

Series 12 Standard Gain Horns

Features

- Each horn meets the standards of NRL Report No. 4433
- Entire series covers 0.35 to 90 GHz frequency range
- Rugged construction ensures long useful life
- Optional mounting flanges prevent mechanical distortions

Description

Series 12 Standard Gain Horns provide accurate and practical microwave antenna gain standards. The prime application of Series 12 Gain Horns is experimental gain determination of an antenna by the substitution method.

Standard Gain Horns are available to cover the frequency range from 0.35 to 90 GHz. Horn dimensions and calibration data are taken from NRL Report No. 4433. Gain versus frequency charts are supplied with each unit.

To prevent corrosion, all horns are plated prior to painting.

Mounting Flanges are available for all the Series 12 Standard Gain Horns.

Gain measurements with the standard gain horn and antenna under test are made by alternately connecting the two antennas to a matched receiver. Received power levels are equalized either with the precision IF attenuator in the wide range receiver, or with a precision variable RF attenuator. The Gain, G , in decibels, of the antenna under test is

$$G = G_s + (A - A_s)$$

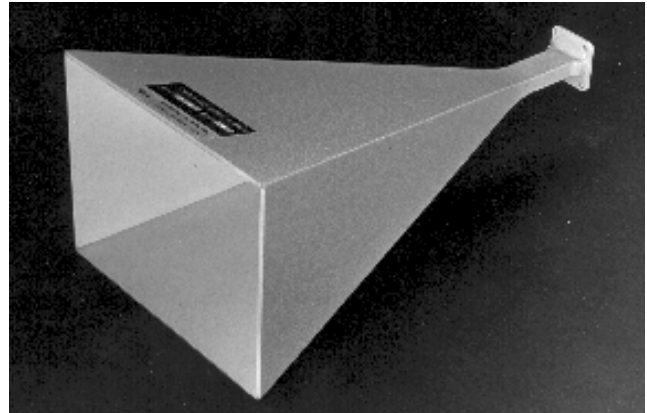
where $(A - A_s)$ is the decibel change in attenuation required to equalize the two received power levels and G_s is the gain of the standard horn at the test frequency.¹

Two conditions are essential for accurate measurements:

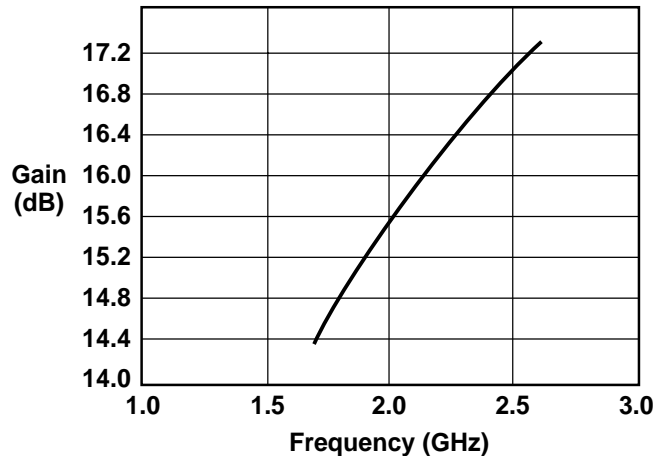
1. The antenna being tested and the standard gain horn must be matched to the line.
2. The gain of the standard above the gain of an isotropic radiator at the test frequency must be known.

¹Gain Accuracy

Model 12-0.4 through Model 12-1.7	±0.5 dB
Model 12-2.6 through 12-60	±0.3 dB



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Calibration data taken from NRL Report 4433

