



Antenna Model:

TFU-20GTH/VP-R 4C160

Proposal Number: C-70487
Date: 14-Mar-17
Customer: Nexstar
Location: Mobile, AL

Electrical Specifications

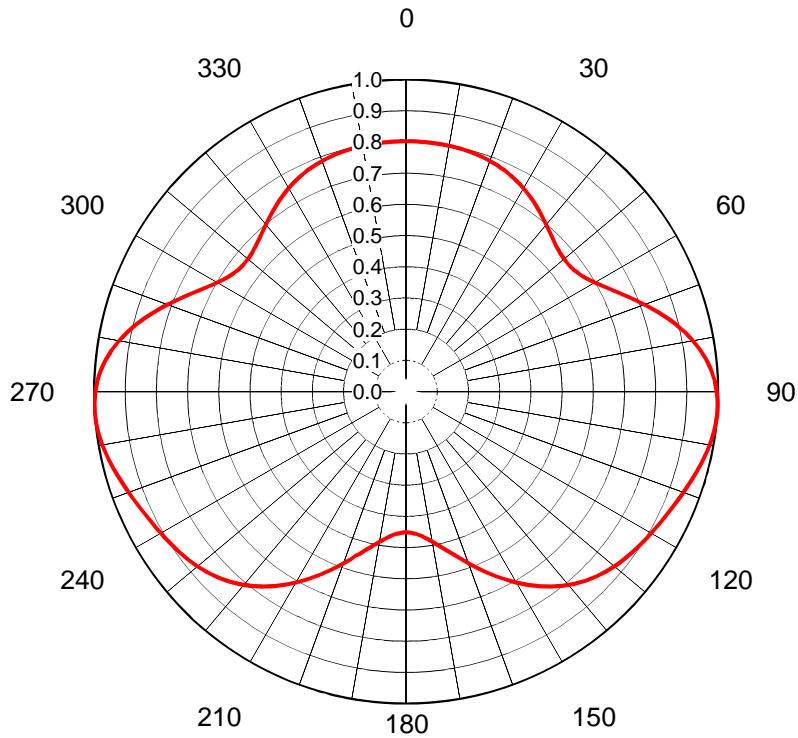
Polarization: Elliptical
Azimuth Pattern: Directional
Antenna Input: 6-1/8" 75 Ohm EIA/DCA
VSWR: Channel 1.08 : 1
Bandwidth: 6 MHz
Rated Input Power: 45 kW (16.53 dBk) Maximum Average Power

Mechanical Specifications

Mounting: Top Mounted
Environmental Protection: Full Radome
Height: 41.6 ft (12.7m) less Lightning Protector 45.6 ft (13.9m) with Lightning Protector
Weight: 6010 lb (2.7t)
Effective Projected Area: 49.6 ft² (4.6m²) TIA/EIA-222-F **Basic Wind Speed:** 95 m/h (152.9 km/h)

Channel Specifications

Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak Main Lobe Vpol Gain	Peak at Horizontal Hpol Gain	Peak at Horizontal Vpol Gain
WKRG	20	509 MHz	853.0 kW (29.31 dBk)	213.3 kW (23.29 dBk)	56.5 kW (17.52 dBk)	23.45 (13.70dB)	5.86 (7.68dB)	20.29 (13.07dB)	5.07 (7.05dB)



