

ASR Registration Search

Registration 1019014 [Map Registration](#)**Registration Detail**

Reg Number	1019014	Status	Constructed
File Number	A1072150	Constructed	10/01/1987
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	39-06-59.0 N 084-30-07.0 W	Address	1906 HIGHLAND AVE
City, State	CINCINNATI , OH		
Zip	45202	County	HAMILTON
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
236.5	294.6
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
531.1	269.8

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 13

Paint and Light in Accordance with FAA Circular Number 70/7460-1J

FAA Notification

FAA Study	96-AGL-4129-OE	FAA Issue Date	01/03/1997
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Owner & Contact Information

FRN	0023451453	Owner Entity Type	Limited Liability Company
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Owner

Vertical Bridge Towers, LLC
 Attention To: FCC Contact
 750 Park of Commerce Drive Ste. 200
 Boca Raton , FL 33487

P: (561)406-4015
 F:
 E: fcc-faa@verticalbridge.com

Contact

Hickey , Richard
 Attention To: FCC Contact
 750 Park of Commerce Drive Ste. 200
 Boca Raton , FL 33487

P: (561)406-4015
 F:
 E: fcc-faa@verticalbridge.com

Last Action Status

Status	Constructed	Received	05/02/2017
Purpose	Admin Update	Entered	05/02/2017
Mode	Interactive		

Related Applications

05/02/2017 A1072150 - Admin Update (AU)
06/29/2015 A0974270 - Change Owner (OC)
05/22/2008 A0594869 - Change Owner (OC)

Related applications (6)

Comments

Comments

None

History

Date

Event

05/03/2017	Registration Printed
05/02/2017	Administrative Update Received
06/30/2015	Registration Printed

All History (13)

Automated Letters

05/03/2017	Authorization, Reference
06/30/2015	Authorization, Reference
06/30/2015	Ownership Change, Reference 868789

All letters (8)

CLOSE WINDOW

Exhibit 13.2 - WCVX(AM) - Present and Proposed Translator vs AM Contours

WCVX.L

Latitude: 38-58-09 N
Longitude: 084-40-56 W

Frequency: 1160 kHz

1777872.A

BNPFT20180131ADV
Latitude: 39-04-50 N
Longitude: 084-31-18 W
ERP: 0.25 kW
Channel: 294
Frequency: 106.7 MHz
AMSL Height: 207.0 m
Elevation: 146.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

1777872.P

BNPFT20180131ADV
Latitude: 39-06-59 N
Longitude: 084-30-07 W
ERP: 0.125 kW
Channel: 241
Frequency: 96.1 MHz
AMSL Height: 406.0 m
Elevation: 237.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

Munn-Reese.com

Clinton

- WCVX.L
- 1777872.A (294)
- 1777872.P (241)

Circle R = 40.0 km

FCC F(50-50) 60.00 dBu (FCC HAAT)

FCC F(50-50) 60.00 dBu (FCC HAAT)

1777872.P

1777872.A

Hamilton

Clermont

Brown

Boone

WCVX.L

Kenton

Campbell

2.0 mV/m

Switzerland

Gallatin

Pendleton

Bracken

Carroll

Scale 1:500,000

0 7 14 21 km

V-Soft Communications LC ©

Munn-Reese
Coldwater, MI 49036

Exhibit 13.3

Christian Broadcasting System, Ltd.

REFERENCE CH# 241D - 96.1 MHz, Pwr= 0.125 kW DA, HAAT= 190.4 M, COR= 406 M DISPLAY DATES
39 06 59.0 N. DATA 04-12-18
84 30 07.0 W. SEARCH 04-17-18
Average Protected F(50-50)= 15.02 km
Standard Directional

CH CITY	CALL	TYPE STATE	ANT AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
241B Richmond	WQLK	LIC _CX IN	336.8 156.5	93.85 BLH20130325AMC	39 53 28.5 84 56 09.5	50.000 150	140.3 474	67.6 Brewer Broadcasting Corpor	-52.5*	0.3
243B Lebanon	WFTK	LIC _C_ OH	30.0 210.1	30.40 BMLH20020320ABO	39 21 11.0 84 19 30.0	19.500 247	5.6 474	64.0 Radio License Holding Src	16.9	-34.0*
240D Milford	1778058	APP _C_ OH	75.1 255.3	23.51 BNPFT20180131AJA	39 10 13.8 84 14 18.0	0.054	16.6 339	10.7 Mustang Media, Inc.	0.1	1.7
241A Stamping Ground	WLXO	LIC ZCN KY	182.2 2.2	101.49 BLH20000728ABS	38 12 15.0 84 32 51.0	6.000 100	86.1 369	27.9 Clarity Communications, In	0.8	28.6
240A Vevay	WKID	LIC _C_ IN	236.0 55.7	55.16 BMLH20150820AAV	38 50 15.4 85 01 47.9	2.800 94	38.0 324	23.4 Dial Broadcasting Inc	3.5	8.4
238D Auburn	W238BJ	LIC _C_ OH	29.5 209.6	30.23 BLFT20130304ACG	39 21 10.8 84 19 44.2	0.070 115	0.6 345	9.6 Educational Media Foundati	21.8	19.9
294A Williamstown	WNKR	LIC _CX KY	188.6 8.6	48.03 BLH20080424AAY	38 41 19.0 84 35 07.0	1.800 185	169.8 432	84.6 Grant County Broadcasters,	9.5R	38.5M
240A Maysville	WFTM-FM	LIC _CN KY	129.9 310.3	81.71 BLH19960207KA	38 38 35.0 83 46 47.0	3.000 94	30.5 333	22.2 Standard Tobacco Company,	42.2	49.3
239B Pleasant Hill	WHIO-FM	LIC _CX OH	8.2 188.4	123.71 BMLH20160916AAF	40 13 03.0 84 17 37.0	50.000 145	6.0 444	65.2 Cox Radio, Inc.	110.0	58.2
244A Madison	WORX-FM	LIC _C_ IN	241.1 60.5	85.22 BLH19990312KD	38 44 32.0 85 21 43.0	1.050 168	1.9 387	24.6 Dubois County Broadcasting	68.5	59.8
242A Austin	WJAA	LIC _CN IN	255.6 74.7	118.19 BLH19911028KF	38 50 39.0 85 49 26.0	3.000 100	31.4 274	21.3 Midland Media, Inc.	72.3	76.0
242B Columbus	WLWQ	LIC _CN OH	52.6 233.5	158.12 BLH19830404AN	39 58 16.0 83 01 40.0	18.000 229	73.2 475	62.2 Franklin Communications, I	77.2	80.0
238B Fishers	WFMS	LIC _CX IN	299.8 118.8	147.84 BLH20101203ABU	39 46 03.0 86 00 12.0	13.000 302	5.5 555	66.5 Radio License Holding Src	132.5	81.2
242A Morehead	WIVY	CP NCX KY	137.4 318.1	141.28 BPH20180207AAR	38 10 33.0 83 24 28.0	2.900 144	46.0 451	30.0 Gateway Radio Works, Inc.	84.8	105.2
242A Morehead	WIVY	LIC NCX KY	137.4 318.1	141.28 BLH20070911AAL	38 10 33.0 83 24 28.0	2.150 158	43.2 453	28.1 Gateway Radio Works, Inc.	87.7	107.2
240A Franklin	WFDM-FM	LIC _CX IN	288.6 107.6	141.80 BMLH20030714AEP	39 30 49.0 86 04 07.0	3.400 91	39.1 324	25.7 Pilgrim Communications, L	91.4	105.7
239B Jeffersonville	WQMF	LIC _C_ IN	229.3 48.4	165.31 BLH19990211KA	38 08 16.0 85 56 06.0	28.500 196	6.7 387	70.7 Cc Licenses, Llc	144.1	93.1
241C Owensboro	WSTO	LIC _CN KY	239.9 58.1	290.08 BLH19820601AO	37 46 20.0 87 21 27.0	100.000 305	173.7 427	73.5 Midwest Communications, In	101.5	168.1
243D Winchester	W243DG	LIC _C_ KY	177.9 357.9	120.32 BLFT20161207ABL	38 02 05.7 84 27 02.2	0.082	0.6 477	13.5 American Family Associatio	105.4	106.3
238B Lancaster	WXMG	LIC DCN OH	67.8 249.0	168.73 BLH19941223KB	39 40 32.0 82 40 34.0	21.000 232	5.3 527	62.4 Blue Chip Broadcasting Lic	155.9	105.9
241B Charleston	WKWS	LIC _CN WV	108.6 290.3	251.33 BLH19930405KB	38 21 54.0 81 46 06.0	45.000 157	138.5 409	66.8 west Virginia Radio Corpor	106.7	161.2
242C3 Stanford	WXYK	LIC _C_ KY	190.4 10.2	179.91 BMLE20040907ABM	37 31 27.0 84 52 12.0	4.900 223	57.5 542	38.8 Educational Media Foundati	107.5	118.0
243D Shelbyville	W243CL	LIC _C_ IN	294.6 113.8	119.60 BLFT20180119AAC	39 33 29.0 85 46 13.0	0.250	1.1 338	11.4 3 Towers Broadcasting Comp	108.0	108.0
242A Indianapolis	WHHH	LIC _CN IN	297.9 116.8	159.55 BLH19960911KB	39 46 32.0 86 09 10.0	3.300 87	30.3 322	20.6 Radio One Of Indiana, Llc	119.2	132.0
244B1 Oak Hill	WKOV-FM	LIC _CX OH	92.8 274.0	164.66 BMLH20160201AFT	39 01 45.0 82 35 51.0	16.000 129	4.0 364	44.5 Jackson County Broadcastin	153.8	119.5

CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	Page # *IN* (Overlap	2 *OUT* in km)
295B St. Matthews	WVEZ	LIC _CX KY		234.6 53.8	141.69 BLH20070706AAP	38 22 19.0 85 49 33.0	24.500 204	169.8 391	84.6 Sm-wvez, Llc	14.5R	127.2M
295B St. Matthews	AL9833	RSV-A _ KY		234.6 53.8	141.69 RM11334	38 22 19.0 85 49 33.0	50.000 150	169.8 338	84.6	14.5R	127.2M
240L1 Richmond	WKRI-LP	LIC _ KY		173.8 353.9	155.65 BLL20160418AAN	37 43 28.1 84 18 37.3	0.100 30	315	132.9 Richmondradio,inc		128.1
243A Lanesville	WGZB-FM	LIC _CX IN		229.9 49.0	161.30 BLH20050927ACD	38 10 25.0 85 54 50.0	1.600 194	2.4 378	32.4 Alpha Media Licensee Llc	144.3	128.1
241C3 Barbourville	WKKQ	LIC NCX KY		167.9 348.3	255.65 BLH20100617AHU	36 51 59.0 83 54 00.0	25.000 100	113.3 458	38.8 Choice Radio Corporation	128.9	174.4
244A Alexandria	WBKQ	LIC _C_ IN		320.0 139.3	154.79 BLH19980921KB	40 10 38.0 85 40 23.0	2.500 107	2.1 371	22.9 woof Boom Radio Muncie Lic	145.3	131.9
243A Lanesville	AL9800	RSV-A _ IN		233.1 52.2	165.36 RM11069	38 12 52.0 86 01 00.0	6.000 100	2.4 320	24.6	148.3	135.9
244A Celina	WCSM-FM	LIC _CX OH		359.5 179.5	159.70 BLH20101206AAR	40 33 10.0 84 31 02.0	2.200 117	2.1 383	23.3 Hayco Broadcasting, Inc.	150.2	136.2
244A Bloomington	WBWB	LIC _CX IN		272.3 91.1	170.02 BMLH20150629AAO	39 09 45.0 86 28 22.0	1.650 134	2.2 348	25.7 Artistic Media Partners, I	154.9	143.7
238C Prestonsburg	WQHY	LIC _CN KY		135.5 316.6	219.22 BLH19910521KB	37 41 45.0 82 45 24.0	100.000 305	10.4 575	73.7 wdoc, Inc.	198.6	145.2
294A Greenwood	WTLC-FM	LIC _CX IN		295.6 114.6	156.24 BLH20070504AAL	39 42 42.0 86 08 45.0	6.000 99	169.8 331	84.6 Radio One Of Indiana, Llc	9.5R	146.7M
294A Dublin	WZCB	LIC _CX OH		51.3 232.2	161.93 BLH20121004AAP	40 01 01.8 83 01 11.3	3.000 144	169.8 392	84.6 Citicasters Licenses, Inc.	9.5R	152.4M
294C3 Berea	WLFX	CP ZCX KY		169.2 349.4	164.55 BPH20160523ABP	37 39 36.0 84 09 00.0	14.500 133	169.8 409	84.6 wallingford Communications	11.5R	153.1M
294A Berea	WLFX	LIC DCX KY		169.1 349.3	164.46 BMLH20140624AAQ	37 39 40.0 84 08 55.0	3.700 128	169.8 403	84.6 wallingford Communications	9.5R	155.0M
240A Wabash	WKUZ	LIC _CN IN		329.2 148.4	205.61 BLH19950707KC	40 41 54.0 85 45 03.0	4.200 120	43.3 363	28.2 Upper Wabash Broadcasting	156.1	172.3
240A Athens	WJKW	LIC ZCN OH		85.6 267.1	209.92 BLH19980825KA	39 14 10.0 82 04 16.0	5.500 104	44.9 353	29.1 Christian Faith Broadcast,	158.0	171.0
240A Caledonia	WYNT	LIC _CX OH		35.7 216.7	215.73 BLH20060829BGI	40 40 55.0 83 00 27.0	4.600 114	43.8 410	28.5 Cc Licenses, Llc	164.2	176.4
242B1 Churubusco	WXKE	LIC NCX IN		345.3 164.8	229.01 BLH20170518AAQ	41 06 24.0 85 11 46.0	8.400 152	57.6 401	44.7 Adams Radio Of Fort Wayne,	164.8	175.8
294B1 Dublin	AL6931	RSV-A _ OH		49.3 230.3	179.29 RM10557	40 09 20.0 82 54 12.0	25.000 100	169.8 390	84.6	11.5R	167.8M
241L1 Bluffton	WBWH-LP	LIC _ OH		14.3 194.6	204.43 BLL20120904AAE	40 53 49.0 83 54 10.0	0.066 37	282	180.2 Bluffton College		173.6
295B Marion	WXXC	LIC _CN IN		329.5 148.8	191.84 BLH19830418AS	40 35 52.0 85 39 21.0	50.000 152	169.8 408	84.6 Hoosier Am/fm, Llc	14.5R	177.3M
241A Archbold	WMTR-FM	LIC NCN OH		5.5 185.7	272.78 BLH19910308KA	41 33 29.0 84 11 08.0	3.800 122	84.1 348	28.4 Nobco, Inc.	181.0	221.0
244A Annville	WANV	LIC NCX KY		168.8 349.1	214.41 BLH20060823AAC	37 13 24.0 84 02 01.0	1.850 152	2.3 506	27.8 F.t.g. Broadcasting, Inc.	198.5	186.2
243C1 Williamson	WXCC	LIC ZCX WV		131.6 313.0	264.87 BLH20071205ABF	37 30 48.0 82 15 20.0	75.000 339	9.2 759	70.6 East Kentucky Radio Networ	246.1	189.9
242A Farmersburg	WMCV	LIC _CX IN		274.5 92.6	248.41 BLED20150824AAH	39 15 16.0 87 22 45.0	6.000 93	40.6 260	26.1 Community Broadcasting, In	195.1	206.6
243B Lafayette	WAZY-FM	LIC _CN IN		302.9 121.2	265.30 BLH7632	40 23 02.0 87 07 55.0	50.000 152	6.1 352	66.2 Star City Broadcasting, L1	249.8	199.0
240A Seelyville	WVIG	LIC _CN IN		282.5 100.6	254.45 BLH19961002KE	39 34 29.0 87 24 06.0	4.100 121	43.3 288	28.4 Dlc Media, Inc.	199.1	213.5

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
"*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

Exhibit 13.4 - WCVX(AM) - Proposed Translator vs WFTK(FM) in support of a 74.1204(d) Waiver Request

WCVX.L

Latitude: 38-58-09 N
Longitude: 084-40-56 W
Frequency: 1160 kHz

1777872.P

BNPFT20180131ADV
Latitude: 39-06-59 N
Longitude: 084-30-07 W
ERP: 0.125 kW
Channel: 241
Frequency: 96.1 MHz
AMSL Height: 406.0 m
Elevation: 237.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

WFTK

BMLH20020320ABO
Latitude: 39-21-11 N
Longitude: 084-19-30 W
ERP: 19.50 kW
Channel: 243
Frequency: 96.5 MHz
AMSL Height: 474.0 m
Elevation: 251.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

Munn-Reese.com

Clinton

- WCVX.L
- 1777872.P (241)
- WFTK (243)

FCC F(50-50) 60.00 dBu (FCC HAAT)

FCC F(50-50) 70.95 dBu (FCC HAAT)

