



ORIGINAL

August 20, 2004

Via Hand Delivery
Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Received
AUG 25 2004
Policy Branch
International Bureau

RECEIVED

AUG 20 2004
Federal Communications Commission
Office of Secretary

RE: XM Radio Inc.

SAT-RPL-20040212-00019 (Call Sign S2617) (Application to Launch and Operate Replacement SDARS Satellite at 85°W)

SAT-MOD-20040212-00017 (Call Sign S2118) (Minor Modification to Relocate SDARS Satellite from 85°W to 115°W)

SAT-RPL-20040212-00018 (Call Sign S2616) (Application to Launch and Operate Replacement SDARS Satellite at 115°W)

Dear Ms. Dortch:

On February 12, 2004, XM Radio Inc. ("XM Radio") filed the above-captioned applications to (i) to launch and operate a replacement satellite ("XM-3"; Call Sign S2617) at 85°W (*see* File No. SAT-RPL-20040212-00019); (ii) upon launch, testing, and successful operation of XM-3, to relocate its current in-orbit satellite at 85°W ("XM-Roll," Call Sign S2118) to the 115°W orbital location where it will be temporarily collocated with XM Radio's in-orbit satellite at that location ("XM-Rock," Call Sign S2119) (*see* File No. SAT-MOD-20040212-00017); and (iii) to launch and operate a replacement satellite ("XM-4"; Call Sign S2616) at 115°W (*see* File No. SAT-RPL-20040212-00018). The International Bureau ("Bureau") placed these applications on *Public Notice* on March 19, 2004. *See* Report No. SAT-00202 (March 19, 2004). The applications were unopposed.

XM Radio hereby supplements these applications with the following information:

(1) In compliance with the Bureau's *Public Notice* released on June 16, 2004,¹ XM Radio attaches as Exhibit A hereto a two-degree spacing analysis for its proposed satellites. XM Radio notes that there are no authorized or proposed satellites using either S-band or X-band frequencies within two degrees of its proposed satellites. XM Radio has accordingly performed this analysis using the technical characteristics of its own satellites.

¹ *See* Report No. SPB-207, DA-1708 (June 16, 2004).

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(2) In compliance with a Bureau decision released on June 16, 2004,² XM Radio attaches as Exhibit B an analysis demonstrating that its X-band feeder link antennas will have 30 dB of cross-polarization isolation as required by Section 25.210(i) of the Commission's rules. 47 C.F.R. § 25.210(i).

(3) XM Radio hereby clarifies that it proposes to locate the satellites subject to this application at the following orbital locations:

- XM-Roll (Call Sign S2118) will be relocated to the 114.90°W orbital location.
- XM-3 (Call Sign S2617) will be located at the 85.10°W orbital location.
- XM-4 (Call Sign S2616) will be located at the 115.00°W orbital location.

Please contact the undersigned with any questions regarding this matter.

Respectfully submitted,

XM RADIO INC.

By: _____



Lon C. Levin
Senior Vice President
1500 Eckington Place, NE
Washington, DC 20002
(202) 380-4000

cc: Tom Tycz, FCC
Stephen Duall, FCC
Robert Nelson, FCC

² See Letter from Thomas S. Tycz, FCC, to Brian Park, AfriSpace, Inc., DA 04-1719, File No. SAT-LOA-20040413-00082 (June 16, 2004).

Exhibit A

Two-Degree Spacing Analysis

XM Radio's feeder link earth station operates in X-band frequencies (7.025 - 7.075 GHz) for uplink and S-band (2332.5 - 2345.0 GHz) for telemetry. There are no satellites operating within 2 degrees of XM Radio's current or proposed satellites at 85°W and 115°W using these frequencies.

According to FCC guidelines, XM Radio provides below a two-degree spacing analysis using technical characteristics of an XM Radio feeder link earth station and XM Radio satellites. Table 1 presents the relevant parameters. Figures 1 and 2 present the measured patterns.

Table 1 – XM Feeder Link Earth Station Antenna Characteristics

Transmit antenna gain (dBi)	53.5
Sidelobe pattern	29-25log θ
Sidelobe gain at 2.2° Topocentric separation	16.5
Delta gain Main-Side lobe (dB)	37.0
Receive antenna gain (dBi)	42.8
Sidelobe pattern	32-25log θ
Sidelobe gain at 2.2° Topocentric separation	22.8
Delta gain Main-Side lobe (dB)	20.0

