

APPLICATION FOR A MINOR MODIFICATION OF CONSTRUCTION PERMIT

FCC FORM 349

File Number BNPFT-20030820ABY

(PRIMARY STATION - WAKD(FM), Facility Number - 1627)

W247AT (Facility ID 157017)

Harvest, Alabama

CHANNEL 247 – 97.3 MHz

ERP: 0.01kW (H&V)

APPLICANT: James R. Henderson

August, 2005

Prepared by:



12585 Old Highway 280 East, Suite 102
Chelsea, Alabama 35043
(205) 618-2020

Engineering Statement
In Support of a Application for a
FM Translator Construction Permit
W247AT(Facility ID 157017), Harvest, Alabama

CONTENTS

1. Statement of Engineers	E3-E6
2. Exhibit E, Figure 1	Directional Antenna Specifications
3. Exhibit E, Figure 2	Protected and Interfering Contours Map

ENGINEERING STATEMENT

Of

Lee S. Reynolds

And

Virgle Leon Strickland

In Support of an

Minor Modification of a

Construction Permit

W247AT (Facility ID 157017)

Harvest, Alabama

Channel 247 – 97.3 MHz

ERP: 0.01kW(H&V)

August, 2005

General

As broadcast technical consultants doing business as Reynolds Technical Associates (RTA), we have been authorized by James R. Henderson (herein referred to as “The Applicant”), to conduct engineering studies and prepare the engineering portion of an application to modify a construction permit for a new FM translator station (File Number BNPFT-20030820ABY).

The requested modification is to change transmitter location and all elevations.

The W247AT facility is to broadcast the programming of WAKD(FM) of Sheffield, Alabama, by receiving the programming from the main studio of WAKD(FM) by off-air method.

The Proposed Site
(No Exhibits)

A study was performed for the proposed site to determine the maximum effective radiated power (MERP) of 0.01 kilowatts.

The antenna supporting structure has an antenna structure registration number of 1003872.

Directional Antenna
(Exhibit E, Figure 1)

The Applicant proposes to use a off shelf directional antenna manufactured by Kathrein. Exhibit E, Figure 1 is the specification for the proposed antenna (Model FMV Dipole).

Protected and Interfering Contours
(Exhibits E, Figure 2)

FM overlap studies where performed for the proposed facility and Exhibit E, Figure 2 is a map displaying the protected and interfering contours.

Exhibit E, Figure 2 shows the lack of prohibited contour overlap with all pertinent stations and application, except 2nd adjacent channel station WRSA-FM, Decatur, Alabama, which can be satisfied by using the provisions of §74.1204d of the Commission's Rules and Regulations. WRSA-FM produces a signal level of 83.0 dBu F(50,50) at the proposed site. Using the appropriate U/D ratio or 40 dBu for 2nd adjacent channel stations, the interfering contour of the proposed translator becomes 123.0 dBu, which extends to a radius of 20 meters (in the maximum lobe). Since the proposed antenna is to be mounted at 25 meters above ground level, the interfering contour does not even reach the ground. Clearly there would be no contour overlap with WRSA-FM over populated areas and no interference to the reception of any station is expected. If a waiver of §74.1204a is required in the case, it is hereby respectfully requested.

Human Exposure
(No Exhibits)

The proposed FM facility was evaluated in terms of potential radiofrequency radiation exposure at ground level in accordance with FCC guidelines for maximum permissible exposure.

Should anyone be required to climb the tower, the facilities located on the tower have an agreement to either reduce power or cease operation, whichever is necessary, to prevent hazardous exposure to radiofrequency radiation.

Environmental Impact
(No Exhibits)

A grant of the proposed construction would not constitute a major action as defined in the Commission's Rules and Regulations since the proposed antenna will be using an existing structure.

Conclusion

This statement/application has been prepared for The Applicant by utilizing the latest available information, cross-checked with the Federal Communications Commission and other sources. Therefore, it is submitted that the engineering data compiled and demonstrated herein for the proposed is in compliance with Commission's Rules and Regulations at the time of this application's filing date. We welcome the opportunity to discuss with the staff of the FCC the engineering data contained in this application.

Should any questions arise concerning the information, please contact us.

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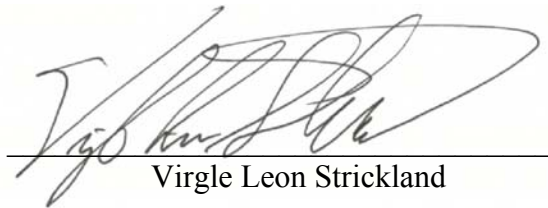
Statement of the Consultants

The instant engineering statement was prepared for The Applicant and supports an application to modify the construction permit of W247AT. It was developed by RTA and may not be used for purposes other than submission to the Commission by the applicant. It may not be reproduced in its entirety, or in part, by anyone (other than from the Commission) without the written consent of RTA.

It is prepared for The Applicant under contractual agreement, and its certification by RTA is used accordingly. If The Applicant fails in its contractual obligation, RTA reserves the right to withdraw its certification.

The information in this application is compiled from the most recent Commission and outside data. RTA is not responsible for errors resulting from incorrect data or unpublished rule and procedure changes.

For RTA:



Virgle Leon Strickland

August 23rd, 2005

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Chelsea, Alabama 35043
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The following pages are exhibits prepared and assembled in support of the proposed.

KATHREIN

SCALA DIVISION

FMV FMVMP

FM DIPOLE ANTENNA

1 dBd gain
88 to 108 MHz

Kathrein Scala Division FMV and FMVMP dipole antennas for FM radio transmission offer high performance, easy installation, and application flexibility. Dipoles may be stacked for more gain and higher power handling capacity as required. Arrays include power dividers and coax feeders, plus installation hardware.

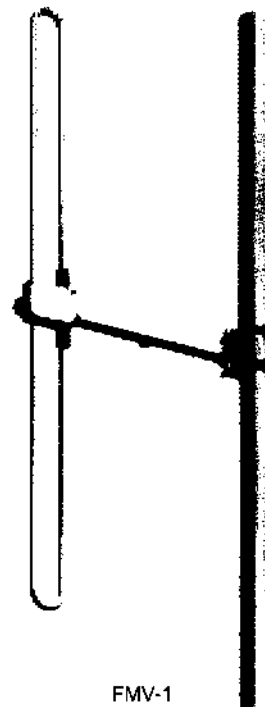
Like all Kathrein Scala Division antennas, the FMV and FMVMP are made of the finest materials using state of the art electrical and mechanical designs, resulting in superior performance and long service life. All FMV and FMVMP antennas feature:

- Triple laminated dipole for superior strength.
- Anodized aluminum and stainless steel construction designed to survive extreme weather.
- Internal balun is sealed in a cast aluminum housing to prevent moisture ingress and ice damage.
- Entire antenna is at DC ground potential for superior resistance to lightning.

