MICRONETIXX COMMUNICATIONS

Mid to High Power FM Antennas

FMM Series

FMP Series

Micronetixx builds two mid to high power FM antenna families, the FMM, and the FMP. Both series of antennas are constructed from rugged stainless steel for a very long service life. All elements are welded in place and are DC grounded for superior lightning protection.

The antennas are available in single through 12 bay configurations. Several feeder options are available for the FMP series of antennas.

FMM Series

The **FMM** series of antennas are a rugged dual ring - stub design that provides excellent H/V linearity. Azimuth pattern circularity is +/- 1.5 dB when mounted to a pole. The **FMM** antenna produces a clockwise C/P signal. The input power rating per bay is 3 kW. The 10 and 12 bay models of the **FMM** have an input power rating of 25 kW and a high enough gain to produce a 100 kW ERP C/P signal when ordered with the optional 3-1/8” EIA RF input.

The **FMM** uses a hardline bay to bay feed system. Multi bay models feature end fed and center fed options. The mounting brackets are stainless steel and Micronetixx can provide custom mounting brackets/structures on request.

Center fed and certain end fed models of the **FMM** antenna can be customized to provide beam tilt and null fill.

The **FMM** antennas are single channel antennas with a useable bandwidth of 500 kHz. Typical V.S.W.R is under a 1.10:1 over a 200 kHz channel in free space. For mounting against large structures or areas that are near guy wires, an optional fine matcher is available.

For installation in areas that experience more than light icing, optional deicers are available. They increase the weight of each bay by about 1-1/2 pounds

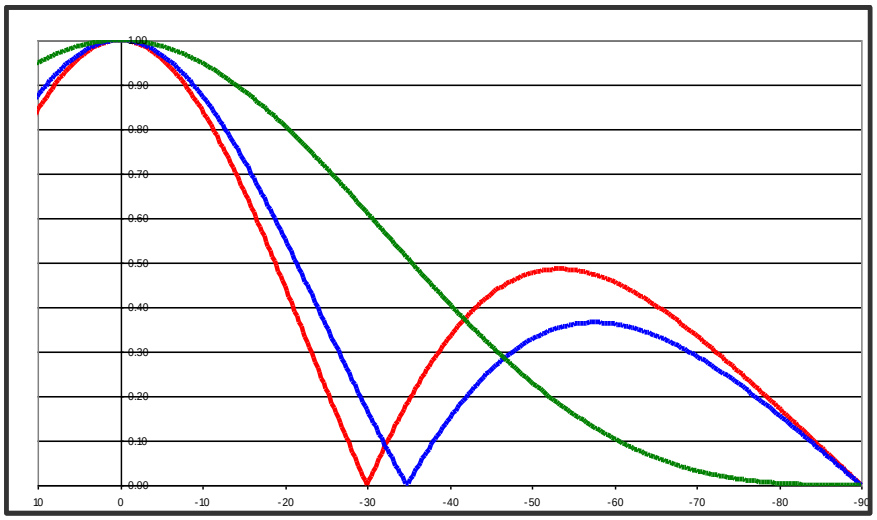
FMP Series

These rugged antennas are built with stainless steel for a long service life. The time tested inverted dual vee design is very immune to icing. All elements are welded together and are held at DC ground for excellent lightning immunity. The **FMP** Series of FM antennas features an excellent H to V ratio, and Omni-directional azimuth pattern (typically +/- 1.5 dB). Typical V.S.W.R. of 1.10: 1 over 200 kHz. Two versions of the **FMP** antennas are available – an end or center fed version with a tapped feedline or a corporate fed model using a power divider. The bays can be spaced at full wavelengths, half wave, or 7/8th wave intervals.

The input power rating per bay is up to **12 kW.** When configured with a 3-1/8” EIA RF input, a 8 to 12 bay antenna can produce a 100 kW C/P ERP. The antenna has an excellent bandwidth when configured with half wave spacing and a corporate feed system. The FMP antenna can also be used on a single low band (band I) TV channel when half wave spaced.

The FMP antenna may be ordered with a fine matcher when the antenna is mounted to a large structure to walk in the match of the antenna.

