

TECHNICAL EXHIBIT
APPLICATION FOR FM LICENSE TO COVER
FACILITY ID 139284
COMANCHE TRAIL TEXAS
CH 293D 99 WATTS

Technical Narrative

The technical exhibit of which this narrative is part was prepared in support of a license to cover for an FM translator at Comanche Trail, Texas (FCC File No. BPFT-20100421ABH, Facility ID 139284).

Compliance with Section 73.317 (b – d)

Per the construction permit issued July 19, 2010, Measurements were made to establish that the operation authorized in the construction permit is in compliance with the spurious emissions requirements of 47 C.F.R. Sections 73.317(b) through 73.317(d). The measurements were performed using a calibrated spectrum analyzer manufactured by Z-Technology Model # R-507 with a calibration expiration date of April, 2011. The results of the measurements appear in Figure 1 below and show that all results comply with Section 73.317 (b) through (d).

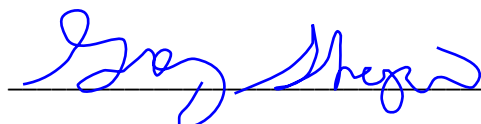
K293BF Antenna System Calculations

Figure 2, appearing below, demonstrate the antenna, transmission line and combiner system loss calculations. The transmission line system plumbing contains a total of 22 connectors and was calculated at 0.125 dB. loss per connector.

K293BF Directional Pattern Certification

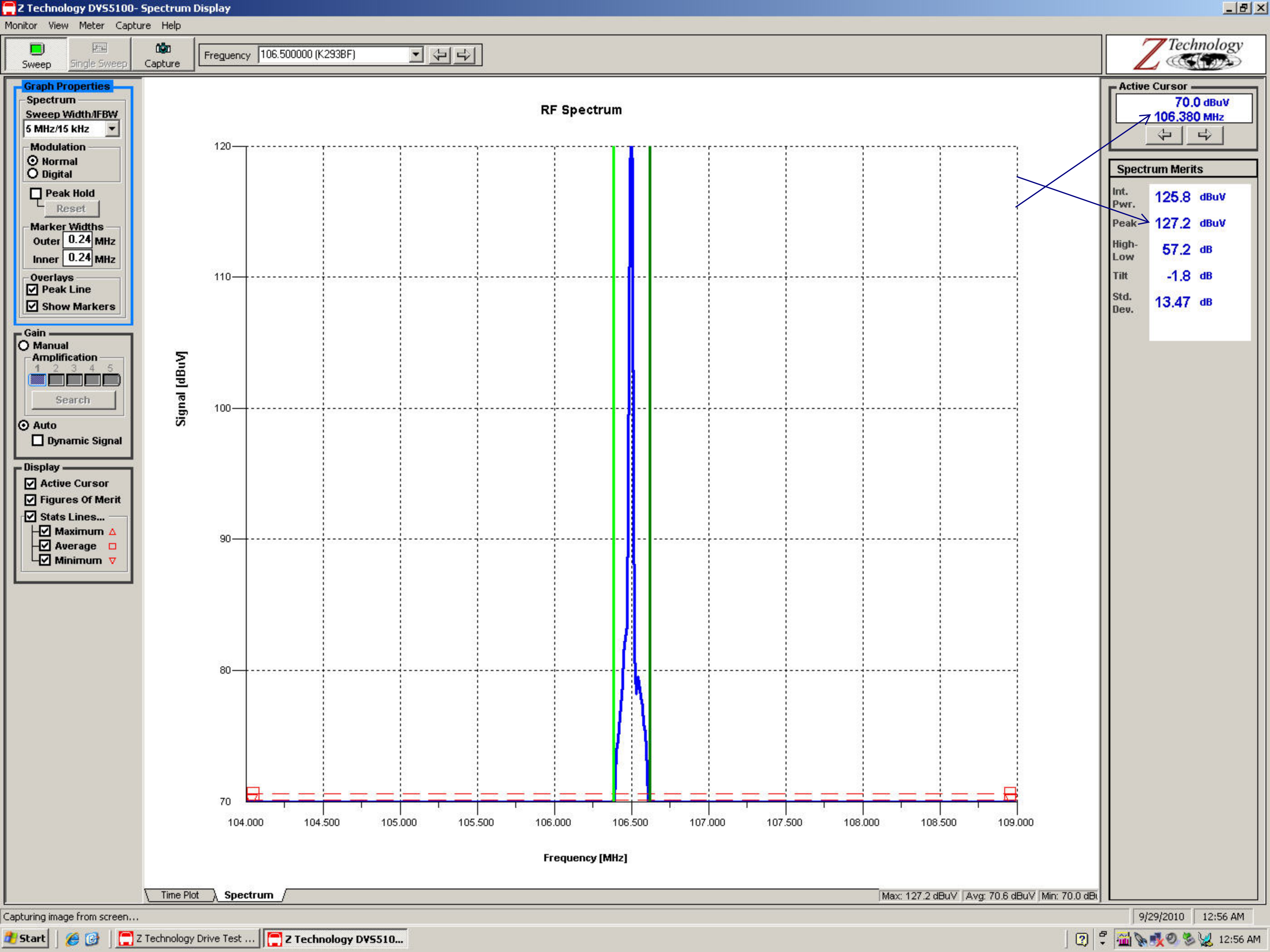
I certify that the installed directional pattern more than protects between the 20 – 65 degree azimuths as defined in the construction permit. My qualifications are a matter of record before the Federal Communications Commission.

