TFU-15JTH-R C250

Proposal Number:	C-70306-6
Date:	15-Jun-17
Customer:	Prairie Public
Location:	Minot, ND

Electrical Specifications

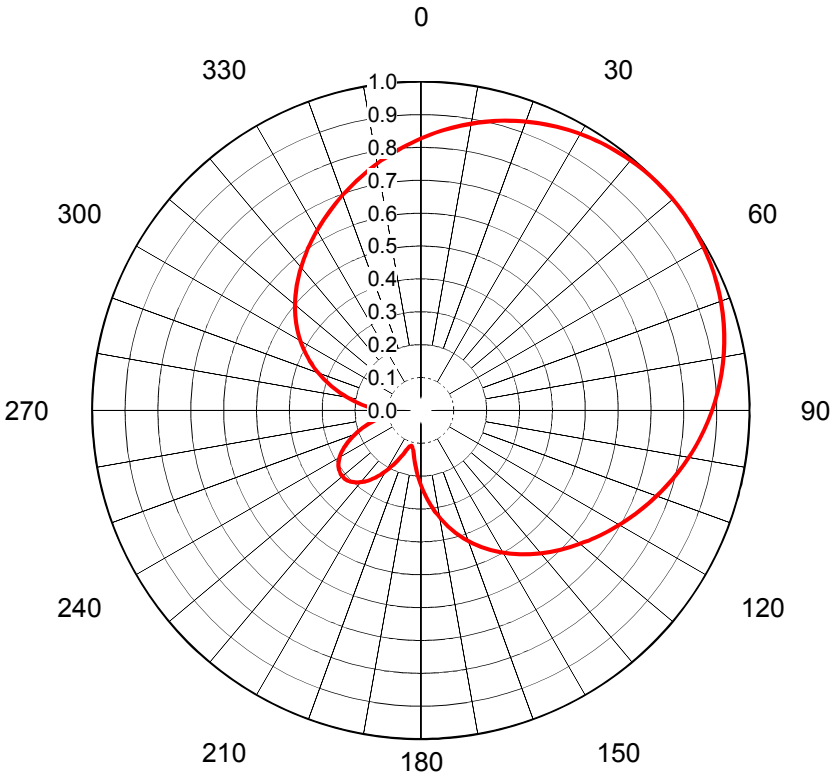
Polarization	Horizontal		
Azimuth Pattern	Directional		
Antenna Input	3-1/8"	50 Ohm	EIA/DCA
VSWR	Channel	1.08 : 1	
Bandwidth	6 MHz		
Rated Input Power	20 kW	(13.01 dBk)	Maximum Average Power

Mechanical Specifications

Mounting	Top Mounted			
Environmental Protection	Full Radome			
Height	33.8 ft (10.3m)	less Lightning Protector	37.8 ft (11.5m)	with Lightning Protector
Weight	3600 lb (1.6t)			
Effective Projected Area	34.6 ft² (3.2m²)	TIA-222-G	**Basic Wind Speed**	90 m/h (144.8 km/h)

Channel Specifications

Call	CH	Freq	Hpol ERP	TPO	Peak Main Lobe Hpol Gain	Peak at Horizontal Hpol Gain
KSRE	15	479 MHz	36.2 kW (15.59 dBk)	1.7 kW (2.35 dBk)	35.45 (15.50dB)	31.06 (14.92dB)



AZIMUTH PATTERN
Horizontal Polarization

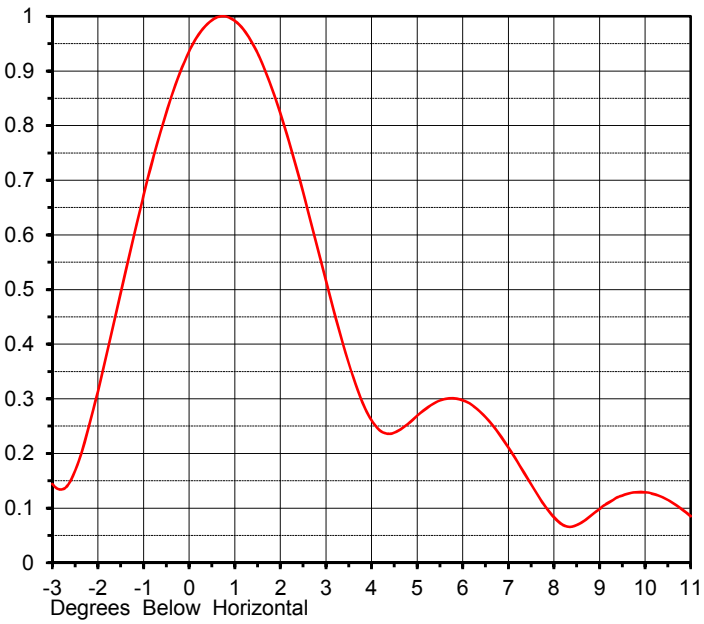
Proposal No.	**C-70306-6**
Date	**15-Jun-17**
Call Letters	**KSRE 15**
Frequency	**479 MHz**
Antenna Type	**TFU-15JTH-R C250**
Gain	**2.45 (3.88dB) Calculated**
Directional Drawing #	**H8625-S2-CH15**

