Shively Labs®

Model 6814 Super-High-Power FM Antenna — Full-Wave-Spaced

True circular polarization

Handles up to 25 kW per bay

Multiplexes over 6 MHz bandwidth,

using coax broadbanding technology

Shively standard features:

- Consistently predictable patterns
- Digital-ready
- Pattern studies available
- No factory personnel needed to install
- Adjustable fine-matching transformer
- Radomes and deicers available
- Rugged stainless steel corrosion-resistant mounts
- Works with regular towers; no need for special frequency-sensitive tower sections
- Pressure relief valve for easy purging of the system
- Special spacing, H/V ratios, null fill and beam tilt available

Performance specifications:

Polarization: Right circular.

VSWR: 1.05 : 1 ± 200 kHz for a single-frequency antenna
1.1 : 1 over ± 200 KHz for a dual frequency antenna with up to 6 MHz frequency separation.

Azimuth pattern circularity: Horizontal component ± 1.5 dB on pole.

Input connection: Standard up to 40 kW; 3-1/8" female flange; end-fed 1- 7 bays; center-fed over 7 bays
Special on request: up to 80 kW input; 4-1/16" male or 6-1/8" male flange.

Electrical specifications:

No. of Bays	Gain		Input Power Rating, kW		No. of Bays	Gain		Input Power Rating, kW	
	Power	dB	End-fed	Center-fed		Power	dB	End-fed	Center-fed
1	0.45	-3.43	25	n/a	6	3.33	5.22	40	80
2	0.99	-0.04	40	50	7	3.93	5.94	40	n/a
3	1.56	1.92	40	n/a	8	4.53	6.56	40	80
4	2.14	3.30	40	80	10	5.74	7.59	40	80
5	2.73	4.36	40	n/a	12	6.97	8.43	40	80

Notes:

1. End-fed arrays include 3-1/8" EIA input. Center-fed arrays include 3-1/8" EIA input (6-1/8" EIA and 4-1/16" optional).
2. 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.

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Model 6814 size and weight (full-wave-spaced):

No. of Bays	Vertical Tower Space						Weight					
	Antenna Radiation Aperture		Physical Space Used		Total Tower Space Recommended		Without radomes		With radomes		With radomes & 1/2" (1.2 cm) radial ice	
	ft	m	ft	m	ft	m	lb	N	lb	N	lb	N
1	2	0.7	9	3.0	20	6.6	145	645	265	1178	392	1743
2	10	3.3	19	6.2	30	9.8	230	1023	470	2090	714	3174
3	20	6.6	29	9.5	40	13.1	315	1400	675	3001	1036	4606
4	30	9.8	39	12.8	50	16.4	400	1778	880	3912	1359	6042
5	40	13.1	49	16.1	60	19.7	485	2156	1085	4824	1681	7474
6	50	16.4	59	19.4	70	23.0	570	2534	1290	5735	2004	8910
7	60	19.7	69	22.6	80	26.2	655	2912	1495	6647	2326	10341
8	70	23.0	73	23.9	90	29.5	780	3468	1740	7736	2696	11986
10	90	29.5	93	30.5	110	36.1	950	4224	2150	9559	3340	14849
12	110	36.1	113	37.1	130	42.6	1120	4979	2560	11382	3985	17717
14	130	42.7	133	43.6	150	49.2	1290	5735	2970	13204	4630	20585
16	150	49.2	153	50.2	170	55.8	1460	6491	3380	15027	5275	23452

Windload (full-wave-spaced):

No. of Bays	Without radomes 90 mph				With radomes 90 mph				With radomes & 1/2" (1.2 cm) radial ice, 45 mph			
	EPA_N		EPA_T		EPA_N		EPA_T		EPA_N		EPA_T	
	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2
1	5.5	0.5	5	0.5	9.7	0.9	8	0.7	13	1.2	10.9	1.0
2	9.4	0.9	8.8	0.8	18.6	1.7	15.7	1.5	25.8	2.4	22.3	2.1
3	13.2	1.2	12.7	1.2	27.4	2.5	23.4	2.2	38.7	3.6	33.7	3.1
4	17.1	1.6	16.5	1.5	36.2	3.4	31.1	2.9	51.6	4.8	45.2	4.2
5	20.9	1.9	20.4	1.9	45.1	4.2	38.8	3.6	64.5	6.0	56.6	5.3
6	24.8	2.3	24.3	2.3	53.9	5.0	46.5	4.3	77.3	7.2	68.1	6.3
7	28.6	2.7	28.1	2.6	62.8	5.8	54.2	5.0	90.2	8.4	79.5	7.4
8	33.6	3.1	32.5	3.0	72.6	6.7	62.3	5.8	103.9	9.7	91.3	8.5
10	41.3	3.8	40.2	3.7	90.3	8.4	77.7	7.2	129.7	12.0	114.2	10.6
12	49	4.6	48	4.5	108	10.0	93.1	8.6	155.4	14.4	137.1	12.7
14	56.7	5.3	55.7	5.2	125.6	11.7	108.5	10.1	181.2	16.8	160	14.9
16	64.4	6.0	63.4	5.9	143.3	13.3	123.9	11.5	206.9	19.2	182.9	17.0

Notes:

1. Ask for technical assistance at Shively for weight and windload information on ice thicker than 1/2 in.
2. The mounting structure must not flex more than ± 3/4 in (± 1.8 cm) in any 10-ft (3-meter) section. 5 feet (1.5 m) of mounting structure is required above and below the antenna bays for proper pattern formation.
3. 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.
4. Seven bays or less are normally end-fed. All antennas supplied with beam tilt will be center-fed. Antennas with an odd number of bays are normally not available with center feed.
5. 1/2" radial ice is at 200 feet above ground with a design ice thickness of 0.21".
6. Windload and weight tabulations are estimates and assume 98 MHz. They include the bay, interbay feedline, input connection, and a fine-matching transformer. No values have been included in these tabulations for mounts. Actual values vary with the specific installation. Contact us with details of your installation if more precise values are needed.
7. Antenna areas and weights calculated using TIA-222-G.
8. Deicers add approximately 1 lb (4.4 N) per bay in weight and 2 lb (8.9 N) or 0.05 ft^2 (0.005 m^2) per bay in windload.
9. Ask for technical assistance at Shively if you are planning to mount antennas on AM towers or install them at altitudes over 3,000 feet (915 m) above mean sea level.