



File # SAT-STA-20070222-00036  
with attached conditions

Call Sign \_\_\_\_\_  
(or other identifier) Grant Date 05/17/07

Approved by OMB  
3060-0678

Term Dates  
From 05/17/07 To: period of 180 days

Date & Time Filed: Feb 22 2007 7:23:38:506PM  
File Number: SAT-STA-20070222-00036  
Callsign:

Approved: Robert G. Nelson Chief Satellite Division

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:  
Request for 180-Day Special Temporary Authority to Operate Very Low Power Repeaters and Signal Boosters at Indefinite Locations

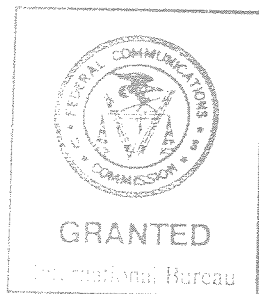
I. Applicant

<b>Name:</b>	XM Radio Inc.	<b>Phone Number:</b>	202-380-1383
<b>DBA Name:</b>		<b>Fax Number:</b>	202-380-4500
<b>Street:</b>	1500 Eckington Place, NE	<b>E-Mail:</b>	james.blitz@xmradio.com
<b>City:</b>	Washington	<b>State:</b>	DC
<b>Country:</b>	USA	<b>Zipcode:</b>	20002
<b>Attention:</b>	James S Blitz		-

**Application of XM Radio Inc. for Special Temporary Authority**  
**IBFS File No. SAT-STA-20070222-00036**

Special temporary authority (STA) IS GRANTED to XM Radio Inc. (XM) to operate indoor terrestrial repeaters with Effective Isotropically Radiated Powers (EIRP) of up to 0.5 watts and up to 0.0001 watts at various events – such as promotional events, press events, and trade shows – for a period of 180 days, with the technical parameters specified in the above-captioned 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 all SDARS repeaters authorized pursuant to this STA is on a non-interference basis with respect to all permanently authorized radiocommunication facilities. XM 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. SDARS repeaters are restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to SDARS subscriber's receivers.
4. SDARS repeaters 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. SDARS repeater out-of-band emissions shall be limited to 75+log(EIRP) dB less than the transmitter EIRP.
6. XM will maintain full ownership and operational control of each repeater.
7. XM 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.



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with attached conditions

Call Sign \_\_\_\_\_ Grant Date 05/17/07  
(or other identifier)

Term Dates  
From 05/17/07 To: period of 180 days

Approved: [Signature] Chief Satell. ID  
Robert G. Nelson PROBIA

2. Contact	
<b>Name:</b> James S. Blitz	<b>Phone Number:</b> 202-380-1383
<b>Company:</b> XM Radio Inc.	<b>Fax Number:</b> 202-380-4500
<b>Street:</b> 1500 Eckington Place, NE	<b>E-Mail:</b> james.blitz@xmradio.com
<b>City:</b> Washington	<b>State:</b> DC
<b>Country:</b> USA	<b>Zipcode:</b> 20002 -
<b>Attention:</b>	<b>Relationship:</b>
(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 CRY - Space Station (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	
N/A	7. Requested Extended Expiration Date

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.)

XM Radio Inc. requests Special Temporary Authority to operate very low power terrestrial repeaters and signal boosters at events in various venues, at locations and on dates that cannot yet be identified, for a period of 180 days after grant of this request. See attached letter.

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"; party to the application; for these purposes.

Yes  No

10. Name of Person Signing  
James S. Blitz

11. Title of Person Signing  
Vice President, Regulatory Counsel

12. Please supply any need attachments.

Attachment 1: Letter

Attachment 2: Exhibits

Attachment 3:

**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).

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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.**



February 22, 2007

**Via IBFS**

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

**RE: XM Radio Inc.  
Request for 180-Day Special Temporary Authority to Operate  
Very Low Power Repeaters and Signal Boosters at Indefinite Locations**

Dear Ms. Dortch:

