

FCC Adopts Long-Awaited Order Enabling Limited Access to Dedicated Spectrum for Uncrewed Aircraft Systems

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On August 21, in a long-awaited action, the Federal Communications Commission (FCC or Commission) adopted a Report and Order (Order) establishing rules to allow limited access to spectrum in the 5030-5091 MHz band for use by uncrewed aircraft systems (UAS), more commonly known as drones. Because drones rely on radio signals for control links, access to spectrum is crucial for the growth of the UAS industry. Once implemented, the rules adopted will enable access to a portion of the band for UAS control-and-non-payload communications (CNPC) via a dynamic frequency assignment process. However, the FCC has also decided to proceed in a phased approach, meaning the current rules are both limited in their applicability and are intended to be temporary – and will themselves be preceded by an interim process for “immediate” access while these temporary rules are being implemented. The FCC has committed to adopting additional, permanent rules that will enable “broader and more intensive use of the band” as it gains experience through the limited operations enabled by the Order.

Background

The 5030-5091 MHz band was initially allocated internationally for UAS use in 2012 at the suggestion of the U.S. government. The FCC mirrored that allocation in its rules in 2017, and the Aerospace Industries Association (AIA) filed a petition for rulemaking seeking to implement this allocation in 2018. Following a comment cycle and a record refresh in 2021, the FCC released a Notice of Proposed Rulemaking (NPRM) in January 2023. The NPRM proposed partitioning the band between direct, non-networked access control

Authors

Sara M. Baxenberg
Partner
202.719.3755
sbaxenberg@wiley.law
Joshua S. Turner
Partner
202.719.4807
jturner@wiley.law
Melissa Alba
Associate
202.719.4729
malba@wiley.law

Practice Areas

Telecom, Media & Technology
Uncrewed Aircraft Systems (UAS)

links (NNA) and network supported service control links (NSS), with the NNA spectrum managed by a frequency management system that would be able to dynamically assign frequencies as operators required them. It also asked about the use of other spectrum bands for UAS CNPC, including certain aeronautical spectrum and bands allocated for “flexible use.”

Ultimately, however, the Commission decided to defer consideration of the NSS rules and adopt a phased approach for band access. Accordingly, the rules adopted in the Order address only NNA and allow operations only in the central portion of the band to avoid interference with adjacent users. The Commission’s intent is to enable early, low-cost access to spectrum for direct ground-to-air UAS control communications within radio line of sight. The agency plans to conduct further rulemaking to establish the final band plan for 5030-5091 MHz, which will include both NNA and NSS operations as well as measures to ensure compatibility between UAS stations operation at and near the 5030-5091 MHz band and services in the adjacent spectrum. As proposed in the NPRM, the rules for NNA rely on a dynamic frequency management system (DFMS) that will oversee the assignment of the frequencies for temporary use during a time tailored to the operator’s UAS flight plan.

Below, we provide a summary of the Order, forecast upcoming changes, and offer observations about the Commission’s approach and how it will impact the UAS industry.

The Report and Order

In the Order, the Commission declines to adopt a permanent band plan, and declines to adopt rules that would permit NSS use in the band at this time. Instead, the FCC has decided to move forward with a phased approach, affording limited access to a portion of the band for NNA operations and deferring consideration of NSS rules (and a final band plan) until the agency gains more experience with administering the spectrum. Recognizing that even implementation of the *temporary* rules (e.g., establishing frequency coordinators, having those coordinators build systems to assign frequencies, etc.) will take a “significant amount of time,” the Order also establishes a mechanism to allow what it calls “immediate” access to a larger portion of the band than will ultimately be used for NNA operations (although even this “immediate” access will take some time). Interested stakeholders can think about the rollout of the band in three phases:

- Short-Term: “Immediate” NNA Access via FAA Coordination and FCC Registration
- Medium-Term: Implementation of DFMS for NNA Operations
- Long-Term: A Final Band Plan Including Rules for Both NNA and NSS; Additional UAS CNPC Spectrum

We discuss each in turn, beginning with the rules adopted in the Order and then moving on to the agency’s short- and long-term plans.

