

## AZIMUTH PATTERN Horizontal Polarization

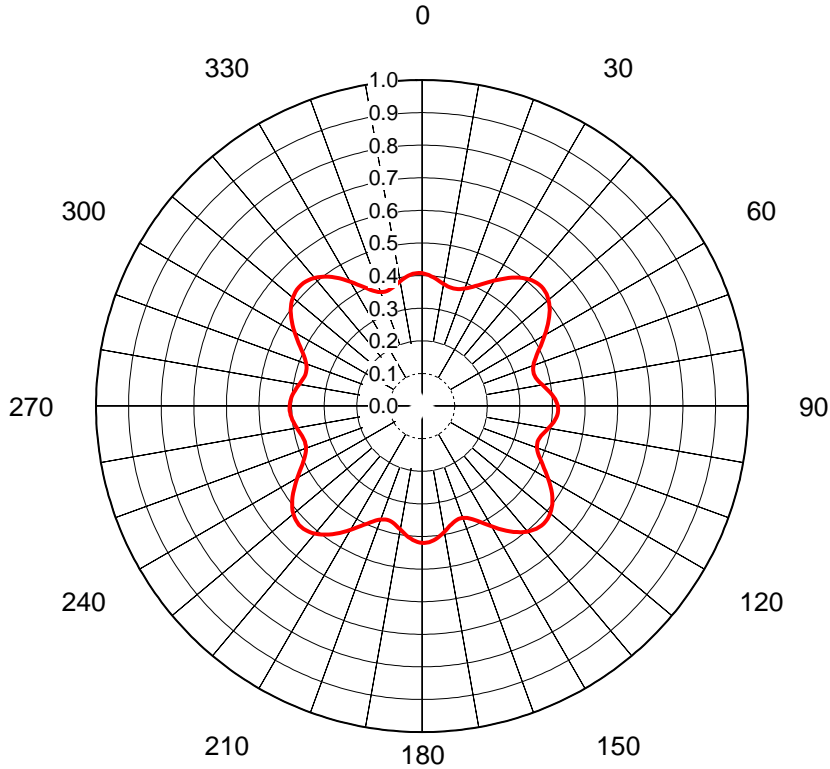
Proposal No. **C-70868-1**  
 Date **6-Oct-17**  
 Call Letters **KATU**  
 Channel **24**  
 Frequency **533 MHz**  
 Antenna Type **TUM25-O4-8/32H-1-R-T**  
 Gain **1.36 (1.34dB)**  
 Calculated  
 Circularity **+/- 2.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.863	72	0.791	108	0.776	144	0.850	180	0.998	216	0.857	252	0.794	288	0.779	324	0.839
1	0.998	37	0.873	73	0.804	109	0.766	145	0.838	181	0.997	217	0.867	253	0.807	289	0.769	325	0.827
2	0.995	38	0.882	74	0.818	110	0.757	146	0.826	182	0.994	218	0.877	254	0.821	290	0.761	326	0.814
3	0.989	39	0.890	75	0.833	111	0.751	147	0.814	183	0.988	219	0.885	255	0.836	291	0.755	327	0.803
4	0.982	40	0.896	76	0.848	112	0.746	148	0.802	184	0.981	220	0.892	256	0.851	292	0.751	328	0.791
5	0.972	41	0.901	77	0.864	113	0.744	149	0.790	185	0.972	221	0.899	257	0.867	293	0.749	329	0.780
6	0.961	42	0.905	78	0.880	114	0.743	150	0.780	186	0.961	222	0.903	258	0.883	294	0.750	330	0.771
7	0.949	43	0.907	79	0.895	115	0.745	151	0.770	187	0.949	223	0.907	259	0.898	295	0.752	331	0.762
8	0.935	44	0.908	80	0.910	116	0.748	152	0.762	188	0.936	224	0.908	260	0.913	296	0.757	332	0.755
9	0.921	45	0.907	81	0.924	117	0.754	153	0.755	189	0.921	225	0.909	261	0.927	297	0.763	333	0.750
10	0.905	46	0.905	82	0.937	118	0.761	154	0.750	190	0.905	226	0.907	262	0.940	298	0.771	334	0.747
11	0.889	47	0.901	83	0.948	119	0.770	155	0.747	191	0.889	227	0.904	263	0.952	299	0.780	335	0.746
12	0.872	48	0.896	84	0.959	120	0.779	156	0.746	192	0.873	228	0.900	264	0.962	300	0.790	336	0.747
13	0.856	49	0.890	85	0.967	121	0.790	157	0.747	193	0.856	229	0.894	265	0.971	301	0.801	337	0.750
14	0.840	50	0.882	86	0.974	122	0.802	158	0.750	194	0.840	230	0.886	266	0.979	302	0.813	338	0.756
15	0.824	51	0.874	87	0.980	123	0.814	159	0.756	195	0.824	231	0.878	267	0.984	303	0.825	339	0.763
