

STEPHEN S. LOCKWOOD, PE, PMP

THOMAS M. ECKELS, PE
ERIK C. SWANSON, PE, PMP
THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
STEPHEN PUMPLE, M.Eng, MBA, PMP
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151

E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**Engineering Statement
Minor Modification of K26PF-D
Channel 26 at Saint Cloud, MN
Nov 2023**

I. Background

This Engineering Statement has been prepared on behalf of Bridge News, LLC, licensee of low-power station K26PF-D Saint Cloud. This material has been prepared in connection with an application for minor modification of construction permit 0000184986.

II. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's TVStudy software.

This study was conducted using a study cell size of 1.0 km and a terrain extraction increment of 1.0 km.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations, beyond the allowed values of 0.5% to full-power and Class A stations, and 2.0% to low-power stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2023.11.03 13:26:11

Study build station data: LMS TV 2023-11-03

Proposal: K26PF-D D26 LD APP SAINT CLOUD, MN
File number: K26PF-MOD-DA
Facility ID: 184641
Station data: User record
Record ID: 1551
Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KKTW-LD	N19-	TX	LIC	Minneapolis, MN	BLTTL19870921IE	11.2 km
No	K25QC-D	D25	LD	LIC	LAKE CRYSTAL, MN	BLANK0000199356	169.1
No	KJNK-LD	D25	LD	LIC	MINNEAPOLIS, MN	BLDTT20090528ACL	107.3
No	KJNK-LD	D25	LD	LIC	MINNEAPOLIS, MN	BLANK0000129957	107.3
No	K25II-D	D25	LD	LIC	REDWOOD FALLS, MN	BLDTT20120604AAV	123.5
No	WQOW	D25	DT	LIC	EAU CLAIRE, WI	BLANK0000135118	241.7
No	KCYM-LD	D26	LD	LIC	Des moines, IA	BLANK0000106670	427.2
No	K26JI-D	D26	LD	LIC	SIBLEY, IA	BLDTT20101213AAZ	262.8
Yes	K26CL-D	D26	LD	LIC	ALEXANDRIA, MN	BLDTL20120313ABG	94.0
Yes	KFTC	D26	DT	LIC	BEMIDJI, MN	BLCDT20090206AAG	223.1
No	K26KF-D	D26	LD	CP	DULUTH, MN	BLANK0000197137	218.9
No	K26KF-D	D26	LD	LIC	DULUTH, MN	BLANK0000198008	218.9
No	K26KF-D	D26	LD	LIC	DULUTH, MN	BLDTL20140501AAY	218.2
Yes	WDMI-LD	D26	LD	LIC	MINNEAPOLIS, MN	BLANK0000194480	107.5
No	K26KM-D	D26	LD	APP	ORR, MN	BLDTT20120315AAJ	291.3
No	KXLT-TV	D26	DT	LIC	ROCHESTER, MN	BLANK0000063320	258.5
No	K26CS-D	D26	LD	LIC	ST. JAMES, MN	BLANK0000124213	164.0
Yes	K26NU-D	D26	LD	LIC	WILLMAR, MN	BLANK0000060757	70.5
No	KSXC-LD	D26z	LD	LIC	SOUTH SIOUX CITY, NE	BLANK0000058765	377.0
No	KDLV-TV	D26	DT	LIC	MITCHELL, SD	BLCDT20081016ADD	379.0
No	KCPO-LD	D26+	LD	LIC	SIOUX FALLS, SD	BLANK0000194735	295.3
No	KCPO-LD	D26+	LD	CP	SIOUX FALLS, SD	BLANK0000219686	290.7
No	KCPO-LD	N26+	TX	LIC	SIOUX FALLS, SD	BLTTL20011029AAL	295.7
No	NEW	D26	DT	CP	EAGLE RIVER, WI	BLANK0000195674	396.8
No	W26FG-D	D26	LD	LIC	EAU CLAIRE, WI	BLANK0000195966	245.5
No	WZEO-LD	D26	LD	LIC	LA CROSSE, WI	BLANK0000197912	315.2
No	WKOW	D26	DT	LIC	MADISON, WI	BLCDT20111006AAO	474.1
No	W26EE-D	D26	LD	LIC	WITTENBERG, WI	BLDTL20120620ABV	423.5
No	K27KN-D	D27	LD	LIC	ALEXANDRIA, MN	BLDTT20111123OCO	94.0
No	KCWV	D27	DT	CP	DULUTH, MN	BLANK0000036079	218.2
No	KCWV	D27	DT	LIC	DULUTH, MN	BLANK0000004652	218.2
No	KRWF	D27	DT	LIC	REDWOOD FALLS, MN	BLCDT20080502ABG	150.5
No	WHWC-TV	D27	DT	LIC	MENOMONIE, WI	BLANK0000157562	203.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D26
Mask: Full Service
Latitude: 45 34 20.50 N (NAD83)
Longitude: 94 21 2.30 W
Height AMSL: 456.3 m
HAAT: 0.0 m
Peak ERP: 15.0 kW
Antenna: ATC 0.0 deg
Elev Pattn: Generic

50.0 dBu contour:

Hatfield & Dawson Consulting Engineers

Azimuth	ERP	HAAT	Distance
0.0 deg	13.8 kW	99.5 m	43.5 km
45.0	14.8	134.9	46.8
90.0	12.9	136.3	46.3
135.0	13.5	126.3	45.8
180.0	5.49	107.6	39.8
225.0	0.915	90.1	28.7
270.0	3.90	89.7	36.0
315.0	11.7	102.2	43.0

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 111 m

Distance to Canadian border: 329.9 km

Distance to Mexican border: 1854.6 km

Conditions at FCC monitoring station: Grand Island NE
Bearing: 214.0 degrees Distance: 613.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 239.6 degrees Distance: 1069.9 km

Study cell size: 1.00 km
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

No IX check failures found.

