



Antenna Model: **TFU-32GTQ/VP-R O8 BB**

Proposal Number: **C-71902-3**
Date: **24-Feb-23**
Customer: **SBG**
Location: **Boise, ID**

Electrical Specifications

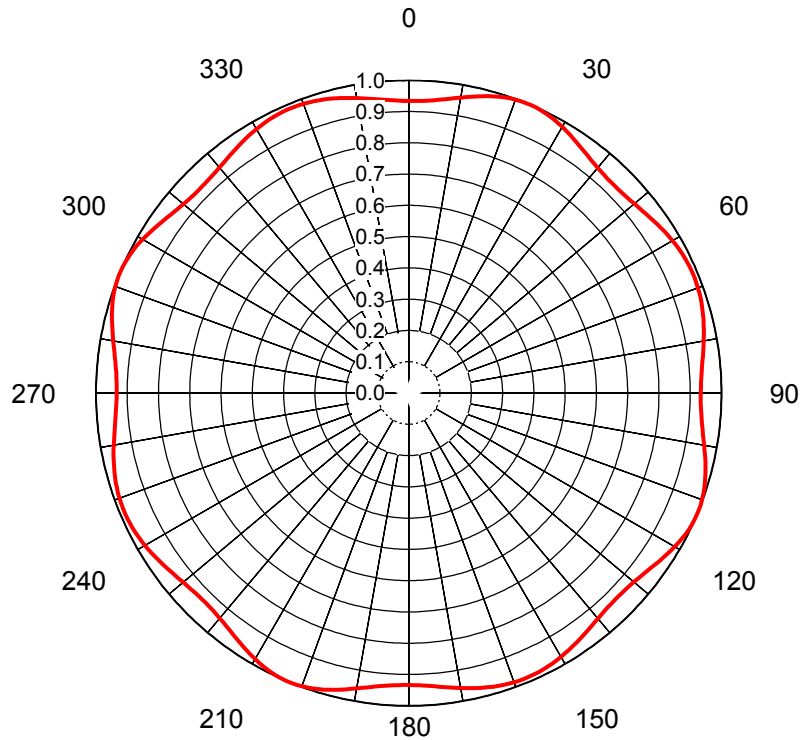
Polarization: **Elliptical**
Azimuth Pattern: **Omni**
Antenna Input: **8-3/16"** **75 Ohm** **EIA/DCA**
VSWR: **Channel** **1.15 : 1** **Band** **1.20 : 1**
Bandwidth: **42 MHz**
Rated Input Power: **90 kW** **(19.54 dBk)** **Maximum combined average power**

Mechanical Specifications

Mounting: **Top Mounted**
Environmental Protection: **Full Radome**
Height: **75.5 ft (23m)** **less Lightning Protector** **79.5 ft (24.2m) with Lightning Protector**
Weight: **19760 lb (9t)**
Effective Projected Area: **158.2 ft² (14.7m² TIA-222-H)** **Basic Wind Speed: 102 m/h (164.2 km/h)**

Channel Specifications

	Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	RMS Main Lobe Hpol Gain	RMS Main Lobe Vpol Gain	RMS at Horizontal Hpol Gain	RMS at Horizontal Vpol Gain
1	KBOI	20	509 MHz	625 kW (27.96 dBk)	156 kW (21.94 dBk)	33.0 kW (15.19 dBk)	20.88 (13.20dB)	5.22 (7.18dB)	0.52 (-2.83dB)	0.13 (-8.85dB)
2	KAID	21	515 MHz	603 kW (27.80 dBk)	151 kW (21.78 dBk)	31.2 kW (14.94 dBk)	21.84 (13.39dB)	5.46 (7.37dB)	0.54 (-2.69dB)	0.13 (-8.71dB)
3	KIVI	24	533 MHz	646 kW (28.10 dBk)	161 kW (22.08 dBk)	31.2 kW (14.94 dBk)	22.88 (13.59dB)	5.72 (7.57dB)	0.53 (-2.77dB)	0.13 (-8.79dB)
4	KYUU	28	557 MHz	15.0 kW (11.76 dBk)	3.75 kW (5.74 dBk)	0.741 kW (-1.30 dBk)	22.40 (13.50dB)	5.60 (7.48dB)	0.46 (-3.33dB)	0.12 (-9.35dB)

