



Proposal Number	C-02797		
Date	30-Jul-08		
Call Letters	KRMA-DT	Channel	18
Location	MT. Morrison, CO		
Customer	Rocky Mountain Broadcasting		
Antenna Type	TUM30-C2-12/24U-R-T		

## SYSTEM SUMMARY

### Antenna:

Type:	TUM30-C2-12/24U-R-T	ERP:	1000 kW ( 30.00 dBk )	300 kW ( 24.77 dBk )
Channel:	18	Peak Gain*:	40.1 ( 16.04 dB )	12.0 ( 10.80 dB )
Location:	MT. Morrison, CO	Input Power:	24.9 kW ( 13.96 dBk )	

### Transmission Line:

Type:	EIA/DCA	Attenuation:	0.27 dB
Size:	6-1/8 in	Efficiency:	94.0%
Impedance:	75 ohm		
Length:	250 ft		76.2 m

Combiner:	DCA	Attenuation:	0.25 dB
		Efficiency:	94.4%

### Combiner Input:

Power Required: **28.1 kW ( 14.48 dBk )**

\* Gain is with respect to half wave dipole.

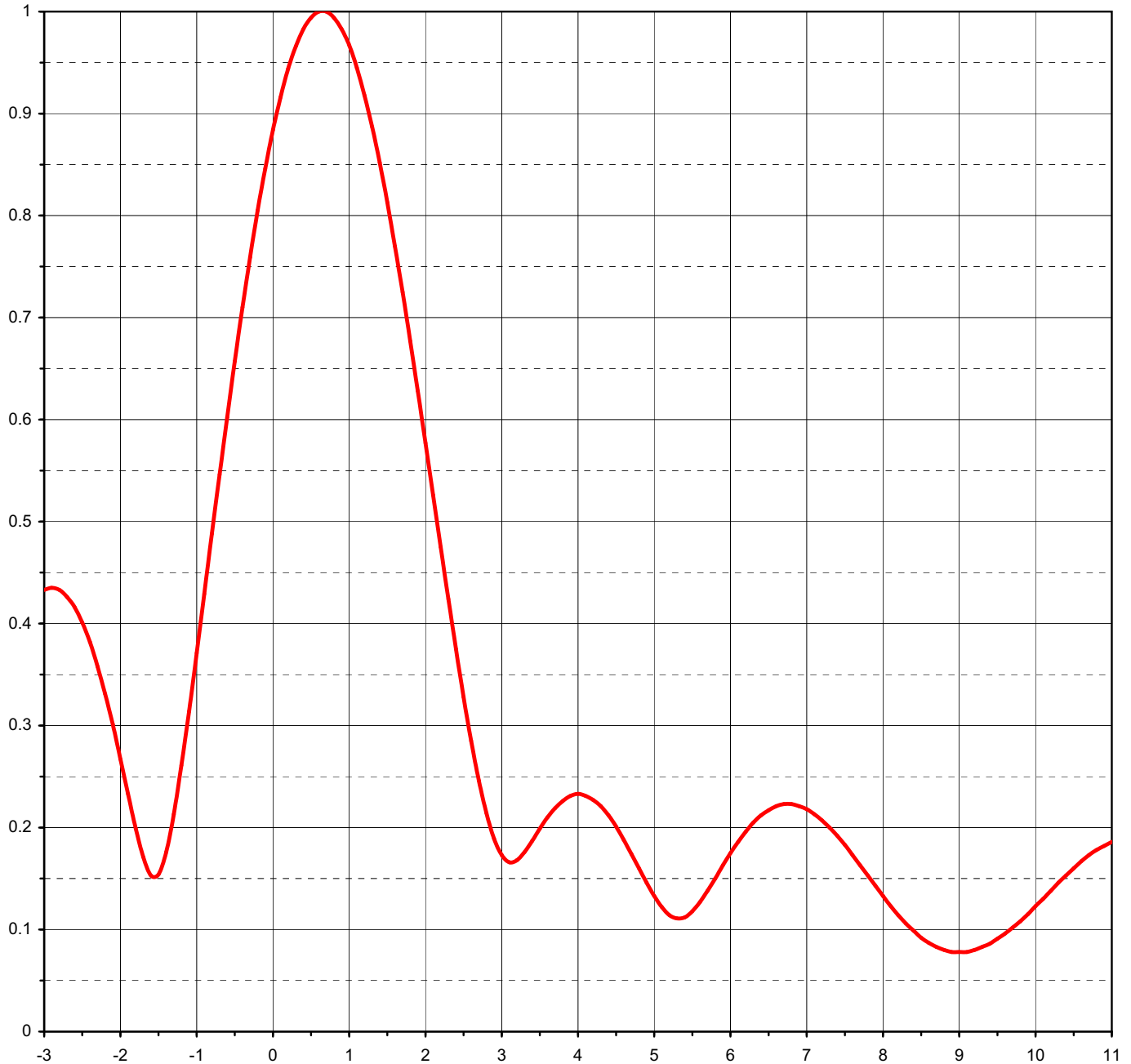
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## ELEVATION PATTERN

