

## Model 6815 FM broadcast antenna

### Shively standard features:

- Power up to 7.5 kW per bay.
- Economical and easy setup.
- Directional configurable.
- Allows multiplexing of closely-spaced stations (< 2.2 MHz separation).
- Full- or half-wave-spaced configurations available.
- Optional fine-matching transformer available.
- Radomes optional.
- Pressurization to 5 psig during operation (10 - 12 psig purge).
- Pattern studies available.



### Performance specifications:

Operating frequency range:	88 - 108 MHz
VSWR bandwidth:	1.05 : 1 or better at center frequency
	1.1 : 1 to $\pm 200$ kHz from center frequency
	1.15 : 1 or better to $\pm 400$ kHz
Power rating:	7.5 kW per antenna bay; 15 kW per array except 30 kW for 3-1/8" center-fed arrays. Contact factory for higher-power arrays.
Bay input connector:	1-5/8" EIA female flange standard. 3-1/8" EIA can be used for center-fed 4-bay and up, in even-numbered arrays with higher-power inputs.
Standard mounting:	To an offset pole or round tower leg, 1-1/2" to 3-1/2" OD with 1/2" hardware & SCP clamp. Custom mounts optional.

### Electrical specifications:

No. of bays	Gain		Maximum power rating kW	No. of bays	Gain		Maximum power rating* kW
	Power	dB			Power	dB	
1	0.45	-3.43	7.5	5	2.73	4.36	15
2	0.99	-0.04	15	6	3.33	5.22	15
3	1.56	1.92	15	7	3.93	5.94	15
4	2.14	3.30	15	8	4.53	6.56	15

\* Based on 1-5/8" EIA input. Contact the factory for other options.

### Notes:

1. Our gain figures are derived from the computed directivity and include the losses in the antenna feed system. Gain is provided for one polarization and is equal in circularly polarized antennas for both horizontal and vertical components. Gain will be reduced if null fill, beam tilt, special H/V ratio, or special wavelength spacing is provided. Gain will increase in a directional array by the directivity of the azimuth pattern.

### Document No. ds-6815 (170517)

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## Vertical tower space:

No. of Bays	Antenna radiation aperture		Physical space used		Total tower space recommended		No. of Bays	Antenna radiation aperture		Physical space used		Total tower space recommended	
	ft	m	ft	m	ft	m		ft	m	ft	m	ft	m
1	2	0.61	12	3.66	20	6.10	5	40	12.19	52	15.85	60	18.29
2	10	3.05	22	6.71	30	9.14	6	50	15.24	62	18.90	70	21.34
3	20	6.10	32	9.75	40	12.19	7	60	18.29	72	21.95	80	24.38
4	30	9.14	42	12.80	50	15.24	8	70	21.34	74	22.56	90	27.44

## Weight:

Add 15 lb for fine-matching transformer.

No. of Bays	Without radomes		With radomes		With radomes & 1/2" (1.2 cm) radial ice		With radomes & 1" (2.5 cm) radial ice		With radomes & 1-1/2" (3.8 cm) radial ice	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
1	48.0	21.8	118.0	53.6	204.9	93.1	298.5	135.7	398.7	181.2
2	96.4	43.8	236.4	107.5	323.3	147.0	416.9	189.5	517.1	235.0
3	144.8	65.8	354.8	161.3	441.7	200.8	535.3	243.3	635.5	288.9
4	193.2	87.8	473.2	215.1	560.1	254.6	653.7	297.1	753.9	342.7
5	241.6	109.8	591.6	268.9	678.5	308.4	772.1	351.0	872.3	396.5
6	290.0	131.8	710.0	322.7	796.9	362.2	890.5	404.8	990.2	450.1
7	338.4	153.8	828.4	376.5	915.3	416.0	1009	458.6	1109	504.1
8	386.8	175.8	946.8	430.4	1033.7	469.9	1127	512.3	1227	557.7

## Revision 'G' effective projected area:

See notes 5 & 8.

No. of Bays	Without radomes		With radomes		With radomes & 1/2" (1.2 cm) radial ice		With radomes & 1" (2.5 cm) radial ice		With radomes & 1-1/2" (3.8 cm) radial ice	
	ft <sup>2</sup>		ft <sup>2</sup>		ft <sup>2</sup>		ft <sup>2</sup>		ft <sup>2</sup>	
	EPA <sub>N</sub>	EPA <sub>T</sub>	EPA <sub>N</sub>	EPA <sub>T</sub>	EPA <sub>N</sub>	EPA <sub>T</sub>	EPA <sub>N</sub>	EPA <sub>T</sub>	EPA <sub>N</sub>	EPA <sub>T</sub>
1	2.95	2.16	4.51	4.18	5.12	4.67	5.73	5.17	6.35	5.67
2	5.89	4.32	9.02	8.36	10.24	9.35	11.46	10.34	12.70	11.34
3	8.84	6.49	13.54	12.54	15.36	14.02	17.19	15.51	19.04	17.01
4	11.79	8.65	18.05	16.72	20.47	18.70	22.92	20.68	25.39	22.67
5	14.73	10.81	22.56	20.90	25.59	23.37	28.65	25.85	31.74	28.34
6	17.68	12.97	27.07	25.07	30.71	28.04	34.38	31.02	38.09	34.01
7	20.63	15.13	31.59	29.25	35.83	32.72	40.11	36.19	44.44	39.68
8	23.57	17.29	36.10	33.43	40.95	37.39	45.84	41.36	50.79	45.35

## Notes:

- The mounting structure must not flex more than  $\pm 3/4$  in (1.8 cm) in any ten-foot (3-meter) section. Five feet (1.5 m) of mounting structure is required above and below the antenna bays for proper pattern formation.
- Antenna radiation aperture is the distance from the center of the top bay to the center of the bottom bay. Physical space used is from the top of the top bay to the input flange at the bottom of the array, or the bottom of the bottom bay in a center-fed array. Total tower space recommended allows ten feet (3 m) of clear tower space above and below the antenna to protect from pattern interference by other antennas. At frequencies lower than 98 MHz, each of these dimensions will increase by up to 1 ft (0.3 m) per bay.
- The antenna is normally end-fed. Arrays supplied with beam tilt will be center-fed.
- Windload and weight tabulations are estimates and assume 98 MHz. They include the bay, interbay feedline, and input connection. No values have been included in these tabulations for mounts or fine-matching transformer. Actual values vary with the specific installation. Contact us with details of your installation if more precise values are needed.
- The effective projected area (EPA) is calculated per TIA standard ANSI/TIA-222-G.  
EPA<sub>N</sub> - Effective projected area associated with the windward face normal to the azimuth of the antenna:  $EPA_N = \sum(C_o A_c)_N$   
EPA<sub>T</sub> - Effective projected area associated with the windward face at the side of the antenna:  $EPA_T = \sum(C_o A_c)_T$   
Assumptions: Structure class II; Exposure category C; Topographic category 1; Maximum basic windspeed 105 mph; with ice, 45 mph; Height above ground 500 ft.
- Ask for technical assistance at Shively if you are planning to mount antennas on AM towers or install them at altitudes over 3,000 ft (915 m) above mean sea level.
- Area of fine-matching transformer: Without ice, EPA<sub>N</sub> = 0.9, EPA<sub>T</sub> = 0.8; 1/2" radial ice, EPA<sub>N</sub> = 1.2, EPA<sub>T</sub> = 1.1; 1" radial ice, EPA<sub>N</sub> = 1.5, EPA<sub>T</sub> = 1.4; 1-1/2" radial ice, EPA<sub>N</sub> = 1.9, EPA<sub>T</sub> = 1.7.