Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Application of	)	
	)	
Sirius XM Radio Inc.	)	File No. _____
	)	
For Authority to Construct and Operate Terrestrial Repeaters in the Satellite Digital Audio Radio Service	)	
	)	

To: Chief, International Bureau

APPLICATION OF SIRIUS XM RADIO INC.

Sirius XM Radio Inc. ("Sirius XM"), a licensee in the satellite digital audio radio service ("SDARS"), hereby applies for authority under the Communications Act of 1934, as amended, and Section 25.144(e) of the Commission's regulations, 47 C.F.R. § 25.144(e), to construct and operate terrestrial repeaters to be used in conjunction with its satellite radio network. A completed FCC Form 312 is attached, pursuant to the Commission's Rules and its May 2010 decision adopting these rules.[1]

Background

The Commission has long recognized that SDARS operations require terrestrial repeaters to provide high-quality service nationwide.[2] Consistent with this policy, in September 2001, the International Bureau granted Special Temporary Authority ("STA") authorizing Sirius XM's

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[1] *See Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, Report and Order and Second Report and Order,* 25 FCC Rcd 11710, 11711 ¶ 1 (2010) ("2010 Order").

[2] *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).

predecessors to operate a nationwide network of terrestrial repeaters.[3] The Bureau subsequently granted many additional STAs for terrestrial repeaters in the satellite radio service, pending the adoption of rules governing the deployment and use of those repeaters.[4]

The 2010 Order adopted rules for satellite radio repeaters, basing those rules on the model the Commission employs to license very small aperture terminals (VSATs) in the Fixed-Satellite Service (FSS). That model allows a system operator to obtain a single earth station license to operate up to an applicant-specified number of remote terminals during the license term. Adapting the VSAT model to an SDARS repeater network, the 2010 Order established a two-part licensing system, under which the Commission will grant: (a) a blanket license for all repeaters meeting the requirements adopted for repeater operations in the 2010 Order (including power and out-of-band emissions limits), and (b) a site-by-site license for those repeaters not

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[3] *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 (International Bureau, 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 (International Bureau, 2001).

[4] *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 (International Bureau, 2004) (granting 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). *See also, XM Radio, Inc.; Request for Special Temporary Authority to Operate Additional Satellite Digital Audio Radio Service Terrestrial Repeaters, Order and Authorization,* 19 FCC Rcd. 18140 (International Bureau, 2004) (granting File No. SAT-STA-20031112-00371, effective Sept. 15, 2004); *Public Notice*, 2002 FCC Lexis 5670 (rel. Oct. 30, 2002) (granting XM an STA, File No. SAT-STA-20020815-00153, effective Sept. 30, 2002); *Public Notice*, 2003 FCC Lexis 4803 (rel. Aug. 29, 2002) (granting File No. SAT-STA-20030409-00076, effective June 26, 2003).

eligible for blanket licensing. The instant application satisfies these requirements, providing the information required both for blanket licensing under Section 25.144(e)(2) of the Rules, 47 C.F.R. § 25.144(e)(2) and site-by-site licensing under Section 25.144(e)(9) of the Rules, 47 C.F.R.§ 25.144(e)(9).

The new rules also established mechanisms to facilitate the continued operation of Sirius XM's terrestrial repeaters under STA until the new rules were fully in effect.[5] Following the release of the 2010 Order, the Bureau continued to grant and renew STAs authorizing Sirius XM to construct and operate its repeater network. Those STAs include grants allowing collocation of Sirius XM and XM network terrestrial repeaters,[6] grants of long-pending STA applications,[7] and grant of a blanket STA for all repeaters not covered by an existing STA until such time as the Commission licenses those repeaters pursuant to Section 25.144 of the Rules.[8] The STAs authorizing Sirius XM's current repeater network have all been renewed and remain valid.

Sirius XM continues to need each of these STAs because the Commission could not implement the permanent licensing authority afforded by the 2010 Order until after those rules were approved by the Office of Management and Budget. That approval has now been obtained and the rules went into effect on September 19, 2011.[9] Accordingly, Sirius XM is filing the instant application at this time.

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[5] *See* 2010 Order, ¶ 264.