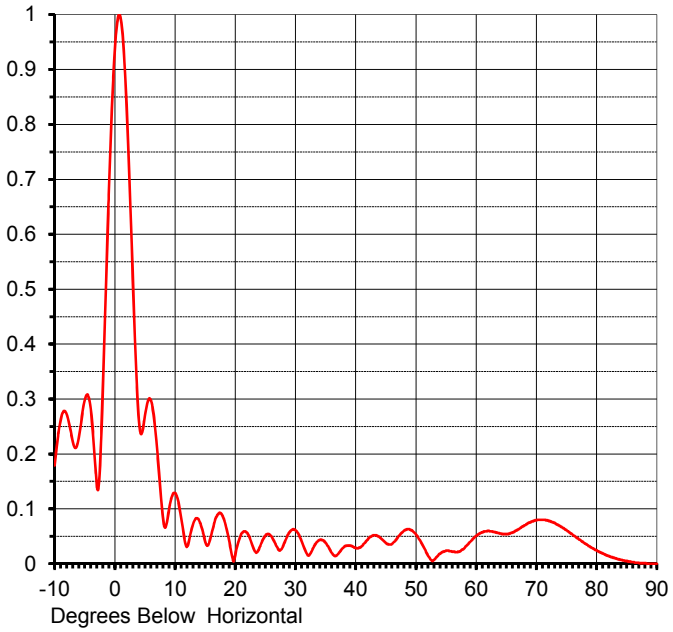
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.827	36	0.986	72	0.965	108	0.776	144	0.541	180	0.227	216	0.261	252	0.196	288	0.312	324	0.593
1	0.834	37	0.988	73	0.962	109	0.769	145	0.535	181	0.216	217	0.268	253	0.187	289	0.322	325	0.600
2	0.840	38	0.990	74	0.958	110	0.763	146	0.528	182	0.205	218	0.274	254	0.178	290	0.332	326	0.606
3	0.846	39	0.991	75	0.955	111	0.756	147	0.521	183	0.195	219	0.280	255	0.169	291	0.342	327	0.613
4	0.852	40	0.993	76	0.951	112	0.750	148	0.514	184	0.184	220	0.285	256	0.160	292	0.351	328	0.619
5	0.858	41	0.994	77	0.947	113	0.743	149	0.507	185	0.174	221	0.290	257	0.152	293	0.361	329	0.625
6	0.864	42	0.995	78	0.943	114	0.736	150	0.500	186	0.164	222	0.295	258	0.143	294	0.370	330	0.632
7	0.869	43	0.996	79	0.939	115	0.730	151	0.493	187	0.155	223	0.299	259	0.136	295	0.379	331	0.638
8	0.875	44	0.997	80	0.935	116	0.723	152	0.486	188	0.146	224	0.302	260	0.129	296	0.389	332	0.645
9	0.881	45	0.998	81	0.931	117	0.717	153	0.478	189	0.138	225	0.305	261	0.123	297	0.397	333	0.651
10	0.886	46	0.999	82	0.926	118	0.710	154	0.471	190	0.130	226	0.308	262	0.118	298	0.406	334	0.658
11	0.892	47	0.999	83	0.922	119	0.703	155	0.463	191	0.124	227	0.310	263	0.114	299	0.415	335	0.664
12	0.897	48	1.000	84	0.917	120	0.697	156	0.455	192	0.119	228	0.311	264	0.112	300	0.423	336	0.671
13	0.902	49	1.000	85	0.912	121	0.690	157	0.448	193	0.115	229	0.312	265	0.111	301	0.431	337	0.677
14	0.907	50	1.000	86	0.907	122	0.684	158	0.440	194	0.112	230	0.310	266	0.112	302	0.440	338	0.684
15	0.912	51	1.000	87	0.902	123	0.677	159	0.431	195	0.111	231	0.312	267	0.115	303	0.448	339	0.690
16	0.917	52	1.000	88	0.897	124	0.671	160	0.423	196	0.112	232	0.311	268	0.119	304	0.455	340	0.697
17	0.922	53	0.999	89	0.892	125	0.664	161	0.415	197	0.114	233	0.310	269	0.124	305	0.463	341	0.703
18	0.926	54	0.999	90	0.886	126	0.658	162	0.406	198	0.118	234	0.308	270	0.130	306	0.471	342	0.710
19	0.931	55	0.998	91	0.881	127	0.651	163	0.397	199	0.123	235	0.305	271	0.138	307	0.478	343	0.716
20	0.935	56	0.997	92	0.875	128	0.645	164	0.389	200	0.129	236	0.302	272	0.146	308	0.486	344	0.723
21	0.939	57	0.996	93	0.869	129	0.638	165	0.379	201	0.136	237	0.299	273	0.155	309	0.493	345	0.730
22	0.943	58	0.995	94	0.864	130	0.632	166	0.370	202	0.143	238	0.295	274	0.164	310	0.500	346	0.736
23	0.947	59	0.994	95	0.858	131	0.625	167	0.361	203	0.152	239	0.290	275	0.174	311	0.507	347	0.743
24	0.951	60	0.993	96	0.852	132	0.619	168	0.351	204	0.160	240	0.285	276	0.184	312	0.514	348	0.750
25	0.955	61	0.991	97	0.846	133	0.613	169	0.342	205	0.169	241	0.280	277	0.195	313	0.521	349	0.756
26	0.958	62	0.990	98	0.840	134	0.606	170	0.332	206	0.178	242	0.274	278	0.205	314	0.528	350	0.763
27	0.962	63	0.988	99	0.834	135	0.600	171	0.322	207	0.187	243	0.268	279	0.216	315	0.535	351	0.769
28	0.965	64	0.986	100	0.827	136	0.593	172	0.312	208	0.196	244	0.261	280	0.227	316	0.541	352	0.776
29	0.968	65	0.984	101	0.821	137	0.587	173	0.301	209	0.205	245	0.254	281	0.238	317	0.548	353	0.782
30	0.971	66	0.981	102	0.815	138	0.581	174	0.291	210	0.213	246	0.246	282	0.248	318	0.555	354	0.789
31	0.974	67	0.979	103	0.808	139	0.574	175	0.280	211	0.222	247	0.239	283	0.259	319	0.561	355	0.795
32	0.977	68	0.977	104	0.802	140	0.568	176	0.270	212	0.230	248	0.230	284	0.270	320	0.568	356	0.802
33	0.979	69	0.974	105	0.796	141	0.561	177	0.259	213	0.238	249	0.222	285	0.280	321	0.574	357	0.808
34	0.981	70	0.971	106	0.789	142	0.555	178	0.248	214	0.246	250	0.213	286	0.291	322	0.581	358	0.815
35	0.984	71	0.968	107	0.783	143	0.548	179	0.238	215	0.254	251	0.205	287	0.301	323	0.587	359	0.821

