

## Proposed Site Change for W280FX at Norwalk, Connecticut

Facility ID 202426

File No. BNPFT-20180501ABN

### Technical Statement

#### Summary

This application proposes a relocation of W280FX to the east tower of co-owned primary station WNLK(AM) at Norwalk, CT.

The 60 dBu service contour of the proposed amended facility overlaps that of the presently authorized facility (both green), and remains lies entirely within 25 miles of the AM site (gray circle), as illustrated in Figure 1 below.

#### Section 74.1204 Study

The following facilities were studied.

Call Sign	C	ST	City	Freq.	ERP	Class	Status	D
Proposed	6	CT	NORWALK	103.9	250.0	A	APP	0.00
WNLK(AM)	0	CT	NORWALK	1350.0	1000.0	A	LIC	0.03
W280FX CP	2	CT	NORWALK	103.9	100.0	D	CP	3.98
W279CI	1	CT	DANBURY	103.7	250.0	D	LIC	28.79
WNBM	2	NY	BRONXVILLE	103.9	980.0	A	LIC	45.51
WAXQ	1	NY	NEW YORK	104.3	6000.0	B	LIC	61.77
WKTU	1	NY	LAKE SUCCESS	103.5	6000.0	B	LIC	61.77
WRCN-FM	1	NY	RIVERHEAD	103.9	1400.0	A	LIC	63.45
WMRQ-FM	2	CT	WATERBURY	104.1	14000.0	B	LIC	69.99

Figure 1 illustrates the absence of prohibited overlap between the proposed modified translator F(50,10) interfering contours and the pertinent service contours of all facilities listed above except WKTU and WAXQ (Key: same colors may not overlap.)

As shown in Figure 1, the proposed translator interfering contour lies inside the protected service contours of WKTU and WAXQ, which are co-located. Therefore, the applicant respectfully requests a waiver pursuant to 74.1204(d) as described below.

Also as illustrated in Figure 1, the signal level from both WKTU and WAXQ at the proposed translator site is 55.5 dBu. The Commission has generally considered overlap from a proposed translator interfering contour to be acceptable where the ratio of undesired to desired signal (U/D) does not exceed 40 dB i.e. where in the instant case the proposed translator F(50,10) interfering signal does not exceed 95.5 dBu.

### **Protection to WKTU and WAXQ**

The proposed translator facility will operate with an ERP of 0.25 kW. As seen in Figure 2, the nearest residence to the proposed antenna site is 69 meters from the tower base. For 0.25 kW ERP the 95.5 dBu F(50,10) interfering contour extends 1,862 meters in free space.

The applicant will employ a phased antenna array to protect the entire area that lies at distances between 69 and 1,862 meters from the proposed site from receiving an interfering signal level that could equal or exceed 95.5 dBu F(50,10). That is to say, the interfering signal will not reach the ground at any point.

The proposed antenna design is comprised of eight Label Italy AKG-1/N vertical dipoles in a phased array centered 51 meters above ground level on the WNLK(AM) east tower and oriented at 330 degrees True. The relative spacing, magnitude, and phase of the power fed to each bay is shown in Figure 3.

The array produces the elevation pattern graphed in Figure 4. The red curve shown indicates the maximum allowed field limits at all pertinent vertical angles in order that the 95.5 dBu F(50,10) interfering contour not reach the ground for an ERP of 0.25 kW. The blue curve illustrates the field produced by the antenna array. As shown, the field from the proposed array remains below the maximum allowable limit at all points. A detailed tabulation at increments of 0.1 degree of the elevation pattern produced by the array is provided in the Appendix.

Figure 5 illustrates interference protection by showing the downward or depression angle to points on the ground at distances between 69 meters and 1,862 meters together with the actual distance in space (hypotenuse of a right triangle) to each point, the field and ERP produced by the antenna array at the pertinent downward angle, the distance to the 95.5 dBu F(50,10) interfering contour, and the margin of safety dB between the interfering contour and the allowable maximum.

It might be noted that whereas the tabulations and figures presented herein assume an ERP of 0.25 kW, the horizontal field of the directional antenna is such that the ERP is less than 0.25 kW along most azimuths, including in the direction of the nearest residence.

