



Sirius Satellite Radio  
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March 12, 2002

**VIA HAND DELIVERY**

Mr. William F. Caton  
 Acting Secretary  
 Federal Communications Commission  
 236 Massachusetts Avenue, NE  
 Washington, DC 20002



File # SAT-STA-20020312-00048  
 Call Sign \_\_\_\_\_ Grant Date 09/15/10  
 (or other identifier) \_\_\_\_\_  
 Term Dates see  
 From 09/15/10 To: conditions  
 Approved: Stephen J. Duall  
 Stephen J. Duall  
 Chief, Satellite Policy Branch

**Re: Request To Extend Special Temporary Authority To Operate Satellite DARS Terrestrial Repeaters; File No. SAT-STA-20010724-00064**

Dear Mr. Caton:

Pursuant to Section 25.120 of the Federal Communications Commission's ("FCC" or "Commission") rules,<sup>1</sup> Sirius Satellite Radio Inc. ("Sirius"), one of the two satellite digital audio radio service ("satellite DARS") licensees in the United States, hereby requests an extension of its special temporary authority ("STA") to operate its terrestrial repeater network.<sup>2</sup> Sirius requests an extension of its STA for 180 days or until such time as the Commission issues final rules governing the use of satellite DARS terrestrial repeaters.<sup>3</sup> Grant of Sirius' extension request would serve the public interest by allowing Sirius to continue its roll-out of uniformly high quality commercial satellite DARS programming nationwide. Attached is a FCC Form 159, with a check payable to the FCC in the amount of \$145.00.

Attached as Exhibit A is a list of sites, including three minor revisions noted below, in which Sirius operates terrestrial repeaters pursuant to its STA and for which Sirius seeks an extension of its STA. Sirius has included the following

<sup>1</sup> 47 C.F.R. § 25.120.

<sup>2</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) ("*Sirius STA Order*").

<sup>3</sup> *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, 5810-12 (1997) ("*Terrestrial Repeater NPRM*").

Attachment to Grant

Application of Sirius XM Radio Inc. for Special Temporary Authority

IBFS File Nos. SAT-STA-20020312-00048, SAT-STA-20031219-00369, SAT-STA-20040623-00119, SAT-STA-20040623-00122, SAT-STA-20050301-00053, SAT-STA-20070710-00097, SAT-STA-20081020-00206

Special temporary authority (STA) is granted to Sirius XM Radio Inc. (Sirius XM), for a period of 180 days, to continue to operate previously authorized terrestrial repeaters for use in the 2320-2345 MHz frequency band, as set forth in the above-referenced applications. This authorization is granted according to the technical parameters specified in these applications and is subject to the conditions below.

1. Any actions taken as a result of these STAs are solely at the applicant's own risk. These STAs shall not prejudice the outcome of the final rules adopted by the Commission in IB Docket No. 95-91.

2. SDARS terrestrial repeaters are restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the SDARS licensee's satellite(s) directly to the SDARS licensee's subscribers' receivers, and may not be used to distribute any information not also transmitted to all subscribers' receivers.

3. Coordination of the operations of the terrestrial repeaters shall be completed with all affected Administrations prior to operation, in accordance with all applicable international agreements including those with Canada and Mexico.

4. The terrestrial repeaters shall comply with Part 17 of the Commission's rules – Construction, Marking, and Lighting of Antenna Structures.

5. The terrestrial 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.

6. Any SDARS terrestrial repeater operating at a power level greater than 2-watt average EIRP is required to attenuate its out-of-band emissions below the transmitter power P by a factor of not less than  $90 + 10 \log (P)$  dB in a 1-megahertz bandwidth outside the 2320-2345 MHz band, where P is average transmitter output power in watts. Any SDARS terrestrial repeater operating at a power level equal to or less than 2-watt average EIRP is required to attenuate its out-of-band emissions below the transmitter power P by a factor of not less than  $75 + 10 \log (P)$  dB in a 1-megahertz bandwidth outside the 2320-2345 MHz band, where P is average transmitter output power in watts.

7. These STAs expire after 180 days, or on the date that permanent authority to operate the covered repeater operations becomes effective, whichever occurs first.

8. Sirius XM is granted 30 days from the date of the release of this authorization to decline the authorization as conditioned. Failure to respond within that period will constitute formal acceptance of the authorization as conditioned.

9. This action is taken on delegated authority pursuant to 47 C.F.R. § 0.261 and is effective upon release. Petitions for reconsideration under 47 C.F.R. § 1.106 or applications for review under 47 C.F.R. § 1.115 may be filed within 30 days of the date of the Public Notice announcing this action.



\*with conditions

File # see above

Call Sign \_\_\_\_\_ Grant Date 09/15/10  
(or other identifier)

Term Dates see  
From 09/15/10 To: conditions

Approved: Stephen J. Duall  
Stephen J. Duall  
Chief, Satellite Policy Branch

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March 12, 2002  
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information for each of the repeaters it operates pursuant to its STA:<sup>4</sup> (1) geographic coordinates; (2) antenna type; (3) antenna orientation; (4) antenna radiation pattern vertical downtilt; (5) total EIRP; and (6) height Above Ground Level (AGL). This list reflects certain changes to the technical parameters of one of Sirius' repeaters in Detroit, Michigan, and one of its repeaters in Las Vegas, Nevada,<sup>5</sup> and the addition of a low power repeater in Jackson, Mississippi.<sup>6</sup> Otherwise, it is identical to the list attached to Sirius' original STA request.<sup>7</sup> Attached as Exhibit B are specification sheets for each of the antenna types described in Exhibit A.

For the same reasons that grant of Sirius' original STA request served the public interest, grant of Sirius' request to extend its STA will serve the public interest.<sup>8</sup> The extension will allow Sirius to continue to offer "high quality radio signals to listeners in areas that have limited radio service," and ensure that no reduction in the quality of this service occurs.<sup>9</sup> Further, grant of the extension request would allow the public to continue to take advantage of long-awaited satellite DARS service, which offers both an increase in listening choices and greatly improved digital quality sound.

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<sup>4</sup> These include 151 high and medium power terrestrial repeaters and one low power terrestrial repeater in 105 sites.

<sup>5</sup> Sirius notified the FCC of these changes on February 11, 2002. Letter from Carl R. Frank, Wiley Rein & Fielding LLP, to William F. Caton, Acting Secretary, Federal Communications Commission (dated Feb. 11, 2002).

<sup>6</sup> Sirius informed the Commission of its plans to install and operate a very low power repeater in Jackson, Mississippi, on February 22, 2002. Letter from Carl R. Frank, Wiley Rein & Fielding LLP, to William F. Caton, Acting Secretary, Federal Communications Commission (dated Feb. 22, 2002).

<sup>7</sup> *Sirius Satellite Radio Inc. Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters*, File No. SAT-STA-20010724-0064 (filed July 24, 2001).

<sup>8</sup> *Sirius STA Order*, ¶ 9.

<sup>9</sup> *Id.*

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In granting Sirius' original request, the Commission itself noted that "Sirius has proceeded with satellite construction, has in fact launched both of its satellites, and needs to employ terrestrial repeaters to provide adequate service" and that it has not yet issued final rules governing the operation of satellite DARS terrestrial repeaters.<sup>10</sup> The FCC concluded that "this situation has created the extraordinary circumstances required by the statute and our rules to justify grant of an STA" and noted that "it would be unfair to penalize Sirius for complying with our required milestone schedule on the one hand but on the other hand force it to seriously delay initiation of service because there are no final repeater rules."<sup>11</sup> These considerations apply with equal force here as the FCC still has not issued final repeater rules.

Sirius has established that its terrestrial repeaters will not cause harmful interference to other radio services.<sup>12</sup> Nevertheless, Sirius will continue to comply with the condition placed upon its STA that it protect "all existing authorized radiocommunication facilities that are in operation during the period the STA is in effect" from interference caused by its terrestrial repeaters.<sup>13</sup> Sirius notes that the Commission had proposed to require satellite DARS licensees to bear the cost of remedying interference to certain Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS") facilities if MDS or ITFS licensees lodged interference complaints prior to *February 20, 2002*.<sup>14</sup> In granting Sirius' STA request, the Commission required Sirius to provide MDS and ITFS licensees with information regarding the locations and technical parameters of all repeaters

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<sup>10</sup> *Id.*, ¶ 7.

<sup>11</sup> *Id.*

<sup>12</sup> *Establishment of Rules and Policies for the Digital Audio Radio Service in 2310-2360 MHz Frequency Band*, Supplemental Comments of Sirius Satellite Radio (Jan. 18, 2000).

<sup>13</sup> *Sirius STA Order*, ¶¶ 13, 18(b).

<sup>14</sup> *Request For Further Comment On Selected Issues Regarding The Authorization Of Satellite Digital Audio Radio Service Terrestrial Repeater Networks*, Public Notice, IB Docket No. 95-91, RM No. 8610, DA 01-2570, at 7 (Nov. 1, 2001). The FCC proposal would apply with respect to MDS or ITFS facilities installed prior to August 20, 1998, and located within a satellite DARS repeater's free space power flux density contour of  $-34$  dBW/m<sup>2</sup>. *Id.*

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operating pursuant to the STA in order to facilitate coordination with these MDS and ITFS operations.<sup>15</sup> Thus, in granting Sirius STA, the FCC extended the procedural aspects of its proposed rules requiring interference protection for certain MDS and ITFS facilities but did not extend the substantive aspects of those proposed rules beyond the proposed February 20, 2002 expiration date. While Sirius views further extension of the notification requirement as unnecessary, out of an abundance of caution, it will continue to comply with these procedural requirements with respect to MDS and ITFS facilities.

