

ELECTRICAL TEST REPORT

**20.5-inch Horizontally polarized, X-band,
Slotted Array Antenna**

PREPARED FOR:
Raven Aerostar Technical Solutions
2231 Crystal Drive, Suite 515
Arlington, VA 22020

Customer Purchase Order: P14000114
ARA Sales Order: 1120055

Report Number: C1925-700

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ARA/SEAVEY ENGINEERING ASSOCIATES, INC.
28 RIVERSIDE DRIVE PEMBROKE MA 02359
(781) 829-4740 • FAX (781) 829-4590

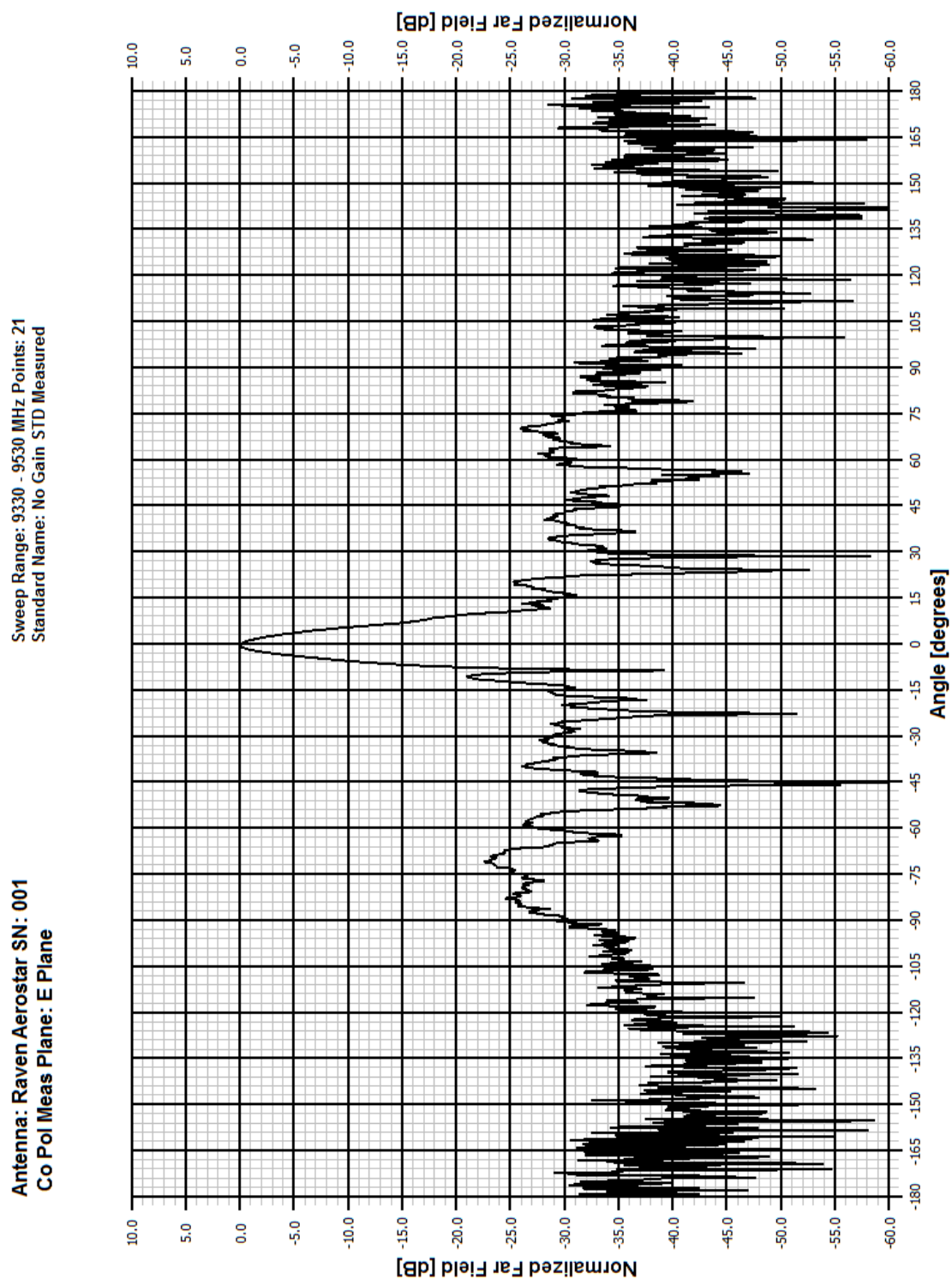
INTRODUCTION:

This test report summarizes the results of electrical testing of Raven Aerostar's 9.33-9.53 GHz, X-band Array Antenna. The antenna under test is a 20.5" long slotted array with a WR-90 RF input port. Testing was performed on ARA's 1100-foot outdoor test range at Middleborough, Massachusetts. The antenna under test was mounted on an azimuth over elevation over azimuth positioner at a test height of 45 feet. The transmit antenna was a 4-foot diameter parabolic antenna mounted on a 25-foot tower with azimuth, elevation, and polarization adjustable mounting. 360° Azimuth and Elevation patterns were collected along with gain and XPOL. Gain was measured utilizing the standard gain substitution method. The standard was a Seavey Engineering Model SGA-90 standard gain horn. All testing is in accordance with the IEEE 149-1979 standard.