ELEVATION PATTERN

Proposal No.	**C-70306-6**
Date	**15-Jun-17**
Call Letters	**KSRE 15**
Frequency	**479 MHz**
Antenna Type	**TFU-15JTH-R C250**

RMS Directivity at Main Lobe	**14.50 (11.61 dB)**	Beam Tilt	**0.75 deg**
RMS Directivity at Horizontal	**12.70 (11.04 dB)**	Drawing Number	**15Q145075**
	Calculated		





Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.179	10.0	0.129	30.0	0.061	50.0	0.053	70.0	0.079
-9.0	0.261	11.0	0.085	31.0	0.042	51.0	0.036	71.0	0.080
-8.0	0.273	12.0	0.031	32.0	0.016	52.0	0.015	72.0	0.078
-7.0	0.224	13.0	0.073	33.0	0.030	53.0	0.007	73.0	0.074
-6.0	0.228	14.0	0.079	34.0	0.043	54.0	0.018	74.0	0.068
-5.0	0.298	15.0	0.041	35.0	0.038	55.0	0.024	75.0	0.061
-4.0	0.282	16.0	0.051	36.0	0.020	56.0	0.022	76.0	0.053
-3.0	0.144	17.0	0.088	37.0	0.017	57.0	0.022	77.0	0.045
-2.0	0.314	18.0	0.084	38.0	0.030	58.0	0.028	78.0	0.037
-1.0	0.672	19.0	0.041	39.0	0.033	59.0	0.040	79.0	0.030
0.0	0.936	20.0	0.016	40.0	0.029	60.0	0.051	80.0	0.024
1.0	0.992	21.0	0.054	41.0	0.032	61.0	0.057	81.0	0.019
2.0	0.823	22.0	0.056	42.0	0.044	62.0	0.060	82.0	0.014
3.0	0.516	23.0	0.029	43.0	0.052	63.0	0.058	83.0	0.010
4.0	0.261	24.0	0.029	44.0	0.048	64.0	0.055	84.0	0.007
5.0	0.269	25.0	0.051	45.0	0.038	65.0	0.054	85.0	0.005
6.0	0.297	26.0	0.050	46.0	0.036	66.0	0.057	86.0	0.003
7.0	0.211	27.0	0.029	47.0	0.048	67.0	0.063	87.0	0.002
8.0	0.083	28.0	0.034	48.0	0.060	68.0	0.070	88.0	0.001
9.0	0.098	29.0	0.057	49.0	0.062	69.0	0.076	89.0	0.000
								90.0	0.000

