

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Reply to Comments on the Petitions for further Rulemaking
Regarding the Citizens Broadband Radio Service

GN Docket No 12-354
RM-11788
RM-11789

**REPLY TO COMMENTS OF RUCKUS
a business unit of BROCADE COMMUNICATIONS SYSTEMS, INC.**

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I. INTRODUCTION

Ruckus is encouraged by the volume, diversity, and quality of comments that have been filed in response to the petitions. We believe these attributes reflect the large, and growing, ecosystem that has formed to capitalize on the innovative CBRS framework that the Commission insightfully put in place.

Ruckus reaffirms our position that we are opposed to CBRS rule changes which would limit access to the Priority Access or General Authorized Access tiers to only certain types of users, or reduce the fundamental opportunity for access at either tier. If enacted, such changes would undermine the global leadership that the United States has shown with CBRS. Ruckus urges the Commission to reject the specific proposals made in the petitions.

We offer the following reply to comments, focusing on a few key areas. Emphasis is ours, unless otherwise noted.

II. PRIORITY ACCESS LICENSES SHOULD BE AVAILABLE TO ALL PARTICIPANTS

In their petition, CTIA asserted that *“A flawed PAL tier will likely undermine the overall success of the band.”*¹ Ruckus agrees with this assertion and believes that it is critically important that all three tiers, or “legs of the stool”, be well structured in order that all the participants in the band - Incumbents, Priority Access licensees, and General Authorized users – will be able to utilize the spectrum to meet their needs and requirements. The question that arises from a careful reading of the existing record, petitions, and comments is, “Who should be able to access the CBRS Band with Priority Access protections and certainties?”

¹ CTIA, Petition for Rulemaking to Amend the Commission’s Rules Regarding the Citizens Broadband Radio Service in the 3550-3700 MHz Band, June 16, 2017 (CTIA Petition), Pg 2.

The petitioners make it clear that they believe Priority Access Licenses should only be available to the national mobile network operators. Their requested changes are quite understandable if this presupposition is accepted. Comments such as *“The PAL model seeks to offer wireless providers the assured access and interference protection they deem essential for the quality of service they offer in today’s highly competitive wireless marketplace.”*² and *“PEAs are based on familiar and manageable Cellular Market areas and will reduce border areas and minimize the risk of interference, while also providing flexibility and encouraging participation by a wide array of carriers.”*³ reflect this preconception that the PAL Tier should be narrowly optimized to meet the specific needs of current wireless providers, i.e. cellular carriers, because they, naturally, will be the ones accessing the CBRS Band with Priority Access.

However, it is clear from the existing record of this proceeding that the Commission envisioned a band which is *“hospitable to a wide variety of users, deployment models, and business cases, including some solutions to market needs not adequately served by our conventional licensed or unlicensed rules.”*⁴, and in which there would be *“fluid movement between service tiers.”*⁵

Additionally, a number of commenters highlighted the needs and requirements for Priority Access to the CBRS band for just the *“variety of users, deployment models, and business cases”* the Commission had noted. Comments included, *“Charter is actively exploring the use of*

² CTIA Petition, Pg 6.

³ T-Mobile, Comment of T-Mobile USA, Inc., 24 July 2017, Pgs 4-5.

⁴ Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 3962 ¶ 7 (2015) (2015 Order).

⁵ Id.

the 3.5 GHz Band—both Priority Access Licenses (“PALs”) and General Authorized Access (“GAA”)—to deliver fixed and mobile wireless service to its subscribers.”⁶, “The well-articulated licensing framework will enable building owners, stadium operators and even, potentially, municipalities to ensure there are no holes in urban deployments of next generation “5G” wireless technologies, investing in shared infrastructure where no single operator is incentivized to build.”⁷, “The notions of “targeted” and “localized” areas mean one thing to large mobile wireless carriers and quite something else to rural broadband providers, private networks, airports, campuses, shopping malls, electric grids, stadia and arenas, and a host of other use cases that do not divide the country into 416 geographic areas that are too large for their service needs and too expensive for their wallets.”⁸, and “With 74K census tracts and up to 7 PALs per tract, even the smallest of school systems, the most budget constrained small town, a single hospital system, and yes, a rural wireless broadband service provider, has a fair shot to obtain a PAL.”⁹

