

# **GENERAL DYNAMICS**

## C4 Systems

Antenna Test Report

Test No. 1519

Project: Prodelin 2.4M Quick Deploy C-X-Ku-Band  
Series 1259-800 Antenna System



East Maiden Antenna Test Facility  
4488 Lawing Chapel Church Road  
Maiden, North Carolina 28650  
828-428-1485 / 828-428-1488 fax

**GENERAL DYNAMICS**  
C4 Systems



1500 Prodelin Drive  
Newton, NC 28658  
828-464-4141

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## 1.0 General information

### 1.1 Notes

The test results of this test report relate exclusively to the specified antenna system in section 2.1 of this report. The purpose of test was to show the level of conformity to "factory" technical specifications following a mechanical refurbishment of such antenna system. This antenna was returned for mechanical and electrical repairs following years of service in the field.

### 1.2 Test range information

General Dynamics C4/ Prodelin Antenna Test Facility is located 5km (3 miles) East of Maiden, NC and approximately 16km (10 Miles) South-southeast of Prodelin main office in Newton, NC. We are located 61km (38 Miles) from Charlotte International Airport and 149km (90 miles) from Piedmont Triad International Airport in Greensboro, NC.

The antenna range can test a multitude of frequencies between 800 MHz and 30.00GHz, and antennas up to 4.5 meters in diameter.

Testing is accomplished over a test path between a fixed transmit tower location and a fixed receive tower location, separated by a distance of 1193.06 Meters (3914.44 feet). Transmit and receive tower heights are 17.41 meters (57.11 feet) above ground level. Using directional antennas, an unmodulated carrier wave (CW) test signal(s) are transmitted from the source tower location toward the receive tower location.

The signal is then received and interpreted by the sophisticated Orbit F/R959 Antenna Measurement System. Data is digitally recorded and many options of data analysis and presentation are possible using the Orbit F/R DataPro and GD specific software.

### 1.3 Test range specifics:

Range Length	1193.06 Meters (3914.44 Feet)
C/L Tx Source Antenna AGL	17.41 Meters (57.11 Feet)
C/L AUT Mounting Positioner AGL	17.49 Meters (57.88 Feet)

#### Test zone:

Frequency range	0.8 - 30.00 GHz
Dynamic range	80 dB (in most frequency bands)
Gain	+/- 0.5 dB*
Amplitude ripple	< +/- 0.3 dB* @ +/-20°-boresight
Amplitude ripple	< +/-0.5 dB* @ greater than 20° boresight
Phase ripple	< +/-5°*
Cross-polar purity:	-40 dB*

\* For the majority of practical applications.

#### Positioner:

Axis 1 Azimuth	
Accuracy	< 0.12°
Axis 2 Elevation	
Accuracy	< 0.1°
Max load:	800 Lbs.

#### 1.4 Test Equipment:

<b>Manufacturer:</b>	<b>Model</b>	<b>Options</b>	<b>S/N</b>
HP Microwave Receiver (Top Section)	8530A	010-011-8Ze	3031A08077
HP Microwave Receiver (Btm Section)	8530A	011-8ZE	3409A00301
HP Synthesized Sweeper Source #1 (Tx Source) 10Mhz – 50GHz	83651B		3844A00444
HP Amplifier 2-50GHz	83050A	8ZE	3331A00520
HP Power Supply (For 83050A Amplifier)	87421A		3611A00932
HP Synthesized Sweeper Source #2 (Reference Source) 10Mhz – 20GHz	83621B		3614A00156
HP LO/IF Distribution Unit	85309A		3224A00188
HP Extender (Up-Range)	37204A	03	3212U24550
HP Extender (Down-Range)	37204A	03	3212U23735
HP Mixer Module (Reference) #1 2-50GHz -140Mv	85320B	H50	2944A00617
HP Mixer Module (Reference) #2 2-26.5GHz -71Mv	85320B		860A00143
HP Mixer Module (Reference) # 3 2-50GHz -148Mv	85320B	H50	2944A00508
HP Mixer Module (Reference) # 4 0.1-3.0GHz -18Mv	85320B	H20	2944A00598
HP Mixer Module (Reference) # 5 0.1-3.0GHz -18Mv	85320B	H20	2944A00272
HP Mixer Module (Test) #6 2-50GHz	85320A	H50	2944A00676
HP Mixer Module (Test) #7 2-50GHz	85320A	H50	2914A00501
HP Mixer Module (Test) #8 0.1-3.0GHz	85320A	H20	2944A00685
HP Mixer Module (Test) #9 2-26.5GHz	85320A		3031A08077

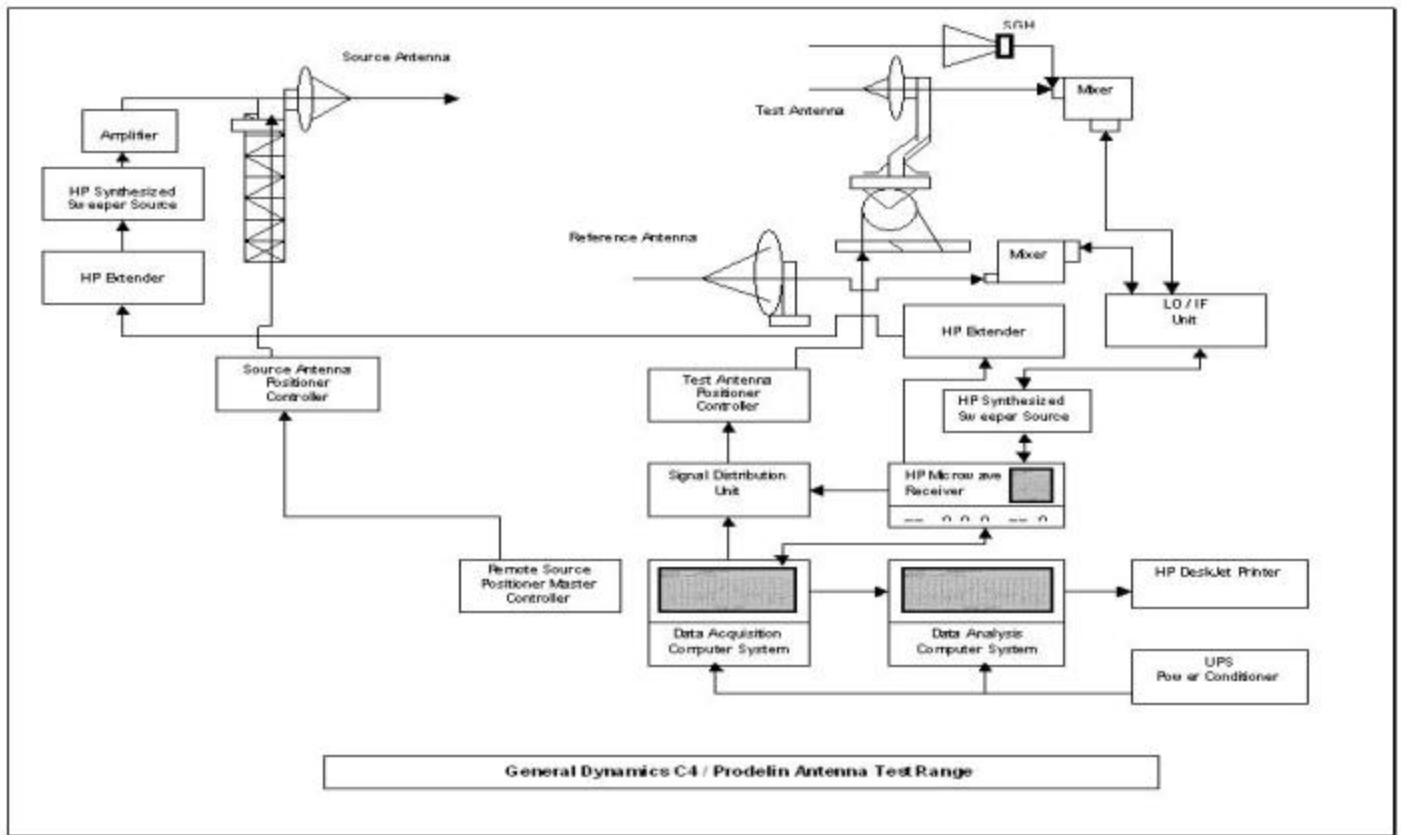
#### 1.5 Positioner Equipment:

Orbit Positioner Programmer (To control Tx positioner)	AL-4706-3B		208
Orbit Positioner Controller & PCU (Up Range – Power Control Unit)	AL-4806-3A		182
Orbit Positioner Controller & PCU (Down Range – Power Control Unit)	AL-4806-3A	1 & 5	266

#### 1.6 Test Software:

F/R Signal Distribution Unit	959		K1036
Orbit F/R 959 Data Acquisition Software Automated Antenna Measurement Workstation	Spectrum Version 2.6.1	Rev-A	
Orbit F/R DataPro Plus Software Antenna Data Presentation and Analysis	Spectrum Version 2.6.1	Rev-A	

## 1.7 Block Diagram / Test Set-up



## 1.8 Staff / Contact Information:

Two full time operators with a combined total of 30+ Years experience in antenna testing.

Dwight B. Lutz                      phone: 828-428-1486  
Email:                                      dwight.lutz@gdsatcom.com

Ken Poovey                              phone: 828-428-1486  
Email:                                      kenneth.poovey@gdsatcom.com

Fax: 828-428-1488  
Internet: <http://www.gdsatcom.com>

## 2.0 Technical Test:

## 2.1 Summary of Test Results



**Summary of test results:**

Test Number		1519					
Antenna Series		1259-800					
Antenna Size (Meter)		2.4					
Operating Frequency	Receive	3.625	3.950	4.200	3.625	3.950	4.200
	Transmit	5.850	6.138	6.425	5.850	6.138	6.425
Polarization		LHCP	LHCP	LHCP	RHCP	RHCP	RHCP
Gain +/-0.2dB	Receive	37.14	37.86	38.49	37.10	38.00	38.52
	Transmit	41.02	41.77	42.19	41.03	41.72	42.27
Cross Polarization Isolation	Receive	17.53	23.89	18.20	15.66	22.03	18.51
	Transmit	18.48	20.90	35.47	21.36	24.81	38.18
-3 dB Beamwidth (deg)	Receive	2.14	2.01	1.93	2.27	2.03	1.85
	Transmit	1.40	1.32	1.27	1.39	1.30	1.25
Sidelobe Compliant with		IESS 207 STD H					
Antenna Noise Temp 30 degree Elevation		3.625	3.950	4.200			
G/T		17.94	18.80	19.32			

