ASR Registration Search

Registration 1003752

Map Registration

Registration Detail

Reg Number	1003752	Status	Constructed
File Number	A0429022	Constructed	07/01/1982
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

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

Location (in NAD83 Coordinates)

Lat/Long	45-10-49.0 N 085-05-50.0 W	Address	RICHARDSON HILL 2 N MI NE
City, State	EAST JORDAN , MI		
Zip	49727	County	CHARLEVOIX
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
327.0	183.5
Overall Height Above Mean Sea Level	**Overall Height Above Ground w/o Appurtenances**
510.5	183.1

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 13
Paint and Light in Accordance with FAA Circular Number 70/7460-1H

FAA Notification

FAA Study	94-AGL-2274-OE	FAA Issue Date	07/08/1994

Owner & Contact Information

FRN	0008983033	Owner Entity Type	
Assignor FRN	0002764900	Assignor ID	L00086826

Owner

MacDonald Garber Broadcasting, Inc.
Attention To: Patricia MacDonald
2095 U.S. 131 South
Petoskey , MI 49770

P: (231)347-8713
F:
E: tmac@106khq.com

Contact

P:
F:
E:

Last Action Status

Status	Constructed	Received	02/12/2005
Purpose	Change Owner	Entered	02/12/2005
Mode	Interactive		

Related Applications

Exhibit 13.2 - W272CR vs AM Contours

Munn-Reese.com

WMKT.L

Latitude: 45-16-22 N
Longitude: 085-15-08 W

Frequency: 1270 kHz

W272CR
BLFT20120524AHU
Latitude: 45-10-49 N
Longitude: 085-05-50 W
ERP: 0.25 kW
Channel: 272
Frequency: 102.3 MHz
AMSL Height: 507.0 m
Elevation: 327.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

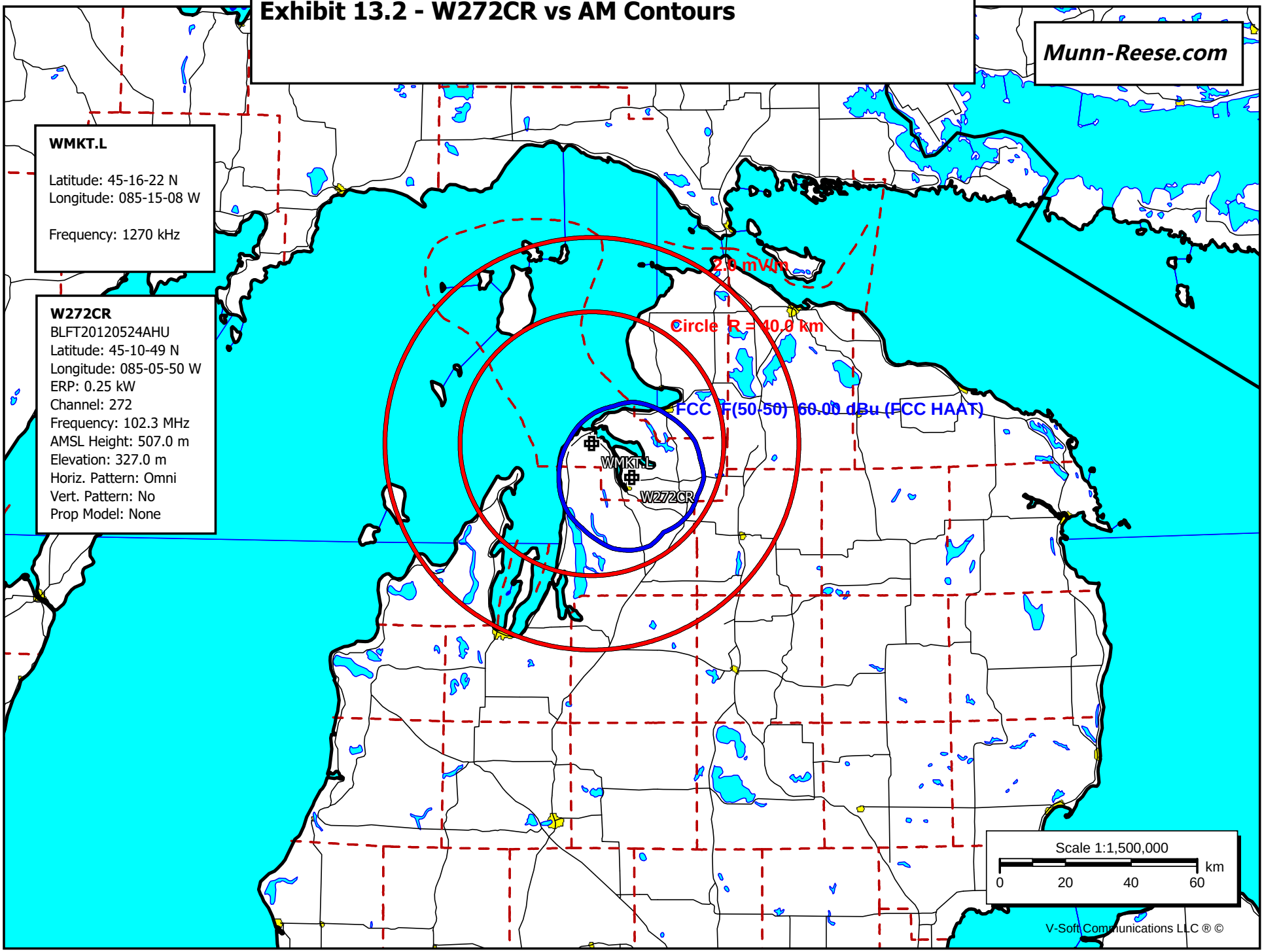


Exhibit 13.3
Macdonald Garber Broadcasting, Inc.