XM Radio Inc. ("XM"), one of the two Satellite Digital Audio Radio Service ("SDARS" or "satellite radio") licensees in the United States, pursuant to Section 25.120(b)(2) of the Commission's rules,<sup>1</sup> hereby requests Special Temporary Authority ("STA") to operate in its licensed frequency band (2332.5-2345 MHz) (i) very low power terrestrial repeaters with an Effective Isotropically Radiated Power ("EIRP") of up to 0.5 watts; and (ii) signal boosters with an EIRP of up to 0.0001 watts that have previously been approved for use in retail stores and other indoor locations. XM expects to operate these very low power repeaters and signal boosters at events in various venues, at locations and on dates that cannot yet be identified, for a period of 180 days after grant of this request. XM intends to operate these very low power repeaters and signal boosters independently – *i.e.*, XM will not operate them in conjunction with Sirius Satellite Radio Inc. ("Sirius"), the other SDARS licensee.

In recent months, the International Bureau has granted two 30-day STA requests and one 180-day STA request filed by XM to operate very low power repeaters and signal boosters at various trade shows at specified locations and dates.<sup>2</sup> Moreover, the coalition of Wireless Communications Services ("WCS") licensees has stated that it has no objection to the operation of repeaters and boosters at trade shows provided that operations are temporary in nature,

<sup>1</sup> 47 C.F.R. § 25.120(b)(2).

<sup>2</sup> See XM Radio Inc., File No. SAT-STA-20061211-00148 (filed December 11, 2006; granted December 19, 2006); XM Radio Inc., File No. SAT-STA-20070117-00011 (filed January 17, 2007; granted January 19, 2007); and File No. SAT-STA-20061211-00147 (filed December 11, 2006; granted February 9, 2007).

operations are at low power levels, the SDARS licensee commits to operate the repeaters and boosters on a non-interference basis, and the SDARS licensee acknowledges that construction of these facilities is at its own risk.<sup>3</sup> As discussed herein, XM satisfies all of these conditions.

*Request for STA.* XM will use the very low power repeaters and signal boosters for which it seeks authority to operate herein to demonstrate equipment and service at events in various venues across the United States, such as automobile dealer promotional events, press events, and trade shows. In many cases, XM expects that it will not know the locations and dates of the events covered by this STA until a few days before the event takes place. Accordingly, XM herein requests STA to operate the very low power repeaters and signal boosters at indefinite locations. The operation of very low power repeaters and signal boosters at each event will not exceed a period of seven days (including operation prior to the official start of each event for set-up and testing activities). XM expects to operate very low power repeaters and signal boosters pursuant to this specific STA at no more than three events per month in the 180 days following grant. Assuming the unlikely occurrence that three events were to happen at the same time, XM expects to operate a total of no more than eight very low power repeaters and six signal boosters across all events at any given time pursuant to this STA.

Due to blockage from walls, ceilings, and other structures, it is often difficult to provide quality reception of SDARS satellite and even terrestrial signals at certain venues, which may not have line-of-sight views to receive XM's signal. The difficulties with providing coverage at certain venues require radios to be displayed with hard wire connections, which limits the locations within a venue at which XM can set up its displays, thereby creating difficulties for event organizers as well as for XM. Because some venues consist of a large, often multi-level space, XM anticipates using one or more (but no more than three) very low power repeaters at each event. Depending on the venue, XM may also use one or more (but no more than three) strategically placed signal boosters. The optimal number of very low power repeaters and signal boosters will be chosen to ensure full coverage of each event. Accordingly, grant of this STA to use these very low power repeaters and signal boosters for the limited periods requested herein will serve the public interest.

*Technical Information for Very Low Power Repeaters.* Enclosed as Exhibit A is the following technical information pertaining to the very low power repeaters: (1) antenna type; (2) antenna beamwidth; (3) total EIRP; (4) approximate maximum height AGL; and (5) antenna specification sheets.

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<sup>3</sup> See Letter from Paul Sinderbrand, Counsel for the WCS Coalition, to John Giusti, Acting Chief, International Bureau, FCC, File No. SAT-STA-20061211-00147; SAT-STA-20061211-00148 (December 14, 2006).

