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Contour-to-Contour Channel Study

Coloff Media, LLC

REFERENCE CH# 272D - 102.3 MHz, Pwr= 0.25 kW, HAAT= 87.2 M, COR= 373 M  
42 24 47.1 N. Average Protected F(50-50)= 12.04 km  
92 26 15.3 W. Omni-directional

DISPLAY DATES  
DATA 04-13-18  
SEARCH 04-13-18

CH CITY	CALL	TYPE STATE	ANT ---	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*OUT* (Overlap in km)
272D Waterloo	1776626	APP _C_ IA		38.7 218.7	12.69 BNPFT20180125ADO	42 30 08.0 92 20 27.0	0.250 347	12.69	12.69 Coloff Media, Llc	
270C Waterloo	KNWS-FM	LIC _CX IA		91.4 271.8	48.80 BLED20051102ABH	42 24 02.0 91 50 36.0	100.000 479	12.4 762	85.2 University of Northwestern	-37.5*<***
275C1 Cedar Rapids	KZIA	LIC _C_ IA		122.7 303.2	72.83 BLH20010521ABM	42 03 25.0 91 41 42.0	100.000 287	9.7 531	70.4 Kzia, Inc.	1.4
273C Des Moines	KSTZ	LIC _CY IA		235.2 54.4	118.12 BLHRB1104ZZ	41 48 01.0 93 36 27.0	100.000 384	117.8 675	79.4 Saga Communications	19.5 Of Iow
272D Cedar Rapids	1775689	APP _C_ IA		121.9 302.4	76.90 BNPFT20180130ACM	42 02 42.0 91 38 48.0	0.250 388	49.9 388	15.0 Kzia, Inc.	19.5
272A Cresco	KCZQ	LIC _CN IA		11.1 191.3	115.20 BLH19910222KA	43 25 47.0 92 09 49.0	3.000 100	77.1 484	25.0 Mega Media, Ltd.	46.4
271L1 Ames	KJAS-LP	LIC _ IA		246.2 65.4	102.55 BLL20151007ABL	42 02 05.0 93 34 25.0	0.094 31	327	Ames Chinese Ministry Asso	79.1
272A Dubuque	KXGE	LIC _C_ IA		82.0 263.2	147.99 BLH19991012ACE	42 35 07.0 90 38 50.0	2.000 94	65.7 332	19.8 Townsquare Media Dubuque L	83.6
218C3 Mason City	KNSM	LIC DVN IA		325.7 145.2	100.53 BLED19880125KA	43 09 27.0 93 08 11.0	8.000 113	0.0 460	0.0 University Of Northern Iow	11.5R 89.0M
219C Iowa City	KSUI	LIC _CY IA		130.0 310.8	118.90 BLED19960708KC	41 43 15.0 91 20 30.0	100.000 394	0.0 626	0.0 The University of Iowa	28.5R 90.4M

Terrain database is GLOBE 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.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
Incoming contour overlap is ignored.  
"\*"affixed to 'IN' or 'OUT' values = site inside restricted contour.  
Reference station has protected zone issue: AM tower  
<\*\*\* Protected using U to D ratio for 2nd adjacent relationship - see page #3 this exhibit

## HOW TO READ THE FM COMPUTER PRINT-OUT

### Translator Reference Station

The computer printout should be self-explanatory for the most part. The parameters of the station being checked, (reference station) are printed in the heading. The 60 dBu protected contour is predicted from the Commission's F(50-50) table. Contour distances are in kilometers and are predicted using the Commission's TVFMINT FORTRAN subroutine. When interference contour distances are less than 16 kilometers the F(50-50) tables are used. If signal contour distances are less than 1.6 km the free-space equation is used.

All distances are derived by the method detailed in Sec. 73.208 of the Rules and Regulations as amended in Docket 80-90. The column labeled "\* OUT \*" shows the greatest distance in kilometers of overlap (or smallest distance of clearance) between the reference station's interference contour and the database station's protected contour. Negative distance figures in this column indicate outgoing contour overlap. Since translators are able to receive interference there is no "In" or incoming column in this report.

Listed antenna heights and power are the specific antenna heights and power from the FCC database.

