpose of the "ENTER" function.

A. To store any incoming DSC message in memory.
B. To recall any previously received message.
C. To transmit a DSC distress alert.
D. To accept the previous selection or data input.

12B4 What mode is a MF/HF transceiver operating in when "TLX" displayed?

A. SITOR (NBDP)
B. SSB
C. DSC
D. AM

12B5 Reducing the "RF Gain" control on an MF/HF transceiver has what effect?

A. Reduces degenerative feedback to the RF amplifier stage.
B. Reduces volume in response to a varying RF signal input.
C. Reduces coupling between the receiver's RF amplifier stages.
D. Reduces sensitivity of the RF amplifier stage.

12B6 What is the function of an "AGC" button?

A. To maintain a relatively constant AF output when the input signal varies.
B. To reduce AF output when the input signal becomes weak.
C. To increase the gain of the RF amplifier when the input signal is strong.
D. To increase RF output when the input signal becomes strong.

Answers: 12B1: B 12B2: C 12B3: D 12B4: A 12B5: D 12B6: A

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-13: Receiver Technology:

13B1 What is the purpose of the BFO?

A. Re-injects the carrier frequency in the receiver's detector to demodulate the SSB signal.
B. Replace the missing sideband and carrier frequency.
C. Remove the carrier from H3E transmissions.
D. Inverts the SSB signal to remove interference.

13B2 If the BFO is turned off what kind of emissions can still be received?

A. J3E and J2B
B. A3E and H3E
C. H3E and F1B
D. A1A and J3E

13B3 If you are listening to another vessel's HF transmission and it sounds garbled what should you do?

A. Change the receive frequency to either adjacent channel.
B. Advise the other vessel that his transmission is faulty.
C. Use the "R.I.T." or "Clarifier" control to adjust the frequency of the receiver.
D. Adjust the squelch control to clear up the sound quality.

13B4 What characteristics are desirable in an AGC circuit for SSB voice reception?

A. Slow attack and decay.
B. Slow attack and fast decay.
C. Fast attack and decay.
D. Fast attack and slow decay.

13B5 What is the primary purpose of both a high and a low I.F. system in a HF receiver?

A. Using a high first I.F. amplifier results in eliminating image signals.
B. Using a high first I.F. amplifier results in less intermodulation products.
C. Using a low first I.F. amplifier results in fewer third harmonic signals.
D. Using a low first I.F. amplifier results in greater signal amplification.

13B6 How does a noise blanker circuit work in a HF receiver?

A. A limiter circuit clips the peaks of the noise pulses.
B. The noise pulses are used to develop a blanking pulse for the I.F. amplifier.
C. The noise pulses operate on the ratio detector to blank the audio output.
D. A Noise blanker briefly reduces the gain of the RF amplifier when the noise pulses occur.

Answers: 13B1: A 13B2: B 13B3: C 13B4: D 13B5: A 13B6: B

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-14: Receiver Faults-1:

14B1 The voice is garbled and unreadable on MF/HF SSB channels. What is the most likely cause?

A. The R.I.T circuit has failed.
B. The first RF stage has failed.
C. The frequency synthesizer has failed.
D. The beat frequency oscillator circuit has failed.

14B2 All signals sound normal on an MF/HF receiver except one that has a very high pitched voice barely readable. What is the most likely cause?

A. The transmitter of the abnormal signal is off frequency.
B. The receiver frequency synthesizer circuit is defective.
C. The voltage controlled oscillator has failed.
D. The B.F.O. circuit is faulty.

14B3 You are able to hear signals in the voice/SSB mode but not in the SITOR (NBDP) mode. What is the most likely cause?

A. The phase locked loop circuit has failed.
B. The 500 Hz I.F. filter has become defective.
C. The R.F. amplifier has failed.
D. The B.F.O. circuit has failed.

14B4 The phase locked loop circuit in an MF/HF receiver appears to be faulty. What is the most likely cause?

A. The AGC circuit has become defective.
B. The Beat Frequency Oscillator is inoperative.
C. The Voltage Controlled Oscillator is inoperative.
D. The 500 Hz I.F. filter has become defective.

14B5 You are able to hear signals in the SITOR (NBDP) mode but not in the voice/SSB mode. What is the most likely cause?

A. The B.F.O. circuit has failed.
B. The audio amplifier is defective.
C. The 2.8 kHz filter has become defective.
D. The R.F. amplifier has failed.

14B6 The AGC function of an MF/HF receiver is inoperative. What is the most likely cause?

A. The B.F.O. circuit has failed.
B. The Voltage controlled Oscillator is inoperative.
C. The audio amplifier is defective.
D. Failure of a variable gain amplifier in the RF stage.

Answers: 14B1: D 14B2: A 14B3: B 14B4: C 14B5: C 14B6: D

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-15: Receiver Faults-2:

15B1 The MF/HF receiver fails to suppress the AF output in the absence of a sufficiently strong input signal. What is the most likely cause?

A. The AGC circuit has failed.
B. The BFO circuit has failed.
C. The squelch circuit has failed.
D. The AF amplifier circuit has failed.

15B2 The MF/HF receiver fails to produce any AF output. An ohmmeter reading is near zero between speaker leads. What is the most likely cause?

A. The 3 – 30 MHz amplifier stage has failed.
B. The speaker is shorted out.
C. Excess negative feedback is reducing AF gain.
D. The audio amplifier stage has failed.

15B3 The MF/HF transceiver produces strong AF output but no signals are heard on any frequency. What is the most likely cause?

A. The transceiver is connected to a "Dummy Load."
B. A high Standing Wave Ratio (SWR) in the antenna system.
C. A "crowbar" circuit in the power supply is activated.
D. The squelch circuit has failed.

15B4 The MF/HF transceiver produces strong AF output but no signals are heard on any frequency. What is the most likely cause?

A. The squelch sensitivity control is set too high.
B. There is an open circuit in the transmission line to the antenna.
C. The final stage of the AF amplifier circuit has failed.
D. The power amplifier stage in the receiver has failed.

15B5 The MF/HF transceiver fails to produce AF output but the radio is powered on and "TX" is illuminated. What is the most likely cause?

A. The speaker is shorted out.
B. A shorted Push-To-Talk circuit in the microphone.
C. A "crowbar" circuit in the power supply has engaged.
D. The final stage of the AF amplifier circuit has failed.

15B6 A received signal on a MF/HF transceiver breaks up rapidly and repeatedly. The signal alternates between mid scale and zero on the "Signal" meter. What is the most likely cause?

A. Intermittent gain in the AF amplifier circuit.
B. The squelch sensitivity control is set too high.
C. An intermittent connection between the antenna and coupler.
D. The AGC circuit has malfunctioned.

Answers: 15B1: C 15B2: D 15B3: A 15B4: B 15B5: B 15B6: C

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-16: Transmitter Tech:

16B1 How is a J3E signal generated?

A. By using high-level modulation to produce a single sideband.
B. By using a double balanced mixer and a sideband filter.
C. By using the audio signal to phase modulate the carrier.
D. By using low level modulation and a sideband filter.

16B2 What would be the most likely power level to use for initial MF-HF communications?

A. 25 watts PEP
B. 50 watts PEP
C.150 watts PEP
D. 600 watts PEP

16B3 How is the lower sideband eliminated?

A. By using a double balanced mixer to block the lower sideband.
B. By using a filter to pass the lower sideband and block the upper sideband.
C. By using a double balanced mixer to insert the carrier.
D. By using a filter to pass the upper sideband and block the lower sideband.

16B4 What is the most common method of generating a SITOR (NBDP) signal on shipboard GMDSS equipment?

A. Two alternating sidebands of 1615 Hz and 1785 Hz are offset from the carrier frequency by 1700 Hz.
B. The carrier frequency is alternately shifted from + 85 Hz to – 85 Hz while suppressing the sidebands.
C. There is one 1500 Hz sideband which is shifted from +170 Hz to – 170 Hz with a suppressed carrier.
D. Two alternating sidebands of 1500 Hz and 2300 Hz are offset from the carrier frequency by 1900 Hz.

16B5 What are the major components of a phase locked loop frequency synthesizer?

A. Ratio detector, master oscillator, limiting amplifier and voltage controlled oscillator.
B. Phase comparator, loop filter, master oscillator and first mixer stage.
C. High pass filter, master oscillator, double balanced mixer and voltage controlled oscillator.
D. Master oscillator, frequency dividers, phase comparator, loop filter and voltage controlled oscillator.

16B6 What is the purpose of a phase comparator in a frequency synthesizer?

A. Compare the divided outputs of the master oscillator and the voltage controlled oscillator.
B. Compare the direct outputs of the master oscillator and the voltage controlled oscillator.
C. Compare the direct output of the master oscillator and the divided output of the voltage controlled oscillator.
D. Compare the divided output of the master oscillator and the direct output of the voltage controlled oscillator.

Answers: 16B1: B 16B2: C 16B3: D 16B4: A 16B5: D 16B6: A

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-17: Transmitter Faults-1:

17B1 An MF-HF transceiver works properly on voice but not SITOR (NBDP). What is the most likely source of the problem?

A. The 500 Hz I.F. filter has failed.
B. The audio amplifier has failed.
C. The phase locked loop circuit has failed.
D. The R.F. amplifier has failed.

17B2 Which of the following conditions would indicate the malfunction of a 2182 kHz radiotelephone system?

A. No discernable traffic has been heard on the 2182 kHz during the radiotelephone silent periods.
B. Failure to contact another station 60 miles distant during daytime operation.
C. Dramatic decrease in noise level observed during night and early morning hours.
D. The visual indication of power to the antenna fluctuates while testing the radiotelephone alarm signal generator into an artificial antenna.

17B3 Which would be an indication of proper operation of a SSB transmitter rated at 60 watt PEP output?