III. RF Exposure Study

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (i.e. 87.9 meters below the antenna radiation center), based on the manufacturer's vertical plane pattern for the elliptically-polarized Alive Telecom model ATC-BCE28CW-V2-26

antenna proposed in this application. This antenna has 30% vertical power (for 15 kW horizontal and 4.5 kW vertical).

The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.127 at these angles, based on the manufacturer's vertical plane pattern for the Kathrein antenna proposed in this application. This relative field value yields a worst-case adjusted effective radiated power of 314.5 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be $1.4 \mu\text{W}/\text{cm}^2$, which is 0.4% of $361 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 26 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307 of the Commission's Rules exempts applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

November 14, 2023

Erik C. Swanson, P.E.

Hatfield & Dawson Consulting Engineers

TECHNICAL
DOCUMENTATION

St Cloud, MN

Bridge News LLC



BROADCAST

K26PF 8-Bay Directional

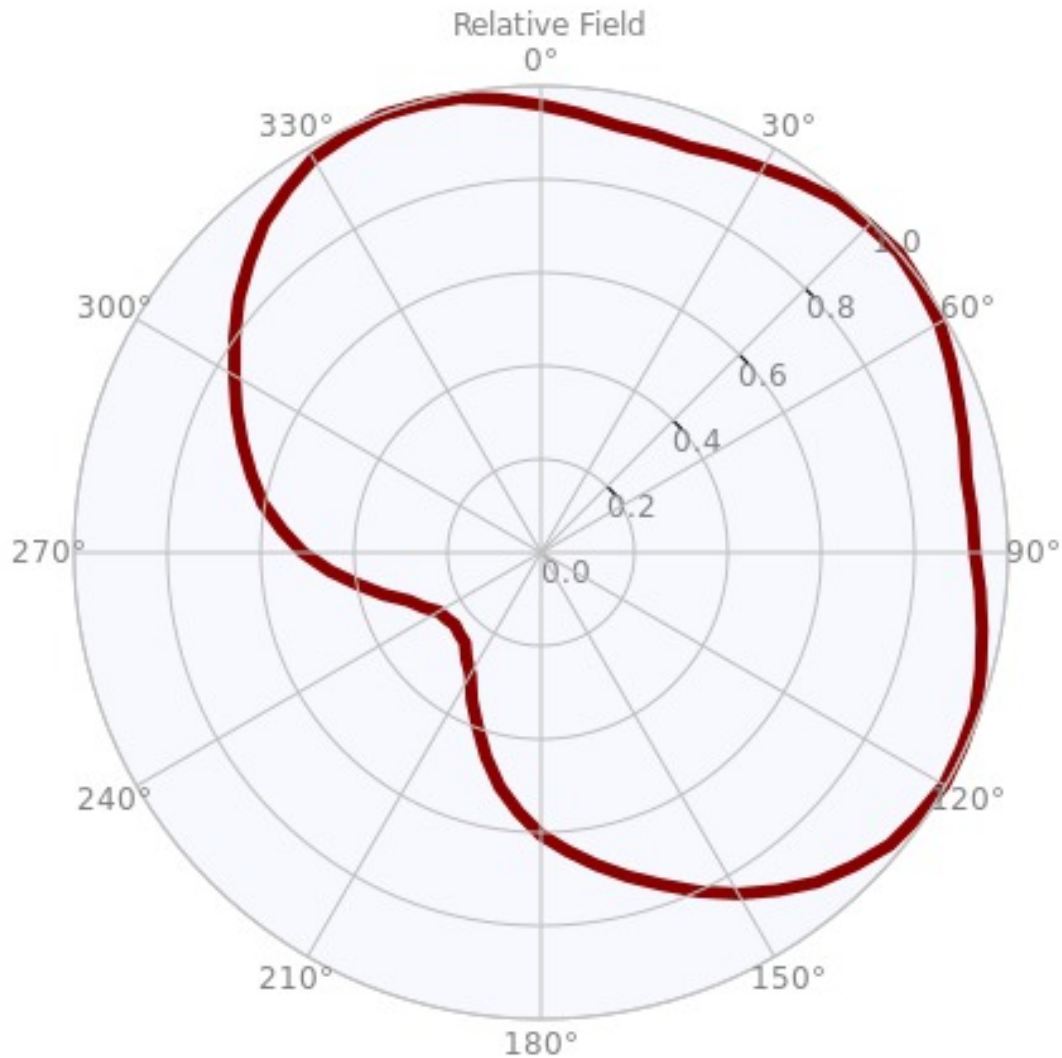
KATHREIN



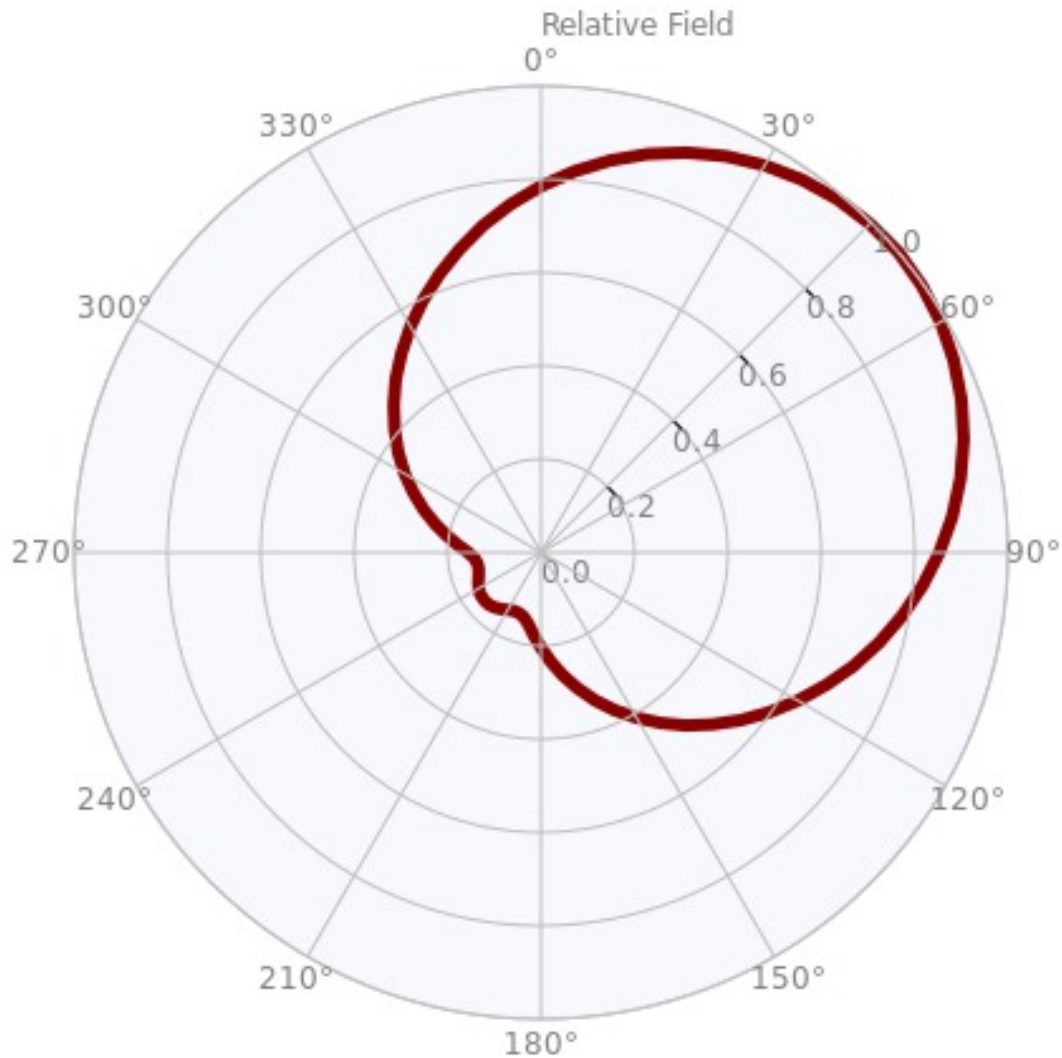
Summary

Antenna Specifications	
Antenna Type	Coaxial Slot
Antenna Model	ATC-BCE28CW-V2-26
Electrical Specifications	
Channel(s)	26
Frequency Range (MHz)	542 - 548
Polarization	Elliptical
Horizontal Azimuth Pattern	CW
Directivity	1.56
dB	1.93
Vertical Azimuth Pattern	V2-Narrow Cardioid
Directivity	2.76
dB	4.41
Vertical Component	30 %
Azimuth Peak of Beam	50 °
Elevation Pattern	BC8
Directivity	8.68
dB	9.39
Electrical Beam Tilt	0.50 °
Antenna Peak Power Gain	
Horizontal Gain Power	10.42
Horizontal Gain Ratio	10.18 dBd
Vertical Gain Power	3.12
Vertical Gain Ratio	4.95 dBd
Line Type	1-5/8" 50 Ohm Foam Flex Line
Line Length	350 ft
Total Line Loss	1.87 dB
Effective Radiated Power (ERP)	15 kW
ERP Vertical Power	4.50 kW
Transmitter Power Output (TPO)	
TPO Power	2.21 kW
TPO Ratio	3.45 dBk
Input Type	EIA 1-5/8"
Mechanical Specifications	
Mount Type	Side Mount
Length of Antenna	16.10 ft
Center of Radiation	8.05 ft
Radome Diameter	3" Slot CoveD
Color	White
Calculated Weight	120 lbs
Windload (Eff Area)	13.2 SQ FT

