

# Exhibit 13.1a Copy of USGS Topographic Map

## Proposed Site

	Latitude (D M S)	Longitude (D M S)
NAD 27 datum values:	28 21 21.98000	80 44 46.60000
NAD 83 datum values:	28 21 23.00000	80 44 45.80000

▲ 23 ft/7 m

0 100 200ft



# Exhibit 13.1b Copy of USGS Aerial Photograph

## Proposed Site

	<u>Latitude (D M S)</u>	<u>Longitude (D M S)</u>
NAD 27 datum values:	28 21 21.98000	80 44 46.60000
NAD 83 datum values:	28 21 23.00000	80 44 45.80000

▲ 23 ft/7 m

0 50 100ft





# Exhibit 13.2

## Vertical Plan of Antenna System

THE SITE IS LOCATED AT 200 SOUTH BURNETT ROAD;  
THE CITY OF COCOA; BREVARD COUNTY; THE STATE OF FLORIDA.

Antenna Structure Registration No.

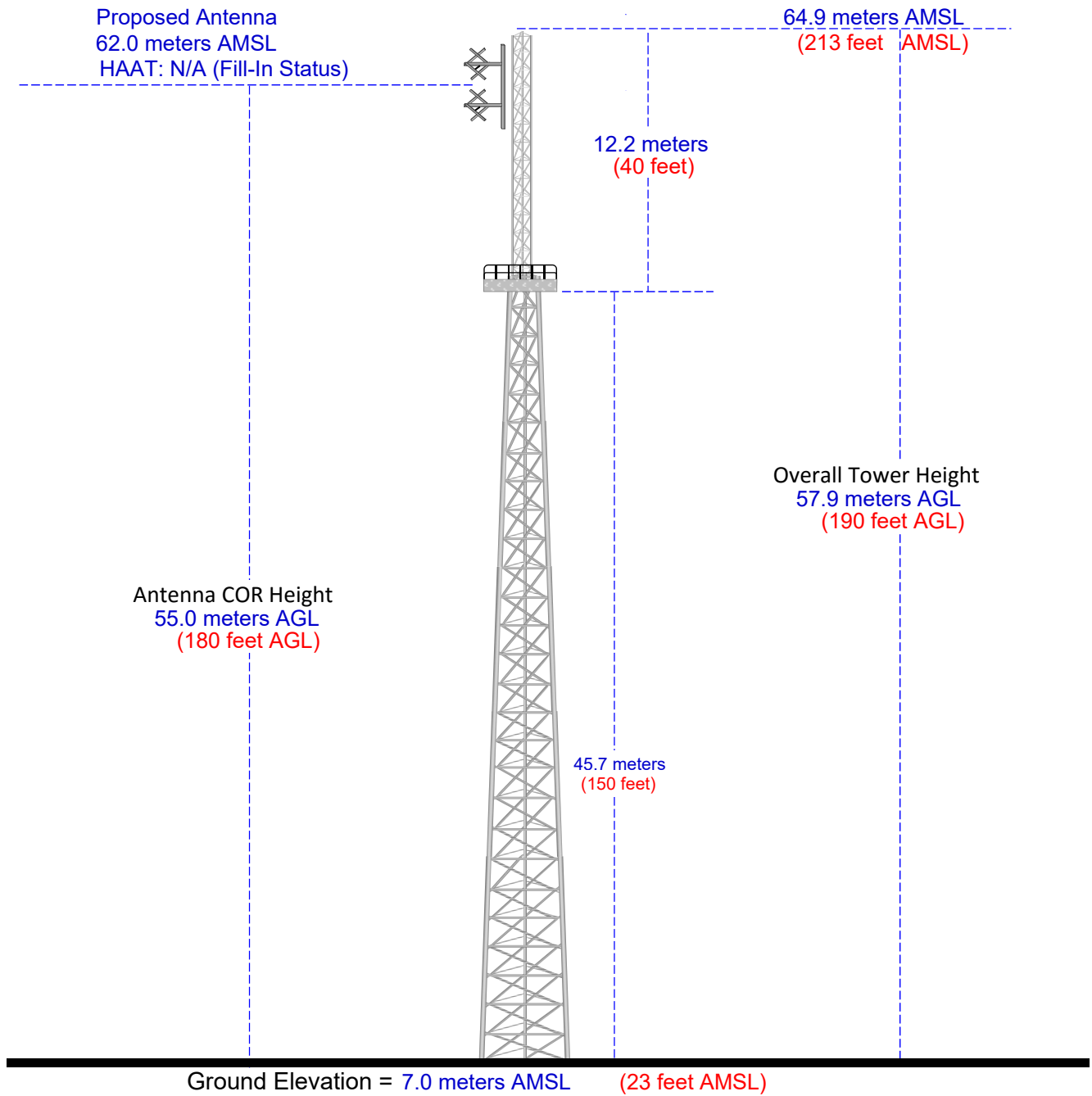
**Not Required**

Latitude (D M S)

Longitude (D M S)