A. In SSB (J3E) voice mode, with the transmitter keyed but without speaking into the microphone, power output is indicated.
B. In SSB (J3E) mode, speaking into the microphone causes power meter to fluctuate slightly around the 60 watt reading.
C. In SITOR (NBDP) communications, the power meter can be seen fluctuating regularly from zero to the 60 watt relative output reading.
D. A steady indication of transmitted energy on an RF Power meter with no fluctuations when speaking into the microphone.

17B4 An MF-HF transceiver is functioning correctly in voice mode/SSB but not in SITOR (NBDP). What is the most likely source of the problem?

A. The second I.F. amplifier has become defective.
B. The voltage controlled oscillator is defective.
C. The 2.8 kHz filter has become defective.
D. The 1615 kHz audio oscillator is not working.

17B5 Which of the following conditions would be a symptom of malfunction in a 2182 kHz SSB radiotelephone?

A. No indication of power output when speaking into the microphone.
B. Much higher noise level observed during daytime operation.
C. When testing a radiotelephone alarm on 2182 kHz into an artificial antenna, the Distress frequency watch receiver becomes un-muted, an improper testing procedure.
D. Failure to contact a shore station 600 nautical miles distant during daytime operation.

17B6 Which would indicate proper operation of a SSB transmitter rated at 60 Watt PEP output in J3E mode?

A. In SITOR communications, the power meter can be seen fluctuating regularly from zero to the 60 watt relative output reading.
B. In SSB (J3E) voice mode, with the transmitter keyed but without speaking into the microphone, no power output is indicated.
C. In SSB (J3E) mode, speaking into the microphone causes the power meter to fluctuate well above the 60 watt reading.
D. A steady indication of transmitted energy on an RF power meter with no fluctuations when speaking into the microphone.

Answers: 17B1: A 17B2: B 17B3: C 17B4: D 17B5: A 17B6: B

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-18: Transmitter Faults-2:

18B1 Which of the following conditions indicate the proper operation of a 150 Watt MF/HF transmitter in the F1B ARQ mode?

A. The RF power meter indicates constant output at a level between 125 watts and 150 watts during transmission.
B. The RF power meter indicates power output only when characters are typed on the NBDP keyboard.
C. The RF "S" meter indicates a signal level between 125 watts and 150 watts during NBDP reception.
D. The RF power meter indicates an output that fluctuates between 0 and 150 watts during transmission.

18B2 Which of the following conditions indicate the proper operation of a 250 Watt MF/HF transmitter in the F1B FEC mode?

A. The RF power meter indicates constant output at a level between 225 watts and 250 watts during transmission.
B. The RF power meter indicates power output only when characters are typed on the NBDP keyboard.
C. The RF "S" meter indicates a signal level between 225 watts and 250 watts during NBDP reception.
D. The RF power meter indicates an output that fluctuates between 0 and 250 watts during transmission.

18B3 Which of the following conditions could cause very low RF output in a MF/HF transmitter operating in the F1B FEC mode?

A. Failure of a voltage controlled oscillator in the IF amplifier stage.
B. A high Standing Wave Ratio (SWR) in the antenna system.
C. The connection of a transceiver is connected to a "Dummy Load" antenna.
D. Failure of a SSB bandpass filter in the stage preceding the RF amplifier.

18B4 which of the following troubleshooting methods is not valid for finding the fault in a MF/HF transmitter operating in the F1B FEC mode?

A. Visual inspection of the transmitter (control settings, signs of physical damage or overheating, etc.)
B. Power supply testing with a DVM to ensure all prescribed operating voltages are within acceptable limits.
C. Modulation testing with a RF spectrum analyzer to measure frequency deviation in the transmit mode.
D. Input/Output checks with a 10:1 oscilloscope probe to identify any points of severe signal degradation.

18B5 Which of the following conditions could cause zero RF output in a MF/HF transmitter operating in the F1B FEC mode?

A. The connection of a transceiver is connected to a "Dummy Load" antenna.
B. The failure of the voice bandpass filter in the stage preceding the RF amplifier.
C. The activation of a "crowbar" circuit in the power supply to prevent an unregulated voltage increase.
D. The generation of a positive VCO feedback signal to a Phase Locked Loop circuit in the transmitter.

18B6 Which of the following conditions indicate improper operation of a 150 Watt MF/HF transmitter in the F1B FEC mode?

A. The RF power meter indicates constant output at a level between 125 watts and 150 watts during transmission.
B. The SWR meter indicates 125 watts forward RF power and 5 watts reflected RF power during transmission.
C. The RF "S" meter fluctuates depending on the strength of the received signal during NBDP reception.
D. The RF power meter indicates an output that fluctuates between 0 and 150 watts during transmission.

Answers: 18B1: D 18B2: A 18B3: B 18B4: C 18B5: C 18B6: D

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-19: DSC Operations:

19B1 What precedes the phasing signal in a DSC distress alert call?

A. An alternating dot pattern of 20 bits
B. An alternating dot pattern of 100 bits
C. An alternating dot pattern of 200 bits
D. An alternating dot pattern of 400 bits

19B2 What type of code is used for DSC transmissions?

A. A 7 bit code with a constant ratio of 4/3 between the 1s and 0s.
B. A 7 bit code followed by an error check character at the end.
C. A 10 bit code followed by an error check character at the end.
D. A 10 bit code with 7 bits used for information and 3 bits used for error correction.

19B3 What is the correct frequency shift and sub-carrier for MF-HF-DSC?

A. +/- 85 Hz and 1700 Hz
B. +/- 170 Hz and 1700 Hz
C. +/- 250 Hz and 1500 Hz
D. +/- 400 Hz and 1900 Hz

19B4 What is the time diversity reception interval for a MF-HF-DSC call?

A. 33-1/3 milliseconds
B. 400 milliseconds
C. 450 milliseconds
D. 250 milliseconds

19B5 A MF/HF Distress priority DSC call may be formatted to include the following:

A. MMSI, vessel position, nature of distress, follow-on communications by J3E only.
B. MMSI, vessel position, nature of distress, follow-on communications by J3E or F1B.
C. Call sign, vessel position, nature of distress, follow-on communications by J3E or F1B.
D. Name of vessel, vessel position, nature of distress, follow-on communications by J3E or F1B.

19B6 What statement is false concerning DSC calls addressed to MMSI 003669999?

A. MMSI 003669999 is an established group call that includes all U.S. Coast Guard Stations.
B. DSC calls to MMSI 003669999 will be received by all DSC-equipped USCG coast stations within radio range.
C. DSC calls to MMSI 003669999 may not be used to test MF/HF DSC equipment aboard ships.
D. DSC calls to MMSI 003669999 may result in an automated acknowledgement from USCG coast stations.

Answers: 19B1: C 19B2: D 19B3: A 19B4: B 19B5: B 19B6: C

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-20: SITOR (NBDP)-ARQ:

20B1 Which of the following statements concerning SITOR (NBDP) communications is true?

A. In ARQ, each character is transmitted twice, about 250 milliseconds apart.
B. In ARQ, the "information sending station" will transmit a block of three characters that the receiving station will subsequently acknowledge or request it to be retransmitted.
C. In ARQ, the "information sending station" transmits a block of three characters twice, about 250 milliseconds apart.
D. SITOR communications can be used to contact a NAVTEX transmitting station when requesting a repeat transmission of a missed NAVTEX message.

20B2 What statement is true regarding the exchange between two stations engaged in SITOR (NBDP) communications?

A. In ARQ, each character is transmitted twice, with the second displaced in time from the first.
B. In ARQ, the "sending" station transmits a block of three characters and the "receiving" station responds with a one character Repeat Request. Following this the "transmitting" station will send a new block.
C. In ARQ, the ISS transmits a block of 3 characters and the IRS checks for parity. If the received block is correct a control signal is sent notifying the ISS to proceed. If the parity check fails the block must be resent.
D. Broadcasts of Maritime Safety Information, traffic lists, etc. can be copied by the receiving station in ARQ mode.

20B3 Which of the following is true of SITOR (NBDP) ARQ mode:

A. The ship station sends a group of 3 characters twice and then waits for an "RQ" signal to indicate proper receipt before transmission of the next 3 characters.
B. The Ship station sends each character twice, using a time diversity system to ensure proper parity.
C. The ship station sends a group of 3 characters, the shore station checks for proper parity and then requests the same group be resent to enable error correction.
D. The ship station sends a group of 3 characters, the shore station checks for proper parity. If parity is OK, the shore station indicates readiness for transmission of the next 3 characters.

20B4 Which of the following keystrokes or characters follows most commands in ARQ communications when working an automated Coast Station?

A. +
B. GA+?
C. ENTER
D. END

20B5 Which characters are sent by the ship station to indicate a desire to send a message via a direct connection to a shoreside TELEX subscriber?

A. MSG+
B. AMV+
C. OPR+
D. DIRTLX0xxyyyy+

20B6 What are the characters that are transmitted to terminate a direct TELEX connection in SITOR (NBDP) operations?

A. KKKK
B. . . . . .
C. END+
D. EOM

Answers: 20B1: B 20B2: C 20B3: D 20B4: A 20B5: D 20B6: A

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-21: SITOR (NBDP)-FEC:

21B1 If a vessel is within range of NAVTEX broadcasts and both the Inmarsat-C and the NAVTEX receiver are inoperative the GMDSS operator should:

A. Select 518 kHz FEC TELEX on the MF/HF console to receive MSI.
B. Select 518 kHz ARQ TELEX on the MF/HF console to receive MSI.
C. Request repairs of the Sat-C system and wait until within range of NAVTEX.
D. Select an HF MSI frequency and ARQ TELEX mode to receive MSI.