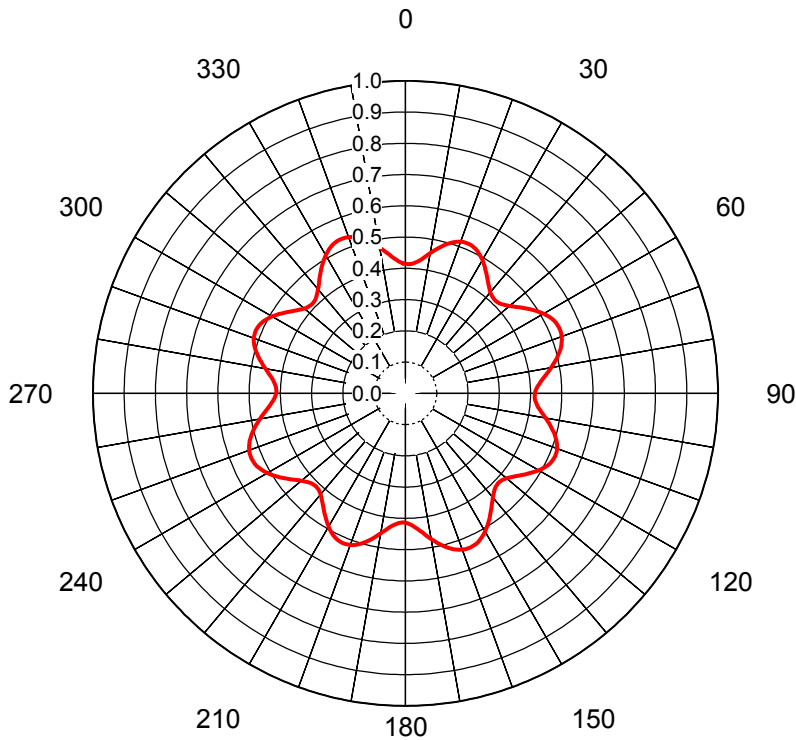


AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-71902-3**
 Date **24-Feb-23**
 Call Letters **KAID**
 Channel **21**
 Frequency **515 MHz**
 Antenna Type **TFU-32GTQ/VP-R 08 BB**
 Gain **1.08 (0.32dB)**
 Calculated
 Circularity **+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.934	36	0.955	72	0.981	108	0.993	144	0.954	180	0.934	216	0.955	252	0.981	288	0.993
1	0.934	37	0.950	73	0.979	109	0.996	145	0.958	181	0.934	217	0.950	253	0.979	289	0.996
2	0.934	38	0.946	74	0.977	110	0.998	146	0.961	182	0.934	218	0.946	254	0.977	290	0.998
3	0.936	39	0.943	75	0.974	111	0.999	147	0.965	183	0.936	219	0.943	255	0.974	291	0.999
4	0.938	40	0.940	76	0.971	112	1.000	148	0.968	184	0.937	220	0.940	256	0.971	292	1.000
5	0.940	41	0.937	77	0.968	113	1.000	149	0.971	185	0.940	221	0.938	257	0.968	293	1.000
6	0.943	42	0.936	78	0.965	114	0.999	150	0.974	186	0.943	222	0.936	258	0.965	294	0.999
7	0.946	43	0.934	79	0.961	115	0.998	151	0.977	187	0.946	223	0.934	259	0.961	295	0.998
8	0.950	44	0.934	80	0.958	116	0.996	152	0.979	188	0.950	224	0.934	260	0.958	296	0.996
9	0.955	45	0.934	81	0.954	117	0.993	153	0.981	189	0.955	225	0.934	261	0.954	297	0.993
10	0.959	46	0.934	82	0.951	118	0.990	154	0.983	190	0.959	226	0.934	262	0.951	298	0.990
11	0.964	47	0.935	83	0.947	119	0.986	155	0.984	191	0.964	227	0.935	263	0.947	299	0.986
12	0.968	48	0.937	84	0.944	120	0.982	156	0.985	192	0.969	228	0.937	264	0.944	300	0.982
13	0.973	49	0.939	85	0.941	121	0.978	157	0.985	193	0.973	229	0.939	265	0.941	301	0.978
14	0.978	50	0.941	86	0.939	122	0.973	158	0.985	194	0.978	230	0.941	266	0.939	302	0.973
15	0.982	51	0.944	87	0.937	123	0.968	159	0.985	195	0.982	231	0.944	267	0.937	303	0.968