*Technical Information for Signal Boosters.* Enclosed as Exhibit B are the technical parameters for the signal boosters, which are identical to the parameters previously approved by the Bureau for use in retail stores and other indoor locations.<sup>4</sup> Specifically, XM has included the following information for these signal boosters: (1) antenna type; (2) antenna beamwidth; (3) total EIRP; and (4) approximate maximum height AGL.

*Location Information.* Given that the locations and dates of the events at which XM will operate very low power repeaters and signal boosters pursuant to this STA will not be known until shortly before the event takes places, XM cannot provide this information in this application. Accordingly, to the extent necessary, XM herein requests waiver under Section 1.3 of the Rules, 47 C.F.R. § 1.3, of the requirement that it provide “full particulars of the proposed operation” with this application for STA.<sup>5</sup> As discussed below, however, because these very low power repeaters and signal boosters will transmit at an extremely low power, there is no potential for interference to other communications services, even ones operated very close to a very low power repeater or signal booster. Moreover, given that the locations and dates of the events will not be known until shortly before an event takes places, it would be impractical for XM to seek authority every time it proposed to operate very low power repeaters and signal boosters at a new venue. XM notes that the Bureau did not require locations and dates of operation for the 5000 in-store signal boosters that XM and Sirius were authorized to operate in June 2005,<sup>6</sup> the 5000 additional such in-store boosters the two companies were authorized to operate in January 2007,<sup>7</sup> or the 5000 indoor boosters that XM was authorized to operate in January 2007.<sup>8</sup>

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<sup>4</sup> XM Radio Inc., Request for Special Temporary Authority, File No. SAT-STA-20030409-00076 (filed April 9, 2003; granted June 23, 2003) (“*XM Signal Booster STA*”). In the 2003 application, XM provided an interference analysis for the signal boosters that are the subject of this application. *See id.*, Exhibit C. XM incorporates this interference analysis by reference. On June 5, 2003, XM further supplemented the application with a sample link budget for the signal boosters. *See* Letter from Lon C. Levin, XM, to Marlene H. Dortch, Secretary, FCC, File No. SAT-STA-20030409-00076 (filed June 5, 2003). The link budget is also incorporated by reference herein. *See also* XM Radio Inc., File No. SAT-STA-20050712-00145 (granted January 18, 2007) (“*Indoor Booster STA*”).

<sup>5</sup> 47 C.F.R. § 25.120(a).

<sup>6</sup> *See* XM Radio Inc., File No. SAT-STA-20030409-00076 (granted June 26, 2003); Sirius Satellite Radio Inc., File No. SAT-STA-20030411-00075 (granted June 26, 2003).

<sup>7</sup> *See* XM Radio Inc., File No. SAT-STA-20050601-00113 (granted January 18, 2007); Sirius Satellite Radio Inc., File No. SAT-STA-20050601-00114 (granted January 18, 2007).

<sup>8</sup> *See* Indoor Booster STA.



*Interference Considerations.* The very low power repeaters and signal boosters will not cause harmful interference to other radio services. Because XM has exclusive use of its licensed frequency band,<sup>9</sup> there is no potential for in-band interference. In addition, the very low power repeaters will operate at a maximum EIRP of 0.5 watts, well below the threshold EIRP of 2000 watts identified by the WCS licensees as a potential interference concern.<sup>10</sup> The adjacent-band WCS licensees are permitted to operate base stations at a power level of 2000 watts EIRP and therefore must be able to withstand potential interference from such operations. With respect to the signal boosters, XM has previously demonstrated that these signal boosters will not cause adjacent band interference to WCS operations.<sup>11</sup> In addition, the very low power repeaters and signal boosters will be operated for at most one week at any individual event, further eliminating any opportunity for interference. Accordingly, XM does not anticipate that these very low power repeaters and signal boosters will cause interference to any WCS receivers.

*Ownership and Control of Very Low Power Repeaters and Signal Boosters.* XM will own each very low power repeater and signal booster operated at a given venue and will retain full operational control of each very low power repeater and signal booster. XM will also be responsible for installation of each very low power repeater and signal booster.