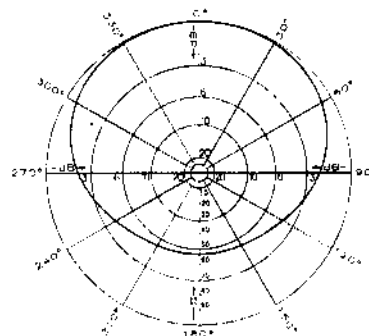
General Specifications:

Frequency	88 to 108 MHz
Bandwidth	88-98 MHz, 93-103 MHz, or 98-108 MHz
Impedance	50 ohms
VSWR	< 1.5:1
Polarization	Vertical
Maximum input power	
FMV	100 watts (at 50° C)
FMVMP	500 watts (at 50° C)
Connector	N female (other terminations are available for stacked arrays)
Wind survival rating*	120 mph (200 kph)
Mounting	For masts of 2.375 inch (60 mm) OD (using supplied hardware).

*Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details



FMV-1
FMVMP-1



Azimuth pattern



10480-C

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-6575
Email: broadcast@kathrein.com Internet: www.kathrein-scala.com

Exhibit E, Figure 1

FMV
FMVMP
FM DIPOLE ANTENNA
1 dBd gain
88 to 108 MHz

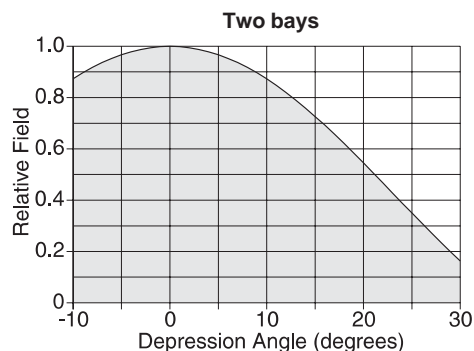
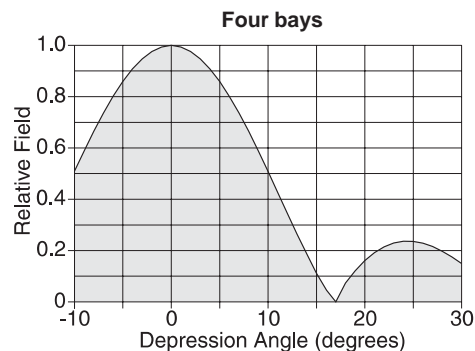
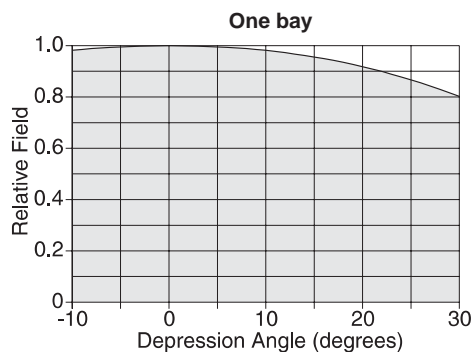
Specifications:

Model	Frequency MHz	Gain dBd	Weight lb (kg)	Power Gain	Equivalent Dimensions	Flat Plate Area	Number of Antennas
FMV-1	88–98	1	6 (2.7)	1.26	56 x 25 inches (1422 x 635 mm)	0.69 ft ² (0.0646 m ²)	1
	93–103	1	6 (2.7)	1.26	53 x 24 inches (1347 x 610 mm)	0.66 ft ² (0.061 m ²)	1
	98–108	1	6 (2.7)	1.26	51 x 23 inches (1422 x 585 mm)	0.64 ft ² (0.059 m ²)	1
FMV-2	88–98	3.5	18 (8.2)	2.24	166 x 25 inches (4216 x 635 mm)	1.64 ft ² (0.153 m ²)	2
	93–103	3.5	18 (8.2)	2.24	158 x 24 inches (4014 x 610 mm)	1.58 ft ² (0.146 m ²)	2
	98–108	3.5	18 (8.2)	2.24	151 x 23 inches (3836 x 585 mm)	1.51 ft ² (0.14 m ²)	2
FMV-3	88–98	4.9	29 (13.2)	2.82	276 x 25 inches (7010 x 635 mm)	2.56 ft ² (0.237 m ²)	3
	93–103	4.9	29 (13.2)	2.82	263 x 24 inches (6681 x 610 mm)	2.35 ft ² (0.218 m ²)	3
	98–108	4.9	29 (13.2)	2.82	251 x 23 inches (6376 x 585 mm)	2.34 ft ² (0.217 m ²)	3
FMV-4	88–98	6	43 (19.5)	3.98	386 x 25 inches (9804 x 635 mm)	3.48 ft ² (0.323 m ²)	4
	93–103	6	43 (19.5)	3.98	368 x 24 inches (9348 x 610 mm)	3.32 ft ² (0.308 m ²)	4
	98–108	6	43 (19.5)	3.98	351 x 23 inches (8916 x 585 mm)	3.18 ft ² (0.295 m ²)	4
FMVMP-1	88–98	1	6 (2.7)	1.26	56 x 33 inches (1422 x 838 mm)	0.69 ft ² (0.064 m ²)	1
	93–103	1	6 (2.7)	1.26	53 x 27.5 inches (1347 x 699 mm)	0.72 ft ² (0.067 m ²)	1
	98–108	1	6 (2.7)	1.26	51 x 26 inches (1422 x 661 mm)	0.66 ft ² (0.061 m ²)	1
FMVMP-2	88–98	3.5	23 (10.5)	2.24	166 x 33 inches (4216 x 838 mm)	1.7 ft ² (0.157 m ²)	2
	93–103	3.5	23 (10.5)	2.24	158 x 31.5 inches (4014 x 800 mm)	1.62 ft ² (0.15 m ²)	2
	98–108	3.5	23 (10.5)	2.24	151 x 30 inches (3836 x 762 mm)	1.55 ft ² (0.144 m ²)	2
FMVMP-3	88–98	4.9	34 (15.5)	2.82	276 x 33 inches (7010 x 838 mm)	2.61 ft ² (0.243 m ²)	3
	93–103	4.9	34 (15.5)	2.82	263 x 31.5 inches (6681 x 800 mm)	2.49 ft ² (0.232 m ²)	3
	98–108	4.9	34 (15.5)	2.82	251 x 30 inches (6376 x 762 mm)	2.39 ft ² (0.222 m ²)	3
FMVMP-4	88–98	6	48 (21.8)	3.98	386 x 33 inches (9804 x 838 mm)	3.52 ft ² (0.328 m ²)	4
	93–103	6	48 (21.8)	3.98	368 x 31.5 inches (9348 x 800 mm)	3.37 ft ² (0.313 m ²)	4
	98–108	6	48 (21.8)	3.98	351 x 30 inches (8916 x 762 mm)	3.22 ft ² (0.299 m ²)	4