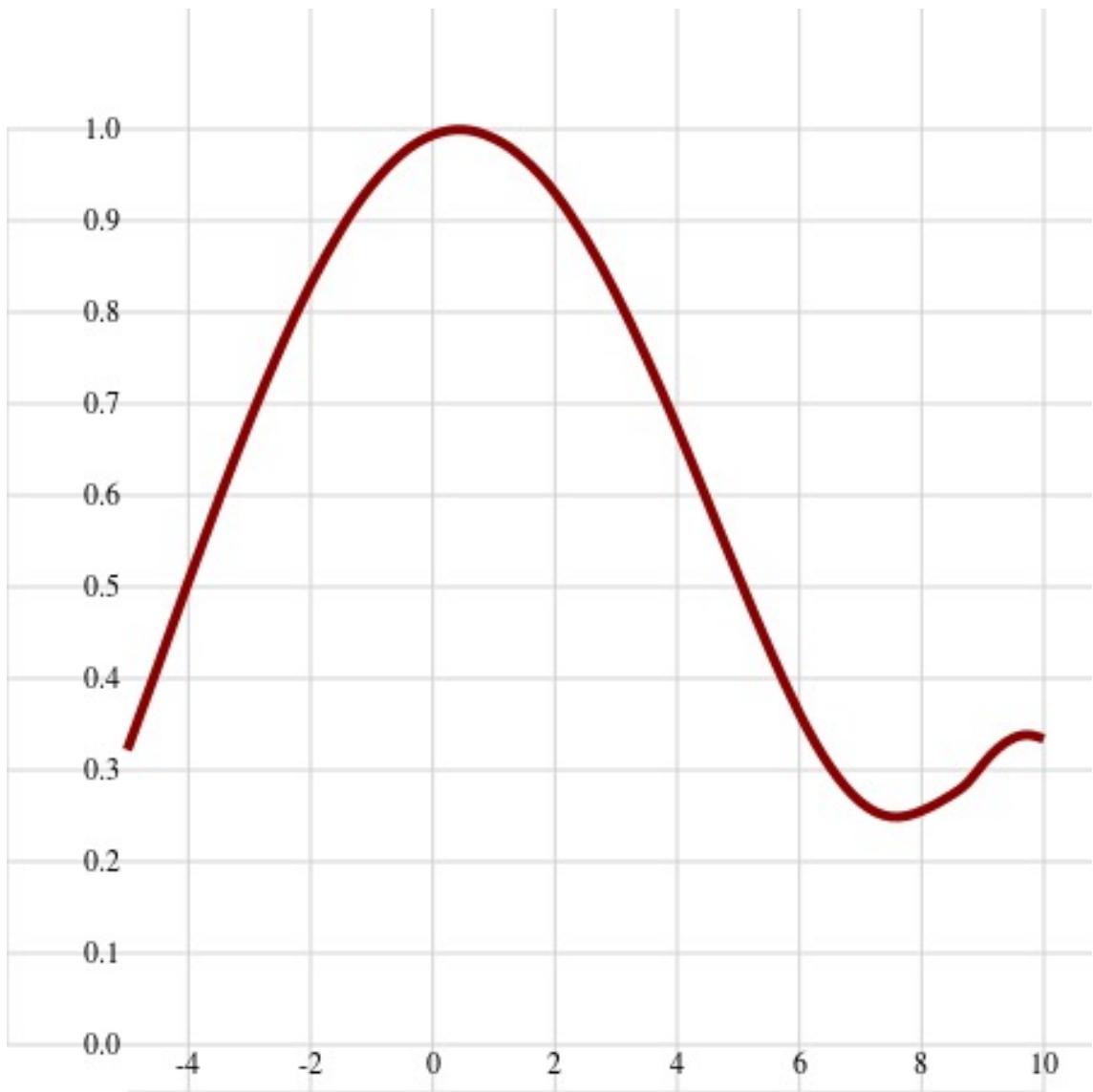
Horizontal Azimuth Pattern



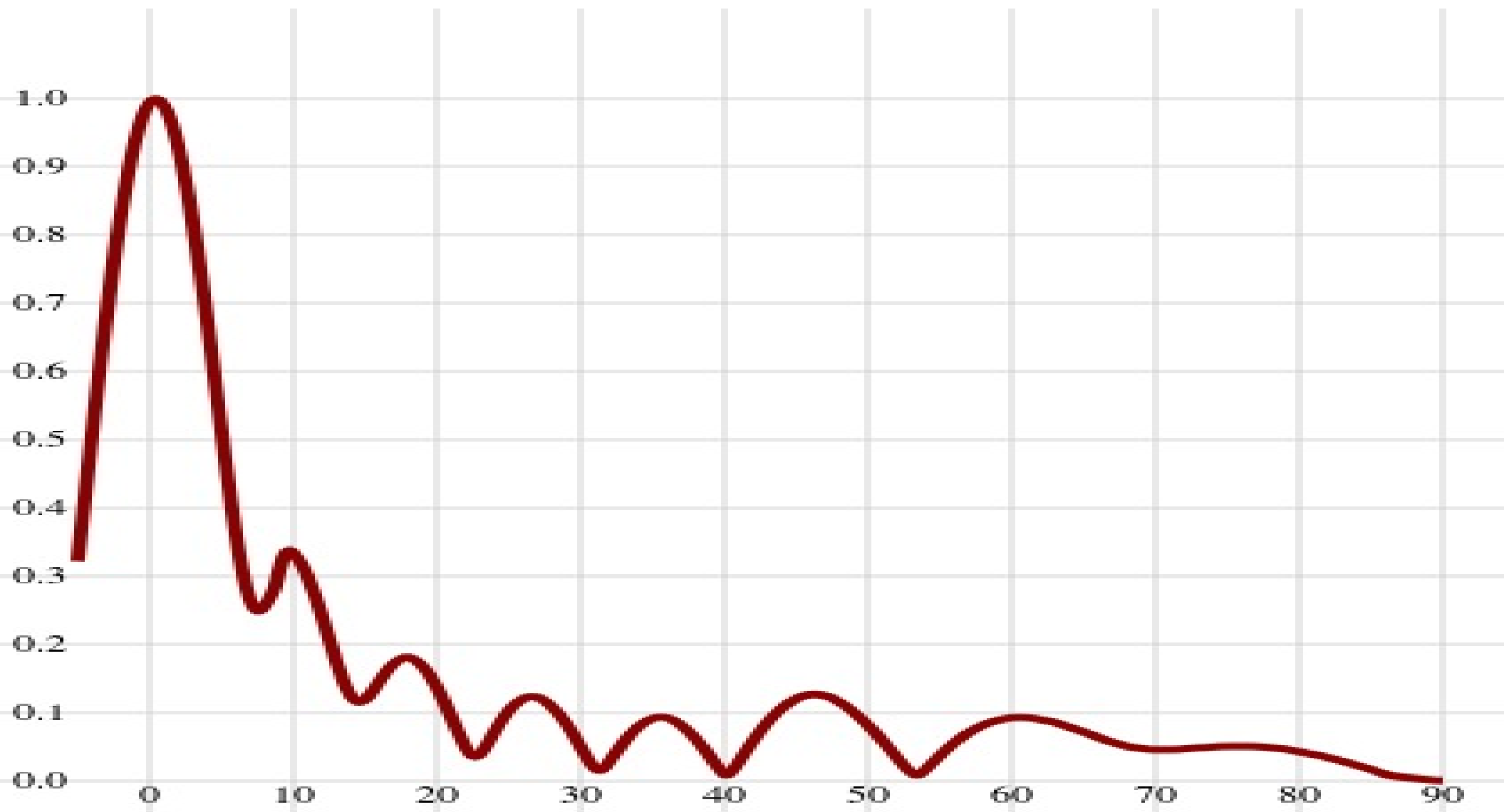
Vertical Azimuth Pattern



Elevation pattern -5 to 10



Elevation pattern -5 to 90



Azimuth Horizontal Pattern Tabulation

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
0°	0.959	-0.36	90°	0.929	-0.64	180°	0.605	-4.36	270°	0.510	-5.85
2°	0.953	-0.42	92°	0.935	-0.58	182°	0.586	-4.64	272°	0.529	-5.53
4°	0.947	-0.47	94°	0.941	-0.53	184°	0.567	-4.93	274°	0.548	-5.22
6°	0.941	-0.53	96°	0.947	-0.47	186°	0.548	-5.22	276°	0.567	-4.93
8°	0.935	-0.58	98°	0.953	-0.42	188°	0.529	-5.53	278°	0.586	-4.64
10°	0.929	-0.64	100°	0.959	-0.36	190°	0.510	-5.85	280°	0.605	-4.36
12°	0.928	-0.65	102°	0.965	-0.31	192°	0.487	-6.25	282°	0.620	-4.15
14°	0.927	-0.66	104°	0.971	-0.26	194°	0.465	-6.65	284°	0.635	-3.94
16°	0.927	-0.66	106°	0.978	-0.19	196°	0.442	-7.09	286°	0.650	-3.74
18°	0.926	-0.67	108°	0.984	-0.14	198°	0.420	-7.54	288°	0.665	-3.54
20°	0.925	-0.68	110°	0.990	-0.09	200°	0.397	-8.02	290°	0.680	-3.35
22°	0.930	-0.63	112°	0.991	-0.08	202°	0.378	-8.45	292°	0.696	-3.15
24°	0.935	-0.58	114°	0.993	-0.06	204°	0.359	-8.90	294°	0.711	-2.96
26°	0.941	-0.53	116°	0.994	-0.05	206°	0.340	-9.37	296°	0.727	-2.77
28°	0.946	-0.48	118°	0.996	-0.03	208°	0.321	-9.87	298°	0.742	-2.59
30°	0.951	-0.44	120°	0.997	-0.03	210°	0.302	-10.40	300°	0.758	-2.41
32°	0.958	-0.37	122°	0.993	-0.06	212°	0.292	-10.69	302°	0.775	-2.21
34°	0.965	-0.31	124°	0.988	-0.10	214°	0.282	-11.00	304°	0.793	-2.01
36°	0.971	-0.26	126°	0.984	-0.14	216°	0.273	-11.28	306°	0.810	-1.83
38°	0.978	-0.19	128°	0.979	-0.18	218°	0.263	-11.60	308°	0.828	-1.64
