

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
Comsearch and C3Spectra) ET Docket No. 23-107
Request for Waiver of Section 15.407(l)(1) of the)
Commission's Rules for AFC System Operation)
in the 6 GHz Band)
The Commission Begins the Process for) ET Docket No. 21-352
Authorizing 6 GHz Band Automated Frequency)
Coordination Systems)

ORDER

Adopted: May 20, 2025

Released: May 20, 2025

By the Acting Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, we grant a waiver of section 15.407(l)(1)¹ of the Commission's rules to permit Comsearch and C3Spectra's automated frequency coordination (AFC) systems operating in the 5.925-6.425 GHz and 6.525-6.875 GHz frequency bands to account for building entry loss (BEL) when determining permitted frequencies and power levels for composite low-power indoor (LPI)/standard-power unlicensed access points. We find that granting this waiver will serve the public interest by increasing the utility of 6 GHz unlicensed devices without increasing the potential for these devices to cause harmful interference to licensed services that share the spectrum.

II. BACKGROUND

2. On April 23, 2020, the Commission adopted a Report and Order and Further Notice of Proposed Rulemaking (6 GHz Report and Order) that expanded unlicensed broadband operations in the 6 GHz band (5.925-7.125 GHz).² The 6 GHz Report and Order adopted rules for two categories of unlicensed operations—standard-power operations and LPI operations.³ Standard-power access points and fixed client devices are limited to two portions of the 6 GHz band—the U-NII-5 band (5.925-6.425 GHz) and the U-NII-7 band (6.525-6.875 GHz)—and are required to operate under the control of an AFC system.⁴ The U-NII-5 and U-NII-7 bands are also used by licensed fixed and temporary-fixed point-to-

¹ 47 CFR § 15.407(l)(1).

² Unlicensed Use of the 6 GHz Band, ET Docket No. 18-295, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852, 3853, para. 1 (2020) (6 GHz Report and Order).

³ 6 GHz Report and Order, 35 FCC Rcd at 3860, paras. 17-18.

⁴ 47 CFR §§ 15.403, 15.407(k)(1); 6 GHz Report and Order, 35 FCC Rcd at 3860, 3923, paras. 17, 22, 192. Only standard-power and fixed-client 6 GHz unlicensed devices are required to operate pursuant to an AFC system. 47 CFR § 15.407(k)(1). Standard-power devices may operate both outdoors and indoors at power levels above the LPI (continued...)

point microwave systems.⁵ In addition, the 6.65-6.6752 GHz portion of the U-NII-7 band is used for radio astronomy observations at a limited number of observatories.⁶ The AFC systems manage spectrum access for standard-power access points and fixed client devices to prevent harmful interference from occurring to fixed microwave systems and certain radio astronomy observatories.⁷ The *6 GHz Report and Order* also allowed unlicensed LPI access points to operate over the entire 6 GHz band without being under the control of an AFC system.⁸ To prevent harmful interference from occurring, LPI access points operate at lower power than standard-power access points and are restricted to indoor operation.⁹ To ensure LPI access points operate only indoors, the access point must adhere to a set of Product Form Factor (PFF) requirements: LPI access points cannot be weather resistant, cannot operate on battery power, must have integrated antennas (and cannot have the capability of connecting to other antennas), must be marketed as “for indoor use only,” must have a label attached to the equipment stating that “FCC regulations restrict to indoor use only,” and must include that statement in the device’s user manual.¹⁰ Client devices may communicate with either standard-power or LPI access points and are restricted to 6 dB less power than the access point with which they are communicating.¹¹ Table 1 summarizes the permitted power levels for the standard-power and LPI access points, as well as the associated client devices.

