

# SIRIUS XM

RADIO INC.

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October 30, 2009

**Via IBFS**

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

**Re: Sirius XM Radio Inc.  
Request for 180-Day Special Temporary Authority  
For Two New Low Power Repeaters in Puerto Rico**

Dear Ms. Dortch:

Pursuant to Section 25.120(b)(2) of the Commission's rules, 47 C.F.R. § 25.120(b)(2), Sirius XM Radio Inc. ("Sirius XM"), a satellite radio licensee in the Satellite Digital Audio Radio Service, hereby requests 180-Day Special Temporary Authority ("STA") for two new low power terrestrial repeaters in Puerto Rico, each with an Effective Isotropically Radiated Power ("EIRP") of up to 2000 watts.<sup>1</sup>

Last month, the Commission granted Sirius XM STA to operate multiple repeaters in Puerto Rico.<sup>2</sup> One of those repeaters -- PR01-01 in San Juan -- is to be the anchor site for the repeater network that Sirius XM is constructing in Puerto Rico. The PR01-01 site has been constructed and began providing commercial service. Shortly thereafter, Sirius XM was notified by the landlord of the building on which this repeater is located that a planned replacement of four 12' chillers on the roof (used in connection with the building's central cooling system) would require equipment lifting devices to be operated on the rooftop, in the vicinity of the transmit antennas, for the duration of that project. Sirius XM believes that the persons controlling these devices may be exposed to unacceptable levels of RF radiation if the PR01-01 repeater were to transmit at its currently authorized height. However, by conducting tests pursuant to our experimental license, Call Sign

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<sup>1</sup> On October 23, 2009, Sirius XM filed a request to operate one of these two repeaters under 60-Day Special Temporary Authority pursuant to Section 25.120(b)(3) of the Commission's rules. See FCC File No. SAT-STA-20091023-00112. That request remains pending.

<sup>2</sup> See Sirius XM Radio Inc., *Order and Authorization*, IBFS File No. SAT-STA-20081027-00210 (Int'l. Bureau, Sept. 11, 2009).

WF2XDO, OET File No. 0326-EX-PL-2009, Sirius XM has confirmed that relocating the two omni-directional antennas only six feet higher than the STA height will eliminate the potential for excessive levels of RF radiation exposure to those workers. Sirius XM has completed an MPE test report showing this result and will retain that report in its files

Anticipating the commencement of construction on the rooftop and to avoid this potential RF hazard, Sirius XM has discontinued providing service using the PR01-01 repeater and herein requests authority to increase the antenna height from 260 feet to 266 feet. In the instant application, Sirius XM also requests authority to increase this repeater's power from 1000 watts to 2000 watts EIRP.

The second repeater -- identified as PR04-01 -- is located in Bayamon, Puerto Rico. Sirius XM herein requests authority to change the height of this repeater from 196 feet to 181 feet. This application seeks to make no other change to this second repeater other than this minor decrease in height, which Sirius XM finds to be necessary for contractual purposes.

The Commission has recognized that SDARS operators require terrestrial repeaters to provide high-quality service nationwide.<sup>3</sup> Consistent with this policy, in September 2001, the Bureau granted STAs to Sirius XM to operate a nationwide network of terrestrial repeaters.<sup>4</sup> In the years since, the Bureau has granted Sirius XM additional STAs to operate terrestrial repeaters, pending issuance of final rules governing the deployment and use of repeaters.<sup>5</sup>

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<sup>3</sup> See *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, and Further Notice of Proposed Rulemaking*, 12 FCC Rcd 5754, 5770 ¶ 37 (1997).

<sup>4</sup> See *Sirius Satellite Radio, Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complimentary Terrestrial Repeaters, Order and Authorization*, 16 FCC Rcd. 16773 ¶ 18 (2001) ("Sirius STA Order"). *XM Radio, Inc., Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complimentary Terrestrial Repeaters, Order and Authorization*, 16 FCC Rcd. 16781 ¶ 18 (2001) ("XM STA Order").

