

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

In the Matter of)
)
Proceq USA, Inc.) ET Docket No. 20-127
)
)
Request for modification of Waiver of Sections)
15.503(d), 15.31(c), and 15.521(d) of the)
Commission's Rules)

ORDER

Adopted: November 4, 2022

Released: November 4, 2022

By the Acting Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, we grant a request by Proceq USA, Inc. (Proceq) for a modification of a previously granted waiver of our rules governing unlicensed ultra-wideband (UWB) devices to permit the certification and marketing of the newest update of its UWB ground penetrating radar (GPR). We find that opening a path for the sale and operation of this next generation equipment will allow Proceq to deploy its system to enhance the GPR capabilities for soil contact construction material assessment, in furtherance of the public interest; and that operation of this device under the specified waiver conditions poses no greater risk of causing harmful interference to communication services than those devices already permitted under the existing rules.

II. BACKGROUND

2. On September 11, 2017, Proceq filed a request for waiver of the measurement procedures found in sections 15.503(d), 15.31(c), and 15.521(d) of the Commission's Part 15 ultra-wideband (UWB) rules to market its Proceq GPR Live.¹ The device is a UWB ground penetrating radar that is used to test the safety, durability, and sustainability of materials such as concrete, metal, rock, and composites used in industrial settings.² The Office of Engineering and Technology (OET) concluded that the request made by Proceq was analogous to prior waivers of measurement procedures that had been previously granted to other manufacturers of UWB devices.³ It also determined that because a waiver of the measurement procedures will not increase the potential for harmful interference to authorized services, permitting

¹ Proceq USA Inc. Request for Waiver of Part 15 of the Commission's Rules (Sept. 11, 2017). The original design of Proceq "GPR Live" product was intended to operate within the frequency range of 972-3822 MHz. The waiver request was not placed on Public Notice and the waiver Order was coordinated with National Telecommunications and Information Administration (NTIA) prior to adoption.

² *Proceq USA Inc. Request for Waiver of Part 15 of the Commission's Rules Applicable to Ultra-Wideband Devices (Waiver Order)*, Order, 33 FCC Rcd 2258 (OET 2018).

³ See Waiver Order, 33 FCC Rcd at 2260.

Proceq to demonstrate compliance with the UWB GPR emission limits with the stepping function active would not undermine the purpose of the rule.⁴ The original Order granting the waiver required Proceq to operate on stepped frequency continuous-wave modulation and to transmit between 200 and 4000 MHz with the step sizes of 10, 20 and 40 MHz and a dwell time not to exceed of 2 micro-seconds.⁵ OET also imposed a condition that the dwell time during any step shall not exceed 0.04 percent of the device's minimum scan/cycle rate.⁶

3. On May 17, 2019, Proceq filed a request to modify the waiver.⁷ Proceq sought an increase of the operating bandwidth by extending the upper transmit frequency limit by 2000 MHz, such that operation would occur between 200 MHz and 6000 MHz instead of 200 MHz and 4000 MHz under the original waiver.⁸ On September 11, 2019, OET subsequently granted this modification request.⁹

4. On February 4, 2020, Proceq filed a new request to modify the waiver, seeking to further increase the device's operating bandwidth.¹⁰ It sought to extend the operating frequency range from 200-6000 MHz to 30-8000 MHz and vary the frequency steps from 1 - 40 MHz, which Proceq claims will result in improved resolution and technical performance for the device. In addition, Proceq asked to include Orthogonal Frequency Division Multiplexing (OFDM) as a part of its modulation scheme.¹¹

5. On May 7, 2020, OET sought comment on Proceq's request.¹² The comment cycle ended on June 23, 2020. Two parties aside from Proceq filed substantive comments in the docket that directly address Proceq's request: Vortezon, Inc. filed general comments in support of the request.¹³ The GPS Innovation Alliance (GPSIA) does not oppose granting the specific waiver request, but suggests that the Commission limit certain aspects of this device, including rejecting or severely restricting Proceq's efforts to introduce OFDM in frequency bands associated with GPS operations.¹⁴ GPSIA also expresses general concerns about the Commission's rule waivers affecting UWB devices due to the proximity of some

⁴ *Id.*

⁵ *Id.*

⁶ See *id.* At the time OET also noted that additional constraints beyond those already designed into the system do not appear to be warranted. *Id.*, 33 FCC Rcd at 2260 n.18. Proceq provided the dwell time for its GPR on any one frequency as 2 microseconds.