Sirius also will comply with the requirements that it not (1) originate any original programming, (2) transmit signals other than those used by its satellites or (3) extend satellite DARS coverage outside of the satellites' authorized service area.<sup>16</sup> Sirius certifies that the out-of-band emissions of these terrestrial repeaters will be attenuated below the transmitted EIRP by no less than  $75 + 10 \log (P)$ .<sup>17</sup>

In accordance with Part 17 of the Commission's Rules, Sirius has or will notify the Federal Aviation Administration ("FAA") of antenna structures for which such notification is required. 47 C.F.R. § § 17.7-17.17. Sirius hereby certifies that operation of these repeaters will not have a significant environmental effect, as defined by 47 C.F.R. § § 1.1301-1.1319, and 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. § 862(a).

As Sirius' extension request is timely filed, Sirius understands that, pursuant to Section 1.62 of the FCC's Rules, 47 C.F.R. § 1.62, its STA will continue in effect without further action by the Commission until such time as the Commission shall make a final determination with respect to its request. Sirius urges the FCC to grant its extension request in order to provide Sirius with STA to make the proposed changes to its Detroit and Las Vegas repeaters and to operate its Jackson repeater.

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<sup>15</sup> *Sirius Satellite Radio Inc. Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters*, Order, File No. SAT-STA-20010724-00064, DA 01-2383 (Oct. 15, 2001).

<sup>16</sup> *Sirius STA Order*, ¶ 18(c). See also *Terrestrial Repeater NPRM*, 12 FCC Rcd at 5845-46 (Appendix C).

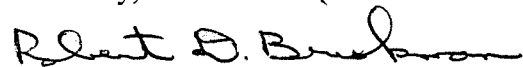
<sup>17</sup> *Sirius STA Order*, ¶ 18(g).

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Alternatively, the Commission should grant the modification request related to the Detroit and Las Vegas repeaters filed on February 11, 2002 and let the notification regarding the Jackson repeater filed on February 22, 2002 become effective.

If there are any questions concerning this request, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert D. Briskman". The signature is fluid and cursive, with a prominent loop at the end.

Robert D. Briskman  
Technical Executive  
Sirius Satellite Radio Inc.

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the foregoing "Request to Extend Special Temporary Authority To Operate Satellite DARS Terrestrial Repeaters" was delivered via hand-delivery, on this 12<sup>th</sup> day of March, 2002, to each of the following:

Donald Abelson  
International Bureau  
Federal Communications Commission  
445 Twelfth Street, SW, Room 6-C750  
Washington, DC 20554

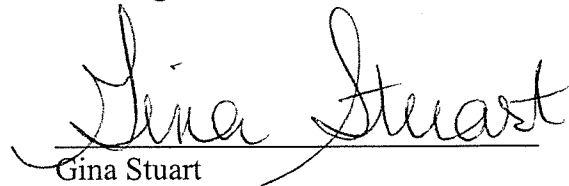
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Rockie Patterson  
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Gina Stuart

**EXHIBIT A**



Market	No Of Sectors	Antenna Type	Sector 1				Sector 2				Sector 3				Coordinates		Antenna Height (feet)
			Antenna Beamwidth	Orientation	Down tilt	EIRP (Watts)	Antenna Beamwidth	Orientation	Down tilt	EIRP (Watts)	Antenna Beamwidth	Orientation	Down tilt	EIRP (Watts)	Longitude (W)	Latitude (N)	
Akron	1	HMD8V90-R05-H	90	320	0	14125.38	-	-	-	-	-	-	-	81-30-14.00	41-03-53.00	150	
Albany	1	HMD8V360-R05-H	Omni	-	-	8511.38	-	-	-	-	-	-	-	73-45-55.80	42-39-32.18	178	
Albuquerque	1	HMD8V90-R05-H	90	230	0	22387.21	-	-	-	-	-	-	-	106-26-58.50	35-12-46.50	65	
Allianta	2	HMD8V120-R05-H	120	250	0	19952.62	-	-	-	-	-	-	-	84-20-07.00	33-55-16.00	443	
Allianta	2	HMD8V90-R05-H	90	30	0	8317.64	150	0	7585.78	-	-	-	-	84-28-25.09	33-53-59.70	228	
Allianta	2	HMD8V90-R05-H	90	45	0	10715.19	180	0	10964.78	-	-	-	-	84-22-39.00	33-51-07.00	231	
Allianta	2	HMD8V180-R05-H	180	0	0	7585.78	180	0	7413.10	-	-	-	-	84-23-25.80	33-47-54.60	154	
Austin	1	HMD8V120-R05-H	120	175	0	12989.25	-	-	-	-	-	-	-	97-44-29.00	30-17-00.00	292	
Baltimore	1	HMD8V180-R05-H	180	0	0	9332.54	-	-	-	-	-	-	-	76-36-50.12	39-17-15.41	526	
Birmingham	1	HMD8V360-R05-H	Omni	-	-	8241.38	-	-	-	-	-	-	-	86-48-30.00	33-31-04.00	537	
Boston	1	HMD8V360-R05-H	Omni	-	-	7943.28	-	-	-	-	-	-	-	71-03-41.2	42-21-30.60	554	
Buffalo	1	HMD8V90-R05-H	90	30	0	9332.54	-	-	-	-	-	-	-	78-52-35.00	42-52-47.00	580	
Charlotte	1	HMD8V180-R05-H	180	65	0	10471.29	-	-	-	-	-	-	-	80-50-49.74	35-13-29.49	524	
Chicago	2	HMD8V90-R05-H	120	235	0	3080.30	340	0	3019.95	-	-	-	-	87-37-17.81	41-53-6.88	988	
Chicago	2	HMD8V120-R05-H	120	170	0	5623.41	120	340	5128.61	-	-	-	-	87-38-21.13	41-55-33.28	296	
Chicago	2	HMD8V90-R05-H	90	180	0	4285.80	90	310	3388.44	-	-	-	-	87-39-18.00	41-58-50.00	489	
Cincinnati	2	HMD8V180-R05-H	180	170	0	8511.38	180	350	7585.78	-	-	-	-	84-30-51.00	39-06-24.00	308	
Cleveland	2	HMD8V120-R05-H	120	70	0	7585.78	120	260	6606.93	-	-	-	-	81-41-34.37	41-29-58.50	656	
Columbus	1	HMD8V360-R05-H	Omni	-	-	5370.32	-	-	-	-	-	-	-	82-59-46.00	39-57-47.00	442	
Dallas	2	HMD8V120-R05-H	120	80	0	8511.38	120	260	8511.38	-	-	-	-	96-47-52.23	32-47-8.95	489	
Dallas	1	HMD8V180-R05-H	180	240	0	10000.00	-	-	-	-	-	-	-	97-19-46.00	32-45-11.00	525	
Dayton	1	HMD8V120-R05-H	120	115	0	5888.44	-	-	-	-	-	-	-	84-11-46.00	39-45-39.00	240	
Denver/Boulder	2	HMD8V180-R05-H	180	150	0	6309.57	180	330	7585.78	-	-	-	-	104-59-22.06	39-44-52.04	598	
Detroit	1	HMD8V120-R05-H	120	330	6	16218.10	-	-	-	-	-	-	-	83-02-51.00	42-19-50.00	648	
Detroit	2	HMD8V45-R05-H	45	90	0	19952.62	45	315	19952.62	-	-	-	-	83-14-35.42	42-28-28.15	389	
Fresno	1	HMD8V90-R05-H	90	120	0	22387.21	-	-	-	-	-	-	-	119-52-56.90	36-48-59.50	180	
Greensboro	1	HMD8V90-R05-H	90	240	0	14125.38	-	-	-	-	-	-	-	79-45-38.10	36-05-10.30	504	
Harrisburg	1	HMD8V90-R05-H	90	140	0	22387.21	-	-	-	-	-	-	-	76-56-45.00	40-19-07.00	178	
Hartford	1	HMD8V360-R05-H	Omni	-	-	6309.57	-	-	-	-	-	-	-	72-40-32.00	41-46-06.00	383	
Houston	2	HMD8V90-R05-H	90	175	0	9772.37	90	295	9772.37	-	-	-	-	95-21-50.00	29-45-37.00	1060	
Indianapolis	1	HMD8V360-R05-H	Omni	-	-	8709.64	-	-	-	-	-	-	-	86-09-20.00	39-46-13.00	532	
Jackson	1	Mobile Mark OD12-2400	Omni	-	-	317.00	-	-	-	-	-	-	-	90-11-09.38	32-18-01.47	324	
Jacksonville	1	HMD8V180-R05-H	180	345	0	6918.31	-	-	-	-	-	-	-	81-39-24.00	30-19-08.00	436	
Kansas City	2	HMD8V90-R05-H	90	115	0	12302.69	90	205	11481.54	-	-	-	-	94-34-57.00	39-06-12.00	568	
Knoxville	1	HMD8V90-R05-H	90	90	0	22387.21	-	-	-	-	-	-	-	84-01-22.60	35-57-46.20	265	
Las Vegas	2	HMD8V180-R05-H	180	20	0	4466.84	180	200	4570.88	-	-	-	-	115-08-31.00	36-10-10.10	466	
Las Vegas	1	HMD8V120-R05-H	120	135	7	15648.90	-	-	-	-	-	-	-	115-10-00.00	36-07-57.00	401	
Little Rock	1	HMD8V360-R05-H	Omni	-	-	5623.41	-	-	-	-	-	-	-	92-16-32.46	34-44-37.67	596	
Los Angeles	3	HMD8V120-R05-H	120	0	3	3715.35	120	120	3715.35	120	3	3715.35	3	118-15-22.00	34-02-58.00	868	
Los Angeles	2	HMD8V90-R05-H	90	60	0	7943.28	90	215	7943.28	-	-	-	-	118-27-35.00	34-03-03.00	273	
Los Angeles	2	HMD8V180-R05-H	180	110	0	5011.87	180	290	5011.87	-	-	-	-	118-23-55.00	34-03-20.00	158	
Los Angeles	2	HMD8V180-R05-H	180	45	0	4265.80	180	225	4677.35	-	-	-	-	118-21-04.55	34-03-44.18	372	
Los Angeles	2	HMD8V180-R05-H	180	90	0	4365.16	180	270	5623.41	-	-	-	-	118-18-34.00	34-03-41.00	302	
Los Angeles	1	HMD8V45-R05-H	45	110	0	16685.87	-	-	-	-	-	-	-	118-11-44.00	34-09-48.00	78	
Los Angeles	1	HMD8V90-R05-H	90	10	0	10232.93	-	-	-	-	-	-	-	118-15-26.39	34-08-29.27	98	
Los Angeles	2	HMD8V90-R05-H	90	135	0	7943.28	90	225	7943.28	-	-	-	-	118-11-09.00	33-46-03.00	146	
Los Angeles	2	HMD8V90-R05-H	90	0	0	7943.28	90	180	7943.28	-	-	-	-	117-52-8.01	33-45-34.23	120	
Los Angeles	2	HMD8V180-R05-H	180	135	0	5011.87	180	315	5011.87	-	-	-	-	117-52-52.00	33-41-22.00	159	
Los Angeles	2	HMD8V90-R05-H	90	30	0	6918.31	90	290	6918.31	-	-	-	-	118-22-03.00	34-07-34.00	50	
Los Angeles	1	HMD8V120-R05-H	120	290	0	7079.46	-	-	-	-	-	-	-	118-27-55.86	34-09-15.13	218	
Louisville	1	HMD8V360-R05-H	Omni	-	-	5623.41	-	-	-	-	-	-	-	85-45-28.00	38-15-20.00	560	
Memphis	1	HMD8V360-R05-H	Omni	-	-	21379.63	-	-	-	-	-	-	-	90-2-59.80	35-8-39.70	358	
Miami	2	HMD8V90-R05-H	90	0	0	12022.64	90	230	12882.50	-	-	-	-	80-11-31.00	25-46-19.00	596	
Miami	1	HMD8V90-R05-H	90	0	0	18920.87	-	-	-	-	-	-	-	80-08-30.84	26-06-50.67	640	
Milwaukee	1	HMD8V180-R05-H	180	310	0	15488.17	-	-	-	-	-	-	-	87-54-06.69	43-02-17.95	588	
Minneapolis	2	HMD8V120-R05-H	120	90	0	5370.32	120	270	4466.84	-	-	-	-	93-16-16.00	44-58-36.00	775	

