

***PRELIMINARY SPECIFICATION FOR  
ERI SHPX ROTOTILLER<sup>®</sup> CIRCULARLY POLARIZED  
FM BROADCAST ANTENNA***

*Prepared For Channel 208  
MS ETV*

*Boonville, MS  
October 4, 2021*

**ANTENNA TYPE:  
SHPX-8AC**

**SPECIFICATION NO:**



**PRELIMINARY SPECIFICATION FOR  
ERI SHPX ROTOTILLER® CIRCULARLY POLARIZED  
FM BROADCAST ANTENNA**

**ELECTRICAL CHARACTERISTICS:**

CHANNEL:		208
FREQUENCY:		89.5 MHz
POWER GAIN:	Cir Pol:	4.4872 (6.5198 dBd)
GAIN AT HORIZONTAL:	Cir Pol:	4.4872 (6.5198 dBd)
ELECTRICAL BEAM TILT:		0.00 Degrees
FIRST NULL FILL:		0.00 %
SECOND NULL FILL:		0.00 %
INPUT POWER REQUIRED:		18.943 kW Average Power
MAXIMUM INPUT POWER:		112.00 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.

*Preliminary, subject to final design and review.*

## **PRELIMINARY SPECIFICATION FOR ERI SHPX ROTOTILLER® CIRCULARLY POLARIZED FM BROADCAST ANTENNA**

### **MECHANICAL CHARACTERISTICS:**

#### **MOUNTING CONFIGURATION:**

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

Side Mount

HEIGHT OF ANTENNA:

85.2 feet

HEIGHT OF CENTER OF  
RADIATION:

42.6 feet

REQUIRED MOUNTING APERTURE°:

91.9 feet

DEICING:

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

DEICER SELECTED:

YES

RADOME SELECTED:

NO

CALCULATED WEIGHT<sup>1</sup>:

928 lbs.

ANTENNA AREA:

$C_A A_C$ :

42.9 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.***

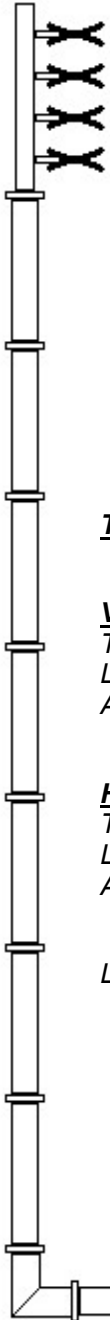
***<sup>1</sup> Calculated weight is based on the PRELIMINARY design of the antenna. The actual weight of the antenna will be within  $\pm 10\%$  of the calculated weight. The actual weight will be given in the technical manual that accompanies the antenna. Weight and wind figures do not include radomes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

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## FM Broadcast Antenna System Power Analysis

**MS ETV Channel 208  
Boonville, MS  
SHPX-8AC**



**ERP:**      **Hor or Ver Pol:**

kW: 85.00

dBk: 19.29

**POWER GAIN:**

Ratio: 4.49

dBd: 6.52

**TRANSMISSION LINE:**

**VERTICAL RUN:**

Type: HJ8-50B

Length, ft: 443 ft.

Attenuation, dB/100 ft: 0.134 dB/100 ft.

**HORIZONTAL RUN:**

Type: HJ8-50B

Length, ft: 20 ft.

Attenuation, dB/100 ft: 0.134 dB/100 ft.

