



Specification Number
Date
Call Letters
Channel
Location
Antenna Type
Customer

1113:3:152447
January 7, 2003
KCGE
DT16
Crookston MN, MN
TFU-16GTH-R C170
Prairie Public Broadcasting

SPECIFICATION SHEET

Electrical Specifications		Value		Remarks
		Ratio	dB	
RMS Gain at Main Lobe over Halfwave Dipole	Hpol			
	Vpol			
RMS Gain at Horizontal over Halfwave Dipole	Hpol			
	Vpol			
Peak Directional Gain at Main Lobe over Halfwave Dipole	Hpol	23.0	13.62	
	Vpol			
Peak Directional Gain at Horizontal over Halfwave Dipole	Hpol	20.6	13.14	
	Vpol			
Circularity				
Axial Ratio				
Beam Tilt		0.75 deg		
Average Power DTV		21 kW	13.22 dBk	
Antenna Input: T/L		3 1/8 inch	50 ohm EIA	
Maximum Antenna Input VSWR				
		Channel 1.08:1		
Patterns	Azimuth	TFU-C170		
	Elevation	16G135075	16G135075-90	
Mechanical Specifications		Metric	English	Preliminary
Height with Lightning Protector	H4	12.0 m	39.5 ft	
Height Less Lightning Protector	H2	10.8 m	35.5 ft	
Height of Center of Radiation	H3	5.4 m	17.8 ft	
Basic Wind Speed	V	136.8 km/h	85 mi/h	
Force Coeff. x Projected Area	CaAc	1.9 m ²	20.1 ft ²	
Moment Arm	D1	6.5 m	21.3 ft	
Force Coeff. x Projected Area	CaAc			
Moment Arm	D3			
Pole Bury Length	D2			
Weight	W	1.5 t	3400 lbs	
Radome				
Antenna designed in accordance with AISC specifications for design of structural steel for building as prescribed by TIA/EIA-222-F				

Exhibit 7.1

TFU-16GTH-R C170
Specification Sheet

Prairie Public Broadcasting, Inc.
Fargo, ND

Azimuth Pattern

Gain
Calculated / measured

1.7
Calculated

(2.30dB)

