



Antenna Model: TFU-16DSB-BB 2P220 OS (C)

Proposal Number: C-71141-1
Date: 6-Jun-18
Customer: TEGNA
Location: Nacogdoches, TX

Electrical Specifications

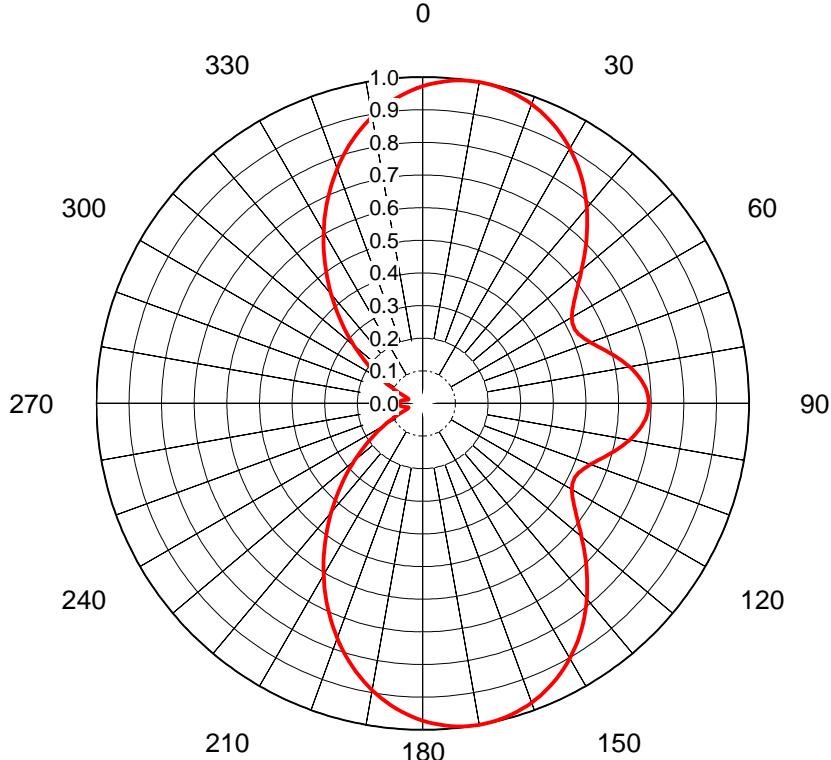
Polarization:	Horizontal		
Azimuth Pattern:	Directional		
Antenna Input:	6-1/8"	75 Ohm	EIA/DCA
VSWR:	Channel	1.20 : 1	Band 1.20 : 1
Bandwidth:	24 MHz		
Rated Input Power:	18 kW	(12.55 dBk)	Maximum combined average power

Mechanical Specifications

Mounting:	Side Mounted		
Environmental Protection:	Slot Cover		
Height:	36.2 ft (11m)		
Weight:	650 lb (0.3t) Excludes Mounts		
Effective Projected Area:	105.7 ft ² (9.8m ²)	TIA-222-G	Basic Wind Speed: 90 m/h (144.8 km/h)

Channel Specifications

Call	CH	Freq	Hpol ERP	TPO	Peak	Peak at Horizontal Hpol Gain
					Main Lobe Hpol Gain	
1	KYTX	18	497 MHz (26.21 dBk)	20.0 kW (13.01 dBk)	29.55 (14.71dB)	19.01 (12.79dB)
2	KYTX	15	479 MHz (26.42 dBk)	20.0 kW (13.01 dBk)	30.83 (14.89dB)	19.83 (12.97dB)



