

**K224FA (FACILITY #150570)
MINOR MODIFICATION TO 2ND ADJACENT CHANNEL
"250 MILE AM WAIVER" FACILITY AT
WATERLOO, IA FOR
KNWS(AM) #49784**

A minor modification to the K224FA licensed facility to second adjacent channel 226 is proposed. The translator will continue to rebroadcast KNWS(AM) at Waterloo, IA (facility ID # 49784. The facility remains located 103.6 miles from the previous, licensed facility and is therefore compliant with the requirements for modification of 250 mile waiver translators.

Distance between

N Latitude 42 45 44.00, W Longitude 90 23 23.00 (Point 1)

and N Latitude 42 26 45.00, W Longitude 92 22 29.00 (Point 2)

166.648 kilometers; 103.550 miles

Allocation discussion:

All exhibits utilize the FCC 30 second terrain database.

- E1 Channel study
- E1A Interference analysis to KCVM licensed facility and CP
- E1B Aerial photograph of interference area
- E2 60 dBu and 2 mV/m contours
- E3 ASR

A channel study is included as E1 demonstrating compliance with §74.1204 with the exception of 2nd adjacent station KCVM. A plot of the proposed 60 dBu contour is provided as E2 showing that it is entirely contained within primary station KNWS(AM)'s 2 mV/m and 40 km radius.

Anderson Communications, LLC

KCVM analysis:

The proposed facility will be located inside the protected contour of KVCM on 228A and the 228C3 construction permit. An interference analysis has been conducted based on the U/D ratio of +40 dB at the proposed site.

The KCVM CP is the worst case facility. It places an 82.6 dBu (50:50) contour at the site (E1A). The corresponding interference contour is 122.6 dBu (50:10) which clears the ground by 67.7 meters at the closest point. E1B and an associated street view show that the tallest building is a 14.6 meter (48 foot) barn at a distance of 222-255 meters from the tower.

It is clear from E1A and E1B that the interference contours will not reach any populated area or major highways. Based on this showing, a waiver of Section 74.1204 is requested in accordance with *Living Way Ministries, Inc.* (FCC 08-242).

RF Exposure Calculation:

The proposed facility will utilize a Bext TFC-2K two bay 0.75 wavelength spaced, circularly polarized antenna. The RF contribution of the proposed translator was calculated using a worst case F factor of 1.0 and the formula included below to be 2.42 μ Watts/cm² or 0.24% of the maximum permissible 200 microwatts/cm² exposure for general population/uncontrolled exposure, and well below the 5% of that limit which requires consideration. The proposed translator clearly complies with Commission RF radiation limits.

$$S \text{ (RF in } \mu\text{Watts/cm}^2\text{)} = \frac{33.4 (F^2 \text{ Vertical Factor}) \times (H \text{ ERP} + V \text{ ERP in Watts})}{R^2 \text{ (distance to radiation center in meters} - 2 \text{ m)}}$$



Charles M. Anderson 7/14/2016

E1 CHANNEL STUDY											
University Of Northwestern St. Paul											
CH# 226D - 93.1 MHz, Pwr= 0.25 kw, HAAT= 103.9 M, COR= 378 M											
Average Protected F(50-50)= 13.11 km											
Omni-directional											
DISPLAY DATES											
DATA 07-14-16											
SEARCH 07-14-16											
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*
228A Hudson	KCVM	LIC IA	ZCX	234.7 54.7	6.31 BLH20100729AAO	42 24 47.0 92 26 15.0	6.000 99	2.9 384	29.9 Coloff Media, LLC	-9.5*	-24.7* (1)
228C3 Evansdale	KCVM	CP IA	NCX	23.9 203.9	6.85 BMPH20150831ADH	42 30 08.0 92 20 27.0	11.000 71	2.6 347	25.3 Coloff Media, LLC	-9.5*	-19.5* (1)
224D Waterloo	K224FA	LIC IA	_C_	0.0 0.0	0.00 BLFT20160629AAP	42 26 45.0 92 22 29.0	0.250	1.1 378	13.8 University Of Northwestern	-14.9*	-14.9*
227C1 Des Moines	K10A	LIC IA	_C_	225.0 44.3	127.18 BLH20000207ABQ	41 37 55.0 93 27 26.0	82.000 325	104.7 596	72.1 Saga Communications Of Iow	9.6	37.0
226D Cedar Rapids	K226BO	LIC IA	_C_	128.3 308.8	73.78 BLFT20110701ACG	42 01 57.0 91 40 24.4	0.250 100	45.7 347	13.4 Sellers Broadcasting, Inc	14.3	13.8
280A Dunkerton	DKCOO	LIC IA	_CX	23.9 204.0	31.70 BLH20110302ABL	42 42 23.9 92 13 03.7	6.000 95	0.0 404	0.0 Magnolia Radio Corporation	9.5R	22.2M
225C1 Dubuque	KATF	LIC IA	_NC_	85.7 266.9	144.47 BLH20030130ACU	42 31 44.0 90 36 58.0	92.000 309	104.7 556	72.0 Radio Dubuque, Inc.	26.1	51.7

