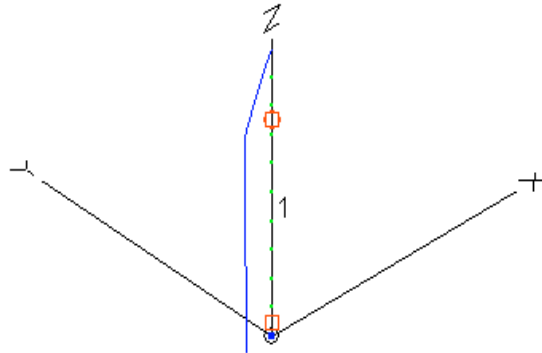


Elevated Antennas for Part 15 AM Use, continued



3m @ 6m Elev, 10 ohm Gnd

8/30/2005

----- FAR FIELD PATTERN DATA -----

Frequency = 1.7 MHz

mV/m for 1 kW at 1 mile

Elevation Pattern	Azimuth angle = 0 deg.		
Deg	V Fld	H Fld	Tot Fld
0	69.22	0.00	69.22

A 3-meter antenna installed with its base at a 6-meter elevation has considerably more radiating structure than the lower antenna. The reason for this is that all of the RF current that can flow in the elevated, 3-meter section has to be conducted from the Earth through the ground wire or structure to which the transmitter ground lead is attached. Therefore the short ground lead connection from the transmitter **and** the conducting path leading to true Earth ground are both part of the radiating elements of the antenna.

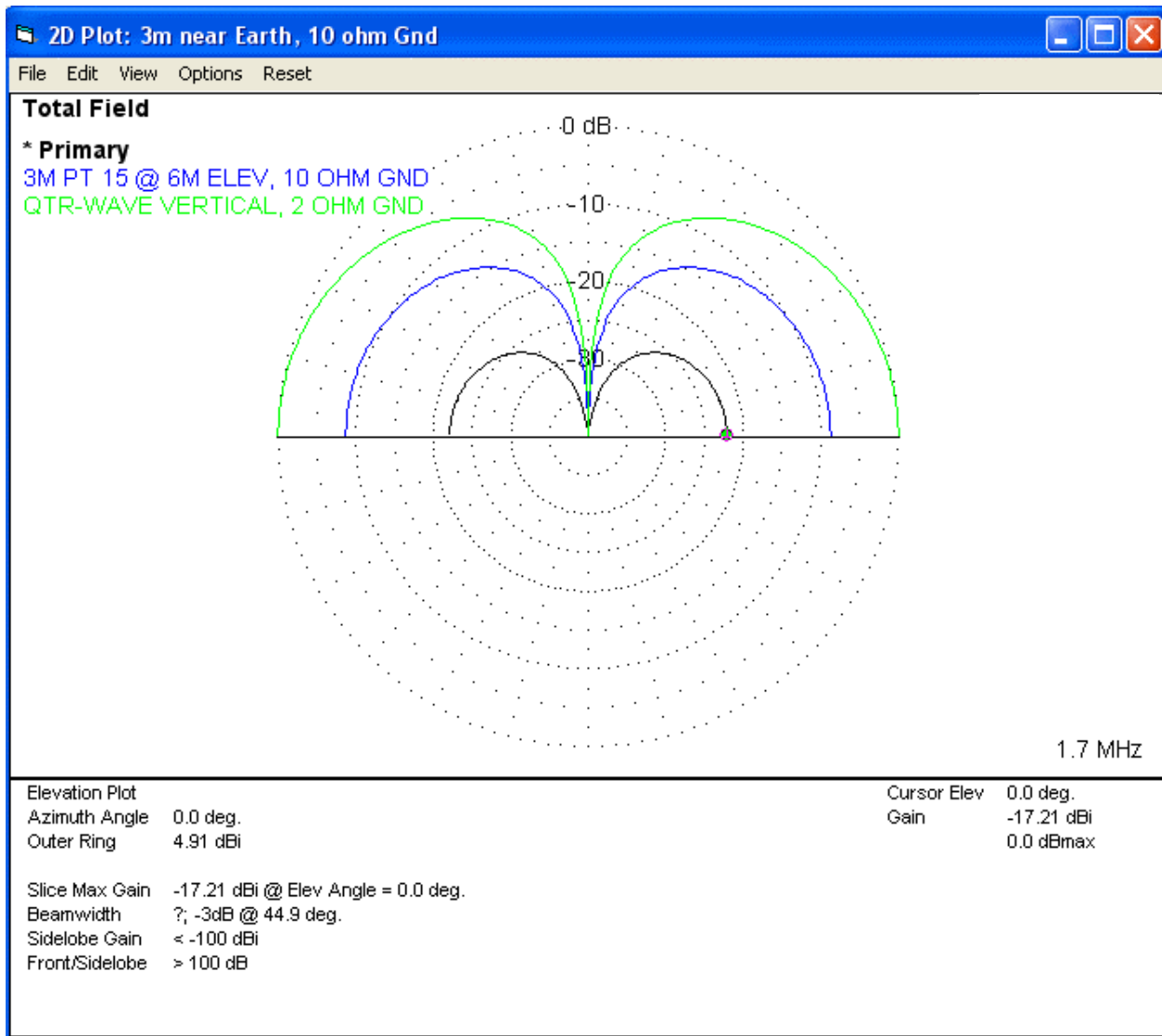
For the elevated antenna, the effect is the same as if the antenna is longer than 3 meters by the length of the "ground" conductors (whatever their form) to Earth ground. This longer antenna has higher radiation resistance, which increases its radiation efficiency, other things equal. Therefore the elevated Part 15 AM antenna generates considerably more field strength than one near the ground.

Assuming that a legal Part 15 AM transmitter could deliver an 80 milliwatt carrier to a matched antenna load, the field strength values for the two configurations given will be 0.9% of the values shown in mV/m below each corresponding graphic. These adjusted values are 133 μ V/m for the configuration near the Earth, and 622 μ V/m for the elevated system. These adjusted values still have to be reduced further as a function of Earth conductivity along the propagation path to the receiver.

Elevated Antennas for Part 15 AM Use, continued

The figure below compares “slices” across the elevation patterns of the two Part 15 antennas compared in this paper, referenced to the very efficient $\frac{1}{4}$ -wave vertical radiator with an excellent radial ground system used by many AM broadcast stations. The horizontal plane is shown by the flat line across the bottom of the traces.

The smallest trace (black) shows the 3-meter antenna near the ground. The next larger trace (blue) shows the 3-meter antenna installed with its base at 6 meters. The largest trace (green) is the broadcast antenna.



Clearly the elevated (longer) Part 15 AM antenna and “ground connection” can produce much higher field strengths for a given frequency, input power and propagation path than the one near the ground, where the total radiating length is limited to 3 meters. Whether or not an elevated installation configuration meets the letter and intent of 47CFR Sec. 15.219(b) is left for readers and FCC field inspectors to determine.