Market	No Of Sectors	Antenna Type	Sector 1				Sector 2				Sector 3				Antenna Height (feet)	
			Antenna Beamwidth	Orientation	DownTilt	EIRP (Watts)	Antenna Beamwidth	Orientation	DownTilt	EIRP (Watts)	Antenna Beamwidth	Orientation	DownTilt	EIRP (Watts)		Longitude (W)
Minneapolis	1	HMD8V90-R05-H	90	135	0	8912.51								93-05-43.00	44-56-52.00	500
Monterey	1	HMD8PV180-R05-H	180	180	0	8912.51								121-51-24.00	36-36-26.00	135
Nashville	1	HMD8V360-R05-H	Omni			6165.95								86-46-55.09	36-09-48.85	868
New Haven	1	HMD8PV180-R05-H	180	250	0	10715.19								72-55-20.00	41-18-33.00	243
New Orleans	1	HMD8V360-R05-H	Omni			10351.42								90-04-16.00	29-57-00.00	626
New York	1	HMD8V360-R05-H	Omni			8912.51								73-58-55.20	40-45-33.00	670
New York	2	HMD8V90-R05-H	90	140	0	12589.25				340	0	12589.25		73-57-01.70	40-46-30.00	560
New York	1	HMD8PV180-R05-H	180	210	0	15948.93								74-00-40.32	40-42-29.88	524
New York	1	HMD8V360-R05-H	Omni			8912.51								73-59-48.00	40-42-54.00	474
New York	2	HMD8PV180-R05-H	180	30	0	6165.95				210	0	6606.93		73-54-19.50	40-51-57.50	170
New York	2	HMD8PV180-R05-H	180	0	0	5754.40				180	0	5888.44		73-56-36.00	40-48-54.00	180
New York	2	HMD8PV180-R05-H	180	110	0	6309.57				290	0	7943.28		73-58-22.53	40-51-18.12	210
New York	1	HMD8PV180-R05-H	180	110	0	16218.10								73-45-44.75	41-01-51.38	261
New York	2	HMD8PV180-R05-H	180	90	0	7943.28				270	0	7943.28		74-10-11.00	40-44-07.00	334
Newark	1	HMD8V360-R05-H	Omni			8912.51								76-17-29.21	36-50-44.47	270
Norfolk	1	HMD8V360-R05-H	Omni			6760.83								97-29-22.00	35-35-52.00	400
Oklahoma City	1	HMD8V90-R05-H	90	190	0	22387.21								81-22-44.32	28-32-37.45	312
Orlando	2	HMD8PV180-R05-H	180	0	0	2511.89				180	0	2630.27		75-10-11.00	39-57-13.00	758
Philadelphia	2	HMD8V120-R05-H	120	120	0	8317.64				280	0	9332.54		112-04-23.66	33-28-37.70	298
Phoenix	2	HMD8PV180-R05-H	180	0	0	5688.44				180	0	7565.78		79-59-42.00	40-26-29.00	690
Pittsburgh	2	HMD8V120-R05-H	120	90	0	9332.54				270	0	10000.00		122-40-33.74	45-30-47.16	464
Portland	2	HMD8V90-R05-H	90	0	0	3801.89				190	0	3715.35		71-24-36.94	41-49-29.33	421
Providence	1	HMD8V360-R05-H	Omni			8912.51								78-38-25.00	35-46-27.00	458
Raleigh	1	HMD8PV180-R05-H	180	0	0	10000.00								77-26-06.00	37-32-11.94	369
Richmond	2	HMD8V120-R05-H	120	65	0	6456.54				305	0	5370.32		77-36-33.00	43-09-23.00	365
Rochester	2	HMD8V90-R05-H	90	130	0	10471.29				220	0	11481.54		121-29-27.00	38-34-28.00	140
Rochester	2	HMD8PV180-R05-H	180	5	0	15848.93								111-51-02.40	40-45-28.80	135
Sacramento	1	HMD8V90-R05-H	90	290	0	8912.51								98-29-32.00	29-25-42.00	428
Salt Lake City	1	HMD8V90-R05-H	90	110	0	10471.29								117-09-43.28	32-42-57.70	450
San Antonio	1	HMD8V120-R05-H	120	60	0	6309.57				240	0	6309.57		122-26-03.00	37-41-12.00	100
San Diego	2	HMD8V45-R05-H,HMD8V120-R05-H	120	25	0	10000.00				130	0	19952.62		122-27-05.00	37-45-20.00	382
San Francisco	1	HMD8V120-R05-H	120	50	0	15848.93								121-45-11.23	37-19-20.06	20
San Francisco	1	HMD8V90-R05-H	90	270	0	25118.86								121-59-45.00	36-59-35.50	60
San Jose	1	HMD8PV180-R05-H	180	180	0	8912.51								122-19-41.77	47-36-16.71	943
Santa Cruz	1	HMD8V120-R05-H	120	180	0	9549.93				330	0	8709.64		72-35-33.50	42-06-09.50	445
Seattle	2	HMD8V120-R05-H	120	180	0	9549.93								96-11-26.00	36-37-48.00	482
Springfield	1	HMD8V90-R05-H	90	90	0	14125.38								76-08-32.00	43-02-49.00	207
St. Louis	2	HMD8V90-R05-H	90	135	0	9549.93				225	0	10232.93		82-27-53.00	27-56-48.00	576
Syracuse	2	HMD8V90-R05-H	90	160	0	6918.31				280	0	6025.60		110-58-16.50	32-13-20.10	265
Tampa	1	HMD8V360-R05-H	Omni			10000.00								95-57-10.85	36-10-10.02	400
Tucson	1	HMD8V120-R05-H	120	135	0	11220.18								77-00-41.00	36-53-48.00	156
Tucson	1	HMD8V90-R05-H	90	240	0	15848.93								77-04-35.08	36-53-43.60	198
Tulsa	1	HMD8V360-R05-H	Omni			6918.31								77-03-39.00	36-51-46.00	208
Washington D.C.	1	HMD8V360-R05-H	Omni			10715.19								77-06-55.87	36-50-36.60	208
Washington D.C.	2	HMD8V120-R05-H	120	90	0	9549.93				250	0	8912.51		77-05-44.00	38-59-07.00	200
Washington D.C.	1	HMD8V360-R05-H	Omni			4897.79								75-32-49.00	39-44-53.00	430
Washington D.C.	3	HMD8V120-R05-H	120	90	0	6025.60				210	0	6165.95		80-15-05.00	36-05-24.00	330
Washington D.C.	1	HMD8V90-R05-H	90	225	0	14125.38										
Wilmington	1	HMD8V90-R05-H	90	30	0	14125.38										
Winston-Salem	1	HMD8V90-R05-H	90	30	0	14125.38										