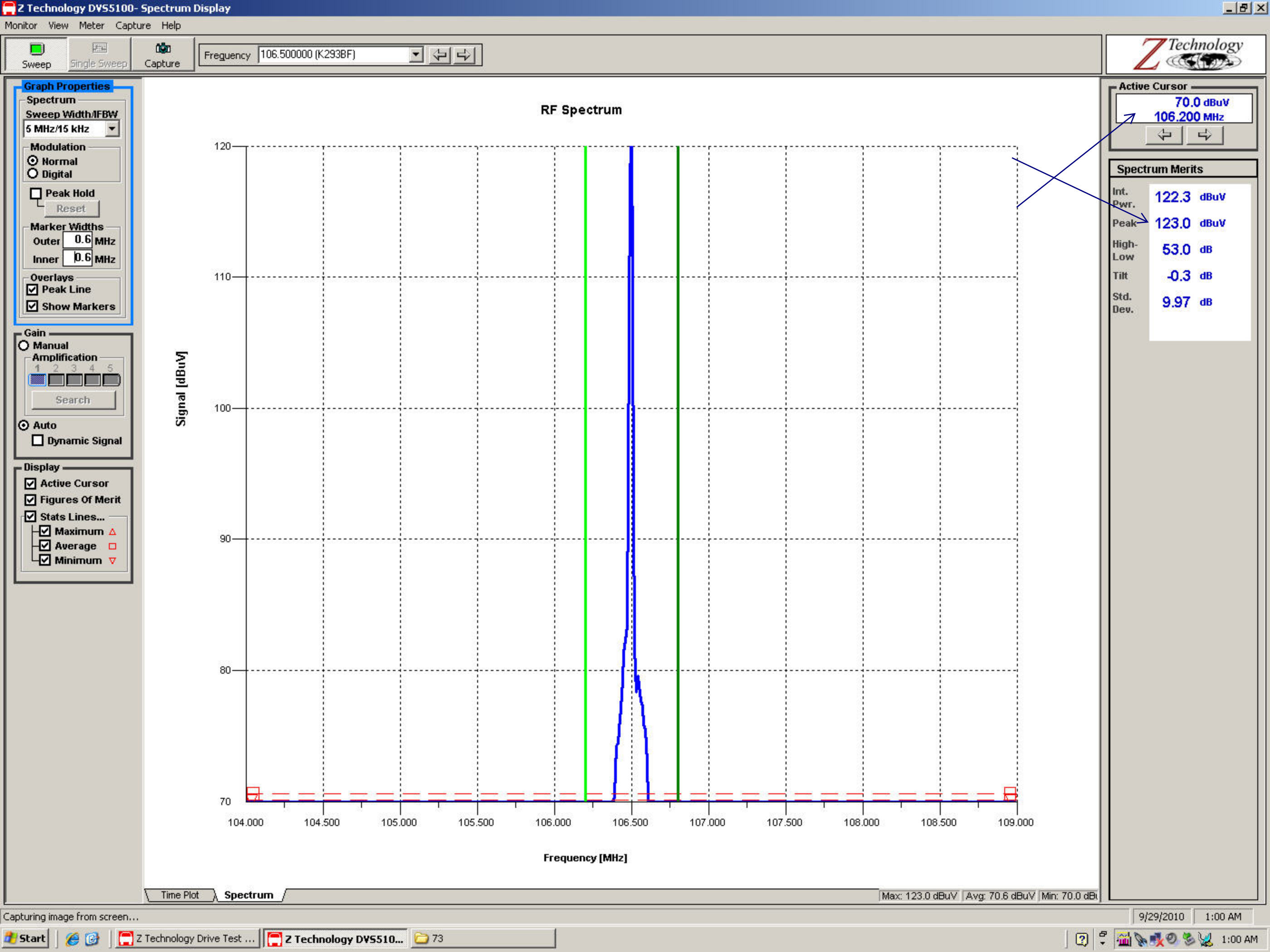
I certify that the information contained in this report is true and correct to the best of my knowledge and belief.