RMS Gain at Main Lobe	<b>19.20 ( 12.83 dB )</b>	Beam Tilt	<b>0.70 deg</b>
RMS Gain at Horizontal	<b>15.00 ( 11.76 dB )</b>	Frequency	<b>497.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>12U192070</b>



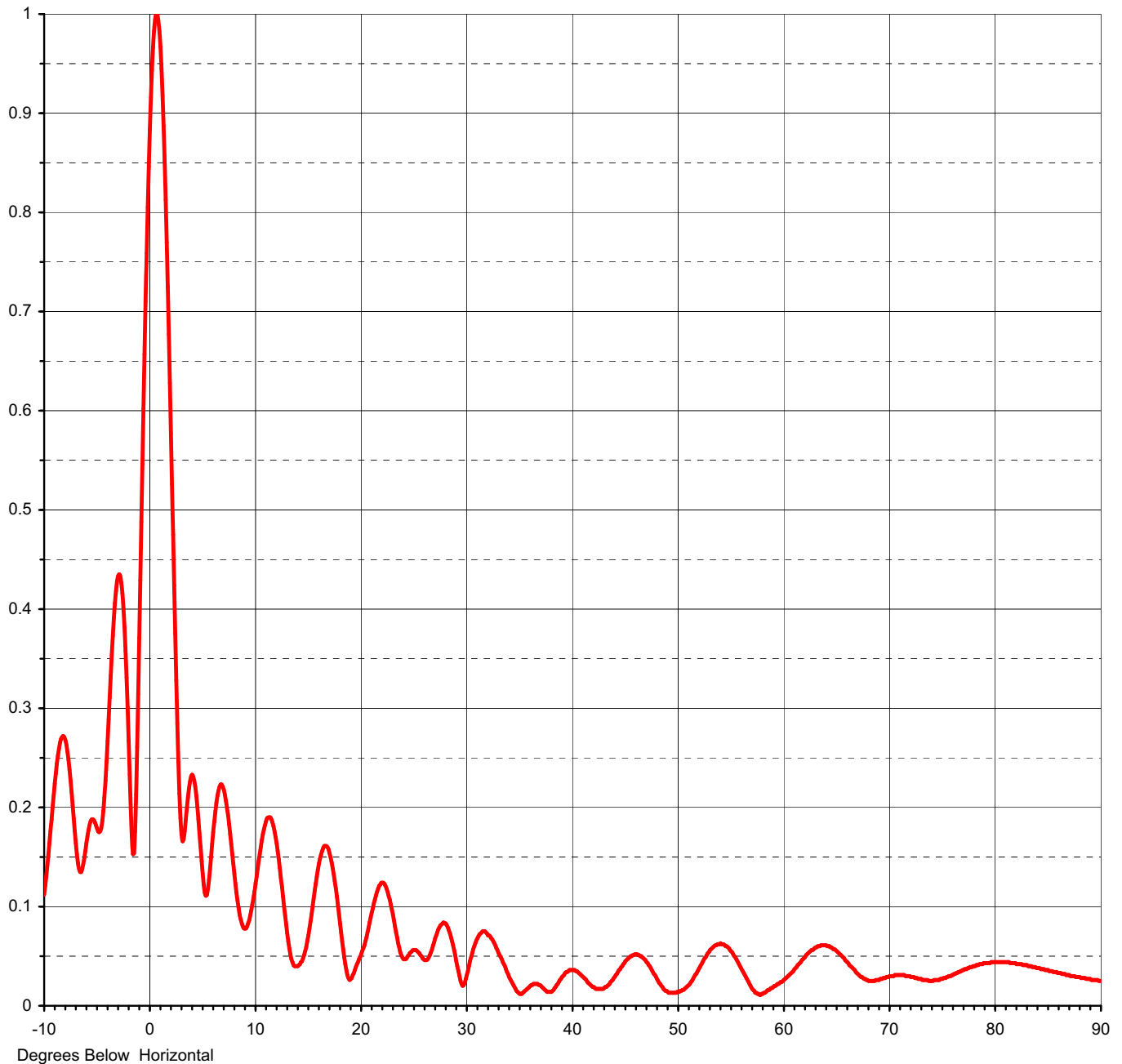
Degrees Below Horizontal



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## ELEVATION PATTERN

RMS Gain at Main Lobe	<b>19.20 ( 12.83 dB )</b>	Beam Tilt	<b>0.70 deg</b>
RMS Gain at Horizontal	<b>15.00 ( 11.76 dB )</b>	Frequency	<b>497.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>12U192070-90</b>





Proposal Number **C-02797**  
Date **30-Jul-08**  
Call Letters **KRMA-DT** Channel **18**  
Location **MT. Morrison, CO**  
Customer **Rocky Mountain Broadcasting**  
Antenna Type **TUM30-C2-12/24U-R-T**

## TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **12U192070-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.112	2.4	0.375	10.6	0.160	30.5	0.049	51.0	0.020	71.5	0.030
-9.5	0.164	2.6	0.285	10.8	0.173	31.0	0.066	51.5	0.027	72.0	0.029
-9.0	0.224	2.8	0.214	11.0	0.182	31.5	0.074	52.0	0.036	72.5	0.028
-8.5	0.265	3.0	0.173	11.5	0.190	32.0	0.073	52.5	0.046	73.0	0.027
-8.0	0.268	3.2	0.168	12.0	0.170	32.5	0.067	53.0	0.054	73.5	0.026
-7.5	0.227	3.4	0.187	12.5	0.129	33.0	0.056	53.5	0.060	74.0	0.025
-7.0	0.164	3.6	0.210	13.0	0.082	33.5	0.044	54.0	0.062	74.5	0.026
-6.5	0.135	3.8	0.226	13.5	0.047	34.0	0.032	54.5	0.061	75.0	0.027
-6.0	0.164	4.0	0.233	14.0	0.040	34.5	0.021	55.0	0.056	75.5	0.029
-5.5	0.188	4.2	0.227	14.5	0.045	35.0	0.013	55.5	0.049	76.0	0.031
-5.0	0.179	4.4	0.212	15.0	0.065	35.5	0.014	56.0	0.039	76.5	0.034
-4.5	0.186	4.6	0.188	15.5	0.100	36.0	0.019	56.5	0.029	77.0	0.036
-4.0	0.267	4.8	0.160	16.0	0.137	36.5	0.022	57.0	0.019	77.5	0.038