M0293-32

Products - Antennas and Components

Series 12 Standard Gain Horn - continued

Specifications

Standard Gain Horns						Mounting Flanges			
Model Number	Freq. Range Gain (dB)	Nominal Gain	Nom. Beamwidth (Deg)		Weight lbs (kg)		Model Number	Weight lbs (kg)	
			E-plane	H-Plane	net	shipping		net	shipping
12-0.4	0.35 to 0.53	15.5	30	27	300 (136)	665 (302)	12F-0.4	27 (13)	60 (27)
12-0.5	0.49 to 0.75	15.5	30	27	180 (82)	403 (183)	12F-0.5	18 (8)	40 (18)
12-0.75	0.75 to 1.12	15.5	30	27	67 (30)	145 (66)	12F-0.75	12 (6)	27 (13)
12-0.9	0.95 to 1.15	13.7	40	35	25 (11)	50 (23)	12F-0.9	8 (4)	15 (7)
12-1.1	1.12 to 1.70	15.5	30	27	15 (7)	30 (14)	12F-1.1	3 (2)	6 (3)
12-1.7	1.70 to 2.60	15.5	30	27	8 (4)	15 (7)	12F-1.7	3 (2)	6 (3)
12-2.6	2.60 to 3.95	18.0	23	22	7 (3)	13 (6)	12FS-2.6	2 (1)	4 (2)
12-3.9	3.95 to 5.85	18.0	23	22	7 (3)	12 (6)	12FS-3.9	2 (1)	4 (2)
12-5.8	5.85 to 8.20	22.1	12	13	5 (2)	10 (4)	12FS-5.8	2 (1)	4(2)
12-8.2	8.20 to 12.4	22.1	12	13	4 (2)	7 (3)	12FS-8.2	2 (1)	4(2)
12-12	12.4 to 18.0	24.7	9	10	3 (1)	6 (3)	12FS-12	1 (0.5)	3 (1.5)
12A-18	18.0 to 26.5	24.7	9	10	2 (1)	5 (2)	12FA-18	1/2 (0.3)	3 (1.5)
12A-26	26.5 to 40.0	24.7	9	10	2 (1)	3 (2)	12FA-26	1/2 (0.3)	2 (1)
12-33	33.0 to 50.0	24.7	9	10	1 (0.5)	3 (2)	12F-33	1/4 (0.1)	2 (1)
12-50	50.0 to 75.0	24.7	9	10	1/4 (0.1)	2 (1)	12F-50	1/4 (0.1)	2 (1)
12-60	60.0 to 90.0	24.7	9	10	1/4 (0.1)	1 (0.5)	12F-60	1/4 (0.1)	2 (1)

Model No. Suffix	Flange Material	Waveguide		Type or Equivalent	Cover Flange		Dimensions, inches (cm)				
		Type	Internal Size in (cm)		Geometry	A	B	C	D	E	
-0.4	aluminum	RG-291/U	21.00 x 10.50 (53.3 x 26.7)	¹	rectangle	62.00 (157.5)	73.03 (185.5)	54.10 (137.4)	16.0 (40.6)	16.00 x 25.00 (40.6 x 63.5)	
-0.5	aluminum	RG-202/U	15.00 x 7.50 (38.1 x 19.1)	¹	rectangle	48.00 (121.9)	48.25 (122.6)	35.74 (98.0)	13.0 (33.0)	14.0 x 19.0 (35.6 x 48.3)	
-0.75	aluminum	RG-204/U	9.75 x 4.88 (24.8 x 12.4)	¹	rectangle	32.25 (81.9)	32.57 (82.7)	24.12 (61.3)	9.75 (24.8)	16 (40.6)	
-0.9	aluminum	RG-205/U	7.70 x 3.85 (19.6 x 9.8)	¹	rectangle	23.23 (59.0)	21.93 (55.7)	16.25 (41.3)	7.38 (18.8)	12 (30.5)	
-1.1	aluminum	RG-103/U	6.50 x 3.25 (16.5 x 8.3)	UG-418B/U	rectangle	21.70 (55.1)	21.93 (55.7)	16.25 (41.3)	6.62 (15.5)	10 (25.4)	
-1.7	aluminum	RG-105/U	4.30 x 2.15 (10.9 x 5.5)	UG-437B/U	rectangle	14.43 (36.7)	14.51 (36.9)	10.75 (27.3)	4.88 (12.4)	8 (20.3)	
-2.6	aluminum	RG-75/U	2.84 x 1.34 (7.2 x 3.4)	UG-584/U	round	16.65 (42.3)	12.76 (32.4)	9.45 (24.0)	4.88 (12.4)	8 (20.3)	
-3.9	aluminum	RG-95/U	1.87 x 0.87 (4.7 x 2.2)	UG-407/U	round	12.14 (30.8)	8.51 (21.6)	6.30 (16.0)	12 (30.5)	4 (10.2)	
-5.8	aluminum	RG-106/U	1.37 x 0.62 (3.5 x 1.6)	UG-441/U	round	20.00 (50.8)	11.36 (28.9)	8.42 (21.4)	11.0 (29.4)	4 (10.2)	
-8.2	aluminum	RG-67/U	0.90 x 0.40 (2.3 x 1.0)	UG-135/U	square	14.00 (35.6)	7.65 (19.4)	5.67 (14.4)	8 (20.3)	4 (10.2)	
-12	aluminum	RG-349/U	0.62 x 0.31 (1.6 x 0.8)	UG-1665/U	square	14.00 (35.6)	5.98 (15.2)	4.91 (12.5)	6 (15.2)	4 (10.2)	
A-18	brass	RG-53/U	0.42 x 0.17 (0.4 x 1.1)	UG-595/U	square	10.65 (27.1)	4.00 (10.2)	3.28 (8.3)	16.50 (41.9)	8 (20.3)	
A-26	brass	RG-96/U ²	0.28 x 0.14 (0.7 x 0.4)	UG-599/U ²	square	6.82 (17.3)	2.72 (6.9)	2.23 (5.7)	16.50 (41.9)	8 (20.3)	
-33	brass	RG-97/U ²	0.22 x .11 (0.6 x 0.3)	UG-383/U ²	square	5.77 (14.7)	2.18 (5.5)	1.79 (4.5)	16.50 (41.9)	8 (20.3)	

