

Cambium Networks Ltd
Unit B2, Linhay Business Park
Eastern Road
Ashburton
Devon
UK
TQ13 7UP

20th May 2015

Telecommunication Certification Body
UL VS Ltd
Offices 18-26
Grove House
Lutyens Close
Chineham Court
Basingstoke
Hampshire
RG24 8AG
United Kingdom

To whom it may concern,

Subject – Attestation of Antenna Performance

We, Cambium Networks Ltd, hereby attest that the key parameters for Out Of band emissions are:

- Return Loss
- VSWR
- Cross Polarization Discrimination
- Antenna gain

As can be seen from the attached antenna information below for the 4' and 6' antennas, the antenna parameters are similar and, hence, Out of Band performance between the 4' and 6' antennas will be similar.

Yours sincerely



Donald W Reid
CEng MIET, MInstLM
Principal Regulatory Engineer



PX4F-52-NXA/A
1.2 m | 4 ft Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized, 5.250–5.850 GHz, N Female, gray antenna, molded gray radome with flash, standard pack—one-piece reflector

General Specifications

Antenna Type	PXF - Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized
Diameter, nominal	1.2 m 4 ft
Packing	Standard pack
Radome Color	Gray
Radome Material	Molded
Reflector Construction	One-piece reflector
Antenna Input	N Female
Antenna Color	Gray
Antenna Type	PXF - Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized
Diameter, nominal	1.2 m 4 ft
Flash Included	Yes
Polarization	Dual

Electrical Specifications

Operating Frequency Band	5.250 – 5.850 GHz
Beamwidth, Horizontal	3.0 °
Beamwidth, Vertical	3.0 °
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI 302 217 Class 1
Front-to-Back Ratio	52 dB
Gain, Low Band	34.5 dBi
Gain, Mid Band	34.9 dBi
Gain, Top Band	35.3 dBi
Operating Frequency Band	5.250 – 5.850 GHz
Radiation Pattern Envelope Reference (RPE)	4750
Return Loss	14.0 dB
VSWR	1.50

Mechanical Specifications

Fine Azimuth Adjustment	±15°
Fine Elevation Adjustment	±20°
Mounting Pipe Diameter	115 mm 4.5 in
Net Weight	54 kg 119 lb
Side Struts, Included	1 inboard

PX4F-52-NXA/A



Side Struts, Optional	1 inboard
Wind Velocity Operational	110 km/h 68 mph
Wind Velocity Survival Rating	200 km/h 124 mph

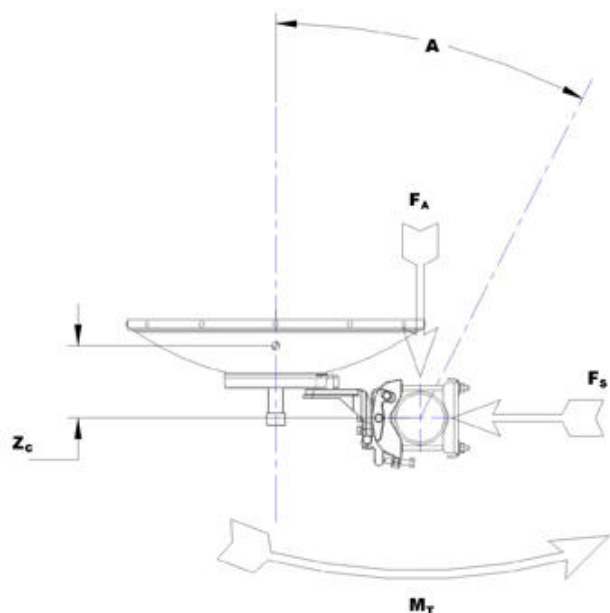
Wind Forces At Wind Velocity Survival Rating

Angle a for MT Max	-130 °
Axial Force (FA)	3881 N 872 lbf
Side Force (FS)	552 N 124 lbf
Twisting Moment (MT)	1236 N•m
Weight with 1/2 in (12 mm) Radial Ice	130 kg 287 lb
Zcg with 1/2 in (12 mm) Radial Ice	346 mm 14 in
Zcg without Ice	203 mm 8 in

PX4F-52-NXA/A



Wind Forces At Wind Velocity Survival Rating Image



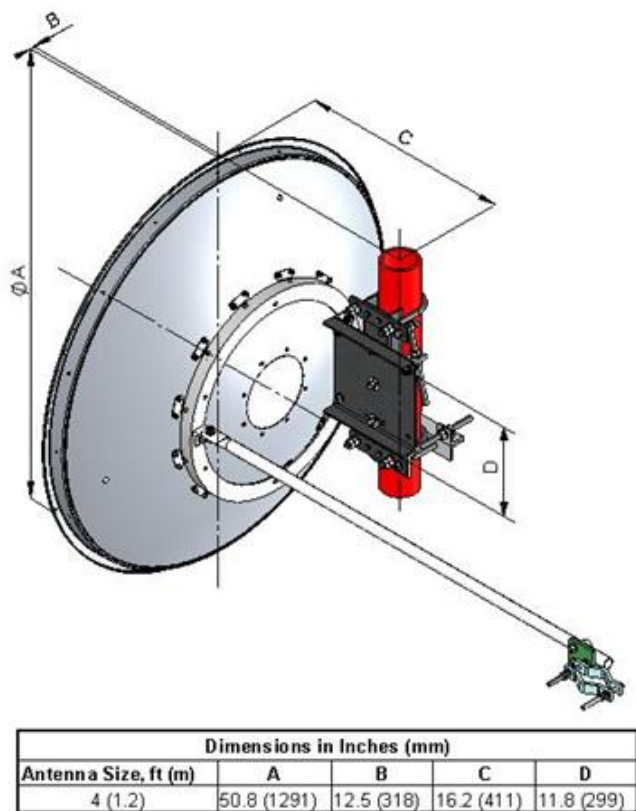
Packed Dimensions

Gross Weight, Packed Antenna	152.0 kg		335.1 lb
Height	143.0 cm		56.3 in
Length	143.0 cm		56.3 in
Width	84.0 cm		33.1 in

PX4F-52-NXA/A



Antenna Dimensions And Mounting Information



Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

PX4F-52/A (Product Component—not orderable) — 1.2 m | 4 ft Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized, 5.250–5.850 GHz

* Footnotes

Axial Force (FA)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Cross Polarization Discrimination (XPD)	The difference between the peak of the co-polarized main beam and the maximum cross-polarized signal over an angle twice the 3 dB beamwidth of the co-polarized main beam.

