

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Expanding Use of the 12.7-13.25 GHz Band for ) GN Docket No. 22-352  
Mobile Broadband or Other Expanded Use )  
 )

**COMMENTS OF THE  
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION**

The National Telecommunications and Information Administration (NTIA), on behalf of the Executive Branch and consistent with its responsibility to ensure that the views of the Executive Branch are effectively presented to the Commission,<sup>1</sup> provides these comments in response to the Notice of Inquiry (NOI). There are a variety of federal uses of 12.7-13.25 GHz and adjacent bands, as well as commercial uses that are important to federal missions. NTIA, therefore, is concerned about the potential for harmful in-band and adjacent-band interference if the 12.7-13.25 GHz band (12.7 GHz band) is repurposed as contemplated in the NOI. This concern is based upon both input from federal agencies that regularly operate in these bands and NTIA’s own preliminary assessment. Accordingly, before the Commission reaches conclusions here, additional technical analysis is necessary to evaluate the effects of repurposing this spectrum and to understand whether such effects can be mitigated (taking into account the costs and required resources for such mitigation).

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<sup>1</sup> 47 U.S.C. § 902(b)(2)(J).

## I. IN-BAND SHARING ISSUES

The 12.7-13.25 GHz band includes a federal allocation for reception-only by a satellite ground station at the Goldstone Deep Space Communications Complex (Goldstone Observatory), operated by the National Aeronautics and Space Administration (NASA). If the 12.7 GHz band is repurposed to allow terrestrial mobile broadband or other expanded use, a coordination zone and/or new coordination agreement may be required to protect the Goldstone Observatory from interference caused by network base stations and handheld mobile stations.

The Department of Defense (DoD) leases commercial satellite services in the 12.7 GHz band and operates its own ground stations. The Commission needs to consider a compatibility study between mobile broadband service and commercial geostationary-orbit (GSO) and non-GSO satellites to ensure the aggregate interference of a large population of terrestrial emitters would not affect existing and future receivers on commercial satellites used by DoD.

Numerous passive radio astronomy observatories,<sup>2</sup> operated and supported by the National Science Foundation (NSF) and NASA, make observations in the 12.7 GHz band. These include very long baseline interferometry (VLBI) stations for geodesy<sup>3</sup> and astrometry high-accuracy reference frames<sup>4</sup> used, for example, as a calibration aid for the radionavigation satellite service. Coordination requirements currently exist for the Green Bank Telescope within

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<sup>2</sup> Radio astronomy facilities currently operating in this band include: Arecibo Observatory, PR; Green Bank Telescope, WV; Very Large Array, NM (with significant upgrade plans); Very Long Baseline Array (VLBA) stations (10 locations in Brewster, WA; Fort Davis, TX; Hancock, NH, Kitt Peak, AZ, Los Alamos, NM; Mauna Kea, HI; North Liberty, IA; Owens Valley, CA; Pie Town, NM; and St. Croix, VI); Kōke'e Park Geophysical Observatory, HI; Goddard Geophysical and Astronomic Observatory, MD; Westford Radio Telescope and Haystack Observatory, MA; and McDonald Geodetic Observatory, TX.

<sup>3</sup> Geodesy is the science of accurately measuring and understanding three fundamental properties of the Earth: its geometric shape, its orientation in space, and its gravity field— as well as the changes of these properties with time.

<sup>4</sup> See Report ITU-R RA.2507-0 (October 2022), “Technical and operational characteristics of the existing and planned Geodetic Very Long Baseline Interferometry”

the National Radio Quiet Zone (NRQZ) for ground-based transmitters.<sup>5</sup> If the 12.7 GHz band is repurposed to allow terrestrial mobile broadband or other expanded use, additional coordination zones and/or new coordination agreements may be necessary and beneficial for other U.S. radio astronomy observatories, and the NRQZ coordination requirements may need to be updated.<sup>6</sup>

## **II. UPPER ADJACENT-BAND COMPATIBILITY ISSUES**

### **A.**

NTIA's adjacent-band concerns are principally with the 13.25-13.75 GHz band, which is primarily a federal band with both military and scientific uses. This band has two segments. The immediately adjacent 13.25-13.4 GHz segment is allocated to federal Earth exploration-satellite services (EESS) (active), space research services (SRS) (active), and aeronautical radionavigation services (ARNS) on a primary basis. The same services are also allocated for non-federal use with ARNS on a primary basis and EESS and SRS on a secondary basis. RR 5.497 limits the ARNS to Doppler navigation aids, and RR 5.498A requires EESS and SRS in 13.25-13.4 GHz to operate on a non-interference basis with respect to ARNS, which is a safety-of-life service.

