Antenna Model: **TUM-LP-C3-2/6M-1-K**

Proposal Number:	**C-71463-1**
Date:	**17-Mar-20**
Customer:	**GA Public**
Location:	**Young Harris, GA**

Electrical Specifications

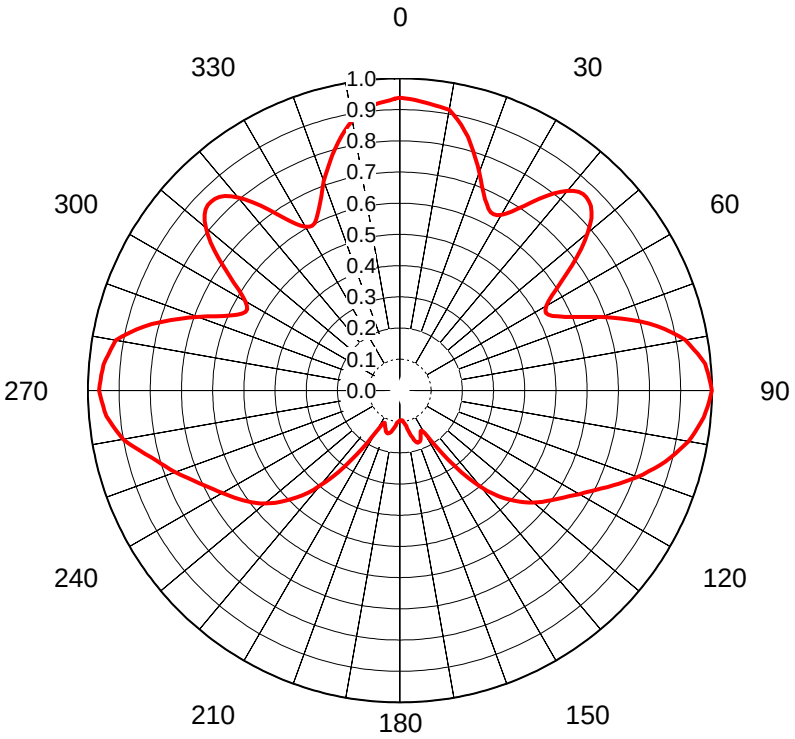
Polarization:	**Elliptical**			
Azimuth Pattern:	**Directional**			
Antenna Input:	**1-5/8"**	**50 Ohm**	**EIA/DCA**	
VSWR:	Channel	**1.15 : 1**		Band
Bandwidth:	**MHz**			
Rated Input Power:	**5 kW**	**(6.99 dBk)**	**Maximum Average Power**	

Mechanical Specifications

Mounting:	**Side Mounted**			
Environmental Protection:	**Panel Cover**			
Height:	**6.8 ft (2.1m)**			
Weight:	**350 lb (0.2t)**	Excludes Mounts		
Effective Projected Area:	**34.9 ft² (3.2m²)**	**TIA-222-G**	Basic Wind Speed:	**90 m/h (144.8 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
W25FP-D	25	539 MHz	4.50 kW (6.53 dBk)	1.93 kW (2.85 dBk)	0.903 kW -(0.45 dBk)	6.52 (8.14dB)	2.80 (4.46dB)	6.50 (8.13dB)	2.78 (4.45dB)