16	0.809	52	0.864	88	0.983	124	0.827	160	0.763	196	0.810	232	0.868	268	0.988	304	0.837	340	0.772
17	0.796	53	0.854	89	0.984	125	0.839	161	0.773	197	0.796	233	0.858	269	0.989	305	0.849	341	0.783
18	0.784	54	0.843	90	0.984	126	0.851	162	0.784	198	0.784	234	0.846	270	0.989	306	0.860	342	0.796
19	0.774	55	0.832	91	0.981	127	0.863	163	0.797	199	0.774	235	0.835	271	0.987	307	0.871	343	0.809
20	0.766	56	0.820	92	0.977	128	0.874	164	0.811	200	0.766	236	0.823	272	0.983	308	0.880	344	0.824
21	0.760	57	0.809	93	0.971	129	0.883	165	0.826	201	0.759	237	0.811	273	0.977	309	0.889	345	0.840
22	0.756	58	0.798	94	0.963	130	0.892	166	0.842	202	0.755	238	0.800	274	0.969	310	0.896	346	0.855
23	0.754	59	0.787	95	0.954	131	0.899	167	0.858	203	0.753	239	0.789	275	0.960	311	0.902	347	0.872
24	0.755	60	0.778	96	0.943	132	0.905	168	0.874	204	0.753	240	0.779	276	0.949	312	0.906	348	0.888
25	0.757	61	0.769	97	0.931	133	0.909	169	0.891	205	0.755	241	0.771	277	0.936	313	0.909	349	0.904
26	0.762	62	0.762	98	0.918	134	0.911	170	0.907	206	0.759	242	0.763	278	0.923	314	0.909	350	0.919
27	0.769	63	0.756	99	0.904	135	0.912	171	0.922	207	0.765	243	0.758	279	0.909	315	0.909	351	0.933
28	0.777	64	0.752	100	0.889	136	0.911	172	0.937	208	0.772	244	0.754	280	0.893	316	0.906	352	0.947
29	0.786	65	0.750	101	0.874	137	0.909	173	0.950	209	0.781	245	0.752	281	0.878	317	0.902	353	0.959
30	0.796	66	0.750	102	0.859	138	0.904	174	0.962	210	0.790	246	0.752	282	0.862	318	0.897	354	0.970
31	0.807	67	0.752	103	0.844	139	0.898	175	0.973	211	0.801	247	0.754	283	0.846	319	0.890	355	0.979
32	0.819	68	0.756	104	0.828	140	0.891	176	0.982	212	0.812	248	0.758	284	0.831	320	0.882	356	0.987
33	0.830	69	0.762	105	0.814	141	0.882	177	0.989	213	0.823	249	0.765	285	0.816	321	0.872	357	0.993
34	0.842	70	0.770	106	0.800	142	0.873	178	0.994	214	0.835	250	0.773	286	0.803	322	0.862	358	0.998
35	0.853	71	0.780	107	0.787	143	0.862	179	0.997	215	0.846	251	0.783	287	0.790	323	0.851	359	1.000