40°	0.985	-0.13	130°	0.975	-0.22	220°	0.253	-11.94	310°	0.845	-1.46
42°	0.988	-0.10	132°	0.964	-0.32	222°	0.251	-12.01	312°	0.860	-1.31
44°	0.991	-0.08	134°	0.954	-0.41	224°	0.248	-12.11	314°	0.876	-1.15
46°	0.994	-0.05	136°	0.943	-0.51	226°	0.246	-12.18	316°	0.891	-1.00
48°	0.997	-0.03	138°	0.933	-0.60	228°	0.243	-12.29	318°	0.907	-0.85
50°	1.000	0.00	140°	0.922	-0.71	230°	0.241	-12.36	320°	0.922	-0.71
52°	0.997	-0.03	142°	0.907	-0.85	232°	0.243	-12.29	322°	0.933	-0.60
54°	0.994	-0.05	144°	0.891	-1.00	234°	0.246	-12.18	324°	0.943	-0.51
56°	0.991	-0.08	146°	0.876	-1.15	236°	0.248	-12.11	326°	0.954	-0.41
58°	0.988	-0.10	148°	0.860	-1.31	238°	0.251	-12.01	328°	0.964	-0.32
60°	0.985	-0.13	150°	0.845	-1.46	240°	0.253	-11.94	330°	0.975	-0.22
62°	0.978	-0.19	152°	0.828	-1.64	242°	0.263	-11.60	332°	0.979	-0.18
64°	0.971	-0.26	154°	0.810	-1.83	244°	0.273	-11.28	334°	0.984	-0.14
66°	0.965	-0.31	156°	0.793	-2.01	246°	0.282	-11.00	336°	0.988	-0.10
68°	0.958	-0.37	158°	0.775	-2.21	248°	0.292	-10.69	338°	0.993	-0.06
70°	0.951	-0.44	160°	0.758	-2.41	250°	0.302	-10.40	340°	0.997	-0.03
72°	0.946	-0.48	162°	0.742	-2.59	252°	0.321	-9.87	342°	0.996	-0.03
74°	0.941	-0.53	164°	0.727	-2.77	254°	0.340	-9.37	344°	0.994	-0.05
76°	0.935	-0.58	166°	0.711	-2.96	256°	0.359	-8.90	346°	0.993	-0.06
78°	0.930	-0.63	168°	0.696	-3.15	258°	0.378	-8.45	348°	0.991	-0.08
80°	0.925	-0.68	170°	0.680	-3.35	260°	0.397	-8.02	350°	0.990	-0.09
82°	0.926	-0.67	172°	0.665	-3.54	262°	0.420	-7.54	352°	0.984	-0.14
84°	0.927	-0.66	174°	0.650	-3.74	264°	0.442	-7.09	354°	0.978	-0.19
86°	0.927	-0.66	176°	0.635	-3.94	266°	0.465	-6.65	356°	0.971	-0.26
88°	0.928	-0.65	178°	0.620	-4.15	268°	0.487	-6.25	358°	0.965	-0.31