PX4F-52-NXA/A

POWERED BY



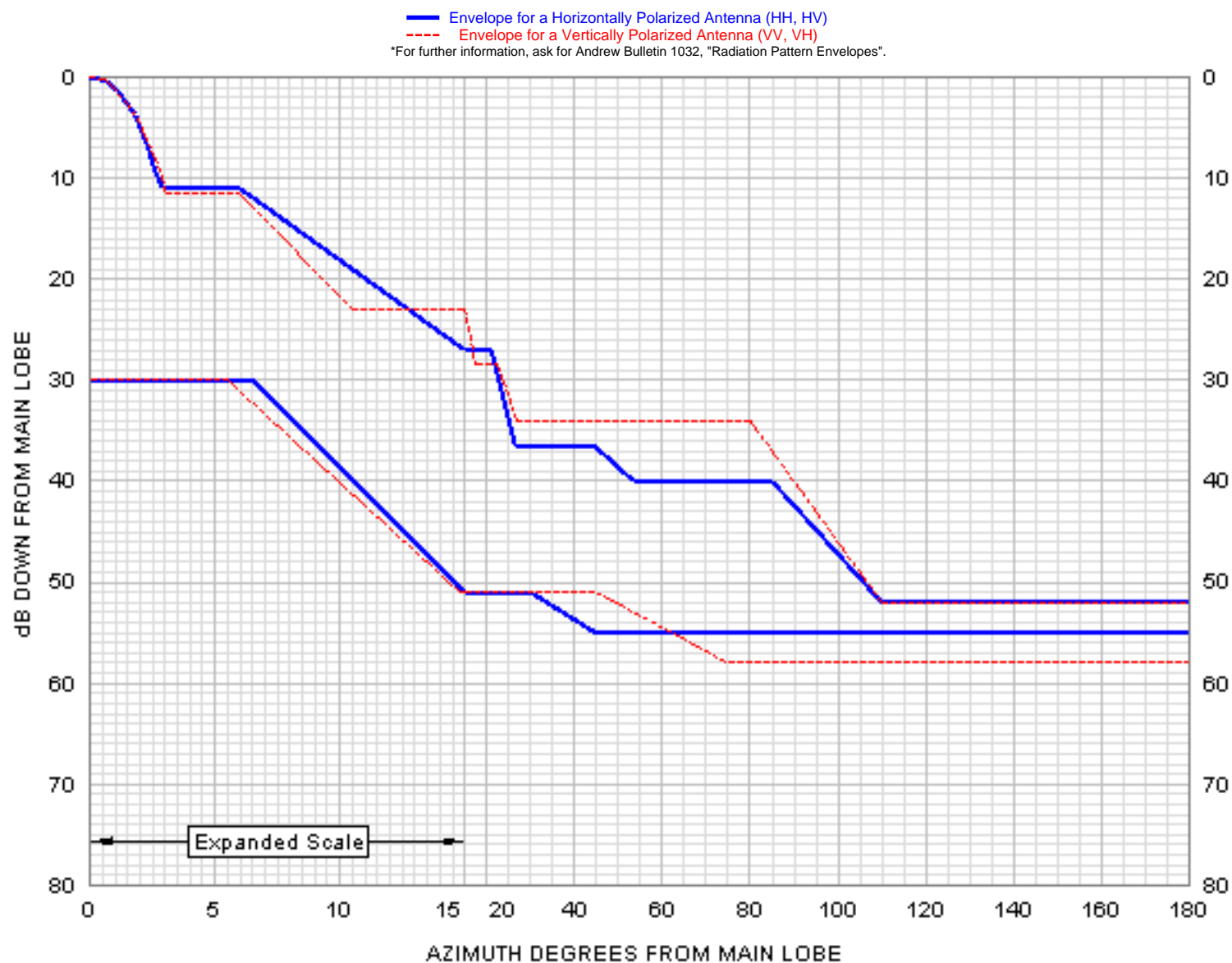
Front-to-Back Ratio	Denotes highest radiation relative to the main beam, at $180^{\circ} \pm 40^{\circ}$, across the band. Production antennas do not exceed rated values by more than 2 dB unless stated otherwise.
Gain, Mid Band	For a given frequency band, gain is primarily a function of antenna size. The gain of Andrew antennas is determined by either gain by comparison or by computer integration of the measured antenna patterns.
Operating Frequency Band	Bands correspond with CCIR recommendations or common allocations used throughout the world. Other ranges can be accommodated on special order.
Packing	Andrew standard packing is suitable for export. Antennas are shipped as standard in totally recyclable cardboard or wire-bound crates (dependent on product). For your convenience, Andrew offers heavy duty export packing options.
Radiation Pattern Envelope Reference (RPE)	Radiation patterns determine an antenna's ability to discriminate against unwanted signals under conditions of radio congestion. Radiation patterns are dependent on antenna series, size, and frequency.
Return Loss	The figure that indicates the proportion of radio waves incident upon the antenna that are rejected as a ratio of those that are accepted.
Side Force (FS)	Maximum side force exerted on the mounting pipe as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Twisting Moment (MT)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
VSWR	Maximum; is the guaranteed Peak Voltage-Standing-Wave-Ratio within the operating band.
Wind Velocity Operational	The wind speed where the antenna deflection is equal to or less than 0.1 degrees. In the case of ValuLine antennas, it is defined as a maximum deflection of 0.3 x the 3 dB beam width of the antenna.
Wind Velocity Survival Rating	The maximum wind speed the antenna, including mounts and radomes, where applicable, will withstand without permanent deformation. Realignment may be required. This wind speed is applicable to antenna with the specified amount of radial ice.

PX4F-52 - Radiation Pattern Envelope



RPE: 4750

Engineering Approved:
28 March 2003



PX4F-52 - Radiation Pattern Envelope



RPE: 4750

Engineering Approved:
28 March 2003

H/H		H/V		V/V		V/H	
Angle	dB	Angle	dB	Angle	dB	Angle	dB
0.00	0.00	0.00	-30.00	0.00	0.00	0.00	-30.00
0.60	-0.30	6.50	-30.00	0.60	-0.30	5.50	-30.00
1.10	-1.30	15.00	-51.00	0.90	-0.95	14.80	-51.00
1.80	-3.70	30.00	-51.00	1.50	-2.60	45.00	-51.00
2.30	-6.80	44.72	-55.00	1.90	-4.10	75.00	-58.00
2.60	-9.30	180.00	-55.00	2.20	-5.75	180.00	-58.00
2.90	-11.00			2.60	-8.00		
6.00	-11.00			2.90	-9.90		
15.00	-27.00			3.00	-11.50		
21.00	-27.00			6.00	-11.50		
26.50	-36.50			10.50	-23.00		
44.50	-36.50			15.00	-23.00		
53.50	-40.00			17.50	-28.50		
85.00	-40.00			22.50	-28.50		
110.00	-52.00			26.90	-34.00		
180.00	-52.00			80.00	-34.00		
				110.00	-52.00		
				180.00	-52.00		