All specifications are subject to change without notice

FMV
FMVMP
FM DIPOLE ANTENNA
1 dBd gain
88 to 108 MHz

Elevation patterns

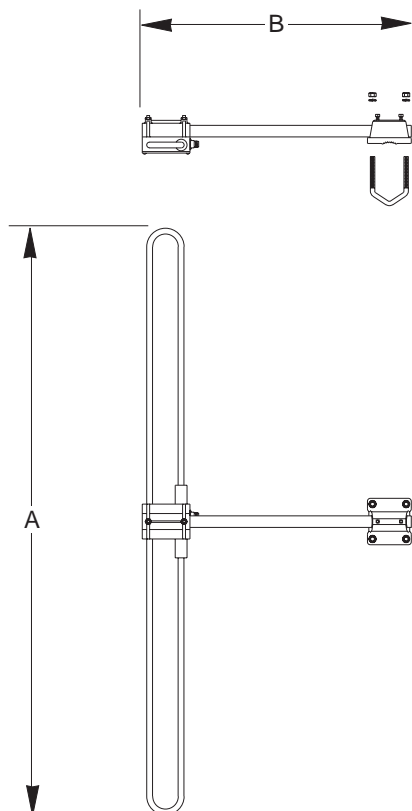


Order Information:

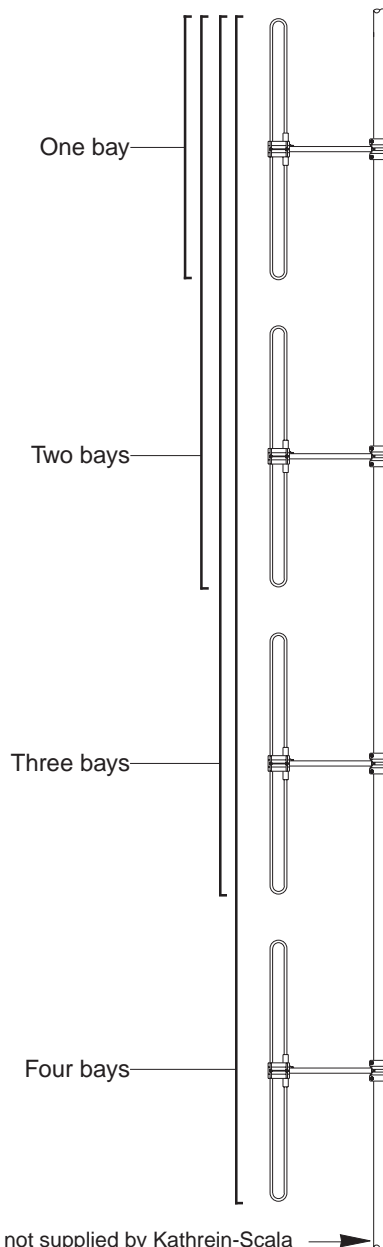
Model	Description
FMV	88–98 MHz antenna
FMV	93–103 MHz antenna
FMV	98–108 MHz antenna
FMVMP	88–98 MHz antenna
FMVMP	93–103 MHz antenna
FMVMP	98–108 MHz antenna