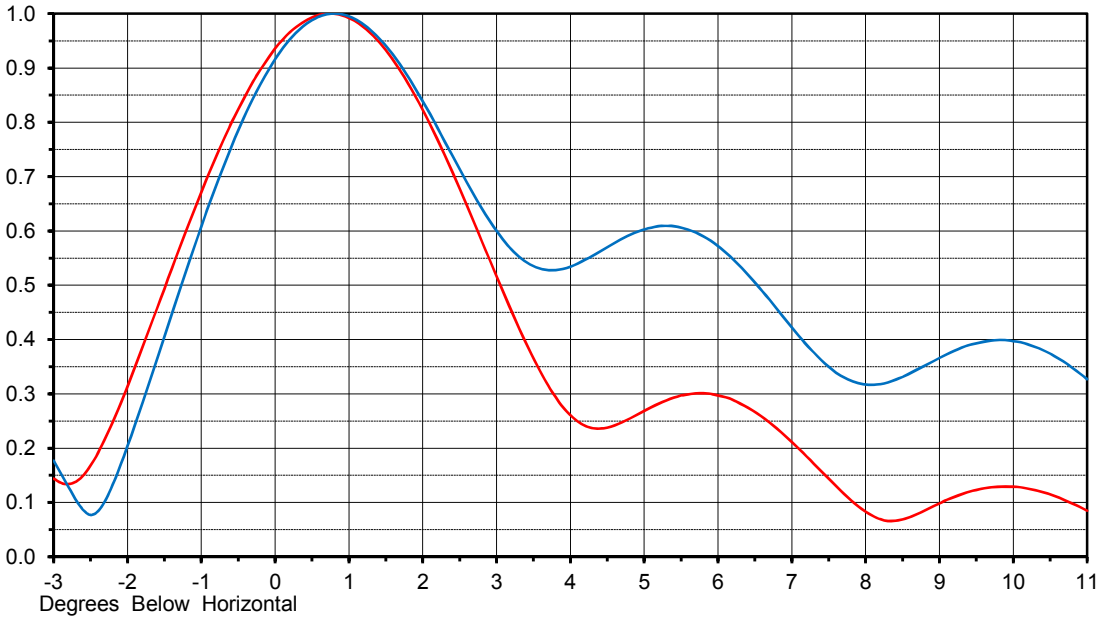
Dielectric®

FutureFill *refers to the use of predetermined illuminations with broadband panels or limited bandwidth slotted coaxial antennas that can be modified in the field to provide the flexibility to customize the null structure at a future date.*

FutureFill OVERLAY

Proposal No.	**C-70306-6**
Date	**15-Jun-17**
Call Letters	**KSRE** **15**
Frequency	**479 MHz**
Antenna Type	**TFU-15JTH-R C250**

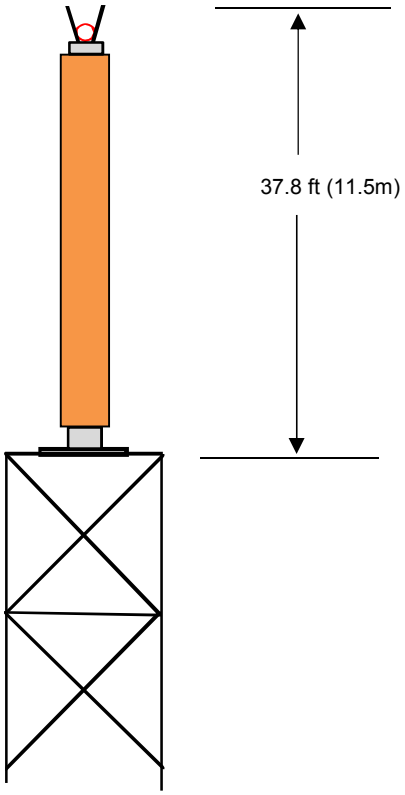
RMS Directivity	14.50	**(11.6 dB)**	Beam Tilt	0.75	Drawing No.	15Q145075 Red
RMS Directivity Calculated	9.49	**(9.8 dB)**	Beam Tilt	0.80	Drawing No.	15Q145008-FF Blue



