

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

In the Matter of)
)
FCC Seeks Comment on the National) ET Docket No. 00-258
Telecommunications and Information)
Administration’s Report “An Assessment of the)
Viability of Accommodating Advanced Mobile)
Wireless (3G) Systems in the 1710-1770 MHz)
and 2110-2170 MHz Band”)

JOINT COMMENTS OF SIRIUS SATELLITE RADIO INC. AND XM RADIO INC.

Sirius Satellite Radio Inc. (“Sirius”) and XM Radio Inc. (“XM Radio”) (collectively, the “Satellite Radio Licensees”) hereby file these Comments in the above-captioned proceeding in which the Commission is considering a Report filed by the National Telecommunications and Information Administration (“NTIA”) concerning accommodating third-generation wireless systems in the 1710-1770 MHz and 2110-2170 MHz bands. Sirius and XM Radio urge the Commission to ensure that any incumbent spectrum users in these bands that are relocated to the 2360-2395 MHz band do not interfere with satellite radio operating in the 2320-2345 MHz band and that the Satellite Radio Licensees are not subjected to new coordination obligations with users relocated to this band.

Background

In 1995, the Commission allocated spectrum in the S-band to the Satellite Digital Audio Radio Service (“SDARS” or “satellite radio”). XM Radio and Sirius were the winning bidders in the SDARS auction held in April 1997, together committing nearly \$170 million to the U.S.

Treasury.¹ XM Radio was awarded the license to provide satellite radio service in the 2332.5-2345 MHz band and Sirius was awarded the license for the 2320-2332.5 MHz band. As the Commission has repeatedly recognized, this new consumer-based mass media service promises enormous public interest benefits for the U.S. public.² Since their licensing, XM Radio and Sirius have made extraordinary progress in the development of their satellite radio systems. Both licensees have successfully launched their satellites, deployed in-band terrestrial repeaters in some markets to fill gaps in satellite coverage, and have initiated commercial service, providing high-quality, continuous, nationwide digital multichannel audio service.

Protection of Satellite Radio from Interference from Adjacent-Band Services. As the Satellite Radio Licensees have explained in a number of Commission proceedings, satellite radio is unique among services the Commission regulates because it is the only service that possesses three characteristics – satellite, mobile, and mass media -- that make interference of greater potential and greater concern.³ First, as a satellite service, satellite radio is necessarily more

¹American Mobile Radio Corporation, 13 FCC Rcd 8829 (Int'l Bur., 1997); Satellite CD Radio, 13 FCC Rcd 7971 (Int'l Bur., 1997).

²See, e.g., Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Report and Order, Memorandum Opinion and Order*, 12 FCC Rcd 5754, ¶ 1 (1997) (“SDARS Order”).

³Sirius and XM Radio have discussed the susceptibility of satellite radio to interference from out-of-band emissions in the following proceedings: Amendment of Part 18 of the Commission’s Rules to Update Regulations for RF Lighting Devices, *Notice of Proposed Rulemaking*, 13 FCC Rcd 11307, ET Docket 98-42 (1998) (“RF Lighting Proceeding”); Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems, *Notice of Proposed Rulemaking*, ET Docket 98-153 (May 11, 2000) (“UWB Proceeding”) (petitions for reconsideration pending); Garmin International, Inc., *Notice of Proposed Rulemaking*, WT Docket No. 01-339 (Dec. 20, 2001) (“Family Radio”); Review of Part 15 and Other Parts of the Commission’s Rules, *Notice of Proposed Rulemaking and Order*, ET Docket No. 01-278 (Oct. 15, 2001) (“Part 15 Review Proceeding”); Amendments to Parts 1, 2, 27 and 90 of the Commission’s Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands, WT Docket No. 02-08 (petitions for reconsideration pending).