[6] *See* FCC File No. SAT-STA-20101118-00240, granted January13, 2011.

[7] *See* FCC File Nos. SAT-STA-20020311-00049, SAT-STA-20020312-00048, SAT-STA-20030325-00056, SAT-STA 20031219-00373, SAT-STA-2003121900369 et al., granted September 15, 2010.

[8] *See* FCC File No. SAT-STA-20110128-00018, granted March 23, 2011.

[9] *See* Establishment of Rules and Policies for the Satellite Digital Audio Radio Service in the 2310–2360 MHz Frequency Band, 76 Fed. Reg. 57,923 (September 19, 2011). *See also*

I. License Application

A. Blanket License Application (47 C.F.R. § 25.144(e)(8))

1. The space station(s) with which the terrestrial repeaters will communicate, the frequencies and emission designators of such communications, and the frequencies and emission designators used by the repeaters to retransmit the received signals.

See Attachment A hereto.

2. The maximum number of terrestrial repeaters that will be deployed under this authorization at 1) power levels equal to or less than 2-watt average EIRP, and 2) power levels greater than 2-watt average EIRP (up to12-kW average EIRP).

Under this license, Sirius XM will deploy: (1) up to 5,000 terrestrial repeaters, on each of the Sirius XM and the XM networks, at a power level equal to or less than 2-watts average EIRP; and (2) up to 1,000 terrestrial repeaters, on each of the Sirius XM and the XM networks, at a power level between 2-watts and 12-kw average EIRP.

B. Site-by-Site License Application (47 C.F.R. § 25.144(e)(9))

1. The technical information for the repeater required to be shared with potentially affected WCS licensees as part of the notification requirement set forth in Sec. 25.263(c)(2).

See Attachment B hereto.

2. The space station(s) with which the terrestrial repeater will communicate, the frequencies and emission designators of such communications, and the frequencies and emission designators used by the repeaters to retransmit the received signals.

See Attachment A hereto.

C. Certification of Compliance (47 C.F.R. § 25.144(e)(1) through (7))

(1) Sirius XM holds SDARS space station licenses. Sirius XM's construction and operation of the terrestrial repeaters under this license will be only in conjunction with at least one SDARS space station that is concurrently authorized and transmitting directly to subscribers.

Operation of Wireless Communications Services in the 2.3 GHz Band; Establishment of Rules and Policies for the Satellite Digital Audio Radio Service in the 2310–2360 MHz Frequency Band, 76 Fed. Reg. 67,070 (October 31, 2011).

(2) The terrestrial repeaters authorized under this license will (i) comply with all applicable power limits set forth in Sec. 25.214(d)(1) (except as indicated on Attachment B hereto) and all applicable out-of-band emission limits in Sec. 25.202(h)(1) and (h)(2); (ii) meet all applicable requirements in part 1, subpart I, and part 17 of the Commission's Rules and Sirius XM will maintain demonstrations of compliance with part 1, subpart I and make such demonstrations available to the Commission upon request within three business days; and (iii) comply with all requirements of applicable international agreements.

(3) Before deploying any new, or modifying any existing, terrestrial repeater, Sirius XM will notify potentially affected WCS licensees pursuant to the procedures set forth in Sec. 25.263 of the Rules.

(4) The terrestrial repeaters will be restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by Sirius XM's satellites directly to subscribers' receivers, and will not be used to distribute any information not also transmitted to all subscribers' receivers.[10]

(5) Sirius XM will not use the terrestrial repeaters to retransmit different transmissions from a satellite to different regions within that satellite's coverage area.

(6) Sirius XM will comply with all applicable provisions of part 1, subpart I, and part 17 of the Commission's Rules.

(7) Except as discussed in the temporary waiver request in Section II below and as otherwise exempted by the Commission, each terrestrial repeater utilized for operation is of a type that the Commission has authorized under its certification procedure. In addition to the procedures set forth in Subpart J of Part 2 of the Commission's Rules, Sirius XM will make power measurements for repeater transmitters as detailed in Section 25.144(e)(7)(ii) of the Rules.

