

Approved by OMB  
3060-0678

Date & Time Filed: Feb 15 2008 6:46:02:296PM  
File Number: SAT-STA-20080215-00047  
Callsign:

FEDERAL COMMUNICATIONS COMMISSION  
APPLICATION FOR SPACE STATION SPECIAL TEMPORARY AUTHORITY  
FOR OFFICIAL USE ONLY

APPLICANT INFORMATION

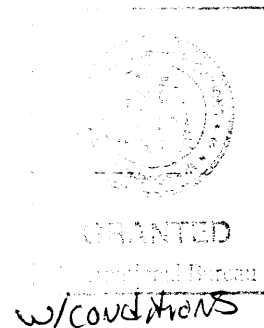
Enter a description of this application to identify it on the main menu:

Sirius Satellite Radio Inc. Request for STA to operate a repeater at a Chrysler Video Demonstration in Auburn Hills, MI (February 28, 2008 to March 21, 2008)

I. Applicant

<b>Name:</b>	Sirius Satellite Radio Inc.	<b>Phone Number:</b>	212-584-5100
<b>DBA Name:</b>		<b>Fax Number:</b>	212-584-5353
<b>Street:</b>	1221 Avenue of the Americas 36th Floor	<b>E-Mail:</b>	
<b>City:</b>	New York	<b>State:</b>	NY
<b>Country:</b>	USA	<b>Zipcode:</b>	10020 -
<b>Attention:</b>	Mr. Patrick L. Donnelly		

1



File # SAT-STA-20080215-00047

Call Sign \_\_\_\_\_ Grant Date 2/28/08  
(or other identifier)

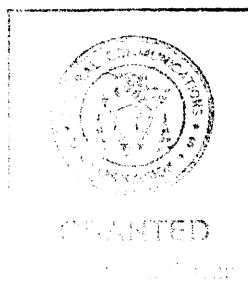
Term Dates  
From 2/28/08 To: 3/21/08

Approved: [Signature]  
Policy Branch Chief

**Application of Sirius Satellite Radio Inc. for Special Temporary Authority**  
**IBFS File No. SAT-STA-20080215-00047**

Special temporary authority (STA) IS GRANTED to Sirius Satellite Radio Inc. (Sirius) to operate a terrestrial repeater with an Effective Isotropically Radiated Power (EIRP) of up to 200 watts (average) at the Chrysler headquarters in Auburn Hills, MI, during the period of February 28, 2007, through March 21, 2008, according to the technical parameters specified in its application, subject to the following conditions:

1. Any actions taken as a result of this STA are solely at the applicant's own risk. This STA shall not prejudice the outcome of the final rules adopted by the Commission in IB Docket No. 95-91;
2. Operation of the terrestrial repeater authorized pursuant to this STA is on a non-interference basis with respect to all permanently authorized radiocommunication facilities. Sirius shall provide the information and follow the process set forth in paragraphs 14 and 17 in 16 FCC Rcd 16773 (Int'l Bur. 2001) and 16 FCC Rcd 16781 (Int'l Bur. 2001), as modified by 16 FCC Rcd 18481 (Int'l Bur. 2001) and 16 FCC Rcd 18484 (Int'l Bur. 2001);
3. The terrestrial repeater is restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to SDARS receivers;
4. The terrestrial repeater shall comply with Part 1 of the Commission's rules, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969, including the guidelines for human exposure to radio frequency electromagnetic fields as defined in Sections 1.1307(b) and 1.1310 of the Commission's rules;
5. The terrestrial repeater shall comply with Part 17 of the Commission's rules - Construction, Marking, and Lighting of Antenna Structures;
6. The out-of-band emissions of the terrestrial repeater shall be limited to 75+log(EIRP) dB less than the transmitter EIRP;
7. Sirius will maintain full ownership and operational control of the terrestrial repeater;
8. Sirius will immediately shut down the terrestrial repeater upon a complaint of interference, upon direction from the Commission, or upon finding that the repeater has not been properly installed;
9. This authorization is not one relating to an "activity of a continuing nature" for purposes of Section 1.62 of the Commission's rules and Section 558(c) of the Administrative Procedure Act. Continuation of operations beyond the term of this authorization will require prior affirmative authorization by the FCC.



