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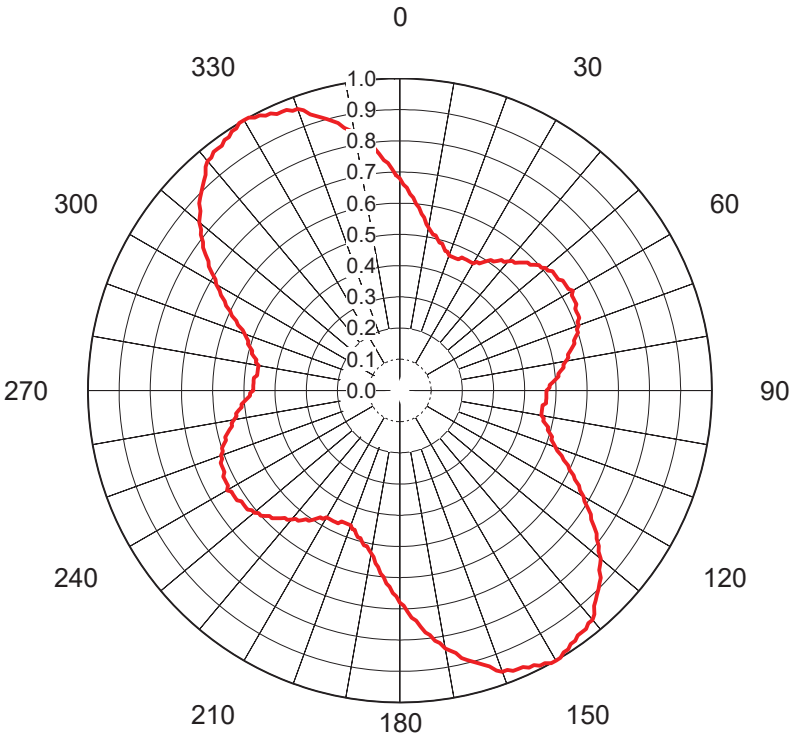


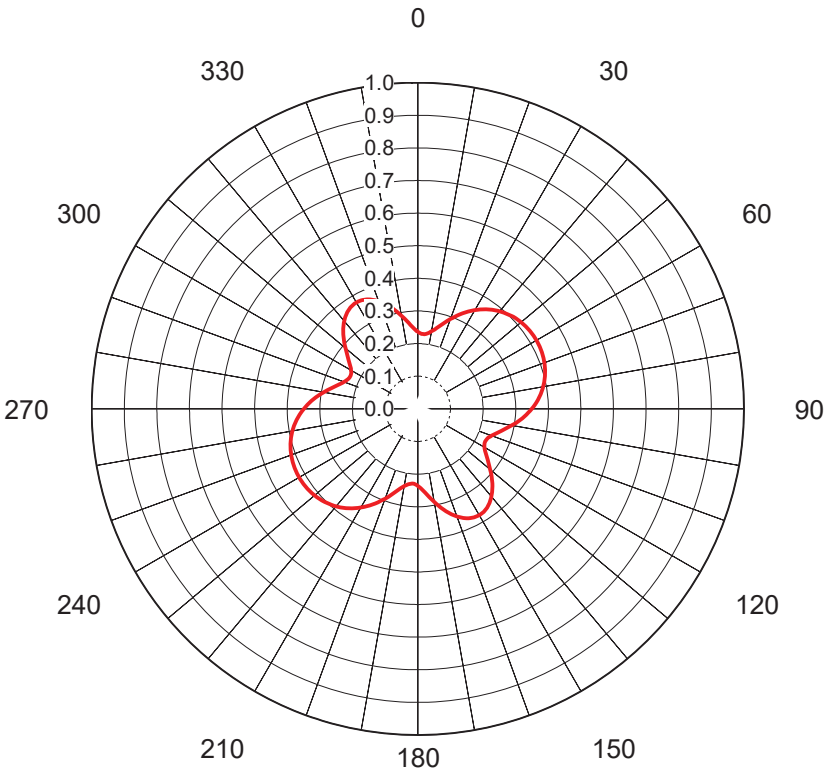
AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**C-70459**
Date	**14-Mar-17**
Call Letters	**KSHV**
Channel	**16**
Frequency	**485 MHz**
Antenna Type	**TFU-30DSC/VP-R P220**
Gain	**2.17 (3.36dB)**
	Calculated