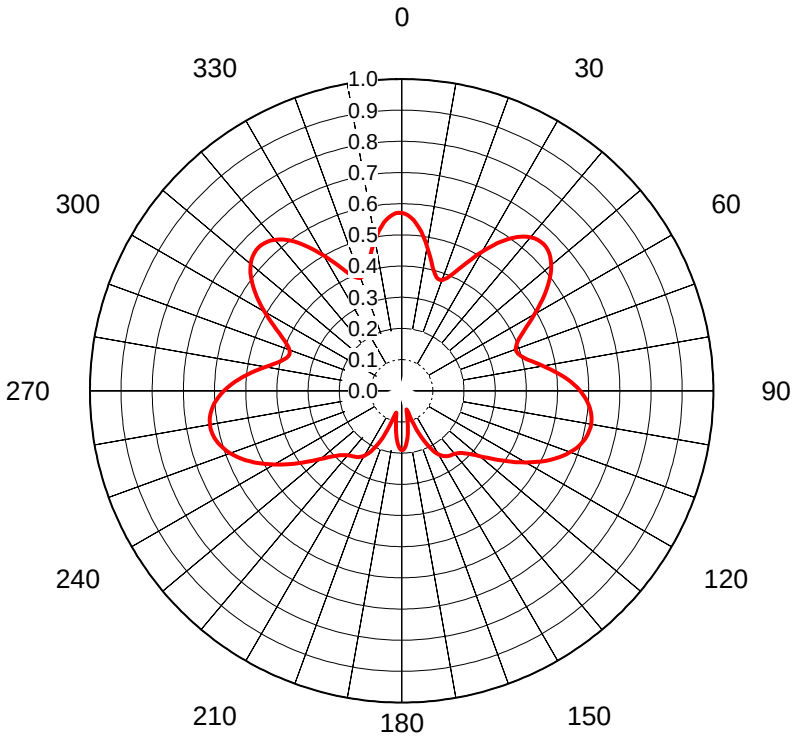


AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**C-71463-1**
Date	**17-Mar-20**
Call Letters	**W25F-D**
Channel	**25**
Frequency	**539 MHz**
Antenna Type	**TUM-LP-C3-2/6M-1-K**
Gain	**2.12 (3.26dB)**
	Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.938	36	0.758	72	0.745	108	0.839	144	0.301	180	0.096	216	0.301	252	0.789	288	0.742	324	0.717
1	0.937	37	0.781	73	0.773	109	0.825	145	0.272	181	0.098	217	0.328	253	0.801	289	0.716	325	0.692
2	0.935	38	0.801	74	0.801	110	0.811	146	0.245	182	0.099	218	0.353	254	0.814	290	0.690	326	0.669
3	0.932	39	0.820	75	0.828	111	0.795	147	0.219	183	0.101	219	0.377	255	0.826	291	0.662	327	0.648
4	0.929	40	0.835	76	0.850	112	0.779	148	0.195	184	0.103	220	0.399	256	0.841	292	0.635	328	0.629
5	0.926	41	0.848	77	0.872	113	0.764	149	0.174	185	0.104	221	0.421	257	0.857	293	0.611	329	0.615
6	0.923	42	0.856	78	0.892	114	0.748	150	0.157	186	0.109	222	0.442	258	0.872	294	0.591	330	0.606
7	0.921	43	0.861	79	0.911	115	0.733	151	0.149	187	0.114	223	0.460	259	0.886	295	0.575	331	0.600
8	0.918	44	0.861	80	0.929	116	0.718	152	0.146	188	0.118	224	0.477	260	0.901	296	0.562	332	0.598
9	0.915	45	0.857	81	0.940	117	0.703	153	0.147	189	0.122	225	0.492	261	0.910	297	0.555	333	0.602
10	0.913	46	0.851	82	0.951	118	0.690	154	0.151	190	0.126	226	0.509	262	0.919	298	0.555	334	0.611
11	0.901	47	0.840	83	0.962	119	0.677	155	0.157	191	0.131	227	0.524	263	0.927	299	0.561	335	0.624
12	0.887	48	0.826	84	0.972	120	0.665	156	0.163	192	0.136	228	0.538	264	0.936	300	0.572	336	0.637
13	0.873	49	0.808	85	0.982	121	0.652	157	0.169	193	0.139	229	0.551	265	0.945	301	0.589	337	0.654
14	0.858	50	0.786	86	0.986	122	0.640	158	0.173	194	0.141	230	0.563	266	0.949	302	0.610	338	0.672
15	0.841	51	0.763	87	0.989	123	0.629	159	0.176	195	0.142	231	0.575	267	0.953	303	0.635	339	0.692
16	0.822	52	0.738	88	0.993	124	0.618	160	0.176	196	0.143	232	0.586	268	0.957	304	0.661	340	0.713
