

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C.**

IN THE MATTER OF

Wireless Telecommunications Bureau Seeks to Refresh Record on

Unmanned Aircraft Systems Use of 5 GHz Band

Docket RM-11798; DA 21-1025

COMMENTS OF THE SMALL UAV COALITION

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October 12, 2021

Filed with <http://apps.fcc.gov/ecfs>

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The Small UAV Coalition (“Coalition”)¹ is pleased to comment on the Wireless Telecommunications Bureau’s request for comments on refreshing the record on Unmanned Aircraft Systems (“UAS”) use of the 5 GHz band, specifically the use of the 5030-5091 MHz band for Control and Non-Payload Communications (“CNPC”) as initially set forth in a petition for rulemaking by the Aerospace Industries Association (“AIA”). 86 Fed. Reg. 50715 (Sept. 10, 2021).²

Below, we first set forth the Coalition’s overall views on UAS spectrum policy and our recommended best path forward for the 5030-5091 MHz band, and then turn to specifically address concerns with the AIA petition. While the Coalition acknowledges the desire of the Federal Communications Commission (“FCC” or “Commission”) to “update the record to reflect

¹ Members of the Small UAV Coalition are listed at www.smalluavcoalition.org

² The Coalition initially provided comments on the AIA petition on May 26, 2018. The Coalition subsequently provided ex parte comments September 9, 2019 in response to AIA’s June 26, 2019 Supplement to Petition for Rulemaking.

operational, technical, and regulatory development that have occurred over the last three years,” the Coalition’s concerns initially expressed about the AIA petition remain.

I. Spectrum will play a crucial role in the growth of the UAS industry, which requires a flexible regulatory regime that supports dynamic use cases as industry scales

a. General Principles for UAS Spectrum Policy

First, spectrum is a critical input to safe and reliable UAS operations in low altitude airspace. Spectrum will be used for a variety of use case, including but not necessarily limited to (1) wireless control links between an unmanned aircraft and its control system; (2) remote identification; (3) payload communications; 4) separation and de-confliction from air- and ground-based risks; and (5) avoiding collision with persons or structures. As the UAS industry is still in its early days, it is important to remember that additional spectrum uses may develop over time as the industry matures.

Second, both licensed and unlicensed spectrum have important roles to play to support these use cases. Policies that take advantage of the full range of spectrum opportunities, including existing commercial wireless networks, will help the commercial drone industry thrive while also enabling the development of a safe, efficient, reliable, and resilient unmanned traffic management (“UTM”) system. While unlicensed spectrum is open to all users and provides greater freedom and flexibility in its use, licensed spectrum offers benefits with respect to UAS operations that require greater geographic range and protection from interference, among other network planning capabilities.

Third, the FCC should avoid prescribing UAS to specific bands so as not to constrain industry to limited amounts of spectrum. Like other users of wireless spectrum, the UAS ecosystem

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will benefit from the continued application of the FCC's flexible use policy for spectrum that allow a licensee to utilize the spectrum in the manner that the licensee deems best, subject to the technical specifications set forth by the Commission. Rather than trying to predict the future spectrum needs of this young industry and prescribing specific use cases to particular spectrum bands, spectrum users should have flexibility to use bands for the use cases that best fit the need of the UAS industry, which may change over time as the industry matures.

Fourth, research and development activities, including through government-industry partnerships, should continue to explore the use of commercial mobile networks, including but not limited to 5G, to provide connectivity to support UAS operations. This includes communications between the UAS and the operator, the operator and UTM service providers and/or air traffic management ("ATM"), and the UAS and remote receivers, as well as Control and Non-Payload Communications.

Fifth, to ensure sufficient spectrum is available to support UAS operations, the FCC and NTIA should undertake a review of regulatory restrictions on the use of certain spectrum bands for airborne operations. This includes consideration of restrictions both licensed and unlicensed spectrum bands that either directly or indirectly prohibit aeronautical use of the bands.

b. The 5030-5091 MHz band is best served by flexible rules that allow the UAS industry to adapt spectrum needs as the industry evolves

While the Coalition appreciates the Commission's proactive efforts to support UAS integration, regulations that constrain spectrum to very specific use cases are premature. UAS operations have increased significantly in recent years, but UAS operations remain constrained by

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regulatory prohibitions and limitations. Operations beyond visual line of sight (“BVLOS”), carrying packages, as well as autonomous operations, remain limited, even where waiver authority exists. The FAA has published a final rule authorizing operations over people, but such authority is also very circumscribed. Therefore, any actions regarding UAS spectrum policy should be made with the realization that the regulatory framework for UAS operations is still to be determined, which has a limiting effect on industry’s ability to anticipate its specific spectrum needs. As a result, providing industry with as much flexibility as possible with respect to spectrum will best future proof any present-day regulatory actions.

