

# Technical Report Supporting a Form 349 Application for a New FM Translator Station

Pursuant to 47 C.F.R. Section 74:

*for*

*CH245D.P - Yankton, SD  
CH245D (96.9 MHz)*

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*"New FM Translator Operation"*

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*as a*

*Commercial, Fill-In Translator  
for Class B AM Station  
WNAX(AM) - Yankton, SD*

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# *Explanation of Technical Report*

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*1*

**EXPLANATION OF PROPOSAL:** This Form 349 Filing and accompanying technical report supports an original Construction Permit Application for a new FM Translator facility for CH245D.P - Yankton, SD. This FCC Form 349 Filing requests a new CH245D (96.9 MHz) operation with a power of 0.250 kW ERP (circular polarization). The FM Translator will operate from a COR of 636 meters AMSL. This Form 349 Filing will specify rebroadcast of Class B, AM Primary Station WNAX(AM) - Yankton, SD (570 kHz); Facility ID No. 57846. The Translator will be licensed to the community of Yankton, SD.

*The applicant would like to note WNAX(AM) is presently rebroadcast on co-owned AM Fill-In Translator K260BO - Yankton, SD (Facility ID: 154848) and will serve substantially the same area as this CH245D.P AM Fill-In Translator proposal. Concurrent with, or prior to the commencement of operations of the future CH245D.P Translator, K260BO will be reassigned to an alternate Primary Station.*

**FACILITY COMPLIANCE SHOWINGS:** A map of the proposed 60 dBμ service contour has been included in **Exhibit 1**. The proposed 60 dBμ contour of the Translator lies wholly inside the larger of the AM primary daytime 2.0 mV/m contour or a 25 mile radius around the AM site. The primary station service contour relationship has been plotted in **Exhibit 2**.

The proposed facility will be located on the tower bearing Antenna Structure Registration Number 1035330. In support of this filing, a copy of the existing ASRN has been included in **Exhibit 3**. A depiction of the tower and antenna configuration has been included in **Exhibit 4**. Further notification to the FAA or ASR governing authorities is not required as this proposal will not increase the overall tower height.

The applicant would like to note use of the NED 03 second terrain database for all allocation, contour and HAAT showings contained herein. A copy of the proposed HAAT calculation has been included in **Exhibit 5**.

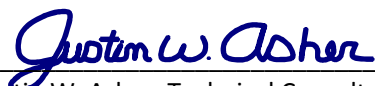
**ALLOCATION COMPLIANCE SHOWINGS:** The proposed Translator remains in compliance with 47 C.F.R. Section 74.1204 toward all allocation protection concerns. A general allocation study for this proposal is found in **Exhibit 6**. There is one additional facility, existing or proposed, close enough to merit further study. Therefore, a supplemental contour protection study has been provided toward this facility as included in **Exhibit 7**. It is believed sufficient clearance exists, precluding the need for additional contour protection showings.

Regarding protection of international concerns, the facility is, and will remain, more than 320 km from the common border between the United States and Canada or Mexico. As a result, no further international protection showings are believed required.

**ENVIRONMENTAL COMPLIANCE SHOWINGS:** The proposed facility complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 and/or §1.1307(b)(3) of the Commission's rules and the guidelines for RF radiation protection guidelines as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). Compliance has been demonstrated in the attached ***RF Appendix 1*** of this filing. The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing with locked doors or gates. In addition, coordination with other users of the site will be secured to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Regarding compliance with the NEPA, Nationwide Programmatic Agreement and NHPA Section 106 for tower co-location, compliance with the Agreement is not required where no new tower construction is being proposed and the tower is not being substantially altered. Specifically, compliance is not necessary where only an existing antenna and feed-line are being reused (diplexed) on an existing structure, as here. However, should the Commission determine compliance is necessary, upon notification to the applicant, the applicant will file FCC Form 621.

