



Antenna Model:

TFU-25JTH/VP-R 4C130

Proposal Number: C-70474
Date: 14-Mar-17
Customer: Nexstar
Location: Hagerstown, MD

Electrical Specifications

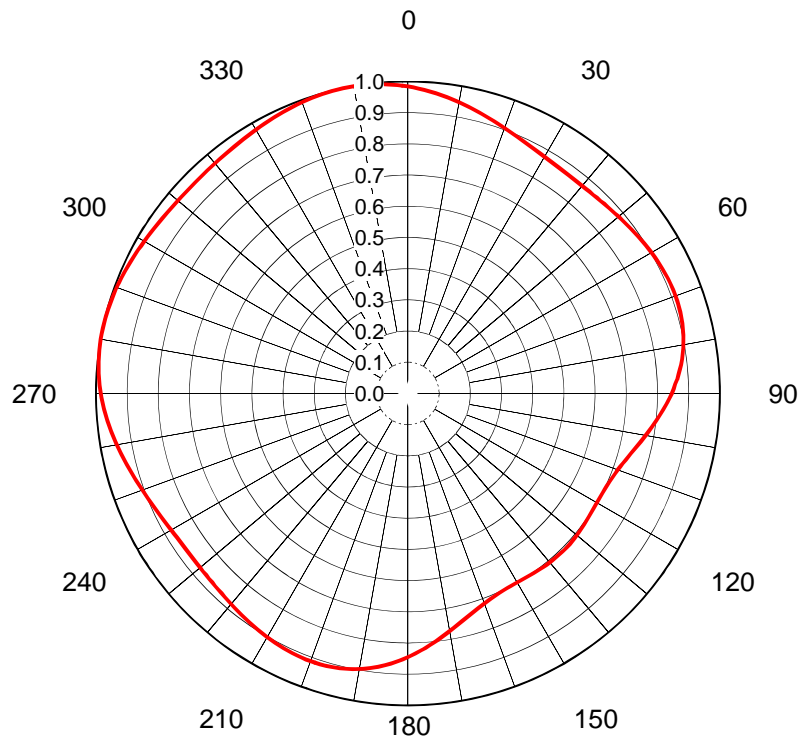
Polarization: Elliptical
Azimuth Pattern: Directional
Antenna Input: 4-1/16" 50 Ohm EIA/DCA
VSWR: Channel 1.08 : 1
Bandwidth: 6 MHz
Rated Input Power: 30 kW (14.77 dBk) Maximum Average Power

Mechanical Specifications

Mounting: Top Mounted
Environmental Protection: Full Radome
Height: 49.6 ft (15.1m) less Lightning Protector 53.6 ft (16.3m) with Lightning Protector
Weight: 6150 lb (2.8t)
Effective Projected Area: 50.4 ft² (4.7m²) TIA/EIA-222-F **Basic Wind Speed:** 70 m/h (112.7 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
WHAG	23	527 MHz	538.0 kW (27.31 dBk)	134.5 kW (21.29 dBk)	23.0 kW (13.62 dBk)	26.54 (14.24dB)	6.63 (8.22dB)	21.98 (13.42dB)	5.49 (7.40dB)



