

Presentation by Encina Communications Corporation
at the
NSMA Annual Conference
May 18, 2022

Encina Communications Corp.

Overview

Unlicensed Use of the 6 GHz Band

- The Problems
- The Solution
- Field Trial Evidence
- ECC's Petition to the FCC
- Updating the Rules
- Benefits
- Summary / Q&A

The Problems

On April 24, 2020 the Commission released a Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295, authorizing AFC¹ coordinated unlicensed outdoor standard power Access Points (APs) and their client devices to operate in the 5,925 to 6,425 MHz and 6,525 to 6,875 MHz licensed bands, pursuant to Rule 15.407.

The Problems are:

1. While none of the Part 15 rules are the same as the Part 101 rules, the AFC interference protection criteria (§15.407²) is the same as that of 101.105: **If an AP network coordinates, it coordinates.**
2. When the Commission approves an AFC system, if the AFC system does **NOT** meet §15.407's stated interference requirement² the result will be:
 - Ever increasing harmful interference to existing fixed service stations.
 - Ever increasing intra AP interference – creating dirty air, the same as in the sub-6 GHz bands.

Even if fixed wireless operators object to the AFC's inadequate interference protection and file suite in the Federal Court they will lose, because the precedence is that if the court has to choose between FCC engineers and fixed wireless engineers, the court will rule in favor of the FCC.

3. This could put at risk all licensed 6 GHz fixed links, dramatically reducing the market size for members of NSMA.

1. Automated Frequency Coordination (AFC) has open technical and operational issues that are being addressed by the Multi-Stakeholder Group (MSG).
2. § 15.407(L)(2)(i) -- Interference at the input of a licensed station must be at least 6 dB below the licensed station's thermal noise.

The Solution

Update Part 101 rules to Harmonize with
Part 15 rules in the 6 GHz band

Field Trial Evidence Supports Updating Part 101 Rules to Harmonize with Part 15 Rules in the 6 GHz band

1. Late in 2021, ECC asked the Commission for an experimental license for Marina, CA and for Portland, ME to investigate expanding flexible use of mid-band spectrum in the 5,925 – 6,425 MHz band, while ensuring that licensed services operating in the band continue to thrive.
2. Experimental licenses WL2XYL and WM2XD1 were issued. In order to protect existing and pending incumbents, the Commission required ECC to:

“... coordinate with the Fixed Microwave Service licensees in the proposed venues in accordance with 47 C.F.R, Part 101.103(d) prior to operation in the 5,925 – 6,425 MHz band.”

Field Trial Evidence Supports Updating Part 101 Rules to Harmonize with Part 15 Rules in the 6 GHz band

3. ECC issued a Prior Coordination Notice for the proposed experimental microwave system to the owners (or their designated agents) of all existing or proposed terrestrial and satellite facilities potentially affected by the proposed system.
4. In the PCNs we stated that radio frequency studies -- based on TIA 10 (formerly TSB 10F) and standard engineering practices -- were completed for the referenced systems, and that the APs along with their fixed and mobile clients can operate within a 5-mile radius of the AP without causing harmful interference. The PCNs cleared.
5. In February 2022 an unlicensed sub-6 GHz network serving multiple underserved clients in Marina, CA was – through a click of a mouse – moved into the licensed 6 GHz band.
6. As expected, no cases of interference have been reported.

ECC's Petition of March 24, 2022

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 101 of the Commission's)
Rules to Facilitate the Use of Microwave for) WT Docket No. 10-153
Wireless Backhaul and Other Uses)
)
Unlicensed Use of the 6 GHz Band) ET Docket No. 18-295

EX PARTE FILING OF ENCINA COMMUNICATIONS CORPORATION (ECC)

March 24, 2022

On March 24, 2022, I had a conference call with Catharin Schroeder, John Schauble, Peter Daronco and Stephen Buenzow, all with the Wireless Telecommunications Bureau.

We discussed updating Part 101 rules to harmonize with Part 15 rules in the 6 GHz band (see Exhibit 1).

Specifically, ECC proposed the following Part 101 rule changes:

1. Add the definitions of Access Point (AP) and Client Device from § 15.403 to § 101.3.
2. In § 101.115(b), in the antenna standards table, add a new reference (16) to frequencies 5,925 to 6,425 MHz and 6,525 to 6,875 MHz, and add a footnote (16) as follows: "APs and their client devices are permitted to use any type of antenna (directional, sector, or omni-directional)."

By making these two minor changes, the outdoor use of AP networks would be harmonized for use in unlicensed sub-6 GHz and licensed 6 GHz bands without requiring any changes to Part 15 rules.

This would give service providers and millions of consumers the choice to coordinate their outdoor Wi-Fi 6E APs using either rule 101.103(d) now, or AFC when it is finalized.

Pursuant to the Commission's rules, I have filed this notice in the above referenced dockets.

Respectfully submitted.

Michael Mulcaey, Chairman & CTO

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For the complete filing (including Exhibit 1) see ECC's ECFS filing ET 18-295, March 24, 2022

Encina Communications Corp.