Azimuth Pattern Tabulation, FCC

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
0°	0.959	-0.36	90°	0.929	-0.64	180°	0.605	-4.36	270°	0.510	-5.85
10°	0.929	-0.64	100°	0.959	-0.36	190°	0.510	-5.85	280°	0.605	-4.36
20°	0.925	-0.68	110°	0.990	-0.09	200°	0.397	-8.02	290°	0.680	-3.35
30°	0.951	-0.44	120°	0.997	-0.03	210°	0.302	-10.40	300°	0.758	-2.41
40°	0.985	-0.13	130°	0.975	-0.22	220°	0.253	-11.94	310°	0.845	-1.46
50°	1.000	0.00	140°	0.922	-0.71	230°	0.241	-12.36	320°	0.922	-0.71
60°	0.985	-0.13	150°	0.845	-1.46	240°	0.253	-11.94	330°	0.975	-0.22
70°	0.951	-0.44	160°	0.758	-2.41	250°	0.302	-10.40	340°	0.997	-0.03
80°	0.925	-0.68	170°	0.680	-3.35	260°	0.397	-8.02	350°	0.990	-0.09

Elevation Pattern Tabulation

-5 to 10 in 0.25 increments, 10 to 90 in 0.50 increments

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-5.00	0.322	-9.84	8.75	0.284	-10.93	35.00	0.092	-20.72	62.50	0.088	-21.11
-4.75	0.368	-8.68	9.00	0.307	-10.26	35.50	0.094	-20.54	63.00	0.086	-21.31
-4.50	0.413	-7.68	9.25	0.325	-9.76	36.00	0.093	-20.63	63.50	0.082	-21.72
-4.25	0.460	-6.74	9.50	0.336	-9.47	36.50	0.089	-21.01	64.00	0.079	-22.05
-4.00	0.506	-5.92	9.75	0.340	-9.37	37.00	0.082	-21.72	64.50	0.075	-22.50
-3.75	0.551	-5.18	10.00	0.334	-9.53	37.50	0.073	-22.73	65.00	0.072	-22.85
-3.50	0.596	-4.50	10.50	0.321	-9.87	38.00	0.063	-24.01	65.50	0.068	-23.35
-3.25	0.639	-3.89	11.00	0.300	-10.46	38.50	0.050	-26.02	66.00	0.064	-23.88
-3.00	0.681	-3.34	11.50	0.273	-11.28	39.00	0.036	-28.87	66.50	0.060	-24.44
-2.75	0.722	-2.83	12.00	0.242	-12.32	39.50	0.021	-33.56	67.00	0.057	-24.88
-2.50	0.760	-2.38	12.50	0.208	-13.64	40.00	0.006	-44.44	67.50	0.054	-25.35
-2.25	0.797	-1.97	13.00	0.175	-15.14	40.50	0.012	-38.42	68.00	0.051	-25.85
-2.00	0.831	-1.61	13.50	0.145	-16.77	41.00	0.028	-31.06	68.50	0.049	-26.20
-1.75	0.862	-1.29	14.00	0.123	-18.20	41.50	0.044	-27.13	69.00	0.048	-26.38
-1.50	0.891	-1.00	14.50	0.114	-18.86	42.00	0.059	-24.58	69.50	0.046	-26.74
-1.25	0.917	-0.75	15.00	0.118	-18.56	42.50	0.073	-22.73	70.00	0.046	-26.74
-1.00	0.939	-0.55	15.50	0.130	-17.72	43.00	0.086	-21.31	70.50	0.046	-26.74
-0.75	0.958	-0.37	16.00	0.147	-16.65	43.50	0.097	-20.26	71.00	0.046	-26.74
-0.50	0.974	-0.23	16.50	0.162	-15.81	44.00	0.107	-19.41	71.50	0.046	-26.74
-0.25	0.986	-0.12	17.00	0.173	-15.24	44.50	0.115	-18.79	72.00	0.047	-26.56
0.00	0.994	-0.05	17.50	0.180	-14.89	45.00	0.121	-18.34	72.50	0.048	-26.38
0.25	0.999	-0.01	18.00	0.182	-14.80	45.50	0.125	-18.06	73.00	0.049	-26.20