AZIMUTH PATTERN Horizontal Polarization

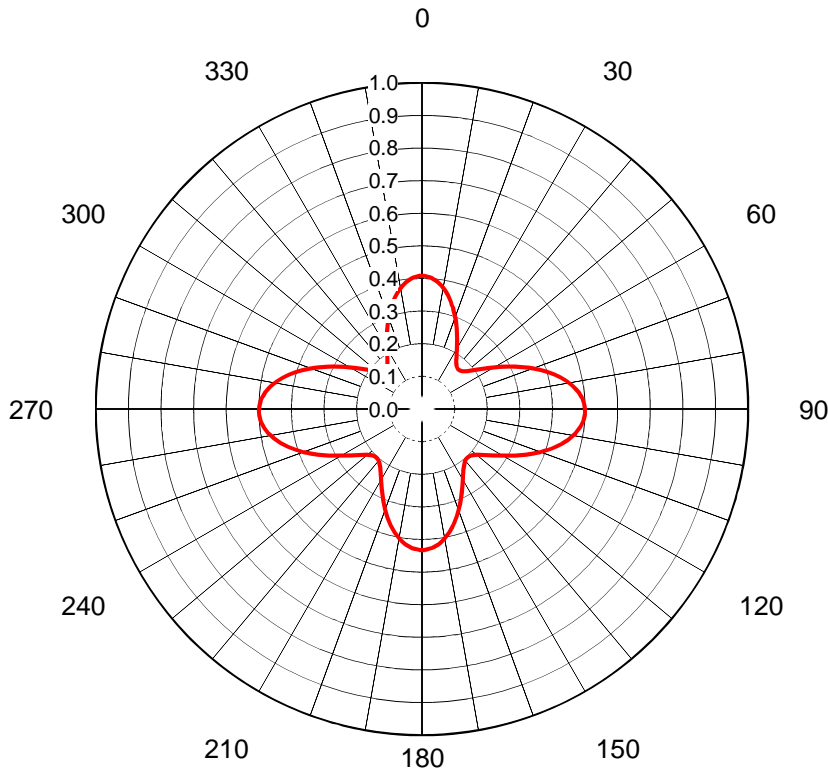
Proposal No. **C-70487**
 Date **14-Mar-17**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-20GTH/VP-R 4C160**
 Gain **1.58 (1.99dB)**
Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.802	36	0.721	72	0.840	108	0.955	144	0.772	180	0.451	216	0.773	252	0.955	288	0.840
1	0.802	37	0.716	73	0.853	109	0.950	145	0.762	181	0.452	217	0.782	253	0.959	289	0.827
2	0.802	38	0.710	74	0.866	110	0.946	146	0.752	182	0.453	218	0.792	254	0.964	290	0.814
3	0.802	39	0.704	75	0.879	111	0.942	147	0.741	183	0.455	219	0.800	255	0.968	291	0.801
4	0.802	40	0.699	76	0.891	112	0.937	148	0.730	184	0.457	220	0.809	256	0.973	292	0.788
5	0.802	41	0.693	77	0.902	113	0.933	149	0.718	185	0.461	221	0.817	257	0.977	293	0.775
6	0.802	42	0.688	78	0.914	114	0.929	150	0.707	186	0.465	222	0.825	258	0.981	294	0.763
7	0.801	43	0.683	79	0.924	115	0.925	151	0.695	187	0.470	223	0.832	259	0.984	295	0.751
8	0.801	44	0.678	80	0.935	116	0.922	152	0.683	188	0.475	224	0.839	260	0.988	296	0.739
9	0.800	45	0.674	81	0.944	117	0.918	153	0.671	189	0.482	225	0.845	261	0.991	297	0.728
10	0.800	46	0.670	82	0.953	118	0.914	154	0.658	190	0.488	226	0.852	262	0.994	298	0.717
11	0.799	47	0.667	83	0.960	119	0.911	155	0.646	191	0.496	227	0.857	263	0.996	299	0.708
12	0.798	48	0.664	84	0.968	120	0.908	156	0.634	192	0.504	228	0.863	264	0.998	300	0.699
13	0.797	49	0.663	85	0.974	121	0.904	157	0.622	193	0.513	229	0.867	265	0.999	301	0.691
14	0.796	50	0.661	86	0.981	122	0.901	158	0.610	194	0.522	230	0.872	266	1.000	302	0.683
15	0.795	51	0.661	87	0.985	123	0.898	159	0.598	195	0.532	231	0.876	267	1.000	303	0.678
16	0.794	52	0.661	88	0.990	124	0.895	160	0.586	196	0.542	232	0.880	268	0.999	304	0.672