The applicant therefore believes its application meets the requirements of Section 74.1204(d) with respect to "other factors" insuring no actual interference to either WKTU or WAXQ. Nevertheless, as required by the Commission's Rules, in the event of any complaints that the proposed translator interferes with reception of either station, the applicant will take the required steps to eliminate the interference, including, if necessary, reducing power or cessation of translator operation.

### **Environmental Considerations**

The proposed antenna will be mounted on an existing tower with no new construction or change in height. Compliance with RFR limits was determined by use of the Commission's RF Worksheet #1.

The applicant will cease operation or reduce power as necessary in order to prevent uncontrolled or controlled exposure in excess of the guidelines of OET-65 Appendix A.

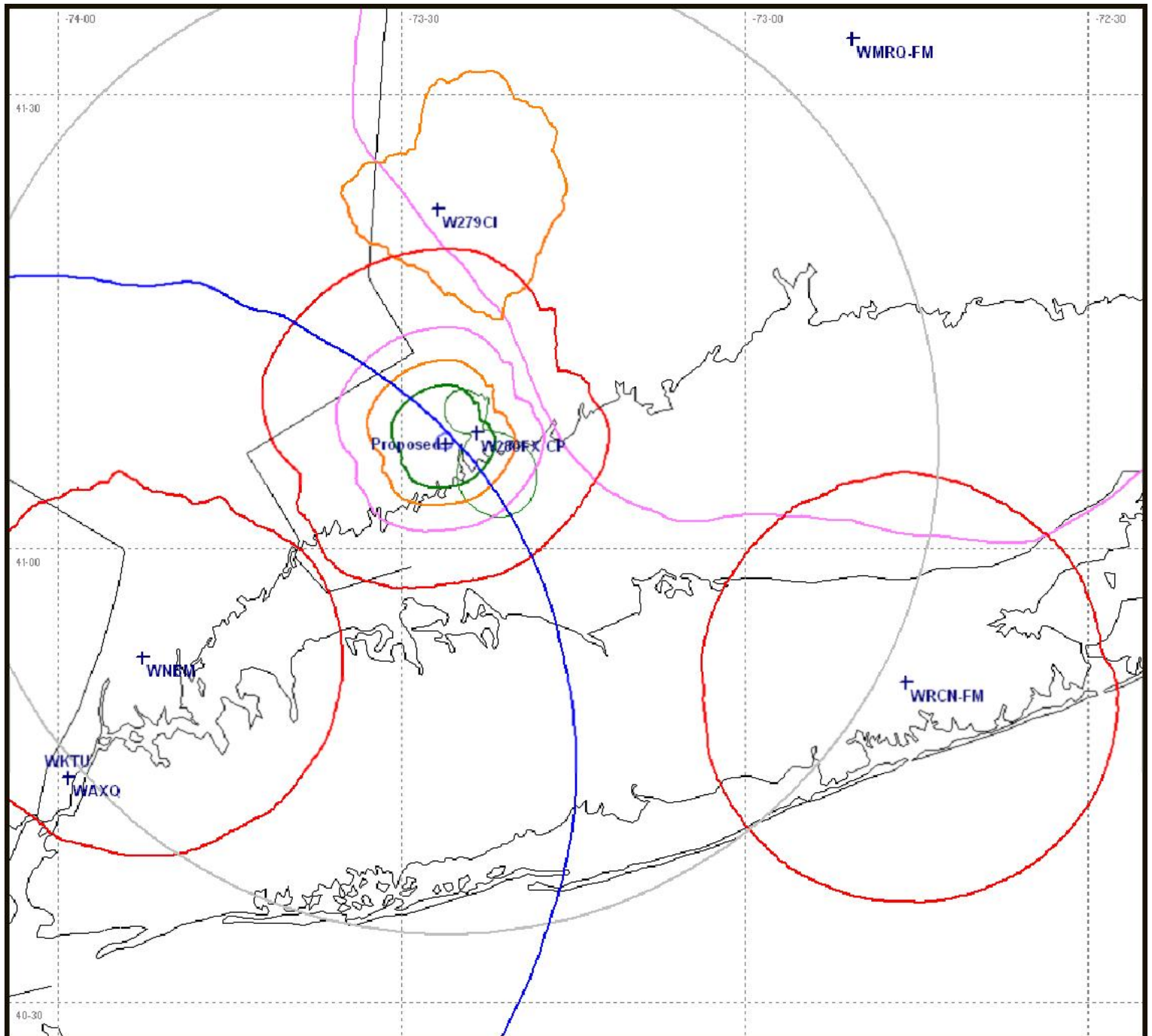
Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Dennis Jackson', with a stylized, flowing script.