In another example of the types of innovative network solutions that are being developed which could make use of Priority Access, the General Electric Global Research Division just filed a Special Temporary Authority (STA) application with the Commission to test CBRS systems for “future airborne CBRS operations within restricted corridors (private commercial property) will be permitted for rural industrial applications” “at a maximum altitude of 250 feet above ground

⁶ Comments of Charter Communications, Inc., July 24, 2017 (Charter Comments), Pg 1.

⁷ The City of New York, Re: Public Notice DA 17-609 regarding petitions to further amend the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12- 354, Pgs 1-2.

⁸ Comments of The Wireless Internet Service Provider Association, July 24, 2017 (WISPA Comments), Pg 22.

⁹ Baicells Technologies North America, Inc. Comment Re FCC Proceeding 12-354, Pg 2.

level".¹⁰ Isn't it likely that some of GE's industrial customers would need the certainty and protections of Priority Access to operate these types of mission-critical applications?

There are obviously a very large number of other market participants beyond the cellular carriers who want to take advantage of Priority Access to the CBRS Band, just as the Commission had intended and hoped. It is true that some of these entities may start out in CBRS utilizing General Authorized Access as Commissioner O'Rielly recently noted¹¹, especially given that GAA operations are likely to be authorized ahead of the Priority Access License auctions. However, the option to move fluidly from the GAA tier to the PAL tier, as envisioned and subsequently affirmed by the Commission, or to participate in the initial auctions for Priority Access Licenses, should not be taken away from these important CBRS constituents.

Will we have Priority Access Licenses that are only available to four companies, due to a reshaping of the PAL Tier at this "eleventh hour" by applying the conventional licensed rules which the Commission has already stated in its previous order do not meet the market needs of a wide variety of users.¹² Or, will we preserve the flexibility in licensing terms that encourages participation and investment by other providers such as Charter, cities like New York, building owners, stadium operators, rural broadband providers, airports, shopping malls, school systems, hospitals, small towns, industrial operators, and others?

¹⁰ General Electric Global Research division application for Special Temporary Authority, https://apps.fcc.gov/oetcf/els/reports/STA_Print.cfm?mode=current&application_seq=79528&RequestTimeout=1000 .

¹¹ Remarks of FCC Commissioner Michael O'Rielly Before the CBRS Alliance, August 1, 2017, (O'Rielly Remarks), Pg 2.

¹² 2015 Order.

In Ruckus' opinion, a Priority Access Licensing framework that bars participation by the many, many other deployers and operators of CBRS networks beyond the cellular carriers will indeed be flawed. And that *"flawed PAL tier will likely undermine the overall success of the band"*, just as CTIA predicted.

Ruckus sees no reason to overturn the Commission's decision from its original 2015 Rules and Order, *"For the same reason that we have determined to expand the size of the tier, we conclude that expanded eligibility for access to the Priority Access tier will promote more intensive use of the 3.5 GHz Band. The increasing growth in demand for wireless broadband service has led to increasing demands for spectrum to accommodate that growth. As T-Mobile explains, many entities besides mission critical users seek access to the type of "quality assured" spectrum that PALs provide. The Consumer Electronics Association notes that "[c]ommercial operations benefit from reliable, prioritized access to spectrum and a predictable quality of service, which will support investment and innovation in the 3.5 GHz Band." Google states that "[o]pening the Priority Access tier will encourage deployment of systems that require reliable access to spectrum to deliver higher quality service." Accordingly, subject to the qualification rules discussed above, any entity, is eligible to be a Priority Access Licensee."*¹³

The existing record, petitions, and comments should compel the Commission to preserve a Priority Access Licensing framework that is accessible to all the diverse participants in the CBRS ecosystem.

¹³ Report and Order and Second Further Notice of Proposed Rulemaking, April 17, 2015 (2015 Order), Sec 89.