16	0.986	52	0.947	88	0.935	124	0.964	160	0.984	196	0.986	232	0.947	268	0.935	304	0.964
17	0.990	53	0.951	89	0.934	125	0.959	161	0.983	197	0.990	233	0.951	269	0.934	305	0.959
18	0.993	54	0.954	90	0.934	126	0.955	162	0.981	198	0.993	234	0.954	270	0.934	306	0.955
19	0.996	55	0.958	91	0.934	127	0.950	163	0.979	199	0.996	235	0.958	271	0.934	307	0.950
20	0.998	56	0.961	92	0.934	128	0.946	164	0.977	200	0.998	236	0.961	272	0.934	308	0.946
21	0.999	57	0.965	93	0.936	129	0.943	165	0.974	201	0.999	237	0.965	273	0.936	309	0.943
22	1.000	58	0.968	94	0.937	130	0.940	166	0.971	202	1.000	238	0.968	274	0.937	310	0.940
23	1.000	59	0.971	95	0.940	131	0.937	167	0.968	203	1.000	239	0.971	275	0.940	311	0.937
24	0.999	60	0.974	96	0.943	132	0.936	168	0.965	204	0.999	240	0.974	276	0.943	312	0.936
25	0.998	61	0.977	97	0.946	133	0.934	169	0.961	205	0.998	241	0.977	277	0.946	313	0.934
26	0.996	62	0.979	98	0.950	134	0.934	170	0.958	206	0.996	242	0.979	278	0.950	314	0.934
27	0.993	63	0.981	99	0.955	135	0.934	171	0.954	207	0.993	243	0.981	279	0.955	315	0.934
28	0.990	64	0.983	100	0.959	136	0.934	172	0.951	208	0.990	244	0.983	280	0.959	316	0.934
29	0.986	65	0.984	101	0.964	137	0.935	173	0.947	209	0.986	245	0.984	281	0.964	317	0.935
30	0.982	66	0.985	102	0.968	138	0.937	174	0.944	210	0.982	246	0.985	282	0.968	318	0.937
31	0.978	67	0.985	103	0.973	139	0.939	175	0.941	211	0.978	247	0.985	283	0.973	319	0.939
32	0.973	68	0.985	104	0.978	140	0.941	176	0.939	212	0.973	248	0.985	284	0.978	320	0.941
33	0.968	69	0.985	105	0.982	141	0.944	177	0.937	213	0.968	249	0.985	285	0.982	321	0.944
34	0.964	70	0.984	106	0.986	142	0.947	178	0.935	214	0.964	250	0.984	286	0.986	322	0.947
35	0.959	71	0.983	107	0.990	143	0.951	179	0.934	215	0.959	251	0.983	287	0.990	323	0.951