**CERTIFICATION OF TECHNICAL CONSULTANT:** *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over eighteen years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*

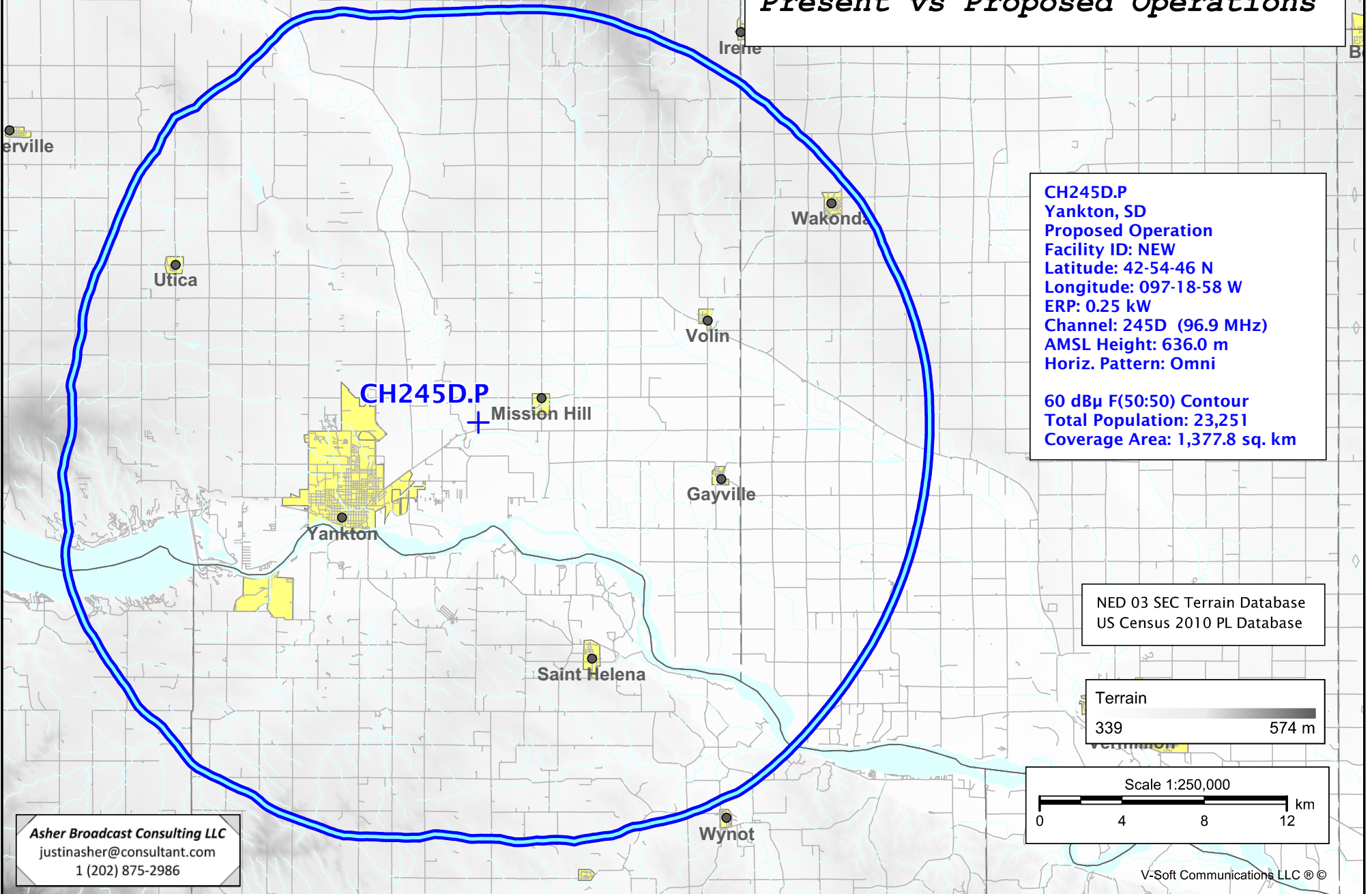


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Justin W. Asher, Technical Consultant  
March 22, 2018

**Exhibit 1**  
**Service Contour Study:**  
**Present vs Proposed Operations**

*Proposed 60 dBμ F(50:50) Contour*



## Primary 2 mV/m Daytime Contour

## Exhibit 2 Service Contour Study: Proposed vs Primary Operations

WNAX 570 kHz  
Yankton, South Dakota  
Station Class: B  
Region 2 Class: B  
Facility ID: 57846  
File Number: BL-19860411AI  
42-54-47.0 N 97-18-58.0 W (NAD 27)  
42-54-47.0 N 97-18-59.2 W (NAD 83)  
Power: 5 kW, Non-Directional  
Hours: Daytime  
Pattern Type: Theoretical  
Towers: 1 Augmentations: 0  
Tower Electrical Height: 190 Deg; 277.59 m  
RMS Theoretical: 395.9 mV/meter (per kW)  
or 885.26 mV/meter at 5 kW