AZIMUTH PATTERN Horizontal Polarization

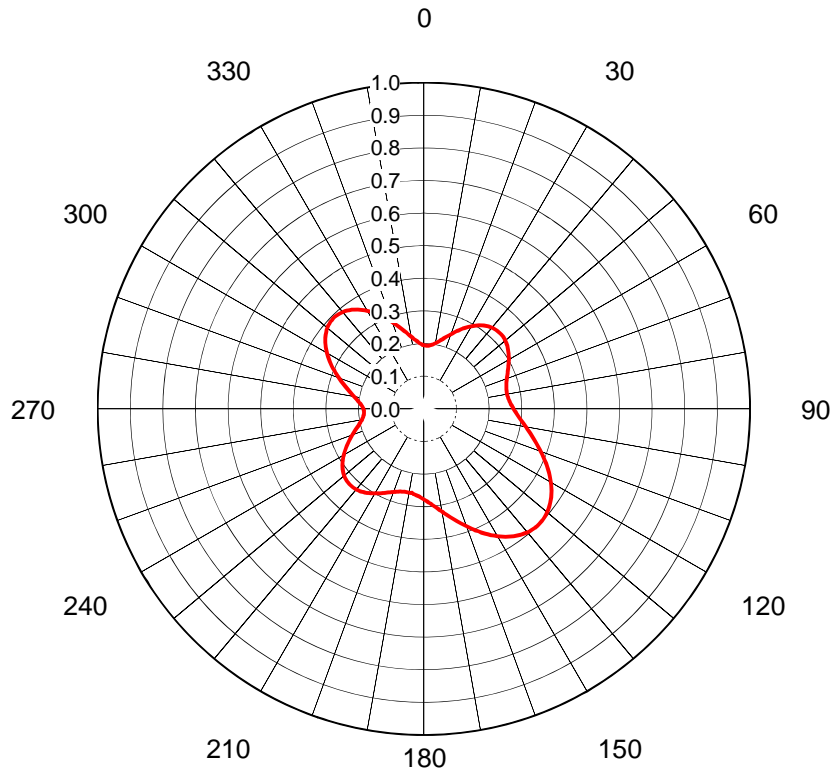
Proposal No. **C-70474**
 Date **14-Mar-17**
 Call Letters **WHAG**
 Channel **23**
 Frequency **527 MHz**
 Antenna Type **TFU-25JTH/VP-R 4C130**
 Gain **1.28 (1.06dB)**
Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.984	36	0.869	72	0.913	108	0.725	144	0.704	180	0.846	216	0.890	252	0.913	288	0.996
1	0.981	37	0.869	73	0.912	109	0.721	145	0.703	181	0.852	217	0.888	253	0.918	289	0.994
2	0.978	38	0.869	74	0.911	110	0.716	146	0.702	182	0.858	218	0.885	254	0.922	290	0.993
3	0.975	39	0.869	75	0.909	111	0.713	147	0.701	183	0.864	219	0.883	255	0.926	291	0.992
4	0.971	40	0.869	76	0.908	112	0.710	148	0.700	184	0.870	220	0.881	256	0.930	292	0.990
5	0.968	41	0.870	77	0.905	113	0.707	149	0.700	185	0.875	221	0.880	257	0.935	293	0.988
6	0.964	42	0.870	78	0.903	114	0.705	150	0.700	186	0.880	222	0.878	258	0.939	294	0.986
7	0.960	43	0.871	79	0.900	115	0.703	151	0.700	187	0.885	223	0.876	259	0.943	295	0.985
8	0.956	44	0.872	80	0.897	116	0.702	152	0.700	188	0.889	224	0.875	260	0.948	296	0.983
9	0.952	45	0.873	81	0.893	117	0.701	153	0.701	189	0.893	225	0.873	261	0.952	297	0.981
10	0.948	46	0.875	82	0.889	118	0.700	154	0.702	190	0.897	226	0.872	262	0.956	298	0.979
11	0.943	47	0.876	83	0.885	119	0.700	155	0.703	191	0.900	227	0.871	263	0.960	299	0.977
12	0.939	48	0.878	84	0.880	120	0.700	156	0.705	192	0.903	228	0.870	264	0.964	300	0.976
13	0.935	49	0.880	85	0.875	121	0.700	157	0.707	193	0.905	229	0.870	265	0.968	301	0.974
14	0.930	50	0.881	86	0.870	122	0.700	158	0.710	194	0.908	230	0.869	266	0.971	302	0.972
15	0.926	51	0.883	87	0.864	123	0.701	159	0.713	195	0.909	231	0.869	267	0.975	303	0.971
16	0.922	52	0.885	88	0.858	124	0.702	160	0.716	196	0.911	232	0.869	268	0.978	304	0.969
17	0.918	53	0.888	89	0.852	125	0.703	161	0.721	197	0.912	233	0.869	269	0.981	305	0.968
18	0.913	54	0.890	90	0.846	126	0.704	162	0.725	198	0.913	234	0.869	270	0.984	306	0.966
19	0.909	55	0.892	91	0.839	127	0.705	163	0.730	199	0.913	235	0.870	271	0.987	307	0.965
20	0.905	56	0.894	92	0.832	128	0.706	164	0.735	200	0.913	236	0.870	272	0.989	308	0.964
21	0.902	57	0.896	93	0.825	129	0.706	165	0.741	201	0.913	237	0.872	273	0.991	309	0.963
22	0.898	58	0.898	94	0.817	130	0.707	166	0.747	202	0.913	238	0.873	274	0.993	310	0.962
23	0.895	59	0.900	95	0.810	131	0.708	167	0.753	203	0.912	239	0.874	275	0.995	311	0.962
24	0.891	60	0.902	96	0.803	132	0.708	168	0.760	204	0.911	240	0.876	276	0.996	312	0.961
25	0.888	61	0.904	97	0.795	133	0.709	169	0.767	205	0.910	241	0.878	277	0.998	313	0.961
26	0.885	62	0.906	98	0.788	134	0.709	170	0.773	206	0.909	242	0.880	278	0.999	314	0.960
27	0.883	63	0.907	99	0.781	135	0.709	171	0.781	207	0.907	243	0.883	279	0.999	315	0.960
28	0.880	64	0.909	100	0.773	136	0.709	172	0.788	208	0.906	244	0.885	280	1.000	316	0.960
29	0.878	65	0.910	101	0.767	137	0.709	173	0.795	209	0.904	245	0.888	281	1.000	317	0.961
30	0.876	66	0.911	102	0.760	138	0.708	174	0.803	210	0.902	246	0.891	282	1.000	318	0.961
31	0.874	67	0.912	103	0.753	139	0.708	175	0.810	211	0.900	247	0.895	283	1.000	319	0.962
32	0.873	68	0.913	104	0.747	140	0.707	176	0.817	212	0.898	248	0.898	284	0.999	320	0.962
33	0.872	69	0.913	105	0.741	141	0.706	177	0.825	213	0.896	249	0.902	285	0.999	321	0.963
34	0.870	70	0.913	106	0.735	142	0.706	178	0.832	214	0.894	250	0.905	286	0.998	322	0.964
35	0.870	71	0.913	107	0.730	143	0.705	179	0.839	215	0.892	251	0.909	287	0.997	323	0.965