II. Request for Temporary Waiver

Sirius XM herein requests a 24 month waiver of the obligation in Section 25.144(e)(7)(i) of the Rules, 47 C.F.R. § 25.144(e)(7)(i), that each terrestrial repeater transmitter utilized for operation is of a type authorized by the Commission under its certification procedure.

The Commission recognized in the 2010 Order that "it will take time to complete the Certification equipment authorization procedure for all terrestrial repeater models that are to be deployed under the initial blanket license application...." Accordingly, the Commission allowed "Sirius XM [to] request a waiver, as part of its initial blanket license application, of the

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[10] *See* 2010 Order, ¶ 308.

requirement that it certify that all repeater models intended to be deployed have been authorized by the Commission under its Certification equipment authorization procedure." The Commission noted that the 24 month waiver to obtain equipment Certification would become a condition on the grant of authorization for the blanket license. The Commission also said the waiver request could seek to exempt "any models of terrestrial repeaters currently deployed but no longer being manufactured and that will not have additional deployments in the future." The Commission explained:

> exempting such discontinued models from the Certification equipment authorization procedure will not undermine the purpose of the rule, since the exemption is likely to cover a limited number of already-deployed repeaters, and that it would be an undue hardship for Sirius XM to undergo the expense of Certification for models of repeaters that it does not intend to deploy in the future.[11]

Pursuant to the process the Commission established in the 2010 Order, Sirius XM requests a waiver for up to 24 months to obtain Certification for terrestrial repeaters it intends to deploy and an exemption from such Certification all models of terrestrial repeaters currently deployed but that are no longer being manufactured and will not have additional deployments after the effective date of the 2010 Order. Such repeaters nonetheless meet the requirements for power, peak-to-average power ratio (PAPR), and out-of-band emissions (OOBE) that the Commission adopted in the 2010 order power for satellite radio terrestrial repeaters, except as to the repeaters on Attachment B which are subjected to site-by-site licensing because they exceed the 12-kw EIRP power limit in the rules.

Accordingly, Sirius XM requests temporary waiver of and exemption from the equipment Certification requirement for the reasons the Commission explained in the 2010 Order.

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[11] 2010 Order, ¶ 304.

III. Public Interest Considerations

As noted above, the Commission has recognized that SDARS operations require terrestrial repeaters to provide high-quality service nationwide. Granting this application will serve the public interest by facilitating Sirius XM's ability to construct and operate its terrestrial repeater network, thereby allowing Sirius XM to continue providing customers with a the high degree of service availability that its customers demand.

Conclusion

For the foregoing reasons, Sirius XM hereby respectfully requests that the Commission promptly grant this Application for a joint blanket repeater license and a site-by-site repeater license,[12] as well as the accompanying waiver request, thereby enabling Sirius XM to continue to provide to the public the significant benefits described above.

Respectfully submitted,

James S. Blitz
Vice President, Regulatory Counsel
Sirius XM Radio Inc.
1500 Eckington Place, NE
Washington, D.C. 20002
(202) 380-4000

November 11, 2011

[12] The site-by-site licensing procedures the Commission adopted in the 2010 Order make clear that no formal rule waiver is needed in connection with an application to operate these repeaters and, as Sirius XM has previously discussed, no waiver should be required. *See* Sirius XM's Opposition to the Petitions for Reconsideration of AT&T and the WCS Coalition, WT Docket No. 07-293, October 18, 2010, at 19-20. However, to the extent the Commission may ultimately determine that a waiver is needed in connection with site-by-site licensed repeaters, such a waiver is hereby requested for the sites identified on Attachment B.

Technical Certification

I, Richard Merkle, V.P., Repeater Engineering and Operations for Sirius XM Radio Inc., hereby certify under penalty of perjury that:

- I am the technically qualified person with overall responsibility for preparation of the technical information contained in this application;
- I am familiar with the technical requirements of Part 25 of the Commission's Rules; and
- The information contained in the application is complete and accurate to the best of my knowledge, information and belief.

Richard W. Merkle, P.E.

Dated: November 11, 2011

Attachment A

Information Required by 47 C.F.R. § 25.144(e)(8)(i).