Under the "AZI" column, the first row of numbers indicate the True North azimuths from the reference station toward the database stations, while the numbers in the second row indicate the reverse bearings from the database stations to the reference station. Bearings are calculated using spherical trigonometry.

The columns labeled "INT" and "PRO" contain the distance in kilometers of the appropriate interference contour and the protected contour of a data base station.

For I.F. relationships the minimum spacings the "OUT" columns change its significance. The letter "R" stands for the minimum **required** distance in kilometers, while the letter "M" in the next column displays the **available clear space** separation in kilometers. Minimum separation distances when displayed are taken from Sec 73.207 of the rules as amended. Canadian and Mexican separation distances, U/D ratios and protected contour values are from the US/Mexican Working Agreement and the US/Canada Working Agreement".

The first three letters of the "TYPE" column identify the current FCC status of the stations. The fourth letter will be a "D" if the facility is directional. "Z" indicates a 73.215 directional. An "N" indicates it is a 73.215 station that operates with an omni-directional antenna. The fifth letter will be an E, H or V depending on the type of antenna polarization. The sixth letter will be a "Y" if the antenna uses beam tilt or an "X" if the commission is not sure, otherwise it will be an "N" or left blank.

1776626 Waterloo, IA, Showing Protection to KNWS-FM  
 74.1204(d) Study - Using GLOBE Terrain Database  
 Translator or LPFM Maximum Licensed ERP = 0.25  
 Translator or LPFM Antenna Height AG = 93 Meters  
 1776626 Antenna Model = NICOM BKG 3-bay half wave

Protected Station's Contour = 75.21057 dBu  
 Translator's or LPFM's full Interference contour 115.21057

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 = 48.8 km  
 Protected Station= KNWS-FM, 100 kw, 762 M Meters COR AMSL