-3.5	0.373	5.0	0.133	16.5	0.159	37.0	0.021	57.5	0.013	78.0	0.040
-3.0	0.433	5.2	0.114	17.0	0.158	37.5	0.016	58.0	0.012	78.5	0.042
-2.8	0.433	5.4	0.112	17.5	0.133	38.0	0.014	58.5	0.015	79.0	0.043
-2.6	0.416	5.6	0.127	18.0	0.092	38.5	0.019	59.0	0.018	79.5	0.043
-2.4	0.382	5.8	0.150	18.5	0.049	39.0	0.027	59.5	0.022	80.0	0.044
-2.2	0.331	6.0	0.175	19.0	0.026	39.5	0.034	60.0	0.025	80.5	0.044
-2.0	0.267	6.2	0.196	19.5	0.036	40.0	0.036	60.5	0.030	81.0	0.044
-1.8	0.199	6.4	0.212	20.0	0.049	40.5	0.035	61.0	0.035	81.5	0.043
-1.6	0.153	6.6	0.221	20.5	0.065	41.0	0.030	61.5	0.042	82.0	0.042
-1.4	0.176	6.8	0.223	21.0	0.089	41.5	0.024	62.0	0.048	82.5	0.042
-1.2	0.261	7.0	0.218	21.5	0.111	42.0	0.019	62.5	0.054	83.0	0.041
-1.0	0.371	7.2	0.207	22.0	0.124	42.5	0.017	63.0	0.058	83.5	0.039
-0.8	0.488	7.4	0.192	22.5	0.118	43.0	0.017	63.5	0.060	84.0	0.038
-0.6	0.602	7.6	0.173	23.0	0.097	43.5	0.021	64.0	0.061	84.5	0.037
-0.4	0.710	7.8	0.153	23.5	0.069	44.0	0.028	64.5	0.059	85.0	0.036
-0.2	0.805	8.0	0.133	24.0	0.049	44.5	0.036	65.0	0.055	85.5	0.034
0.0	0.884	8.2	0.114	24.5	0.050	45.0	0.043	65.5	0.050	86.0	0.033
0.2	0.944	8.4	0.099	25.0	0.056	45.5	0.049	66.0	0.044	86.5	0.032
0.4	0.983	8.6	0.087	25.5	0.054	46.0	0.052	66.5	0.038	87.0	0.031
0.6	1.000	8.8	0.080	26.0	0.047	46.5	0.050	67.0	0.032	87.5	0.030
0.8	0.994	9.0	0.078	26.5	0.049	47.0	0.046	67.5	0.028	88.0	0.029
1.0	0.967	9.2	0.080	27.0	0.064	47.5	0.038	68.0	0.025	88.5	0.028
1.2	0.918	9.4	0.086	27.5	0.079	48.0	0.029	68.5	0.025	89.0	0.027
1.4	0.852	9.6	0.096	28.0	0.083	48.5	0.020	69.0	0.026	89.5	0.026
1.6	0.770	9.8	0.102	28.5	0.073	49.0	0.015	69.5	0.028	90.0	0.025
1.8	0.677	10.0	0.115	29.0	0.051	49.5	0.013	70.0	0.030		
2.0	0.577	10.2	0.130	29.5	0.025	50.0	0.014	70.5	0.031		
2.2	0.475	10.4	0.146	30.0	0.027	50.5	0.016	71.0	0.031		

