



Antenna Model: **TUM-C4-10/34H-1-R SM**

Proposal Number: **C-70856-3**
Date: **28-Mar-19**
Customer: **Nexstar**
Location: **Mobile, AL**

Electrical Specifications

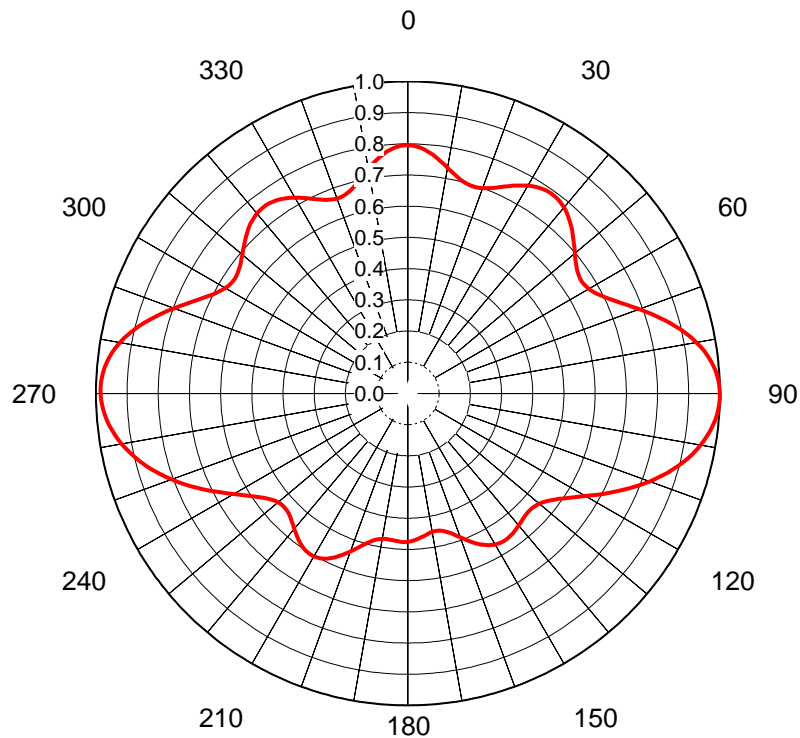
Polarization: **Elliptical**
Azimuth Pattern: **Directional**
Antenna Input: **8-3/16"** **75 Ohm** **EIA/DCA**
VSWR: **Channel** **1.10 : 1** **Band** **1.10 : 1**
Bandwidth: **120 MHz**
Rated Input Power: **64 kW** **(18.06 dBk)** **Maximum combined average power**

Mechanical Specifications

Mounting: **Side Mounted**
Environmental Protection: **Full Radome**
Height: **37.1 ft (11.3m)**
Weight: **8000 lb (3.6t)** **Excludes Mounts**
Effective Projected Area: **101.5 ft² (9.4m²)** **TIA-222-G** **Basic Wind Speed: 120 m/h (193.1 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
1	WKRQ	20	509 MHz	717.0 kW (28.56 dBk)	172.1 kW (22.36 dBk)	38.4 kW (15.85 dBk)	28.05 (14.48dB)	6.73 (8.28dB)	26.01 (14.15dB)	6.24 (7.95dB)
2	WFNA	27	551 MHz	1000.0 kW (30.00 dBk)	250.0 kW (23.98 dBk)	58.5 kW (17.67 dBk)	26.04 (14.16dB)	6.51 (8.14dB)	23.85 (13.78dB)	5.96 (7.75dB)



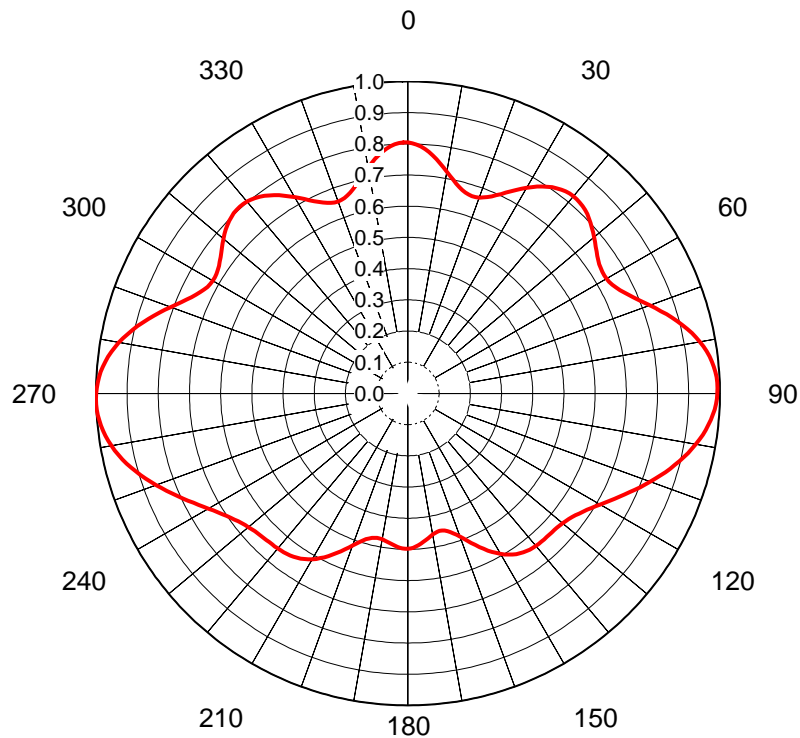
AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. **C-70856-3**
Date **28-Mar-19**
Call Letters **WKRG**
Channel **20**
Frequency **509 MHz**
Antenna Type **TUM-C4-10/34H-1-R SM**
Gain **1.91 (2.81dB)**
Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.796	36	0.789	72	0.822	108	0.855	144	0.562	180	0.475	216	0.589	252	0.836	288	0.829
1	0.795	37	0.788	73	0.839	109	0.840	145	0.564	181	0.476	217	0.584	253	0.850	289	0.813
2	0.792	38	0.786	74	0.855	110	0.825	146	0.564	182	0.476	218	0.578	254	0.864	290	0.798
3	0.788	39	0.783	75	0.871	111	0.808	147	0.564	183	0.476	219	0.572	255	0.877	291	0.782
4	0.783	40	0.778	76	0.886	112	0.792	148	0.564	184	0.475	220	0.566	256	0.889	292	0.766
5	0.776	41	0.773	77	0.901	113	0.775	149	0.562	185	0.474	221	0.560	257	0.901	293	0.752
6	0.769	42	0.767	78	0.914	114	0.758	150	0.559	186	0.473	222	0.555	258	0.912	294	0.737
7	0.761	43	0.760	79	0.928	115	0.741	151	0.555	187	0.472	223	0.550	259	0.922	295	0.724
8	0.752	44	0.752	80	0.940	116	0.724	152	0.551	188	0.472	224	0.545	260	0.932	296	0.712
9	0.743	45	0.743	81	0.951	117	0.707	153	0.545	189	0.472	225	0.542	261	0.941	297	0.701
10	0.734	46	0.734	82	0.961	118	0.691	154	0.539	190	0.473	226	0.539	262	0.949	298	0.691
11	0.726	47	0.725	83	0.970	119	0.674	155	0.532	191	0.475	227	0.538	263	0.957	299	0.683
12	0.718	48	0.716	84	0.977	120	0.658	156	0.524	192	0.479	228	0.538	264	0.963	300	0.676
13	0.711	49	0.707	85	0.984	121	0.643	157	0.516	193	0.483	229	0.540	265	0.969	301	0.671
14	0.705	50	0.698	86	0.990	122	0.628	158	0.508	194	0.488	230	0.543	266	0.974	302	0.668
15	0.700	51	0.690	87	0.994	123	0.614	159	0.499	195	0.495	231	0.547	267	0.978	303	0.666
16	0.697	52	0.683	88	0.997	124	0.602	160	0.491	196	0.502	232	0.553	268	0.982	304	0.666
17	0.696	53	0.676	89	0.999	125	0.590	161	0.483	197	0.511	233	0.561	269	0.984	305	0.668
18	0.696	54	0.671	90	1.000	126	0.579	162	0.475	198	0.520	234	0.570	270	0.985	306	0.670
19	0.697	55	0.667	91	1.000	127	0.570	163	0.468	199	0.529	235	0.580	271	0.985	307	0.675
20	0.700	56	0.664	92	0.998	128	0.562	164	0.463	200	0.539	236	0.591	272	0.984	308	0.680
21	0.705	57	0.663	93	0.996	129	0.555	165	0.458	201	0.549	237	0.603	273	0.983	309	0.686
22	0.710	58	0.664	94	0.993	130	0.550	166	0.454	202	0.558	238	0.617	274	0.979	310	0.693
23	0.716	59	0.666	95	0.988	131	0.546	167	0.451	203	0.567	239	0.631	275	0.975	311	0.700
24	0.724	60	0.670	96	0.983	132	0.543	168	0.450	204	0.575	240	0.646	276	0.970	312	0.707
25	0.731	61	0.676	97	0.977	133	0.542	169	0.450	205	0.582	241	0.661	277	0.964	313	0.715
26	0.739	62	0.683	98	0.970	134	0.541	170	0.451	206	0.589	242	0.677	278	0.956	314	0.722
27	0.747	63	0.692	99	0.962	135	0.541	171	0.452	207	0.594	243	0.693	279	0.947	315	0.729
28	0.755	64	0.703	100	0.953	136	0.543	172	0.455	208	0.598	244	0.709	280	0.938	316	0.735
29	0.762	65	0.715	101	0.943	137	0.545	173	0.458	209	0.601	245	0.726	281	0.927	317	0.741
30	0.769	66	0.728	102	0.933	138	0.547	174	0.461	210	0.603	246	0.742	282	0.915	318	0.746
31	0.775	67	0.742	103	0.922	139	0.550	175	0.464	211	0.603	247	0.759	283	0.902	319	0.750
32	0.780	68	0.757	104	0.910	140	0.552	176	0.467	212	0.603	248	0.775	284	0.889	320	0.753
33	0.784	69	0.773	105	0.897	141	0.555	177	0.470	213	0.601	249	0.791	285	0.875	321	0.755
34	0.786	70	0.789	106	0.884	142	0.558	178	0.472	214	0.598	250	0.806	286	0.860	322	0.756
35	0.788	71	0.806	107	0.870	143	0.560	179	0.474	215	0.594	251	0.821	287	0.845	323	0.755

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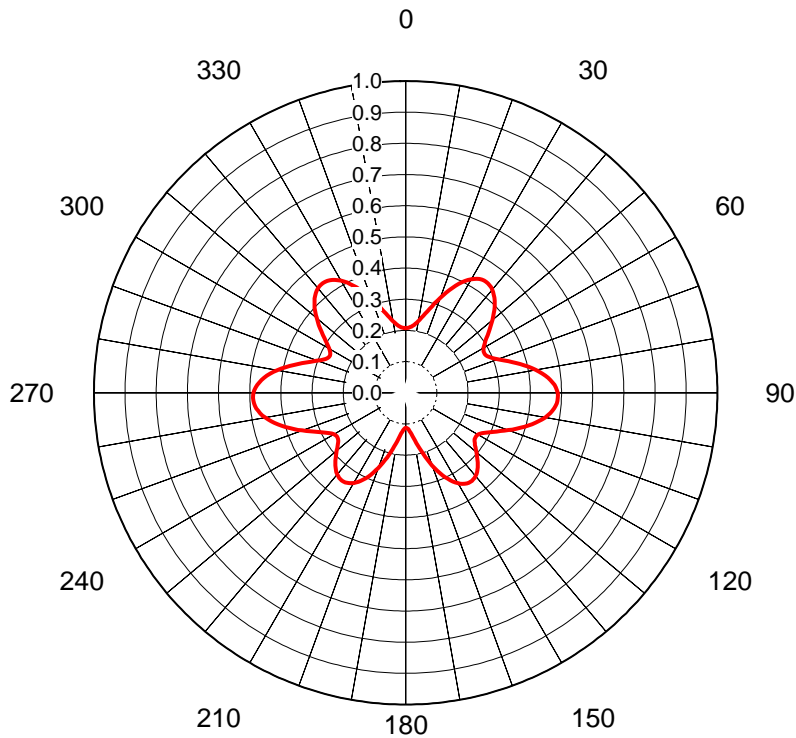
AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WFNA**
 Channel **27**
 Frequency **551 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**
 Gain **1.77 (2.49dB)**
 Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.804	36	0.813	72	0.853	108	0.851	144	0.630	180	0.498	216	0.642	252	0.884	288	0.837
1	0.802	37	0.818	73	0.867	109	0.839	145	0.626	181	0.498	217	0.644	253	0.896	289	0.823
2	0.798	38	0.822	74	0.881	110	0.827	146	0.621	182	0.497	218	0.646	254	0.907	290	0.809
3	0.792	39	0.824	75	0.894	111	0.814	147	0.616	183	0.495	219	0.648	255	0.918	291	0.796
4	0.785	40	0.825	76	0.907	112	0.802	148	0.609	184	0.493	220	0.649	256	0.929	292	0.783
5	0.776	41	0.825	77	0.919	113	0.790	149	0.602	185	0.490	221	0.650	257	0.939	293	0.770
6	0.767	42	0.824	78	0.930	114	0.778	150	0.594	186	0.486	222	0.651	258	0.948	294	0.759
7	0.756	43	0.821	79	0.941	115	0.767	151	0.585	187	0.483	223	0.652	259	0.957	295	0.749
8	0.745	44	0.817	80	0.951	116	0.755	152	0.575	188	0.480	224	0.653	260	0.965	296	0.740
9	0.733	45	0.813	81	0.960	117	0.744	153	0.565	189	0.477	225	0.654	261	0.972	297	0.733
10	0.721	46	0.807	82	0.967	118	0.733	154	0.554	190	0.475	226	0.656	262	0.979	298	0.728
11	0.710	47	0.801	83	0.974	119	0.722	155	0.543	191	0.474	227	0.658	263	0.984	299	0.724
12	0.700	48	0.794	84	0.980	120	0.712	156	0.532	192	0.474	228	0.660	264	0.989	300	0.722
13	0.690	49	0.787	85	0.984	121	0.702	157	0.521	193	0.475	229	0.663	265	0.993	301	0.722
14	0.682	50	0.779	86	0.988	122	0.693	158	0.509	194	0.477	230	0.667	266	0.996	302	0.723
15	0.675	51	0.771	87	0.991	123	0.685	159	0.499	195	0.481	231	0.671	267	0.998	303	0.726
16	0.669	52	0.764	88	0.992	124	0.677	160	0.489	196	0.486	232	0.676	268	1.000	304	0.730
17	0.666	53	0.757	89	0.993	125	0.670	161	0.479	197	0.493	233	0.681	269	1.000	305	0.736
18	0.665	54	0.750	90	0.992	126	0.664	162	0.471	198	0.501	234	0.687	270	0.999	306	0.742
19	0.665	55	0.745	91	0.990	127	0.659	163	0.464	199	0.509	235	0.694	271	0.998	307	0.749
20	0.668	56	0.740	92	0.988	128	0.654	164	0.459	200	0.519	236	0.702	272	0.995	308	0.757
21	0.673	57	0.737	93	0.984	129	0.650	165	0.455	201	0.529	237	0.710	273	0.992	309	0.764
22	0.679	58	0.735	94	0.980	130	0.647	166	0.453	202	0.539	238	0.719	274	0.987	310	0.772
23	0.686	59	0.734	95	0.975	131	0.645	167	0.452	203	0.549	239	0.728	275	0.982	311	0.779
24	0.695	60	0.735	96	0.969	132	0.643	168	0.453	204	0.560	240	0.738	276	0.975	312	0.785
25	0.705	61	0.738	97	0.962	133	0.642	169	0.456	205	0.570	241	0.749	277	0.968	313	0.791
26	0.716	62	0.742	98	0.954	134	0.641	170	0.459	206	0.580	242	0.760	278	0.960	314	0.796
27	0.727	63	0.748	99	0.946	135	0.640	171	0.463	207	0.589	243	0.772	279	0.951	315	0.800
28	0.738	64	0.756	100	0.937	136	0.640	172	0.468	208	0.598	244	0.784	280	0.941	316	0.803
29	0.750	65	0.765	101	0.928	137	0.640	173	0.473	209	0.606	245	0.796	281	0.930	317	0.805
30	0.761	66	0.775	102	0.918	138	0.639	174	0.478	210	0.614	246	0.809	282	0.918	318	0.805
31	0.772	67	0.786	103	0.908	139	0.639	175	0.483	211	0.620	247	0.821	283	0.906	319	0.805
32	0.782	68	0.799	104	0.897	140	0.638	176	0.488	212	0.626	248	0.834	284	0.893	320	0.803
33	0.791	69	0.812	105	0.886	141	0.637	177	0.492	213	0.631	249	0.847	285	0.880	321	0.799
34	0.799	70	0.825	106	0.874	142	0.635	178	0.495	214	0.636	250	0.859	286	0.866	322	0.795
35	0.807	71	0.839	107	0.863	143	0.633	179	0.497	215	0.639	251	0.872	287	0.852	323	0.789