vulnerable to interference than terrestrially based services, but no more vulnerable than other mobile satellite service systems in existence today.⁴ Reception of satellite radio signals depends on the transmission of a signal from a satellite thousands of miles away to a very small aperture, low gain antenna. While the SDARS satellites are state-of-the-art and among the most powerful communications satellites ever manufactured, the downlink signal power available to the receiver is much lower than terrestrial-based communications systems, thereby requiring very sensitive satellite radio receivers.⁵ Second, satellite radio is primarily a mobile service.⁶ This eliminates the ability to enter into prior coordination agreements with sources of interference. Satellite radio receivers also use omnidirectional antennas that eliminate the ability to “point” an antenna away from a source of interference.⁷ Third, satellite radio providers must achieve 99.9% availability to satisfy consumer expectations for quality of service.⁸ For some services, such as

⁴See Petition for Reconsideration of XM Radio Inc., WT Docket No. 02-8, at 2 (July 22, 2002); Joint Petition for Partial Reconsideration of XM Radio and Sirius, ET Docket No. 98-153, at 2 (June 17, 2002); Comments of XM Radio, ET Docket No. 01-278, at 3 and Exhibit A (Feb. 12, 2002); Comments of Sirius, ET Docket No. 01-278, Exhibit A at 20-26 (Feb. 12, 2002); Comments of XM Radio, ET Docket No. 98-153, at 3 (Sept. 12, 2000).

⁵See Comments of XM Radio Inc., ET Docket No. 01-278, at Exhibit A; Letter from David M. Leive, Counsel for Sirius, to Ms. Marlene H. Dortch, FCC, ET Docket No. 01-278 (April 19, 2002); Comments of Sirius Satellite Radio, ET Docket No. 01-278, Exhibit A at 20-26.

⁶See Petition for Reconsideration of XM Radio, Inc., WT Docket No. 02-08, at 2-3; Joint Petition for Partial Reconsideration of XM Radio and Sirius, ET Docket No. 98-153, at 2, 9-10; Reply Comments of XM Radio, ET Docket No. 01-278, at 8 (March 12, 2002); Comments of XM Radio, ET Docket No. 01-278, at 3, 18; Comments of Sirius, ET Docket No. 01-278, Exhibit A, at 20.

⁷See Petition for Reconsideration of XM Radio, Inc., WT Docket No. 02-08, at 3; Joint Petition for Partial Reconsideration of XM Radio and Sirius, ET Docket No. 98-153, at 2; Reply Comments of XM Radio, ET Docket No. 01-278, at 8; Comments of XM Radio, ET Docket No. 01-278, at 18; Comments of XM Radio, ET Docket No. 98-153, at 3.

⁸See Petition for Reconsideration of XM Radio, Inc., WT Docket No. 02-08, at 3; Comments of XM Radio, ET Docket No. 01-278, at 3, 18; *see also* Joint Petition for Partial Reconsideration of XM Radio and Sirius, ET Docket No. 98-153, at 20-21.

cellular service, intermittent interference, some dropped calls, and other annoyances have become commonplace and generally accepted by consumers. For a service such as satellite radio, however, consumers demand nothing less than near perfect continuous, uninterrupted service. Even intermittent interference is unacceptable for consumers who are paying for high-quality, digital audio entertainment.

In adopting out-of-band emission (“OOBE”) limits for Wireless Communications Service (“WCS”) licensees, which operate in the 2305-2320 MHz and 2345-2360 MHz bands adjacent to satellite radio, the Commission accounted for these unique features of satellite radio. The Commission concluded that “[i]n authorizing DARS, it was our desire to ensure a high quality radio service” and that if satellite radio “is subject to excessive interference, the service will not be successful and the American public will not benefit from the service.”⁹ The rules adopted require the power of any emission into the SDARS band from a mobile and most portable WCS transmitters to be attenuated below the transmitter power (p) by a factor of $110 + 10 \log (p)$ dB. *See* 47 C.F.R. §27.53(a)(2). Assuming a 1 Watt WCS mobile transmitter, this equates to a signal level of -80 dBm at the source (5.8 μ V/m at 3 meters). The limit also requires the power of any emission into the SDARS band from a fixed WCS transmitter to be attenuated below the transmitter power (p) by a factor of $80 + 10 \log (p)$ dB. *See* 47 C.F.R. §27.53(a)(1). Assuming a 1 Watt WCS fixed transmitter, this equates to a signal level of -50 dBm at the source (180 μ V/m at 3 meters). The Commission has also negotiated for similar limits in international coordination agreements.¹⁰

⁹Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (“WCS”), *Memorandum Opinion and Order*, 12 FCC Rcd 3977, ¶ 25, 27 (1997) (“WCS Order”).