Note: For purposes of this attachment, "Sirius Band" refers to the band originally licensed to Sirius Satellite Radio (2320 MHz - 2332.5 MHz) and "XM Band" refers to the band originally licensed to XM Radio (2332.5 MHz – 2345 MHz).

1. The space station(s) with which the terrestrial repeaters will communicate:

Space Stations – XM Band:

Satellite Name	Call Sign	Bandwidth (MHz)	Frequency (MHz)	Emission Designator
XM-3	S2617	1.84	2333.465	1M84G1W
XM-3	S2617	1.84	2344.045	1M84G1W
XM-4	S2616	1.84	2335.305	1M84G1W
XM-4	S2616	1.84	2342.205	1M84G1W
XM-5	S2786	1.84	2333.465	1M84G1W
XM-5	S2786	1.84	2344.045	1M84G1W

Space Stations – Sirius Band:

Commercial FSS Satellite	Call Sign	Bandwidth (MHz)	Frequency (MHz)	Emission Designator
Galaxy 16 (G-16)	S2687	11.0	11700 - 12200	11M0G7W
ALLSAT	N/A	11.0	11700 - 12200	11M0G7W

As the Commission recognized in the 2010 Order, repeaters operating in the former Sirius band (2320-2332.5 MHz) receive Ku-band (11.7-12.2 GHz space-to-Earth) transmissions via a Commercial FSS satellite in geostationary orbit. The repeaters then convert the Ku-band signal into S-band (2.3 GHz-band) frequencies used for SDARS repeater transmissions. *See* 2010 Order, ¶ 658. The specific frequency of space station transmissions to these repeaters may change if, in the future, Sirius XM changes the commercial Ku-band satellite provider that it uses to feed these repeaters.

2. The frequencies and emission designators used by the repeaters to retransmit the received signals:

Repeater Network	Center Frequency (MHz)	Bandwidth (MHz)	Emission Designator
Sirius Band	2326.25	4.012	4M01D7W
XM Band	2338.75	5.06	5M06D7W

Attachment B

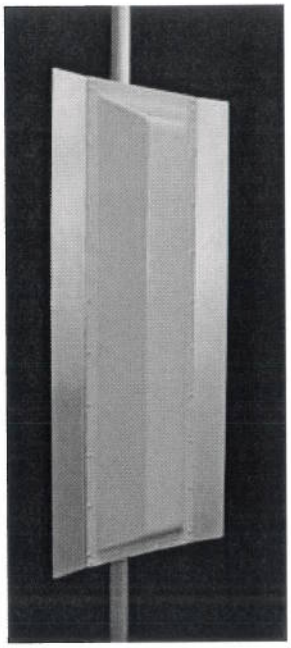
City	Antenna Number	Site Latitude	Site Longitude	Ground Elevation	Antenna Type	Antenna Orientation	Antenna Height	Antenna Downtilt	Total Average EIRP
Rensselaer, NY	XM ALB013B	42-36-12	73-44-00	396	TA-2304-2-DAB- H(60)	40	108	0	34,000
Fresno, CA	XM FRE002A	36-49-00	119-52-56	302	TA-2304-2-DAB-H(90)	120	180	0	38,000
Tacoma, WA	XM SEA525D-1	47-15-48	122-20-53	424	TA-2335-DAB-H	150	220	0	18,000
Tacoma, WA	XM SEA525D-2	47-15-48	122-20-53	424	TA-2335-DAB-H	260	220	0	18,000
Washington, DC	XM WDC105I	38-57-01	77-04-47	403	TA-2335-DAB-H	260	207	0	24,000

On the following pages, Sirius XM provides antenna specification sheets showing the gain patterns for the antennas identified above.

TA-2335-DAB-H

High Power Sector

2330-2345 MHz



The TA-2335-DAB-H is a high power vertically polarized sectoral antenna specifically designed for Digital Audio Broadcast transmission. The antenna is also designed to provide a shaped azimuth beamwidth of 95 degrees by use of shaped reflector phasing enabling multi-sector applications. The antenna elements are at DC ground to aid in lightning protection.