Terrain database is FCC 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= west Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with strikeout need not be protected.
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.

(1) See E1A for disproval of interference.

E1A1 KCVM LIC ANALYSIS

W240BX Waterloo, IA

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.25

Translator or LPFM Antenna Height AG = 85 Meters

W240BX Antenna Model = BEXT TFC2K-2-75%

Protected Station's Contour = 87.51337 dBu

Translator's or LPFM's full Interference contour 127.51337

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW

Distance between stations = 6.3 km

Protected Station= KCVM, 6 kW, 384 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	1.0	0.2500	046.6983	046.6983	085.000
05.00	0.955	1.0	0.2280	044.5969	044.4272	081.113
10.00	0.859	1.0	0.1845	040.1139	039.5045	078.034
15.00	0.737	1.0	0.1358	034.4167	033.2440	076.092
20.00	0.615	1.0	0.0946	028.7195	026.9875	075.177
25.00	0.494	1.0	0.0610	023.0690	020.9076	075.251
30.00	0.35	1.0	0.0306	016.3444	014.1547	076.828
35.00	0.194	1.0	0.0094	009.0595	007.4211	079.804
40.00	0.051	1.0	0.0007	002.3816	001.8244	083.469
45.00	0.071	1.0	0.0013	003.3156	002.3445	082.656
50.00	0.149	1.0	0.0056	006.9581	004.4726	079.670
55.00	0.184	1.0	0.0085	008.5925	004.9285	077.961
60.00	0.19	1.0	0.0090	008.8727	004.4363	077.316
65.00	0.178	1.0	0.0079	008.3123	003.5129	077.466
70.00	0.156	1.0	0.0061	007.2849	002.4916	078.154
75.00	0.126	1.0	0.0040	005.8840	001.5229	079.317
80.00	0.09	1.0	0.0020	004.2029	000.7298	080.861
85.00	0.051	1.0	0.0007	002.3816	000.2076	082.627
90.00	0.02	1.0	0.0001	000.9340	000.0000	084.066