**ANTENNA INPUT:**

kW: 18.94

dBk: 12.77

**LINE LOSS:**

kW: 2.90

dB: 0.62

Line Efficiency: 86.71 %

**Circulator Loss**

kW: 0.00  
dB: 0.00

**Filter Loss**

kW: 0.00  
dB: 0.00

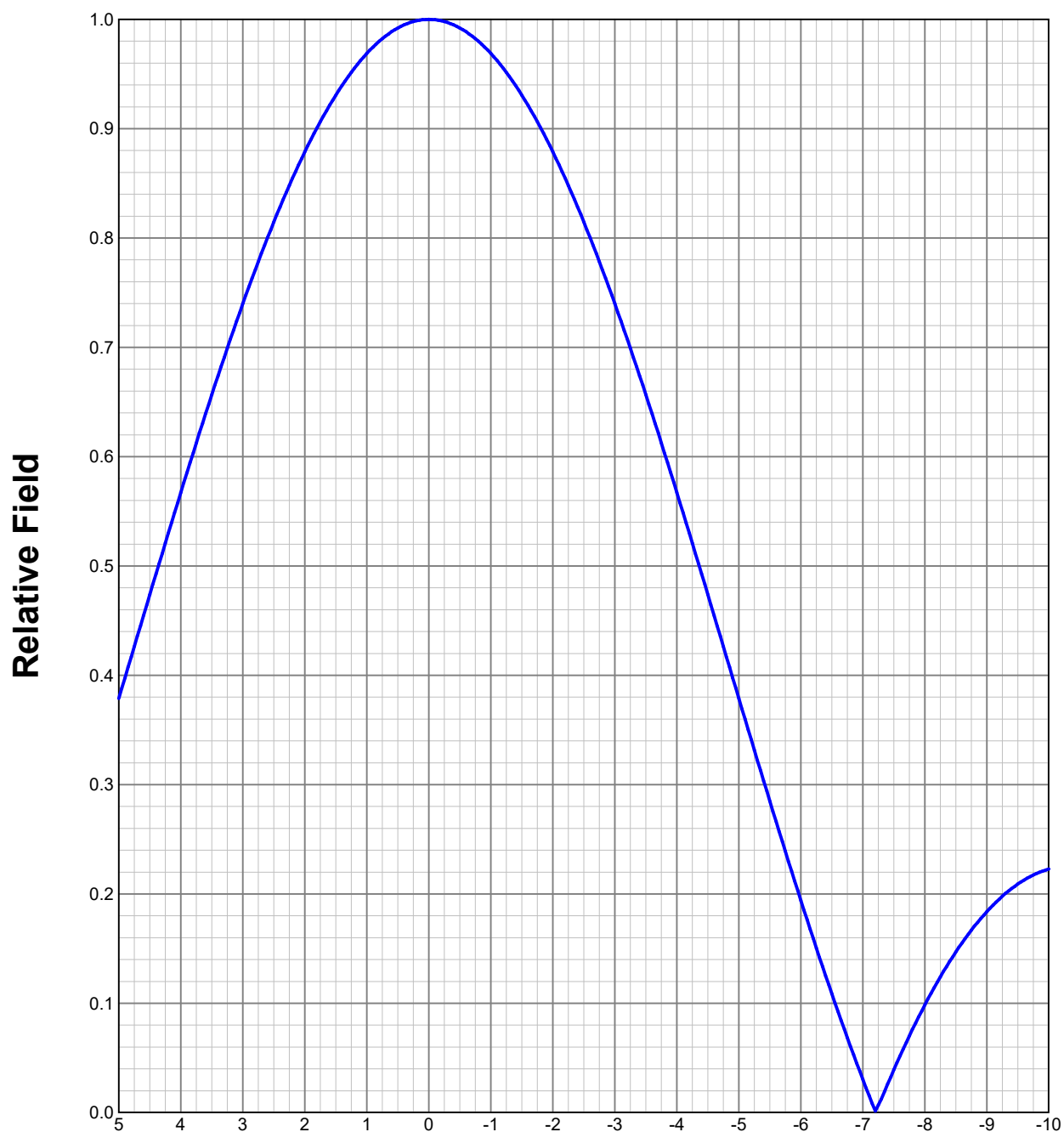
**Isol Trans Loss**

kW: 0.00  
dB: 0.00

**Transmitter Power**

kW: 21.85  
dBk: 13.39

*Preliminary, subject to final design and review.*

**ELEVATION PATTERN****Type:****SHPX8F****Channel:****208****Directivity:****Numeric****dBd****Location:****Boonville, MS****Main Lobe:****4.49****6.52****Beam Tilt:****0.00****Horizontal:****4.49****6.52****Polarization:****Circular**