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70868-1**  
 Date **6-Oct-17**  
 Call Letters **KATU**  
 Channel **24**  
 Frequency **533 MHz**  
 Antenna Type **TUM25-O4-8/32H-1-R-T**  
 Gain **1.5 (1.75dB)**  
 Calculated  
 Circularity **+/- 2.0 dB**



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.407	36	0.487	72	0.358	108	0.371	144	0.477	180	0.420	216	0.487	252	0.376	288	0.372
1	0.406	37	0.493	73	0.357	109	0.373	145	0.469	181	0.419	217	0.494	253	0.376	289	0.375
2	0.404	38	0.499	74	0.357	110	0.375	146	0.461	182	0.417	218	0.500	254	0.377	290	0.378
3	0.402	39	0.504	75	0.358	111	0.379	147	0.453	183	0.415	219	0.506	255	0.378	291	0.382
4	0.399	40	0.508	76	0.360	112	0.384	148	0.444	184	0.412	220	0.511	256	0.379	292	0.387
5	0.396	41	0.511	77	0.362	113	0.390	149	0.435	185	0.408	221	0.515	257	0.382	293	0.394
6	0.393	42	0.514	78	0.366	114	0.396	150	0.426	186	0.404	222	0.519	258	0.384	294	0.401
7	0.390	43	0.516	79	0.370	115	0.404	151	0.417	187	0.399	223	0.521	259	0.387	295	0.408
8	0.386	44	0.517	80	0.375	116	0.412	152	0.409	188	0.394	224	0.523	260	0.390	296	0.416
9	0.383	45	0.518	81	0.380	117	0.420	153	0.401	189	0.390	225	0.524	261	0.392	297	0.425
10	0.380	46	0.517	82	0.385	118	0.429	154	0.393	190	0.385	226	0.524	262	0.395	298	0.434
11	0.378	47	0.516	83	0.390	119	0.438	155	0.386	191	0.380	227	0.524	263	0.398	299	0.442
12	0.376	48	0.513	84	0.395	120	0.447	156	0.380	192	0.376	228	0.522	264	0.400	300	0.451
13	0.375	49	0.510	85	0.400	121	0.456	157	0.375	193	0.372	229	0.519	265	0.402	301	0.460
14	0.374	50	0.506	86	0.405	122	0.464	158	0.370	194	0.369	230	0.515	266	0.404	302	0.469
15	0.374	51	0.502	87	0.409	123	0.473	159	0.367	195	0.367	231	0.511	267	0.405	303	0.477
16	0.374	52	0.496	88	0.412	124	0.480	160	0.365	196	0.366	232	0.505	268	0.406	304	0.484
17	0.375	53	0.490	89	0.415	125	0.488	161	0.364	197	0.365	233	0.499	269	0.406	305	0.491
18	0.377	54	0.483	90	0.416	126	0.494	162	0.364	198	0.366	234	0.492	270	0.406	306	0.498
19	0.380	55	0.476	91	0.417	127	0.500	163	0.365	199	0.368	235	0.485	271	0.406	307	0.504
20	0.383	56	0.468	92	0.418	128	0.505	164	0.367	200	0.370	236	0.477	272	0.405	308	0.509
21	0.387	57	0.460	93	0.417	129	0.510	165	0.370	201	0.374	237	0.468	273	0.403	309	0.514
22	0.392	58	0.452	94	0.415	130	0.513	166	0.374	202	0.379	238	0.459	274	0.401	310	0.517
23	0.397	59	0.443	95	0.413	131	0.516	167	0.378	203	0.384	239	0.450	275	0.399	311	0.520
24	0.403	60	0.434	96	0.410	132	0.518	168	0.382	204	0.391	240	0.442	276	0.396	312	0.523
25	0.409	61	0.426	97	0.406	133	0.519	169	0.387	205	0.398	241	0.433	277	0.393	313	0.524
26	0.416	62	0.417	98	0.402	134	0.519	170	0.392	206	0.405	242	0.424	278	0.390	314	0.525
27	0.422	63	0.408	99	0.398	135	0.518	171	0.397	207	0.413	243	0.416	279	0.386	315	0.525
28	0.430	64	0.400	100	0.393	136	0.517	172	0.401	208	0.421	244	0.408	280	0.383	316	0.524
29	0.437	65	0.392	101	0.389	137	0.514	173	0.406	209	0.430	245	0.401	281	0.380	317	0.522
30	0.444	66	0.385	102	0.384	138	0.511	174	0.410	210	0.438	246	0.395	282	0.377	318	0.520
31	0.452	67	0.378	103	0.380	139	0.507	175	0.413	211	0.447	247	0.390	283	0.374	319	0.517
32	0.459	68	0.373	104	0.377	140	0.503	176	0.416	212	0.455	248	0.385	284	0.372	320	0.513
33	0.467	69	0.368	105	0.374	141	0.497	177	0.418	213	0.464	249	0.381	285	0.371	321	0.508
34	0.474	70	0.363	106	0.372	142	0.491	178	0.419	214	0.472	250	0.379	286	0.371	322	0.503
35	0.481	71	0.360	107	0.371	143	0.484	179	0.420	215	0.479	251	0.377	287	0.371	323	0.497