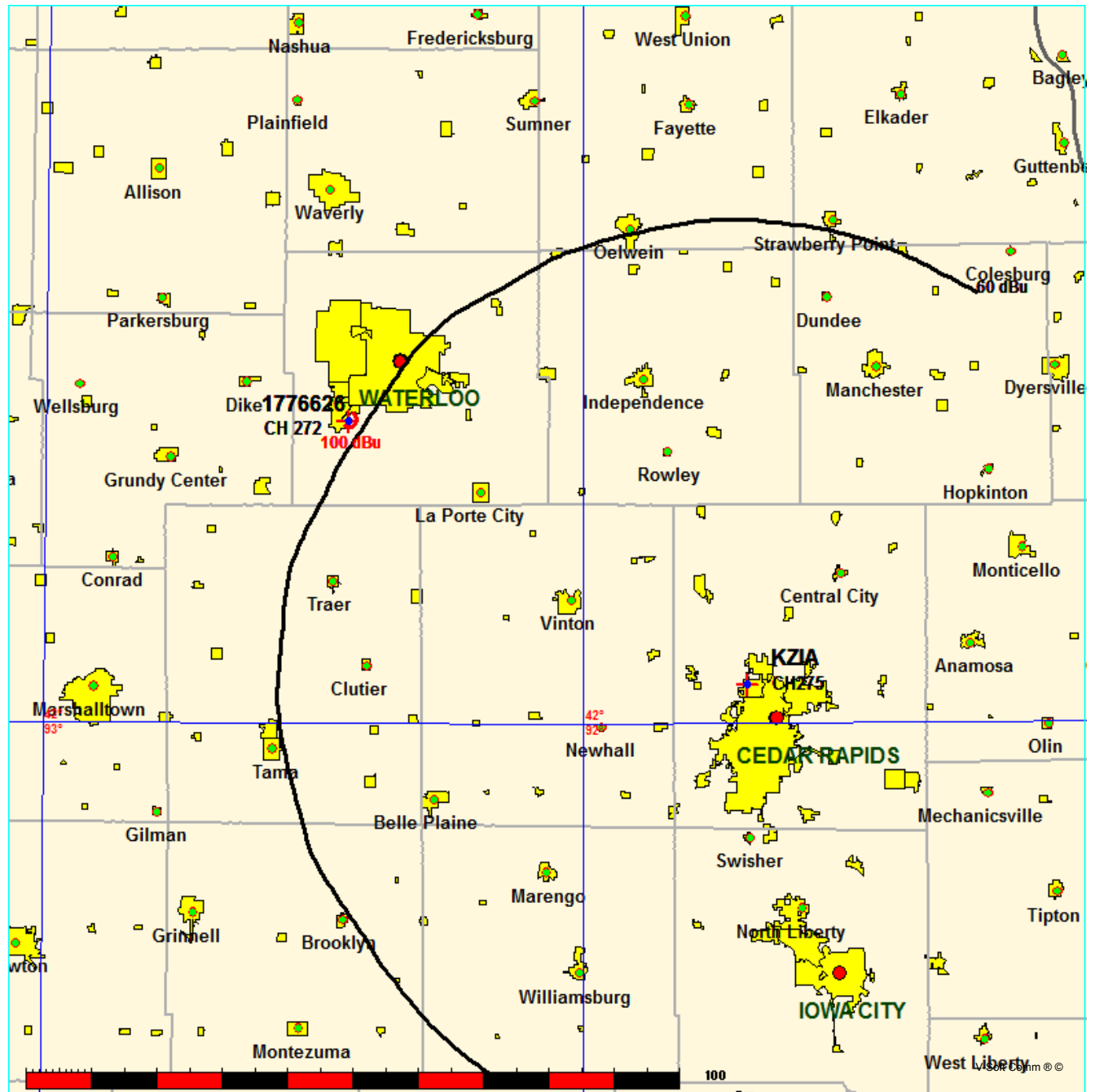
Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	1.0	0.2500	192.5048	192.5048	093.000
05.00	0.972	1.0	0.2362	187.1146	186.4026	076.692
10.00	0.892	1.0	0.1989	171.7143	169.1055	063.182
15.00	0.769	1.0	0.1478	148.0362	142.9920	054.685
20.00	0.619	1.0	0.0958	119.1605	111.9742	052.245
25.00	0.457	1.0	0.0522	087.9747	079.7321	055.820
30.00	0.298	1.0	0.0222	057.3664	049.6808	064.317
35.00	0.156	1.0	0.0061	030.0307	024.5997	075.775
40.00	0.039	1.0	0.0004	007.5077	005.7512	088.174
45.00	0.049	1.0	0.0006	009.4327	006.6699	086.330
50.00	0.108	1.0	0.0029	020.7905	013.3639	077.074
55.00	0.141	1.0	0.0050	027.1432	015.5687	070.766
60.00	0.153	1.0	0.0059	029.4532	014.7266	067.493
65.00	0.15	1.0	0.0056	028.8757	012.2034	066.830
70.00	0.136	1.0	0.0046	026.1807	008.9543	068.398
75.00	0.116	1.0	0.0034	022.3306	005.7796	071.430
80.00	0.092	1.0	0.0021	017.7104	003.0754	075.559
85.00	0.067	1.0	0.0011	012.8978	001.1241	080.151
90.00	0.042	1.0	0.0004	008.0852	000.0000	084.915

Fill-in for KCNZ - 1776626 vs KZIA  
Coloff Media, LLC

FMCommander Single Allocation Study - 04-13-2018 - GLOBE 30 Sec  
1776626's Overlaps (In= 50.74 km, Out= 1.37 km)

1776626 CH 272 D  
Lat= 42 24 47.1, Lng= 92 26 15.3  
0.25 kW 87.2 m HAAT, 373 m COR  
Prot.= 60 dBu, Intef.= 100 dBu

KZIA CH 275 C1 BLH20010521ABM  
Lat= 42 03 25.0, Lng= 91 41 42.0  
100.0 kW 287 m HAAT, 531 m COR  
Prot.= 60 dBu, Intef.= 100 dBu