Tabulations for 15Q145008-FF

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.451	10.0	0.397	30.0	0.078	50.0	0.018	70.0	0.071
-9.0	0.540	11.0	0.327	31.0	0.062	51.0	0.040	71.0	0.073
-8.0	0.503	12.0	0.199	32.0	0.037	52.0	0.064	72.0	0.074
-7.0	0.315	13.0	0.117	33.0	0.025	53.0	0.084	73.0	0.071
-6.0	0.048	14.0	0.149	34.0	0.021	54.0	0.095	74.0	0.067
-5.0	0.227	15.0	0.198	35.0	0.012	55.0	0.099	75.0	0.060
-4.0	0.315	16.0	0.226	36.0	0.040	56.0	0.098	76.0	0.053
-3.0	0.177	17.0	0.220	37.0	0.075	57.0	0.099	77.0	0.046
-2.0	0.204	18.0	0.174	38.0	0.100	58.0	0.106	78.0	0.038
-1.0	0.608	19.0	0.122	39.0	0.108	59.0	0.118	79.0	0.031
0.0	0.916	20.0	0.137	40.0	0.108	60.0	0.128	80.0	0.025
1.0	0.995	21.0	0.171	41.0	0.115	61.0	0.134	81.0	0.019
2.0	0.839	22.0	0.164	42.0	0.131	62.0	0.133	82.0	0.014
3.0	0.600	23.0	0.110	43.0	0.145	63.0	0.124	83.0	0.011
4.0	0.534	24.0	0.040	44.0	0.145	64.0	0.110	84.0	0.007
5.0	0.603	25.0	0.014	45.0	0.129	65.0	0.094	85.0	0.005
6.0	0.572	26.0	0.029	46.0	0.102	66.0	0.079	86.0	0.003
7.0	0.422	27.0	0.007	47.0	0.072	67.0	0.069	87.0	0.002
8.0	0.317	28.0	0.034	48.0	0.043	68.0	0.066	88.0	0.001
9.0	0.366	29.0	0.068	49.0	0.020	69.0	0.068	89.0	0.000
								90.0	0.000

MECHANICALS



Proposal No.	**C-70306-6**	
Date	**15-Jun-17**	
Call Letters	**KSRE**	**15**
Frequency	**479 MHz**	
Antenna Type	**TFU-15JTH-R C250**	

Preliminary Specifications

Top Mounted

Mechanical Specification without ice TIA-222-G

Basic Wind Speed	90 m/h (144.8 km/h)
Structure Class	II
Exposure Category	C
Topography Category	1

Mechanical Specifications with ice TIA-222-G

Design Ice	0.5 in	t_{iz} = 1.40 in
Wind Speed w/Ice	60 m/h (96.6 km/h)	

Mechanical Specifications		**without ice**	**with ice**
Height with Lightning Protector	H4	37.8 ft (11.5m)	
Height less Lightning Protector	H2	33.8 ft (10.3m)	
Height of Center of Radiation	H3	16.9 ft (5.2m)	
Effective Projected Area	$(EPA)_S$	34.6 ft² (3.2m²)	95.4 ft² (8.9m²)
Moment Arm	D1	18.7 ft (5.7m)	19.1 ft (5.8m)
Weight	W	3600 lb (1.6t)	5200 lb (2.4t)

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

Prepared by:	JBC	**Date:**	15-Jun-17	**ME:**	**EE:**
Rev. No.6 by:	jls	**Date:**	6-Jul-17		

Summary

Proposal No.	**C-70306-6**	
Date	**15-Jun-17**	
Call Letters	**KSRE**	**15 DTV**
Frequency	**479 MHz**	
Antenna Type	**TFU-15JTH-R C250**	

Antenna

	Hpol	
ERP:	**36.2 kW**	**(15.59 dBk)**
Peak Gain*	35.45	(15.50 dB)

Antenna Input Power

1.0 kW **(0.09 dBk)**

Transmission Line

Type	Rigid	Attenuation	(2.26 dB)
Size	Size 3-1/8"	Efficiency	59.4%
Impedance	50 Ohm		
Length	1000 ft	304.8 m	

Transmitter Output

1.7 kW **(2.35 dBk)**

Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole.

**Antenna Gain includes feed system losses