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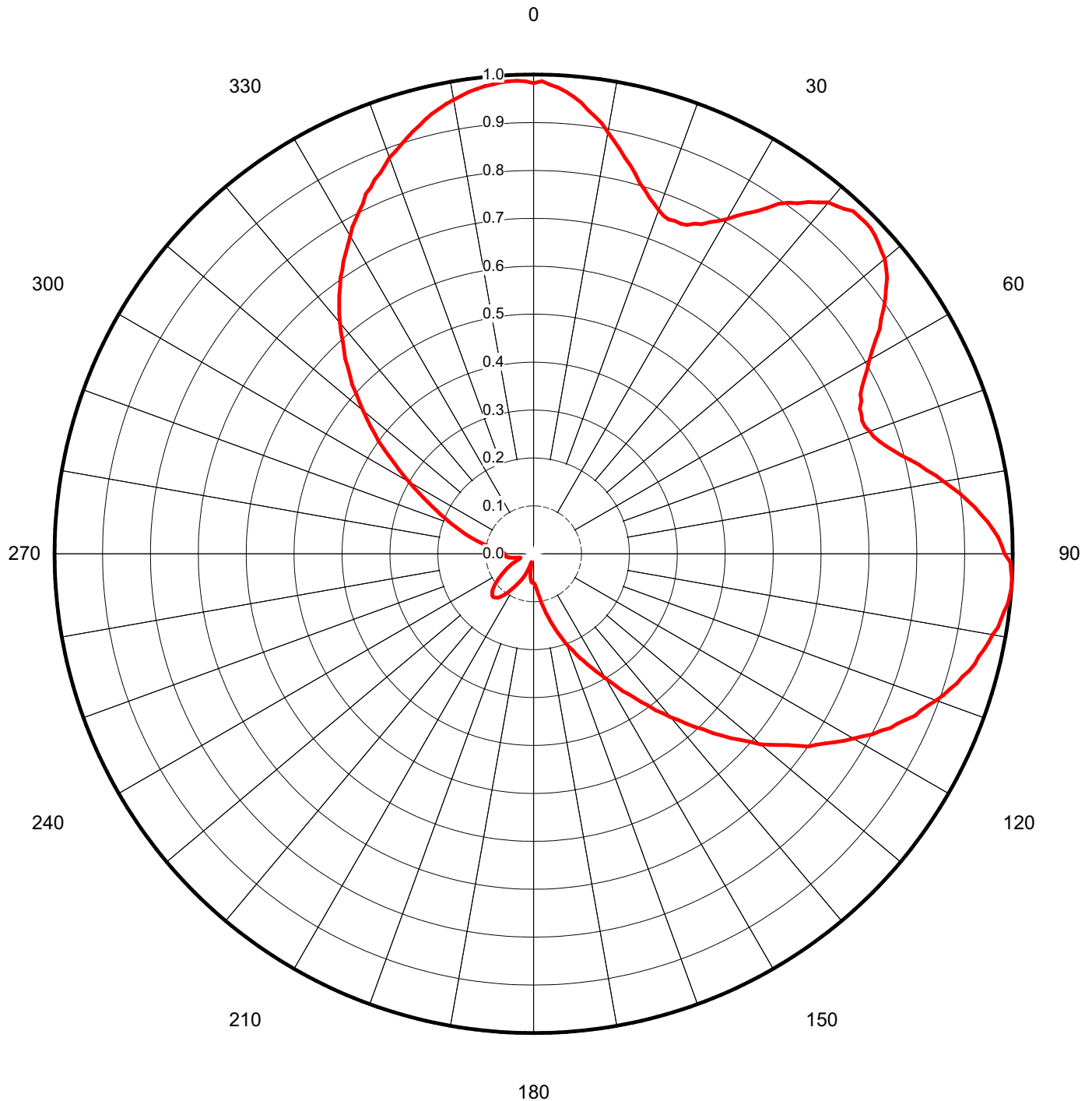


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Antenna Type	<b>TUM30-C2-12/24U-R-T</b>		

## AZIMUTH PATTERN

Gain	<b>2.60</b>	<b>( 4.15 dB)</b>
Calculated / Measured	<b>Calculated</b>	

Frequency	<b>497.00 MHz</b>
Drawing #	<b>TUM-C2-4970</b>





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Antenna Type **TUM30-C2-12/24U-R-T**

## TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing #: **TUM-C2-4970**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.982	45	0.979	90	0.983	135	0.529	180	0.061	225	0.122	270	0.060	315	0.548
1	0.987	46	0.978	91	0.995	136	0.509	181	0.060	226	0.120	271	0.062	316	0.567
2	0.979	47	0.974	92	0.997	137	0.494	182	0.060	227	0.119	272	0.063	317	0.580
3	0.974	48	0.969	93	1.000	138	0.477	183	0.060	228	0.116	273	0.065	318	0.595
4	0.967	49	0.962	94	1.000	139	0.459	184	0.059	229	0.113	274	0.068	319	0.613
5	0.957	50	0.957	95	0.998	140	0.445	185	0.057	230	0.109	275	0.072	320	0.629
6	0.947	51	0.947	96	0.995	141	0.428	186	0.054	231	0.105	276	0.076	321	0.645
7	0.933	52	0.936	97	0.989	142	0.414	187	0.051	232	0.101	277	0.082	322	0.659
8	0.921	53	0.921	98	0.985	143	0.396	188	0.046	233	0.096	278	0.088	323	0.674
9	0.910	54	0.908	99	0.981	144	0.382	189	0.041	234	0.092	279	0.093	324	0.688
10	0.893	55	0.892	100	0.973	145	0.366	190	0.035	235	0.088	280	0.100	325	0.703
11	0.878	56	0.875	101	0.968	146	0.353	191	0.030	236	0.083	281	0.107	326	0.714
12	0.863	57	0.862	102	0.961	147	0.342	192	0.025	237	0.079	282	0.115	327	0.729
13	0.848	58	0.842	103	0.953	148	0.326	193	0.021	238	0.075	283	0.122	328	0.740
14	0.835	59	0.825	104	0.949	149	0.312	194	0.018	239	0.071	284	0.131	329	0.753
15	0.821	60	0.810	105	0.942	150	0.300	195	0.018	240	0.068	285	0.139	330	0.766
16	0.805	61	0.797	106	0.931	151	0.288	196	0.021	241	0.064	286	0.147	331	0.780
17	0.794	62	0.783	107	0.924	152	0.278	197	0.024	242	0.060	287	0.155	332	0.791
18	0.782	63	0.770	108	0.913	153	0.267	198	0.029	243	0.057	288	0.163	333	0.802
19	0.772	64	0.759	109	0.905	154	0.257	199	0.034	244	0.054	289	0.172	334	0.813
20	0.763	65	0.755	110	0.894	155	0.246	200	0.039	245	0.050	290	0.182	335	0.829
21	0.756	66	0.745	111	0.882	156	0.238	201	0.043	246	0.046	291	0.191	336	0.836