<sup>5</sup> See, e.g., *Sirius Satellite Radio Inc.; Request to Modify Special Temporary Authority to Operate Additional Satellite Digital Audio Radio Service Terrestrial Repeaters, Order and Authorization*, 19 FCC Rcd. 18140 (2004) (granting Sirius an STA in File No. SAT-STA-20031106-00370, effective Sept. 15, 2004. Since that time, the Commission has extended the STA several times, pending the issuance of final rules governing the use of satellite DARS terrestrial repeaters. In September 2004, the Commission granted Sirius a new STA to operate for 180 days or until the Commission issues final rules governing the use of satellite DARS terrestrial repeaters. See *Sirius Satellite Radio Inc. Request to Modify Special Temporary Authority to Operate Satellite DARS Terrestrial Repeaters, Order and Authorization*, 19 FCC Rcd 18149 (2004) ("2004 STA Grant Order"). Sirius timely filed an application for renewal of this STA on March 1, 2005. See File No. SAT-STA-20050301-00053. To date, the Commission has not acted on this application. See also, *XM Radio, Inc.; Request for Special*

*Public Interest Considerations.* Granting the instant STA will serve the public interest by ensuring the ability of Sirius XM subscribers in Puerto Rico to receive high quality satellite radio service. As to the change in the PR01-01 site requested in IBFS File No. SAT-STA-20081027-00210, granting the instant STA will serve the public interest by allowing Sirius XM to minimize the disruption of service to San Juan residents and will eliminate the possibility of excessive RF radiation exposure to workers replacing equipment on the building's roof.

*Technical Information for the New Low Power Repeaters.* The following technical information pertaining to the repeaters is provided in Exhibit A: (1) antenna type; (2) antenna orientation; (3) average EIRP; (4) height above ground level ("AGL"); and (5) antenna downtilt.<sup>6</sup> Exhibits B and C consist respectively, of Google™ satellite images and topographic maps showing the location of the proposed facilities. The specification sheet for the antennas to be used by the repeaters is attached as Exhibit D.

*Interference Considerations.* As proposed in this STA, the repeaters will operate at an average EIRP of less than 2000 watts. Because Sirius XM has exclusive use of its licensed band, it is highly unlikely that this low power repeater will create interference to other licensees. To the extent Sirius XM's original 2001 STAs require it to coordinate with affected Wireless Communications Services ("WCS") licensees prior to operating any repeater, Sirius XM is not aware of any operational WCS facilities in Puerto Rico.<sup>7</sup> Moreover, as the Bureau acknowledged in granting Sirius XM's original repeater STA requests, the WCS licensees have confirmed that operating terrestrial repeaters at an EIRP of 2 kW or less is not an interference concern.<sup>8</sup> However, if prohibited interference does occur, Sirius XM will cease operation of the repeater until such interference can be eliminated.<sup>9</sup>

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*Temporary Authority to Operate Additional Satellite Digital Audio Radio Service Terrestrial Repeaters, Order and Authorization*, 19 FCC Rcd. 18140 (2004) (granting XM an STA in File No. SAT-STA-20031112-00371, effective Sept. 15, 2004); *Public Notice*, 2002 FCC Lexis 5670 (rel. Oct. 30, 2002) (granting XM an STA in File No. SAT-STA-20020815-00153, effective Sept. 30, 2002); *Public Notice*, 2003 FCC Lexis 4803 (rel. Aug. 29, 2002) (granting XM an STA in File No. SAT-STA-20030409-00076, effective June 26, 2003). XM has filed applications to renew its STAs, and those renewal applications remain pending.

<sup>6</sup> For purposes of Sirius XM's repeater STA applications, "antenna downtilt" refers to an antenna's mechanical downtilt, without reference to any electrical downtilt built into the antenna.

<sup>7</sup> See *Sirius STA Order* ¶ 14 and *XM STA Order* ¶ 14. Despite the Bureau's statement in the *XM STA Order* (at ¶ 14) and *Sirius STA Order* (at ¶ 14) that it expects "WCS licensees to provide a schedule or as much advance notice as possible of when their stations are to be placed in operation," Sirius XM has not received information directly from any WCS licensee regarding plans for WCS deployment in these markets. Moreover, Sirius XM's own reviews of "substantial service" filings do not show any operational WCS stations in this market.

<sup>8</sup> *XM STA Order* ¶ 12 ("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."). Moreover, in March 2007, the WCS Coalition said that it will defer

*Ownership and Control of Repeaters.* Sirius XM will continue to own the repeaters and it will be responsible for the repeaters' installation and operation.

