FCC MOVING ON COMMERCIAL USE OF 3.5 GHz BAND; IMMINENT OPPORTUNITIES FOR RF EQUIPMENT SUPPLIERS AND SERVICE PROVIDERS

By Ronald E. Quirk, Jr., Esq.

The Federal Communications Commission ("FCC" or "Commission") recently released a Public Notice, seeking proposals for Spectrum Access System ("SAS") Administrators and Environmental Sensing Capability ("ESC") Operators in order to facilitate commercial operations in the 3550-3700 MHz band ("3.5 GHz Band"). The FCC will begin accepting proposals on **January 15, 2016**. The deadline for the "first wave" (*i.e.* priority) proposals is **April 15, 2016**.

SASs and ESCs are essential components of commercial 3.5 GHz frequency utilization; authorized use of the band cannot commence until they are in place. SASs will serve as highly automated frequency coordinators across the 3.5 GHz entire band, protecting higher tier users from harmful interference from lower tier users, and optimizing frequency use. ESCs will consist of networks of sensors that will detect the presence of signals from federal systems in 3.5 GHz Band and communicate that information to the SASs to protect existing federal operations.

The FCC's solicitation of SAS and ESC proposals is a milestone in moving the 3.5 GHz authorization process forward. New commercial operations in the band will likely commence sooner rather than later. Commercial use of the 3.5 GHz band presents numerous business opportunities for service providers and equipment suppliers alike, especially for those that get on board early.

New Spectrum Available for Commercial Wireless Operations

In April 2015, the FCC released a Report and Order ("R&O") containing new rules that will allow varied and flexible commercial uses of the 3.5 GHz band. Among other things, the new rules: (a) establish a new commercial radio service called Citizens Broadband Radio Service ("CBRS"); (b) implement a three-tiered spectrum authorization framework to facilitate a variety of broadband uses on a shared basis with incumbent federal and non-federal users; and (c) impose specific technical requirements on equipment utilizing the 3.5 GHz Band.

The new 3.5 GHz rules and polices provide a very low barrier to entry for potential wireless service providers. Unlicensed operators will have access to many frequencies and will not have to incur the expense of bidding on spectrum. Licensed operators will be subject to spectrum auctions, but with very small geographic service areas, the per-license costs should be less than licenses issued in other spectrum auctions.

Operations in the 3.5 GHz Band are governed by a new Part 96 of the Commission's Rules. Nearly all of the new rules were made effective as of December 16, 2015.

RF Equipment Marketing Opportunities

Opening of the 3.5 GHz band for commercial use with an emphasis on unlicensed operations will undoubtedly spawn a strong demand for a new generation of RF equipment. CBRS will advance the use of low-power small cell technologies, including Long-Term Evolution for unlicensed spectrum ("LTE-U") and License Assisted Access ("LAA"). These technologies and others will enable mobile broadband operators to efficiently extend their service coverage and increase network capacity, which in turn will require sophisticated, smart transmitters and end-user equipment.

Three-Tiered Spectrum Authorization

The new rules will enable spectrum sharing and flexible use in the 3.5 GHz band by means of a three-tiered sharing system. The order of priority is: (1) incumbent licensees; (2) Priority Access ("PA") licensees; and (3) General Authorized Access ("GAA") operators. CBRS consists of the PA and GAA service tiers.

Tier 1 consists of the incumbent federal users and fixed satellite service ("FSS") operators. These incumbents will have complete interference protection from the two CBRS tiers.

The second tier is PA. A PA license ("PAL") authorizes use of an unpaired 10 MHz channel in the 3550-3650 MHz range in a geographic service area for a three year period. PA geographic service areas are census tracts, which typically align with the borders of cities or counties. PA licensees can aggregate up to four PA channels in any census tract at any given time. While PA licensees must provide interference protection for Tier 1 incumbent licensees and accept interference from them, they are entitled to interference protection from GAA operators.

The third tier, GAA, permits access to 80 MHz of the 3.5 GHz band that is not assigned to a higher tier. GAA will be licensed "by rule," meaning that entities that qualify to be FCC licensees may use FCC-authorized telecommunications equipment in the GAA band without having to obtain an individual spectrum license. GAA operators will receive no interference protection from PA or Tier 1 operators, and must accept interference from them.

PAL Authorization Process

The FCC will announce the application procedure for PALs in a future Public Notice. The FCC will assign seven PALs per geographic area. When the FCC receives competing applications in a geographic area that seek a number of PALs that exceed the available supply, the FCC will assign PALs via auction. If PAL applications for a specific geographic area do not exceed the available supply, the FCC will cancel the auction for that area and assign the subject spectrum for GAA.

Applications for PALs will be similar to those for other wide-area licenses (*e.g.*, applicants must list their qualifications, public interest description, corporate and citizenship information, etc.) with the additional requirement that an applicant's proposed CBRS transmission equipment be registered with an SAS and comply with the FCC's equipment authorization and operational requirements.

PALs will be licensed for one three-year, non-renewable term, but the first application window will permit PAL applicants to apply for two consecutive three-year terms. PAL auctions will be held every three years. PA licensees may apply for subsequent auctions to "renew" their existing PALs and/or apply for new ones.

GAA Authorization Process

The FCC will permit qualified FCC applicants (*i.e.*, those who have general FCC license qualifications) to utilize GAA frequencies on a shared basis without an individual license. GAA operators must employ CBRS transmission equipment that comports with applicable FCC rules and is registered with, and approved by, an SAS.