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Call Sign \_\_\_\_\_ Grant Date 2/28/08  
(or other identifier)

Term Dates  
From 2/29/08 To: 3/21/08

Approved: [Signature]

w/conditions

Policy Branch Chief

2. Contact	
<b>Name:</b> Mr. Patrick L. Donnelly	<b>Phone Number:</b> 212-584-5100
<b>Company:</b> Sirius Satellite Radio Inc.	<b>Fax Number:</b> 212-584-5353
<b>Street:</b> 1221 Avenue of the Americas 36 Floor	<b>E-Mail:</b>
<b>City:</b> New York	<b>State:</b> NY
<b>Country:</b> USA	<b>Zipcode:</b> 10020 -
<b>Attention:</b>	<b>Relationship:</b> Same
(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)	
3. Reference File Number or Submission ID	
4a. Is a fee submitted with this application?	
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114). <input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee <input type="radio"/> Other (please explain):	
4b. Fee Classification    CXW – Space Station (Non-Geostationary)	
5. Type Request	
<input type="radio"/> Change Station Location <input type="radio"/> Extend Expiration Date <input checked="" type="radio"/> Other	
6. Temporary Orbit Location	7. Requested Extended Expiration Date

<p>8. Description (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Sirius Satellite Radio requests Special Temporary Authority to operate a terrestrial repeater at a Chrysler Video Demonstration in Auburn Hills, MI from February 28, 2008 to March 21, 2008.</p> </div>					
<p>9. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes. <input checked="" type="radio"/> Yes <input type="radio"/> No</p>					
<p>10. Name of Person Signing Patrick L. Donnelly</p>	<p>11. Title of Person Signing Exec. VP, GC and Sec'y</p>				
<p>12. Please supply any need attachments.</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 33%;">Attachment 1: Exhibits</td> <td style="width: 33%;">Attachment 2:</td> <td style="width: 33%;">Attachment 3:</td> </tr> </table>			Attachment 1: Exhibits	Attachment 2:	Attachment 3:
Attachment 1: Exhibits	Attachment 2:	Attachment 3:			
<p>WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).</p>					

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**THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.**

## Attachment

Sirius Satellite Radio Inc. (“Sirius”), pursuant to 47 C.F.R. § 25.120,<sup>1</sup> hereby requests Special Temporary Authority (“STA”) to operate in its licensed frequency band (2320-2332.5 MHz) a low-power satellite DARS repeater with an Effective Isotropically Radiated Power (“EIRP”) of 200 watts.<sup>2</sup> The low-power repeater will be utilized at a Chrysler Video Demonstration in Auburn Hills, MI. Because the date of this event is uncertain, Sirius requests STA from February 28, 2008 to March 21, 2008; however, Sirius will only operate the repeater for three days (two days for set-up and testing activities and one day for the demonstration). Sirius intends to operate the repeater independently – *i.e.*, Sirius will *not* operate it in conjunction with XM Radio, Inc., the other satellite DARS licensee.

The repeater will be used by Sirius to carry out equipment and service demonstrations at an event for Chrysler executives at Chrysler’s Corporate Headquarters in Auburn Hills. Due to blockage from walls and ceilings, it is often difficult to provide quality reception of SDARS satellite and even terrestrial signals inside of certain venues, such as Chrysler’s Corporate Headquarters, which often do not have line-of-sight views to receive Sirius’ signal. These difficulties with providing coverage inside the venues require equipment to be displayed with hard wire connections, which limits the locations within a venue that Sirius can set up its displays, creating difficulties for organizers and Sirius. This demonstration will enable Chrysler’s representatives to experience the full benefits of SDARS, particularly Sirius’ Backseat TV service. Accordingly, grant of the requested STA to use this repeater for this limited period will serve the public interest.

*Technical Information.* In Exhibit A, Sirius provides a list of technical parameters, including the location and dates for the repeater it seeks to operate pursuant to this STA. Sirius has included the following information: (1) event; (2) event date; (3) event location (specifying the center longitude and latitude of the venue); (4) market; (5) antenna type; (6) antenna beamwidth; (7) total EIRP; and (8) approximate maximum height Above Ground Level (AGL). Exhibit B provides an RF exposure analysis for the repeater and demonstrates that any human radiofrequency exposure that might occur is well below acceptable limits.