_____9/28/2010

Greg Shapiro

RF Services Inc.





***CALCULATIONS FOR MULTI-STATION
ERI SHP ROTOTILLER[®] CIRCULARLY POLARIZED
FM BROADCAST ANTENNA***

*Prepared For
K293BF
Channel 293
Austin Tower Farm
September 22, 2010*

**ANTENNA TYPE:
SHP-2AE-HW**

**SPECIFICATION NO:
1065**



SPECIFICATION FOR ERI SHP ROTOTILLER® CIRCULARLY POLARIZED FM BROADCAST ANTENNA

ELECTRICAL CHARACTERISTICS:

CHANNEL:		293
FREQUENCY:		106.5 MHz
POWER GAIN:	Cir Pol:	0.7020 (-1.5366 dBd)
GAIN AT HORIZONTAL:	Cir Pol:	0.7020 (-1.5366 dBd)
ELECTRICAL BEAM TILT:		0.00 Degrees
FIRST NULL FILL:		0.00 %
SECOND NULL FILL:		0.00 %
INPUT POWER REQUIRED:		0.141 kW Average Power
MAXIMUM INPUT POWER:		80.00 kW Average Power
INPUT TYPE:		3-1/8 EIA 50 Ohm
ANTENNA VSWR (MAXIMUM):		1.07:1 or less, with field matching; 1.25:1 or less, top pole or Lambda™ section mounting; 1.5:1 or less, side mounted, without field mounting.

SPECIFICATION FOR ERI SHP ROTOTILLER® CIRCULARLY POLARIZED FM BROADCAST ANTENNA

MECHANICAL CHARACTERISTICS:

MOUNTING CONFIGURATION:

**(Tower Interface supplied and installed by others.)*

Side Mount

HEIGHT OF ANTENNA:

8.1 feet

HEIGHT OF CENTER OF
RADIATION:

4.0 feet

REQUIRED MOUNTING APERTURE°:

19.6 feet

DEICING:

Radomes or deicing heaters not normally required for radial ice less than 1/2-inch

DEICER SELECTED:

NO

RADOME SELECTED:

NO

CALCULATED WEIGHT¹:

206 lbs.

ANTENNA AREA:

$C_A A_C$:

8.4 square feet

This antenna is designed to be supported by a structure that can resist the antenna base reactions and which provides a support that is rigid in the three transitional and three rotational degrees of freedom.

