

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

<b>In re Petition of</b>	)	
	)	
<b>AT&amp;T Mobility Spectrum, LLC, et al.</b>	)	<b>RM-11731</b>
	)	
<b>Amendment of Part 27 of the Commission's</b>	)	
<b>Rules Governing the Technical Standards</b>	)	
<b>for the Wireless Communications Services</b>	)	
<b>in the 2.3 GHz Band</b>	)	

**To: The Commission**

**COMMENTS OF ARRL,  
THE NATIONAL ASSOCIATION FOR AMATEUR RADIO**

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.405 of the Commission's rules (47 C.F.R. §1.405), hereby respectfully submits its comments in response to the *Public Notice*, DA 14-1210, released August 21, 2014 (the Public Notice) relative to the above-captioned Petition for Rule Making filed August 8, 2014 by AT&T Mobility Spectrum, LLC; Bellsouth Mobile Data, Inc.; New Cingular Wireless PCS, LLC; and SBC Telecom, Inc.<sup>1</sup> The Petition seeks to modify<sup>2</sup> the Commission's Part 27 rules governing the C and D Blocks of the Wireless Communications Service (WCS) (and also apparently the rules governing the A and B Blocks of the WCS) pertaining to construction requirements, power limits, and out-of-band

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<sup>1</sup> The Petitioners will be referred to collectively herein as "AT&T" as does the Public Notice.

<sup>2</sup> AT&T claims to have contemporaneously filed petitions for limited waivers to permit the immediate commencement of air-to-ground, high-speed LTE 4G service for airlines and passengers in portions of the bands 2305-2320 MHz and 2345-2360 MHz (Petition for Limited Waiver of WCS Technical Standards and Service Rules, WQND999, File No. 0006417028, filed August 2, 2014. ARRL intends to submit copies of these comments in the waiver proceeding(s) as well. ARRL submits that AT&T et al. has pursued the proper procedural course in the filing of this Petition but the wrong course in filing a request for waiver. Attempting to effectuate what are in essence rule changes by waiver is completely inappropriate in this context. This is especially true where the effects of the waived rules and the proposed operation on incumbent in-band and adjacent band, licensed users are either undetermined or not documented. The waiver request should be dismissed or denied without further consideration.

emission limits. The Public Notice seeks comments on the proposals in the Petition. In the interests of the Amateur Radio Service in continued useful access to, and compatible sharing with the WCS in the segment 2305-2310 MHz; and especially in the avoidance of further deterioration in the utility of the important Amateur Radio adjacent-band allocation at 2300-2305 MHz, ARRL states as follows:

## **I. Introduction.**

1. The AT&T Petition seeks in essence to permit a new air-to-ground communications system which would enable the use of WCS spectrum (specifically, but not exclusively the C and D Blocks) for LTE-based in-flight connectivity service for airlines and air passengers. AT&T claims that it has been able to use the A and B blocks of those bands (2305-2315 MHz and 2350-2360 MHz) but that restrictions in out-of-band emission limits and power limits to protect adjacent band users [i.e. Satellite Digital Audio Radio Service, i.e. Sirius/XM Radio (SDARS) at 2320-2345 MHz] make use of the C and D Blocks of WCS spectrum (2315-2320 MHz and 2345-2360 MHz) problematic. AT&T claims at page 2 of its Petition that technical regulatory changes requested in the Petition (including rule changes governing use of WCS Block A) will permit “nationwide deployment of AT&T’s innovative in-flight connectivity service using currently fallow spectrum (sic) *while at the same time preserving adequate interference protection to users of adjacent bands*” (italics added). Notwithstanding this broad and nebulous claim, there is no showing anywhere in the four corners of the Petition that the proposed rule changes would permit *any* continued Amateur Radio operations on a secondary basis in the shared A Block (2305-2310 MHz). More importantly, there is no showing whatsoever that Amateur Radio operations in the 2300-2305 MHz band, immediately adjacent to WCS Block A, would be protected from increased out-of-band emissions (OOBE) after the proposed rule

changes set forth in the Petition are implemented, and after AT&T's air-to-ground LTE service is launched. The Petition is therefore incomplete and fails to justify the relief requested.