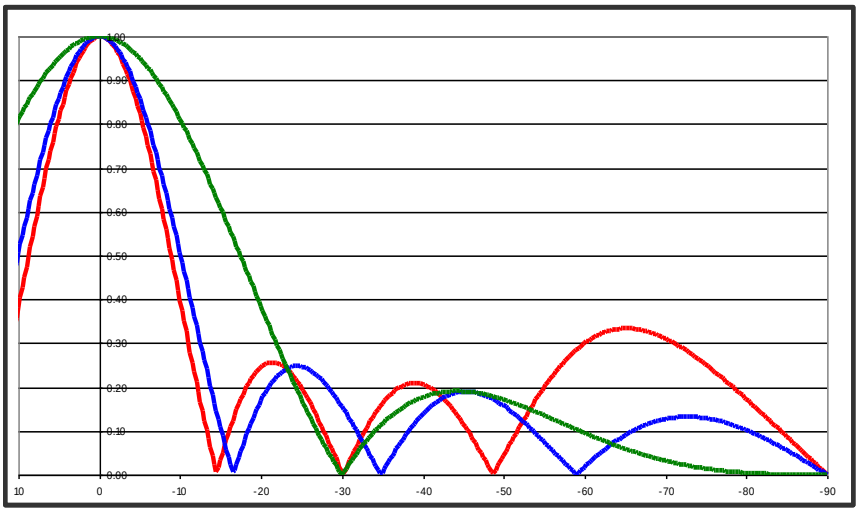
FMM and FMP sample elevation patterns



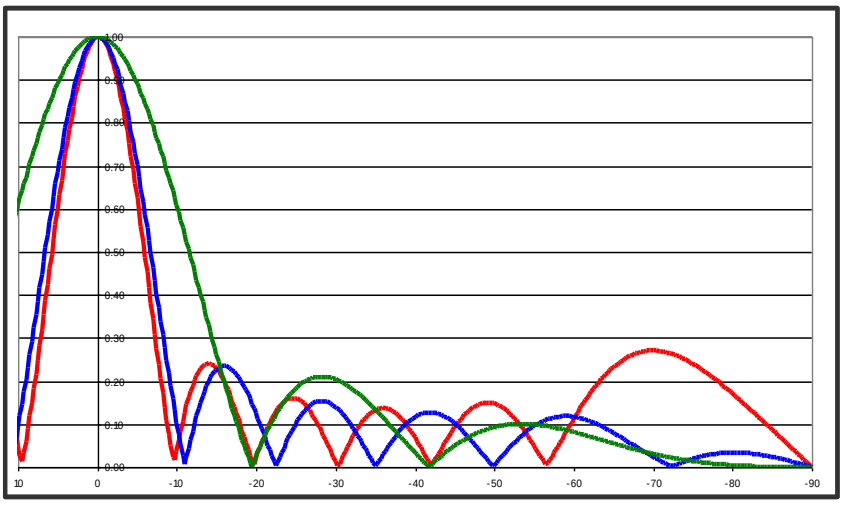
Two Bay

---1 λ (gain 0.99)
---7/8th λ (gain 0.92)
---½ λ (gain 0.68)

Four Bay



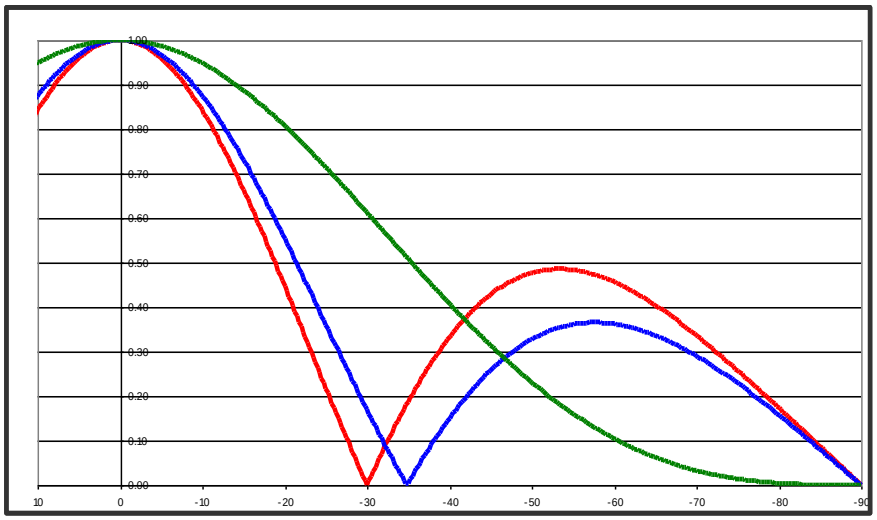
---1 λ (gain 2.12)
---7/8th λ (gain 1.95)
---½ λ (gain 1.30)