Operating Frequency	Receive				7.250	7.500	7.750
	Transmit	7.900	8.200	8.400			
Polarization		LHCP	LHCP	LHCP	RHCP	RHCP	RHCP
Gain +/-0.2dB	Receive				43.53	43.92	44.14
	Transmit	43.98	44.2	44.39			
Cross Polarization Isolation		23.16	23.22	17.73	15.56	17.39	19.63
-3 dB Beamwidth (deg)		1.03	0.97	0.96	1.09	1.05	1.02
Sidelobe Compliant with		IESS 207 STD H					
Antenna Noise Temp 30 degree Elevation		N/A	N/A	N/A			
G/T		N/A	N/A	N/A			

Operating Frequency	Receive	10.950	11.950	12.750	10.950	11.950	12.750
	Transmit	13.750	14.125	14.500	13.750	14.125	14.500
Polarization		Vertical	Vertical	Vertical	Horizontal	Horizontal	Horizontal
Gain +/-0.2dB	Receive	46.88	47.63	48.07	46.90	47.66	48.20
	Transmit	48.81	48.91	49.04	48.75	48.91	49.18
Cross Polarization Isolation	Receive	55.84	40.61	38.00	39.09	37.81	38.53
	Transmit	36.57	45.97	42.49	33.53	36.88	42.37
-3 dB Beamwidth (deg)	Receive	0.76	0.71	0.65	0.78	0.70	0.67
	Transmit	0.62	0.60	0.57	0.62	0.61	0.58
Sidelobe Compliant with		IESS 208 STD E1					
Antenna Noise Temp 30 degree Elevation		10.950	11.950	12.750			
G/T		25.33	26.18	26.66			

## 2.2 Radiation Patterns

## 2.3 Ku-Band Patterns

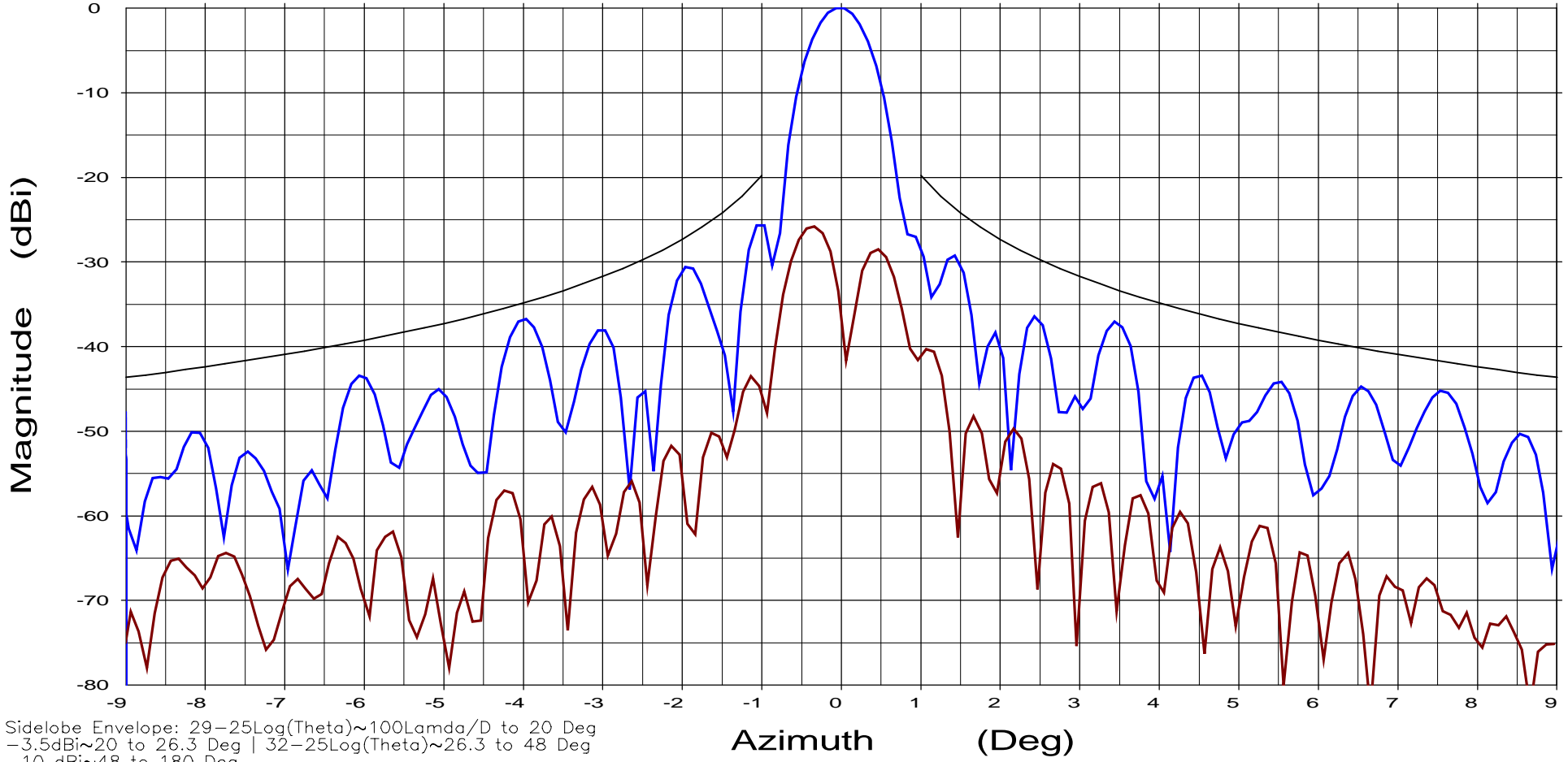
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 13.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

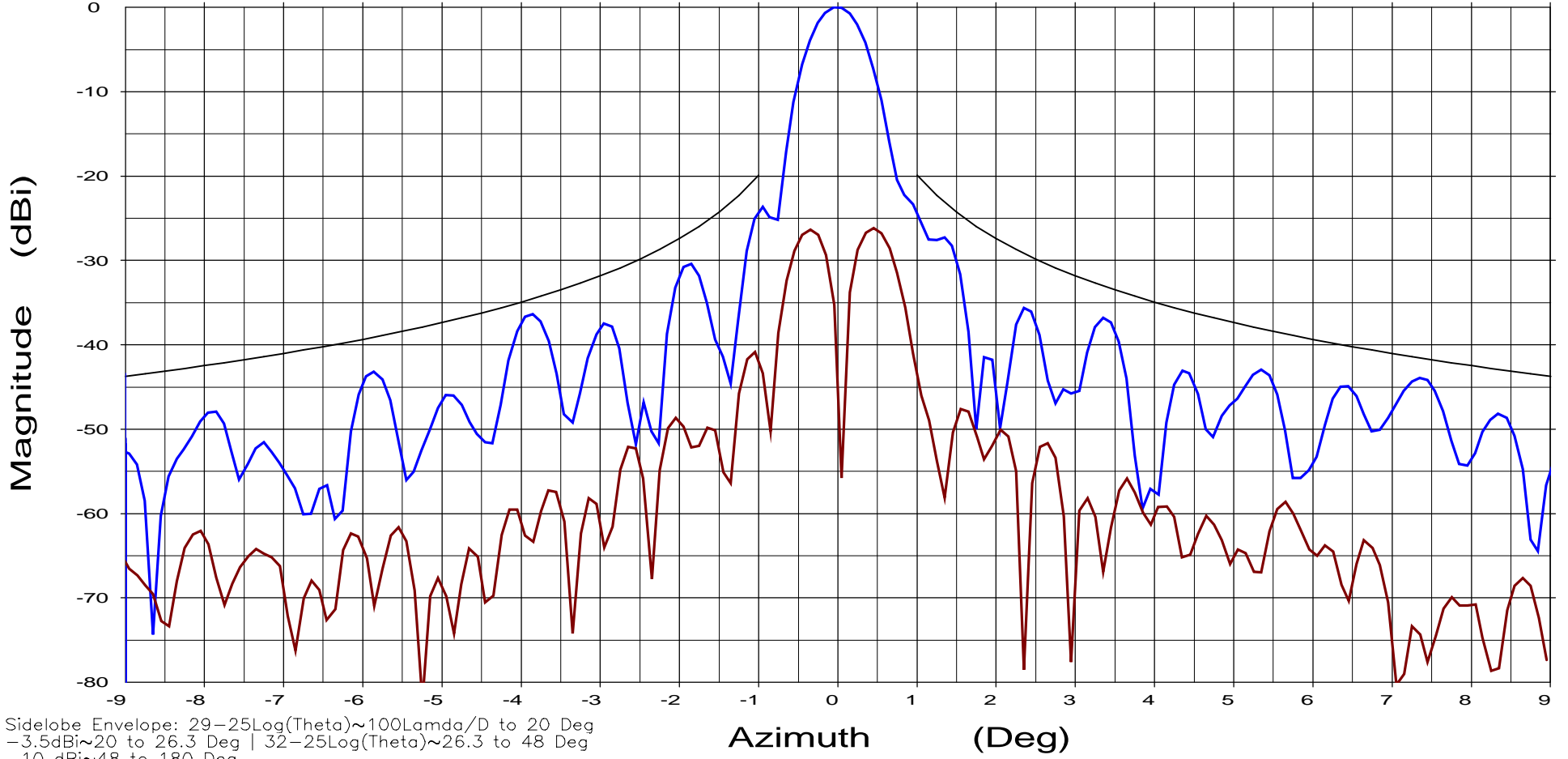
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.125 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