Dennis Jackson  
Technical Consultant  
March 14, 2021

**Figure 1 – Section 74.1204 Study**

**No prohibited overlap is created. (Key: Same colors may not overlap.)**  
**Proposed service contour overlaps that of authorized facility (both green)**  
**and remains within 25 miles of primary station WNLK(AM) (gray.)**  
**WKTU and WAXQ both place 55.5 dBu service contours to the proposed site (blue.)**



**Figure 2 – Antenna Vicinity**

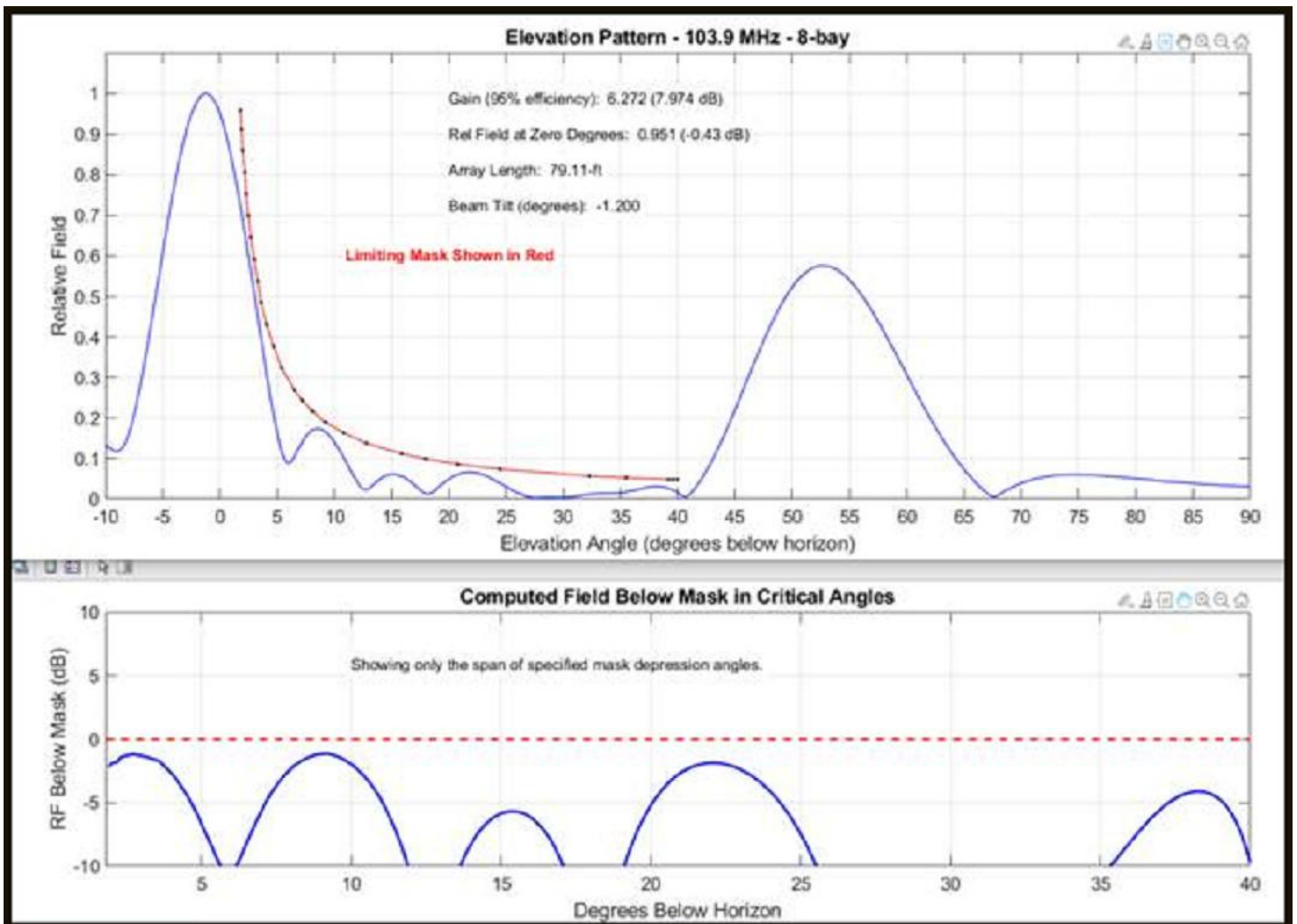
**Nearest residence is 69 meters from proposed antenna site on WNLK(AM) east tower**



