

Microwave Grid Antennas

Introduction and Antenna Descriptions

RFS offers grid antennas in the frequency bands mainly used in point-to point microwave networks as well as for far access terminal stations in point- to multipoint systems.

Grid antennas are available in two different performance classes providing excellent radiation performance and easy installation.

A low weight and a very small package volume are the outstanding features of RFS Grid antennas.

The antennas have been designed according to the high electrical and mechanical specifications applied to RFS solid parabolic antennas.

All antennas include a pipe mount.

APL Series

The APL Series of grid antennas offers high gain and good performance with a design specially developed for small package.

The antennas are supplied in five sizes: 3ft, 4ft, 6ft, 8ft, and 10ft (0.9, 1.2, 1.8, 2.4, 3.0m) covering the frequency ranges of 1.5 and 2.5 GHz.

The use of broadband feeds allows a maximum flexibility in system planning.

The small package and light weight in consumption with high gain and high front-to-back ratio makes the APL series interesting in rural areas where transportation cost is a key cost factor.

Features

- Small design for high survival wind speeds of 200 km/h (125 mph)
- Broad band feeds for 1.5 GHz and 2.5 GHz
- Horizontal and vertical polarization
- Low volume packing for low cost transportation
- Reflector and mount made of aluminum alloy
- Low tower wind loading
- High front-to-back ratio
- Lightweight
- Simple and quick assembly

MODEL NUMBERS

APL3	3ft (0.9m) diameter
APL4	4ft (1.2m) diameter
APL6	6ft (1.8m) diameter
APL8	8ft (2.4m) diameter
APL10	10ft (3.0m) diameter

HPL Series

The HPL series of Grid antennas is designed for radio link systems where a higher front to back ratio is required.

Antennas are available in 2.5 GHz and 3.6 GHz frequency bands. Different sizes from 3ft to 10ft (0.9 to 3.0 m) offer the necessary flexibility in radio link planning.

These antennas are the optimum choice for WLL and WiMax applications where the terminal station is far away from the next base station.

The high density aluminum grid reflector are entirely dismountable from 4 to 10 ft. The 3 ft reflector is fixed to provide the necessary stability for high wind applications.

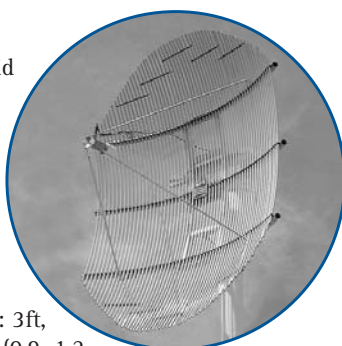
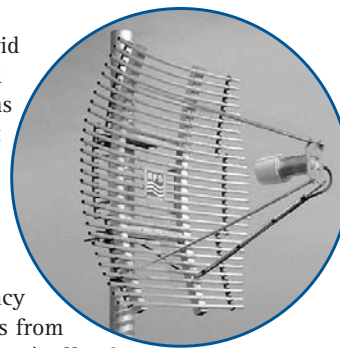
All antennas combine low windload with advanced electrical performance.

Features

- Small design for high survival wind speeds of 200 km/h (125 mph)
- Broad band feeds at 2.5 GHz and 3.6 GHz
- Horizontal and vertical polarization
- Low cost packing and transportation
- Reflector and mount made of aluminum alloy
- Low tower wind loading
- Extended front-to-back ratio
- Lightweight
- Simple and quick assembly

MODEL NUMBERS

HPL3	3ft (0.9m) diameter
HPL4	4ft (1.2m) diameter
HPL6	6ft (1.8m) diameter
HPL8	8ft (2.4m) diameter
HPL10	10ft (3.0m) diameter



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Introduction and Antenna Descriptions

MINIGRID Antennas, MGA and MGAR Series

The MINIGRID Antennas developed and produced by RFS offers high gain and extreme rugged reliability in a relative small page.

The antennas are supplied in four sizes: 2 ft, 3 ft, 4 ft and 6 ft (0.6, 0.9, 1.2 and 1.8m).

Broadband feeds for maximum flexibility are covering the standard bands from 0.82 GHz to 2.7 GHz (MGA-types).