17	0.792	53	0.663	89	0.993	125	0.891	161	0.575	197	0.550	233	0.884	269	0.998	305	0.668
18	0.791	54	0.665	90	0.996	126	0.888	162	0.563	198	0.563	234	0.888	270	0.996	306	0.665
19	0.789	55	0.668	91	0.998	127	0.884	163	0.552	199	0.575	235	0.891	271	0.993	307	0.663
20	0.787	56	0.672	92	0.999	128	0.880	164	0.542	200	0.586	236	0.895	272	0.990	308	0.661
21	0.784	57	0.678	93	1.000	129	0.876	165	0.532	201	0.598	237	0.898	273	0.985	309	0.661
22	0.782	58	0.684	94	1.000	130	0.872	166	0.522	202	0.610	238	0.901	274	0.981	310	0.661
23	0.779	59	0.691	95	0.999	131	0.867	167	0.513	203	0.622	239	0.904	275	0.974	311	0.663
24	0.776	60	0.699	96	0.998	132	0.863	168	0.504	204	0.634	240	0.908	276	0.968	312	0.664
25	0.773	61	0.708	97	0.996	133	0.857	169	0.496	205	0.646	241	0.911	277	0.960	313	0.667
26	0.769	62	0.717	98	0.994	134	0.852	170	0.488	206	0.658	242	0.914	278	0.953	314	0.670
27	0.765	63	0.728	99	0.991	135	0.845	171	0.482	207	0.671	243	0.918	279	0.944	315	0.674
28	0.761	64	0.739	100	0.988	136	0.839	172	0.475	208	0.683	244	0.922	280	0.935	316	0.678
29	0.757	65	0.751	101	0.984	137	0.832	173	0.470	209	0.695	245	0.925	281	0.924	317	0.683
30	0.753	66	0.763	102	0.981	138	0.825	174	0.465	210	0.707	246	0.929	282	0.914	318	0.688
31	0.748	67	0.775	103	0.977	139	0.817	175	0.461	211	0.718	247	0.933	283	0.902	319	0.693
32	0.743	68	0.788	104	0.973	140	0.809	176	0.457	212	0.730	248	0.937	284	0.891	320	0.699
33	0.738	69	0.801	105	0.968	141	0.800	177	0.455	213	0.741	249	0.942	285	0.879	321	0.704
34	0.732	70	0.814	106	0.964	142	0.792	178	0.453	214	0.752	250	0.946	286	0.866	322	0.710
35	0.727	71	0.827	107	0.959	143	0.782	179	0.452	215	0.762	251	0.950	287	0.853	323	0.716

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70487**
 Date **14-Mar-17**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-20GTH/VP-R 4C160**
 Gain **2.2 (3.42dB)**
Calculated



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.408	36	0.179	72	0.385	108	0.406	144	0.218	180	0.433	216	0.218	252	0.406	288	0.385
1	0.408	37	0.175	73	0.395	109	0.396	145	0.222	181	0.432	217	0.215	253	0.415	289	0.374
2	0.407	38	0.172	74	0.406	110	0.386	146	0.227	182	0.431	218	0.211	254	0.424	290	0.363
3	0.405	39	0.169	75	0.416	111	0.376	147	0.232	183	0.430	219	0.209	255	0.433	291	0.352
4	0.403	40	0.167	76	0.425	112	0.366	148	0.238	184	0.428	220	0.207	256	0.442	292	0.341
5	0.400	41	0.166	77	0.434	113	0.356	149	0.244	185	0.425	221	0.205	257	0.450	293	0.330
6	0.397	42	0.165	78	0.443	114	0.345	150	0.250	186	0.422	222	0.205	258	0.457	294	0.319
7	0.392	43	0.164	79	0.451	115	0.335	151	0.257	187	0.418	223	0.204	259	0.464	295	0.308
8	0.388	44	0.165	80	0.459	116	0.325	152	0.264	188	0.413	224	0.205	260	0.471	296	0.297
9	0.382	45	0.166	81	0.466	117	0.315	153	0.272	189	0.408	225	0.205	261	0.476	297	0.286
10	0.377	46	0.168	82	0.472	118	0.306	154	0.280	190	0.403	226	0.207	262	0.482	298	0.275
11	0.370	47	0.170	83	0.478	119	0.296	155	0.288	191	0.397	227	0.209	263	0.486	299	0.265
12	0.364	48	0.173	84	0.483	120	0.287	156	0.296	192	0.391	228	0.212	264	0.490	300	0.255
13	0.357	49	0.176	85	0.488	121	0.278	157	0.304	193	0.384	229	0.215	265	0.494	301	0.245
14	0.349	50	0.181	86	0.492	122	0.270	158	0.312	194	0.377	230	0.219	266	0.496	302	0.236
15	0.341	51	0.186	87	0.495	123	0.261	159	0.321	195	0.370	231	0.223	267	0.498	303	0.227
16	0.333	52	0.191	88	0.497	124	0.254	160	0.329	196	0.362	232	0.228	268	0.500	304	0.219
17	0.325	53	0.197	89	0.499	125	0.247	161	0.338	197	0.354	233	0.234	269	0.500	305	0.211
18	0.316	54	0.204	90	0.500	126	0.240	162	0.346	198	0.346	234	0.240	270	0.500	306	0.204
19	0.307	55	0.211	91	0.500	127	0.234	163	0.354	199	0.338	235	0.247	271	0.499	307	0.197
20	0.298	56	0.219	92	0.500	128	0.228	164	0.362	200	0.329	236	0.254	272	0.497	308	0.191
21	0.290	57	0.227	93	0.498	129	0.223	165	0.370	201	0.321	237	0.261	273	0.495	309	0.186
22	0.281	58	0.236	94	0.496	130	0.219	166	0.377	202	0.312	238	0.270	274	0.492	310	0.181
23	0.272	59	0.245	95	0.494	131	0.215	167	0.384	203	0.304	239	0.278	275	0.488	311	0.176
24	0.263	60	0.255	96	0.490	132	0.212	168	0.391	204	0.296	240	0.287	276	0.483	312	0.173
25	0.254	61	0.265	97	0.486	133	0.209	169	0.397	205	0.288	241	0.296	277	0.478	313	0.170
26	0.245	62	0.275	98	0.482	134	0.207	170	0.403	206	0.280	242	0.306	278	0.472	314	0.168
27	0.237	63	0.286	99	0.476	135	0.205	171	0.408	207	0.272	243	0.315	279	0.466	315	0.166
28	0.229	64	0.297	100	0.471	136	0.205	172	0.413	208	0.264	244	0.325	280	0.459	316	0.165
29	0.221	65	0.308	101	0.464	137	0.204	173	0.418	209	0.257	245	0.335	281	0.451	317	0.164
30	0.214	66	0.319	102	0.457	138	0.205	174	0.422	210	0.250	246	0.345	282	0.443	318	0.165
31	0.207	67	0.330	103	0.450	139	0.205	175	0.425	211	0.244	247	0.356	283	0.434	319	0.166
32	0.201	68	0.341	104	0.442	140	0.207	176	0.428	212	0.238	248	0.366	284	0.425	320	0.167
33	0.194	69	0.352	105	0.433	141	0.209	177	0.430	213	0.232	249	0.376	285	0.416	321	0.169
34	0.189	70	0.363	106	0.424	142	0.211	178	0.431	214	0.227	250	0.386	286	0.406	322	0.172
35	0.184	71	0.374	107	0.415	143	0.215	179	0.432	215	0.222	251	0.396	287	0.395	323	0.175

