Nextel: Overcoming Interference Problems With Public Safety Radio Services

It is our understanding that Nextel has experienced significant interference issues in areas where its mobile services bands are adjacent to public safety bands. REMEC believes that these problems are caused by antenna elevation patterns and down-tilt techniques that result in uneven and excessive receive RF power density at ground level at varying distances from the tower.

REMEC has developed design capability using electromagnetic design programs coupled with artificial intelligence algorithms. REMEC currently offers null filled and cosecant squared elevation pattern antennas for broadband communications and is able to apply these techniques to mobile communications bands. Preliminary design of an antenna with null-filled elevation and very tightly controlled sector azimuth patterns show that REMEC could offer Nextel replacement antennas that would significantly decrease interference with public safety services without any need to relocate those services. These antennas have well behaved patterns that evenly distribute the RF energy on the ground with distance from the tower. Due to the tight control of the close-in side lobes the interference levels are dramatically reduced.

REMEC is prepared to design and manufacture these antennas for Nextel. REMEC also believes that these antennas would have benefits for other carriers with cellular "A Block" spectrum deploying digital services in the vicinity of public safety services.

Plots of the antenna patterns, receive power density, and receive power vs. distance from the tower are submitted as a part of this submission.

For further information, please contact:

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Radiation patterns

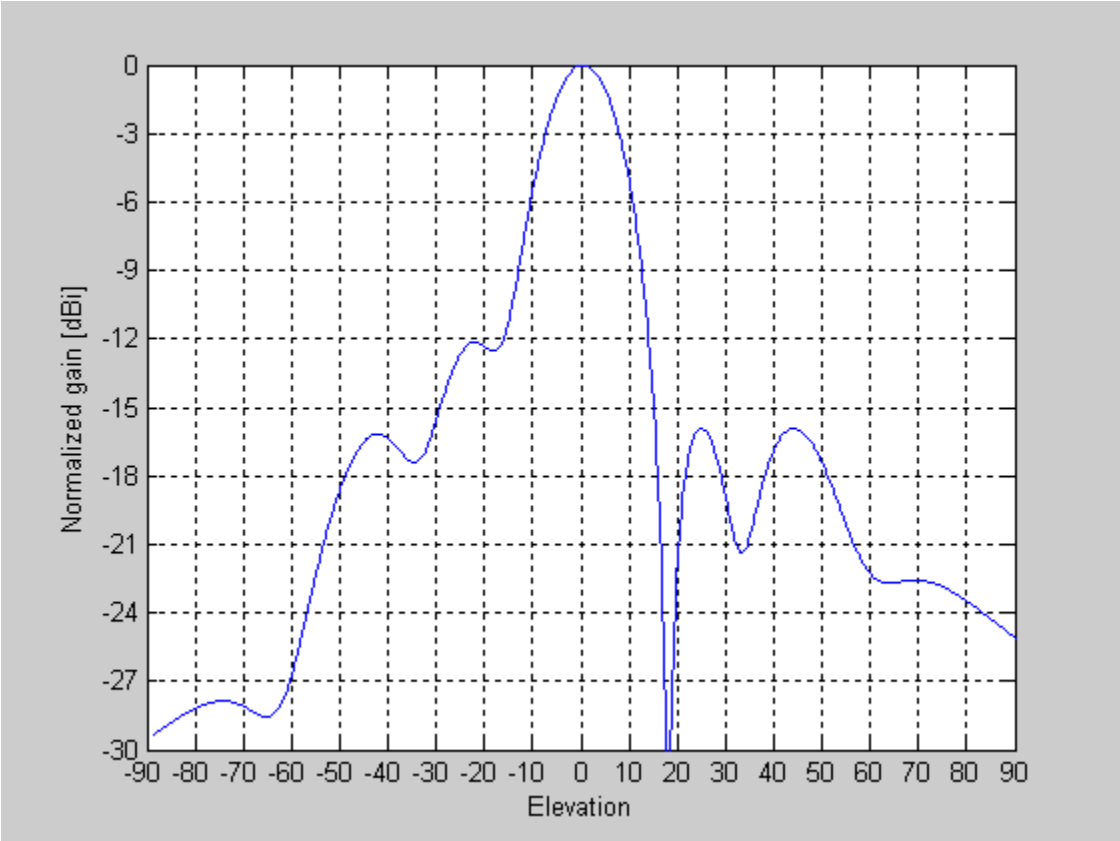

Figure 1. Cosecant squared approximated elevation pattern.