Operations in the Medium Term: Dynamic Frequency Assignment for NNA

The FCC spends the bulk of the Order introducing and explaining the regulations it is adopting to afford access to spectrum in the medium term pursuant to the DFMS framework. These regulations will be codified in a new FCC rule part, 47 C.F.R. part 88, and consist of the following components:

NNA Band Plan. Consistent with its decision to focus initially on NNA spectrum access, the Commission declined “at this time” to adopt industry proposals to adopt any exclusive licensing or to allow an operator to choose whether to use NNA or NSS in a given block. Instead, the Order makes 10 megahertz of spectrum within the 5030-5091 MHz band available for NNA operations as a single, contiguous block, with the caveat that the Commission may adopt a different NNA segment size (and locate this block in a different part of the spectrum) as a part of their final plan. Given concerns raised in the record regarding potential interference in adjacent bands, the Order places the NNA spectrum block in the center of the spectrum, away from band edges, at 5040-5050 MHz. The Commission notes that this decision is consistent with FAA practice for temporary operations in the 5040-5050 MHz block and FAA initial Technical Standards Order TSO-C213.

Scope of Permissible Uses. Consistent with its proposal in the NPRM, the FCC limits use of the 5040-5050 MHz band to CNPC communications, and rejects using the spectrum for payload operations. Moreover, the Order narrows the definition of CNPC to apply specifically to air-to-ground and ground-to-air transmissions, rejecting the idea that the concept could encompass aircraft-to-aircraft communication. However, the Commission “do [es] not foreclose the possibility that future actions may allow more flexibility by permitting non-CNPC uses.” (¶ 25) Thus, it is possible that the Commission will consider relaxing this restriction as final rules are developed for the band. Importantly, the Order also makes clear that given the expected growth of UAS, the Commission does not “intend for CNPC operations to be limited to this band.” (¶ 35)

The Order also permits the use of both fixed and mobile ground stations for NNA operations “as long as they are not in motion during operation and operations are limited to the location associated with the specific frequency assignment.” (¶ 36) And while the “NNA spectrum is not intended to promote the deployment of widescale networks for consumer or customer-oriented commercial wireless services,” the Commission “will not set specific limits as to the use of multiple fixed stations to achieve a single NNA operation.” (¶ 37) Thus, though the Order permits only NNA operations and does not establish rules for NSS, drone operators may construct limited, *ad hoc* networks for specific operations that stretch beyond the operator’s visual line of sight (and, for FCC purposes, radio line of sight), so long as those networks abide by the NNA concept of operations and technical rules. This may be especially useful for utility, railroad, and other linear infrastructure operations.

Licensing By Rule. The Order adopts a flexible licensing-by-rule approach for both NNA ground and aircraft stations. Under this approach, NNA users can obtain FCC authorization to use the NNA spectrum by using an FCC-certified NNA station, and complying with applicable NNA rules. No individual spectrum license is required. However, equipment will have to be certified for use under the NNA rules pursuant to the FCC’s equipment authorization process. Any previously certified equipment will need to be re-certified for compliance with Part 88 as set forth below.

Technical Requirements. The Order incorporates the RTCA DO-362A technical standard by reference, and adopts the portions of the standard that are applicable to transmitter output power, emissions bandwidth, out-of-band emissions limits, emission mask, and time division duplexing. Transmitters must be certified for use in new part 88 service under Office of Engineering and Technology (OET) procedures for equipment authorization under part 2 of the Commission's rules. Applicants must identify the transmitter equipment manufacturer to ensure compliance with restrictions on authorization of equipment that appears on the FCC's Covered List of entities that pose a national security threat. In lieu of mandating specific emission designators, the FCC will allow applicants seeking equipment certification to specify the emission designator that is appropriate for their equipment design and operation, provided it meets the other required technical requirements adopted by the Commission.