Licensed 60 dBu F(50:50) Contour  
Proposed 60 dBu F(50:50) Contour

25 mile Radius from AM Site

WNAX(AM)  
CH245D.P  
K260BO.L

CH245D.P  
Yankton, SD  
Proposed Operation  
Facility ID: NEW  
Latitude: 42-54-46 N  
Longitude: 097-18-58 W  
ERP: 0.25 kW  
Channel: 245D (96.9 MHz)  
AMSL Height: 636.0 m  
Horiz. Pattern: Omni

K260BO.L  
Yankton, SD  
BLFT20111019AHW  
Facility ID: 154848  
Latitude: 42-54-46 N  
Longitude: 097-18-58 W  
ERP: 0.25 kW  
Channel: 260D (99.9 MHz)  
AMSL Height: 636.0 m  
Horiz. Pattern: Omni

Asher Broadcast Consulting LLC  
justinasher@consultant.com  
1 (202) 875-2986

The applicant would like to note WNAX(AM) is presently being rebroadcast on co-owned AM Fill-In Translator K260BO - Yankton, SD (Facility ID: 154848) and will serve substantially the same area as this CH245D.P AM Fill-In Translator proposal. Concurrent with, or prior to the commencement of operations of the future CH245D.P Translator, K260BO will be reassigned to an alternate Primary Station.

NED 03 SEC Terrain Database  
US Census 2010 PL Database

Scale 1:2,000,000



# Exhibit 3

## Copy of Existing Antenna Structure Registration

(public record copy)

**Registration Detail**

Reg Number	1035330	Status	Constructed
File Number	A0453030	Constructed	07/10/1991
EMI	No	Dismantled	
NEPA	No		

**Antenna Structure**

Structure Type 3TA1 - Antenna Tower Array - 1st N = # towers 2nd N =

**Location** (in NAD83 Coordinates)

Lat/Long	42-54-46.0 N 097-18-59.0 W	Address	TWR 1 5 MILES NORTHEAST
City, State	YANKTON , SD		
Zip	57046	County	YANKTON
Center of AM Array	42-54-46.0 N 097-18-57.0 W	Position of Tower in Array	

**Heights (meters)**

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
357.2	283.2
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
640.4	282.4

**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	97-AGL-4906-OE	FAA Issue Date	11/13/1997
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**Owner & Contact Information**

FRN	0002750206	Owner Entity Type
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**Owner**

Saga Communications, Inc.	P: (313)886-7070
Attention To: Gregory Urbiel	F:
73 Kercheval Avenue, Suite 201	E: gurbiel@sagacom.com
Grosse Pointe Farms , MI 48236	

**Contact**

Smithwick , Gary S Esq	P: (202)363-4050
5028 Wisconsin Avenue, NW Suite 301	F:
Washington , DC 20016	E: gsmithwick@fccworld.com

**Last Action Status**

Status	Constructed	Received	06/27/2005
Purpose	Admin Update	Entered	06/27/2005
Mode	Interactive		

**Related Applications**

06/27/2005	A0453030 - Admin Update (AU)
12/09/1997	A0041751 - New (NE)