21B2 The sequence ARQ, FEC, SFEC best corresponds to which of the following sequences?

A. One-way communications to a single station, one-way communications to all stations, two-way communications.
B. Two way communications, one-way communications to all stations, one-way communications to a single station.
C. One-way communications to all stations, two-way communications, one-way communications to a single station.
D. Two way communications, One way communications to a single station, One way communications to all stations.

21B3 Selective FEC communications (SFEC) are employed when:

A. Multiple stations without a group SELCALL must receive communications without using their transmitters.
B. Multiple stations must receive communications by using their transmitters to achieve phasing.
C. An individual station must receive communications without transmitting (Radio Silence).
D. An individual station must receive communications by using their transmitter to achieve phasing and block other stations from breaking in.

21B4 Which of the following is true of SITOR (NBDP) Mode B (FEC), in the presence of static crashes.

A. Data flow rate depends on signal propagation.
B. Idle characters are sent upon request.
C. Transmitter and receiver cannot synchronize.
D. FEC reduces the error rate by transmitting each character twice.

21B5 If the vessel is beyond range of NAVTEX broadcasts and the Sat-C system fails, the GMDSS operator must:

A. Select an HF MSI frequency and FEC TELEX mode to receive MSI.
B. Select 518 kHz ARQ TELEX on the MF/HF console to receive MSI.
C. Request repairs of the Sat-C system and wait until within range of NAVTEX.
D. Select 518 kHz FEC TELEX on the MF/HF console to receive MSI.

21B6 If the vessel is experiencing atmospheric interference with NAVTEX broadcasts, especially in the tropics, the GMDSS operator should:

A. Select one of the 6 HF MSI frequencies and set-up the transceiver in ARQ TELEX mode.
B. Select one of the 8 HF MSI frequencies and set-up the transceiver in FEC TELEX mode.
C. Select one of the 6 MF MSI frequencies and set-up the transceiver in FEC TELEX mode.
D. Select the MF MSI frequency dedicated to tropical MSI and set-up the transceiver in FEC TELEX mode.

Answers: 21B1: A 21B2: B 21B3: C 21B4: D 21B5: A 21B6: B

Section-B: MF-HF-DSC-SITOR (NBDP) Equip. & Operations: Key Topic-22: Antenna Systems:

22B1 What is the purpose of the antenna tuner?

A. Minimizes the carrier output.
B. Maximizes the sidebands.
C. Provides for maximum VSWR.
D. Match the antenna to the operating frequency.

22B2 What is the electrical effect of an inductance in series with the antenna?

A. It electrically lengthens a physically fixed length antenna.
B. It electrically shortens a physically fixed length antenna.
C. It raises the resonant frequency of a physically fixed length antenna.
D. It increases the bandwidth of a physically fixed length antenna.

22B3 What is the electrical effect of a capacitance in series with the antenna?

A. It electrically lengthens a physically fixed length antenna.
B. It electrically shortens a physically fixed length antenna.
C. It lowers the resonant frequency of a physically fixed length antenna.
D. It increases the bandwidth of a physically fixed length antenna.

22B4 Which of the following coaxial cables is suitable for use in GMDSS MF/HF antenna systems?

A. RG-59, 72 ohm Coax
B. RG-6, 72 ohm Coax
C. RG-8, 50 ohm Coax
D. RG-179, 75 ohm Coax

22B5 A ship's MF-HF whip antenna breaks off and is carried away in a storm. What would you do to regain operation on MF-HF GMDSS frequencies?

A. Rig a wire antenna 10 ft long from the antenna tuner to the highest vertical support.
B. Rig a horizontal, center-fed dipole antenna 10 ft long to the antenna tuner.
C. Rig a wire antenna approximately 35-40 ft long per the equipment instruction manual.
D. Connect the MF/HF transceiver to the VHF antenna.

22B6 Which of the following connectors is often used in GMDSS MF/HF antenna systems?

A. "F" Connector
B. "SMA" Connector
C. "EIA-232" Connector
D. "PL-259" Connector

Answers: 22B1: D 22B2: A 22B3: B 22B4: C 22B5: C 22B6: D

Section-C: Satellite Systems: Key Topic-23: Technology:

23C1 What are the frequencies for Inmarsat-C shipboard satellite operation?

A. Reception: 1526.5 - 1560.5 MHz and Transmission: 1625.0 - 1659.0 MHz
B. Reception: 1625.0 - 1659.0 MHz and Transmission: 1526.5 - 1560.5 MHz
C. Reception: 1530.0 - 1545.0 MHZ and Transmission: 1626.5 - 1645.5 MHz
D. Reception: 1625.0 - 1659.0 MHz and Transmission: 1526.5 - 1560.5 MHz

23C2 What is an LNA?

A. Line noise amplifier
B. Low number algorithm
C. Low noise antenna
D. Low noise amplifier

23C3 What function does the LNA perform?

A. Receives and amplifies a very weak signal from the satellite.
B. Calculates data received.
C. Increases the receiver's noise figure.
D. Provides degenerative feedback to the LNB.

23C4 What is the fade margin factor?

A. A design allowance that provides for the sun to accommodate expected fading for the purpose of ensuring that the required quality of service is maintained.
B. A design allowance to accommodate expected fading.
C. The increase in fade over a receiver's noise floor.
D. The ratio between the largest and smallest values of a received signal.

23C5 What is signal to noise ratio?

A. A measure used that compares the distance of a desired signal to the level of background noise.
B. A measure used that compares the level of a desired signal to the level of background noise.
C. A measure used that compares the frequency of a desired signal to the frequency of background noise.
D. A measure that measures signal in the forward direction and noise in the reverse direction.

23C6 What is the abbreviation for signal to noise?

A. STN
B. SIG/NR
C. SNR
D. SIN

Answers: 23C1: C 23C2: D 23C3: A 23C4: B 23C5: B 23C6: C

Section-C: Satellite Systems: Key Topic-24: C-Terminals:

24C1 Which of the following actions should be taken to minimize shock hazard of an Inmarsat terminal?

A. Ensure the DC power supply is insulated from the ship's hull.
B. Ensure the chassis of the Inmarsat terminal is connected to an electrical ground.
C. Install a common busbar for grounding to ensure common-mode coupling.
D. Isolate the transceiver's metal frame to avoid a return path for fault currents.

24C2 How do you perform a LOOP BACK test?

A. Initiate a Performance Verification Test through terminal software.
B. Initiate a test to IP address: 127.0.0.1.
C. Send yourself a test message.
D. Request the LES to send you a test message.

24C3 What do EGC messages contain?

A. Maritime Mobile Service Identity information.
B. SafeNet™, FleetwideNet™ and System information.
C. Electronic Grounding Codes and System information.
D. SafetyNet™, FleetNet™ and System information.

24C4 Which of the following is not recommended for Inmarsat-C antenna installations?

A. Ensure the antenna is electrically insulated from the mounting mast. Check resistance with ohmmeter.
B. Ground the antenna chassis to the mounting mast. Apply silicone to weatherproof the connection.
C. Fashion a drip loop in the transmission line near the antenna. Secure to the mounting mast with cable tie.
D. Apply waterproof sealant or putty around transmission line connectors. Wrap with self-bonding/vinyl tape.

24C5 How many NCS's operate in each Inmarsat ocean region per Inmarsat system?

A. Three
B. Four
C. Two
D. One

24C6 What type of services cannot be provided by the Inmarsat-C system?

A. Telephone communications via VOIP.
B. Message transmission to and from a mobile unit.
C. Broadcast data to groups of mobile terminals.
D. Position reporting from fleets of mobile units.

Answers: 24C1: B 24C2: C 24C3: D 24C4: A 24C5: D 24C6: A

Section-C: Satellite Systems: Key Topic-25: Long Range Identity Tracking:

25C1 The U.S. National Data Center that monitors polling input for each US Flag ship:

A. Must receive at least 4 position reports daily.
B. Must receive LRIT position reports each hour.
C. Must receive at least 1 position report daily including the number of crew aboard.
D. Is a double check on AIS output.

25C2 LRIT Long Range Information Tracking data:

A. Need not be transmitted if AMVER daily messages are sent.
B. Is a separate tracking system for each flag state's security.
C. Is shared for the Captain of the Port.
D. Is broadcast on the Internet for company tracking purposes.

25C3 LRIT Long Range Information Tracking:

A. Can serve as duplicate back up information for AIS (Automatic Information System.)
B. Works on the same frequencies as AIS, but on different channels.
C. is detected on the Inmarsat-C satellite network.
D. Puts out a polling signal on the Inmarsat B system.

25C4 When a compulsory equipped IMO ship is not correctly broadcasting LRIT Info what action should be taken?

A. Check the power fuse on the Sat D box located on the bridge.
B. Can re-boot the AIS broadcasting unit.
C. Verify the Ship Security Alerting System has not been accidentally activated.
D. Double check the GMDSS Console's Inmarsat-C terminal for regular operation.

25C5 What must a LRIT terminal do?

A. Capable of being configured to automatically transmit an APR, transmit an APR every 6 hours, be able to automatically transmit a PR if requested.
B. Capable of being configured to automatically transmit an APR, transmit an APR every 12 hours, be able to automatically transmit a PR if requested.
C. Capable of being configured to automatically receive an APR, transmit an APR every 8 hours, be able to automatically transmit a PR if requested.
D. Capable of being configured to automatically receive an APR, transmit an APR every 24 hours, be able to automatically transmit a PR if requested.

25C6 What satellite system does not support LRIT?

A. Inmarsat-C
B. GPS
C. IRIDIUM
D. Inmarsat-D+

Answers: 25C1: A 25C2: B 25C3: C 25C4: D 25C5: A 25C6: B

Section-C: Satellite Systems: Key Topic-26: Fleet-33-55-77 Terminals:

26C1 Which of the following Inmarsat units stores configuration data and contains all user interfaces and LED indicators?

