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**FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY**

Ms. Magalie Roman Salas  
Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, D.C. 20554

**RE: XM Radio Inc.  
Ex Parte Submission  
IB Docket No. 95-91**

Dear Ms. Salas:

XM Radio Inc. ("XM Radio"), by its attorneys, hereby submits a draft rule for the operation of DARS terrestrial repeaters. The Notice of Proposed Rulemaking regarding repeaters was issued over four years ago.<sup>1</sup> During the past four years, XM Radio has submitted ample information regarding its planned repeater deployment on a number of occasions, providing more than adequate notice to Wireless Communications Services ("WCS") licensees.<sup>2</sup> Despite this, some WCS licensees are now concerned that DARS terrestrial repeaters operating at power levels higher than 2 kW EIRP might interfere with WCS operations.

AT&T Wireless Services ("ATTWS") recently disclosed that its concerns with terrestrial repeaters are based on its having designed the front end of its receivers to tune to the entire 2305 – 2360 MHz band, covering both the WCS and the DARS band, and that it has no filtering to eliminate DARS transmissions in the 2320 – 2345 MHz band. Rather than requiring XM Radio to bear the cost of ATTWS's failure to adopt reasonable engineering practices, the more equitable solution to ATTWS's problem is to require ATTWS to use better designed receivers and appropriate filtering. Such receivers can be deployed without adding significant cost. Indeed, affordable consumer receivers being deployed by XM Radio and Sirius Satellite Radio,

<sup>1</sup> Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, Report and Order and Further Notice of Proposed Rulemaking, 12 FCC Rcd 5754 (March 3, 1997).

<sup>2</sup> See Letter from William Garner, American Mobile Radio Corporation, to Rosalee Chiara, FCC (filed Nov. 14, 1997); Supplemental Comments of XM Radio Inc. (filed Dec. 17, 1999); Consolidated Reply of XM Radio Inc. (filed Mar. 8, 2000).

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the other DARS licensee, provide sufficient protection from each others' transmitters on immediately adjacent frequencies, a more challenging task than that faced by WCS licensees.

Despite ATTWS's design flaws and the ample notice DARS licensees have provided over the past four years, XM Radio nevertheless seeks to address the concerns of WCS licensees by committing in the attached rule to a detailed coordination procedure for certain repeaters. This commitment does not reflect a concession that the WCS licensees' interference concerns are legitimate, but rather reflects XM Radio's good faith attempt to finally resolve the last regulatory issue remaining before XM Radio can provide its long-awaited digital radio service to the public.<sup>3</sup>

The attached rule provides for three categories of repeaters: (i) low power; (ii) medium power; and (iii) high power.

*(i) Low Power Repeaters.* These are repeaters that operate at an EIRP of 2 kW or less. There should be no unusual restrictions on the deployment of these repeaters, since they operate at a power level this is completely standard in this part of the spectrum.

*(ii) Medium Power Repeaters.* The draft rule provides for a new category of "medium power" repeaters, which are defined as repeaters operating with an EIRP between 2 kW and 10 kW. These repeaters are being deployed as modifications to certain low power repeaters to provide more targeted transmissions by increasing power in a given direction. These transmitters use sectorized antennas and focus energy into a relatively narrow beamwidth. For example, a 5 kW medium power repeater with 120 degrees of sectorization will focus all of its energy into a 120 degree beamwidth, while little or no energy will be transmitted in the other 240 degrees of the beamwidth. The interference potential of these repeaters is thus relatively limited. By using a sectorized antenna, the probability that a WCS base station will be located within this range is significantly less than if the repeater used an omnidirectional antenna. XM Radio commits to coordinate every medium power repeater with WCS licensees.

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<sup>3</sup> Recently, Sirius Satellite Radio filed its own proposed rule for the operation of terrestrial repeaters which differs from XM Radio's proposal in the following ways: (i) Sirius proposes a cap of 150 high power repeaters it can operate without coordination; (ii) Sirius does not include a category for medium power repeaters; and (iii) Sirius has proposed slightly different coordination procedures. The variations between the two are based on the two systems having somewhat different system architectures and approaches to deployment.

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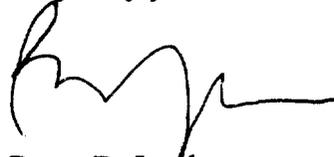
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(iii) *High Power Repeaters.* The draft rule defines a "high power" repeater as a repeater operating with an EIRP between 10 kW and 40 kW. XM Radio has proposed a limit of 250 high power repeaters it will operate without coordination. This limit is fully consistent with the information the DARS licensees have been providing to the FCC for over two years and provides critical certainty and flexibility needed to begin operations.