All specifications are subject to change without notice

FMV
FMVMP
FM DIPOLE ANTENNA
1 dBd gain
88 to 108 MHz

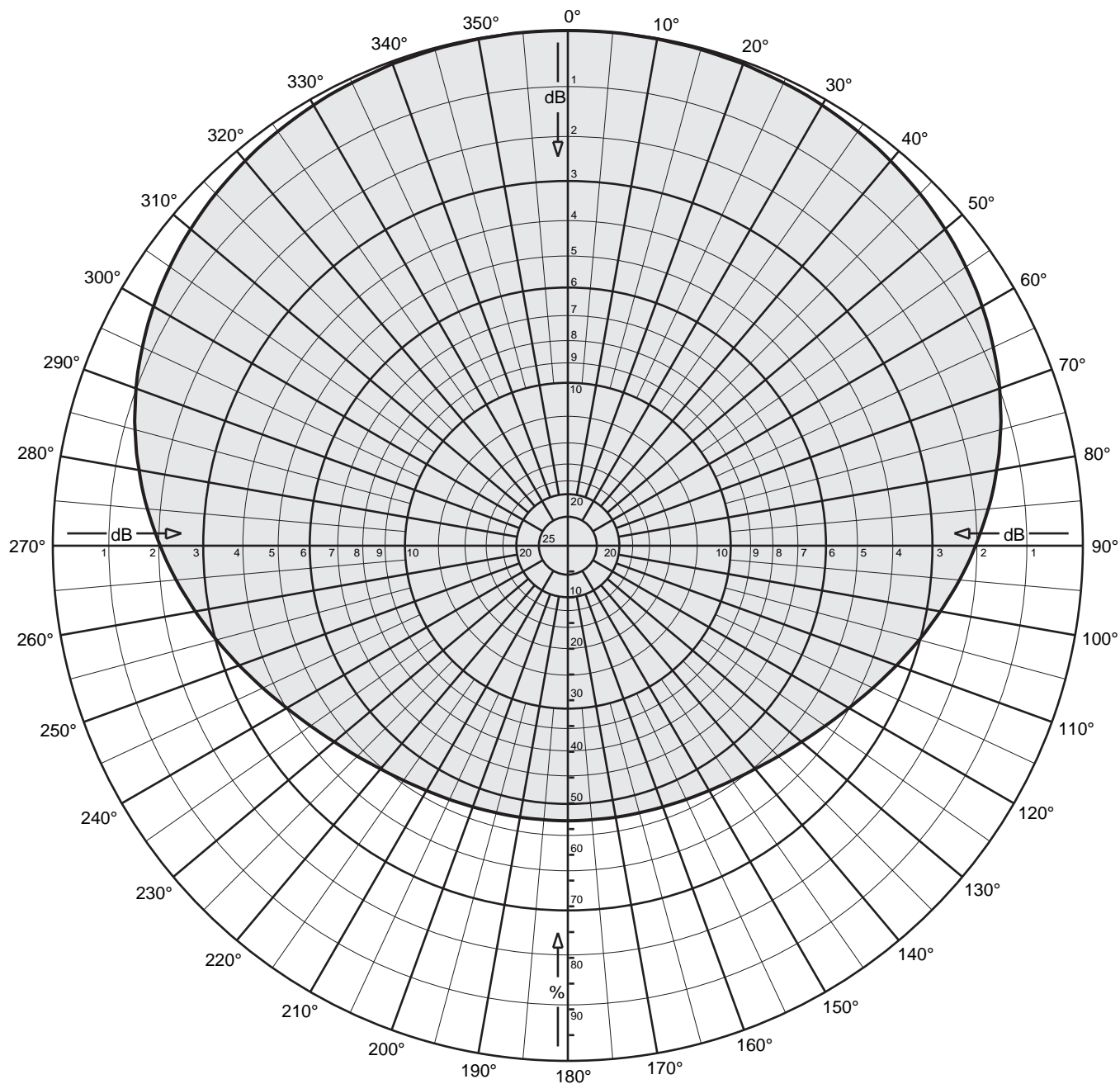


Dimensions:		A	B
FMV	88–98 MHz	56 inches (1422 mm)	25 inches (635 mm)
	93–103 MHz	53 inches (1347 mm)	24 inches (610 mm)
	98–108 MHz	51 inches (1422 mm)	23 inches (585 mm)
FMVMP	88–98 MHz	56 inches (1422 mm)	33 inches (838 mm)
	93–103 MHz	53 inches (1347 mm)	31.5 inches (800 mm)
	98–108 MHz	51 inches (1422 mm)	30 inches (762 mm)



Installation note:

In order to obtain proper impedance matching (minimum VSWR) and radiation patterns as shown the FMV and FMVMP antennas must be attached to a 2.375 inch (60 mm) OD mast that extends at least 12 inches (305 mm) above and below the antenna dipoles.



FMV Dipole
FM
1.0 dBd (3.15 dBi)
Vertical polarization
Horizontal radiation pattern



FMV Dipole

Horizontal radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	1.00	1.26	45	0.967	-0.29	0.71	1.18
1	1.000	0.00	1.00	1.26	46	0.965	-0.31	0.69	1.17
2	1.000	0.00	1.00	1.26	47	0.963	-0.33	0.67	1.17
3	1.000	0.00	1.00	1.26	48	0.961	-0.35	0.65	1.16
4	1.000	0.00	1.00	1.26	49	0.958	-0.37	0.63	1.16
5	1.000	0.00	1.00	1.26	50	0.956	-0.39	0.61	1.15
6	1.000	0.00	1.00	1.26	51	0.954	-0.41	0.59	1.15
7	0.999	-0.00	1.00	1.26	52	0.952	-0.43	0.57	1.14
8	0.999	-0.01	0.99	1.26	53	0.949	-0.45	0.55	1.13
9	0.999	-0.01	0.99	1.26	54	0.946	-0.48	0.52	1.13
10	0.999	-0.01	0.99	1.26	55	0.944	-0.50	0.50	1.12
11	0.998	-0.01	0.99	1.25	56	0.941	-0.53	0.47	1.11
12	0.998	-0.02	0.98	1.25	57	0.938	-0.55	0.45	1.11
13	0.998	-0.02	0.98	1.25	58	0.935	-0.58	0.42	1.10
14	0.998	-0.02	0.98	1.25	59	0.932	-0.61	0.39	1.09
15	0.997	-0.02	0.98	1.25	60	0.929	-0.64	0.36	1.09
16	0.997	-0.03	0.97	1.25	61	0.926	-0.67	0.33	1.08
17	0.996	-0.03	0.97	1.25	62	0.923	-0.70	0.30	1.07
18	0.995	-0.04	0.96	1.25	63	0.919	-0.73	0.27	1.06
19	0.995	-0.04	0.96	1.25	64	0.915	-0.77	0.23	1.05
20	0.995	-0.04	0.96	1.25	65	0.911	-0.80	0.20	1.05
21	0.994	-0.05	0.95	1.24	66	0.908	-0.84	0.16	1.04
22	0.993	-0.06	0.94	1.24	67	0.904	-0.87	0.13	1.03
23	0.993	-0.06	0.94	1.24	68	0.901	-0.91	0.09	1.02
24	0.992	-0.07	0.93	1.24	69	0.896	-0.95	0.05	1.01
25	0.991	-0.07	0.93	1.24	70	0.892	-0.99	0.01	1.00
26	0.991	-0.08	0.92	1.24	71	0.888	-1.03	-0.03	0.99
27	0.990	-0.08	0.92	1.23	72	0.883	-1.08	-0.08	0.98
28	0.990	-0.09	0.91	1.23	73	0.879	-1.12	-0.12	0.97
29	0.989	-0.10	0.90	1.23	74	0.875	-1.16	-0.16	0.96
30	0.987	-0.11	0.89	1.23	75	0.870	-1.21	-0.21	0.95
31	0.986	-0.12	0.88	1.22	76	0.865	-1.26	-0.26	0.94
32	0.985	-0.13	0.87	1.22	77	0.861	-1.30	-0.30	0.93
33	0.984	-0.14	0.86	1.22	78	0.856	-1.35	-0.35	0.92
34	0.983	-0.15	0.85	1.22	79	0.851	-1.40	-0.40	0.91
35	0.982	-0.16	0.84	1.21	80	0.845	-1.46	-0.46	0.90
36	0.981	-0.17	0.83	1.21	81	0.840	-1.51	-0.51	0.89
37	0.979	-0.18	0.82	1.21	82	0.836	-1.56	-0.56	0.88
38	0.978	-0.19	0.81	1.21	83	0.830	-1.61	-0.61	0.87
39	0.977	-0.20	0.80	1.20	84	0.825	-1.67	-0.67	0.86
40	0.975	-0.22	0.78	1.20	85	0.819	-1.73	-0.73	0.85
41	0.973	-0.23	0.77	1.19	86	0.814	-1.79	-0.79	0.83
42	0.972	-0.25	0.75	1.19	87	0.808	-1.85	-0.85	0.82
43	0.970	-0.26	0.74	1.18	88	0.803	-1.91	-0.91	0.81
44	0.968	-0.28	0.72	1.18	89	0.797	-1.97	-0.97	0.80