X-Field™ By V-Soft

Communications®LLC

E1A2 KCVN CP ANALYSIS

W240BX Waterloo, IA

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.25

Translator or LPFM Antenna Height AG = 85 Meters

W240BX Antenna Model = BEXT TFC2K-2-75%

Protected Station's Contour = 82.60474 dBu

Translator's or LPFM's full Interference contour 122.60474

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW

Distance between stations = 6.9 km

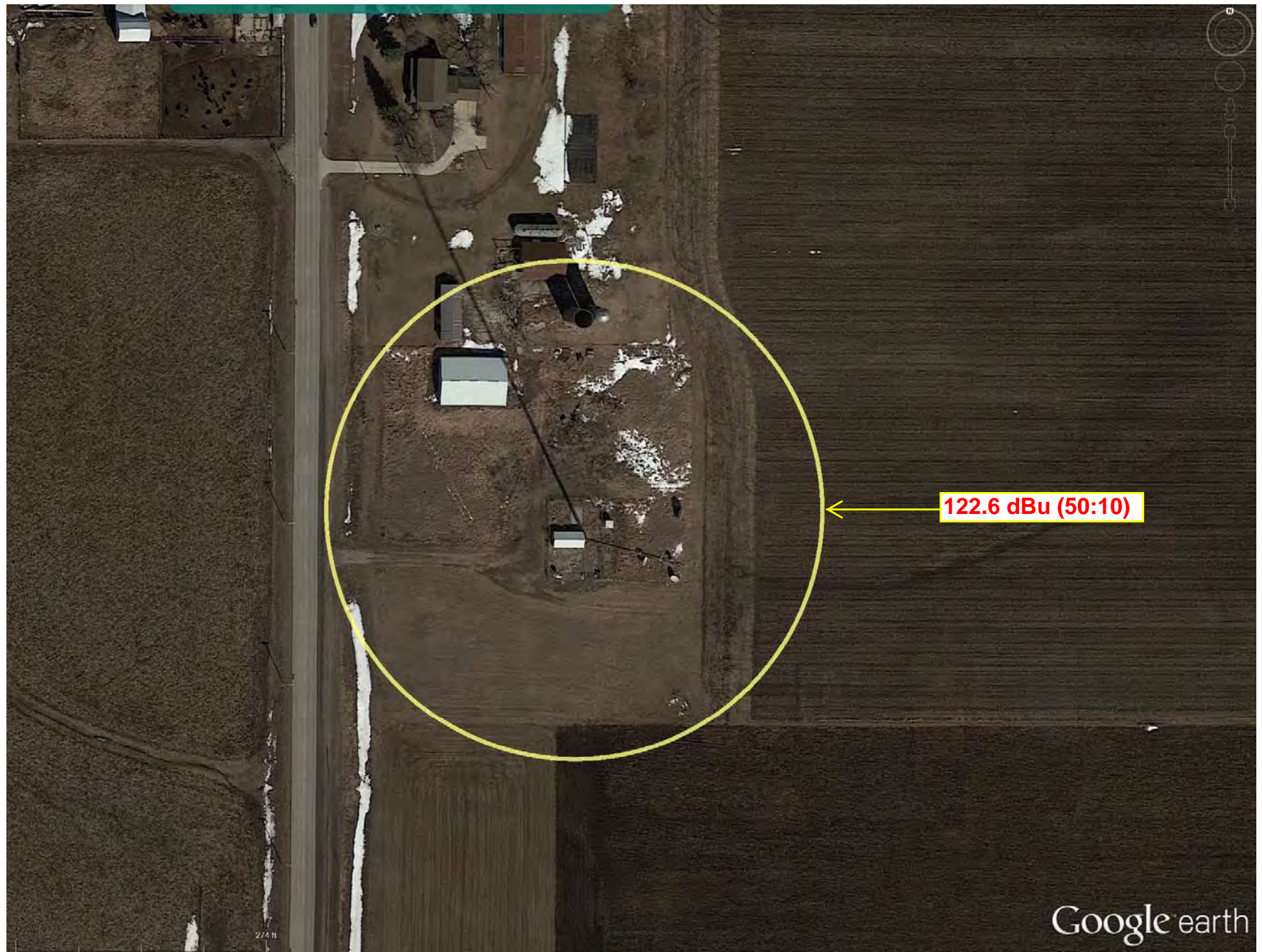
Protected Station= KCVN.C, 11 kW, 347.4 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	1.0	0.2500	082.1737	082.1737	085.000
05.00	0.955	1.0	0.2280	078.4759	078.1773	078.160
10.00	0.859	1.0	0.1845	070.5872	069.5149	072.743
15.00	0.737	1.0	0.1358	060.5620	058.4984	069.325
20.00	0.615	1.0	0.0946	050.5368	047.4891	067.715
25.00	0.494	1.0	0.0610	040.5938	036.7905	067.844
30.00	0.35	1.0	0.0306	028.7608	024.9076	070.620
35.00	0.194	1.0	0.0094	015.9417	013.0587	075.856
40.00	0.051	1.0	0.0007	004.1909	003.2104	082.306
45.00	0.071	1.0	0.0013	005.8343	004.1255	080.875
50.00	0.149	1.0	0.0056	012.2439	007.8702	075.621
55.00	0.184	1.0	0.0085	015.1200	008.6725	072.614
60.00	0.19	1.0	0.0090	015.6130	007.8065	071.479
65.00	0.178	1.0	0.0079	014.6269	006.1816	071.744
70.00	0.156	1.0	0.0061	012.8191	004.3844	072.954
75.00	0.126	1.0	0.0040	010.3539	002.6798	074.999
80.00	0.09	1.0	0.0020	007.3956	001.2842	077.717
85.00	0.051	1.0	0.0007	004.1909	000.3653	080.825
90.00	0.02	1.0	0.0001	001.6435	000.0000	083.357