Electrical Specifications

Frequency Range: 2330-2345 MHz
Gain: 15 dBi
VSWR: 1.4:1 min.
Front to Back Ratio: 20 dB
Polarization: Vertical
Power Rating: 1000 W avg. 4000 W peak
H-Plane Beamwidth: 95° @ -3dB, 120° @ -10
E-Plane Beamwidth: 7 degrees
Cross Pol. Discrimination: 20 dB
Impedance: 50 ohms nominal
Termination: 7/16 DIN female

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

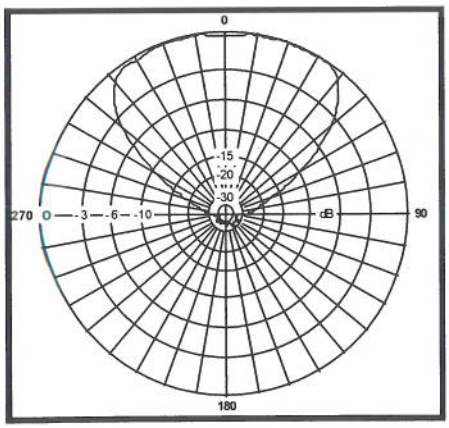
Mechanical Specifications

Length: 38 in. (965 mm)
Width: 21 in. (533 mm)
Depth: 8 in. (203 mm)
Weight (incl. Clamps): 33 lb. (15 kg)
Rated Wind Velocity: 125 mph (200 km/h)
Hor. Thrust at rated wind: 344 lb. (156 kg)
Mechanical Tilt: +5° to -15°
Mounting (O.D.):0.75 - 3.0 in. (19 - 76 mm)

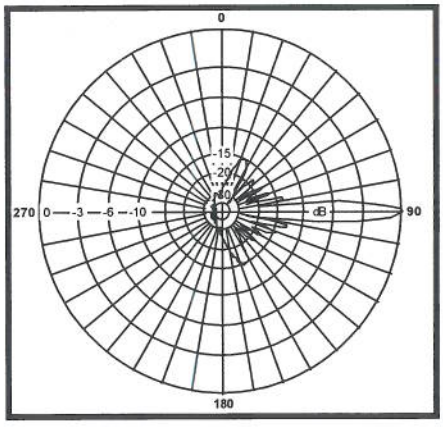
Materials

Radiating Elements: Gold-plated copper on PCB
Reflector: Irridited aluminum
Radome: Gray UV stabilized ASA
Clamps: HDG steel

H-Plane



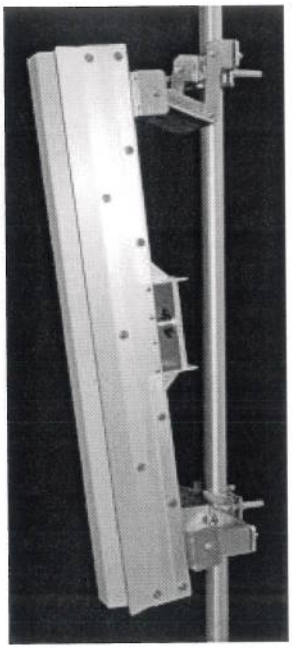
E-Plane



TA-2304-2-DAB-H

High Power Adjustable Sector

2330-2345 MHz



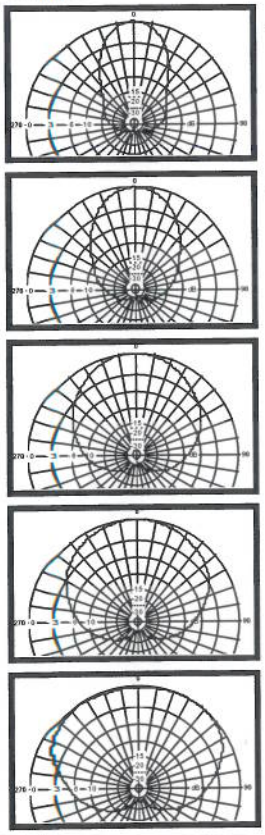
The TA-2304-2-DAB-H is a high power vertically polarized sectoral antenna specifically designed for Digital Audio Broadcast transmission. The antenna is designed to provide field adjustable azimuth beamwidths of 45, 60, 90, 120, or 160 degrees by use of side panels. The antenna elements are at DC ground to aid in lightning protection.