*Public Interest Considerations.* Prompt grant of this STA will promote the continued success of satellite radio and thereby serve the public interest. The demand for SDARS radios by the public has continued to increase over time. Accordingly, XM participates in events at various venues where it provides demonstrations of its equipment and service, such as automobile dealer promotional events, press events, and trade shows. Grant of this STA will serve the public interest because the very low power repeaters and signal boosters will allow for adequate reception of XM's satellite radio service at venues where satellite radio signals may be attenuated due to blockage from walls, ceilings, or other structures. Without these very low power repeaters and signal boosters to overcome signal blockage within the venues, however, XM cannot undertake real-time demonstrations of its equipment and service, especially demonstrations of the full mobility of SDARS service. These very low power repeaters and signal boosters will provide clear signal reception within these venues for these demonstrations, and will eliminate any need for a hard wire connection.

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<sup>9</sup> 47 C.F.R. § 25.202(a)(6).

<sup>10</sup> See *supra* note 3; see also *XM Radio, Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complimentary Terrestrial Repeaters, Order and Authorization*, DA 01-2172, at ¶ 12 (rel. September 17, 2001) ("*XM Radio STA Order*") ("The comments from WCS licensees express concern about blanketing interference from DARS repeaters that operate with an Equivalent Isotropically Radiated Power (EIRP) above 2 kW").

<sup>11</sup> *XM Signal Booster STA* at Exhibit C.

Ms. Marlene H. Dortch  
February 22, 2007  
Page 6

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 very low power repeaters and signal boosters will be limited to  $75 + \log(\text{EIRP})$  dB less than the transmitter EIRP;

(8) XM will operate the very low power repeaters and signal boosters according to the technical parameters provided in this application;

(9) XM will maintain full ownership and operational control of each very low power repeater and signal booster; and

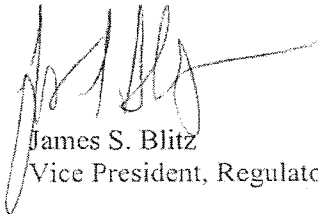
(10) XM will immediately shut down any very low power repeater and any signal booster upon a complaint of interference, upon direction from the Commission, or upon finding that a very low power repeater or signal booster has not been properly installed.

XM hereby certifies that no party to this application is subject to a denial of Federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. § 853(a).

XM is submitting payment to the Federal Communications Commission in the amount of Seven Hundred Ninety Dollars (\$790.00). This filing fee amount is applicable to requests for STAs for geostationary satellites. *See* International and Satellite Services Fee Filing Guide (October 2006).

Please direct any questions regarding this matter to the undersigned.

Very truly yours,



James S. Blitz  
Vice President, Regulatory Counsel

Enclosures

cc: Stephen Duall, FCC

## Exhibit A

### Technical Parameters for Trade Show Repeaters

Below is the following technical information for the trade show repeaters:

- (1) antenna type;
- (2) antenna beamwidth;
- (3) total EIRP; and
- (4) approximate height Above Ground Level (AGL)
- (5) antenna specification sheets

<b>Antenna Type</b>	<b>Antenna Beamwidth</b>	<b>EIRP Total in Watts</b>	<b>Height AGL</b>
Omni -- YDI Model # A2408	360 degrees	0.05	< 50 feet
Multi-Patch Panel – PCTel Model WISP24018PTNF	18 degrees	0.3	< 50 feet
Omni Antenna and External Amplifier (CPI Model # 01027997-00)	360 degrees	0.5	< 50 feet