0.50	1.000	0.00	18.50	0.178	-14.99	46.00	0.127	-17.92	73.50	0.049	-26.20
0.75	0.997	-0.03	19.00	0.169	-15.44	46.50	0.127	-17.92	74.00	0.050	-26.02
1.00	0.990	-0.09	19.50	0.156	-16.14	47.00	0.125	-18.06	74.50	0.051	-25.85
1.25	0.981	-0.17	20.00	0.138	-17.20	47.50	0.122	-18.27	75.00	0.051	-25.85
1.50	0.967	-0.29	20.50	0.117	-18.64	48.00	0.116	-18.71	75.50	0.051	-25.85
1.75	0.951	-0.44	21.00	0.093	-20.63	48.50	0.110	-19.17	76.00	0.051	-25.85
2.00	0.931	-0.62	21.50	0.069	-23.22	49.00	0.101	-19.91	76.50	0.051	-25.85
2.25	0.907	-0.85	22.00	0.047	-26.56	49.50	0.092	-20.72	77.00	0.051	-25.85
2.50	0.881	-1.10	22.50	0.033	-29.63	50.00	0.082	-21.72	77.50	0.050	-26.02
2.75	0.852	-1.39	23.00	0.037	-28.64	50.50	0.071	-22.97	78.00	0.049	-26.20
3.00	0.820	-1.72	23.50	0.054	-25.35	51.00	0.059	-24.58	78.50	0.048	-26.38
3.25	0.786	-2.09	24.00	0.072	-22.85	51.50	0.047	-26.56	79.00	0.047	-26.56
3.50	0.750	-2.50	24.50	0.089	-21.01	52.00	0.034	-29.37	79.50	0.045	-26.94
3.75	0.713	-2.94	25.00	0.104	-19.66	52.50	0.022	-33.15	80.00	0.043	-27.33
4.00	0.674	-3.43	25.50	0.114	-18.86	53.00	0.011	-39.17	80.50	0.041	-27.74
4.25	0.634	-3.96	26.00	0.121	-18.34	53.50	0.007	-43.10	81.00	0.039	-28.18
4.50	0.593	-4.54	26.50	0.124	-18.13	54.00	0.016	-35.92	81.50	0.037	-28.64
4.75	0.552	-5.16	27.00	0.123	-18.20	54.50	0.027	-31.37	82.00	0.034	-29.37
5.00	0.512	-5.81	27.50	0.118	-18.56	55.00	0.037	-28.64	82.50	0.032	-29.90
5.25	0.472	-6.52	28.00	0.109	-19.25	55.50	0.047	-26.56	83.00	0.029	-30.75
5.50	0.433	-7.27	28.50	0.098	-20.18	56.00	0.056	-25.04	83.50	0.026	-31.70
5.75	0.396	-8.05	29.00	0.084	-21.51	56.50	0.064	-23.88	84.00	0.023	-32.77
6.00	0.361	-8.85	29.50	0.068	-23.35	57.00	0.071	-22.97	84.50	0.020	-33.98
6.25	0.330	-9.63	30.00	0.050	-26.02	57.50	0.077	-22.27	85.00	0.017	-35.39
6.50	0.303	-10.37	30.50	0.032	-29.90	58.00	0.082	-21.72	85.50	0.013	-37.72
6.75	0.281	-11.03	31.00	0.016	-35.92	58.50	0.086	-21.31	86.00	0.010	-40.00
7.00	0.264	-11.57	31.50	0.013	-37.72	59.00	0.089	-21.01	86.50	0.007	-43.10
7.25	0.253	-11.94	32.00	0.028	-31.06	59.50	0.091	-20.82	87.00	0.006	-44.44
7.50	0.248	-12.11	32.50	0.043	-27.33	60.00	0.093	-20.63	87.50	0.005	-46.02
7.75	0.249	-12.08	33.00	0.057	-24.88	60.50	0.093	-20.63	88.00	0.004	-47.96
8.00	0.255	-11.87	33.50	0.070	-23.10	61.00	0.093	-20.63	88.50	0.003	-50.46
8.25	0.263	-11.60	34.00	0.080	-21.94	61.50	0.092	-20.72	89.00	0.002	-53.98
8.50	0.273	-11.28	34.50	0.087	-21.21	62.00	0.090	-20.92	89.50	0.001	-60.00
8.75	0.284	-10.93	35.00	0.092	-20.72	62.50	0.088	-21.11	90.00	0.001	-60.00