Updating Part 101 Rules to Harmonize with Part 15 Rules Only Requires a Minor Change to Part 101 Rules

1. Add the definitions of Access Point (AP) and Client Device given in § 15.403 to § 101.3.
2. In § 101.115(b), in the antenna standards table add a new reference (16) to frequencies 5,925 to 6,425 MHz and 6,525 to 6,875 MHz, and add a new footnote (16) as follows:

“APs and their client devices are permitted to use any type of antenna (directional, sector, or omni-directional).”

Benefits of Updating Part 101 to Harmonize with Part 15

By Updating Part 101 rules to Harmonize with Part 15 rules in the 6 GHz band, outdoor standard power APs can be licensed, resulting in the following benefits for consumers and industry:

1. By prior coordinating using 101.103(b), industry is assured that licensed AP networks will not interfere with existing fixed licensed stations.
2. New fixed license applicants know where all licensed APs are located. If there is a potential interference problem with a new applicant using a Category A antenna, the AP operator must mitigate the interference problem.
3. Allows for the immediate deployment of off-the-shelf low cost, high performance (Gigabit) AP networks, solving the “last-mile” problem and thereby helping close the digital divide.
4. Preserves “clean air spectrum” since licensed APs can be synchronized with each other, whereas unlicensed APs are uncoordinated with each other, causing “dirty air” as in the sub-6 GHz unlicensed bands.
5. Licensed APs have priority over unlicensed APs.
6. A significant opportunity for Members of NSMA to dramatically increase revenue and profits.

Summary

- ❖ There is nothing that can be done to overturn the April 24, 2020 Report and Order, authorizing AFC coordinated unlicensed outdoor standard power Access Points (APs) and their client devices from operating in the 5,925 to 6,425 MHz and 6,525 to 6,875 MHz licensed band pursuant to Rule 15.407. That is: Part 15 Devices are Allowed to Operate in Licensed Bands.
- ❖ When the Commission approves an AFC system, if the AFC system does **NOT** meet the stated interference requirement, the result will be:
 1. Ever increasing harmful interference to existing fixed service stations, and
 2. Ever increasing intra AP interference – creating dirty air, the same as the in the sub-6 bands.
 3. Significant decrease in the size of the 6 GHz Part 101 frequency coordination market.

Even if fixed wireless operators object to the AFC's inadequate interference protection and files suit with the Federal Court they will lose, because if the court has to choose between FCC engineers and industry fixed wireless engineers the court will rule in favor of the FCC.

Note that harmonizing Part 101 and Part 15 rules would mitigate all the problems above.

A Few Frequently Asked Questions

Q. Would Updating Part 101 rules to Harmonize with Part 15 rules in the 6 GHz band increase the stature of unlicensed APs?

A. No.

Unlicensed devices are always secondary to licensed devices.

Q. Will licensed APs block new fixed link applications?

A. No.

APs (licensed and unlicensed) do not use Category A antennas. Therefore, a new fixed license applicant using a Category A antenna is primary, and AP operators must mitigate any interference problems.

A Few Frequently Asked Questions

Q. Why is the coordination of APs using Rule 101.103 better than coordination using AFC?

A. Because:

- 1. By prior coordinating using 101.103(b), industry is assured that licensed AP networks will not interfere with existing fixed licensed stations.*
- 2. AFC has open technical and operational issues and the date when these issues will be resolved is unknown. Also, it is unknown if AFC will meet the requirements of Rule 15.407 (Interference at the input of a licensed station must be at least 6 dB below the licensed station's thermal noise).*

A Few Frequently Asked Questions

Q. *Is FDD more spectrum efficient than TDD?*

A. No.

APs operating in the 6 GHz band will normally operate FDD-TDMA, where the peak download or upload speed can be twice that of FDD and the number of paths can be many times that of a single path using FDD.

A Few Frequently Asked Questions

Q. Will AFC system operator fees be less than Part 101 frequency coordinator and FCC licensing fees?

A. No.

Part 101 prior coordination and licensing charges are a one-time event and a balance sheet item. The monthly cost per client will be the one-time charges divided by the term of the license (120 months) times the number of clients served per AP per month, resulting in an operating cost of a few cents per month.

Also, service providers with licensed APs can offer consumers Wi-Fi 6E hot spots with clean air and high speeds for the same monthly price as unlicensed Wi-Fi 6E with dirty air and lower speeds. By capturing market share licensed operators additional revenue goes straight to the bottom line as profit.

Note. We do not know what AFC system operators will charge for their services, but we expect them to be more than a few cents a month.

A Few Frequently Asked Questions

Q. Do individual consumers need outdoor APs with AFC, and what is the size of the market?

A. No, consumers do not need outdoor APs with AFC, the market size is somewhere between small and none.

Today, when individual consumers leave their home or office they connect to the internet via a service provider, not via a personal outdoor Wi-Fi AP. Likewise for outdoor Wi-Fi 6E.

Any Other Questions?