AZIMUTH PATTERN Horizontal Polarization

In Free Space

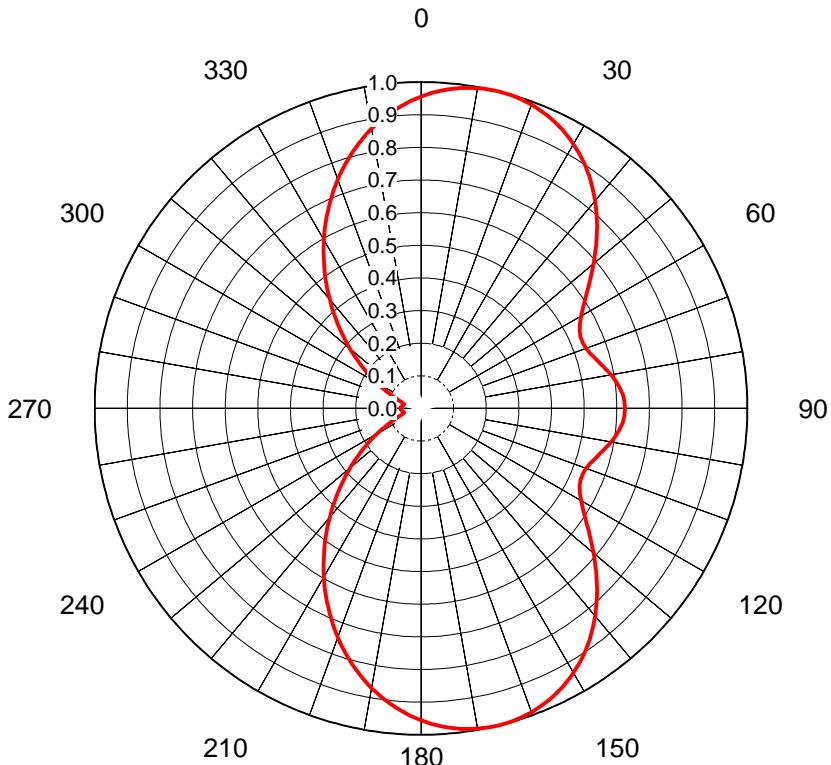
Proposal No.	C-71141-1
Date	6-Jun-18
Call Letters	KYTX
Channel	18
Frequency	497 MHz
Antenna Type	TFU-16DSB-BB 2P220 OS (C)
Gain	2.25 (3.52dB)