The following plots show the power received at ground level as a function of distance from the tower. The power levels close in to the tower are shown in detail in Figure 4.

The antenna would be about 4 to 6 feet tall depending on the gain requirements and 10 to 18 inches wide depending on the azimuth pattern requirements. The estimated production price is in the range of $700 to $1500 depending on options and quantities.

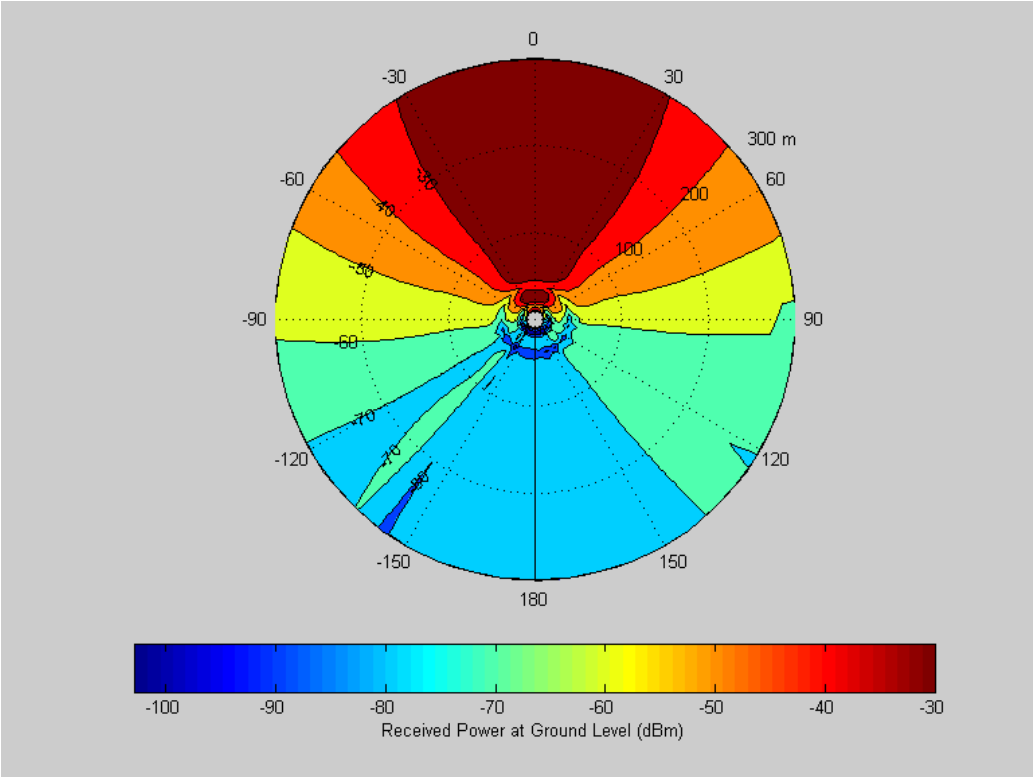

Figure 2. Received power at ground level out to 300 meters from the antenna tower for a 60degree Remec antenna. The transmit power is+40dBm, the base station antenna gain is 16dBi, and the receive antenna gain is 0dBi. The tower is 25 meters high.