**EXHIBIT B**

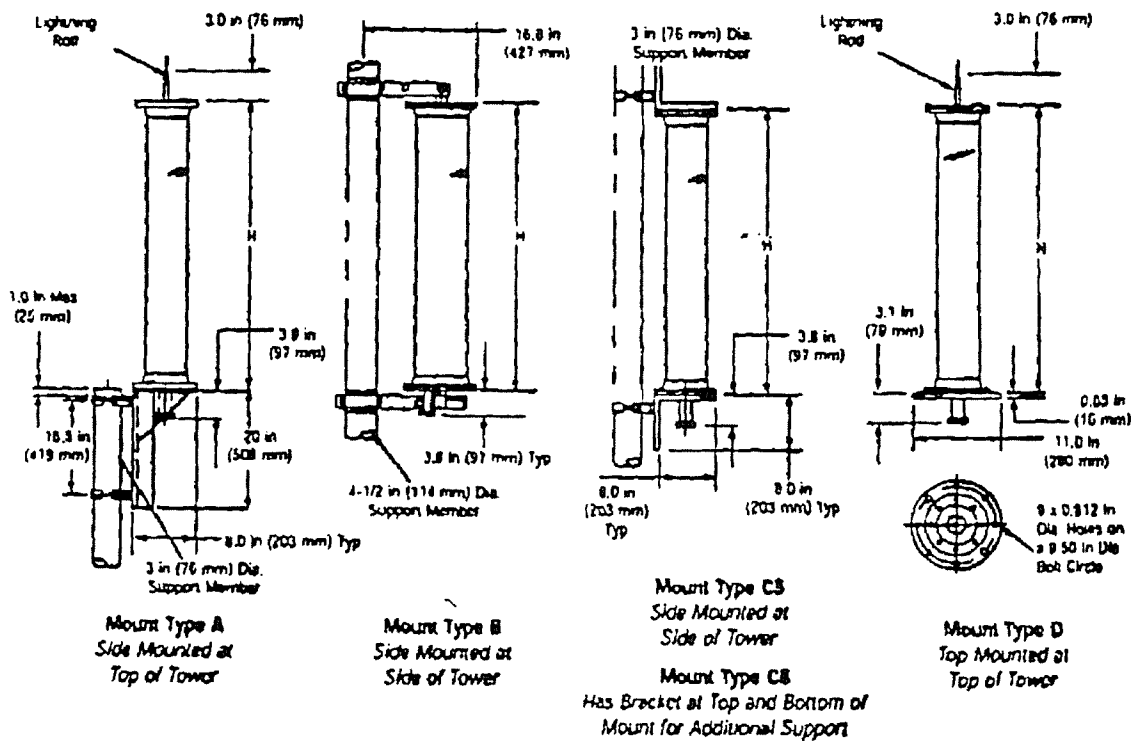
## HMD Series Antennas for MMDS/ITFS and Wireless Cable Applications



### Features

- Pressurizable, radome enclosed for long, trouble-free life
- Excellent VSWR performance
  - 1.35:1 max for W-Band
  - 1.5:1 max for other bands
- Optimized beam tilt
  - 0.5° Standard for 8, 12, and 16 bay
  - 0.75° Standard for 24 and 32 bay
  - Others available on request
- High power handling - 800 watts typical
- Wide selection of frequency bands and patterns
- Horizontal or vertical polarization
- Suitable for analog or digital transmission
- Null fill for excellent coverage

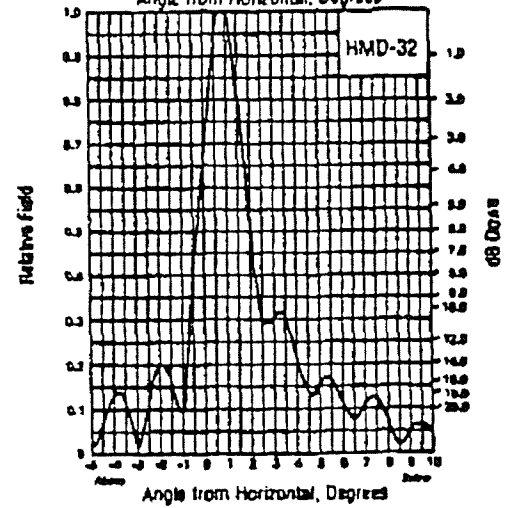
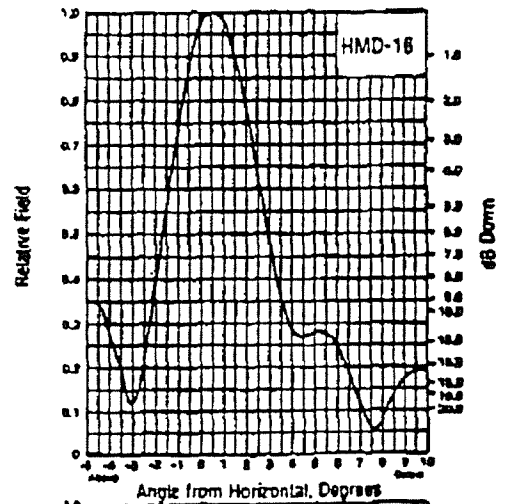
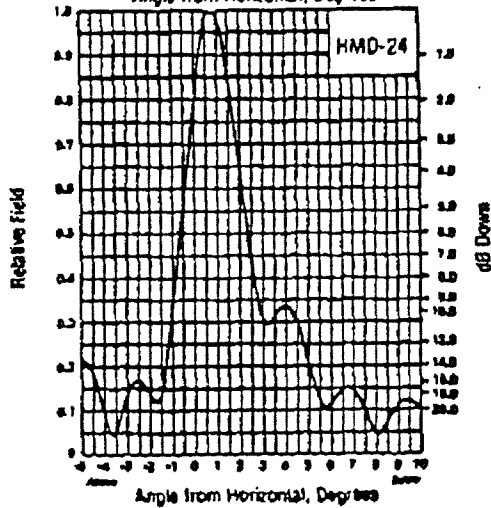
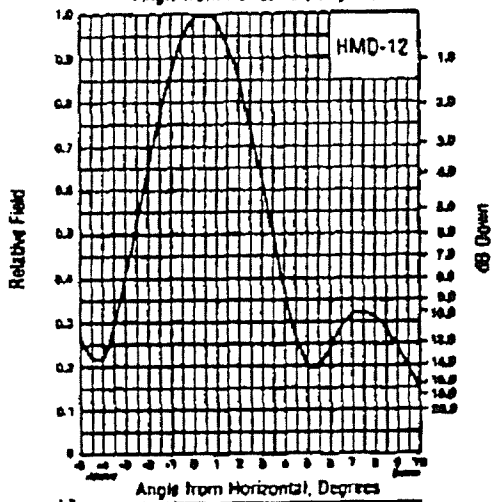
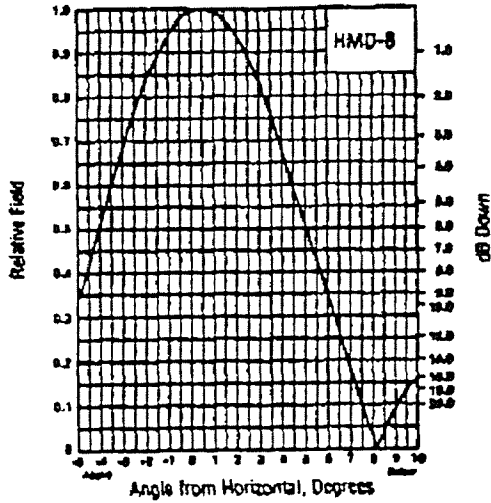
### Standard Mounting Configurations