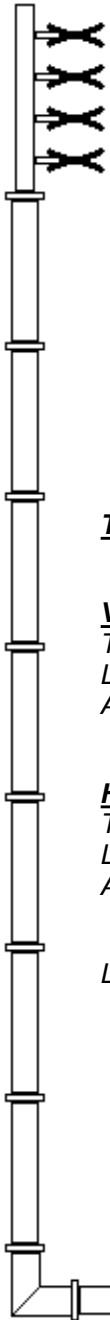
° Vertical tower space is based on the top bay mounted 5 feet from the top of the tower. Add 5 feet if the antenna is to be mounted somewhere other than near the top of the tower.

¹ Calculated weight is based on the PRELIMINARY design of the antenna. The actual weight of the antenna will be within $\pm 10\%$ of the calculated weight. The actual weight will be given in the technical manual that accompanies the antenna. Weight and wind figures do not include radomes or radial ice.

Note: Localized conditions may require higher wind speed specifications than TIA/EIA specifications. Check with local authorities to verify wind speed requirements.

FM Broadcast Antenna System Power Analysis

K293BF Channel 293
Austin Tower Farm
SHP-2AE-HW



ERP: **Hor or Ver Pol:**

kW: 0.099
 dBk: -10.04

POWER GAIN:

Ratio: 0.70
 dBd: -1.54

TRANSMISSION LINE:

VERTICAL RUN:

Type: HJ5-50
 Length, ft: 1000 ft.
 Attenuation, dB/100 ft: 0.384 dB/100 ft.

HORIZONTAL RUN:

Type: HJ5-50
 Length, ft: 100 ft.
 Attenuation, dB/100 ft: 0.384 dB/100 ft.

Line Efficiency: 37.81 %

ANTENNA INPUT:

kW: 0.14
 dBk: -8.50

LINE LOSS:

kW: 0.23
 dB: 4.22

Connector Loss

kW: 0.31
 dB: 2.60

Filter Loss

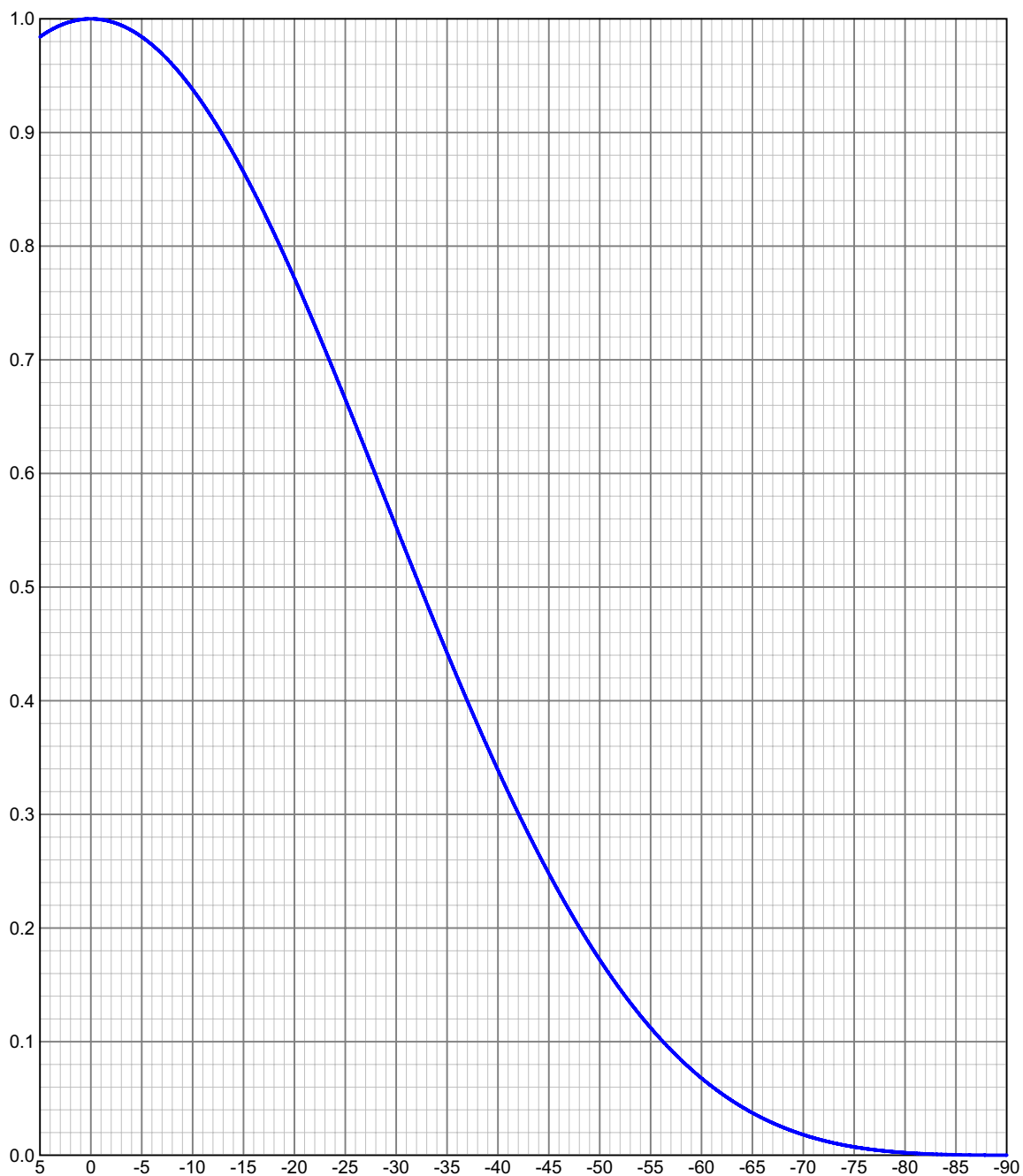
kW: 0.00
 dB: 0.00

Combiner Loss

kW: 0.04
 dB: 0.25

Transmitter Power

kW: 0.72
 dBk: -1.43

ELEVATION PATTERN**Type:****SHP-2H****Channel:****293****Directivity:****Numeric****dBd****Location:****Austin Tower Farm****Main Lobe:****0.70****-1.54****Beam Tilt:****0.00****Horizontal:****0.70****-1.54****Polarization:****Circular****Relative Field**