*Preliminary, subject to final design and review.*

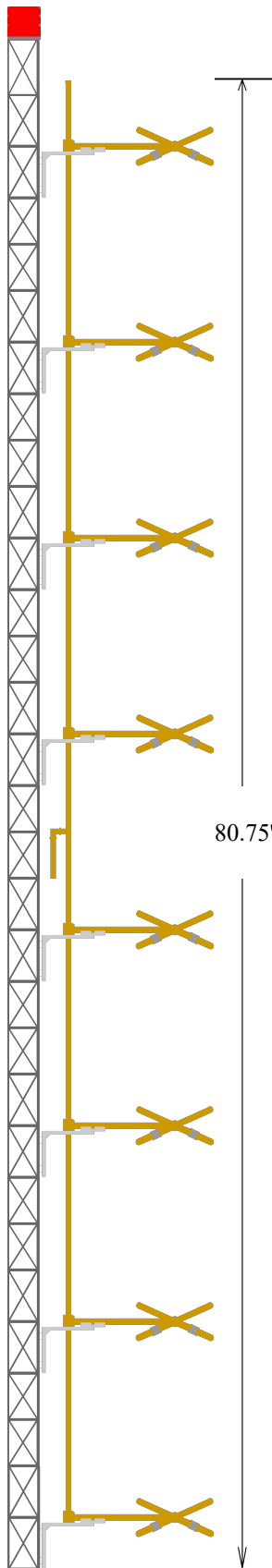
## TABULATED DATA FOR ELEVATION PATTERN

Type: SHPX8F

Polarization: Circular

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
5.00	0.379	-8.43	-6.75	0.068	-23.29	-27.00	0.107	-19.44	-50.50	0.058	-24.79	-74.00	0.302	-10.41
4.75	0.426	-7.40	-7.00	0.030	-30.37	-27.50	0.096	-20.35	-51.00	0.074	-22.66	-74.50	0.302	-10.39
4.50	0.474	-6.49	-7.25	0.007	-43.16	-28.00	0.082	-21.72	-51.50	0.089	-21.06	-75.00	0.302	-10.40
4.25	0.521	-5.67	-7.50	0.039	-28.14	-28.50	0.065	-23.70	-52.00	0.102	-19.83	-75.50	0.301	-10.43
4.00	0.567	-4.93	-7.75	0.070	-23.08	-29.00	0.047	-26.65	-52.50	0.114	-18.88	-76.00	0.299	-10.48
3.75	0.613	-4.26	-8.00	0.099	-20.12	-29.50	0.026	-31.58	-53.00	0.124	-18.15	-76.50	0.297	-10.54
3.50	0.657	-3.65	-8.25	0.124	-18.12	-30.00	0.006	-45.12	-53.50	0.132	-17.61	-77.00	0.294	-10.63
3.25	0.699	-3.11	-8.50	0.147	-16.65	-30.50	0.015	-36.38	-54.00	0.138	-17.23	-77.50	0.291	-10.73
3.00	0.740	-2.62	-8.75	0.167	-15.55	-31.00	0.035	-29.10	-54.50	0.141	-17.00	-78.00	0.287	-10.84
2.75	0.778	-2.18	-9.00	0.184	-14.71	-31.50	0.054	-25.42	-55.00	0.143	-16.90	-78.50	0.283	-10.98
2.50	0.815	-1.78	-9.25	0.198	-14.07	-32.00	0.070	-23.10	-55.50	0.142	-16.94	-79.00	0.278	-11.12
2.25	0.848	-1.43	-9.50	0.209	-13.59	-32.50	0.084	-21.52	-56.00	0.140	-17.11	-79.50	0.273	-11.28
2.00	0.879	-1.12	-9.75	0.217	-13.26	-33.00	0.095	-20.46	-56.50	0.135	-17.41	-80.00	0.267	-11.46
1.75	0.906	-0.85	-10.00	0.223	-13.04	-33.50	0.103	-19.77	-57.00	0.128	-17.87	-80.50	0.262	-11.65
1.50	0.931	-0.62	-10.50	0.226	-12.93	-34.00	0.107	-19.41	-57.50	0.119	-18.49	-81.00	0.256	-11.85
1.25	0.952	-0.43	-11.00	0.218	-13.22	-34.50	0.108	-19.34	-58.00	0.109	-19.29	-81.50	0.249	-12.06
1.00	0.969	-0.27	-11.50	0.202	-13.89	-35.00	0.105	-19.55	-58.50	0.096	-20.32	-82.00	0.243	-12.29
0.75	0.982	-0.15	-12.00	0.178	-14.97	-35.50	0.099	-20.05	-59.00	0.083	-21.65	-82.50	0.236	-12.53
0.50	0.992	-0.07	-12.50	0.149	-16.55	-36.00	0.091	-20.86	-59.50	0.068	-23.38	-83.00	0.229	-12.79
0.25	0.998	-0.02	-13.00	0.115	-18.82	-36.50	0.079	-22.06	-60.00	0.052	-25.73	-83.50	0.222	-13.06
0.00	1.000	0.00	-13.50	0.078	-22.18	-37.00	0.065	-23.75	-60.50	0.035	-29.19	-84.00	0.215	-13.34
-0.25	0.998	-0.02	-14.00	0.040	-27.97	-37.50	0.049	-26.19	-61.00	0.017	-35.40	-84.50	0.208	-13.63
-0.50	0.992	-0.07	-14.50	0.003	-51.41	-38.00	0.032	-29.96	-61.50	0.001	-57.40	-85.00	0.201	-13.94
-0.75	0.982	-0.15	-15.00	0.033	-29.75	-38.50	0.014	-37.34	-62.00	0.020	-33.95	-85.50	0.194	-14.26