Calculated

Deg	Value																
0	0.972	36	0.835	72	0.565	108	0.565	144	0.835	180	0.972	216	0.505	252	0.046	288	0.046
1	0.977	37	0.822	73	0.574	109	0.556	145	0.847	181	0.966	217	0.487	253	0.046	289	0.049
2	0.982	38	0.809	74	0.584	110	0.547	146	0.859	182	0.960	218	0.470	254	0.045	290	0.052
3	0.986	39	0.796	75	0.595	111	0.540	147	0.870	183	0.953	219	0.453	255	0.046	291	0.058
4	0.990	40	0.782	76	0.605	112	0.533	148	0.882	184	0.946	220	0.436	256	0.048	292	0.063
5	0.993	41	0.768	77	0.615	113	0.528	149	0.892	185	0.938	221	0.419	257	0.050	293	0.071
6	0.995	42	0.754	78	0.625	114	0.523	150	0.902	186	0.930	222	0.402	258	0.053	294	0.078
7	0.997	43	0.739	79	0.635	115	0.521	151	0.911	187	0.921	223	0.386	259	0.056	295	0.087
8	0.999	44	0.724	80	0.644	116	0.519	152	0.921	188	0.912	224	0.369	260	0.059	296	0.096
9	0.999	45	0.710	81	0.652	117	0.519	153	0.929	189	0.902	225	0.353	261	0.061	297	0.106
10	1.000	46	0.695	82	0.661	118	0.520	154	0.937	190	0.892	226	0.336	262	0.064	298	0.116
11	1.000	47	0.680	83	0.668	119	0.524	155	0.945	191	0.881	227	0.320	263	0.066	299	0.127
12	0.999	48	0.665	84	0.675	120	0.528	156	0.952	192	0.870	228	0.305	264	0.068	300	0.139
13	0.998	49	0.650	85	0.680	121	0.534	157	0.959	193	0.859	229	0.289	265	0.070	301	0.151
14	0.996	50	0.635	86	0.685	122	0.541	158	0.965	194	0.847	230	0.274	266	0.072	302	0.163
15	0.994	51	0.622	87	0.688	123	0.550	159	0.970	195	0.834	231	0.259	267	0.073	303	0.176
16	0.992	52	0.607	88	0.691	124	0.559	160	0.976	196	0.821	232	0.244	268	0.074	304	0.188
17	0.988	53	0.595	89	0.692	125	0.571	161	0.980	197	0.808	233	0.230	269	0.074	305	0.202
18	0.985	54	0.582	90	0.693	126	0.582	162	0.985	198	0.794	234	0.216	270	0.075	306	0.216
19	0.980	55	0.571	91	0.692	127	0.595	163	0.988	199	0.780	235	0.202	271	0.074	307	0.230
20	0.976	56	0.559	92	0.691	128	0.607	164	0.992	200	0.766	236	0.188	272	0.074	308	0.244
21	0.970	57	0.550	93	0.688	129	0.621	165	0.994	201	0.751	237	0.176	273	0.073	309	0.259
22	0.965	58	0.541	94	0.685	130	0.635	166	0.996	202	0.736	238	0.163	274	0.072	310	0.274
23	0.959	59	0.534	95	0.680	131	0.650	167	0.998	203	0.721	239	0.151	275	0.070	311	0.289
24	0.952	60	0.528	96	0.675	132	0.665	168	0.999	204	0.705	240	0.139	276	0.068	312	0.305
25	0.945	61	0.524	97	0.668	133	0.680	169	1.000	205	0.689	241	0.127	277	0.066	313	0.320
26	0.937	62	0.520	98	0.661	134	0.695	170	1.000	206	0.673	242	0.116	278	0.064	314	0.336
27	0.929	63	0.519	99	0.652	135	0.710	171	0.999	207	0.657	243	0.106	279	0.061	315	0.353
28	0.921	64	0.519	100	0.644	136	0.724	172	0.999	208	0.641	244	0.096	280	0.059	316	0.369
29	0.911	65	0.521	101	0.635	137	0.739	173	0.997	209	0.624	245	0.087	281	0.056	317	0.386
30	0.902	66	0.523	102	0.625	138	0.754	174	0.995	210	0.607	246	0.078	282	0.053	318	0.402
31	0.892	67	0.528	103	0.615	139	0.768	175	0.993	211	0.590	247	0.071	283	0.050	319	0.419
32	0.882	68	0.533	104	0.605	140	0.782	176	0.990	212	0.573	248	0.063	284	0.048	320	0.436
33	0.870	69	0.540	105	0.595	141	0.796	177	0.986	213	0.556	249	0.058	285	0.046	321	0.453
34	0.859	70	0.547	106	0.584	142	0.809	178	0.982	214	0.539	250	0.052	286	0.045	322	0.470
35	0.847	71	0.556	107	0.574	143	0.822	179	0.977	215	0.522	251	0.049	287	0.046	323	0.487

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AZIMUTH PATTERN Horizontal Polarization

In Free Space

Proposal No.	C-71141-1
Date	6-Jun-18
Call Letters	KYTX
Channel	15
Frequency	479 MHz
Antenna Type	TFU-16DSB-BB 2P220 OS (C)
Gain	2.23 (3.49dB)
Calculated	