3. A single access point can be authorized to operate in both LPI and standard power modes – i.e., a composite LPI/standard-power access point. OET has granted equipment authorizations only to composite LPI/standard-power access points that meet both categories’ requirements, including the PFF rules for LPI devices, thereby restricting operations to indoor use.¹² Composite LPI/standard-power access points that are operating indoors under the control of an AFC system can operate at the higher power level permitted for standard-power access points.¹³ When they are not operating under the control of an AFC system, they are limited to the LPI power level.¹⁴

device power limits. *See id.* § 15.407(a)(4); *see also id.* § 15.407(a)(5). A fixed client device is “intended as customer premise equipment that is permanently attached to a structure, operates only on channels provided by an AFC, has a geolocation capability, and complies with antenna pointing angle requirements.” *Id.* § 15.403.

⁵ *6 GHz Report and Order*, 35 FCC Rcd at 3855, para. 7.

⁶ *Id.* at 3884, para. 87.

⁷ *Id.* at 3862, para. 22.

⁸ *Id.* at 3860, para. 18.

⁹ *Id.* at 3888-89, paras. 99-103.

¹⁰ 47 CFR §§ 15.403 (definitions of “Indoor Access Point” and “Subordinate Device”), 15.407(d)(4); *6 GHz Report and Order*, 35 FCC Rcd at 3891, para. 107; *see also Part 15 Subpart E U-NII 6 GHz: General Guidance Bands 5, 6, 7, 8*, Office of Engineering and Technology Laboratory Division, Federal Communications Commission, KDB 987594 D01 v03 at 6 (Oct. 10, 2024), <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=277034>.

¹¹ 47 CFR § 15.407(a)(4)-(8); *6 GHz Report and Order*, 35 FCC Rcd at 3922, para. 189.

¹² *Part 15 Subpart E U-NII 6 GHz: General Guidance Bands 5, 6, 7, 8*, FCC Office of Engineering and Technology Laboratory Division Knowledge Database (KDB) publication, KDB 987594 D01 v03 at 16 (Oct. 10, 2024), <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=277034>.

¹³ *See* 47 CFR § 15.407(a)(4).

¹⁴ *See id.* § 15.407(a)(5).

Table 1: 6 GHz Band Standard-Power and LPI Devices

Device Class	Operating Bands	Maximum EIRP	Maximum EIRP Power Spectral Density
Standard-Power Access Point (AFC Controlled)	U-NII-5 (5.925-6.425 GHz) U-NII-7 (6.525-6.875 GHz)	36 dBm	23 dBm/MHz
Client Connected to Standard-Power Access Point		30 dBm	17 dBm/MHz
Low-Power Access Point (indoor only)	U-NII-5 (5.925-6.425 GHz) U-NII-6 (6.425-6.525 GHz) U-NII-7 (6.525-6.875 GHz) U-NII-8 (6.875-7.125 GHz)	30 dBm	5 dBm/MHz
Client Connected to Low-Power Access Point		24 dBm	-1 dBm/MHz

4. Section 15.407(l) of the Commission's rules defines the predictive propagation models and interference protection criteria that an AFC system must use to protect microwave receivers.¹⁵ AFC systems are required to use the designated propagation models to protect microwave receivers based on the -6 dB I/N interference protection criterion adopted in the *6 GHz Report and Order*.¹⁶ The existing rules do not permit AFC systems to incorporate building entry losses (BEL) into their algorithm for determining permissible standard power device operating channels and power levels. The Office of Engineering and Technology, however, has noted that if AFC operators developed technology or had unique circumstances, the Commission may consider waiver requests to allow AFC operations to account for BEL.¹⁷

5. On December 5, 2024, the Commission's Office of Engineering and Technology (OET) issued an order (*BEL Waiver Order*) granting waiver requests to Wi-Fi Alliance, Broadcom, Sony, Federated Wireless, and Qualcomm allowing them to apply BEL in their AFC system calculations.¹⁸ To ensure that harmful interference to authorized operations and other spectrum users would not occur, OET required that the AFC systems be capable of identifying composite LPI/standard-power access points based on the FCC identification number (FCC ID) and certified Equipment Class information provided by a standard power device spectrum inquiry request.¹⁹ OET permitted the AFC systems to incorporate building entry loss up to and including 6 dB in their predictive propagation model calculations solely in response to a spectrum inquiry request initiated from a composite LPI/standard-power access point.²⁰

6. On January 27, 2025, Comsearch filed a request seeking waiver of section 15.407(l)(1) of the Commission's rules to allow its AFC system to incorporate BEL when assessing allowable channel availability and power constraints for access points that are authorized to operate in both standard power

¹⁵ 47 CFR § 15.407(l).