NAD 27 datum values: 28 21 21.98000 80 44 46.60000

NAD 83 datum values: 28 21 23.00000 80 44 45.80000



Drawing is not to Scale

**Munn-Reese, Inc.**

Broadcast Engineering Consultants  
Coldwater, MI 49036

## Exhibit 13.3 Proposed Service Contour Map

**Proposed 60 dBμ F(50:50) Contour**

**CH260D.P**  
Cocoa, FL  
Proposed Operation  
Facility ID: 146519  
Latitude: 28-21-22 N  
Longitude: 080-44-47 W  
ERP: 0.25 kW  
Channel: 260D (99.9 MHz)  
AMSL Height: 62.0 m  
Horiz. Pattern: Omni

**60 dBμ F(50:50) Contour**  
Total Population: 104,786  
Coverage Area: 318 sq. km

NED 03 SEC Terrain Database  
US Census 2010 PL Database

Terrain  
0 23 m

Scale 1:125,000  
0 2 4 6 km

V-Soft Communications LLC ©



## Exhibit 13.4

### Proposed vs. Primary Contour & §74.1233(a)(1) Relocation Showing ("250 Mile Window Application")

NED 03 SEC Terrain Database  
US Census 2010 PL Database

**2 mV/m Daytime Contour**

**25 mile AM site Radius**

**WWBC(AM)**

**Proposed 60 dBμ F(50:50) Contour**

**CH260D.P**

**CH260D.P**  
Cocoa, FL  
Proposed Operation  
Facility ID: 146519  
Latitude: 28-21-22 N  
Longitude: 080-44-47 W  
ERP: 0.25 kW  
Channel: 260D (99.9 MHz)  
AMSL Height: 62.0 m  
Horiz. Pattern: Omni

**W260CL.C**  
West Palm Beach, FL  
BNPFT20130805ACD  
Facility ID: 146519  
Latitude: 26-45-42 N  
Longitude: 080-04-42 W  
ERP: 0.17 kW  
Channel: 260D (99.9 MHz)  
AMSL Height: 38.0 m  
Horiz. Pattern: Directional

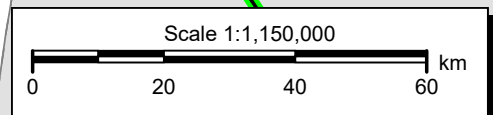
**§74.1233(a)(1) Relocation Distance: 189 km**

**WWBC 1510 kHz**  
Cocoa, Florida  
Station Class: D  
Region 2 Class: B  
Facility ID: 3071  
File Number: BL-20070503ACZ  
Site Location: 28-21-12.0 N 80-46-45.0 W (NAD 27)  
Site Location: 28-21-13.0 N 80-46-44.2 W (NAD 83)  
Power: 50 kW, Directional  
Hours: Daytime  
Pattern Type: Augmented  
Towers: 2 Augmentations: 2  
RMS Theoretical: 2294.35 mV/meter  
RMS Standard: 2410.35 mV/meter  
RMS Augmented: mV/meter  
Time Zone: 1

**Present 60 dBμ F(50:50) Contour**



**W260CL.C**



# Exhibit 13.5

## Tabulation of Proposed Allocation

REFERENCE		CH# 260D - 99.9 MHz, Pwr= 0.25 kW, HAAT= 58.7 M, COR= 62 M							DISPLAY DATES		
28 21 22.0 N.		Average Protected F(50-50)= 10.07 km							DATA 01-26-16		
80 44 47.0 W.		Omni -di rectional							SEARCH 01-27-16		
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR(kW)	INT(km)	PRO(km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG	HAAT(M)	COR(M)	LICENSEE	(Overlap	in km)
262C	WRUM	LIC	CY	307.9	40.73	28 34 51.0	100.000	12.5	86.0	18.4	-46.3*<
Orlando		FL		127.8	BMLH20031010ADF	81 04 32.0	484	497	Clear Channel	Broadcasting	
257C2	WLRQ-FM	LIC	CN	152.7	9.72	28 16 42.0	50.000	5.8	51.4	-6.0*<	-42.7*<
Cocoa		FL		332.7	BLH19910122KC	80 42 03.0	150	151	Capstar Tx, LLC		
259C2	WJKD	LIC	CX	157.6	74.61	27 44 07.0	50.000	75.2	49.6	-10.3*<	11.5
Vero Beach		FL		337.7	BMLH20040527AKU	80 27 27.0	134	137	Vero Beach Fm Radio Partne		
260L1	WIME-LP	CP		300.6	45.90	28 33 56.0	0.100			17.4	7.2
Orlando		FL		120.4	BNPL20131104ABD	81 09 04.0	28	43	Musica Sublime Inc.		
207C3	WPIO	LIC	CX	337.9	26.83	28 34 49.0	7.100	23.8	7.1	11.5R	15.3M
Titusville		FL		157.9	BLED20100315AAA	80 51 00.0	102	105	Florida Public Radio, Inc.		
260L1	WOGJ-LP	LIC		282.0	62.46	28 28 16.0	0.048			34.6	23.7
Orlando		FL		101.7	BLL20160111ABP	81 22 18.0	43	67	Haitian Relief Radio And C		
260L1	WJRQ-LP	CP		249.5	76.51	28 06 47.0	0.014			47.6	37.4
Poinciana		FL		69.1	BMPL20150105AAI	81 28 38.0	79	101	Hispanic Women Of Poincian		
259L1	WXDN-LP	CP		290.4	58.56	28 32 18.4	0.100			40.6	39.1
Orlando		FL		110.1	BNPL20131106AJH	81 18 30.3	25	46	Awakening/art & Culture		
260L1	WJVE-LP	LIC		318.6	79.45	28 53 29.0	0.025			49.7	40.6
DeBary		FL		138.4	BLL20151228BAD	81 17 09.0	60	69	Ministerio R.m., Inc.		
260L1	WPKA-LP	LIC		296.0	82.60	28 40 48.2	0.067			54.5	44.0
Apopka		FL		115.7	BLL20151019AVX	81 30 26.5	37	64	Vjil Inc.		
206C3	WLAZ	LIC	DVX	249.1	56.43	28 10 27.0	5.200	23.8	7.1	11.5R	44.9M
Kissimmee		FL		68.8	BLED20110525ADJ	81 17 01.0	159	177	Caguas Educational Tv, Inc		
259L1	WBVL-LP	LIC		267.6	65.79	28 19 46.0	0.089			47.8	46.3
Kissimmee		FL		87.3	BLL20141009ADQ	81 25 05.0	32	54	The Broadcasting Group, In		
259L1	WDDT-LP	APP		308.0	72.22	28 45 17.3	0.100			53.8	52.5
Lake Mary		FL		127.7	BMPL20150713ACO	81 19 49.0	27	42	Education Through Media Fo		
260C3	WXJB	CP	ZCX	281.3	168.21	28 38 28.0	9.200	101.9	38.1	56.4	96.8
Homosassa		FL		100.5	BPH20130711AAH	82 26 14.0	163	181	George S. Flinn, Jr.		
One Step Application											

