

Ask an Elmer

This month's question: What is "Take off Angle"?

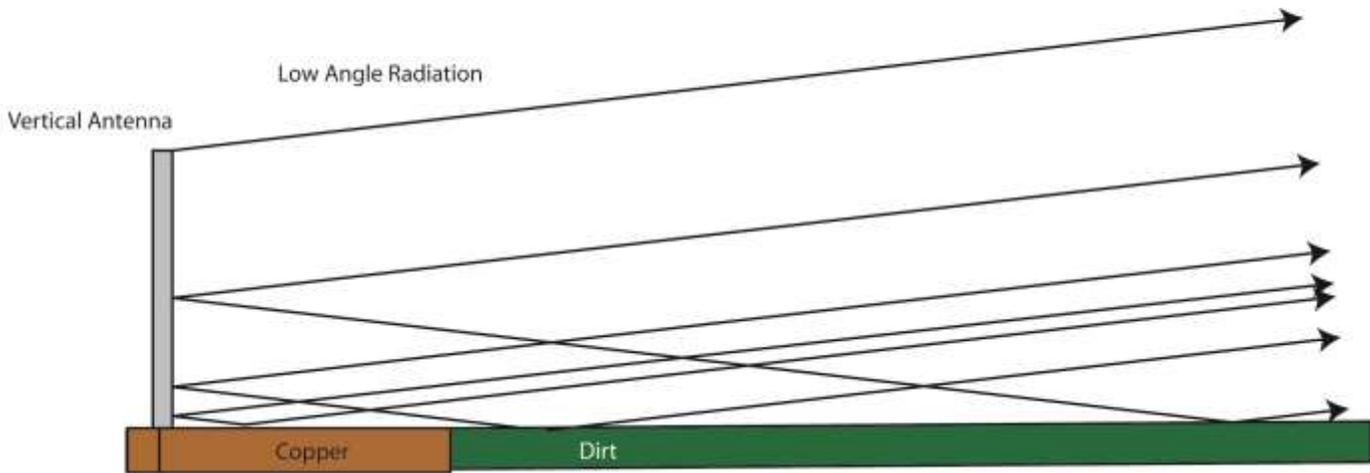
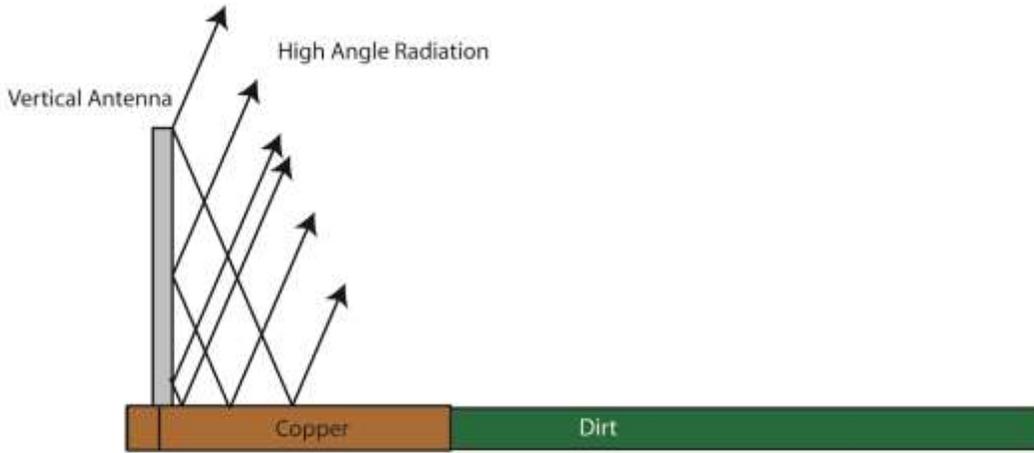
Another term for "Take off Angle" is "Angle of Radiation" (in some circles and to the misinformed, "Angle of Radiation" may not be the "politically correct" term to use). "Take off Angle" has to do with the angle your High Frequency (HF) signal takes once it leaves your antenna to get to the Ionosphere.

Remember this rule:

1. the **higher** your antenna, the **lower your** "angle of radiation"!
AND
2. the **lower** your antenna, the **higher** your "angle of radiation"!

Why is this important to know? If your intent in HF communications is to talk to stations in distant lands (DXing), you'll want a low "take off angle". To get this low "angle of radiation", you'll want to mount your antenna a 1/2 wavelength or higher above the ground (to calculate a half wavelength for your antenna, divide 468 by your antenna's operating frequency..in MHz). This height will allow your signal to travel just above the earth's horizon to the ionosphere which is 90 to 240 miles above the earth before it's reflected by the electrical density of the ionosphere's "F" Layer" back to earth. The distance your signal will travel with this "low angle of radiation" can easily be 1500 miles or more depending on your operating frequency and where we are in the sunspot cycle.

If your intent is to communicate shorter distances, you'll want to mount your antenna closer to the ground. A good example of this is the "Nearly Vertical Incidence Skywave" or "NVIS" antenna (this is good topic to cover in an upcoming issue). NVIS antennas are frequently used by HAM's participating in "emergency" radio communications or the Military in tactical radio operations. The idea behind the NVIS is to send your radio signal, as its name states, "Nearly Vertically". To do this, you can mount your antenna as close as 1/20 wavelength above the ground. In this configuration, your signal will travel almost straight up to the ionosphere, and return straight (shower) back down to the earth. Communications with a NVIS antenna can range from a few miles up to 500 miles. Most generally, NVIS is used below 4 MHz.



A more detailed but easy to understand article written about "Take off Angle" or "Angle of Radiation" can be found at: <http://www.qsl.net/co8tw/angle.htm>

As always, happy HAMing.

73,

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Next month's question: "What is the Ionosphere and what's it do?"