**Comments****Comments**

None

**History**

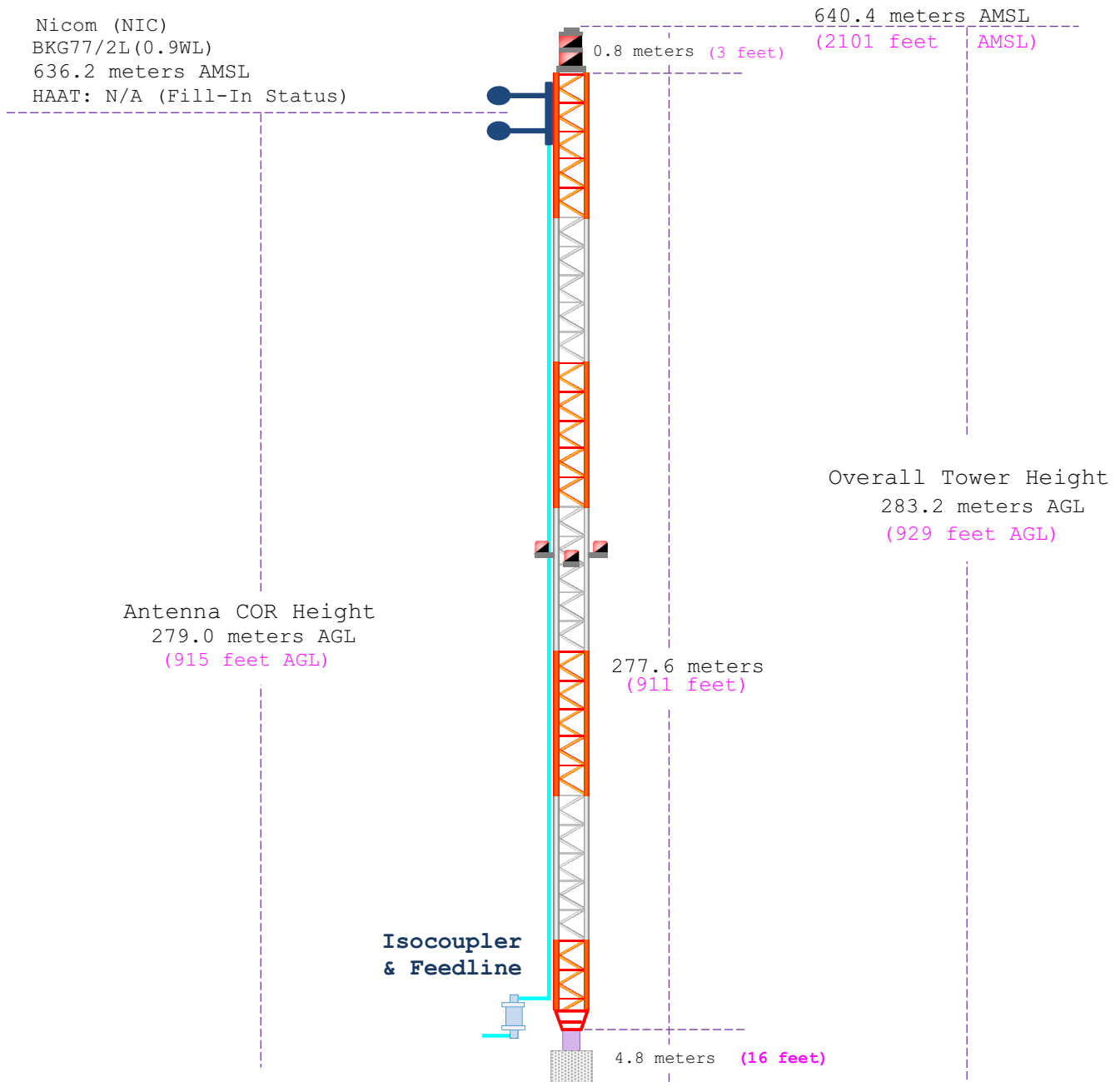
Date	Event
06/28/2005	Registration Printed
06/27/2005	FRN association email send: Tower email
06/27/2005	ASR Application receipt email sent: Tower email
All History (4)	

**Automated Letters**

06/28/2005	Authorization, Reference 432705
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# Exhibit 4

## Vertical Plan of Antenna System



Ground Elevation: 357.2 meters AMSL (1172 feet AMSL)		
Address: Tower 1 - 1.5 miles northeast of Yankton		
City: Yankton		
County: Yankton		
State: South Dakota		
Antenna Structure Registration 1035330	Drawing Is Not To Scale	Asher Broadcast Consulting, LLC justinasher@consultant.com 1(202)875-2986