X-Field™ By V-Soft

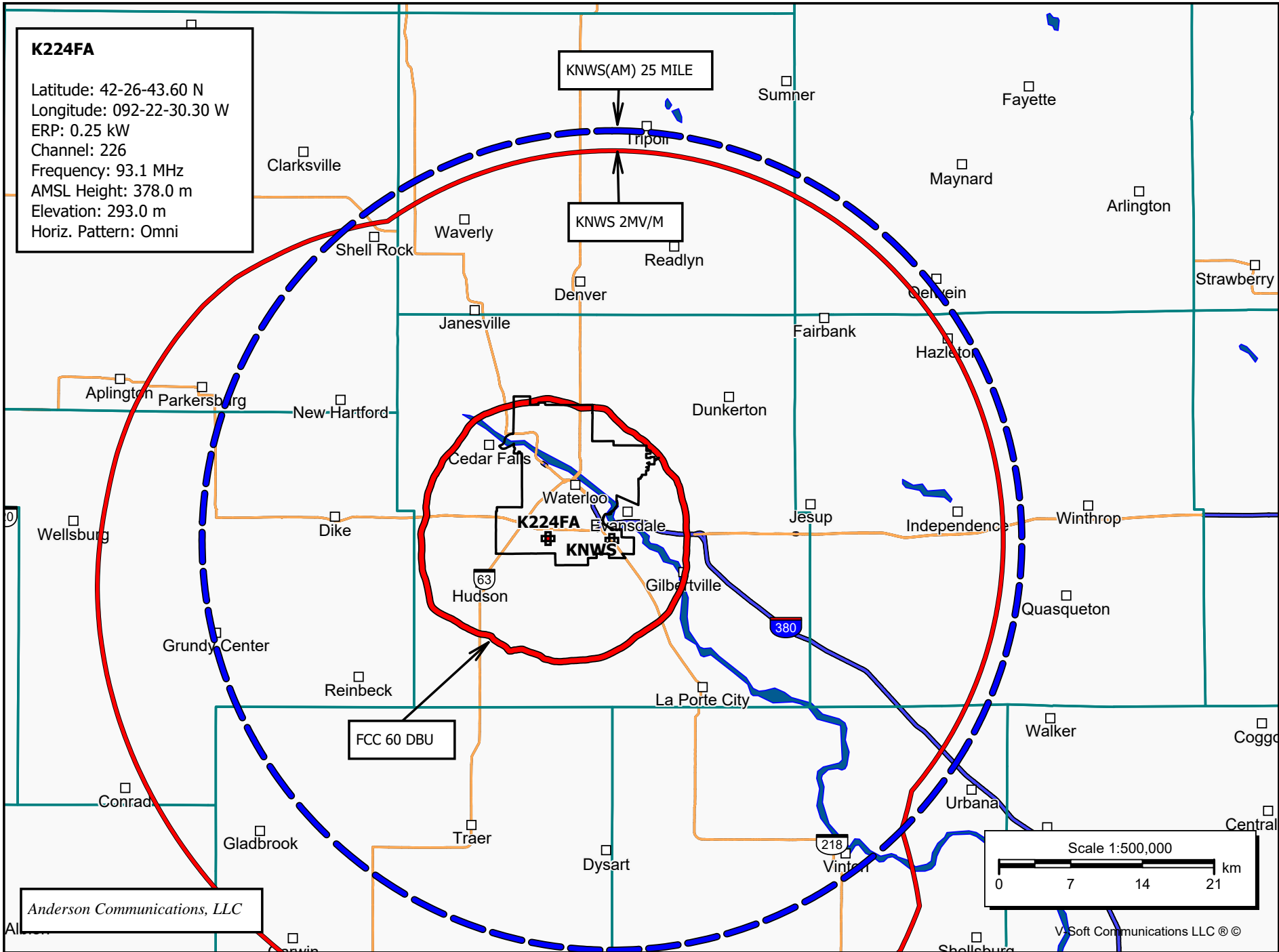
Communications®LLC

E1B AERIAL VIEW OF 122.6 DBU (50:10) CONTOUR



E1B STREET VIEW





E3 Registration 1018166

 [Map Registration](#)