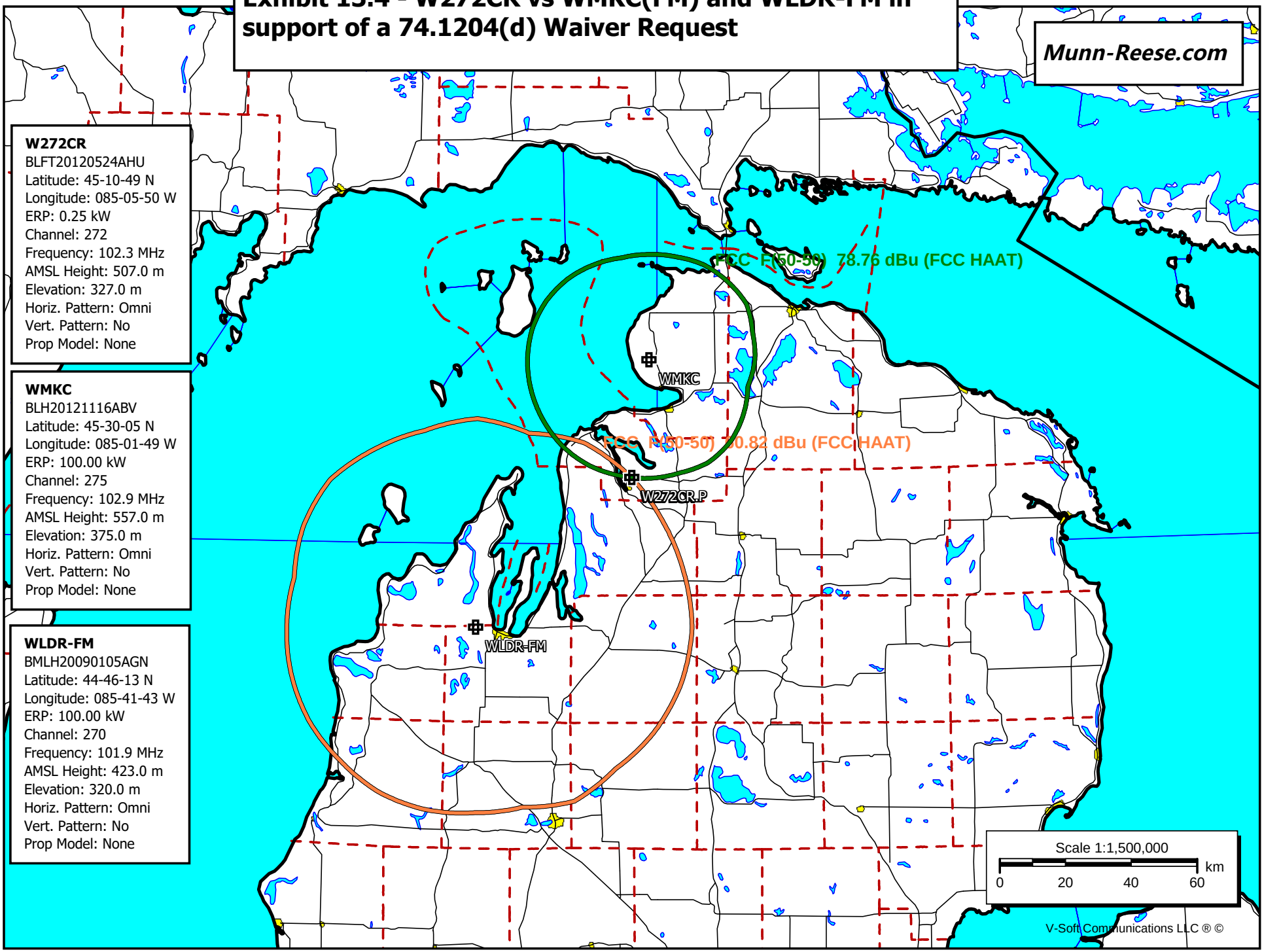
REFERENCE CH# 272D - 102.3 MHz, Pwr= 0.25 kW, HAAT= 277.3 M, COR= 507 M DISPLAY DATES
45 10 49.0 N. Average Protected F(50-50)= 21.72 km DATA 07-29-19
85 05 50.0 W. Omni-directional SEARCH 08-06-19

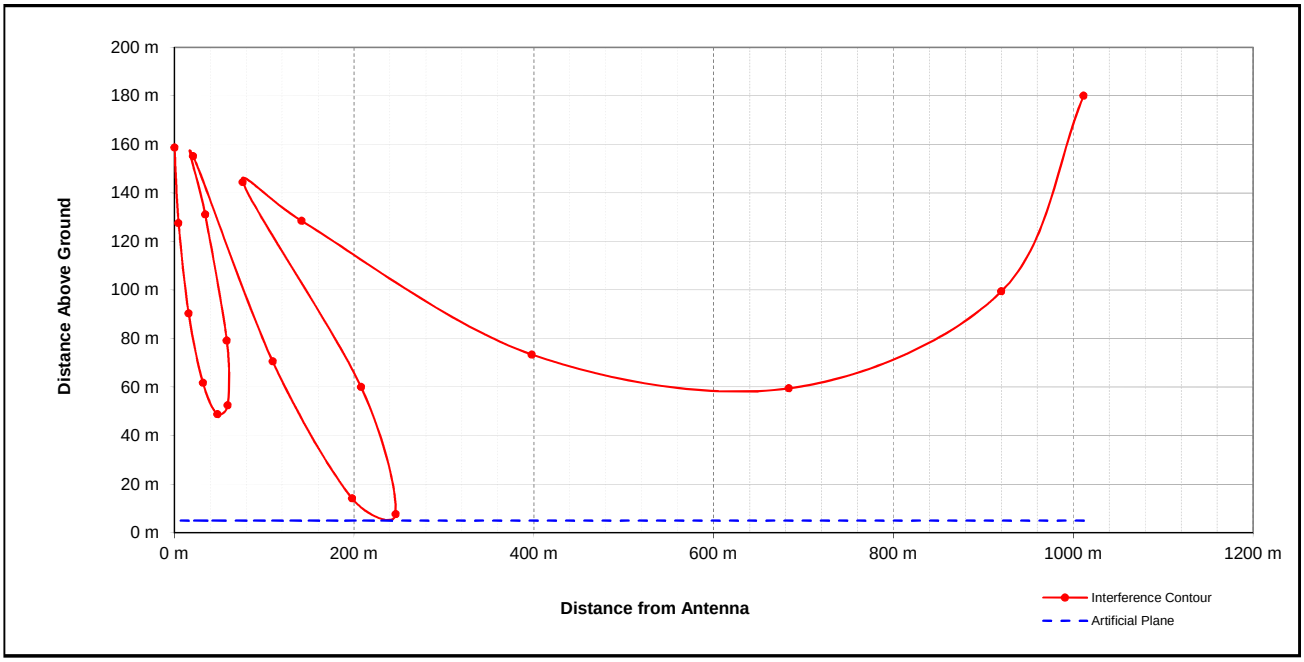
CH CALL / CITY	TYPE ANT / STATE	AZI <--	DIST / FILE #	LAT / LNG	PWR(kW) / HAAT(M)	INT(km) / COR(M)	PRO(km) / LICENSEE	*IN* (Overlap in km)	*OUT*
272D W272CR Petoskey	LIC _C_ MI	0.0 0.0	0.00 BLFT20120524AHU	45 10 49.0 85 05 50.0	0.250 277	 507	---Reference--- Macdonald Garber Broadcast		
275C0 WMKC Indian River	LIC _CX MI	8.3 188.4	36.08 BLH20121116ABV	45 30 05.0 85 01 49.0	100.000 324	10.9 557	76.1 Black Diamond Broadcast Ho	2.4	-41.1*
270C1 WLDR-FM Traverse City	LIC _CX MI	226.1 45.7	65.50 BMLH20090105AGN	44 46 13.0 85 41 43.0	100.000 192	9.0 423	67.3 N Content Marketing, Llc	34.7	-3.0*
273D W273CR East Bay Township	CP _C_ MI	224.8 44.4	65.58 BPFT20160727ADM	44 45 37.0 85 40 58.0	0.250	34.6 496	23.0 Michigan Community Radio	9.2	10.5
272C3 WTHN Sault Ste. Marie	LIC _CX MI	24.5 205.1	159.90 BLED20050202ABC	46 29 08.0 84 13 49.0	22.500 105	115.5 313	41.9 Northern Christian Radio,	22.2	51.0
273D W273CR East Bay Township	LIC _C_ MI	224.8 44.4	65.58 BLFT20140918ADV	44 45 37.0 85 40 58.0	0.010	14.6 496	10.3 Michigan Community Radio	29.3	23.3
273C1 WCMM Gulliver	LIC _CX MI	309.4 128.4	139.13 BLH20170630AAM	45 58 00.0 86 29 17.0	60.000 248	92.4 456	62.7 Amc Partners Escanaba, Llc	24.2	42.6
271D W271AG Mackinaw City	LIC _C_ MI	22.2 202.4	71.04 BLFT20031125ACX	45 46 17.0 84 45 04.0	0.019 89	7.4 284	5.4 Gospel Opportunities, Inc.	41.3	32.5
219C0 WCML-FM Alpena	LIC _CX MI	93.3 274.0	73.67 BLED20101006AAG	45 08 17.3 84 09 43.6	92.000 364	169.8 641	84.6 Central Michigan Universit	24.5R	49.2M
272C3 WYBR Big Rapids	LIC NCN MI	193.2 12.9	170.79 BLH19921112KE	43 41 01.0 85 34 56.0	10.500 133	98.0 443	34.0 Mentor Partners, Inc.	50.7	68.3
218C3 WICA Traverse City	LIC DC_ MI	224.3 43.9	65.75 BLED20001114AAH	44 45 22.0 85 40 42.0	4.000 228	169.8 466	84.6 Interlochen Center For The	11.5R	54.3M
273B WIOG Bay City	LIC _CN MI	151.9 332.7	214.33 BLH19850207KK	43 28 24.0 83 50 40.0	86.000 244	97.8 427	80.3 Radio License Holding Cbc,	95.4	93.3
274D W274BN Alpena	CP DC_ MI	96.8 277.9	127.88 BPFT20181109AAL	45 02 00.0 83 28 51.0	0.250	1.1 237	7.1 West Central Michigan Medi	105.0	119.7
274D W274BN Alpena	LIC DC_ MI	96.8 277.9	127.88 BLFT20151210ACK	45 02 00.0 83 28 51.0	0.250	1.1 238	7.1 West Central Michigan Medi	105.0	119.7
271C2 WLEW-FM Bad Axe	LIC _CN MI	131.8 313.2	212.12 BLH19890117KK	43 53 28.0 83 07 26.0	50.000 150	80.5 350	54.3 Thumb Broadcasting, Inc.	111.3	127.7
271A WRKU Forestville	LIC ZC_ WI	254.7 73.0	189.22 BLH20000726AAJ	44 42 26.0 87 24 26.0	2.600 152	44.5 348	29.5 Nicolet Broadcasting, Inc.	122.4	126.6
272A WQTC-FM Manitowoc	LIC _CX WI	240.5 58.7	231.98 BLH20071001AKD	44 07 31.0 87 37 41.0	4.500 100	86.4 305	29.4 Seehafer Broadcasting Corp	123.4	135.7
269A WPRJ Coleman	LIC _CX MI	161.5 342.0	160.32 BLED20050808ACN	43 48 39.0 84 27 50.0	4.600 114	2.6 328	26.9 Spirit Communications, Inc	135.7	132.1
218A WJOH Raco	LIC _CX MI	19.8 200.3	143.29 BLED20060427AFF	46 23 28.0 84 27 52.0	5.500 100	169.8 301	84.6 Michigan Community Radio	9.5R	133.8M
274A WMOM Pentwater	LIC _CN MI	214.9 34.0	176.74 BLH19990927ABJ	43 52 10.0 86 21 32.0	6.000 100	2.8 302	28.6 Bay View Broadcasting, Inc	152.2	146.8
272C3 AU9198451 Laona	VAC ___ WI	281.9 99.3	287.81 RM11082	45 39 30.0 88 43 20.0	25.000 100	117.1 580	42.0 Results Bc'sting Of Iron M	148.5	178.5
273A R12372 Elliot Lake	VAC ___ ON	54.2 235.9	234.63	46 23 15.0 82 37 17.0	6.000 100	43.7 100	38.0	169.0	151.0
273A AL3479 Elliot Lake	DEL ___ ON	54.2 235.9	234.92	46 23 21.0 82 37 06.0	6.000 100	43.7 100	38.0	169.3	151.3
271L1 WVFC-LP Stephenson	LIC ___ MI	278.5 96.7	197.90 BLL20150626AAQ	45 24 53.9 87 36 20.6	0.100 22	 240	 Amdg Radio, Inc.	166.9	158.6
269B R28960 Elliot Lake	ADD ___ ON	54.2 235.9	234.66	46 23 16.0 82 37 16.0	50.000 150	6.0 150	65.0	206.9	167.5