Products - Antennas and Components

Series 12 Standard Gain Horn - continued

Model No. Suffix	Flange Material	Waveguide			Cover Flange		Dimensions, inches (cm)				
		Type	Internal Size in (cm)	Type or Equivalent	Geometry	A	B	C	D	E	
-50	brass	RG-98/U ²	0.15 x 0.07 (0.4 x 0.2)	UG-385/U ²	round	3.85 (9.8)	1.45 (3.7)	1.19 (3.0)	16.50 (41.9)	8 (20.3)	
-60	brass	RG-99/U ²	0.12 x 0.06 (0.3 x 0.2)	UG-387/U ²	round	3.21 (8.2)	1.21 (3.1)	0.99 (2.5)	16.50 (41.9)	8 (20.3)	

¹ Does not have preferred military designation, but is compatible with mating Series 11 Coax-to-Waveguide Adapter.

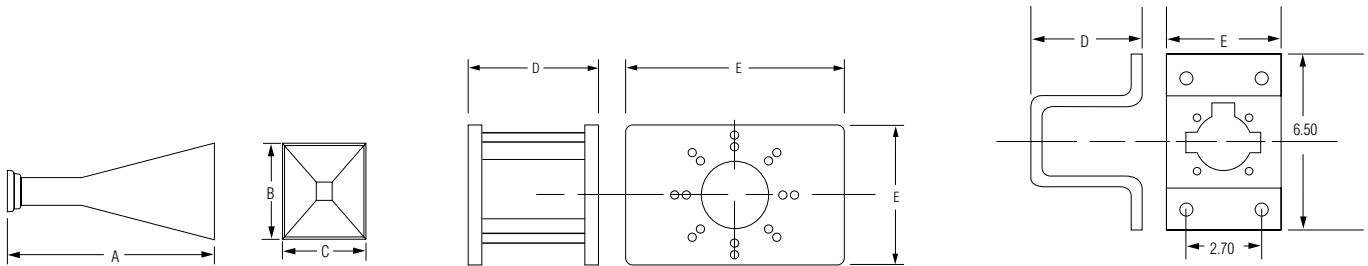
² Waveguide Dimensions per JAN specification, but brass instead of silver.

Ordering Information

When ordering one of the Series 12 Standard Gain Horns, use the appropriate model number for the horn you desire. The model numbers and their specifications are outlined in the specifications section.

Each standard gain horn unit includes a chart depicting the horn's gain across the frequency band it covers.

Optional mounting flanges may be ordered with a corresponding horn or ordered separately. Flange dimensions are outlined in the specifications table (under "D" and "E"). Optional Series 11 Coax-to-Waveguide Adapters may be ordered for use with Series 12 Standard Gain Horns.



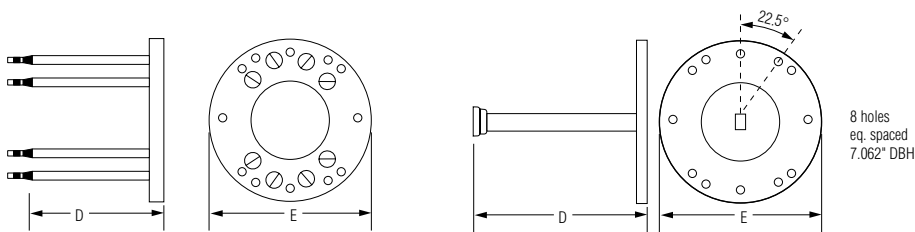
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Model 12 Standard Gain Horn

12F-0.4 and 12F-0.5 Mounting Flange 12FS-3.9 to 12S-12 Mounting Flange

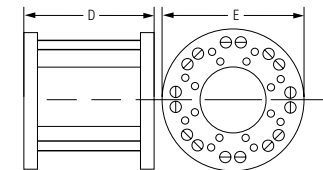


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12F-0.9 to 12F-2.6 Mounting Flange

12FA-18 to 12F-60 Mounting Flange



M0293-117

12F-0.75 Mounting Flange

Options

Not Applicable

Accessories

Series 11 Coax-to-Waveguide Adapters