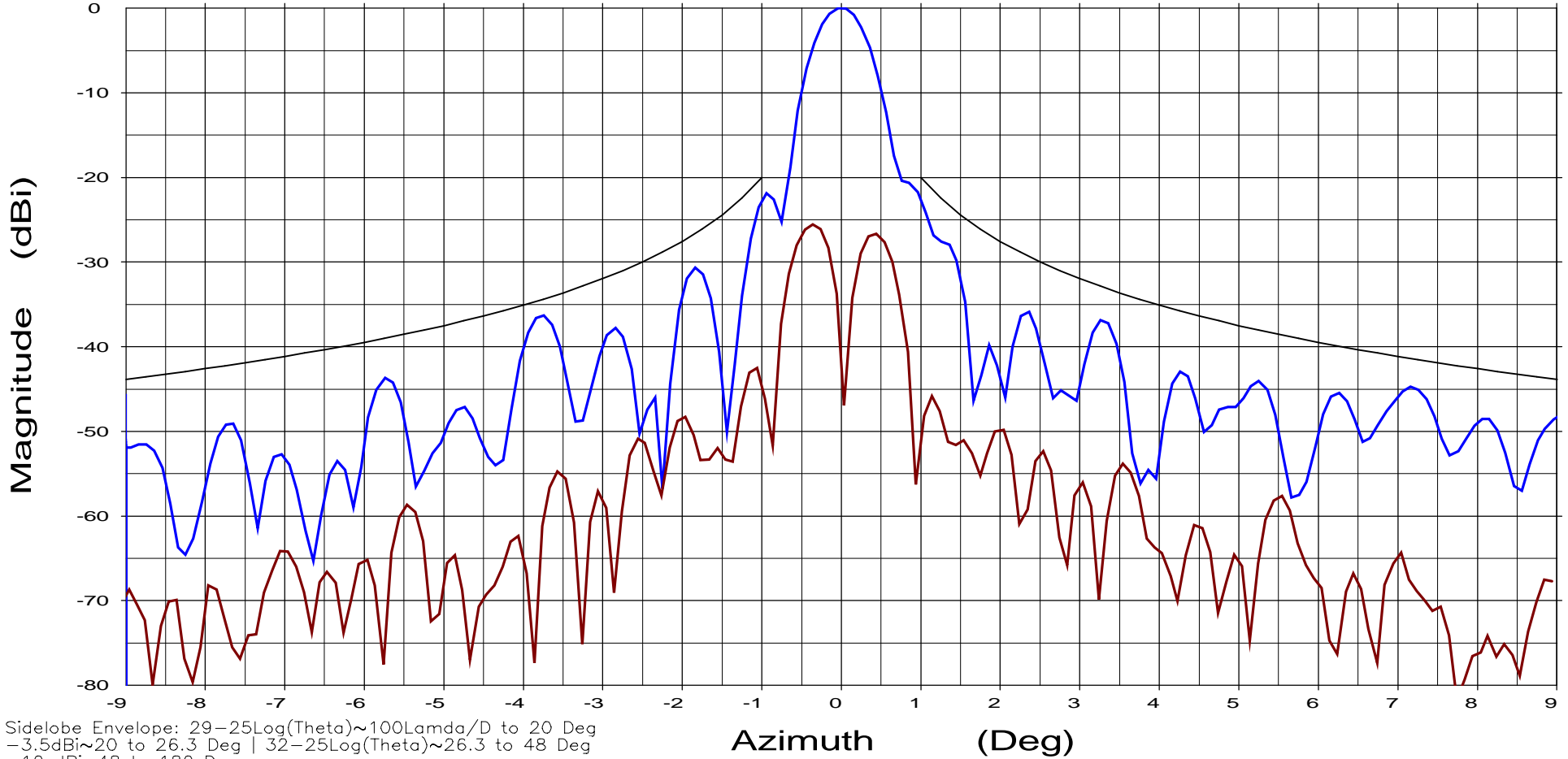
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

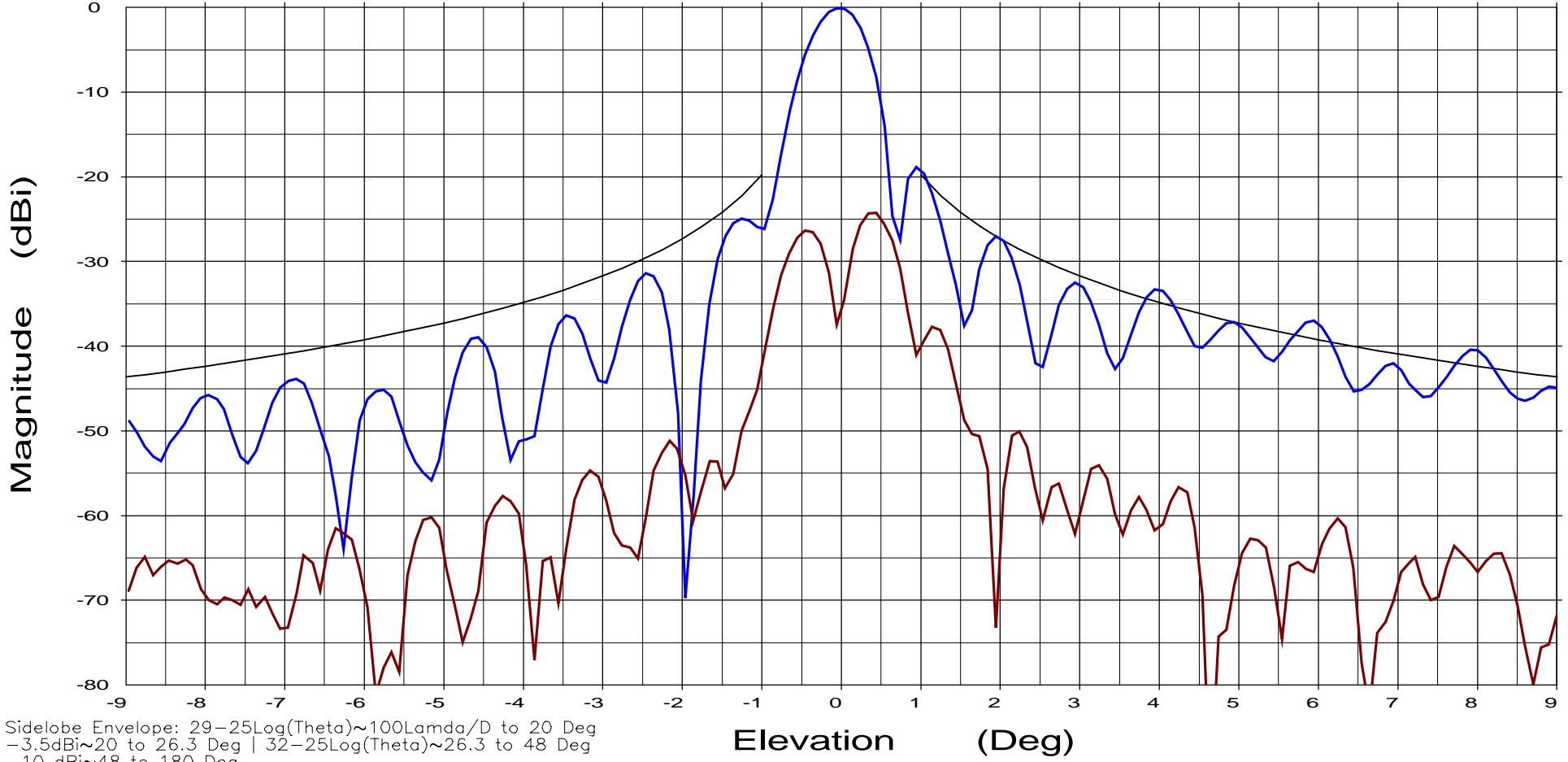
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 13.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi

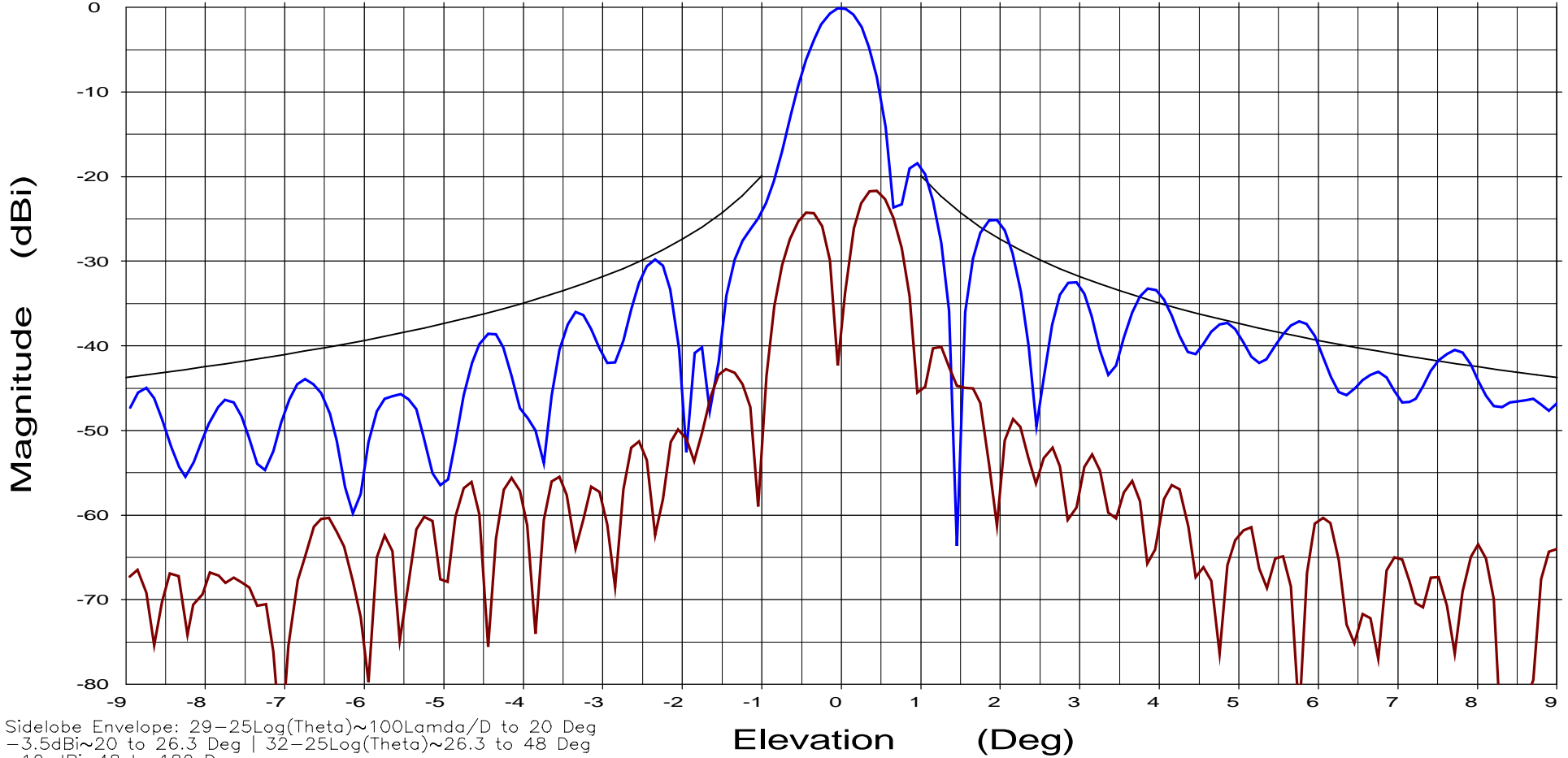
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.125 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi



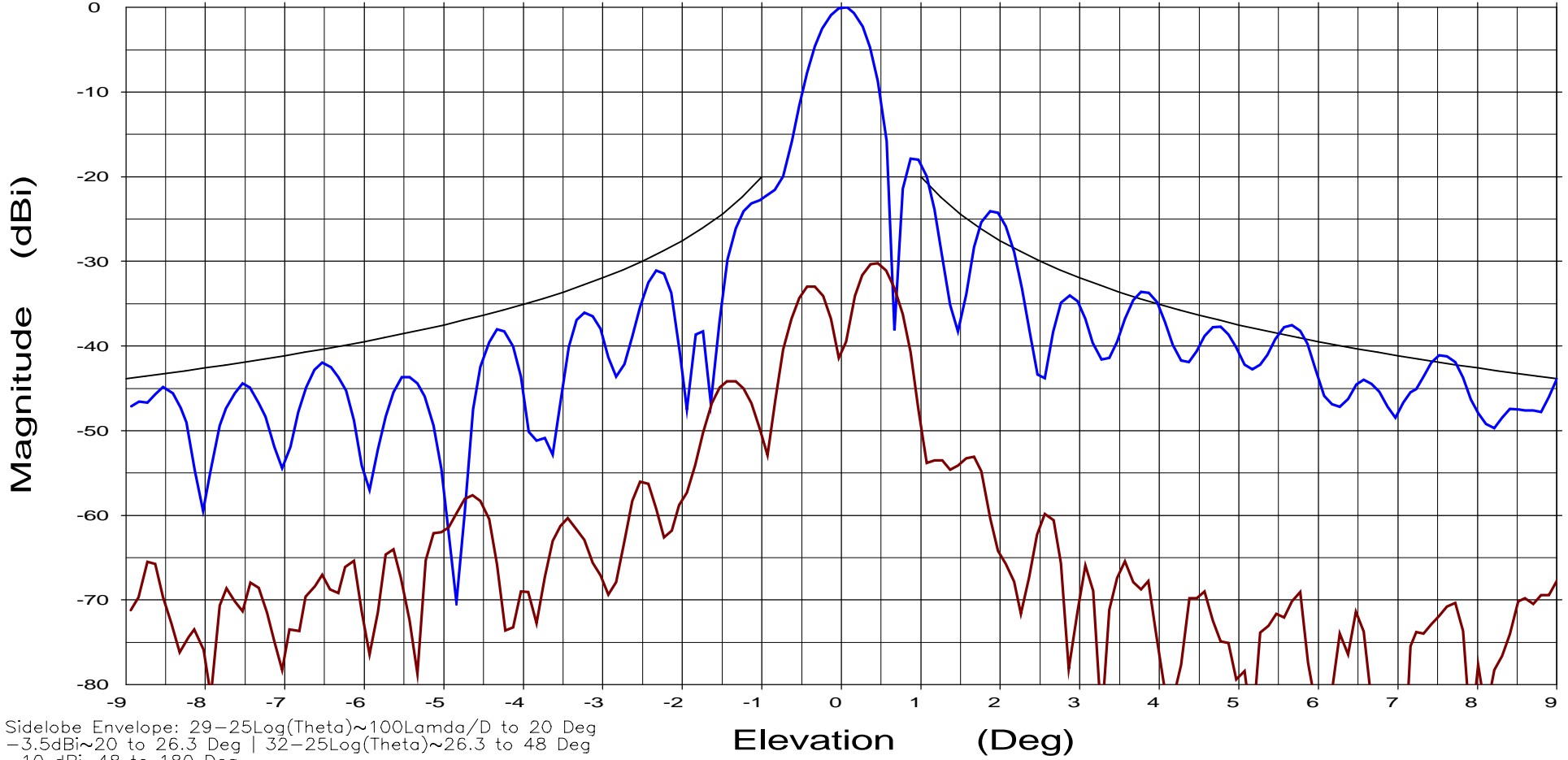
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi

File: 1519-12.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

Calibration status:  
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Chan.: nch1  
Table: SGH-110  
Units: dBi

Frequency : See Legend

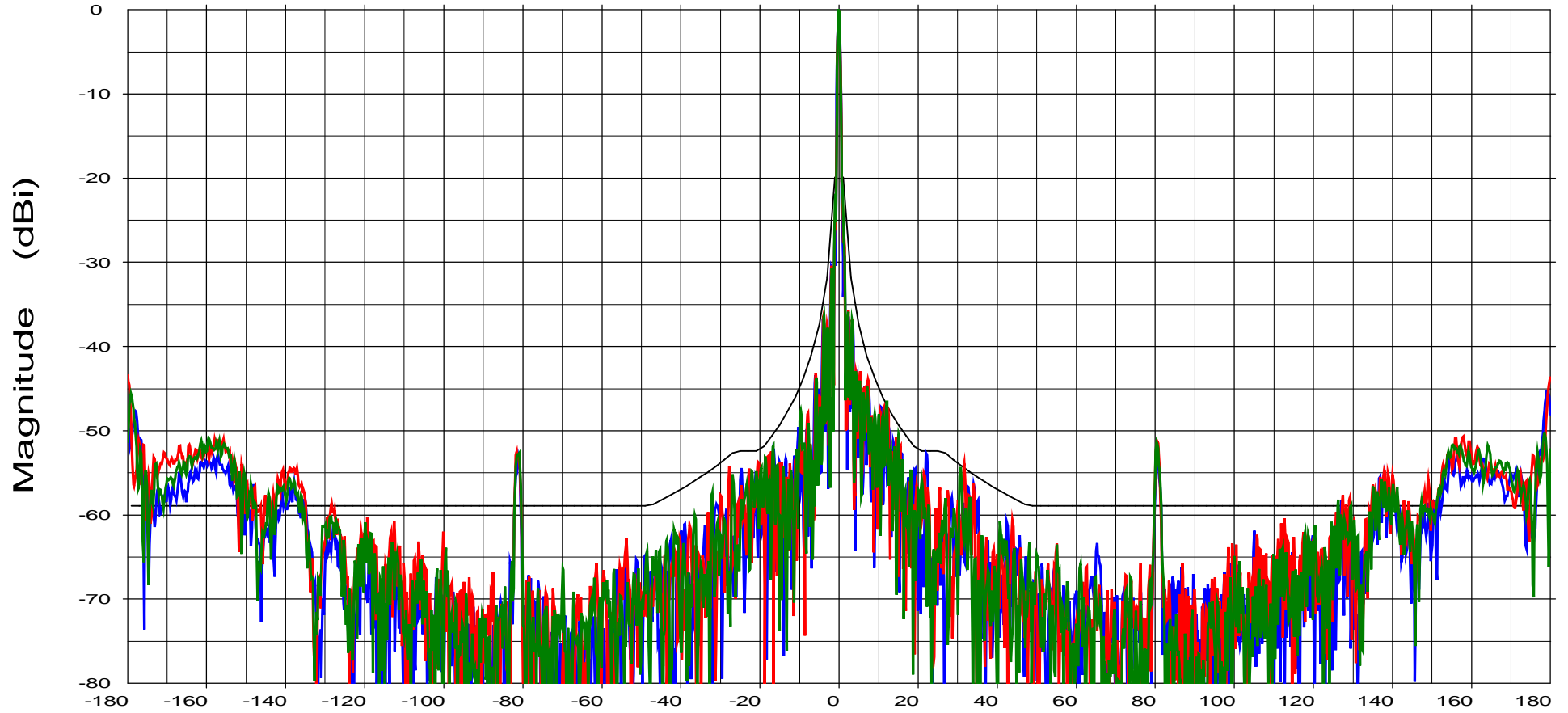
Operator: Dwight B. Lutz

Ser. no.: Sys #3

Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

Frequency : 13.750 GHz — blue  
Frequency : 14.125 GHz — red  
Frequency : 14.500 GHz — green

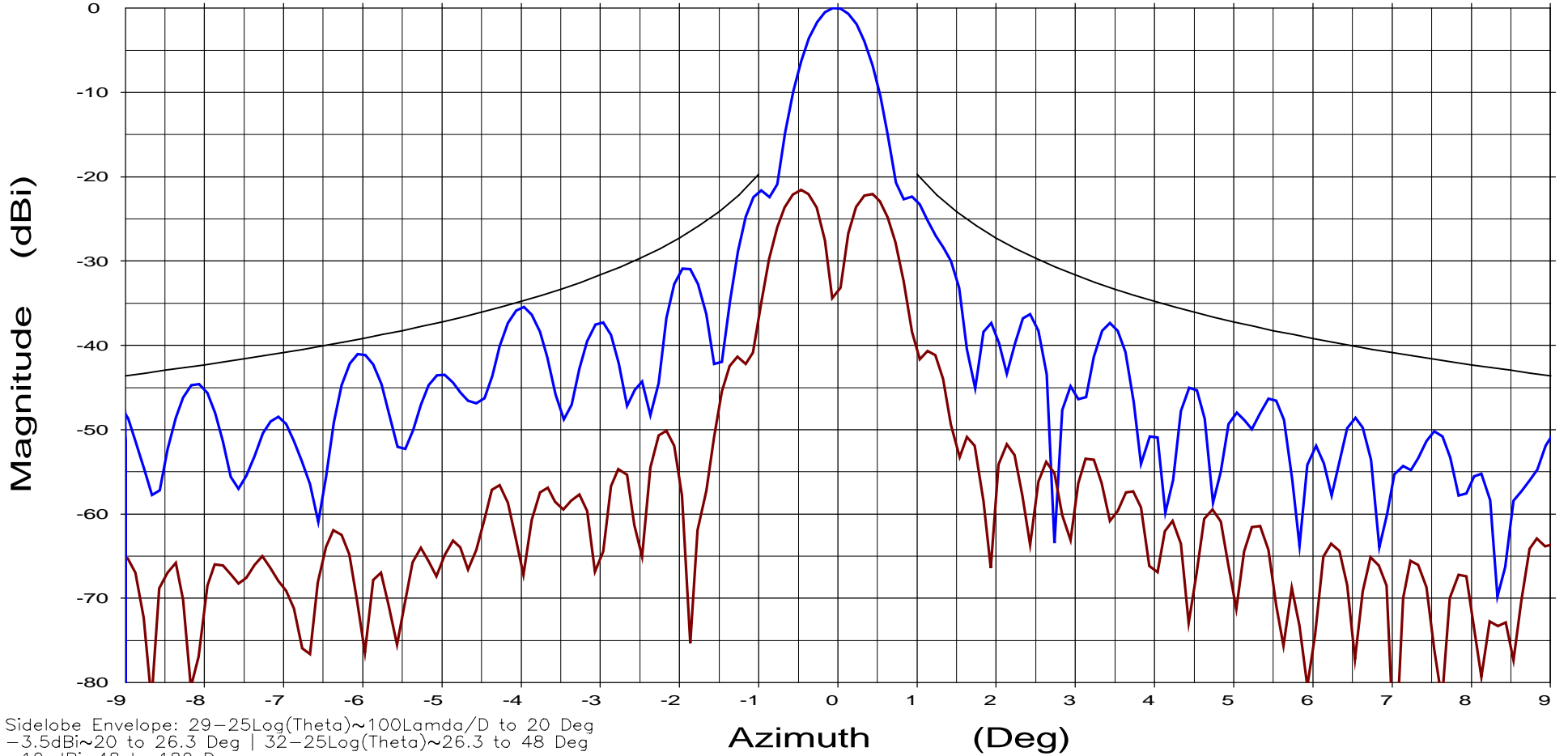
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 13.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-17.dat-ant_under_test	1519-17.dat	dBi
1519-19.dat-ant_under_test	1519-19.dat	dBi