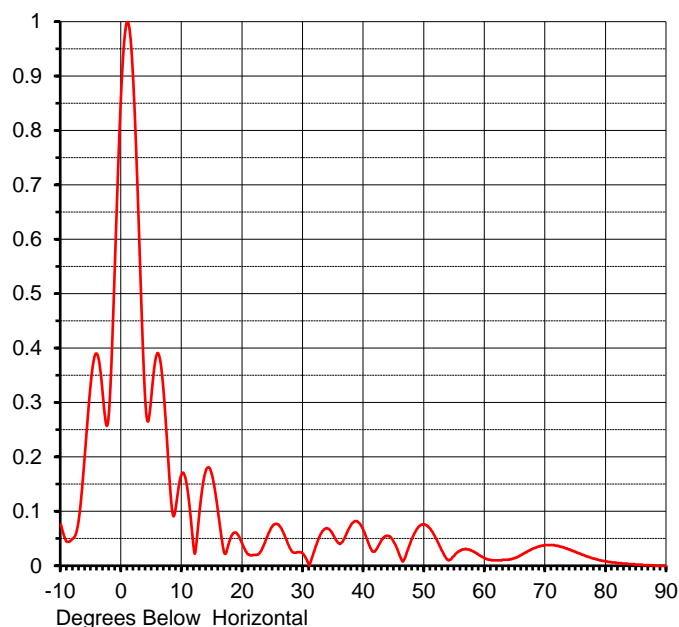
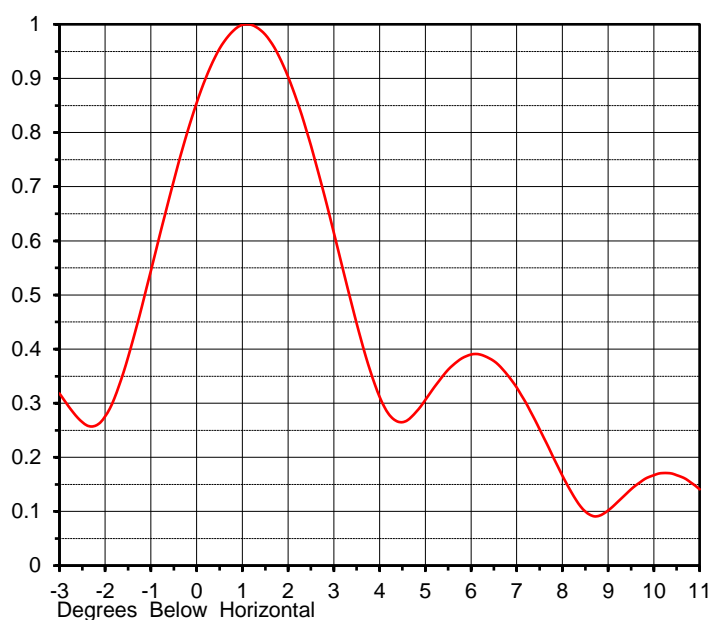
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## ELEVATION PATTERN