04-13-2018

Terrain Data: GLOBE 30 Sec

FMOver Analysis

KZIA BLH20010521ABM

1776626

Channel = 275C1

Max ERP = 100 kW

RCAMSL = 531 m

N. Lat. 42 03 25.0

W. Lng. 91 41 42.0

Protected

60 dBu

Channel = 272D

Max ERP = 0.25 kW

RCAMSL = 373 m

N. Lat. 42 24 47.1

W. Lng. 92 26 15.3

Interfering

100 dBu

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
243.0	100.0000	0282.0	070.9	181.3	000.2500	0075.8	072.1	28.91	
244.0	100.0000	0283.3	071.0	181.8	000.2500	0075.0	071.1	29.14	
245.0	100.0000	0284.7	071.1	182.4	000.2500	0074.2	070.0	29.38	
246.0	100.0000	0286.4	071.3	183.0	000.2500	0073.4	069.0	29.61	
247.0	100.0000	0288.3	071.4	183.6	000.2500	0072.9	067.9	29.85	
248.0	100.0000	0290.0	071.6	184.2	000.2500	0072.4	066.9	30.11	
249.0	100.0000	0291.2	071.7	184.7	000.2500	0071.9	065.8	30.37	
250.0	100.0000	0291.4	071.7	185.2	000.2500	0071.4	064.7	30.64	
251.0	100.0000	0290.8	071.7	185.6	000.2500	0071.2	063.6	30.94	
252.0	100.0000	0290.0	071.6	186.1	000.2500	0071.1	062.4	31.27	
253.0	100.0000	0289.3	071.5	186.5	000.2500	0071.1	061.2	31.63	
254.0	100.0000	0288.8	071.5	186.9	000.2500	0071.4	060.1	32.01	
255.0	100.0000	0288.7	071.5	187.4	000.2500	0071.9	058.9	32.41	
256.0	100.0000	0289.0	071.5	187.9	000.2500	0072.4	057.8	32.82	
257.0	100.0000	0289.5	071.5	188.4	000.2500	0073.0	056.6	33.24	
258.0	100.0000	0290.1	071.6	188.9	000.2500	0073.4	055.5	33.66	
259.0	100.0000	0290.7	071.6	189.4	000.2500	0073.6	054.3	34.07	
260.0	100.0000	0291.4	071.7	190.0	000.2500	0073.5	053.2	34.46	
261.0	100.0000	0292.0	071.7	190.5	000.2500	0073.4	052.0	34.84	
262.0	100.0000	0292.8	071.8	191.0	000.2500	0073.1	050.9	35.22	
263.0	100.0000	0293.7	071.9	191.6	000.2500	0072.9	049.7	35.59	
264.0	100.0000	0294.4	071.9	192.1	000.2500	0072.8	048.6	35.98	
265.0	100.0000	0295.3	072.0	192.7	000.2500	0072.9	047.4	36.38	
266.0	100.0000	0296.2	072.1	193.2	000.2500	0073.0	046.2	36.79	
267.0	100.0000	0296.8	072.1	193.8	000.2500	0073.2	045.0	37.23	
268.0	100.0000	0297.3	072.2	194.3	000.2500	0073.3	043.8	37.69	
269.0	100.0000	0297.0	072.1	194.7	000.2500	0073.4	042.6	38.15	
270.0	100.0000	0295.9	072.1	195.1	000.2500	0073.4	041.4	38.62	
271.0	100.0000	0294.9	072.0	195.4	000.2500	0073.4	040.1	39.10	
272.0	100.0000	0293.8	071.9	195.8	000.2500	0073.4	038.9	39.60	
273.0	100.0000	0292.8	071.8	196.1	000.2500	0073.4	037.7	40.11	
274.0	100.0000	0292.3	071.8	196.5	000.2500	0073.4	036.4	40.63	
275.0	100.0000	0291.9	071.7	196.9	000.2500	0073.4	035.2	41.15	
276.0	100.0000	0291.7	071.7	197.3	000.2500	0073.4	034.0	41.69	