**Figure 3 – Antenna Array Parameters**

Bay # From Top	1	2	3	4	5	6	7	8
Relative Phase (deg)	-64.796	-54.775	-44.359	-31.257	-26.27	-14.007	-9.147	0
Relative Magnitude (V)	0.447	0.892	1.000	0.989	0.892	0.881	0.794	0.501
Equal spacing at 134-inches (1.1796 wavelength)								

**Figure 4 – Antenna Array Elevation Pattern**



**Figure 5**

**Clearance from 95.5 dBu F(50,10) Interfering Contour to Ground**

**at distances from 69 meters to 1,862 meters from antenna site,**

**expressed as a margin of safety in dB.**

**Antenna HAGL = 57 meters**

<b>Horizontal Distance to Point (meters)</b>	<b>Downward Vertical Angle (degrees)</b>	<b>Actual Distance in Space (meters)</b>	<b>Power Limit (Watts)</b>	<b>Antenna Field Limit</b>	<b>Actual Antenna Field</b>	<b>Margin of Safety (dB)</b>
69	36.5	85.8	0.53	0.046	0.023	6.03
70	36.1	86.6	0.54	0.046	0.012	11.76
85	31.0	99.1	0.70	0.053	0.022	7.62
100	27.0	112.3	0.90	0.060	0.046	2.31
125	22.2	135.0	1.32	0.073	0.017	12.62
150	18.8	158.4	1.81	0.085	0.006	23.03
175	16.2	182.3	2.40	0.098	0.057	4.71
200	14.3	206.4	3.03	0.110	0.057	5.72
250	11.5	255.1	4.70	0.137	0.052	8.42
300	9.6	304.3	6.68	0.163	0.146	0.98
325	8.9	329.0	7.80	0.177	0.164	0.64
350	8.3	353.7	9.00	0.190	0.167	1.11
400	7.3	403.2	11.7	0.216	0.140	3.78
450	6.5	452.9	14.8	0.243	0.090	8.64
500	5.8	502.6	18.2	0.270	0.055	13.81
600	4.9	602.2	26.1	0.323	0.145	6.96
700	4.2	701.9	35.5	0.377	0.260	3.22
800	3.6	801.6	46.4	0.431	0.370	1.32
850	3.4	851.5	52.3	0.457	0.408	0.99
875	3.3	876.5	55.4	0.471	0.427	0.85
900	3.2	901.4	58.6	0.484	0.447	0.69
950	3.1	951.4	65.2	0.511	0.466	0.80
975	3.0	976.3	68.7	0.524	0.485	0.68
1000	2.9	1001.3	72.3	0.538	0.504	0.56
1050	2.8	1051.2	79.7	0.565	0.523	0.67
1100	2.7	1101.2	87.4	0.591	0.542	0.76
1200	2.4	1201.1	104.0	0.645	0.599	0.64
1300	2.2	1301.0	122.1	0.699	0.636	0.82
1400	2.1	1400.9	141.6	0.753	0.654	1.22
1500	1.9	1500.9	162.5	0.806	0.689	1.36
1600	1.8	1600.8	184.8	0.860	0.707	1.70
1700	1.7	1700.8	208.0	0.912	0.724	2.01
1800	1.6	1800.7	234.0	0.967	0.740	2.33
1862	1.6	1862.7	250.0	1.000	0.740	2.62

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**Antenna Array Elevation Pattern Tabulation**