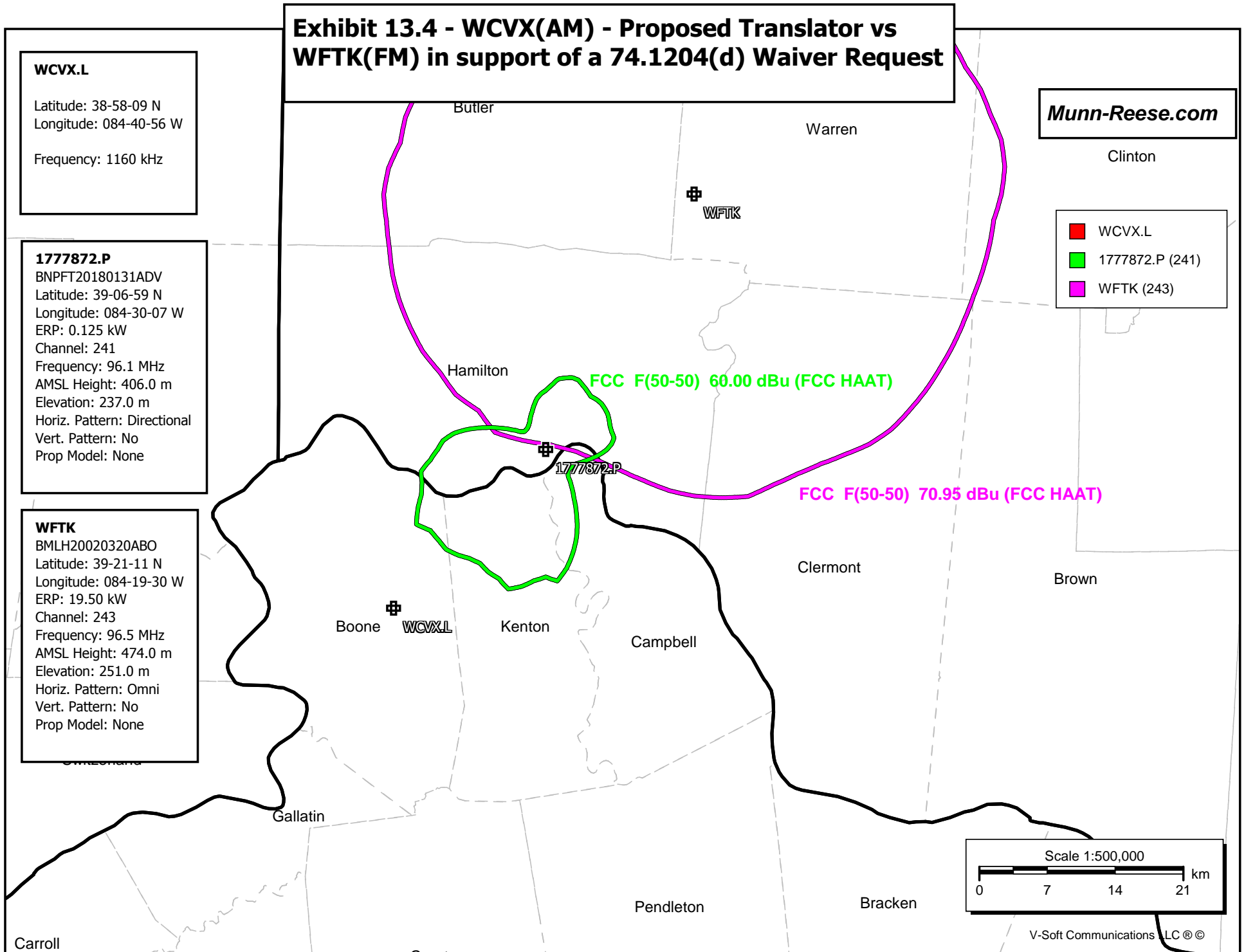
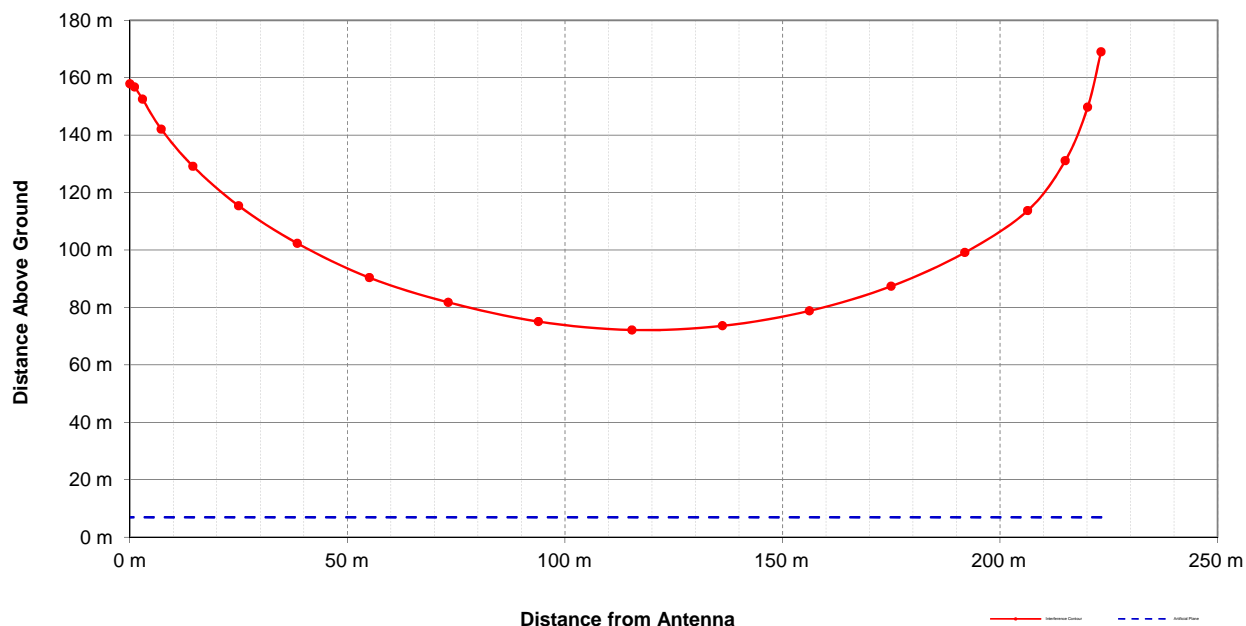


Exhibit 13.4 - Downward Radiation Study in Support of a 74.1204(d) Waiver Request



Proposed Antenna: 1 Bay Scala CA2-FM
Proposed Power: 0.126 kW
Antenna Height AGL: 169 meters
Interference Contour: 110.95 dBu f(50:10)
Artificial Ground Plane Height: 7 meters
Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}$
Field Strength (dBu) Equation: $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$

Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field Strength
Below	Relative	ERP	ERP	to Interference	from Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.126	-9.00	223.20 m	infinite	---	---	---
-5°	0.990	0.123	-9.08	220.96 m	1858.74 m	92.45 dBu	1939.06 m	92.08 dBu
-10°	0.978	0.121	-9.19	218.29 m	932.92 m	98.33 dBu	973.23 m	97.97 dBu
-15°	0.957	0.115	-9.38	213.60 m	625.92 m	101.61 dBu	652.97 m	101.24 dBu
-20°	0.915	0.105	-9.77	204.22 m	473.66 m	103.64 dBu	494.12 m	103.28 dBu
-25°	0.865	0.094	-10.26	193.06 m	383.32 m	104.99 dBu	399.89 m	104.63 dBu
-30°	0.808	0.082	-10.85	180.34 m	324.00 m	105.86 dBu	338.00 m	105.49 dBu
-35°	0.745	0.070	-11.55	166.28 m	282.44 m	106.35 dBu	294.64 m	105.98 dBu
-40°	0.675	0.057	-12.41	150.66 m	252.03 m	106.48 dBu	262.92 m	106.11 dBu
-45°	0.595	0.045	-13.51	132.80 m	229.10 m	106.21 dBu	239.00 m	105.85 dBu
-50°	0.510	0.033	-14.84	113.83 m	211.48 m	105.57 dBu	220.61 m	105.20 dBu
-55°	0.430	0.023	-16.33	95.97 m	197.77 m	104.67 dBu	206.31 m	104.30 dBu
-60°	0.345	0.015	-18.24	77.00 m	187.06 m	103.24 dBu	195.14 m	102.87 dBu
-65°	0.265	0.009	-20.53	59.15 m	178.75 m	101.34 dBu	186.47 m	100.98 dBu
-70°	0.190	0.005	-23.42	42.41 m	172.40 m	98.77 dBu	179.85 m	98.40 dBu
-75°	0.125	0.002	-27.06	27.90 m	167.71 m	95.37 dBu	174.96 m	95.00 dBu
-80°	0.075	0.001	-31.50	16.74 m	164.50 m	91.10 dBu	171.61 m	90.73 dBu
-85°	0.055	0.000	-34.19	12.28 m	162.62 m	88.51 dBu	169.65 m	88.14 dBu
-90°	0.050	0.000	-35.02	11.16 m	162.00 m	87.71 dBu	169.00 m	87.35 dBu

Exhibit 13.5 - Manufacturers Antenna Specifications

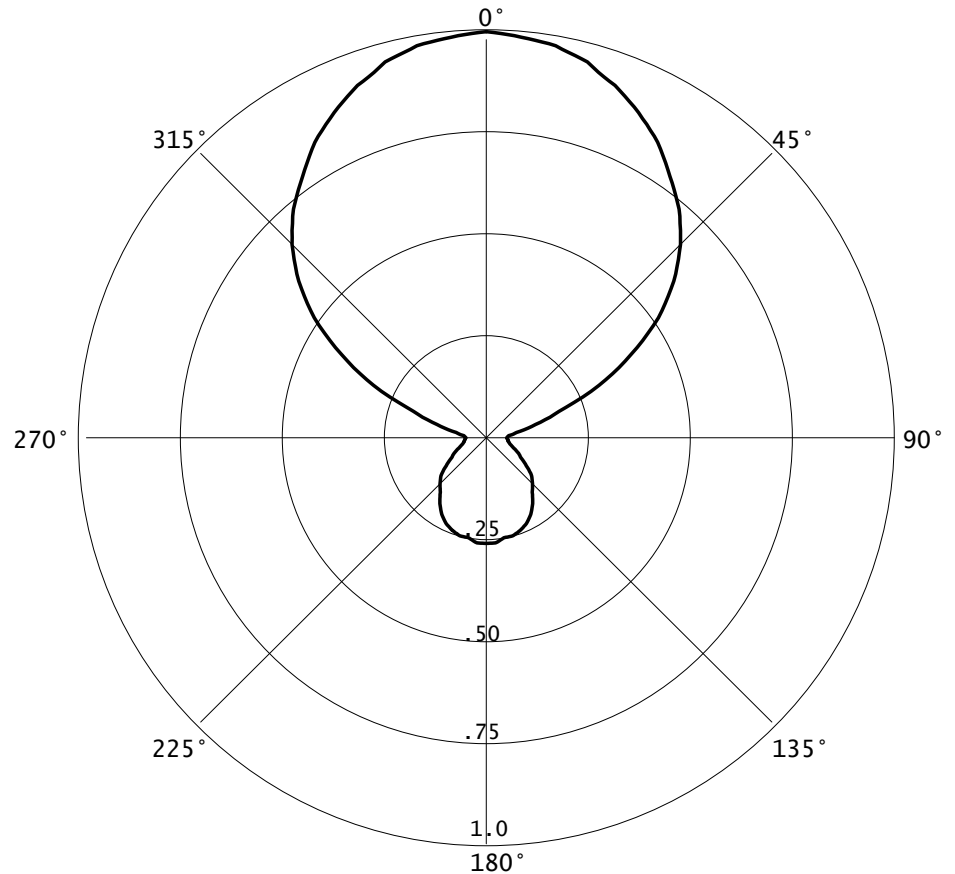
CA2-FM(Slant-45) COMPOSITE PATTERN

03-14-2016

RMS(V)= .494

Graph is Relative Field

Azi	Field	dBk	kw
000	1.000	-10.000	0.100
010	0.980	-10.175	0.096
020	0.923	-10.696	0.085
030	0.840	-11.514	0.071
040	0.735	-12.674	0.054
050	0.600	-14.437	0.036
060	0.410	-17.744	0.017
070	0.190	-24.425	0.004
080	0.075	-32.499	0.001
090	0.050	-36.021	0.000
100	0.055	-35.193	0.000
110	0.070	-33.098	0.000
120	0.098	-30.175	0.001
130	0.145	-26.773	0.002
140	0.175	-25.139	0.003
150	0.218	-23.231	0.005
160	0.243	-22.288	0.006
170	0.250	-22.041	0.006
180	0.260	-21.701	0.007
190	0.250	-22.041	0.006
200	0.243	-22.288	0.006
210	0.218	-23.231	0.005
220	0.175	-25.139	0.003
230	0.145	-26.773	0.002
240	0.098	-30.175	0.001
250	0.070	-33.098	0.000
260	0.055	-35.193	0.000
270	0.050	-36.021	0.000
280	0.075	-32.499	0.001
290	0.190	-24.425	0.004
300	0.410	-17.744	0.017
310	0.600	-14.437	0.036
320	0.735	-12.674	0.054
330	0.840	-11.514	0.071
340	0.923	-10.696	0.085
350	0.980	-10.175	0.096



The directional antenna pattern will be produced by means of a Scala Dipole Reflector CA2-FM broadcast element mounted at a 45° (degree) slant orientation to achieve horizontal and vertical polarization. The CA2-FM(Slant-45) Directional Pattern is therefore a maximum composite pattern of the current CA2-FM(Horizontal) and CA2-FM(Vertical) broadcast patterns as notified by the Scala Division (Kathrein-Scala) of Kathrein, Inc.