Dynamic Frequency Management System (DFMS). As previously mentioned, the new rules rely on the establishment of one or more automated DFMSs to oversee spectrum management and assignment. The Commission models the DFMS framework after the Spectrum Access System (SAS) framework adopted for the 3.55-3.7 GHz band (also called the Citizens Broadband Radio Service, or CBRS, band). Parties seeking to use the NNA spectrum must register with a Commission-approved DFMS for each UAS flight and can only transmit in the 5030-5091 MHz band pursuant to and consistent with the terms of a frequency assignment issued by that DFMS. The Commission contemplates that frequency assignments will be made rapidly through an automated system following operator requests that identify the operator's name and contact information, desired frequencies, time period, and geographic area for the operation, as well as other information that the DFMS may require. The Commission hopes to attract multiple DFMSs and third-party DFMS administrators to "foster a diverse, competitive marketplace" of providers. (¶ 79) These providers will be approved through a process similar to the Commission's selection of SASs and SAS administrators in the 3.5 GHz band and will be developed by the WTB and OET in consultation with the Federal Aviation Administration (FAA) and the National Telecommunications and Information Administration (NTIA) within the U.S. Department of Commerce. DFMSs are permitted to charge reasonable fees for their services, and the Order requires they provide service for a 10-year term. Approved DFMSs will have to ensure proper FAA authorization prior to providing access to frequencies. They must also communicate and coordinate with other approved DFMSs, NNA stations, Microwave Landing System (MLS) users, and users in adjacent bands as necessary to prevent interference and ensure proper spectrum use. DFMS and NNA stations are also expected to communicate regarding flight status to empower DFMSs to end unauthorized operations by reassigning negatively affected operators.

DFMS providers will "determine the parameters of the frequency assignment necessary to support the UAS flight, including specific frequencies, bandwidth, maximum transmit power, amount of time, and coverage area." (¶ 98) Requests for frequency use may be approved for an operation lasting no more than 24 hours and may not be approved for periods commencing more than seven calendar days after the submission of the request. However, the adopted rules permit NNA users to submit in-flight revision requests if necessary. The rules also provide that the "DFMS should, to the extent feasible and consistent with the interests of aviation safety," prioritize requests from public safety entities during emergencies, and prioritize single-ground-station requests over multiple-station requests during "extended periods of congestion." Lastly, DFMSs are expected to enforce Commission-established zones that protect federal MLS use over NNA operations and

notify the National Science Foundation of approved frequency assignments within 25 miles of a radio astronomy site.

Operations in the Short Term: The Interim Access Mechanism for NNA

Recognizing that “there will be a significant period of time before a DFMS is operational,” the Order creates an “interim access mechanism” (IAM) to enable access to the band for NNA operations while the details surrounding the DFMS framework are developed and administrators are approved. The IAM process consists of the following components:

- *IAM Band Plan.* Operators will have access to 20 megahertz of the band, at 5040-5060 MHz, during the IAM period, rather than the 10 megahertz that will be permitted once the DFMS is up and running.
- *Eligibility Requirements and Application Process.* Operators must first submit a request to the FAA for deconfliction and approval for their operation. They then must submit to the FCC a registration form providing “various basic information” and certifying that “(1) they have complied with the FAA authorization process; (2) they have/will comply with the Commission’s NNA rules and technical requirements; (3) all equipment utilized in NNA operations meets the equipment certification requirements; and (4) their authorization to use the IAM assignment terminates immediately in the event a DFMS becomes operational prior to the end of the IAM assignment.” (¶ 136)
- *Commencement of Operations.* After the registration is submitted to the FCC, “a confirmation number of their registration will be provided and NNA operations can commence immediately.” (¶ 136)

WTB is responsible for setting up the IAM registration process consistent with the determinations of the Commission’s Order.

Next Steps

Although adoption and release of the Order is a major milestone in realizing the long-intended use of the 5030-5091 MHz band for drone operations, it will still be at least several months before anyone can actually use the spectrum, even through the interim access process. Before drone operations can be conducted in the band via the IAM, the following steps need to occur:

- The rules must become effective. For this to happen, the Order must be published in the Federal Register, and then rules requiring information collection under the Paperwork Reduction Act (which includes the rule governing interim access) must undergo review and approval by the Office of Management and Budget.
- Transmission equipment must be certified as compliant with Part 88’s technical rules (which cannot be done until the Part 88 rules are effective).
- WTB must create a registration process and release a Public Notice regarding that process.

