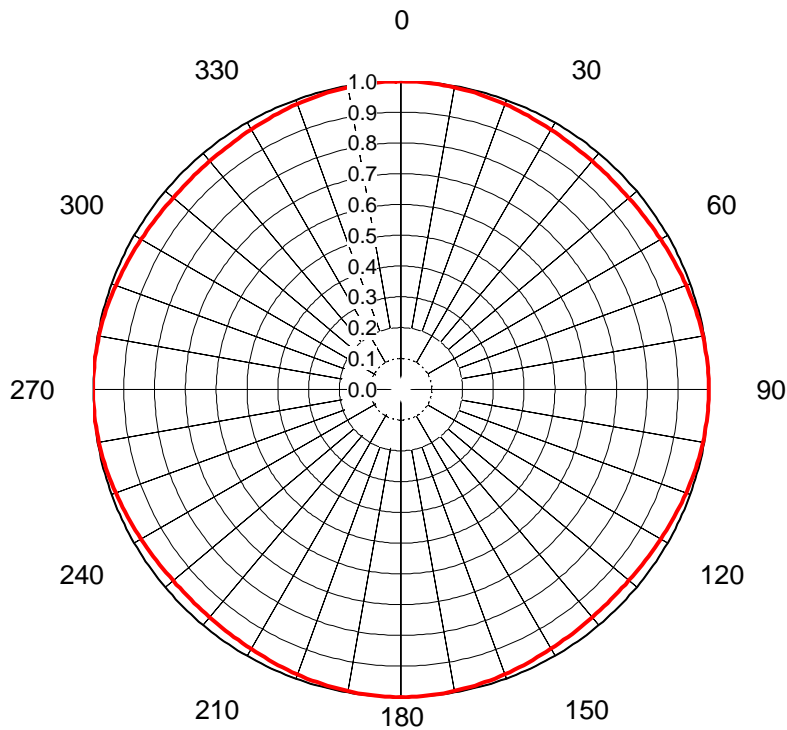


## AZIMUTH PATTERN Horizontal Polarization

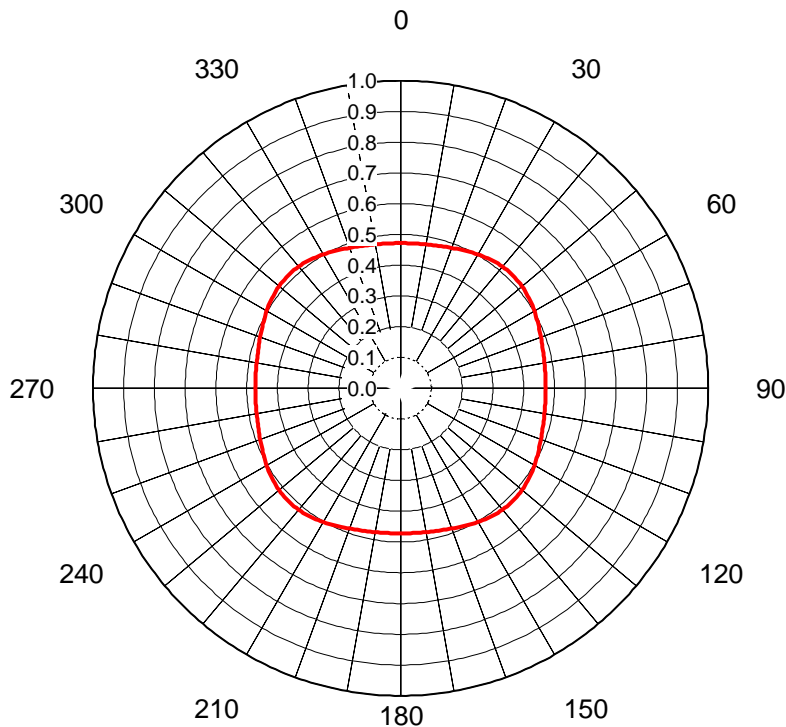
In Free Space

Proposal No. **C-71641**  
Date **9-Nov-20**  
Call Letters **KTVM-TV**  
Channel **20**  
Frequency **509 MHz**  
Antenna Type **TFU-21EST/VP-R 04**  
Gain **1.04 (0.15dB)**  
Circularity **+/- 1.0 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	0.969	72	0.988	108	0.988	144	0.969	180	1.000	216	0.969	252	0.988	288	0.988	324	0.969
1	1.000	37	0.968	73	0.989	109	0.987	145	0.970	181	1.000	217	0.968	253	0.989	289	0.987	325	0.970
2	1.000	38	0.968	74	0.990	110	0.986	146	0.970	182	1.000	218	0.968	254	0.990	290	0.986	326	0.970
3	1.000	39	0.967	75	0.991	111	0.985	147	0.971	183	1.000	219	0.967	255	0.991	291	0.985	327	0.971
4	0.999	40	0.967	76	0.992	112	0.983	148	0.972	184	0.999	220	0.967	256	0.992	292	0.983	328	0.972
5	0.999	41	0.966	77	0.993	113	0.982	149	0.973	185	0.999	221	0.966	257	0.993	293	0.982	329	0.973
6	0.998	42	0.966	78	0.994	114	0.981	150	0.974	186	0.998	222	0.966	258	0.994	294	0.981	330	0.974
7	0.998	43	0.966	79	0.995	115	0.980	151	0.975	187	0.998	223	0.966	259	0.995	295	0.980	331	0.975
8	0.997	44	0.966	80	0.996	116	0.979	152	0.976	188	0.997	224	0.966	260	0.996	296	0.979	332	0.976
9	0.997	45	0.966	81	0.997	117	0.977	153	0.977	189	0.997	225	0.966	261	0.997	297	0.977	333	0.977
10	0.996	46	0.966	82	0.997	118	0.976	154	0.979	190	0.996	226	0.966	262	0.997	298	0.976	334	0.979
11	0.995	47	0.966	83	0.998	119	0.975	155	0.980	191	0.995	227	0.966	263	0.998	299	0.975	335	0.980
12	0.994	48	0.966	84	0.998	120	0.974	156	0.981	192	0.994	228	0.966	264	0.998	300	0.974	336	0.981
13	0.993	49	0.966	85	0.999	121	0.973	157	0.982	193	0.993	229	0.966	265	0.999	301	0.973	337	0.982
14	0.992	50	0.967	86	0.999	122	0.972	158	0.983	194	0.992	230	0.967	266	0.999	302	0.972	338	0.983
15	0.991	51	0.967	87	1.000	123	0.971	159	0.985	195	0.991	231	0.967	267	1.000	303	0.971	339	0.985