Registration Detail

Reg Number	1018166	Status	Constructed
File Number	A0021787	Constructed	09/01/1985
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

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

Location (in NAD83 Coordinates)

Lat/Long	42-26-45.0 N 092-22-30.0 W	Address	4813 ANSBOROUGH AVE
City, State	WATERLOO , IA		
Zip	50701	County	BLACK HAWK
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
293.2	132.5
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
425.7	132.5

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 9

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

FAA Notification

FAA Study	85-ACE-250-OE	FAA Issue Date	04/17/1985
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Owner & Contact Information

FRN	Owner Entity Type
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Owner

BRAINARD, RONALD E	P: (319)234-3511
1657 FALLS AVE	F:
WATERLOO , IA 50701	E: RADCOMM@FORBIN.COM

Contact

P:
F:
E:

Last Action Status

Status	Constructed	Received	03/31/1997
Purpose	New	Entered	04/04/1997
Mode	Mail In (Manual)		

Related Applications

03/31/1997	A0021787 - New (NE)
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Comments

Comments

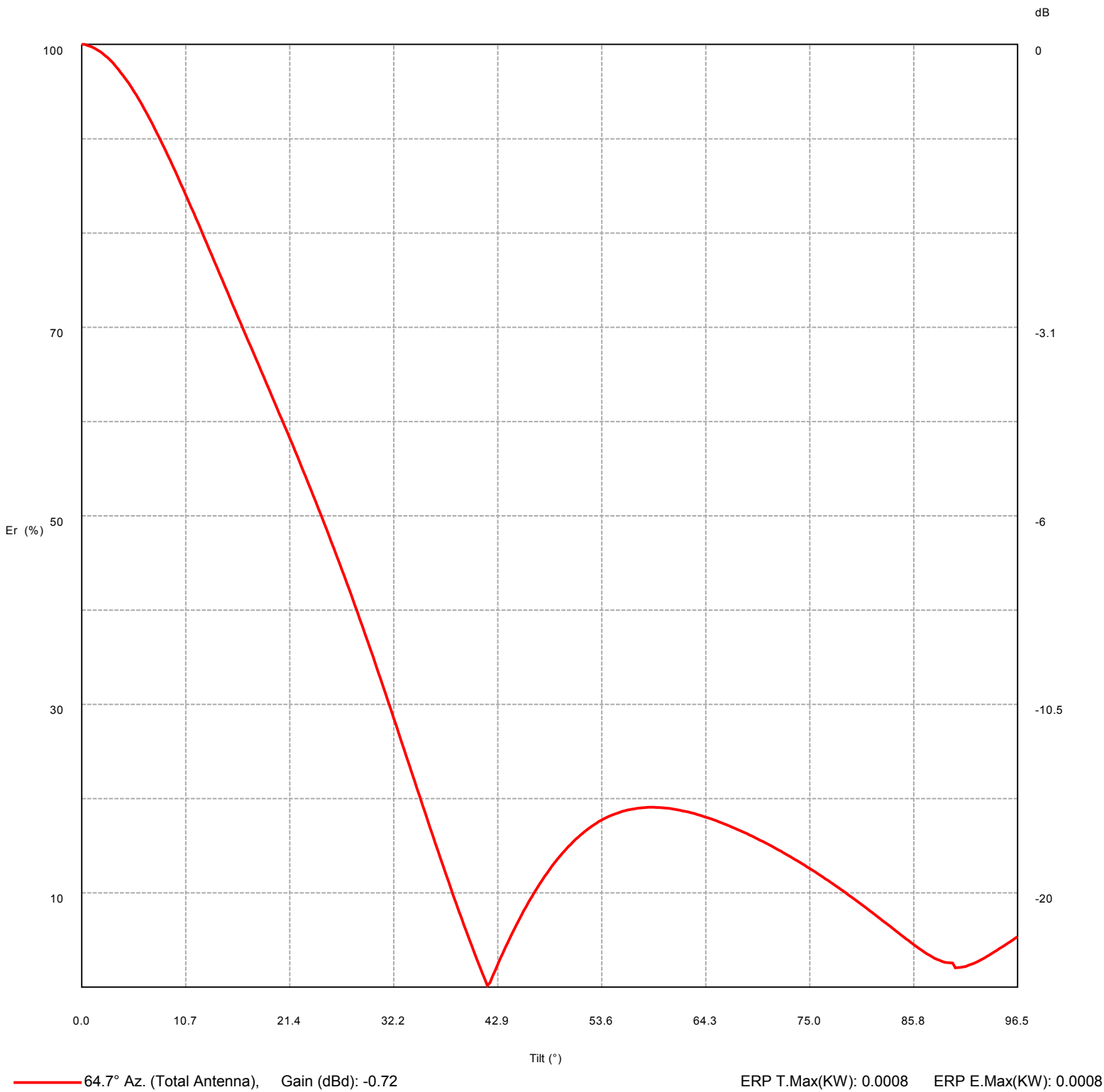
None

2 Bay TFC2K .75 Wave 97.7MHz