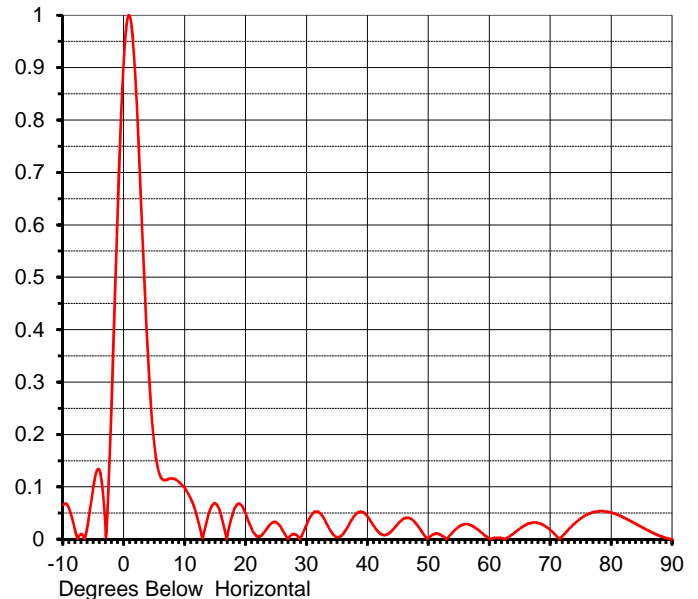
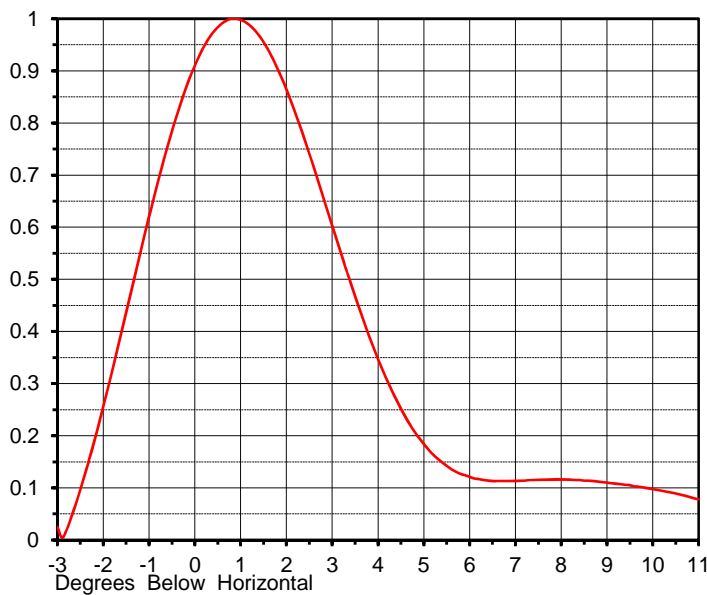
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ELEVATION PATTERN

Proposal No. **C-70487**
 Date **14-Mar-17**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-20GTH/VP-R 4C160**

RMS Directivity at Main Lobe **17.5 (12.43 dB)**
 RMS Directivity at Horizontal **14.5 (11.61 dB)**
Calculated