The maximum antenna gain for a single CL-FM(Slant-45) element will be 1.0 dBd or the common Horizontal or Vertical maximum antenna gain of 4.0 dBd adjusted by 3 dBd for dual broadcast in the Horizontal and Vertical planes (1.0 dBd = 4.0 dBd - 3.0 dBd). The maximum gain for multiple bay options of the Scala CA2-FM(Slant-45) antenna would therefore also be adjusted by -3 dBd to account for operation in the Horizontal and Vertical planes.

The antenna proposed in this application will be mounted in accordance with specific instructions provided by the antenna manufacturer. The directional antenna will be mounted on the tower which is of uniform cross section. No other antennas of any type are or will be mounted on the same tower level as the directional antenna.

No antenna is or will be mounted within any vertical or horizontal distance specified by the antenna manufacturer as being necessary for proper operation of the directional antenna. In addition, the antenna will be assembled under the supervision of a qualified engineer and installed pursuant to the manufacturer's instructions and manufacturer specified antenna orientation.



CA2-FM

FM DIPOLE REFLECTOR ANTENNA

4 dBd gain
88 to 108 MHz

The Scala CA2-FM is a ruggedly built dipole reflector antenna, designed for professional FM transmit and receive applications.

Like all Scala antennas, the CA2-FM is made of the finest materials resulting in superior performance and long service life.

The CA2-FM may be used stand-alone or in stacked arrays for higher gain, increased side-lobe suppression, or custom azimuth patterns.

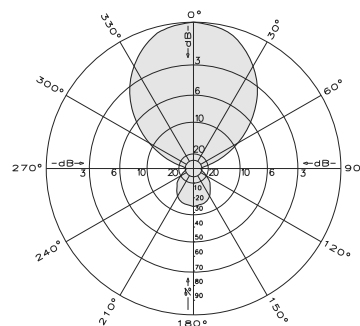
Specifications:

Frequency range	Any specified FM channel 88 to 108 MHz
Gain	4 dBd
Impedance	50 or 75 ohms
VSWR	< 1.5:1
Polarization	Horizontal
Front-to-back ratio	>11 dB
Maximum input power	250 watts
Azimuth pattern	72 degrees (half-power)
Elevation pattern	80 degrees (half-power)
Connector	50Ω or 75Ω N female
Weight	5.7 lb (2.6 kg)
Dimensions	35.3 x 68.9 inches maximum (897 x 1750 mm)
Equivalent flat plate area	1.19 ft ² (0.11 m ²) maximum
Wind survival rating*	120 mph (194 kph)
Shipping dimensions	70 x 6 x 5 inches maximum (1778 x 152 x 127mm)
Shipping weight	10 lb (4.5 kg) maximum
Mounting	For masts of 2.375 inches (60 mm) OD.

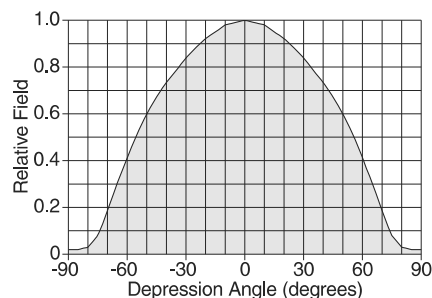
* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Order Information:

Contact Scala Customer Service for detailed order information.



Azimuth pattern (E-plane - typical)

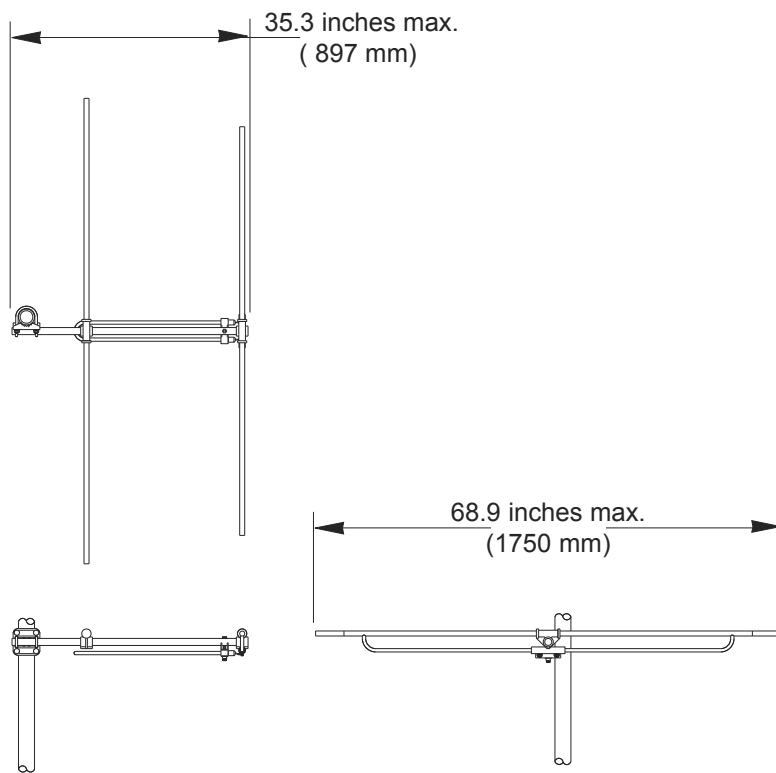


Elevation pattern (H-plane)



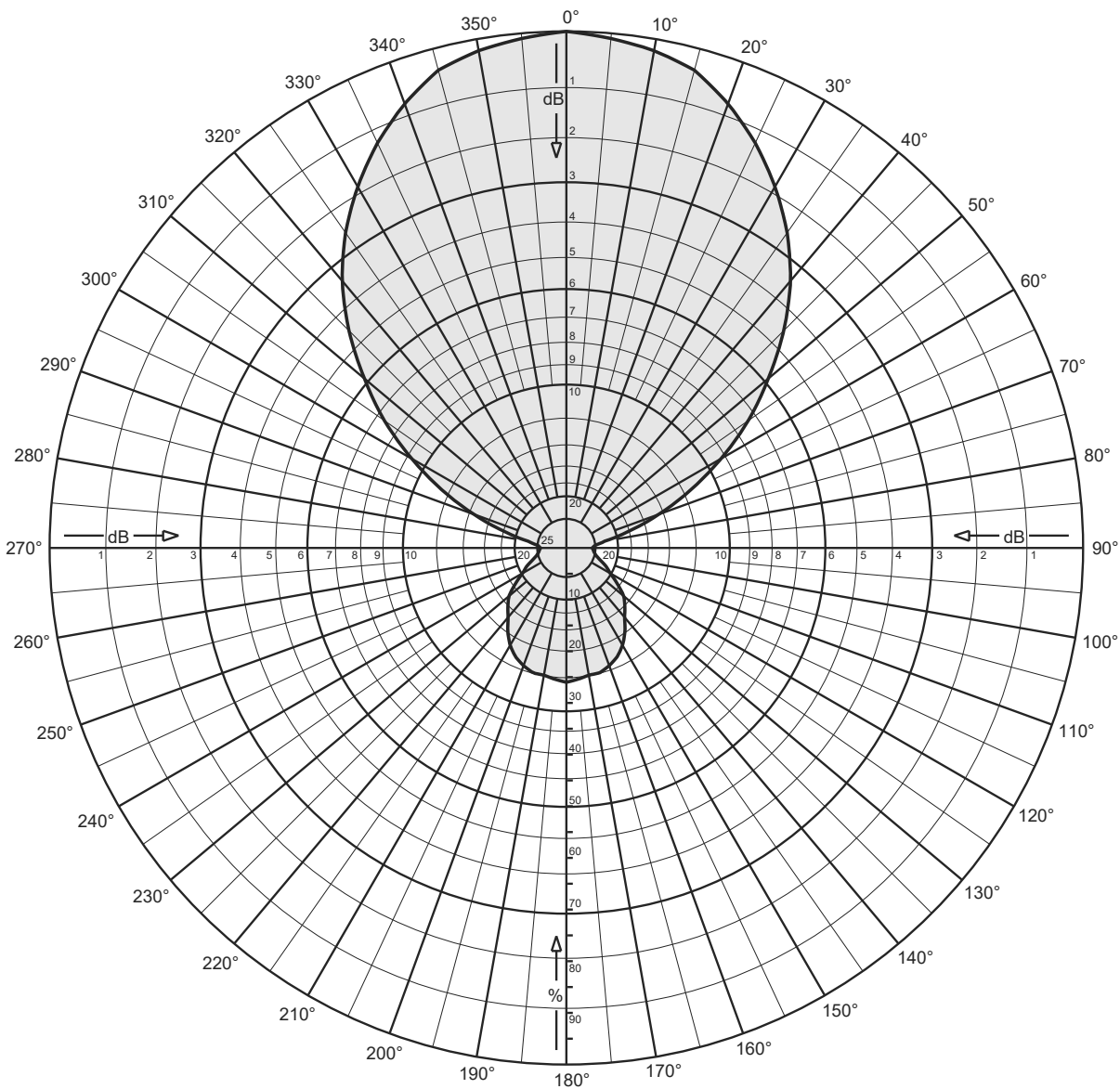


CA2-FM
FM DIPOLE REFLECTOR ANTENNA
4 dBd gain
88 to 108 MHz



Order Information:

Contact Scala Customer Service for detailed order information.