*Interference Considerations.* Sirius does not anticipate that the repeater at this demonstration will cause harmful interference to other radio services. Because Sirius has exclusive use of its licensed frequency band,<sup>3</sup> there is no potential for in-band interference. Moreover, the repeater will operate at 200 watts, well below the threshold EIRP of 2000 watts that Wireless Communications Service (“WCS”) licensees have identified as acceptable to avoid any

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<sup>1</sup> Because Sirius is requesting STA for less than 30 days, the Commission can grant this application without placing it on Public Notice. 47 C.F.R. § 25.120(b)(4).

<sup>2</sup> To the extent this application is opposed, Sirius hereby requests that this proceeding be designated “permit-but-disclose” for purposes of the Commission’s rules governing ex parte communications. 47 C.F.R. §§ 1.1200(a) and 1.1206.

<sup>3</sup> 47 C.F.R. § 25.202(a)(6) (stating the 2320-2345 MHz band is allocated exclusively for SDARS).

interference with their services. In addition, the repeater will only be used for a limited time, further eliminating any opportunity for interference. Therefore, Sirius does not anticipate that the repeater will cause blanketing interference to any WCS receivers.

*Ownership and Control of Repeaters.* Sirius will own the repeater installed at the venue and will retain full operational control of the repeater. Sirius will also be responsible for installation of the repeater.

*Public Interest Considerations.* Prompt grant of this STA will promote the continued success of satellite radio and serve the public interest. Sirius plans to demonstrate its services in order to better inform Chrysler executives of available equipment and services. In particular, Sirius will demonstrate its Backseat TV service, which is being offered in certain 2008 Chrysler vehicles. Without the repeater to overcome signal blockage within the venues, however, Sirius cannot undertake real-time demonstrations of its equipment, especially demonstrations of the full mobility of SDARS service. This repeater will help provide clear signal reception within the venue for these demonstrations and will eliminate any need for a hard wire connection.

Sirius understands that its operation of the repeaters under the STA is on a secondary, non-interference basis. While Sirius does not anticipate any interference, should interference occur, it will cease operation of the interfering repeater until such interference can be eliminated.

*Certifications.* Sirius acknowledges that the conditions imposed in the 2001 Order granting Sirius' request for STA to operate terrestrial repeaters<sup>4</sup> will continue to apply to any repeaters authorized as a result of this application. Specifically, Sirius certifies the following:

- (1) Sirius will operate the repeater at its own risk, and such operation shall not prejudice the outcome of the final rules adopted by the Commission in IB Docket 95-91;
- (2) Sirius will operate the repeater on a non-interference basis with respect to all permanently authorized radiocommunication facilities;
- (3) The repeater will be restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to SDARS receivers;
- (4) Where applicable, coordination of the repeater will be completed with all affected Administrations prior to operation, in accordance with all applicable international agreements including those with Canada and Mexico;
- (5) The repeater will comply with Part 17 of the Commission's rules – Construction, Marking, and Lighting of Antenna Structures;

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<sup>4</sup> *Sirius Satellite Radio Inc. Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters, Order and Authorization, File No. SAT-STA-20010724-00064, DA 01-2171 (Sept. 17, 2001).*

- (6) The repeater will comply with Part 1 of the Commission's rules, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969, including the guidelines for human exposure to radio frequency electromagnetic fields as defined in Sections 1.1307(b) and 1.1310 of the Commission's rules;
- (7) The out-of-band emissions of the repeater will be limited to  $75 + \log(\text{EIRP})$  dB less than the transmitter EIRP;
- (8) Sirius will operate the repeater according to the technical parameters provided in this application;
- (9) Sirius will maintain full ownership and operational control of each repeater; and
- (10) Sirius will immediately shut down any repeater upon a complaint of interference, upon direction from the Commission, or upon finding that a repeater has not been properly installed.