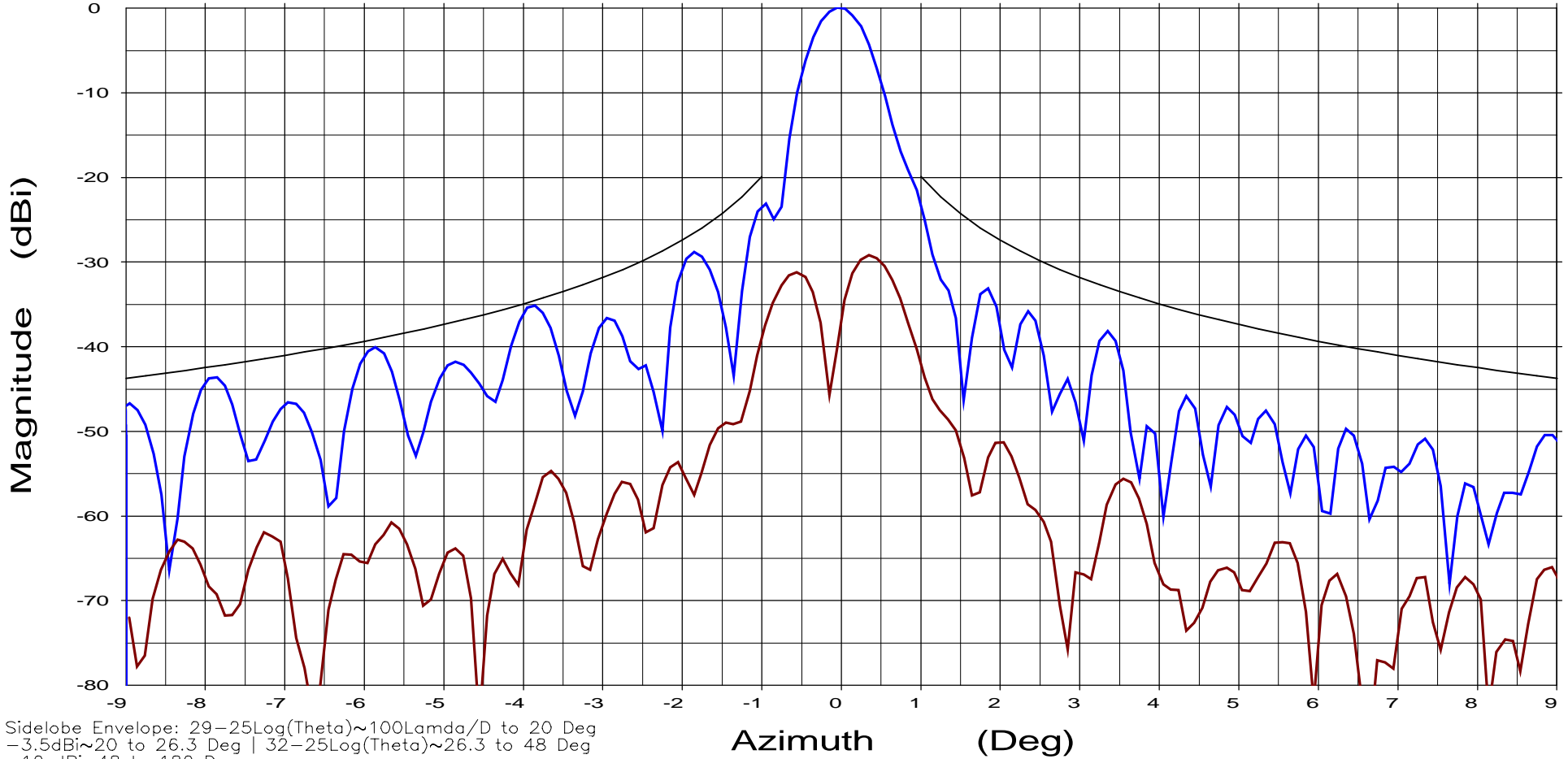
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.125 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-17.dat-ant_under_test	1519-17.dat	dBi
1519-19.dat-ant_under_test	1519-19.dat	dBi

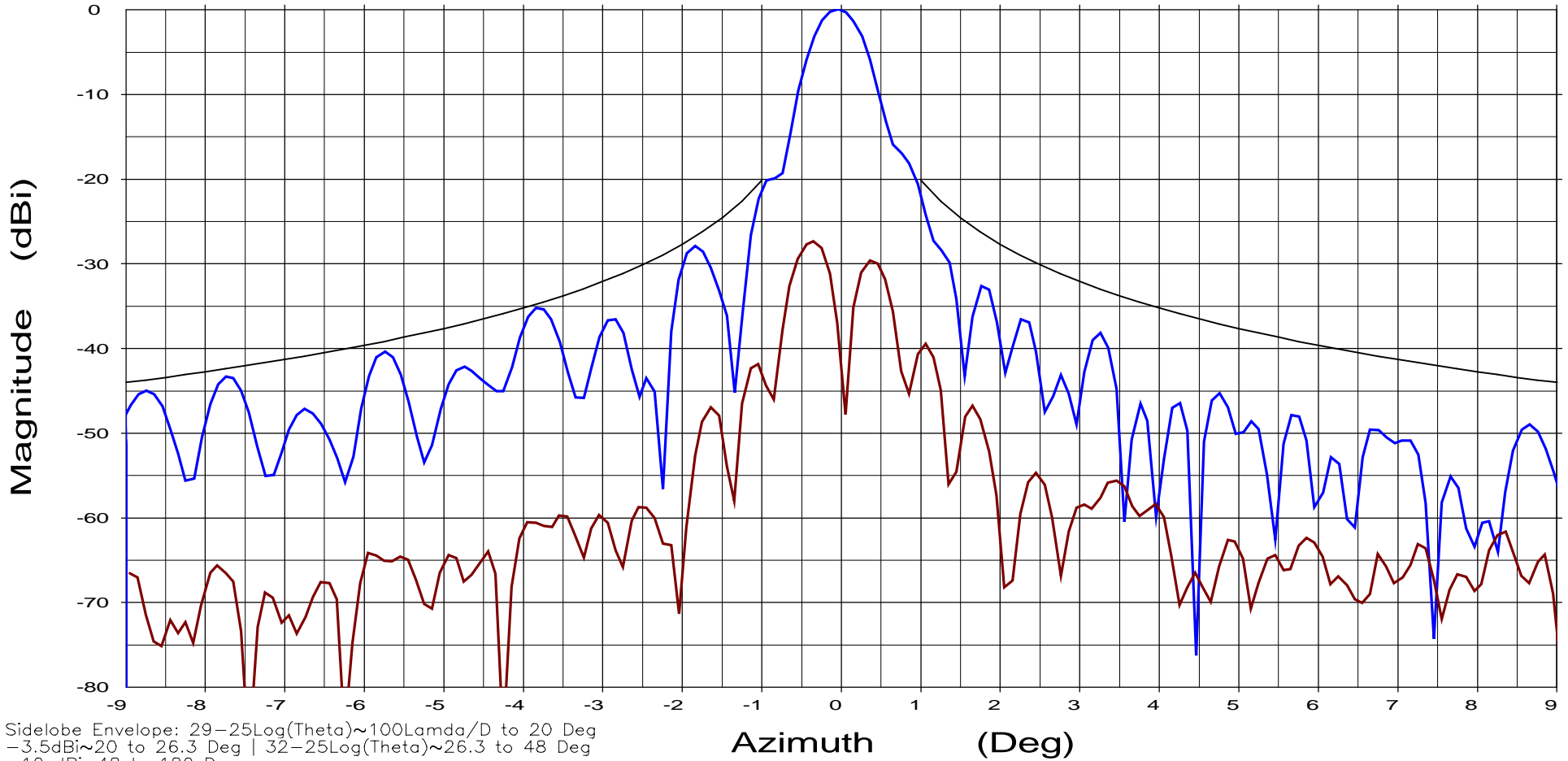
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
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1519-19.dat-ant_under_test	1519-19.dat	dBi

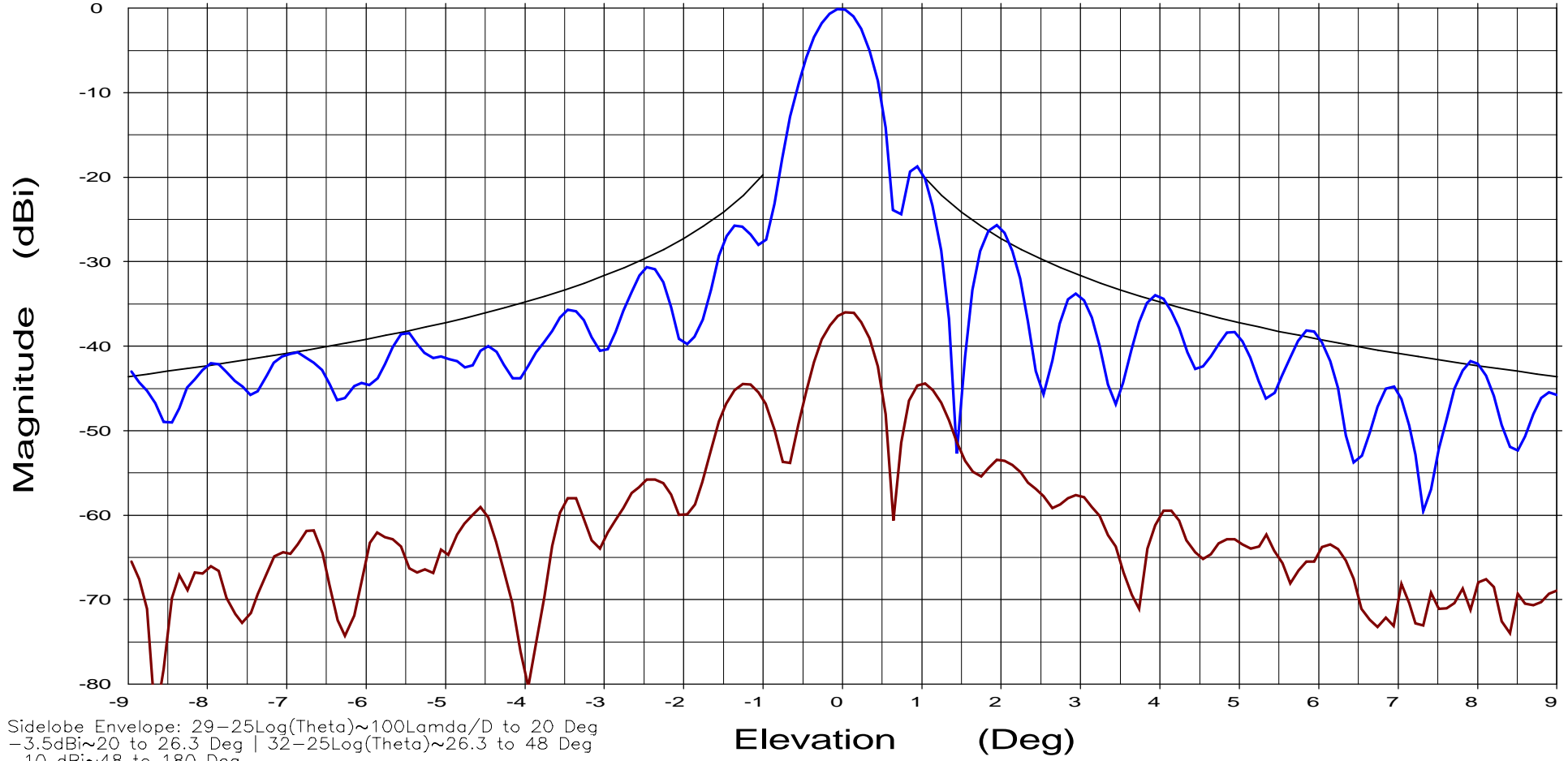
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 13.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays	Cal. file	units
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1519-20.dat-ant_under_test	1519-20.dat	dBi