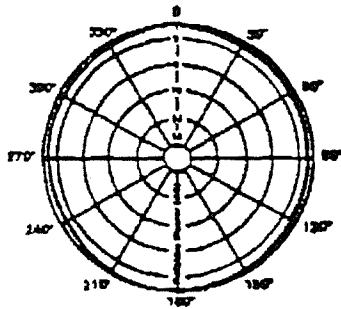


# HMD Series Antennas

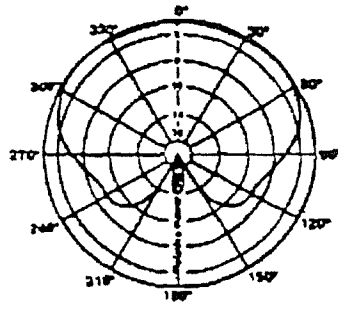
## Elevation Patterns



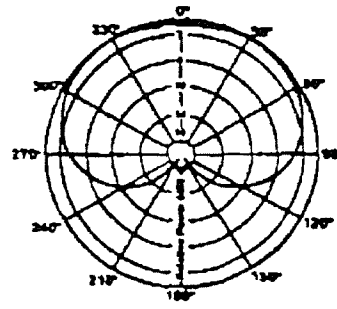
## HMD Series Antennas Azimuth Patterns



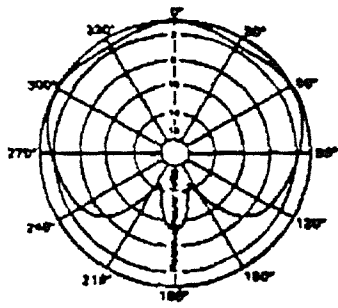
Omnidirectional



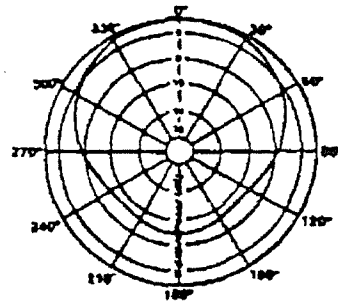
Horizontal Cardioid



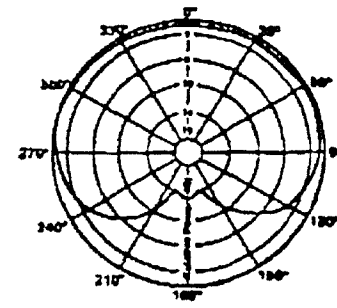
Vertical Cardioid



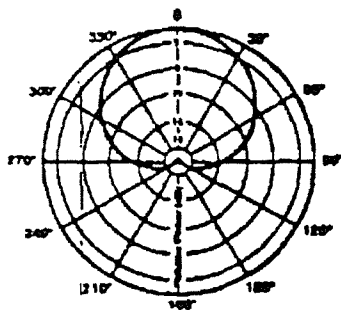
Wide Horizontal Cardioid



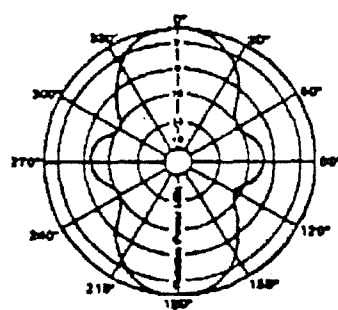
Narrow Horizontal Cardioid



Wide Vertical Cardioid



Narrow Vertical Cardioid



Horizontal Peanut

# List for Andrew Antennas for Sirius Radio Deployment

Andrew Corporation Products Antennas	Product Description	Average			E-Plane Beamwidth (-3 dB)	Total Length (in)	Radome Weight (lbs.)	Radome Diam. (in)
		Power Gain (dBi)	Input Power (W)	Null Fill (%)				
<b>45 DEGREE ANTENNA</b>								
HMD8V45-R05-H	45 degree Az. Pattern, 8 Bays, Vertical Polarization, Standard Beamtilt (0.5 deg.), 2300 -2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	18 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	50 lbs	8"
<b>60 DEGREE ANTENNA</b>								
HMD8V60-R05-H	60 degree Azimuth pattern, 8 Bays, Vertical Polarization, Standard Beamtilt (0.5 deg.), 2300 -2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	17.0 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	40 lbs	5"
<b>90 DEGREE ANTENNA</b>								
HMD8V90-R05-H	90 degree Az. Pattern, 8 Bays, Vertical Polarization, Standard Beamtilt (0.5 deg.), 2300 -2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	16 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	40 lbs	5"

# List for Andrew Antennas for Sirius Radio Deployment

## 120 DEGREE ANTENNA

HMD8V120-R05	120 degree Azimuth pattern, 8 Bays, Vertical Polarization, Standard Beamfill (0.5 deg.), 2300 - 2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	15.0 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	40 lbs	5"
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## 160 DEGREE ANTENNA

HMD8V160-R05-H	160 degree Azimuth pattern, 8 Bays, Vertical Polarization, Standard Beamfill (0.5 deg.), 2300 - 2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	15.0 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	40 lbs	5"
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## 180 DEGREE ANTENNA

HMD8PV180-R05-H	180 degree Azimuth pattern, 8 Bays, Vertical Polarization, Standard Beamfill (0.5 deg.), 2300 - 2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.38 :1 Max. VSWR	14.0 dBi	1000 W (rms)	None	7.0 - 7.5 deg.	57"	40 lbs	5"
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Note: All Directional (Sector) Antennas come with Type 'C' Mount

## OMNI ANTENNAS

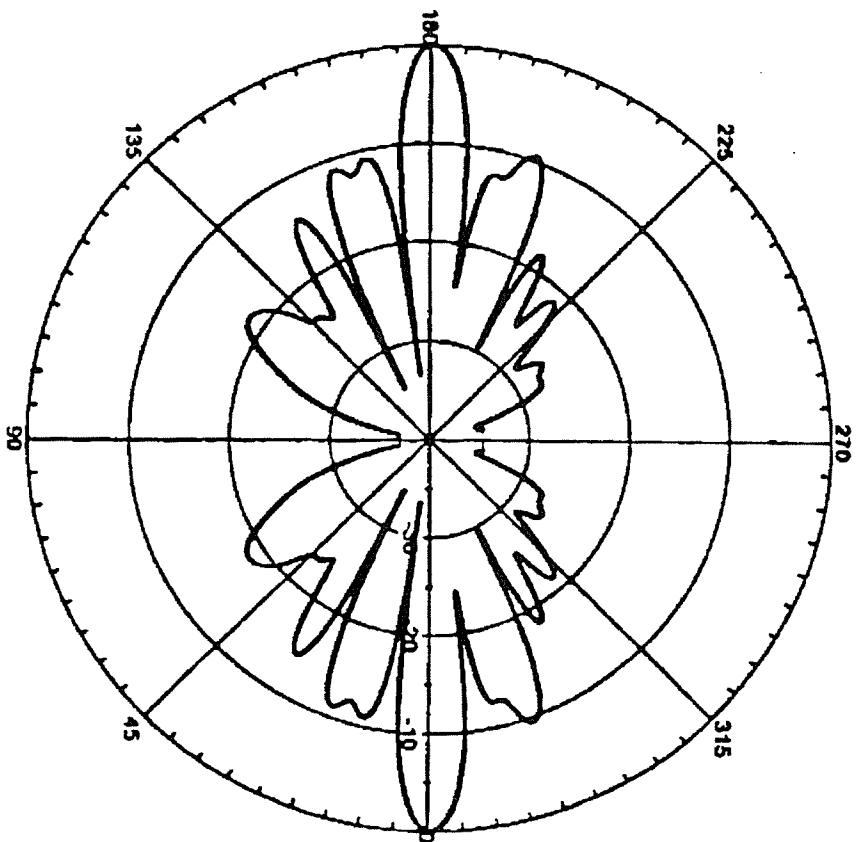
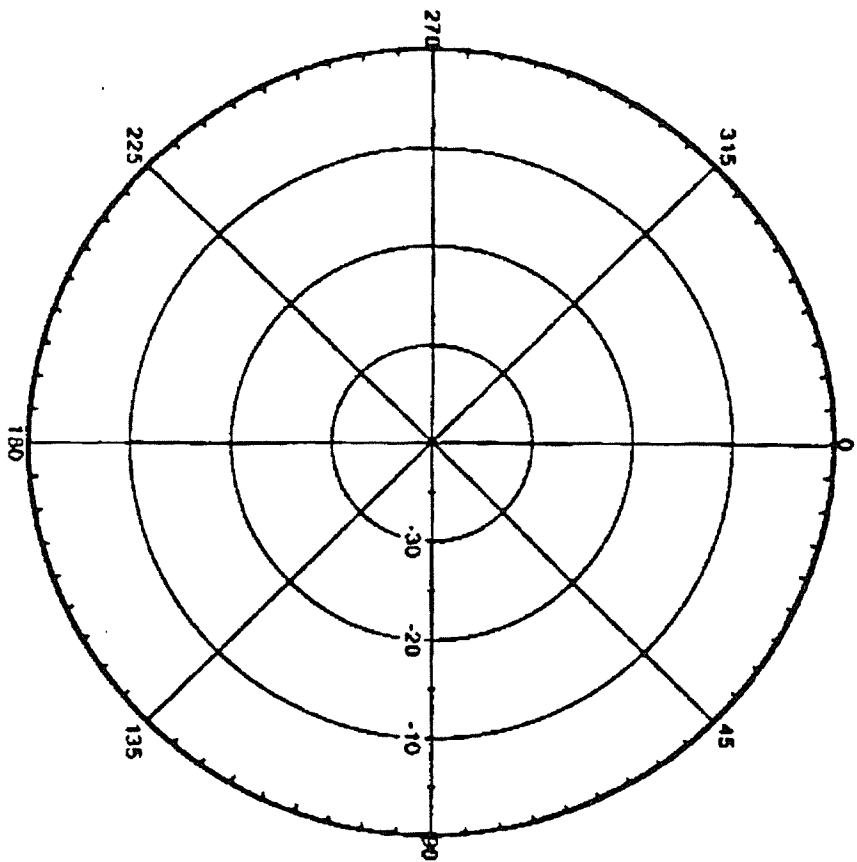
HMD6V360-R05-H	Omni pattern, 8 Bays, Standard Beamfill (0.5 deg.), Vertical Polarization, 2300 -2500 MHz Freq. Band, 50 Ohm, 7/8" EIA Flange, 1.5 :1 Max. VSWR	11.5 dBi	1,000 W (rms)	None	7.0 - 7.5 deg.	44"	50 lbs	5"
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Note: All Omni antennas come with Type 'A' Mount (for Top Installation)



