

# KATHREIN

## KATHREIN BROADCAST USA

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Arizona Broadcast Engineering Services  
Ref: KJJJ (AUX) CH: 272C1 FCC ID: 63410  
Laughlin, NV.  
ATT: [Faron@KNLB.com](mailto:Faron@KNLB.com)  
928-706-5652

August 10, 2021

Faron:

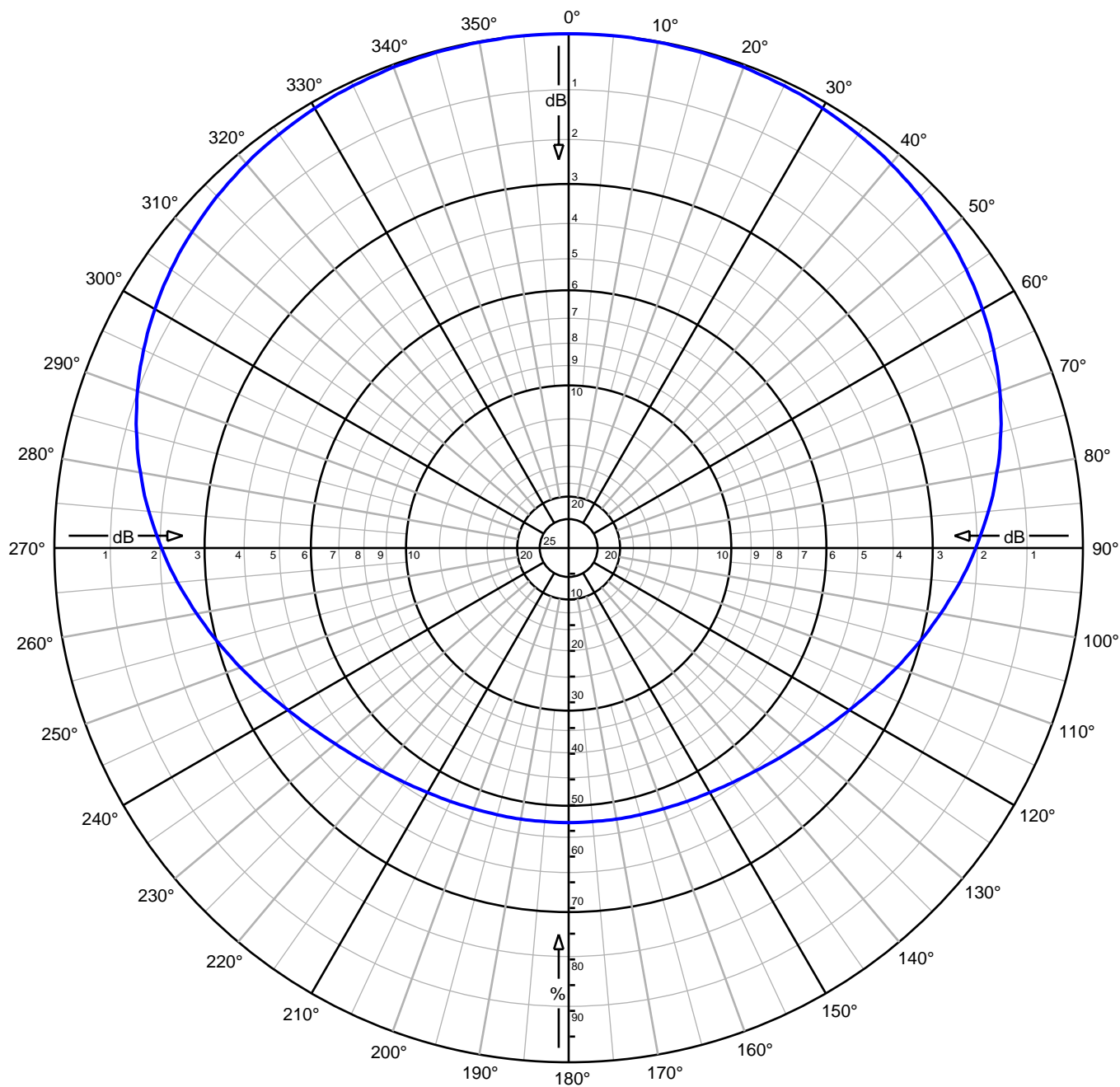
The Proposed SCALA FMVMP Antenna installation for KJJJ (AUX) on 102.3 MHz, mounted to a 2" SCH-40 Pipe, located 30 foot above the ground matches exactly the Legacy Radiation pattern Measurement conditions used by Scala Radio Corp prior to 1991. The test set up consisted of a Scientific Atlanta Analog measurement turntable, a General Radio precision RF Oscillator and a HP 430C RF detector.

The construction of these Antenna models (FMVMP-50N) has remained the same since these original Measurement were made.

The HRP, VRP pattern and relative field data of the SCALA FMVMP measured as described above are attached to this letter.