A. Main Control Unit – an element of the Pedestal Control Assembly.
B. Master Communications Unit – an element of the antenna control unit.
C. Master Communications Unit – an element of the RF transceiver.
D. Fleet Broadband terminal – a component of below deck equipment.

26C2 Which of the following is not a function of an Inmarsat Fleet Broadband IP handset?

A. Polling and Data Reporting.
B. Voice over IP telephone calls.
C. Displaying terminal status.
D. Changing terminal parameters.

26C3 Which of the following best describes Inmarsat BGAN Streaming Data service?

A. A service ideal for TCP/IP traffic such as e-mail, file transfers and Internet access.
B. Exclusive, high-priority connection ideal for time critical applications.
C. A service used by the Inmarsat terminal's web interface for operation and configuration.
D. A high speed data service used for high speed connections via ISDN.

26C4 Which of the following is the best procedure to test the Inmarsat Distress Alarm?

A. Lift the plastic cover and depress the "DISTRESS" button.
B. Advise the US Coast Guard you are going to test the Distress Alarm.
C. Use service number 33 to arrange a Distress Alarm test transmission with the LES in advance.
D. Broadcast a SAFETY priority call to all stations immediately prior to initiating the Distress Alarm.

26C5 Which of the following is the correct Fax/Data configuration of a Fleet Broadband terminal?

A. RJ11 Port 1 and 2 set to standard voice.
B. ISDN Port set to standard voice.
C. RJ11 Port 1 and 2 set to 3.1 kHz audio.
D. LAN Ports set to 3.1 kHz audio.

26C6 Which of the following is not a characteristic of an Inmarsat Fleet Broadband IP handset?

A. Ability to transmit telephone calls as circuit-switched calls.
B. Displays menu options to configure the terminal.
C. Uses TCP/IP to communicate with the terminal.
D. Provides the terminal with Power over Ethernet.

Answers: 26C1: D 26C2: A 26C3: B 26C4: C 26C5: C 26C6: D

Section-C: Satellite Systems: Key Topic-27: Fleet Broadband Terminals:

27C1 What protocol can be used in connecting a PC to the LAN interface of an Inmarsat terminal?

A. ISDN
B. SMTP
C. TCP/IP
D. FTP

27C2 When is a PIN Unlock Key (PUK) used with an Inmarsat terminal?

A. To place a credit card telephone call via the Inmarsat terminal.
B. To input the Personal Identification Number (PIN) applied to a telephone extension.
C. To override a long distance block on an Inmarsat terminal.
D. To unlock the SIM card in a Fleet broadband terminal.

27C3 Which of the following is NOT a function of the LAN port on a Fleet Broadband terminal?

A. To provide connectivity to an ISDN telephone handset.
B. To provide IP connectivity for terminal configuration and troubleshooting.
C. To provide connectivity for Internet browsing with a computer.
D. To provide connectivity for a Voice Over IP (VOIP) telephone Handset.

27C4 What is the configuration for Thrane & Thrane F250 & F500 facsimile operation?

A. Fax - Group 3 fax via standard voice channel for analog fax applications.
B. Fax - Group 3 fax via 3.1 kHz audio channel for analog fax applications.
C. Fax - Group 5 fax via 5.1 kHz audio channel for efax applications.
D. Fax - Group 3 fax via ISDN channel for analog fax applications.

27C5 What is the configuration Thrane & Thrane F500 for standard voice telephone operation?

A. RJ11 Port 1 and 2 set to 3.1 kHz.
B. RJ11 Port 1 and 2 set to standard voice.
C. ISDN Port set to 3.1 kHz.
D. ISDN Port 1 and 2 set to standard voice.

27C6 Which of the following best describes a Subscriber Identity Module (SIM)?

A. A removable device to implement Inmarsat digital rights management (DRM).
B. A non-volatile device to implement high-speed data and other advanced terminal features.
C. An integrated circuit device that securely stores the Inmarsat identity and an authentication key.
D. A Read/Write data device that uses x.25 protocol to limit terminal access to authorized users.

Answers: 27C1: C 27C2: D 27C3: A 27C4: B 27C5: B 27C6: C

Section-C: Satellite Systems: Key Topic-28: GPS:

28C1 What is the usual arrangement of GPS satellites?

A. 18 satellites in 3 orbital planes, 6 satellites in each plane, 23,400 km altitude and 55 degrees inclination.
B. 24 satellites in 6 orbital planes, 4 satellites in each plane, 20,200 km altitude and 55 degrees inclination.
C. 30 satellites in 5 orbital planes, 6 satellites in each plane, 20,200 km altitude and 60 degrees inclination.
D. 36 satellites in 6 orbital planes, 6 satellites in each plane, 23,600 km altitude and 60 degrees inclination.

28C2 What is the purpose of the Differential GPS system and how does it work?

A. To measure the difference between L-1 and L-2 signals and transmit the information via the GPS signal.
B. To correct for time errors in the satellites and transmit this information via the GPS signal.
C. To correct for various errors using a fixed receiving station which transmits corrections via radio signals.
D. To correct for phase errors between L-1 and L-2 signals and transmit the information via radio beacons.

28C3 How is the GPS usually interconnected with other bridge equipment?

A. Through a 8-bit parallel line network.
B. Through a USB port.
C. Through an Ethernet LAN.
D. Through a NMEA-0183 or NMEA-2000 LAN.

28C4 Which of the following statements is true?

A. The L2 carrier of 1227.60 MHz is used to measure the ionospheric delay.
B. The L1 carrier of 1650.5 MHz is used to measure the ionospheric delay.
C. The L1 carrier of 1545.22 MHz is used to provide the navigation message.
D. The L2 carrier of 1575.42 MHz is used to provide the navigation message.

28C5 Which of the following best describes the GPS satellite signals transmitted?

A. The L2 carrier at 1650.5 MHz carries the navigation message and the L1 carrier at 1575.42 MHz is used to measure the ionospheric delay.
B. The two carriers are combined in a mixer circuit to develop an intermediate signal which is transmitted.
C. The main carrier of 1650.5 MHz and a sub-carrier of 1575.24 MHz containing the SPS code signals.
D. The L1 carrier of 1575.42 MHz carries the navigation message and the SPS code signals and the L2 carrier 1227.60 MHz which is used to measure the ionospheric delay.

28C6 What is the minimum number of satellites that must be received to provide the highest accuracy?

A. Four
B. Two
C. Eight
D. Six

Answers: 28C1: B 28C2: C 28C3: D 28C4: A 28C5: D 28C6: A

Section-C: Satellite Systems: Key Topic-29: Antenna Systems:

29C1 Which of the following best describes the polarization of a satellite signal?

A. The orientation of the RF signal's electric field component.
B. The orientation of the RF signal relative to a dipole antenna.
C. The orientation of the RF signal relative to a parabolic antenna.
D. The orientation of the RF signal's magnetic field component.

29C2 Which of the following is characteristic of the parabolic dish antenna?

A. Feedhorn located behind the parabolic reflector.
B. Feedhorn adjusted to the focal point of the antenna.
C. Most often used on high frequencies (3-30 MHz).
D. Low gain, highly directional radiation pattern.

29C3 Which of the following best describes a phased array antenna system?

A. RF from the feedline array is dissipated by a single antenna element.
B. RF from a multiple feedline array is dissipated by a single antenna element.
C. RF from multiple antennas is varied to produce a desired radiation pattern.
D. RF from multiple antennas is combined to produce unity gain.

29C4 Which of the following is characteristic of an Inmarsat-C antenna?

A. The antenna is RHC polarized with a cardioid radiation pattern.
B. The antenna is vertically polarized and highly directional.
C. The antenna is horizontally polarized and omni-directional.
D. The antenna is RHC polarized with an omni-directional radiation pattern.

29C5 What is a best practice for installing Inmarsat satellite antennas aboard ship?

A. Install antennas as high as practical, free from shadowing of structures.
B. Install antennas next to other Inmarsat antennas, away from structures.
C. Connect the antenna to transmission line with the highest characteristic impedance.
D. Install an inline filter with the transmission line to attenuate frequencies above 1 GHz.

29C6 What components does an Inmarsat Fleet Broadband RADOME typically include?

A. Phased array antenna, gyro-stabilized platform, rotary joint, AC power supply.
B. Stabilized antenna, RF unit, Antenna Control Unit, GPS antenna.
C. Parabolic dish antenna, Main Control Unit, rotary joint, HV power supply.
D. Parabolic dish antenna, rotary joint, AC power supply TDMA Control Unit.

Answers: 29C1: A 29C2: B 29C3: C 29C4: D 29C5: A 29C6: B

Section-C: Satellite Systems: Key Topic-30: Equipment Faults and troubleshooting-1:

30C1 Which of the following conditions would prevent communications between an Inmarsat-C data port and external data terminal equipment (DTE)?

A. Use of a stop bit in the DCE/DTE communication parameters.
B. Grounding pin 5 of the standard EIA-232 connector.
C. Use of a "0" parity bit in the DCE/DTE communication parameters.
D. Use of a "null" MODEM cable to connect the DTE device.

30C2 How can a LES/RCC (Rescue Coordination Centre) determine if an Inmarsat-C Distress Alert is a TEST transmission?

A. A flag in the message is set to identify the transmission as a test alert.
B. The validity of each Distress alert must be manually verified by LES/RCC personnel.
C. A Distress acknowledgement is sent from the LES/RCC to the originating station.
D. LES/RCC personnel cannot distinguish between valid and TEST transmissions.

30C3 What is the meaning of the "ACB" Inmarsat-C Non-Delivery Notification (NDN) failure code?