Six Bay

---1 λ (gain 3.28)
---7/8th λ (gain 3.15)
---½ λ (gain 1.92)

FMM and FMP sample elevation patterns

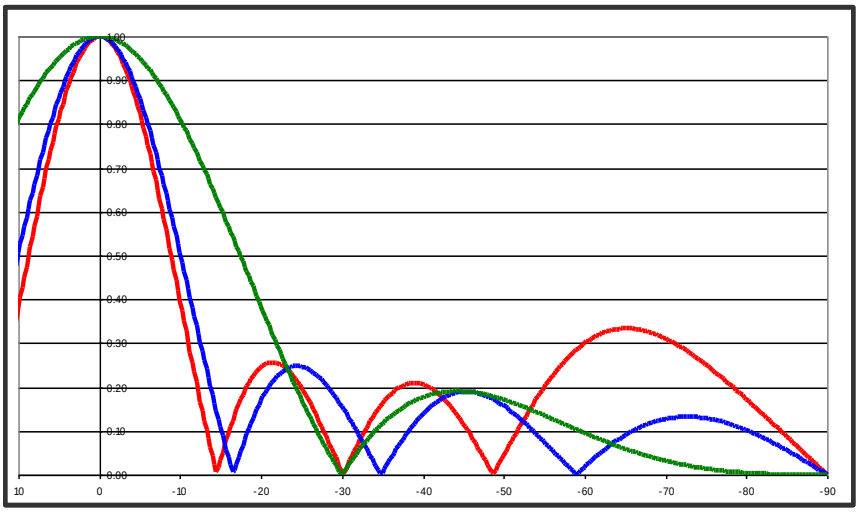


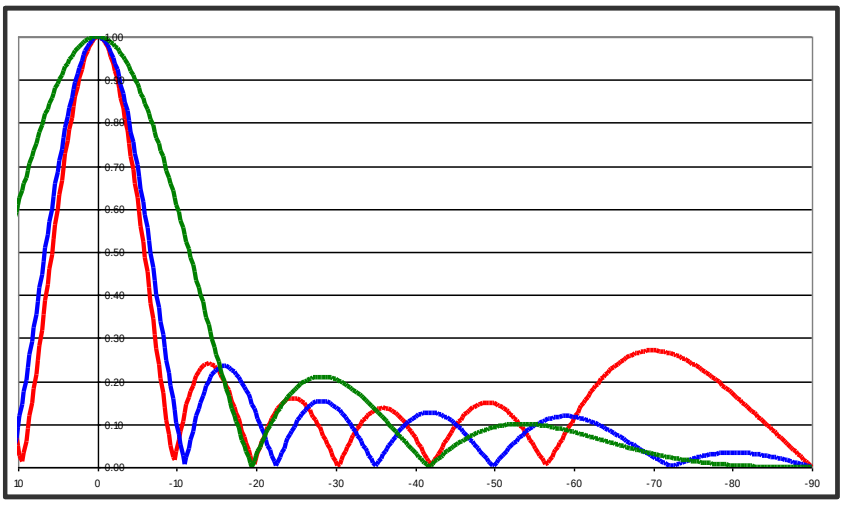
Eight Bay

---1 λ (gain 4.35)
---7/8th λ (gain 4.20)
---½ λ (gain 2.50)

Ten Bay

---1 λ (gain 5.65)
---7/8th λ (gain 5.25)
---½ λ (gain 3.13)