Deg	Value																		
0	0.956	36	0.878	72	0.545	108	0.545	144	0.878	180	0.956	216	0.499	252	0.062	288	0.062	324	0.499
1	0.962	37	0.867	73	0.550	109	0.542	145	0.889	181	0.949	217	0.483	253	0.059	289	0.067	325	0.515
2	0.968	38	0.855	74	0.555	110	0.538	146	0.899	182	0.942	218	0.467	254	0.056	290	0.071	326	0.531
3	0.973	39	0.843	75	0.561	111	0.536	147	0.909	183	0.935	219	0.451	255	0.055	291	0.077	327	0.547
4	0.978	40	0.830	76	0.567	112	0.535	148	0.918	184	0.927	220	0.435	256	0.053	292	0.084	328	0.563
5	0.982	41	0.817	77	0.573	113	0.535	149	0.927	185	0.918	221	0.419	257	0.053	293	0.091	329	0.579
6	0.986	42	0.804	78	0.579	114	0.535	150	0.935	186	0.910	222	0.403	258	0.053	294	0.099	330	0.595
7	0.989	43	0.790	79	0.585	115	0.538	151	0.943	187	0.900	223	0.388	259	0.054	295	0.107	331	0.611
8	0.992	44	0.777	80	0.592	116	0.541	152	0.950	188	0.891	224	0.372	260	0.055	296	0.116	332	0.627
9	0.995	45	0.762	81	0.597	117	0.546	153	0.957	189	0.881	225	0.357	261	0.056	297	0.125	333	0.642
10	0.997	46	0.748	82	0.603	118	0.552	154	0.963	190	0.870	226	0.342	262	0.057	298	0.135	334	0.658
11	0.998	47	0.734	83	0.608	119	0.559	155	0.969	191	0.859	227	0.327	263	0.058	299	0.146	335	0.673
12	0.999	48	0.719	84	0.612	120	0.567	156	0.975	192	0.848	228	0.312	264	0.060	300	0.156	336	0.688
13	1.000	49	0.705	85	0.616	121	0.576	157	0.979	193	0.837	229	0.297	265	0.061	301	0.167	337	0.703
14	1.000	50	0.690	86	0.620	122	0.586	158	0.984	194	0.825	230	0.283	266	0.062	302	0.179	338	0.718
15	0.999	51	0.676	87	0.622	123	0.597	159	0.987	195	0.812	231	0.269	267	0.062	303	0.191	339	0.732
16	0.999	52	0.661	88	0.624	124	0.609	160	0.991	196	0.800	232	0.255	268	0.063	304	0.203	340	0.746
17	0.997	53	0.648	89	0.625	125	0.621	161	0.993	197	0.787	233	0.242	269	0.063	305	0.216	341	0.760
18	0.996	54	0.634	90	0.626	126	0.634	162	0.996	198	0.774	234	0.228	270	0.064	306	0.228	342	0.774
19	0.993	55	0.621	91	0.625	127	0.648	163	0.997	199	0.760	235	0.216	271	0.063	307	0.242	343	0.787
20	0.991	56	0.609	92	0.624	128	0.661	164	0.999	200	0.746	236	0.203	272	0.063	308	0.255	344	0.800
21	0.987	57	0.597	93	0.622	129	0.676	165	0.999	201	0.732	237	0.191	273	0.062	309	0.269	345	0.812
22	0.984	58	0.586	94	0.620	130	0.690	166	1.000	202	0.718	238	0.179	274	0.062	310	0.283	346	0.825
23	0.979	59	0.576	95	0.616	131	0.705	167	1.000	203	0.703	239	0.167	275	0.061	311	0.297	347	0.837
24	0.975	60	0.567	96	0.612	132	0.719	168	0.999	204	0.688	240	0.156	276	0.060	312	0.312	348	0.848
25	0.969	61	0.559	97	0.608	133	0.734	169	0.998	205	0.673	241	0.146	277	0.058	313	0.327	349	0.859
26	0.963	62	0.552	98	0.603	134	0.748	170	0.997	206	0.658	242	0.135	278	0.057	314	0.342	350	0.870
27	0.957	63	0.546	99	0.597	135	0.762	171	0.995	207	0.642	243	0.125	279	0.056	315	0.357	351	0.881
28	0.950	64	0.541	100	0.592	136	0.777	172	0.992	208	0.627	244	0.116	280	0.055	316	0.372	352	0.891
29	0.943	65	0.538	101	0.585	137	0.790	173	0.989	209	0.611	245	0.107	281	0.054	317	0.388	353	0.900
30	0.935	66	0.535	102	0.579	138	0.804	174	0.986	210	0.595	246	0.099	282	0.053	318	0.403	354	0.910
31	0.927	67	0.535	103	0.573	139	0.817	175	0.982	211	0.579	247	0.091	283	0.053	319	0.419	355	0.918
32	0.918	68	0.535	104	0.567	140	0.830	176	0.978	212	0.563	248	0.084	284	0.053	320	0.435	356	0.927
33	0.909	69	0.536	105	0.561	141	0.843	177	0.973	213	0.547	249	0.077	285	0.055	321	0.451	357	0.935
34	0.899	70	0.538	106	0.555	142	0.855	178	0.968	214	0.531	250	0.071	286	0.056	322	0.467	358	0.942
35	0.889	71	0.542	107	0.550	143	0.867	179	0.962	215	0.515	251	0.067	287	0.059	323	0.483	359	0.949