*Certifications.* Sirius XM certifies that it will operate the repeaters subject to the conditions and certifications set forth in the *Sirius STA Order* and *XM STA Order* granting Sirius XM's September 2001 requests for STAs to operate terrestrial repeaters. Specifically, Sirius XM certifies the following:

- (1) Sirius XM will operate these repeaters at its own risk, and such operation shall not prejudice the outcome of the final rules adopted by the Commission in GEN Docket 95-91;
- (2) Sirius XM will operate these facilities on a non-interference basis with respect to all permanently authorized radiocommunication facilities;
- (3) The facilities 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 facilities 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 facilities will comply with Part 17 of the Commission's rules – Construction, Marking, and Lighting of Antenna Structures;
- (6) The facilities 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 facilities will be limited to  $75+10\log$  (EIRP) dB less than the transmitter EIRP;

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from objecting to STA requests that propose operations of no more than 2,000 watts EIRP, even if they do not specify peak or average EIRP, provided that grant of the STA (i) is conditioned on operation on a non-interference basis; and (ii) is subject to the condition that the issue of peak versus average EIRP will be addressed in the pending DARS rulemaking (IB Docket No. 95-91). *See* Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Ms. Helen Domenici, FCC, File No. SAT-STA-20061207-00145 (March 19, 2007). XM agrees to these conditions.

<sup>9</sup> The design of these repeaters includes several automated shutdown mechanisms that are triggered in the event of equipment major malfunctions. The transmit chain also includes a transmit output coupler which feeds a self-monitoring system detecting any transmission anomalies. Any such anomalies are automatically reported back to Sirius XM's National Repeater Control Center (202-380-4725), which is available on a continuous basis to receive any reports of any suspected interference and take immediate corrective action.

- (8) Sirius XM will operate these repeaters according to the technical parameters provided in this application;
- (9) Sirius XM will maintain full ownership and operational control of these repeaters; and
- (10) Sirius XM will immediately shut down these repeaters upon a complaint of interference, upon direction from the Commission, or upon finding that a facility has not been properly installed.

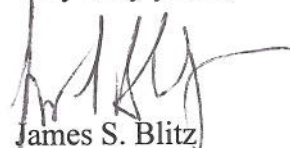
Granting this request will not alter Sirius XM's obligation to protect authorized radio-communications facilities from interference, nor will it prejudice the outcome of the Commission's ongoing rulemaking pertaining to the deployment and operation of terrestrial repeaters.

Sirius 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).

Sirius XM is submitting payment to the Federal Communications Commission in the amount of Two Thousand Eight Hundred Sixty Dollars (\$2860.00) -- the filing fee applicable to requests for STAs for non-geostationary ("NGSO") satellites.<sup>10</sup>

Please direct any questions regarding this matter to the undersigned.

Very truly yours,



James S. Blitz

Vice President, Regulatory Counsel

cc: Stephen Duall, FCC International Bureau  
Jay Whaley, FCC International Bureau  
Sankar Persaud, FCC International Bureau

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<sup>10</sup> See International and Satellite Services Fee Filing Guide (February 2009).