FMV Dipole

Horizontal radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.792	-2.03	-1.03	0.79	135	0.578	-4.76	-3.76	0.42
91	0.786	-2.09	-1.09	0.78	136	0.575	-4.80	-3.80	0.42
92	0.781	-2.15	-1.15	0.77	137	0.573	-4.84	-3.84	0.41
93	0.775	-2.21	-1.21	0.76	138	0.570	-4.88	-3.88	0.41
94	0.769	-2.28	-1.28	0.74	139	0.568	-4.91	-3.91	0.41
95	0.763	-2.34	-1.34	0.73	140	0.566	-4.95	-3.95	0.40
96	0.758	-2.41	-1.41	0.72	141	0.564	-4.98	-3.98	0.40
97	0.752	-2.48	-1.48	0.71	142	0.562	-5.01	-4.01	0.40
98	0.746	-2.55	-1.55	0.70	143	0.560	-5.04	-4.04	0.39
99	0.740	-2.61	-1.61	0.69	144	0.558	-5.07	-4.07	0.39
100	0.735	-2.68	-1.68	0.68	145	0.556	-5.09	-4.09	0.39
101	0.729	-2.75	-1.75	0.67	146	0.555	-5.12	-4.12	0.39
102	0.723	-2.82	-1.82	0.66	147	0.553	-5.14	-4.14	0.39
103	0.717	-2.88	-1.88	0.65	148	0.551	-5.17	-4.17	0.38
104	0.712	-2.95	-1.95	0.64	149	0.550	-5.19	-4.19	0.38
105	0.706	-3.02	-2.02	0.63	150	0.549	-5.21	-4.21	0.38
106	0.701	-3.09	-2.09	0.62	151	0.548	-5.23	-4.23	0.38
107	0.695	-3.16	-2.16	0.61	152	0.546	-5.25	-4.25	0.38
108	0.689	-3.23	-2.23	0.60	153	0.545	-5.26	-4.26	0.37
109	0.684	-3.29	-2.29	0.59	154	0.545	-5.28	-4.28	0.37
110	0.679	-3.36	-2.36	0.58	155	0.544	-5.29	-4.29	0.37
111	0.674	-3.43	-2.43	0.57	156	0.543	-5.31	-4.31	0.37
112	0.668	-3.50	-2.50	0.56	157	0.542	-5.32	-4.32	0.37
113	0.663	-3.56	-2.56	0.55	158	0.541	-5.34	-4.34	0.37
114	0.658	-3.63	-2.63	0.55	159	0.540	-5.35	-4.35	0.37
115	0.654	-3.69	-2.69	0.54	160	0.540	-5.36	-4.36	0.37
116	0.649	-3.76	-2.76	0.53	161	0.539	-5.37	-4.37	0.37
117	0.644	-3.82	-2.82	0.52	162	0.538	-5.38	-4.38	0.36
118	0.639	-3.89	-2.89	0.51	163	0.538	-5.39	-4.39	0.36
119	0.635	-3.95	-2.95	0.51	164	0.537	-5.40	-4.40	0.36
120	0.630	-4.01	-3.01	0.50	165	0.537	-5.40	-4.40	0.36
121	0.626	-4.07	-3.07	0.49	166	0.536	-5.41	-4.41	0.36
122	0.622	-4.13	-3.13	0.49	167	0.536	-5.41	-4.41	0.36
123	0.618	-4.18	-3.18	0.48	168	0.536	-5.42	-4.42	0.36
124	0.614	-4.24	-3.24	0.47	169	0.535	-5.42	-4.42	0.36
125	0.610	-4.29	-3.29	0.47	170	0.535	-5.43	-4.43	0.36
126	0.606	-4.35	-3.35	0.46	171	0.535	-5.43	-4.43	0.36
127	0.603	-4.40	-3.40	0.46	172	0.535	-5.44	-4.44	0.36
128	0.599	-4.45	-3.45	0.45	173	0.534	-5.44	-4.44	0.36
129	0.596	-4.50	-3.50	0.45	174	0.534	-5.45	-4.45	0.36
130	0.592	-4.55	-3.55	0.44	175	0.534	-5.45	-4.45	0.36
131	0.589	-4.59	-3.59	0.44	176	0.534	-5.45	-4.45	0.36
132	0.586	-4.64	-3.64	0.43	177	0.534	-5.45	-4.45	0.36
133	0.583	-4.68	-3.68	0.43	178	0.534	-5.45	-4.45	0.36
134	0.581	-4.72	-3.72	0.42	179	0.534	-5.45	-4.45	0.36



FMV Dipole

Horizontal radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.534	-5.45	-4.45	0.36	225	0.578	-4.76	-3.76	0.42
181	0.534	-5.45	-4.45	0.36	226	0.581	-4.72	-3.72	0.42
182	0.534	-5.45	-4.45	0.36	227	0.583	-4.68	-3.68	0.43
183	0.534	-5.45	-4.45	0.36	228	0.586	-4.64	-3.64	0.43
184	0.534	-5.45	-4.45	0.36	229	0.589	-4.59	-3.59	0.44
185	0.534	-5.45	-4.45	0.36	230	0.592	-4.55	-3.55	0.44
186	0.534	-5.45	-4.45	0.36	231	0.596	-4.50	-3.50	0.45
187	0.534	-5.44	-4.44	0.36	232	0.599	-4.45	-3.45	0.45
188	0.535	-5.44	-4.44	0.36	233	0.603	-4.40	-3.40	0.46
189	0.535	-5.43	-4.43	0.36	234	0.606	-4.35	-3.35	0.46
190	0.535	-5.43	-4.43	0.36	235	0.610	-4.29	-3.29	0.47
191	0.535	-5.42	-4.42	0.36	236	0.614	-4.24	-3.24	0.47
192	0.536	-5.42	-4.42	0.36	237	0.618	-4.18	-3.18	0.48
193	0.536	-5.41	-4.41	0.36	238	0.622	-4.13	-3.13	0.49
194	0.536	-5.41	-4.41	0.36	239	0.626	-4.07	-3.07	0.49
195	0.537	-5.40	-4.40	0.36	240	0.630	-4.01	-3.01	0.50
196	0.537	-5.40	-4.40	0.36	241	0.635	-3.95	-2.95	0.51
197	0.538	-5.39	-4.39	0.36	242	0.639	-3.89	-2.89	0.51
198	0.538	-5.38	-4.38	0.36	243	0.644	-3.82	-2.82	0.52
199	0.539	-5.37	-4.37	0.37	244	0.649	-3.76	-2.76	0.53
200	0.540	-5.36	-4.36	0.37	245	0.654	-3.69	-2.69	0.54
201	0.540	-5.35	-4.35	0.37	246	0.658	-3.63	-2.63	0.55
202	0.541	-5.34	-4.34	0.37	247	0.663	-3.56	-2.56	0.55
203	0.542	-5.32	-4.32	0.37	248	0.668	-3.50	-2.50	0.56
204	0.543	-5.31	-4.31	0.37	249	0.674	-3.43	-2.43	0.57
205	0.544	-5.29	-4.29	0.37	250	0.679	-3.36	-2.36	0.58
206	0.545	-5.28	-4.28	0.37	251	0.684	-3.29	-2.29	0.59
207	0.545	-5.26	-4.26	0.37	252	0.689	-3.23	-2.23	0.60
208	0.546	-5.25	-4.25	0.38	253	0.695	-3.16	-2.16	0.61
209	0.548	-5.23	-4.23	0.38	254	0.701	-3.09	-2.09	0.62
210	0.549	-5.21	-4.21	0.38	255	0.706	-3.02	-2.02	0.63
211	0.550	-5.19	-4.19	0.38	256	0.712	-2.95	-1.95	0.64
212	0.551	-5.17	-4.17	0.38	257	0.717	-2.88	-1.88	0.65
213	0.553	-5.14	-4.14	0.39	258	0.723	-2.82	-1.82	0.66
214	0.555	-5.12	-4.12	0.39	259	0.729	-2.75	-1.75	0.67
215	0.556	-5.09	-4.09	0.39	260	0.735	-2.68	-1.68	0.68
216	0.558	-5.07	-4.07	0.39	261	0.740	-2.61	-1.61	0.69
217	0.560	-5.04	-4.04	0.39	262	0.746	-2.55	-1.55	0.70
218	0.562	-5.01	-4.01	0.40	263	0.752	-2.48	-1.48	0.71
219	0.564	-4.98	-3.98	0.40	264	0.758	-2.41	-1.41	0.72
220	0.566	-4.95	-3.95	0.40	265	0.763	-2.34	-1.34	0.73
221	0.568	-4.91	-3.91	0.41	266	0.769	-2.28	-1.28	0.74
222	0.570	-4.88	-3.88	0.41	267	0.775	-2.21	-1.21	0.76
223	0.573	-4.84	-3.84	0.41	268	0.781	-2.15	-1.15	0.77
224	0.575	-4.80	-3.80	0.42	269	0.786	-2.09	-1.09	0.78