Proposal No. **C-70868-1**  
 Date **6-Oct-17**  
 Call Letters **KATU**  
 Channel **24**  
 Frequency **533 MHz**  
 Antenna Type **TUM25-O4-8/32H-1-R-T**

RMS Directivity at Main Lobe **14.0 ( 11.46 dB )**  
 RMS Directivity at Horizontal **10.8 ( 10.33 dB )**  
**Calculated**

Beam Tilt **1.00 deg**  
 Pattern Number **08U140100**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.076	10.0	0.170	30.0	0.022	50.0	0.076	70.0	0.038
-9.0	0.044	11.0	0.133	31.0	0.000	51.0	0.068	71.0	0.038
-8.0	0.050	12.0	0.027	32.0	0.033	52.0	0.049	72.0	0.037
-7.0	0.088	13.0	0.110	33.0	0.060	53.0	0.026	73.0	0.034
-6.0	0.209	14.0	0.177	34.0	0.069	54.0	0.010	74.0	0.030
-5.0	0.342	15.0	0.165	35.0	0.056	55.0	0.019	75.0	0.025
-4.0	0.389	16.0	0.095	36.0	0.041	56.0	0.028	76.0	0.021
-3.0	0.306	17.0	0.023	37.0	0.055	57.0	0.030	77.0	0.017
-2.0	0.290	18.0	0.050	38.0	0.077	58.0	0.027	78.0	0.013
-1.0	0.579	19.0	0.060	39.0	0.081	59.0	0.020	79.0	0.010
0.0	0.879	20.0	0.039	40.0	0.064	60.0	0.014	80.0	0.008
1.0	1.000	21.0	0.021	41.0	0.036	61.0	0.011	81.0	0.006
2.0	0.881	22.0	0.020	42.0	0.029	62.0	0.010	82.0	0.005
3.0	0.581	23.0	0.026	43.0	0.048	63.0	0.011	83.0	0.004
4.0	0.294	24.0	0.052	44.0	0.055	64.0	0.011	84.0	0.003
5.0	0.318	25.0	0.074	45.0	0.043	65.0	0.014	85.0	0.002
6.0	0.391	26.0	0.075	46.0	0.017	66.0	0.020	86.0	0.002
7.0	0.315	27.0	0.054	47.0	0.020	67.0	0.026	87.0	0.001
8.0	0.150	28.0	0.029	48.0	0.050	68.0	0.032	88.0	0.000
9.0	0.109	29.0	0.025	49.0	0.071	69.0	0.036	89.0	0.000
								90.0	0.000

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## Summary

Proposal No. **C-70868-1**  
Date **6-Oct-17**  
Call Letters **KATU**  
Channel **24**  
Frequency **533 MHz**  
Antenna Type **TUM25-O4-8/32H-1-R-T**

## Antenna

	Hpol	Vpol
ERP:	<b>42.9 kW ( 16.32 dBk )</b>	<b>10.7 kW ( 10.30 dBk )</b>
RMS Gain*	11.20 ( 10.49 dB )	2.80 ( 4.47 dB )

**Antenna Input Power** **3.83 kW ( 5.83 dBk )**

## Transmission Line

Type: **Rigid Digiline** Attenuation: **( 1.01 dB )**  
Size: **6-1/8"** Efficiency: **79.3%**  
Impedance: **75 Ohm**  
Length: **900 ft 274.3 m**

## Combiner Losses

Attenuation ( 0.15 dB)  
Efficiency 96.6%

## Combiner Input

**5.00 kW ( 6.99 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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