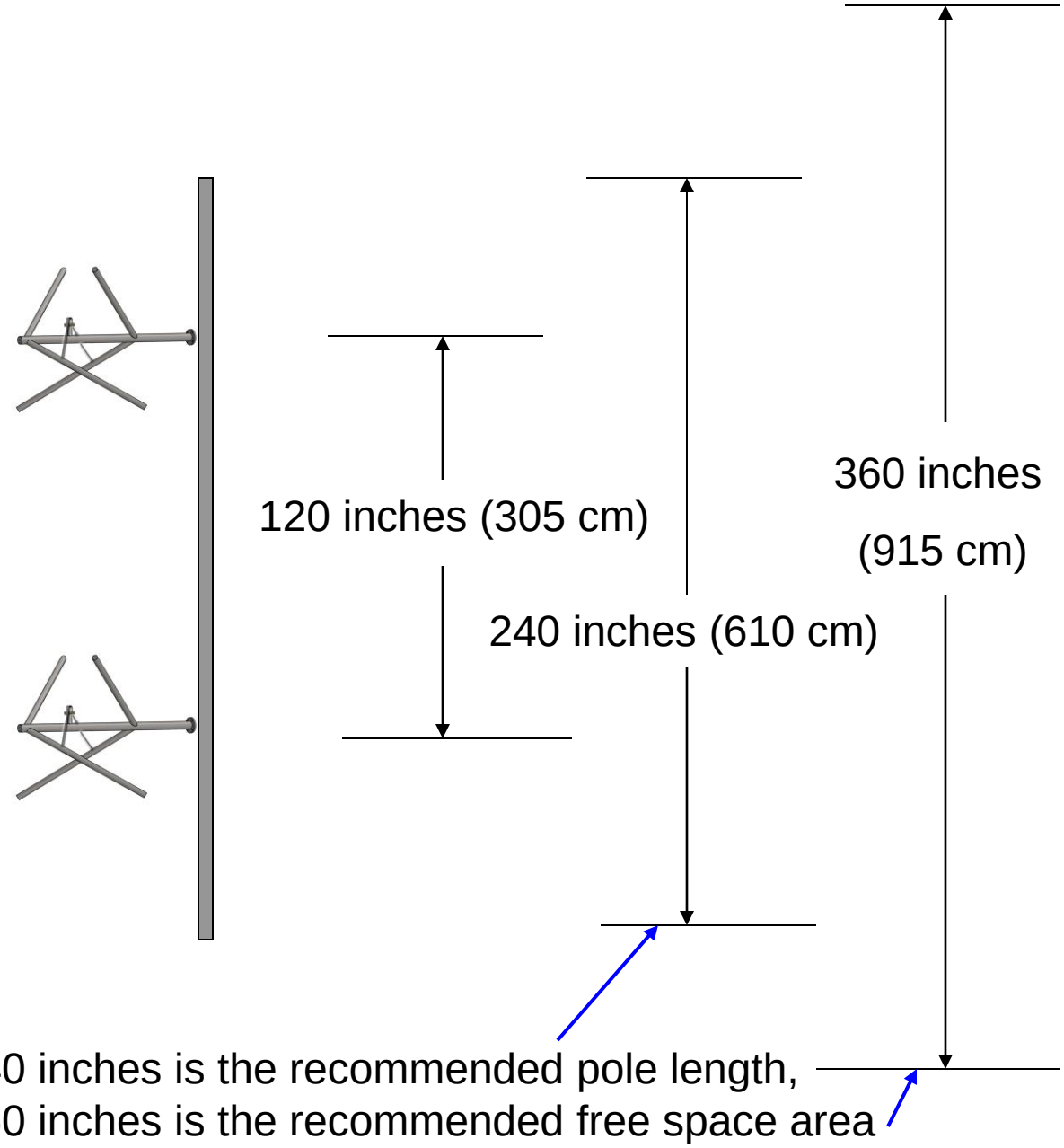




Twelve Bay

---1 λ (gain 6.84)
---7/8th λ (gain 6.34)
---½ λ (gain 3.75)

The FMM and FMP antennas are easy to install and are pre tuned at the factory. The diagram below depicts a two bay antenna (FMP-2). The antennas will produce the best radiation pattern if mounted to a small support pole, typically 3” (89 mm) and installed with free space above and below the antenna. The numbers provided are for operation at 98 MHz.



