

Chapter 5.0 Antennas

Section 5.1 Theory & Principles

G3C11 (B) p.135

Which of the following antenna types will be most effective for skip communications on 40-meters during the day?

- A. A vertical antenna
- B. A horizontal dipole placed between $1/8$ and $1/4$ wavelength above the ground
- C. A left-hand circularly polarized antenna
- D. A right-hand circularly polarized antenna

G4E01 (C) p.145

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 allow automatic band changing
- C. To electrically lengthen a physically short antenna
- D. To allow remote tuning

G4E02 (D) p.146

What is the purpose of a corona ball on a 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 high voltage discharge from the tip of the antenna

G4E05 (C) p.143

Which of the following most limits the effectiveness of an HF mobile transceiver operating in the 75-meter band?

- A. "Picket Fencing" signal variation
- B. The wire gauge of the DC power line to the transceiver
- C. The antenna system
- D. FCC rules limiting mobile output power on the 75-meter band

G4E06 (C) p.144

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. Short antennas can only receive circularly polarized signals
- C. Operating bandwidth may be very limited
- D. Harmonic radiation may increase

G9B01 (B) p.140

What is one disadvantage of a directly fed random-wire HF antenna?

- A. It must be longer than 1 wavelength
- B. You may experience RF burns when touching metal objects in your station
- C. It produces only vertically polarized radiation
- D. It is more effective on the lower HF bands than on the higher bands

G9B02 (B) p.138

Which of the following is a common way to adjust the feed point impedance of a 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
- D. Shorten the radials

G9B03 (B) p.138

What happens to the feed point impedance of a ground plane antenna when its radials are changed from horizontal to sloping downward?

- A. It decreases
- B. It increases
- C. It stays the same
- D. It reaches a maximum at an angle of 45 degrees

G9B04 (A) p.129

What is the radiation pattern of a dipole antenna in free space in the plane of 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 (C) p.134

How does antenna height affect the horizontal (azimuthal) radiation pattern of a horizontal dipole HF antenna?

- 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 (C) p.137

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 of the Earth or buried a few inches below the ground
- D. At the center of the antenna

G9B07 (B) p.133

How does the feed point impedance of a $1/2$ wave dipole antenna change as the antenna is lowered below $1/4$ wave 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 (A) p.132

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 (A) p.139

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

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

G9B10 (D) p.130

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. 32 feet

G9B11 (C) p.130

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

- A. 42 feet
- B. 84 feet
- C. 131 feet
- D. 263 feet

G9B12 (A) p.138

What is the approximate length for a $1/4$ wave vertical antenna cut for 28.5 MHz?

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

G9C19 (B) p.127

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

- A. dBi gain figures are 2.15 dB lower than dBd gain figures
- B. dBi gain figures are 2.15 dB higher than dBd gain figures
- C. dBi gain figures are the same as the square root of dBd gain figures multiplied by 2.15
- D. dBi gain figures are the reciprocal of dBd gain figures + 2.15 dB

G9C20 (A) p.127

What is meant by the terms dBi and dBd when referring to antenna gain?

- A. dBi refers to an isotropic antenna, dBd refers to a dipole antenna
- B. dBi refers to an ionospheric reflecting antenna, dBd refers to a dissipative antenna
- C. dBi refers to an inverted-vee antenna, dBd refers to a downward reflecting antenna
- D. dBi refers to an isometric antenna, dBd refers to a discone antenna

G9D01 (D) p.135

What does the term NVIS mean as related to antennas?

- A. Nearly Vertical Inductance System
- B. Non-Varying Indicated SWR
- C. Non-Varying Impedance Smoothing
- D. Near Vertical Incidence sky-wave

G9D02 (B) p.135

Which of the following is an advantage of an NVIS antenna?

- A. Low vertical angle radiation for working stations out to ranges of several thousand kilometers
- B. High vertical angle radiation for working stations within a radius of a few hundred kilometers
- C. High forward gain
- D. All of these choices are correct

G9D03 (D) p.135

At what height above ground is an NVIS antenna typically installed?

- A. As close to $1/2$ wavelength as possible
- B. As close to one wavelength as possible
- C. Height is not critical as long as it is significantly more than $1/2$ wavelength
- D. Between $1/10$ and $1/4$ wavelength

G9D04 (A) p.140

What is the primary purpose of antenna traps?

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

G9D08 (B) p.143

Why is a Beverage antenna not used for transmitting?

- A. Its impedance is too low for effective matching
- B. It has high losses compared to other types of antennas
- C. It has poor directivity
- D. All of these choices are correct

G9D09 (B) p.142

Which of the following is an application for a Beverage antenna?

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

G9D10 (D) p.143

Which of the following describes a Beverage antenna?

- A. A vertical antenna
- B. A broad-band mobile antenna
- C. A helical antenna for space reception
- D. A very long and low directional receiving antenna

G9D11 (D) p.142

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