CA2-FM
 FM
 Maximum gain: 4.0 dBd
 Horizontal polarization
 Horizontal radiation pattern

KATHREIN
 USA

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Horizontal polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	4.00	2.51	45	0.595	-4.51	-0.51	0.89
1	0.998	-0.02	3.98	2.50	46	0.578	-4.76	-0.76	0.84
2	0.996	-0.03	3.97	2.49	47	0.561	-5.02	-1.02	0.79
3	0.994	-0.05	3.95	2.48	48	0.544	-5.29	-1.29	0.74
4	0.992	-0.07	3.93	2.47	49	0.527	-5.56	-1.56	0.70
5	0.990	-0.09	3.91	2.46	50	0.510	-5.85	-1.85	0.65
6	0.988	-0.11	3.89	2.45	51	0.494	-6.13	-2.13	0.61
7	0.985	-0.13	3.87	2.44	52	0.478	-6.41	-2.41	0.57
8	0.982	-0.15	3.85	2.42	53	0.462	-6.71	-2.71	0.54
9	0.980	-0.18	3.82	2.41	54	0.446	-7.01	-3.01	0.50
10	0.978	-0.20	3.80	2.40	55	0.430	-7.33	-3.33	0.46
11	0.974	-0.23	3.77	2.38	56	0.413	-7.68	-3.68	0.43
12	0.970	-0.27	3.73	2.36	57	0.396	-8.05	-4.05	0.39
13	0.965	-0.30	3.70	2.34	58	0.379	-8.43	-4.43	0.36
14	0.961	-0.34	3.66	2.32	59	0.362	-8.83	-4.83	0.33
15	0.957	-0.38	3.62	2.30	60	0.345	-9.24	-5.24	0.30
16	0.949	-0.45	3.55	2.26	61	0.329	-9.66	-5.66	0.27
17	0.940	-0.53	3.47	2.22	62	0.313	-10.09	-6.09	0.25
18	0.932	-0.61	3.39	2.18	63	0.297	-10.54	-6.54	0.22
19	0.924	-0.69	3.31	2.14	64	0.281	-11.03	-7.03	0.20
20	0.915	-0.77	3.23	2.10	65	0.265	-11.54	-7.54	0.18
21	0.905	-0.87	3.13	2.06	66	0.250	-12.04	-8.04	0.16
22	0.895	-0.96	3.04	2.01	67	0.235	-12.58	-8.58	0.14
23	0.885	-1.06	2.94	1.97	68	0.220	-13.15	-9.15	0.12
24	0.875	-1.16	2.84	1.92	69	0.205	-13.76	-9.76	0.11
25	0.865	-1.26	2.74	1.88	70	0.190	-14.42	-10.42	0.09
26	0.854	-1.38	2.62	1.83	71	0.177	-15.04	-11.04	0.08
27	0.842	-1.49	2.51	1.78	72	0.164	-15.70	-11.70	0.07
28	0.831	-1.61	2.39	1.73	73	0.151	-16.42	-12.42	0.06
29	0.819	-1.73	2.27	1.68	74	0.138	-17.20	-13.20	0.05
30	0.808	-1.86	2.14	1.64	75	0.125	-18.06	-14.06	0.04
31	0.795	-1.99	2.01	1.59	76	0.115	-18.79	-14.79	0.03
32	0.783	-2.13	1.87	1.54	77	0.105	-19.58	-15.58	0.03
33	0.770	-2.27	1.73	1.49	78	0.095	-20.45	-16.45	0.02
34	0.757	-2.41	1.59	1.44	79	0.085	-21.41	-17.41	0.02
35	0.745	-2.56	1.44	1.39	80	0.075	-22.50	-18.50	0.01
36	0.731	-2.72	1.28	1.34	81	0.071	-22.97	-18.97	0.01
37	0.717	-2.89	1.11	1.29	82	0.067	-23.48	-19.48	0.01
38	0.703	-3.06	0.94	1.24	83	0.063	-24.01	-20.01	0.01
39	0.689	-3.24	0.76	1.19	84	0.059	-24.58	-20.58	0.01
40	0.675	-3.41	0.59	1.14	85	0.055	-25.19	-21.19	0.01
41	0.659	-3.62	0.38	1.09	86	0.054	-25.35	-21.35	0.01
42	0.643	-3.84	0.16	1.04	87	0.053	-25.51	-21.51	0.01
43	0.627	-4.05	-0.05	0.99	88	0.052	-25.68	-21.68	0.01
44	0.611	-4.28	-0.28	0.94	89	0.051	-25.85	-21.85	0.01

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Horizontal polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.050	-26.02	-22.02	0.01	135	0.160	-15.92	-11.92	0.06
91	0.051	-25.93	-21.93	0.01	136	0.163	-15.76	-11.76	0.07
92	0.051	-25.85	-21.85	0.01	137	0.166	-15.60	-11.60	0.07
93	0.052	-25.76	-21.76	0.01	138	0.169	-15.44	-11.44	0.07
94	0.052	-25.68	-21.68	0.01	139	0.172	-15.29	-11.29	0.07
95	0.053	-25.60	-21.60	0.01	140	0.175	-15.14	-11.14	0.08
96	0.053	-25.51	-21.51	0.01	141	0.179	-14.92	-10.92	0.08
97	0.054	-25.43	-21.43	0.01	142	0.184	-14.70	-10.70	0.09
98	0.054	-25.35	-21.35	0.01	143	0.188	-14.49	-10.49	0.09
99	0.055	-25.27	-21.27	0.01	144	0.193	-14.29	-10.29	0.09
100	0.055	-25.19	-21.19	0.01	145	0.197	-14.09	-10.09	0.10
101	0.056	-25.04	-21.04	0.01	146	0.201	-13.91	-9.91	0.10
102	0.057	-24.88	-20.88	0.01	147	0.205	-13.74	-9.74	0.11
103	0.058	-24.73	-20.73	0.01	148	0.209	-13.58	-9.58	0.11
104	0.059	-24.58	-20.58	0.01	149	0.213	-13.41	-9.41	0.11
105	0.060	-24.44	-20.44	0.01	150	0.218	-13.25	-9.25	0.12
106	0.062	-24.15	-20.15	0.01	151	0.220	-13.13	-9.13	0.12
107	0.064	-23.88	-19.88	0.01	152	0.224	-13.01	-9.01	0.13
108	0.066	-23.61	-19.61	0.01	153	0.226	-12.90	-8.90	0.13
109	0.068	-23.35	-19.35	0.01	154	0.230	-12.78	-8.78	0.13
110	0.070	-23.10	-19.10	0.01	155	0.233	-12.67	-8.67	0.14
111	0.073	-22.73	-18.73	0.01	156	0.235	-12.60	-8.60	0.14
112	0.076	-22.38	-18.38	0.01	157	0.236	-12.52	-8.52	0.14
113	0.079	-22.05	-18.05	0.02	158	0.238	-12.45	-8.45	0.14
114	0.082	-21.72	-17.72	0.02	159	0.241	-12.38	-8.38	0.15
115	0.085	-21.41	-17.41	0.02	160	0.242	-12.31	-8.31	0.15
116	0.087	-21.16	-17.16	0.02	161	0.244	-12.25	-8.25	0.15
117	0.090	-20.92	-16.92	0.02	162	0.246	-12.20	-8.20	0.15
118	0.093	-20.68	-16.68	0.02	163	0.247	-12.15	-8.15	0.15
119	0.095	-20.45	-16.45	0.02	164	0.248	-12.09	-8.09	0.16
120	0.097	-20.22	-16.22	0.02	165	0.250	-12.04	-8.04	0.16
121	0.102	-19.83	-15.83	0.03	166	0.250	-12.04	-8.04	0.16
122	0.107	-19.45	-15.45	0.03	167	0.250	-12.04	-8.04	0.16
123	0.111	-19.09	-15.09	0.03	168	0.250	-12.04	-8.04	0.16
124	0.115	-18.75	-14.75	0.03	169	0.250	-12.04	-8.04	0.16
125	0.120	-18.42	-14.42	0.04	170	0.250	-12.04	-8.04	0.16
126	0.125	-18.06	-14.06	0.04	171	0.251	-12.01	-8.01	0.16
127	0.130	-17.72	-13.72	0.04	172	0.252	-11.97	-7.97	0.16
128	0.135	-17.39	-13.39	0.05	173	0.253	-11.94	-7.94	0.16
129	0.140	-17.08	-13.08	0.05	174	0.254	-11.90	-7.90	0.16
130	0.145	-16.77	-12.77	0.05	175	0.255	-11.87	-7.87	0.16
131	0.148	-16.59	-12.59	0.06	176	0.256	-11.84	-7.84	0.16
132	0.151	-16.42	-12.42	0.06	177	0.257	-11.80	-7.80	0.17
133	0.154	-16.25	-12.25	0.06	178	0.258	-11.77	-7.77	0.17
134	0.157	-16.08	-12.08	0.06	179	0.259	-11.73	-7.73	0.17

