

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

In the Matter of

Additional Spectrum for Unlicensed
Devices Below 900 MHz and in the 3 GHz
Band

IB Docket No. 02-380

To: The Commission

REPLY COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association (“SIA”) replies to the comments filed in response to the Notice of Inquiry (“*Notice*”) in the above-captioned proceeding.¹ SIA’s opening round comments addressed whether unlicensed devices should be permitted to operate, with power levels as much as 1 watt or more, in the 3650-3700 MHz band. Through a detailed technical analysis, SIA demonstrated that the unlicensed operations in the so-called “extended C-Band” likely would interfere with co-frequency incumbent Fixed-Satellite Service (“FSS”) operations as well as FSS operations in the adjacent conventional C-band.

None of the comments filed present evidence that undermine SIA’s interference analysis. Indeed, only a few commenters express more than perfunctory support for

¹ *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, Notice of Inquiry*, ET Docket No. 02-380, FCC 02-328 (Dec. 20, 2002) (“*Notice*”).

unlicensed operations in the extended C-band, and none demonstrate any compelling need for such use. As a result, the record in this proceeding reflects widespread and appropriate skepticism regarding permitting unlicensed devices to use the extended C-band given the impossibility of a global allocation, the difficulty in assessing interference from future fixed service networks whose designs are inchoate and whose emissions are not yet capped, on top of the further challenge of protecting co- and adjacent-frequency Fixed Satellite Service (FSS) operations. Therefore, SIA urges the Commission to eliminate the 3650-3700 MHz band from consideration for additional deployment of unlicensed services.

I. WITHOUT A GLOBAL ALLOCATION, THE 3650-3700 MHZ BAND IS UNSUITABLE FOR UNLICENSED DEVICES

The FCC's *Notice* speculated that the extended C-band might be a future home for unlicensed devices, including "Wi-Fi" applications.² SIA's opening comments questioned the need for designating the 3650-3700 MHz band for unlicensed use, in view of the fact that the nearby 2.4 GHz and 5 GHz bands are the international standards.³ The record confirms that globally harmonized spectrum is "essential" for "continued development of a wide variety of [unlicensed] products and applications,"⁴ because "potential for worldwide sales and deployment" generates the necessary interest and excitement among users and manufacturers.⁵ The Bluetooth SIG explains that global harmonization "bolsters manufacturers' confidence in their ability to sell products

² *Notice* at ¶¶ 6-8, 17-21.

³ Comments of the Satellite Industry Association at 12 ("SIA Comments").

⁴ Comments of Ericsson Inc. at 3 ("Ericsson Comments").

⁵ Comments of the Bluetooth SIG at 4 ("Bluetooth SIG Comments").

worldwide, which in turn justifies their investment in new design and innovation.”⁶

Thus, as noted by IEEE, global spectrum harmonization and the resultant expansion of markets are critical to “promote further innovation and help to reduce costs to consumers through economies of scale.”⁷

The 3650-3700 MHz band is allocated and intensely used for FSS operations throughout ITU Regions 1 (Europe/Africa) and 3 (Asia), precluding any international designation for unlicensed or Wi-Fi devices.⁸ As a result, most commenters addressing this question concur with SIA that the extended C-band is *not* needed for unlicensed devices, especially the Wi-Fi-type systems envisioned by the agency. So, for example, IEEE and Ericsson concede that the lack of a globally harmonized allocation for unlicensed devices in the band likely will dampen incentives for development in this band.⁹ Ericsson amplifies that a single-nation band designation “creates particular problems for short-range radiocommunication devices both in terms of inefficient or fragmented use of spectrum and in an inability to capitalize on the benefits derived from economies of scale.”¹⁰ Indeed, Ericsson warns that additional U.S.-only, non-standard unlicensed spectrum could hinder development in other, globally-allocated bands.¹¹

⁶ Bluetooth SIG Comments at 5.

⁷ Comments of IEEE 802.18 at ¶ 13 (“IEEE Comments”).

⁸ See ITU Radio Regs, Art. 5; 47 C.F.R. § 2.106 (2003).

⁹ Ericsson Comments at 5; see also IEEE Comments at ¶ 10.

¹⁰ Ericsson Comments at 5.

¹¹ *Id.* at 3.

SIA and others agree that unlicensed devices in the extended C-band will not be able to take advantage of economies of scale from global demand, a large manufacturing base, roaming and reduced complexity of equipment. Thus, as Ericsson concluded, unlicensed operations at 3650-3700 MHz could “lead to market fragmentation and thereby detract from the Commission’s overarching goal to promote competition, a diversity of affordable devices and applications, and spectrum efficiency.”¹² Accordingly, the record in this proceeding does not suggest any public interest in authorizing unlicensed devices to use the extended C-band.