A. The terminal received an invalid answer-back from the destination.
B. Access to the Inmarsat system has been barred.
C. The Automatic Communications Bit error rate was exceeded.
D. An Inmarsat message channel failure occurred.

30C4 What condition can indicate a communication failure between the second receiver (RX2) and the Antenna Control Unit (ACU) in an Inmarsat Fleet 77 terminal?

A. The terminal will indicate RX2 is locked onto a signal on the Inmarsat NCSC channel.
B. The terminal will indicate receipt of a valid frame on the Inmarsat NCSC channel.
C. The message "RX2 Comm error" or "ACU Comm error" will be displayed.
D. The DCE/DTE communication protocol is improperly configured.

30C5 Which of the following devices can cause interference to Fleet 77/55 systems?

A. 406 MHz Emergency Position Indicating Radio Beacons (EPIRBs) in the transmit mode.
B. 9.3 GHz Search And Rescue RADAR Transponders (SARTs) in the transmit mode.
C. Transmitters operating in the 3-30 MHz range and shipboard RADARS in close proximity.
D. Survival Craft Equipment in the VHF range in the high power transmit mode.

30C6 What error message may be displayed if a connection to the Inmarsat Mobile Packet Data Service (MPDS) network fails?

A. "ECM 0071" is displayed indicating the called station ID was not properly decoded.
B. "ECM 00F0" is displayed indicating the terminal's failure to transmit over the Inmarsat network.
C. "77F0h" or "77F1h" is displayed indicating the terminal is not registered to the MPDS network.
D. "00F0h" or "00F1h" is displayed indicating the terminal is not registered to the MPDS network.

Answers: 30C1: D 30C2: A 30C3: B 30C4: C 30C5: C 30C6: D

Section-C: Satellite Systems: Key Topic-31: Equipment Faults and troubleshooting-2:

31C1 An Inmarsat-C terminal shows a "No Receive Signal" alarm. There is no voltage on the antenna center pin. What is the most likely cause?

A. Defective AZ or EL motor in the above deck equipment.
B. Blown line fuse in the terminal's DC power supply.
C. Blown antenna power fuse in the above deck equipment.
D. Defective Low Noise Amplifier in the above deck equipment.

31C2 An Inmarsat-C terminal will not "LOG IN". A test antenna cable with a new ADE attached in view of the satellite allows the terminal to "LOG IN". What steps would you take?

A. Replace the AZ or EL motor in the above deck equipment.
B. Try logging into a different satellite with the original ADE.
C. Use a DVM to check the feedline between the terminal and ADE.
D. Install a replacement ADE.

31C3 An Inmarsat-C terminal will not "LOG IN" and shows an "Antenna not connected" alarm. What action would you take?

A. Short one end of coax cable. If the resistance is above one ohm replace the cable.
B. Change to a different satellite and try a new "LOG IN".
C. Replace the antenna unit.
D. Replace the AZ-EL board.

31C4 The antenna goes past the AZ EL of the satellite but does not initialize but you can manually point the antenna at the satellite and acquire signal. What is the most likely problem?

A. Defective coax cable.
B. Faulty antenna control module.
C. Bad I.F. amplifier.
D. Bad Gyro repeater motor.

31C5 The antenna creeps up and down after initialization. What action would you take?

A. Check AZ step motor with power off. If it is stiff replace the motor.
B. Check EL step motor with power off. If it is stiff replace the motor.
C. Replace the platform sensor.
D. Replace the gyro repeater motor.

31C6 The antenna tries to initialize then points straight up and stops. What is the most likely problem?

A. A defective EL motor.
B. A defective AZ motor.
C. A defective level platform sensor.
D. A defective I.F. amplifier.

Answers: 31C1: C 31C2: D 31C3: A 31C4: B 31C5: B 31C6: C

Section-C: Satellite Systems: Key Topic-32: Equipment Faults and troubleshooting-3:

32C1 What action should be taken if an Inmarsat Fleet Broadband antenna continuously changes azimuth after initialization?

A. Replace the gyro repeater motor in the Antenna Tracking Unit.
B. Use the Web interface to check the event log.
C. Check the EL step motor with power off.
D. Check the integrity of the antenna interface cable.

32C2 What condition would cause failure of an Inmarsat-C terminal to power up when AC voltage is present at the input terminals of the power supply?

A. A defective coaxial cable connecting the terminal to the antenna.
B. The failure of an I.F. amplifier stage in the terminal's receiver.
C. A component failure within the power supply itself.
D. A defective video monitor connected to the Inmarsat-C terminal.

32C3 What condition would cause an IP connection failure between a technician's laptop and an Inmarsat Fleet Broadband terminal?

A. The laptop settings are not compatible with the terminal's LAN port.
B. The technician has disabled the Power over Ethernet (POE) function.
C. The EIA-232 configuration is not compatible with the Inmarsat terminal.
D. The technician has connected the Ethernet cable to the terminal's ISDN port.

32C4 What condition would cause a connection failure between a technician's laptop and an Inmarsat Fleet Broadband terminal?

A. The wrong IP address was entered as the URL in the web browser.
B. The ASD function is enabled but the HSD function is disabled.
C. The terminal's DTE port is set to the Asynchronous Data Service.
D. The password for the High Speed Data service has been improperly entered.

32C5 Interference induced from nearby HF transmitters may cause Inmarsat system failures. What is the most appropriate action to resolve this problem?

A. Install a longer ground lead to the INMARSAT terminal.
B. Install a low-pass filter between the coax cable and antenna.
C Reduce bias to the INMARSAT antenna's Low Noise Amplifier.
D. Install ferrite clamps on the coax cable to suppress induced RF.

32C6 What condition will lower the observed bit rate on a Fleet Broadband terminal?

A. A standard IP satellite channel that is "busy" with many active users.
B. Selection of an upstream IP data service for downstream high-speed data transmission.
C. Use of the FTP, POP, SMTP or HTTP protocol instead of TCP/IP.
D. Use of highly contended connections instead of store-and-forward IP circuits.

Answers: 32C1: B 32C2: C 32C3: D 32C4: A 32C5: D 32C6: A

Section-D: Other GMDSS Equipment: Key Topic-33: EPIRB:

33D1 Which is not a function of a satellite under COSPAS-SARSAT using satellite EPIRBs?

A. After the EPIRB's position is calculated using the Doppler shift COSPAS-SARSAT satellites provide follow-on SAR communications.
B. Relayed satellite message includes the EPIRB ID number which provides a reference for retrieval of vessel information from the shore database.
C. Doppler shift of EPIRB signal is measured and the EPIRB's position is calculated.
D. Information received from EPIRBs is time-tagged and transmitted to any Local User Terminal in the satellite's view.

33D2 What is the purpose of the magnet in the EPIRB mounting bracket?

A. To secure the EPIRB in the mounting bracket.
B. Prevent accidental operation of the EPIRB while secured in the mounting bracket.
C. To activate the automatic release mechanism.
D. When the EPIRB is released it causes a signal to be sent to the bridge.

33D3 How often must the EPIRB battery be replaced?

A. Every 2 years.
B. Every 3 years or after use.
C. Every 5 years or after use.
D. Every 8 years.

33D4 What feature is not a component of a 406 MHz satellite EPIRB?

A. 121.5 MHz emergency homing transmitter.
B. Emergency transmission on 406.025 MHz.
C. Float-free release bracket.
D. Aural locator signal.

33D5 How often must the automatic release mechanism be replaced.

A. Every 2 years
B. Every 3 years
C. Every 5 years
D. Every 8 years

33D6 Which of the following is normally part of 406 MHz satellite EPIRBs?

A. A strobe light, automatic float-free bracket, 1-watt 406-MHz alert beacon.
B. A 5-watt 406-MHz alert beacon, Automatic Hydrostatic Release (ARM), strobe light.
C. Automatic float-free bracket, 5-watt 121.5 MHz homing beacon, strobe light.
D. Automatic Hydrostatic Release (ARM), 1-watt 121.5 MHz alerting beacon, strobe light.

Answers: 33D1: A 33D2: B 33D3: C 33D4: D 33D5: A 33D6: B

Section-D: Other GMDSS Equipment: Key Topic-34: SART:

34D1 How should the signal from a Search And Rescue RADAR Transponder appear on a RADAR display?

A. A series of dashes.
B. A series of spirals all originating from the range and bearing of the SART.
C. A series of twenty dashes.
D. A series of 12 equally spaced dots.

34D2 In what frequency band does a search and rescue transponder operate?

A. 9 GHz
B. 3 GHz
C. S-band
D. 406 MHz

34D3 What causes the SART to begin a transmission?

A. When activated manually, it begins radiating immediately.
B. After being activated the SART responds to RADAR interrogation.
C. It is either manually or water activated before radiating.
D. It begins radiating only when keyed by the operator.

34D4 At what interval must the SART's battery be replaced?

A. Every 2 years.
B. Every 3 years or after being used.
C. Every 5 years or after being used.
D. Every 8 years.

34D5 What are the characteristics of the SART transmitted signal?

A. It starts with a sweep of 10.2 usec.followed by a sweep of 0.6 usec for a total of 10 sweeps.
B. It starts with a sweep of 0.8 usec followed by a sweep of 12.6 usec for a total of 12 sweeps.
C. It starts with a sweep of 0.4usec across the entire 3 cm radar band followed by a returning sweep of 7.5 usec back to the beginning for a total of 12 sweeps.
D. It starts with a sweep of 8.5 usec followed by a sweep of 0.4 usec for 10 sweeps.

34D6 What is the approximate distance between dots on a radar display at a distance of 5 miles?