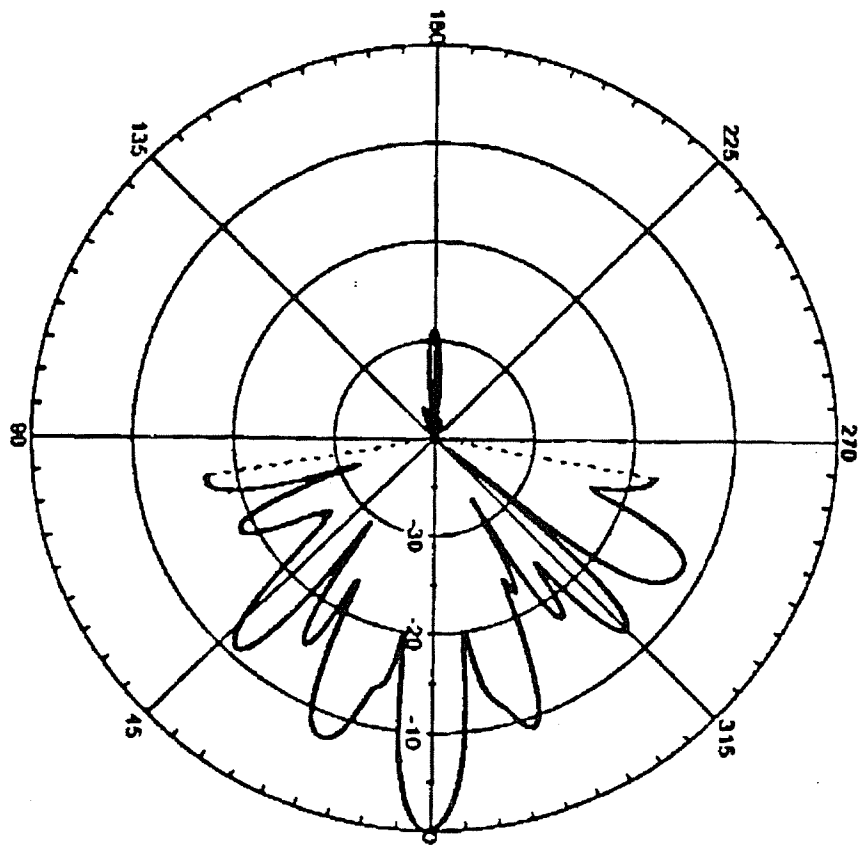
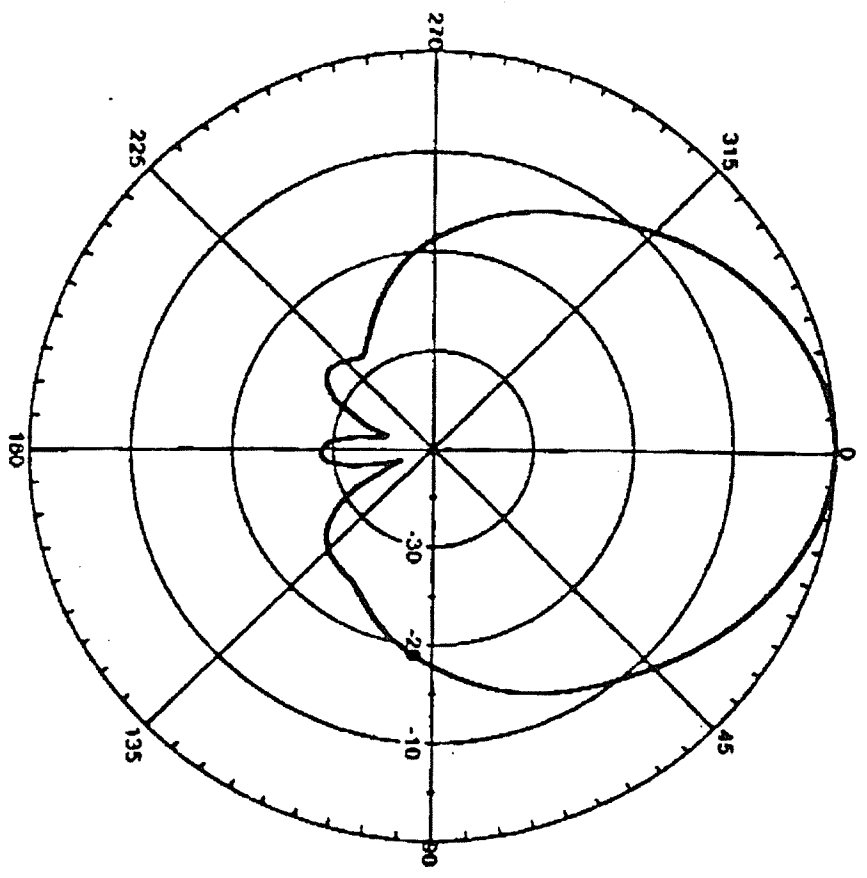
Boresight Gain: 0.00  
Front to Back: 0.02 dB  
H. Beamwidth: 360.00°

V. Beamwidth: 7.42°



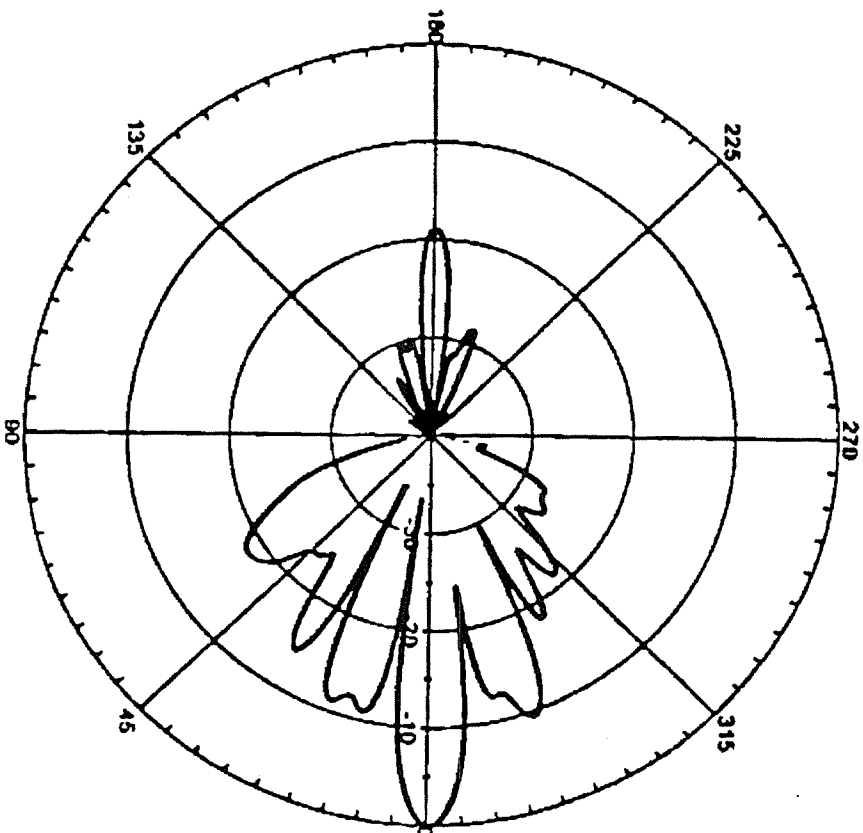
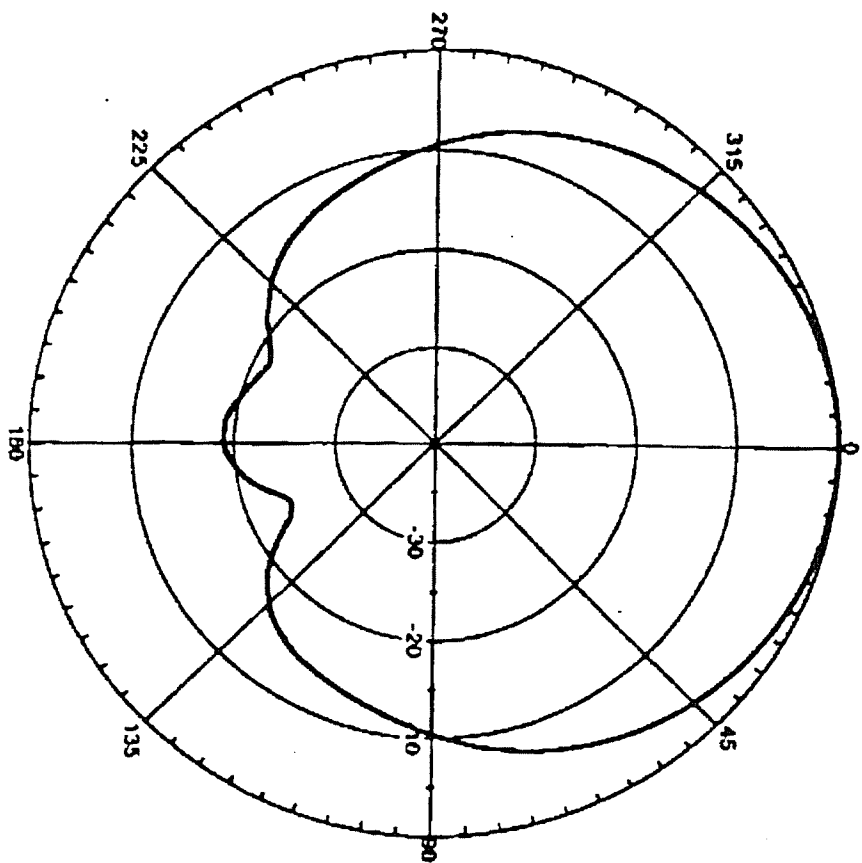
Boresight Gain: 0.00  
Front to Back : 29.07 dB  
H. Beamwidth : 44.78°

