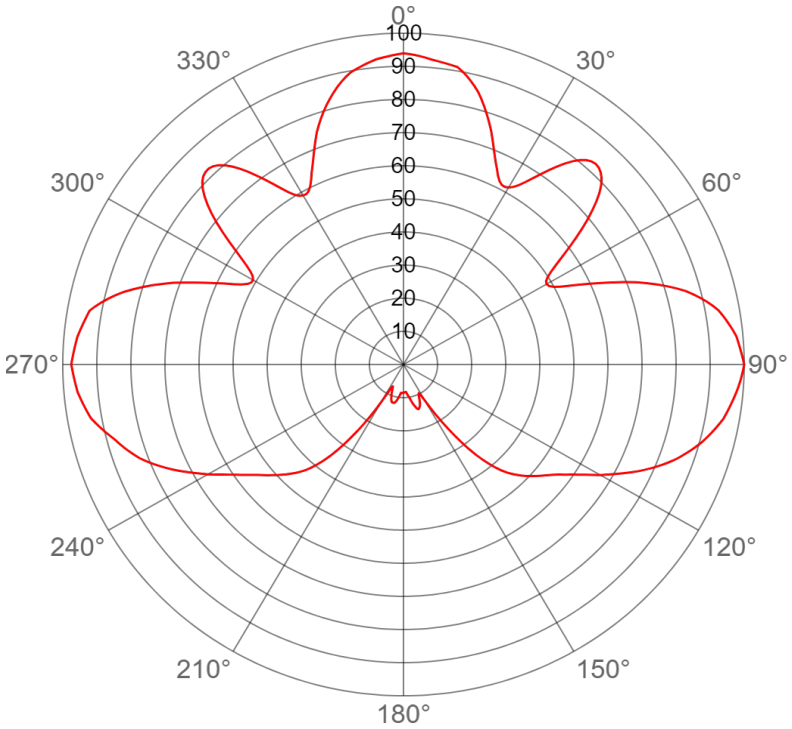


Horizontal Polarization
AZIMUTH PATTERN

Exhibit No.	
Date	**2 May 2018**
Call Letters	**W11DD-D**
Channel	**32**
Antenna Type	**TUM-C3-02/06M-T**
Location	**Hartwell & Royston, GA**
Customer	**GPB**
Gain	**2.1 (3.28 dB)**
	Calculated
Drawing #	**TUM-C3C**