16	0.990	52	0.968	88	1.000	124	0.970	160	0.986	196	0.990	232	0.968	268	1.000	304	0.970	340	0.986
17	0.989	53	0.968	89	1.000	125	0.970	161	0.987	197	0.989	233	0.968	269	1.000	305	0.970	341	0.987
18	0.988	54	0.969	90	1.000	126	0.969	162	0.988	198	0.988	234	0.969	270	1.000	306	0.969	342	0.988
19	0.987	55	0.970	91	1.000	127	0.968	163	0.989	199	0.987	235	0.970	271	1.000	307	0.968	343	0.989
20	0.986	56	0.970	92	1.000	128	0.968	164	0.990	200	0.986	236	0.970	272	1.000	308	0.968	344	0.990
21	0.985	57	0.971	93	1.000	129	0.967	165	0.991	201	0.985	237	0.971	273	1.000	309	0.967	345	0.991
22	0.983	58	0.972	94	0.999	130	0.967	166	0.992	202	0.983	238	0.972	274	0.999	310	0.967	346	0.992
23	0.982	59	0.973	95	0.999	131	0.966	167	0.993	203	0.982	239	0.973	275	0.999	311	0.966	347	0.993
24	0.981	60	0.974	96	0.998	132	0.966	168	0.994	204	0.981	240	0.974	276	0.998	312	0.966	348	0.994
25	0.980	61	0.975	97	0.998	133	0.966	169	0.995	205	0.980	241	0.975	277	0.998	313	0.966	349	0.995
26	0.979	62	0.976	98	0.997	134	0.966	170	0.996	206	0.979	242	0.976	278	0.997	314	0.966	350	0.996
27	0.977	63	0.977	99	0.997	135	0.966	171	0.997	207	0.977	243	0.977	279	0.997	315	0.966	351	0.997
28	0.976	64	0.979	100	0.996	136	0.966	172	0.997	208	0.976	244	0.979	280	0.996	316	0.966	352	0.997
29	0.975	65	0.980	101	0.995	137	0.966	173	0.998	209	0.975	245	0.980	281	0.995	317	0.966	353	0.998
30	0.974	66	0.981	102	0.994	138	0.966	174	0.998	210	0.974	246	0.981	282	0.994	318	0.966	354	0.998
31	0.973	67	0.982	103	0.993	139	0.966	175	0.999	211	0.973	247	0.982	283	0.993	319	0.966	355	0.999
32	0.972	68	0.983	104	0.992	140	0.967	176	0.999	212	0.972	248	0.983	284	0.992	320	0.967	356	0.999
33	0.971	69	0.985	105	0.991	141	0.967	177	1.000	213	0.971	249	0.985	285	0.991	321	0.967	357	1.000
34	0.970	70	0.986	106	0.990	142	0.968	178	1.000	214	0.970	250	0.986	286	0.990	322	0.968	358	1.000
35	0.970	71	0.987	107	0.989	143	0.968	179	1.000	215	0.970	251	0.987	287	0.989	323	0.968	359	1.000