17	0.803	53	0.710	89	0.997	125	0.608	161	0.177	197	0.143	233	0.596	269	0.961	305	0.688	341	0.731
18	0.783	54	0.682	90	1.000	126	0.599	162	0.175	198	0.141	234	0.605	270	0.964	306	0.717	342	0.749
19	0.763	55	0.653	91	0.996	127	0.589	163	0.171	199	0.138	235	0.614	271	0.962	307	0.744	343	0.767
20	0.745	56	0.625	92	0.992	128	0.580	164	0.165	200	0.134	236	0.623	272	0.960	308	0.770	344	0.785
21	0.724	57	0.599	93	0.988	129	0.570	165	0.157	201	0.130	237	0.631	273	0.958	309	0.792	345	0.802
22	0.704	58	0.575	94	0.983	130	0.559	166	0.149	202	0.126	238	0.640	274	0.956	310	0.812	346	0.819
23	0.686	59	0.556	95	0.978	131	0.548	167	0.141	203	0.122	239	0.649	275	0.953	311	0.829	347	0.836
24	0.671	60	0.542	96	0.971	132	0.536	168	0.133	204	0.118	240	0.658	276	0.948	312	0.842	348	0.851
25	0.659	61	0.533	97	0.963	133	0.523	169	0.124	205	0.115	241	0.666	277	0.942	313	0.851	349	0.865
26	0.648	62	0.530	98	0.955	134	0.509	170	0.115	206	0.116	242	0.676	278	0.936	314	0.856	350	0.878
27	0.641	63	0.534	99	0.948	135	0.493	171	0.111	207	0.119	243	0.685	279	0.931	315	0.856	351	0.887
28	0.639	64	0.544	100	0.939	136	0.479	172	0.107	208	0.127	244	0.696	280	0.925	316	0.854	352	0.895
29	0.643	65	0.561	101	0.928	137	0.463	173	0.103	209	0.139	245	0.706	281	0.907	317	0.848	353	0.903
30	0.650	66	0.580	102	0.917	138	0.446	174	0.100	210	0.154	246	0.718	282	0.888	318	0.838	354	0.912
31	0.661	67	0.603	103	0.905	139	0.426	175	0.096	211	0.175	247	0.729	283	0.867	319	0.824	355	0.920
32	0.676	68	0.630	104	0.893	140	0.403	176	0.096	212	0.199	248	0.741	284	0.845	320	0.806	356	0.923
33	0.694	69	0.659	105	0.881	141	0.381	177	0.095	213	0.223	249	0.754	285	0.823	321	0.787	357	0.927
34	0.714	70	0.689	106	0.867	142	0.356	178	0.095	214	0.248	250	0.767	286	0.796	322	0.765	358	0.931
35	0.736	71	0.717	107	0.853	143	0.329	179	0.096	215	0.273	251	0.778	287	0.769	323	0.741	359	0.935