FMV Dipole

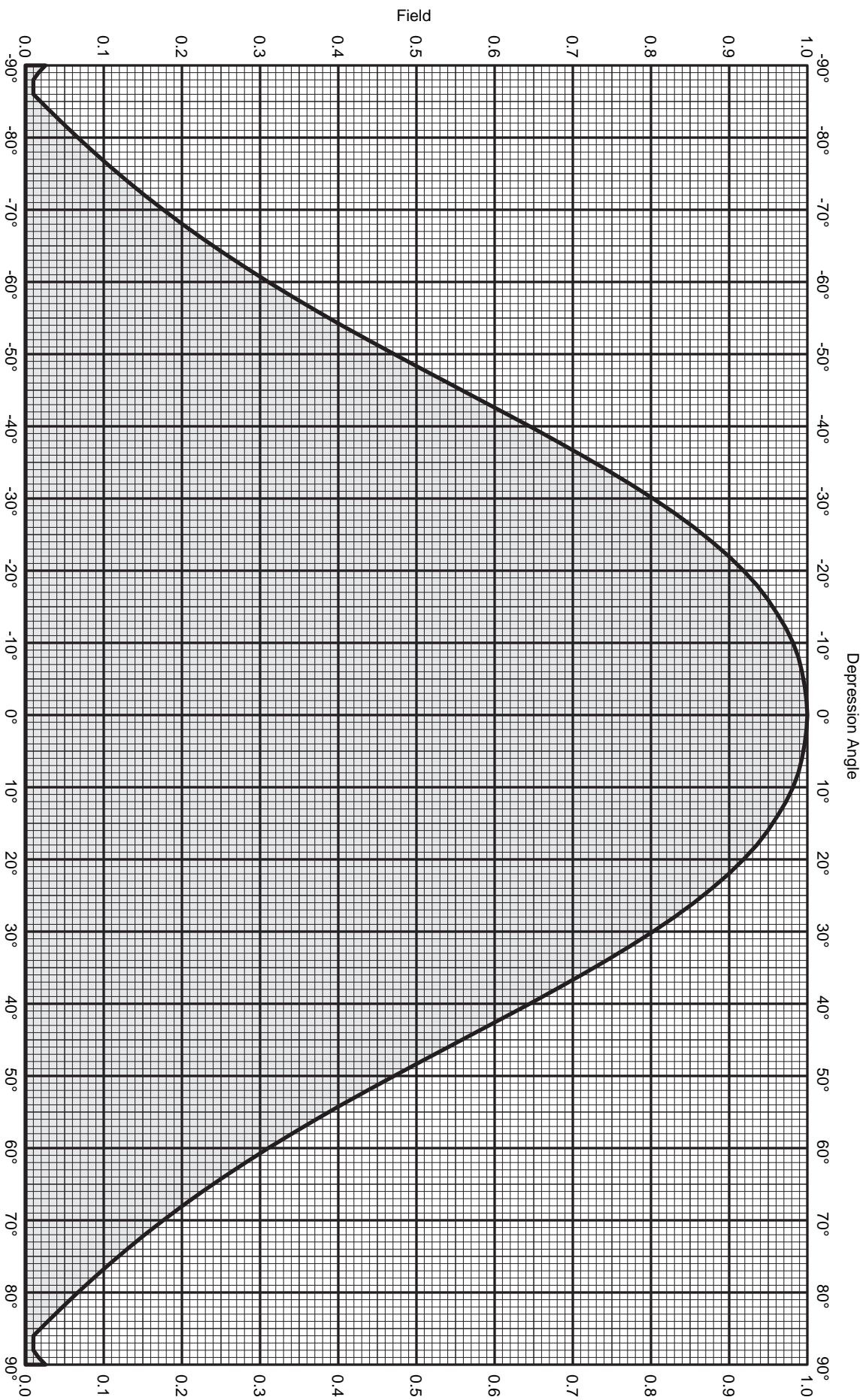
Horizontal radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.792	-2.03	-1.03	0.79	315	0.967	-0.29	0.71	1.18
271	0.797	-1.97	-0.97	0.80	316	0.968	-0.28	0.72	1.18
272	0.803	-1.91	-0.91	0.81	317	0.970	-0.26	0.74	1.18
273	0.808	-1.85	-0.85	0.82	318	0.972	-0.25	0.75	1.19
274	0.814	-1.79	-0.79	0.83	319	0.973	-0.23	0.77	1.19
275	0.819	-1.73	-0.73	0.85	320	0.975	-0.22	0.78	1.20
276	0.825	-1.67	-0.67	0.86	321	0.977	-0.20	0.80	1.20
277	0.830	-1.61	-0.61	0.87	322	0.978	-0.19	0.81	1.21
278	0.836	-1.56	-0.56	0.88	323	0.979	-0.18	0.82	1.21
279	0.840	-1.51	-0.51	0.89	324	0.981	-0.17	0.83	1.21
280	0.845	-1.46	-0.46	0.90	325	0.982	-0.16	0.84	1.21
281	0.851	-1.40	-0.40	0.91	326	0.983	-0.15	0.85	1.22
282	0.856	-1.35	-0.35	0.92	327	0.984	-0.14	0.86	1.22
283	0.861	-1.30	-0.30	0.93	328	0.985	-0.13	0.87	1.22
284	0.865	-1.26	-0.26	0.94	329	0.986	-0.12	0.88	1.22
285	0.870	-1.21	-0.21	0.95	330	0.987	-0.11	0.89	1.23
286	0.875	-1.16	-0.16	0.96	331	0.989	-0.10	0.90	1.23
287	0.879	-1.12	-0.12	0.97	332	0.990	-0.09	0.91	1.23
288	0.883	-1.08	-0.08	0.98	333	0.990	-0.08	0.92	1.23
289	0.888	-1.03	-0.03	0.99	334	0.991	-0.08	0.92	1.24
290	0.892	-0.99	0.01	1.00	335	0.991	-0.07	0.93	1.24
291	0.896	-0.95	0.05	1.01	336	0.992	-0.07	0.93	1.24
292	0.901	-0.91	0.09	1.02	337	0.993	-0.06	0.94	1.24
293	0.904	-0.87	0.13	1.03	338	0.993	-0.06	0.94	1.24
294	0.908	-0.84	0.16	1.04	339	0.994	-0.05	0.95	1.24
295	0.911	-0.80	0.20	1.05	340	0.995	-0.04	0.96	1.25
296	0.915	-0.77	0.23	1.05	341	0.995	-0.04	0.96	1.25
297	0.919	-0.73	0.27	1.06	342	0.995	-0.04	0.96	1.25
298	0.923	-0.70	0.30	1.07	343	0.996	-0.03	0.97	1.25
299	0.926	-0.67	0.33	1.08	344	0.997	-0.03	0.97	1.25
300	0.929	-0.64	0.36	1.09	345	0.997	-0.02	0.98	1.25
301	0.932	-0.61	0.39	1.09	346	0.998	-0.02	0.98	1.25
302	0.935	-0.58	0.42	1.10	347	0.998	-0.02	0.98	1.25
303	0.938	-0.55	0.45	1.11	348	0.998	-0.02	0.98	1.25
304	0.941	-0.53	0.47	1.11	349	0.998	-0.01	0.99	1.25
305	0.944	-0.50	0.50	1.12	350	0.999	-0.01	0.99	1.26
306	0.946	-0.48	0.52	1.13	351	0.999	-0.01	0.99	1.26
307	0.949	-0.45	0.55	1.13	352	0.999	-0.01	0.99	1.26
308	0.952	-0.43	0.57	1.14	353	0.999	-0.00	1.00	1.26
309	0.954	-0.41	0.59	1.15	354	1.000	0.00	1.00	1.26
310	0.956	-0.39	0.61	1.15	355	1.000	0.00	1.00	1.26
311	0.958	-0.37	0.63	1.16	356	1.000	0.00	1.00	1.26
312	0.961	-0.35	0.65	1.16	357	1.000	0.00	1.00	1.26
313	0.963	-0.33	0.67	1.17	358	1.000	0.00	1.00	1.26
314	0.965	-0.31	0.69	1.17	359	1.000	0.00	1.00	1.26