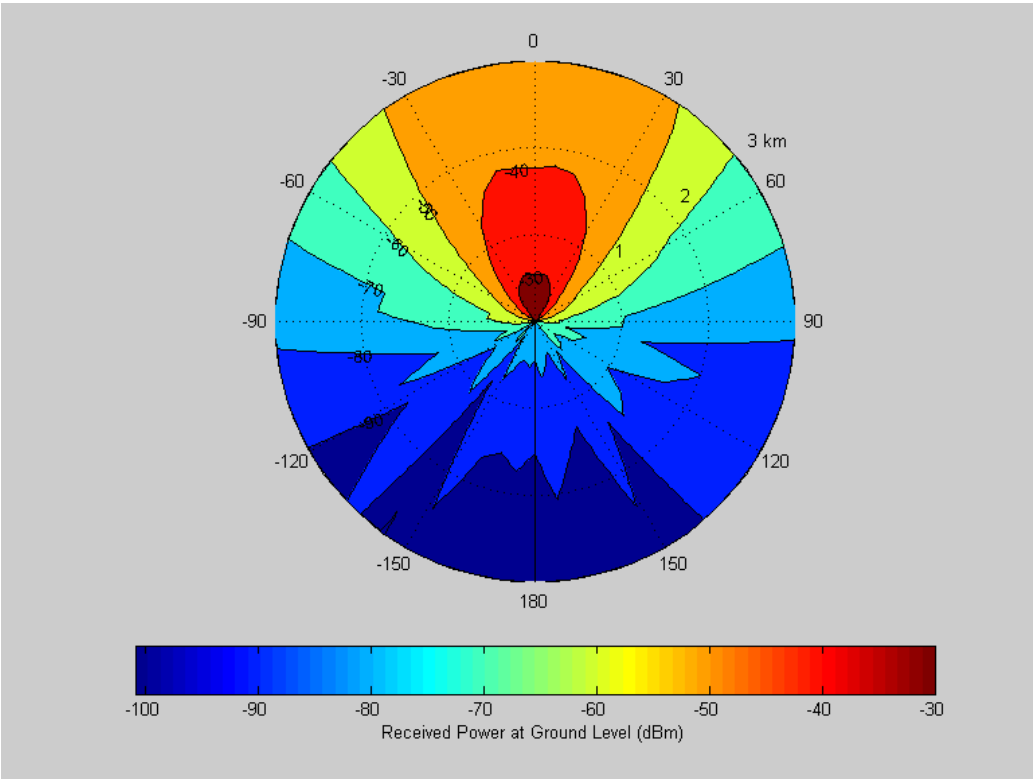

Figure 3. Received power at ground level out to 3000 meters from the antenna tower for a 60degree Remec antenna. The transmit power is+40dBm, the base station antenna gain is 16dBi, and the receive antenna gain is 0dBi. The tower is 25 meters high.

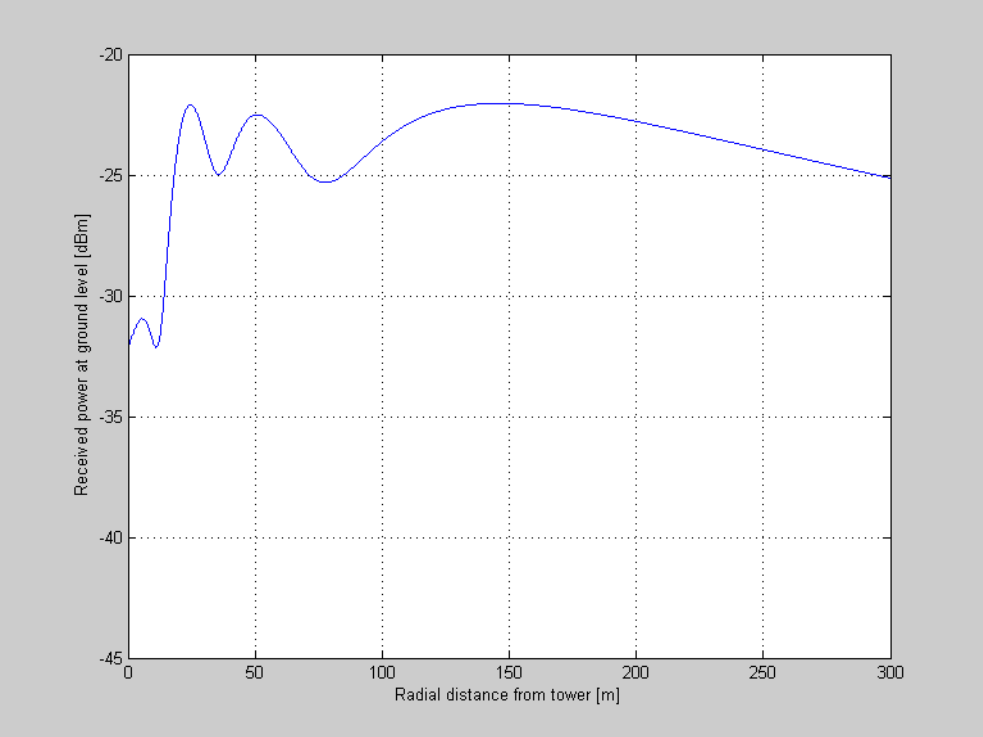

Figure 4. Received power at ground level out to 300 meters from the antenna tower for a 60degree Remec antenna. The transmit power is+40dBm, the base station antenna gain is 16dBi, and the receive antenna gain is 0dBi. The tower is 25 meters high.

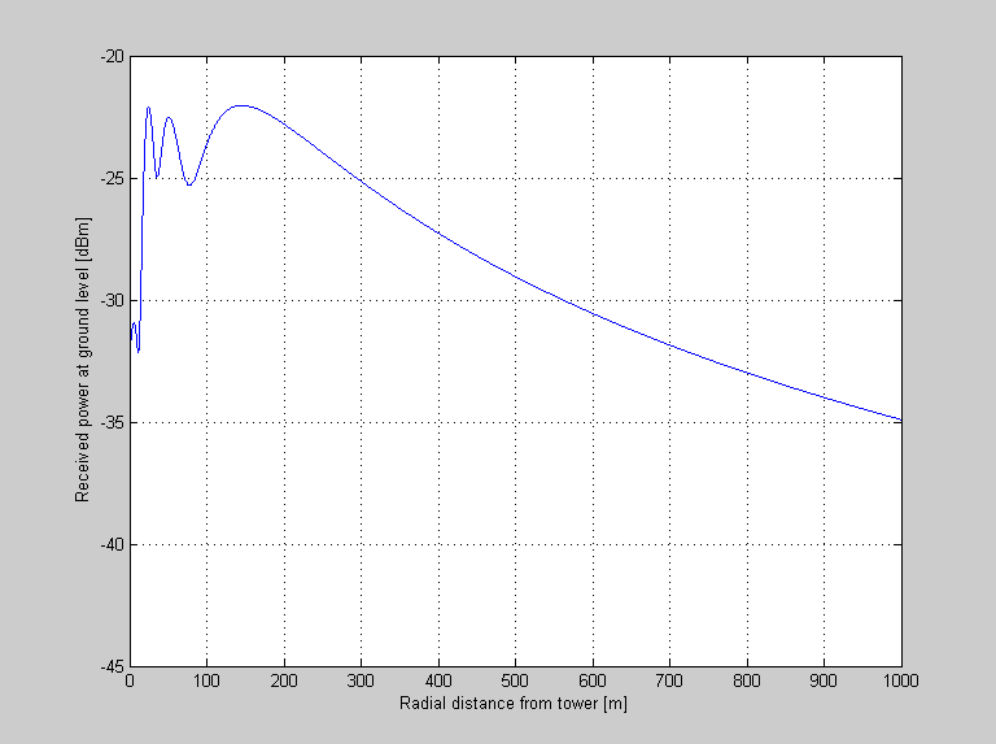

Figure 5. Received power at ground level out to 1000 meters from the antenna tower for a 60degree Remec antenna. The transmit power is+40dBm, the base station antenna gain is 16dBi, and the receive antenna gain is 0dBi. The tower is 25 meters high.