III. THE CURRENT RULES MOVE US FORWARD, THE PETITIONS HOLD ON TO THE PAST

The current CBRS framework holds the potential to create an entirely new opportunity for spectrum management, providing policymakers and regulators with a new, innovative option in their “toolkits” which they can selectively apply when they consider making additional spectrum available for commercial uses. As UK-based analyst firm Disruptive Analysis recently noted, **“The US' innovative CBRS model for 3.5GHz is worth examining, and perhaps replicating elsewhere**, especially Europe. It is much more sophisticated - but more complex to implement - than the Licensed Shared Access (LSA) that Europe has leaned towards historically. In Disruptive Analysis' view this extra complexity is worthwhile, as it **allows a much broader group of stakeholders to access spectrum, fostering greater innovation.**”¹⁴ By combining protected incumbent, new exclusive access, and new permissive access – with the ability to fluidly move between the exclusive and permissive access tiers – the Commission created a new, third option for spectrum management, one that supports *“solutions to market needs not adequately served by our conventional licensed or unlicensed rules”*.¹⁵

Instead of leading the world forward by following through on the Commission’s vision to create an entirely new spectrum management paradigm, it is clear from the petitions and comments of the petitions’ supporters that they would prefer a framework for the CBRS Band which preserves and embraces the longstanding distinctions and divisions between licensed and unlicensed spectrum, business cases, and users. CTIA’s statements in their petition are

¹⁴ Disruptive Analysis, “Spectrum-Sharing: Europe & Asia need something like CBRS”, May 11, 2017, <http://disruptivewireless.blogspot.com/2017/05/spectrum-sharing-europe-needs-something.html> (emphasis in original).

¹⁵ 2015 Order.

most telling, *“The PAL model seeks to offer wireless providers the assured access and interference protection they deem essential for the quality of service they offer in today’s highly competitive wireless marketplace.”*¹⁶, and *“A provider’s “option” to downgrade and operate on a GAA basis following the loss of a PAL in a subsequent auction does not provide the necessary certainty to justify investments in the band,”*¹⁷. AT&T used similarly dramatic language to highlight their view of the distinction between the PAL and GAA tiers when they commented that the current PAL auction rules could result in a party being *“forced to migrate from PAL status to GAA if they wish to maintain service.”*¹⁸

The petitioners and their supporters clearly desire a CBRS framework in which a high-quality PAL tier is their exclusive domain, while the large majority of CBRS users can make do with the “downgraded”, uncertainty of the GAA tier. Such a framework would exactly mirror the situation that we have had for the last 30 years, where fully licensed spectrum holders operate with their own spectrum access rules and business models, while unlicensed users operate with an entirely different set of rules and business models. That they seek to maintain the status quo is evident from CTIA’s basis that *“today’s”* wireless marketplace should be the background upon which the Commission makes its judgements. This is quite odd, considering that they also argue that the CBRS framework needs to position our nation to lead in the transition to 5G¹⁹, and, as Ruckus previously highlighted in our comments²⁰, 5G network

¹⁶ CTIA Petition, Pg 6.

¹⁷ Ibid.

¹⁸ Comments of AT&T Services, Inc., July 24, 2017, (AT&T Comments) Pg 10.

¹⁹ CTIA Petition, Section II. A RULEMAKING TO REMOVE UNCERTAINTY FROM THE PRIORITY ACCESS LICENSE FRAMEWORK WILL FACILITATE U.S. GLOBAL LEADERSHIP FROM 4G TO 5G.

²⁰ Comments of Ruckus, July 24, 2017.

architectures, business models, use cases, and operators will be dramatically different from, and more diverse than, “*today’s*” wireless marketplace. Do we want a CBRS framework structured for what has happened in the past, or one that positions us for the future?

While Ruckus has focused most of its argument on the point that the PAL tier should not be recast in the traditional fully licensed model, we also feel strongly that it is incorrect to equate the GAA tier, or GAA access, with the traditional unlicensed model. While it may be convenient to conceptualize GAA access in unlicensed terms when speaking to the public, for the purposes of this proceeding it is critical that the nuances be well understood. The tagline that “GAA is unlicensed” reinforces the incorrect notion of a rigid caste system within CBRS where the PAL tier represents the traditional licensed model and the GAA tier represents the traditional unlicensed model, merely perpetuating the existing state of affairs within a CBRS context.

