



Exhibit No.  
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Date	24 Apr 2002	
Call Letters	WBFF-DT	Channel 46
Location	Baltimore, MD	
Customer		
Antenna Type	TUD-C5SP-12/44H-1-B	

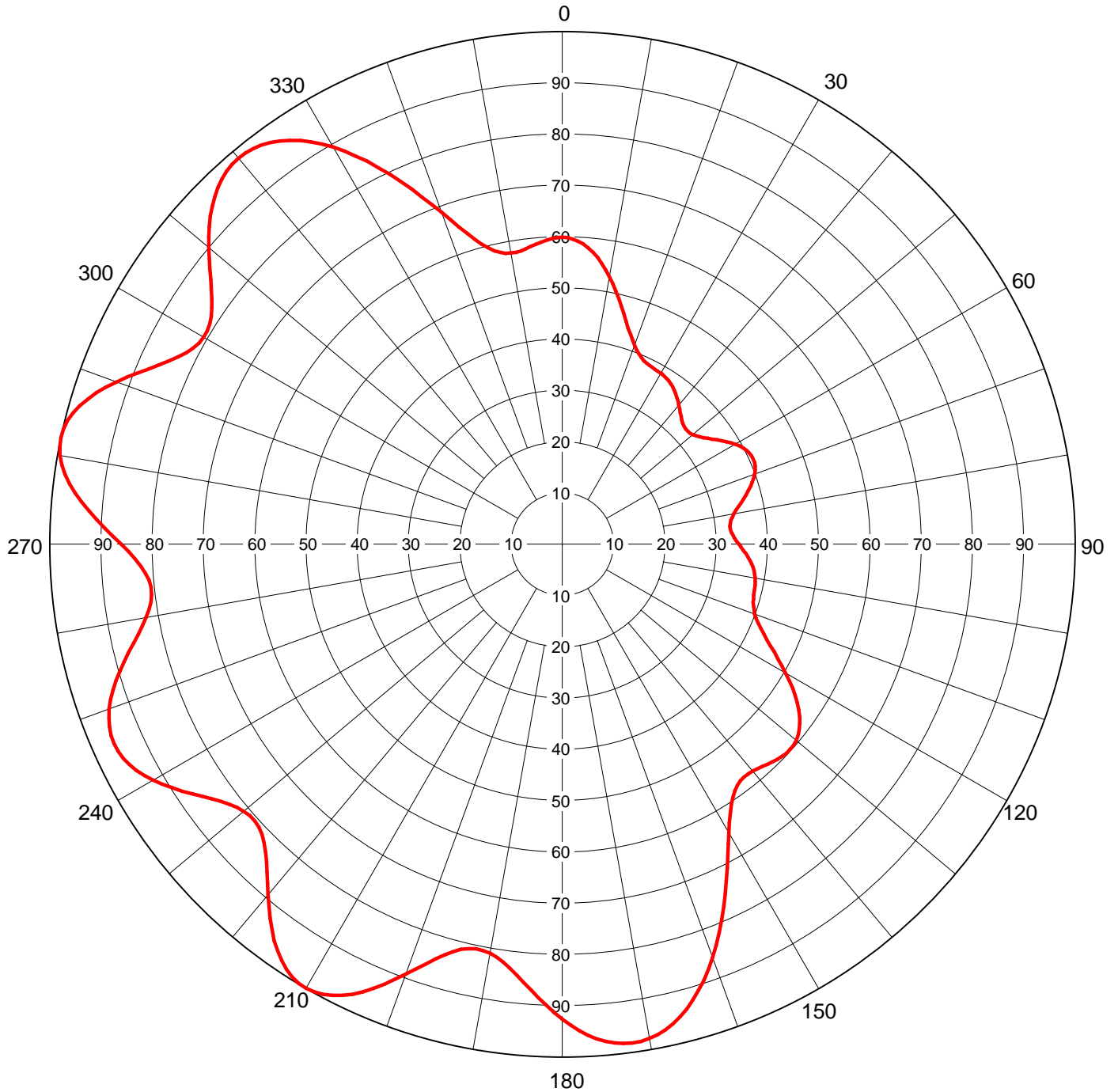
### AZIMUTH PATTERN

RMS Gain at Main Lobe  
Calculated / Measured

**1.90 (2.79 dB)**  
**Calculated**

Frequency  
Drawing #

**665 MHz**  
**TUD-C5SP-665**



Remarks:



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Customer	
Antenna Type	<b>TUD-C5SP-12/44H-1-B</b>

### TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing #    **TUD-C5SP-665**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.598	45	0.333	90	0.344	135	0.594	180	0.926	225	0.823	270	0.860	315	0.959
1	0.598	46	0.331	91	0.349	136	0.591	181	0.913	226	0.815	271	0.876	316	0.967
2	0.595	47	0.329	92	0.354	137	0.587	182	0.900	227	0.809	272	0.892	317	0.973
3	0.592	48	0.329	93	0.359	138	0.584	183	0.886	228	0.807	273	0.909	318	0.978
4	0.587	49	0.330	94	0.363	139	0.580	184	0.872	229	0.807	274	0.925	319	0.981
5	0.580	50	0.332	95	0.368	140	0.578	185	0.858	230	0.810	275	0.941	320	0.982
6	0.572	51	0.336	96	0.372	141	0.576	186	0.846	231	0.816	276	0.955	321	0.982
7	0.563	52	0.340	97	0.375	142	0.576	187	0.834	232	0.824	277	0.968	322	0.979
8	0.553	53	0.345	98	0.378	143	0.578	188	0.824	233	0.834	278	0.979	323	0.974
9	0.542	54	0.351	99	0.380	144	0.581	189	0.816	234	0.845	279	0.988	324	0.968
10	0.529	55	0.357	100	0.382	145	0.587	190	0.810	235	0.858	280	0.995	325	0.960
11	0.517	56	0.364	101	0.383	146	0.595	191	0.807	236	0.871	281	0.999	326	0.950
12	0.503	57	0.371	102	0.384	147	0.606	192	0.807	237	0.884	282	1.000	327	0.938
13	0.490	58	0.377	103	0.385	148	0.619	193	0.809	238	0.897	283	0.999	328	0.925
14	0.477	59	0.384	104	0.386	149	0.633	194	0.815	239	0.910	284	0.995	329	0.910
15	0.464	60	0.390	105	0.387	150	0.650	195	0.823	240	0.921	285	0.988	330	0.894
16	0.452	61	0.395	106	0.388	151	0.668	196	0.833	241	0.932	286	0.979	331	0.876
17	0.441	62	0.400	107	0.390	152	0.688	197	0.846	242	0.940	287	0.968	332	0.857
18	0.430	63	0.403	108	0.392	153	0.709	198	0.860	243	0.947	288	0.955	333	0.838
19	0.421	64	0.406	109	0.395	154	0.730	199	0.876	244	0.952	289	0.941	334	0.817
20	0.413	65	0.407	110	0.400	155	0.752	200	0.892	245	0.956	290	0.925	335	0.796
21	0.406	66	0.408	111	0.406	156	0.774	201	0.909	246	0.957	291	0.909	336	0.774
22	0.400	67	0.407	112	0.413	157	0.796	202	0.925	247	0.956	292	0.892	337	0.752
23	0.395	68	0.406	113	0.421	158	0.817	203	0.941	248	0.952	293	0.876	338	0.730
24	0.392	69	0.403	114	0.430	159	0.838	204	0.955	249	0.947	294	0.860	339	0.709
25	0.390	70	0.400	115	0.441	160	0.857	205	0.968	250	0.940	295	0.846	340	0.688
26	0.388	71	0.395	116	0.452	161	0.876	206	0.979	251	0.932	296	0.833	341	0.668
27	0.387	72	0.390	117	0.464	162	0.894	207	0.988	252	0.921	297	0.823	342	0.650
28	0.386	73	0.384	118	0.477	163	0.910	208	0.995	253	0.910	298	0.815	343	0.633
29	0.385	74	0.377	119	0.490	164	0.925	209	0.999	254	0.897	299	0.809	344	0.619
30	0.384	75	0.371	120	0.503	165	0.938	210	1.000	255	0.884	300	0.807	345	0.606
31	0.383	76	0.364	121	0.517	166	0.950	211	0.999	256	0.871	301	0.807	346	0.595
32	0.382	77	0.357	122	0.529	167	0.960	212	0.995	257	0.858	302	0.810	347	0.587
33	0.380	78	0.351	123	0.542	168	0.968	213	0.988	258	0.845	303	0.816	348	0.581
34	0.378	79	0.345	124	0.553	169	0.974	214	0.979	259	0.834	304	0.824	349	0.578
35	0.375	80	0.340	125	0.563	170	0.979	215	0.968	260	0.824	305	0.834	350	0.576
36	0.372	81	0.336	126	0.572	171	0.982	216	0.955	261	0.816	306	0.846	351	0.576
37	0.368	82	0.332	127	0.580	172	0.982	217	0.941	262	0.810	307	0.858	352	0.578
38	0.363	83	0.330	128	0.587	173	0.981	218	0.925	263	0.807	308	0.872	353	0.580
39	0.359	84	0.329	129	0.592	174	0.978	219	0.909	264	0.807	309	0.886	354	0.584
40	0.354	85	0.329	130	0.595	175	0.973	220	0.892	265	0.809	310	0.900	355	0.587
41	0.349	86	0.331	131	0.598	176	0.967	221	0.876	266	0.815	311	0.913	356	0.591
42	0.344	87	0.333	132	0.598	177	0.959	222	0.860	267	0.823	312	0.926	357	0.594
43	0.340	88	0.336	133	0.598	178	0.949	223	0.846	268	0.833	313	0.938	358	0.596
44	0.336	89	0.340	134	0.596	179	0.938	224	0.833	269	0.846	314	0.949	359	0.598