In addition RFS offers a range of narrow band antennas (MGAR-types) for low capacity rural telephony and spread spectrum applications in the 1.35-1.535 GHz, 2.3-2.5 GHz and 3.4-3.6 GHz bands.

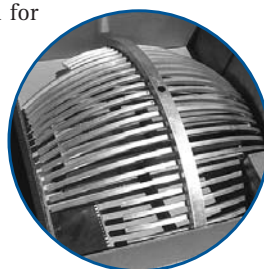
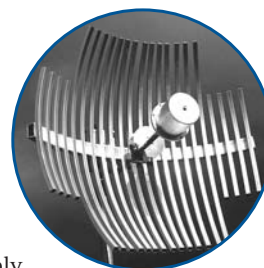
The small size, lightweight and low wind loading in addition to the high gain and high front-to-back ratio make the MINIGRID antennas the perfect replacement for stacked Yagis.

Features

- Small rugged design for high wind speeds 350 km/h (220 mph). 200 km/h (125 mph) for 6 ft (1.8m)
- Horizontal or vertical polarization
- Low-cost packing and transportation
- Corrosion-resistant aluminum tube reflector,

hot-dipped galvanized mounting, stainless steel hardware

- Welded construction
- Low tower wind loading
- High front-to-back ratio
- Lightweight
- Simple and quick assembly
- Reflectors can be stacked for reduced shipping volumes



MODEL NUMBERS

MGA(R) 2 series	2 ft (0.6 m) diameter
MGA(R) 3 series	3 ft. (0.9 m) diameter
MGA(R) 4 series	4 ft. (1.2 m) diameter
MGA(R) 6 series	6 ft. (1.8 m) diameter

Overview Grid Antennas

FREQUENCY, GHz	RFS CODE	MGA	MGAR	APL	HPL
0.82-0.96	082	3-6ft			
1.35-1.535	14		2-6ft		
1.35-1.55	15			3-10ft	
1.35-1.85	16	2-6ft			
1.7-2.1	18	2-6ft			
1.9-2.3	19	2-6ft			
2.3-2.5	23		2-6ft		
2.3-2.7	24	2-6ft		3-10ft	3-10ft
3.4-3.6	35		2-6ft		
3.4-3.8	34				3-10ft

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
MINIGRID									
MGA3-082AN	3 (0.9)	21	25	16.0	16.3	16.5	20	1.40 / 15.6	Infinite
MGA4-082AN	4 (1.2)	17.4	21.2	18.3	18.6	19.1	21	1.40 / 15.6	Infinite
MGA6-082AN	6 (1.8)	12.6	14.7	21.2	21.3	21.6	30	1.40 / 15.6	Infinite

1.350 - 1.535 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
Narrow Band MINIGRID for Spread Spectrum/ISMBand									
MGAR2-14AN	2 (0.6)	21.4	21.4	15.9	16.6	17.3	21	1.35 / 16.5	Infinite
MGAR3-14AN	3 (0.9)	13.5	13.5	19.0	20.0	20.9	30	1.35 / 16.5	Infinite
MGAR4-14AN	4 (1.2)	10.0	11.0	22.0	22.5	23.0	30	1.35 / 16.5	Infinite
MGAR6-14AN	6 (1.8)	7.1	7.1	25.1	25.7	26.2	32	1.35 / 16.5	Infinite

1.350 - 1.555 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
Grid, Standard Performance, Single Polarized (horizontal or vertical)									
APL3-15AN	3 (0.9)	10.5	10.5	19.8	20.0	20.5	25	1.5 / 14.0	
APL4-15AN	4 (1.2)	9	9	22.8	23.1	23.4	28	1.5 / 14.0	
APL6-15AN	6 (1.8)	7	7	25.9	26.4	26.9	30	1.5 / 14.0	
APL8-15AN	8 (2.4)	5.4	5.4	27.8	28.1	28.4	34	1.5 / 14.0	
APL10-15AN	10 (3.0)	4.8	4.8	29.5	30.0	30.5	35	1.5 / 14.0	