22	0.753	67	0.743	112	0.872	157	0.228	202	0.048	247	0.043	292	0.201	337	0.849
23	0.755	68	0.740	113	0.865	158	0.217	203	0.052	248	0.039	293	0.212	338	0.856
24	0.754	69	0.741	114	0.851	159	0.209	204	0.056	249	0.036	294	0.222	339	0.867
25	0.757	70	0.747	115	0.838	160	0.200	205	0.060	250	0.033	295	0.234	340	0.880
26	0.766	71	0.751	116	0.829	161	0.190	206	0.063	251	0.031	296	0.246	341	0.888
27	0.772	72	0.759	117	0.813	162	0.180	207	0.067	252	0.029	297	0.258	342	0.897
28	0.784	73	0.769	118	0.802	163	0.172	208	0.071	253	0.029	298	0.271	343	0.906
29	0.794	74	0.781	119	0.785	164	0.163	209	0.075	254	0.029	299	0.287	344	0.916
30	0.806	75	0.794	120	0.771	165	0.153	210	0.079	255	0.030	300	0.300	345	0.924
31	0.822	76	0.810	121	0.757	166	0.144	211	0.084	256	0.033	301	0.316	346	0.934
32	0.838	77	0.826	122	0.742	167	0.135	212	0.088	257	0.036	302	0.332	347	0.942
33	0.852	78	0.839	123	0.726	168	0.128	213	0.093	258	0.039	303	0.346	348	0.949
34	0.870	79	0.856	124	0.712	169	0.118	214	0.098	259	0.043	304	0.364	349	0.956
35	0.891	80	0.869	125	0.701	170	0.111	215	0.102	260	0.047	305	0.381	350	0.962
36	0.906	81	0.884	126	0.681	171	0.102	216	0.107	261	0.050	306	0.400	351	0.967
37	0.916	82	0.900	127	0.663	172	0.094	217	0.110	262	0.053	307	0.414	352	0.973
38	0.931	83	0.913	128	0.648	173	0.087	218	0.114	263	0.055	308	0.432	353	0.977
39	0.943	84	0.926	129	0.633	174	0.081	219	0.118	264	0.057	309	0.448	354	0.981
40	0.957	85	0.938	130	0.619	175	0.075	220	0.119	265	0.058	310	0.464	355	0.983
41	0.962	86	0.950	131	0.598	176	0.070	221	0.121	266	0.059	311	0.481	356	0.986
42	0.969	87	0.961	132	0.580	177	0.066	222	0.122	267	0.060	312	0.498	357	0.987
43	0.978	88	0.971	133	0.564	178	0.063	223	0.124	268	0.059	313	0.518	358	0.988
44	0.978	89	0.977	134	0.546	179	0.062	224	0.123	269	0.060	314	0.532	359	0.986

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Customer	<b>Rocky Mountain Broadcasting</b>		
Antenna Type	<b>TUM30-C2-12/24U-R-T</b>		

## AZIMUTH PATTERN/VERTICAL POLARIZATION

Gain	<b>3.20</b>	<b>( 5.05 dB)</b>
Calculated / Measured		<b>Calculated</b>

Frequency	<b>497.00 MHz</b>
Drawing #	<b>TUM-C2VP-4970</b>