V. Beamwidth : 7.48°



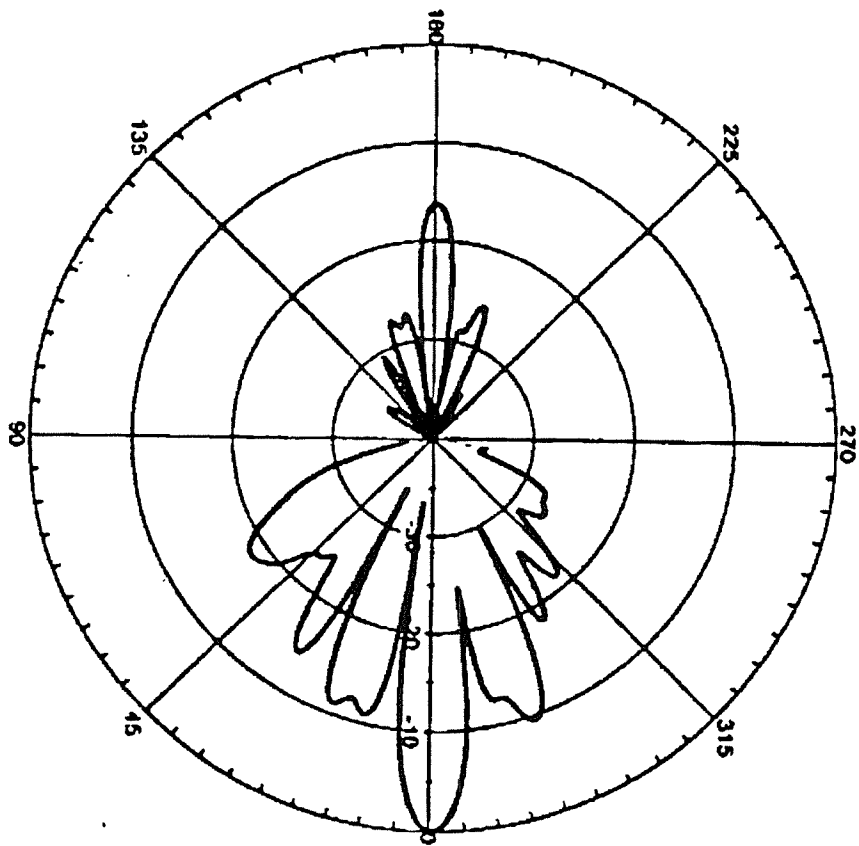
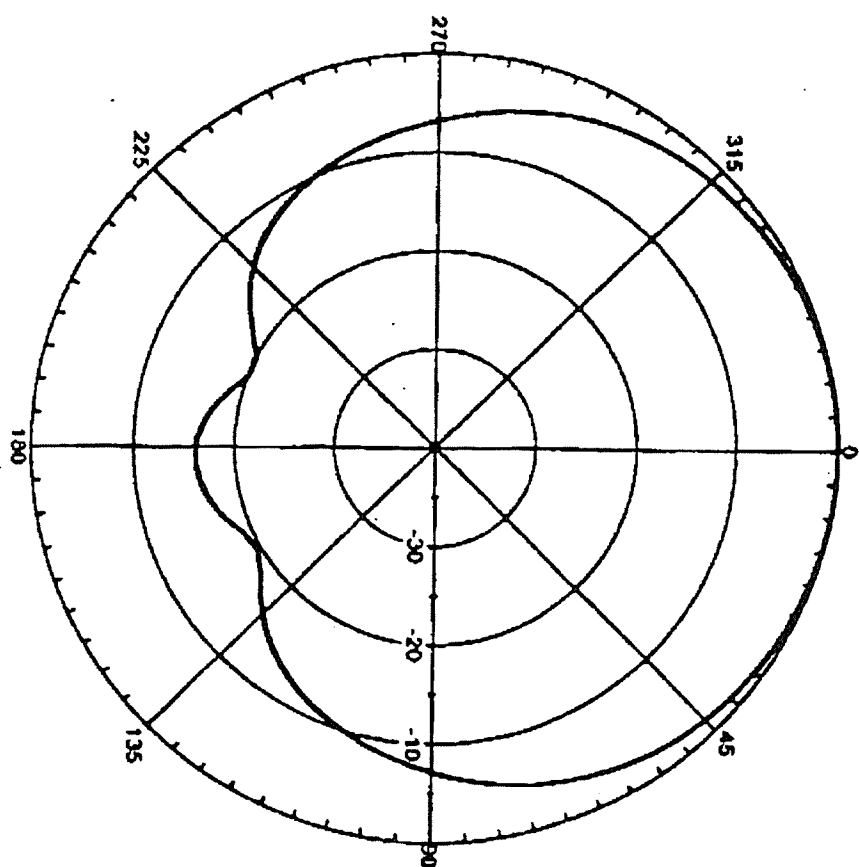
Boresight Gain: 10.62  
Front to Back : 19.05 dB  
H. Beamwidth : 89.75°