SIRIUS SATELLITE RADIO INC.  
EXHIBIT A

Event	Event Dates	Market	Location	No Of Sators	Antenna Type	Sector 1		Coordinates		Antenna Height (feet)		
						Antenna Beamwidth	Orientation	Down tilt	EIRP (Watts)		Longitude (W)	Latitude (N)
Chrysler Video Demonstration	February 28 - March 21, 2008	Auburn Hills, MI	Chrysler LLC World Headquarters 800 Chrysler Drive, Auburn Hills, MI	1	Mobile Mark OD/2-2400	Omni	0	0	200	83-13-47.8	42-39-14.8	25

## **EXHIBIT B**

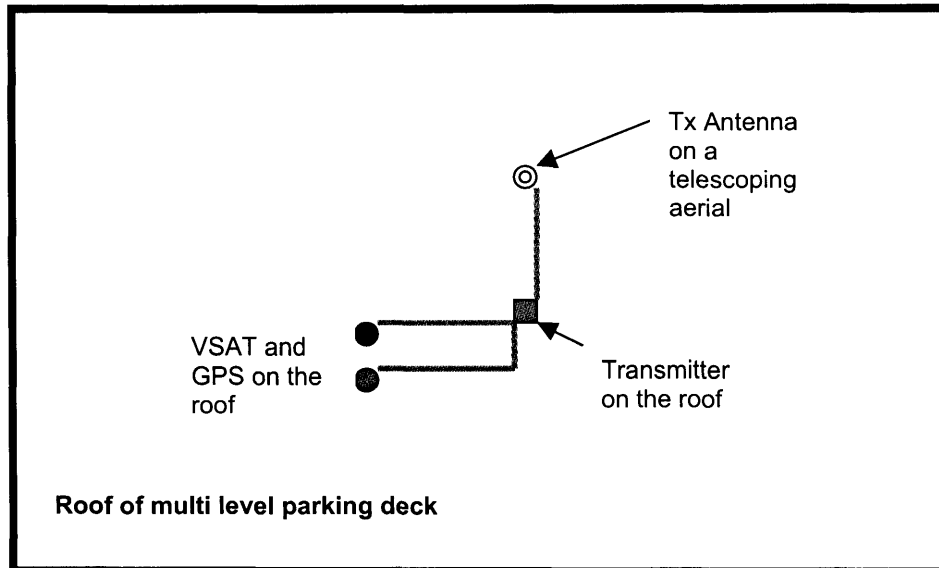
## RF Exposure Analysis

### Chrysler Video Demonstration Chrysler LLC World Headquarters Auburn Hills, MI

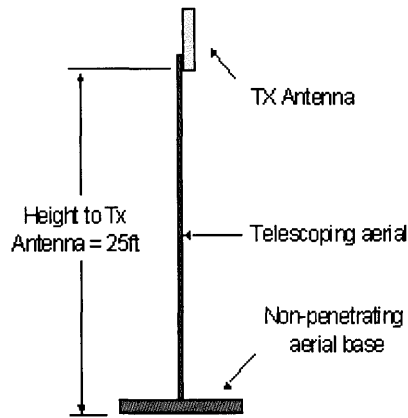
This technical addendum is to support the STA request for the Chrysler Video Demonstration. This event is being held at the Chrysler Headquarters in Auburn Hills, MI. A low-power transmitter will be used to provide coverage at the event.

#### 1. RF Exposure Analysis for Low-Power Transmitter

The transmitter set up for the demonstration is illustrated in the figures below:



**Figure 1. Diagram of transmitter setup**



**Figure 2. TX Antenna setup**

To establish the RF exposure environment for this request the following process has been used to establish that there is no general population exposure over the allowed limit:

1. The location of the antenna and the transmission parameters have been established. The antenna is mounted 25 feet above the roof as seen in Figure 2. A 20 watt (average), 90 watt (peak) power transmitter is used. Together with the assumed length and type of cable feeding the antenna (which is omni directional) and the type and gain of the antenna used, this leads to an effective isotropically radiated power (EIRP) of 200 watts (average) and 900 watts (peak). This calculation is summarized in Table1. The transmitter operates at 2.32625 GHz which is the carrier frequency allocated to the Sirius repeater network. At this frequency the FCC has established a limit of 1 mW/square centimeter for general population exposure (OET 65).
2. Using the calculation methods described in OET 65 and the EIRP's derived as described in "1" a calculation is made of the power density at various distances from the antenna for both the average and peak powers involved. The distance of 18 feet was chosen as the minimum distance criteria for exposure by taking the height of the antenna (25 feet) and subtracting a 7 foot allowance for the height of any individuals who may be present on the show floor. This distance represents the closest point that an individual could approach this repeater antenna. Table 2 summarizes the results of the normal calculation (using the formula  $\text{Power Density} = \text{EIRP} / (4 * \pi * R^2)$  from OET 65) and also a more conservative formula which takes into account reflection (the formula  $\text{PD} = 2.56 * \text{EIRP} / (4 * \pi * R^2)$  ) also from OET 65. In order to provide a comprehensive view, values are included separately for the regular case (average and peak power based ) and for the reflective case (peak power based).

## Summary

Using a very conservative approach the calculated RF exposure levels from the proposed installation are well within the stated limits defined in OET 65. Several worst case assumptions were made as follows:

1. No allowance was made for the significant reduction in power density that will occur due to the attenuation of the antenna pattern at the location immediately under the antenna, the location to which the minimum distance of 18 feet applies.
2. No allowance was made in the case of peak level calculations for the fact that these levels occur a very small fraction of the overall time of transmission.
3. The highest level of exposure, involving the potential for additive reflection and peak level EIRP was used as the exposure criteria.

**Table 1. Transmit chain loss budget**

	Average (watts)	Average (dBW)	Peak (watts)	Peak (dBW)
Transmitter output power	20	13.0	90	19.5
Cable Loss (db)		2		2
Antenna gain dBi (max)		12		12
EIRP (max)	200.0	23.0	900.0	29.5

The effective isotropic radiated power (EIRP) is calculated by taking the transmitter output power, subtracting the cable loss and adding the antenna gain.

The peak power is determined by applying the peak to average factor of the OFDM waveform to the average power of the transmitter. This peak level occurs less than 1/1000<sup>th</sup> of the time for the Sirius waveform for this transmitter type.

**Table 2. Calculations for power density**

- Power Density =  $EIRP / (4\pi R^2)$  (Equation 4 page 19 of OET 65)
- Power Density adjusted for reflection =  $2.56 * \text{Power Density}$  (Equation 7, page 21 of OET 65)

As can be seen from this table, even under very conservative transmission assumptions, the general population exposure limits are not exceeded at the worst case location.

<b>Radial Distance from Antenna (Feet)</b>	<b>Power Density (Average) mW/square cm</b>	<b>Power density (Peak) mW/square cm</b>	<b>Peak power density with 2.56 multiplier (Max reflection)</b>	<b>Worst Case Safety Margin over exposure standard (times)</b>
18	0.05458	0.24561	0.62876	1.59043
23	0.03343	0.15043	0.38510	2.59672
28	0.02256	0.10150	0.25984	3.84845
33	0.01624	0.07307	0.18707	5.34562
38	0.01225	0.05511	0.14108	7.08822
43	0.00956	0.04304	0.11018	9.07626
48	0.00768	0.03454	0.08842	11.30973
53	0.00630	0.02833	0.07252	13.78865
58	0.00526	0.02366	0.06056	16.51300
63	0.00446	0.02005	0.05133	19.48278
68	0.00382	0.01721	0.04406	22.69801
73	0.00332	0.01493	0.03823	26.15867
78	0.00291	0.01308	0.03348	29.86477
83	0.00257	0.01155	0.02957	33.81630
88	0.00228	0.01028	0.02631	38.01327
93	0.00204	0.00920	0.02355	42.45568
98	0.00184	0.00829	0.02121	47.14352
103	0.00167	0.00750	0.01920	52.07681
108	0.00152	0.00682	0.01747	57.25553
113	0.00138	0.00623	0.01595	62.67968
118	0.00127	0.00572	0.01463	68.34928
123	0.00117	0.00526	0.01347	74.26431
128	0.00108	0.00486	0.01243	80.42477
133	0.00100	0.00450	0.01152	86.83068
138	0.00093	0.00418	0.01070	93.48202
143	0.00086	0.00389	0.00996	100.37879
148	0.00081	0.00363	0.00930	107.52101
153	0.00076	0.00340	0.00870	114.90866