Amazon Prime Air
Application for Experimental License Under Part 5 of the FCC's Rules
ELS File No. 0708-EX-CN-2026

NARRATIVE STATEMENT

Pursuant to Section 5.3 and Section 5.61 of the Commission's rules, Amazon Prime Air ("Prime Air" or the "Company") hereby respectfully requests conventional experimental authority to conduct testing and evaluation of an ultra-wideband ("UWB") precision localization system for unmanned aircraft systems ("drones"). Specifically, Prime Air seeks authorization to operate ground-based UWB anchor transmitters on UWB Channel 9, centered at approximately 8 GHz within the 3.1-10.6 GHz band allocated under FCC rules at four Prime Air Drone Delivery Center ("PADDC") locations.

A. Purpose of Operation and Need for Experimental License

Prime Air is Amazon's commercial drone package delivery service. Prime Air holds a Federal Aviation Administration Part 135 air carrier certificate and conducts beyond visual line of sight package delivery operations using drones operating from PADDCs. During low-altitude operations near PADDCs, drones experience degraded GPS performance affecting positioning precision during takeoff and the initial transition to reliable satellite-based navigation. Prime Air has identified UWB technology as the solution for precision localization in these conditions.

The proposed experimental system has two components: (1) receive-only UWB tags mounted on each drone that process incoming signals from ground-based anchors but do not transmit radiofrequency; and (2) ground-based, fixed UWB anchor stations mounted around the PADDC perimeter, which emit UWB radiofrequency signals to localize and triangulate drone positions during active takeoff sequences and related low-altitude testing. The system is geographically contained within the PADDC, and UWB is used only until the drone climbs to reliable Global Navigation Satellite System ("GNSS") reception, at which point it transitions back to GNSS-based navigation.

This application seeks experimental authorization for testing and evaluation. The proposed testing will allow Prime Air to evaluate the UWB localization concept under controlled conditions, gather performance data, and develop practical evidence to support a subsequent petition for waiver of applicable Part 15 restrictions.

B. Location of Proposed Operation

This application requests authority to conduct tests at the four PADDC fixed location sites identified below. Operations will be conducted only on property controlled by Prime Air.

Location	Coordinates (NAD83)	Station Class
5292 NW Doolittle Canyon Ln, Pendleton, OR, 97801	45° 41’ 21” N 118° 51’ 81” W	Fixed (FX)
6050 E Marginal Way, Seattle, WA, 98108	47° 32’ 51” N 122° 19’ 54” W	Fixed (FX)
1400 East Ten Mile Road, Hazel Park, MI, 48030	42° 28' 26.7" N 83° 5' 24.2" W	Fixed (FX)
1200 Featherstone Road, Pontiac, MI, 48342	42° 38' 40.6" N 83° 15' 20.9" W	Fixed (FX)

Operational Conditions:

- During the experimental evaluation, each PADDC site will deploy 12–20 UWB ground anchor units around the PADDC perimeter on removable, portable tripods or, as an alternative deployment configuration to be evaluated, on perimeter structures at or below 2 meters above ground level using removable clamp attachments.
- Two additional anchor units will be mounted on building rooftop or side of building at <= 30 meters above ground level. Any non-ground-level mounting evaluated during the experiment will remain below 30 meters above ground level and within property controlled by Prime Air.
- Prime Air will utilize Downlink Time Difference of Arrival to trilaterate the position of the UWB tags mounted on the drones.
- Prime Air will evaluate the minimum practicable mounting height and number of anchors needed to support reliable takeoff operations.
- Prime Air will evaluate the minimum practicable transmit power needed to support reliable takeoff operations.
- All testing will be conducted at locations controlled by Prime Air.
- The drone-mounted UWB tags are receive-only devices that do not transmit UWB signals.
- Drone operations utilizing the UWB localization system will be limited to the takeoff and initial transition phase of flight, at altitudes of approximately 30–50 meters above ground level and will be geographically contained to the PADDC footprint with a horizontal buffer.

Prime Air respectfully notes that the Commission has previously granted Prime Air a two-year conventional experimental license (File No. 1224-EX-CN-2024, granted December 18, 2024) to operate radar systems in the 9.3–9.5 GHz band at the Pendleton and Seattle PADDC locations for testing and evaluation of air traffic monitoring systems. The present application seeks authorization for complementary UWB testing at the same controlled facilities, consistent with Prime Air's ongoing development of safety systems for drone delivery operations.

Prime Air's system is designed to operate consistently with the Commission's Part 15, Subpart F rules. Regarding the aircraft prohibition under 47 C.F.R. § 15.521(a), the drone-mounted UWB tags are receive-only devices that do not transmit UWB signals. Because operation under the rule is typically associated with active radio frequency transmission, a passive receiver that merely processes incoming UWB signals for positioning purposes would fall outside the scope of the aircraft prohibition. This interpretation is consistent with the Commission's broader regulatory framework, which distinguishes between intentional radiators and passive receivers.