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
Contour distances are on direct line to and from reference station. 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.  
< = Contour Overlap  
Reference station has protected zone issue: AM tower

Blue Highlighted Text denotes supplemental contour protection studies toward select facilities as included in **Exhibit(s) 13.6(a-b)**.

Yellow Highlighted Text denotes the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WRUM(FM) - Orlando, FL (CH262B) and WLRQ-FM - Cocoa, FL (CH257C2) as noted in **Exhibit 13.7**. Protection has been based on the worst case calculated 119.5 dBμ F(50:10) Interference Contour, corresponding to the worst case 79.5 dBμ F(50:50) Protected Contour. Protection has been demonstrated through the attached downward radiation study. Full protection will be afforded each facility as the interference area will not reach the ground nor a seven meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer specifications has also been included in **Exhibit 13.8**.

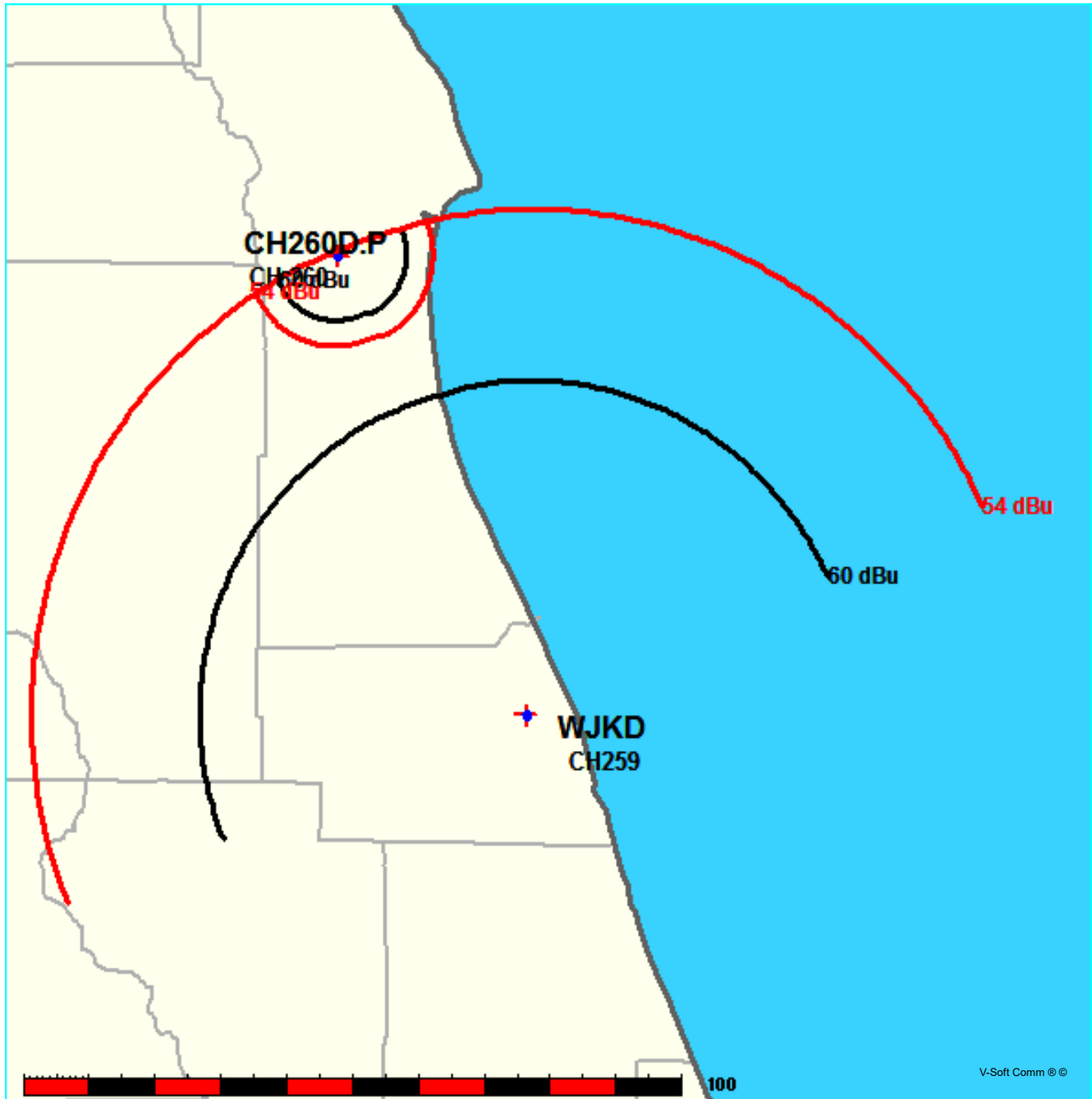
## Exhibit 13.6a

### Contour Protection Studies Toward Select Station(s)

FMCommander Single Allocation Study - 01-27-2016 - NED 03 SEC  
CH260D.P's Overlaps (In= -10.3 km, Out= 11.5 km)

CH260D.P CH 260 D  
Lat= 28 21 22.0, Lng= 80 44 47.0  
0.25 kW 58.7 m HAAT, 62 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

WJKD CH 259 C2 BMLH20040527AKU  
Lat= 27 44 07.0, Lng= 80 27 27.0  
50.0 kW 134 m HAAT, 137 m COR  
Prot.= 60 dBu, Intef.= 54 dBu



