

FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Spectrum Rules and Policies for the Operation Of Unmanned Aircraft Systems)	WT Docket No. 22-323
)	
Petition of AIA for Rulemaking to Adopt Service Rules for Unmanned Aircraft Systems Command and Control in the 5030-5091 MHz Band)	RM-11798 (terminated)

To: The Commission

COMMENTS

The undersigned signatories (“Parties”) respectfully submit these Joint Comments in the above-entitled proceeding.¹ This is an essential step in the complex process of authorizing unmanned aircraft systems (“UAS”) on spectrum regulated by the Federal Communications Commission (“FCC”). As noted in the NPRM, the deployment of UAS requires addressing overlapping jurisdictional issues of the FCC, the Federal Aviation Administration (“FAA”), and the National Telecommunications and Information Administration (“NTIA”).² The process will be evolutionary as the technical, operational, safety, and other issues are considered, but the time to begin the process is now.

The Parties represent a broad variety of public safety and industrial/business entities that have begun to or expect to deploy Unmanned Aircraft (“UA”) in support of their day-to-day operations, many of which involve critical safety of life and property responsibilities. They agree with the NPRM that UAS can deliver “innumerable other beneficial public and private uses”³ and

¹ *Spectrum Rules and Policies for the Operation of Unmanned Aircraft Systems*, Notice of Proposed Rulemaking, WT Docket No. 22-323, FCC 22-101 (rel. Jan. 4, 2023) (“NPRM”).

² *Id.* at ¶ 3.

³ *Id.* at ¶ 1.

support the FCC’s intention to proceed promptly with adopting UAS rules for the 5030-5091 MHz band.

These entities are seeking a solid regulatory foundation on which to develop a secure UAS approach to enhance the safety and efficiency of their primary operations. Currently they deploy UAS pursuant to Special Temporary Authorizations or waivers, neither of which offer the certainty their operations require. As discussed below, to the extent the FCC does not propose to allow payload on UAS in the 5030-5091 MHz band and because authority to operate UAs beyond visual line-of-sight, defined as network-supported services (“NSS”), would be awarded by competitive bidding, UAS operations in this band are not expected to meet the entire range of applications required by entities represented by the Parties. Therefore, while they support adoption of 5030-5091 MHz band UAS rules, they also urge the FCC to proceed with its exploration of other bands where governmental and industrial entities are able to deploy UAs on their own licensed spectrum.

A 5030-5091 MHz Band

The NPRM reflects the considerable work that has been undertaken already on the introduction of UAS into this spectrum. This proceeding is responsive to the Petition for Rulemaking filed by the Aerospace Industries Association (“AIA”) recommending adoption of licensing and service rules for UAS control-and-non-payload communications (“CNPC”) links in this band.⁴

The proposed UAS rules for the 5030-5091 MHz band appear to focus on large, commercial operations that require very substantial bandwidth and likely will be flying at relatively high altitudes. The NPRM describes these as “UAS platforms [that] offer potential benefits in particular to disadvantaged, remote and rural communications, including delivery of

⁴ See Petition of AIA for Rulemaking to Adopt Service Rules for Unmanned Aircraft Systems (UAS) Command and Control in the 5030-5091 MHz Band, RM -11798 (filed Feb. 8, 2018).

essential goods or medical and other critical supplies in hard-to-reach areas, as well as innovative agricultural uses.”⁵ This focus is apparent in the fact that, for aviation groups, RTCA, EUROCAE, and ICAO are developing standards for large UAS. These include, for example, RTCA Minimum Operational Performance Standards (“MOPS”) such as DO-362, as well as Minimum Aviation System Performance Standards (“MASPS”), such as DO-377. EUROCAE is developing similar standards to those developed by RTCA, with an emphasis on European operations. Finally, ICAO is developing SARPS under Annex 8 to the Chicago Convention for the global harmonization of UAS flights via its RPAS Panel.

The Parties endorse all these efforts as large commercial UAS undoubtedly will have an important role in precisely the type of applications described in the NPRM. Certain public safety and industrial entities may also want to use this band for CNPC when the UAs operate in visual line-of-sight, a model defined in the NPRM as non-networked access (“NNA”). That use will be “licensed by rule” without individual authorizations, and operations will need to be approved by and spectrum assigned by one or more dynamic frequency management systems (“DFMS”) on an as-needed basis. It is uncertain how effectively DFMS can accommodate the emergency situations that frequently arise for governmental and industrial entities, where access is needed immediately and the temporal and geographic scope of the situation is not always definable at the outset. Their willingness to operate in that environment will depend on the degree of criticality of the operation and on the track record that DFMS develop.