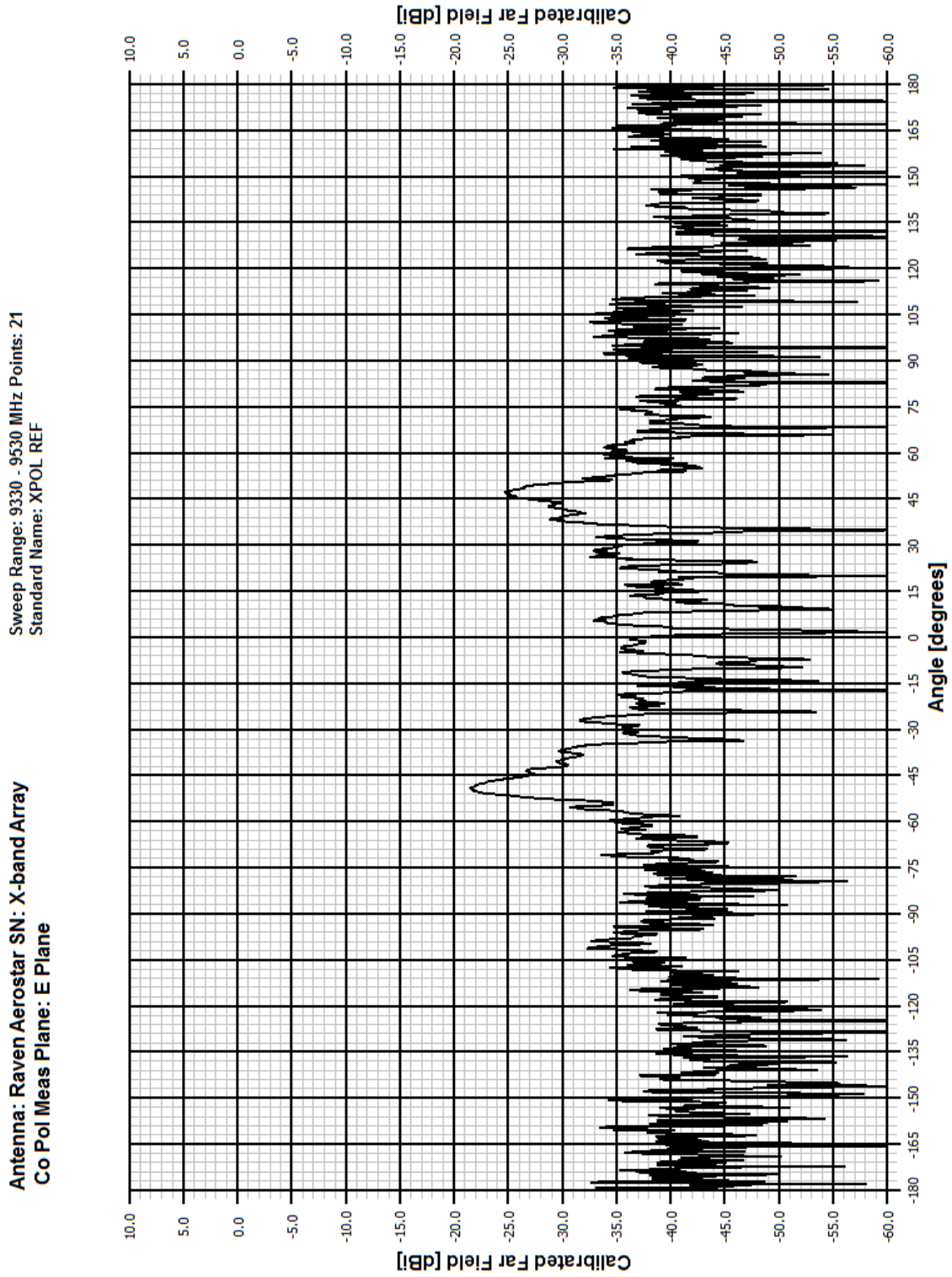
Test Data Summary

Frequency (GHz)	Gain (dBil)	Azimuth 3 dB Beamwidth	Azimuth Sidelobe Level (dB)	Elevation 3 dB Beamwidth	Elevation Sidelobe Level (dB)	On-axis Cross-pol (dB)
9.33	21.7	5.66°	21/18	21.7°	25/23.5	37
9.34	22.47	5.4°	21.6/19	21.6°	28.5/24.5	45
9.35	22.99	5.3°	21.7/20	21.11°	30/26	42.6
9.36	23.41	5.18°	23/20.6	20.87°	31/27.5	45.5
9.37	23.80	5.18°	22.5/21.1	20.62°	29.3/27.0	41
9.38	23.95	5.11°	22.9/21.8	20.12°	29.5/26.7	40
9.39	24.07	5.13°	23/22	19.63°	30/26.7	41.8
9.40	24.18	5.12°	23/22.8	19.48°	29.5/26.8	43.8
9.41	24.31	5.13°	23.2/23.2	19.33°	29.7/26.9	44
9.42	24.44	5.12°	23.1/23.7	19.09°	29.1/26.6	40
9.43	24.51	5.11°	22.8/24.3	19.09°	29.5/26.5	37
9.44	24.57	5.1°	22.3/25.0	19.0°	29.5/26.8	40.4
9.45	24.52	5.07°	22.3/25.2	19.1°	28.8/26.2	43.4
9.46	24.41	5.08°	22.3/26	19.3°	30/26	49.6
9.47	24.46	5.03°	22/26.6	19.5°	30/26.4	39.8
9.48	24.53	5.02°	22/27.2	19.57°	36.5/26.8	36
9.49	24.25	5.01°	21.8/26.8	20.05°	33/27	33.1
9.50	24.20	5.01°	21.6/26.9	20.18°	35/27.2	34.3
9.51	24.27	5.0°	21.7/26.7	20.6°	33/27	33.7
9.52	23.97	5.01°	21.9/26.8	20.9°	31.5/25.8	33.8
9.53	23.86	4.98°	22/27	21.28°	31.7/24.7	35.5