## Exhibit A

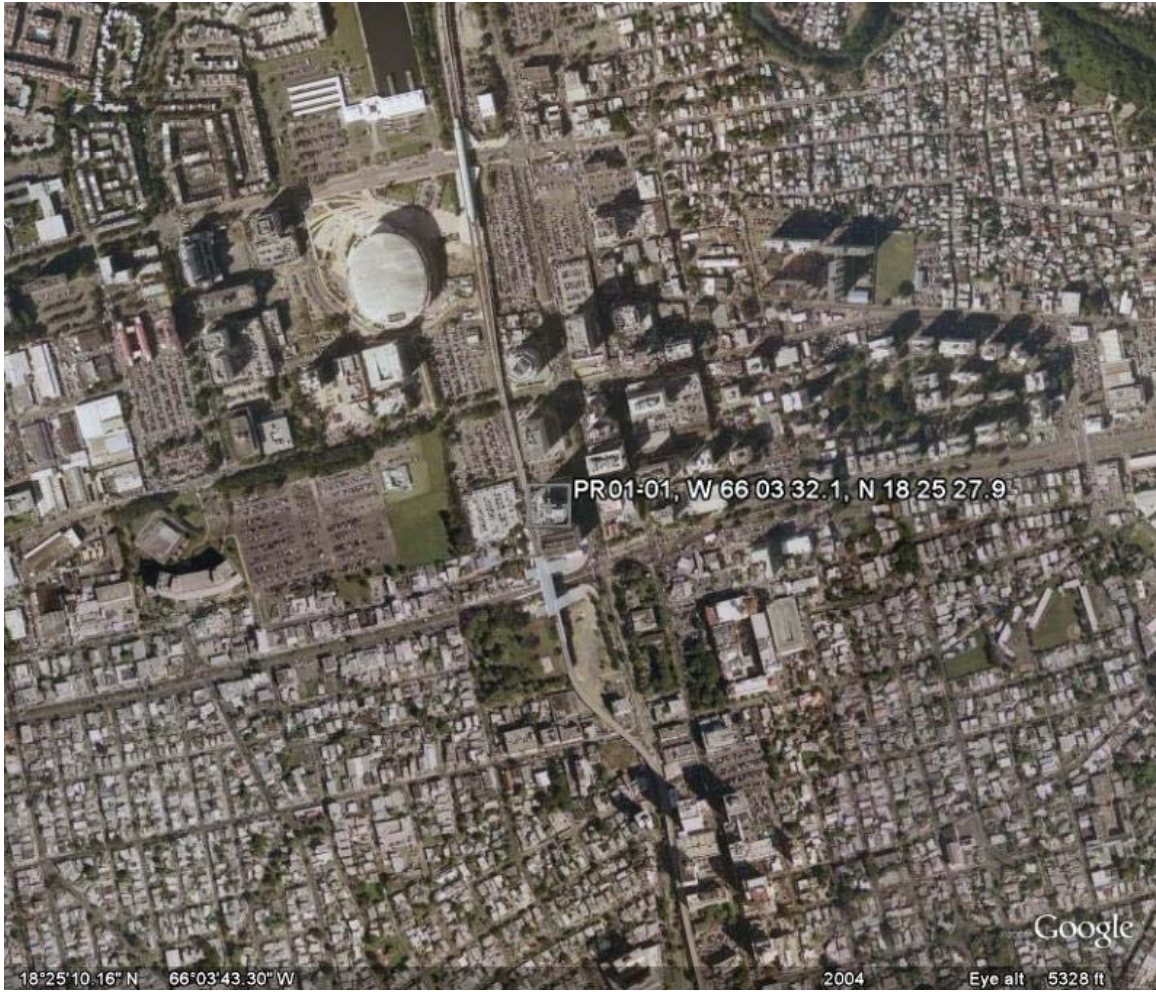
### Technical parameters for repeaters

<b>CITY</b>	<b>ANTENNA NUMBER</b>	<b>SITE LATITUDE (N)</b>	<b>SITE LONGITUDE (W)</b>	<b>ANTENNA TYPE</b>	<b>ANTENNA ORIENTATION (AZIMUTH)</b>	<b>ANTENNA HEIGHT (FT. AGL)</b>	<b>ANTENNA DOWNTILT (DEGREES)</b>	<b>TOTAL AVERAGE EIRP(W)</b>
San Juan, PR	PR01-01 (Sector 1)	66-03-32	18-25-28	TA-2350-DAB	N/A	266	0	1000
San Juan, PR	PR01-01 (Sector 2)	66-03-32	18-25-28	TA-2350-DAB	N/A	266	0	1000
Bayamon, PR	PR04-01 (Sector 1)	66-08-43	18-23-48	SA2500-090X-16	225	181	0	2000
Bayamon, PR	PR04-01 (Sector 2)	66-08-43	18-23-48	SA2500-090X-16	315	181	0	2000

**Exhibit B**

**Google™ Satellite Image of Repeater Location**

**PR01-01**



**Exhibit B**

**Google™ Satellite Image of Repeater Location**

**PR04-01**





Exhibit C

Topographic Map of Repeater Location

PR01-01

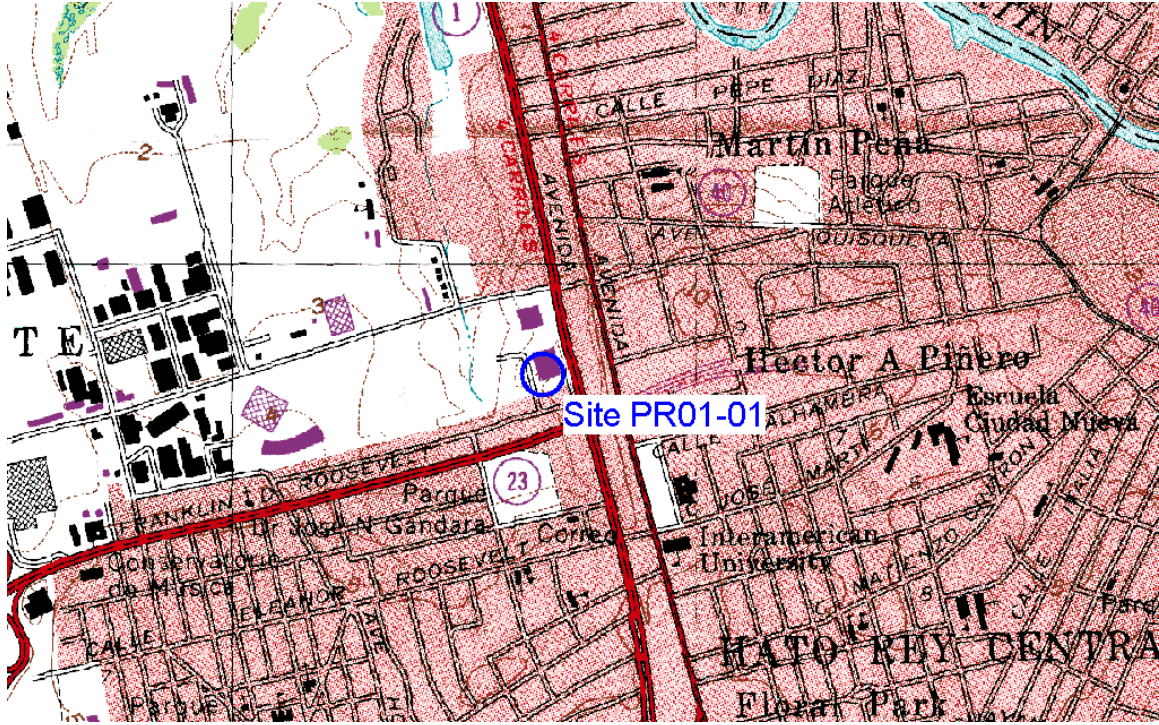
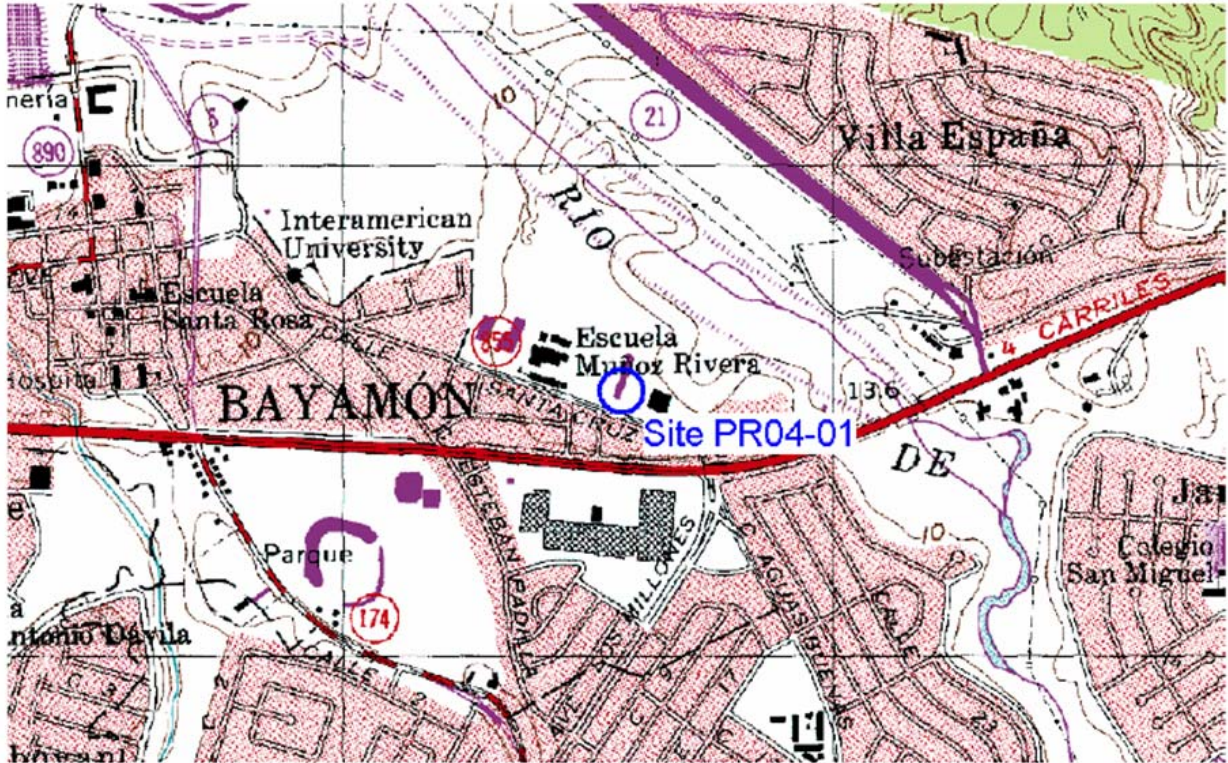


