

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

In the Matter of)
Rohde & Schwarz USA, Inc.) ET Docket No. 19-88
Request for Waiver of Sections 15.205(a) and)
15.209(a) of the Commission's Rules to Permit the)
Deployment of Security Screening Portal Devices)
that Operate in the 70-80 GHz Frequency Range)

ORDER

Adopted: September 3, 2020

Released: September 3, 2020

By the Acting Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, we grant a request for waiver filed by Rohde & Schwarz USA, Inc. (Rohde & Schwarz) to allow for FCC certification of its QPS 201 Personnel Security Scanner (QPS 201). The QPS 201 is a walk-through security screening system intended for use at airports, arenas, courthouses, federal buildings and other venues where security inspection is critical. Specifically, we waive compliance with the requirements of sections 15.205(a) and 15.209(a) of the Commission's rules, to allow the QPS 201 for indoor operations in the 70-80 GHz frequency band, at field strength levels higher than the permitted limits. For the reasons discussed below, we find that there is good cause to grant Rohde & Schwarz's request for waiver with certain conditions.

II. BACKGROUND

2. The QPS 201 is designed to detect the presence of concealed metallic and non-metallic threats that may be carried in or underneath the clothing of persons entering locations where the device has been deployed. The QPS 201 consists of two vertical open panels each with two microwave antenna arrays. The panels are arranged to face one another, with a walk-through space of about 4 feet between them. A person to be scanned would step into the space between the panels. Metallic or non-metallic objects can be detected by feeding the panels with a signal in the 70-80 GHz frequency range and

1 Request for Waiver of sections 15.205(a) and 15.209(a) of the Commission's Rules to Permit the Deployment of a Personnel Security Screening System Operating in the 70-80 GHz Range, ET Docket No. 19-88 (filed Sep. 10, 2019) (Waiver Request).

2 47 CFR §§ 15.205(a) & 15.209(a).

3 Waiver Request at 2.

4 Id.

5 Id.

evaluating the backscatter of the emitted signals. After having transmitted on all antennas on one panel, the procedure is repeated for the second panel. The complete scanning time takes 164 milliseconds.

3. Rohde & Schwarz seeks a waiver of section 15.205(a) of the Commission's rules to permit the operation of the QPS 201 in the 70-80 GHz band.⁶ Section 15.205(a) identifies certain frequency bands, referred to as "restricted bands," where unlicensed Part 15 devices are not allowed to intentionally radiate energy and may only make spurious emissions.⁷ All frequencies above 38.6 GHz are classified as "restricted," except for a few bands where the Commission has permitted special types of unlicensed operations, such as the 57-71 GHz, 75-85 GHz, and 92-95 GHz frequency bands.⁸

4. Rohde & Schwarz also seeks a waiver of section 15.209(a) of the Commission's rules, which limits the field strength of emissions from unlicensed intentional radiators operating in frequencies above 470 MHz to 500 $\mu\text{V}/\text{m}$ measured at a distance of 3 meters.⁹ Rohde & Schwarz requests to operate the QPS 201 at 31,405 $\mu\text{V}/\text{m}$ at 3 meters (36 dB higher than the limit), to allow the device to adequately perform its security scanning functions without increasing the potential for harmful interference to authorized users.¹⁰

5. In response to the Office of Engineering and Technology's public notice,¹¹ only two parties filed comments: the National Academy of Sciences' Committee on Radio Frequencies (CORF), and James Edwin Whedbee. Both parties supported the waiver request, but CORF recommended either restricting installations of the QPS 201 to indoors or not permitting outdoor installations within 70 kilometers of any radio astronomy facility operating in the 70-80 GHz band.¹²

III. DISCUSSION

6. 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.¹³ Good cause, in turn, may be found and a waiver

⁶ Operation under Part 15 is subject to the conditions that the operator of a device must accept any interference received and must correct any harmful interference caused. In the event a Part 15 device causes harmful interference, the operator is required to immediately correct the interference problem, even if correction requires ceasing operation of the Part 15 device causing the interference. 47 CFR § 15.5.

⁷ 47 CFR § 15.205(a).

⁸ See 47 CFR §§ 15.255, 15.256 and 15.257.

⁹ 47 CFR § 15.209(a).

¹⁰ *Waiver Request* at 1.