Full Wave Spaced
FMM Antenna Mechanical Information

Number of Bays	Antenna Length	Reccomended tower space	Radiation Aperture	Antena Weight	Antenna Load Area
1	10 ft. (3.04 m)	20 ft. (6.08 m)	7 ft. (3.04 m)	35 lbs. (15.9 kg)	2.4 ft^2 (0.22 m^2)
2 EF	15 ft. (4.57 m)	30 ft. (9.14 m)	10 ft. (3.04 m)	80 lbs. (36.4 kg)	8.0 ft^2 0.75 m^2)
2 CF	15 ft. (4.57 m)	30 ft. (9.14 m)	10 ft. (3.04 m)	85 lbs. (38.6 kg)	8.1 ft^2 (0.76 m^2)
3 EF	25 ft. (7.62) m)	40 ft. (12.19 m)	20 ft. (6.08) m)	125 lbs. (56.8 kg)	12.1 ft^2 (1.13 m^2)
4 EF	35 ft. (10.67 m)	50 ft. (15.24 m)	30 ft. (9.14 m)	170 lbs. (77.3 kg)	14.5 ft^2 (1.36 m^2)
4 CF	35 ft. (10.67 m)	50 ft. (15.24 m)	30 ft. (9.14 m)	175 lbs. (79.5 kg)	14.6 ft^2 (1.37 $m^{2)}$
5 EF	45 ft. (13.71 m)	60 ft. (18.28 m)	40 ft. (12.19 m)	215 lbs. (97.7 kg)	18.6 ft^2 (1.75 m^2)
6 EF	55 ft. (16.76 m)	70 ft. (21.33 m)	50 ft. (15.24 m)	260 lbs. (118.2 kg)	22.5 ft^2 (2.11 m^2)
6 CF	55 ft. (16.76 m)	70 ft. (21.33 m)	50 ft. (15.24 m)	265 lbs. (120.4 kg)	22.6 ft^2 2.12 m^2)
7 EF	65 ft. (19.81 m)	80 ft. (24.38 m)	60 ft. (18.28 m)	305 lbs. (138.6 kg)	26.7 ft^2 (2.51 m^2)
8 CF	75 ft. (22.86 m)	90 ft. 27.43 m)	70 ft. (21.33 m)	350 lbs. (159.1 kg)	30.6 ft^2 (2.88 m^2)
10 CF	95 ft. (28.95 m)	110 ft. (33.50 m)	90 ft. (27.43 m)	405 lbs. (184.1 kg)	38.9 ft^2 (3.66 m^2)
12 CF	115 ft. (35.05 m)	130 ft. (39.60 m)	110 ft. (33.50 m)	460 lbs. (209.1 kg)	46.7 ft^2 (4.39 m^2)

Full Wave Spaced
FMP Antenna Mechanical Information

Number of Bays	Antenna Length	Reccomended tower space	Radiation Aperture	Antena Weight	Antenna Load Area
1	10 ft. (3.04 m)	20 ft. (6.08 m)	7 ft. (3.04 m)	25 lbs. (11.4 kg)	1.1 ft^2 (0.10 m^2)
2 EF	15 ft. (4.57 m)	30 ft. (9.14 m)	10 ft. (3.04 m)	62 lbs. (28.2 kg)	3.9 ft^2 (0.36 m^2)
2 CF	15 ft. (4.57 m)	30 ft. (9.14 m)	10 ft. (3.04 m)	66 lbs. (30.0 kg)	4.0 ft^2 (0.37 m^2)
3 EF	25 ft. (7.62) m)	40 ft. (12.19 m)	20 ft. (6.08) m)	100 lbs. (45.5 kg)	6.6 ft^2 (0.62m^2)
4 EF	35 ft. (10.67 m)	50 ft. (15.24 m)	30 ft. (9.14 m)	138 lbs. (62.7 kg)	9.4 ft^2 (0.88 m^2)
4 CF	35 ft. (10.67 m)	50 ft. (15.24 m)	30 ft. (9.14 m)	142 lbs. (64.5 kg)	9.5 ft^2 (0.89 $m^{2)}$
5 EF	45 ft. (13.71 m)	60 ft. (18.28 m)	40 ft. (12.19 m)	175 lbs. (79.5 kg)	12.1 ft^2 (1.14 m^2)
6 EF	55 ft. (16.76 m)	70 ft. (21.33 m)	50 ft. (15.24 m)	213 lbs. (96.8 kg)	14.9 ft^2 (1.40 m^2)
6 CF	55 ft. (16.76 m)	70 ft. (21.33 m)	50 ft. (15.24 m)	217 lbs. (98.36 kg)	15.0 ft^2 1.41 m^2)
7 EF	65 ft. (19.81 m)	80 ft. (24.38 m)	60 ft. (18.28 m)	250 lbs. (113.6 kg)	17.7 ft^2 (1.66 m^2)
8 CF	75 ft. (22.86 m)	90 ft. 27.43 m)	70 ft. (21.33 m)	290 lbs. (131.8 kg)	20.4 ft^2 (1.92 m^2)
10 CF	95 ft. (28.95 m)	110 ft. (33.50 m)	90 ft. (27.43 m)	365 lbs. (166.0 kg)	25.9 ft^2 (2.43 m^2)
12 CF	115 ft. (35.05 m)	130 ft. (39.60 m)	110 ft. (33.50 m)	442 lbs. (201.0 kg)	31.4 ft^2 (2.95 m^2)