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Horizontal polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.260	-11.70	-7.70	0.17	225	0.160	-15.92	-11.92	0.06
181	0.259	-11.73	-7.73	0.17	226	0.157	-16.08	-12.08	0.06
182	0.258	-11.77	-7.77	0.17	227	0.154	-16.25	-12.25	0.06
183	0.257	-11.80	-7.80	0.17	228	0.151	-16.42	-12.42	0.06
184	0.256	-11.84	-7.84	0.16	229	0.148	-16.59	-12.59	0.06
185	0.255	-11.87	-7.87	0.16	230	0.145	-16.77	-12.77	0.05
186	0.254	-11.90	-7.90	0.16	231	0.140	-17.08	-13.08	0.05
187	0.253	-11.94	-7.94	0.16	232	0.135	-17.39	-13.39	0.05
188	0.252	-11.97	-7.97	0.16	233	0.130	-17.72	-13.72	0.04
189	0.251	-12.01	-8.01	0.16	234	0.125	-18.06	-14.06	0.04
190	0.250	-12.04	-8.04	0.16	235	0.120	-18.42	-14.42	0.04
191	0.250	-12.04	-8.04	0.16	236	0.115	-18.75	-14.75	0.03
192	0.250	-12.04	-8.04	0.16	237	0.111	-19.09	-15.09	0.03
193	0.250	-12.04	-8.04	0.16	238	0.107	-19.45	-15.45	0.03
194	0.250	-12.04	-8.04	0.16	239	0.102	-19.83	-15.83	0.03
195	0.250	-12.04	-8.04	0.16	240	0.097	-20.22	-16.22	0.02
196	0.248	-12.09	-8.09	0.16	241	0.095	-20.45	-16.45	0.02
197	0.247	-12.15	-8.15	0.15	242	0.093	-20.68	-16.68	0.02
198	0.246	-12.20	-8.20	0.15	243	0.090	-20.92	-16.92	0.02
199	0.244	-12.25	-8.25	0.15	244	0.087	-21.16	-17.16	0.02
200	0.242	-12.31	-8.31	0.15	245	0.085	-21.41	-17.41	0.02
201	0.241	-12.38	-8.38	0.15	246	0.082	-21.72	-17.72	0.02
202	0.238	-12.45	-8.45	0.14	247	0.079	-22.05	-18.05	0.02
203	0.236	-12.52	-8.52	0.14	248	0.076	-22.38	-18.38	0.01
204	0.235	-12.60	-8.60	0.14	249	0.073	-22.73	-18.73	0.01
205	0.233	-12.67	-8.67	0.14	250	0.070	-23.10	-19.10	0.01
206	0.230	-12.78	-8.78	0.13	251	0.068	-23.35	-19.35	0.01
207	0.226	-12.90	-8.90	0.13	252	0.066	-23.61	-19.61	0.01
208	0.224	-13.01	-9.01	0.13	253	0.064	-23.88	-19.88	0.01
209	0.220	-13.13	-9.13	0.12	254	0.062	-24.15	-20.15	0.01
210	0.218	-13.25	-9.25	0.12	255	0.060	-24.44	-20.44	0.01
211	0.213	-13.41	-9.41	0.11	256	0.059	-24.58	-20.58	0.01
212	0.209	-13.58	-9.58	0.11	257	0.058	-24.73	-20.73	0.01
213	0.205	-13.74	-9.74	0.11	258	0.057	-24.88	-20.88	0.01
214	0.201	-13.91	-9.91	0.10	259	0.056	-25.04	-21.04	0.01
215	0.197	-14.09	-10.09	0.10	260	0.055	-25.19	-21.19	0.01
216	0.193	-14.29	-10.29	0.09	261	0.055	-25.27	-21.27	0.01
217	0.188	-14.49	-10.49	0.09	262	0.054	-25.35	-21.35	0.01
218	0.184	-14.70	-10.70	0.09	263	0.054	-25.43	-21.43	0.01
219	0.179	-14.92	-10.92	0.08	264	0.053	-25.51	-21.51	0.01
220	0.175	-15.14	-11.14	0.08	265	0.053	-25.60	-21.60	0.01
221	0.172	-15.29	-11.29	0.07	266	0.052	-25.68	-21.68	0.01
222	0.169	-15.44	-11.44	0.07	267	0.052	-25.76	-21.76	0.01
223	0.166	-15.60	-11.60	0.07	268	0.051	-25.85	-21.85	0.01
224	0.163	-15.76	-11.76	0.07	269	0.051	-25.93	-21.93	0.01

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CA2-FM

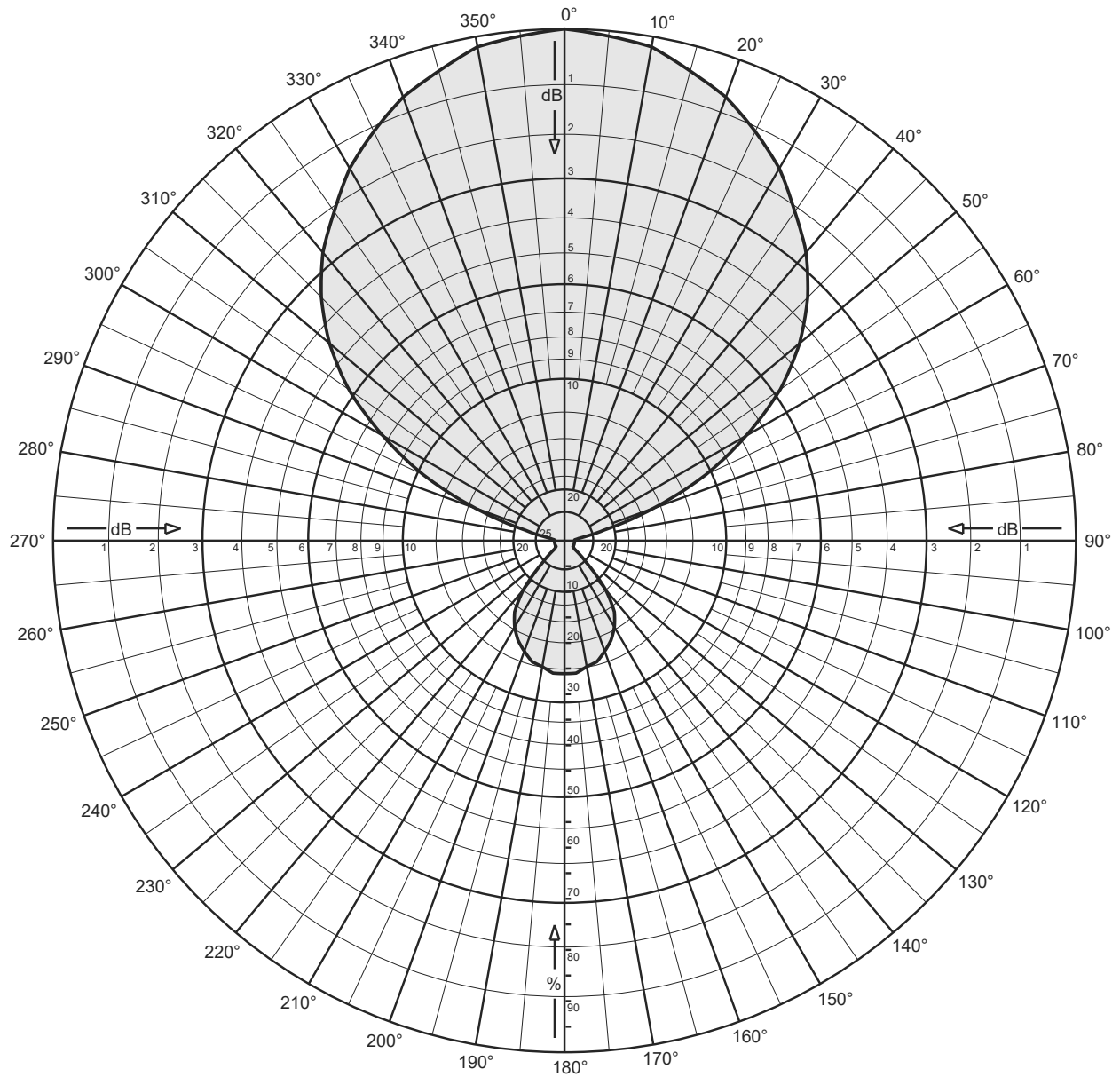
Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Horizontal polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.050	-26.02	-22.02	0.01	315	0.595	-4.51	-0.51	0.89
271	0.051	-25.85	-21.85	0.01	316	0.611	-4.28	-0.28	0.94
272	0.052	-25.68	-21.68	0.01	317	0.627	-4.05	-0.05	0.99
273	0.053	-25.51	-21.51	0.01	318	0.643	-3.84	0.16	1.04
274	0.054	-25.35	-21.35	0.01	319	0.659	-3.62	0.38	1.09
275	0.055	-25.19	-21.19	0.01	320	0.675	-3.41	0.59	1.14
276	0.059	-24.58	-20.58	0.01	321	0.689	-3.24	0.76	1.19
277	0.063	-24.01	-20.01	0.01	322	0.703	-3.06	0.94	1.24
278	0.067	-23.48	-19.48	0.01	323	0.717	-2.89	1.11	1.29
279	0.071	-22.97	-18.97	0.01	324	0.731	-2.72	1.28	1.34
280	0.075	-22.50	-18.50	0.01	325	0.745	-2.56	1.44	1.39
281	0.085	-21.41	-17.41	0.02	326	0.757	-2.41	1.59	1.44
282	0.095	-20.45	-16.45	0.02	327	0.770	-2.27	1.73	1.49
283	0.105	-19.58	-15.58	0.03	328	0.783	-2.13	1.87	1.54
284	0.115	-18.79	-14.79	0.03	329	0.795	-1.99	2.01	1.59
285	0.125	-18.06	-14.06	0.04	330	0.808	-1.86	2.14	1.64
286	0.138	-17.20	-13.20	0.05	331	0.819	-1.73	2.27	1.68
287	0.151	-16.42	-12.42	0.06	332	0.831	-1.61	2.39	1.73
288	0.164	-15.70	-11.70	0.07	333	0.842	-1.49	2.51	1.78
289	0.177	-15.04	-11.04	0.08	334	0.854	-1.38	2.62	1.83
290	0.190	-14.42	-10.42	0.09	335	0.865	-1.26	2.74	1.88
291	0.205	-13.76	-9.76	0.11	336	0.875	-1.16	2.84	1.92
292	0.220	-13.15	-9.15	0.12	337	0.885	-1.06	2.94	1.97
293	0.235	-12.58	-8.58	0.14	338	0.895	-0.96	3.04	2.01
294	0.250	-12.04	-8.04	0.16	339	0.905	-0.87	3.13	2.06
295	0.265	-11.54	-7.54	0.18	340	0.915	-0.77	3.23	2.10
296	0.281	-11.03	-7.03	0.20	341	0.924	-0.69	3.31	2.14
297	0.297	-10.54	-6.54	0.22	342	0.932	-0.61	3.39	2.18
298	0.313	-10.09	-6.09	0.25	343	0.940	-0.53	3.47	2.22
299	0.329	-9.66	-5.66	0.27	344	0.949	-0.45	3.55	2.26
300	0.345	-9.24	-5.24	0.30	345	0.957	-0.38	3.62	2.30
301	0.362	-8.83	-4.83	0.33	346	0.961	-0.34	3.66	2.32
302	0.379	-8.43	-4.43	0.36	347	0.965	-0.30	3.70	2.34
303	0.396	-8.05	-4.05	0.39	348	0.970	-0.27	3.73	2.36
304	0.413	-7.68	-3.68	0.43	349	0.974	-0.23	3.77	2.38
305	0.430	-7.33	-3.33	0.46	350	0.978	-0.20	3.80	2.40
306	0.446	-7.01	-3.01	0.50	351	0.980	-0.18	3.82	2.41
307	0.462	-6.71	-2.71	0.54	352	0.982	-0.15	3.85	2.42
308	0.478	-6.41	-2.41	0.57	353	0.985	-0.13	3.87	2.44
309	0.494	-6.13	-2.13	0.61	354	0.988	-0.11	3.89	2.45
310	0.510	-5.85	-1.85	0.65	355	0.990	-0.09	3.91	2.46
311	0.527	-5.56	-1.56	0.70	356	0.992	-0.07	3.93	2.47
312	0.544	-5.29	-1.29	0.74	357	0.994	-0.05	3.95	2.48
313	0.561	-5.02	-1.02	0.79	358	0.996	-0.03	3.97	2.49
314	0.578	-4.76	-0.76	0.84	359	0.998	-0.02	3.98	2.50