AZIMUTH PATTERN
Vertical Polarization

In Free Space

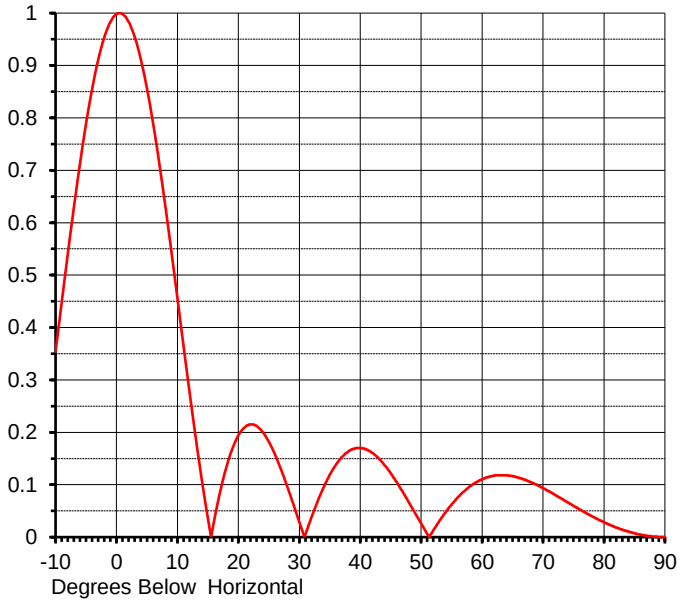
Proposal No.	**C-71463-1**
Date	**17-Mar-20**
Call Letters	**W25FP-D**
Channel	**25**
Frequency	**539 MHz**
Antenna Type	**TUM-LP-C3-2/6M-1-K**
Gain	**2.05 (3.13dB)**
	Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.571	36	0.606	72	0.391	108	0.591	144	0.258	180	0.190	216	0.261	252	0.600	288	0.379	324	0.593
1	0.568	37	0.617	73	0.394	109	0.583	145	0.256	181	0.188	217	0.263	253	0.606	289	0.380	325	0.580
2	0.564	38	0.627	74	0.400	110	0.576	146	0.253	182	0.185	218	0.265	254	0.612	290	0.383	326	0.566
3	0.557	39	0.636	75	0.407	111	0.567	147	0.250	183	0.179	219	0.267	255	0.616	291	0.389	327	0.551
4	0.549	40	0.643	76	0.416	112	0.557	148	0.246	184	0.172	220	0.270	256	0.619	292	0.397	328	0.535
5	0.539	41	0.648	77	0.425	113	0.547	149	0.241	185	0.163	221	0.273	257	0.622	293	0.407	329	0.519
6	0.527	42	0.652	78	0.436	114	0.536	150	0.235	186	0.153	222	0.277	258	0.624	294	0.419	330	0.502
7	0.514	43	0.654	79	0.448	115	0.525	151	0.228	187	0.142	223	0.282	259	0.625	295	0.432	331	0.485
8	0.500	44	0.655	80	0.460	116	0.513	152	0.220	188	0.130	224	0.288	260	0.624	296	0.446	332	0.468
9	0.485	45	0.654	81	0.472	117	0.500	153	0.210	189	0.117	225	0.294	261	0.623	297	0.461	333	0.452
10	0.470	46	0.651	82	0.485	118	0.487	154	0.200	190	0.104	226	0.302	262	0.621	298	0.477	334	0.437
11	0.454	47	0.647	83	0.497	119	0.474	155	0.188	191	0.092	227	0.311	263	0.618	299	0.492	335	0.423
12	0.439	48	0.642	84	0.509	120	0.460	156	0.175	192	0.082	228	0.320	264	0.614	300	0.508	336	0.410
13	0.424	49	0.635	85	0.521	121	0.446	157	0.161	193	0.075	229	0.330	265	0.609	301	0.524	337	0.400
14	0.411	50	0.627	86	0.533	122	0.432	158	0.146	194	0.072	230	0.341	266	0.603	302	0.539	338	0.392
15	0.399	51	0.617	87	0.544	123	0.417	159	0.131	195	0.075	231	0.353	267	0.596	303	0.554	339	0.387
16	0.389	52	0.607	88	0.554	124	0.403	160	0.115	196	0.082	232	0.365	268	0.588	304	0.568	340	0.386
17	0.382	53	0.595	89	0.564	125	0.389	161	0.100	197	0.092	233	0.378	269	0.580	305	0.581	341	0.387
18	0.377	54	0.582	90	0.573	126	0.376	162	0.086	198	0.105	234	0.391	270	0.570	306	0.594	342	0.391
19	0.376	55	0.568	91	0.581	127	0.362	163	0.074	199	0.119	235	0.405	271	0.560	307	0.605	343	0.398
20	0.378	56	0.554	92	0.588	128	0.350	164	0.065	200	0.133	236	0.418	272	0.548	308	0.615	344	0.407
21	0.383	57	0.539	93	0.595	129	0.337	165	0.062	201	0.148	237	0.432	273	0.536	309	0.624	345	0.419
22	0.391	58	0.524	94	0.601	130	0.326	166	0.066	202	0.162	238	0.446	274	0.524	310	0.632	346	0.432
23	0.401	59	0.508	95	0.605	131	0.316	167	0.074	203	0.175	239	0.460	275	0.511	311	0.638	347	0.446
24	0.414	60	0.493	96	0.610	132	0.306	168	0.086	204	0.187	240	0.473	276	0.497	312	0.643	348	0.461
25	0.429	61	0.478	97	0.613	133	0.297	169	0.099	205	0.199	241	0.487	277	0.484	313	0.647	349	0.476
26	0.445	62	0.463	98	0.615	134	0.290	170	0.113	206	0.209	242	0.500	278	0.470	314	0.649	350	0.491
27	0.462	63	0.449	99	0.617	135	0.283	171	0.126	207	0.219	243	0.512	279	0.456	315	0.650	351	0.506
28	0.479	64	0.435	100	0.617	136	0.278	172	0.139	208	0.227	244	0.524	280	0.443	316	0.649	352	0.519
29	0.497	65	0.424	101	0.617	137	0.273	173	0.151	209	0.234	245	0.536	281	0.430	317	0.647	353	0.532
30	0.514	66	0.413	102	0.616	138	0.270	174	0.162	210	0.240	246	0.547	282	0.418	318	0.644	354	0.543
31	0.532	67	0.404	103	0.614	139	0.267	175	0.171	211	0.246	247	0.558	283	0.407	319	0.639	355	0.552
32	0.549	68	0.397	104	0.611	140	0.264	176	0.179	212	0.250	248	0.568	284	0.397	320	0.632	356	0.560
33	0.565	69	0.392	105	0.607	141	0.263	177	0.184	213	0.253	249	0.577	285	0.390	321	0.624	357	0.565
34	0.579	70	0.390	106	0.602	142	0.261	178	0.188	214	0.256	250	0.585	286	0.384	322	0.615	358	0.569
35	0.593	71	0.389	107	0.597	143	0.259	179	0.190	215	0.259	251	0.593	287	0.380	323	0.605	359	0.571