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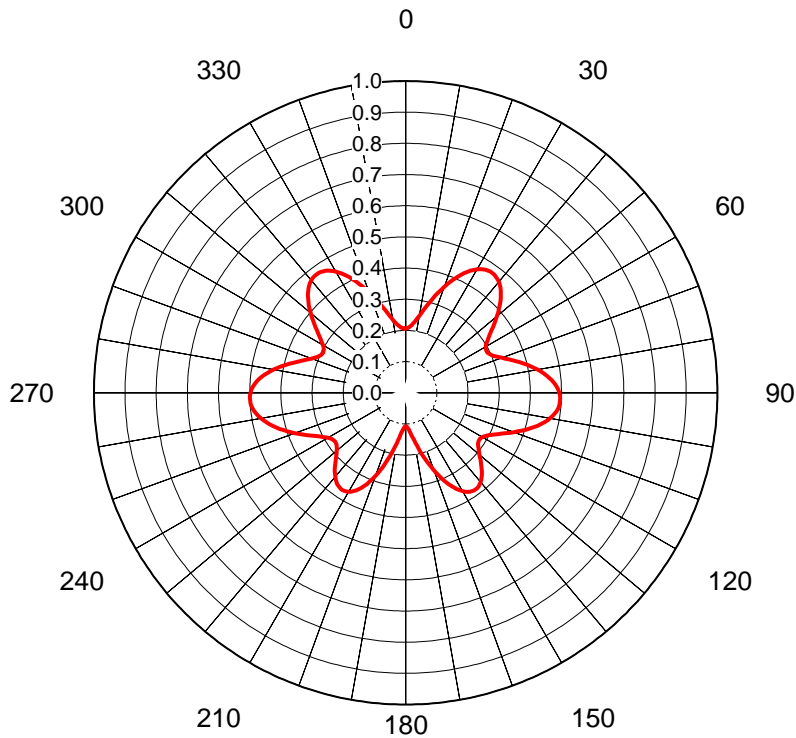
AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**
 Gain **2.07 (3.17dB)**
 Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.208	36	0.440	72	0.334	108	0.373	144	0.353	180	0.113	216	0.348	252	0.377	288	0.322
1	0.208	37	0.439	73	0.345	109	0.362	145	0.352	181	0.114	217	0.347	253	0.388	289	0.311
2	0.209	38	0.438	74	0.356	110	0.351	146	0.351	182	0.115	218	0.346	254	0.400	290	0.301
3	0.210	39	0.435	75	0.368	111	0.339	147	0.348	183	0.118	219	0.344	255	0.411	291	0.292
4	0.211	40	0.432	76	0.379	112	0.328	148	0.344	184	0.121	220	0.342	256	0.421	292	0.285
5	0.213	41	0.428	77	0.391	113	0.318	149	0.340	185	0.126	221	0.338	257	0.431	293	0.279
6	0.216	42	0.423	78	0.402	114	0.308	150	0.335	186	0.131	222	0.334	258	0.441	294	0.274
7	0.219	43	0.417	79	0.413	115	0.298	151	0.329	187	0.136	223	0.330	259	0.449	295	0.272
8	0.223	44	0.411	80	0.423	116	0.290	152	0.322	188	0.143	224	0.325	260	0.457	296	0.271
9	0.228	45	0.404	81	0.434	117	0.283	153	0.315	189	0.150	225	0.319	261	0.465	297	0.271
10	0.233	46	0.397	82	0.443	118	0.277	154	0.307	190	0.158	226	0.313	262	0.471	298	0.274
11	0.239	47	0.389	83	0.452	119	0.272	155	0.298	191	0.167	227	0.307	263	0.477	299	0.278
12	0.246	48	0.381	84	0.459	120	0.268	156	0.289	192	0.176	228	0.301	264	0.481	300	0.283
13	0.254	49	0.372	85	0.466	121	0.266	157	0.279	193	0.185	229	0.295	265	0.485	301	0.289
14	0.262	50	0.364	86	0.473	122	0.265	158	0.269	194	0.195	230	0.288	266	0.488	302	0.297
15	0.271	51	0.355	87	0.478	123	0.266	159	0.259	195	0.205	231	0.282	267	0.489	303	0.305
16	0.281	52	0.346	88	0.482	124	0.267	160	0.248	196	0.216	232	0.277	268	0.490	304	0.314
17	0.291	53	0.337	89	0.485	125	0.270	161	0.237	197	0.226	233	0.272	269	0.489	305	0.324
18	0.302	54	0.329	90	0.487	126	0.274	162	0.226	198	0.237	234	0.268	270	0.488	306	0.333
19	0.313	55	0.321	91	0.489	127	0.279	163	0.215	199	0.247	235	0.265	271	0.485	307	0.343
20	0.324	56	0.313	92	0.489	128	0.284	164	0.205	200	0.257	236	0.262	272	0.482	308	0.353
21	0.335	57	0.306	93	0.488	129	0.290	165	0.194	201	0.267	237	0.261	273	0.477	309	0.363
22	0.347	58	0.299	94	0.486	130	0.296	166	0.184	202	0.276	238	0.262	274	0.471	310	0.373
23	0.358	59	0.294	95	0.483	131	0.302	167	0.174	203	0.286	239	0.263	275	0.464	311	0.382
24	0.369	60	0.289	96	0.479	132	0.309	168	0.165	204	0.294	240	0.266	276	0.457	312	0.391
25	0.379	61	0.285	97	0.474	133	0.315	169	0.156	205	0.303	241	0.270	277	0.448	313	0.399
26	0.389	62	0.283	98	0.468	134	0.321	170	0.148	206	0.310	242	0.276	278	0.439	314	0.407
27	0.398	63	0.282	99	0.462	135	0.327	171	0.141	207	0.317	243	0.283	279	0.429	315	0.414
28	0.406	64	0.283	100	0.454	136	0.333	172	0.134	208	0.324	244	0.291	280	0.418	316	0.420
29	0.414	65	0.285	101	0.446	137	0.338	173	0.129	209	0.329	245	0.300	281	0.406	317	0.426
30	0.421	66	0.288	102	0.437	138	0.342	174	0.124	210	0.334	246	0.309	282	0.394	318	0.430
31	0.426	67	0.293	103	0.428	139	0.346	175	0.120	211	0.339	247	0.320	283	0.382	319	0.434
32	0.431	68	0.299	104	0.418	140	0.349	176	0.117	212	0.342	248	0.331	284	0.370	320	0.437
33	0.435	69	0.306	105	0.407	141	0.351	177	0.114	213	0.345	249	0.342	285	0.357	321	0.439
34	0.437	70	0.315	106	0.396	142	0.353	178	0.113	214	0.347	250	0.354	286	0.345	322	0.441
35	0.439	71	0.324	107	0.385	143	0.353	179	0.112	215	0.348	251	0.365	287	0.333	323	0.441

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AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WFNA**
 Channel **27**
 Frequency **551 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**
 Gain **1.95 (2.89dB)**
 Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.206	36	0.474	72	0.347	108	0.392	144	0.383	180	0.107	216	0.368	252	0.400	288	0.340
1	0.207	37	0.474	73	0.357	109	0.381	145	0.382	181	0.108	217	0.365	253	0.410	289	0.330
2	0.208	38	0.472	74	0.368	110	0.369	146	0.381	182	0.110	218	0.361	254	0.420	290	0.321
3	0.210	39	0.469	75	0.379	111	0.358	147	0.379	183	0.113	219	0.357	255	0.430	291	0.313
4	0.213	40	0.465	76	0.389	112	0.346	148	0.375	184	0.118	220	0.351	256	0.439	292	0.307
5	0.217	41	0.460	77	0.400	113	0.336	149	0.370	185	0.123	221	0.346	257	0.448	293	0.301
6	0.222	42	0.454	78	0.410	114	0.325	150	0.364	186	0.129	222	0.339	258	0.457	294	0.297
7	0.228	43	0.447	79	0.420	115	0.316	151	0.358	187	0.137	223	0.333	259	0.464	295	0.295
8	0.234	44	0.440	80	0.429	116	0.307	152	0.350	188	0.145	224	0.326	260	0.472	296	0.294
9	0.242	45	0.431	81	0.439	117	0.300	153	0.341	189	0.154	225	0.319	261	0.478	297	0.295
10	0.250	46	0.423	82	0.447	118	0.293	154	0.332	190	0.164	226	0.313	262	0.484	298	0.298
11	0.259	47	0.413	83	0.455	119	0.288	155	0.322	191	0.175	227	0.306	263	0.489	299	0.301
12	0.269	48	0.403	84	0.463	120	0.284	156	0.311	192	0.187	228	0.300	264	0.493	300	0.307
13	0.279	49	0.393	85	0.470	121	0.282	157	0.300	193	0.198	229	0.294	265	0.496	301	0.313
14	0.290	50	0.382	86	0.476	122	0.280	158	0.288	194	0.211	230	0.289	266	0.498	302	0.320
15	0.302	51	0.372	87	0.481	123	0.280	159	0.277	195	0.223	231	0.284	267	0.500	303	0.329
16	0.314	52	0.361	88	0.486	124	0.281	160	0.265	196	0.235	232	0.280	268	0.500	304	0.338
17	0.326	53	0.351	89	0.490	125	0.284	161	0.252	197	0.248	233	0.278	269	0.499	305	0.347
18	0.338	54	0.341	90	0.493	126	0.287	162	0.240	198	0.261	234	0.276	270	0.498	306	0.357
19	0.350	55	0.331	91	0.495	127	0.292	163	0.228	199	0.273	235	0.275	271	0.495	307	0.367
20	0.362	56	0.323	92	0.496	128	0.297	164	0.217	200	0.285	236	0.275	272	0.491	308	0.377
21	0.373	57	0.315	93	0.496	129	0.303	165	0.205	201	0.296	237	0.277	273	0.487	309	0.388
22	0.385	58	0.307	94	0.496	130	0.309	166	0.194	202	0.307	238	0.280	274	0.481	310	0.398
23	0.396	59	0.301	95	0.494	131	0.316	167	0.183	203	0.318	239	0.283	275	0.475	311	0.408
24	0.407	60	0.297	96	0.491	132	0.323	168	0.173	204	0.327	240	0.289	276	0.467	312	0.417
25	0.417	61	0.294	97	0.487	133	0.331	169	0.163	205	0.336	241	0.294	277	0.459	313	0.427
26	0.426	62	0.292	98	0.483	134	0.338	170	0.154	206	0.344	242	0.301	278	0.450	314	0.435
27	0.435	63	0.292	99	0.477	135	0.345	171	0.145	207	0.351	243	0.309	279	0.440	315	0.443
28	0.443	64	0.293	100	0.471	136	0.352	172	0.138	208	0.358	244	0.318	280	0.430	316	0.451
29	0.451	65	0.296	101	0.463	137	0.358	173	0.131	209	0.363	245	0.327	281	0.419	317	0.457
30	0.457	66	0.300	102	0.455	138	0.364	174	0.124	210	0.367	246	0.337	282	0.408	318	0.463
31	0.462	67	0.305	103	0.446	139	0.369	175	0.119	211	0.370	247	0.347	283	0.396	319	0.467
32	0.467	68	0.312	104	0.436	140	0.374	176	0.115	212	0.371	248	0.357	284	0.384	320	0.471
33	0.470	69	0.320	105	0.426	141	0.377	177	0.111	213	0.372	249	0.368	285	0.373	321	0.474
34	0.473	70	0.328	106	0.415	142	0.380	178	0.109	214	0.372	250	0.378	286	0.361	322	0.475
35	0.474	71	0.337	107	0.404	143	0.382	179	0.108	215	0.371	251	0.389	287	0.350	323	0.476

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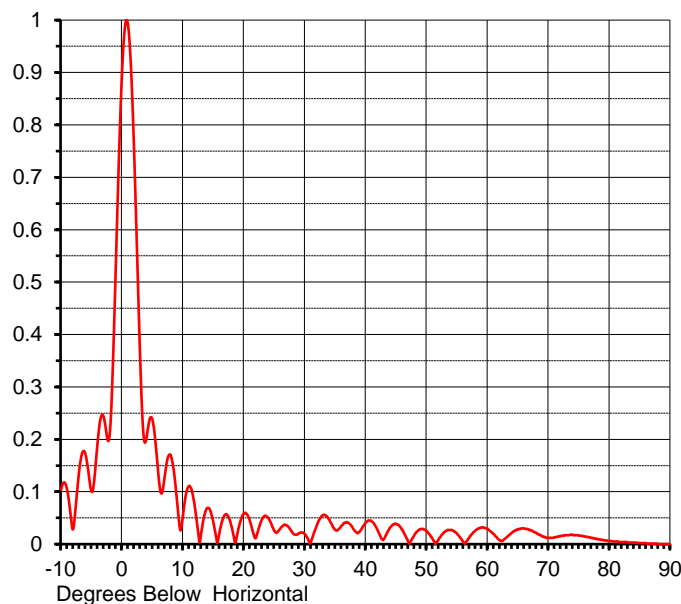
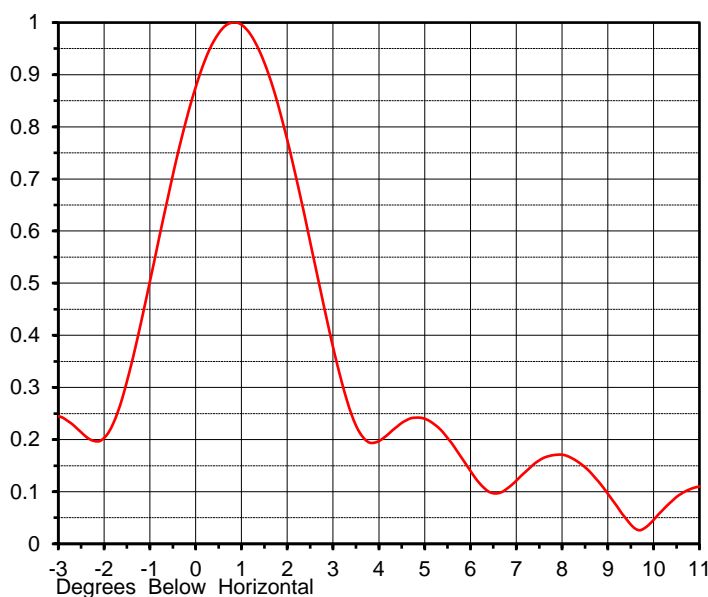
Face B and D

ELEVATION PATTERN

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

RMS Directivity at Main Lobe **20.1 (13.04 dB)**
 RMS Directivity at Horizontal **16.4 (12.15 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **10U202075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.104	10.0	0.056	30.0	0.019	50.0	0.025	70.0	0.012
-9.0	0.102	11.0	0.111	31.0	0.005	51.0	0.009	71.0	0.013
-8.0	0.030	12.0	0.066	32.0	0.037	52.0	0.010	72.0	0.015
-7.0	0.144	13.0	0.023	33.0	0.055	53.0	0.024	73.0	0.017
-6.0	0.171	14.0	0.069	34.0	0.047	54.0	0.027	74.0	0.017
-5.0	0.100	15.0	0.040	35.0	0.027	55.0	0.019	75.0	0.016
-4.0	0.197	16.0	0.023	36.0	0.035	56.0	0.004	76.0	0.014
-3.0	0.242	17.0	0.057	37.0	0.041	57.0	0.013	77.0	0.012
-2.0	0.214	18.0	0.032	38.0	0.028	58.0	0.026	78.0	0.010
-1.0	0.544	19.0	0.024	39.0	0.024	59.0	0.032	79.0	0.008
0.0	0.903	20.0	0.059	40.0	0.041	60.0	0.029	80.0	0.006
1.0	0.988	21.0	0.043	41.0	0.043	61.0	0.019	81.0	0.005
2.0	0.738	22.0	0.013	42.0	0.025	62.0	0.007	82.0	0.004
3.0	0.341	23.0	0.048	43.0	0.010	63.0	0.012	83.0	0.003
4.0	0.203	24.0	0.050	44.0	0.032	64.0	0.022	84.0	0.003
5.0	0.236	25.0	0.025	45.0	0.038	65.0	0.028	85.0	0.002
6.0	0.127	26.0	0.030	46.0	0.027	66.0	0.030	86.0	0.002
7.0	0.130	27.0	0.036	47.0	0.004	67.0	0.027	87.0	0.001
8.0	0.169	28.0	0.021	48.0	0.018	68.0	0.021	88.0	0.000
9.0	0.084	29.0	0.020	49.0	0.029	69.0	0.015	89.0	0.000
								90.0	0.000

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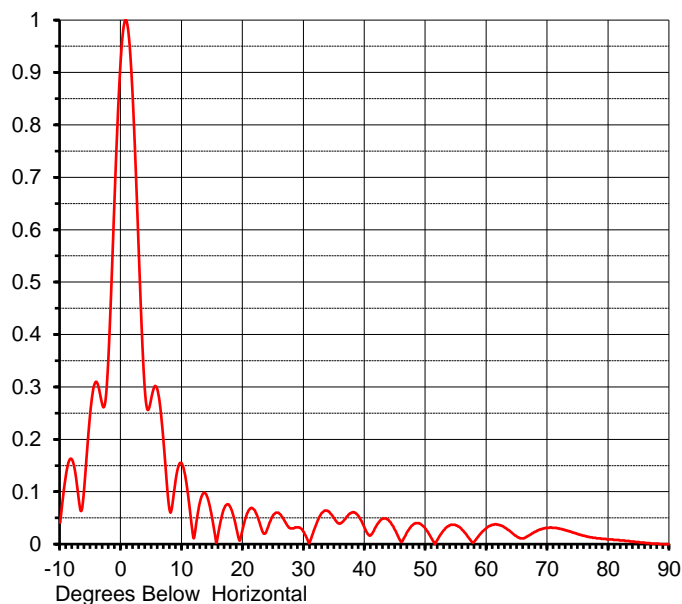
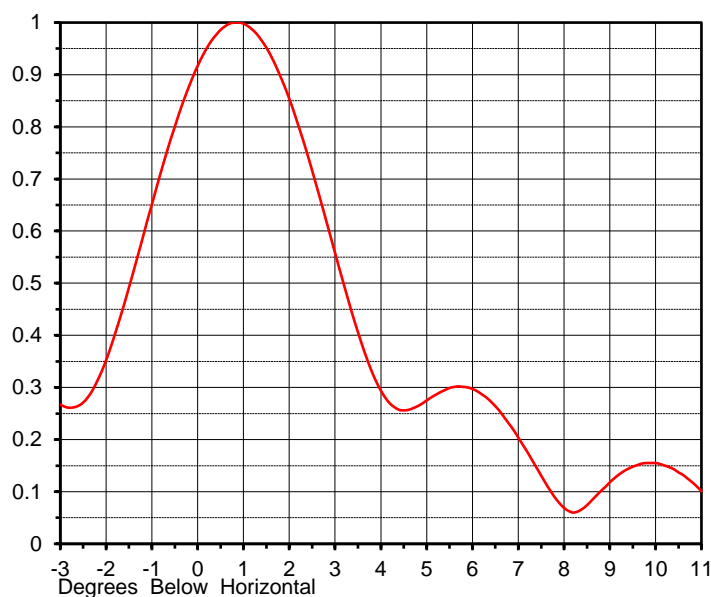
ELEVATION PATTERN

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

Face A

RMS Directivity at Main Lobe **15.2 (11.82 dB)**
 RMS Directivity at Horizontal **13.3 (11.24 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **08U152075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.041	10.0	0.153	30.0	0.023	50.0	0.029	70.0	0.031
-9.0	0.136	11.0	0.093	31.0	0.005	51.0	0.010	71.0	0.031
-8.0	0.160	12.0	0.013	32.0	0.037	52.0	0.010	72.0	0.029
-7.0	0.090	13.0	0.083	33.0	0.060	53.0	0.027	73.0	0.026
-6.0	0.115	14.0	0.094	34.0	0.063	54.0	0.036	74.0	0.023
-5.0	0.258	15.0	0.046	35.0	0.049	55.0	0.036	75.0	0.019
-4.0	0.309	16.0	0.024	36.0	0.040	56.0	0.027	76.0	0.016
-3.0	0.263	17.0	0.070	37.0	0.052	57.0	0.013	77.0	0.013
-2.0	0.377	18.0	0.069	38.0	0.061	58.0	0.005	78.0	0.011
-1.0	0.683	19.0	0.026	39.0	0.053	59.0	0.020	79.0	0.010
0.0	0.935	20.0	0.031	40.0	0.030	60.0	0.031	80.0	0.009
1.0	0.993	21.0	0.065	41.0	0.017	61.0	0.037	81.0	0.008
2.0	0.829	22.0	0.063	42.0	0.037	62.0	0.037	82.0	0.007
3.0	0.526	23.0	0.031	43.0	0.049	63.0	0.031	83.0	0.006
4.0	0.280	24.0	0.029	44.0	0.044	64.0	0.023	84.0	0.005
5.0	0.281	25.0	0.056	45.0	0.026	65.0	0.014	85.0	0.004
6.0	0.293	26.0	0.058	46.0	0.004	66.0	0.011	86.0	0.002
7.0	0.190	27.0	0.041	47.0	0.024	67.0	0.017	87.0	0.001
8.0	0.063	28.0	0.030	48.0	0.038	68.0	0.024	88.0	0.001
9.0	0.126	29.0	0.032	49.0	0.039	69.0	0.029	89.0	0.000
								90.0	0.000