¹⁰The limit for new Canadian fixed systems into the SDARS band is -155 dBW/m²/4kHz, which is equivalent to 5.5 μ V/m. *See United States and Canada Agree on Conditions for*

Protection of Adjacent-Band Licensees from Satellite Radio Terrestrial Repeaters. The Commission has been conducting a proceeding since 1995 regarding final rules for the operation of in-band satellite radio terrestrial repeaters.¹¹ The Satellite Radio Licensees currently operate terrestrial repeaters pursuant to Special Temporary Authority (“STA”).¹² To protect certain adjacent-band licensees, the Satellite Radio Licensees have entered into coordination agreements with the Aerospace and Flight Test Radio Coordinating Council (“AFTRCC”), an association of aerospace companies licensed to conduct aeronautical telemetry operations in the 2360-2390 MHz band.¹³ This agreement requires the Satellite Radio Licensees and AFTRCC to exchange information regarding the locations of their facilities and requires the Satellite Radio Licensees to calculate the in-band power flux density and out-of-band emissions produced by terrestrial repeaters at aeronautical telemetry facilities. In instances where out-of-band emissions or in-band power flux densities exceed certain levels, the parties agree to coordinate in good faith.

NTIA 3G Report. In the above-captioned proceeding, the Commission is considering a Report prepared by NTIA in which it concludes that the 1710-1755 MHz and 2110-2170 MHz

Implementation of U.S. Satellite Digital Audio Radio Services (DARS) and Canadian Terrestrial Digital Radio Broadcast Services (T-DRB) along the U.S./Canada Border Area, Report No. IN 98-50, News Release (Sept. 3, 1998) at 4 (“Canadian Coordination Agreement”).

¹¹See Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Notice of Proposed Rulemaking*, 11 FCC Rcd 1 (June 15, 1995).

¹²See XM Radio, Inc., *Order and Authorization*, DA 01-2172 (rel. September 17, 2001) (“*XM STA Order*”); Sirius Satellite Radio, Inc., *Order and Authorization*, DA 01-2171 (rel. September 17, 2001) (“*Sirius STA Order*”).

¹³See Letter from Bruce D. Jacobs, Counsel for XM Radio, to Ronald Repasi, FCC, IB Docket No. 95-91 (Sept. 11, 2000); Letter from Jennifer Hindin, Counsel for Sirius, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (Oct. 10, 2000).

bands can be reallocated for third-generation (3G) wireless services.¹⁴ NTIA notes that the 1710-1755 MHz band is currently used exclusively by the federal government, including the Department of Defense (“DOD”), and that the 2110-2170 band is currently occupied by non-government users. *NTIA 3G Report* at 4-5. These spectrum users will need to be relocated to other frequency bands in order to make way for 3G wireless operations. In particular, NTIA states that the DOD will relocate its “airborne operations by December 2008 to other frequency bands, such as the 1755-1850 MHz, 2360-2385 MHz or other telemetry bands; or the 2385-2395 MHz band.” *Id.* at 2-3. In assessing whether 3G system could share the 1710-1755 MHz band with existing DOD aeronautical operations, NTIA notes that there are sixteen DOD sites nationwide used for DOD aeronautical mobile systems and that the potential interference impact from these operations extends to points within line-of-sight of high altitude aircraft. *Id.* at 7. NTIA explains that this interference potential extends into “high population areas in Southern California, most of Nevada, Seattle, much of the Gulf Coast, and major portions of the Eastern seaboard.” *Id.* With respect to aeronautical telemetry operations, NTIA explains that “because of the operating altitude (up to 30,000 ft above mean sea level) of some of the aircraft, a wide area may be illuminated by telemetry signals.” *Id.* at 16.