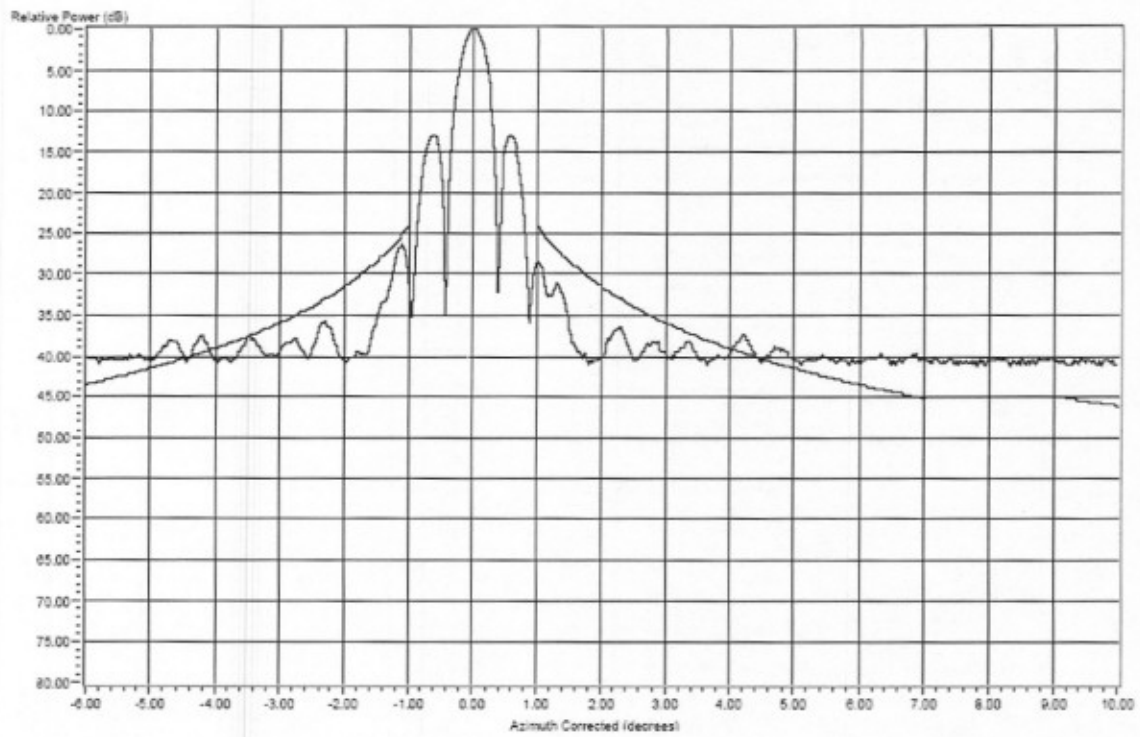


Figure 1 – Measured X-Band Antenna pattern

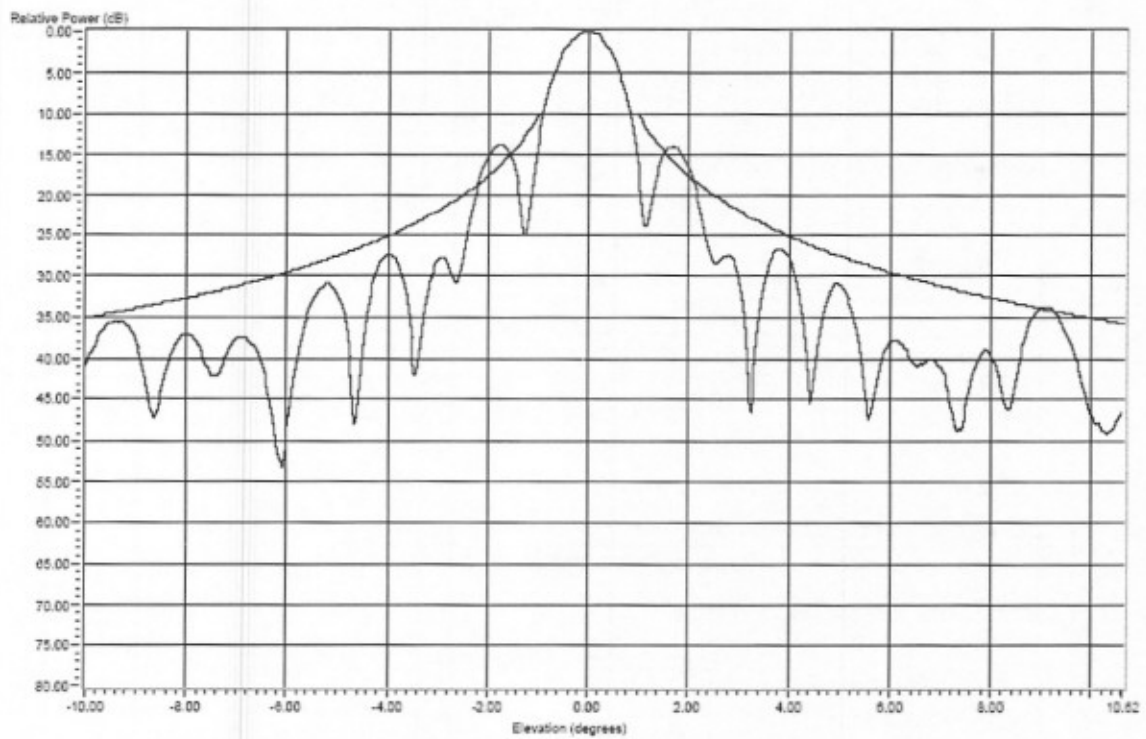


Figure 2 – Measured S-Band Antenna pattern

Carrier-to-Interference analysis is shown in following section:

Uplink

$$C/I = \text{EIRP}_t - \text{EIRP}_i + (G_{rt} - G_{ri})$$

where:

EIRP_t = transmit power of wanted carrier toward the wanted satellite,

EIRP_i = transmit power of interfering carrier toward the wanted satellite,

G_{rt} = wanted satellite receive antenna gain in direction of wanted feeder link station,

G_{ri} = wanted satellite receive antenna gain in direction of interfering feeder link station,

Calculated uplink C/I is about 39dB, well below the coordination threshold value.