Andrew Corporation
3 Westbrook Corporate Center
Suite 900
Westchester, Illinois 60154 USA

Corporate Web Site: <http://www.andrew.com>
Customer Service Center: 1-800-255-1479
Outside North America Telephone +1 708 873-2307

**PX6F-52/A****1.8 m | 6 ft Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized, 5.250–5.850 GHz**

General Specifications

Antenna Type	PXF - Standard Parabolic Unshielded, Dual-Polarized Antenna, unpressurized
Diameter, nominal	1.8 m 6 ft
Polarization	Dual

Electrical Specifications

Beamwidth, Horizontal	1.8 °
Beamwidth, Vertical	1.8 °
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI 302 217 Class 1
Front-to-Back Ratio	49 dB
Gain, Low Band	37.0 dBi
Gain, Mid Band	37.6 dBi
Gain, Top Band	38.1 dBi
Operating Frequency Band	5.250 – 5.850 GHz
Radiation Pattern Envelope Reference (RPE)	4752
Return Loss	14.0 dB
VSWR	1.50

Mechanical Specifications

Fine Azimuth Adjustment	±15°
Fine Elevation Adjustment	±20°
Mounting Pipe Diameter	115 mm 4.5 in
Net Weight	70 kg 154 lb
Side Struts, Included	1 inboard
Side Struts, Optional	1 inboard
Wind Velocity Operational	110 km/h 68 mph
Wind Velocity Survival Rating	200 km/h 124 mph

Wind Forces At Wind Velocity Survival Rating

Angle α for MT Max	-130 °
Axial Force (FA)	8779 N 1974 lbf
Side Force (FS)	1946 N 437 lbf
Twisting Moment (MT)	3826 N•m

PX6F-52/A



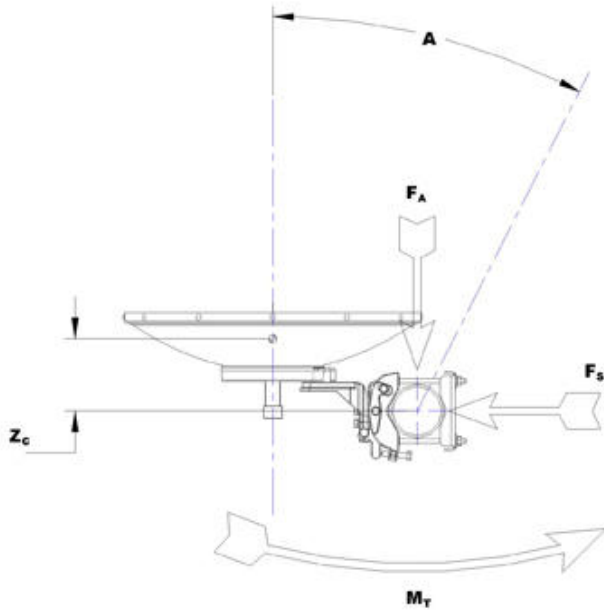
Weight with 1/2 in (12 mm) Radial Ice	122 kg 269 lb
Zcg with 1/2 in (12 mm) Radial Ice	347 mm 14 in
Zcg without Ice	278 mm 11 in