FMV Dipole

FM

1.0 dBd (3.15 dBi)

Vertical polarization



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FMV Dipole

Vertical radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.025	-31.89	-30.89	0.00	-45	0.558	-5.07	-4.07	0.39
-89	0.017	-35.56	-34.56	0.00	-44	0.575	-4.80	-3.80	0.42
-88	0.010	-40.00	-39.00	0.00	-43	0.593	-4.54	-3.54	0.44
-87	0.010	-40.00	-39.00	0.00	-42	0.610	-4.29	-3.29	0.47
-86	0.010	-39.94	-38.94	0.00	-41	0.628	-4.05	-3.05	0.50
-85	0.019	-34.30	-33.30	0.00	-40	0.645	-3.81	-2.81	0.52
-84	0.028	-30.91	-29.91	0.00	-39	0.662	-3.59	-2.59	0.55
-83	0.038	-28.42	-27.42	0.00	-38	0.678	-3.37	-2.37	0.58
-82	0.047	-26.48	-25.48	0.00	-37	0.695	-3.16	-2.16	0.61
-81	0.057	-24.86	-23.86	0.00	-36	0.711	-2.96	-1.96	0.64
-80	0.067	-23.49	-22.49	0.01	-35	0.727	-2.77	-1.77	0.67
-79	0.077	-22.27	-21.27	0.01	-34	0.743	-2.58	-1.58	0.70
-78	0.087	-21.20	-20.20	0.01	-33	0.758	-2.40	-1.40	0.72
-77	0.098	-20.21	-19.21	0.01	-32	0.774	-2.23	-1.23	0.75
-76	0.108	-19.33	-18.33	0.01	-31	0.788	-2.07	-1.07	0.78
-75	0.119	-18.49	-17.49	0.02	-30	0.803	-1.91	-0.91	0.81
-74	0.130	-17.73	-16.73	0.02	-29	0.816	-1.76	-0.76	0.84
-73	0.141	-17.01	-16.01	0.03	-28	0.830	-1.62	-0.62	0.87
-72	0.152	-16.34	-15.34	0.03	-27	0.842	-1.49	-0.49	0.89
-71	0.164	-15.69	-14.69	0.03	-26	0.855	-1.36	-0.36	0.92
-70	0.176	-15.08	-14.08	0.04	-25	0.867	-1.24	-0.24	0.95
-69	0.188	-14.50	-13.50	0.04	-24	0.878	-1.13	-0.13	0.97
-68	0.201	-13.95	-12.95	0.05	-23	0.889	-1.02	-0.02	0.99
-67	0.214	-13.41	-12.41	0.06	-22	0.899	-0.92	0.08	1.02
-66	0.226	-12.90	-11.90	0.06	-21	0.909	-0.83	0.17	1.04
-65	0.240	-12.40	-11.40	0.07	-20	0.918	-0.74	0.26	1.06
-64	0.254	-11.92	-10.92	0.08	-19	0.927	-0.66	0.34	1.08
-63	0.268	-11.45	-10.45	0.09	-18	0.935	-0.58	0.42	1.10
-62	0.282	-11.01	-10.01	0.10	-17	0.942	-0.51	0.49	1.12
-61	0.296	-10.57	-9.57	0.11	-16	0.950	-0.45	0.55	1.14
-60	0.310	-10.16	-9.16	0.12	-15	0.956	-0.39	0.61	1.15
-59	0.326	-9.75	-8.75	0.13	-14	0.962	-0.34	0.66	1.16
-58	0.341	-9.35	-8.35	0.15	-13	0.967	-0.29	0.71	1.18
-57	0.356	-8.96	-7.96	0.16	-12	0.973	-0.24	0.76	1.19
-56	0.372	-8.59	-7.59	0.17	-11	0.977	-0.20	0.80	1.20
-55	0.388	-8.22	-7.22	0.19	-10	0.982	-0.16	0.84	1.21
-54	0.404	-7.87	-6.87	0.21	-9	0.985	-0.13	0.87	1.22
-53	0.421	-7.52	-6.52	0.22	-8	0.989	-0.10	0.90	1.23
-52	0.438	-7.18	-6.18	0.24	-7	0.991	-0.08	0.92	1.24
-51	0.455	-6.85	-5.85	0.26	-6	0.993	-0.06	0.94	1.24
-50	0.472	-6.53	-5.53	0.28	-5	0.995	-0.04	0.96	1.25
-49	0.489	-6.22	-5.22	0.30	-4	0.997	-0.03	0.97	1.25
-48	0.506	-5.92	-4.92	0.32	-3	0.998	-0.02	0.98	1.25
-47	0.523	-5.63	-4.63	0.34	-2	0.999	-0.01	0.99	1.26
-46	0.541	-5.34	-4.34	0.37	-1	0.999	-0.00	1.00	1.26
					0	1.000	0.00	1.00	1.26