9.33 GHz Azimuth E-plane



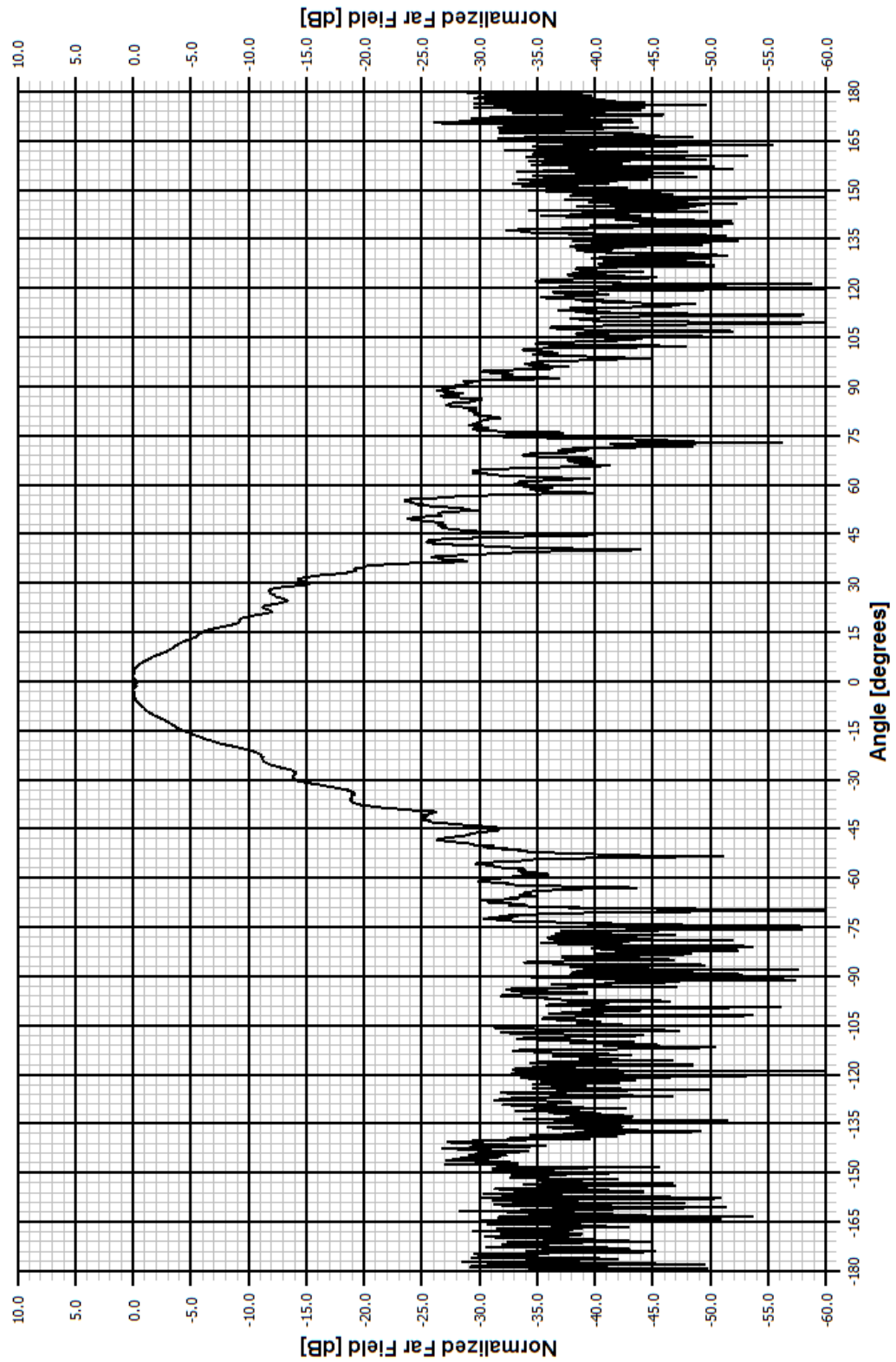
9.33 GHz Azimuth XPOL



9.33 GHz Elevation H-plane

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: No Gain STD Measured

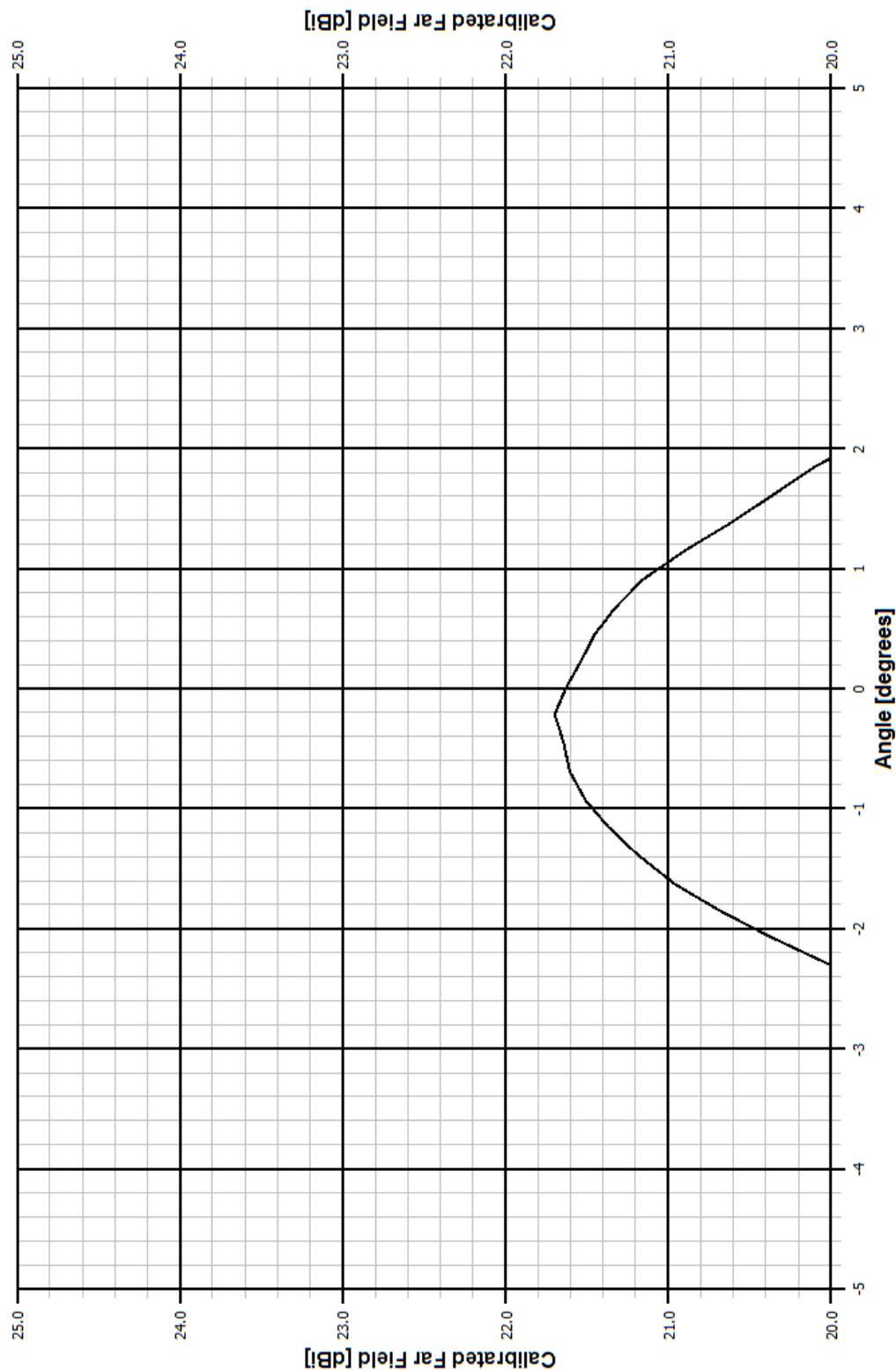