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.680	36	0.510	72	0.600	108	0.510	144	0.970	180	0.680	216	0.510	252	0.600	288	0.510	324	0.970
1	0.660	37	0.520	73	0.590	109	0.520	145	0.980	181	0.660	217	0.520	253	0.590	289	0.520	325	0.980
2	0.650	38	0.530	74	0.580	110	0.530	146	0.980	182	0.650	218	0.530	254	0.580	290	0.530	326	0.980
3	0.630	39	0.530	75	0.580	111	0.540	147	0.990	183	0.630	219	0.530	255	0.580	291	0.540	327	0.990
4	0.620	40	0.540	76	0.570	112	0.560	148	0.990	184	0.620	220	0.540	256	0.570	292	0.560	328	0.990
5	0.600	41	0.550	77	0.560	113	0.570	149	1.000	185	0.600	221	0.550	257	0.560	293	0.570	329	1.000
6	0.590	42	0.550	78	0.550	114	0.590	150	1.000	186	0.590	222	0.550	258	0.550	294	0.590	330	1.000
7	0.570	43	0.560	79	0.550	115	0.600	151	1.000	187	0.570	223	0.560	259	0.550	295	0.600	331	1.000
8	0.560	44	0.570	80	0.540	116	0.620	152	0.990	188	0.560	224	0.570	260	0.540	296	0.620	332	0.990
9	0.540	45	0.580	81	0.530	117	0.630	153	0.990	189	0.540	225	0.580	261	0.530	297	0.630	333	0.990
10	0.530	46	0.580	82	0.530	118	0.650	154	0.980	190	0.530	226	0.580	262	0.530	298	0.650	334	0.980
11	0.520	47	0.590	83	0.520	119	0.660	155	0.980	191	0.520	227	0.590	263	0.520	299	0.660	335	0.980
12	0.510	48	0.600	84	0.510	120	0.680	156	0.970	192	0.510	228	0.600	264	0.510	300	0.680	336	0.970
13	0.510	49	0.600	85	0.510	121	0.690	157	0.970	193	0.510	229	0.600	265	0.510	301	0.690	337	0.970
14	0.500	50	0.610	86	0.500	122	0.710	158	0.970	194	0.500	230	0.610	266	0.500	302	0.710	338	0.970
15	0.490	51	0.610	87	0.490	123	0.730	159	0.960	195	0.490	231	0.610	267	0.490	303	0.730	339	0.960
16	0.490	52	0.620	88	0.480	124	0.740	160	0.960	196	0.490	232	0.620	268	0.480	304	0.740	340	0.960
17	0.480	53	0.620	89	0.480	125	0.760	161	0.950	197	0.480	233	0.620	269	0.480	305	0.760	341	0.950
18	0.470	54	0.620	90	0.470	126	0.780	162	0.930	198	0.470	234	0.620	270	0.470	306	0.780	342	0.930
19	0.470	55	0.620	91	0.470	127	0.790	163	0.920	199	0.470	235	0.620	271	0.470	307	0.790	343	0.920
20	0.460	56	0.630	92	0.470	128	0.810	164	0.910	200	0.460	236	0.630	272	0.470	308	0.810	344	0.910
21	0.460	57	0.630	93	0.470	129	0.820	165	0.900	201	0.460	237	0.630	273	0.470	309	0.820	345	0.900
22	0.460	58	0.630	94	0.470	130	0.840	166	0.890	202	0.460	238	0.630	274	0.470	310	0.840	346	0.890
23	0.460	59	0.630	95	0.470	131	0.850	167	0.880	203	0.460	239	0.630	275	0.470	311	0.850	347	0.880
24	0.460	60	0.640	96	0.460	132	0.860	168	0.860	204	0.460	240	0.640	276	0.460	312	0.860	348	0.860
25	0.470	61	0.630	97	0.460	133	0.880	169	0.850	205	0.470	241	0.630	277	0.460	313	0.880	349	0.850
26	0.470	62	0.630	98	0.460	134	0.890	170	0.840	206	0.470	242	0.630	278	0.460	314	0.890	350	0.840
27	0.470	63	0.630	99	0.460	135	0.900	171	0.820	207	0.470	243	0.630	279	0.460	315	0.900	351	0.820
28	0.470	64	0.630	100	0.460	136	0.910	172	0.810	208	0.470	244	0.630	280	0.460	316	0.910	352	0.810
29	0.470	65	0.620	101	0.470	137	0.920	173	0.790	209	0.470	245	0.620	281	0.470	317	0.920	353	0.790
30	0.470	66	0.620	102	0.470	138	0.930	174	0.780	210	0.470	246	0.620	282	0.470	318	0.930	354	0.780
31	0.480	67	0.620	103	0.480	139	0.950	175	0.760	211	0.480	247	0.620	283	0.480	319	0.950	355	0.760
32	0.480	68	0.620	104	0.490	140	0.960	176	0.740	212	0.480	248	0.620	284	0.490	320	0.960	356	0.740
33	0.490	69	0.610	105	0.490	141	0.960	177	0.730	213	0.490	249	0.610	285	0.490	321	0.960	357	0.730
34	0.500	70	0.610	106	0.500	142	0.970	178	0.710	214	0.500	250	0.610	286	0.500	322	0.970	358	0.710
35	0.510	71	0.600	107	0.510	143	0.970	179	0.690	215	0.510	251	0.600	287	0.510	323	0.970	359	0.690