2. Specifically, AT&T asks, among other things, for: (1) the adoption of a definition of "Avionics station" in Section 27.4 of the WCS rules, which would be defined broadly as "a station on an aircraft that is part of a service using the 2305-2320 MHz and 2345-2360 MHz bands" and would include multiple transceivers operating as a single system;<sup>3</sup> (2) adoption of a new rule section that would impose large-scale deployment of air-to-ground systems in this band (not just the C and D Blocks); (3) creation of a peak EIRP for base and fixed stations of up to 2 kilowatts with an exception for D Block base stations which could transmit at up to 2 kilowatts *average* EIRP; (4) *average* EIRP limits of 50 milliwatts per 1 megahertz of authorized bandwidth for mobile and portable stations operating in, *inter alia*, the band 2305-2315 MHz (the A Block); (5) for mobile and portable stations operating in the 2305-2315 MHz band using Time Division Duplexing (TDD) technology, duty cycles up to 38 percent; (6) adoption of rules permitting "avionics stations" to transmit at up to 8 watts at flight elevations between 10,000 and 20,000 feet, with higher power permitted above those flight elevations.<sup>4</sup> In addition to these and other proposals in the Petition, AT&T requests that out-of-band emissions become negotiable by private agreement among "all affected licensees."

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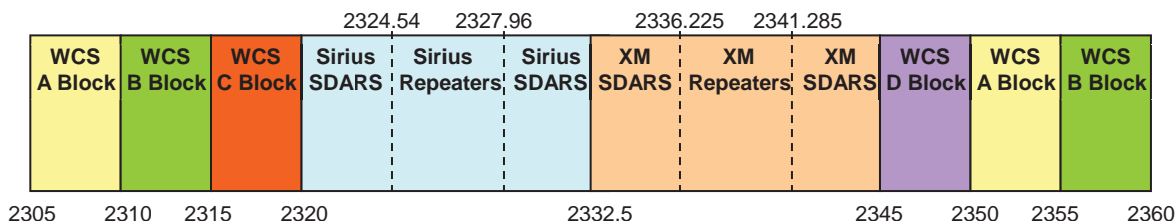
<sup>3</sup> This is an odd use of the term "avionics" which is generally understood to refer to the electronic equipment incorporated in the aircraft for operations purposes, rather than communications systems for use by airline passengers. The uses of the term in Part 87 of the Commission's rules (*See*, 47 C.F.R. §§ 87.5; 87.133, and 87.137) do not support the inappropriately broad use of the term in this context. What AT&T is really referring to is an aeronautical mobile service station.

<sup>4</sup> At footnote 16 of its Petition, AT&T states that if it cannot satisfy Sirius XM that the technical requirements proposed above do not prevent "Harmful Interference" to SDARS operations by Sirius XM, it will amend its Petition to specify lower EIRP levels for avionics stations operating in WCS allocations. It makes no such offer with respect to Amateur Radio adjacent band operations, and there is no showing made whatsoever in the Petition relative to the impact of this proposal on Amateur Radio operations in either the 2305-2310 MHz band or the 2300-2305 MHz band.

3. Though the AT&T Petition, at pages 6-8, suggests the adoption of detailed “special coordination requirements” as between WCS licensees and SDARS operations, there is no mention of any coordination requirement, real-time or prior to initiation of operation, relative to Amateur Radio operations. Yet, at the top of page 9 of the Petition, AT&T makes the startling statement that “(c)ombined, these proposed technical restrictions and coordination requirements clearly provide adequate interference protection to adjacent band operations.” The statement is of course incorrect. There is no showing at all, nor even a mention, of Amateur Radio operations at 2300-2305 MHz, which is adjacent to WCS Block A, and there is no mention of the overlap at 2305-2310 MHz between WCS Block A and the Amateur Service’s secondary allocation.

## **II. The Commission has, to Date, Failed to Protect Amateur Radio Operations at 2300-2305 MHz from WCS Out-of-Band Emissions.**

4. The Amateur Radio Service has a secondary allocation at 2300-2310 MHz. The 2305-2310 MHz segment of this allocation overlaps WCS Channel Block A:



The lower half of the Amateur allocation, 2300-2305 MHz, though secondary as well, is secondary to no other radio service. That band is regularly and substantially utilized by radio Amateurs for narrowband (i.e. 3 kilohertz bandwidth emissions or less) long-distance propagation communications using exceptionally weak received signal levels, most especially around and just above 2304 MHz; and for other purposes. The type of Amateur Radio operation conducted at 2300-2305 MHz has proven over time to be completely compatible with NASA

deep-space research and other operations below 2300 MHz, and the ambient noise levels in the 2300-2305 MHz band are historically very low, making the band attractive for Amateur weak-signal, long-distance communications, the principal Amateur use of that segment. WCS fixed operations, though at high power, have not to date proven a significant noise source at 2300-2305 MHz. This is due perhaps to the relative absence of deployed WCS operation to date. For the same reason, the band 2305-2310 MHz has been useful for some types of Amateur Radio communications, though it is well-understood that in the A Block, WCS operations take precedence: At 2305-2310 MHz, Amateur operations are secondary to WCS operations and are not protected from interference from WCS facilities. However, WCS has no allocation below 2305 MHz. The Commission's rules are quite clear that WCS licensees enjoy no entitlement to disrupt adjacent band radio service operations.<sup>5</sup>

5. Prior to August of 1995, the 2300-2310 MHz band was shared successfully between the Federal Government and the Amateur Service. The Amateur Service held a secondary allocation relative to the Federal government in that segment. The band 2300-2310 MHz was among several bands reallocated from Federal government use for non-government use pursuant to the Omnibus Budget Reconciliation Act of 1996. Title VI of that Act required that the Secretary of Commerce, in making reallocations of government spectrum shared with the Amateur Service, determine the extent to which, in general, commercial users could share the frequencies to be reallocated with Amateur Radio licensees. The Consolidated Omnibus

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<sup>5</sup> See, Section 2.102(f) of the Commission's Rules [47 C.F.R. § 2.102(f)] which states that "(t)he stations of a service shall use frequencies so separated from the limits of a band allocated to that service as not to cause harmful interference to allocated services in immediately adjoining frequency bands." This rule is taken almost verbatim from the international Radio Regulations. RR 4.5 states as follows: "The frequency assigned to a station of a given service shall be separated from the limits of the band allocated to this service in such a way that, taking account of the frequency band assigned to a station, no harmful interference is caused to services to which frequency bands immediately adjoining are allocated." The obligation to protect adjacent band services is not based solely on domestic decisionmaking. It is also an international treaty obligation, binding on the Commission.

Appropriations Act of 1997 very specifically ordered that the Commission make available for auction the bands 2305-2320 MHz and 2345-2360 MHz to wireless services that are consistent with international allocations agreements. Therefore, neither Congress nor the Commission at any time envisioned or considered any allocation for WCS (or any other radio service other than the Amateur Service) below 2305 MHz. The continued Amateur secondary status at 2300-2305 MHz that prevails to the present date is therefore historical rather than intentional, and relates only to the priority of the Amateur Service relative to the (formerly primary) Federal government uses. Amateur Radio was never secondary in that band to any non-government service. Only the 2305-2310 MHz portion of the 2300-2310 MHz secondary Amateur allocation is secondary to WCS, and hence subject to any interference from WCS facilities above 2305 MHz.

6. The Commission most recently revised the WCS rules in 2010. In a *Report and Order and Second Report and Order* adopted in May 2010 in WT Docket No. 07-293 and IB Docket No. 95-91, the Commission amended the Part 27 rules governing WCS mobile and portable devices operating in the 2305-2320 MHz and 2345-2360 MHz bands to facilitate the provision of mobile broadband services.<sup>6</sup> The 2010 *Report and Order and Second Report and Order* created a situation in which: (1) mobile broadband devices would proliferate at and above 2305 MHz; which (2) would be operated in close geographic proximity to Amateur stations operating in the 2300-2305 MHz band. The *Report and Order and Second Report and Order* amended the Part 27 rules so as to delete the effective limitations on WCS terrestrial operations to fixed services, and to enable licensees to provide mobile broadband services in 25 megahertz of the WCS band. There was no consideration given in that proceeding to interference protection following these

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<sup>6</sup> See Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, WT Docket No. 07-293, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Band, IB Docket No. 95-91, *Report and Order and Second Report and Order*, 25 FCC Rcd 11710 (2010); *Order on Reconsideration*, 27 FCC Rcd. 13651 (2012).

rule changes for the Amateur Radio Service. In fact, the Commission stated at Footnote 405 of the 2010 *Report and Order and Second Report and Order* that OOB from WCS, when expanded to permit mobile broadband and portable devices at up to 250 mW EIRP, would have an adverse effect on Amateur operations at 2300-2305 MHz:

We note that some amateur stations operating around 2304 MHz may experience an increased antenna noise temperature caused by the implementation of mobile WCS operations, and will have to tolerate this change in the RF environment. Due to the technical flexibility allowed to amateur stations in Part 97 of our rules, however, we believe that operators of these stations may be able to offset or mitigate the effects of this change by relocating or redirecting their antennas, or by making other permitted technical adjustments.