II. FUTURE UNLICENSED OPERATIONS MAY BE PRECLUDED BY PLANNED CO-FREQUENCY FIXED SERVICES NETWORKS AND, IN ANY EVENT, MUST AWAIT FINAL FS SERVICE RULES

SIA’s opening comments reminded the agency that any interference analysis addressing the suitability of adding unlicensed equipment into the extended C-band also must consider interference arising from the operation of Fixed Service (“FS”) transmitters.¹³ The Commission has reallocated this band from government to commercial use for fixed and mobile (base stations only) terrestrial services, but has not finalized service rules or auctioned licenses. Because the interference from unlicensed and FS uses would be cumulative, SIA demonstrated that the interference modeling necessary to protect satellite earth station operations from unlicensed device emissions cannot be finalized absent the completion of the somewhat similar modeling to protect

¹² *Id.* at 4-5.

¹³ SIA Comments at 5-7.

FSS from future co-frequency fixed services, which is being addressed in the Fixed Service rulemaking.¹⁴

The record in this proceeding reflects substantial and widespread concern over the unresolved Fixed Service sharing issues. As several commenters noted, unlicensed devices are secondary to any licensed uses. Thus, they question whether the future deployment of Fixed Services in this band will permit the concurrent use of unlicensed devices on a non-interference basis.¹⁵ Indeed, commenters suggest that future Fixed Service deployment (on top of the existing FSS operations) may make sharing by ubiquitously deployed unlicensed devices “technically challenging, or even infeasible.”¹⁶ Intersil Corporation and Symbol Technologies (in their joint comments) and the IEEE recommend abandoning Fixed Services licensing in the extended C-band because “it is hard to see how large numbers of unlicensed devices could operate on a non-interference

¹⁴ *Amendment of the Commission’s Rules with Regard to the 3650-3700 MHz Government Transfer Band*, First Report and Order and Second Notice of Proposed Rule Making, 15 FCC Rcd 20488 (2000). Several petitions for reconsideration filed by satellite operators are pending in that proceeding. See Extended C-Band Ad Hoc Coalition, Petition for Reconsideration and Comments, Docket No. 98-237 (filed Dec. 18, 2000); Lockheed Martin Corporation, Petition for Reconsideration, Docket Nos. 98-237 and 00-32 (filed Dec. 14, 2000); Inmarsat Ltd., Petition for Reconsideration of the First Report and Order, Docket Nos. 98-237 and 00-32 (filed Dec. 18, 2000); EchoStar Satellite Corporation, Petition for Clarification and, If Necessary, Reconsideration of the First Report and Order and Comments to the Second Notice of Proposed Rule Making, Docket Nos. 98-237 and RM-9411 (filed Dec. 18, 2000).

¹⁵ Comments of Motorola, Inc. at 9 (“Motorola Comments”); IEEE Comments at ¶ 10; Joint Comments of Intersil Corporation and Symbol Technologies, Inc. at 7 (“Intersil Comments”).

¹⁶ IEEE Comments at ¶ 7.

basis in the basis of arbitrary numbers of fixed links.”¹⁷ For example, the IEEE states that even very low power unlicensed devices are likely to have difficulty avoiding interference to wireless local loop or fixed wireless access (FWA) terminals in the homes of end-users or their neighbors.¹⁸ Because the Fixed Service is likely to “ultimately occupy the entire band rather ubiquitously” even at a modest growth rate, any future Part 15 devices “would likely ultimately be forced to cease operation.”¹⁹

SIA already has shown that studies identifying a mechanism for sharing between unlicensed devices and FSS operations cannot be separated from the related investigation into sharing between the FS and FSS. Thus, potential operators of unlicensed devices in the extended C-band cannot now model the pattern of expected primary services, or even the expected noise floor. All this will undermine any incentives to develop standards and design products for the band, particularly since—as detailed above—the 3650-3700 MHz spectrum would be, at most, an unlicensed device “orphan band.” Within the next few months, the FCC will auction new Fixed Service licenses in the band, making the extended C-band even more intensely used than today. Let that be enough; the FCC should not simultaneously propose adding unlicensed products into the 3650-3700 MHz band.

III. COMMERCIALLY VIABLE UNLICENSED PRODUCTS CANNOT PROVIDE SUFFICIENT INTERFERENCE PROTECTION TO INCUMBENT FSS EARTH STATION OPERATIONS

¹⁷ Intersil Comments at 7; *see also* IEEE Comments at ¶ 8 (“If the Commission were to abandon its proposal for the licensed use of its band... it could be a much more valuable resource for some types of unlicensed operations”).

¹⁸ IEEE Comments at ¶ 10.