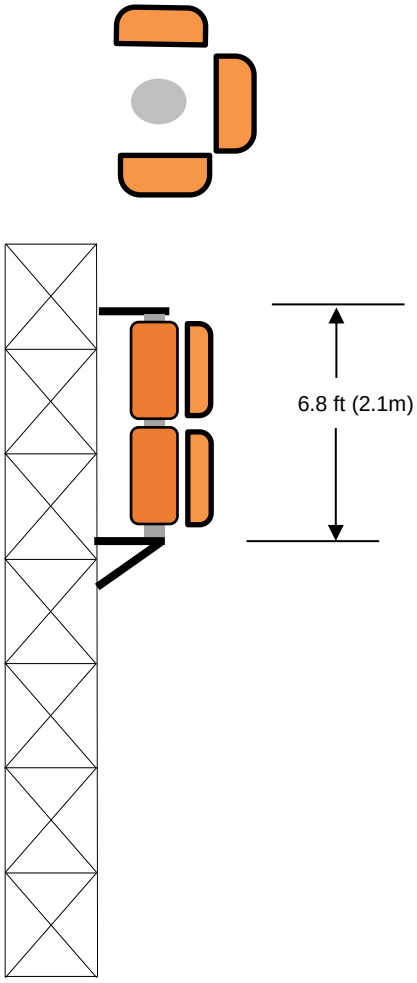
ELEVATION PATTERN

Proposal No.	**C-71463-1**
Date	**17-Mar-20**
Call Letters	**W25FP-D**
Channel	**25**
Frequency	**539 MHz**
Antenna Type	**TUM-LP-C3-2/6M-1-K**

RMS Directivity at Main Lobe	**4.4 (6.47 dB)**	Beam Tilt	**0.50 deg**
RMS Directivity at Horizontal	**4.4 (6.43 dB)**	Pattern Number	**02U045050**
	Calculated		