CA2-FM

FM

Maximum gain: 4.0 dBd

Vertical polarization

Horizontal radiation pattern

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CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	4.00	2.51	45	0.673	-3.45	0.55	1.14
1	0.998	-0.02	3.98	2.50	46	0.658	-3.64	0.36	1.09
2	0.996	-0.03	3.97	2.49	47	0.643	-3.83	0.17	1.04
3	0.994	-0.05	3.95	2.48	48	0.629	-4.03	-0.03	0.99
4	0.992	-0.07	3.93	2.47	49	0.615	-4.23	-0.23	0.95
5	0.990	-0.09	3.91	2.46	50	0.600	-4.44	-0.44	0.90
6	0.988	-0.10	3.90	2.45	51	0.583	-4.69	-0.69	0.85
7	0.986	-0.12	3.88	2.44	52	0.566	-4.94	-0.94	0.80
8	0.984	-0.14	3.86	2.43	53	0.549	-5.21	-1.21	0.76
9	0.982	-0.16	3.84	2.42	54	0.532	-5.48	-1.48	0.71
10	0.980	-0.18	3.82	2.41	55	0.515	-5.76	-1.76	0.67
11	0.974	-0.23	3.77	2.38	56	0.494	-6.13	-2.13	0.61
12	0.968	-0.28	3.72	2.35	57	0.473	-6.50	-2.50	0.56
13	0.962	-0.34	3.66	2.32	58	0.452	-6.90	-2.90	0.51
14	0.956	-0.39	3.61	2.30	59	0.431	-7.31	-3.31	0.47
15	0.950	-0.45	3.55	2.27	60	0.410	-7.74	-3.74	0.42
16	0.944	-0.50	3.50	2.24	61	0.389	-8.20	-4.20	0.38
17	0.939	-0.55	3.45	2.21	62	0.368	-8.68	-4.68	0.34
18	0.933	-0.60	3.40	2.19	63	0.347	-9.19	-5.19	0.30
19	0.928	-0.65	3.35	2.16	64	0.326	-9.74	-5.74	0.27
20	0.923	-0.70	3.30	2.14	65	0.305	-10.31	-6.31	0.23
21	0.914	-0.78	3.22	2.10	66	0.281	-11.03	-7.03	0.20
22	0.906	-0.85	3.15	2.06	67	0.257	-11.80	-7.80	0.17
23	0.898	-0.93	3.07	2.03	68	0.233	-12.65	-8.65	0.14
24	0.891	-1.01	2.99	1.99	69	0.209	-13.60	-9.60	0.11
25	0.883	-1.09	2.91	1.96	70	0.185	-14.66	-10.66	0.09
26	0.874	-1.17	2.83	1.92	71	0.164	-15.70	-11.70	0.07
27	0.865	-1.25	2.75	1.88	72	0.143	-16.89	-12.89	0.05
28	0.857	-1.34	2.66	1.84	73	0.122	-18.27	-14.27	0.04
29	0.849	-1.43	2.57	1.81	74	0.101	-19.91	-15.91	0.03
30	0.840	-1.51	2.49	1.77	75	0.080	-21.94	-17.94	0.02
31	0.829	-1.63	2.37	1.73	76	0.070	-23.10	-19.10	0.01
32	0.818	-1.74	2.26	1.68	77	0.060	-24.44	-20.44	0.01
33	0.807	-1.86	2.14	1.64	78	0.050	-26.02	-22.02	0.01
34	0.796	-1.98	2.02	1.59	79	0.040	-27.96	-23.96	0.00
35	0.785	-2.10	1.90	1.55	80	0.030	-30.46	-26.46	0.00
36	0.775	-2.21	1.79	1.51	81	0.028	-31.06	-27.06	0.00
37	0.765	-2.33	1.67	1.47	82	0.026	-31.70	-27.70	0.00
38	0.755	-2.44	1.56	1.43	83	0.024	-32.40	-28.40	0.00
39	0.745	-2.56	1.44	1.39	84	0.022	-33.15	-29.15	0.00
40	0.735	-2.67	1.33	1.36	85	0.020	-33.98	-29.98	0.00
41	0.722	-2.82	1.18	1.31	86	0.020	-33.98	-29.98	0.00
42	0.710	-2.97	1.03	1.27	87	0.020	-33.98	-29.98	0.00
43	0.697	-3.13	0.87	1.22	88	0.020	-33.98	-29.98	0.00
44	0.685	-3.29	0.71	1.18	89	0.020	-33.98	-29.98	0.00

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.020	-33.98	-29.98	0.00	135	0.060	-24.44	-20.44	0.01
91	0.020	-33.98	-29.98	0.00	136	0.073	-22.73	-18.73	0.01
92	0.020	-33.98	-29.98	0.00	137	0.086	-21.31	-17.31	0.02
93	0.020	-33.98	-29.98	0.00	138	0.099	-20.09	-16.09	0.02
94	0.020	-33.98	-29.98	0.00	139	0.112	-19.02	-15.02	0.03
95	0.020	-33.98	-29.98	0.00	140	0.125	-18.06	-14.06	0.04
96	0.020	-33.98	-29.98	0.00	141	0.134	-17.46	-13.46	0.05
97	0.020	-33.98	-29.98	0.00	142	0.143	-16.89	-12.89	0.05
98	0.020	-33.98	-29.98	0.00	143	0.152	-16.36	-12.36	0.06
99	0.020	-33.98	-29.98	0.00	144	0.161	-15.86	-11.86	0.07
100	0.020	-33.98	-29.98	0.00	145	0.170	-15.39	-11.39	0.07
101	0.020	-33.98	-29.98	0.00	146	0.175	-15.14	-11.14	0.08
102	0.020	-33.98	-29.98	0.00	147	0.180	-14.89	-10.89	0.08
103	0.020	-33.98	-29.98	0.00	148	0.185	-14.66	-10.66	0.09
104	0.020	-33.98	-29.98	0.00	149	0.190	-14.42	-10.42	0.09
105	0.020	-33.98	-29.98	0.00	150	0.195	-14.20	-10.20	0.10
106	0.020	-33.98	-29.98	0.00	151	0.199	-14.02	-10.02	0.10
107	0.020	-33.98	-29.98	0.00	152	0.203	-13.85	-9.85	0.10
108	0.020	-33.98	-29.98	0.00	153	0.207	-13.68	-9.68	0.11
109	0.020	-33.98	-29.98	0.00	154	0.211	-13.51	-9.51	0.11
110	0.020	-33.98	-29.98	0.00	155	0.215	-13.35	-9.35	0.12
111	0.020	-33.98	-29.98	0.00	156	0.218	-13.23	-9.23	0.12
112	0.020	-33.98	-29.98	0.00	157	0.221	-13.11	-9.11	0.12
113	0.020	-33.98	-29.98	0.00	158	0.224	-13.00	-9.00	0.13
114	0.020	-33.98	-29.98	0.00	159	0.227	-12.88	-8.88	0.13
115	0.020	-33.98	-29.98	0.00	160	0.230	-12.77	-8.77	0.13
116	0.020	-33.98	-29.98	0.00	161	0.233	-12.65	-8.65	0.14
117	0.020	-33.98	-29.98	0.00	162	0.236	-12.54	-8.54	0.14
118	0.020	-33.98	-29.98	0.00	163	0.239	-12.43	-8.43	0.14
119	0.020	-33.98	-29.98	0.00	164	0.242	-12.32	-8.32	0.15
120	0.020	-33.98	-29.98	0.00	165	0.245	-12.22	-8.22	0.15
121	0.020	-33.98	-29.98	0.00	166	0.246	-12.18	-8.18	0.15
122	0.020	-33.98	-29.98	0.00	167	0.247	-12.15	-8.15	0.15
123	0.020	-33.98	-29.98	0.00	168	0.248	-12.11	-8.11	0.15
124	0.020	-33.98	-29.98	0.00	169	0.249	-12.08	-8.08	0.16
125	0.020	-33.98	-29.98	0.00	170	0.250	-12.04	-8.04	0.16
126	0.021	-33.56	-29.56	0.00	171	0.252	-11.97	-7.97	0.16
127	0.022	-33.15	-29.15	0.00	172	0.254	-11.90	-7.90	0.16
128	0.023	-32.77	-28.77	0.00	173	0.256	-11.84	-7.84	0.16
129	0.024	-32.40	-28.40	0.00	174	0.258	-11.77	-7.77	0.17
130	0.025	-32.04	-28.04	0.00	175	0.260	-11.70	-7.70	0.17
131	0.032	-29.90	-25.90	0.00	176	0.260	-11.70	-7.70	0.17
132	0.039	-28.18	-24.18	0.00	177	0.260	-11.70	-7.70	0.17
133	0.046	-26.74	-22.74	0.01	178	0.260	-11.70	-7.70	0.17
134	0.053	-25.51	-21.51	0.01	179	0.260	-11.70	-7.70	0.17