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-71902-3**
 Date **24-Feb-23**
 Call Letters **KAID**
 Channel **21**
 Frequency **515 MHz**
 Antenna Type **TFU-32GTQ/VP-R O8 BB**
 Gain **1.27 (1.05dB)**
 Calculated
 Circularity **+/- 2.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.414	36	0.447	72	0.526	108	0.509	144	0.465	180	0.414	216	0.447	252	0.526	288	0.509	324	0.465
1	0.413	37	0.440	73	0.521	109	0.513	145	0.473	181	0.413	217	0.440	253	0.521	289	0.513	325	0.473
2	0.414	38	0.434	74	0.516	110	0.516	146	0.481	182	0.414	218	0.434	254	0.516	290	0.516	326	0.481
3	0.416	39	0.428	75	0.510	111	0.518	147	0.489	183	0.416	219	0.428	255	0.510	291	0.518	327	0.489
4	0.418	40	0.423	76	0.504	112	0.519	148	0.497	184	0.418	220	0.423	256	0.504	292	0.519	328	0.497
5	0.423	41	0.418	77	0.497	113	0.519	149	0.504	185	0.423	221	0.418	257	0.497	293	0.519	329	0.504
6	0.428	42	0.416	78	0.489	114	0.518	150	0.510	186	0.428	222	0.416	258	0.489	294	0.518	330	0.510
7	0.434	43	0.414	79	0.481	115	0.516	151	0.516	187	0.434	223	0.414	259	0.481	295	0.516	331	0.516
8	0.440	44	0.413	80	0.473	116	0.513	152	0.521	188	0.440	224	0.413	260	0.473	296	0.513	332	0.521
9	0.447	45	0.414	81	0.465	117	0.509	153	0.526	189	0.447	225	0.414	261	0.465	297	0.509	333	0.526
10	0.455	46	0.416	82	0.457	118	0.504	154	0.529	190	0.455	226	0.416	262	0.457	298	0.504	334	0.529
11	0.463	47	0.419	83	0.449	119	0.499	155	0.532	191	0.463	227	0.419	263	0.449	299	0.499	335	0.532
12	0.470	48	0.424	84	0.442	120	0.492	156	0.534	192	0.470	228	0.424	264	0.442	300	0.492	336	0.534
13	0.478	49	0.429	85	0.435	121	0.485	157	0.535	193	0.478	229	0.429	265	0.435	301	0.485	337	0.535
14	0.485	50	0.435	86	0.429	122	0.478	158	0.535	194	0.485	230	0.435	266	0.429	302	0.478	338	0.535
15	0.492	51	0.442	87	0.424	123	0.470	159	0.534	195	0.492	231	0.442	267	0.424	303	0.470	339	0.534
16	0.499	52	0.449	88	0.419	124	0.463	160	0.532	196	0.499	232	0.449	268	0.419	304	0.463	340	0.532
17	0.504	53	0.457	89	0.416	125	0.455	161	0.529	197	0.504	233	0.457	269	0.416	305	0.455	341	0.529
18	0.509	54	0.465	90	0.414	126	0.447	162	0.526	198	0.509	234	0.465	270	0.414	306	0.447	342	0.526
19	0.513	55	0.473	91	0.413	127	0.440	163	0.521	199	0.513	235	0.473	271	0.413	307	0.440	343	0.521
20	0.516	56	0.481	92	0.414	128	0.434	164	0.516	200	0.516	236	0.481	272	0.414	308	0.434	344	0.516
21	0.518	57	0.489	93	0.416	129	0.428	165	0.510	201	0.518	237	0.489	273	0.416	309	0.428	345	0.510
22	0.519	58	0.497	94	0.418	130	0.423	166	0.504	202	0.519	238	0.497	274	0.418	310	0.423	346	0.504
23	0.519	59	0.504	95	0.423	131	0.418	167	0.497	203	0.519	239	0.504	275	0.423	311	0.418	347	0.497
24	0.518	60	0.510	96	0.428	132	0.416	168	0.489	204	0.518	240	0.510	276	0.428	312	0.416	348	0.489
25	0.516	61	0.516	97	0.434	133	0.414	169	0.481	205	0.516	241	0.516	277	0.434	313	0.414	349	0.481
26	0.513	62	0.521	98	0.440	134	0.413	170	0.473	206	0.513	242	0.521	278	0.440	314	0.413	350	0.473
27	0.509	63	0.526	99	0.447	135	0.414	171	0.465	207	0.509	243	0.526	279	0.447	315	0.414	351	0.465
28	0.504	64	0.529	100	0.455	136	0.416	172	0.457	208	0.504	244	0.529	280	0.455	316	0.416	352	0.457
29	0.499	65	0.532	101	0.463	137	0.419	173	0.449	209	0.499	245	0.532	281	0.463	317	0.419	353	0.449
30	0.492	66	0.534	102	0.470	138	0.424	174	0.442	210	0.492	246	0.534	282	0.470	318	0.424	354	0.442
31	0.485	67	0.535	103	0.478	139	0.429	175	0.435	211	0.485	247	0.535	283	0.478	319	0.429	355	0.435
32	0.478	68	0.535	104	0.485	140	0.435	176	0.429	212	0.478	248	0.535	284	0.485	320	0.435	356	0.429
33	0.470	69	0.534	105	0.492	141	0.442	177	0.424	213	0.470	249	0.534	285	0.492	321	0.442	357	0.424
34	0.463	70	0.532	106	0.499	142	0.449	178	0.419	214	0.463	250	0.532	286	0.499	322	0.449	358	0.419
35	0.455	71	0.529	107	0.504	143	0.457	179	0.416	215	0.455	251	0.529	287	0.504	323	0.457	359	0.416