Antenna: Raven Aerostar SN: X-band array
Co Pol Meas Plane: H Plane



9.33 GHz Gain

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: SGA-90

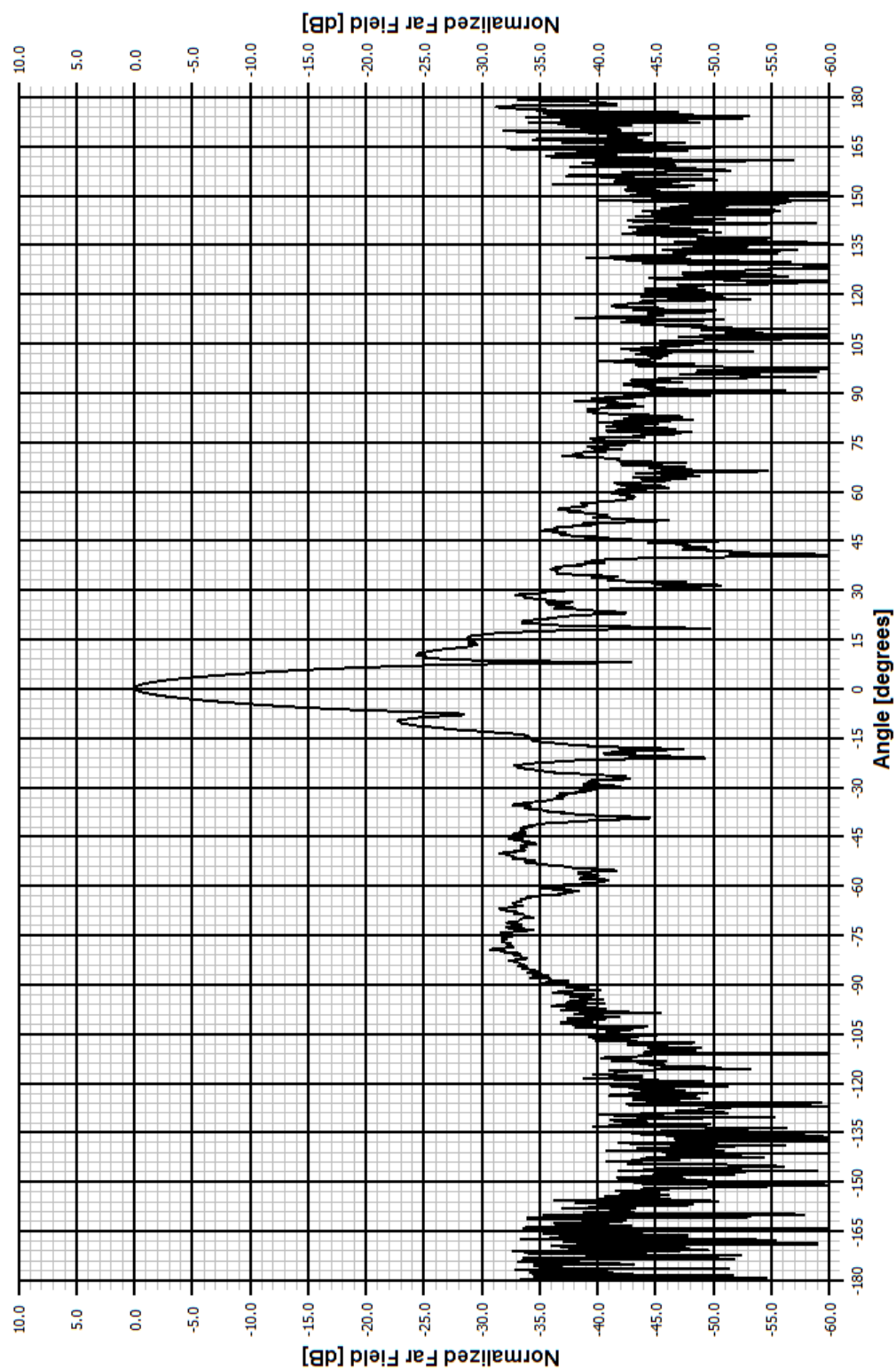
Antenna: Raven Aerostar SN: X-band Array
Co Pol Meas Plane: E Plane