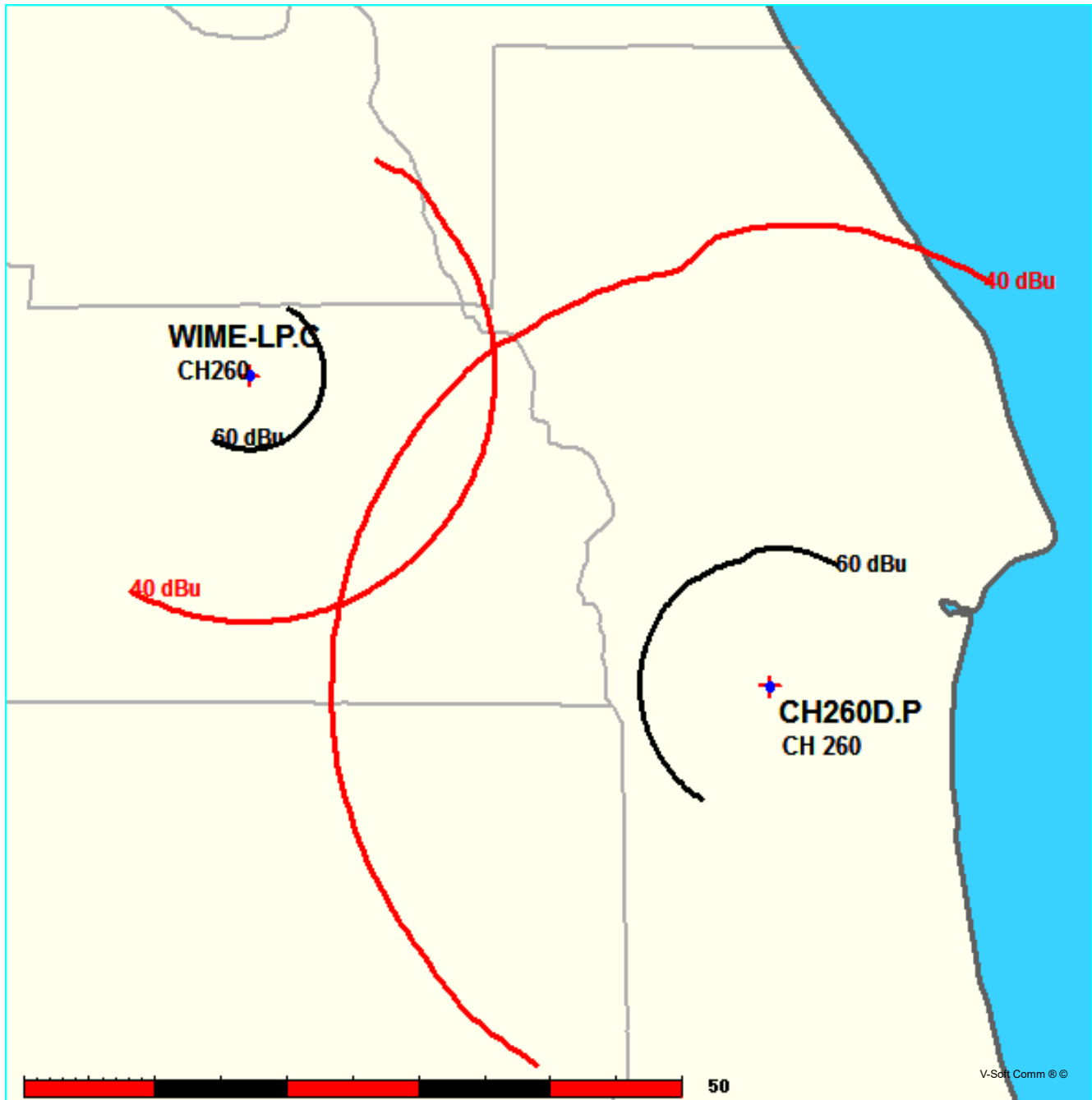
## Exhibit 13.6b

### Contour Protection Studies Toward Select Station(s)

FMCommander Single Allocation Study - 01-27-2016 - NED 03 SEC  
CH260D.P's Overlaps (In= 17.43 km, Out= 7.2 km)

CH260D.P CH 260 D  
Lat= 28 21 22.0, Lng= 80 44 47.0  
0.25 kW 58.7 m HAAT, 62 m COR  
Prot.= 60 dBu, Intef.= 40 dBu

WIME-LP CH 260 L1 BNPL20131104ABD  
Lat= 28 33 56.0, Lng= 81 09 04.0  
0.1 kW 28 m HAAT, 42.8 m COR  
Prot.= 60 dBu, Intef.= 40 dBu





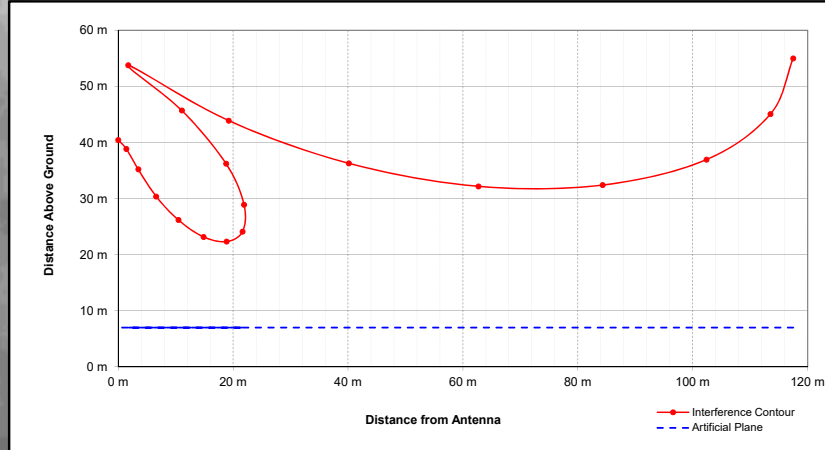
WRUM(FM)  
Orlando, FL  
BMLH20031010ADF  
Facility ID: 59976  
Latitude: 28-34-51 N  
Longitude: 081-04-32 W  
ERP: 100.00 kW  
Channel: 262C (100.3 MHz)  
AMSL Height: 497.0 m  
Horiz. Pattern: Omni

WLRQ-FM  
Cocoa, FL  
BLH19910122KC  
Facility ID: 20372  
Latitude: 28-16-42 N  
Longitude: 080-42-03 W  
ERP: 50.00 kW  
Channel: 257C2 (99.3 MHz)  
AMSL Height: 151.0 m  