Ruckus has built our existing businesses upon unlicensed access to the 2.4 GHz and 5 GHz bands which made 802.11 (i.e. Wi-Fi) technologies and solutions possible, and we are well-versed in the pros and cons of unlicensed operations. CBRS GAA operation may be similar in some ways to unlicensed, in that such operations will be open to deployment without the need to acquire spectrum rights at auction, but there are very significant differences as well. CBRS GAA users will have to formally agree to abide by the Part 96 rules, acknowledging that they may be subject to preemption by incumbent or Priority Access operations. They further have to operate in the band under the coordination and supervision of a Spectrum Access System (SAS), and agree to provide significant information to their SAS administrator, including radio locations and organizational information. None of this is required for traditional Part 15

unlicensed operations. Our customers are willing to accept this additional complexity, which we will do our best to simplify, in order to enjoy the benefits of CBRS operation, both at the GAA and PAL tiers.

The record in this proceeding is clear on the point that the Commission did not intend to simply apply the traditional licensed spectrum paradigm to the PAL tier and apply the traditional unlicensed spectrum paradigm to the GAA tier, but instead was seeking to create a new paradigm which would create room for market solutions that the two existing spectrum management regimes had not shown themselves able to adequately address.

A foundational principle embodied throughout the record of this proceeding is that the Commission was putting in place a framework that would enable new commercial shared uses in both exclusive and permissive access modes, whereby market forces would determine the exact allocation of the band between those access modes in a given area, and would determine who would be accessing the band with Priority Access in that area. Further, it is clear from the record that the Commission intended a dynamic rebalancing of this allocation and Priority Access rights via a more frequent auction process and a vibrant secondary market for Priority Access rights, again in recognition of the wisdom of the market to decide the highest and best use on an ongoing basis, and not to preordain a semi-static allocation by bureaucratic fiat for the next decade or more.

Ruckus strongly agrees with the comment by Google and Alphabet Access that, *“In addition, the Commission should maintain rules that enable flexible market forces to determine the most efficient use of Priority Access Licenses (“PALs”) in the 3.5 GHz band, including license*

terms, periodic contestability, census-tract licensing, and dynamic frequency assignment.”²¹ We are encouraged by the recent statement from Commissioner O’Rielly, “My view is that the band should be designed to permit as many uses as possible and the market should decide the highest value use for this spectrum. This is the fundamental thought behind the Commission’s flexible use policies.”²² CTIA also agrees with the principle that, “...dynamic market forces, not static regulations, can ensure the spectrum is put to its highest, best, and most efficient use.”²³

Based on the existing record, petitions, and comments, the Commission should maintain the position it has taken, and previously reaffirmed, to advance the field of spectrum management with the innovative, flexible approach embodied in the current CBRS rules, and it should reject attempts to turn CBRS into a bipolar, semi-static manifestation of the longstanding distinctions between licensed and unlicensed spectrum.

IV. CENSUS TRACT-BASED LICENSING IS NOT OVERLY COMPLEX

The petitioners and their supporters claim that the current rules governing Priority Access Licensing and auctions are overly complex. CTIA asserts that, *“The existing PAL framework introduces needless layers of uncertainty and complexity that undermine investment incentives and undercut the balance between PALs and the General Authorized Access (“GAA”) tier.”²⁴*, while AT&T claims that, *“This high number of licenses makes for an incredibly complex auction process with few attendant benefits.”²⁵*

²¹ Comments of Google Inc. and Alphabet Access, July 24, 2017, (Google Comments), Pg 5.

²² O’Rielly Remarks, Pg 2.

²³ CTIA Petition, Pgs 10-11.

²⁴ Id., Pg 2.

²⁵ AT&T Comments, Pg 7.