Flexible spectrum policies further help ensure that spectrum allocated for specific use cases does not lie fallow should those use cases wane over time. Flexible spectrum policies also prevent industry from going back to the Commission seeking additional spectrum or requesting rule changes that take up limited Commission time and resources. Furthermore, given the lengthy process required for any rule change, flexible spectrum policies also allow industry to quickly react to changing industry dynamics, rather than having to wait through a laborious regulatory proceeding.

Additionally, the FCC should clarify that the actions taken within this proceeding are not necessarily setting binding precedent, or even an anticipated baseline framework, for future UAS spectrum policy. While it may be that the policies adopted in this proceeding are ones that will logically be applied in future UAS spectrum proceedings, just as the Commission’s flexible use spectrum policies have remained the default wireless spectrum policies for more than a decade, the Commission should make clear that it is not hamstringing itself to today’s decisions going forward. Thus, the Coalition asks the Commission to explicitly state that this allocation and the technical

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rules that govern such allocation shall not serve as a precedent binding on subsequent Commission UAS spectrum decisions.

The Coalition agrees that available spectrum is critical to ensure the safety and reliability of UAS operations in low altitude airspace. Spectrum will be used for almost every aspect of commercial UAS operations, including control links, electronic identification and tracking, payload communications and de-confliction. Research presented to the FAA Drone Advisory Committee confirms that currently licensed LTE networks should be explored as an option for non-payload command and control communications, as well as payload communications. Unlicensed spectrum already plays an important role in UAS operations, and will continue to do so. However, while some of these use cases are still in development, those currently in operation apply to an industry that will likely look very different five to ten years from now. The Commission should continue its promotion of service and technical rules that allow flexible uses of spectrum.

c. The 5030-5091 band should include Beyond Line of Sight Operations; such operations may also use other spectrum

The Commission requests comments whether this band is appropriate for command and control links for operations beyond the line of sight of the pilot (“BLOS”).³ The Commission’s UAS Allocation Order in 2017 appeared to limit use of this band to UAS operations within the line-of-sight of the pilot. The Coalition believes that the utility of this spectrum would be reduced significantly if it would be used only for line-of-sight operations, whether the Commission adopts AIA’s proposal or otherwise. With respect to the AIA proposal specifically, if the Coalition’s understanding is correct that the UAS operations AIA seeks to conduct in this band will be at

³ The FAA commonly uses the acronym “BVLOS,” meaning beyond the visual line or sight” BLOS is also used an acronym for “beyond radio line of sight.” The Coalition will use the term BVLOS when referencing the FAA.

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higher altitudes, it follows that nearly all of these operations will be BLOS. Even at altitudes below 500 feet Above Ground Level (“AGL”), CNPC communications will be made during flights beyond the visual line of sight of the remote pilot.

Currently, UAS operations conducted beyond the visual line of sight (“BVLOS”) of the operator are authorized only by waiver under 14 C.F.R. Part 107 or an exemption under 49 U.S.C. 44807. Earlier this year the FAA convened a BVLOS Aviation Rulemaking Committee (ARC), and charged the ARC with submitting recommendations before the end of this year. Still, a rulemaking to authorize BVLOS operations and obviate waivers and exemption is not expected in the next year. Thus, the Coalition recommends the Commission not impose in this proceeding any limitations of the use of spectrum for BVLOS operations

The Coalition agrees with the Commission’s anticipation that BLOS communications will require the deployment of network infrastructure, but does not believe that the spectrum assignment model proposed by AIA is necessary “to incentivize deployment of network infrastructure that can support both LOS and BLOS flights.” 86 Fed. Reg. at 50717. The FAA is developing a network-based UTM system that will include CNPC and well as payload communications, initially in low altitude airspace. The Coalition urges the FCC to participate with FAA and industry in UTM development and implementation.

II. Concerns regarding the AIA Petition

While the Coalition believes the FCC should adopt rules that allow flexible use of the 5030-5091 MHz band, should the FCC move forward with the AIA Petition, there are several concerns that should be addressed.

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a. Use of 5030-5091 MHz band should not be exclusive even as to CNPC

In its petition, AIA seeks the allocation of the 5030-5091 MHz band for UAS Control and Non-Payload Communications, and thus restricted to safety-of-life communications (i.e., no payload communications). AIA also seeks the establishment of an FCC licensing system for UAS operators and a dynamic frequency assignment management system to require each flight to be authorized to use this spectrum by a frequency assignment manager.

There is nothing in the petition that differentiates controlled airspace from uncontrolled airspace, or distinguishes UAS operations based on altitude. RTCA SC-228 Minimum Operations Performance Standards (“MOPS”) for Command and Control (“C2”), on which the petition heavily relies, are focused on operations in controlled airspace. In discussions between the Coalition and AIA after AIA initially filed its petition, representations were made that the service and operational rules sought by AIA would apply only to large drones at high altitudes. By emphasizing large drones, the Coalition understood AIA’s intention would be that the CNPC links would be for drones well over 55 pounds (the weight ceiling in 14 C.F.R. Part 107) and that high altitudes was meant to be Class A airspace, which generally is 18,000 feet AGL and higher.

