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Putting Unused Spectrum to Work for Public Service, Education and Technology

STRENGTHENING OUR COMMUNICATIONS NETWORKS
TO MEET THE NEEDS OF CONSUMERS

U.S. House of Representatives
House Committee on Energy and Commerce
Subcommittee on Communications and Technology

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Putting Unused Spectrum to Work for Public Service, Education and Technology

Summary

Our nation's radio amateurs have employed spectrum in the 3 GHz band (3.3 – 3.5 GHz) on a secondary, non-interfering basis since the 1950's. A core standard of spectrum policy should be to maximize use of this valuable but finite spectrum resource. The Federal Communications Commission (Commission) in earlier proceedings adopted a variety of methods to share and maximize use of the spectrum by radio amateurs and others, but in its latest 3 GHz proceeding it did not do so despite hundreds of comments filed in the record by licensed radio amateurs.

If the current policy continues, existing spectrum in the 3 GHz band being addressed in H.R.5378 will be cleared indiscriminately. This would leave significant spectrum resources vacant into the foreseeable future while radio amateur experimentation and operation will be forced to cease for no reason except regulatory myopia.

It need not be so. In earlier proceedings the Commission adopted methods to ensure the unencumbered spectrum use by its primary commercial licensees while accommodating secondary users on a non-interference basis. These methods work well and remain effective without complaint in other frequency bands, and also should be applied to the 3 GHz band. Doing so will ensure unencumbered use by primary existing federal government and future commercial providers while allowing technically proficient radio amateurs in many (not all) cases to continue with their scientific exploration, experiments, and services.

Congress should take the opportunity presented by H.R.5378 to instruct the Commission that radio amateur secondary uses should continue to be authorized on a secondary, non-interfering basis.

Introduction

ARRL, The National Association for Amateur Radio (ARRL), has represented the nation's radio amateurs since 1914. Today it has well over 150,000 members who live in every community in the United States. ARRL is a noncommercial organization dedicated to public service, education, technology, training, and advocacy. ARRL:

- Encourages radio experimentation and advances in radio technology and education;
- Organizes and trains volunteers to serve their communities by providing public service and emergency communications;
- Advocates for meaningful access to radio spectrum;
- Strives for every licensed amateur to be involved and active; and
- Supports the awareness and growth of amateur radio worldwide.

Radio Amateurs Have Long Used 3 GHz Spectrum on a Secondary, Non-Interfering Basis

Radio amateur licensees have employed spectrum in the 3 GHz band since the 1950's on a secondary, non-interfering basis. If a possibility to interfere with another service is presented or observed, amateurs have the technical knowledge and capability to make technical adjustments to eliminate that possibility, change frequency, or cease transmitting.

Hundreds of radio amateurs submitted comments to the FCC for its 3 GHz proceeding last year (WT Docket No. 19-348) in which they addressed how and why this and similar spectrum should continue to be available to radio amateurs to be used opportunistically for public service and experimentation.

We are, in effect, gleaners of the 3 GHz band. We employ 3 GHz spectrum that otherwise would be unused. We use this spectrum capacity to:

- provide voluntary, uncompensated communications services such as audio, video, and mesh network capabilities in remote areas with little or no communications infrastructure that are made available to emergency responders and fire-fighting teams whenever needed;
- develop STEM projects to attract student interest in science and engineering;
- experiment with unusual modes, such as communicating by bouncing signals off the moon and using digital signals that are below receiver noise levels;
- study the propagation characteristics of 3 GHz by deploying beacons, observing changes, and correlating signal strengths with other scientific phenomena; and
- train and hone largely self-taught electronics and digital coding skills by building equipment, antennas, and re-purposing commercial equipment.

Amateur Secondary Operations are Compatible With and Can Avoid Interference to Both Existing Federal and New Non-Federal Users in the 3 GHz Band

Most spectrum available to radio amateurs above 1 GHz, including that in the 3 GHz band at issue, is allocated to the amateur radio service on a secondary basis. This status requires that *amateurs not cause interference to any primary and certain other defined users, and that the amateurs' own operations are not protected from interference from any of these other users.*

A core standard of our nation's spectrum policy has been, and should continue to be, to maximize use of the limited spectrum resource. An important aspect of that policy is that secondary users are permitted entry to exclusive spectrum but must protect the operations of the primary licensees, including new exclusive and flexible licensees, whenever the amateur's continued operation might interfere with the primary user.

Secondary use is embodied in the ITU Radio Regulations and long has been recognized worldwide, including in the United States, as a regulatory construct enabling more efficient and intensive spectrum use. Secondary use is entirely consistent with exclusive, primary licenses and continued amateur secondary operations in the 3 GHz band are compatible with future commercial flexible use operators.

Primary users in the types of commercial services at issue in the 3 GHz band rarely would use all of their licensed spectrum throughout their entire licensed service area. Different geographic areas have starkly different communications needs that are based on population density. This frequently results in spectrum bands being congested in urban areas while the same bands are only lightly used outside the city and its inner suburbs. Not infrequently the same spectrum is completely vacant in rural areas.

The Commission's build-out requirements explicitly recognize these differences by not requiring 100 percent area coverage using 100 percent of the licensed spectrum. This is where the spectrum for amateur secondary operations is found. And because radio amateurs by rule do not provide commercial service, nor can they be compensated for any licensed activity, they have the freedom as well as the responsibility to adjust their operations as needed to fully protect primary licensees.