CH CALL / CITY	TYPE ANT / STATE	AZI / <--	DIST / FILE #	LAT / LNG	PWR(kW) / HAAT(M)	INT(km) / COR(M)	PRO(km) / LICENSEE	*IN* / (Overlap in km)	*OUT*
218C3 WMHW-FM Mount Pleasant	LIC _CX MI	171.7 351.9	180.12 BMLED20161222AAW	43 34 33.0 84 46 29.0	9.100 164	169.8 405	84.6 Central Michigan Universit	11.5R	168.6M
271A R11060 Little Current	VAC ___ ON	69.5 251.8	260.56	45 57 15.0 81 56 45.0	6.000 100	43.7 100	38.0	195.0	176.9
275B WFUR-FM Grand Rapids	LIC _CN MI	191.2 10.8	252.17 BLH19890911KD	42 57 13.0 85 41 55.0	50.000 150	5.9 365	65.0 Furniture City Broadcastin	224.0	184.2
274C1 WRVM Suring	LIC _C_ WI	266.7 84.3	259.78 BMLED20020919AAW	44 59 50.0 88 23 49.0	100.000 299	10.1 558	72.5 Wrvm, Inc.	227.4	186.2
269B1 WMRR Muskegon Heights	LIC _CN MI	205.4 24.6	233.41 BLH19940902KB	43 16 38.0 86 20 05.0	12.000 145	3.8 335	43.3 Cc Licenses, Llc	207.4	188.3
219C3 WQQA Forestville	LIC DCX WI	250.9 69.2	201.93 BLED20121113AOL	44 33 41.0 87 29 59.0	12.000 45	169.8 246	84.6 Radio 74 Internationale	11.5R	190.4M
270C2 WKQS-FM Negaunee	LIC NCX MI	309.9 128.1	251.34 BLH20090619ABG	46 36 14.0 87 37 15.0	13.000 286	5.3 667	50.8 Great Lakes Radio, Inc.	223.4	197.5
271B WMUK Kalamazoo	LIC _CX MI	186.6 6.3	309.20 BLED20140522AFS	42 25 01.0 85 31 55.0	49.000 151	76.5 414	63.6 Western Michigan Universit	210.5	198.4

Terrain database is NED 03 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.
« = Station meets FCC minimum distance spacing for its class.
Reference station has protected zone issue: Canada

Exhibit 13.4 - W272CR vs WMKC(FM) and WLDR-FM in support of a 74.1204(d) Waiver Request



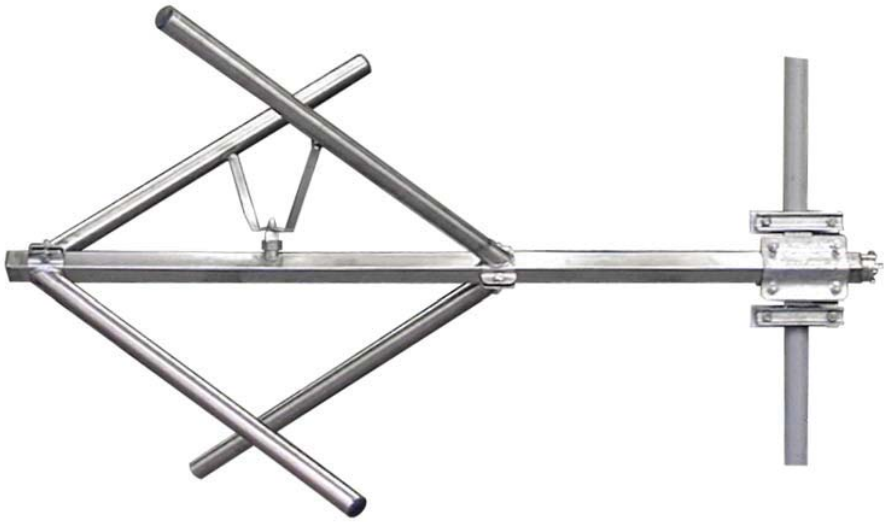


Proposed Antenna:	BEXT TFC2K Three Bay 0.85λ Spaced
Proposed Power:	0.25 kW
Antenna Height AGL:	180 meters
Interference Contour:	100.80 dBu f(50:10)
Artificial Ground Plane Height:	5 meters
Distance (Free Space) Equation:	=(10^((106.92-[desired dBu]+[ERP in dBk])/20))*1000
Field Strength (dBu) Equation	"=106.92-(20*(LOG10[DistMeters]/1000)))+[ERPin dBk]