Dielectric®



AZIMUTH PATTERN
Vertical Polarization

In Free Space

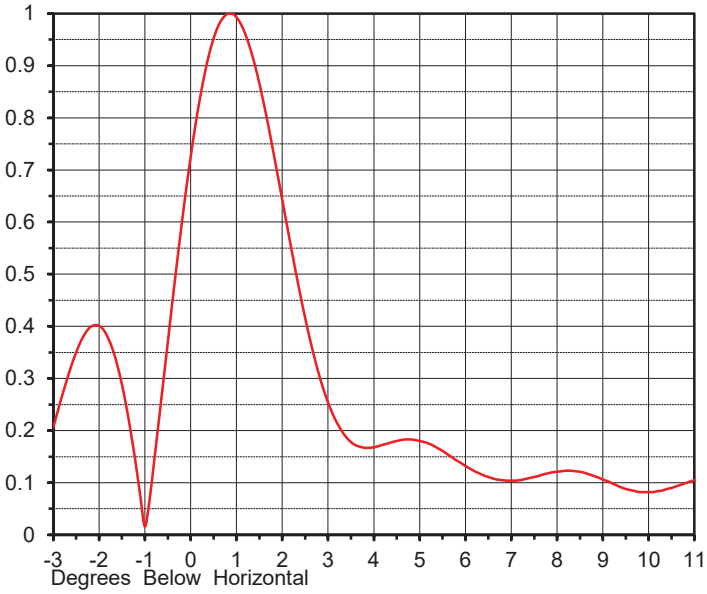
Proposal No.	**C-70459**
Date	**14-Mar-17**
Call Letters	**KSHV**
Channel	**16**
Frequency	**485 MHz**
Antenna Type	**TFU-30DSC/VP-R P220**
Gain	**1.57 (1.96dB)**
	Calculated