1.35 - 1.85 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
MINIGRID									
MGA2-16AN	2 (0.6)	21.4	21.4	16.2	18.0	18.7	21	1.30 / 17.7	Infinite
MGA3-16AN	3 (0.9)	13.5	13.5	19.3	21.7	21.9	30	1.40 / 15.6	Infinite
MGA4-16AN	4 (1.2)	10	11	22.3	23.7	25.3	30	1.40 / 15.6	Infinite
MGA6-16AN	6 (1.8)	7.1	7.1	25.5	27.0	28.2	30	1.25 / 19.0	Infinite

Microwave Grid Antennas

1.7 - 2.1 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
MINIGRID									
MGA2-18AN	2 (0.6)	18	16.2	18.5	18.9	19.3	25	1.30 / 17.7	Infinite
MGA3-18AN	3 (0.9)	11.4	11.4	21.2	22.5	23.5	33	1.30 / 17.7	Infinite
MGA4-18AN	4 (1.2)	9.2	9.2	24.8	25.3	26.2	32	1.30 / 17.7	Infinite
MGA6-18AN	6 (1.8)	6	6	27.5	28.5	29.3	34	1.20 / 20.8	Infinite

1.9 - 2.3 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
MINIGRID									
MGA2-19AN	2 (0.6)	16.3	16.3	19.1	19.4	21.6	27	1.30 / 17.7	Infinite
MGA3-19AN	3 (0.9)	10.3	10.3	22.5	23.4	23.9	35	1.30 / 17.7	Infinite
MGA4-19AN	4 (1.2)	8	8	25.6	26.8	27.2	34	1.30 / 17.7	Infinite
MGA6-19AN	6 (1.8)	5.4	5.4	28.5	29.3	30.1	35	1.20 / 20.8	Infinite

2.3 - 2.5 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
Narrow Band MINIGRID for Spread Spectrum/ISMBand									
MGAR2-23AN	2 (0.6)	13.7	13.7	20.4	20.8	21.1	29	1.35 / 16.5	Infinite
MGAR3-23AN	3 (0.9)	8.6	8.6	23.7	24.2	24.7	32	1.35 / 16.5	Infinite
MGAR4-23AN	4 (1.2)	7	7	26.8	27.0	27.2	32	1.35 / 16.5	Infinite
MGAR6-23AN	6 (1.8)	4.5	4.5	29.6	30.1	30.4	38	1.35 / 16.5	Infinite

2.3 - 2.7 GHz

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
Grid, Standard Performance, Single Polarized (horizontal or vertical)									
APL3-24AN	3 (0.9)	8	8	23.5	24	24.8	20	1.4 / 15.6	
APL4-24AN	4 (1.2)	5.5	5.5	26.8	27	27.2	30	1.3 / 17.7	±10
APL6-24AN	6 (1.8)	4	4	29.9	30	30.1	30	1.3 / 17.7	±10
APL8-24AN	8 (2.4)	3.8	3.8	32.1	32.5	32.9	32	1.3 / 17.7	±10
APL10-24AN	10 (3.0)	2.8	2.8	35	35.5	36	35	1.3 / 17.7	±10
Grid, High Performance, Single Polarized ((horizontal or vertical)									
HPL3-24AN	3 (0.9)	6.9	7	24.8	25.5	25.9	30	1.33 / 17.0	
HPL4-24AN	4 (1.2)	6	6.2	27.2	28	28.8	33	1.3 / 17.7	±10
HPL6-24AN	6 (1.8)	4.2	4.1	30.9	31.6	32.1	41	1.3 / 17.7	±10
HPL8-24AN	8 (2.4)	3.6	3.2	32.7	33.4	34	43	1.3 / 17.7	±10
HPL10-24AN	10 (3.0)	2.8	2.7	34.2	35	35.8	45	1.3 / 17.7	±10
MINIGRID									
MGA2-24AN	2 (0.6)	13.7	13.7	21.4	21.6	21.8	29	1.30 / 17.7	Infinite
MGA3-24AN	3 (0.9)	8.6	8.6	24.0	25.0	25.5	32	1.30 / 17.7	Infinite
MGA4-24AN	4 (1.2)	7	7	27.2	27.6	28.3	32	1.30 / 17.7	Infinite
MGA6-24AN	6 (1.8)	4.3	4.7	30.1	30.9	31.5	36	1.20 / 20.8	Infinite

Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
MINIGRID, Narrow Band									
MGAR2-35AN	2 (0.6)	9.5	10.0	23.0	23.4	23.7	30	1.40 / 15.6 @ (3.4 - 3.6GHz), 1.5 / 15.0 @ (3.4 - 3.7 GHz)	Infinite
MGAR3-35AN	3 (0.9)	7	7	26.6	27.0	27.3	32	1.40 / 15.6 @ (3.4 - 3.6GHz), 1.5 / 15.0 @ (3.4 - 3.7 GHz)	Infinite
MGAR4-35AN	4 (1.2)	5.3	5.3	29.0	29.4	29.7	32	1.40 / 15.6 @ (3.4 - 3.6GHz), 1.5 / 15.0 @ (3.4 - 3.7 GHz)	Infinite
MGAR6-35AN	6 (1.8)	3.5	3.5	32.6	33.0	33.3	34	1.40 / 15.6 @ (3.4 - 3.6GHz), 1.5 / 15.0 @ (3.4 - 3.7 GHz)	Infinite

3.4 - 3.8 GHz

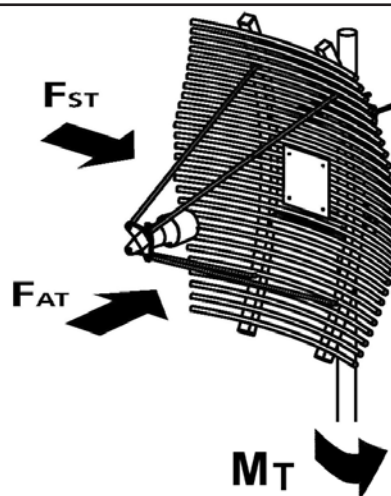
Antenna Input – N Female

Model Number	Diameter ft (m)	Beamwidth, degrees		Low	Gain (dBi)		F/B Ratio (dB)	VSWR/ R L (dB)	Fine Adjustment Az (deg)
		H Plane	E Plane		Mid	High			
Grid, High Performance, Single Polarized ((horizontal or vertical)									
HPL3-34AN	3 (0.9)	5.4	5.4	28	28.2	28.4	30	1.3 / 17.7	
HPL4-34AN	4 (1.2)	4.9	4.9	30.1	30.3	30.5	32	1.3 / 17.7	±10
HPL6-34AN	6 (1.8)	3	3	34	34.3	34.6	37	1.3 / 17.7	±10
HPL8-34AN	8 (2.4)	2.4	2.4	36.1	36.2	36.3	42	1.3 / 17.7	±10
HPL10-34AN	10 (3.0)	2	2	38	38.2	38.4	45	1.3 / 17.7	±10

Microwave Grid Antennas

Forces Due to Wind

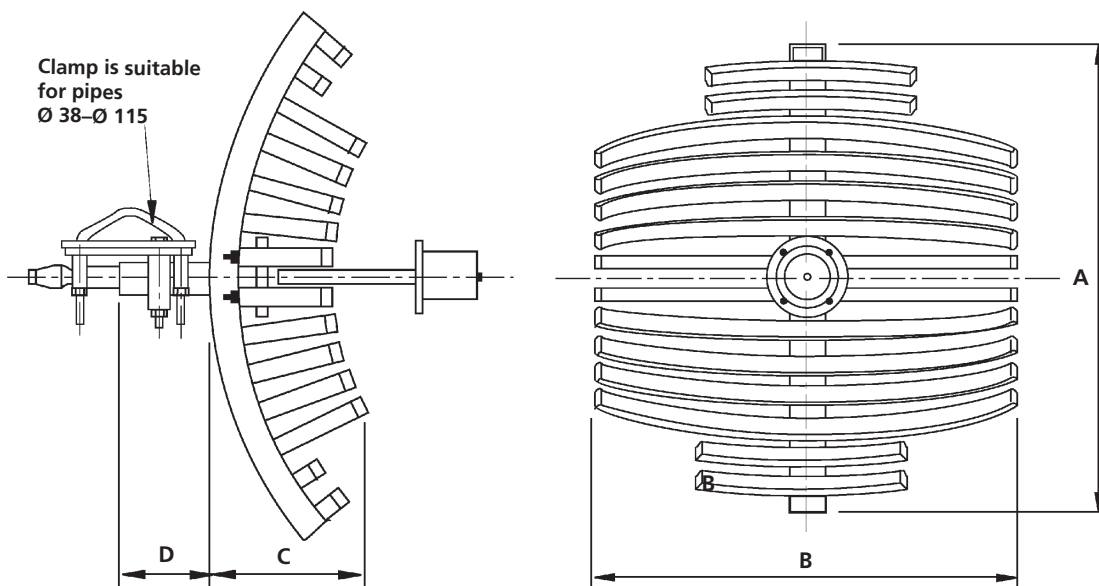
The influence of wind and ice on parabolic antennas is important in planning support structures. Wind forces usually are multiples of the antenna weight. The maximum values do not occur simultaneously.