Frequency
Drawing#

485 MHz
TFU-C170

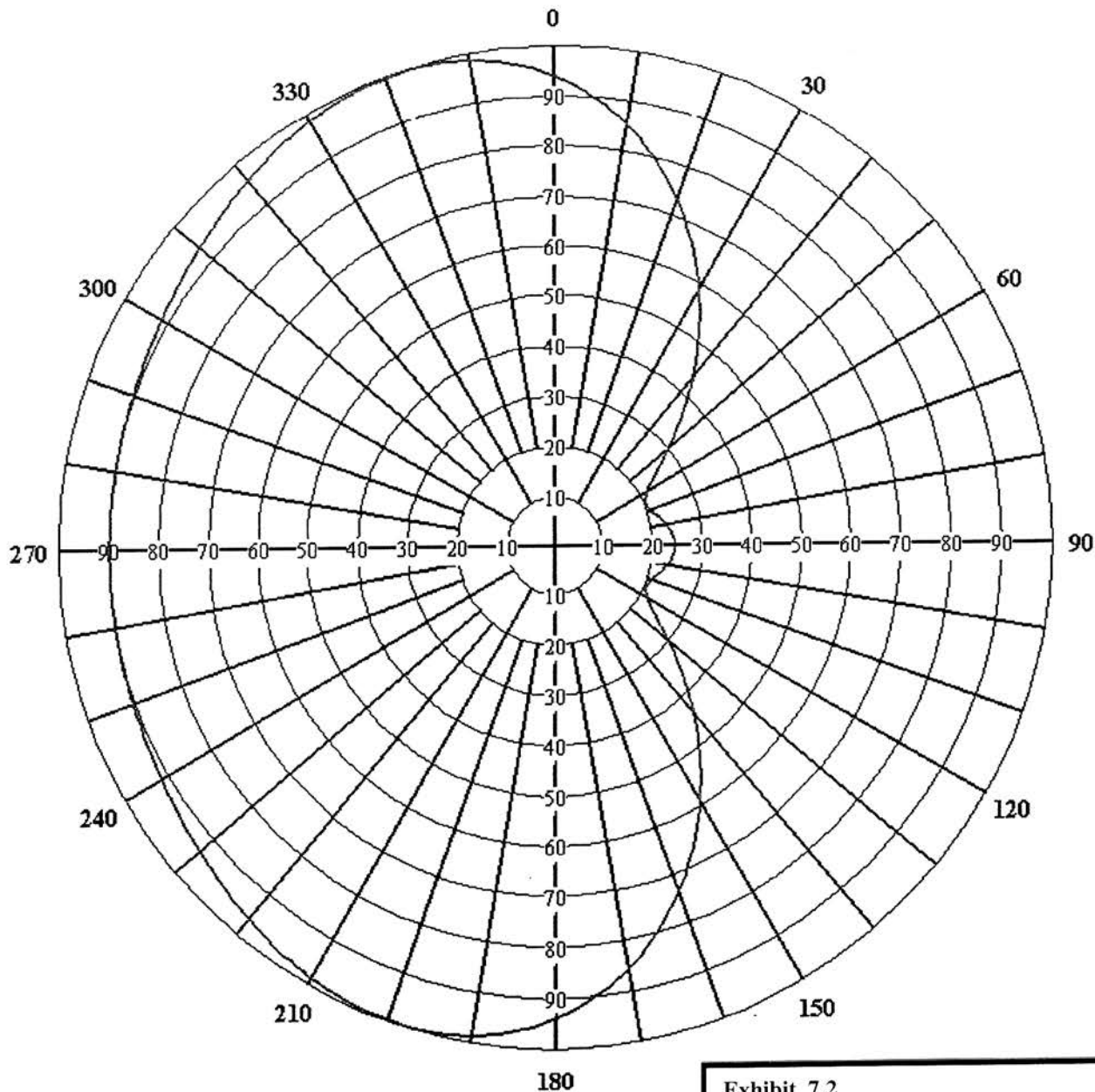


Exhibit 7.2

TFU-16GTH-R C170
Azimuth Pattern

Prairie Public Broadcasting, Inc.
Fargo, ND



Specification Number
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Call Letters
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1113:3:152447
January 7, 2003
KCGE
16
Crookston MN, MN
TFU-16GTH-R C170
Prairie Public Broadcasting