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## AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. **C-71641**  
 Date **9-Nov-20**  
 Call Letters **KTVM-TV**  
 Channel **20**  
 Frequency **509 MHz**  
 Antenna Type **TFU-21EST/VP-R O4**  
 Gain **1.11 (0.44dB)**  
 Calculated  
 Circularity **+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.472	36	0.512	72	0.483	108	0.483	144	0.512	180	0.472	216	0.512	252	0.483	288	0.483
1	0.472	37	0.513	73	0.482	109	0.484	145	0.510	181	0.472	217	0.513	253	0.482	289	0.484
2	0.472	38	0.514	74	0.480	110	0.486	146	0.509	182	0.472	218	0.514	254	0.480	290	0.486
3	0.472	39	0.515	75	0.479	111	0.487	147	0.507	183	0.472	219	0.515	255	0.479	291	0.487
4	0.472	40	0.516	76	0.478	112	0.489	148	0.506	184	0.472	220	0.516	256	0.478	292	0.489
5	0.473	41	0.516	77	0.477	113	0.490	149	0.504	185	0.473	221	0.516	257	0.477	293	0.490
6	0.473	42	0.517	78	0.476	114	0.492	150	0.502	186	0.473	222	0.517	258	0.476	294	0.492
7	0.473	43	0.517	79	0.476	115	0.494	151	0.501	187	0.473	223	0.517	259	0.476	295	0.494
8	0.474	44	0.518	80	0.475	116	0.495	152	0.499	188	0.474	224	0.518	260	0.475	296	0.495
9	0.474	45	0.518	81	0.474	117	0.497	153	0.497	189	0.474	225	0.518	261	0.474	297	0.497
10	0.475	46	0.518	82	0.474	118	0.499	154	0.495	190	0.475	226	0.518	262	0.474	298	0.499
11	0.476	47	0.517	83	0.473	119	0.501	155	0.494	191	0.476	227	0.517	263	0.473	299	0.501
12	0.476	48	0.517	84	0.473	120	0.502	156	0.492	192	0.476	228	0.517	264	0.473	300	0.502
13	0.477	49	0.516	85	0.473	121	0.504	157	0.490	193	0.477	229	0.516	265	0.473	301	0.504
14	0.478	50	0.516	86	0.472	122	0.506	158	0.489	194	0.478	230	0.516	266	0.472	302	0.506
15	0.479	51	0.515	87	0.472	123	0.507	159	0.487	195	0.479	231	0.515	267	0.472	303	0.507
16	0.480	52	0.514	88	0.472	124	0.509	160	0.486	196	0.480	232	0.514	268	0.472	304	0.509
17	0.482	53	0.513	89	0.472	125	0.510	161	0.484	197	0.482	233	0.513	269	0.472	305	0.510
18	0.483	54	0.512	90	0.472	126	0.512	162	0.483	198	0.483	234	0.512	270	0.472	306	0.512
19	0.484	55	0.510	91	0.472	127	0.513	163	0.482	199	0.484	235	0.510	271	0.472	307	0.513
20	0.486	56	0.509	92	0.472	128	0.514	164	0.480	200	0.486	236	0.509	272	0.472	308	0.514
21	0.487	57	0.507	93	0.472	129	0.515	165	0.479	201	0.487	237	0.507	273	0.472	309	0.515
22	0.489	58	0.506	94	0.472	130	0.516	166	0.478	202	0.489	238	0.506	274	0.472	310	0.516
23	0.490	59	0.504	95	0.473	131	0.516	167	0.477	203	0.490	239	0.504	275	0.473	311	0.516
24	0.492	60	0.502	96	0.473	132	0.517	168	0.476	204	0.492	240	0.502	276	0.473	312	0.517
25	0.494	61	0.501	97	0.473	133	0.517	169	0.476	205	0.494	241	0.501	277	0.473	313	0.517
26	0.495	62	0.499	98	0.474	134	0.518	170	0.475	206	0.495	242	0.499	278	0.474	314	0.518
27	0.497	63	0.497	99	0.474	135	0.518	171	0.474	207	0.497	243	0.497	279	0.474	315	0.518
28	0.499	64	0.495	100	0.475	136	0.518	172	0.474	208	0.499	244	0.495	280	0.475	316	0.518
29	0.501	65	0.494	101	0.476	137	0.517	173	0.473	209	0.501	245	0.494	281	0.476	317	0.517
30	0.502	66	0.492	102	0.476	138	0.517	174	0.473	210	0.502	246	0.492	282	0.476	318	0.517
31	0.504	67	0.490	103	0.477	139	0.516	175	0.473	211	0.504	247	0.490	283	0.477	319	0.516
32	0.506	68	0.489	104	0.478	140	0.516	176	0.472	212	0.506	248	0.489	284	0.478	320	0.516
33	0.507	69	0.487	105	0.479	141	0.515	177	0.472	213	0.507	249	0.487	285	0.479	321	0.515
34	0.509	70	0.486	106	0.480	142	0.514	178	0.472	214	0.509	250	0.486	286	0.480	322	0.514
35	0.510	71	0.484	107	0.482	143	0.513	179	0.472	215	0.510	251	0.484	287	0.482	323	0.513