September 8, 2014



Vertical diagram at an azimuth of 64.7°



Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	0.8	16.1	71.1	0.4	32.2	28.5	0.1
0.3	100.0	0.8	16.3	70.5	0.4	32.4	27.7	0.1
0.5	99.9	0.8	16.6	69.8	0.4	32.7	26.8	0.1
0.8	99.8	0.8	16.9	69.2	0.4	33.0	26.0	0.1
1.1	99.7	0.8	17.2	68.5	0.4	33.2	25.2	0.1
1.3	99.6	0.8	17.4	67.9	0.4	33.5	24.3	0.1
1.6	99.4	0.8	17.7	67.3	0.4	33.8	23.5	0.0
1.9	99.2	0.8	18.0	66.7	0.4	34.0	22.7	0.0
2.1	99.0	0.8	18.2	66.0	0.4	34.3	21.9	0.0
2.4	98.8	0.8	18.5	65.4	0.4	34.6	21.0	0.0
2.7	98.6	0.8	18.8	64.7	0.4	34.8	20.2	0.0
2.9	98.3	0.8	19.0	64.1	0.3	35.1	19.4	0.0
3.2	98.0	0.8	19.3	63.4	0.3	35.4	18.5	0.0
3.5	97.7	0.8	19.6	62.8	0.3	35.6	17.7	0.0
3.8	97.4	0.8	19.8	62.1	0.3	35.9	16.9	0.0
4.0	97.0	0.8	20.1	61.5	0.3	36.2	16.1	0.0
4.3	96.6	0.8	20.4	60.8	0.3	36.4	15.2	0.0
4.6	96.3	0.8	20.6	60.2	0.3	36.7	14.4	0.0
4.8	95.9	0.8	20.9	59.5	0.3	37.0	13.6	0.0
5.1	95.5	0.8	21.2	58.9	0.3	37.3	12.8	0.0
5.4	95.1	0.8	21.4	58.2	0.3	37.5	12.0	0.0
5.6	94.6	0.8	21.7	57.6	0.3	37.8	11.2	0.0
5.9	94.2	0.8	22.0	56.9	0.3	38.1	10.4	0.0
6.2	93.7	0.7	22.2	56.2	0.3	38.3	9.6	0.0
6.4	93.2	0.7	22.5	55.6	0.3	38.6	8.9	0.0
6.7	92.7	0.7	22.8	54.9	0.3	38.9	8.1	0.0
7.0	92.1	0.7	23.0	54.2	0.2	39.1	7.3	0.0
7.2	91.6	0.7	23.3	53.5	0.2	39.4	6.6	0.0
7.5	91.1	0.7	23.6	52.8	0.2	39.7	5.8	0.0