9.43 GHz Azimuth E-plane

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: No Gain STD Measured

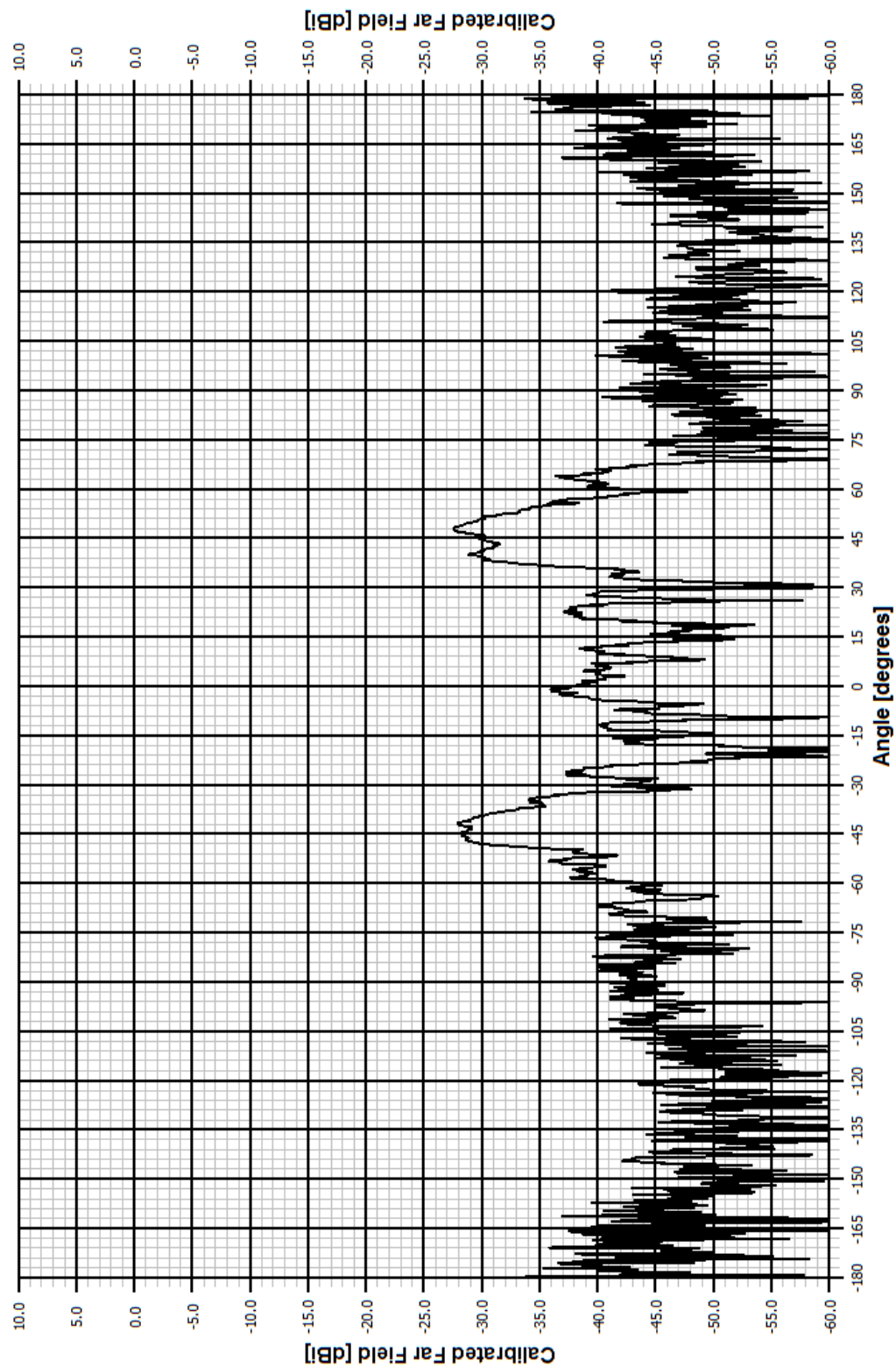
Antenna: Raven Aerostar SN: 001
Co Pol Meas Plane: E Plane