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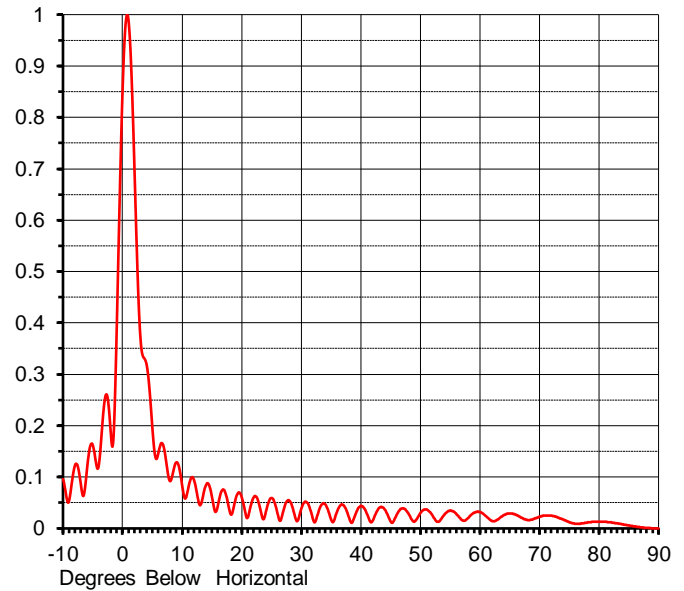
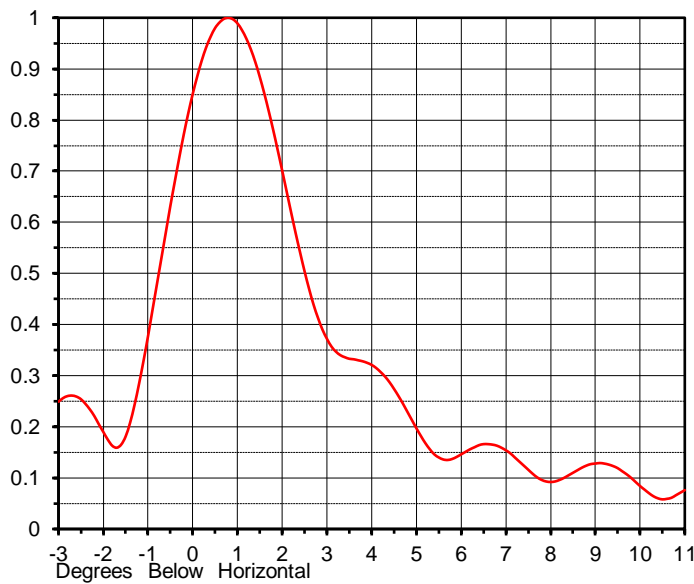
## ELEVATION PATTERN