It also is possible that certain governmental or industrial applicants could be successful in bidding for licensed NSS rights, although that licensing model rarely has enabled entities like these to secure the spectrum they need. They typically are outbid by commercial service providers able to monetize spectrum through subscriber fees and often find that the geographic packages in which

⁵ NPRM at ¶ 11.

spectrum is sold do not conform easily to the service areas they need to cover. While NSS spectrum may address some UAS requirements for these entities, that is likely to be the exception rather than the rule. It is for these reasons that the Parties urge the FCC to consider other bands for UAS operations.

B. Flexible Use/Other Bands

The Parties agree with the FCC that the use of other spectrum, “and existing networks as platforms for UAS offers promise because these existing networks provide significant coverage with low latency, high throughput, and dedicated and secure communications.”⁶ However, they recommend that the FCC expand its scope of investigation beyond spectrum currently labeled as “flexible use”⁷ to include bands in which public safety and industrial entities have opportunities to deploy licensed networks on exclusive spectrum capable of supporting UAS. Today, the 4.9 GHz (4940-4990 MHz) and 900 MHz bands have that potential and other bands might develop it in the future. Those opportunities should not be foreclosed if they can offer the same capabilities and can satisfy comparable interference-protection criteria as will be applied to bands already classified as flexible use.

Integrating UAS into spectrum that heretofore has not been authorized for any aeronautical mobile use, including UAS, will require careful consideration of the potential for co-channel and adjacent channel interference.⁸ It is not clear why flexible use bands would be less problematic than other spectrum from that perspective. In all cases, the FCC will need to evaluate the proximity of other allocations, the OOB criteria applicable to the proposed UAS-approved band and how that would apply to UAS operations, and the typical UAS use in the band.

⁶ *Id.* at ¶ 111.

⁷ This designation is not a defined term in the FCC rules but has been applied to certain bands, all of which are intended primarily for commercial operations. *See* NPRM at ¶ 120.

⁸ The Table of Allocations prohibits mobile aeronautical use in a number of flexible use allocations and in both the 900 MHz and 4.9 GHz bands. Obviously that restriction would need to be lifted.

The Parties believe UAS operations on public safety and governmental networks have certain clear advantages over their use on commercial networks. Private entities will only deploy UAs that they own and operate and will do so in coordination with their terrestrial operations. They will not be building UAS networks but will be equipping existing facilities to deploy UAs used in support of operations on the ground, which will be controlled by and integrated into their primary operations.

The NPRM notes “Use of flexible-use spectrum by UAS can raise interference problems for co-channel and potentially adjacent-channel operation—particularly the high-density use that is expected to occur in the future.”⁹ That may be the case on commercial, flexible use allocations, but that density of use will not occur on private networks. Their use of UAS will be limited and targeted to address specific use cases. Each entity will determine its need for UAs and will not exceed that limit. Importantly, they will not need to contend with the UAS requirements of other commercial subscribers but will be able to design operations to address their individual requirements.

UAs utilizing private networks also are not expected to operate at the same altitudes as commercial UAS. For that reason, as an additional prophylactic against interference, the FCC might consider, in collaboration with the FAA, establishing an altitude limitation on private allocations and on other flexible use bands as appropriate, perhaps in connection with the removal of aeronautical exclusions that will be required for bands with that restriction. For example, at 5,000 thousand feet the footprint of a UAS would be 23,506 square miles. While the potential impact also will depend on numerous variables such as power and bandwidth, generally, the higher the UAS altitude, the greater the potential for interference from command-and-control links to terrestrial networks and protected Federal uses. Likewise, the higher the altitude, the greater the

⁹ NPRM at ¶ 123.

preclusive effect of UAS operations on other spectrum users. In either case, for UAS that are not designed to operate routinely in FAA-controlled airspace, an altitude limitation might be appropriate.¹⁰

The NPRM also identifies specific measures that could be considered for interference mitigation purposes.¹¹ These include those that could be applicable for uplink and for downlink transmissions. The FCC and the industry will need to give these and perhaps other factors that would permit UAS to be deployed on other than 5030-5091 MHz spectrum a thorough assessment to avoid interference to non-UAS operations.

The entities represented by the Parties are eager for opportunities to utilize UAS in their day-to-day operations on a licensed, protected basis. They are particularly eager to do so on networks they design, operate, and control. They look forward to working closely with the FCC and other involved agencies to make the promise of this technology a reality and thereby improve the delivery of their services to the American public.

Respectfully submitted,

American Association of State Highway and
Transportation Officials
APCO International
Enterprise Wireless Alliance
Forest Industries Telecommunications
Forestry Conservation Communications Association
International Association of Fire Chiefs
International Municipal Signal Association
MRFAC, Inc.

March 9, 2023

¹⁰ *Id.* at ¶¶ 92, 123, 137, and 139. By contrast, an altitude limitation is not appropriate in the 5030-5091 MHz band. Current and future communications architectures will include appropriate coordination mechanisms among UA operators and spectrum managers; this is an essential condition for enabling large UAS operations that will be conducted in FAA-controlled airspace.

¹¹ *Id.* at ¶¶ 129-139.