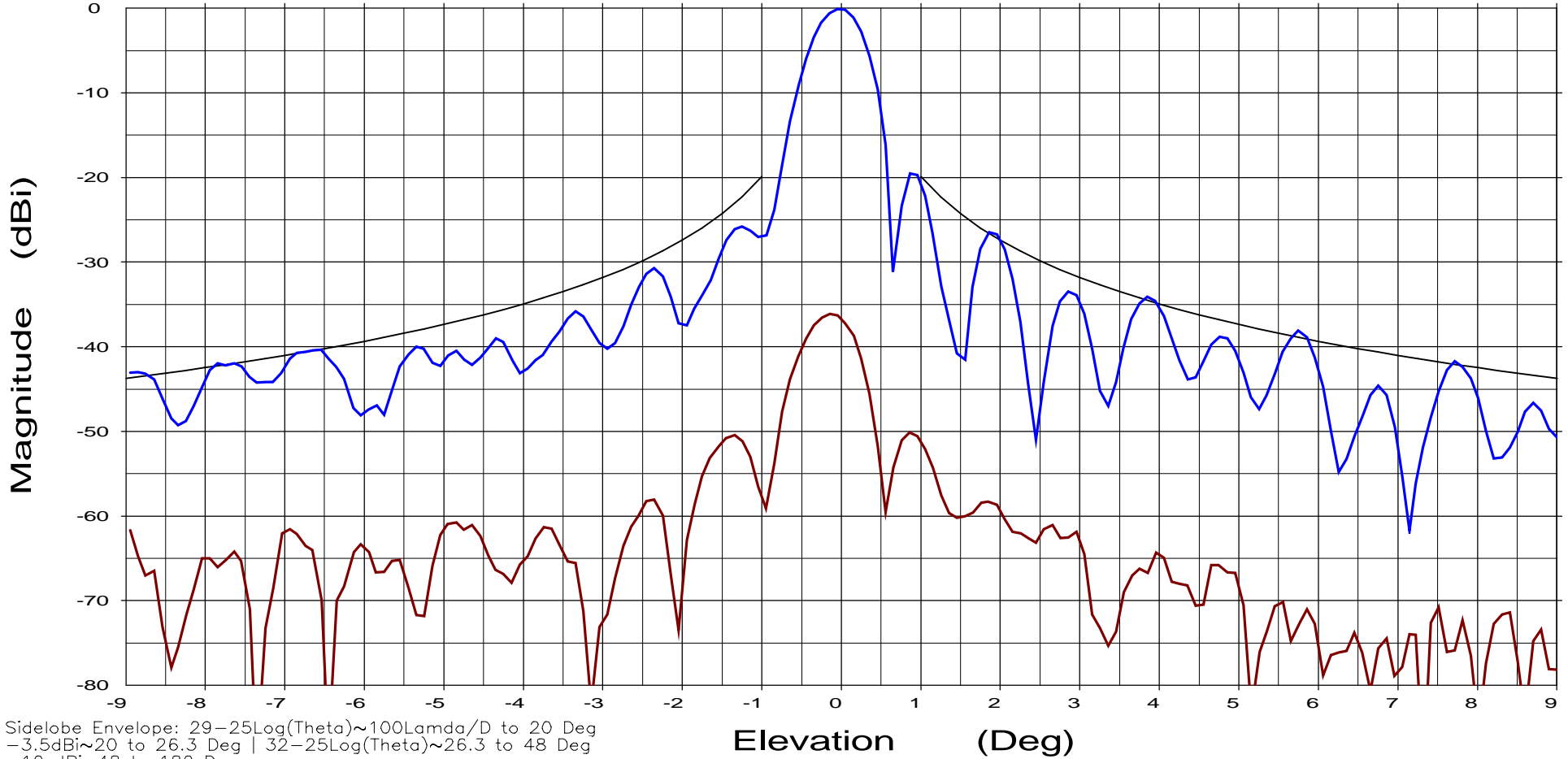
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.125 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\Theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\Theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-18.dat-ant_under_test	1519-18.dat	dBi
1519-20.dat-ant_under_test	1519-20.dat	dBi

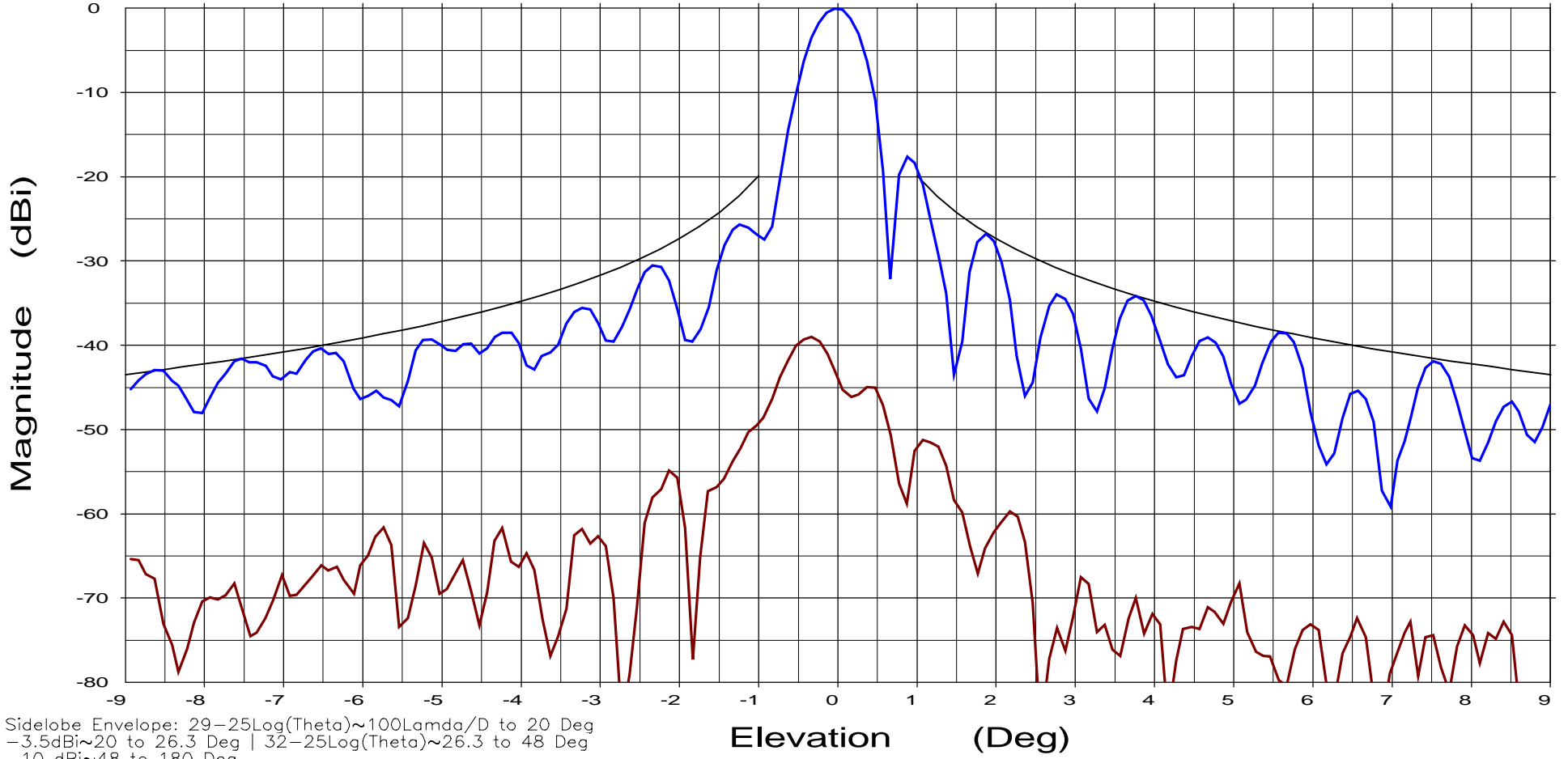
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 14.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-18.dat-ant_under_test	1519-18.dat	dBi
1519-20.dat-ant_under_test	1519-20.dat	dBi



File: 1519-17.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

Calibration status:  
File: 1519-17.dat  
Chan.: nch1  
Table: SGH-110  
Units: dBi