Proposal No. **C-71641**  
 Date **9-Nov-20**  
 Call Letters **KTVM-TV**  
 Channel **20**  
 Frequency **509 MHz**  
 Antenna Type **TFU-21EST/VP-R 04**

RMS Directivity at Main Lobe  
 RMS Directivity at Horizontal

**21.5 ( 13.32 dB )**  
**15.6 ( 11.93 dB )**  
**Calculated**

Beam Tilt **0.80 deg**  
 Pattern Number **080**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.096	10.0	0.084	30.0	0.038	50.0	0.030	70.0	0.023
-9.0	0.053	11.0	0.076	31.0	0.050	51.0	0.037	71.0	0.025
-8.0	0.122	12.0	0.094	32.0	0.017	52.0	0.026	72.0	0.025
-7.0	0.086	13.0	0.045	33.0	0.036	53.0	0.013	73.0	0.022
-6.0	0.112	14.0	0.084	34.0	0.047	54.0	0.026	74.0	0.017
-5.0	0.162	15.0	0.062	35.0	0.018	55.0	0.035	75.0	0.012
-4.0	0.122	16.0	0.044	36.0	0.032	56.0	0.029	76.0	0.009
-3.0	0.249	17.0	0.075	37.0	0.046	57.0	0.016	77.0	0.010
-2.0	0.190	18.0	0.033	38.0	0.022	58.0	0.020	78.0	0.011
-1.0	0.377	19.0	0.058	39.0	0.024	59.0	0.030	79.0	0.013
0.0	0.851	20.0	0.061	40.0	0.044	60.0	0.032	80.0	0.013
1.0	0.989	21.0	0.021	41.0	0.029	61.0	0.024	81.0	0.013
2.0	0.701	22.0	0.060	42.0	0.015	62.0	0.015	82.0	0.012
3.0	0.372	23.0	0.044	43.0	0.039	63.0	0.017	83.0	0.010
4.0	0.321	24.0	0.029	44.0	0.037	64.0	0.026	84.0	0.008
5.0	0.197	25.0	0.059	45.0	0.014	65.0	0.029	85.0	0.006
6.0	0.146	26.0	0.030	46.0	0.026	66.0	0.027	86.0	0.004
7.0	0.154	27.0	0.034	47.0	0.039	67.0	0.021	87.0	0.002
8.0	0.092	28.0	0.054	48.0	0.029	68.0	0.016	88.0	0.001
9.0	0.128	29.0	0.021	49.0	0.013	69.0	0.018	89.0	0.000
								90.0	0.000

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