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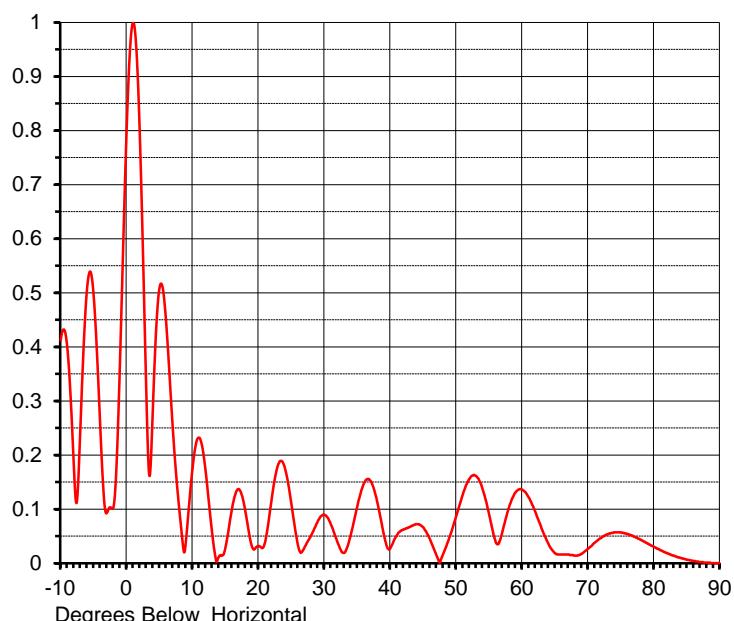
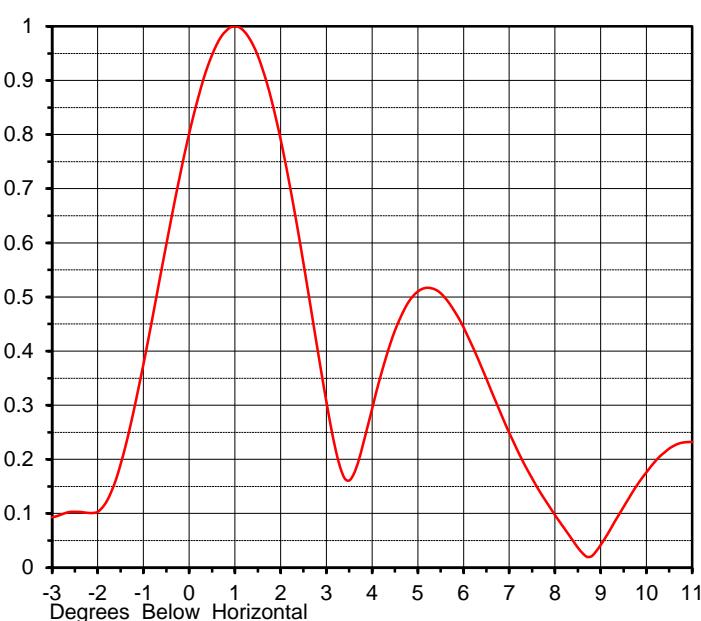
ELEVATION PATTERN