7.8	90.5	0.7	23.9	52.2	0.2	39.9	5.1	0.0
8.0	90.0	0.7	24.1	51.5	0.2	40.2	4.4	0.0
8.3	89.4	0.7	24.4	50.8	0.2	40.5	3.6	0.0
8.6	88.9	0.7	24.7	50.1	0.2	40.7	2.9	0.0
8.8	88.3	0.7	24.9	49.4	0.2	41.0	2.2	0.0
9.1	87.7	0.7	25.2	48.7	0.2	41.3	1.5	0.0
9.4	87.1	0.6	25.5	47.9	0.2	41.5	0.8	0.0
9.6	86.5	0.6	25.7	47.2	0.2	41.8	0.2	0.0
9.9	85.9	0.6	26.0	46.5	0.2	42.1	0.5	0.0
10.2	85.3	0.6	26.3	45.8	0.2	42.3	1.1	0.0
10.5	84.7	0.6	26.5	45.0	0.2	42.6	1.8	0.0
10.7	84.0	0.6	26.8	44.3	0.2	42.9	2.4	0.0
11.0	83.4	0.6	27.1	43.6	0.2	43.1	3.0	0.0
11.3	82.8	0.6	27.3	42.8	0.2	43.4	3.6	0.0
11.5	82.1	0.6	27.6	42.1	0.1	43.7	4.2	0.0
11.8	81.5	0.6	27.9	41.3	0.1	44.0	4.8	0.0
12.1	80.9	0.6	28.1	40.6	0.1	44.2	5.4	0.0
12.3	80.2	0.5	28.4	39.8	0.1	44.5	6.0	0.0
12.6	79.6	0.5	28.7	39.0	0.1	44.8	6.5	0.0
12.9	78.9	0.5	28.9	38.2	0.1	45.0	7.1	0.0
13.1	78.3	0.5	29.2	37.4	0.1	45.3	7.6	0.0
13.4	77.6	0.5	29.5	36.6	0.1	45.6	8.1	0.0
13.7	77.0	0.5	29.7	35.8	0.1	45.8	8.6	0.0
13.9	76.3	0.5	30.0	35.0	0.1	46.1	9.1	0.0
14.2	75.7	0.5	30.3	34.2	0.1	46.4	9.5	0.0
14.5	75.0	0.5	30.6	33.4	0.1	46.6	10.0	0.0
14.7	74.4	0.5	30.8	32.6	0.1	46.9	10.5	0.0
15.0	73.7	0.5	31.1	31.8	0.1	47.2	10.9	0.0
15.3	73.1	0.5	31.4	31.0	0.1	47.4	11.3	0.0
15.5	72.4	0.4	31.6	30.2	0.1	47.7	11.7	0.0
15.8	71.8	0.4	31.9	29.3	0.1	48.0	12.1	0.0

Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
48.2	12.5	0.0	64.3	18.0	0.0	80.4	8.8	0.0
48.5	12.9	0.0	64.6	17.9	0.0	80.7	8.5	0.0
48.8	13.2	0.0	64.9	17.8	0.0	80.9	8.3	0.0
49.0	13.6	0.0	65.1	17.8	0.0	81.2	8.1	0.0
49.3	13.9	0.0	65.4	17.7	0.0	81.5	7.9	0.0
49.6	14.2	0.0	65.7	17.6	0.0	81.7	7.7	0.0
49.8	14.6	0.0	65.9	17.4	0.0	82.0	7.5	0.0
50.1	14.9	0.0	66.2	17.3	0.0	82.3	7.3	0.0
50.4	15.1	0.0	66.5	17.2	0.0	82.5	7.1	0.0
50.7	15.4	0.0	66.7	17.1	0.0	82.8	6.9	0.0
50.9	15.7	0.0	67.0	17.0	0.0	83.1	6.6	0.0
51.2	15.9	0.0	67.3	16.9	0.0	83.3	6.4	0.0
51.5	16.2	0.0	67.5	16.8	0.0	83.6	6.2	0.0
51.7	16.4	0.0	67.8	16.6	0.0	83.9	6.0	0.0
52.0	16.6	0.0	68.1	16.5	0.0	84.2	5.8	0.0
52.3	16.8	0.0	68.3	16.4	0.0	84.4	5.6	0.0
52.5	17.0	0.0	68.6	16.3	0.0	84.7	5.4	0.0
52.8	17.2	0.0	68.9	16.1	0.0	85.0	5.1	0.0
53.1	17.4	0.0	69.1	16.0	0.0	85.2	4.9	0.0
53.3	17.6	0.0	69.4	15.9	0.0	85.5	4.7	0.0
53.6	17.7	0.0	69.7	15.7	0.0	85.8	4.5	0.0
53.9	17.9	0.0	69.9	15.6	0.0	86.0	4.3	0.0
54.1	18.0	0.0	70.2	15.4	0.0	86.3	4.1	0.0
54.4	18.1	0.0	70.5	15.3	0.0	86.6	3.9	0.0
54.7	18.3	0.0	70.8	15.2	0.0	86.8	3.7	0.0
54.9	18.4	0.0	71.0	15.0	0.0	87.1	3.5	0.0
55.2	18.5	0.0	71.3	14.9	0.0	87.4	3.4	0.0
55.5	18.6	0.0	71.6	14.7	0.0	87.6	3.2	0.0
55.7	18.6	0.0	71.8	14.6	0.0	87.9	3.1	0.0
56.0	18.7	0.0	72.1	14.4	0.0	88.2	2.9	0.0
56.3	18.8	0.0	72.4	14.2	0.0	88.4	2.8	0.0
56.5	18.8	0.0	72.6	14.1	0.0	88.7	2.7	0.0
56.8	18.9	0.0	72.9	13.9	0.0	89.0	2.6	0.0
57.1	18.9	0.0	73.2	13.8	0.0	89.2	2.6	0.0
57.4	19.0	0.0	73.4	13.6	0.0	89.5	2.6	0.0
57.6	19.0	0.0	73.7	13.4	0.0	89.8	2.5	0.0
57.9	19.0	0.0	74.0	13.3	0.0	90.0	2.0	0.0
58.2	19.1	0.0	74.2	13.1	0.0	90.3	2.1	0.0
58.4	19.1	0.0	74.5	12.9	0.0	90.6	2.1	0.0
58.7	19.1	0.0	74.8	12.8	0.0	90.9	2.1	0.0
59.0	19.1	0.0	75.0	12.6	0.0	91.1	2.2	0.0
59.2	19.1	0.0	75.3	12.4	0.0	91.4	2.3	0.0
59.5	19.1	0.0	75.6	12.2	0.0	91.7	2.4	0.0
59.8	19.0	0.0	75.8	12.0	0.0	91.9	2.5	0.0
60.0	19.0	0.0	76.1	11.9	0.0	92.2	2.6	0.0
60.3	19.0	0.0	76.4	11.7	0.0	92.5	2.8	0.0
60.6	19.0	0.0	76.6	11.5	0.0	92.7	2.9	0.0
60.8	18.9	0.0	76.9	11.3	0.0	93.0	3.1	0.0
61.1	18.9	0.0	77.2	11.1	0.0	93.3	3.2	0.0
61.4	18.8	0.0	77.5	10.9	0.0	93.5	3.4	0.0
61.6	18.8	0.0	77.7	10.8	0.0	93.8	3.6	0.0
61.9	18.7	0.0	78.0	10.6	0.0	94.1	3.7	0.0
62.2	18.6	0.0	78.3	10.4	0.0	94.3	3.9	0.0
62.4	18.6	0.0	78.5	10.2	0.0	94.6	4.1	0.0
62.7	18.5	0.0	78.8	10.0	0.0	94.9	4.3	0.0
63.0	18.5	0.0	79.1	9.8	0.0	95.1	4.4	0.0
63.2	18.4	0.0	79.3	9.6	0.0	95.4	4.6	0.0
63.5	18.3	0.0	79.6	9.4	0.0	95.7	4.8	0.0
63.8	18.2	0.0	79.9	9.2	0.0	95.9	5.0	0.0
64.1	18.1	0.0	80.1	9.0	0.0	96.2	5.2	0.0