Depression Angle Below Horizon	Antenna Relative Field	ERP in kW	ERP in dBk	Distance from Ant. to Interference Contour	Distance from Ant. to Artificial Plane	Field Strength in dBu @ Artificial Plane	Distance from Ant. to Ground Level	Field Strength in dBu @ Ground Level
0°	1.000	0.250	-6.02	1011.51 m	infinite	---	---	---
-5°	0.913	0.208	-6.81	923.51 m	2007.90 m	94.05 dBu	2065.27 m	93.81 dBu
-10°	0.686	0.118	-9.29	693.90 m	1007.78 m	97.56 dBu	1036.58 m	97.31 dBu
-15°	0.407	0.041	-13.83	411.68 m	676.15 m	96.49 dBu	695.47 m	96.25 dBu
-20°	0.149	0.006	-22.56	150.71 m	511.67 m	90.18 dBu	526.28 m	89.94 dBu
-25°	0.083	0.002	-27.64	83.96 m	414.09 m	86.94 dBu	425.92 m	86.69 dBu
-30°	0.237	0.014	-18.53	239.73 m	350.00 m	97.51 dBu	360.00 m	97.27 dBu
-35°	0.297	0.022	-16.57	300.42 m	305.10 m	100.67 dBu	313.82 m	100.42 dBu
-40°	0.255	0.016	-17.89	257.93 m	272.25 m	100.33 dBu	280.03 m	100.09 dBu
-45°	0.153	0.006	-22.33	154.76 m	247.49 m	96.72 dBu	254.56 m	96.48 dBu
-50°	0.032	0.000	-35.92	32.37 m	228.45 m	83.83 dBu	234.97 m	83.58 dBu
-55°	0.059	0.001	-30.60	59.68 m	213.64 m	89.72 dBu	219.74 m	89.48 dBu
-60°	0.115	0.003	-24.81	116.32 m	202.07 m	96.00 dBu	207.85 m	95.76 dBu
-65°	0.139	0.005	-23.16	140.60 m	193.09 m	98.04 dBu	198.61 m	97.80 dBu
-70°	0.138	0.005	-23.22	139.59 m	186.23 m	98.30 dBu	191.55 m	98.05 dBu
-75°	0.121	0.004	-24.36	122.39 m	181.17 m	97.39 dBu	186.35 m	97.15 dBu
-80°	0.090	0.002	-26.94	91.04 m	177.70 m	94.99 dBu	182.78 m	94.75 dBu
-85°	0.052	0.001	-31.70	52.60 m	175.67 m	90.33 dBu	180.69 m	90.08 dBu
-90°	0.021	0.000	-39.58	21.24 m	175.00 m	82.48 dBu	180.00 m	82.24 dBu

3 Bay TFC2K 98.1MHz

October 2015



General data of antenna System

TX station	
Site Name	
System of coordinates	WGS84
Longitude	
Latitude	
Ground level a.s.l. (m)	1.0
Antenna system height (m)	20.0
Transmitter power(Watt)	1.000
Carrier wave frequency (MHz)	98.100
Antenna system central frequency (MHz)	98.100
Antenna base diagrams type 1	TFC2K
Polarization (H/V/C/X)	C
Transmitting cable attenuation (dB)	0.0
Additional attenuations(dB)	0.0
Base diagrams sectors (T = All, F = Front)	T
Velocity factor of cables to Antennas (0÷1)	1.00
Coordinate System(C = cartesian, P = polar)	P
Mast side / diameter(cm)	0.0
Mast cross section (T/Q/C)	Q
Structure rotation w.r.t. North (°)	0.0
Mast rotation w.r.t. North (°)	0.0

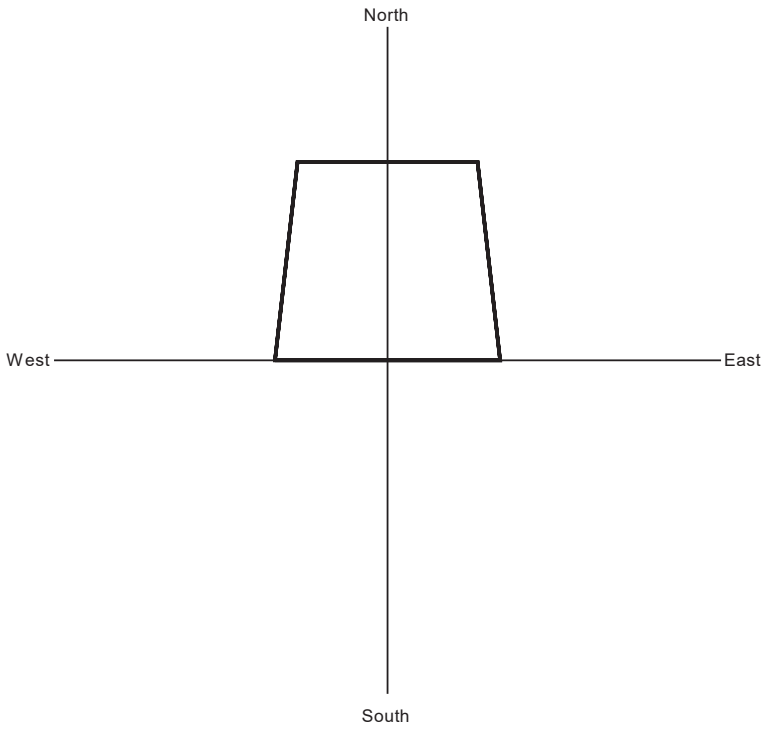
Information about antennas used in the System

	Antenna
Manufacturer	BEXTelecom
Antenna model	TFC2K
Band start(MHz)	87
Band stop(MHz)	108
diagrams Frequency(MHz)	98.1
Polariz (H/V/C/X)	C
Vertical dist (cm)	320
Height (cm)	250
Width (cm)	170
Thickness (cm)	150
Weight (Kg)	80
Maximum power (KW)	4
Gain (dBd)	-3.4
North E.C. (cm)	70
East E.C. (cm)	0
Return loss (dB)	0
R.C.Phase (°)	0

Geometrical and electrical data of antenna System

	Power (%)	*Tilt (°)*	*Az. (°/N)*	*Phase (°)*	*V dist. (m)*	*Scr-d (cm)*	*Scr-Az (°/N)*	*Rot. (1÷4)*	*Type (1÷2)*	*L cables (cm)*	*Car. phase (°)*
1	33.333	0	0	0 +0.0	2.60	0.0	0.0	1	1	0.0	0.0
2	33.333	0	0	0 +0.0	0.00	0.0	0.0	1	1	0.0	0.0
3	33.333	0	0	0 +0.0	-2.60	0.0	0.0	1	1	0.0	0.0

Plan of antenna system



Side of antenna system

Antennas arrays data

Note: calculation of single antennas arrays data (without taking into account mutual effects)

A. Antennas array azimuth (°/N)	0
B. Number of antennas	3
C. Nominal power supply (W)	1.00
D. Losses (addit. + cables) (dB)	0.0
E. Effective power supply (W)	1.00
F. Theor. maximum gain (dBd)	1.37
G. Distribution losses (dB)	0.00
H. Nominal max gain F - G (dBd)	1.37
I. Compensation losses (dB)	0.01
J. Effec. max gain H - I (dBd)	1.36
K. Effec. max gain (times)	1.37
L. Effec. max power E * K (KW)	0.0014
M. Max power depr. angle (°)	-0.2
N. Max power az. angle (°)	66