With respect to the ground-based anchor stations and the provisions of 47 C.F.R. § 15.519(a), Prime Air requests experimental authority to evaluate small, low-power UWB anchor devices that share the essential characteristics of the hand-held UWB systems contemplated by the rule, while also evaluating low-elevation deployment configurations that may require waiver relief. The anchors are small, approximately the size of a smartphone, and weigh less than 50 grams. They will be deployed on removable, portable tripods and may alternatively be mounted on perimeter structures at or below 2 meters above ground level using removable clamp attachments. Two anchors will be mounted on side of the building or rooftop at heights <= 30m. In each configuration, the anchors will be located on property controlled by Prime Air, powered only during active operating periods, and operated for temporary, controlled testing rather than as permanent, elevated, always-on outdoor infrastructure. And, as noted below, Prime Air does seek approval to operate at power levels exceeding the levels authorized under Part 15.

Prime Air will collect real-time location system position and ranging information from the UWB tags throughout the experimental evaluation. Testing will adopt a phased approach, beginning with data collection in a captive carry capacity and progressing to closed-loop iteration as development advances.

C. Technical Specifications

1. Frequencies Desired

Prime Air requests authorization to operate ground-based UWB anchor transmitters on UWB Channel 9, centered at approximately 8 GHz within the 3.1-10.6 GHz UWB band.

2. Effective Radiated Power

The UWB anchor units to be deployed will typically operate at a maximum mean equivalent isotropically radiated power ("EIRP") spectral density of −41.3 dBm/MHz, consistent with the emission limits prescribed in 47 C.F.R. §§ 15.517 and 15.519. For experimental testing, Prime Air requests authority to operate, when necessary, up to −31.3 dBm/MHz by increasing the transmit

output power, which is 10 dB above the standard Part 15 average EIRP spectral-density limit. This elevated-power operation will be limited to temporary, controlled testing within Amazon operated property to quantitatively determine the amplification required for reliable operation for Prime Air use cases.

Prime Air will minimize the actual production transmit to the minimum power required for successful operation, based on set-up and testing at the proposed locations. This experimental filing will authorize Prime Air to collect performance data to determine whether higher power levels at <= -31.3 dBm/MHz are needed to support reliable operation. Operations will be conducted to comply with rules relating to human exposure to radiation.

3. Modulation and Emissions

Below find the requested information for the ground-based UWB anchor stations.

Parameter	**Specification**
Frequency Range	Channel 9, centered at approximately 8 GHz
Necessary bandwidth	500MHz, i.e. +/- 250MHz from the center frequency
Modulation	BPM+BPSK (compatible with IEEE802.15.4a or IEEE802.15.4z)
Emission Designator	500M0X1D
Maximum Mean EIRP Spectral Density	-41.3 dBm/MHz (without a power amplifier) A maximum of −31.3 dBm/MHz with a power amplifier.

The emissions will not extend beyond the frequency band requested.

4. Antenna Information

The ground anchor units will be deployed on removable, portable tripods or on perimeter structures at or below 2 meters above ground level using removable clamp attachments as an alternative configuration to be evaluated during the experimental term. The total number of ground anchors is expected to be anywhere from 12 to 20 anchors, where testing will inform Prime Air of the optimal amount and placement of these anchors. Two anchor units will be mounted at height around 20m, but no higher than 30m, on the side of an Amazon operated building. The final height of these two anchors will also be determined as part of the experimental testing and data collection. The mounted configuration will be removable, powered only during

active operating periods, and located on structures owned or controlled by Prime Air. No antennas will be mounted in a fashion that would require approval under FAA or FCC rules and regulations. The antennas used are PCB antennas co-located with the RF front end and transceiver noted in section 5.

5. Equipment To Be Used

Manufacturer	Model Number	No. of Units	Experimental?
Qorvo[1]	DWM3001C (UWB chipset)	[X]	No
Murata[2]	Murata Type 2AB	• 12 -20 anchors for transmitting • 2 receive-only tags	No
PA/LEAPS	Custom integration for Tag and Anchor utilizing Murata Type 2 AB modules.	• 12 -20 anchors for transmitting • 2 receive-only tags	Yes

D. Protection Against Causing Interference

In the event that it receives a complaint of harmful interference from the proposed operation, Prime Air will take immediate action to address the interference, including discontinuing operations if necessary. The Stop Buzzer contact is identified below.

E. Restrictions on Operation

Prime Air recognizes that the operation of any equipment under experimental authority must not cause harmful interference to authorized facilities. Should interference occur, Prime Air will take immediate steps to resolve the interference, including discontinuing operations if necessary. In addition, Prime Air will advise all personnel using the equipment that permission to operate has been granted under experimental authority issued to Prime Air, that such operation is strictly temporary, and that the equipment may not cause harmful interference.

[1] FCC Approved (FCC ID: 2A35D-DWM3001), per FCC Reports.
[2] FCC Approved (FCC ID: VPYLB2AB), Manual.

F. Public Interest

Grant of authorization will permit Prime Air to test and evaluate a UWB-based precision localization system that addresses a critical safety need in commercial drone delivery operations. The experimental data will directly support Prime Air's ability to develop standards and technology for safe drone navigation systems around commercial delivery centers, improving the safety of drone operations for both Prime Air personnel and the public.

G. Contact Information

For questions about the Company or the testing, please contact:

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Name: Marce Montano
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In the unlikely event interference concerns should arise during the period of authorization requested by this application, please contact the Company's "Stop Buzzer" identified below:

Name: Ron Huebner
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