Notes: All data on this page is for **full wave spaced** antennas at 98.0 MHz, using a mid power inter bay feed system. Adding beam tilt or null fill will change values slightly. Adding deicers will slightly increase loads and weights. Weights are calculated using standard mounting brackets, custom brackets can add up to 20% more weight**.** **EF** = end fed models **CF**=center fed models. On center fed models the input comes out of the antenna horizontally in the middle of the array. On narrow faced towers an EIA 90 degree elbow may be needed to connect to transmission lines larger than 7/8th flex line.

Half Wave Spaced
FMM Antenna Mechanical Information

Number of Bays	Antenna Length	Reccomended tower space	Radiation Aperture	Antena Weight	Antenna Load Area
1	6 ft. (1.83 m)	20 ft. (6.08 m)	3 ft. (0.91 m)	35 lbs. (15.9 kg)	2.4 ft^2 (0.22 m^2)
2 EF	10 ft. (3.04 m)	30 ft. (9.14 m)	5 ft. (1.52 m)	75 lbs. (34.1kg)	4.8 ft^2 0.45 m^2)
2 CF	10 ft. (3.04 m)	30 ft. (9.14 m)	5 ft. (1.52 m)	81 lbs. (36.8 kg)	4.9 ft^2 (0.46 m^2)
3 EF	14 ft. (7.62) m)	34 ft. (12.19 m)	10 ft. (3.04) m)	113 lbs. (51.4 kg)	8.9 ft^2 (0.84^2)
4 EF	19 ft. (5.79 m)	39 ft. (15.24 m)	14 ft. (4.27 m)	152 lbs. (69.1 kg)	12.1ft^2 (1.14 m^2)
4 CF	19 ft. (5.79 m)	39 ft. (15.24 m)	14 ft. (4.27 m)	157 lbs. (71.4 kg)	12.2 ft^2 (1.15 $m^{2)}$
5 EF	23 ft. (7.01 m)	43 ft. (18.28 m)	18 ft. (5.48 m)	191 lbs. (86.8 kg)	15.3 ft^2 (1.44 m^2)
6 EF	28 ft. (8.53 m)	48 ft. (21.33 m)	23 ft. (7.01 m)	230 lbs. (104.5 kg)	18.5 ft^2 (1.74 m^2)
6 CF	28 ft. (8.53 m)	48 ft. (21.33 m)	23 ft. (7.01 m)	235 lbs. (106.8 kg)	18.6 ft^2 1.75 m^2)
7 EF	32 ft. (9.75 m)	52 ft. (24.38 m)	27 ft. (8.23 m)	269 lbs. (122.3 kg)	19.4 ft^2 (1.82 m^2)
8 CF	38 ft. (11.58 m)	58 ft. (27.43 m)	33 ft. (10.06 m)	308 lbs. (140.0 kg)	25.0 ft^2 (2.35 m^2)
10 CF	47 ft. (14.32 m)	67 ft. (33.50 m)	42 ft. (12.80 m)	351 lbs. (159.6 kg)	31.5 ft^2 (2.96 m^2)
12 CF	57 ft. (17.37 m)	77 ft. (39.60 m)	52 ft. (15.85 m)	394 lbs. (179.1 kg)	38.0 ft^2 (3.57 m^2)