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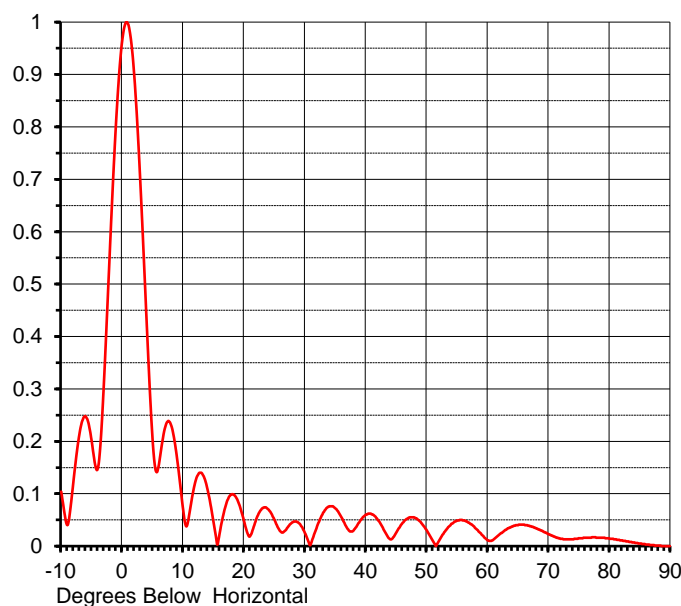
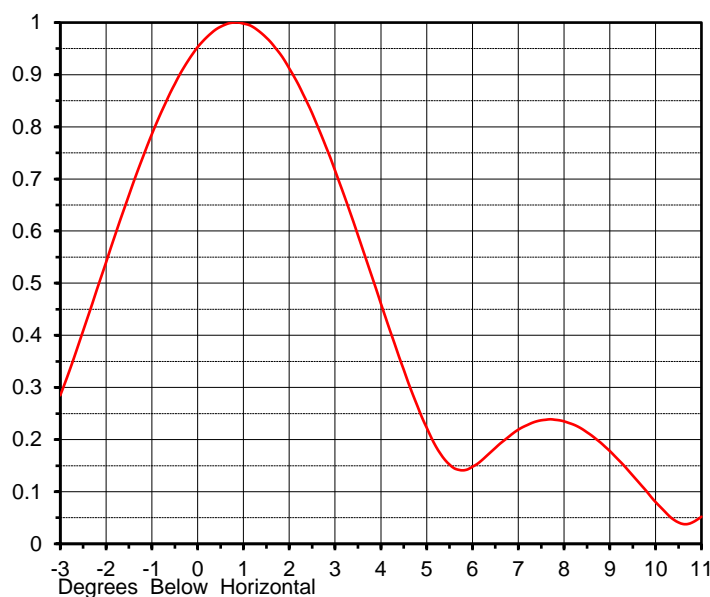
ELEVATION PATTERN

Face C

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

RMS Directivity at Main Lobe **12.4 (10.93 dB)**
 RMS Directivity at Horizontal **11.5 (10.61 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **06U124075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.104	10.0	0.071	30.0	0.025	50.0	0.030	70.0	0.023
-9.0	0.040	11.0	0.059	31.0	0.005	51.0	0.010	71.0	0.018
-8.0	0.122	12.0	0.122	32.0	0.038	52.0	0.010	72.0	0.014
-7.0	0.214	13.0	0.140	33.0	0.064	53.0	0.028	73.0	0.013
-6.0	0.248	14.0	0.109	34.0	0.076	54.0	0.042	74.0	0.013
-5.0	0.201	15.0	0.046	35.0	0.072	55.0	0.049	75.0	0.015
-4.0	0.148	16.0	0.024	36.0	0.055	56.0	0.049	76.0	0.016
-3.0	0.308	17.0	0.077	37.0	0.033	57.0	0.044	77.0	0.016
-2.0	0.567	18.0	0.099	38.0	0.030	58.0	0.034	78.0	0.016
-1.0	0.807	19.0	0.086	39.0	0.047	59.0	0.022	79.0	0.016
0.0	0.963	20.0	0.048	40.0	0.060	60.0	0.011	80.0	0.014
1.0	0.996	21.0	0.019	41.0	0.061	61.0	0.013	81.0	0.013
2.0	0.897	22.0	0.051	42.0	0.050	62.0	0.023	82.0	0.011
3.0	0.692	23.0	0.072	43.0	0.030	63.0	0.031	83.0	0.009
4.0	0.435	24.0	0.070	44.0	0.013	64.0	0.037	84.0	0.007
5.0	0.204	25.0	0.050	45.0	0.026	65.0	0.040	85.0	0.005
6.0	0.153	26.0	0.028	46.0	0.044	66.0	0.041	86.0	0.003
7.0	0.224	27.0	0.033	47.0	0.054	67.0	0.038	87.0	0.002
8.0	0.232	28.0	0.046	48.0	0.054	68.0	0.034	88.0	0.001
9.0	0.169	29.0	0.044	49.0	0.046	69.0	0.029	89.0	0.000
								90.0	0.000

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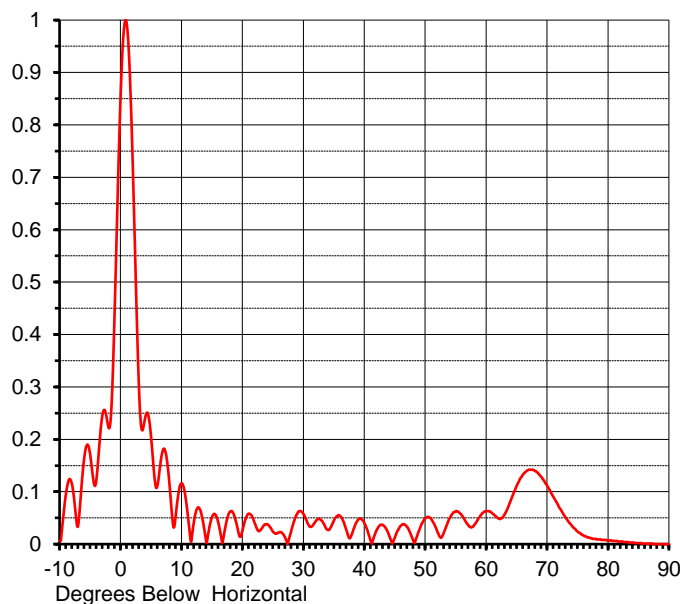
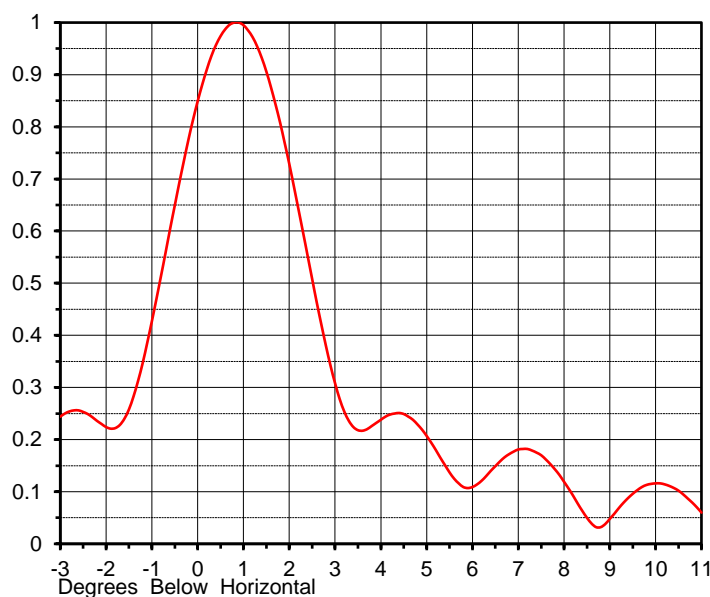
ELEVATION PATTERN

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WFNA**
 Channel **27**
 Frequency **551 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