Proposal No. C-71141-1
 Date 6-Jun-18
 Call Letters KYTX
 Channel 18
 Frequency 497 MHz
 Antenna Type TFU-16DSB-BB 2P220 OS (C)

RMS Directivity at Main Lobe
 RMS Directivity at Horizontal

13.1 (11.19 dB)
8.5 (9.29 dB)
Calculated

Beam Tilt 1.00 deg
 Pattern Number 16L131100



Angle Field

-10.0	0.412
-9.0	0.399
-8.0	0.178
-7.0	0.255
-6.0	0.508
-5.0	0.494
-4.0	0.252
-3.0	0.093
-2.0	0.103
-1.0	0.376
0.0	0.802
1.0	1.000
2.0	0.791
3.0	0.307
4.0	0.293
5.0	0.510
6.0	0.444
7.0	0.249
8.0	0.097
9.0	0.042

Angle Field

10.0	0.176
11.0	0.232
12.0	0.168
13.0	0.052
14.0	0.012
15.0	0.030
16.0	0.102
17.0	0.137
18.0	0.096
19.0	0.031
20.0	0.032
21.0	0.039
22.0	0.119
23.0	0.183
24.0	0.176
25.0	0.108
26.0	0.032
27.0	0.030
28.0	0.052
29.0	0.078

Angle Field

30.0	0.089
31.0	0.071
32.0	0.038
33.0	0.019
34.0	0.053
35.0	0.106
36.0	0.148
37.0	0.152
38.0	0.113
39.0	0.053
40.0	0.028
41.0	0.052
42.0	0.062
43.0	0.067
44.0	0.072
45.0	0.066
46.0	0.044
47.0	0.014
48.0	0.017
49.0	0.049

Angle Field

50.0	0.088
51.0	0.128
52.0	0.156
53.0	0.161
54.0	0.136
55.0	0.088
56.0	0.038
57.0	0.059
58.0	0.104
59.0	0.131
60.0	0.136
61.0	0.121
62.0	0.094
63.0	0.062
64.0	0.035
65.0	0.018
66.0	0.016
67.0	0.016
68.0	0.014
69.0	0.017
70.0	0.027

Angle Field

71.0	0.038
72.0	0.047
73.0	0.054
74.0	0.057
75.0	0.057
76.0	0.054
77.0	0.049
78.0	0.043
79.0	0.036
80.0	0.030
81.0	0.024
82.0	0.018
83.0	0.014
84.0	0.010
85.0	0.006
86.0	0.004
87.0	0.002
88.0	0.001
89.0	0.000
90.0	0.000