Beam Tilt **0.75 deg**
 Drawing Number **20G175075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.066	10.0	0.096	30.0	0.030	50.0	0.003	70.0	0.017
-9.0	0.057	11.0	0.075	31.0	0.050	51.0	0.010	71.0	0.005
-8.0	0.014	12.0	0.041	32.0	0.051	52.0	0.008	72.0	0.007
-7.0	0.010	13.0	0.008	33.0	0.035	53.0	0.002	73.0	0.020
-6.0	0.028	14.0	0.053	34.0	0.014	54.0	0.015	74.0	0.031
-5.0	0.105	15.0	0.068	35.0	0.004	55.0	0.025	75.0	0.040
-4.0	0.130	16.0	0.041	36.0	0.011	56.0	0.029	76.0	0.047
-3.0	0.004	17.0	0.011	37.0	0.031	57.0	0.026	77.0	0.052
-2.0	0.290	18.0	0.056	38.0	0.048	58.0	0.019	78.0	0.054
-1.0	0.655	19.0	0.067	39.0	0.052	59.0	0.009	79.0	0.053
0.0	0.930	20.0	0.047	40.0	0.042	60.0	0.001	80.0	0.051
1.0	0.994	21.0	0.018	41.0	0.025	61.0	0.003	81.0	0.047
2.0	0.842	22.0	0.005	42.0	0.011	62.0	0.002	82.0	0.041
3.0	0.575	23.0	0.014	43.0	0.009	63.0	0.004	83.0	0.035
4.0	0.326	24.0	0.029	44.0	0.017	64.0	0.012	84.0	0.029
5.0	0.174	25.0	0.032	45.0	0.031	65.0	0.021	85.0	0.023
6.0	0.118	26.0	0.017	46.0	0.040	66.0	0.028	86.0	0.017
7.0	0.114	27.0	0.003	47.0	0.039	67.0	0.032	87.0	0.011
8.0	0.116	28.0	0.010	48.0	0.028	68.0	0.031	88.0	0.006
9.0	0.109	29.0	0.004	49.0	0.012	69.0	0.026	89.0	0.002
								90.0	0.000

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***FutureFill** refers to broadband panels or limited bandwidth slotted coaxial antennas that can be modified in the field to provide the flexibility to customize the null structure at a future date.*

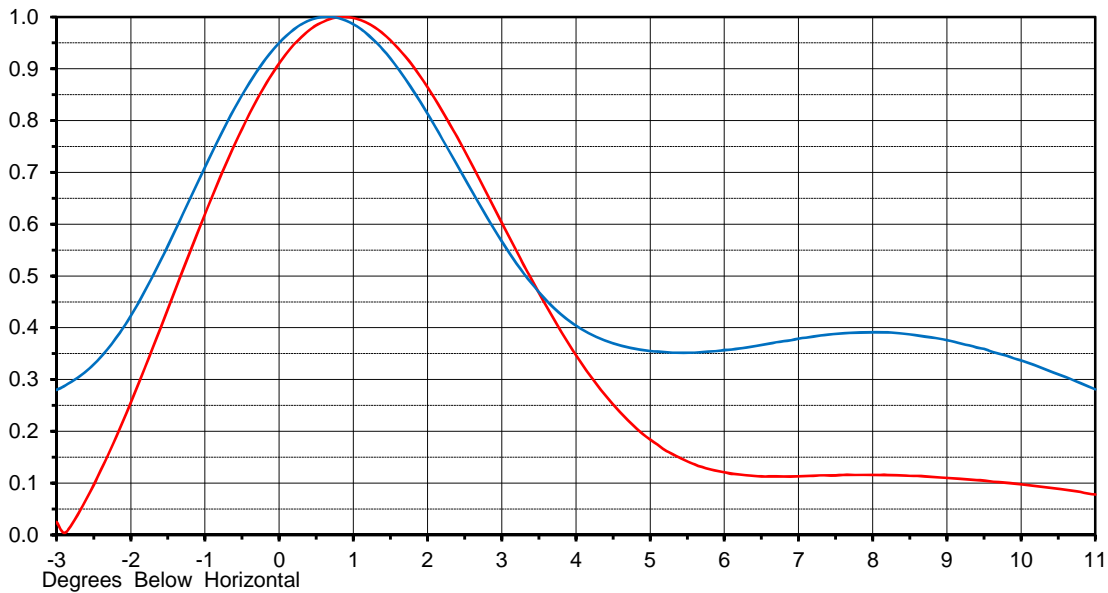
FutureFill OVERLAY

Proposal No. **C-70487**
 Date **14-Mar-17**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-20GTH/VP-R 4C160**

RMS Directivity 17.5 **(12.43dB)**
 RMS Directivity 10.9 **(10.38dB)**
 Calculated