## ***Exhibit 5***

### **HAAT and Miscellaneous Coordinate Information**

#### **HAAT Calculation (1927):**

N. Lat. = 425446.0    W. Lng. = 971858.0  
 HAAT and Distance to Contour,  
 FCC, FM 2-10 Mi, 51 pts Method - NED 03 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	403.6	232.4	0.2500	-6.02	1.000	19.95
030	386.3	249.7	0.2500	-6.02	1.000	20.66
060	367.4	268.6	0.2500	-6.02	1.000	21.40
090	354.6	281.4	0.2500	-6.02	1.000	21.87
120	354.4	281.6	0.2500	-6.02	1.000	21.88
150	361.2	274.8	0.2500	-6.02	1.000	21.63
180	398.2	237.8	0.2500	-6.02	1.000	20.18
210	373.6	262.4	0.2500	-6.02	1.000	21.16
240	368.5	267.5	0.2500	-6.02	1.000	21.35
270	410.1	225.9	0.2500	-6.02	1.000	19.67
300	400.8	235.2	0.2500	-6.02	1.000	20.07
330	381.8	254.2	0.2500	-6.02	1.000	20.84

Ave El= 380.04 M    HAAT= 255.96 M    AMSL= 636.0

#### **NAD 1983 to NAD 1927 Conversion:**

	<u>Latitude</u>	<u>Longitude</u>
NAD 27 datum values:	42 54 46.01165	97 18 57.79853
NAD 83 datum values:	42 54 46.00000	97 18 59.00000

#### **Various Coordinate Conversion Calculations (NAD 1983):**

<b>Position Type</b>	Lat Lon
<b>Degrees Lat Long</b>	42.9127778°, -097.3163889°
<b>Degrees Minutes</b>	42°54.76667', -097°18.98333'
<b>Degrees Minutes Seconds</b>	42°54'46.0000", -097°18'59.0000"
<b>UTM</b>	14T 637423mE 4752503mN
<b>UTM centimeter</b>	14T 637423.78mE 4752503.94mN
<b>MGRS</b>	14TPN3742352503
<b>Grid North</b>	1.1°
<b>GARS</b>	166MB16
<b>Maidenhead</b>	EN12IV29AB85
<b>GEOREF</b>	FJHN41015476

# ***Exhibit 6***

## **Tabulation of Proposed Allocation**

Blue Text indicates contour protection studies toward select station(s) as included in **Exhibit 7**.

REFERENCE		CH# 245D - 96.9 MHz, Pwr= 0.25 kW, HAAT= 256.0 M, COR= 636 M								DISPLAY DATES	
42 54 46.0 N.		Average Protected F(50-50)= 20.91 km								DATA 06-21-17	
97 18 58.0 W.		Omni-directional								SEARCH 06-21-17	
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*
243C Sioux Falls	KNWC-FM	LIC_CN SD		43.0 223.5	92.44 BMLED20030304AAH	43 31 07.0 96 32 05.0	100.000 488	12.6 918	86.9 University Of Northwestern	59.1	4.4