V. Beamwidth : 7.42°

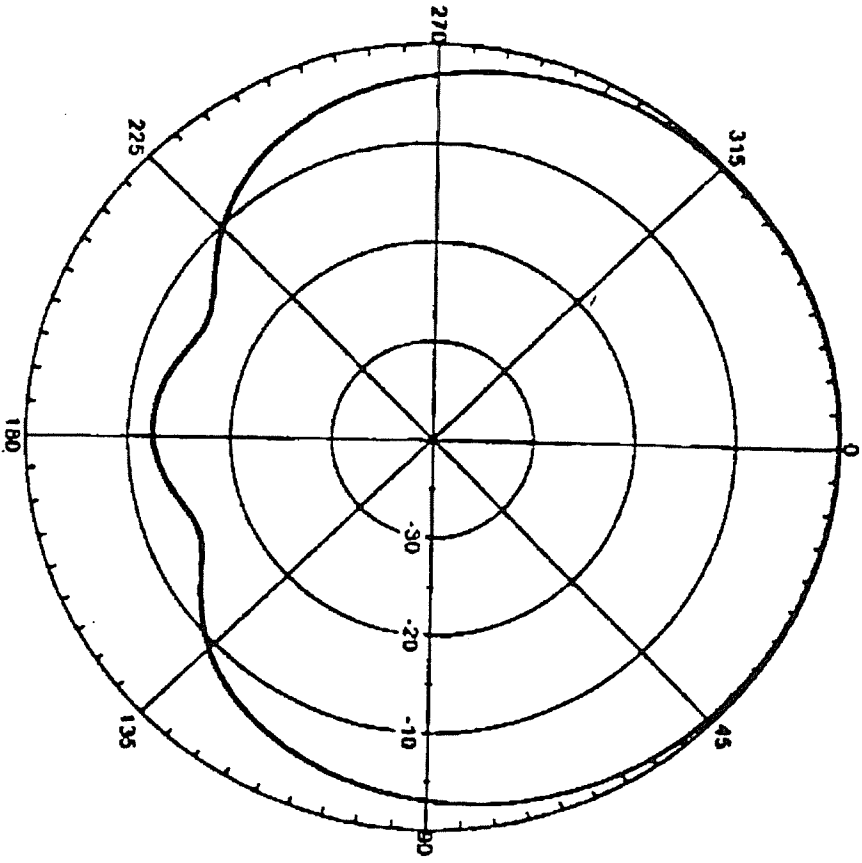


Boresight Gain: 10.62  
Front to Back : 16.31 dB  
H. Beamwidth : 122.45°

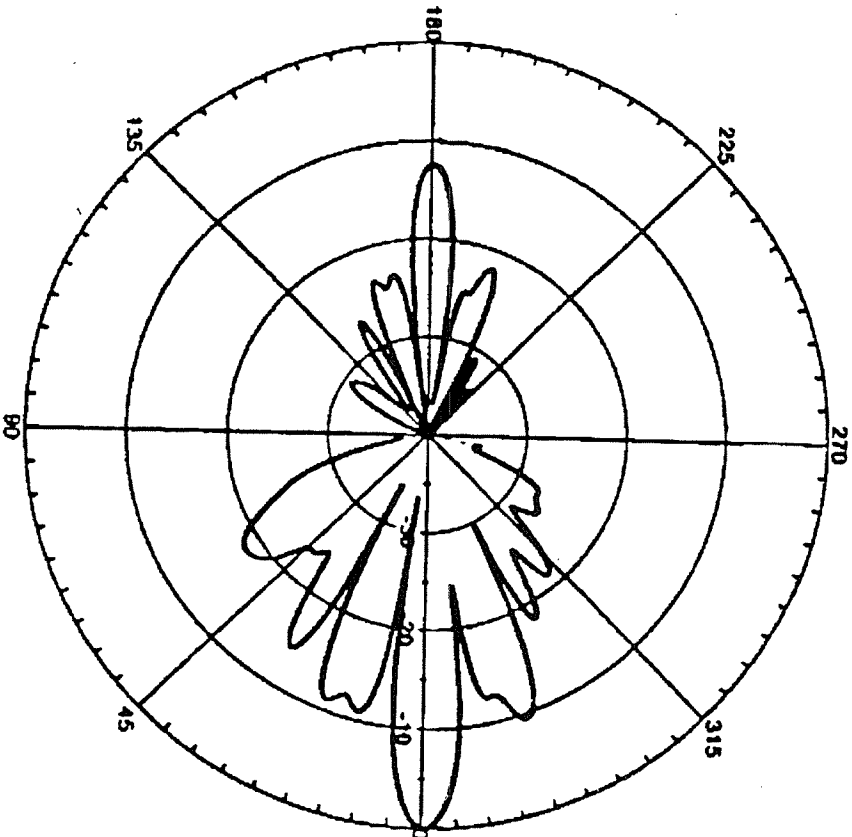
V. Beamwidth : 7.42°

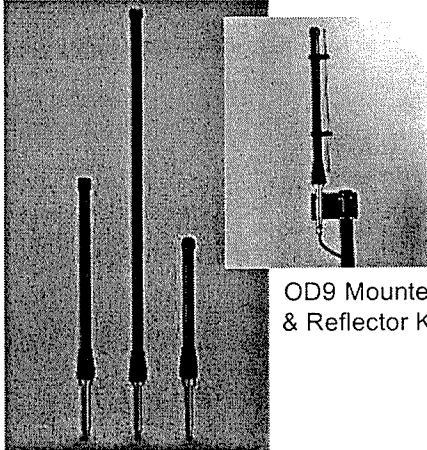


Front to Back : 12.48 dB  
H. Beamwidth : 178.25°



V. Beamwidth : 7.42°





OD9, OD12, OD6 Shown

OD9 Mounted & Reflector Kit

## OD Series Omni Antenna

For WLAN, Video and Data Systems

- 3 dBi, 6 dBi, 9 dBi & 12 dBi antennas provide uniform omni coverage
- Unique design allows economical build out
- Mounting kit includes all hardware needed
- Reflector option provides directional beamshaping & increased performance

The OD Series Antennas are optimized for use in a wide variety of wireless systems. Typical uses include WLAN access points or bridge (802.11), and surveillance transmitters.

These antennas consist of a collinear array with elements stacked vertically. Unique phasing cancels out-of-phase current distribution, improving system performance. This design maintains an omni pattern in the horizontal plane. The OD Series are free space antennas; no ground plane is required.

An option for the OD series is a reflector kit that beam shapes the omni pattern into a directional cardioid shape. This can result in improved directional gain, and isolation for reduced interference.

The low profile black radome (1" diameter) makes the antennas durable and rugged. They can withstand the harshest environments of snow, wind, rain and ice. The feed assembly is made of precision machined aluminum components and is irradiated for weather protection. The antennas comes with all the hardware needed to install it to a mast. The OD antennas normally terminate with a

female N connector. Optional models include pigtail cable with connector. For ISM, Part 15 compliant connectors are available (reverse polarized), please consult factory.

### Model Numbers

Model	Freq.(MHz)	Gain	Applications
OD3-2400	2400-2485	3 dBi	WLAN, ISM, Video
OD6-2400	2400-2485	6 dBi	WLAN, ISM, Video
OD9-2400	2400-2485	9 dBi	WLAN, ISM, Video
OD12-2400	2400-2485	12 dBi	WLAN, ISM, Video

Frequencies subject to bandwidth constraints; confirm desired frequencies at time of order. For pigtail cable options and special frequencies, please consult factory for latest model numbers and configurations.

### Options

Options	Model
Add-on kit for 6 dBi models	ODR6-Kit
Add-on kit for 9 dBi models	ODR9-Kit
Add-on kit for 12 dBi models	ODR12-Kit
Rev TNC with 1 ft Cable option	add -PTA to OD model
Rev BNC with 4 ft Cable option	add -PT2 to OD model

### Specifications

<b>Frequency &amp; Gain:</b>	See above	<b>Length/Weight:</b>	
<b>Bandwidth @2:1 VSWR:</b>	See above	3 dBi Models	16 inches, 1.5 lbs
<b>Nominal Impedance:</b>	50 ohms	6 dBi Models	19 inches, 1.5 lbs
<b>Max. Power (continuous):</b>	100 watts	9 dBi Models	27 inches, 2.0 lbs
<b>Vertical Beamwidth (-3 dB point):</b>		12 dBi Model	41 inches, 2.5 lbs
3 dBi Model	55 degrees	<b>OD Series Interface:</b>	N female connector
6 dBi Models	25 degrees	<b>Mounting Kit:</b>	Mast mount kit included
9 dBi Models	14 degrees	<b>Mounting Dimensions:</b>	Use mast up to 2" OD
12 dBi Model	7 degrees	<b>Material:</b>	Polycarbonate with aluminum body, fiberglass radome on OD12 with aluminum body
<b>Wind Loading (flat plate equiv.):</b>	30-40 sq. inches	<b>Options:</b>	Reflector Option Kit
<b>Rated Wind Velocity:</b>	100+ mph		Pigtail Cable Option
<b>Lightning Protection:</b>	External suggested		Part 15 Reverse Connectors
<b>Antenna Diameter:</b>	1", main mast		

**WILEY REIN & FIELDING LLP**  
1776 K Street, N.W.  
Washington, DC  
**Operating Account**

**147870**

Date	Amount
03/11/2002	*****145.00

**Pay** One Hundred Forty Five and 00/100 Dollars ONLY

**To the Order of** FEDERAL COMMUNICATIONS COMMISSION

Bank of America, N.A.  
Washington, DC

*Barry L. Strauss*

(Two Signatures Required For Amounts Over \$1,000.00)

⑈ 147870⑈ ⑆ 05400 1 204⑆ ⑆ 000003702987⑈

Attached is our check in full settlement of items shown hereon. If not correct, please return with explanation or call us at (202)719-7512.

**No. 147870**

**Check Date 03/11/2002**

FEDERAL COMMUNICATIONS COMMISSION

Description	Date	Invoice No.	Amount of Invoice	Discount	Net
REQUEST TO EXTEND STA	03/11/2002		145.00	.00	145.00
				<b>Total</b>	<b>145.00</b>

COPY

READ INSTRUCTIONS CAREFULLY BEFORE PROCEEDING

FEDERAL COMMUNICATIONS COMMISSION  
REMITTANCE ADVICE

Approved by OMB  
3060-0589  
Page No \_\_\_ of \_\_\_

(1) LOCKBOX # 358160

FCC/MELLON

MAR 12 2002

SPECIAL USE  
FCC USE ONLY

SECTION A - PAYER INFORMATION

(2) PAYER NAME (if paying by credit card, enter name exactly as it appears on your card)  
**Wiley Rein & Fielding LLP** (3) TOTAL AMOUNT PAID (U.S. Dollars and cents)  
**\$145.00**

(4) STREET ADDRESS LINE NO. 1  
**1776 K Street, NW**

(5) STREET ADDRESS LINE NO. 2

(6) CITY **Washington** (7) STATE **DC** (8) ZIP CODE **20006**

(9) DAYTIME TELEPHONE NUMBER (include area code)  
**202.719.7000**

(10) COUNTRY CODE (if not in U.S.A.)  
**SAT-STA-20020312-00048**  
**Sirius Satellite Radio**  
**SDARS**

FCC REGISTRATION NUMBER (FRN)  
(11) PAYER (FRN)  
**0002-1517-44**

IF PAYER NAME AND THE APPLICANT ARE THE SAME, CHECK THIS BOX.  
IF MORE THAN ONE APPLICANT, CHECK THIS BOX.

(13) APPLICANT NAME  
**Sirius Satellite Radio Inc.**

(14) STREET ADDRESS LINE NO. 1  
**1221 Avenue of the Americas**

(15) STREET ADDRESS LINE NO. 2  
**36th Floor**

(16) CITY **New York** (17) STATE **NY** (18) ZIP CODE **10020**

(19) DAYTIME TELEPHONE NUMBER (include area code) **212.584.5100** (20) COUNTRY CODE (if not in U.S.A.)

FCC REGISTRATION NUMBER (FRN) AND TAX IDENTIFICATION NUMBER (TIN) REQUIRED

(21) APPLICANT (FRN) **0006-3457-30** (22) APPLICANT (TIN) **0521700207**

COMPLETE SECTION C FOR EACH SERVICE, IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEET

(23A) CALL SIGN/OTHER ID (24A) PAYMENT TYPE CODE **CGB** (25A) QUANTITY **1**

(26A) FEE DUE FOR (PTC) **\$145.00** (27A) TOTAL FEE **\$145.00** FCC USE ONLY

(28A) FCC CODE 1 (29A) FCC CODE 2

(23B) CALL SIGN/OTHER ID (24B) PAYMENT TYPE CODE (25B) QUANTITY

(26B) FEE DUE FOR (PTC) (27B) TOTAL FEE FCC USE ONLY

(28B) FCC CODE 1 (29B) FCC CODE 2

SECTION D - CERTIFICATION

(30) CERTIFICATION STATEMENT  
I, **ROBERT D BRISKMAN**, certify under penalty of perjury that the foregoing and supporting information is true and correct to the best of my knowledge, information and belief. SIGNATURE **Robert D Briskman** DATE **Mar 12, 2002**

SECTION E - CREDIT CARD PAYMENT INFORMATION

(31)  MASTERCARD MASTERCARD/VISA ACCOUNT NUMBER: EXPIRATION DATE:

VISA I hereby authorize the FCC to charge my VISA or MASTERCARD for the service(s)/authorization herein described. SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_