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70474**
 Date **14-Mar-17**
 Call Letters **WHAG**
 Channel **23**
 Frequency **527 MHz**
 Antenna Type **TFU-25JTH/VP-R 4C130**
 Gain **2.47 (3.93dB)**
Calculated



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.195	36	0.315	72	0.267	108	0.368	144	0.481	180	0.277	216	0.316	252	0.223	288	0.264
1	0.194	37	0.318	73	0.265	109	0.375	145	0.477	181	0.274	217	0.318	253	0.218	289	0.270
2	0.194	38	0.321	74	0.263	110	0.382	146	0.473	182	0.272	218	0.320	254	0.214	290	0.277
3	0.194	39	0.323	75	0.262	111	0.389	147	0.468	183	0.270	219	0.321	255	0.210	291	0.284
4	0.194	40	0.325	76	0.261	112	0.396	148	0.462	184	0.267	220	0.322	256	0.206	292	0.291
5	0.195	41	0.326	77	0.260	113	0.403	149	0.457	185	0.266	221	0.323	257	0.202	293	0.298
6	0.196	42	0.328	78	0.260	114	0.410	150	0.451	186	0.264	222	0.324	258	0.198	294	0.304
7	0.197	43	0.329	79	0.259	115	0.417	151	0.445	187	0.263	223	0.325	259	0.195	295	0.311
8	0.199	44	0.329	80	0.259	116	0.424	152	0.438	188	0.260	224	0.325	260	0.193	296	0.318
9	0.201	45	0.329	81	0.260	117	0.431	153	0.432	189	0.261	225	0.325	261	0.190	297	0.324
10	0.204	46	0.329	82	0.260	118	0.437	154	0.425	190	0.261	226	0.324	262	0.188	298	0.331
11	0.207	47	0.329	83	0.261	119	0.444	155	0.419	191	0.261	227	0.323	263	0.186	299	0.337
12	0.210	48	0.328	84	0.263	120	0.450	156	0.412	192	0.261	228	0.322	264	0.185	300	0.343
13	0.213	49	0.327	85	0.264	121	0.456	157	0.405	193	0.261	229	0.320	265	0.184	301	0.349
14	0.217	50	0.326	86	0.266	122	0.461	158	0.398	194	0.262	230	0.318	266	0.184	302	0.354
15	0.221	51	0.324	87	0.268	123	0.467	159	0.391	195	0.263	231	0.316	267	0.183	303	0.359
16	0.225	52	0.323	88	0.270	124	0.472	160	0.384	196	0.264	232	0.314	268	0.184	304	0.364
17	0.229	53	0.321	89	0.272	125	0.476	161	0.377	197	0.265	233	0.311	269	0.184	305	0.369
18	0.234	54	0.318	90	0.275	126	0.481	162	0.370	198	0.267	234	0.308	270	0.185	306	0.373
19	0.239	55	0.316	91	0.278	127	0.485	163	0.363	199	0.269	235	0.304	271	0.187	307	0.377
20	0.244	56	0.313	92	0.282	128	0.488	164	0.356	200	0.271	236	0.301	272	0.189	308	0.380
21	0.249	57	0.310	93	0.285	129	0.491	165	0.350	201	0.273	237	0.297	273	0.191	309	0.383
22	0.253	58	0.307	94	0.289	130	0.494	166	0.343	202	0.276	238	0.292	274	0.194	310	0.386
23	0.259	59	0.304	95	0.293	131	0.496	167	0.337	203	0.279	239	0.288	275	0.197	311	0.388
24	0.264	60	0.301	96	0.297	132	0.498	168	0.331	204	0.281	240	0.283	276	0.200	312	0.390
25	0.269	61	0.298	97	0.302	133	0.499	169	0.325	205	0.284	241	0.279	277	0.204	313	0.391
26	0.274	62	0.294	98	0.307	134	0.500	170	0.320	206	0.287	242	0.274	278	0.208	314	0.392
27	0.278	63	0.291	99	0.312	135	0.500	171	0.314	207	0.290	243	0.269	279	0.212	315	0.392
28	0.283	64	0.288	100	0.317	136	0.500	172	0.309	208	0.293	244	0.264	280	0.217	316	0.392
29	0.288	65	0.285	101	0.323	137	0.499	173	0.304	209	0.296	245	0.258	281	0.222	317	0.392
30	0.292	66	0.282	102	0.329	138	0.498	174	0.300	210	0.300	246	0.253	282	0.227	318	0.391
31	0.297	67	0.279	103	0.335	139	0.496	175	0.295	211	0.302	247	0.248	283	0.233	319	0.389
32	0.301	68	0.276	104	0.341	140	0.494	176	0.291	212	0.305	248	0.243	284	0.239	320	0.387
33	0.305	69	0.273	105	0.348	141	0.492	177	0.287	213	0.308	249	0.238	285	0.245	321	0.385
34	0.309	70	0.271	106	0.354	142	0.489	178	0.284	214	0.311	250	0.233	286	0.251	322	0.382
35	0.312	71	0.269	107	0.361	143	0.485	179	0.280	215	0.313	251	0.228	287	0.257	323	0.379