The Commission received extensive industry input on the appropriate licensing area, as noted in its 2015 Order, which discussed how some respondents argued for larger coverage areas, including Economic Areas (EAs) and Cellular Market Areas (CMAs), while other respondents argued for smaller coverage areas. The Commission decided that census tract-based licenses were the best for CBRS Priority Access for a number of reasons, but specifically noted that smaller license areas than census tract-based would *“significantly increase the complexity and data management requirements”*²⁶. It is clear that in April of 2015, and again in April of 2016, the Commission believed that census tract-based licensing was not overly complex nor unmanageable.

Ruckus also believe the comments of the companies who have applied to become SAS administrators are worth extra consideration on this point, as they will be the ones responsible for implementing the Priority Access licensing framework for the ecosystem, and they have extensive experience at this point under the current rules. As Google commented, *“Therefore, the size of the PAL license area has essentially no effect on the complexity of PAL protections.”*²⁷, and *“No candidate SAS administrator has suggested that the existing census tract regulation is beyond its technical capability to implement.”*²⁸ Sony stated, *“In addition, Sony disagrees with claims that allocating priority access licenses (“PALs”) on a census tract basis will create unnecessary interference risks and unmanageable challenges for SAS administration. Although allocation by census tract requires somewhat more sophisticated spectrum management than allocation by larger geographic units such as Partial Economic Areas, Sony’s research and*

²⁶ 2015 Order, Sec 99.

²⁷ Google Comments, Pg 25.

²⁸ Ibid.

development efforts indicate that the difference between the two approaches is minor and entirely manageable with a sufficiently robust database implementation.”²⁹

CTIA’s claim that *“Census tract licensing, moreover, will be unnecessarily challenging for SAS administration and for licensees themselves to manage.”³⁰* is in direct opposition to the affirmation they made to comply with all of the Commission’s rules in their May 2016 application to become a SAS administrator. We are sorry CTIA has apparently determined that census tract-based licensing is unnecessarily challenging for their SAS, but are glad that the other candidate SAS administrators are not experiencing these challenges.

The Commission should reject the argument that census tract-based licensing is overly complicated, based upon the existing record, the petitions, and the comments.

V. INTERFERENCE PROTECTION RULES FOR HIGH-POWER COMMERCIAL WEATHER RADARS

Ruckus agrees with the points made by the Wireless Innovation Forum regarding the need for the Commission to incorporate additional interference protection rules for the high-power commercial weather radars operating on a secondary basis just below 3550 MHz.³¹ We support and endorse the specific elements of the Interference Protection Proposal listed below, believing that they would provide greater certainty to both CBRS users (at both the PAL and GAA tier) and to the commercial weather radar operators.

1. Weather radars should include filters to protect against interference;
2. Weather radars should be licensed below 3540 MHz to provide a guard band;

²⁹ Comments of Sony Electronics, July 21, 2017, Pgs 1-2.

³⁰ CTIA Petition, Pg 9.

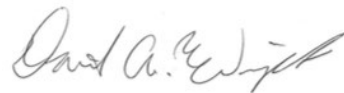
³¹ Comments of the Wireless Innovation Forum, 24 July, 2017.

3. Section 90.175 of the Commission's rules should be modified to require frequency coordination with ESC operators within 150 km of proposed radiolocation stations operating in the 3500-3550 MHz band; and
4. A neutral frequency coordination body should be established to conduct coordination.

VI. CONCLUSION

Ruckus does not oppose minor adjustments to the CBRS framework that would maximize the utility of the band for all participants while protecting the existing, substantial investments which were driven by models reasonably based upon the current rules. However, the wholesale changes sought in the petitions to the Priority Access tier would fundamentally alter the opportunities for participation, completely undoing the Commission's well-reasoned judgement in its 2015 order that *"any entity, is eligible to be a Priority Access Licensee"*. This in turn, would strand a very large amount of investment, and, as importantly, would squander the opportunity we are on the verge of realizing to greatly advance spectrum management and the wireless industry.

Very respectfully,

A handwritten signature in dark ink, appearing to read "David A. Wright", with a stylized flourish at the end.

David A. Wright