




# Federal Aviation Administration

---

## Memorandum

Date: April 19, 2023

To: All Airports Regional Division Managers

From:   
Michael A. P. Meyers, P.E.  
Manager, Airports Engineering Division, AAS-100

Prepared by: Carlton Lambiasi, P.E., Civil Engineer, AAS-120

Subject: Engineering Brief No. 107, Aeronautical Study of 5G C-Band Antennas

---

This Engineering Brief provides information about the Federal Aviation Administration's (FAA's) implementation of Title 14 of the Code of Federal Regulations (14 CFR) Part 77 with respect to the installation of 5<sup>th</sup> generation (5G) C-Band antennas on or near airports.

Attachment



**FAA  
Airports**

## **ENGINEERING BRIEF No. 107**

### **Aeronautical Study of 5G C-Band Antennas**

#### **1.0 Purpose.**

This Engineering Brief (EB) provides information about the FAA's implementation of Title 14 of the Code of Federal Regulations, Part 77 (Part 77) with respect to the installation of 5<sup>th</sup> generation (5G) C-Band antennas on or near airports.<sup>1</sup> This is in response to concerns from both local airport authorities who fear that 5G C-Band antennas will impact airport operations and from antenna construction companies concerned that airports will not allow them to install 5G C-Band radios.

#### **2.0 Application**

The information in this EB is not legally binding in its own right and will not be relied upon by the FAA as a separate basis for affirmative enforcement action or other administrative penalty. Rather, it is intended to clarify the FAA's implementation of Part 77 with respect to 5G C-Band antennas on or near airports. Conformity with this information, as distinct from existing statutes, regulations, and grant assurances, is voluntary only, and nonconformity will not affect existing rights and obligations.

#### **3.0 Effective Date**

This EB becomes effective as of the date the associated memorandum is signed by the Manager, FAA Airports Engineering Division, AAS-100.

#### **4.0 Background**

5G is the new generation of cellular technology that increases speed and improves flexibility of wireless services. In the United States, 5G services launched using frequencies in a radio spectrum called the C-Band, operating in the 3.7 through 3.98-gigahertz (GHz) band. Commercial aviation radio altimeters operate in the 4.2 GHz through 4.4 GHz band. With just a 0.22 GHz separation from the C-Band telecommunication system, the FAA determined through analysis that, without mitigations, the presence of 5G C-Band (not all 5G, only the C-Band frequencies between 3.7-3.98 GHz) may interfere with the radio altimeter's ability to precisely measure the aircraft height over the ground.

The FAA has been working with the aviation users to assist them in retrofitting aircraft to make them less susceptible to 5G C-Band interference. Many have completed those retrofits, and while

the remaining are in the process of completing the work by early 2024, the FAA has been working with the wireless companies to keep in place the 5G C-Band radio base station mitigations that allow for safe access to airports today. In April 2023, agreements from the major wireless companies (licensees) deploying 5G C-Band today were submitted to the Federal Communications Commission (FCC). These agreements commit those licensees to certain mitigations that have ensured the safe co-existence of 5G C-Band deployment and aviation operations to date. The FAA has assessed the risks and determined that the existing Part 77 process, the aircraft retrofits, and the mitigations implemented by the 5G C-Band wireless licensees' are sufficient to ensure the continued safe and efficient use of airspace.

Title 49 United States Code Section 44718 (§ 44718) grants the FAA's authority to promote the safe and efficient use of the navigable airspace. The FAA codified its implementation regulations in Part 77 (*Safe, Efficient Use, and Preservation of the Navigable Airspace*), which established notice standards for proposed construction or alteration that may result in an obstruction or an interference with air navigation facilities and equipment or the navigable airspace. Once structure proponents file notice, the FAA conducts an aeronautical analysis to determine the effect on aeronautical operations and whether that effect is a hazard to air navigation. The FAA's primary objective in implementing § 44718 and Part 77 is to ensure the safety of air navigation and efficient utilization of navigable airspace by aircraft.

For additional information, refer to the FAA's [5G webpage](#) and [5G Frequently Asked Questions webpage](#).

## 5.0 Notable References

- [FAA's 5G Webpage](#)
- [5G Frequently Asked Questions Webpage](#)
- [14 CFR Part 77](#)
- [JO Order 7400.2, Procedures for Handling Airspace Matters](#)
- [SOP 9.2, FAA Aeronautical Study, Coordination and Evaluation](#)

## 6.0 FAA Expectations of Airport Operators

While the initial deployment of 5G C-Band technology presented the FAA and aviation industry with a substantial challenge, the aviation industry, the FAA, and the telecommunication companies have partnered successfully to ensure aviation safety and efficiency. For over a year, the FAA and wireless network operators have interacted daily to ensure 5G C-Band and the United States aviation system can safely co-exist. Wireless network operators, or delegated authorities, are notifying the FAA of proposed 5G C-Band antennas by [electronically filing FAA Form 7460-1](#), triggering the Part 77 obstruction evaluation process.

It also bears highlighting that not every 5G frequency band can potentially interfere with radio altimeters. Indeed, 5G transmissions outside the C-Band are acceptable and will not cause radio altimeter interference.

Given the extensive work and collaboration between the FAA and telecommunication companies to ensure the safety and efficiency of aviation, we ask that airports and their managing authorities let the existing processes run their course. That is, allow proponents of 5G antennas to file notice with the FAA so that we can determine whether the 5G technology creates a hazard to air navigation. To that end, we ask that airport authorities not prevent the deployment of 5G technology before the FAA reviews the proposal as part of the part 77 obstruction evaluation process.

Given the FAA's authority to promote the safe and efficient use of the navigable airspace, the FAA will conduct an aeronautical study to determine if the proposal would be a hazard to air navigation and we have very high confidence that our analysis and processes will accurately determine any hazards to air navigation.

## **7.0 Expectations of FAA ARP Regional/Airports District Offices (ADOs)**

For on-airport proposals, the Office of Airports (ARP) is responsible for managing the evaluation of notice received under part 77 as a non-rulemaking airport (NRA) aeronautical study. The Obstruction Evaluation (OE) Group is responsible for managing off-airport proposals as an OE aeronautical study.

The FAA ARP Regional and ADO staff is to refer to the latest guidance contained in Joint Order (JO) 7400.2, Procedures for Handling Airspace Matters, and SOP 9.2, FAA Aeronautical Study, Coordination and Evaluation, to process, verify, coordinate, and determine any NRA notices received. Specifically, the ARP Regional/ADO staff is to ensure the submission includes sufficient information to allow each division/service area office (e.g. FAA Spectrum Engineering) to accomplish its specialized portion of the evaluation and to ensure the frequencies and effective radiated power are included.

## **8.0 Questions**

Please contact Carlton Lambiasi at 847.294.7552 or [Carlton.Lambiasi@faa.gov](mailto:Carlton.Lambiasi@faa.gov) for any questions about this Engineering Brief.

<sup>1</sup>An [online notice criteria tool](#) is available to determine if FAA notice is required. Pursuant to §77.9, the FAA requests notice of any 5G C-Band antenna within a building located on airport-owned property.

<sup>2</sup>Persons who knowingly and willingly violate the notice requirements of Part 77 may be subject to a civil penalty, pursuant to 49 U.S.C., Section 46301(a).