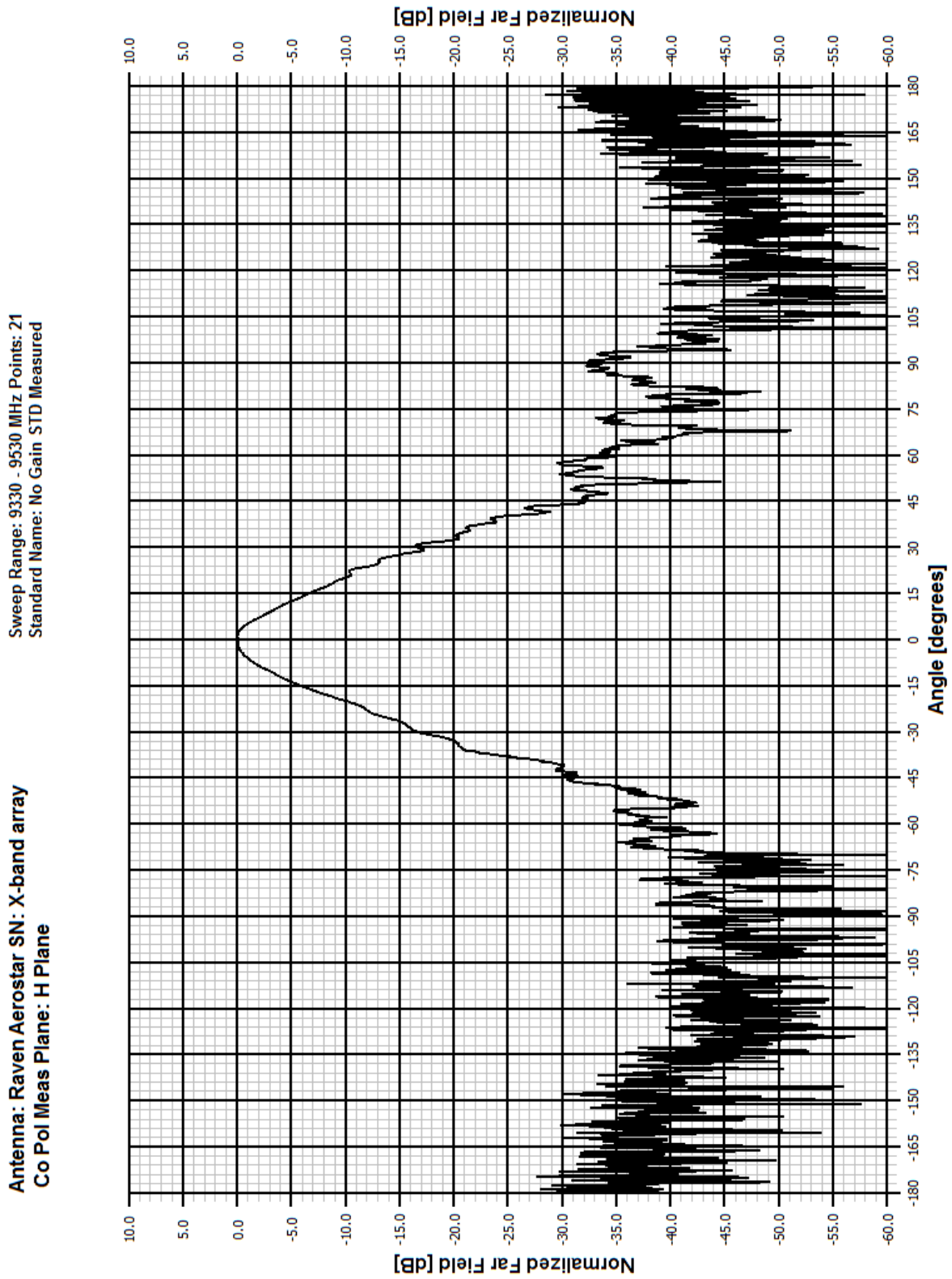
9.43 GHz Azimuth XPOL

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: XPOL REF

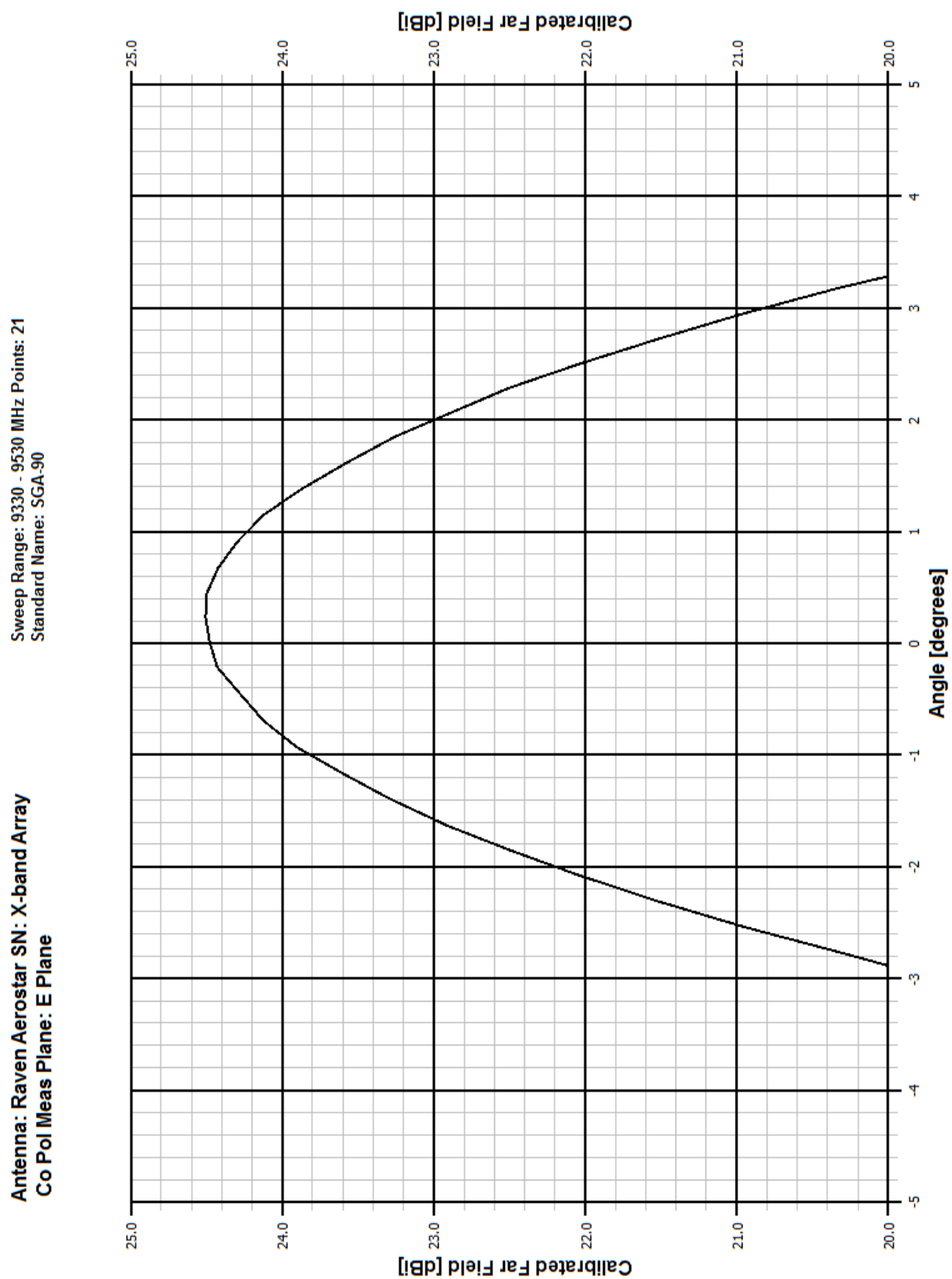
Antenna: Raven Aerostar SN: X-band Array
Co Pol Meas Plane: E Plane