Horiz. Pattern: Omni

# Exhibit 13.7

## \$74.1204(d) 2nd/3rd Adjacent Channel Given Interference Waiver Request WRUM(FM) - Orlando, FL (CH262C) WLRQ-FM - Cocoa, FL (CH257C2)

+ WRUM(FM)



Terrain  
0 24 m

NED 03 SEC Terrain Database  
US Census 2010 PL Database

CH260D.P  
Cocoa, FL  
Proposed Operation  
Facility ID: 146519  
Latitude: 28-21-22 N  
Longitude: 080-44-47 W  
ERP: 0.25 kW  
Channel: 260D (99.9 MHz)  
AMSL Height: 62.0 m  
Horiz. Pattern: Omni

Proposed Antenna: BKG77/2 Two Bay 0.9 λ Spaced  
Proposed Power: 0.25 kW  
Antenna Height AGL: 55 meters  
Interference Contour: 119.50 dBu f(50:10)  
Artificial Ground Plane Height: 7 meters  
Distance (Free Space) Equation:  $= (10^{\frac{1}{20}((106.92 - \text{desired dBu}) + \text{ERP in dBk}) / 20)) * 1000$   
Field Strength (dBu) Equation:  $= 106.92 - (20 * (\text{LOG10}(\text{DistMeters} / 1000))) + \text{ERP in dBk}$