To reach the DFMS phase of band implementation, WTB and OET will need to undertake substantial efforts pursuant to authority delegated by the Order to determine administrative and technical criteria for DFMS, establish a process for entities to apply to serve as DFMS administrators, review the applications of interested entities, and select the universe of administrators. The Commission directs WTB and OET to coordinate closely with the FAA and NTIA throughout this process. The Order also encourages interested stakeholders to form an “informal multi-stakeholder group” to “help develop the requirements and processes applicable to the DFMS as well as to study standards and interference issues associated with UAS operations in the band.” (¶ 127) In the course of this implementation, stakeholders also can expect other actions from WTB, including “identify [ing] and impos[ing] on the DFMS any applicable security or privacy requirements arising from Federal law or Federal guidance” (¶ 106) and identifying exclusion zones for Microwave Landing System operations in the band.

Finally, to achieve full implementation of the band, the FCC will need to undertake additional rulemaking. That future proceeding (or, likely, proceedings) will consider several issues deferred by the present Order, including a final band plan that utilizes more spectrum in the band and accommodates both NNA and NSS use cases; interference protection for adjacent band operations; licensing, technical, and service rules for NSS operations; and changes to the NNA rules and DFMS framework to accommodate NSS and the new band plan or as otherwise needed to improve the process. The Order also suggests that the FCC may convene a Federal Advisory Committee to help inform these efforts. In addition to finalizing a band plan for 5030-5091 MHz, the Commission also intends to use future proceedings to consider other spectrum bands for future CNPC use, including “the use of flexible-use spectrum and existing networks as platforms for UAS operations” and the aeronautical VHF band (117.975 MHz – 137 MHz).

Taking Stock of the Commission’s Approach

There are a number of key takeaways from the FCC’s adoption of an incremental approach to UAS access to the 5030-5091 MHz band:

- The FCC’s strategy of providing for limited but immediate operation in order to gain experience for larger-scale operations in the future is consistent with the general approach that the FAA has taken to UAS integration; the structure of the FCC’s regulations seems designed to both accommodate current, relatively limited use cases and to allow expansion as FAA authorizations grow and scale. This may disappoint stakeholders who have called for faster enabling regulations for the UAS industry. While the FCC’s approach may be able to keep pace with the FAA’s regulatory trajectory for drones, its decision not to pursue NSS rules at this time will likely complicate investment in UAS communications infrastructure.
- The FCC’s authorization of NNA operations and its deferral on NSS rules provides an interesting parallel to the FAA’s Remote ID rules, which also first envisioned a network-based solution but ultimately adopted a non-networked, line-of-sight approach partly for reasons of cost and expediency.
- From an FCC regulatory perspective, DFMS is not a new idea, and is expressly modeled on the SAS approach in the CBRS band. That model has presented some implementation challenges in the CBRS

context, but the FCC appears to be seeking to mitigate these concerns, in part through granting a level of interim access even before DFMS rules are implemented.

- The FCC also appears to be taking steps to avoid some of the concerns that might otherwise come from focusing solely on non-networked access in the initial rules, notably by expressly contemplating the construction of limited, *ad hoc* networks. The overall approach of the Order seems geared toward flexibility for initial, limited operations, which is consistent with the idea of permitting operator experimentation and innovation before committing to an overall, large-scale band plan.
- The Order further emphasizes the need for interagency coordination, reflecting the tensions that have sometimes arisen in this area. In that regard, the Order tracks FAA practices and rules, and envisions FAA collaboration in enforcement as well as close coordination with FAA and NTIA throughout the implementation process. Notably, the 5030-5091 MHz frequency range is one of the spectrum bands identified in the National Spectrum Strategy published by NTIA last year to identify spectrum bands for “in-depth study” to “promote innovation and U.S. leadership in wireless technologies.” The Strategy indicates that the 5030-5091 MHz band “will be studied so that the FCC can optimize UAS spectrum access across the band while avoiding harmful interference” to in-band and adjacent users. Interagency coordination may make for somewhat longer implementation timeframes, but ideally will avoid disputes over spectrum rules or circumstances where lack of spectrum access is the gating factor on UAS expansion.

Wiley’s Telecom, Media & Technology practitioners can assist clients in navigating the complex rules associated with operating uncrewed aircraft systems. For more information about the FCC’s Report and Order, please contact one of the authors listed on this alert.