245C Watertown	KDLO-FM	LIC_CN SD		354.6 174.4	229.30 BLH19790226AB	44 57 57.0 97 35 22.0	100.000 479	189.1 1030	85.3 Alpha 3e Licensee Llc	20.2	82.4
245D Le Mars	K245AM	LIC_C_ IA		96.0 276.8	94.55 BLFT20090724AAI	42 49 04.0 96 09 47.0	0.100 65	24.8 462	7.4 Powell Broadcasting Compan	47.8	20.8
247C1 Sioux Falls	KMXC	LIC_CX SD		11.4 191.6	92.66 BLH20121116AJV	43 43 46.0 97 05 14.0	100.000 260	9.5 758	69.4 Townsquare Media Sioux Fal	62.8	22.2
245C1 Seward	KZKX	LIC_CX NE		168.5 348.9	202.90 BLH20160408AAU	41 07 23.6 96 50 03.7	100.000 183	157.3 614	60.3 Alpha 3e Licensee Llc	25.0	79.5
248C3 Pierce	KEXL	LIC_CX NE		187.9 7.9	66.38 BLH20091030AFQ	42 19 17.0 97 25 40.0	6.500 141	3.1 669	31.7 Wjag Incorporated	43.0	33.5
246D Sioux City	K246CJ	LIC_DC_ IA		120.2 300.8	82.14 BLFT20160411AAX	42 32 16.0 96 26 58.0	0.250 486	22.0 486	14.6 Cup O' Dirt, Llc	38.3	35.0
246A Menville	AL5573	VAC__N IA		113.5 294.4	116.77 RM9561	42 29 11.0 96 00 36.0	6.000 100	46.3 494	30.1 Mountain West Broadcasting	48.6	54.1
10/19/2004: per MB 04-93 reserved for noncommercial educ. use.											
242D Norfolk	K242BE	LIC_C_ NE		181.2 1.1	98.38 BLFT20151215ADQ	42 01 41.0 97 20 25.0	0.115 612	0.8 612	10.2 Community Broadcasting, In	77.5	87.1
245C1 Clarion	KIAQ	LIC_CN IA		94.9 277.0	259.43 BLH19870120KA	42 40 18.0 94 09 11.0	100.000 176	158.9 518	61.5 Alpha 3e Licensee Llc	78.7	131.6
298C3 Castana	KILV	LIC_ZCX IA		128.4 309.2	125.41 BLED20021002ACU	42 12 26.0 96 07 26.0	25.000 100	5.5 432	1.8 Educational Media Foundati	11.5R	113.9M
298C3 Whiting	KILV	APP_ZCX IA		128.4 309.2	125.41 BPED20170317AAB	42 12 26.0 96 07 26.0	25.000 100	5.5 432	1.8 Educational Media Foundati	11.5R	113.9M
298C3 Whiting	KILV	RSV-A__ IA		133.1 313.9	128.64	42 07 02.0 96 10 43.0	25.000 100	5.5 427	1.8 Educational Media Foundati	11.5R	117.1M
247C3 Blair	KBLR-FM	LIC_ZEN NE		146.9 327.6	168.37 BLH20010830AAH	41 38 21.0 96 12 31.0	25.000 92	3.4 436	33.1 Walnut Radio, Llc	143.3	134.1
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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= West 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)											
< = Contour Overlap											
Reference station has protected zone issue: AM tower											