Discussion

I. THE COMMISSION SHOULD ENSURE THAT ANY SPECTRUM USERS RELOCATED TO THE 2360-2395 MHZ BAND DO NOT INTERFERE WITH SATELLITE RADIO

The Satellite Radio Licensees urge the Commission to ensure that any incumbent spectrum users in the bands designated for 3G that are relocated to the 2360-2395 MHz band or

¹⁴See NTIA, “An Assessment of the Viability of Accommodating Advanced Mobile Wireless (3G) Systems in the 1710-1770 MHz band 2110-2170 MHz Band” (July 22, 2002) (“*NTIA 3G Report*”).

other nearby bands do not interfere with satellite radio operations in the 2320-2345 MHz band. In its Report, NTIA mentions only DOD airborne operations as possibly relocating to the 2360-2395 MHz band. *NTIA 3G Report* at 2. As NTIA recognizes, aeronautical operations are likely to cause interference given that high altitude aircraft illuminate large areas and are within line-of-sight of numerous victim facilities. *Id.* at 7, 16. The potential interference to satellite radio from aeronautical operations is particularly acute as satellite radio receiver antennas are predominantly located on the roofs of automobiles in order to have a clear line of sight to SDARS satellites. As a result, these antennas will also be in line-of-sight of aircraft. To ensure that satellite radio is protected from interference from these potential new spectrum neighbors, the Satellite Radio Licensees urge the Commission to adopt the same out-of-band emission limits for new operators in the 2360-2395 MHz band that currently apply to mobile devices of WCS licensees operating in the 2305-2320 MHz and 2345-2360 MHz bands. *See* 47 C.F.R. § 27.53(a)(2).¹⁵ In 1997, the Commission found that this limit would be sufficient to avoid interference to satellite radio from mobile WCS devices.¹⁶

¹⁵The Commission recently rejected XM Radio's request that this limit be extended to the new licensee in the recently reallocated 2385-2390 MHz band. *See* Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands, *Report and Order*, WT Docket No. 02-08, FCC 02-152 (rel. May 24, 2002) ("*Order*"). XM Radio's Petition for Reconsideration of this decision is pending. *See* Petition for Reconsideration of XM Radio Inc., WT Docket No. 02-8, at 2 (July 22, 2002).

¹⁶Sirius and XM Radio have also urged the Commission to apply to ultra-wideband and 2.4 GHz unlicensed devices, including RF lights, an OOB limit of 8.6 μ V/m at 3 meters in the SDARS band. *See* Sirius and XM Radio filings in ET Docket 98-153 (UWB); ET Docket 98-42 (RF lighting); ET Docket No. 01-278 (2.4 GHz unlicensed devices). Sirius and XM Radio would find this limit for new operators in the 2360-2395 MHz band equally acceptable to the OOB limit for WCS mobile devices.

II. SATELLITE RADIO LICENSEES SHOULD NOT BE REQUIRED TO TAKE EXTRAORDINARY MEASURES TO PROTECT NEW USERS IN THE 2360-2395 MHZ BAND

The Satellite Radio Licensees urge the Commission to ensure that they are not burdened with new coordination obligations to protect spectrum users relocated to the 2360-2395 MHz band. As the Commission has explained, the “first-in-time” concept, whereby a “newcomer” is responsible for taking whatever steps may be necessary to eliminate objectionable interference, is a mainstay of the Commission’s interference protection policies.¹⁷ These same policies should be extended to relocated users in the 2.3 GHz band. While the current coordination agreement between AFTRCC and the Satellite Radio Licensees has worked effectively, there should be no need for incumbent satellite radio licensees in the 2.3 GHz band to take extraordinary actions to protect newcomers to the band.

¹⁷See Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, 14 FCC Rcd 20912, ¶ 211 and n. 498 (December 9, 1999).

Conclusion

Sirius and XM Radio urge the Commission to act consistently with the view expressed herein.

Respectfully submitted,

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