PX6F-52/A

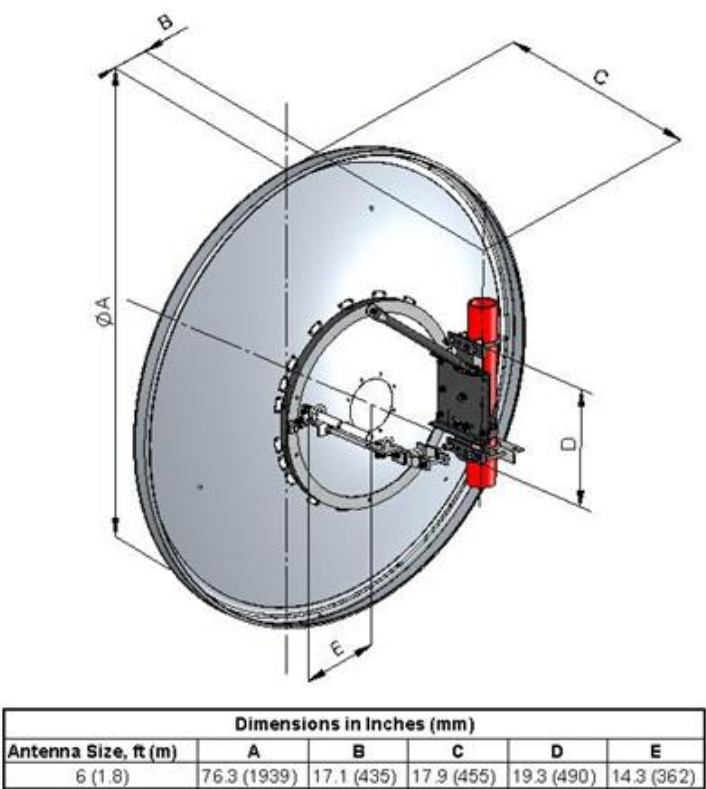
POWERED BY



Wind Forces At Wind Velocity Survival Rating Image



Antenna Dimensions And Mounting Information



* Footnotes

Axial Force (FA)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Cross Polarization Discrimination (XPD)	The difference between the peak of the co-polarized main beam and the maximum cross-polarized signal over an angle twice the 3 dB beamwidth of the co-polarized main beam.
Front-to-Back Ratio	Denotes highest radiation relative to the main beam, at 180° ±40°, across the band. Production antennas do not exceed rated values by more than 2 dB unless stated otherwise.
Gain, Mid Band	For a given frequency band, gain is primarily a function of antenna size. The gain of Andrew antennas is determined by either gain by comparison or by computer integration of the measured antenna patterns.
Operating Frequency Band	Bands correspond with CCIR recommendations or common allocations used throughout the world. Other ranges can be accommodated on special order.
Radiation Pattern Envelope Reference (RPE)	Radiation patterns determine an antenna’s ability to discriminate against unwanted signals under conditions of radio congestion. Radiation patterns