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.354	10.0	0.456	30.0	0.029	50.0	0.026	70.0	0.094
-9.0	0.447	11.0	0.365	31.0	0.005	51.0	0.006	71.0	0.087
-8.0	0.540	12.0	0.276	32.0	0.038	52.0	0.013	72.0	0.080
-7.0	0.629	13.0	0.190	33.0	0.068	53.0	0.031	73.0	0.074
-6.0	0.712	14.0	0.109	34.0	0.095	54.0	0.047	74.0	0.067
-5.0	0.789	15.0	0.036	35.0	0.119	55.0	0.062	75.0	0.060
-4.0	0.855	16.0	0.030	36.0	0.138	56.0	0.076	76.0	0.053
-3.0	0.911	17.0	0.086	37.0	0.153	57.0	0.087	77.0	0.046
-2.0	0.954	18.0	0.132	38.0	0.163	58.0	0.097	78.0	0.040
-1.0	0.983	19.0	0.168	39.0	0.169	59.0	0.104	79.0	0.034
0.0	0.998	20.0	0.194	40.0	0.170	60.0	0.110	80.0	0.028
1.0	0.998	21.0	0.209	41.0	0.167	61.0	0.115	81.0	0.023
2.0	0.983	22.0	0.215	42.0	0.161	62.0	0.117	82.0	0.018
3.0	0.954	23.0	0.212	43.0	0.151	63.0	0.118	83.0	0.014
4.0	0.911	24.0	0.200	44.0	0.137	64.0	0.118	84.0	0.011
5.0	0.856	25.0	0.182	45.0	0.122	65.0	0.116	85.0	0.007
6.0	0.790	26.0	0.158	46.0	0.105	66.0	0.113	86.0	0.005
7.0	0.715	27.0	0.129	47.0	0.086	67.0	0.110	87.0	0.003
8.0	0.633	28.0	0.097	48.0	0.066	68.0	0.105	88.0	0.001
9.0	0.546	29.0	0.064	49.0	0.046	69.0	0.100	89.0	0.000
								90.0	0.000



MECHANICAL SPECIFICATIONS

Proposal No.	**C-71463-1**
Date	**17-Mar-20**
Call Letters	**W25FP-D**
Channel	**25**
Frequency	**539 MHz**
Antenna Type	**TUM-LP-C3-2/6M-1-K**

Preliminary Specifications

Side Mounted

With ice TIA-222-G

Height AGL(z)	100 ft (30.5 m)
Basic Wind Speed	90 m/h (144.8 km/h)
Structure Class	II
Exposure Category	C
Topography Category	1
Design Ice	0.5 in t_{iz} = 1.10 in
Wind Speed w/Ice	40 m/h (64.4 km/h)

Mechanical Specifications		**without ice**	**with ice**	
Height	H2	6.8 ft (2.1m)		
Height of Center of Radiation	H3	3.4 ft (1m)		
Effective Projected Area	$(EPA)_A$	34.9 ft² (3.2m²)	51.6 ft² (4.8m²)	Mounts Excluded
Weight	W	350 lb (0.2t)	800 lb (0.4t)	Mounts Excluded

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

Prepared by:	CAB	**Date:**	26-Feb-20	**ME:**	**EE:**
Rev. No.1 by:	CAB	**Date:**	17-Mar-20		

Summary

Proposal No.	**C-71463-1**
Date	**17-Mar-20**
Call Letters	**W25FP-D**
Channel	**25**
Frequency	**539 MHz**
Antenna Type	**TUM-LP-C3-2/6M-1-K**

Antenna

	Hpol		Vpol	
ERP:	**4.50 kW**	**(6.53 dBk)**	**1.93 kW**	**(2.85 dBk)**
Peak Gain*	6.52	(8.14 dB)	2.80	(4.46 dB)

Antenna Input Power

0.690 kW **-(1.61 dBk)**

Transmission Line

Type:	**Flexline Foam**	Attenuation:	**(1.17 dB)**
Size:	**1/2"**	Efficiency:	**76.4%**
Impedance:	**50 Ohm**		
Length:	**70 ft**	**21.3 m**	

Transmitter Output

0.903 kW **-(0.45 dBk)**

Transmitter filter losses not included

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