Half Wave Spaced
FMP Antenna Mechanical Information

Number of Bays	Antenna Length	Reccomended tower space	Radiation Aperture	Antena Weight	Antenna Load Area
1	6 ft. (1.83 m)	20 ft. (6.08 m)	3 ft. (0.91 m)	25 lbs. (11.4 kg)	1.1 ft^2 (0.10 m^2)
2 EF	10 ft. (3.04 m)	30 ft. (9.14 m)	5 ft. (1.52 m)	56 lbs. (25.5 kg)	3.9 ft^2 (0.37 m^2)
2 CF	10 ft. (3.04 m)	30 ft. (9.14 m)	5 ft. (1.52 m)	60 lbs. (27.3 kg)	4.0 ft^2 (0.38 m^2)
3 EF	14 ft. (7.62) m)	34 ft. (12.19 m)	10 ft. (3.04) m)	88 lbs. (40.0 kg)	5.0 ft^2 (0.47m^2)
4 EF	19 ft. (5.79 m)	39 ft. (15.24 m)	14 ft. (4.27 m)	120 lbs. (54.5 kg)	6.9 ft^2 (0.85 m^2)
4 CF	19 ft. (5.79 m)	39 ft. (15.24 m)	14 ft. (4.27 m)	124 lbs. (56.4 kg)	7.0 ft^2 (0.66 m^2)
5 EF	23 ft. (7.01 m)	43 ft. (18.28 m)	18 ft. (5.48 m)	151 lbs. (68.6 kg)	8.8 ft^2 (0.83 m^2)
6 EF	28 ft. (8.53 m)	48 ft. (21.33 m)	23 ft. (7.01 m)	183 lbs. (83.2 kg)	9.4 ft^2 (0.88 m^2)
6 CF	28 ft. (8.53 m)	48 ft. (21.33 m)	23 ft. (7.01 m)	187 lbs. (85.0 kg)	9.6 ft^2 (0.90 m^2)
7 EF	32 ft. (9.75 m)	52 ft. (24.38 m)	27 ft. (8.23 m)	214 lbs. (97.3 kg)	12.7 ft^2 1.20 m^2)
8 CF	38 ft. (11.58 m)	58 ft. (27.43 m)	33 ft. (10.06 m)	248 lbs. (112.7 kg)	14.6 ft^2 (1.37 m^2)
10 CF	47 ft. (14.32 m)	67 ft. (33.50 m)	42 ft. (12.80 m)	311 lbs. (141.3 kg)	18.5 ft^2 (1.73 m^2)
12 CF	57 ft. (17.37 m)	77 ft. (39.60 m)	52 ft. (15.85 m)	382 lbs. (173.6 kg)	22.3 ft^2 (2.10 m^2)

Notes: All data on this page is for **half wave spaced** antennas at 98.0 MHz, using a mid power inter bay feed system. Adding beam tilt or null fill will change values slightly. Adding deicers will slightly increase loads and weights. Weights are calculated using standard mounting brackets, custom brackets can add up to 20% more weight. **EF** = end fed models **CF**=center fed models. On center fed models the input comes out of the antenna horizontally in the middle of the array. On narrow faced towers an EIA 90 degree elbow may be needed to connect to transmission lines larger than 7/8th flex line.

FMM and **FMP** series FM antenna input power ratings

Model	**FMM** 3-1/8” input*	**FMP** 3-1/8” input*
1 Bay End Fed	3 kW	12 kW
2 Bay End Fed	6 kW	20 kW
2 Bay Center Fed	6 kW	25 kW
3 Bay End Fed	9 kW	30 kW
4 Bay End Fed	12 kW	40 kW
4 Bay Center Fed	12 kW	40 kW
5 Bay End Fed	12 kW	40 kW
6 Bay End Fed	15 kW	40 kW
6 Bay Center Fed	18 kW	40 kW
7 Bay End Fed	18 kW	40 kW
8 Bay Center Fed	18 kW	40 kW
10 Bay Center Fed	25 kW	40 kW
12 Bay Center Fed	25 kW	40 kW

***Note: Power ratings are good for up to 3000 feet (914 meters) above sea level. For de-rating in higher elevations, please contact us.

Options: beam tilt, null fill, special inter-bay spacing, and de-icers. Lower input power versions are available. Contact Micronetixx for details

The rugged mid power FMM and FMP antennas will deliver your station a long and dependable service life. The antennas are fabricated from high grade stainless steel. If your station is in a marine or tropical zone, the finish of these antennas will not degrade over time. All elements are DC grounded to ensue the best protection from lightning damage. Best of all they deliver with pin point accuracy your signal to your listeners.

Need some assistance or advice in planning your station's antenna ? Our engineers have decades of experience in antenna design and applications. Give us a call and we will help to design the best system for you. And after it is up and working we will love to hear from you how great the coverage area is.

MICRONETIXX COMMUNICATIONS

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