TABULATION OF AZIMUTH PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.940	45	0.365	90	0.245	135	0.365	180	0.940	225	0.949	270	0.899	315	0.949
1	0.933	46	0.352	91	0.244	136	0.379	181	0.946	226	0.946	271	0.899	316	0.952
2	0.925	47	0.338	92	0.244	137	0.393	182	0.952	227	0.944	272	0.899	317	0.954
3	0.918	48	0.326	93	0.243	138	0.407	183	0.958	228	0.941	273	0.899	318	0.957
4	0.910	49	0.313	94	0.242	139	0.422	184	0.963	229	0.939	274	0.899	319	0.960
5	0.901	50	0.302	95	0.241	140	0.437	185	0.968	230	0.936	275	0.900	320	0.963
6	0.893	51	0.290	96	0.240	141	0.451	186	0.973	231	0.934	276	0.900	321	0.965
7	0.883	52	0.280	97	0.238	142	0.466	187	0.977	232	0.932	277	0.900	322	0.968
8	0.874	53	0.269	98	0.236	143	0.482	188	0.981	233	0.930	278	0.900	323	0.971
9	0.864	54	0.260	99	0.234	144	0.497	189	0.984	234	0.928	279	0.900	324	0.973
10	0.854	55	0.251	100	0.232	145	0.512	190	0.987	235	0.926	280	0.900	325	0.976
11	0.843	56	0.243	101	0.229	146	0.527	191	0.990	236	0.924	281	0.901	326	0.978
12	0.832	57	0.235	102	0.227	147	0.543	192	0.992	237	0.922	282	0.901	327	0.981
13	0.821	58	0.229	103	0.224	148	0.558	193	0.994	238	0.920	283	0.901	328	0.983
14	0.809	59	0.223	104	0.222	149	0.573	194	0.996	239	0.918	284	0.902	329	0.986
15	0.797	60	0.218	105	0.219	150	0.588	195	0.997	240	0.917	285	0.902	330	0.988
16	0.785	61	0.214	106	0.216	151	0.604	196	0.998	241	0.915	286	0.903	331	0.990
17	0.773	62	0.210	107	0.214	152	0.619	197	0.999	242	0.914	287	0.903	332	0.992
18	0.760	63	0.207	108	0.211	153	0.634	198	1.000	243	0.912	288	0.904	333	0.993
19	0.747	64	0.206	109	0.209	154	0.648	199	1.000	244	0.911	289	0.905	334	0.995
20	0.733	65	0.204	110	0.207	155	0.663	200	1.000	245	0.910	290	0.905	335	0.996
21	0.720	66	0.204	111	0.206	156	0.677	201	1.000	246	0.909	291	0.906	336	0.997
22	0.706	67	0.204	112	0.205	157	0.692	202	0.999	247	0.908	292	0.907	337	0.998
23	0.692	68	0.205	113	0.204	158	0.706	203	0.998	248	0.907	293	0.908	338	0.999
24	0.677	69	0.206	114	0.204	159	0.720	204	0.997	249	0.906	294	0.909	339	1.000
25	0.663	70	0.207	115	0.204	160	0.733	205	0.996	250	0.905	295	0.910	340	1.000
26	0.648	71	0.209	116	0.206	161	0.747	206	0.995	251	0.905	296	0.911	341	1.000
27	0.634	72	0.211	117	0.207	162	0.760	207	0.993	252	0.904	297	0.912	342	1.000
28	0.619	73	0.214	118	0.210	163	0.773	208	0.992	253	0.903	298	0.914	343	0.999
29	0.604	74	0.216	119	0.214	164	0.785	209	0.990	254	0.903	299	0.915	344	0.998
30	0.588	75	0.219	120	0.218	165	0.797	210	0.988	255	0.902	300	0.917	345	0.997
31	0.573	76	0.222	121	0.223	166	0.809	211	0.986	256	0.902	301	0.918	346	0.996
32	0.558	77	0.224	122	0.229	167	0.821	212	0.983	257	0.901	302	0.920	347	0.994
33	0.543	78	0.227	123	0.235	168	0.832	213	0.981	258	0.901	303	0.922	348	0.992
34	0.527	79	0.229	124	0.243	169	0.843	214	0.978	259	0.901	304	0.924	349	0.990
35	0.512	80	0.232	125	0.251	170	0.854	215	0.976	260	0.900	305	0.926	350	0.987
36	0.497	81	0.234	126	0.260	171	0.864	216	0.973	261	0.900	306	0.928	351	0.984
37	0.482	82	0.236	127	0.269	172	0.874	217	0.971	262	0.900	307	0.930	352	0.981
38	0.466	83	0.238	128	0.280	173	0.883	218	0.968	263	0.900	308	0.932	353	0.977
39	0.451	84	0.240	129	0.290	174	0.893	219	0.965	264	0.900	309	0.934	354	0.973
40	0.437	85	0.241	130	0.302	175	0.901	220	0.963	265	0.900	310	0.936	355	0.968
41	0.422	86	0.242	131	0.313	176	0.910	221	0.960	266	0.899	311	0.939	356	0.963
42	0.407	87	0.243	132	0.326	177	0.918	222	0.957	267	0.899	312	0.941	357	0.958
43	0.393	88	0.244	133	0.338	178	0.925	223	0.954	268	0.899	313	0.944	358	0.952
44	0.379	89	0.244	134	0.352	179	0.933	224	0.952	269	0.899	314	0.946	359	0.946