*Coordination.* XM Radio has proposed a detailed coordination process to ensure that the operation of its repeaters does not cause interference to WCS licensees. For any existing WCS base station within an area where the signal strength from any medium power repeater or any high repeater in excess of the limit is above minus 25 dBm per 1 MHz, based upon line of sight free space loss calculations, XM Radio will provide the WCS licensee with a filter to limit energy into the RF front end of the WCS base station. If the filter does not achieve the desired result, then the parties will engage in good faith discussions, which may include informal action by the Commission.

Having now committed to coordinate a significant portion of its repeater network with WCS licensees, XM Radio urges the Commission to adopt the attached rule and finally allow for the provision of long-awaited DARS to the public.

Very truly yours,



Bruce D. Jacobs  
David S. Konczal

Counsel for XM Radio Inc.

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## Exhibit 1

### § 25.144 Licensing provisions for the 2.3 GHz satellite digital audio radio service.

\* \* \* \* \*

(e)(1) *Licensing of satellite DARS terrestrial repeaters.* Satellite DARS licensees may construct and operate ground-based transmitters with a total EIRP of each transmitter not exceeding 40 kW in the frequency assignment of the licensee (“terrestrial repeaters”). Terrestrial repeaters shall not be used to originate programming not also transmitted from authorized DARS satellites. Any medium or high power repeater must be operated so that the amplitude of the repeater’s main signal within the spectrum assigned to the licensee, measured anywhere between ground level and 30 feet above ground level, shall not exceed minus 25 dBm per 1 MHz, using a calibrated field measurement set to measure 1 MHz intervals.

(2) *Notification Requirement.* Each satellite DARS licensee shall file a report with the Commission’s International Bureau containing the geographic coordinates, total EIRP, antenna pattern, and antenna height above average terrain:

- (i) for each medium power terrestrial repeater at least 30 days before beginning operation of the applicable terrestrial repeater.
- (ii) for each high power terrestrial repeater constructed and operational pursuant to Section 25.144(e)(3)(iii)(A) within 30 days of beginning operation of the repeater; and
- (iii) for each high power terrestrial repeater constructed and operational pursuant to Sections 25.144(e)(3)(iii)(B), at least 30 days before beginning operation of the applicable terrestrial repeater.

(3) *No Commission approval required.* A satellite DARS licensee may construct and operate terrestrial repeaters without obtaining Commission approval in any of the following circumstances:

- (i) *Low power.* A satellite DARS licensee may construct and operate an unlimited number of low power terrestrial repeaters without any obligation to coordinate with WCS base stations.
- (ii) *Medium power.* A satellite DARS licensee may construct and operate an unlimited number of medium power terrestrial repeaters that have been coordinated with WCS base stations pursuant to Section 25.144(e)(4).
- (iii) *High power.* A satellite DARS licensee may construct and operate:
  - (A) up to 250 high power terrestrial repeaters of its own choosing without any obligation to coordinate such repeaters with WCS base stations; and
  - (B) an unlimited number of high power terrestrial repeaters that have been coordinated with WCS base stations pursuant to Section 25.144(e)(4).

(4) *Coordination required between DARS and WCS licensees.* Coordination shall be required between DARS licensees and WCS licensees when the DARS licensee wishes to construct and operate any medium or high power terrestrial repeater as follows:

- (i) Within 30 days of the filing of notice by a DARS licensee pursuant to Section 25.144(e)(2)(i) or (iii), WCS licensees must provide the DARS licensee with the coordinates and antenna height of any WCS base station located within a reasonable geographic area surrounding the proposed repeater with which coordination is desired.

(ii) If there are no existing WCS base stations within an area for which the signal strength from the medium or high power repeater, based upon line of sight free space loss calculations, is above minus 25 dBm per 1 MHz, no further coordination is required.

(iii) For any existing WCS base station within an area for which the signal strength from the medium or high repeater is above minus 25 dBm per 1 MHz, based upon line of sight free space loss calculations, no further coordination is required if:

(A) in the case of a medium power repeater, the WCS licensee installs a band-stop rejection filter that limits energy into the RF front end of the WCS base station to the level equivalent to that which would be produced by a low power repeater.

(B) in the case of a high power repeater, the WCS licensee installs a band-stop rejection filter that limits energy into the RF front end of the WCS base station to minus 25 dBm per 1 MHz.