DIAMETER FT (M)	ANTENNA TYPE	FORCES MOMENTS	WIND SPEED	
			110 KM/H (68 MPH)	200 KM/H (125 MPH)
2ft (0.6)	MGA, MGAR	FAT max N (lb)	75 (39)	600 (135)
		FST max N (lb)	50 (11)	200 (45)
		MT max Nm (lbft)	50 (37)	160 (118)
3ft (0.9)	APL	FAT max N (lb)	194 (44)	641 (144)
		FST max N (lb)	118 (27)	391 (88)
		MT max Nm (lbft)	51(38)	168 (124)
3ft (0.9)	HPL	FAT max N (lb)	260 (58)	860 (193)
		FST max N (lb)	113 (25)	375 (84)
		MT max Nm (lbft)	49 (36)	161 (119)
3ft (0.9)	MGA, MGAR	FAT max N (lb)	387 (87)	1300 (292)
		FST max N (lb)	140 (31)	500 (112)
		MT max Nm (lbft)	90 (66)	310 (229)
4ft (1.2)	APL	FAT max N (lb)	331 (74)	1094 (246)
		FST max N (lb)	189 (42)	625 (141)
		MT max Nm (lbft)	81 (60)	269 (198)
4ft (1.2)	HPL	FAT max N (lb)	454 (102)	1500 (337)
		FST max N (lb)	198 (45)	656 (147)
		MT max Nm (lbft)	85 (63)	282 (208)
4ft (1.2)	MGA, MGAR	FAT max N (lb)	671 (151)	2200 (493)
		FST max N (lb)	240 (54)	800 (179)
		MT max Nm (lbft)	240 (177)	800 (590)
6ft (1.8)	APL	FAT max N (lb)	671 (151)	2189 (492)
		FST max N (lb)	364 (82)	1203 (270)
		MT max Nm (lbft)	157 (116)	517 (381)
6ft (1.8)	HPL	FAT max N (lb)	1020 (229)	3375 (759)
		FST max N (lb)	445 (100)	1476 (332)
		MT max Nm (lbft)	191 (141)	635 (468)
6ft (1.8)	MGA, MGAR	FAT max N (lb)	1371 (308)	4500 (1009)
		FST max N (lb)	610 (137)	2000 (449)
		MT max Nm (lbft)	330 (243)	1090 (804)
8ft (2.4)	APL	FAT max N (lb)	1418 (319)	4688 (1054)
		FST max N (lb)	638 (143)	2109 (474)
		MT max Nm (lbft)	274 (202)	907 (669)
8ft (2.4)	HPL	FAT max N (lb)	1805 (406)	5959 (1340)
		FST max N (lb)	799 (180)	2640 (594)
		MT max Nm (lbft)	344 (254)	1135 (837)
10ft (3.0)	APL	FAT max N (lb)	2221 (499)	7344 (1651)
		FST max N (lb)	1016 (228)	3394 (763)
		MT max Nm (lbft)	437 (322)	1459 (1076)
10ft (3.0)	HPL	FAT max N (lb)	2826 (635)	9344 (2101)
		FST max N (lb)	1248 (281)	4125 (927)
		MT max Nm (lbft)	537 (396)	1774 (1308)

Grid Antenna Mount Outlines

MINIGRID Antennas MGA2/MGAR2 Series - 2 ft (0.6 m)