Exhibit 7.3

TFU-16GTH-R C170
Azimuth Pattern Tabulation

Prairie Public Broadcasting, Inc.
Fargo, ND



Call Letters **KCGE-DT** Channel **16**
Location **Crookston, MN**
Customer **Prairie Public Broadcasting**
Antenna Type **TFU-16GTH-R C170**

TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # **TFU-C170**

Angle	Field	ERP (kW)	ERP (dBk)
0	0.940	92.8	19.67
10	0.854	76.6	18.84
20	0.733	56.4	17.51
30	0.588	36.3	15.60
40	0.437	20.1	13.02
50	0.302	9.6	9.81
60	0.218	5.0	6.98
70	0.207	4.5	6.53
80	0.232	5.7	7.52
90	0.245	6.3	8.00
100	0.232	5.7	7.52
110	0.207	4.5	6.53
120	0.218	5.0	6.98
130	0.302	9.6	9.81
140	0.437	20.1	13.02
150	0.588	36.3	15.60
160	0.733	56.4	17.51
170	0.854	76.6	18.84
180	0.940	92.8	19.67
190	0.987	102.3	20.10
200	1.000	105.0	20.21
210	0.988	102.5	20.11
220	0.963	97.4	19.88
230	0.936	92.0	19.64
240	0.917	88.3	19.46
250	0.905	86.0	19.34
260	0.900	85.1	19.30
270	0.899	84.9	19.29
280	0.900	85.1	19.30
290	0.905	86.0	19.34
300	0.917	88.3	19.46
310	0.936	92.0	19.64
320	0.963	97.4	19.88
330	0.988	102.5	20.11
340	1.000	105.0	20.21
350	0.987	102.3	20.10

Maxima

Angle	Field	ERP (kW)	ERP (dBk)
0	0.940	92.8	19.67
90	0.245	6.3	8.00
199	1.000	105.0	20.21
341	1.000	105.0	20.21

Minima

Angle	Field	ERP (kW)	ERP (dBk)
66	0.204	4.4	6.40
114	0.204	4.4	6.40
270	0.899	84.9	19.29

Exhibit 7.4

TFU-16GTH-R C170
Maxima and Minima

Prairie Public Broadcasting, Inc.
Fargo, ND



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TFU-16GTH-R C170
Prairie Public Broadcasting