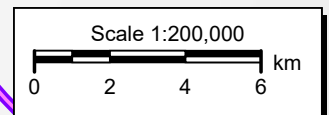
Depression Angle	Antenna Relative Field	ERP in kW	ERP in dBk	Distance from Ant. to Interference Contour	Distance from Ant. to Artificial Plane	Field Strength in dBu @ Artificial Plane	Distance from Ant. to Ground Level	Field Strength in dBu @ Ground Level
0°	1.000	0.250	-6.02	117.48 m	infinite	---	---	---
-5°	0.970	0.235	-6.29	113.96 m	550.74 m	105.82 dBu	631.05 m	104.63 dBu
-10°	0.885	0.196	-7.08	103.97 m	276.42 m	111.01 dBu	316.73 m	109.82 dBu
-15°	0.743	0.138	-8.60	87.29 m	185.46 m	112.95 dBu	212.50 m	111.77 dBu
-20°	0.598	0.081	-10.53	66.73 m	140.34 m	113.04 dBu	160.81 m	111.86 dBu
-25°	0.377	0.036	-14.49	44.29 m	113.58 m	111.32 dBu	130.14 m	110.14 dBu
-30°	0.189	0.006	-20.49	22.20 m	86.00 m	106.78 dBu	110.00 m	105.60 dBu
-35°	0.018	0.000	-40.82	2.11 m	33.69 m	87.55 dBu	95.89 m	86.37 dBu
-40°	0.123	0.004	-24.22	14.45 m	74.67 m	105.23 dBu	85.56 m	104.05 dBu
-45°	0.226	0.013	-18.94	26.55 m	67.88 m	111.35 dBu	77.78 m	110.16 dBu
-50°	0.290	0.021	-16.77	34.07 m	62.66 m	114.21 dBu	71.80 m	113.03 dBu
-55°	0.321	0.026	-15.89	37.71 m	58.60 m	115.67 dBu	67.14 m	114.49 dBu
-60°	0.321	0.026	-15.89	37.71 m	55.43 m	116.16 dBu	63.51 m	114.97 dBu
-65°	0.299	0.022	-16.51	35.13 m	52.96 m	115.93 dBu	60.69 m	114.75 dBu
-70°	0.261	0.017	-17.69	30.66 m	51.08 m	115.07 dBu	58.53 m	113.88 dBu
-75°	0.217	0.012	-19.29	25.49 m	49.69 m	113.70 dBu	56.94 m	112.52 dBu
-80°	0.171	0.007	-21.36	20.09 m	48.74 m	111.80 dBu	55.85 m	110.62 dBu
-85°	0.138	0.005	-23.22	16.21 m	48.18 m	110.04 dBu	55.21 m	108.86 dBu
-90°	0.124	0.004	-24.15	14.57 m	48.00 m	109.14 dBu	55.00 m	107.96 dBu

Yellow Highlighted Text denotes the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WRUM(FM) - Orlando, FL (CH262B) and WLRQ-FM - Cocoa, FL (CH257C2) as noted in **Exhibit 13.7**. Protection has been based on the worst case calculated 119.5 dBu F(50:10) Interference Contour, corresponding to the worst case 79.5 dBu F(50:50) Protected Contour. Protection has been demonstrated through the attached downward radiation study. Full protection will be afforded each facility as the interference area will not reach the ground nor a seven meter artificial plane representing a standard two story home when taking into account the downward radiation characteristics of the antenna as supplied by the antenna manufacturer. A copy of the antenna manufacturer specifications has also been included in **Exhibit 13.8**.

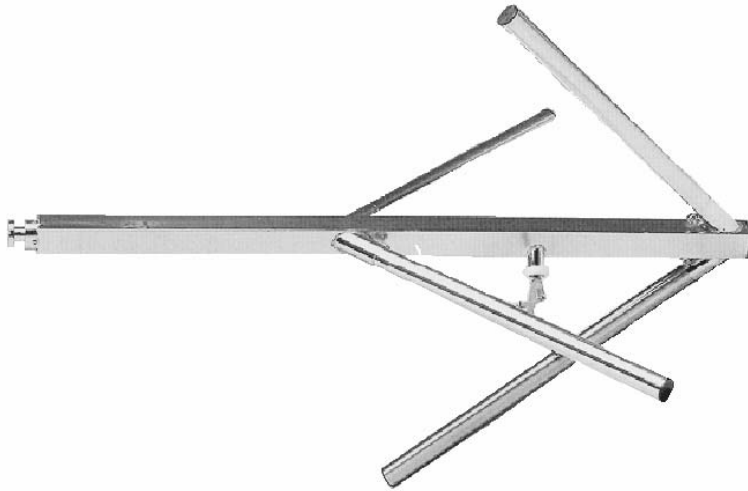


WLRQ-FM - 91.2 F(50:50)dBu Contour

WRUM(FM) - 79.5 F(50:50)dBu Contour



## Exhibit 13.8 - Copy of Manufacturer's Vertical Directional Antenna Pattern Documentation



**NICOM**  
**BKG77**  
**Low Power**

**Broadband  
FM Circular  
Polarization  
Antenna**  
**Antena de  
FM Banda Ancha  
Polarizacion Circular**

This antenna, constructed completely of stainless steel, offers circular polarization for better coverage especially in urban areas. In order to facilitate and decrease shipping costs, this model is simple to break down and reassemble when ready to be installed. It is insulated with Teflon, and with the appropriate connector has a maximum input of 0.5 kw.