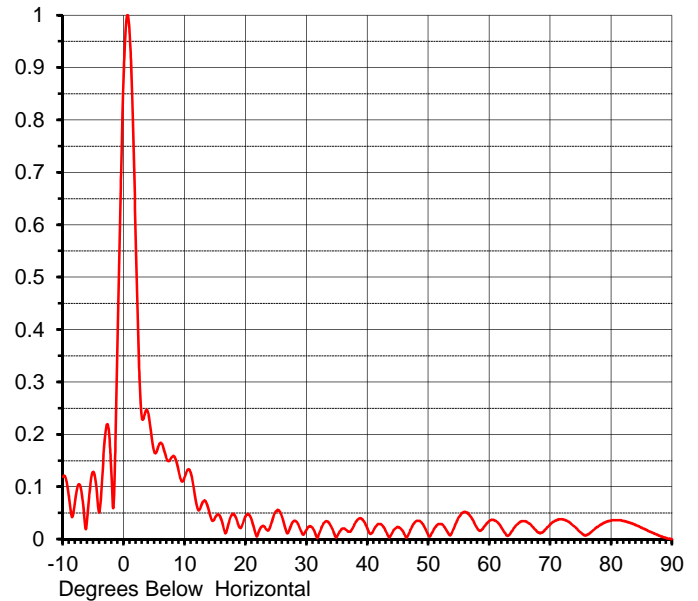
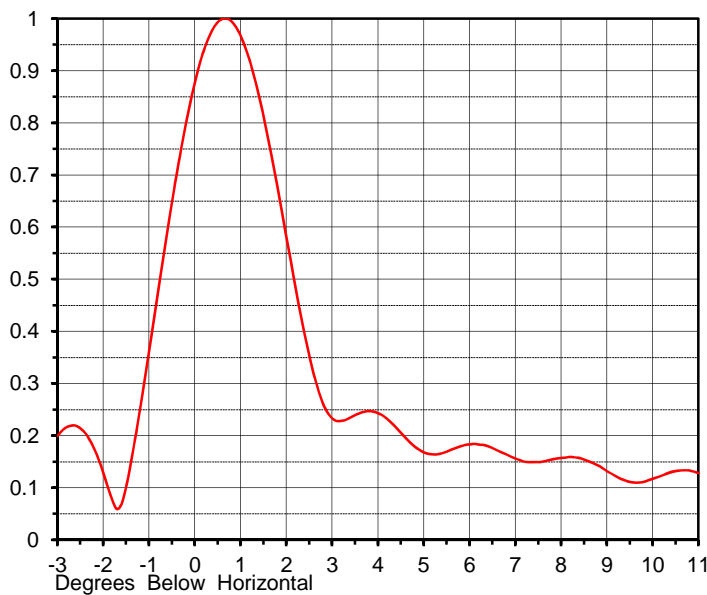
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ELEVATION PATTERN

Proposal No. **C-70474**
 Date **14-Mar-17**
 Call Letters **WHAG**
 Channel **23**
 Frequency **527 MHz**
 Antenna Type **TFU-25JTH/VP-R 4C130**

RMS Directivity at Main Lobe **23.5 (13.71 dB)**
 RMS Directivity at Horizontal **18.0 (12.55 dB)**
Calculated