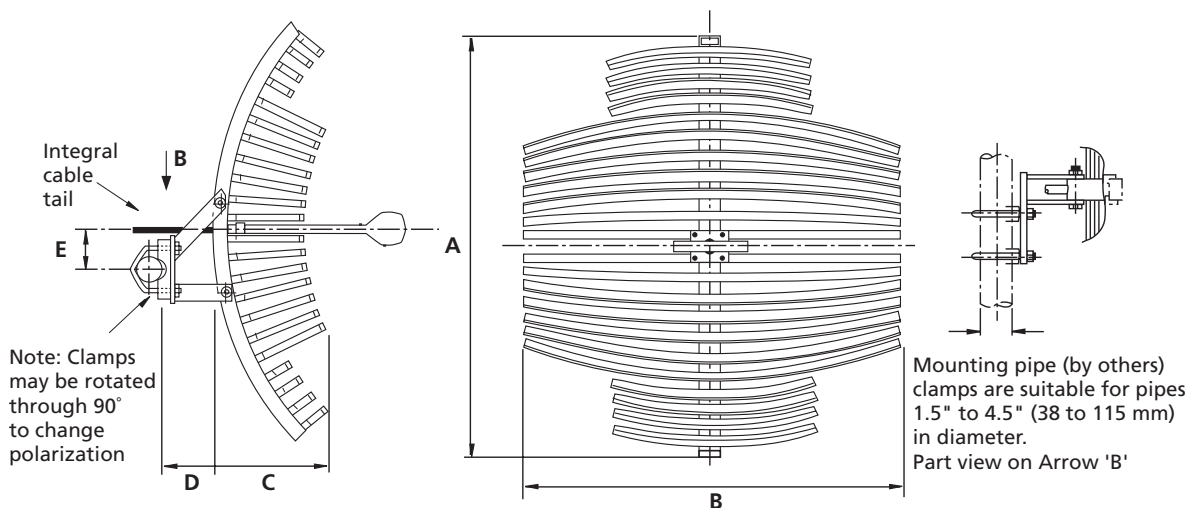


All dimensions in mm (inch)

A	B	C	D
640(25.2)	690(27.17)	200(7.87)	120(4.72)

Grid Antenna Mount Outlines

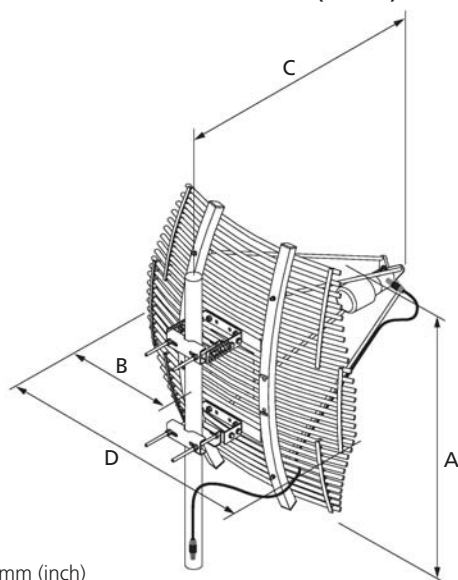
MINIGRID Antennas MGA3/MGAR3 Series - 3 ft (0.9 m)



All dimensions in mm (inch)

A	B	C	D	E
1030(40.55)	950(37.4)	290(11.41)	130(5.11)	100(3.94)

GRID Antennas APL3/HPL3 Series - 3 ft (0.9 m)