PX6F-52/A

POWERED BY



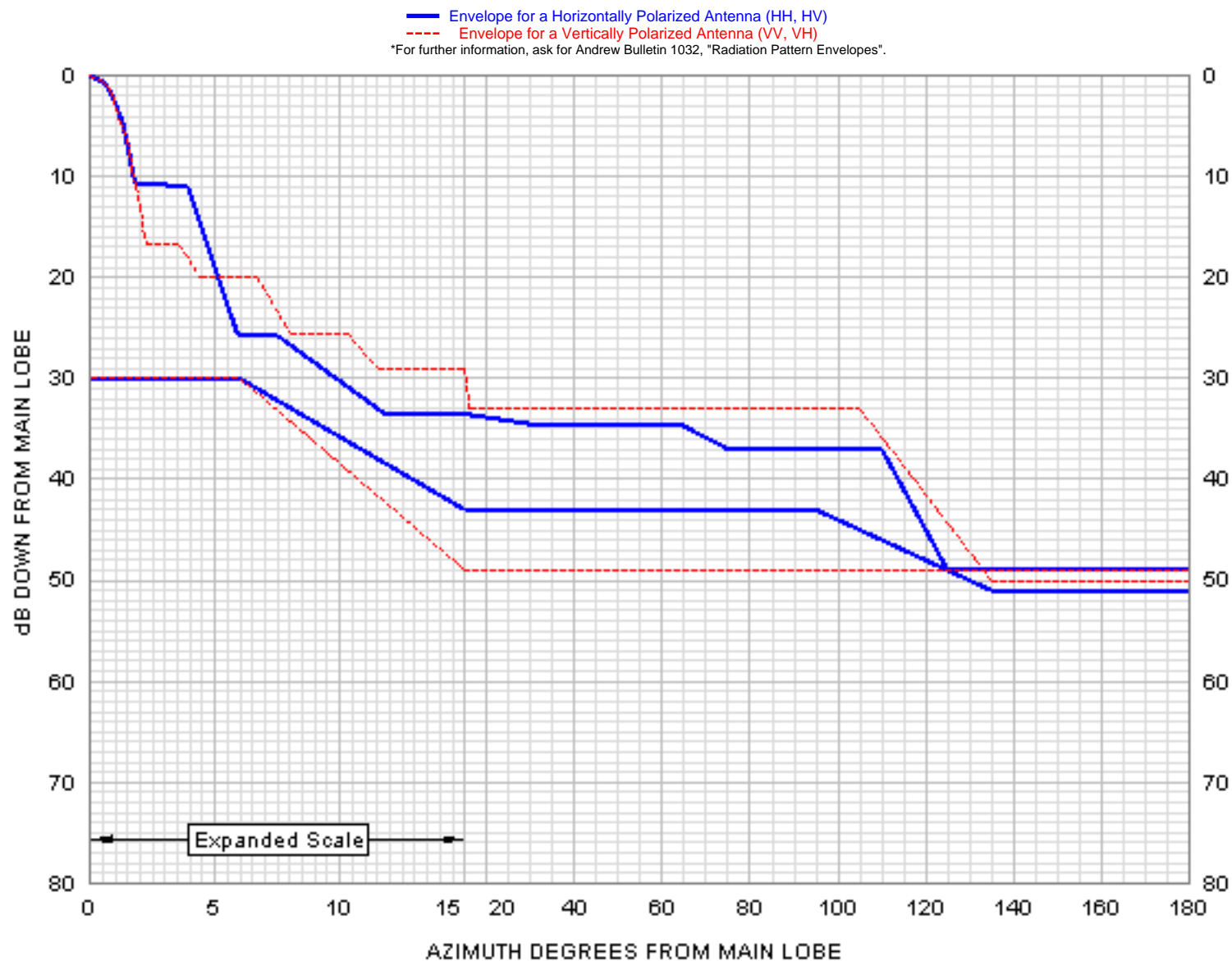
	are dependent on antenna series, size, and frequency.
Return Loss	The figure that indicates the proportion of radio waves incident upon the antenna that are rejected as a ratio of those that are accepted.
Side Force (FS)	Maximum side force exerted on the mounting pipe as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Twisting Moment (MT)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
VSWR	Maximum; is the guaranteed Peak Voltage-Standing-Wave-Ratio within the operating band.
Wind Velocity Operational	The wind speed where the antenna deflection is equal to or less than 0.1 degrees. In the case of ValuLine antennas, it is defined as a maximum deflection of 0.3 x the 3 dB beam width of the antenna.
Wind Velocity Survival Rating	The maximum wind speed the antenna, including mounts and radomes, where applicable, will withstand without permanent deformation. Realignment may be required. This wind speed is applicable to antenna with the specified amount of radial ice.

PX6F-52 - Radiation Pattern Envelope



RPE: 4752

Engineering Approved:
28 March 2003



PX6F-52 - Radiation Pattern Envelope



RPE: 4752

Engineering Approved:
28 March 2003

H/H		H/V		V/V		V/H	
Angle	dB	Angle	dB	Angle	dB	Angle	dB
0.00	0.00	0.00	-30.00	0.00	0.00	0.00	-30.00
0.50	-0.60	6.00	-30.00	0.50	-0.60	6.00	-30.00
0.80	-1.50	15.00	-43.00	0.70	-1.10	15.00	-49.00
1.10	-3.30	95.00	-43.00	0.85	-1.60	180.00	-49.00
1.30	-4.70	135.00	-51.00	1.05	-3.30		
1.40	-5.80	180.00	-51.00	1.20	-4.50		
1.50	-6.90			1.50	-6.50		
1.60	-8.20			1.60	-8.00		
1.70	-9.50			1.70	-9.50		
1.80	-10.70			1.85	-11.00		
3.90	-10.90			2.00	-12.80		
5.90	-25.65			2.10	-14.40		
7.50	-25.75			2.15	-15.60		
11.80	-33.50			2.25	-16.60		
15.00	-33.50			3.60	-16.80		
30.00	-34.50			4.40	-20.00		
64.00	-34.50			6.70	-20.00		
75.00	-37.00			8.00	-25.50		
110.00	-37.00			10.30	-25.50		
125.00	-49.00			11.50	-29.00		
180.00	-49.00			15.00	-29.00		
				16.00	-33.00		
				105.00	-33.00		
				135.00	-50.00		
				180.00	-50.00		

Andrew Corporation
3 Westbrook Corporate Center
Suite 900
Westchester, Illinois 60154 USA

Corporate Web Site: <http://www.andrew.com>
Customer Service Center: 1-800-255-1479
Outside North America Telephone +1 708 873-2307