Face B and D

RMS Directivity at Main Lobe **20.7 (13.16 dB)**
 RMS Directivity at Horizontal **16.1 (12.07 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **10U208075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.006	10.0	0.116	30.0	0.056	50.0	0.050	70.0	0.110
-9.0	0.100	11.0	0.050	31.0	0.033	51.0	0.046	71.0	0.089
-8.0	0.111	12.0	0.046	32.0	0.045	52.0	0.021	72.0	0.068
-7.0	0.040	13.0	0.065	33.0	0.044	53.0	0.023	73.0	0.050
-6.0	0.169	14.0	0.002	34.0	0.027	54.0	0.051	74.0	0.035
-5.0	0.164	15.0	0.054	35.0	0.047	55.0	0.063	75.0	0.023
-4.0	0.129	16.0	0.039	36.0	0.053	56.0	0.054	76.0	0.016
-3.0	0.250	17.0	0.026	37.0	0.026	57.0	0.036	77.0	0.012
-2.0	0.221	18.0	0.063	38.0	0.023	58.0	0.037	78.0	0.009
-1.0	0.470	19.0	0.036	39.0	0.048	59.0	0.055	79.0	0.008
0.0	0.881	20.0	0.030	40.0	0.038	60.0	0.063	80.0	0.007
1.0	0.985	21.0	0.058	41.0	0.005	61.0	0.058	81.0	0.006
2.0	0.686	22.0	0.038	42.0	0.028	62.0	0.049	82.0	0.005
3.0	0.278	23.0	0.029	43.0	0.036	63.0	0.058	83.0	0.004
4.0	0.244	24.0	0.038	44.0	0.016	64.0	0.085	84.0	0.003
5.0	0.194	25.0	0.023	45.0	0.015	65.0	0.113	85.0	0.002
6.0	0.114	26.0	0.023	46.0	0.036	66.0	0.133	86.0	0.001
7.0	0.182	27.0	0.010	47.0	0.032	67.0	0.142	87.0	0.001
8.0	0.106	28.0	0.029	48.0	0.005	68.0	0.139	88.0	0.000
9.0	0.058	29.0	0.060	49.0	0.029	69.0	0.128	89.0	0.000
								90.0	0.000

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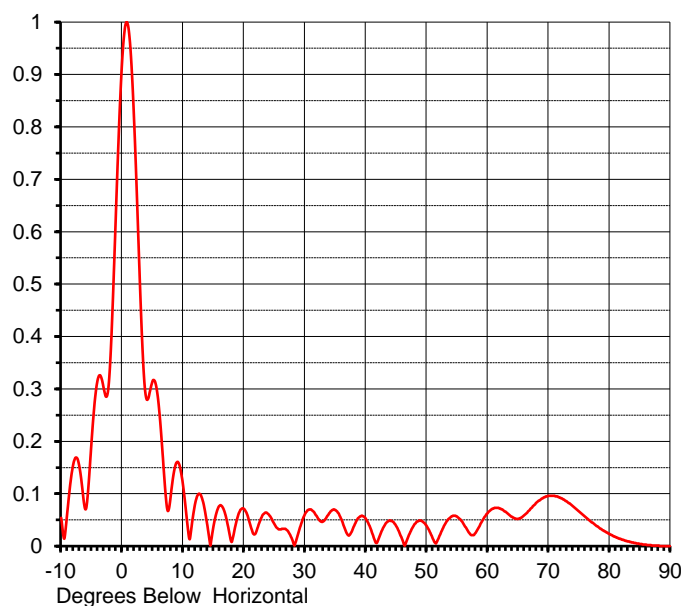
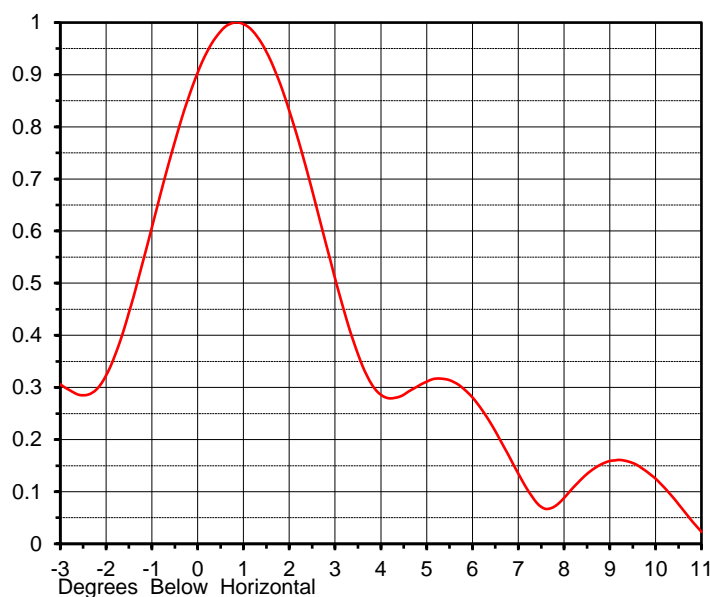
ELEVATION PATTERN

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WFNA**
 Channel **27**
 Frequency **551 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

Face A

RMS Directivity at Main Lobe **15.5 (11.90 dB)**
 RMS Directivity at Horizontal **13.3 (11.24 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **08U155075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.054	10.0	0.116	30.0	0.061	50.0	0.038	70.0	0.096
-9.0	0.064	11.0	0.015	31.0	0.070	51.0	0.014	71.0	0.096
-8.0	0.157	12.0	0.082	32.0	0.056	52.0	0.017	72.0	0.092
-7.0	0.151	13.0	0.095	33.0	0.047	53.0	0.042	73.0	0.085
-6.0	0.070	14.0	0.039	34.0	0.063	54.0	0.056	74.0	0.076
-5.0	0.202	15.0	0.038	35.0	0.069	55.0	0.056	75.0	0.066
-4.0	0.318	16.0	0.077	36.0	0.051	56.0	0.043	76.0	0.056
-3.0	0.300	17.0	0.058	37.0	0.022	57.0	0.025	77.0	0.046
-2.0	0.341	18.0	0.008	38.0	0.037	58.0	0.025	78.0	0.038
-1.0	0.641	19.0	0.057	39.0	0.056	59.0	0.046	79.0	0.030
0.0	0.925	20.0	0.071	40.0	0.052	60.0	0.063	80.0	0.023
1.0	0.992	21.0	0.042	41.0	0.026	61.0	0.072	81.0	0.017
2.0	0.803	22.0	0.027	42.0	0.011	62.0	0.072	82.0	0.013
3.0	0.477	23.0	0.058	43.0	0.038	63.0	0.065	83.0	0.009
4.0	0.281	24.0	0.061	44.0	0.049	64.0	0.056	84.0	0.006
5.0	0.315	25.0	0.042	45.0	0.038	65.0	0.052	85.0	0.004
6.0	0.270	26.0	0.032	46.0	0.012	66.0	0.059	86.0	0.003
7.0	0.119	27.0	0.031	47.0	0.019	67.0	0.071	87.0	0.001
8.0	0.098	28.0	0.010	48.0	0.042	68.0	0.083	88.0	0.001
9.0	0.160	29.0	0.028	49.0	0.049	69.0	0.091	89.0	0.000
								90.0	0.000

