

Chapter 7.1 – Quiz 1 – Dipoles and Ground-planes

G4E01 - What is the purpose of a capacitance hat on a mobile antenna?

- A. To increase the power handling capacity of a whip antenna
- B. To reduce radiation resistance
- C. To electrically lengthen a physically short antenna
- D. To lower the radiation angle

G4E02 - What is the purpose of a corona ball on an HF mobile antenna?

- A. To narrow the operating bandwidth of the antenna
- B. To increase the "Q" of the antenna
- C. To reduce the chance of damage if the antenna should strike an object
- D. To reduce RF voltage discharge from the tip of the antenna while transmitting

G4E06 - What is one disadvantage of using a shortened mobile antenna as opposed to a full-size antenna?

- A. Short antennas are more likely to cause distortion of transmitted signals
- B. Q of the antenna will be very low
- C. Operating bandwidth may be very limited
- D. Harmonic radiation may increase

G9B02 - Which of the following is a common way to adjust the feed point impedance of an elevated quarter-wave ground-plane vertical antenna to be approximately 50 ohms?

- A. Slope the radials upward
- B. Slope the radials downward
- C. Lengthen the radials beyond one wavelength
- D. Coil the radials

G9B03 - Which of the following best describes the radiation pattern of a quarter-wave ground-plane vertical antenna?

- A. Bi-directional in azimuth
- B. Isotropic
- C. Hemispherical
- D. Omnidirectional in azimuth

G9B04 - What is the radiation pattern of a dipole antenna in free space in a plane containing the conductor?

- A. It is a figure-eight at right angles to the antenna
- B. It is a figure-eight off both ends of the antenna
- C. It is a circle (equal radiation in all directions)
- D. It has a pair of lobes on one side of the antenna and a single lobe on the other side

G9B05 - How does antenna height affect the azimuthal radiation pattern of a horizontal dipole HF antenna at elevation angles higher than about 45 degrees?

- A. If the antenna is too high, the pattern becomes unpredictable
- B. Antenna height has no effect on the pattern
- C. If the antenna is less than 1/2 wavelength high, the azimuthal pattern is almost omnidirectional
- D. If the antenna is less than 1/2 wavelength high, radiation off the ends of the wire is eliminated

G9B06 - Where should the radial wires of a ground-mounted vertical antenna system be placed?

- A. As high as possible above the ground
- B. Parallel to the antenna element
- C. On the surface or buried a few inches below the ground
- D. At the center of the antenna

G9B07 - How does the feed point impedance of a horizontal 1/2 wave dipole antenna change as the antenna height is reduced to 1/10 wavelength above ground?

- A. It steadily increases
- B. It steadily decreases
- C. It peaks at about 1/8 wavelength above ground
- D. It is unaffected by the height above ground

G9B08 - How does the feed point impedance of a 1/2 wave dipole change as the feed point is moved from the center toward the ends?

- A. It steadily increases
- B. It steadily decreases
- C. It peaks at about 1/8 wavelength from the end
- D. It is unaffected by the location of the feed point

G9B09 - Which of the following is an advantage of using a horizontally polarized as compared to a vertically polarized HF antenna?

- A. Lower ground losses
- B. Lower feed point impedance
- C. Shorter radials
- D. Lower radiation resistance

G9B10 - What is the approximate length for a 1/2 wave dipole antenna cut for 14.250 MHz?

- A. 8 feet
- B. 16 feet
- C. 24 feet
- D. 33 feet

G9B11 - What is the approximate length for a 1/2 wave dipole antenna cut for 3.550 MHz?

- A. 42 feet
- B. 84 feet
- C. 132 feet
- D. 263 feet

G9B12 - What is the approximate length for a 1/4 wave monopole antenna cut for 28.5 MHz?

- A. 8 feet
- B. 11 feet
- C. 16 feet
- D. 21 feet

G9C04 - How does antenna gain in dBi compare to gain stated in dBd for the same antenna?

- A. Gain in dBi is 2.15 dB lower
- B. Gain in dBi is 2.15 dB higher
- C. Gain in dBd is 1.25 dBd lower
- D. Gain in dBd is 1.25 dBd higher

G9D01 - Which of the following antenna types will be most effective as a near vertical incidence skywave (NVIS) antenna for short-skip communications on 40 meters during the day?

- A. A horizontal dipole placed between 1/10 and 1/4 wavelength above the ground
- B. A vertical antenna placed between 1/4 and 1/2 wavelength above the ground
- C. A horizontal dipole placed at approximately 1/2 wavelength above the ground
- D. A vertical dipole placed at approximately 1/2 wavelength above the ground

G9D02 - What is the feed point impedance of an end-fed half-wave antenna?

- A. Very low
- B. Approximately 50 ohms
- C. Approximately 300 ohms
- D. Very high

G9D08 - How does a "screwdriver" mobile antenna adjust its feed point impedance?

- A. By varying its body capacitance
- B. By varying the base loading inductance
- C. By extending and retracting the whip
- D. By deploying a capacitance hat

G9D12 - What is the common name of a dipole with a single central support?

- A. Inverted V
- B. Inverted L
- C. Sloper
- D. Lazy H

Chapter 7.2 and 7.3 – Quiz 2 – Yagi, Loop, Antennas

G2D04 - Which of the following describes an azimuthal projection map?