7. ARRL filed a *Petition for Clarification or Partial Reconsideration* in Docket 07-293, objecting to the failure of the Commission to protect Amateur operation at 2300-2305 MHz from WCS interference, noting that: (A) It is in most cases impossible to “relocate” an Amateur antenna array (especially for the 2300-2305 MHz band), as those are typically fixed directional arrays mounted at high elevations above ground. (B) “Redirecting” a directional antenna is possible in some instances, assuming that the station from which an Amateur station desires to receive signals is not located on or near an azimuth that includes a mobile broadband device, in which case the Amateur communication would be precluded. In any case, however, (C) The operation of mobile broadband devices can be anticipated to be ubiquitous, making the “redirecting” of Amateur antennas an exercise in futility.

8. ARRL also argued that interference cannot be avoided from an incompatible use in an adjacent band notwithstanding the technical competence of licensed radio Amateurs. The location of Amateur stations operating at 2300-2305 MHz is in residences, typically, where they may be in close geographic proximity to WCS fixed or mobile devices (including AT&T’s ground facilities, and the high gain antennas will be unable to avoid AT&T’s “avionics” aboard

aircraft). ARRL objected to the Commission's practice of making allocation decisions which place incompatible uses in close proximity to Amateur stations and then place on the Amateur licensees the burden of avoiding the interference. Finally, ARRL noted the Commission's failure to abide by Section 2.102(f) of the Commission's Rules, because it did not ensure that "(t)he stations of a service shall use frequencies so separated from the limits of a band allocated to that service as not to cause harmful interference to allocated services in immediately adjoining frequency bands."

9. On reconsideration in Docket 07-293, however, the Commission refused to clarify that it is clearly the obligation of WCS mobile facilities providers to avoid interference to Amateur stations operating in the band 2300-2305 MHz. Nor did it explain why it was not adhering to Section 2.102(f) or justify the departure from its longstanding obligation. Any liberalization of the Part 27 rules in response to AT&T's current Petition will similarly be inconsistent with Section 2.102(f) of the Commission's rules and RR4.5 of the international Radio Regulations.

### **III. The Commission Should Elevate the Amateur Service Allocation at 2300-2305 MHz to Primary.**

10. It is obvious that the result of the AT&T Petition will be a virtual preclusion of Amateur access to the 2305-2310 MHz segment. A ubiquitous air-to-ground system which operates at and above 2305 MHz will clearly render the secondary allocation status of that segment a virtual nullity. The Commission should, as a matter of fundamental fairness, take this opportunity to do now what it failed to do in Docket 07-293: (1) clarify the obligation of WCS licensees in all contexts to protect the adjacent band Amateur Service operations at 2300-2305 MHz from harmful interference; and (2) acknowledge the *de facto* primary status of the Amateur Service allocation and to finally take the action long overdue and elevate that status *de jure* from secondary to primary at 2300-2305 MHz. Unless the Commission takes these actions



contemporaneously with any affirmative action on the AT&T Petition, ARRL submits that the rule changes proposed in the AT&T Petition should be denied. In any case, the Commission should not take any action on the AT&T Petition without a technical record establishing compatibility between the proposed air-to-ground LTE service proposed by AT&T and adjacent-band Amateur operation at 2300-2305 MHz.

Therefore, for all of the above reasons, ARRL, the national association for Amateur Radio respectfully requests that the Commission (1) elevate the Amateur Radio Service allocation at 2300-2305 MHz from secondary to primary in the domestic table of allocations; (2) clarify the obligation of WCS licensees in all contexts, including AT&T's proposed air-to-ground LTE service, to protect the adjacent band Amateur Service operations at 2300-2305 MHz from harmful interference; and (3) call for a complete technical compatibility showing and

interference analysis to be provided by the AT&T parties, demonstrating compatibility between the proposed air-to-ground LTE service and the Amateur Service operations at 2300-2305 MHz, all in accordance with the foregoing.

Respectfully submitted,

**ARRL, THE NATIONAL ASSOCIATION FOR  
AMATEUR RADIO**

225 Main Street  
Newington, CT 06111-1494

By: Christopher D. Imlay  
Christopher D. Imlay  
Its General Counsel

BOOTH, FRERET & IMLAY, LLC  
14356 Cape May Road  
Silver Spring, MD 20904-6011  
(301) 384-5525

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