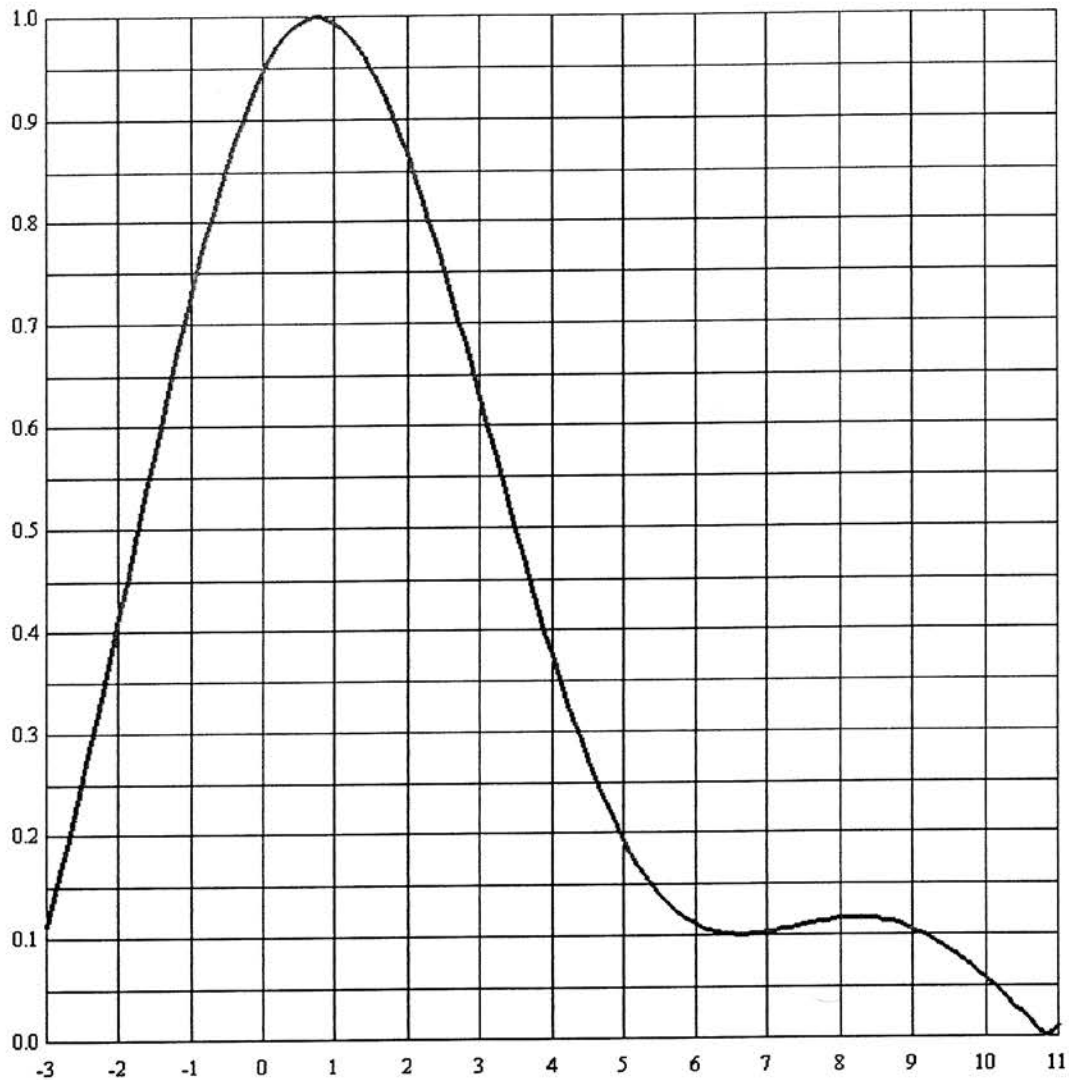
Elevation Pattern

RMS Gain at Main Lobe 13.5
RMS Gain at Horizontal 12.1
Calculated / Measured Calculated

11.30 dB
10.83 dB

Beam Tilt
Frequency
Drawing#

0.75 degrees
485 MHz
16G135075-90



Degrees below horizontal.

Exhibit 7.5

TFU-16GTH-R C170
Elevation Pattern

Prairie Public Broadcasting, Inc.
Fargo, ND



Specification Number
Date
Call Letters
Channel
Location
Antenna Type
Customer

1113:3:152447
January 7, 2003
KCGE
16
Crookston MN, MN
TFU-16GTH-R C170
Prairie Public Broadcasting