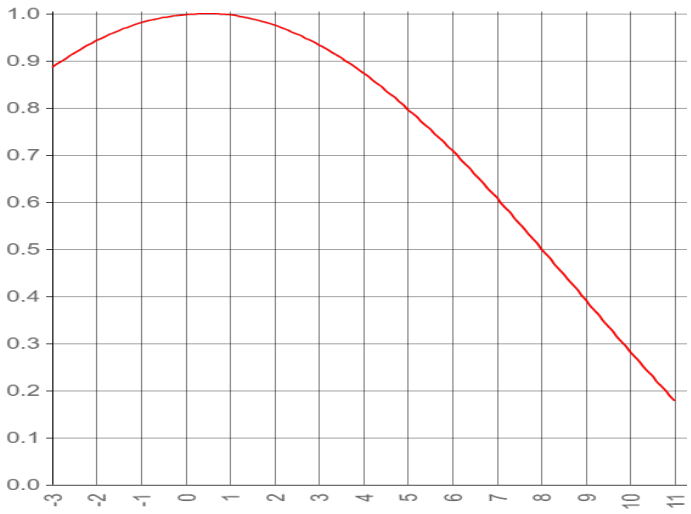
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.939	36	0.725	72	0.782	108	0.871	144	0.292	180	0.086	216	0.299	252	0.847	288	0.774	324	0.688
1	0.937	37	0.748	73	0.809	109	0.858	145	0.262	181	0.086	217	0.326	253	0.857	289	0.748	325	0.664
2	0.935	38	0.770	74	0.834	110	0.845	146	0.233	182	0.086	218	0.351	254	0.867	290	0.721	326	0.641
3	0.932	39	0.790	75	0.857	111	0.829	147	0.205	183	0.086	219	0.374	255	0.877	291	0.690	327	0.620
4	0.929	40	0.806	76	0.876	112	0.813	148	0.177	184	0.086	220	0.394	256	0.888	292	0.660	328	0.604
5	0.925	41	0.818	77	0.894	113	0.797	149	0.150	185	0.086	221	0.412	257	0.900	293	0.631	329	0.594
6	0.922	42	0.825	78	0.911	114	0.779	150	0.126	186	0.091	222	0.428	258	0.911	294	0.604	330	0.589
7	0.919	43	0.828	79	0.926	115	0.762	151	0.111	187	0.096	223	0.443	259	0.921	295	0.578	331	0.588
8	0.917	44	0.826	80	0.939	116	0.743	152	0.102	188	0.100	224	0.455	260	0.932	296	0.553	332	0.593
9	0.914	45	0.819	81	0.948	117	0.723	153	0.099	189	0.105	225	0.466	261	0.938	297	0.532	333	0.603
10	0.912	46	0.808	82	0.957	118	0.704	154	0.101	190	0.109	226	0.477	262	0.943	298	0.518	334	0.618
11	0.902	47	0.793	83	0.965	119	0.686	155	0.107	191	0.113	227	0.488	263	0.949	299	0.510	335	0.638
12	0.891	48	0.774	84	0.973	120	0.667	156	0.115	192	0.117	228	0.499	264	0.954	300	0.510	336	0.656
13	0.879	49	0.750	85	0.981	121	0.647	157	0.123	193	0.119	229	0.509	265	0.960	301	0.516	337	0.677
14	0.865	50	0.723	86	0.985	122	0.628	158	0.130	194	0.120	230	0.520	266	0.963	302	0.530	338	0.699
15	0.850	51	0.695	87	0.988	123	0.611	159	0.135	195	0.119	231	0.531	267	0.966	303	0.550	339	0.722
16	0.832	52	0.664	88	0.992	124	0.594	160	0.137	196	0.119	232	0.542	268	0.969	304	0.575	340	0.745
17	0.813	53	0.633	89	0.996	125	0.580	161	0.141	197	0.118	233	0.554	269	0.972	305	0.603	341	0.764
18	0.793	54	0.601	90	1.000	126	0.566	162	0.141	198	0.115	234	0.567	270	0.975	306	0.634	342	0.782
19	0.772	55	0.571	91	0.997	127	0.553	163	0.140	199	0.110	235	0.581	271	0.972	307	0.665	343	0.800
20	0.752	56	0.542	92	0.993	128	0.542	164	0.136	200	0.104	236	0.595	272	0.969	308	0.696	344	0.816
21	0.729	57	0.518	93	0.989	129	0.532	165	0.131	201	0.099	237	0.610	273	0.966	309	0.725	345	0.832
22	0.706	58	0.499	94	0.985	130	0.523	166	0.126	202	0.092	238	0.627	274	0.964	310	0.751	346	0.847
23	0.685	59	0.488	95	0.980	131	0.513	167	0.121	203	0.085	239	0.644	275	0.961	311	0.774	347	0.861
24	0.666	60	0.485	96	0.975	132	0.503	168	0.115	204	0.078	240	0.663	276	0.956	312	0.793	348	0.873
25	0.650	61	0.488	97	0.969	133	0.494	169	0.108	205	0.073	241	0.680	277	0.951	313	0.807	349	0.885
26	0.633	62	0.500	98	0.964	134	0.483	170	0.102	206	0.074	242	0.697	278	0.946	314	0.817	350	0.895
27	0.621	63	0.518	99	0.958	135	0.471	171	0.098	207	0.080	243	0.714	279	0.941	315	0.822	351	0.902
28	0.614	64	0.542	100	0.952	136	0.460	172	0.094	208	0.093	244	0.732	280	0.936	316	0.823	352	0.908
29	0.613	65	0.571	101	0.944	137	0.446	173	0.091	209	0.110	245	0.750	281	0.921	317	0.819	353	0.914
30	0.617	66	0.599	102	0.935	138	0.431	174	0.087	210	0.131	246	0.766	282	0.905	318	0.810	354	0.919
31	0.625	67	0.630	103	0.926	139	0.413	175	0.083	211	0.158	247	0.782	283	0.887	319	0.797	355	0.925
32	0.638	68	0.662	104	0.916	140	0.392	176	0.083	212	0.187	248	0.797	284	0.868	320	0.779	356	0.928
33	0.656	69	0.694	105	0.906	141	0.371	177	0.084	213	0.215	249	0.811	285	0.848	321	0.759	357	0.931
34	0.678	70	0.726	106	0.895	142	0.346	178	0.084	214	0.243	250	0.825	286	0.825	322	0.737	358	0.934
35	0.701	71	0.754	107	0.883	143	0.320	179	0.085	215	0.270	251	0.836	287	0.800	323	0.713	359	0.937