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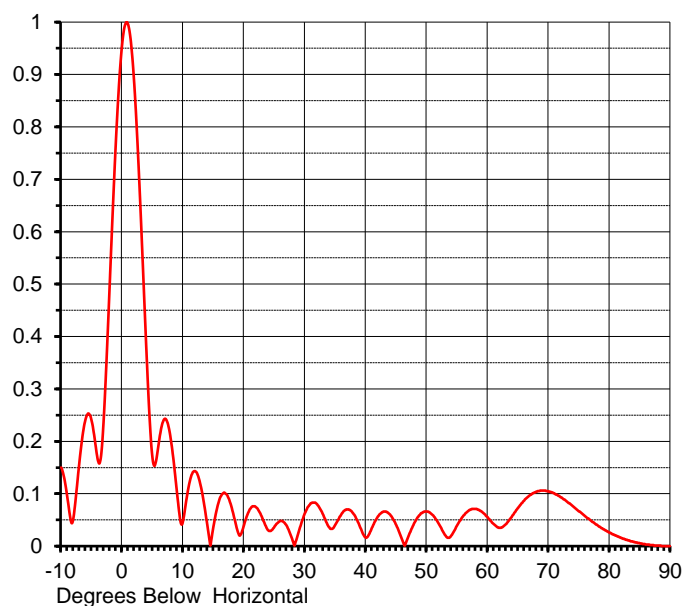
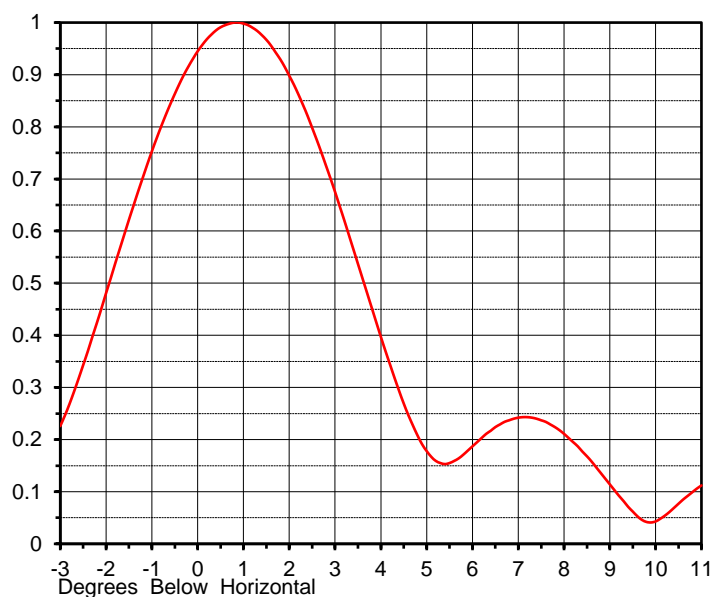
ELEVATION PATTERN

Face C

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WFNA**
 Channel **27**
 Frequency **551 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

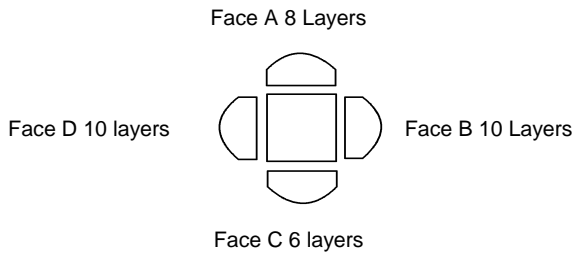
RMS Directivity at Main Lobe **12.9 (11.11 dB)**
 RMS Directivity at Horizontal **11.8 (10.72 dB)**
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **06U129075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.150	10.0	0.048	30.0	0.063	50.0	0.066	70.0	0.104
-9.0	0.094	11.0	0.118	31.0	0.082	51.0	0.059	71.0	0.100
-8.0	0.053	12.0	0.143	32.0	0.080	52.0	0.042	72.0	0.093
-7.0	0.161	13.0	0.110	33.0	0.060	53.0	0.021	73.0	0.085
-6.0	0.242	14.0	0.039	34.0	0.036	54.0	0.020	74.0	0.076
-5.0	0.239	15.0	0.038	35.0	0.041	55.0	0.040	75.0	0.066
-4.0	0.165	16.0	0.090	36.0	0.061	56.0	0.058	76.0	0.057
-3.0	0.246	17.0	0.100	37.0	0.070	57.0	0.069	77.0	0.048
-2.0	0.509	18.0	0.073	38.0	0.061	58.0	0.071	78.0	0.040
-1.0	0.777	19.0	0.027	39.0	0.038	59.0	0.066	79.0	0.032
0.0	0.957	20.0	0.040	40.0	0.016	60.0	0.055	80.0	0.026
1.0	0.995	21.0	0.071	41.0	0.035	61.0	0.042	81.0	0.020
2.0	0.881	22.0	0.074	42.0	0.057	62.0	0.035	82.0	0.015
3.0	0.648	23.0	0.054	43.0	0.066	63.0	0.042	83.0	0.011
4.0	0.370	24.0	0.030	44.0	0.060	64.0	0.057	84.0	0.008
5.0	0.167	25.0	0.037	45.0	0.040	65.0	0.073	85.0	0.005
6.0	0.195	26.0	0.048	46.0	0.011	66.0	0.087	86.0	0.003
7.0	0.243	27.0	0.039	47.0	0.019	67.0	0.098	87.0	0.002
8.0	0.203	28.0	0.010	48.0	0.045	68.0	0.104	88.0	0.001
9.0	0.103	29.0	0.028	49.0	0.062	69.0	0.106	89.0	0.000
								90.0	0.000

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MECHANICAL SPECIFICATIONS

Proposal No. **C-70856-3**
 Date **28-Mar-19**
 Call Letters **WKRG**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TUM-C4-10/34H-1-R SM**

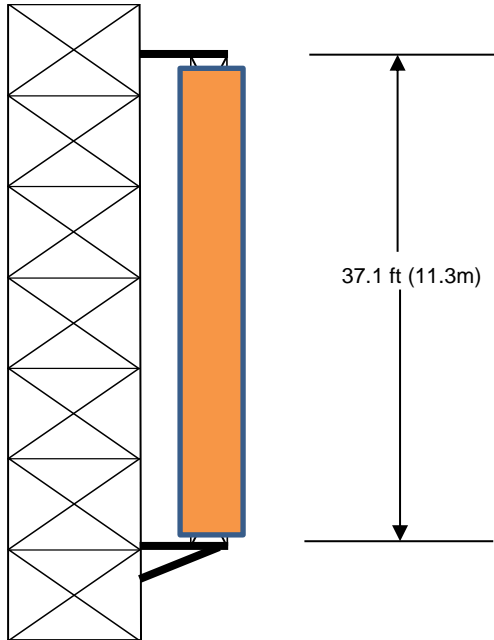
Preliminary Specifications

Side Mounted

Without ice TIA-222-G

Height AGL(z) 1850 ft (563.9 m)
 Basic Wind Speed 120 m/h (193.1 km/h)

Structure Class II
 Exposure Category C
 Topography Category 1



Mechanical Specifications

Height	H2	37.1 ft (11.3m)	
Height of Center of Radiation	H3	18.6 ft (5.7m)	
Effective Projected Area	(EPA) _A	101.5 ft ² (9.4m ²)	Mounts Excluded
Weight	W	8000 lb (3.6t)	Mounts Excluded

Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: JBC
 Rev. No.3 by: JCB

Date: 28-Mar-19
 Date: 28-Mar-19

ME: JCB

EE:

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Summary

Proposal No.	C-70856-3
Date	28-Mar-19
Call Letters	WKRG
Channel	20
Frequency	509 MHz
Antenna Type	TUM-C4-10/34H-1-R SM

Antenna

	Hpol	Vpol
ERP:	717.0 kW (28.56 dBk)	172.1 kW (22.36 dBk)
Peak Gain*	28.05 (14.48 dB)	6.73 (8.28 dB)

Antenna Input Power	25.6 kW (14.08 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(1.47 dB)
Size:	8-3/16"	Efficiency:	71.3%
Impedance:	75 Ohm		
Length:	1795 ft	547.1 m	

Combiner Losses

Attenuation	(0.30 dB)
Efficiency	93.3%

Combiner Input

38.4 kW (15.85 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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Summary

Proposal No.	C-70856-3
Date	28-Mar-19
Call Letters	WFNA
Channel	27
Frequency	551 MHz
Antenna Type	TUM-C4-10/34H-1-R SM

Antenna

	Hpol	Vpol
ERP:	1000.0 kW (30.00 dBk)	250.0 kW (23.98 dBk)
Peak Gain*	26.04 (14.16 dB)	6.51 (8.14 dB)

Antenna Input Power	38.4 kW (15.84 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(1.53 dB)
Size:	8-3/16"	Efficiency:	70.3%
Impedance:	75 Ohm		
Length:	1795 ft	547.1 m	

Combiner Losses

Attenuation	(0.30 dB)
Efficiency	93.3%

Combiner Input

58.5 kW (17.67 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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