Exhibit C

Topographic Map of Repeater Location

PR04-01



**Exhibit D**

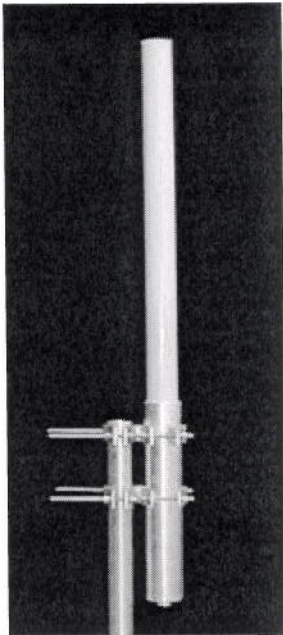
**Antenna Specification Sheet for Repeaters**



# TA-2350-DAB

## Medium Power Omnidirectional

### 2330-2345 MHz



The TA-2350-DAB is a medium power vertically polarized omnidirectional antenna specifically designed for Digital Audio Broadcast transmission. The antenna consists of a phased corporately fed broadband dipole array which is configured to provide electrical beam downtilt and null fill. The antenna elements are at DC ground to aid in lightning protection.

#### Electrical Specifications

- Frequency Range:** 2330-2345 MHz
- Gain:** 10 dBi
- VSWR:** 1.4:1 max.
- Polarization:** Vertical
- Power Rating:** 200 W avg., 800 W peak
- H-Plane Beamwidth:** 360 degrees
- E-Plane Beamwidth:** 8 degrees
- Electrical\_Downtilt:** 2, 4, 6 degrees
- Cross Pol. Discrimination:** 20 dB min.
- Null Fill:** -20 dB (1st Null)
- Impedance:** 50 ohms nominal
- Termination:** 7/16 DIN female

Typical mid band values. (For details , contact factory)

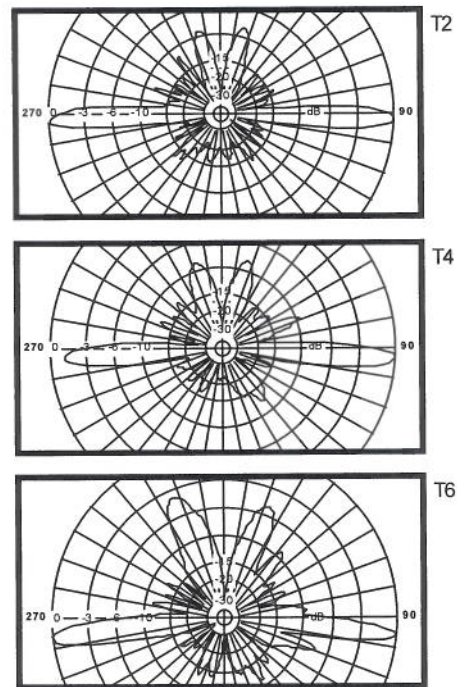
#### Mechanical Specifications

- Length:** 70 in. (1778 mm)
- Diameter:** 2.25 in. (57 mm)
- Weight (Incl. Clamps):** 15 lb. (6.8 kg)
- Rated Wind Velocity:** 125 mph (200 km/h)
- Hor. Thrust at rated wind:** 31 lb. (14 kg)
- Mounting Pipe:** 1.75 - 4.0 in. (44.5 - 102 mm)