FMV Dipole

Vertical radiation pattern

FM

1.0 dBd (3.15 dBi)

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	1.00	1.26	45	0.558	-5.07	-4.07	0.39
1	0.999	-0.00	1.00	1.26	46	0.541	-5.34	-4.34	0.37
2	0.999	-0.01	0.99	1.26	47	0.523	-5.63	-4.63	0.34
3	0.998	-0.02	0.98	1.25	48	0.506	-5.92	-4.92	0.32
4	0.997	-0.03	0.97	1.25	49	0.489	-6.22	-5.22	0.30
5	0.995	-0.04	0.96	1.25	50	0.472	-6.53	-5.53	0.28
6	0.993	-0.06	0.94	1.24	51	0.455	-6.85	-5.85	0.26
7	0.991	-0.08	0.92	1.24	52	0.438	-7.18	-6.18	0.24
8	0.989	-0.10	0.90	1.23	53	0.421	-7.52	-6.52	0.22
9	0.985	-0.13	0.87	1.22	54	0.404	-7.87	-6.87	0.21
10	0.982	-0.16	0.84	1.21	55	0.388	-8.22	-7.22	0.19
11	0.977	-0.20	0.80	1.20	56	0.372	-8.59	-7.59	0.17
12	0.973	-0.24	0.76	1.19	57	0.356	-8.96	-7.96	0.16
13	0.967	-0.29	0.71	1.18	58	0.341	-9.35	-8.35	0.15
14	0.962	-0.34	0.66	1.16	59	0.326	-9.75	-8.75	0.13
15	0.956	-0.39	0.61	1.15	60	0.310	-10.16	-9.16	0.12
16	0.950	-0.45	0.55	1.14	61	0.296	-10.57	-9.57	0.11
17	0.942	-0.51	0.49	1.12	62	0.282	-11.01	-10.01	0.10
18	0.935	-0.58	0.42	1.10	63	0.268	-11.45	-10.45	0.09
19	0.927	-0.66	0.34	1.08	64	0.254	-11.92	-10.92	0.08
20	0.918	-0.74	0.26	1.06	65	0.240	-12.40	-11.40	0.07
21	0.909	-0.83	0.17	1.04	66	0.226	-12.90	-11.90	0.06
22	0.899	-0.92	0.08	1.02	67	0.214	-13.41	-12.41	0.06
23	0.889	-1.02	-0.02	0.99	68	0.201	-13.95	-12.95	0.05
24	0.878	-1.13	-0.13	0.97	69	0.188	-14.50	-13.50	0.04
25	0.867	-1.24	-0.24	0.95	70	0.176	-15.08	-14.08	0.04
26	0.855	-1.36	-0.36	0.92	71	0.164	-15.69	-14.69	0.03
27	0.842	-1.49	-0.49	0.89	72	0.152	-16.34	-15.34	0.03
28	0.830	-1.62	-0.62	0.87	73	0.141	-17.01	-16.01	0.03
29	0.816	-1.76	-0.76	0.84	74	0.130	-17.73	-16.73	0.02
30	0.803	-1.91	-0.91	0.81	75	0.119	-18.49	-17.49	0.02
31	0.788	-2.07	-1.07	0.78	76	0.108	-19.33	-18.33	0.01
32	0.774	-2.23	-1.23	0.75	77	0.098	-20.21	-19.21	0.01
33	0.758	-2.40	-1.40	0.72	78	0.087	-21.20	-20.20	0.01
34	0.743	-2.58	-1.58	0.70	79	0.077	-22.27	-21.27	0.01
35	0.727	-2.77	-1.77	0.67	80	0.067	-23.49	-22.49	0.01
36	0.711	-2.96	-1.96	0.64	81	0.057	-24.86	-23.86	0.00
37	0.695	-3.16	-2.16	0.61	82	0.047	-26.48	-25.48	0.00
38	0.678	-3.37	-2.37	0.58	83	0.038	-28.42	-27.42	0.00
39	0.662	-3.59	-2.59	0.55	84	0.028	-30.91	-29.91	0.00
40	0.645	-3.81	-2.81	0.52	85	0.019	-34.30	-33.30	0.00
41	0.628	-4.05	-3.05	0.50	86	0.010	-39.94	-38.94	0.00
42	0.610	-4.29	-3.29	0.47	87	0.010	-40.00	-39.00	0.00
43	0.593	-4.54	-3.54	0.44	88	0.010	-40.00	-39.00	0.00
44	0.575	-4.80	-3.80	0.42	89	0.017	-35.56	-34.56	0.00
					90	0.025	-31.89	-30.89	0.00

