



**DCPJ**

- Omni or directional radiation pattern
- Economic design for single station operation
- Single line or split feed arrangements
- Designed for -10 dB IBOC signals
- Single input per panel
- Fine matcher included
- Optional radomes
- Available in arrays of 1 to 12 layers
- Input: 3 1/8" 50 ohm EIA
- Multi-station options available

The DCPJ Cross Dipole FM Panel Antennas are designed to provide circularly polarized transmission for single station operation at an economical cost where optimum circularity of pattern or controlled directional characteristics are the prime requisites. The antenna is designed for face mounting, three panels per layer, around a triangular tower structure. Single or multi-layer operation is used, depending on the gain desired.

**Feed System**

The feed system is simple, comprised of a single 3 1/8" input with power dividers feeding each panel. The feed system is fully pressurized. Elements are at DC ground for lightning protection.

**Radome Protection**

For situations where ice formation is common, the elements can be equipped with optional radomes.

**Gains & Power Rating**

RMS gains from 0.46 (-3.37 dB) to 6.6 (8.2 dB) are available.

**Options**

Electrical beam tilt and null fill are available.

**Accommodates Split-Feed System**

The DCPJ antenna is designed to operate with a single 3 1/8" array input; however, the array may be configured to operate with two transmission lines between the array and the transmitter. In the event of failure of some array component, the inoperable half can be switched out of service and operation continued from the other half of the array at reduced ERP until the outage is corrected. Appropriate switching arrangements in the transmitter room will feed either or both portions.

**Pattern Circularity**

On towers of triangular cross section up to 7 1/2 foot face width, the following omnidirectional circularity values can be obtained:

- Horizontally Polarized Component: +/-2 dB average
- Vertically Polarized Component: +/-2.5 dB average

On towers of triangular cross section with an 8 to 10 foot face width, the anticipated circularity is:

- Horizontally Polarized Component: +/-2 dB average
- Vertically Polarized Component: +/-3 dB average

Tower member configuration does influence circularity. Optional scaled pattern measurements taking into account the actual tower configuration provide more precise data.

**DCPJ**

**Input VSWR**

At the input to the antenna feed system, the VSWR is 1.1:1 or better across the station channel bandwidth, and field adjustment of the variable transformer is provided.

**Windloads**

The antenna is designed to withstand winds of 110 mph. Under those conditions the windload on a layer of panels is shown in the table on page 50. The values were calculated as follows: Windload = Frontal Windload + (2) (Frontal Windload) (cos 60 degrees). Therefore the tabulated values do not include the effect of the tower or assume any shielding of one panel by another panel.

Weights for the various numbers of layers are also given.

**Electrical Specifications**

| Antenna Type | # of Layers | Gain Polarization<br>λ Spacing |       | Power Rating kW <sup>3</sup> |
|--------------|-------------|--------------------------------|-------|------------------------------|
|              |             | Power Gain                     | dB    |                              |
| DCPJ-1       | 1           | 0.46                           | -3.37 | 10                           |
| DCPJ-2       | 2           | 1.0                            | 0     | 20                           |
| DCPJ-3       | 3           | 1.5                            | 1.76  | 30                           |
| DCPJ-4       | 4           | 2.1                            | 3.22  | 40                           |
| DCPJ-5       | 5           | 2.7                            | 4.31  | 45                           |
| DCPJ-6       | 6           | 3.3                            | 5.19  | 45                           |
| DCPJ-8       | 8           | 4.4                            | 6.43  | 45                           |
| DCPJ-10      | 10          | 5.5                            | 7.40  | 45                           |
| DCPJ-12      | 12          | 6.6                            | 8.20  | 45                           |

**Notes:**

1. RMS gain data is given relative to dipole. Values are for each polarization and nominal for midband and include standard harness configurations. Actual gain will vary depending on feed system, frequency, null fill and beam tilt.
2. Average power ratings are nominal @ 40°C (104°F) ambient. Assumes constant pressurization with dry air or nitrogen. Ratings may vary based on specific feed system design and local conditions.
3. Higher power ratings and custom feed systems may be available on request.
4. Antenna components and feed harnesses are optimized for FM channels of interest

**Mechanical Specifications**

| Antenna Type | # of Layers | Without Radomes |                   |  |
|--------------|-------------|-----------------|-------------------|--|
|              |             | Weight lbs (kg) | Windload lbs (kg) | Projected Area ft <sup>2</sup> (m <sup>2</sup> ) |
| DCPJ-1       | 1           | 925 (421)       | 850 (387)         | 17 (1.6)   |
| DCPJ-2       | 2           | 1,700 (774)     | 1,700 (774)       | 34 (3.2)   |
| DCPJ-3       | 3           | 2,475 (1,126)   | 2,550 (1,160)     | 51 (4.7)   |
| DCPJ-4       | 4           | 3,365 (1,531)   | 3,400 (1,547)     | 68 (6.3)   |
| DCPJ-5       | 5           | 4,250 (1,934)   | 4,250 (1,934)     | 85 (7.9)   |
| DCPJ-6       | 6           | 5,180 (2,357)   | 5,100 (2,321)     | 102 (9.5)  |
| DCPJ-8       | 8           | 6,875 (3,128)   | 6,800 (3,094)     | 136 (12.6)                                       |
| DCPJ-10      | 10          | 8,620 (3,922)   | 8,500 (3,868)     | 170 (15.8)                                       |
| DCPJ-12      | 12          | 10,350 (4,709)  | 10,200 (4,641)    | 204 (19.0)                                       |

**Notes:**

1. Weights include bays and standard extension brackets for mounting. Excludes feed system and custom mounts. For antennas that included pattern studies, contact factory for additional information.
2. Projected area excludes feed system and custom mounts.
3. Dimensions are for antennas at 98.0 MHz and can vary ±10% across the band.
4. Ice shields are strongly recommended for areas subject to tower icing. Dielectric is not responsible for antenna damage caused by impact from falling ice.
5. Area calculated expressed in terms of equivalent flats (RS-222-C standard).
6. Windload force calculated based on 50 pounds per square foot (50psf) on flats (RS-222-C standard).
7. To convert area to equivalent rounds, multiply area by 1.5.
8. To convert area to Aerodynamic area (CaAa - linear or CaAc - discrete) based on EIA-222-F standard, multiply area by 1.8.