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.260	-11.70	-7.70	0.17	225	0.060	-24.44	-20.44	0.01
181	0.260	-11.70	-7.70	0.17	226	0.053	-25.51	-21.51	0.01
182	0.260	-11.70	-7.70	0.17	227	0.046	-26.74	-22.74	0.01
183	0.260	-11.70	-7.70	0.17	228	0.039	-28.18	-24.18	0.00
184	0.260	-11.70	-7.70	0.17	229	0.032	-29.90	-25.90	0.00
185	0.260	-11.70	-7.70	0.17	230	0.025	-32.04	-28.04	0.00
186	0.258	-11.77	-7.77	0.17	231	0.024	-32.40	-28.40	0.00
187	0.256	-11.84	-7.84	0.16	232	0.023	-32.77	-28.77	0.00
188	0.254	-11.90	-7.90	0.16	233	0.022	-33.15	-29.15	0.00
189	0.252	-11.97	-7.97	0.16	234	0.021	-33.56	-29.56	0.00
190	0.250	-12.04	-8.04	0.16	235	0.020	-33.98	-29.98	0.00
191	0.249	-12.08	-8.08	0.16	236	0.020	-33.98	-29.98	0.00
192	0.248	-12.11	-8.11	0.15	237	0.020	-33.98	-29.98	0.00
193	0.247	-12.15	-8.15	0.15	238	0.020	-33.98	-29.98	0.00
194	0.246	-12.18	-8.18	0.15	239	0.020	-33.98	-29.98	0.00
195	0.245	-12.22	-8.22	0.15	240	0.020	-33.98	-29.98	0.00
196	0.242	-12.32	-8.32	0.15	241	0.020	-33.98	-29.98	0.00
197	0.239	-12.43	-8.43	0.14	242	0.020	-33.98	-29.98	0.00
198	0.236	-12.54	-8.54	0.14	243	0.020	-33.98	-29.98	0.00
199	0.233	-12.65	-8.65	0.14	244	0.020	-33.98	-29.98	0.00
200	0.230	-12.77	-8.77	0.13	245	0.020	-33.98	-29.98	0.00
201	0.227	-12.88	-8.88	0.13	246	0.020	-33.98	-29.98	0.00
202	0.224	-13.00	-9.00	0.13	247	0.020	-33.98	-29.98	0.00
203	0.221	-13.11	-9.11	0.12	248	0.020	-33.98	-29.98	0.00
204	0.218	-13.23	-9.23	0.12	249	0.020	-33.98	-29.98	0.00
205	0.215	-13.35	-9.35	0.12	250	0.020	-33.98	-29.98	0.00
206	0.211	-13.51	-9.51	0.11	251	0.020	-33.98	-29.98	0.00
207	0.207	-13.68	-9.68	0.11	252	0.020	-33.98	-29.98	0.00
208	0.203	-13.85	-9.85	0.10	253	0.020	-33.98	-29.98	0.00
209	0.199	-14.02	-10.02	0.10	254	0.020	-33.98	-29.98	0.00
210	0.195	-14.20	-10.20	0.10	255	0.020	-33.98	-29.98	0.00
211	0.190	-14.42	-10.42	0.09	256	0.020	-33.98	-29.98	0.00
212	0.185	-14.66	-10.66	0.09	257	0.020	-33.98	-29.98	0.00
213	0.180	-14.89	-10.89	0.08	258	0.020	-33.98	-29.98	0.00
214	0.175	-15.14	-11.14	0.08	259	0.020	-33.98	-29.98	0.00
215	0.170	-15.39	-11.39	0.07	260	0.020	-33.98	-29.98	0.00
216	0.161	-15.86	-11.86	0.07	261	0.020	-33.98	-29.98	0.00
217	0.152	-16.36	-12.36	0.06	262	0.020	-33.98	-29.98	0.00
218	0.143	-16.89	-12.89	0.05	263	0.020	-33.98	-29.98	0.00
219	0.134	-17.46	-13.46	0.05	264	0.020	-33.98	-29.98	0.00
220	0.125	-18.06	-14.06	0.04	265	0.020	-33.98	-29.98	0.00
221	0.112	-19.02	-15.02	0.03	266	0.020	-33.98	-29.98	0.00
222	0.099	-20.09	-16.09	0.02	267	0.020	-33.98	-29.98	0.00
223	0.086	-21.31	-17.31	0.02	268	0.020	-33.98	-29.98	0.00
224	0.073	-22.73	-18.73	0.01	269	0.020	-33.98	-29.98	0.00

KATHREIN

USA

CA2-FM

Horizontal radiation pattern

FM

Maximum gain: 4.0 dBd

Vertical polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.020	-33.98	-29.98	0.00	315	0.673	-3.45	0.55	1.14
271	0.020	-33.98	-29.98	0.00	316	0.685	-3.29	0.71	1.18
272	0.020	-33.98	-29.98	0.00	317	0.697	-3.13	0.87	1.22
273	0.020	-33.98	-29.98	0.00	318	0.710	-2.97	1.03	1.27
274	0.020	-33.98	-29.98	0.00	319	0.722	-2.82	1.18	1.31
275	0.020	-33.98	-29.98	0.00	320	0.735	-2.67	1.33	1.36
276	0.022	-33.15	-29.15	0.00	321	0.745	-2.56	1.44	1.39
277	0.024	-32.40	-28.40	0.00	322	0.755	-2.44	1.56	1.43
278	0.026	-31.70	-27.70	0.00	323	0.765	-2.33	1.67	1.47
279	0.028	-31.06	-27.06	0.00	324	0.775	-2.21	1.79	1.51
280	0.030	-30.46	-26.46	0.00	325	0.785	-2.10	1.90	1.55
281	0.040	-27.96	-23.96	0.00	326	0.796	-1.98	2.02	1.59
282	0.050	-26.02	-22.02	0.01	327	0.807	-1.86	2.14	1.64
283	0.060	-24.44	-20.44	0.01	328	0.818	-1.74	2.26	1.68
284	0.070	-23.10	-19.10	0.01	329	0.829	-1.63	2.37	1.73
285	0.080	-21.94	-17.94	0.02	330	0.840	-1.51	2.49	1.77
286	0.101	-19.91	-15.91	0.03	331	0.849	-1.43	2.57	1.81
287	0.122	-18.27	-14.27	0.04	332	0.857	-1.34	2.66	1.84
288	0.143	-16.89	-12.89	0.05	333	0.865	-1.25	2.75	1.88
289	0.164	-15.70	-11.70	0.07	334	0.874	-1.17	2.83	1.92
290	0.185	-14.66	-10.66	0.09	335	0.883	-1.09	2.91	1.96
291	0.209	-13.60	-9.60	0.11	336	0.891	-1.01	2.99	1.99
292	0.233	-12.65	-8.65	0.14	337	0.898	-0.93	3.07	2.03
293	0.257	-11.80	-7.80	0.17	338	0.906	-0.85	3.15	2.06
294	0.281	-11.03	-7.03	0.20	339	0.914	-0.78	3.22	2.10
295	0.305	-10.31	-6.31	0.23	340	0.923	-0.70	3.30	2.14
296	0.326	-9.74	-5.74	0.27	341	0.928	-0.65	3.35	2.16
297	0.347	-9.19	-5.19	0.30	342	0.933	-0.60	3.40	2.19
298	0.368	-8.68	-4.68	0.34	343	0.939	-0.55	3.45	2.21
299	0.389	-8.20	-4.20	0.38	344	0.944	-0.50	3.50	2.24
300	0.410	-7.74	-3.74	0.42	345	0.950	-0.45	3.55	2.27
301	0.431	-7.31	-3.31	0.47	346	0.956	-0.39	3.61	2.30
302	0.452	-6.90	-2.90	0.51	347	0.962	-0.34	3.66	2.32
303	0.473	-6.50	-2.50	0.56	348	0.968	-0.28	3.72	2.35
304	0.494	-6.13	-2.13	0.61	349	0.974	-0.23	3.77	2.38
305	0.515	-5.76	-1.76	0.67	350	0.980	-0.18	3.82	2.41
306	0.532	-5.48	-1.48	0.71	351	0.982	-0.16	3.84	2.42
307	0.549	-5.21	-1.21	0.76	352	0.984	-0.14	3.86	2.43
308	0.566	-4.94	-0.94	0.80	353	0.986	-0.12	3.88	2.44
309	0.583	-4.69	-0.69	0.85	354	0.988	-0.10	3.90	2.45
310	0.600	-4.44	-0.44	0.90	355	0.990	-0.09	3.91	2.46
311	0.615	-4.23	-0.23	0.95	356	0.992	-0.07	3.93	2.47
312	0.629	-4.03	-0.03	0.99	357	0.994	-0.05	3.95	2.48
313	0.643	-3.83	0.17	1.04	358	0.996	-0.03	3.97	2.49
314	0.658	-3.64	0.36	1.09	359	0.998	-0.02	3.98	2.50