Beam Tilt **0.55 deg**
 Drawing Number **25J235055**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.119	10.0	0.120	30.0	0.019	50.0	0.006	70.0	0.029
-9.0	0.075	11.0	0.124	31.0	0.020	51.0	0.022	71.0	0.036
-8.0	0.077	12.0	0.060	32.0	0.010	52.0	0.029	72.0	0.038
-7.0	0.091	13.0	0.072	33.0	0.033	53.0	0.015	73.0	0.033
-6.0	0.047	14.0	0.050	34.0	0.024	54.0	0.018	74.0	0.023
-5.0	0.128	15.0	0.042	35.0	0.006	55.0	0.043	75.0	0.012
-4.0	0.053	16.0	0.036	36.0	0.020	56.0	0.052	76.0	0.008
-3.0	0.209	17.0	0.023	37.0	0.014	57.0	0.041	77.0	0.017
-2.0	0.103	18.0	0.048	38.0	0.032	58.0	0.020	78.0	0.026
-1.0	0.417	19.0	0.022	39.0	0.039	59.0	0.022	79.0	0.032
0.0	0.910	20.0	0.045	40.0	0.018	60.0	0.035	80.0	0.036
1.0	0.946	21.0	0.034	41.0	0.018	61.0	0.035	81.0	0.036
2.0	0.534	22.0	0.011	42.0	0.029	62.0	0.021	82.0	0.035
3.0	0.228	23.0	0.024	43.0	0.014	63.0	0.006	83.0	0.031
4.0	0.239	24.0	0.024	44.0	0.012	64.0	0.021	84.0	0.027
5.0	0.165	25.0	0.054	45.0	0.023	65.0	0.033	85.0	0.021
6.0	0.184	26.0	0.040	46.0	0.009	66.0	0.033	86.0	0.016
7.0	0.153	27.0	0.014	47.0	0.018	67.0	0.024	87.0	0.011
8.0	0.158	28.0	0.035	48.0	0.035	68.0	0.013	88.0	0.006
9.0	0.127	29.0	0.016	49.0	0.029	69.0	0.017	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.*

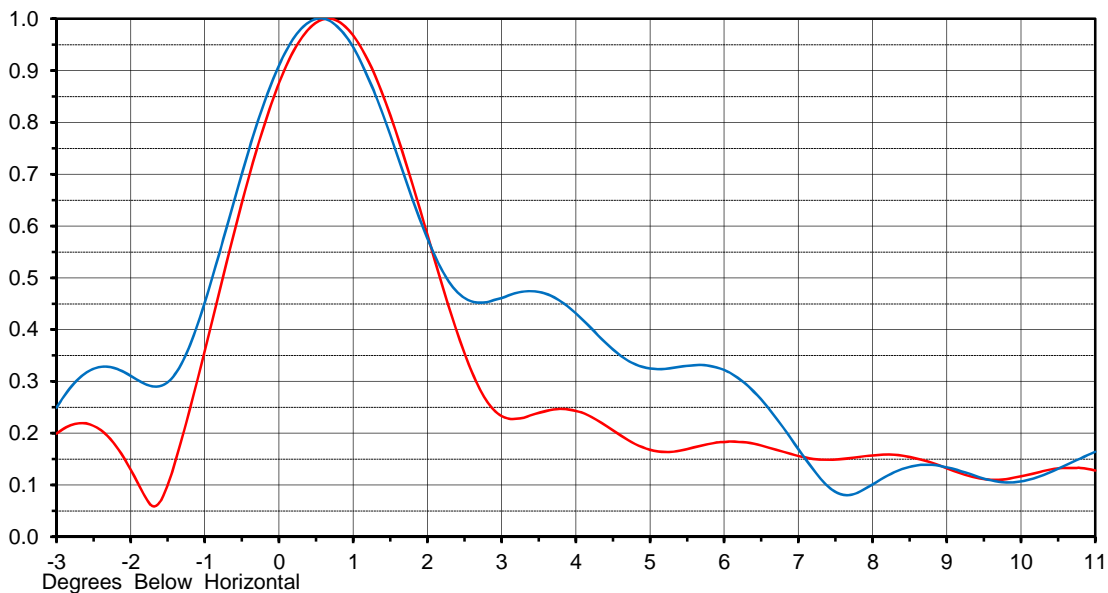
FutureFill OVERLAY

Proposal No. **C-70474**
 Date **14-Mar-17**
 Call Letters **WHAG**
 Channel **23**
 Frequency **527 MHz**
 Antenna Type **TFU-25JTH/VP-R 4C130**