Esta antena, fabricada completamente de acero inoxidable, le ofrece polarización circular para mejor alcance, especialmente en zonas urbanas. Para facilitar y disminuir los costos de transportación, este modelo es fácil de desarmar y volver a montar tan pronto que la quiera instalar. Está aislada con Teflon, y con el conector apropiado tiene una entrada máxima de 0.5 kw.



### TECHNICAL SPECIFICATIONS (per bay)

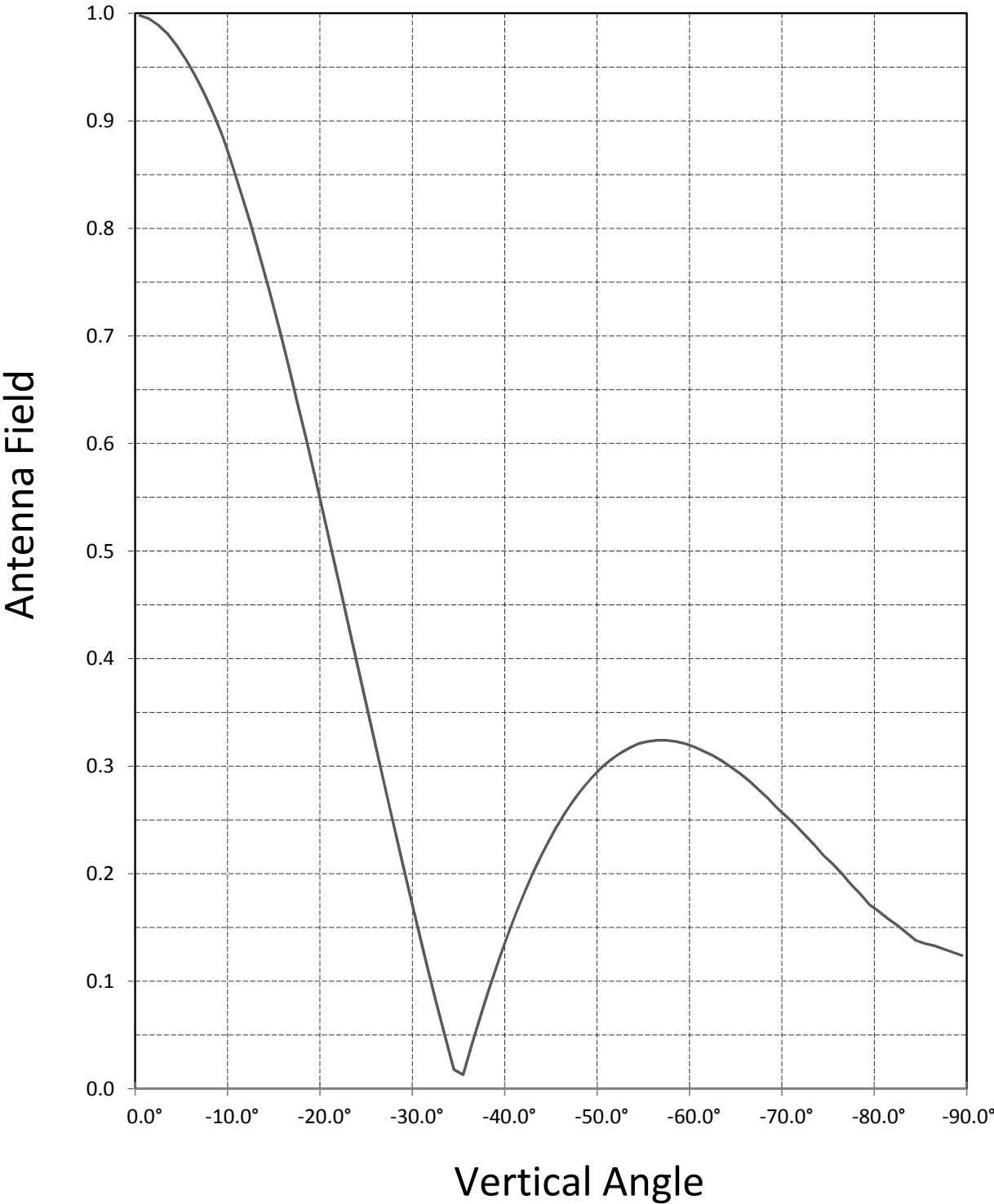
Antenna type	circular polarization dipole	Front-to-back ratio	3 dB
Frequency range	87.5 - 108 MHz	Lightening protection	all parts grounded
Bandwidth	500 kHz max	Max wind velocity	119 mph (190 km/h)
Impedance	50 ohms	Wind load	8 Lbs (3.6 kg)
Connectors	N type (0.5 kw)	Wind surface	0.3 ft <sup>2</sup> (0.04 m <sup>2</sup> )
Power rating	500 Watts max	Materials (external)	stainless steel
VSWR	< 1.1:1	Mounting	from 2" to 4"
Polarization	vertical and horizontal	Weight	7.7 Lbs (3.5 kg)
Gain	- 3 dBd (referred to half-wave dipole)	Dimensions	58"×32"×32" (1450×800×800mm)
H plane	omnidirectional ±1.5 dB (with a 4" mast)	Packing	72"×6"×6" (1500×152×152mm)
V plane	omnidirectional ±3 dB (with a 4" mast)		