Azimuth Vertical Pattern Tabulation

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
0°	0.785	-2.10	90°	0.853	-1.38	180°	0.204	-13.81	270°	0.156	-16.14
2°	0.799	-1.95	92°	0.840	-1.51	182°	0.193	-14.29	272°	0.165	-15.65
4°	0.813	-1.80	94°	0.827	-1.65	184°	0.182	-14.80	274°	0.174	-15.19
6°	0.827	-1.65	96°	0.813	-1.80	186°	0.174	-15.19	276°	0.182	-14.80
8°	0.840	-1.51	98°	0.799	-1.95	188°	0.165	-15.65	278°	0.193	-14.29
10°	0.853	-1.38	100°	0.785	-2.10	190°	0.156	-16.14	280°	0.204	-13.81
12°	0.865	-1.26	102°	0.771	-2.26	192°	0.151	-16.42	282°	0.216	-13.31
14°	0.877	-1.14	104°	0.756	-2.43	194°	0.146	-16.71	284°	0.228	-12.84
16°	0.890	-1.01	106°	0.741	-2.60	196°	0.141	-17.02	286°	0.241	-12.36
18°	0.901	-0.91	108°	0.727	-2.77	198°	0.139	-17.14	288°	0.253	-11.94
20°	0.912	-0.80	110°	0.712	-2.95	200°	0.138	-17.20	290°	0.267	-11.47
22°	0.923	-0.70	112°	0.696	-3.15	202°	0.136	-17.33	292°	0.280	-11.06
24°	0.932	-0.61	114°	0.681	-3.34	204°	0.137	-17.27	294°	0.294	-10.63
26°	0.941	-0.53	116°	0.665	-3.54	206°	0.138	-17.20	296°	0.308	-10.23
28°	0.950	-0.45	118°	0.650	-3.74	208°	0.140	-17.08	298°	0.322	-9.84
30°	0.958	-0.37	120°	0.635	-3.94	210°	0.142	-16.95	300°	0.337	-9.45
32°	0.965	-0.31	122°	0.619	-4.17	212°	0.144	-16.83	302°	0.351	-9.09
34°	0.972	-0.25	124°	0.604	-4.38	214°	0.147	-16.65	304°	0.365	-8.75
36°	0.978	-0.19	126°	0.589	-4.60	216°	0.149	-16.54	306°	0.380	-8.40
38°	0.983	-0.15	128°	0.575	-4.81	218°	0.152	-16.36	308°	0.395	-8.07
40°	0.988	-0.10	130°	0.559	-5.05	220°	0.154	-16.25	310°	0.409	-7.77
42°	0.992	-0.07	132°	0.544	-5.29	222°	0.156	-16.14	312°	0.424	-7.45
44°	0.995	-0.04	134°	0.529	-5.53	224°	0.157	-16.08	314°	0.438	-7.17
46°	0.998	-0.02	136°	0.514	-5.78	226°	0.159	-15.97	316°	0.453	-6.88
48°	0.999	-0.01	138°	0.499	-6.04	228°	0.159	-15.97	318°	0.469	-6.58
50°	1.000	0.00	140°	0.484	-6.30	230°	0.159	-15.97	320°	0.484	-6.30
52°	0.999	-0.01	142°	0.469	-6.58	232°	0.159	-15.97	322°	0.499	-6.04
54°	0.998	-0.02	144°	0.453	-6.88	234°	0.159	-15.97	324°	0.514	-5.78
56°	0.995	-0.04	146°	0.438	-7.17	236°	0.157	-16.08	326°	0.529	-5.53
58°	0.992	-0.07	148°	0.424	-7.45	238°	0.156	-16.14	328°	0.544	-5.29
60°	0.988	-0.10	150°	0.409	-7.77	240°	0.154	-16.25	330°	0.559	-5.05
62°	0.983	-0.15	152°	0.395	-8.07	242°	0.152	-16.36	332°	0.575	-4.81
64°	0.978	-0.19	154°	0.380	-8.40	244°	0.149	-16.54	334°	0.589	-4.60
66°	0.972	-0.25	156°	0.365	-8.75	246°	0.147	-16.65	336°	0.604	-4.38
68°	0.965	-0.31	158°	0.351	-9.09	248°	0.144	-16.83	338°	0.619	-4.17
70°	0.958	-0.37	160°	0.337	-9.45	250°	0.142	-16.95	340°	0.635	-3.94
72°	0.950	-0.45	162°	0.322	-9.84	252°	0.140	-17.08	342°	0.650	-3.74
74°	0.941	-0.53	164°	0.308	-10.23	254°	0.138	-17.20	344°	0.665	-3.54
76°	0.932	-0.61	166°	0.294	-10.63	256°	0.137	-17.27	346°	0.681	-3.34
78°	0.923	-0.70	168°	0.280	-11.06	258°	0.136	-17.33	348°	0.696	-3.15
80°	0.912	-0.80	170°	0.267	-11.47	260°	0.138	-17.20	350°	0.712	-2.95
82°	0.901	-0.91	172°	0.253	-11.94	262°	0.139	-17.14	352°	0.727	-2.77
84°	0.890	-1.01	174°	0.241	-12.36	264°	0.141	-17.02	354°	0.741	-2.60
86°	0.877	-1.14	176°	0.228	-12.84	266°	0.146	-16.71	356°	0.756	-2.43
88°	0.865	-1.26	178°	0.216	-13.31	268°	0.151	-16.42	358°	0.771	-2.26