Beam Tilt 0.75
 Beam Tilt 0.65

Drawing No. 20G175075 **Red**
 Drawing No. 20G17507-FF **Blue**



Tabulations for 20G17507-FF

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.268	10.0	0.337	30.0	0.067	50.0	0.111	70.0	0.051
-9.0	0.240	11.0	0.281	31.0	0.095	51.0	0.101	71.0	0.051
-8.0	0.248	12.0	0.221	32.0	0.099	52.0	0.104	72.0	0.051
-7.0	0.278	13.0	0.201	33.0	0.080	53.0	0.113	73.0	0.052
-6.0	0.236	14.0	0.236	34.0	0.063	54.0	0.120	74.0	0.054
-5.0	0.167	15.0	0.256	35.0	0.065	55.0	0.120	75.0	0.057
-4.0	0.217	16.0	0.216	36.0	0.067	56.0	0.113	76.0	0.060
-3.0	0.280	17.0	0.137	37.0	0.058	57.0	0.102	77.0	0.061
-2.0	0.423	18.0	0.099	38.0	0.042	58.0	0.093	78.0	0.060
-1.0	0.710	19.0	0.119	39.0	0.027	59.0	0.091	79.0	0.058
0.0	0.950	20.0	0.125	40.0	0.043	60.0	0.093	80.0	0.054
1.0	0.986	21.0	0.110	41.0	0.073	61.0	0.094	81.0	0.049
2.0	0.813	22.0	0.093	42.0	0.094	62.0	0.089	82.0	0.043
3.0	0.567	23.0	0.092	43.0	0.102	63.0	0.079	83.0	0.037
4.0	0.404	24.0	0.101	44.0	0.107	64.0	0.064	84.0	0.030
5.0	0.355	25.0	0.095	45.0	0.122	65.0	0.051	85.0	0.023
6.0	0.357	26.0	0.066	46.0	0.141	66.0	0.043	86.0	0.017
7.0	0.379	27.0	0.033	47.0	0.151	67.0	0.043	87.0	0.011
8.0	0.391	28.0	0.022	48.0	0.146	68.0	0.047	88.0	0.006
9.0	0.376	29.0	0.034	49.0	0.129	69.0	0.050	89.0	0.002
								90.0	0.000

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MECHANICAL SPECIFICATIONS

Proposal No.	C-70487
Date	14-Mar-17
Call Letters	WKRG
Channel	20
Frequency	509 MHz
Antenna Type	TFU-20GTH/VP-R 4C160

Preliminary Specifications

Top Mounted

Without ice TIA/EIA-222-F

Basic Wind Speed	95 m/h (152.9 km/h)
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Mechanical Specifications

Height with Lightning Protector	H4	45.6 ft (13.9m)
Height less Lightning Protector	H2	41.6 ft (12.7m)
Height of Center of Radiation	H3	20.8 ft (6.3m)
Force Coeff. x Projected Area	CaAc	49.6 ft ² (4.6m ²)
Moment Arm	D1	22.5 ft (6.9m)

Weight	W	6010 lb (2.7t)
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Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA/EIA-222-F

Prepared by:	KLP	Date:	14-Mar-17	ME:	EE:
	jls	Date:	14-Mar-17		

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Summary

Proposal No.	C-70487
Date	14-Mar-17
Call Letters	WKRG
Channel	20
Frequency	509 MHz
Antenna Type	TFU-20GTH/VP-R 4C160

Antenna

	Hpol	Vpol
ERP:	853.0 kW (29.31 dBk)	213.3 kW (23.29 dBk)
Peak Gain*	23.45 (13.70 dB)	5.86 (7.68 dB)

Antenna Input Power	36.4 kW (15.61 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(1.91 dB)
Size:	7-3/16"	Efficiency:	64.4%
Impedance:	75 Ohm		
Length:	2035 ft	620.3 m	

Transmitter Output

56.5 kW (17.52 dBk)

Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole. The gain includes feed system losses

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