TERABEAM

WIRELESS

Model A2408  
A2412-O, A2412-D

2.4 GHz HEAVY DUTY OMNI-DIRECTIONAL ANTENNAS



**Model A2408**

- 8 dBi gain
- Wide beamwidth (25°)
- Low profile

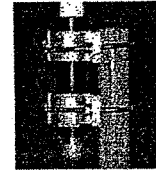


**Model A2412-O**

- 12 dBi gain
- No downtilt
- 5° beamwidth

**Model A2412-D**

- 12 dBi gain
- 3° downtilt
- 5° beamwidth



**Mounting Details  
for Model A2412**

Specifications

Model	A2408 (omni)	A2412-O (omni)	A2412-D (omni)
TBW Part Number	203-900009-001	203-900004-001	203-900003-001
<b>Electrical</b>			
Frequency Range:	2.400 to 2.500 GHz	2.400 to 2.485 GHz	2.400 to 2.485 GHz
Forward Gain:	8 dBi	12 dBi	12 dBi
VSWR:	< 2:1	< 2:1	< 2:1
Polarization:	Vertical	Vertical	Vertical
Beamwidth:	25 degrees	5 degrees	5 degrees with 3 degrees downtilt
<b>Mechanical</b>			
Termination:	N-type Female	N-type Female	N-type Female
Mounting:	U-Bolt bracket mount for 1-2.5 in O.D.	U-Bolt bracket mount for 1-2.5 in O.D.	U-Bolt bracket mount for 1-2.5 in O.D.
Dimensions (Diameter x Length):	1 in / 16 in	1 in / 5 ft, 5 in	1 in / 5 ft, 5 in
Weight:	2 lbs	3 lbs 8 oz	3 lbs 8 oz
Flat Panel Equivalent Area:	0.11 sq ft	0.45 sq ft	0.45 sq ft
Wind Survival:	125 mph	125 mph	125 mph
Radome:	Heavy-duty white UV inhibited fiberglass radome seal with internal copper elements		

Specifications subject to change without notice

Apr 2005-01

8000 Lee Highway, Falls Church VA 22042  
 Tel: (703) 205-0600 Fax: (703) 205-0610  
 Sales: 1-888-297-9090

990 Almanor Avenue, Sunnyvale, CA 94085  
 Tel: (408) 617-8150 Fax: (408) 617-8151  
 Sales: 1-800-664-7060

www.terabeam.com

# WISPerformance Series Directional Panel Antennas

**MAXRAD**

## Directional Panels

The WISP directional panel antennas are designed to provide maximum gain at 2.4 GHz frequencies. With a VSWR of less than 1.6:1, all models provide efficient and stable performance across the band. These robust antennas are designed for outdoor applications.

**General Specifications:**  
Directional panel antennas

**Radome Material:**  
UV stable plastic

**Polarization:**  
Linear, Vertical/Horizontal

**Nominal Impedance:**  
50 Ohms

**VSWR:**  
<1.6:1

**Maximum Power Input:**  
20 Watts

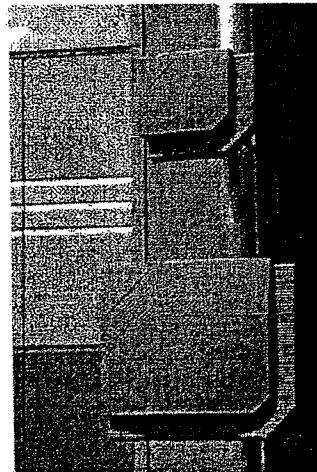
**Cable:**  
12" RG58/U with attached female N connector

**Mounting Method:**  
Mast mount included

**Temperature Range:**  
-40°C to +70°C

**Features and Benefits:**

- Patented printed circuit board design. Best performance-to-price ratio.
- Attractive, low profile UV stable housing. Blends well with indoor and outdoor environments where aesthetic considerations are important.
- Corner exit RG-58/U pigtail design. Permits the panel to be mounted in vertical or horizontal polarity.
- Adjustable mounting brackets for outdoor mounting. Provide maximum flexibility for outdoor installations.