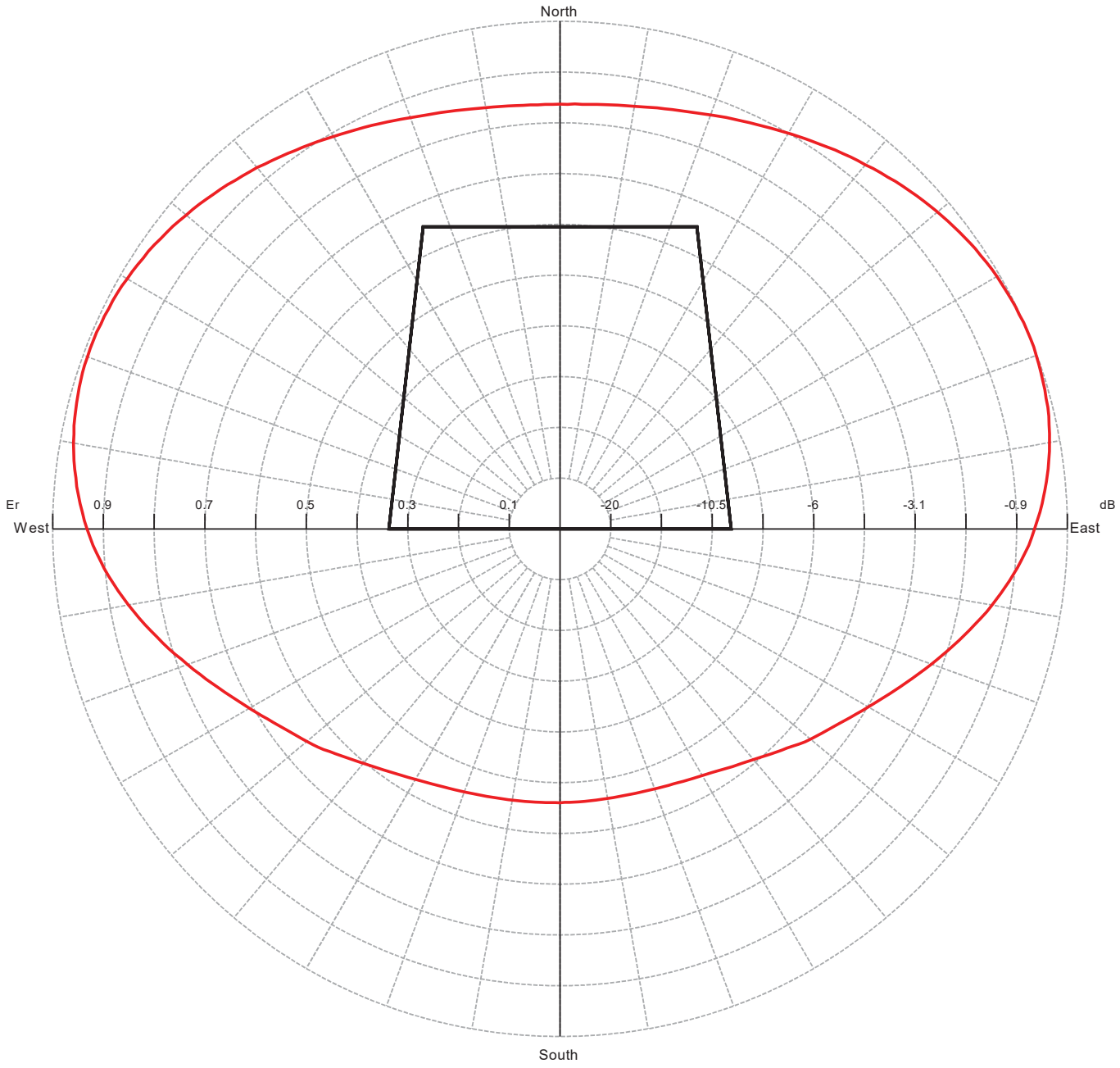
Diagram in dBK calculated at horizon

Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK
0	-30.2	90	-29.2	180	-34.0	270	-29.2
10	-30.1	100	-29.9	190	-33.9	280	-28.9
20	-29.9	110	-30.8	200	-33.8	290	-28.7
30	-29.5	120	-31.7	210	-33.5	300	-28.8
40	-29.2	130	-32.5	220	-33.0	310	-29.0
50	-28.9	140	-33.2	230	-32.4	320	-29.3
60	-28.7	150	-33.7	240	-31.7	330	-29.6
70	-28.6	160	-33.9	250	-30.8	340	-29.9
80	-28.8	170	-34.0	260	-29.9	350	-30.1

Diagram in dBK calculated at horizon
(without -20dB\'s lower limit vs maximum power)

Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK	Az. (°/N)	dBK
0	-30.2	90	-29.2	180	-34.0	270	-29.2
10	-30.1	100	-29.9	190	-33.9	280	-28.9
20	-29.9	110	-30.8	200	-33.8	290	-28.7
30	-29.5	120	-31.7	210	-33.5	300	-28.8
40	-29.2	130	-32.5	220	-33.0	310	-29.0
50	-28.9	140	-33.2	230	-32.4	320	-29.3
60	-28.7	150	-33.7	240	-31.7	330	-29.6
70	-28.6	160	-33.9	250	-30.8	340	-29.9
80	-28.8	170	-34.0	260	-29.9	350	-30.1

Horizontal diagram at 0.0° Tilt (Total Antenna)



0.0° Tilt (Total Antenna), Gain (dBd): 1.36 ERP T.Max(KW): 0.001 ERP E.Max(KW): 0.001

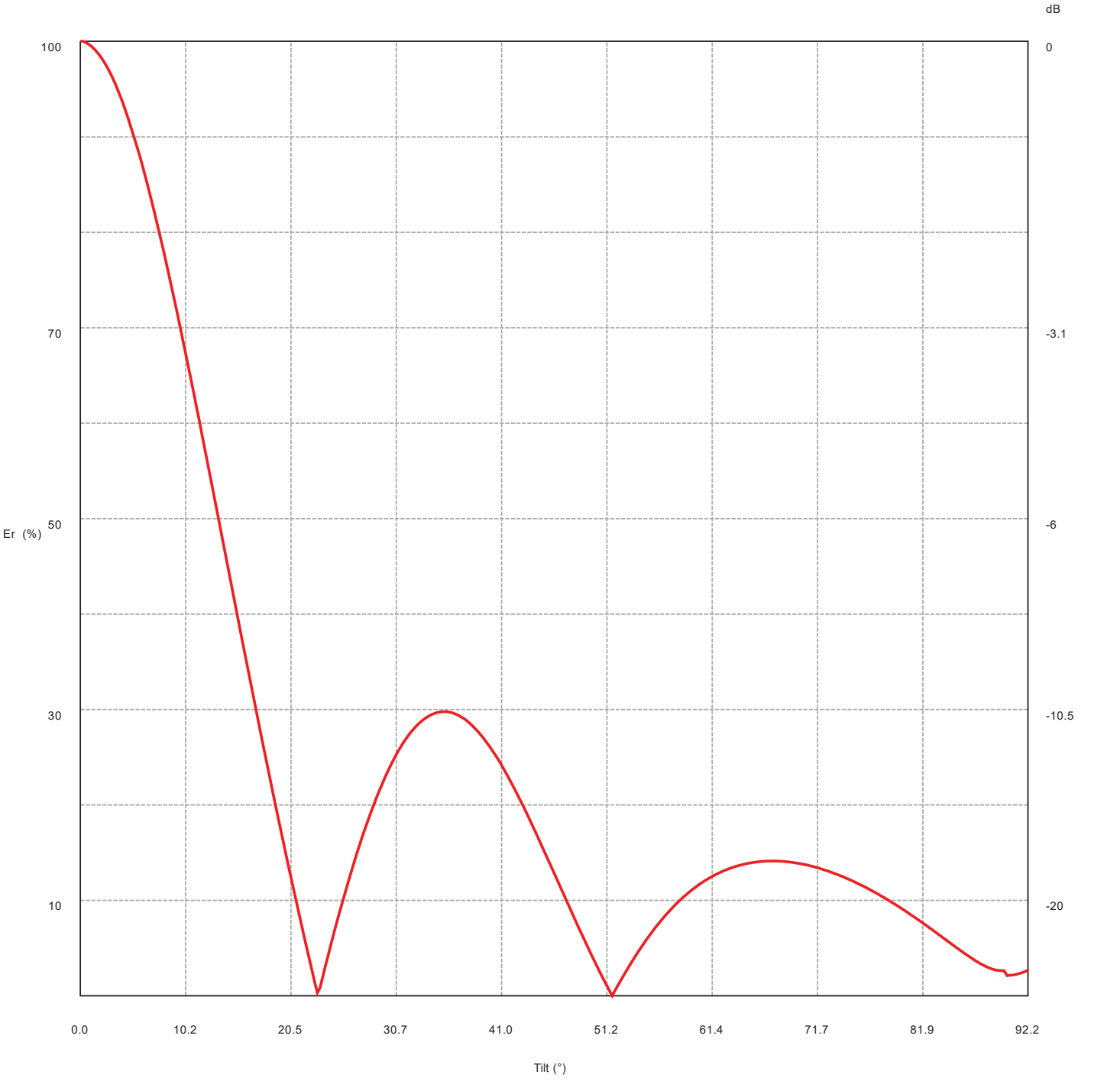
Horizontal diagram at 0.0° Tilt (Total Antenna)

Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
0.0	83.7	1.0	60.0	99.4	1.4	120.0	70.2	0.7
1.0	83.7	1.0	61.0	99.5	1.4	121.0	69.5	0.7
2.0	83.8	1.0	62.0	99.7	1.4	122.0	68.8	0.6
3.0	83.8	1.0	63.0	99.8	1.4	123.0	68.2	0.6
4.0	83.8	1.0	64.0	99.9	1.4	124.0	67.6	0.6
5.0	83.9	1.0	65.0	99.9	1.4	125.0	67.0	0.6
6.0	84.0	1.0	66.0	100.0	1.4	126.0	66.5	0.6
7.0	84.1	1.0	67.0	100.0	1.4	127.0	66.0	0.6
8.0	84.2	1.0	68.0	100.0	1.4	128.0	65.4	0.6
9.0	84.4	1.0	69.0	100.0	1.4	129.0	64.9	0.6
10.0	84.5	1.0	70.0	99.9	1.4	130.0	64.5	0.6
11.0	84.7	1.0	71.0	99.8	1.4	131.0	63.9	0.6
12.0	84.9	1.0	72.0	99.7	1.4	132.0	63.3	0.5
13.0	85.1	1.0	73.0	99.5	1.4	133.0	62.8	0.5
14.0	85.3	1.0	74.0	99.4	1.4	134.0	62.2	0.5
15.0	85.5	1.0	75.0	99.2	1.3	135.0	61.7	0.5
16.0	85.7	1.0	76.0	99.1	1.3	136.0	61.2	0.5
17.0	86.0	1.0	77.0	98.9	1.3	137.0	60.7	0.5
18.0	86.2	1.0	78.0	98.5	1.3	138.0	60.2	0.5
19.0	86.5	1.0	79.0	98.3	1.3	139.0	59.7	0.5
20.0	86.8	1.0	80.0	97.9	1.3	140.0	59.3	0.5
21.0	87.1	1.0	81.0	97.6	1.3	141.0	58.9	0.5
22.0	87.4	1.0	82.0	97.3	1.3	142.0	58.5	0.5
23.0	87.7	1.1	83.0	96.9	1.3	143.0	58.2	0.5
24.0	88.0	1.1	84.0	96.5	1.3	144.0	57.9	0.5
25.0	88.3	1.1	85.0	96.1	1.3	145.0	57.5	0.5
26.0	88.6	1.1	86.0	95.6	1.3	146.0	57.2	0.4
27.0	88.9	1.1	87.0	95.2	1.2	147.0	56.9	0.4
28.0	89.3	1.1	88.0	94.6	1.2	148.0	56.6	0.4
29.0	89.6	1.1	89.0	94.1	1.2	149.0	56.3	0.4
30.0	90.1	1.1	90.0	93.5	1.2	150.0	56.1	0.4
31.0	90.4	1.1	91.0	93.0	1.2	151.0	55.9	0.4
32.0	90.7	1.1	92.0	92.4	1.2	152.0	55.7	0.4
33.0	91.1	1.1	93.0	91.8	1.2	153.0	55.5	0.4
34.0	91.4	1.1	94.0	91.1	1.1	154.0	55.3	0.4
35.0	91.8	1.2	95.0	90.4	1.1	155.0	55.1	0.4
36.0	92.3	1.2	96.0	89.6	1.1	156.0	55.0	0.4
37.0	92.6	1.2	97.0	88.9	1.1	157.0	54.9	0.4
38.0	93.0	1.2	98.0	88.1	1.1	158.0	54.8	0.4
39.0	93.3	1.2	99.0	87.3	1.0	159.0	54.6	0.4
40.0	93.6	1.2	100.0	86.4	1.0	160.0	54.5	0.4
41.0	94.1	1.2	101.0	85.6	1.0	161.0	54.4	0.4
42.0	94.4	1.2	102.0	84.8	1.0	162.0	54.3	0.4
43.0	94.7	1.2	103.0	83.9	1.0	163.0	54.3	0.4
44.0	95.2	1.2	104.0	83.0	0.9	164.0	54.2	0.4
45.0	95.5	1.2	105.0	82.2	0.9	165.0	54.1	0.4
46.0	95.8	1.3	106.0	81.3	0.9	166.0	54.1	0.4
47.0	96.2	1.3	107.0	80.5	0.9	167.0	54.0	0.4
48.0	96.5	1.3	108.0	79.6	0.9	168.0	54.0	0.4
49.0	96.8	1.3	109.0	78.8	0.8	169.0	53.9	0.4
50.0	97.2	1.3	110.0	77.9	0.8	170.0	53.9	0.4
51.0	97.4	1.3	111.0	77.0	0.8	171.0	53.9	0.4
52.0	97.7	1.3	112.0	76.2	0.8	172.0	53.9	0.4
53.0	97.9	1.3	113.0	75.4	0.8	173.0	53.9	0.4
54.0	98.2	1.3	114.0	74.6	0.8	174.0	53.9	0.4
55.0	98.5	1.3	115.0	73.8	0.7	175.0	53.9	0.4
56.0	98.7	1.3	116.0	73.1	0.7	176.0	53.9	0.4
57.0	98.9	1.3	117.0	72.3	0.7	177.0	53.9	0.4
58.0	99.1	1.3	118.0	71.5	0.7	178.0	53.9	0.4
59.0	99.3	1.3	119.0	70.8	0.7	179.0	53.9	0.4

Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)	Az (°)	Er (%)	ERP (W)
180.0	54.0	0.4	240.0	70.7	0.7	300.0	98.5	1.3
181.0	54.0	0.4	241.0	71.3	0.7	301.0	98.4	1.3
182.0	54.0	0.4	242.0	72.0	0.7	302.0	98.2	1.3
183.0	54.0	0.4	243.0	72.7	0.7	303.0	97.9	1.3
184.0	54.0	0.4	244.0	73.5	0.7	304.0	97.8	1.3
185.0	54.1	0.4	245.0	74.2	0.8	305.0	97.6	1.3
186.0	54.1	0.4	246.0	75.0	0.8	306.0	97.3	1.3
187.0	54.1	0.4	247.0	75.8	0.8	307.0	97.1	1.3
188.0	54.1	0.4	248.0	76.5	0.8	308.0	96.8	1.3
189.0	54.2	0.4	249.0	77.4	0.8	309.0	96.5	1.3
190.0	54.3	0.4	250.0	78.1	0.8	310.0	96.2	1.3
191.0	54.3	0.4	251.0	78.9	0.9	311.0	95.9	1.3
192.0	54.4	0.4	252.0	79.8	0.9	312.0	95.6	1.3
193.0	54.4	0.4	253.0	80.6	0.9	313.0	95.3	1.2
194.0	54.5	0.4	254.0	81.5	0.9	314.0	95.0	1.2
195.0	54.6	0.4	255.0	82.2	0.9	315.0	94.6	1.2
196.0	54.7	0.4	256.0	83.1	0.9	316.0	94.3	1.2
197.0	54.8	0.4	257.0	84.0	1.0	317.0	93.9	1.2
198.0	54.9	0.4	258.0	84.8	1.0	318.0	93.5	1.2
199.0	55.0	0.4	259.0	85.6	1.0	319.0	93.2	1.2
200.0	55.1	0.4	260.0	86.4	1.0	320.0	92.9	1.2
201.0	55.3	0.4	261.0	87.2	1.0	321.0	92.5	1.2
202.0	55.5	0.4	262.0	88.0	1.1	322.0	92.2	1.2
203.0	55.6	0.4	263.0	88.7	1.1	323.0	91.7	1.2
204.0	55.7	0.4	264.0	89.4	1.1	324.0	91.4	1.1
205.0	55.9	0.4	265.0	90.2	1.1	325.0	91.0	1.1
206.0	56.1	0.4	266.0	90.8	1.1	326.0	90.7	1.1
207.0	56.3	0.4	267.0	91.4	1.1	327.0	90.4	1.1
208.0	56.5	0.4	268.0	92.1	1.2	328.0	89.9	1.1
209.0	56.7	0.4	269.0	92.7	1.2	329.0	89.6	1.1
210.0	57.0	0.4	270.0	93.2	1.2	330.0	89.3	1.1
211.0	57.3	0.4	271.0	93.8	1.2	331.0	88.9	1.1
212.0	57.5	0.5	272.0	94.2	1.2	332.0	88.6	1.1
213.0	57.8	0.5	273.0	94.7	1.2	333.0	88.3	1.1
214.0	58.1	0.5	274.0	95.2	1.2	334.0	88.0	1.1
215.0	58.5	0.5	275.0	95.6	1.3	335.0	87.7	1.1
216.0	58.8	0.5	276.0	95.9	1.3	336.0	87.4	1.0
217.0	59.1	0.5	277.0	96.4	1.3	337.0	87.1	1.0
218.0	59.5	0.5	278.0	96.7	1.3	338.0	86.8	1.0
219.0	59.9	0.5	279.0	97.1	1.3	339.0	86.5	1.0
220.0	60.3	0.5	280.0	97.4	1.3	340.0	86.2	1.0
221.0	60.7	0.5	281.0	97.6	1.3	341.0	86.0	1.0
222.0	61.2	0.5	282.0	97.9	1.3	342.0	85.7	1.0
223.0	61.6	0.5	283.0	98.2	1.3	343.0	85.5	1.0
224.0	62.1	0.5	284.0	98.3	1.3	344.0	85.3	1.0
225.0	62.6	0.5	285.0	98.5	1.3	345.0	85.1	1.0
226.0	63.1	0.5	286.0	98.7	1.3	346.0	84.9	1.0
227.0	63.7	0.6	287.0	98.9	1.3	347.0	84.7	1.0
228.0	64.2	0.6	288.0	99.0	1.3	348.0	84.5	1.0
229.0	64.7	0.6	289.0	99.1	1.3	349.0	84.4	1.0
230.0	65.1	0.6	290.0	99.1	1.3	350.0	84.2	1.0
231.0	65.6	0.6	291.0	99.2	1.3	351.0	84.1	1.0
232.0	66.1	0.6	292.0	99.2	1.3	352.0	84.0	1.0
233.0	66.5	0.6	293.0	99.2	1.3	353.0	83.9	1.0
234.0	67.1	0.6	294.0	99.1	1.3	354.0	83.8	1.0
235.0	67.6	0.6	295.0	99.1	1.3	355.0	83.8	1.0
236.0	68.2	0.6	296.0	99.0	1.3	356.0	83.8	1.0
237.0	68.8	0.6	297.0	99.0	1.3	357.0	83.7	1.0
238.0	69.4	0.7	298.0	98.9	1.3	358.0	83.7	1.0
239.0	70.0	0.7	299.0	98.7	1.3	359.0	83.7	1.0

Vertical diagram at an azimuth of 66.9°



66.9° Az. (Total Antenna), Gain (dBd): 1.36 ERP T.Max(KW): 0.001 ERP E.Max(KW): 0.001

Vertical diagram at an azimuth of 66.9°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	1.4	15.4	39.3	0.2	30.7	25.3	0.1
0.3	100.0	1.4	15.6	37.9	0.2	31.0	25.8	0.1
0.5	99.9	1.4	15.9	36.5	0.2	31.2	26.2	0.1
0.8	99.7	1.4	16.1	35.1	0.2	31.5	26.6	0.1
1.0	99.5	1.4	16.4	33.7	0.2	31.7	27.0	0.1
1.3	99.3	1.3	16.6	32.3	0.1	32.0	27.4	0.1
1.5	99.0	1.3	16.9	30.9	0.1	32.3	27.8	0.1
1.8	98.7	1.3	17.2	29.5	0.1	32.5	28.1	0.1
2.0	98.3	1.3	17.4	28.2	0.1	32.8	28.4	0.1
2.3	97.8	1.3	17.7	26.8	0.1	33.0	28.6	0.1
2.6	97.4	1.3	17.9	25.5	0.1	33.3	28.9	0.1
2.8	96.9	1.3	18.2	24.1	0.1	33.5	29.1	0.1
3.1	96.3	1.3	18.4	22.8	0.1	33.8	29.3	0.1
3.3	95.7	1.3	18.7	21.4	0.1	34.0	29.4	0.1
3.6	95.0	1.2	18.9	20.1	0.1	34.3	29.5	0.1
3.8	94.3	1.2	19.2	18.8	0.0	34.6	29.6	0.1
4.1	93.6	1.2	19.5	17.5	0.0	34.8	29.7	0.1
4.4	92.8	1.2	19.7	16.2	0.0	35.1	29.8	0.1
4.6	92.0	1.2	20.0	14.9	0.0	35.3	29.8	0.1
4.9	91.2	1.1	20.2	13.6	0.0	35.6	29.8	0.1
5.1	90.4	1.1	20.5	12.4	0.0	35.8	29.7	0.1
5.4	89.4	1.1	20.7	11.1	0.0	36.1	29.7	0.1
5.6	88.5	1.1	21.0	9.8	0.0	36.4	29.6	0.1
5.9	87.5	1.0	21.2	8.6	0.0	36.6	29.5	0.1
6.1	86.5	1.0	21.5	7.4	0.0	36.9	29.3	0.1
6.4	85.5	1.0	21.8	6.2	0.0	37.1	29.2	0.1
6.7	84.4	1.0	22.0	5.0	0.0	37.4	29.0	0.1
6.9	83.3	0.9	22.3	3.8	0.0	37.6	28.8	0.1
7.2	82.2	0.9	22.5	2.6	0.0	37.9	28.5	0.1
7.4	81.1	0.9	22.8	1.4	0.0	38.1	28.3	0.1
7.7	79.9	0.9	23.0	0.3	0.0	38.4	28.0	0.1
7.9	78.7	0.8	23.3	0.8	0.0	38.7	27.7	0.1
8.2	77.5	0.8	23.6	1.9	0.0	38.9	27.4	0.1
8.4	76.3	0.8	23.8	3.0	0.0	39.2	27.0	0.1
8.7	75.1	0.8	24.1	4.1	0.0	39.4	26.7	0.1
9.0	73.8	0.7	24.3	5.2	0.0	39.7	26.3	0.1
9.2	72.5	0.7	24.6	6.3	0.0	39.9	25.9	0.1
9.5	71.2	0.7	24.8	7.3	0.0	40.2	25.5	0.1
9.7	69.9	0.7	25.1	8.3	0.0	40.4	25.1	0.1
10.0	68.6	0.6	25.3	9.3	0.0	40.7	24.6	0.1
10.2	67.3	0.6	25.6	10.3	0.0	41.0	24.2	0.1
10.5	65.9	0.6	25.9	11.2	0.0	41.2	23.7	0.1
10.8	64.6	0.6	26.1	12.2	0.0	41.5	23.2	0.1
11.0	63.2	0.5	26.4	13.1	0.0	41.7	22.7	0.1
11.3	61.8	0.5	26.6	14.0	0.0	42.0	22.2	0.1
11.5	60.4	0.5	26.9	14.9	0.0	42.2	21.6	0.1
11.8	59.1	0.5	27.1	15.8	0.0	42.5	21.1	0.1
12.0	57.7	0.5	27.4	16.6	0.0	42.8	20.6	0.1
12.3	56.3	0.4	27.6	17.4	0.0	43.0	20.0	0.1
12.5	54.9	0.4	27.9	18.2	0.0	43.3	19.4	0.1
12.8	53.4	0.4	28.2	19.0	0.0	43.5	18.8	0.0
13.1	52.0	0.4	28.4	19.7	0.1	43.8	18.3	0.0
13.3	50.6	0.3	28.7	20.4	0.1	44.0	17.7	0.0
13.6	49.2	0.3	28.9	21.1	0.1	44.3	17.1	0.0
13.8	47.8	0.3	29.2	21.8	0.1	44.5	16.5	0.0
14.1	46.4	0.3	29.4	22.4	0.1	44.8	15.9	0.0
14.3	44.9	0.3	29.7	23.1	0.1	45.1	15.3	0.0
14.6	43.5	0.3	30.0	23.7	0.1	45.3	14.7	0.0
14.8	42.1	0.2	30.2	24.2	0.1	45.6	14.0	0.0
15.1	40.7	0.2	30.5	24.8	0.1	45.8	13.4	0.0

