July 2017 FCC Meeting Recap: FCC Approves Expanded Rules for Radar Services in the 76-81 GHz Band and Plans to Phase Out Other Vehicular Radar Operations

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In its July Open Meeting, the Federal Communications Commission ("FCC" or "Commission") adopted new rules in a Report and Order ("R&O") to allow a more flexible, streamlined approach for certain radar operations in the 76-81 GHz band. The R&O modifies the applicable rules to increase access for enhanced safety vehicular, fixed, and mobile radar applications to all of the contiguous spectrum in the 76-81 GHz band.

Building on earlier decisions, the R&O modifies the U.S. Table of Frequency Allocations to enhance radar access to the contiguous five gigahertz of millimeter wave spectrum in the 76-81 GHz band for vehicular and certain non-vehicular airport-based radar operations. The Commission previously authorized long-range radar ("LRR") applications to be deployed in the 76-77 GHz portion of the 76-81 GHz band which has supported a host of vehicle safety features like collision avoidance, but the Commission found that more spectrum is needed to accommodate newer, more advanced short-range vehicular radar ("SRR") applications. SRR applications (e.g., autonomous braking and pedestrian detection) provide higher resolution than LRR and can be useful for detecting objects in close proximity. The FCC concluded based on the record that SRR applications require up to four gigahertz of bandwidth for operation. Thus, the 76-81 GHz band, under the new framework, will be able accommodate LRR, which uses only one gigahertz, and SRR development, without overlap of sub-bands.

Additionally, the FCC previously authorized the unlicensed use of the 76-77 GHz band for fixed radars operating at airport locations that detect foreign object debris ("FOD") on airport runways and radars that monitor aircraft and service vehicles movement on the taxiway and other airport vehicle areas. Under current rules, licensed FOD detection systems can be authorized as either fixed or mobile devices in the 78-81 GHz band. The revised rules will now enable FOD detection radars licensed-by-rule to access the entire band from 76-81 GHz subject to the same technical restrictions that apply in the 76-77 MHz band currently. The R&O expressly confirms, however, that fixed radars in the 76-81 GHz band will be limited to airport locations to provide geographic separation from, and in order to limit possible interference to, vehicular radars. FOD radar already installed or in use will be grandfathered for the life of the equipment.

The R&O also permits the use of aircraft-mounted radar applications (also known as "wingtip

radars") in the entire 76-81 GHz band. These radars are used to reduce the incidence of aircraft wingtip collisions while planes move between airport gates and runways. To address stakeholder concerns about possible interference to vehicular radars or FOD detection radars, air-mounted radars are restricted to use in airport air operations areas while the aircraft is on the ground. Aircraft-mounted radars must also include a mechanism that automatically shuts off all 76-81 GHz radar functions when the aircraft is airborne.

In addition, the R&O reorganizes and consolidates relevant rules. The FCC consolidates rules for all radar operations in the 76-81 GHz band in a new Subpart M to Part 95 instead of the regimes under Parts 15 (unlicensed) and 90 (licensed) currently in effect for radar operations. Licensing of all radar systems in the 76-81 GHz band will now be required, but licenses will be conferred upon eligible entities for qualifying operations by rule. The Commission foresees that this new Part 95 licensing approach will afford radar systems interference protection that the Part 15 rules do not provide and will reduce the application and licensing burdens associated with authorizing radar operations under the individual license model like Part 90. The FCC also adopts for the entire band for all types of radars in the band the same equivalent isotropically radiated power ("EIRP") limits as those currently specified in the Part 15 rules for unlicensed vehicular radars in the 76-77 GHz band and unwanted, i.e., spurious, emission limits that mirror the ones under Part 15.

Furthermore, as part of the FCC's decision to consolidate future vehicular radar use into the 76-81 GHz spectrum band, the R&O resolves issues with existing vehicular radar allocations that are dispersed across other spectrum bands. Specifically, the R&O removes the references to vehicular radar operations in the 16.2-17.7 GHz and 46.7-46.9 GHz bands from the Part 15 rules and prohibits the continued manufacture, importation, marketing, sale, and installation of 16.2-17.7 GHz band equipment, effective upon adoption of the R&O, i.e., as of July 13, 2017. The FCC noted these bands are lightly used for vehicular radars. Any existing vehicular radar system authorized to operate in that band is grandfathered for the life of the equipment.

The Commission also requires unlicensed 24 GHz wideband and ultra-wideband ("UWB") vehicular radar equipment to phase out use of the 22-29 GHz band. For the phasing out, Telecommunications Certification Bodies ("TCBs") must cease certifying unlicensed 24 GHz wideband and UWB equipment one year after publication of the R&O in the Federal Register. The FCC will continue to allow the manufacture, importation, marketing, sale, and installation of previously certified unlicensed 24 GHz wideband and UWB vehicular radar devices until January 1, 2022, consistent with European Union transition plan for 24 GHz vehicular radars. Those 24 GHz vehicular radars that are already installed or in use by January 1, 2022 may continue to operate in the vehicle as well as be sold and installed for repair purposes for the life of the vehicle.

To effectuate the revamping of the 76-81 GHz band for vehicular, FOD, and detection radar activities, the R&O makes the following changes to the service designations for the 76-81 GHz portion of the U.S. Table of Frequency Allocations (the resulting allocation table is show below):

- **Radiolocation Service ("RLS") Allocation** –The 76-77.5 GHz and 78-81 GHz bands have been allocated to RLS on a primary basis. The R&O adds a primary RLS allocation at 77.5-78 GHz to make the entire 76-81 GHz band available for licensed radar applications. This change harmonizes U.S. operations with international efforts to create a global allocation for vehicular radars.
- **Amateur Service and Amateur-Satellite Service Allocation –** The Amateur Service has a secondary allocation in the 76-77.5 and 78-81 GHz bands, and the Amateur-Satellite service is

secondary in the 77-77.5 and 78-81 GHz bands. Both services enjoy co-primary allocations in the 77.5-78 GHz band. The R&O lifts an existing suspension of Amateur operations in the 76-77 GHz band. The FCC also downgrades the Amateur Service and Amateur-Satellite Service allocations in the 77.5-78 GHz band to secondary status to match the Amateur allocations for those services in the remainder of the 76-81 GHz band. To further protect again potential interference to vehicular radar, the FCC amends the Part 97 rules to specify a peak EIRP of 55 dBm.

- **Radio Astronomy Service (“RAS”) and Space Research Service (“SRS”) Allocations**

At this time, RAS has access to the 76-77.5 GHz and 78-81 GHz bands on a primary basis and the 77.5-78 GHz band on a secondary basis. The entire 76-81 GHz band is allocated to the SRS (space-to-Earth) on a secondary basis. As a result of the R&O, RAS now has co-primary status with RLS throughout the 76-81 GHz band to ensure regulatory consistency and address any possible difficulties in determining protection rights in the event of harmful interference to RAS. The R&O specifically declined to adopt the proposal of the radio astronomy advocates for an automatic or manual on/off switch on vehicular radars and coordination zones to protect RAS. SRS maintains its secondary status throughout the band.

Resultant Allocations in the 76-81 GHz Band

76-77 GHz	77-81 GHz
RADIOLOCATION	RADIOLOCATION
RADIO ASTRONOMY	RADIO ASTRONOMY
Space Research (space-to-Earth)	Space Research (space-to-Earth)
	Amateur
Amateur	Amateur Satellite

NOTE: RADIOLOCATION and RADIO ASTRONOMY have priority service access; the other services listed are secondary.