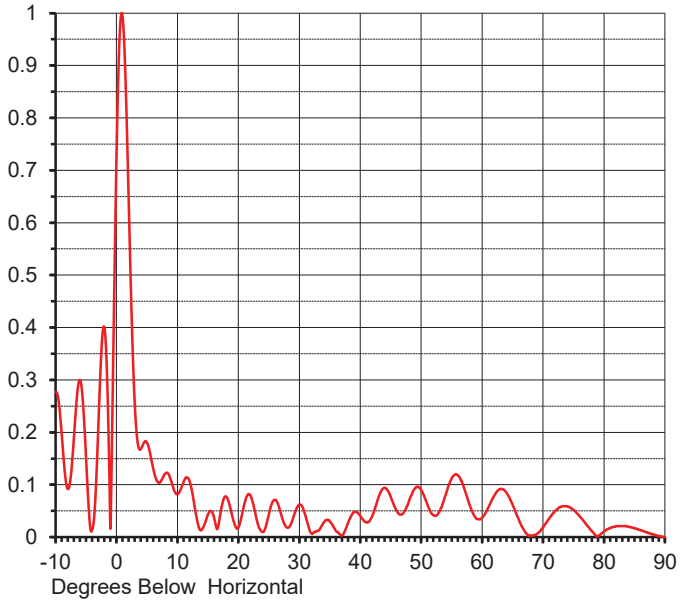
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.236	36	0.376	72	0.410	108	0.249	144	0.367	180	0.236	216	0.376	252	0.410	288	0.249	324	0.367
1	0.234	37	0.380	73	0.408	109	0.244	145	0.370	181	0.234	217	0.380	253	0.408	289	0.244	325	0.370
2	0.232	38	0.384	74	0.406	110	0.241	146	0.372	182	0.232	218	0.384	254	0.406	290	0.241	326	0.372
3	0.230	39	0.387	75	0.404	111	0.237	147	0.374	183	0.230	219	0.387	255	0.404	291	0.237	327	0.374
4	0.230	40	0.390	76	0.402	112	0.234	148	0.375	184	0.230	220	0.390	256	0.402	292	0.234	328	0.375
5	0.230	41	0.393	77	0.399	113	0.232	149	0.376	185	0.230	221	0.393	257	0.399	293	0.232	329	0.376
6	0.231	42	0.396	78	0.396	114	0.231	150	0.377	186	0.231	222	0.396	258	0.396	294	0.231	330	0.377
7	0.232	43	0.399	79	0.393	115	0.230	151	0.376	187	0.232	223	0.399	259	0.393	295	0.230	331	0.376
8	0.234	44	0.402	80	0.390	116	0.230	152	0.375	188	0.234	224	0.402	260	0.390	296	0.230	332	0.375
9	0.237	45	0.404	81	0.387	117	0.230	153	0.374	189	0.237	225	0.404	261	0.387	297	0.230	333	0.374
10	0.241	46	0.406	82	0.384	118	0.232	154	0.372	190	0.241	226	0.406	262	0.384	298	0.232	334	0.372
11	0.244	47	0.408	83	0.380	119	0.234	155	0.370	191	0.244	227	0.408	263	0.380	299	0.234	335	0.370
12	0.249	48	0.410	84	0.376	120	0.236	156	0.367	192	0.249	228	0.410	264	0.376	300	0.236	336	0.367
13	0.253	49	0.412	85	0.372	121	0.240	157	0.364	193	0.253	229	0.412	265	0.372	301	0.240	337	0.364
14	0.258	50	0.413	86	0.368	122	0.243	158	0.360	194	0.258	230	0.413	266	0.368	302	0.243	338	0.360
15	0.264	51	0.414	87	0.364	123	0.248	159	0.356	195	0.264	231	0.414	267	0.364	303	0.248	339	0.356
16	0.269	52	0.416	88	0.359	124	0.253	160	0.351	196	0.269	232	0.416	268	0.359	304	0.253	340	0.351
17	0.275	53	0.417	89	0.354	125	0.258	161	0.346	197	0.275	233	0.417	269	0.354	305	0.258	341	0.346
18	0.281	54	0.418	90	0.349	126	0.264	162	0.341	198	0.281	234	0.418	270	0.349	306	0.264	342	0.341
19	0.287	55	0.418	91	0.344	127	0.270	163	0.335	199	0.287	235	0.418	271	0.344	307	0.270	343	0.335
20	0.293	56	0.419	92	0.339	128	0.277	164	0.329	200	0.293	236	0.419	272	0.339	308	0.277	344	0.329
21	0.299	57	0.419	93	0.334	129	0.283	165	0.323	201	0.299	237	0.419	273	0.334	309	0.283	345	0.323
22	0.305	58	0.420	94	0.328	130	0.290	166	0.317	202	0.305	238	0.420	274	0.328	310	0.290	346	0.317
23	0.311	59	0.420	95	0.322	131	0.297	167	0.310	203	0.311	239	0.420	275	0.322	311	0.297	347	0.310
24	0.317	60	0.420	96	0.317	132	0.303	168	0.303	204	0.317	240	0.420	276	0.317	312	0.303	348	0.303
25	0.322	61	0.420	97	0.311	133	0.310	169	0.297	205	0.322	241	0.420	277	0.311	313	0.310	349	0.298
26	0.328	62	0.420	98	0.305	134	0.317	170	0.290	206	0.328	242	0.420	278	0.305	314	0.317	350	0.290
27	0.334	63	0.419	99	0.299	135	0.323	171	0.283	207	0.334	243	0.419	279	0.299	315	0.323	351	0.283
28	0.339	64	0.419	100	0.293	136	0.329	172	0.277	208	0.339	244	0.419	280	0.293	316	0.329	352	0.277
29	0.344	65	0.418	101	0.287	137	0.335	173	0.270	209	0.344	245	0.418	281	0.287	317	0.335	353	0.270
30	0.349	66	0.418	102	0.281	138	0.341	174	0.264	210	0.349	246	0.418	282	0.281	318	0.341	354	0.264
31	0.354	67	0.417	103	0.275	139	0.346	175	0.258	211	0.354	247	0.417	283	0.275	319	0.346	355	0.258
32	0.359	68	0.416	104	0.269	140	0.351	176	0.253	212	0.359	248	0.416	284	0.269	320	0.351	356	0.253
33	0.364	69	0.414	105	0.264	141	0.356	177	0.248	213	0.364	249	0.414	285	0.264	321	0.356	357	0.248
34	0.368	70	0.413	106	0.258	142	0.360	178	0.243	214	0.368	250	0.413	286	0.258	322	0.360	358	0.243
35	0.372	71	0.412	107	0.253	143	0.364	179	0.240	215	0.372	251	0.412	287	0.253	323	0.364	359	0.240