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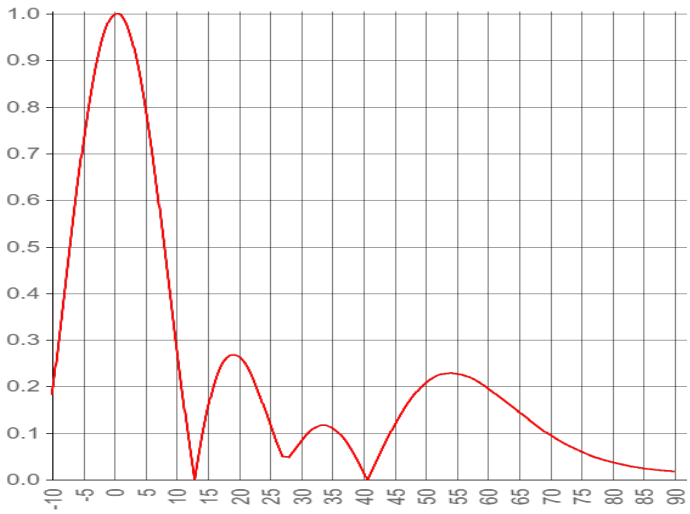
ELEVATION PATTERN

Exhibit No.	
Date	**2 May 2018**
Call Letters	**W11DD-D**
Channel	**32**
Antenna Type	**TUM-C3-02/06M-T**
Location	**Hartwell & Royston, GA**
Customer	**GPB**

RMS Gain at Main Lobe	**4.6 (6.60 dB)**	Beam Tilt	**0.5 Degrees**
RMS Gain at Horizontal	**4.6 (6.59 dB)**	Drawing #	**02U046050**
	Calculated		



Degrees below horizontal



Degrees below horizontal

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10	0.182	10	0.283	30	0.082	50	0.208	70	0.096
-9	0.292	11	0.178	31	0.098	51	0.217	71	0.088
-8	0.404	12	0.080	32	0.110	52	0.224	72	0.080
-7	0.516	13	0.010	33	0.116	53	0.227	73	0.073
-6	0.625	14	0.088	34	0.117	54	0.229	74	0.066
-5	0.723	15	0.153	35	0.111	55	0.227	75	0.060
-4	0.812	16	0.204	36	0.101	56	0.225	76	0.055
-3	0.886	17	0.241	37	0.086	57	0.220	77	0.049
-2	0.943	18	0.261	38	0.066	58	0.214	78	0.045
-1	0.981	19	0.268	39	0.043	59	0.205	79	0.041
0	0.998	20	0.264	40	0.017	60	0.196	80	0.038
1	0.998	21	0.250	41	0.010	61	0.186	81	0.034
2	0.976	22	0.225	42	0.038	62	0.176	82	0.031
3	0.934	23	0.192	43	0.066	63	0.166	83	0.028
4	0.874	24	0.157	44	0.092	64	0.156	84	0.027
5	0.797	25	0.120	45	0.118	65	0.145	85	0.024
6	0.710	26	0.082	46	0.141	66	0.135	86	0.023
7	0.609	27	0.050	47	0.162	67	0.124	87	0.021
8	0.501	28	0.048	48	0.180	68	0.114	88	0.020
9	0.392	29	0.065	49	0.195	69	0.104	89	0.019

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System Summary

Exhibit No.	
Date	**2 May 2018**
Call Letters	**W11DD-D**
Channel	**32**
Antenna Type	**TUM-C3-02/06M-T**
Location	**Hartwell & Royston, GA**
Customer	**GPB**

Antenna

ERP:	15.0 kW (11.76 dBk)
Peak Gain*:	9.7 (9.89 dB)

Antenna Input Power:

1.5 kW

Transmission Line

Type:	Flexline Air		
Size:	1-5/8"		
Impedance:	50 ohm		
Length:	410 ft (125.0 m)	Attenuation:	2.1 dB
		Efficiency:	61.29 %

Transmitter Output

2.5 kW (4.00 dBk)

* Gain is with respect to half wave dipole.

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Mechanicals

Exhibit No.	
Date	**2 May 2018**
Call Letters	**W11DD-D**
Channel	**32**
Antenna Type	**TUM-C3-02/06M-T**
Location	**Hartwell & Royston, GA**
Customer	**GPB**

Preliminary Specifications

Top Mounted

Mechanical Specification without ice TIA-222-G

Basic Wind Speed	90 mph

Mechanical Specification with ice TIA-222-G

Ice Design:	0.5 in.
Basic Wind Speed	40 mph

Structure Class	II
Exposure Category	C
Topography Category	1

Mechanical Specifications		**without ice**	**with ice**
Height less Lightning Protector	(H2)	8.9 ft (2.7 m)	
Height with Lightning Protector	(H4)	12.9 ft (3.9 m)	
Center of Radiation	(H3)	4.8 ft (1.5 m)	

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