**At Downward Angles between 1.6 degrees (1,862 meters from antenna)**

**To 36.5 degrees (corresponds to 69 meters from antenna)**

<b>Downward</b>		<b>Downward</b>		<b>Downward</b>		<b>Downward</b>	
<b>Angle (Deg)</b>	<b>Field</b>	<b>Angle (Deg)</b>	<b>Field</b>	<b>Angle (Deg)</b>	<b>Field</b>	<b>Angle (Deg)</b>	<b>Field</b>
0.0	0.946	4.8	0.160	9.6	0.146	14.4	0.059
0.1	0.937	4.9	0.145	9.7	0.142	14.5	0.060
0.2	0.928	5.0	0.130	9.8	0.138	14.6	0.061
0.3	0.918	5.1	0.116	9.9	0.134	14.7	0.062
0.4	0.907	5.2	0.103	10.0	0.130	14.8	0.063
0.5	0.896	5.3	0.091	10.1	0.125	14.9	0.064
0.6	0.885	5.4	0.080	10.2	0.121	15.0	0.064
0.7	0.872	5.5	0.071	10.3	0.116	15.1	0.064
0.8	0.860	5.6	0.063	10.4	0.111	15.2	0.064
0.9	0.846	5.7	0.058	10.5	0.106	15.3	0.064
1.0	0.832	5.8	0.055	10.6	0.101	15.4	0.064
1.1	0.818	5.9	0.056	10.7	0.096	15.5	0.064
1.2	0.803	6.0	0.058	10.8	0.090	15.6	0.063
1.3	0.788	6.1	0.063	10.9	0.085	15.7	0.062
1.4	0.773	6.2	0.069	11.0	0.080	15.8	0.062
1.5	0.757	6.3	0.076	11.1	0.074	15.9	0.061
1.6	0.740	6.4	0.083	11.2	0.069	16.0	0.060
1.7	0.724	6.5	0.090	11.3	0.063	16.1	0.058
1.8	0.707	6.6	0.097	11.4	0.058	16.2	0.057
1.9	0.689	6.7	0.104	11.5	0.052	16.3	0.056
2.0	0.672	6.8	0.111	11.6	0.047	16.4	0.054
2.1	0.654	6.9	0.117	11.7	0.041	16.5	0.052
2.2	0.636	7.0	0.123	11.8	0.036	16.6	0.051
2.3	0.617	7.1	0.129	11.9	0.031	16.7	0.049
2.4	0.599	7.2	0.135	12.0	0.026	16.8	0.047
2.5	0.580	7.3	0.140	12.1	0.021	16.9	0.045
2.6	0.561	7.4	0.144	12.2	0.016	17.0	0.043
2.7	0.542	7.5	0.148	12.3	0.011	17.1	0.041
2.8	0.523	7.6	0.152	12.4	0.007	17.2	0.039
2.9	0.504	7.7	0.155	12.5	0.004	17.3	0.037
3.0	0.485	7.8	0.158	12.6	0.005	17.4	0.035
3.1	0.466	7.9	0.161	12.7	0.009	17.5	0.033
3.2	0.447	8.0	0.163	12.8	0.013	17.6	0.030
3.3	0.427	8.1	0.164	12.9	0.017	17.7	0.028
3.4	0.408	8.2	0.166	13.0	0.021	17.8	0.026
3.5	0.389	8.3	0.167	13.1	0.025	17.9	0.024
3.6	0.370	8.4	0.167	13.2	0.029	18.0	0.022
3.7	0.351	8.5	0.167	13.3	0.032	18.1	0.020
3.8	0.333	8.6	0.167	13.4	0.036	18.2	0.017
3.9	0.314	8.7	0.166	13.5	0.039	18.3	0.015
4.0	0.296	8.8	0.165	13.6	0.042	18.4	0.013
4.1	0.278	8.9	0.164	13.7	0.045	18.5	0.011
4.2	0.260	9.0	0.162	13.8	0.047	18.6	0.009
4.3	0.242	9.1	0.160	13.9	0.050	18.7	0.008
4.4	0.225	9.2	0.158	14.0	0.052	18.8	0.006
4.5	0.208	9.3	0.155	14.1	0.054	18.9	0.004
4.6	0.192	9.4	0.152	14.2	0.056	19.0	0.003
4.7	0.175	9.5	0.149	14.3	0.057	19.1	0.003

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**Antenna Array Elevation Pattern Tabulation**