The Commission in its recent 3 GHz proceeding went beyond merely prohibiting amateur operations in areas and at times when primary Commission licensees might use the spectrum. Instead of allowing operation until a commercial licensee is ready to build out in a specific geographic area and turn on, the Commission instead ruled that all amateur operations in the sub-band now being auctioned must terminate within 90 days of the close of the auction. *Even ordered closed are amateur operations in Alaska, Hawaii, and the U.S. territories where no licenses are being auctioned now or in the foreseeable future.*

When taking these actions, the Commission relied in part on "Congressional direction to make the licenses available for flexible use expeditiously."[1] "Making licenses available for flexible use expeditiously" has no logical connection to leaving spectrum unused before licensees begin using it. Nor is it a logical justification for prohibiting amateur operations in Alaska, Hawaii, and U.S. territories where no licenses will be auctioned or issued in the foreseeable future.

Finally, it must be noted that the same scientific attribute that makes this spectrum especially attractive to commercial users – short and medium range signal propagation – makes this spectrum particularly unattractive for long range paths typically needed in less-populated areas for many of their services. But however the spectrum may be used in the future by its primary licensees, secondary use provides a flexible regulatory mechanism that fully protects exclusive rights while providing for use of resources that otherwise would lay fallow.

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[1] FCC, In the Matter of Facilitating Shared Use in the 3100-3550 MHz Band, WT Docket No. 19-348, *Second Report and Order, Order on Reconsideration, and Order of Proposed Modification*, 36 FCC Rcd 5987 at 6052, para. 184 (2021).

Consequently the ARRL, on behalf of the more than 750,000 amateur licensees in the United States, respectfully requests that Congress take this opportunity to instruct the Commission that radio amateur secondary uses should continue to be authorized in the 3 GHz band. Doing so on a strictly secondary, non-interfering basis will provide full protection to commercial licensees with exclusive licenses.

FCC Precedent Provides Guidance to Securely Protect Primary Operations from Secondary Amateur Uses

Consistent with the precedent discussed below, radio amateur licensees should be permitted to continue operating on a secondary non-interference basis unless and until a new commercial licensee is ready to employ the spectrum by initiating operation. The new licensee would have unilateral control -- "exclusivity" -- to use the licensed spectrum at will and in whatever manner it chooses. This clear delineation of spectrum rights for the 3 GHz band would allow the spectrum to be put to use during the time – often many years and even decades in significant geographic areas – before the new licensee is ready to use it under its long-term license.

Continued use of spectrum being auctioned to a new primary user until the new primary user is ready to employ it was the regulatory scheme adopted by the FCC in the Emerging Technologies and Personal Communications Service (PCS) proceeding in the 1990's. The resulted in very successful license auctions and service build-out while, in that case, existing users who did not accept a buy-out were allowed to continue operating on a secondary basis until new licensees were ready to put the spectrum to use. Almost identical wording in the 3 GHz regulations similarly would permit secondary spectrum use while fully protecting the new commercial licensees.

Therefore, building upon this regulatory scheme used in a similar situation for other spectrum, radio amateurs should be permitted to use the 3 GHz spectrum until new licensees are ready to use it. This is not a difficult regulatory construct to implement. The FCC already has written the rules to do so that need only to be conformed and adopted within its 3 GHz rules. Section 101.79 of the Commission's Rules could be used as a template.

47 C.F.R. § 101.79
Sunset provisions for licensees in the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands.

(a) FMS [Fixed Microwave Service] licensees will maintain primary status in the 1850- 1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands unless and until an ET [Emerging Technology] licensee requires use of the spectrum. ET licensees are not required to pay relocation costs after the relocation rules sunset. Once the relocation rules sunset, an ET licensee may require the incumbent to cease operations, provided that the ET licensee intends to turn on a system within interference range of the incumbent, as determined by TIA TSB 10-F (for terrestrial-to-terrestrial situations) or TIA TSB 86 (for MSS satellite-to-terrestrial situations) or any standard successor. ET licensee notification to the affected FMS licensee must be in writing and must provide the incumbent with no less than six months to vacate the spectrum. After the six-monthnotice period has expired, the FMS licensee must turn its license back into the Commission, unless the parties have entered into an agreement which allows the FMS licensee to continue to operate on a mutually agreed upon basis. (Emphasis highlight added.)

To ensure that amateur operations could easily be notified if and when the spectrum would be used by the primary licensee, ARRL offered that amateurs could be required to register their operations in the band. Such a requirement could mirror requirements that already exist for radio amateurs to register before operating on the shared 2200 and 630 meter bands.[2]

Conclusion

There is no technical basis for removing amateur secondary operations from the 3 GHz band where they long have used the bits and pieces of unused spectrum for technological innovation. Consequently the ARRL, on behalf of the more than 750,000 amateur licensees in the United States, respectfully requests that Congress take this opportunity to instruct the Commission in H.R.5378 that radio amateur secondary uses should continue to be authorized in the 3 GHz band. Doing so on a strictly secondary, non-interfering basis will provide full protection to commercial licensees with exclusive licenses and further the public interest in providing a means for continued technological innovation.

Thank you for your consideration.

[2] *See* 47 C.F.R. § 97.303(g): radio amateurs operating in the 2200 and/or 630 meter bands must register their operations.