¹¹ *Office of Engineering and Technology Seeks Comment on Rohde & Schwarz USA, Inc. Request for Waiver of Part 15 General Emissions and Restricted Bands Rules for a 70-80 GHz Personnel Security Scanner System*, Public Notice, DA 19-1313, 34 FCC Rcd 12475 (2019). Rohde & Schwarz initially submitted a waiver request in the same proceeding on Dec. 4, 2018, asking for waiver of section 15.231(b), instead of waiver of section 15.209(a). Comments from CORF and Whedbee were filed in response to the Public Notice for this initial request. See *Office of Engineering and Technology Seeks Comment on Rohde & Schwarz USA, Inc. Request for Waiver of Part 15 Periodic Operation And Restricted Bands Rules for a 70-80 GHz Personnel Security Scanner System*, Public Notice, DA 19-227, 34 FCC Rcd 1978 (2019). Rohde & Schwarz later submitted the instant amended request under the same proceeding, on Sep. 10, 2019. No new comments were received in response to the amended request.

¹² CORF Comments at 4-5. Whedbee Comments at 1 (stating that "[t]he proposed good of the suggested operation outweighs any theoretical negatives.")

¹³ 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).

granted “where particular facts would make strict compliance inconsistent with the public interest.”¹⁴ To make this public interest determination, the waiver cannot undermine the purposes of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.¹⁵

7. We find that granting a waiver to Rohde & Schwarz will not undermine the purpose of the rules, i.e., to prevent harmful interference to authorized services. Authorized services in the 70-80 GHz band consist of fixed microwave links in the 71-76 GHz band, vehicular radars in the 76-81 GHz band, foreign object debris (FOD) radars that are used at airports in the 76-81 GHz band, as well as satellite downlinks, space research, and radio astronomy in portions of the 70-80 GHz band.¹⁶ We find that the QPS 201 device would pose a negligible risk of harmful interference to the other authorized operations for several reasons. First, the QPS 201 uses highly directional antennas, which reduces the likelihood that signals from the QPS 201 and other radio services will align in ways that are likely to result in harmful interference. The Commission has previously determined that highly directional, “pencil-beam” signal characteristics permit the fixed microwave systems in the 71-76 GHz band to be engineered so that many operations can co-exist in the same vicinity without causing interference to one another.¹⁷ Satellite earth station receivers, radio astronomy facilities, FOD radars, and vehicular radars also employ highly directional antennas. Further, the QPS 201 would be expected to focus its energy between the two physical panels, typically located at ground level, in order to reduce the possibility of false detections from persons/objects that are located in surrounding areas, as well as to reduce the potential for interference from other sources that would adversely affect its operation.¹⁸ Moreover, in the 70-80 GHz frequency range, free space path loss is significant and nearby people and objects would further attenuate the signals; therefore, leakage signals, if any, would not travel very far.¹⁹

8. To further minimize the potential for harmful interference, we limit authorization of the QPS 201 under this waiver to indoor operations.²⁰ Building entry loss (BEL) has been found to be

¹⁴ *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.

¹⁵ *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).

¹⁶ Federal Users of the 70-80 GHz band consist of Mobile, Mobile Satellite, Radionavigation, Radionavigation Satellite, Fixed, Fixed Satellite, Space Research, Radio Astronomy, and Radio Location. Non-Federal Users in the band include Mobile, Mobile Satellite, Radionavigation, Radionavigation Satellite, Inter-Satellite, Fixed, Fixed Satellite, Space Research, Broadcasting, Broadcasting Satellite, Radio Astronomy, Radio Location, Amateur, and Amateur Satellite. Vehicular radars and foreign object debris (FOD) radars also operate in the 76-81 GHz band, with FOD radars limited to airport locations only. *See* 47 CFR § 2.106.

¹⁷ *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8158-8159, para. 424 (2016). *See also Modernizing and Expanding Access to the 70/80/90 GHz Bands*, WT Docket No. 20-133, Notice of Proposed Rulemaking and Order, FCC 20-76, 35 FCC Rcd 6039 (June 10, 2020) (proposing, *inter alia*, a number of changes to the antenna standards for the 70 GHz and 80 GHz bands to provide greater flexibility in deploying 5G wireless backhaul).

¹⁸ *Waiver Request* at 2.

¹⁹ There is approximately 80 dB of free space attenuation at 3 meters and 100 dB of free space attenuation at 30 meters for an 80 GHz signal. Free space path loss (FSPL) is calculated according to the formula $FSPL = 20 \log F(\text{GHz}) + 20 \log D(\text{m}) + 32.5$, with frequency F in GHz and distance D in meters.