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
277.0	100.0000	0292.5	071.8	197.8	000.2500	0073.4	032.8	42.23
278.0	100.0000	0293.4	071.9	198.4	000.2500	0073.3	031.6	42.77
279.0	100.0000	0294.3	071.9	198.9	000.2500	0073.1	030.3	43.37
280.0	100.0000	0295.1	072.0	199.5	000.2500	0072.9	029.1	44.03
281.0	100.0000	0296.2	072.1	200.1	000.2500	0072.8	027.9	44.74
282.0	100.0000	0297.2	072.2	200.7	000.2500	0072.7	026.7	45.51
283.0	100.0000	0297.7	072.2	201.2	000.2500	0072.7	025.4	46.35
284.0	100.0000	0297.1	072.2	201.5	000.2500	0072.7	024.2	47.25
285.0	100.0000	0295.7	072.0	201.7	000.2500	0072.7	022.9	48.19
286.0	100.0000	0294.0	071.9	201.7	000.2500	0072.8	021.6	49.17
287.0	100.0000	0292.1	071.8	201.6	000.2500	0072.7	020.4	50.17
288.0	100.0000	0290.1	071.6	201.4	000.2500	0072.7	019.1	51.20
289.0	100.0000	0287.9	071.4	201.1	000.2500	0072.7	017.9	52.26
290.0	100.0000	0285.5	071.2	200.5	000.2500	0072.7	016.6	53.33
291.0	100.0000	0283.3	071.0	199.9	000.2500	0072.8	015.4	54.42
292.0	100.0000	0281.5	070.9	199.2	000.2500	0073.0	014.1	55.59
293.0	100.0000	0280.2	070.8	198.4	000.2500	0073.3	012.9	57.26
294.0	100.0000	0279.3	070.7	197.6	000.2500	0073.4	011.7	59.11
295.0	100.0000	0278.9	070.7	196.7	000.2500	0073.4	010.5	61.11
296.0	100.0000	0279.1	070.7	195.7	000.2500	0073.4	009.2	63.26
297.0	100.0000	0279.6	070.7	194.4	000.2500	0073.4	008.0	65.54
298.0	100.0000	0279.9	070.8	192.4	000.2500	0072.8	006.8	68.28
299.0	100.0000	0279.5	070.7	188.6	000.2500	0073.2	005.6	71.72
300.0	100.0000	0278.2	070.6	182.0	000.2500	0074.9	004.6	75.61
301.0	100.0000	0276.8	070.5	170.9	000.2500	0073.1	003.6	79.40
302.0	100.0000	0275.7	070.4	153.4	000.2500	0073.1	002.8	83.31
303.0	100.0000	0275.3	070.4	127.9	000.2500	0085.4	002.5	86.78
304.0	100.0000	0275.4	070.4	100.6	000.2500	0093.6	002.7	86.18
305.0	100.0000	0275.7	070.4	080.5	000.2500	0099.2	003.3	83.09
306.0	100.0000	0276.4	070.5	068.1	000.2500	0100.2	004.2	79.27
307.0	100.0000	0277.1	070.5	060.4	000.2500	0098.4	005.3	75.52
308.0	100.0000	0277.9	070.6	055.5	000.2500	0098.6	006.4	72.15
309.0	100.0000	0278.6	070.6	052.3	000.2500	0097.8	007.6	69.03
310.0	100.0000	0279.9	070.7	049.8	000.2500	0096.7	008.8	66.49
311.0	100.0000	0281.6	070.9	047.8	000.2500	0096.4	010.0	64.25
312.0	100.0000	0283.5	071.1	046.2	000.2500	0096.5	011.2	62.19
313.0	100.0000	0285.5	071.2	045.0	000.2500	0096.8	012.4	60.33
314.0	100.0000	0286.9	071.3	044.4	000.2500	0097.3	013.7	58.68
315.0	100.0000	0287.9	071.4	044.0	000.2500	0097.6	014.9	57.23
316.0	100.0000	0288.6	071.5	043.9	000.2500	0097.7	016.2	56.30
317.0	100.0000	0289.1	071.5	043.9	000.2500	0097.7	017.4	55.25
318.0	100.0000	0289.2	071.5	044.1	000.2500	0097.5	018.7	54.21
319.0	100.0000	0289.2	071.5	044.3	000.2500	0097.3	019.9	53.17
320.0	100.0000	0288.9	071.5	044.7	000.2500	0097.0	021.1	52.17
321.0	100.0000	0288.4	071.5	045.1	000.2500	0096.8	022.4	51.19
322.0	100.0000	0287.3	071.4	045.6	000.2500	0096.6	023.6	50.25
323.0	100.0000	0285.4	071.2	046.3	000.2500	0096.5	024.8	49.36
324.0	100.0000	0282.9	071.0	047.0	000.2500	0096.5	026.0	48.52
325.0	100.0000	0280.6	070.8	047.8	000.2500	0096.4	027.3	47.72
326.0	100.0000	0278.7	070.6	048.4	000.2500	0096.4	028.5	46.97
327.0	100.0000	0277.5	070.5	048.9	000.2500	0096.5	029.7	46.26

Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)		Azimuth (degrees)	ERP (kW)	HAAT (m)	Dist (km)	Actual (dBu)
328.0	100.0000	0276.7	070.5		049.4	000.2500	0096.6	030.9	45.61
329.0	100.0000	0276.1	070.4		049.8	000.2500	0096.7	032.1	45.01
330.0	100.0000	0275.6	070.4		050.2	000.2500	0096.9	033.3	44.46
331.0	100.0000	0275.6	070.4		050.5	000.2500	0097.1	034.5	43.91
332.0	100.0000	0276.2	070.4		050.8	000.2500	0097.2	035.7	43.36
333.0	100.0000	0277.2	070.5		051.0	000.2500	0097.3	036.9	42.82
334.0	100.0000	0278.0	070.6		051.3	000.2500	0097.4	038.2	42.30
335.0	100.0000	0278.1	070.6		051.7	000.2500	0097.5	039.4	41.79
336.0	100.0000	0277.7	070.6		052.2	000.2500	0097.7	040.6	41.30
337.0	100.0000	0277.0	070.5		052.6	000.2500	0097.8	041.7	40.82
338.0	100.0000	0276.1	070.4		053.2	000.2500	0098.0	042.9	40.36
339.0	100.0000	0275.2	070.4		053.7	000.2500	0098.1	044.1	39.90
340.0	100.0000	0274.6	070.3		054.1	000.2500	0098.2	045.3	39.45
341.0	100.0000	0274.0	070.3		054.6	000.2500	0098.4	046.4	39.01
342.0	100.0000	0273.3	070.2		055.1	000.2500	0098.5	047.6	38.59
343.0	100.0000	0272.5	070.1		055.6	000.2500	0098.7	048.7	38.17
344.0	100.0000	0271.8	070.1		056.1	000.2500	0098.7	049.9	37.74
345.0	100.0000	0271.2	070.0		056.5	000.2500	0098.7	051.0	37.31
346.0	100.0000	0270.6	070.0		057.0	000.2500	0098.7	052.2	36.87
347.0	100.0000	0270.1	069.9		057.5	000.2500	0098.7	053.3	36.43
348.0	100.0000	0270.0	069.9		057.9	000.2500	0098.6	054.5	35.99
349.0	100.0000	0270.3	069.9		058.3	000.2500	0098.5	055.6	35.55
350.0	100.0000	0270.7	070.0		058.7	000.2500	0098.4	056.8	35.11
351.0	100.0000	0270.9	070.0		059.2	000.2500	0098.3	057.9	34.69
352.0	100.0000	0270.9	070.0		059.6	000.2500	0098.3	059.1	34.28
353.0	100.0000	0270.6	070.0		060.1	000.2500	0098.3	060.2	33.88
354.0	100.0000	0270.5	070.0		060.5	000.2500	0098.4	061.3	33.50
355.0	100.0000	0270.7	070.0		060.9	000.2500	0098.5	062.4	33.13
356.0	100.0000	0270.8	070.0		061.4	000.2500	0098.7	063.6	32.79
357.0	100.0000	0270.5	070.0		061.9	000.2500	0099.0	064.7	32.46
358.0	100.0000	0270.0	069.9		062.3	000.2500	0099.4	065.8	32.15
359.0	100.0000	0269.5	069.9		062.8	000.2500	0099.7	066.8	31.84
000.0	100.0000	0269.0	069.8		063.3	000.2500	0100.0	067.9	31.54
001.0	100.0000	0267.8	069.7		063.8	000.2500	0100.3	069.0	31.24
002.0	100.0000	0266.6	069.6		064.4	000.2500	0100.4	070.0	30.94