Michael Johnson  
Broadcast Sales Engineering  
Kathrein-BCA



FMVMP  
98.0 MHz  
1.0 dBd  
Vertical polarization  
Horizontal radiation pattern



FMV Dipole

FM

Maximum gain: 1.0 dBd

Vertical polarization

Horizontal radiation pattern

0 degree electrical downtilt

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  
FM

Maximum gain: 1.0 dBd  
Vertical polarization

Horizontal radiation pattern  
0 degree electrical downtilt

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

FM

Maximum gain: 1.0 dBd

Vertical polarization

Horizontal radiation pattern

0 degree electrical downtilt

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

FM

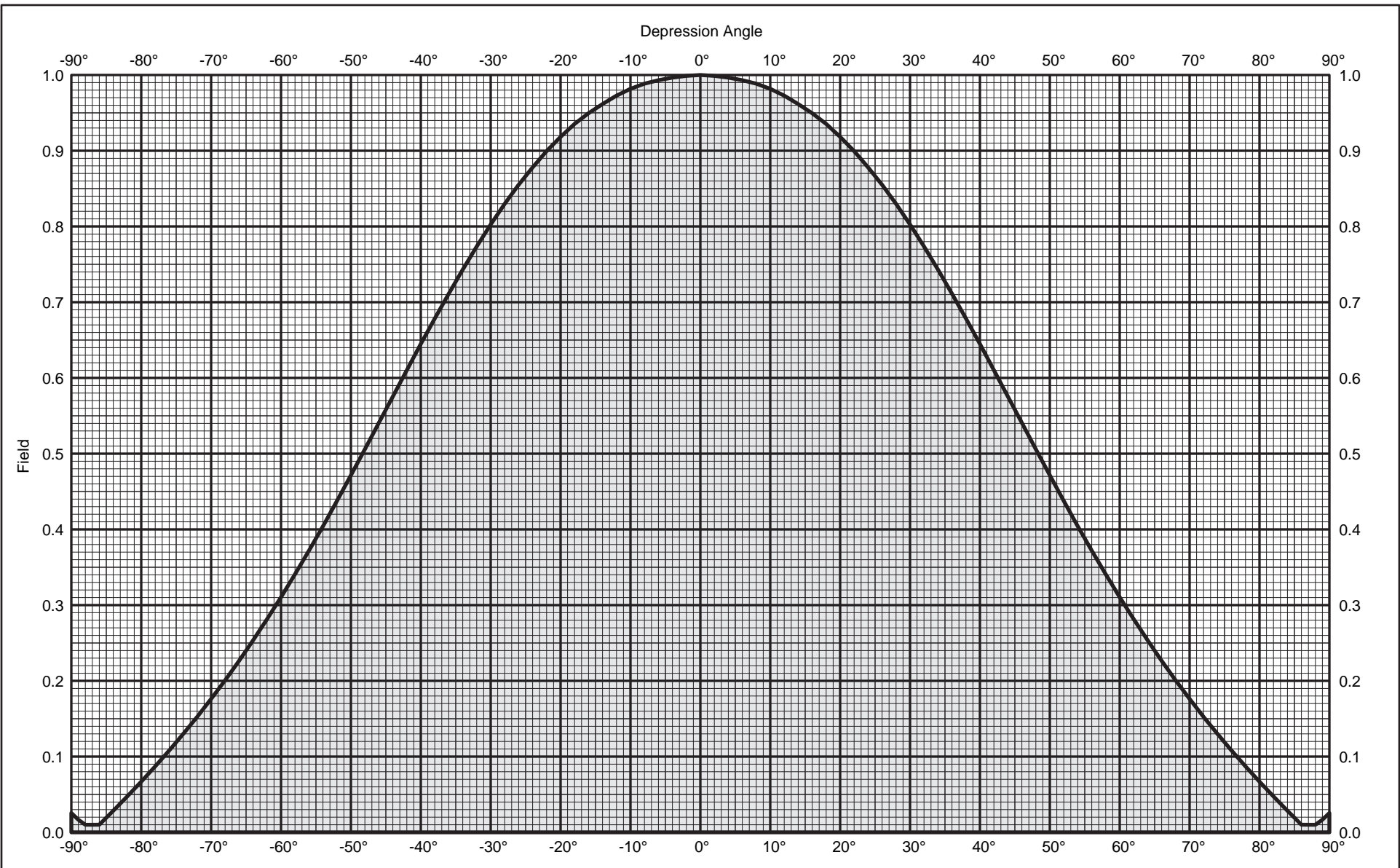
Maximum gain: 1.0 dBd

Vertical polarization

Horizontal radiation pattern

0 degree electrical downtilt

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




**KATHREIN**  
**SCALA DIVISION**

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FMVMP Dipole  
FM  
Maximum gain: 1.0 dBd  
Vertical polarization

Vertical radiation pattern  
0 degree electrical downtilt



FMVMP Dipole

FM

Maximum gain: 1.0 dBd

Vertical polarization

Vertical radiation pattern

0 degree electrical downtilt

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





FMVMP Dipole

FM

Maximum gain: 1.0 dBd

Vertical polarization

Vertical radiation pattern

0 degree electrical downtilt

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