Electrical Specifications

Frequency Range: 2330-2345 MHz
Gain: 18 dBi @ 45°, 17 dBi @ 60°, 15 dBi @ 90°
14 dBi @ 120°, 13 dBi @ 160°
VSWR: 1.3:1 max.
Front to Back Ratio: 15 dB min.
Polarization: Vertical
Power Rating: 2000 W avg., 8000 W peak
H-Plane Beamwidth: 45°, 60°, 90°, 120°, 160°
E-Plane Beamwidth: 7 degrees
Cross Pol. Discrimination: 20 dB
Impedance: 50 ohms nominal
Termination: 7/8" EIA Flange

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

H-Plane



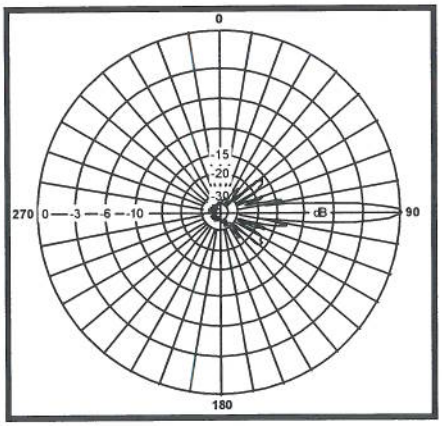
Mechanical Specifications

Length: 39.4 in. (1001 mm)
Width: 6.5 in. (165 mm) with 45° side panels
5.0 in. (127 mm) without 45° side panels
Depth: 9.0 in. (228.6 mm)
Weight (incl. Clamps): 31 lb. (14.1 kg)
Rated Wind Velocity: 125 mph (200 km/h)
Hor. Thrust at rated wind: 86 lb. (39 kg)
with 45° side panels: 111 lb. (50.4 kg)
Mechanical Tilt: 0° +/- 11.5°
Mounting (O.D.):0.75 - 3.0 in. (19 - 76 mm)

Materials

Radiating Elements: Tin Plated copper on PCB
Reflector: Irridited aluminum
Radome: Gray UV stabilized ASA
Clamps: Stainless and HDG steel

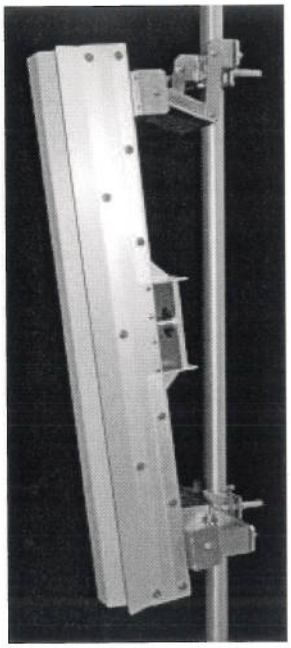
E-Plane



TA-2304-2-DAB-H

High Power Adjustable Sector

2330-2345 MHz



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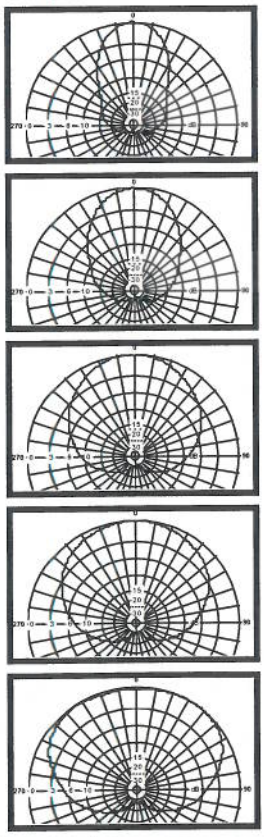

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with 45° side panels: 111 lb. (50.4 kg)
Mechanical Tilt: 0° +/- 11.5°
Mounting (O.D.):0.75 - 3.0 in. (19 - 76 mm)

Materials

Radiating Elements: Tin Plated copper on PCB
Reflector: Irridited aluminum
Radome: Gray UV stabilized ASA
Clamps: Stainless and HDG steel

E-Plane