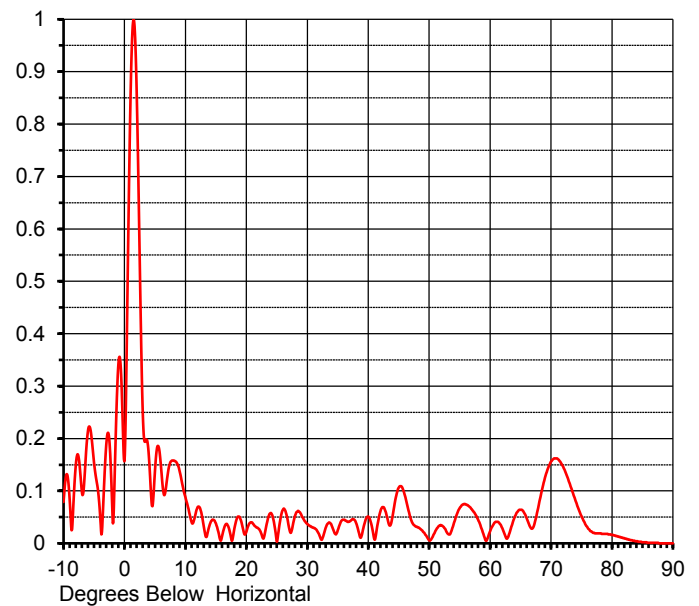
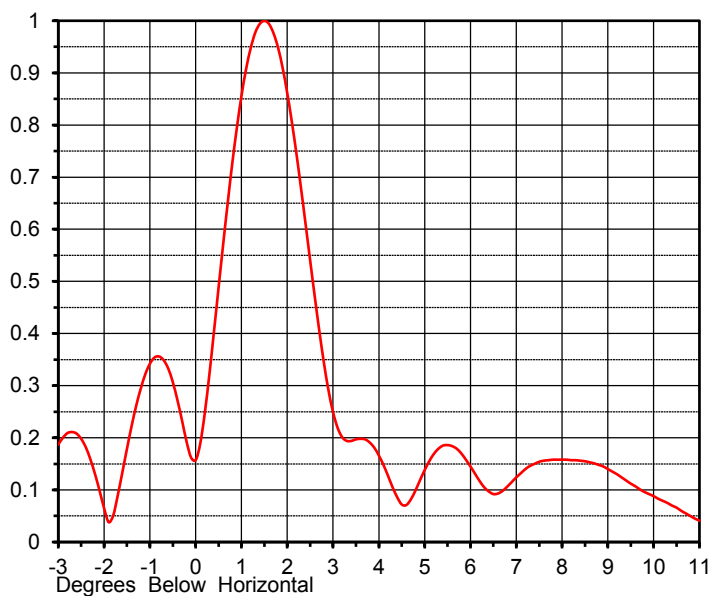
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ELEVATION PATTERN

Proposal No. **C-71902-3**
 Date **24-Feb-23**
 Call Letters **KAID**
 Channel **21**
 Frequency **515 MHz**
 Antenna Type **TFU-32GTQ/VP-R O8 BB**

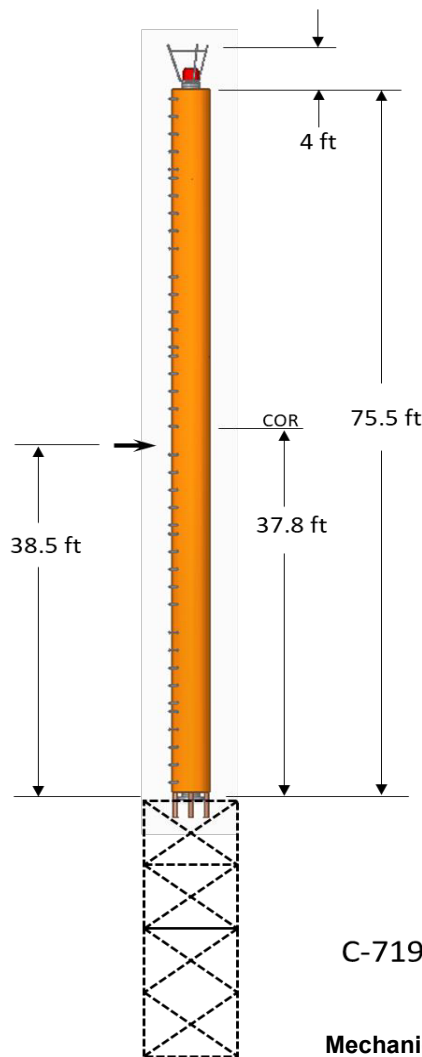
RMS Directivity at Main Lobe **27.3 (14.36 dB)**
 RMS Directivity at Horizontal **0.7 -(1.55 dB)**
Calculated