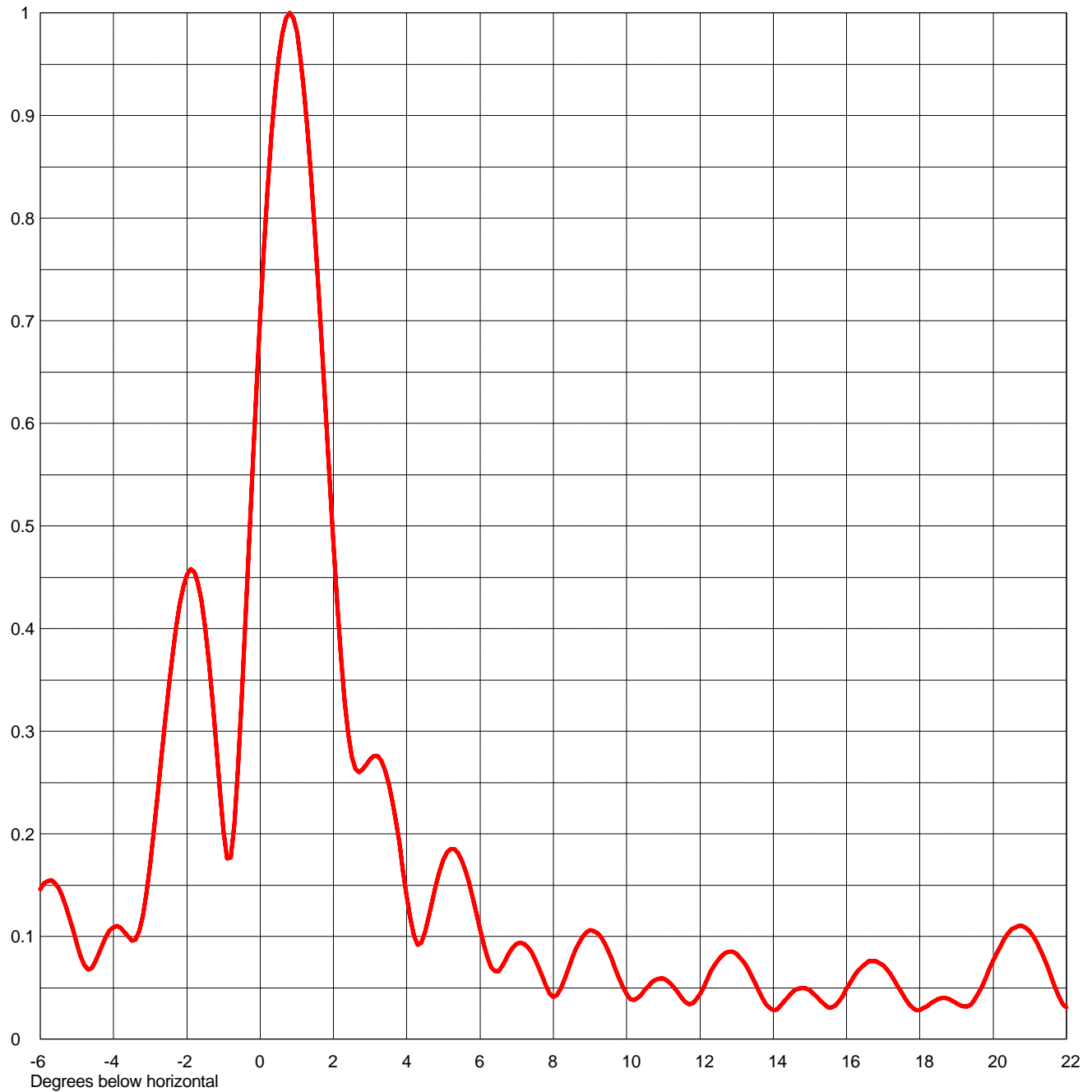
Remarks:



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Customer		
Antenna Type	TUD-C5SP-12/44H-1-B	

ELEVATION PATTERN

RMS Gain at Main Lobe	21.5 (13.32 dB)	Beam Tilt	0.75 Degrees
RMS Gain at Horizontal	10.7 (10.29 dB)	Frequency	665 MHz
Calculated / Measured	Calculated	Drawing #	12U215075