TABULATION OF ELEVATION PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.168	2.4	0.778	10.6	0.017	30.5	0.007	51.0	0.014	71.5	0.138
-9.5	0.141	2.6	0.729	10.8	0.003	31.0	0.013	51.5	0.022	72.0	0.135
-9.0	0.114	2.8	0.679	11.0	0.011	31.5	0.022	52.0	0.032	72.5	0.131
-8.5	0.093	3.0	0.626	11.5	0.042	32.0	0.035	52.5	0.043	73.0	0.127
-8.0	0.083	3.2	0.574	12.0	0.068	32.5	0.051	53.0	0.054	73.5	0.122
-7.5	0.085	3.4	0.522	12.5	0.085	33.0	0.067	53.5	0.066	74.0	0.117
-7.0	0.100	3.6	0.471	13.0	0.094	33.5	0.082	54.0	0.076	74.5	0.111
-6.5	0.123	3.8	0.422	13.5	0.095	34.0	0.096	54.5	0.086	75.0	0.105
-6.0	0.147	4.0	0.375	14.0	0.091	34.5	0.105	55.0	0.094	75.5	0.099
-5.5	0.165	4.2	0.331	14.5	0.085	35.0	0.110	55.5	0.100	76.0	0.092
-5.0	0.167	4.4	0.291	15.0	0.079	35.5	0.111	56.0	0.104	76.5	0.086
-4.5	0.145	4.6	0.254	15.5	0.075	36.0	0.106	56.5	0.107	77.0	0.080
-4.0	0.092	4.8	0.222	16.0	0.074	36.5	0.097	57.0	0.107	77.5	0.074
-3.5	0.006	5.0	0.193	16.5	0.077	37.0	0.085	57.5	0.107	78.0	0.068
-3.0	0.112	5.2	0.169	17.0	0.083	37.5	0.072	58.0	0.104	78.5	0.062
-2.8	0.167	5.4	0.149	17.5	0.090	38.0	0.058	58.5	0.101	79.0	0.056
-2.6	0.226	5.6	0.132	18.0	0.095	38.5	0.046	59.0	0.098	79.5	0.051
-2.4	0.287	5.8	0.120	18.5	0.096	39.0	0.036	59.5	0.094	80.0	0.046
-2.2	0.351	6.0	0.111	19.0	0.092	39.5	0.029	60.0	0.091	80.5	0.041
-2.0	0.416	6.2	0.105	19.5	0.082	40.0	0.026	60.5	0.088	81.0	0.037
-1.8	0.481	6.4	0.101	20.0	0.067	40.5	0.028	61.0	0.086	81.5	0.032
-1.6	0.546	6.6	0.100	20.5	0.046	41.0	0.032	61.5	0.085	82.0	0.029
-1.4	0.610	6.8	0.101	21.0	0.022	41.5	0.039	62.0	0.085	82.5	0.025
-1.2	0.672	7.0	0.103	21.5	0.002	42.0	0.048	62.5	0.086	83.0	0.022
-1.0	0.730	7.2	0.106	22.0	0.025	42.5	0.057	63.0	0.088	83.5	0.019
-0.8	0.784	7.4	0.109	22.5	0.042	43.0	0.066	63.5	0.091	84.0	0.016
-0.6	0.834	7.6	0.112	23.0	0.054	43.5	0.073	64.0	0.095	84.5	0.014
-0.4	0.878	7.8	0.114	23.5	0.059	44.0	0.077	64.5	0.099	85.0	0.011
-0.2	0.916	8.0	0.116	24.0	0.058	44.5	0.078	65.0	0.104	85.5	0.010
0.0	0.948	8.2	0.117	24.5	0.050	45.0	0.076	65.5	0.109	86.0	0.008
0.2	0.972	8.4	0.116	25.0	0.039	45.5	0.071	66.0	0.115	86.5	0.006
0.4	0.989	8.6	0.114	25.5	0.025	46.0	0.064	66.5	0.120	87.0	0.005
0.6	0.998	8.8	0.111	26.0	0.012	46.5	0.054	67.0	0.125	87.5	0.004
0.8	1.000	9.0	0.105	26.5	0.001	47.0	0.044	67.5	0.130	88.0	0.003
1.0	0.994	9.2	0.098	27.0	0.008	47.5	0.033	68.0	0.134	88.5	0.002
1.2	0.981	9.4	0.090	27.5	0.012	48.0	0.023	68.5	0.137	89.0	0.001
1.4	0.962	9.6	0.080	28.0	0.013	48.5	0.015	69.0	0.139	89.5	0.000
1.6	0.935	9.8	0.069	28.5	0.012	49.0	0.009	69.5	0.141	90.0	0.000
1.8	0.903	10.0	0.057	29.0	0.009	49.5	0.006	70.0	0.141		
2.0	0.866	10.2	0.044	29.5	0.006	50.0	0.006	70.5	0.141		
2.2	0.824	10.4	0.030	30.0	0.005	50.5	0.009	71.0	0.140		

Exhibit 7.6

TFU-16GTH-R C170
Elevation Pattern Tabulation

Prairie Public Broadcasting, Inc.
Fargo, ND