Frequency : See Legend

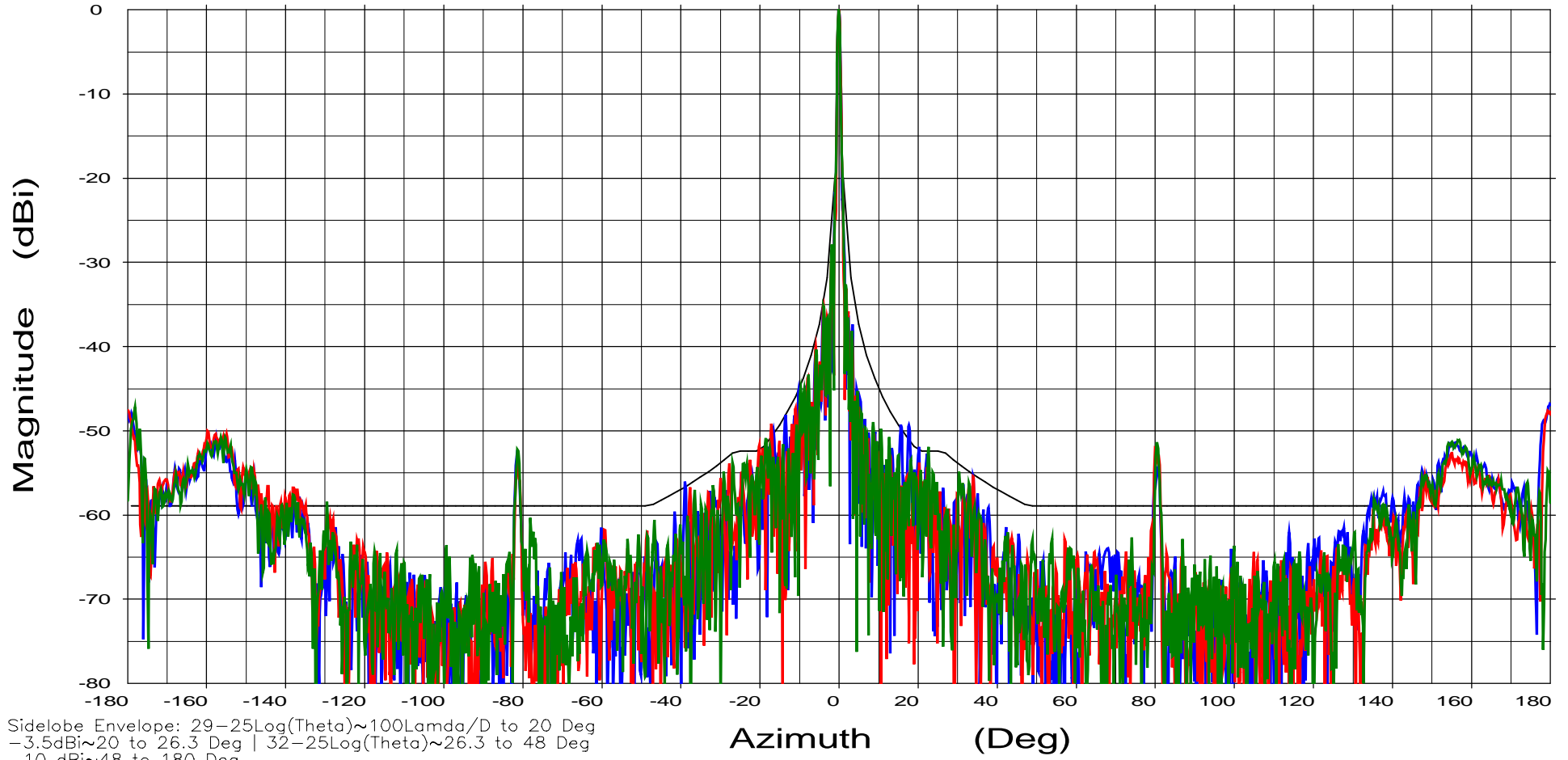
Operator: Dwight B. Lutz

Ser. no.: Sys #3

Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

Frequency : 13.750 GHz — blue  
Frequency : 14.125 GHz — red  
Frequency : 14.500 GHz — green

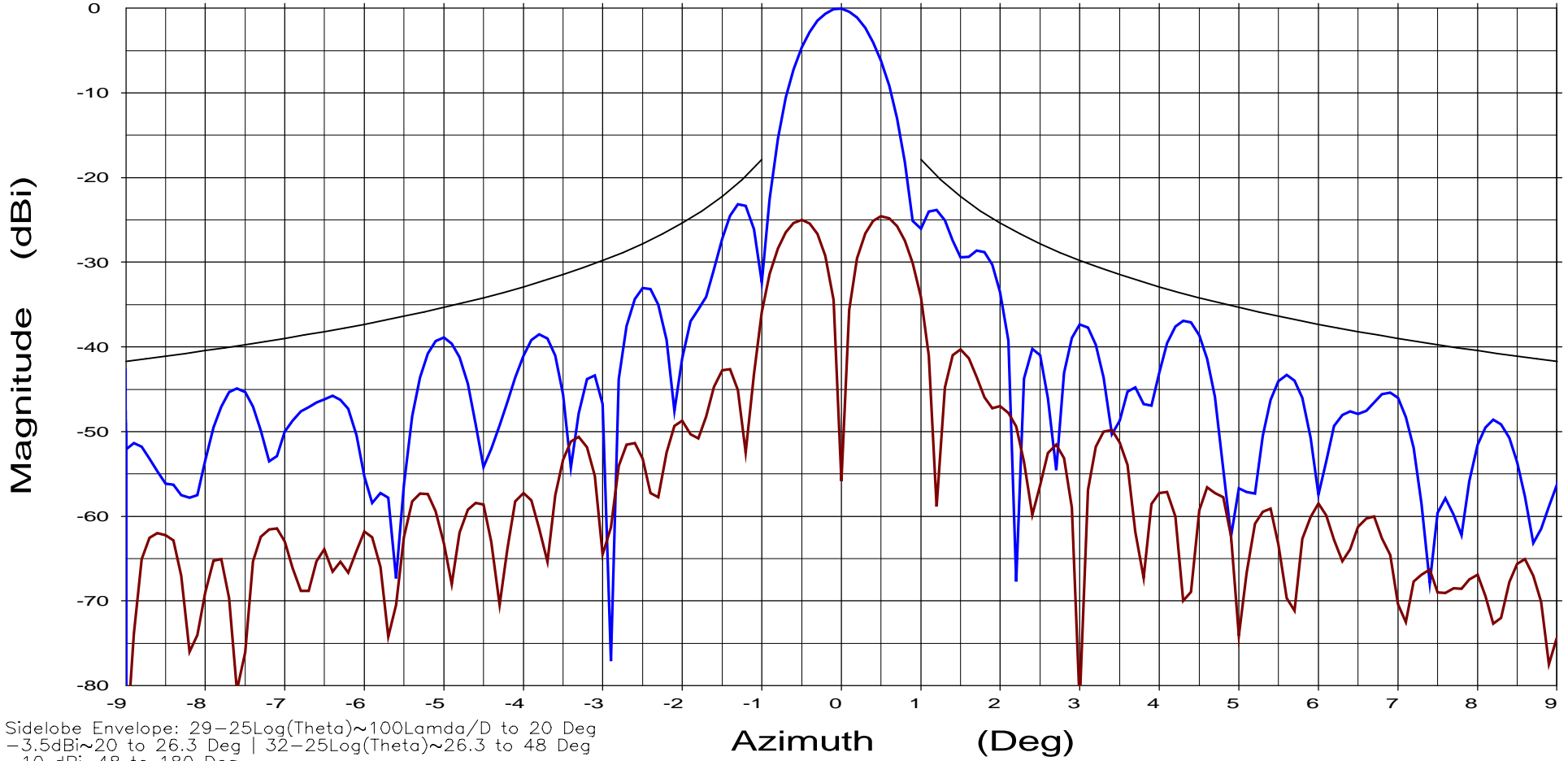
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 10.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

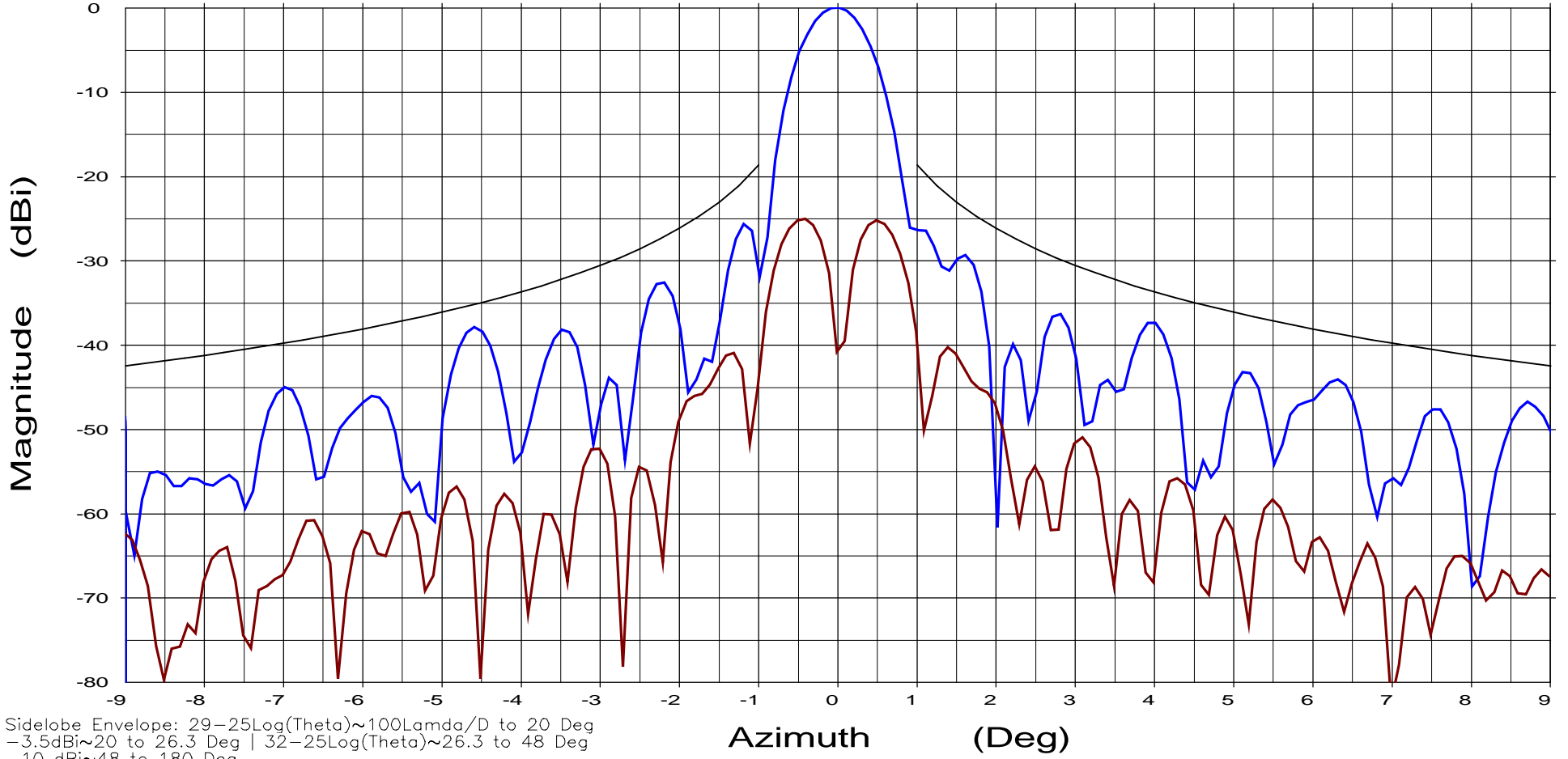
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 11.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