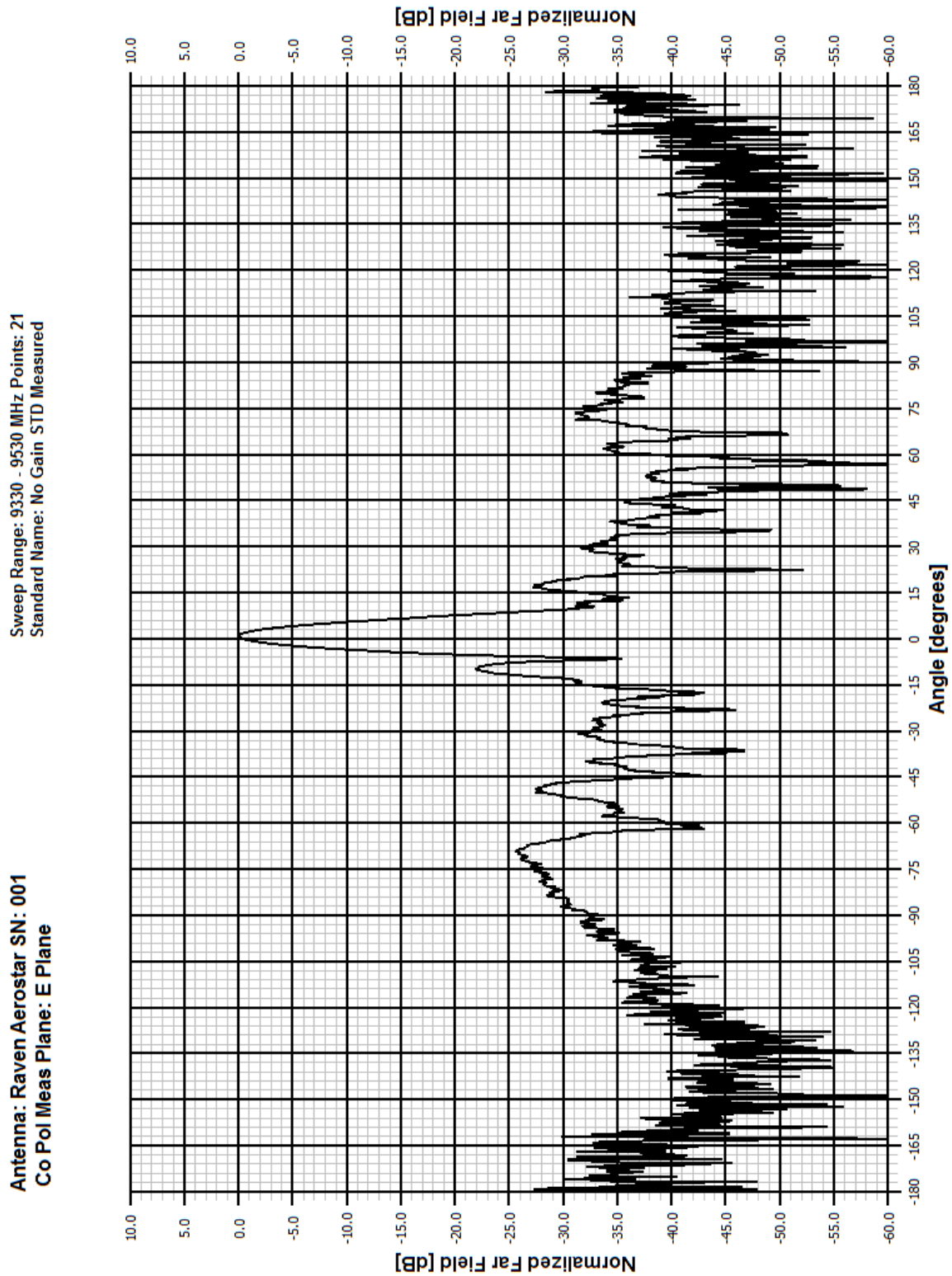
9.43 GHz Elevation H-plane



9.43 GHz Gain



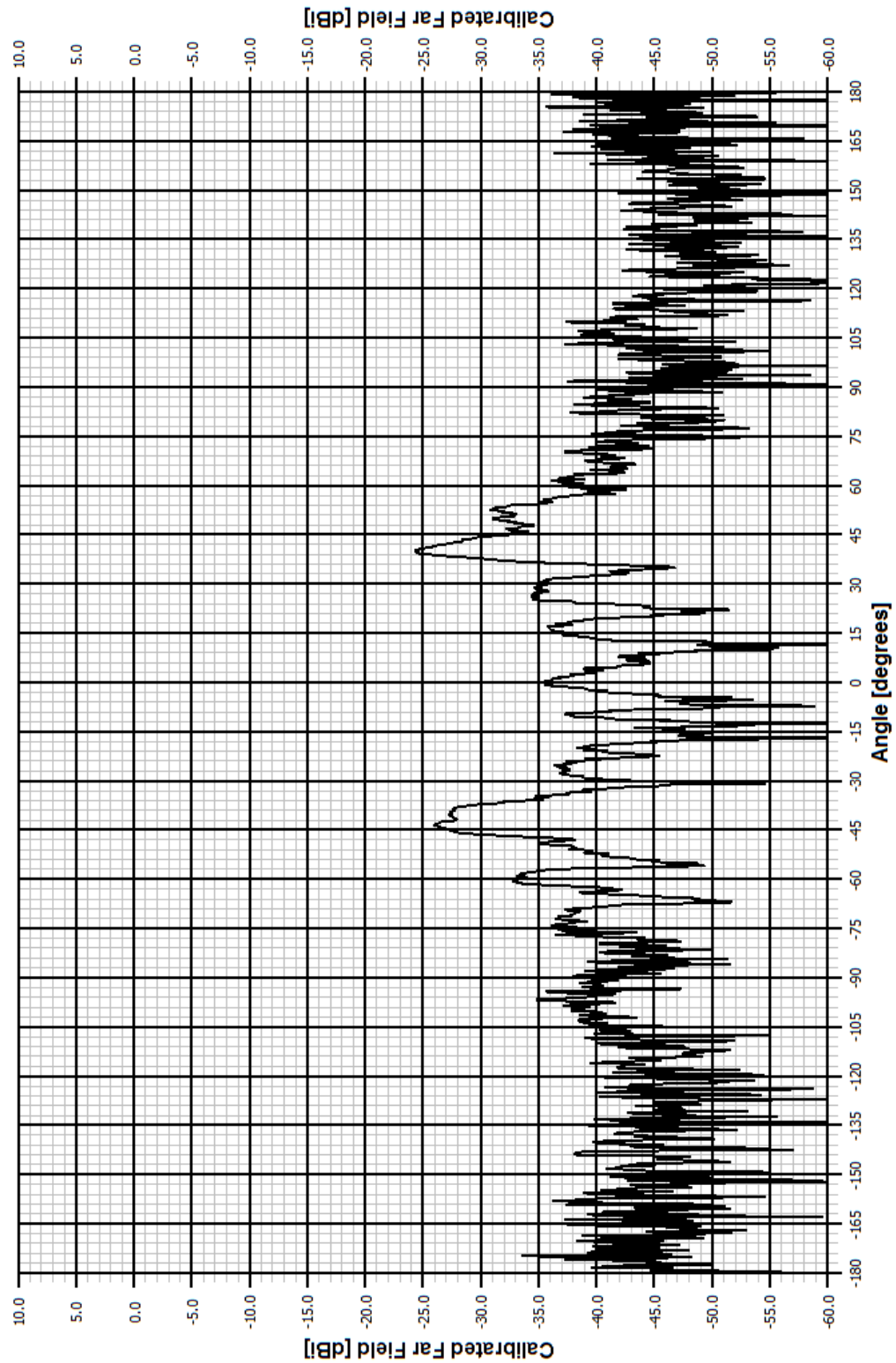
9.53 GHz Azimuth E-plane



9.53 GHz Azimuth XPOL

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: XPOL REF

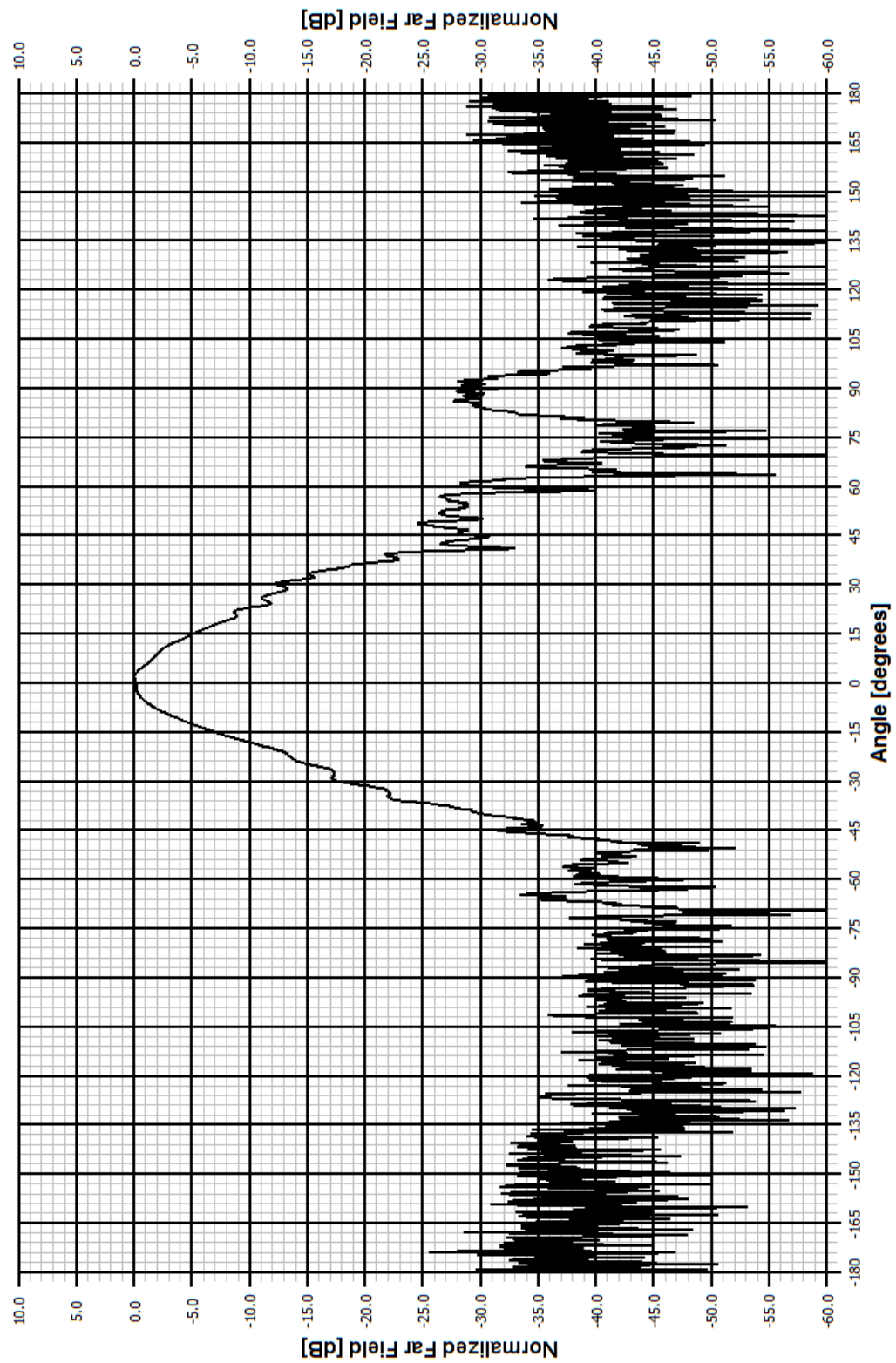
Antenna: Raven Aerostar SN: X-band Array
Co Pol Meas Plane: E Plane