¹⁶ 47 CFR § 15.407(l)(2); *6 GHz Report and Order*, 35 FCC Rcd at 3878-79, paras. 70-71.

¹⁷ *OET Announces Conditional Approval for 6 GHz Band Automated Frequency Coordination Systems*, Public Notice, DA 22-1146, 37 FCC Rcd 13071, 13089, para. 40 (OET 2022) (*AFC Approval Public Notice*).

¹⁸ *Wi-Fi Alliance; Request for Waiver of Section 15.407(l)(2) of the Commission's Rules for AFC System Operation in the 6 GHz Band*, ET Docket No. 23-107, DA 24-1217, at 1, 9, paras. 1, 20 (OET Dec. 5, 2024) (*BEL Waiver Order*).

¹⁹ *Id.* at 9, paras. 17, 19.

²⁰ *Id.* at 8, 9, paras. 15, 19.

and LPI modes — i.e., composite LPI/standard-power access points.²¹ In its waiver request, Comsearch explains that its AFC system is capable of “retriev[ing] the list of FCC identification numbers (“FCC IDs”) of certified [standard-power] devices from the OET Equipment Authorization System (“EAS”) to verify the validity of the FCC IDs of any [standard-power] device seeking access to the 6 GHz band.”²² Comsearch notes that, based on FCC ID and Equipment Authorization Grant Note information, its AFC system can “positively confirm which [standard-power] devices, by design and FCC certification, are constrained to indoor locations and, thereby, apply BEL only for calculation of 6 GHz band availability for [standard-power indoor] devices.”²³ On February 9, 2025, C3Spectra filed an identical request to waive section 15.407(l)(1) of the Commission’s rules to allow it to incorporate, based on the same principle as Comsearch, BEL into its AFC system propagation model for composite LPI/standard-power devices.²⁴

III. DISCUSSION

7. We are authorized to grant a waiver under section 1.3 of the Commission’s rules if the petitioner demonstrates good cause for such action.²⁵ Good cause may be found and a waiver granted “where particular facts would make strict compliance inconsistent with the public interest.”²⁶ When examining a request for waiver of the Commission’s rules, we undertake a two-part analysis. A waiver of the Commission’s rules is appropriate when (1) “special circumstances warrant a deviation from the general rule”; and (2) “such deviation will serve the public interest.”²⁷ To satisfy this public interest requirement, there must be a stronger public interest benefit in granting the waiver than in applying the rule. We may find this to be the case when grant of a waiver would not undermine the purpose of the rule.²⁸

8. We find that the specifics of the authorized composite LPI/standard-power access points and the recent technological developments for AFC systems constitute sufficiently special circumstances to meet the first prong of our waiver standard. In adopting rules for the 6 GHz band, the Commission created two device categories: standard-power operations and LPI operations.²⁹ As we noted in the *BEL Waiver Order*, OET has granted equipment authorizations only to composite LPI/standard-power access

²¹ *Request by Comsearch for Waiver of Section 15.407(l)(1) of the Commission’s Rules*, ET Docket No. 21-352 (filed Jan. 27, 2025) (*Comsearch Waiver Request*).

²² *Comsearch Waiver Request* at 3-4.

²³ *Comsearch Waiver Request* at 4.

²⁴ *Request for Waiver of Section 15.407(l)(1) to Incorporate Building Entry Loss (BEL) into C3Spectra’s AFC System*, ET Docket No. 21-352 (filed Feb. 20, 2025) (*C3Spectra Waiver Request*).

²⁵ 47 CFR § 1.3; *see AT&T Corp. v. FCC*, 448 F.3d 426, 433 (D.C. Cir. 2006); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

²⁶ *Ne. Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *accord ICO Global Commc’ns (Holdings) Ltd. v. FCC*, 428 F.3d 264, 269 (quoting *Ne. Cellular*); *see also WAIT Radio*, 418 F.2d at 1157-59.

²⁷ *Ne. Cellular*, 897 F.2d at 1166; *see also ICO Global Commc’ns*, 428 F.3d at 269; *WAIT Radio*, 418 F.2d at 1157-59.

²⁸ *See, e.g., WAIT Radio*, 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant’s proposal does not undermine the public interest policy served by the rule); *Ne. Cellular*, 897 F.2d at 1166 (stating that, in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to that rule).

²⁹ *6 GHz Report and Order*, 35 FCC Rcd at 3860, paras. 17-18.

points that meet both categories' requirements, including the PFF rules for LPI devices, thereby restricting operations to indoor use.³⁰

9. Furthermore, as we found in the *BEL Waiver Order*, location-determining technologies for AFC systems have advanced since the release of the *AFC Approval Public Notice* in 2022.³¹ Certain AFC systems, including those operated by Comsearch and C3Spectra, now have the capability of distinguishing between composite LPI/standard power access points—that operate only indoors—and stand-alone standard power access points, based on the FCC ID and certified equipment class information.³² As set forth in the *BEL Waiver Order*, to be eligible to apply BEL in its predictive propagation calculations, an AFC system must support this function through a request by the AFC to the Commission's Equipment Authorization System.³³ Only upon confirmation that a device is certified as a composite LPI/standard-power device can the AFC system assume no more than 6 dB of BEL when it provides channel and power level information to that device.³⁴ This will keep the harmful interference risk commensurate with the insignificant risk already determined by the Commission for 6 GHz unlicensed devices.³⁵ Thus, consistent with the *BEL Waiver Order*, we find that special circumstances warrant a deviation from section 15.407(l)(1) of the Commission's rules for Comsearch and C3Spectra.

10. We also find that Comsearch's and C3Spectra's requested waivers meet the second prong of our waiver standard—such deviation will serve the public interest—because a waiver to enable their respective AFC systems to consider BEL for composite LPI/standard-power access points would provide significant public benefits while not undermining the purpose of the rules, which is to prevent the occurrence of harmful interference. In its waiver request, Comsearch highlights that waiver relief will “serve the public interest by enabling the [composite LPI/standard-power] devices to transmit at standard-power levels, resulting in enhanced connectivity and capacity to the benefit of American consumers and

³⁰ *BEL Waiver Order* at 5, para. 8; *see id.* at 6, para. 10 (noting that Wi-Fi Alliance stated that composite LPI/standard-power access points “by nature are constrained to indoor operation,” that Hewlett Packard Enterprises stated that such devices “are inherently indoors, given that they fully comply with all of the [PFF] requirements of LPI devices,” and the Broadcom stated that the prior waiver “is limited to a category of [access points] for which the Commission's rules already require indoor-only operation” (internal quotation marks omitted)); *see also Part 15 Subpart E U-NII 6 GHz General Guidance Bands 5, 6, 7, 8*, FCC Office of Engineering and Technology Laboratory Division Publications, Knowledge Database at 10, Table 4, Composite Equipment Class Product 3 “Indoor Only With AFC With Restriction” (May 20, 2022), *available at* https://apps.fcc.gov/kdb/GetAttachment.html?id=4iuZjuFgWiNypCLVpSN3cQ%3D%3D&desc=987594%20D01%20U-NII%206GHz%20General%20Requirements%20v01r03&tracking_number=277034 (last visited Feb. 27, 2024).

³¹ *BEL Waiver Order* at 5, para. 8 (“When OET first granted conditional approval of thirteen entities to operate AFC systems, we recognized the location determining technologies that AFCs could employ were still in development. As evidenced by the waiver requests before us, the formerly nascent technology has advanced.” (footnote omitted) (citing *AFC Approval Public Notice*, 37 FCC Red at 13089, para. 40)).