ELEVATION PATTERN

Proposal No.	**C-70459**
Date	**14-Mar-17**
Call Letters	**KSHV**
Channel	**16**
Frequency	**485 MHz**
Antenna Type	**TFU-30DSC/VP-R P220**

RMS Directivity at Main Lobe	**22.6 (13.54 dB)**	Beam Tilt	**0.75 deg**
RMS Directivity at Horizontal	**11.9 (10.76 dB)**	Pattern Number	**30Q226075**
	Calculated		





Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.277	10.0	0.082	30.0	0.062	50.0	0.088	70.0	0.020
-9.0	0.183	11.0	0.108	31.0	0.037	51.0	0.060	71.0	0.037
-8.0	0.092	12.0	0.103	32.0	0.006	52.0	0.041	72.0	0.051
-7.0	0.205	13.0	0.040	33.0	0.012	53.0	0.051	73.0	0.059
-6.0	0.298	14.0	0.016	34.0	0.029	54.0	0.084	74.0	0.058
-5.0	0.129	15.0	0.045	35.0	0.029	55.0	0.114	75.0	0.051
-4.0	0.017	16.0	0.033	36.0	0.011	56.0	0.117	76.0	0.039
-3.0	0.238	17.0	0.048	37.0	0.004	57.0	0.092	77.0	0.024
-2.0	0.393	18.0	0.076	38.0	0.030	58.0	0.057	78.0	0.010
-1.0	0.066	19.0	0.036	39.0	0.048	59.0	0.035	79.0	0.002
0.0	0.784	20.0	0.021	40.0	0.039	60.0	0.038	80.0	0.012
1.0	0.979	21.0	0.068	41.0	0.028	61.0	0.058	81.0	0.018
2.0	0.595	22.0	0.076	42.0	0.044	62.0	0.081	82.0	0.021
3.0	0.232	23.0	0.029	43.0	0.079	63.0	0.092	83.0	0.021
4.0	0.170	24.0	0.010	44.0	0.094	64.0	0.083	84.0	0.020
5.0	0.178	25.0	0.048	45.0	0.074	65.0	0.059	85.0	0.017
6.0	0.127	26.0	0.071	46.0	0.048	66.0	0.031	86.0	0.013
7.0	0.104	27.0	0.040	47.0	0.046	67.0	0.009	87.0	0.009
8.0	0.122	28.0	0.018	48.0	0.072	68.0	0.003	88.0	0.005
9.0	0.103	29.0	0.040	49.0	0.095	69.0	0.007	89.0	0.002
								90.0	0.000

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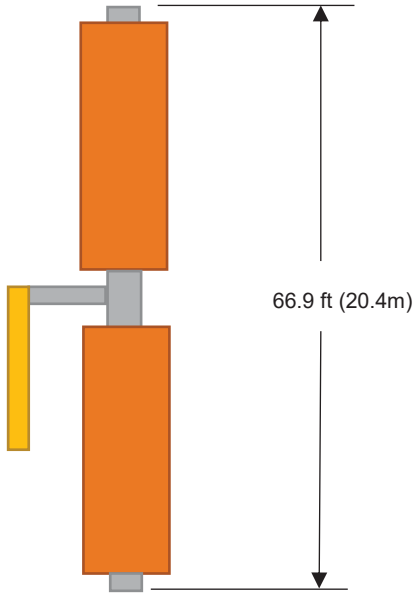
MECHANICAL SPECIFICATIONS



Proposal No.	**C-70459**
Date	**14-Mar-17**
Call Letters	**KSHV**
Channel	**16**
Frequency	**485 MHz**
Antenna Type	**TFU-30DSC/VP-R P220**

Preliminary Specifications

Side Mounted

Without ice TIA/EIA-222-F

Height AGL	1657 ft (505.1 m)
Basic Wind Speed	70 m/h (112.7 km/h)

Mechanical Specifications

Height	H2	66.9 ft (20.4m)	
Height of Center of Radiation	H3	33.45 ft (10.2m)	
Force Coeff. x Projected Area	CaAc	134.4 ft² (12.5m²)	Mounts Excluded
Weight	W	2000 lb (0.9t)	

Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA/EIA-222-F

Prepared by: KLP **Date:** 14-Mar-17 **ME:** RS **EE:**