²⁰ Most of the authorized services in this band such as fixed microwave links, satellite earth station receivers, and automotive radars are used only outdoors. While it may be possible for amateur, fixed, radiolocation, and mobile service receivers to be used indoors, we are not aware of any such indoor use in this band. Nonetheless, we note that operations under Part 15 would be secondary to any such licensed operations.

significant;²¹ therefore, the QPS 201 would not cause harmful interference to typical outdoor radio services such as satellite receivers, vehicular radars, FOD radars, radionavigation, space research and radio astronomy. Thus, for these services, with our indoor-only restriction on the QPS 201 operation, the likelihood of harmful interference caused by the QPS 201 would be greatly diminished. This indoor-only restriction will also address CORF's concerns regarding potential harmful interference to radio astronomy facilities, which are primary users in the 76-81 GHz band.²² While we recognize that the relatively low power of the QPS 201 and the directional antennas employed by receivers in the band make such interference unlikely, we take this cautious approach because of the lack of analysis submitted on the record regarding the potential of outdoor QPS 201 operations to cause harmful interference to other radio services. Moreover, we are limiting the allowable field strength levels of the QPS 201 to no more than 36 dB above the limit in section 15.209(a).²³ Based on the above, we conclude that, although the 70-80 GHz band is allocated to a large number of radio services,²⁴ due to the extremely high propagation losses of signals in this band; the directional antennas used both by the QPS 201 and the other radio services in this spectrum; and the limitation to indoor-only operation, there is very little likelihood that the QPS 201 will cause harmful interference to other authorized services. Thus, granting this request would not undermine the purpose of the rules.

9. We further determine that the QPS 201 device promises to deliver strong public interest benefits, because it is designed to enable the rapid identification of concealed dangerous objects in places with high public foot traffic where there is a strong interest in enhancing security and promoting the safety of the public. Moreover, considering the vital importance of improving the safety of persons in public places and the potential for the QPS 201 system to provide such improvements, we find that there is a stronger public interest benefit in granting the waiver than in applying the rule. The QPS 201 device is designed to be used at security checkpoints in locations with large numbers of people that could be possible targets of attack. It will enable the screening of people without requiring them to raise their hands above their head or cause them to feel claustrophobic because there is no enclosed cabin as the people to be scanned are walking through the two open panels of the device.²⁵ According to Rohde & Schwarz the QPS 201's scanning time of 164 milliseconds, of which 100 milliseconds is a pause in transmitting, minimizes false alarms caused by people's movement.²⁶ Rohde & Schwarz further claims that the QPS 201 will serve a valuable national security function that cannot be comparably replicated by currently available equipment. Accordingly, we find that a public-interest consideration in granting this request is that the QPS 201 promises to bring substantial improvements over existing available means of security detection, thereby providing significant public safety benefits.

10. Based on the above, we determine that, given the minimal likelihood of harmful interference to authorized radio services, and the strong public interest benefits associated with promoting

²¹ The ITU has determined statistically the median (50% probability) BEL at 80 GHz to be approximately 22dB for traditional buildings, and approximately 55dB for thermally efficient buildings. See International Telecommunication Union Radiocommunication Sector (ITU-R), *Prediction of Building Entry Loss*, Recommendation ITU-R P.2109-1, at Figure 2 (Aug 2019), https://www.itu.int/dms_pubrec/itu-r/rec/p/R-REC-P.2109-1-201908-I!!PDF-E.pdf.

²² CORF has recommended to keep the QPS 201 operation indoors or maintain at least 70 km distance separation from any radio astronomy facilities operating in the 70-80 GHz band. CORF Comments at 4-5.

²³ For frequencies above 470 MHz, the field strength limit is 500 $\mu\text{V}/\text{m}$ (54 dB $\mu\text{V}/\text{m}$) measured at a distance of 3 meters. Rohde & Schwarz wishes to operate its system at 31,405 $\mu\text{V}/\text{m}$ (90 dB $\mu\text{V}/\text{m}$) as measured at 3 meters.

²⁴ See *supra* n.16.

²⁵ *Waiver Request* at 4.

²⁶ *Id.*

improved security, the public safety benefits outweigh the risk of harmful interference. Therefore, we will approve Rohde & Schwarz's waiver request subject to the conditions we elaborate below.