⁷ Letter from Terry G. Mahn, Counsel to Proceq USA Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission (May 17, 2019) (filed in INBOX-PART 15 in the Commission's Electronic Comment Filing System) (Proceq Waiver Modification Letter). This letter corrected and replaced an earlier submission made on behalf of Proceq on Dec. 17, 2018.

⁸ *Id.* Proceq stated that it was not seeking to alter the technical and operational conditions included in the existing waiver.

⁹ *Request for Modification of Waiver Granted to Proceq USA Inc.*, Order, 34 FCC Rcd 7977 (OET, Sept. 11, 2019) (Modification Order).

¹⁰ Proceq USA Inc., Petition to Modify Part 15 Rule Waiver (Feb. 4, 2020) (Second Waiver Modification Request).

¹¹ *Id.*

¹² *Office of Engineering and Technology Declares Proceq USA, Inc. Request for Waiver of Certain Part 15 Ultra-Wideband (UWB) Rules to be a "Permit-but-Disclose" Proceeding for Ex Parte Purposes and Requests Comment*, Public Notice, DA 20-494, ET Docket 20-127, May 7, 2020.

¹³ See Vortezon comments. Deere & Company also submitted several *ex parte* submissions in the docket memorializing its discussions with Commission members and staff about numerous open proceedings. While not directly addressing the waiver, these filings mention continued enforcement of the Commission's UWB rules. See letters from Catherine Wang, Counsel for Deere & Company to Marlene Dortch, Secretary, FCC dated Mar. 26, 2021, Mar. 30, 2021, Apr. 5, 2021, May 20, 2021, and July 19, 2021.

¹⁴ GPSIA comments at 7-8.

UWB device operations to spectrum used by GNSS receivers.¹⁵ Finally, GPSIA states that we should require UWB rule waiver applicants to provide specific technical information at the time they initiate a request for a waiver to assist GPSIA and other interested parties in evaluating such filings.¹⁶

6. On April 22, 2022, Proceq provided additional information about the Second Waiver Modification Request, including documenting its desire to withdraw the portion of its request that would extend the upper operating range of its device from 6000 MHz to 8000 MHz.¹⁷ Thus, Proceq now seeks to operate in the 30-6000 MHz frequency range.

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.¹⁸ Good cause, in turn, may be found "where particular facts would make strict compliance inconsistent with the public interest."¹⁹ To make this public interest determination, the waiver cannot undermine the purpose of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.²⁰ The UWB standards in Part 15 were adopted to ensure that UWB devices, including GPRs, do not cause harmful interference to authorized radio services, including those operated by the Federal Government.²¹ We find that the particular circumstances that supported the grant of the Waiver Order and the subsequent Modification Order also support our grant of this relatively minor modification of the waiver for the Proceq Live device as requested by Proceq. With appropriate operational and technical limitations, granting Proceq's request to modify its waiver poses no greater risk of causing harmful interference to radio communications services than any other GPR device operating under our rules. In addition, we find that there is a stronger public interest benefit in granting this waiver than in strictly applying the rules.

8. As we stated in the Waiver Order, this waiver presents a compelling public interest situation in providing for a variety of GPR technologies that will increase competition, which in turn will provide potential users with more choices to obtain the products that best meet their needs.²² We acknowledge Proceq's continued efforts to improve upon its technology and conclude that, in furtherance of achieving this desirable goal, it is reasonable and appropriate for us to accommodate the additional technical changes that improve the accuracy and efficiency of Proceq's GPR product. The waiver modification granted herein will ensure that the detection capabilities provided by Proceq's devices will continue to be available to the public for the purposes of detecting the parameters of soil contact materials, and the

¹⁵ *Id.*

¹⁶ *Id.* at 9-12.

¹⁷ See Proceq, Inc., Supplement to Request for Immediate Action on Pending Waiver, Apr. 22, 2022 (Proceq Supplement).