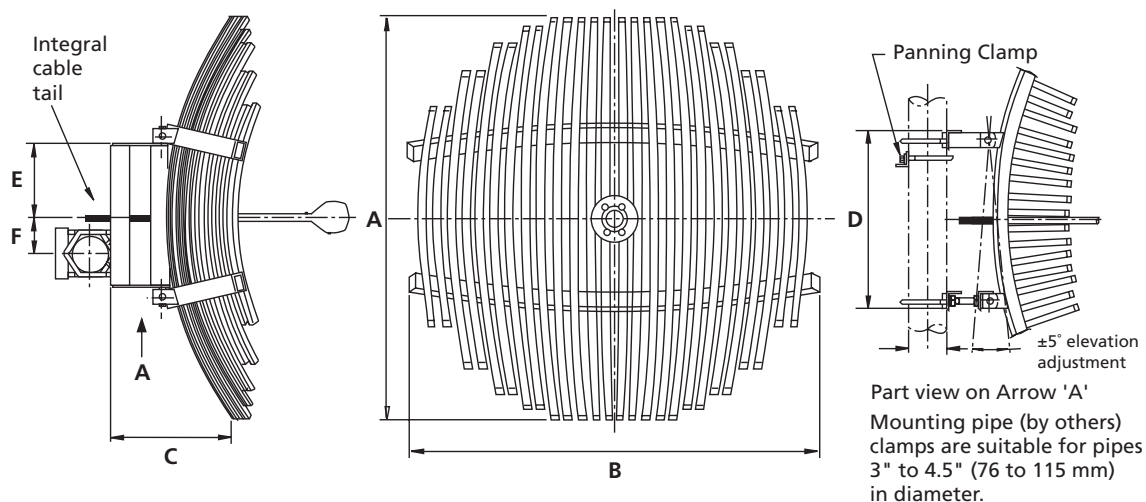


All dimensions in mm (inch)

A	B	CØ30	CØ124	D
1125(44.3)	510(20.1)	980(38.6)	1030(40.6)	1020(40.2)

Grid Antenna Mount Outlines

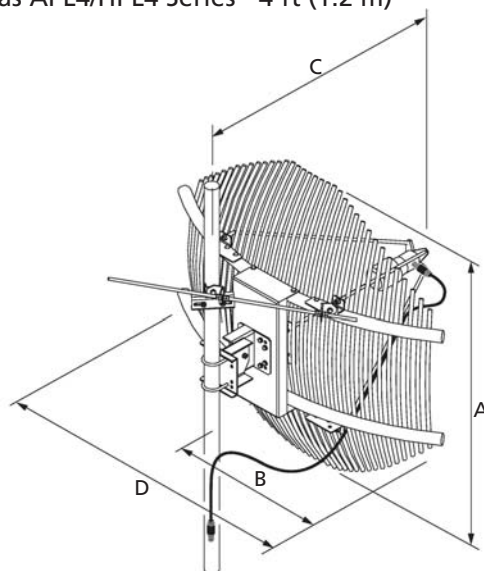
MINIGRID Antennas MGA4/MGAR4 Series - 4 ft (1.2 m)



All dimensions in mm (inch)

A	B	C	D	E	F
1220(48)	1265(50)	350(13.78)	530(20.87)	220(8.66)	110(4.33)

GRID Antennas APL4/HPL4 Series - 4 ft (1.2 m)

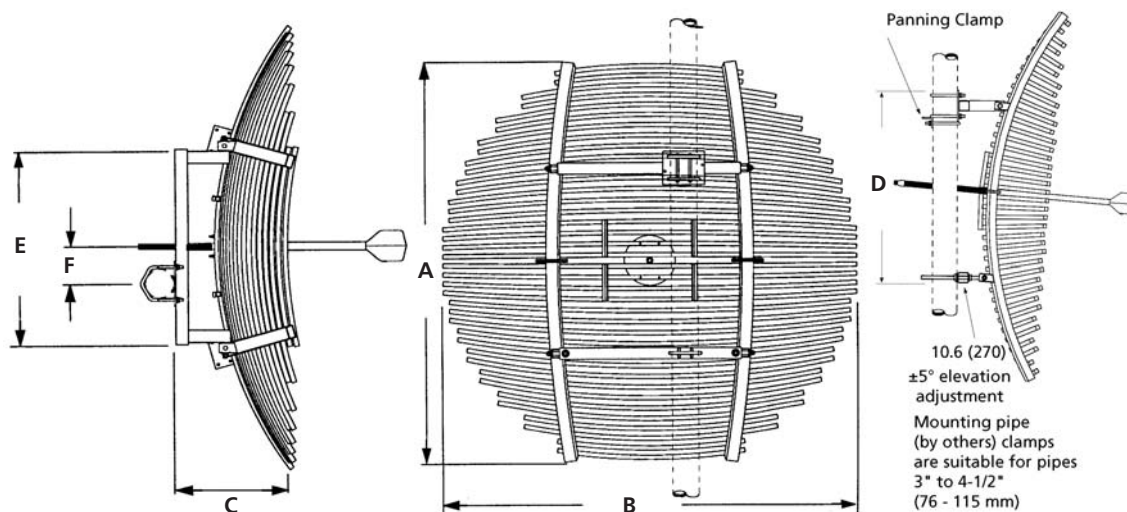


All dimensions in mm (inch)