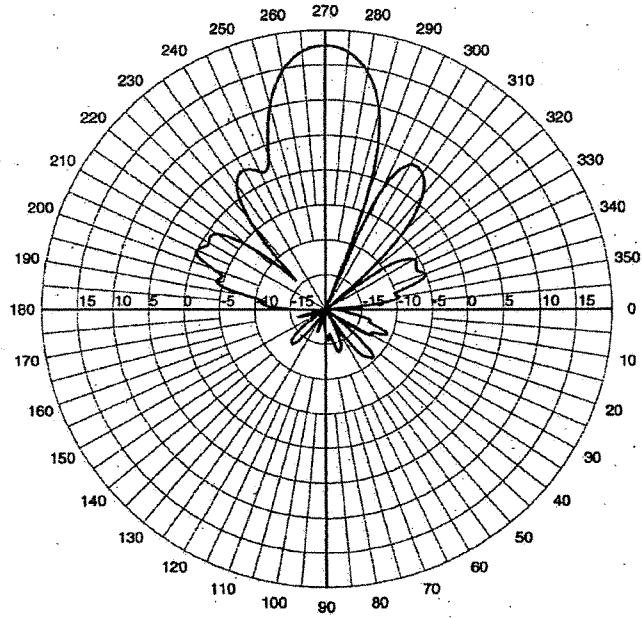
Directional Panels

### Electrical Specifications

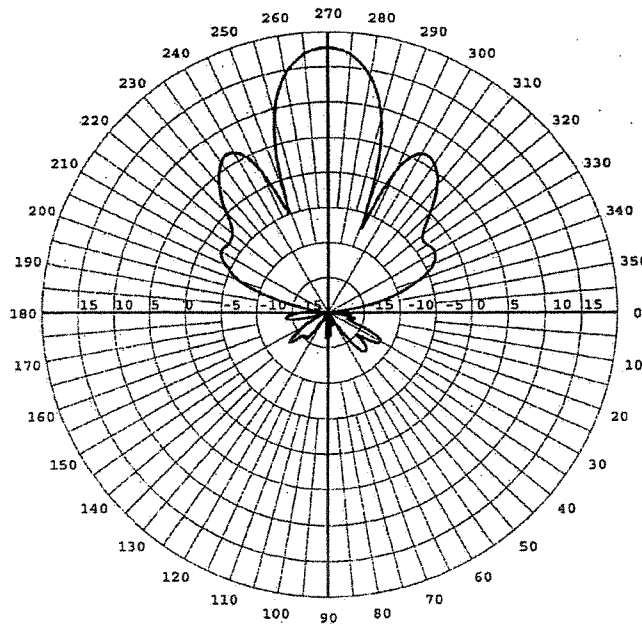
Model #	Frequency Range	Gain	Front-to-Back- Ratio	3 dB Horizontal Beamwidth	3 dB Vertical Beamwidth	VSWR	Maximum Power Input
WISP24009PTNF	2.3-2.5 GHz	9.0 dBi	> 15 dB	60°	60°	< 1.6:1	20 Watts
WISP24013PTNF	2.3-2.5 GHz	13.0 dBi	> 18 dB	35°	35°	< 1.6:1	20 Watts
→ WISP24018PTNF	2.3-2.5 GHz	18.0 dBi	> 25 dB	18°	19°	< 1.6:1	20 Watts

### Mechanical Specifications

Model #	Frontal Wind Loading @100 mph	Dimensions	Weight	Included Mount	Cable
WISP24009PTNF	9.3 lbs.	5.1" x 4.7" x 1.5"	0.5 lbs.	Indoor/outdoor articulating mount	12" RG58/U
WISP24013PTNF	27.9 lbs.	8.8" x 8.1" x 1.6"	1.2 lbs.	Heavy duty outdoor adjustable mount	12" RG58/U
→ WISP24018PTNF	85 lbs.	15.1" x 13.9" x 1.9"	3.9 lbs.	Heavy duty outdoor adjustable mount	12" RG58/U



WISP24018PTNF Elevation Cut



WISP24018PTNF Azimuth Cut

## Exhibit B

### Technical Parameters for Signal Boosters

Below is the following information for the signal boosters.

- (1) antenna type;
- (2) antenna beamwidth;
- (3) total EIRP; and
- (4) approximate height Above Ground Level (AGL)

<b>Antenna Type</b>	<b>Antenna Beamwidth</b>	<b>EIRP Total in Watts</b>	<b>Height AGL</b>
Antenna Specialists XMSSR923WR	75 degrees	.0001	< 50 feet
Integrated patch	160 degrees	.0001	< 50 feet

The transmitted carriers have a center frequency and frequency stability identical to the received SDARS satellite or terrestrial carriers. Frequency accuracy is controlled by the satellite or terrestrial repeater and not by the signal booster.