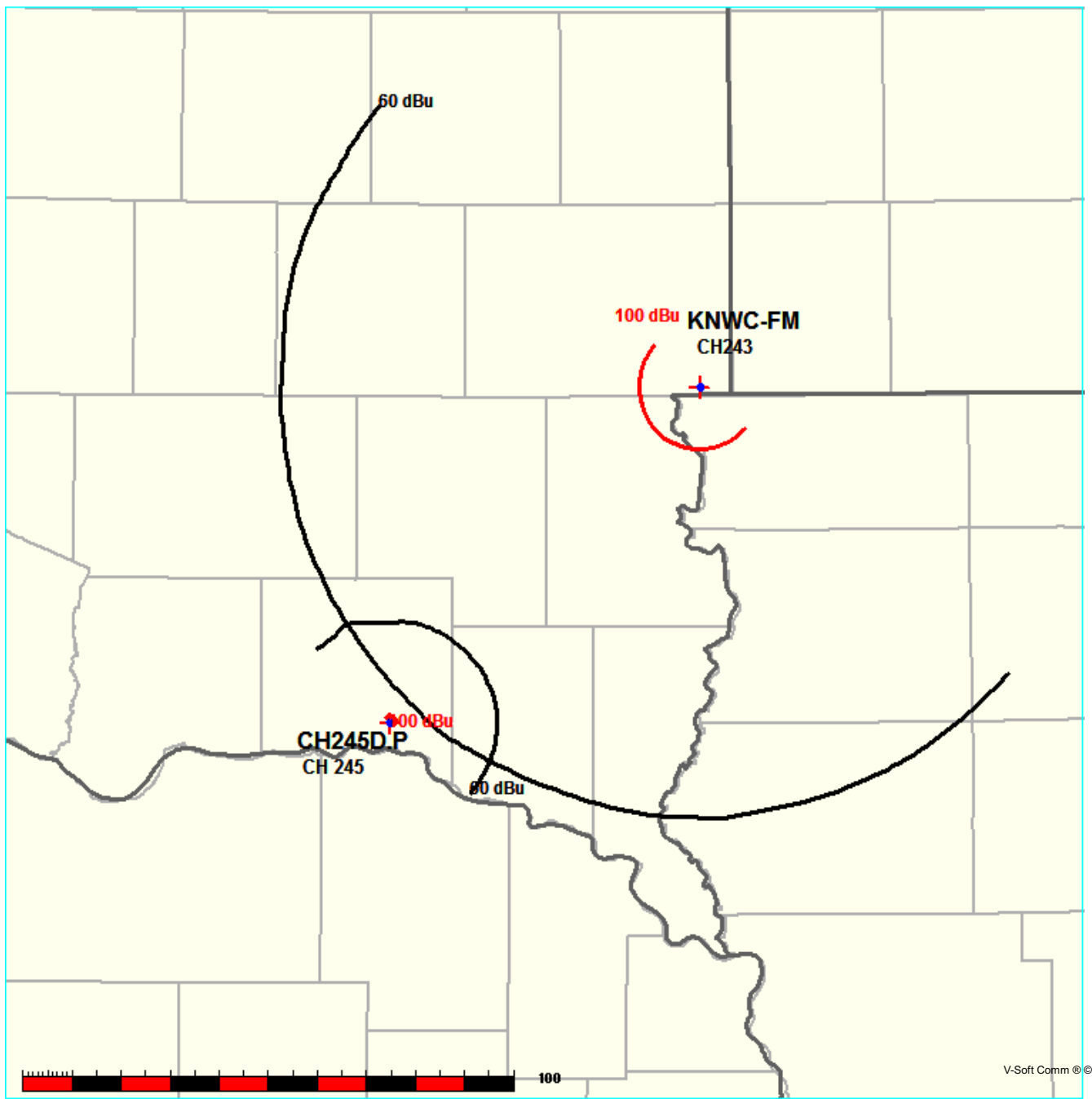
# *Exhibit 7*

## *Contour Protection Studies Toward Select Allocation Concern(s)*

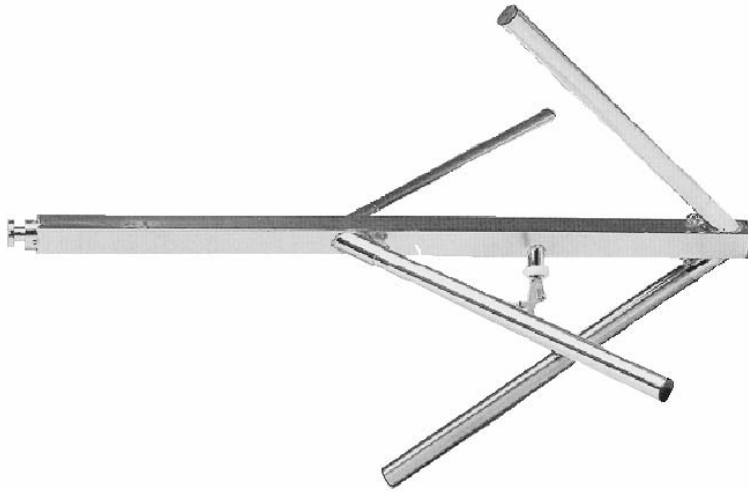
FMCommander Single Allocation Study - 06-21-2017 - NED 03 SEC  
CH245D.P's Overlaps (In= 59.05 km, Out= 4.45 km)

CH245D.P CH 245 D  
Lat= 42 54 46.0, Lng= 97 18 58.0  
0.25 kW 256 m HAAT, 636 m COR  
Prot.= 60 dBu, Intef.= 100 dBu

KNWC-FM CH 243 C BMLED20030304AAH  
Lat= 43 31 07.0, Lng= 96 32 05.0  
100.0 kW 488 m HAAT, 918 m COR  
Prot.= 60 dBu, Intef.= 100 dBu