A. 0.36 nm
B. 0.48 nm
C. 0.56 nm
D. 0.64 nm

Answers: 34D1: D 34D2: A 34D3: B 34D4: C 34D5: C 34D6: D

Section-D: Other GMDSS Equipment: Key Topic-35: Survival Craft Transceiver:

35D1 How often must the Survival Craft Transceiver battery be changed?

A. 2 years or after use for distress communications.
B. 3 years or after use for distress communications.
C. 5 years or after use for distress communications.
D. 8 years or after use for distress communications.

35D2 What is the minimum receiver sensitivity required for a Survival Craft Transceiver?

A. 0.1 microvolts
B. 0.5 microvolts
C. 1.0 microvolts
D. 2.0 microvolts

35D3 What is the minimum required effective radiated power?

A. 0.25 watt
B. 0.5 watt
C. 1 watt
D. 2 watts

35D4 Equipment for radiotelephony use in survival craft stations under GMDSS must have what capability?

A. Operation on 457.525 MHz.
B. Operation on Ch-16.
C. Operation on 121.5 MHz.
D. Operation on Ch-70.

35D5 Which statement is NOT true regarding the requirements of survival craft portable two-way VHF radiotelephone equipment?

A. Watertight to a depth of 1 meter for 5 minutes.
B. Operates simplex on Ch-70 and at least one other channel.
C. Effective radiated power should be a minimum of 0.25 Watts.
D. The antenna is fixed and non-removable.

35D6 Equipment for radiotelephony use in survival craft stations under GMDSS must have what characteristics?

A. Permanently-affixed antenna, watertight, power 1W or 25W.
B. Watertight, power a minimum of 1W, operation on CH-16, Ch-13 & Ch-70.
C. Operation on Ch-16, watertight, permanently-affixed antenna.
D. Operation on Ch-16, Ch-13 & Ch-70, power 1W, permanently-affixed antenna.

Answers: 35D1: C 35D2: D 35D3: A 35D4: B 35D5: B 35D6: C

Section-D: Other GMDSS Equipment: Key Topic-36: Navtex:

36D1Which of the following is the primary frequency that is used exclusively for NAVTEX broadcasts internationally?

A. 490 kHz
B. 518 kHz
C. 2187.5 kHz
D. 4209.5 kHz

36D2 The NAVTEX is powering on and appears to be functioning normally except there have been no new messages for an extended period. The station settings are correct. What is the most likely source of the problem?

A. The audio amplifier is defective.
B. The wrong frequency has been selected.
C. The RF amplifier at the antenna base is defective.
D. The DC supply voltage is too low.

36D3 How is a NAVTEX receiver programmed to reject certain messages?

A. The transmitting station's two-digit identification can be entered to de-select reception of its broadcasts.
B. By entering the SELCALL of the transmitting station.
C. By pressing "00" in the transmitter's ID block.
D. By choosing a message category's single letter (A-Z) identifier and then deselecting or deactivating.

34D4 How can reception of certain NAVTEX broadcasts be prevented?

A. The receiver can be programmed to reject certain stations and message categories.
B. Stations are limited to daytime operation only.
C. Coordinating reception with published broadcast schedules.
D. Automatic receiver desensitization during night hours.

36D5 How is accuracy insured in NAVTEX broadcasts?

A. A parity check character is sent at the end of each line.
B. Each message is retransmitted.
C. Selective FEC is used to prevent errors.
D. Each character is sent twice with a time interval.

36D6 NAVTEX broadcasts are sent:

A. In categories of messages indicated by a single letter or identifier.
B. Immediately following traffic lists.
C. On request of maritime mobile stations.
D. Regularly, after the radiotelephone silent periods.

Answers: 36D1: B 36D2: C 36D3: D 36D4: A 36D5: D 36D6: A

Section-E: Power Sources: Key Topic-37: Batteries:

37E1 What is the normal voltage of a single NICAD battery cell?

A. 1.2 volts
B. 1.5 volts
C. 2.1 volts
D. 2.5 volts

37E2 What is the effect of temperature on the specific gravity of lead acid batteries?

A. Higher temperature results in a higher specific gravity reading.
B. Higher temperature results in a lower specific gravity reading.
C. Temperature has no effect on the specific gravity reading.
D. Lower temperature results in a lower specific gravity reading.

37E3 What will cause an individual battery cell to reverse polarity?

A. The charging circuits are connected in the correct polarity but all of the cells are equally charged.
B. High discharge rates without allowing for a cool down period.
C. When discharging the battery — if a cell becomes weaker then the remaining cells the discharge current will effectively charge the weaker cell in reverse polarity.
D. Insufficient charging which does not bring all of the cells up to full charge.

37E4 What is the normal specific gravity of a fully charged lead acid battery cell? What device is used to measuring the electrolyte of a lead acid battery?

A. 1.375 Voltmeter
B. 1.180 Voltmeter
C. 1.210 Hydrometer
D. 1.280 Hydrometer

37E5 What is a gel cell battery and how is it maintained & cared for?

A. Gel cell batteries are typically sealed — special charging rates and voltages may be required.
B. Gel cell batteries are lead acid with a solid electrolyte — each cell is checked with a voltmeter.
C. Gel cell batteries are NICAD with a solid electrolyte — each cell is checked with a voltmeter.
D. Gel cell batteries are have special liquid electrolytes — they are charged with the NICAD charging rates and voltages.

37E6 What is the normal voltage of a single lead acid battery cell?

A. 1.5 volts
B. 2.1 volts
C. 2.5 volts
D. 2.8 volts

Answers: 37E1: A 37E2: B 37E3: C 37E4: D 37E5: A 37E6: B

Section-E: Power Sources: Key Topic-38: Battery Chargers and Power Sources:

38E1 How often should high charging be use with a standard lead acid battery and a fully automatic GMDSS compliant Battery charger?

A. Once every 24 hours for 1 hour.
B. Once every month till the battery reaches 2.5V/cell.
C. Never use High charging rate on a fully charged battery.
D. Once a week till the battery reaches the gassing range.

38E2 What are the different modes of charging for a GMDSS compliant battery charger/supply?

A. Charging, Change-over, Parallel
B. Charging, float, trickle
C. Charging, Full, Trickle
D. Boots, Full, Float

38E3 What would be an indication of a malfunction on a GMDSS station with a 24 VDC battery system?

A. All of these symptoms would indicate a potential battery charger malfunction.
B. A constant 30 volt reading on the GMDSS console voltmeter.
C. After testing the station on battery power, a voltmeter reading of 30 volts for a brief period followed by a steady 26 volt reading.
D. After testing the station on battery power, the ammeter reading indicates a high rate of charge that then declines.

38E4 What is the meaning of "Reserve Source of Energy"?

A. High caloric value items for lifeboat, per SOLAS regulations.
B. Diesel fuel stored for the purpose of operating the powered survival craft for a period equal to or exceeding the U.S.C.G. and SOLAS requirements.
C. Power to operate the radio installation and conduct Distress and Safety communications in the event of failure of the ship's main and emergency sources of electrical power.
D. The diesel fueled emergency generator that supplies AC to the vessel's Emergency power bus.

38E5 With a fully automatic GMDSS compliant battery charger / power supply, when must the high charging process be interrupted?

A. To keep the battery from overheating.
B. To keep the battery electrolyte from reaching 212 degrees F.
C. To inhibit the generation of electrolytic gas.
D. To keep the battery as cool as possible.

38E6 A fully automatic GMDSS compliant Battery charger/ Power supply's high (Full) charging mode must be disabled during setup for what type batteries?

A. When the batteries are Ni Cadmium type.
B. When the Batteries are standard lead acid type.
C. When the batteries are lithium ion type.
D. When the batteries are Maintenance free lead acid gel type.

Answers: 38E1: D 38E2: A 38E3: B 38E4: C 38E5: C 38E6: D

Section-E: Power Sources: Key Topic-39: Power Supplies-1:

39E1 Which of the following best describes a standard full wave rectifier power supply?

A. It uses a capacitor input filter to provide good voltage regulation.
B. It must only use a single diode rectifier.
C. The ripple frequency is twice the input frequency.
D. It must always use a center tapped transformer secondary.

39E2 Which of the following statements concerning power supply filters is true?

A. A capacitor input has high output voltage, good voltage regulation, low rectifier peak currents and low transformer utilization factor.
B. A capacitor input has low output voltage, poor voltage regulation, high rectifier peak currents and low transformer utilization factor.
C. An Inductive input has poor voltage regulation, low transformer utilization factor, high rectifier peak currents and relative low output voltage.
D. An Inductive input has good voltage regulation, high transformer utilization factor, low rectifier peak currents and relatively low output voltage.

39E3 What are the main advantages of using switcher type power supply?

A. Line voltage is directly rectified and filtered to produce a high dc voltage, components are much smaller and lighter weight, can provide much better efficiency.
B. The transformed voltage is directly rectified and filtered to produce a high dc voltage, components are much smaller and lighter weight and can provide much better efficiency.
C. They use laminated steel transformers which are more efficient.
D. Using a center tapped transformer secondary allows fewer rectifiers to be used.

39E4 What are the disadvantages of using a switcher type power supply?

A. Increased complexity (more likelihood of a component failure), increased cost (many more parts) and tendency to create radiated AF.
B. Increased complexity (more likelihood of a component failure), increased cost (many more parts) and tendency to create radiated RF.
C. Decreased complexity (less likelihood of a component failure) and decreased cost (fewer parts and tendency to create radiated RF.
D. Decreased complexity (less likelihood of a component failure) and decreased cost (fewer parts and tendency to create radiated AF.

39E5 Power supplies with inductive input filters have the following characteristics:

A. Poor voltage regulation with high peak rectifier currents.
B. Good voltage regulation with high transformer utilization factor.
C. Low transformer utilization factor with low rectifier peak currents.
D. High transformer utilization factor with high rectifier peak currents.