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### TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **12U215075**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.087	2.4	0.298	10.6	0.052	30.5	0.014	51.0	0.166	71.5	0.006
-9.5	0.104	2.6	0.263	10.8	0.058	31.0	0.017	51.5	0.212	72.0	0.004
-9.0	0.076	2.8	0.263	11.0	0.059	31.5	0.013	52.0	0.237	72.5	0.004
-8.5	0.039	3.0	0.273	11.5	0.040	32.0	0.009	52.5	0.239	73.0	0.003
-8.0	0.066	3.2	0.276	12.0	0.044	32.5	0.019	53.0	0.220	73.5	0.004
-7.5	0.075	3.4	0.262	12.5	0.077	33.0	0.027	53.5	0.186	74.0	0.004
-7.0	0.053	3.6	0.232	13.0	0.083	33.5	0.026	54.0	0.143	74.5	0.004
-6.5	0.091	3.8	0.189	13.5	0.055	34.0	0.018	54.5	0.101	75.0	0.004
-6.0	0.146	4.0	0.140	14.0	0.028	34.5	0.012	55.0	0.069	75.5	0.004
-5.5	0.147	4.2	0.101	14.5	0.045	35.0	0.018	55.5	0.056	76.0	0.004
-5.0	0.092	4.4	0.094	15.0	0.047	35.5	0.020	56.0	0.056	76.5	0.004
-4.5	0.075	4.6	0.119	15.5	0.031	36.0	0.015	56.5	0.056	77.0	0.003
-4.0	0.109	4.8	0.151	16.0	0.049	36.5	0.014	57.0	0.051	77.5	0.003
-3.5	0.096	5.0	0.175	16.5	0.073	37.0	0.026	57.5	0.040	78.0	0.002
-3.0	0.171	5.2	0.185	17.0	0.072	37.5	0.035	58.0	0.027	78.5	0.002
-2.8	0.238	5.4	0.181	17.5	0.045	38.0	0.036	58.5	0.018	79.0	0.002
-2.6	0.309	5.6	0.164	18.0	0.028	38.5	0.026	59.0	0.019	79.5	0.002
-2.4	0.373	5.8	0.137	18.5	0.039	39.0	0.015	59.5	0.026	80.0	0.002
-2.2	0.424	6.0	0.106	19.0	0.035	39.5	0.019	60.0	0.031	80.5	0.002
-2.0	0.453	6.2	0.079	19.5	0.039	40.0	0.026	60.5	0.032	81.0	0.002
-1.8	0.455	6.4	0.066	20.0	0.077	40.5	0.025	61.0	0.029	81.5	0.003
-1.6	0.428	6.6	0.071	20.5	0.107	41.0	0.018	61.5	0.023	82.0	0.003
-1.4	0.370	6.8	0.084	21.0	0.105	41.5	0.024	62.0	0.017	82.5	0.003
-1.2	0.289	7.0	0.093	21.5	0.069	42.0	0.040	62.5	0.012	83.0	0.003
-1.0	0.203	7.2	0.093	22.0	0.031	42.5	0.049	63.0	0.010	83.5	0.003
-0.8	0.177	7.4	0.085	22.5	0.068	43.0	0.048	63.5	0.011	84.0	0.003
-0.6	0.267	7.6	0.070	23.0	0.104	43.5	0.036	64.0	0.013	84.5	0.003
-0.4	0.410	7.8	0.052	23.5	0.112	44.0	0.023	64.5	0.013	85.0	0.003
-0.2	0.562	8.0	0.041	24.0	0.093	44.5	0.025	65.0	0.012	85.5	0.003
0.0	0.706	8.2	0.049	24.5	0.062	45.0	0.033	65.5	0.010	86.0	0.003
0.2	0.829	8.4	0.068	25.0	0.031	45.5	0.032	66.0	0.007	86.5	0.003
0.4	0.922	8.6	0.087	25.5	0.015	46.0	0.029	66.5	0.005	87.0	0.003
0.6	0.980	8.8	0.100	26.0	0.010	46.5	0.047	67.0	0.006	87.5	0.003
0.8	1.000	9.0	0.106	26.5	0.012	47.0	0.079	67.5	0.008	88.0	0.003
1.0	0.981	9.2	0.103	27.0	0.010	47.5	0.110	68.0	0.010	88.5	0.003
1.2	0.924	9.4	0.093	27.5	0.007	48.0	0.127	68.5	0.011	89.0	0.003
1.4	0.837	9.6	0.078	28.0	0.009	48.5	0.123	69.0	0.011	89.5	0.002
1.6	0.727	9.8	0.059	28.5	0.017	49.0	0.097	69.5	0.011	90.0	0.002
1.8	0.605	10.0	0.044	29.0	0.020	49.5	0.058	70.0	0.010		
2.0	0.483	10.2	0.038	29.5	0.015	50.0	0.054	70.5	0.009		
2.2	0.375	10.4	0.043	30.0	0.010	50.5	0.108	71.0	0.007		

Remarks: