

FCC Creating New Opportunities For Wireless Broadband

By Robert D. Primosch ■ *Esq.*

The FCC continues to change its rules to promote wireless broadband service, particularly over license-exempt spectrum. These rule changes (some of which are already in place) will give wireless broadband service providers easier access to customer premises, with more spectrum and higher power to boot. Here's what's happening right now:

Access to Customer Premises

Nearly three and a half years ago, the Wireless Communications Association International (WCAI) convinced the FCC to expand its antenna preemption or "OTARD" rule to cover wireless broadband antennas on customer premises. As a result, customer antennas now enjoy broad protection from local government or property owner restrictions that impair installation, maintenance and/or reception of wireless broadband.

Very recently, the FCC denied a reconsideration request from a coalition of property owners, thus leaving the expanded rule in place. In so doing, and again at WCAI's request, the FCC clarified that local governments and property owners may not impose their own professional installation requirements unless they comply with the OTARD rule's "safety exception." The safety exception requires that safety-related restrictions have a written, clearly defined, legitimate safety objective and be narrowly tailored to meet that objective. However, under no circumstances may a local government or property owner impose its own professional installation requirement on grounds of RF safety.

Generally speaking, compliance with any applicable FCC professional installation requirements and any related manufacturer's recommendations should

be sufficient to rebut any attempt by a local government or property owner to impose its own professional installation requirements on non-RF safety grounds. As an additional safeguard, however, the Commission recommends that manufacturers and service providers give antenna users adequate information with their

Hence, the FCC views the 3650-3700 MHz band as ideal for license-exempt broadband service to rural areas.

The FCC will also propose rules that will require license-exempt operators to provide interference protection to incumbent non-Government fixed satellite service earth stations at 3650-3700

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antennas regarding proper installation, including admonition to employ professional installers when necessary.

Lastly, the FCC clarified that the protections of the OTARD rule apply where a subscriber premises antenna is used both to serve the subscriber and relay signals to other subscribers (for example, in a mesh network). Protection is not available where a wireless provider simply places a hub site on a subscriber's premises—the antenna must serve the subscriber as well.

More License-Exempt Spectrum

3650-3700 MHz Band: On April 15, the FCC announced that it will propose rules to make the 3650-3700 MHz band available for license-exempt service. In addition, the FCC will propose to permit license-exempt operators in the 3650-3700 MHz band to use higher power than ordinarily allowed in Part 15 of the FCC's Rules.

The 3650-3700 MHz band is unoccupied in most of the country—the vast majority of existing facilities in the band are located on the east and west coasts.

MHz. There are approximately 100 of these earth stations throughout the country, mostly located on the east and west coasts and used for international TV reception. Although the FCC has released few details about this, it seems clear that the satellite industry will be expected to cooperate in the Commission's effort to make the band available for license-exempt use.

Those who are interested in deploying wireless broadband at 3650-3700 MHz should examine the incumbency problem carefully. When the FCC initially proposed to make the band available for licensed wireless services in 1998, it proposed to require licensed wireless operators to coordinate with earth station incumbents within 200 kilometers around each site. It may propose to do the same for license-exempt operators in the band.

Moreover, within those coordination zones there will be "exclusion zones" within which a wireless operator absolutely cannot operate without causing harmful interference to the earth station. The size of the exclusion zones will vary

from site-to-site, depending upon terrain and other factors.

Another potentially serious interference threat: high-powered Government mobile radar systems operating in the lower adjacent 3300-3650 MHz band. In December 1999, the National Telecommunications and Information Ad-

3650-3700 MHz proceeding had not been scheduled as of the date of this writing, but a June-July filing period appears likely.

TV Spectrum Below 1 GHz: In late 2002, the FCC launched a general inquiry into whether it would be feasible to permit license-exempt use of unused

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ministration (NTIA) released a report on the technical characteristics of these systems. It is recommended that wireless operators or vendors interested in the 3650-3700 MHz band consult that report to determine their possible exposure to harmful interference.

Comment deadlines in the FCC’s

television broadcast spectrum below 1 GHz. There are indications that the FCC will soon take comments on specific rules to make this happen. Note that the FCC is interested in permitting license-exempt use of *vacant* television spectrum—occupied TV channels are not on the table.

Higher Power

Use of Cognitive Radios in Rural Areas: The FCC has proposed to adopt rules that would permit operators to increase output power in the license-exempt bands by approximately 8 dB (e.g., from one watt to six watts) in rural areas where they deploy “cognitive radios.” Loosely defined, cognitive radios are those which are capable of sensing the radiofrequency environment around them and self-adjusting (e.g., by changing power, frequency and/modulation) to avoid causing interference to other spectrum users.

The FCC estimates that the proposed power increase could potentially more than double the existing coverage areas of license-exempt broadband providers in less populated regions of the country.

A key aspect of this proceeding is how the FCC defines “rural area.” Rather than rely exclusively on traditional geographic definitions, the FCC is proposing to define rural areas as those where spectrum is “unused.” Hence, license-exempt operators using cognitive radios would be permitted to use higher power where the radios detect a signal plus noise level of no more than 30 dB above the noise floor. In this situation, the FCC would presume that the license-exempt bands are “unused” and that higher power therefore would not cause harmful interference.

Already, however, the vendor community has raised some concerns about this. To achieve better spectral efficiency, some wireless broadband equipment is designed to operate at or below the noise floor. Under the FCC’s proposal, it is conceivable that such equipment could suffer harmful interference, since higher power operations effectively would not be required to protect those facilities.

This issue, along with protection of existing licensed operations both within and adjacent to the license-exempt bands, must be addressed thoroughly if license-exempt operators expect to succeed in this proceeding.

Use of Advanced Antenna Technologies

In the license-exempt band at 2.4 GHz, the FCC permits point-to-point



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systems to utilize higher gain than point-to-multipoint systems, the theory being that point-to-point systems pose less of an interference risk. The FCC is now proposing to expand its definition of "point-to-point" to include transmis-

sion configurations, so long as the overall system does not exceed the Part 15 power limits.

Under the FCC's proposal, a certification applicant would be required to test its system only with the highest gain

antenna) or one that exceeds the gain of the tested antenna would require retesting and re-approval.

Separately marketed amplifiers would be required to obtain their own individual certification and demonstrate that they cannot operate with an output power of more than 1 Watt, which is the maximum permitted under the FCC's rules. The separate marketing opportunity would be limited to amps capable of operating under the FCC's spread spectrum rules or its U-NII rules for the 5.8 GHz band. ■

"In late 2002, the FCC launched a general inquiry into whether it would be feasible to permit license-exempt use of unused television broadcast spectrum below 1 GHz."

sions by advanced antenna technologies, including sectorized and "phased array" antennas that transmit to multiple points but in a manner which is closer to the traditional point-to-point model.

There are a few caveats to the FCC's proposal. To be eligible for point-to-point treatment, the advanced antenna must be capable of forming at least two discrete beams, with a total simultaneous beamwidth of no more than 120 degrees. Thus, a sector system or phased array would be permitted to transmit simultaneously in 2 beams of 60 degrees, 10 beams of 12 degrees, etc.

Also, each beam would be subject to the point-to-point power limit already in the FCC's rules, e.g., .125 watt or 1 watt, depending upon the type of modulation used. However, the aggregate power transmitted simultaneously on all beams would be limited to no more than 8 dB above the limit for an individual beam. Hence, the 8 dB limit will enable antenna systems to create up to 6 individual beams or sectors, all operating at the point-to-point limit.

Equipment Certification

The FCC is proposing to relax its equipment certification rules to give license-exempt operators more freedom to "mix and match" individual system components and purchase amplifiers on a stand-alone basis rather than as part of an entire system. The purpose of these rule changes is to give service providers greater latitude to select optimal equip-

ment configurations, so long as the overall system does not exceed the Part 15 power limits. Under the FCC's proposal, a certification applicant would be required to test its system only with the highest gain antenna of each type that would be used with the system's transmitter, assuming operation at maximum output power. Any antenna of a similar type that does not exceed the antenna gain of tested antennas may be used without retesting. Conversely, use of an antenna of a different type (i.e., a yagi antenna vs. a horn

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