# Exhibit 13.8 - Copy of Manufacturer's Vertical Directional Antenna Pattern Documentation



## Plot of Vertical Radiation Pattern

<b>Manufacturer:</b>	NicomUSA, Inc.	<b>Frequency:</b>	87.5 MHz - 108.0 MHz
<b>Make/Model:</b>	BKG77/2	<b>Weight:</b>	14 kg
<b>Polarization:</b>	Circular	<b>Max Power:</b>	1.0 kW
<b>Inter Bay Spacing:</b>	0.9 $\lambda$ (Wavelength)	<b>Return Loss:</b>	-27.1 dB
<b>Antenna Gain:</b>	-0.1 dBd	<b>R.C. Phase:</b>	-89°



# Exhibit 13.8 - Copy of Manufacturer's Vertical Directional Antenna Pattern Documentation



## Tabulation of Vertical Radiation Pattern

**Manufacturer:** NicomUSA, Inc.

**Frequency:** 87.5 MHz - 108.0 MHz

**Make/Model:** BKG77/2

**Weight:** 14 Kg

**Polarization:** Circular

**Max Power:** 1.0 kW

**Inter Bay Spacing:** 0.9  $\lambda$  (Wavelength)

**Return Loss:** -27.1 dB

**Antenna Gain:** -0.1 dBd

**R.C. Phase:** -89°

Vertical Azimuth	Field (%)	dB	Vertical Azimuth	Field (%)	dB	Vertical Azimuth	Field (%)	dB
0.0°	1.000	0.00	-30.0°	0.189	-7.24	-60.0°	0.321	-4.93
-1.0°	0.998	-0.01	-31.0°	0.153	-8.15	-61.0°	0.318	-4.98
-2.0°	0.995	-0.02	-32.0°	0.118	-9.28	-62.0°	0.314	-5.03
-3.0°	0.989	-0.05	-33.0°	0.083	-10.81	-63.0°	0.310	-5.09
-4.0°	0.981	-0.08	-34.0°	0.050	-13.01	-64.0°	0.305	-5.16
-5.0°	0.970	-0.13	-35.0°	0.018	-17.45	-65.0°	0.299	-5.24
-6.0°	0.957	-0.19	-36.0°	0.013	-18.86	-66.0°	0.293	-5.33
-7.0°	0.942	-0.26	-37.0°	0.043	-13.67	-67.0°	0.286	-5.44
-8.0°	0.925	-0.34	-38.0°	0.071	-11.49	-68.0°	0.278	-5.56
-9.0°	0.906	-0.43	-39.0°	0.098	-10.09	-69.0°	0.270	-5.69
-10.0°	0.885	-0.53	-40.0°	0.123	-9.10	-70.0°	0.261	-5.83
-11.0°	0.859	-0.66	-41.0°	0.147	-8.33	-71.0°	0.253	-5.97
-12.0°	0.832	-0.80	-42.0°	0.169	-7.72	-72.0°	0.245	-6.11
-13.0°	0.804	-0.95	-43.0°	0.190	-7.21	-73.0°	0.236	-6.27
-14.0°	0.774	-1.11	-44.0°	0.209	-6.80	-74.0°	0.227	-6.44
-15.0°	0.743	-1.29	-45.0°	0.226	-6.46	-75.0°	0.217	-6.64
-16.0°	0.710	-1.49	-46.0°	0.242	-6.16	-76.0°	0.209	-6.80
-17.0°	0.676	-1.70	-47.0°	0.256	-5.92	-77.0°	0.200	-6.99
-18.0°	0.640	-1.94	-48.0°	0.269	-5.70	-78.0°	0.190	-7.21
-19.0°	0.605	-2.18	-49.0°	0.280	-5.53	-79.0°	0.181	-7.42
-20.0°	0.568	-2.46	-50.0°	0.290	-5.38	-80.0°	0.171	-7.67
-21.0°	0.530	-2.76	-51.0°	0.299	-5.24	-81.0°	0.165	-7.83
-22.0°	0.492	-3.08	-52.0°	0.306	-5.14	-82.0°	0.158	-8.01
-23.0°	0.454	-3.43	-53.0°	0.312	-5.06	-83.0°	0.152	-8.18
-24.0°	0.415	-3.82	-54.0°	0.317	-4.99	-84.0°	0.145	-8.39
-25.0°	0.377	-4.24	-55.0°	0.321	-4.93	-85.0°	0.138	-8.60
-26.0°	0.339	-4.70	-56.0°	0.323	-4.91	-86.0°	0.135	-8.70
-27.0°	0.301	-5.21	-57.0°	0.324	-4.89	-87.0°	0.133	-8.76
-28.0°	0.263	-5.80	-58.0°	0.324	-4.89	-88.0°	0.130	-8.86
-29.0°	0.226	-6.46	-59.0°	0.323	-4.91	-89.0°	0.127	-8.96
						-90.0°	0.124	-9.07