If this band is limited in scope to higher altitude and/or larger UAS, it follows that other spectrum bands may be used by UAS operators, even for CNPC. There are over 20 other spectrum bands allocated to UAS operators in experimental licenses granted by the FCC. The Coalition believes the relative merits of these bands vis-à-vis the 5030-5091 MHz band should be evaluated before granting this petition. It would seem prudent to review the data from the use of these experimental licenses before ultimately agreeing upon a primary or exclusive spectrum band for CNPC.

b. The need for frequency assignment management system has not been shown

The petition recommends the Commission establish a frequency assignment management system because the 5030-5091 MHz band is narrow and will not be able to accommodate the expected growth in UAS operations, even if limited, as proposed, to CNPC. This frequency assignment management system would require each UAS operator to seek authorization for each flight from a Frequency Assignment Manager, who would provide authority for only that short period of time required for the command and control non-payload communication. RTCA SC-228 MOPS for C2 suggests that authority would be granted on a first-come, first-served basis with a narrow window of time to make the request (no more than 20 minutes from the time of flight). The UAS operator would either receive authority to operate on that frequency, or if not available, would be assigned a backup frequency channel.

The case for a highly particularized frequency assignment management system has not been made, given the lack of analysis and evidence that it is preferable to other alternatives. The creation of such a system appears to be a heavy, complex regulatory response that could result in unintended adverse consequences. Any assignment system involves opportunities that result in mutually exclusive use, creating winners and losers, and inviting some to exploit or game the system. Such a system would also introduce a mechanism susceptible to single point failure point and unlikely to be scalable.

Such a system should not be created unless shown to be necessary. While the 5030-5091 MHz band may not be sufficient for the expected magnitude of CNPC, that limitation does not dictate the establishment of a frequency assignment system. One simple and obvious alternative would be the use of other spectrum for CNPC, which would be available if the Commission limited the scope of the band as argued above.

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While those CNPC UAS operations would need to be coordinated across the different operators and spectrum licensees, that work is already being done in the development of a UTM system, which will be necessary regardless of the manner in which CNPC UAS operations are conducted. Given that coordination of CNPC UAS operations could simply be a UTM component, setting up a second UAS coordination system, that in and of itself would need to be coordinated with UTM, would only add unnecessary complication to UAS operations.

c. There is no need for an FCC Operator License

The petition is unclear as to the nature of the “FCC license” UAS operators would be required to obtain. AIA requests that the Commission require UAS Pilots in Command (“PICs”) to secure an operator license under the FCC’s Commercial Radio Operator Program. This broad request, which would appear to apply to all UAS operators, regardless of the type of operation or spectrum band used, is at odds with the rest of the petition, which is limited to the 5030-5901 MHz band and UAS CNPC operations.

The Commission seeks comment on the benefits of conditioning license eligibility on an operator having obtained a remote pilot certificate from the FAA. The Coalition sees little in the way of benefits, and further opposes the operator license requirement. The FAA has the exclusive role in determining the qualifications of remote pilots. If it is indeed the intent of the petition to seek a broad requirement that all UAS operators be FCC-licensed, such a request would exceed the scope of the FCC’s authority. Additionally, such a regime would be unnecessarily restrictive; just as the FCC places spectrum management in the hands of cellular operators and not every person who owns a cell phone, it is not necessary for all UAS operators to be FCC-licensed, since the actual spectrum licensees will manage the spectrum used by the UAS operators.

Instead, if the FCC does adopt AIA's proposal at least in part, the Coalition supports some form of station license, with station equipment held to technical requirements in the Commission's equipment authorization process. 86 Fed. Reg. at 50717.

d. Technical Requirements

The technical requirements set forth in the AIA Petition would apply only to the use of the 5030-5091 MHz band. The Coalition takes no position on these technical requirements other than to note that these requirements, if adopted, should not be used as a template for future UAS spectrum, as other, different requirements may be suitable for different use cases in other spectrum bands. Additionally, as part of a more expanded view of this spectrum, a more generic set of technical requirements are needed so as not to prevent future use of this spectrum by an existing or modified commercially available standard, such as 802.11 or 5G.

CONCLUSION

While both industry and government authorities are taking steps to advance UAS operations, those efforts do not require, nor would they be helped by, establishing a set of restrictive rules around UAS spectrum. The Commission can best serve efforts to advance the UAS industry by maintaining a flexible, light-touch approach to UAS spectrum. There is also no need to rush to establish a UAS spectrum regulatory regime such as that proposed by AIA, particularly one that will set operational barriers that may unnecessarily constrain industry growth and innovation. If the Commission approves AIA's petition, it should do so without a frequency allocation system and without prejudice to other spectrum bands for the vast majority of UAS operations that will be conducted in low altitude, uncontrolled airspace.

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Respectfully submitted,



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October 12, 2021