¹⁸ 47 CFR § 1.3. See also *ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264 (D.C. Cir. 2005); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

¹⁹ *Northeast Cellular*, 897 F.2d at 1166; see also *ICO Global Communications*, 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

²⁰ 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); *Northeast 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 the rule).

²¹ *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, ET Docket No. 98-153, First Report and Order, 17 FCC Rcd 7435 (2002) (UWB First R&O); see also 47 CFR §§ 15.501-15.525.

²² Waiver Order, 33 FCC Rcd at 2261.

critical benefits provided by these devices continue to present a significant public interest basis for the requested relief. As we have previously determined, these GPRs present an extremely small risk of harmful interference to other authorized operations.²³ Given the remote likelihood of such interference, we find that grant of this waiver modification will not contravene the underlying purpose of Sections 15.503(d), 15.31(c), 15.521(d) of the Rules.

9. In its comments, GPSIA raised concerns that Proceq's device modifications could potentially cause harmful interference to GNSS receivers and other protected services.²⁴ In this and other UWB proceedings, GPSIA has noted the importance of GPS and GNSS operations, and has consistently sought to ensure that there is sufficient technical and operational information for it to assess how a proposed waiver will affect its interests. In this instance, GPSIA contended that because Proceq's proposal would shift from discrete frequencies to clustered stepping and introduce new operations in the GNSS band, it wanted to more fully understand Proceq's planned operations, including the power levels associated with Proceq's operations within the GNSS band, before determining whether it would oppose the request.²⁵ In reply, Proceq stated that the "different characteristics and functions" of its GPR devices represent normal evolutionary product changes that would otherwise be permitted under the equipment certification procedures.²⁶ Proceq also comments that it will fully comply with all UWB rules in all authorized bands and the Commission's certification process will ensure this to be the case.²⁷ As a reference, Proceq asserts that MBOA-SIG applied for and received a waiver of the same two rules at issue in Proceq's pending Petition for a UWB OFDM communications system.²⁸ More recently, GPSIA filed *ex parte* submissions documenting the status and ultimate resolution of its concerns. On August 1, 2022, it met with Commission staff to reiterate its request for more specific details on the operation of the Proceq device.²⁹ Shortly thereafter, it reported that it had had "productive, constructive, and transparent" discussions with Proceq, and that based on its more complete understanding of Proceq's device and limited scope of operations (i.e., for underground utility detection and not for broader communications means), "it does not object to the grant of Proceq's current request for waiver modification."³⁰ Based on this filing as well as the information previously submitted in the docket, we now proceed to consider the pending request.

10. We find that the waiver standard has been met. In the Waiver Order, we found the primary difference between the Proceq device and other UWB GPR devices provided for in the rules to be that the Proceq GPR device uses stepped frequency CW modulation—i.e., an array of closely spaced transmitting/receiving antennas that transmit sequentially over a large band of spectrum—to gather all the needed data.³¹ OET also determined that this modulation scheme was functionally equivalent to other

²³ *Id.* 33 FCC Rcd at 2260.

²⁴ See GPSIA comments at 6-7.

²⁵ *Id.*

²⁶ See Proceq reply comments at 3-4.

²⁷ *Id.* at 3.

²⁸ *Id.* (citing Petition for Waiver of the Part 15 UWB Regulations Filed by the Multi-band OFDM Alliance Special Interest Group, ET Docket No. 04-352, Order, 20 FCC Rcd 5528 (2005) (MBOA-SIG Waiver).

²⁹ Letter from Catherine Wang, Counsel for GPSIA member Deere & Company to Marlene H Dortch, Secretary, FCC, filed Aug. 1, 2022 (documenting a July 28, 2022 meeting with members of the Office of Engineering and Technology).

³⁰ Letter from Catherine Wang, Counsel for GPSIA member Deere & Company to Marlene H Dortch, Secretary, FCC, filed Aug. 22, 2022.