¹⁹ *Id.*

By definition, unlicensed devices operate at sufferance to licensed radio services (including both primary and secondary operations) and can be authorized only on an unprotected, non-interference basis.²⁰ SIA demonstrated in its opening comments that secondary unlicensed operations would cause significant interference to incumbent FSS operations.²¹ SIA first noted that primary “grandfathered” and secondary extended C-band earth stations typically are licensed to communicate with a range of satellites in various orbit locations, thus dramatically increasing any required earth station protection zone. SIA next demonstrated that, unless unlicensed devices were limited to commercially impracticable power levels, the required exclusion zones would be quite large (extending, in many cases, to the radio horizon), and would encompass significantly populated areas (including most of the Northeast Corridor and much of the states of California, Washington, Florida and Tennessee). Prohibiting unlicensed devices from those zones, even if practical from an enforcement perspective, would effectively foreclose any mass market.²² Furthermore, given the necessity to protect *adjacent channel* FSS operations in the conventional C-band,²³ any unlicensed device exclusion zone might grow to be, effectively, nationwide.

Only a few parties actually support authorizing unlicensed devices in the extended C-band. Significantly, no commenter supplied any sharing analysis or technical

²⁰ 47 C.F.R. § 15.5 (2003).

²¹ SIA Comments at 7-11; 14-21.

²² See SIA Comments at 21 (showing exclusion zones). Thus, AT&T’s claim that its own six C-band earth stations generally are located in remote locations is not representative of FSS earth station licensees as a whole. Cf. Comments of AT&T Corp. at 4 (“AT&T Comments”).

²³ See SIA Comments at 10-11.

description of the power and other capabilities of future unlicensed equipment in the band.²⁴ At best, the record contains a few cursory suggestions on how to address the interference problem in this band. As explained below, these suggestions fall well short of ensuring that any commercially viable unlicensed device design (especially those operating at one watt or more) could transmit without interfering with incumbent FSS operations.

AT&T and Comsearch recommend restricting user behavior in order to prevent interference. Without providing any engineering analysis, AT&T endorses the geographic restrictions suggested in the *Notice*,²⁵ and Comsearch proposes that the Commission require registration and coordination of unlicensed devices by end-users in this band.²⁶ But other commenters correctly identify the weakness in that approach.²⁷ Radio Shack accurately warns that such measures would “be very unpopular with

²⁴ See, e.g., Comments of the Coalition of Program Networks and Distributors, Broadcast Networks, Satellite Operators and Others at 2 (stating that the commenters, while not opposing unlicensed use, have not conducted any independent analysis to assess the interference risks); Comments of the American Petroleum Institute at 5-6 (supporting unlicensed use without discussion of interference mitigation measures); Comments of the Land Mobile Communications Council at 11 (same); Comments of the New America Foundation, Consumers Union, Consumer Federation of America, Media Access Project, Center for Digital Democracy, Public Knowledge, and the Benton Foundation at 6 (same).

²⁵ See AT&T Comments at 4-5; *Notice* at ¶ 21.

²⁶ Comments of Comsearch at 2-3.

²⁷ Comsearch provides no engineering basis behind supporting the designation of extended C-band for unlicensed devices. Rather, Comsearch’s interest in this docket appears to stem from a hope that it ultimately might be selected as the band’s frequency coordinator, permitting it to charge additional fees for inter-network coordination. Comsearch’s narrow pecuniary interest, however, hardly provides the necessary *public* interest justification to sustain additional sharing in the 3650-3700 MHz band.

consumers.”²⁸ Given that the hypothesized unlicensed devices could be sold directly to consumers and—possibly—designed as portable, even Radio Shack concedes that enforcement of geographic restrictions would be ineffective.²⁹

The *Notice* mentioned including embedded GPS location capability, and Intersil and Symbol Technologies suggest that the FCC might require the devices to disable automatically when within interfering distance of an incumbent earth station.³⁰ Again, however, embedding GPS and mandating automatic shutdown hardly is a universal panacea. Such a consolidated device would be more expensive, and the IEEE correctly doubts that the low-price consumer product envisioned for this band could support the costs.³¹ Moreover, IEEE also properly observes that a GPS solution could not comprehensively address interference from unlicensed consumer products intended to be used indoors (out of the range of GPS).³² Thus, mandating GPS, and a shut-down circuit, might be—at best—an additional technique to help mitigate interference caused by 3650-3700 MHz unlicensed devices.³³ Nonetheless, because the record does not establish that either manufactures or users of unlicensed devices in the extended C-band could meet their obligation to avoid harmful interference with licensed services, the FCC should not propose additional operations in the 3650-3700 MHz band.

²⁸ Comments of RadioShack Corporation at 3-4.

²⁹ *Id.*

³⁰ Intersil Comments at 6.

³¹ IEEE Comments at ¶ 10.

³² *Id.*

³³ *Id.*

IV. CONCLUSION

For the reasons set forth above and in SIA's initial comments, unlicensed devices do not require (and may not be able to use effectively) the 3650-3700 MHz band. Moreover, the record does not establish that unlicensed devices could provide adequate interference protection to existing licensees. Therefore, the Commission should refrain from proposing to authorize unlicensed devices in the 3650-3700 MHz band.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Richard DalBello". The signature is stylized with a large initial "R" and "D".

Richard DalBello, President

SATELLITE INDUSTRY ASSOCIATION

May 16, 2003