A	B	CØ65	CØ114	D
1370(53.9)	703(27.7)	1145(45.1)	1165(45.9)	1406(55.4)

Grid Antenna Mount Outlines

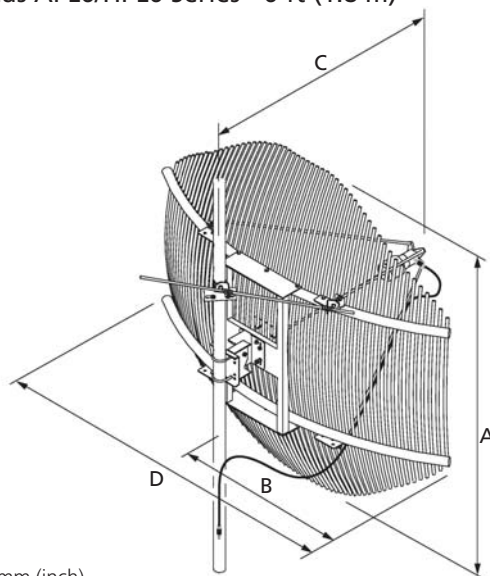
MINIGRID Antennas MGA6/MGAR6 Series - 6 ft (1.8 m)



All dimensions in mm (inch)

A	B	C	D	E	F
1746(68.7)	1800(70.87)	485(19.09)	920(36.22)	766(30.16)	150(5.90)

GRID Antennas APL6/HPL6 Series - 6 ft (1.8 m)

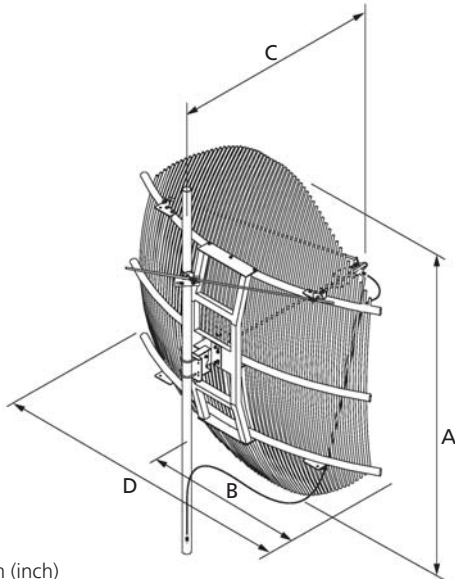


All dimensions in mm (inch)

A	B	CØ65	CØ114	D
1980(78.0)	1015(40.0)	1430(56.3)	1450(57.1)	2030(80.0)

Grid Antenna Mount Outlines

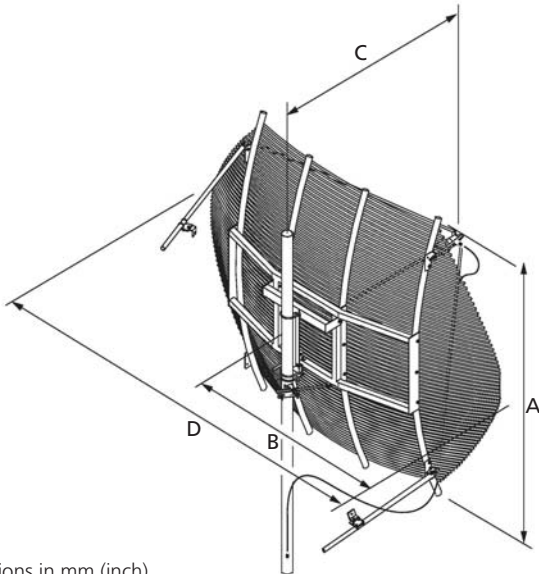
GRID Antennas APL8/HPL8 Series - 8 ft (2.4 m)



All dimensions in mm (inch)

A	B	CØ65	CØ114	D
2690(105.9)	1110(43.7)	1625(64.0)	1550(61.0)	2220(87.4)

GRID Antennas APL10/HPL10 Series - 10 ft (3.0 m)



All dimensions in mm (inch)

A	B	CØ89	CØ114	D
2560(100.8)	1610(63.4)	1908(75.1)	1920(75.6)	3220(126.8)