CBRS Equipment Requirements

The new FCC rules require that all transmission equipment used by CBRS carriers have standardized capabilities. This equipment is called Citizens Broadband Service Device ("CBSD"). CBDSs are fixed stations or networks of stations. There are two types of CBDSs: Category A (a lower power CBSD) and Category B (a higher power CBSD).

The FCC has mandated that CBSD, in addition to complying with universal equipment authorization and marketing rules, provide many new capabilities and requirements. Some of these include:

(a) two-way transmission on any frequency in the 3.5 GHz band;
(b) determinate coordinates to an accuracy of plus or minus 50 meters horizontal and 3 meters of elevation;
(c) registration with, and authorization by, an SAS;
(d) receive and comply with incoming signals from an SAS regarding power limits and frequency assignments;
(e) incorporate sufficient security measures to prevent corruption or unauthorized interception of data; and
(f) contain security features sufficient to protect against unauthorized modification of software and firmware.

End-User Devices

CBRS end-user devices are controlled by an authorized CBSD. These devices, which are also subject to the FCC's equipment authorization and marketing rules, must have the capability to receive and decode information from a CBSD. Additionally, end -user devices are subject to power restrictions, and must discontinue operations, change frequencies and/or operating power within 10 seconds of receiving instructions from the associated CBSD.

SAS Administrator Duties and Application Process

The FCC has mandated that SASs will authorize and manage use of CBRS spectrum. SASs will be tasked with protecting higher tier users from harmful interference while optimizing frequency use to facilitate coexistence among all users of the 3.5 GHz Band.

Each SAS will be operated by an SAS Administrator. The primary function of SAS Administrators will be to follow the FCC's protocols and procedures that implement the core functions of their SASs. SAS Administrators will be subject to certain information gathering and retention duties in order to securely maintain registration information, investigate sources of interference, prevent interference and respond to FCC information requests. SAS Administrators will be permitted to charge CBRS operators fees for registration and frequency coordination services

SAS Administrators will also have authority to assist the FCC in its enforcement duties. SAS Administrators will be required to establish and follow protocols to comply with enforcement instructions from the FCC. Hence, SAS Administrators will be the "first line of recourse" for resolving issues, especially interference disputes that could arise regarding use of the CBRS band. The FCC will retain ultimate enforcement authority, if an SAS Administrator cannot resolve issues among CBRS users, in matters of interference, unauthorized frequency and equipment use.

The Public Notice contains specific information concerning the SAS Administrator proposal process. As shown therein. The FCC's proposal process is very complex and competitive. Accordingly, potential applicants would be well advised to contact knowledgeable counsel for advice and assistance.

Phased-In CBRS Operations and Exclusion Zones

The FCC will implement CBRS operations in two phases. Phase I, in which large parts of the U.S. will be available for CBRS use, will commence as soon as a commercial SAS is approved by the FCC and made commercially available. Phase II, much of the rest of the U.S., including coastal cities, will be made available for CBRS operations, once an ESC is implemented and detects no federal incumbent use.

The FCC has maintained Exclusion Zones along all coastal areas in the U.S., including the Gulf Coast. During Phase I, no CBRS operations will be permitted in the 3550-3650 MHz (PA operations) in the Exclusion Zones. But, the FCC's rules do not *per se* prohibit operations in the 3650-3670 MHz band, except for base and fixed stations located within 80 km of federal radiolocation sites in St. Inigoes, MD and Pensacola, FL. Operations in those areas must be approved through coordination with the National Telecommunications and Information Administration.

Once Phase I has been concluded, the Exclusion Zones will be converted to Protection Zones, in which CBRS may operate with the permission of an approved SAS and ESC.

ESC Systems and Operator Requirements

As stated above, all CBRS operators must provide interference protection to federal incumbent and existing FSS licensees in the 3.5 GHz Band. In order to protect federal incumbents, the FCC will implement ESC systems, in addition to the Exclusion and Protection Zones described herein

An ESC is a system that detects the presence of a signal from an incumbent federal user, and communicates that information to an SAS in order to facilitate shared spectrum access and use in and adjacent to the 3.5 GHz band. ESCs will employ spectrum sensing technologies in conjunction with SASs, in order to allow CBRS users to operate near coastlines on frequencies not being used by federal radar systems.

The FCC requires that an ESC be developed, managed, and maintained by a non-governmental entity. ESC Operator proposals are simpler than SAS Administrator proposals, but still have a degree of complexity that makes legal assistance advisable.

Incumbent FSS Protection and FCC Registration Requirements

As discussed, protection of incumbent FSS operations will be accomplished by the SASs. All incumbent FSS operators operating in the 3600-3560 and 3700-4200 MHz bands requesting protection must register with the FCC by no later than December 1 each year, providing information such as the affected earth stations' geographic locations, antenna gain, azimuth and elevation gain patters, elevation angle, etc.

The Emerging 3.5 GHz Regulatory Landscape

The FCC's rules for commercial use of the 3.5 GHz deployment are varied and complex. It is certain that many legal and regulatory issues will arise and changes will occur as deployment proceeds.

As discussed herein, businesses that wish to submit SAS Administrator and ESC Operator proposals should seek advice of knowledgeable professionals. With the emphasis on unlicensed and shared licensed

operations, equipment manufactures must be sure that they understand and comply with FCC regulations concerning specifications, technical requirements and marketing/operations in the 3.5 GHz Band. Potential service providers must be aware of the FCC's new frequency coordination procedures, as well as auctions protocol and specific licensing requirements. Experienced legal counsel can be of tremendous assistance in helping to ensure that your business takes full advantage of the opportunities in the 3.5 GHz band without the headaches and delays caused by regulatory traps that catch the unwary.

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