11. Although we expect little to no harmful interference to other radio services while operating in indoors, in an abundance of caution, we will require the QPS 201 to comply with the same notification and record keeping conditions that we have imposed on other security portals previously authorized under waiver.²⁷ Specifically, we will require Rohde & Schwarz to notify the Commission of any instances of interference that it is made aware of and how the interference was remedied. We will also require Rohde & Schwarz to maintain a record of installations of all devices sold under this waiver. This information will assist Rohde & Schwarz, the Commission and NTIA²⁸ should it become necessary to identify and investigate any patterns of harmful interference, should they occur. We will further require Rohde & Schwarz to disclose in a manner that would be conspicuous to both initial and subsequent purchasers of QPS 201 security scanners that they may only be operated on a non-interference basis to existing and future services with frequency allocations in the 70 to 80 GHz frequency band, and that operators will be required to mitigate any instances of harmful interference that may occur.²⁹

12. Accordingly, pursuant to the delegated authority in sections 0.31 and 0.241 of the Commission's rules, we waive the requirements of sections 15.205(a) and 15.209(a) of our rules to permit the certification and marketing of the QPS 201 device for indoor operation. This waiver is subject to the following conditions:

- 1) The QPS 201 security scanner shall be certified according to the Commission's rules and must comply with the technical specifications applicable to operation under Part 15 of 47 CFR, except as permitted below. The requirement in 47 CFR § 15.205(a) is waived to permit the QPS 201 to operate in the 70-80 GHz restricted frequency band, and the requirement of § 15.209(a) is relaxed to allow a transmitted field strength level of 31,405 $\mu\text{V}/\text{m}$ as measured at 3 meters, with a reference bandwidth of 1 MHz in accordance with the requirements of 47 CFR § 15.35(b).
- 2) The intentional emissions generated by the QPS 201 security scanner must be completely contained within the 70 to 80 GHz frequency range.
- 3) Authorized users of the QPS 201 are limited to law enforcement, fire or emergency rescue organizations or by manufacturers licensees, petroleum licensees or power licensees as defined in 47 CFR § 90.7.
- 4) Rohde & Schwarz shall maintain a record of installations, including latitude and longitude, of all devices sold under this waiver and shall notify the Commission and NTIA of any instances of interference that it is made aware of and how the interference was remedied.
- 5) All installations of the QPS 201 operated under this waiver shall be restricted to supervised indoor use.
- 6) Rohde & Schwarz shall disclose in a manner that would be conspicuous to both initial and subsequent purchasers of QPS 201 security scanners that these devices may only be operated on a non-interference basis to existing and future authorized services in the 70-80 GHz frequency

²⁷ See *Evolv Technologies, Inc. Request for Waiver of Sections 15.31(c) and 15.35(b) of the Commission's Rules to Permit the Deployment of Security Screening Portal Devices that Operate in the 24.0-28.8 GHz Range*, DA 17-1073, Order, 32 FCC Rcd 9271 (2017); *L-3 Communications Security and Detection Systems, Inc. Request for Waiver*, DA 16-1075, Order, 31 FCC Rcd 12310 (2016). *SafeView, Inc. Request for Waiver of Sections 15.31 and 15.35 of the Commission's Rules to Permit the Deployment of Security Screening Portal Devices that Operate in the 24.25-30 GHz Range*, DA 06-1589, Order, 21 FCC Rcd 8814 (2006).

²⁸ The National Telecommunications and Information Administration (NTIA) manages the Federal Government's use of the radio spectrum.

²⁹ This is a condition required of all unlicensed devices operating under Part 15 of our rules. See 47 CFR § 15.5.

bands, and operators of these devices will be required to mitigate any instances of harmful interference that may occur.

- 7) Rohde & Schwarz shall include a copy of this waiver order with its application for certification of the QPS 201 security scanner.
- 8) This waiver shall apply to the QPS 201 security scanner produced by Rohde & Schwarz as described herein and provided no major changes are made to the transmitter circuitry or to the housing and position of the antenna masts that would increase the device's emitted field strength or bandwidth. This waiver and its conditions shall apply only to the Rohde & Schwarz QPS 201 security scanner as described herein and are not to be considered to apply generally to other security portal devices.
- 9) This waiver shall apply to a total of 400 Rohde & Schwarz QPS 201 security scanners. If Rohde & Schwarz finds its needs will exceed 400 scanners, it must request and receive approval to increase in the number of scanners.

IV. ORDERING CLAUSES

13. 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 Rohde & Schwarz USA, Inc. 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.

14. 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