

## Antenna QUIZ by K3EUI Barry TRUE or FALSE

1. A balanced two-wire feed line will not radiate as long as the two conductors have equal currents in opposite directions, since their fields cancel.
2. The SWR on a feed line is determined by the impedance mismatch that occurs at the junction of the feed line at the antenna terminals.
3. Changing the feed line length by  $\frac{1}{4}$  wavelength will change the measured impedance and antenna system resonant frequency in your shack, but will not change the SWR on the line (assuming low-loss line).
4. The impedance of a  $\frac{1}{2}$  wavelength dipole operating slightly off the resonant frequency changes mostly due to reactance changes (X) and not so much from changes in resistance (R).
5. If your antenna operates on a frequency where one-half of the forward voltage is reflected at the antenna terminals, then the reflected power will be 25% of the forward power, and the SWR will be about 3:1.
6. The attenuation of all feed lines increases with frequency of the RF.
7. Attenuations of 1 dB or less are too small to be detected so ignore them.
8. Attenuations of 3 dB in your coax result in 50% of the power lost to heat in the cable. That represents about  $\frac{1}{2}$  S – unit loss to the receiving station.
9. Ladder-line and window-line have far less loss than typical coax.
10. RG213 has a loss of less than 0.5 dB / 100 ft at 4 MHz, so 200 ft of this cable can be neglected in terms of your antenna efficiency on 80m.
11. The impedance of a center-fed  $\frac{1}{2}$  wave dipole at a reasonable height in the clear is roughly 50-70 ohms, depending on ground and other nearby conductors. As the dipole gets closer to ground, the impedance drops rapidly.
12. If both halves of a center-fed dipole get equal current, then each half of the antenna will radiate the same energy. Even the side that is connected to the shield (grounded at the rig) will radiate 50% of the wave's energy.

13. When operating at a frequency BELOW resonance, a dipole exhibits CAPACITIVE reactance (the current leads the voltage at the feed point).
14. When operating at a frequency ABOVE resonance, a dipole exhibits INDUCTIVE reactance (the current lags the voltage at the feed point).
15. The **resonant frequency** of a dipole does NOT depend on where the feed line is attached (center-fed, off-center fed, end-fed) .
16. The **impedance** of a dipole increases as the feed point location moves outward from the center of the dipole towards the ends of the dipole.
17. A 100 ft long dipole mounted at least 40 ft above ground and fed with ladder-line or window-line makes a great all-band HF antenna, but you will likely need an antenna tuner in the shack to match the higher impedance ladder line to 50 ohms that your rig wants to see.
18. All **end-fed** antennas present a high impedance to your feed line, and thus need a high impedance to low impedance UNUN or a parallel tuned LC circuit to match the antenna to typical 50-ohm coax.
19. The main function of an antenna tuner is to provide a “conjugate match” and turn the reflection LOSS due to high SWR into a reflection GAIN. The reflected power is turned into additional forward power.
20. Non-resonant antennas can radiate just as well as resonant antennas if matched to your rig.