39E6 Power supplies with capacitive input filters have the following characteristics:

A. Relatively high output voltage with low rectifier peak currents.
B. High transformer utilization factor with good voltage regulation.
C. Poor voltage regulation and high rectifier peak currents.
D. Good voltage regulation with high transformer utilization factor.

Answers: 39E1: C 39E2: D 39E3: A 39E4: B 39E5: B 39E6: C

Section-E: Power Sources: Key Topic-40: Power Supplies-2:

40E1 What is the function of a crowbar circuit?

A. It provides a voltage reference for the voltage regulator.
B. It prevents an overvoltage condition from damaging circuitry by shorting the power supply output.
C. It provides a voltage reference for the chopper circuit.
D. It provides a feedback signal for the chopper circuit.

40E2 Which of the following is not one of the main advantages of a switching power supply?

A. Works with a wide range of input voltages.
B. Can work with direct current input.
C. No RFI problems.
D. Lighter weight than linear power supplies.

40E3 What is the configuration for a mains operated switching power supply with output regulation?

A. Input rectifier and filter, Inverter (chopper), output transformer, feedback loop to a chopper controller and inverter and output rectifier and filter to DC output.
B. Line, Inverter (chopper), input rectifier and filter, output transformer, output rectifier and filter to DC output.
C. Input rectifier and filter, output transformer, output rectifier and filter to DC output with feedback loop to the input followed by the chopper controller.
D. Input rectifier and filter, Inverter (chopper), output transformer, output rectifier and filter to DC output with feedback loop to a chopper controller and the inverter.

40E4 Which of the following statements about switching power supplies is the most accurate?

A. Transformers use a ferrite core to reduce losses at high frequencies.
B. Transformers use a laminated steel core to reduce losses at high frequencies.
C. Lower switching frequencies provide better voltage regulation.
D. Higher switching frequencies are more difficult to filter.

40E5 What are the input/output voltages of a "BUCK" switching power supply with a 50% duty cycle?

A. 120 volts in, 240 volts out.
B. 24 volts in, 36 volts out.
C. 12 volts in, 12 volts out.
D. 10 volts in, 5 volts out.

40E6 Which of the following statements about a switching mode power supply input current is correct?

A. It has high harmonic content and a low power factor.
B. It has low harmonic content and a low power factor.
C. It has high harmonic content and a high power factor.
D. It has low harmonic content and a high power factor.

Answers: 40E1: B 40E2: C 40E3: D 40E4: A 40E5: D 40E6: A

Section-F: Other Equipment and Networks: Key Topic-41: Computers:

41F1 The printer will not print a document. Which of the following is NOT a likely reason?

A. The graphics card is defective.
B. The printer queue is frozen.
C. The printer may be out of toner or ink.
D. There may be a paper jam in the printer.

41F2 There is no display on the monitor. What are the most likely causes?

A. Bad video card, defective RAM or bad CD-ROM.
B. Bad video card, bad 15 pin video connector or no power to monitor.
C. Defective CD-ROM Drive.
D. Fragmented Hard Drive.

41F3 What are the four main functions of the "BIOS" in most computers?

A. BIOS Drivers, Bootstrap Loader, Printer Driver and BIOS Setup.
B. CPU Setup, Disc Partition, USB driver and BIOS Setup.
C. P.O.S.T., Bootstrap Loader, BIOS Drivers and BIOS Setup.
D. BIOS Setup, P.O.S.T., CPU Setup and RAM Setup.

41F4 Power is on but the computer will not boot into the operating system. What steps should you take?

A. Make sure the CPU fan is operating normally.
B. Remove the network driver card, clean contacts and reinsert.
C. Remove all external cables and try again.
D. Use the BIOS setup mode to check for proper BIOS settings.

41F5 How do you determine the type of disc drives in an XP system?

A. Click on Start programs, accessories and system information.
B. Click on System information then Disc Drives.
C. Click on Control panel then Sounds and Audio Devices.
D. Click on Control panel followed by Taskbar and Start Menu.

41F6 What are important considerations when replacing a CD-ROM drive?

A. The speed must be identical to the drive it is replacing.
B. The replacement drive should use the same interface system as the old drive.
C. The amount of RAM in the replacement unit must match the old drive.
D. The rate of data transfer must match the old drive.

Answers: 41F1: A 41F2: B 41F3: C 41F4: D 41F5: A 41F6: B

Section-F: Other Equipment and Networks: Key Topic-42: Computer Networks – Ethernet:

42F1 Nodes in an Ethernet network are interconnected using a cable making a "Home Run"back to the central:

A. Router
B. Backbone
C. Computer
D. Hub

42F2 What is the maximum length of a USB 2.0 cable between two hubs or between a hub and peripheral?

A. 5 meters
B. 10 meters
C. 15 meters
D. 20 meters

42F3 10Base-T and 100Base-TX systems generally uses the following type of cable:

A. CAT-5 with 2 twisted pairs
B. CAT-5 with 4 twisted pairs
C. Coax
D. Fiber optic

42F4 What initial steps should be taken when installing a router?

A. Connect the router to your computer and boot up the router with the setup software.
B. Open web browser, access the internet, enter username and password and download instructions.
C. Open web browser, enter router's address for network admin and enter username and password.
D. Connect the router to your computer and enter the addresses for all stations in the system.

42F5 What are the most commonly used IP addresses for routers?

A. 198.162.1.1, 196.168.1.1 and 196.166.1.1
B. 194.166.1.0, 194.166.1.1 and 194.168.1.2
C. 192.168.1.1, 192.168.0.1 and 192.168.2.0
D. 192.166.1.0, 192.166.1.1 and 192.164.2.0

42F6 In an Ethernet network, the available bandwidth is shared between all nodes within the same:

A. Vessel Compartment
B. Address Range
C. Star Topology
D. Collision Domain

Answers: 42F1: D 42F2: A 42F3: B 42F4: C 42F5: C 42F6: D

Section-F: Other Equipment and Networks: Key Topic-43: Local Area Networks- NMEA-0183:

43F1 A typical PC program that is used widely for logging and troubleshooting NMEA 0183 data is:

A. Excel
B. Windows Explorer
C. HyperTerminal
D. Microsoft Word

43F2 what is the maximum signal voltage range that an NMEA-0183 unit must be capable of handling without damage?

A. +/- 5 volts
B. +/- 10 volts
C. +/- 12 volts
D. +/- 15 volts

43F3 The current and most recent version of NMEA 0183 uses what standard for data communications?

A. RS422
B. RS485
C. RS232
D. ISO 11783

43F4 What type of data communication is used for NMEA 0183.

A. Parallel
B. Serial
C. Can Bus
D. Ethernet

43F5 Which of the following statements about an NMEA -0183 system is correct?

A. The cable shield must be grounded at both ends including the opto-isolators.
B. Opto-isolators must be used and the shield should be grounded to the talker chassis only.
C. Opto-isolators must be used and the shield should be grounded to the listener chassis only.
D. Version 2 devices use higher voltages than version 1 devices.

43F6 An important difference between NMEA 0183 and NMEA 2000 is:

A. Relay switched vs diode switch
B. Low voltage vs high voltage
C. Single talker vs multi-talkers
D. Data transfer vs video transfer

Answers: 43F1: C 43F2: D 43F3: A 43F4: B 43F5: B 43F6: C

Section-F: Other Equipment and Networks: Key Topic-44: Local Area Networks- NMEA-2000:

44F1 The Voltage of the NMEA 2000 backbone power supply pair must be maintained to within the following range.

A. 0 to 5 volts
B. 9 to 16 volts
C. 10.5 to 13.6 volts
D. 12 to 24 volts

44F2 NMEA 2000 Certified Device identify their current requirements in terms of LENs (load Equivalent Number). 1 LEN is equal to:

A. 1 Amp
B. 500 mA
C. 50 mA
D. 25 mA

44F3 Which of the following are NOT components of a NMEA 2000 network?

A. Tees, Drop Cables and terminating Resistors.
B. Tees, Backbone Cables, Power Cables.
C. Termination Resistors, Power Cables, Backbone Cables.
D. Multiplexers, Combiners, Routers.

44F4 The NMEA 2000 backbone operating speed is:

A. 250 bps
B. 500 bps
C. 1500 bps
D. 2000 bps

44F5 When viewing NMEA 2000 data you must use the following.

A Voltmeter
B. Converter
C. HyperTerminal
D. Gateway

44F6 What is the maximum length for a drop cable to a single NMEA 2000 device?

A. 6 meters
B. 12 meters
C. 18 meters
D. 24 meters

Answers: 44F1: B 44F2: C 44F3: D 44F4: A 44F5: D 44F6: A

Section-F: Other Equipment and Networks: Key Topic-45: Depth Finders, Gyro Compass, SSAS, AIS:

45F1 What is a common range of frequencies used for depth finding equipment?

A. 200-400 kHz
B. 1000-2600 kHz
C. 200-800 Hz
D. 4,000-6,000 kHz

45F2 What is a common range of pulse widths used for depth finding equipment?

A. 10 to 30 microseconds
B. 25 to 600 microseconds
C. 2 to 20 milliseconds
D. 50 to 200 milliseconds

45F3 What is the purpose of the "carbon pile" on an older gyro compass?

A. Ballast regulation
B. Precession control
C. Voltage regulation
D. Prevent pendulum effect errors

45F4 What are the principles of operation of a fiber-optic gyro compass?

A. A fiber-optic coil and three accelerometers determine the speed of rotation of the earth.
B. Two fiber-optic coils with one accelerometer and a level sensor determine the direction of true north.
C. Three fiber-optic coils with a dual accelerometer and a yaw detector determines the direction of true north.
D. Three fiber-optic coils and a dual-axis electronic level sensor determine the direction of true north.

45F5 How does the Ship Security Alert System operate?