The further adjacent 13.4-13.75 GHz segment is allocated to federal EESS (active), SRS (active), and radiolocation services on a primary basis and standard frequency and time signal-satellite (Earth-to-space) on a secondary basis. The same services are also allocated for non-

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<sup>5</sup> NRQZ coordination is required for all new or modified, permanent, fixed, licensed transmitters inside the NRQZ, as specified for federal transmitters by NTIA Manual section 8.3.9 (47 C.F.R. § 300) and for non-federal transmitters by the FCC in 47 C.F.R. § 1.924.

<sup>6</sup> Recommendation ITU-R RA.769-2 (May 2003), "Protection criteria used for radio astronomical measurements," recommends that that when proposing frequency allocations, administrations take into account that it is very difficult for the radio astronomy observatories to share frequencies with any other service in which direct line-of-sight paths from the transmitters to the observatories are involved. The recommendation notes sharing concerns may be mitigated by coordination.

federal use on a secondary basis. Federal non-military radiolocation in 13.4-14 GHz is secondary to military radiolocation pursuant to G59. RR 5.501B requires EESS and SRS to operate on a non-interference basis with respect to radiolocation. RR5.499D requires SRS in 13.4-13.65 GHz to operate on a non-interference basis with respect to fixed, mobile, radiolocation, and EESS (active) services. RR 5.501A limits primary SRS allocation in 13.65-13.75 GHz to active spaceborne sensors; all other SRS uses in this band are secondary.

### **B.**

In the 13.25-13.4 GHz band, DoD and the Federal Aviation Administration (FAA) operate airborne Doppler navigation radar systems used to determine ground speed and drift angle of an aircraft with respect to the ground. Unmanned aircraft detect-and-avoid safety systems are also being developed in this band. Recommendation ITU-R M.2008-1 (February 2014), “Characteristics and protection criteria for radars operating in the aeronautical radionavigation service in the frequency band 13.25-13.40 GHz,” provides characteristics and protection criteria for these airborne Doppler radars. However, this Recommendation may need to be updated to reflect the characteristics for current and future airborne Doppler navigation radars. As a result, adjacent-band compatibility studies with representative commercial deployments will be required to ensure there would be no degradation to the DoD and FAA’s airborne Doppler navigation radar operations. Since civil aircraft radar systems do not require individual airframe licenses, it’s difficult to know the number of civil systems operated in this band. Likewise, it’s difficult to determine the number of military systems because they are typically captured under one single United States and its Possessions (US&P) assignment.

### **C.**

In the 13.4-13.75 GHz band, military agencies operate shipborne radars, including search radars, tracking radars, and missile and gun fire-control radars. The National Oceanic and Atmospheric Administration (NOAA) operates the JASON series of altimeter satellites. NASA uses this band for active remote sensing, including the future Surface Water and Ocean Topography (SWOT) mission. NASA's Global Precipitation Mission (GPM) and Tracking and Data Relay Satellite (TDRS) system also use this band. Further, the NSF uses this band for continuum and spectral-line research, including as a calibration aid for the radionavigation satellite service.

NTIA believes NASA and NOAA's satellite systems may be susceptible to aggregate interference from mobile base stations and ubiquitous handheld units. DoD's various platform-based radar systems might also be susceptible to interference from mobile broadband operations. As is the case with the 13.25-13.4 GHz band, adjacent-band compatibility studies with representative commercial deployments will be needed before any determination can be made regarding degradation of federal operations in the 13.4-13.75 GHz band.

### **III. ESTABLISHMENT OF A TECHNICAL INTERCHANGE GROUP TO ASSESS ELECTROMAGNETIC COMPATIBILITY (EMC) WITH FEDERAL SYSTEMS**

NTIA intends to establish a technical interchange group (TIG) within the Interdepartment Radio Advisory Committee (IRAC) to define the technical and deployment parameters for commercial systems and the receiver parameters and interference protection criteria for the federal systems. Within the TIG, NTIA will work with the agencies to identify future systems that can operate in the 13.25-13.75 GHz band. The federal and commercial technical parameters will be used in an EMC analysis to evaluate whether the proposed out-of-band emission limit in

the NOI is adequate to protect adjacent band federal receivers,<sup>7</sup> and also to provide recommendations on coordination zones and/or requirements. The TIG will also examine the role federal receiver performance has on EMC with adjacent band commercial systems. NTIA will forward a copy of the findings of the TIG to the Commission when available.

Respectfully Submitted,

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<sup>7</sup> See NOI, para. 39.