**At Downward Angles between 1.6 degrees (1,862 meters from antenna)**

<b>Downward Angle (Deg)</b>	<b>Field</b>		<b>Downward Angle (Deg)</b>	<b>Field</b>		<b>Downward Angle (Deg)</b>	<b>Field</b>		<b>Downward Angle (Deg)</b>	<b>Field</b>
19.2	0.003		24.0	0.030		28.8	0.023		33.6	0.040
19.3	0.004		24.1	0.031		28.9	0.021		33.7	0.040
19.4	0.006		24.2	0.032		29.0	0.019		33.8	0.039
19.5	0.007		24.3	0.033		29.1	0.017		33.9	0.038
19.6	0.008		24.4	0.034		29.2	0.015		34.0	0.037
19.7	0.009		24.5	0.036		29.3	0.013		34.1	0.036
19.8	0.010		24.6	0.037		29.4	0.011		34.2	0.035
19.9	0.012		24.7	0.038		29.5	0.009		34.3	0.034
20.0	0.012		24.8	0.039		29.6	0.007		34.4	0.032
20.1	0.013		24.9	0.040		29.7	0.005		34.5	0.031
20.2	0.014		25.0	0.041		29.8	0.004		34.6	0.029
20.3	0.015		25.1	0.042		29.9	0.003		34.7	0.027
20.4	0.015		25.2	0.043		30.0	0.003		34.8	0.026
20.5	0.016		25.3	0.044		30.1	0.005		34.9	0.024
20.6	0.016		25.4	0.044		30.2	0.007		35.0	0.022
20.7	0.017		25.5	0.045		30.3	0.009		35.1	0.020
20.8	0.017		25.6	0.046		30.4	0.011		35.2	0.018
20.9	0.017		25.7	0.046		30.5	0.012		35.3	0.016
21.0	0.018		25.8	0.047		30.6	0.014		35.4	0.014
21.1	0.018		25.9	0.047		30.7	0.016		35.5	0.012
21.2	0.018		26.0	0.047		30.8	0.018		35.6	0.010
21.3	0.018		26.1	0.048		30.9	0.020		35.7	0.009
21.4	0.018		26.2	0.048		31.0	0.022		35.8	0.009
21.5	0.018		26.3	0.048		31.1	0.024		35.9	0.009
21.6	0.017		26.4	0.048		31.2	0.025		36.0	0.010
21.7	0.017		26.5	0.048		31.3	0.027		36.1	0.012
21.8	0.017		26.6	0.047		31.4	0.028		36.2	0.015
21.9	0.017		26.7	0.047		31.5	0.030		36.3	0.017
22.0	0.017		26.8	0.047		31.6	0.031		36.4	0.020
22.1	0.017		26.9	0.046		31.7	0.033		36.5	0.023
22.2	0.017		27.0	0.046		31.8	0.034		36.6	0.026
22.3	0.017		27.1	0.045		31.9	0.035		36.7	0.029
22.4	0.017		27.2	0.044		32.0	0.036		36.8	0.032
22.5	0.017		27.3	0.044		32.1	0.037		36.9	0.035
22.6	0.017		27.4	0.043		32.2	0.038		37.0	0.038
22.7	0.017		27.5	0.042		32.3	0.039		37.1	0.041
22.8	0.018		27.6	0.041		32.4	0.040		37.2	0.044
22.9	0.018		27.7	0.040		32.5	0.040		37.3	0.047
23.0	0.019		27.8	0.038		32.6	0.041		37.4	0.051
23.1	0.020		27.9	0.037		32.7	0.041		37.5	0.054
23.2	0.021		28.0	0.036		32.8	0.042		37.6	0.057
23.3	0.022		28.1	0.034		32.9	0.042		37.7	0.060
23.4	0.023		28.2	0.033		33.0	0.042		37.8	0.063
23.5	0.024		28.3	0.031		33.1	0.042		37.9	0.067
23.6	0.025		28.4	0.030		33.2	0.042		38.0	0.070
23.7	0.026		28.5	0.028		33.3	0.042		38.1	0.073
23.8	0.027		28.6	0.026		33.4	0.041		38.2	0.076
23.9	0.028		28.7	0.024		33.5	0.041		38.3	0.079