

SCALAR AND CONICAL HORN ANTENNAS



Millitech series SFH scalar horn antennas are both physically and electromagnetically symmetrical, and lend themselves to either multiple polarizations or polarization-independent (scalar) operation. The suppression of E-plane wall currents provides a nearly symmetrical radiation pattern. Thus, SFH scalar horns have nearly identical beamwidths in both E- and H-planes, as well as specially-designed low sidelobes. Scalar horns are particularly suited to generating higher order modes for use in very efficient monopulse applications.

Typical radiation characteristics are shown on the following page. The on-axis cross-polarized response is low, typically -30 dB relative to the co-polarized level. The standard designs cover 26 to 325 GHz, with approximately 25° beamwidth. Custom horns can be provided with half-power (-3 dB) beamwidths from 60° to below 10° for narrow beamwidth feeds or horn-reflector

FEATURES:

- Symmetric radiation pattern
- Wide range of beamwidths
- Low sidelobes
- Polarization options
- Low cross-polarization

APPLICATIONS:

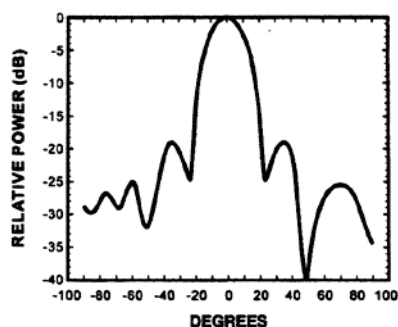
- Feeds for Cassegrain antennas
- Gaussian optics systems
- Illumination, instrumentation
- EW/ELINT
- Radar systems

antenna combinations. Multiple polarization options are available, as are full waveguide band models with single linear polarization.

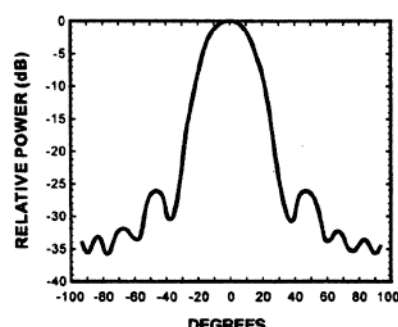
Series CHA conical horn antennas are a cost-effective alternative to the scalar feedhorns, with beamwidths ranging from 10° to 60°. They have lower sidelobe levels than pyramidal horns (such as series SGH standard gain horns), because the TE₁₁ mode electric field distribution is tapered in both dimensions of the horn aperture. However, the beam is asymmetric in the two planes, and the sidelobes are higher than for series SFH antennas.

Standard products for both types of horn antennas have circular waveguide outputs for a given diameter. However, a rectangular waveguide output is offered using either an integral built-in step transition or a removable circular-to-rectangular transition (see series WAC).

TYPICAL RADIATION PATTERNS

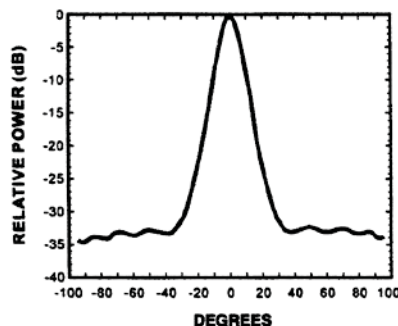


E-PLANE

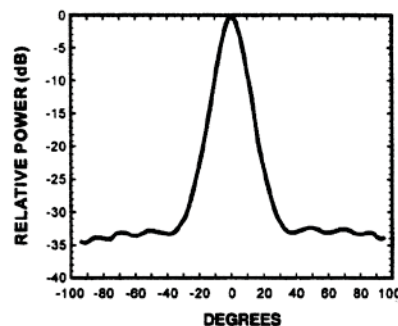


H-PLANE

Series CHA



E-PLANE



H-PLANE

Series SFH

HOW TO ORDER

Specify Model Number SFH-XX-ABBBCC (scalar horns) CHA-XX-ABBBCC (conical horns)
XX = Waveguide Band WR – number
A = Flange Type R – round (not available in WR-42) S – square (WR-42 and WR-28 only) A – Precision Flange per Millitech IS000131, flat option (WR-08 through WR-05 only)
BBB = Circular Waveguide Diameter (in inches) See Waveguide Sizes Table (next page) Specify $\emptyset\emptyset\emptyset$ for rectangular waveguide output using an integral step transition
CC = Beamwidth Degrees $\emptyset\emptyset$ – 25° beamwidth (SFH), 30° (CHA) $1\emptyset$ – 10° beamwidth (SFH)

XXN – nonstandard, specify XX as HPBW, degrees

CIRCULAR WAVEGUIDE SIZES

Rectangular Waveguide Band	Circular Diameter Size	Frequency Range (GHz)*	Circular Waveguide Diameter (in/mm)	Specify When Ordering
K	Large	17.5-20.5	0.455/11.56	455
	Medium	20.0-24.5	0.396/10.06	396
	Small	24.0-26.5	0.328/8.33	328
Ka	Large	26.5-33.0	0.315/8.00	315
	Medium	33.0-38.5	0.250/6.35	250
	Small	38.5-40.0	0.219/5.56	219
Q	Large	33.0-38.5	0.250/6.35	250
	Medium	38.5-43.0	0.219/5.56	219
	Small	43.0-50.0	0.188/4.78	188
U	Large	40.0-43.0	0.210/5.33	210
	Medium	43.0-50.0	0.188/4.78	188
	Small	50.0-60.0	0.165/4.19	165
V	Large	50.0-58.0	0.165/4.19	165
	Medium	58.0-68.0	0.141/3.58	141
	Small	68.0-75.0	0.125/3.18	125
E	Large	60.0-66.0	0.136/3.45	136
	Medium	66.0-82.0	0.125/3.18	125
	Small	82.0-90.0	0.094/2.39	094
W	Large	75.0-88.0	0.112/2.84	112
	Small	88.0-110.0	0.094/2.39	094
F	Large	90.0-115.0	0.089/2.26	089
	Small	115.0-140.0	0.075/1.91	075
D	Large	110.0-140.0	0.073/1.85	073
	Small	140.0-160.0	0.059/1.50	059
G	Large	140.0-180.0	0.058/1.47	058
	Small	180.0-220.0	0.045/1.14	045
---	---	170.0-260.0	0.049/1.25	049
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*If the required frequencies fall within two waveguide diameter sizes, the larger one should be selected.