TABULATED DATA FOR ELEVATION PATTERN

Type: SHP-2H

Polarization: Circular

ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB
5.00	0.984	-0.14	-6.75	0.971	-0.25	-27.00	0.621	-4.14	-50.50
4.75	0.986	-0.13	-7.00	0.969	-0.27	-27.50	0.609	-4.30	-51.00
4.50	0.987	-0.11	-7.25	0.967	-0.29	-28.00	0.598	-4.46	-51.50
4.25	0.989	-0.10	-7.50	0.965	-0.31	-28.50	0.587	-4.63	-52.00
4.00	0.990	-0.09	-7.75	0.962	-0.33	-29.00	0.576	-4.80	-52.50
3.75	0.991	-0.08	-8.00	0.960	-0.36	-29.50	0.564	-4.97	-53.00
3.50	0.992	-0.07	-8.25	0.957	-0.38	-30.00	0.553	-5.15	-53.50
3.25	0.993	-0.06	-8.50	0.955	-0.40	-30.50	0.542	-5.33	-54.00
3.00	0.994	-0.05	-8.75	0.952	-0.43	-31.00	0.530	-5.51	-54.50
2.75	0.995	-0.04	-9.00	0.949	-0.45	-31.50	0.519	-5.69	-55.00
2.50	0.996	-0.03	-9.25	0.947	-0.48	-32.00	0.508	-5.88	-55.50
2.25	0.997	-0.03	-9.50	0.944	-0.50	-32.50	0.497	-6.07	-56.00
2.00	0.997	-0.02	-9.75	0.941	-0.53	-33.00	0.486	-6.27	-56.50
1.75	0.998	-0.02	-10.00	0.938	-0.56	-33.50	0.475	-6.47	-57.00
1.50	0.999	-0.01	-10.50	0.932	-0.61	-34.00	0.464	-6.67	-57.50
1.25	0.999	-0.01	-11.00	0.925	-0.67	-34.50	0.453	-6.88	-58.00
1.00	0.999	-0.01	-11.50	0.919	-0.74	-35.00	0.442	-7.09	-58.50
0.75	1.000	0.00	-12.00	0.912	-0.80	-35.50	0.431	-7.30	-59.00
0.50	1.000	0.00	-12.50	0.905	-0.87	-36.00	0.421	-7.52	-59.50
0.25	1.000	0.00	-13.00	0.897	-0.94	-36.50	0.410	-7.74	-60.00
0.00	1.000	0.00	-13.50	0.889	-1.02	-37.00	0.400	-7.97	-60.50
-0.25	1.000	0.00	-14.00	0.882	-1.09	-37.50	0.389	-8.20	-61.00
-0.50	1.000	0.00	-14.50	0.874	-1.17	-38.00	0.379	-8.43	-61.50
-0.75	1.000	0.00	-15.00	0.865	-1.26	-38.50	0.369	-8.67	-62.00
-1.00	0.999	-0.01	-15.50	0.857	-1.34	-39.00	0.359	-8.91	-62.50
-1.25	0.999	-0.01	-16.00	0.848	-1.43	-39.50	0.349	-9.15	-63.00
-1.50	0.999	-0.01	-16.50	0.839	-1.52	-40.00	0.339	-9.40	-63.50
-1.75	0.998	-0.02	-17.00	0.830	-1.62	-40.50	0.329	-9.65	-64.00
-2.00	0.997	-0.02	-17.50	0.821	-1.72	-41.00	0.320	-9.91	-64.50
-2.25	0.997	-0.03	-18.00	0.811	-1.82	-41.50	0.310	-10.17	-65.00
-2.50	0.996	-0.03	-18.50	0.802	-1.92	-42.00	0.301	-10.43	-65.50
-2.75	0.995	-0.04	-19.00	0.792	-2.03	-42.50	0.292	-10.70	-66.00
-3.00	0.994	-0.05	-19.50	0.782	-2.14	-43.00	0.283	-10.97	-66.50
-3.25	0.993	-0.06	-20.00	0.772	-2.25	-43.50	0.274	-11.25	-67.00
-3.50	0.992	-0.07	-20.50	0.762	-2.36	-44.00	0.265	-11.53	-67.50
-3.75	0.991	-0.08	-21.00	0.751	-2.48	-44.50	0.256	-11.82	-68.00
-4.00	0.990	-0.09	-21.50	0.741	-2.60	-45.00	0.248	-12.11	-68.50
-4.25	0.989	-0.10	-22.00	0.730	-2.73	-45.50	0.240	-12.41	-69.00
-4.50	0.987	-0.11	-22.50	0.720	-2.86	-46.00	0.232	-12.71	-69.50
-4.75	0.986	-0.13	-23.00	0.709	-2.99	-46.50	0.224	-13.01	-70.00
-5.00	0.984	-0.14	-23.50	0.698	-3.12	-47.00	0.216	-13.32	-70.50
-5.25	0.983	-0.15	-24.00	0.687	-3.26	-47.50	0.208	-13.64	-71.00
-5.50	0.981	-0.17	-24.50	0.676	-3.40	-48.00	0.201	-13.96	-71.50
-5.75	0.979	-0.18	-25.00	0.665	-3.54	-48.50	0.193	-14.28	-72.00
-6.00	0.977	-0.20	-25.50	0.654	-3.69	-49.00	0.186	-14.61	-72.50
-6.25	0.975	-0.22	-26.00	0.643	-3.84	-49.50	0.179	-14.95	-73.00
-6.50	0.973	-0.23	-26.50	0.632	-3.99	-50.00	0.172	-15.29	-73.50