The DARS licensee shall provide required filters to the WCS licensee upon request by the WCS licensee. The WCS licensee shall cooperate with the DARS licensee by providing reasonable WCS system information to the DARS licensee to establish performance and interface requirements for the band-stop filter.

(iv) For any existing WCS base station within an area for which the signal strength from the medium or high power repeater is above minus 25 dBm per 1 MHz, based upon line of sight free space loss calculations, if filtering in accordance with Section 25.144(e)(4)(iii) does not eliminate the need for coordination, the parties will coordinate in good faith to achieve a satisfactory resolution. If the parties cannot achieve a satisfactory resolution within 90 days of the date of the DARS licensee's filing pursuant to 25.144(e)(2)(i) or (iii), any party may ask the Commission to resolve the dispute pursuant to Section 1.41. The DARS licensee may operate the repeater at issue while the Commission is considering the matter without prejudice to any Commission action in resolving the dispute.

(v) A DARS licensee is not required to coordinate any medium or high power repeater with a WCS base station that is constructed or operated subsequent to the construction of such repeater.

(vi) A DARS licensee may replace an already-coordinated medium or high power repeater with one having the same characteristics without undertaking further coordination.

(5) *Commission approval required.* A satellite DARS licensee shall obtain Commission approval to construct and operate terrestrial repeaters in any of the following circumstances:

(i) *International coordination.* To construct and operate any terrestrial repeater that exceeds the power levels and/or proximity restrictions specified in the existing coordination agreements reached with Canada and Mexico for co-frequency systems (see Agreement

Concerning the Coordination between U.S. Satellite Digital Audio Radio Service and Canadian Fixed Service and Mobile Aeronautical Telemetry Service in the band 2320-2345 MHz, and Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Use of the 2310-2360 MHz band); *except that* Commission approval shall not be required if the satellite DARS licensee notifies the Commission that the terrestrial repeater has been coordinated successfully with Canada or Mexico.

(ii) *Antenna structure clearance required.* To construct and operate any terrestrial repeater that fails to comply with the requirements of Section 17.4 of the Commission's Rules.

(iii) *Environmental.* To construct and operate any terrestrial repeater that will have significant environmental effects, as defined by Sections 1.1301 through 1.1319 of the Commission's Rules.

(iv) To operate any terrestrial repeater a DARS Licensee has been unable to coordinate pursuant to 25.144(e)(4).

(6) *Interference to wide-band analog MDS/ITFS receivers.* A satellite DARS licensee shall have no obligation to remedy interference to wide-band analog MDS/ITFS receivers; *except that* a satellite DARS licensee shall reimburse an MDS/ITFS customer or licensee for a band-pass or band-stop filter if the satellite DARS licensee receives a written complaint prior to February 20, 2002 from such MDS/ITFS customer or licensee and such MDS/ITFS customer or licensee demonstrates by a preponderance of the evidence all of the following:

(i) The wide-band analog MDS/ITFS receiver was installed and operating prior to August 20, 1998;

(ii) The wide-band analog MDS/ITFS receiver is located within the satellite DARS licensee's medium or high power terrestrial repeater's free space power flux density contour of -34 dBW/m<sup>2</sup>;

(iii) The medium or high power terrestrial repeater operated by the satellite DARS licensee is the sole cause of interference to the wide-band analog MDS/ITFS receiver;

(iv) The interference to the wide-band analog MDS/ITFS receiver would not have been caused by a low power terrestrial repeater; *and*

(vi) The MDS/ITFS customer or licensee is not entitled to compensation pursuant to Section 27.58 of the Commission's Rules;

*provided that* the maximum cumulative liability of each satellite DARS licensee under this Section shall not exceed \$500,000.

(7) *Definitions.* For the purpose of §25.144, the following definitions shall apply:

(i) *Low power.* The term "low power" means an EIRP not exceeding 2 kW.

(ii) *Medium power.* The term "medium power" means an EIRP greater than 2 kW and not exceeding 10 kW.

(iii) *High power.* The term "high power" means an EIRP greater than 10 kW and not exceeding 40 kW.

(iv) *Base station.* The term "base station" has the same meaning as that term is defined in Section 27.4 of this chapter.

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**§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared**

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**Table 1: Transmitters, Facilities and Operations Subject to Routine Environmental Evaluation**

Service (title 47 CFR rule part)

Evaluation required if

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Satellite Communications (part 25)

*Satellite DARS Terrestrial Repeaters: >2000  
W EIRP  
All others included.*