- A. A map that shows accurate land masses
- B. A map that shows true bearings and distances from a specific location
- C. A map that shows the angle at which an amateur satellite crosses the equator
- D. A map that shows the number of degrees longitude that an amateur satellite appears to move westward at the equator with each orbit

G9C01 - Which of the following would increase the bandwidth of a Yagi antenna?

- A. Larger-diameter elements
- B. Closer element spacing
- C. Loading coils in series with the element
- D. Tapered-diameter elements

G9C02 - What is the approximate length of the driven element of a Yagi antenna?

- A. 1/4 wavelength
- B. 1/2 wavelength
- C. 3/4 wavelength
- D. 1 wavelength

G9C03 - How do the lengths of a three-element Yagi reflector and director compare to that of the driven element?

- A. The reflector is longer, and the director is shorter
- B. The reflector is shorter, and the director is longer
- C. They are all the same length
- D. Relative length depends on the frequency of operation

G9C05 - What is the primary effect of increasing boom length and adding directors to a Yagi antenna?

- A. Gain increases
- B. Beamwidth increases
- C. Front-to-back ratio decreases
- D. Resonant frequency is lower

G9C07 - What does "front-to-back ratio" mean in reference to a Yagi antenna?

- A. The number of directors versus the number of reflectors
- B. The relative position of the driven element with respect to the reflectors and directors
- C. The power radiated in the major lobe compared to that in the opposite direction
- D. The ratio of forward gain to dipole gain

G9C08 - What is meant by the "main lobe" of a directive antenna?

- A. The magnitude of the maximum vertical angle of radiation
- B. The point of maximum current in a radiating antenna element
- C. The maximum voltage standing wave point on a radiating element
- D. The direction of maximum radiated field strength from the antenna

G9C10 - Which of the following can be adjusted to optimize forward gain, front-to-back ratio, or SWR bandwidth of a Yagi antenna?

- A. The physical length of the boom
- B. The number of elements on the boom
- C. The spacing of each element along the boom
- D. All these choices are correct

G9C11 - What is a beta or hairpin match?

- A. A shorted transmission line stub placed at the feed point of a Yagi antenna to provide impedance matching
- B. A 1/4 wavelength section of 75-ohm coax in series with the feed point of a Yagi to provide impedance matching
- C. A series capacitor selected to cancel the inductive reactance of a folded dipole antenna
- D. A section of 300-ohm twin-lead transmission line used to match a folded dipole antenna

G9C12 - Which of the following is a characteristic of using a gamma match with a Yagi antenna?

- A. It does not require the driven element to be insulated from the boom
- B. It does not require any inductors or capacitors
- C. It is useful for matching multiband antennas
- D. All these choices are correct

G9D03 - In which direction is the maximum radiation from a VHF/UHF "halo" antenna?

- A. Broadside to the plane of the halo
- B. Opposite the feed point
- C. Omnidirectional in the plane of the halo
- D. On the same side as the feed point

G9D10 - In which direction or directions does an electrically small loop (less than 1/10 wavelength in circumference) have nulls in its radiation pattern?

- A. In the plane of the loop
- B. Broadside to the loop
- C. Broadside and in the plane of the loop
- D. Electrically small loops are omnidirectional

End of Quiz 2

Chapter 7.4 – Quiz 3 – Specialized Antennas – (Please forgive the small print; I wanted to squeeze it onto one page)

G9B01 - What is a characteristic of a random-wire HF antenna connected directly to the transmitter?

- A. It must be longer than 1 wavelength
- B. Station equipment may carry significant RF current
- C. It produces only vertically polarized radiation
- D. It is more effective on the lower HF bands than on the higher bands

G9C09 - In free space, how does the gain of two three-element, horizontally polarized Yagi antennas spaced vertically 1/2 wavelength apart typically compare to the gain of a single three-element Yagi?

- A. Approximately 1.5 dB higher
- B. Approximately 3 dB higher
- C. Approximately 6 dB higher
- D. Approximately 9 dB higher

G9D04 - What is the primary function of antenna traps?

- A. To enable multiband operation
- B. To notch spurious frequencies
- C. To provide balanced feed point impedance
- D. To prevent out-of-band operation

G9D05 - What is an advantage of vertically stacking horizontally polarized Yagi antennas?

- A. It allows quick selection of vertical or horizontal polarization
- B. It allows simultaneous vertical and horizontal polarization
- C. It narrows the main lobe in azimuth
- D. It narrows the main lobe in elevation

G9D06 - Which of the following is an advantage of a log-periodic antenna?

- A. Wide bandwidth
- B. Higher gain per element than a Yagi antenna
- C. Harmonic suppression
- D. Polarization diversity

G9D07 - Which of the following describes a log-periodic antenna?

- A. Element length and spacing vary logarithmically along the boom
- B. Impedance varies periodically as a function of frequency
- C. Gain varies logarithmically as a function of frequency
- D. SWR varies periodically as a function of boom length

G9D09 - What is the primary use of a Beverage antenna?

- A. Directional receiving for MF and low HF bands
- B. Directional transmitting for low HF bands
- C. Portable direction finding at higher HF frequencies
- D. Portable direction finding at lower HF frequencies

G9D11 - Which of the following is a disadvantage of multiband antennas?

- A. They present low impedance on all design frequencies
- B. They must be used with an antenna tuner
- C. They must be fed with open wire line
- D. They have poor harmonic rejection

(End of Quiz 3)