Downlink

$$C/I = \text{EIRP}_t - \text{EIRP}_i + (G_{rt} - G_{ri})$$

where:

EIRP_t = downlink power of wanted carrier toward the wanted earth station,

EIRP_i = transmit power of interfering carrier toward the wanted earth station,

G_{rt} = wanted earth station receive antenna gain in direction of wanted satellite,

G_{ri} = wanted earth station receive antenna gain in direction of interfering satellite,

Calculated downlink C/I is about 28 dB, well below the coordination threshold value.

Exhibit B

Cross-Polarization Isolation of Feeder Links

With reference to Figures 3, the XM Radio feeder link earth station, operating in X-band frequencies, complies with Commission requirement stated in Section 25.210(i). 47 C.F.R. § 25.210(i). Measured cross-polarization discrimination is at least 30dB within the half-power beamwidth.

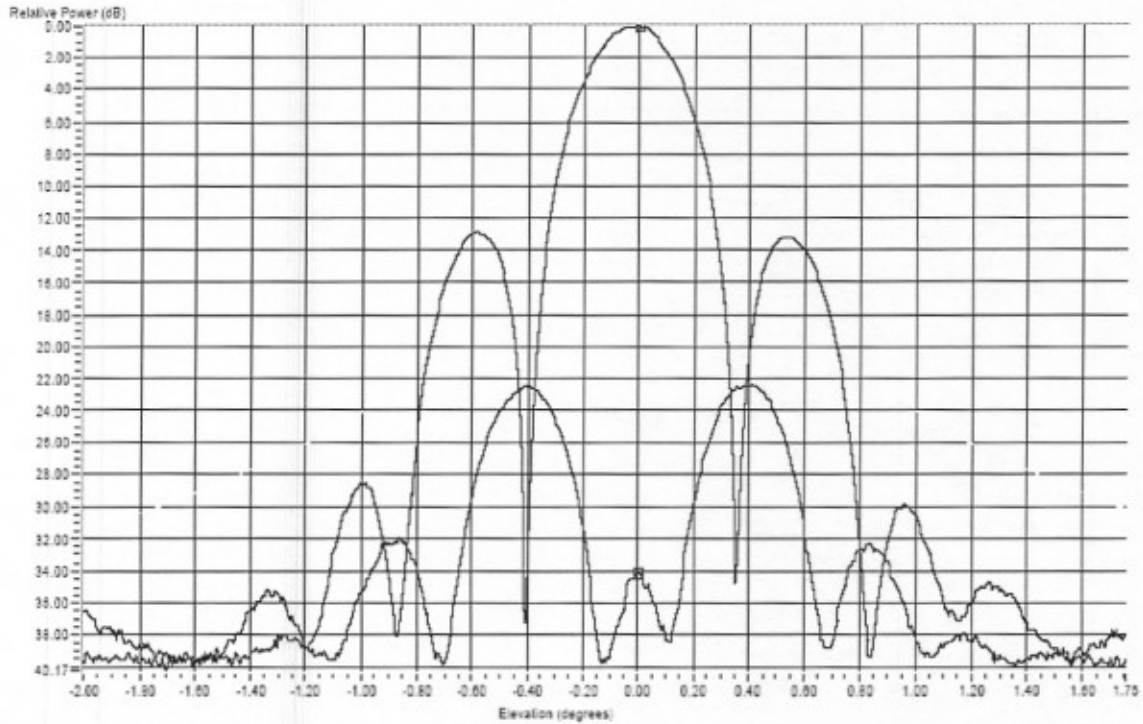
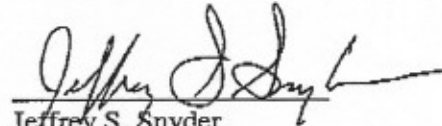


Figure 3 – XM Feeder Link Earth Station - Measured Cross-Polarization Isolation

Technical Certification

I, Jeffrey S. Snyder, Senior Vice President, Space and Ground Systems, of XM Radio Inc., certify under penalty of perjury that:

I am the technically qualified person with overall responsibility for preparation of the technical information contained in the foregoing. I am familiar with the requirements of Part 25 of the Commission's rules, and the information contained in the application is true and correct to the best of my knowledge and belief.


Jeffrey S. Snyder

Dated: August 19, 2004