#### Materials

- Radiating Elements:** Nickel plated copper array
- Radome:** Gray UV stabilized fiberglass
- Clamps:** HDG steel

E-Plane





# SA2500-090X-16

DualPol® Antenna

**Decibel®**  
Base Station Antennas

- Broadband Sector Antenna ideally suited for WiMax applications
- High performance in a small, lightweight package
- Superior front to back ratio
- Rugged reliable design

## ELECTRICAL

Frequency (MHz) :	2300 - 2700
Polarization :	±45°
Gain (dBd/dBi) :	14.5/16.6
Azimuth BW (Deg.):	90
Elevation BW (Deg.):	5.6
Beam Tilt (Deg.):	2
USLS* (dB) :	18
Front-To-Back Ratio* (dB) :	34
Isolation (dB) :	>30
VSWR :	<1.4:1
PIM3 @ 2 x 20w (dBc) :	-140
Max. Input Power (Watts) :	80
Impedance (Ohms) :	50
Lightning Protection :	DC Ground

Notes: Antenna mount is included with antenna.

## MECHANICAL

Weight :	3.9 kg (8.7 lb)
Dimensions (LxWxD) :	1,219 x 165 x 84 mm (48 x 6.5 x 3.3 in)
Max. Wind Area :	0.10 m <sup>2</sup> (1.1 ft <sup>2</sup> )
Max. Wind Load (@ 100 mph) :	271.7 N (61.1 lbf)
Max. Wind Speed :	241 km/h (150 mph)
Hardware Material :	Stainless Steel
Connector Type :	N - Type Female (2, Bottom)
Color :	Light Gray
Standard Mounting Hardware :	602030WM



Andrew Corporation  
2601 Telecom Parkway  
Richardson, Texas U.S.A 75082-3521  
Tel: 214.631.0310

Fax: 214.631.4706  
Toll Free Tel: 1.800.676.5342  
Fax: 1.800.229.4706  
www.andrew.com

\* - Indicates Typical  
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dbtech@andrew.com

Information correct at date of issue but may be subject to change without notice.



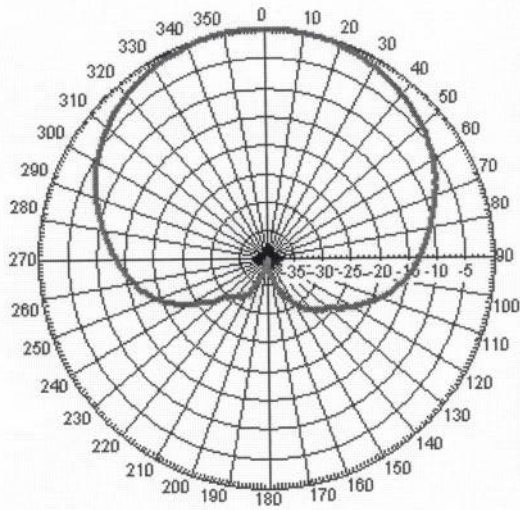
# SA2500-090X-16

DualPol® Antenna

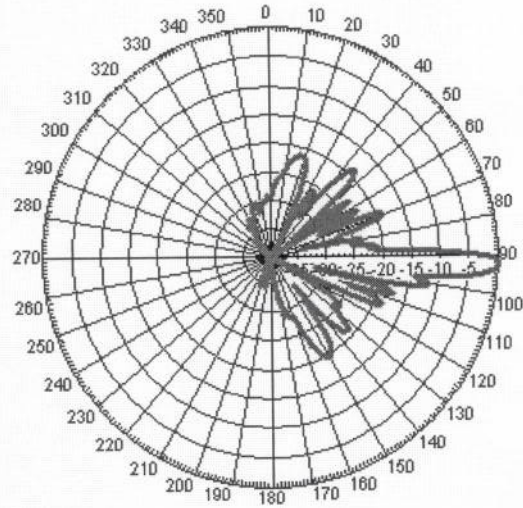
**Decibel®**  
Base Station Antennas

## AZIMUTH PATTERN

## ELEVATION PATTERN



Freq: 2500 MHz, Tilt: 2



Freq: 2500 MHz, Tilt: 2

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