³¹ 47 C.F.R. § 15.509. See Waiver Order, 33 FCC Rcd at 2259-2260.

types of UWB GPR devices in that it uses transient-like signals spread across a wide bandwidth.³² Similarly, OFDM is a transmission scheme whereby the data stream is split into brief transmissions over multiple overlapping channels spanning a wide swath of spectrum. Here, for the same reasons as we have previously determined for stepped frequency CW modulation, we find that including OFDM in UWB devices under certain requirements is functionally equivalent to other types of UWB GPR.³³ It has long been understood that incorporating OFDM into UWB devices is an acceptable practice.³⁴ In addition, changing the frequency range of the Proceq GPR from 200-6000 MHz to 30-6000 MHz is consistent with spectrum currently available for GPR devices. We find it important to reiterate that Proceq is not requesting any new rule sections be waived that it has not previously sought. Accordingly, consistent with our earlier actions with respect to this matter, we find good cause to modify the waiver of Section 15.503(d), 15.31(c), and 15.521(d) of our rules for the Proceq devices as requested.

11. We agree with Proceq that the duty cycle and dwell time set forth in the original waiver was deemed to be sufficient not to introduce an increased risk of harmful interference.³⁵ As an added measure to mitigate the potential for harmful interference the energy from the GPR will be directed at the soil and other soil contact materials. The majority of the energy will be attenuated by these materials resulting in a lower potential for harmful interference. We note that Proceq is not requesting a waiver of the existing power limits and will be required to meet the Part 15 emission limits for UWB. For these reasons, we conclude that with the conditions previously imposed and those we impose herein, the Proceq device can operate without a significant risk to incumbent services.³⁶

IV. SCOPE OF DECISION

12. This Order is narrowly tailored to address the particular facts relevant to the Proceq device and is conditioned on Proceq meeting the specified waiver conditions. In doing so, as with every waiver request, we address the circumstances particular to the request before us. Therefore, we agree with GPSIA on the need to carefully evaluate future Part 15 UWB waivers based on the specific and unique circumstances associated with each application.³⁷ It is beyond the scope of this Order, however, to establish a new precedent for UWB rule waiver applicants to provide specific technical information in their petitions, as GPSIA has asked.³⁸ Applicants have broad flexibility in how they choose to structure their petitions. As a practical matter, because parties must submit sufficient information to mitigate the risk of delayed consideration or outright dismissal of their petitions, there is ample incentive for them to make their filings as complete and detailed as practical. The general concerns about issuing future Part 15 UWB waivers that GPISA has raised in its comments are beyond the scope of this particular proceeding, but remain available for our future consideration as appropriate and necessary.

V. MODIFIED WAIVER CONDITIONS.

13. To give effect to our decisions, we revise the second condition of the existing waiver to read as follows: “The Proceq GPR device shall operate with OFDM and stepped frequency CW modulation in

³² See Waiver Order, 33 FCC Rcd at 2259.

³³ See, e.g., Waiver Order, 33 FCC Rcd at 2259. OET determined that Proceq’s use of CW stepped frequency modulation, which used an array of closely spaced transmitting/receiving antennas that transmit sequentially over a large band of spectrum, was functionally equivalent to other types of UWB GPR devices in that it uses transient-like signals spread across a wide bandwidth. *Id.*

³⁴ See, e.g., MBOA-SIG Waiver.

³⁵ See Proceq Supplement at 3.

³⁶ See Waiver Order, 33 FCC Rcd at 2260. See also Modification Order, 34 FCC Rcd at 7798.

³⁷ See GPSIA comments at 9.

³⁸ *Id.* at 8-12.

1 - 40 megahertz steps between 30 and 6000 MHz.” All other conditions associated with the waiver continue to apply without alteration.

VI. ORDERING CLAUSES

14. Accordingly, pursuant to authority delegated in Sections 0.31 and 0.241 of the Commission's rules, 47 CFR §§ 0.31, 0.241, and Section 1.3 of the Commission's rules, 47 CFR § 1.3, IT IS ORDERED that the Request for Waiver filed by Proceq USA, Inc. on February 4, 2020 IS GRANTED consistent with the terms of this Order. This action is taken pursuant to Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 302, 303(e), and 303(r). This action is effective upon release of this Order.

15. IT IS FURTHER ORDERED that, if no applications for review are timely filed, this proceeding SHALL BE TERMINATED and the docket CLOSED.

FEDERAL COMMUNICATIONS COMMISSION

Ronald T. Repasi
Acting Chief
Office of Engineering and Technology