-1.00	0.969	-0.27	-15.50	0.064	-23.81	-39.00	0.005	-46.11	-62.50	0.039	-28.17	-86.00	0.186	-14.60
-1.25	0.952	-0.43	-16.00	0.092	-20.73	-39.50	0.023	-32.65	-63.00	0.058	-24.72	-86.50	0.179	-14.96
-1.50	0.931	-0.62	-16.50	0.114	-18.85	-40.00	0.041	-27.74	-63.50	0.077	-22.27	-87.00	0.171	-15.33
-1.75	0.906	-0.85	-17.00	0.130	-17.69	-40.50	0.058	-24.79	-64.00	0.096	-20.38	-87.50	0.164	-15.72
-2.00	0.879	-1.12	-17.50	0.141	-17.04	-41.00	0.073	-22.78	-64.50	0.114	-18.86	-88.00	0.156	-16.13
-2.25	0.848	-1.43	-18.00	0.144	-16.81	-41.50	0.086	-21.34	-65.00	0.132	-17.60	-88.50	0.149	-16.56
-2.50	0.815	-1.78	-18.50	0.142	-16.96	-42.00	0.097	-20.30	-65.50	0.149	-16.53	-89.00	0.141	-17.02
-2.75	0.778	-2.18	-19.00	0.134	-17.47	-42.50	0.105	-19.58	-66.00	0.166	-15.62	-89.50	0.133	-17.50
-3.00	0.740	-2.62	-19.50	0.120	-18.39	-43.00	0.111	-19.12	-66.50	0.181	-14.83	-90.00	0.126	-18.01
-3.25	0.699	-3.11	-20.00	0.103	-19.78	-43.50	0.114	-18.89	-67.00	0.196	-14.14			
-3.50	0.657	-3.65	-20.50	0.081	-21.81	-44.00	0.114	-18.87	-67.50	0.210	-13.54			
-3.75	0.613	-4.26	-21.00	0.057	-24.83	-44.50	0.111	-19.08	-68.00	0.223	-13.02			
-4.00	0.567	-4.93	-21.50	0.032	-29.92	-45.00	0.106	-19.50	-68.50	0.235	-12.56			
-4.25	0.521	-5.67	-22.00	0.006	-44.38	-45.50	0.098	-20.16	-69.00	0.247	-12.16			
-4.50	0.474	-6.49	-22.50	0.019	-34.29	-46.00	0.088	-21.11	-69.50	0.257	-11.82			
-4.75	0.426	-7.40	-23.00	0.043	-27.30	-46.50	0.076	-22.41	-70.00	0.265	-11.52			
-5.00	0.379	-8.43	-23.50	0.065	-23.79	-47.00	0.062	-24.18	-70.50	0.273	-11.26			
-5.25	0.332	-9.59	-24.00	0.083	-21.62	-47.50	0.046	-26.67	-71.00	0.280	-11.05			
-5.50	0.285	-10.91	-24.50	0.098	-20.20	-48.00	0.030	-30.51	-71.50	0.286	-10.87			
-5.75	0.239	-12.43	-25.00	0.108	-19.31	-48.50	0.012	-38.08	-72.00	0.291	-10.72			
-6.00	0.194	-14.24	-25.50	0.114	-18.83	-49.00	0.005	-45.55	-72.50	0.295	-10.60			
-6.25	0.151	-16.44	-26.00	0.116	-18.70	-49.50	0.023	-32.73	-73.00	0.298	-10.51			
-6.50	0.109	-19.28	-26.50	0.114	-18.90	-50.00	0.041	-27.82	-73.50	0.300	-10.45			

Preliminary, subject to final design and review.



Antenna Type: SHPX-8AC  
Frequency: 89.5 MHz  
Bay Spacing: 131.397 in.  
System Length: 80.75 ft.  
Vertical tower space: 91.648 ft.  
System Gain: 4.487 (6.52 dBdc)  
ERP: 20 kW (13.01 dBk)  
Input power: 4.457 kW (6.491 dBk)  
System Weight: 928 lbs.  
System CaAa: 42.898 ft<sup>2</sup>.

System CaAa is based on TIA/EIA-222-F Standards

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 mounded somewhere other than near the top of the tower.

Weight and wind figures do not include radomes or radial ice