***Exhibit 8 - Copy of Manufacturer's  
Antenna Documentation  
(public record copy)***



**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)**

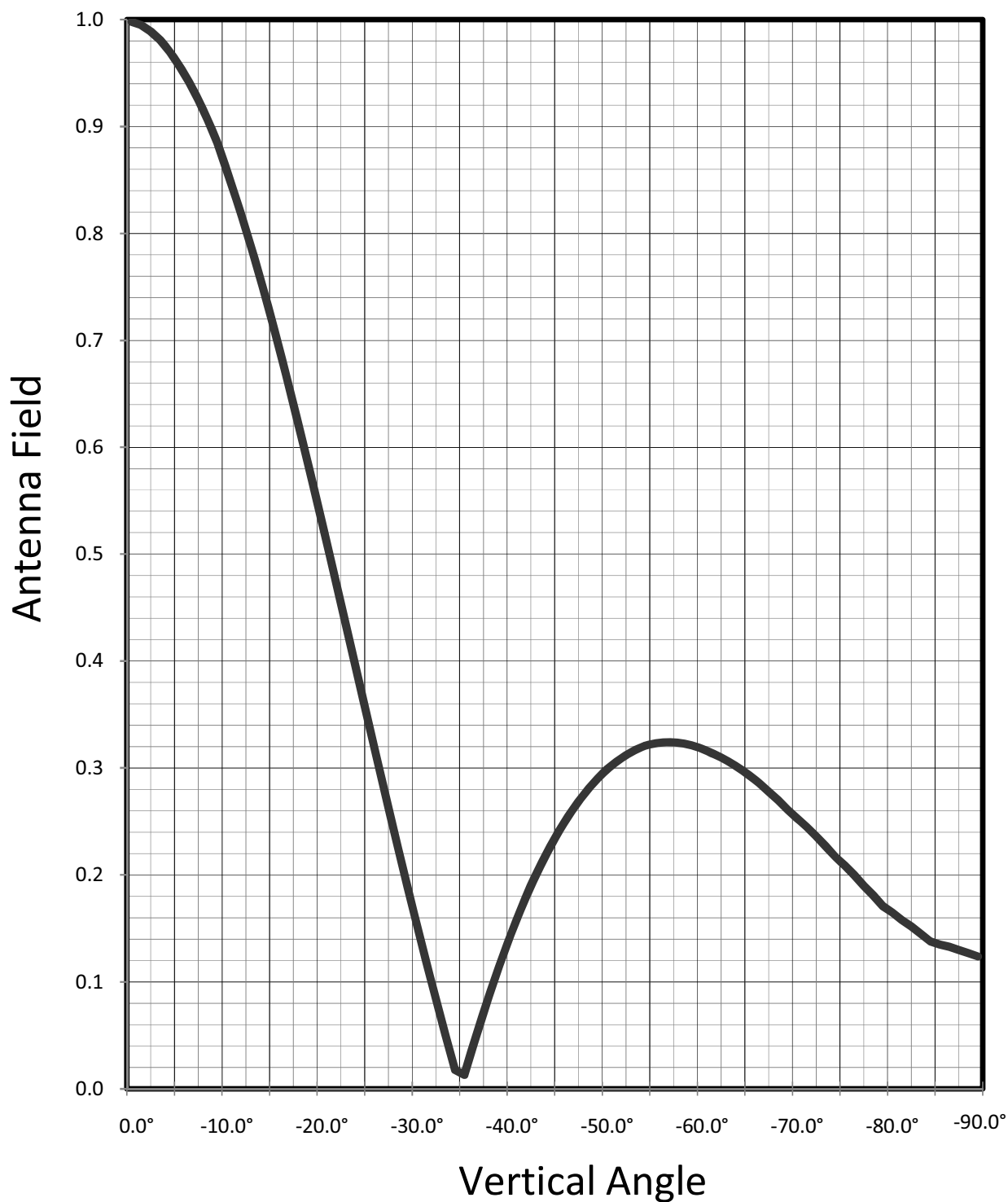
Antenna type	circular polarization dipole	Front-to-back ratio	3 dB
Frequency range	87.5 - 108 MHz	Lightening protection	all parts grounded
Bandwidth	500 kHz max	Max wind velocity	119 mph (190 km/h)
Impedance	50 ohms	Wind load	8 Lbs (3.6 kg)
Connectors	N type (0.5 kw)	Wind surface	0.3 ft <sup>2</sup> (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 8 - Copy of Manufacturer's  
Antenna Documentation  
(public record copy)***

## Plot of Vertical Radiation Pattern

**Manufacturer:** NicomUSA, Inc.  
**Make/Model:** BKG77/2  
**Polarization:** Circular  
**Inter Bay Spacing:**  $0.9 \lambda$  (Wavelength)  
**Antenna Gain:** -0.1 dBd

**Frequency:** 87.5 MHz - 108.0 MHz  
**Weight:** 14 kg  
**Max Power:** 5.0 kW  
**Return Loss:** -27.1 dB  
**R.C. Phase:**  $-89^\circ$



***Exhibit 8 - Copy of Manufacturer's  
Antenna Documentation  
(public record copy)***

**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:** 5 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