Beam Tilt **1.50 deg**
 Pattern Number **32SP273150**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.079	10.0	0.088	30.0	0.037	50.0	0.006	70.0	0.156
-9.0	0.084	11.0	0.041	31.0	0.030	51.0	0.023	71.0	0.162
-8.0	0.148	12.0	0.069	32.0	0.015	52.0	0.034	72.0	0.146
-7.0	0.099	13.0	0.033	33.0	0.029	53.0	0.019	73.0	0.116
-6.0	0.214	14.0	0.036	34.0	0.034	54.0	0.036	74.0	0.082
-5.0	0.154	15.0	0.038	35.0	0.025	55.0	0.067	75.0	0.052
-4.0	0.053	16.0	0.013	36.0	0.045	56.0	0.074	76.0	0.030
-3.0	0.187	17.0	0.033	37.0	0.042	57.0	0.065	77.0	0.020
-2.0	0.065	18.0	0.026	38.0	0.039	58.0	0.046	78.0	0.019
-1.0	0.342	19.0	0.047	39.0	0.018	59.0	0.014	79.0	0.018
0.0	0.157	20.0	0.022	40.0	0.051	60.0	0.023	80.0	0.016
1.0	0.856	21.0	0.039	41.0	0.008	61.0	0.041	81.0	0.013
2.0	0.861	22.0	0.028	42.0	0.061	62.0	0.029	82.0	0.010
3.0	0.249	23.0	0.017	43.0	0.054	63.0	0.013	83.0	0.006
4.0	0.166	24.0	0.058	44.0	0.052	64.0	0.049	84.0	0.004
5.0	0.138	25.0	0.003	45.0	0.106	65.0	0.064	85.0	0.002
6.0	0.145	26.0	0.064	46.0	0.092	66.0	0.048	86.0	0.001
7.0	0.124	27.0	0.030	47.0	0.046	67.0	0.029	87.0	0.001
8.0	0.158	28.0	0.053	48.0	0.031	68.0	0.074	88.0	0.000
9.0	0.140	29.0	0.055	49.0	0.022	69.0	0.125	89.0	0.000
								90.0	0.000

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C-71902

MECHANICAL SPECIFICATIONS

Proposal No. **C-71902-3**
 Date **24-Feb-23**
 Call Letters **KBOI**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **TFU-32GTQ/VP-R 08 BB**

Preliminary Specifications

Top Mounted

With ice TIA-222-H

Height AGL(z) 350 ft (106.7 m)
 Design Ult. Wind Speed 102 m/h (164.2 km/h)

Risk Category II
 Exposure Category B
 Topography Category 5
 7036 ft (2144.6 m)

Design Ice 1.5 in $t_{iz} = 2.44$ in
 Wind Speed w/Ice 40 m/h (64.4 km/h)

Mechanical Specifications

		without ice	with ice
Height with Lightning Protector	H4	79.5 ft (24.2m)	
Height less Lightning Protector	H2	75.5 ft (23m)	
Height of Center of Radiation	H3	37.75 ft (11.5m)	
Force Coeff. x Projected Area	CaAc	158.2 ft ² (14.7m ²)	368.3 ft ² (34.2m ²)
Moment Arm	D1	38.5 ft (11.7m)	38.6 ft (11.8m)

Weight W 19760 lb (9t) 29800 lb (13.5t)

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

Prepared by: CAB

Date: 25-May-22

ME:

EE:

Rev. No.3 by: SPJC

Date: 24-Feb-23

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Summary

Proposal No.	C-71902-3
Date	24-Feb-23
Call Letters	KAID
Channel	21
Frequency	515 MHz
Antenna Type	TFU-32GTQ/VP-R 08 BB

Antenna

	Hpol		Vpol	
ERP:	603 kW	(27.80 dBk)	151 kW	(21.78 dBk)
RMS Gain*	21.84	(13.39 dB)	5.46	(7.37 dB)

Antenna Input Power	27.6 kW	(14.41 dBk)
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Transmission Line

Type:	Rigid	Attenuation:	(0.23 dB)	
Size:	8-3/16"	Efficiency:	94.8%	
Impedance:	75 Ohm			
Length:	280 ft	85.3 m		

Combiner Losses

Attenuation	(0.30 dB)
Efficiency	93.3%

Combiner Input

31.2 kW	(14.94 dBk)
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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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