Vertical diagram at an azimuth of 66.9°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
46.1	12.8	0.0	61.4	12.5	0.0	76.8	11.1	0.0
46.3	12.2	0.0	61.7	12.7	0.0	77.1	11.0	0.0
46.6	11.6	0.0	62.0	12.8	0.0	77.3	10.8	0.0
46.8	11.0	0.0	62.2	12.9	0.0	77.6	10.7	0.0
47.1	10.4	0.0	62.5	13.1	0.0	77.8	10.5	0.0
47.4	9.7	0.0	62.7	13.2	0.0	78.1	10.3	0.0
47.6	9.1	0.0	63.0	13.3	0.0	78.3	10.2	0.0
47.9	8.5	0.0	63.2	13.4	0.0	78.6	10.0	0.0
48.1	7.9	0.0	63.5	13.5	0.0	78.8	9.8	0.0
48.4	7.3	0.0	63.7	13.6	0.0	79.1	9.7	0.0
48.6	6.7	0.0	64.0	13.6	0.0	79.4	9.5	0.0
48.9	6.1	0.0	64.3	13.7	0.0	79.6	9.3	0.0
49.2	5.5	0.0	64.5	13.8	0.0	79.9	9.1	0.0
49.4	4.9	0.0	64.8	13.8	0.0	80.1	9.0	0.0
49.7	4.4	0.0	65.0	13.9	0.0	80.4	8.8	0.0
49.9	3.8	0.0	65.3	13.9	0.0	80.6	8.6	0.0
50.2	3.2	0.0	65.5	14.0	0.0	80.9	8.4	0.0
50.4	2.7	0.0	65.8	14.0	0.0	81.2	8.2	0.0
50.7	2.1	0.0	66.0	14.1	0.0	81.4	8.0	0.0
50.9	1.6	0.0	66.3	14.1	0.0	81.7	7.8	0.0
51.2	1.0	0.0	66.6	14.1	0.0	81.9	7.6	0.0
51.5	0.5	0.0	66.8	14.1	0.0	82.2	7.4	0.0
51.7	0.0	0.0	67.1	14.1	0.0	82.4	7.2	0.0
52.0	0.5	0.0	67.3	14.1	0.0	82.7	7.0	0.0
52.2	1.0	0.0	67.6	14.1	0.0	82.9	6.8	0.0
52.5	1.5	0.0	67.8	14.1	0.0	83.2	6.6	0.0
52.7	2.0	0.0	68.1	14.1	0.0	83.5	6.4	0.0
53.0	2.4	0.0	68.4	14.1	0.0	83.7	6.2	0.0
53.2	2.9	0.0	68.6	14.1	0.0	84.0	6.0	0.0
53.5	3.4	0.0	68.9	14.0	0.0	84.2	5.8	0.0
53.8	3.8	0.0	69.1	14.0	0.0	84.5	5.6	0.0
54.0	4.2	0.0	69.4	14.0	0.0	84.7	5.4	0.0
54.3	4.7	0.0	69.6	13.9	0.0	85.0	5.2	0.0
54.5	5.1	0.0	69.9	13.9	0.0	85.2	5.0	0.0
54.8	5.5	0.0	70.1	13.8	0.0	85.5	4.8	0.0
55.0	5.9	0.0	70.4	13.8	0.0	85.8	4.6	0.0
55.3	6.3	0.0	70.7	13.7	0.0	86.0	4.4	0.0
55.6	6.6	0.0	70.9	13.6	0.0	86.3	4.2	0.0
55.8	7.0	0.0	71.2	13.6	0.0	86.5	4.0	0.0
56.1	7.3	0.0	71.4	13.5	0.0	86.8	3.9	0.0
56.3	7.7	0.0	71.7	13.4	0.0	87.0	3.7	0.0
56.6	8.0	0.0	71.9	13.3	0.0	87.3	3.5	0.0
56.8	8.3	0.0	72.2	13.2	0.0	87.6	3.4	0.0
57.1	8.7	0.0	72.4	13.2	0.0	87.8	3.2	0.0
57.3	9.0	0.0	72.7	13.1	0.0	88.1	3.1	0.0
57.6	9.2	0.0	73.0	13.0	0.0	88.3	2.9	0.0
57.9	9.5	0.0	73.2	12.9	0.0	88.6	2.8	0.0
58.1	9.8	0.0	73.5	12.8	0.0	88.8	2.7	0.0
58.4	10.1	0.0	73.7	12.7	0.0	89.1	2.7	0.0
58.6	10.3	0.0	74.0	12.6	0.0	89.3	2.6	0.0
58.9	10.6	0.0	74.2	12.4	0.0	89.6	2.6	0.0
59.1	10.8	0.0	74.5	12.3	0.0	89.9	2.6	0.0
59.4	11.0	0.0	74.8	12.2	0.0	90.1	2.1	0.0
59.6	11.2	0.0	75.0	12.1	0.0	90.4	2.1	0.0
59.9	11.5	0.0	75.3	11.9	0.0	90.6	2.2	0.0
60.2	11.7	0.0	75.5	11.8	0.0	90.9	2.2	0.0
60.4	11.8	0.0	75.8	11.7	0.0	91.1	2.3	0.0
60.7	12.0	0.0	76.0	11.5	0.0	91.4	2.4	0.0
60.9	12.2	0.0	76.3	11.4	0.0	91.6	2.5	0.0
61.2	12.4	0.0	76.5	11.3	0.0	91.9	2.6	0.0