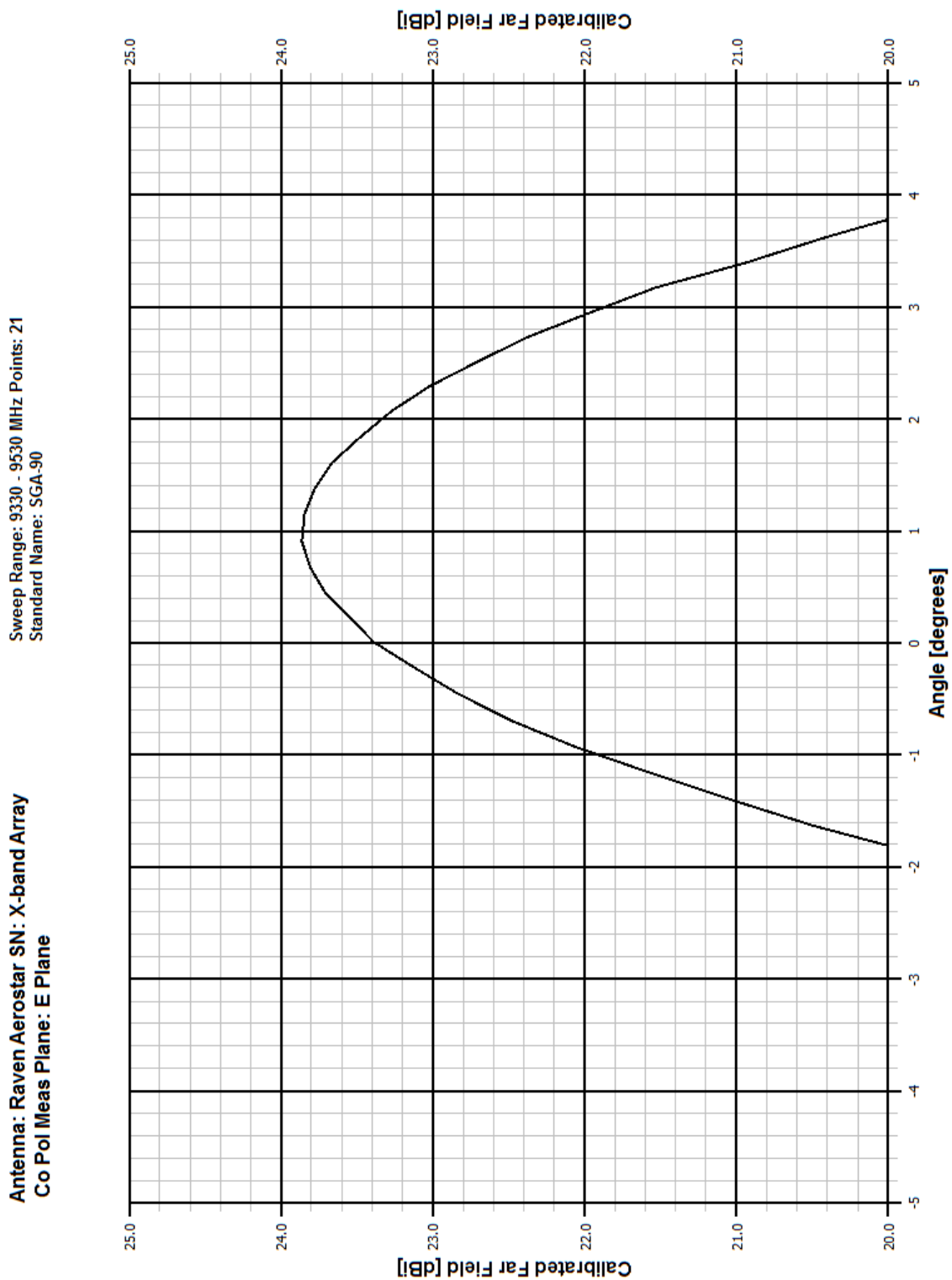
9.53 GHz Elevation H-plane

Sweep Range: 9330 - 9530 MHz Points: 21
Standard Name: No Gain STD Measured

Antenna: Raven AeroStar SN: X-band array
Co Pol Meas Plane: H Plane



9.53 GHz Gain

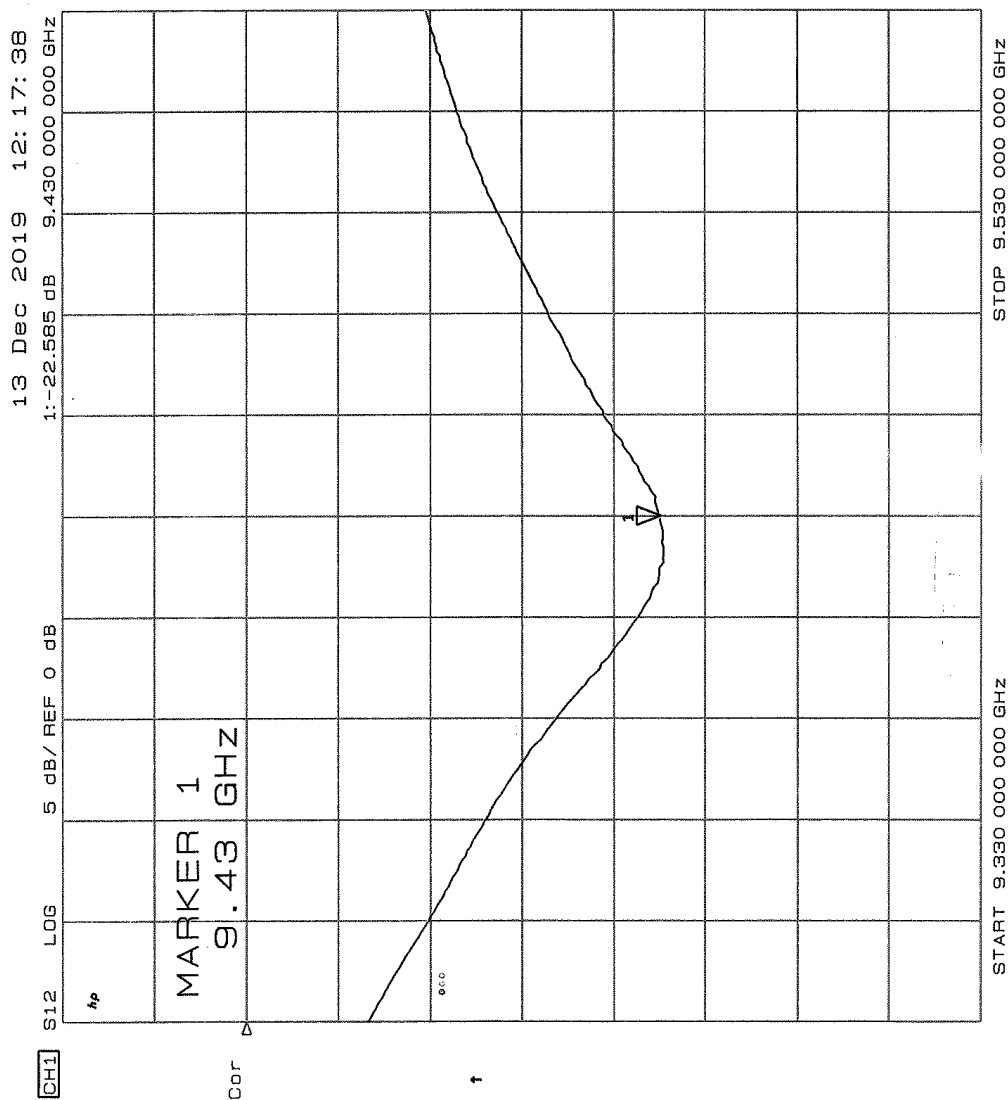


Swept Return Loss without Transition

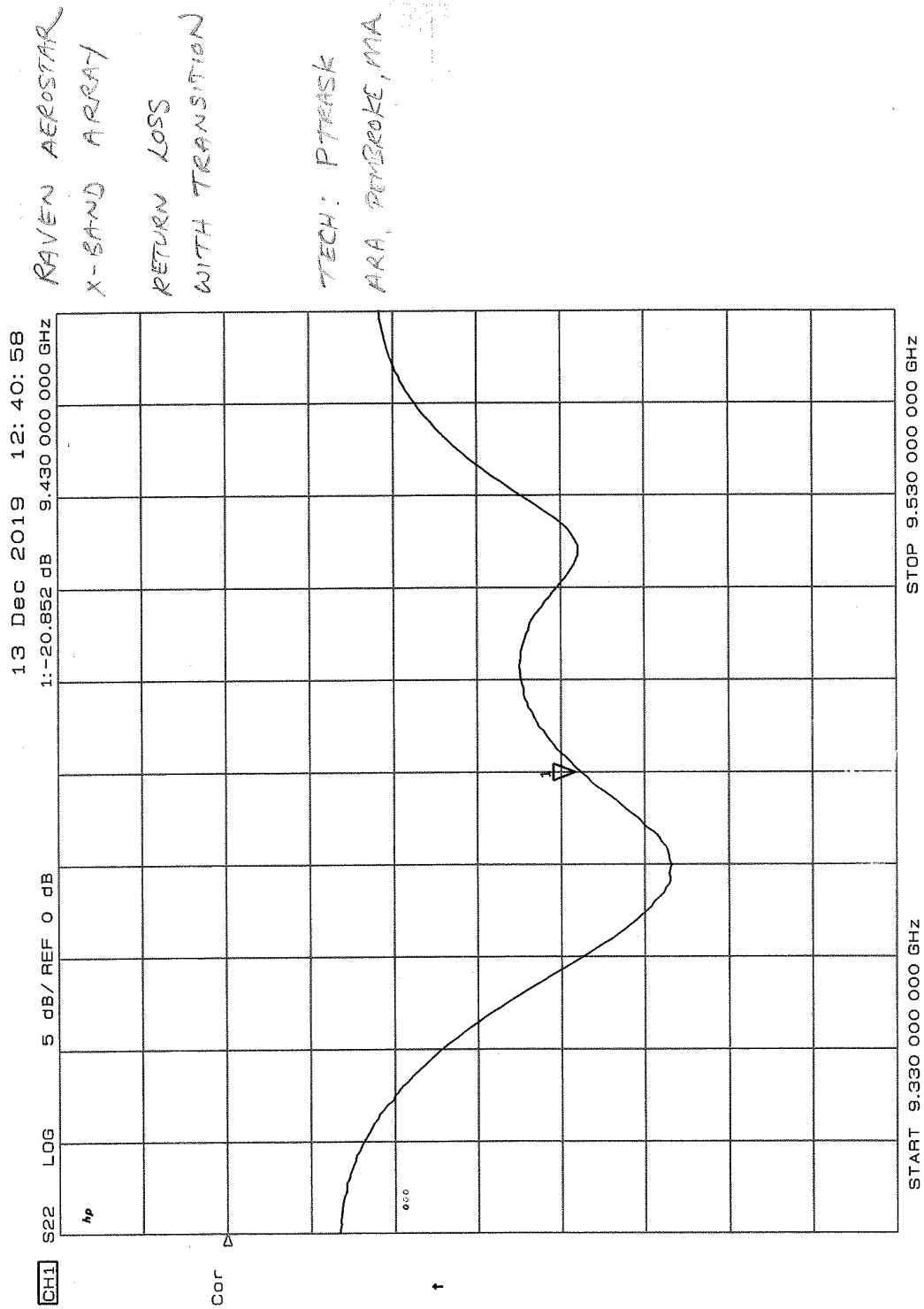
RAVEN AEROSTAR
X-BAND ARRAY

RETURN LOSS
WITHOUT
TRANSITION

TECH: P. TRASK
ARA, PEMBROKE, MA



Swept Return Loss with Test Transition



ARA Range at Middleboro, MA

Transmit Tower



Test Tower



Antenna Under Test