A. It sends an alert to specific addresses via the Inmarsat-C terminal.
B. It sends an all ships alert via the VHF-DSC unit.
C. It sends an alert to the RCC via the Inmarsat-C terminal.
D. It sends an all ships alert via MF-HF.

45F6 AIS units use the following:

A. VHF channels 65B (160.875 MHz) and 66B (160.925 MHz) and 9.6 kbs GMSK modulation.
B. VHF channels 87B (161.975 MHz) and 88B (162.025 MHz) and 9.6 kbs GMSK modulation.
C. VHF channels 16 (158.800 MHz) and 70 (156.525 MHz) and 4.8 kbs GMSK modulation.
D. VHF channels 18B (161.500 MHz) and 19B (161.550 MHz) and 4.8 kbs GMSK modulation.

Answers: 45F1: A 45F2: B 45F3: C 45F4: D 45F5: A 45F6: B

Section-F: Other Equipment and Networks: Key Topic-46: ECDIS – Auto Pilots – Data Recorders:

46F1 What procedure must be followed before using C-Map charts for an Electronic Chart System?

A. License information must be entered in the master computer terminal.
B. The C-Map charts must be downloaded from the internet.
C. A dongle or password device must be inserted in the master computer terminal.
D. License information must be entered for each computer being used.

46F2 Which of the following lists of data inputs for an Electronic Chart System is incorrect?

A. Radar, SSAS and Position.
B. Speed, Depth and Position.
C. Radar, Depth and Position.
D. Speed, Radar and Depth.

46F3 Which of the following is a necessary component of an auto pilot?

A. GPS
B. Rudder feedback unit
C. Engine RPM data
D. SSAS

46F4 What inputs are normally required for an Auto Pilot?

A. Course information and GPS.
B. Rudder feedback and Radar data.
C. Course information and rudder feedback.
D. Rudder feedback and yaw sensors.

46F5 Which of the following is not an accurate list of functions/data recorded by the Vessel Data Recorder?

A. Position, Date, Time and Speed.
B. Heading, VHF radio communications, Position and Depth of water.
C. Heading, Depth of water, EGC data and Radar.
D. Depth of water, Audio from the bridge, Speed and Position.

46F6 Which of the following statements about Vessel Data Recorders is NOT true?

A. The "Crash Survivable Module" (CSM) retains data for up to 12 hours.
B. The "Data Acquisition Unit" (DAU) may have data storage for as long as 30 days.
C. Data input may include Rudder feedback, Depth of water and Radar.
D. Data input may include Position, Date, MSI information and Audio from the bridge.

Answers: 46F1: D 46F2: A 46F3: B 46F4: C 46F5: C 46F6: D

Section-G: Inspections, Installations and Instruments: Key Topic-47: Equipment Installation:

47G1 What is the best method for grounding an Inmarsat-C terminal?

A. Number 10 copper wire between terminal and the ship/s steel hull.
B. A good ground at the antenna is sufficient.
C. Copper strap brazed to the steel terminal and ship's steel hull.
D. An aluminum strap bolted to both the steel terminal and ship's steel hull.

47G2 What is the most important consideration for installing a Full-Duplex VHF radiotelephone.

A. Maximum separation between the transmitter and receiver.
B. Minimum separation between transmitting antennas.
C. Maximum separation between transmitting antennas.
D. Maximum separation between transmitting antenna and the duplex receiver antenna.

47G3 What is the most important factor when locating depth finder transducers?

A. In an area not subject to cavitation.
B. They must be equidistant from the bow and the stern.
C. They must be on the centerline of the ship.
D. They should be as close to the bow as possible.

47G4 Bridge equipment separation recommendations generally refer to what instrument?

A. GPS
B. Magnetic compass
C. ECDIS
D. Auto Pilot

47G5 When installing an Inmarsat-C antenna what should be the minimum distance to other Inmarsat antennas?

A. 4 meters
B. 8 meters
C. 10 meters
D. 12 meters

47G6 What action must be taken after an Inmarsat-C system is fully installed?

A. Advise the nearest RCC that your terminal is active.
B. Send a distress alert and then cancel it.
C. Your Inmarsat Mobile Number must be entered in the terminal.
D. Send a brief test message to your own terminal.

Answers: 47G1: C 47G2: D 47G3: A 47G4: B 47G5: B 47G6: C

Section-G: Inspections, Installations and Instruments: Key Topic-48: Annual Inspections:

48G1 What are the operator's license requirements for conducting a GMDSS ship station annual inspection?

A. GMDSS Radio Operator's License.
B. GMDSS Maintainer's License.
C. First Class Radiotelegraph Operator's License.
D. General Radiotelephone Operator's License.

48G2 What log entries are required after passing the annual inspection?

A. One of the ship's GMDSS Radio Operators must certify that inspecting technician as properly conducted all the required equipment tests.
B. The inspecting technician must enter the results of all the equipment tests and specifically note which tests passed and which tests failed.
C. Certification by both the inspecting technician and the vessel's Master/owner that the inspection was successful.
D. The vessel's Master/Owner must certify that the inspection was successful.

48G3 What battery tests are made during the annual inspection?

A. Record the specific gravity of all cells while the batteries are charging.
B. The terminal voltage is measured and recorded at the end of a 6 hour full load discharge.
C. Record the specific gravity of all cells while the batteries are discharging.
D. With battery off charge and maximum required load measure and record maximum discharge current and voltage.

48G4 What is the easiest way to test the Inmarsat-C terminal for proper operation?

A. Send a brief test message to your own terminal.
B. Contact the nearest RCC for a signal report.
C. Contact the nearest ship for a signal report.
D. Use the internal POST function.

48G5 After the station has successfully passed the survey what document is issued to the vessel?

A. FCC 817
B. SOLAS Annual Certificate
C. Radio Station License
D. Cargo Ship Safety Certificate

48G6 Which of the following is NOT a required VHF test during an annual inspection?

A. Carrier deviation measurement.
B. Power output and VSWR on Channels 6, 13 and 16.
C. Equipment is within frequency tolerance.
D. Equipment operates from all required power sources.

Answers: 48G1: B 48G2: C 48G3: D 48G4: A 48G5: D 48G6: A

Section-G: Inspections, Installations and Instruments: Key Topic-49: Test Equipment-1:

49G1 A 4 digit multi-meter with an accuracy of 0.15% and 2 counts is set on the 6 volt scale. What range of readings may be expected when measuring a 5 volt DC source?

A. 4.99 to 5.01 volts DC
B. 4.98 to 5.02 volts DC
C. 4.97 to 5.02 volts DC
D. 4.95 to 5.05 volts DC

49G2 A 4 digit multi-meter with an accuracy of 0.15% and 2 counts is set on the 60 volt scale. What range of readings may be expected when measuring a 24 volt DC source?

A. 23.74 to 24.52 volts DC
B. 23.62 to 24.38 volts DC
C. 23.56 to 24.28 volts DC
D. 23.42 to 24.52 volts DC

49G3 What is the most important specification for an R. F. Signal Generator used at VHF frequencies?

A. Frequency accuracy
B. Modulation percentage
C. Low signal leakage
D. Frequency modulation

49G4 A good lab type signal generator for VHF measurements should be able to reduce its output to:

A. 5.0 microvolt
B. 1.0 microvolt
C. 0.5 microvolt
D. 0.1 microvolt

49G5 The characteristics of a 10:1 attenuation probe for an oscilloscope is as follows:

A. A load of about 10 megohms shunted by 12 pF.
B. A load of about 20 megohms shunted by a 12 mH coil.
C. A load of about 5 megohms shunted by 6 pF.
D. A load of about 5 megohms shunted by a 6 mH coil.

49G6 In dual-trace oscilloscopes the purpose of the "Mode" control is to:

A. Select a choice between DC or AC input on either channel.
B. Select either channel alone or a combination of both channels.
C. Select the proper time base of either channel.
D. Select the proper frequency compensation for both channels.

Answers: 49G1: A 49G2: B 49G3: C 49G4: D 49G5: A 49G6: B

Section-G: Inspections, Installations and Instruments: Key Topic-50: Test Equipment-2:

50G1 What type of signals are usually provided by a simple Function Generator?

A. Sine Waves with pulse modulation.
B. Sine Waves and Square Waves.
C. Square Waves and Triangular Waves.
D. Sine Waves, Square Waves and Triangular Waves.

50G2 a SINAD meter consists of a multi-range audio frequency voltmeter:

A. Calibrated in decibels with a sharp internal 1000 Hz bandstop filter.
B. Calibrated in millivolts with a medium 1000 Hz bandpass filter.
C. Calibrated in decibels with an internal 1000 Hz highpass filter.
D. Calibrated in decibels with an internal 1000 Hz lowpass filter.

50G3 Which of the following statements about a logic probe is false?

A. A "Red" LED indicates a "High" state.
B. Both "Red" and "Green" LEDs on indicate a short.
C. A "Green" LED indicates a "Low" state.
D. An "Amber" LED indicates a "pulse".

50G4 An analog RF wattmeter provides the most accurate reading:

A. At the middle one third of the dial.
B. At the lower one third of the dial.
C. At the upper one third of the dial.
D. The accuracy is uniform the whole scale.

50G5 What is the purpose of a deviation meter?

A. Measure the number of sidebands.
B. Measure the modulation index.
C. Measure the carrier deviation in an FM transmitter.
D. Measure the carrier frequency.

50G6 What would be the most likely reason to observe the transmitter output with a spectrum analyzer?

A. Measure frequency modulation deviation.
B. Measure percentage of amplitude modulation.
C. Measure the carrier frequency.
D. Measure spurious signals.

Answers: 50G1: D 50G2: A 50G3: B 50G4: C 50G5: C 50G6: D