³² *Comsearch Waiver Request* at 3 (stating that Comsearch's AFC system is able to distinguish between composite LPI/standard-power access points and stand-alone standard-power access points “by virtue of the device's Federal Communications Commission (“FCC”) certification authorization”); *id.* at 6 (“Using the FCC ID and grant note information, Comsearch's AFC system can distinguish between the [composite LPI/standard-power] devices and other [standard-power] devices.”); *C3Spectra Waiver Request* at 1-2 (stating that “[t]echnological advancements now enable AFC systems to identify indoor composite devices based on FCC ID and certified Equipment Class information” and that “C3Spectra agrees to . . . [v]erify that composite LPI/standard-power devices are certified for indoor-only operation based on FCC ID and Equipment Class information”); *see BEL Waiver Order* at 6, para. 10 (noting that the record indicates that Wi-Fi Alliance's “AFC system will verify the nature of the standard-power access point using its corresponding FCC ID and certified Equipment Class information”).

³³ *BEL Waiver Order* at 5, para. 9.

³⁴ *Id.* at 5-6, para. 9.

³⁵ *Id.* at 6, para. 9.

businesses.”³⁶ Comsearch states that it has “the technical experience needed to ensure that incumbent microwave transmitters will continue to be protected from interference caused by [standard-power] devices, including the [composite LPI/standard-power] device radiofrequency transmissions.”³⁷ Similarly, C3Spectra states that waiver relief “will enhance indoor coverage and data rates, promoting efficient spectrum use while protecting incumbent services from harmful interference.”³⁸

11. We note that these assertions are consistent with our findings in the *BEL Waiver Order*. In particular, as we found in that *Order*, allowing the AFC systems to consider BEL when determining channel availability will increase the composite LPI/standard-power access points’ operating power when appropriate, thereby increasing their utility to consumers.³⁹ The greater operating power will enable the access points to provide increased indoor coverage and/or provide higher data rates.⁴⁰ This will expand the use of the 6 GHz band and further the Commission’s goal of encouraging more efficient spectrum use.⁴¹ In addition, as we concluded in the *BEL Waiver Order*, permitting the AFC systems to take into account up to 6 dB of BEL for composite LPI/standard-power access points will not increase the risk that harmful interference will occur to the microwave receivers which share the U-NII-5 and U-NII-7 portions of the 6 GHz band.⁴² Thus, because the waivers will result in more efficient spectrum use without increasing harmful interference risk, granting the waivers is in the public interest.

12. Finally, for the same reasons as in the *BEL Waiver Order*, we adopt conditions on the waivers that will prevent the composite LPI/standard-power access points from presenting an increased risk of harmful interference to microwave receivers, as compared to stand-alone standard-power access points.⁴³ These conditions are as follows:

- The AFC system must be capable of identifying composite LPI/standard-power access points based on the FCC ID and certified Equipment Class information provided by a standard-power device spectrum inquiry request.
- The AFC system can apply up to and including 6 dB of building entry loss in its predictive propagation model calculations solely in response to a spectrum inquiry request initiated from a composite LPI/standard-power access point.⁴⁴

13. IT IS ORDERED that, pursuant to sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302a, 303(e), and 303(r), and sections 0.31, 0.241, and 1.3 of the Commission’s rules, 47 CFR §§ 0.31, 0.241, 1.3, the Requests for Waiver filed by Comsearch and C3Spectra ARE GRANTED, consistent with the terms of this Order.

³⁶ *Comsearch Waiver Request* at 9.

³⁷ *Comsearch Waiver Request* at 6.

³⁸ *C3Spectra Waiver Request* at 1.

³⁹ *BEL Waiver Order* at 7, para. 14.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.* at 8, para. 15.

⁴³ *Id.* at 7, para. 14; *see id.* at 5-6, 8, 9, paras. 9, 15, 17, 19.

⁴⁴ *Id.* at 9, para. 19.

14. IT IS FURTHER ORDERED that, pursuant to section 1.102(b) of the Commission's rules, 47 CFR § 1.102(b), this Order SHALL BE EFFECTIVE upon release.

FEDERAL COMMUNICATIONS COMMISSION

Ira Keltz
Acting Chief
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