RMS Directivity 23.5 **(13.71dB)**
 RMS Directivity 16.9 **(12.28dB)**
 Calculated

Beam Tilt 0.55
 Beam Tilt 0.55

Drawing No. 25J235055 **Red**
 Drawing No. 25J235050-FF **Blue**



Tabulations for 25J235050-FF

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.063	10.0	0.107	30.0	0.029	50.0	0.072	70.0	0.026
-9.0	0.085	11.0	0.164	31.0	0.024	51.0	0.052	71.0	0.041
-8.0	0.178	12.0	0.220	32.0	0.053	52.0	0.064	72.0	0.050
-7.0	0.146	13.0	0.210	33.0	0.077	53.0	0.064	73.0	0.051
-6.0	0.198	14.0	0.129	34.0	0.059	54.0	0.049	74.0	0.047
-5.0	0.314	15.0	0.179	35.0	0.022	55.0	0.033	75.0	0.040
-4.0	0.138	16.0	0.204	36.0	0.015	56.0	0.026	76.0	0.035
-3.0	0.249	17.0	0.139	37.0	0.040	57.0	0.027	77.0	0.032
-2.0	0.311	18.0	0.123	38.0	0.082	58.0	0.043	78.0	0.033
-1.0	0.452	19.0	0.150	39.0	0.099	59.0	0.061	79.0	0.036
0.0	0.910	20.0	0.141	40.0	0.076	60.0	0.067	80.0	0.037
1.0	0.945	21.0	0.089	41.0	0.050	61.0	0.056	81.0	0.037
2.0	0.576	22.0	0.076	42.0	0.066	62.0	0.040	82.0	0.035
3.0	0.461	23.0	0.069	43.0	0.085	63.0	0.047	83.0	0.031
4.0	0.431	24.0	0.018	44.0	0.089	64.0	0.069	84.0	0.027
5.0	0.325	25.0	0.067	45.0	0.079	65.0	0.083	85.0	0.021
6.0	0.322	26.0	0.062	46.0	0.077	66.0	0.082	86.0	0.016
7.0	0.169	27.0	0.013	47.0	0.105	67.0	0.066	87.0	0.011
8.0	0.101	28.0	0.044	48.0	0.124	68.0	0.042	88.0	0.006
9.0	0.134	29.0	0.043	49.0	0.110	69.0	0.021	89.0	0.002
								90.0	0.000

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MECHANICAL SPECIFICATIONS

Proposal No.	C-70474
Date	14-Mar-17
Call Letters	WHAG
Channel	23
Frequency	527 MHz
Antenna Type	TFU-25JTH/VP-R 4C130

Preliminary Specifications

Top Mounted

Without ice TIA/EIA-222-F

Basic Wind Speed	70 m/h (112.7 km/h)
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Mechanical Specifications

Height with Lightning Protector	H4	53.6 ft (16.3m)
Height less Lightning Protector	H2	49.6 ft (15.1m)
Height of Center of Radiation	H3	24.8 ft (7.6m)
Force Coeff. x Projected Area	CaAc	50.4 ft² (4.7m²)
Moment Arm	D1	26.8 ft (8.2m)

Weight	W	6150 lb (2.8t)
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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-70474**
Date **14-Mar-17**
Call Letters **WHAG**
Channel **23**
Frequency **527 MHz**
Antenna Type **TFU-25JTH/VP-R 4C130**

Antenna

	Hpol	Vpol
ERP:	538.0 kW (27.31 dBk)	134.5 kW (21.29 dBk)
Peak Gain*	26.54 (14.24 dB)	6.63 (8.22 dB)

Antenna Input Power **20.3 kW (13.07 dBk)**

Transmission Line

Type:	Rigid	Attenuation:	(0.55 dB)
Size:	6-1/8"	Efficiency:	88.1%
Impedance:	75 Ohm		
Length:	495 ft	150.9 m	

Transmitter Output

23.0 kW (13.62 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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