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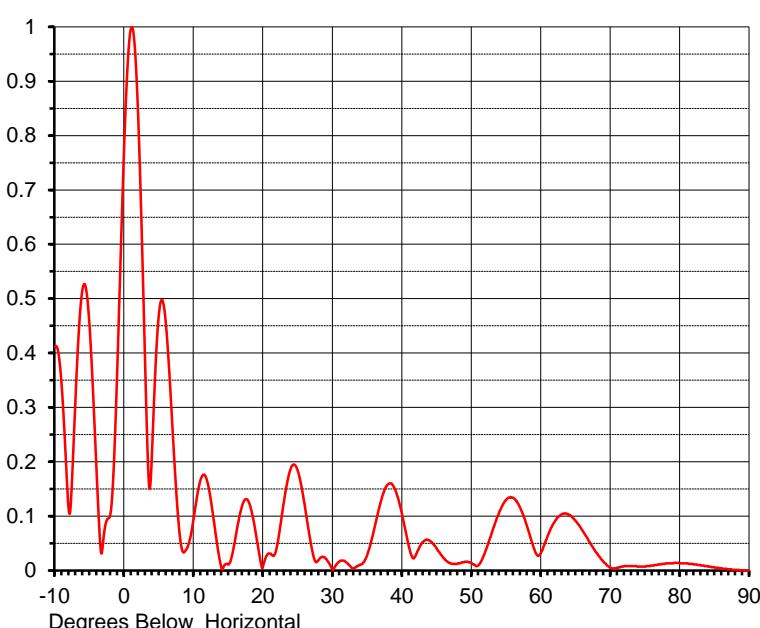
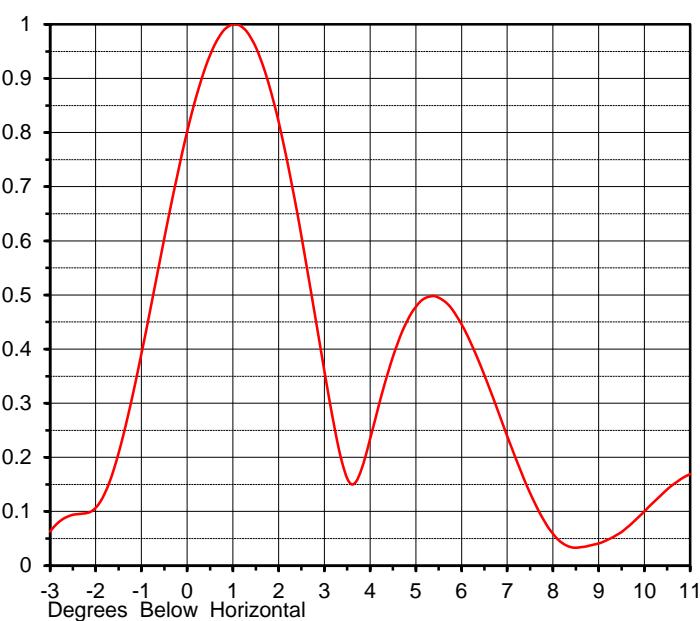
ELEVATION PATTERN

Proposal No. C-71141-1
 Date 6-Jun-18
 Call Letters KYTX
 Channel 15
 Frequency 479 MHz
 Antenna Type TFU-16DSB-BB 2P220 OS (C)

RMS Directivity at Main Lobe
 RMS Directivity at Horizontal

13.8 (11.40 dB)
8.9 (9.49 dB)
Calculated

Beam Tilt 1.05 deg
 Pattern Number 16L138105



Angle Field

-10.0	0.411
-9.0	0.330
-8.0	0.107
-7.0	0.336
-6.0	0.521
-5.0	0.441
-4.0	0.173
-3.0	0.063
-2.0	0.107
-1.0	0.392
0.0	0.802
1.0	1.000
2.0	0.820
3.0	0.360
4.0	0.234
5.0	0.478
6.0	0.446
7.0	0.239
8.0	0.059
9.0	0.041

Angle Field

10.0	0.100
11.0	0.169
12.0	0.159
13.0	0.078
14.0	0.002
15.0	0.011
16.0	0.063
17.0	0.122
18.0	0.122
19.0	0.060
20.0	0.011
21.0	0.031
22.0	0.048
23.0	0.131
24.0	0.190
25.0	0.181
26.0	0.115
27.0	0.038
28.0	0.020
29.0	0.021

Angle Field

30.0	0.000
31.0	0.017
32.0	0.014
33.0	0.004
34.0	0.011
35.0	0.031
36.0	0.079
37.0	0.131
38.0	0.159
39.0	0.147
40.0	0.100
41.0	0.041
42.0	0.030
43.0	0.053
44.0	0.054
45.0	0.039
46.0	0.022
47.0	0.013
48.0	0.013
49.0	0.016

Angle Field

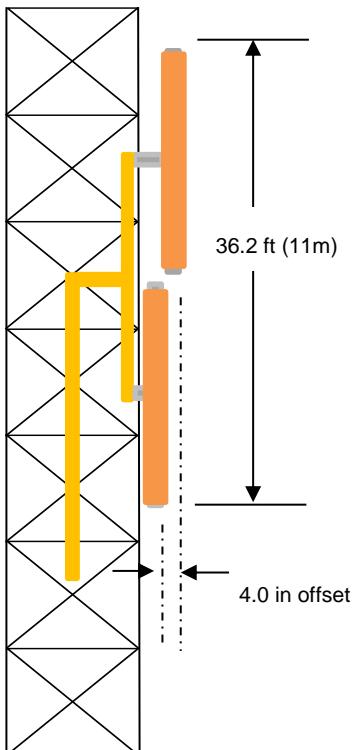
50.0	0.013
51.0	0.010
52.0	0.037
53.0	0.074
54.0	0.109
55.0	0.131
56.0	0.133
57.0	0.114
58.0	0.079
59.0	0.039
60.0	0.034
61.0	0.066
62.0	0.091
63.0	0.104
64.0	0.102
65.0	0.090
66.0	0.072
67.0	0.051
68.0	0.032
69.0	0.015

Angle Field

70.0	0.005
71.0	0.005
72.0	0.008
73.0	0.008
74.0	0.007
75.0	0.007
76.0	0.009
77.0	0.011
78.0	0.013
79.0	0.013
80.0	0.013
81.0	0.013
82.0	0.011
83.0	0.009
84.0	0.007
85.0	0.005
86.0	0.004
87.0	0.002
88.0	0.001
89.0	0.000
90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No.	C-71141-1
Date	6-Jun-18
Call Letters	KYTX
Channel	18
Frequency	497 MHz
Antenna Type	TFU-16DSB-BB 2P220 OS (C)

Preliminary Specifications

Side Mounted

With ice TIA-222-G

Height AGL(z)	1300 ft (396.2 m)
Basic Wind Speed	90 m/h (144.8 km/h)

Structure Class II

Exposure Category C

Topography Category 1

Design Ice	0.5 in	$t_{iz} = 1.40 \text{ in}$
Wind Speed w/Ice	40 m/h	(64.4 km/h)

Mechanical Specifications	without ice	with ice	
Height	H2	36.2 ft (11m)	
Height of Center of Radiation	H3	18.8 ft (5.7m)	
Effective Projected Area	(EPA) _A	105.7 ft ² (9.8m ²)	142.2 ft ² (13.2m ²)
Weight	W	650 lb (0.3t)	1950 lb (0.9t)
			Mounts Excluded
			Mounts Excluded

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

Prepared by: JBC

Date: 6-Jun-18

ME:

EE:

Rev. No.1 by: JBC

Date: 6-Jun-18

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Summary

Proposal No.	C-71141-1
Date	6-Jun-18
Call Letters	KYTX
Channel	18
Frequency	497 MHz
Antenna Type	TFU-16DSB-BB 2P220 OS (C)

Antenna

Hpol

ERP:	418 kW	(26.21 dBk)
Peak Gain*	29.55	(14.71 dB)

Antenna Input Power	14.1 kW	(11.50 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(1.51 dB)
Size:	6-1/8"	Efficiency:	70.6%
Impedance:	75 Ohm		
Length:	1400 ft	426.7 m	

Transmitter Output

20.0 kW (13.01 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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Summary

Proposal No.	C-71141-1
Date	6-Jun-18
Call Letters	KYTX
Channel	15
Frequency	479 MHz
Antenna Type	TFU-16DSB-BB 2P220 OS (C)

Antenna

Hpol

ERP:	439 kW	(26.42 dBk)
Peak Gain*	30.83	(14.89 dB)

Antenna Input Power **14.2 kW** (11.53 dBk)

Transmission Line

Type:	Rigid	Attenuation:	(1.48 dB)
Size:	6-1/8"	Efficiency:	71.1%
Impedance:	75 Ohm		
Length:	1400 ft	426.7 m	

Transmitter Output

20.0 kW (13.01 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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