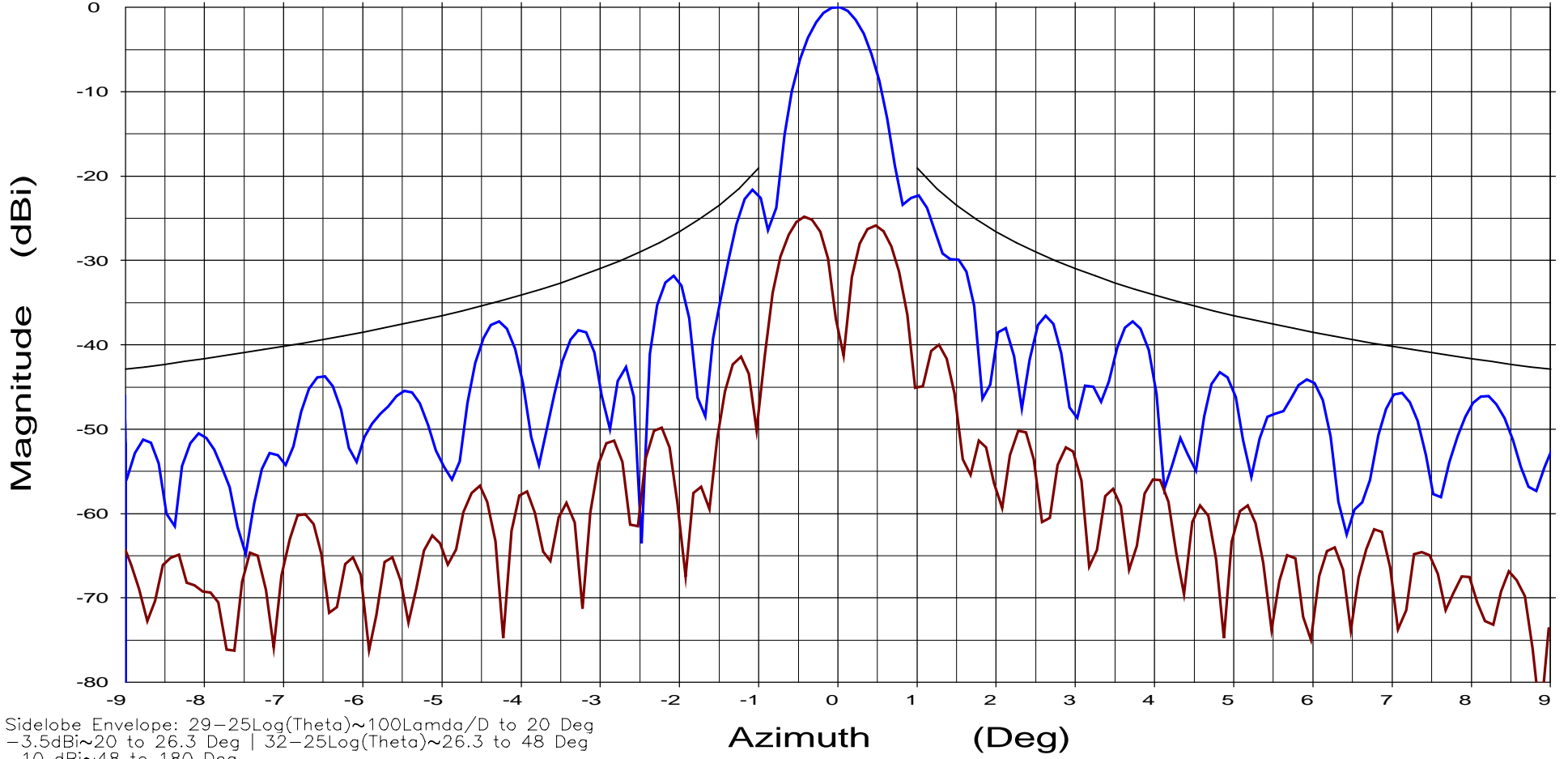
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 12.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-12.dat-ant_under_test	1519-12.dat	dBi
1519-14.dat-ant_under_test	1519-14.dat	dBi

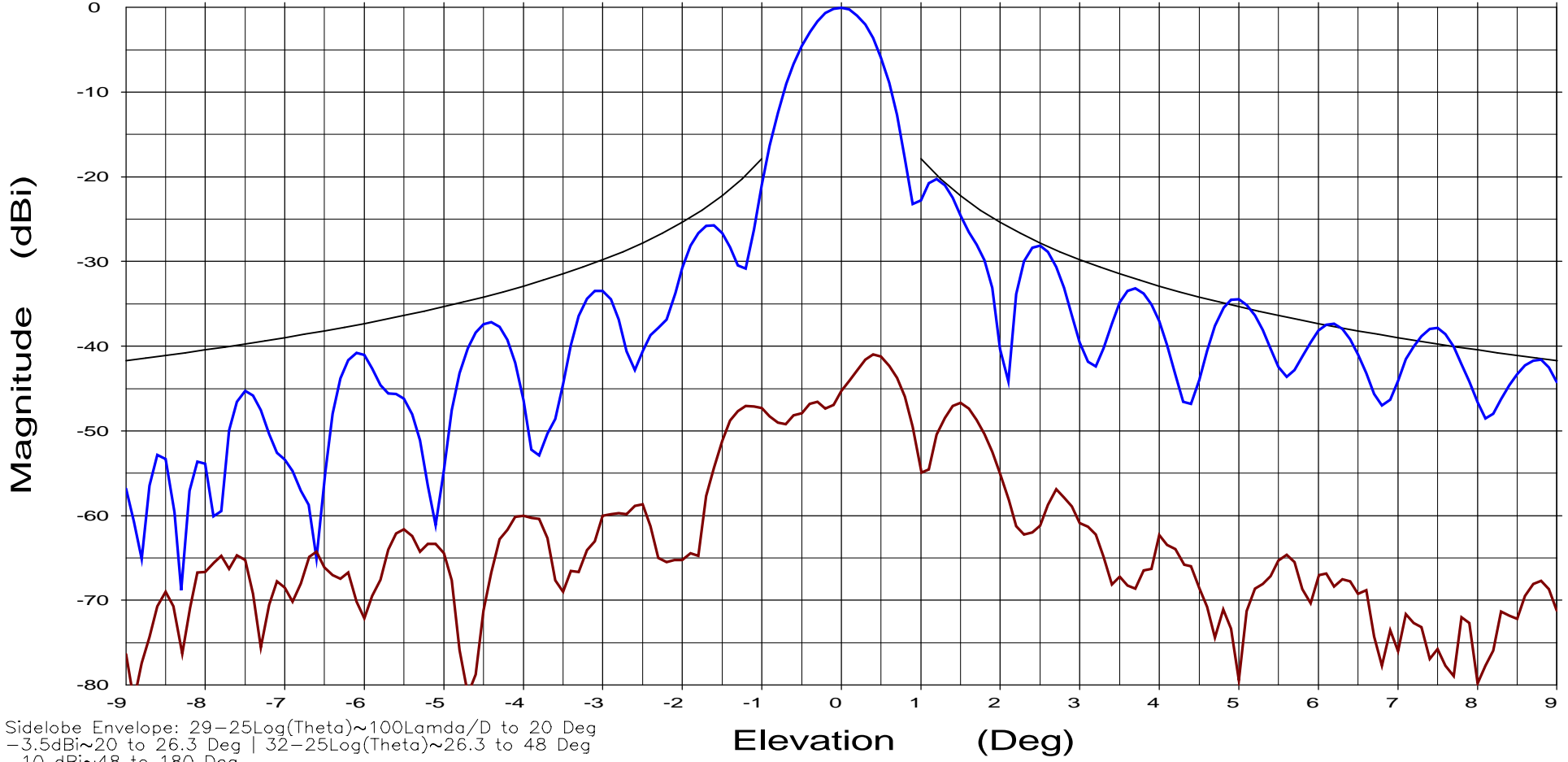
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 10.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi

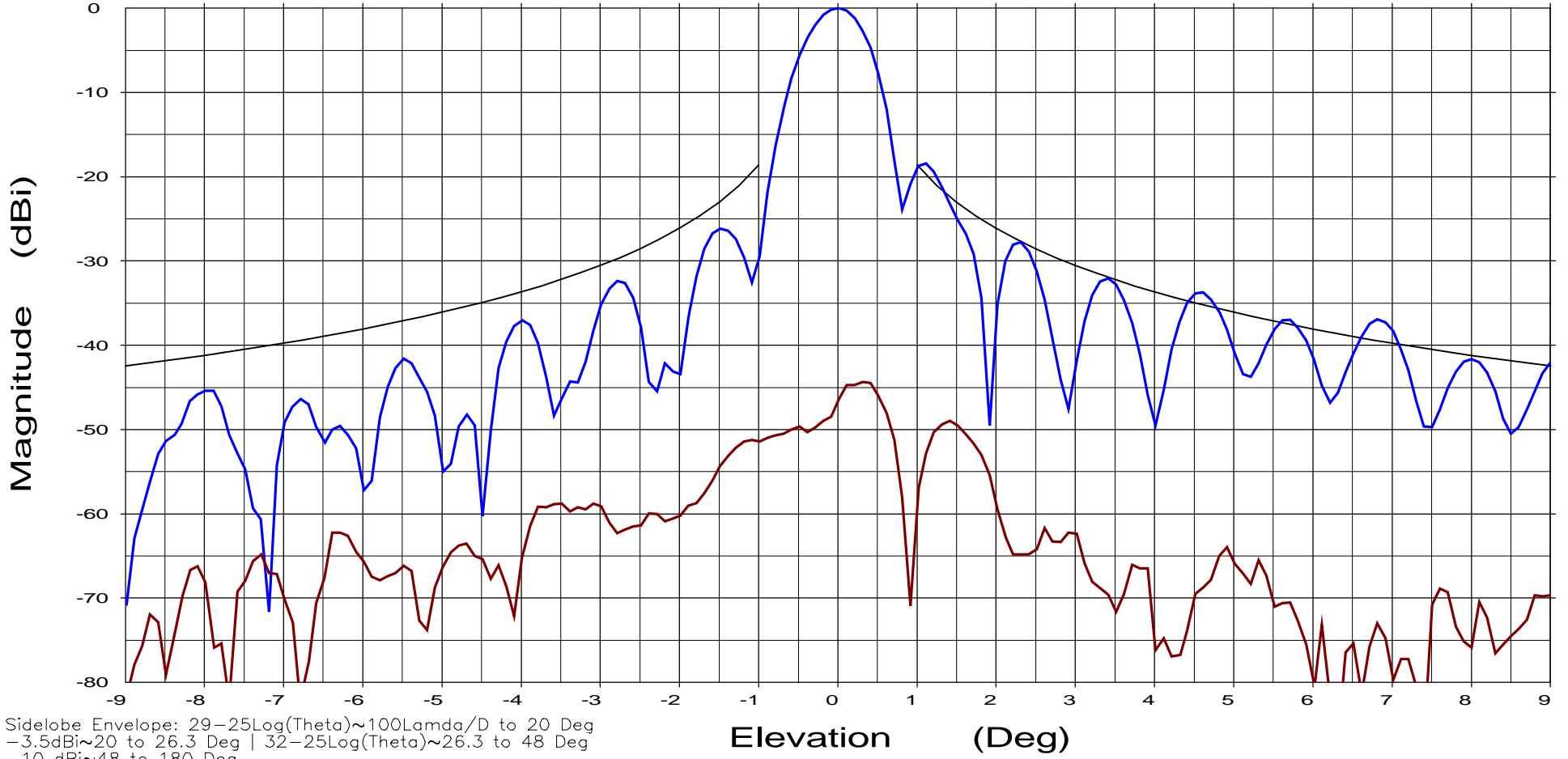
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 11.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi

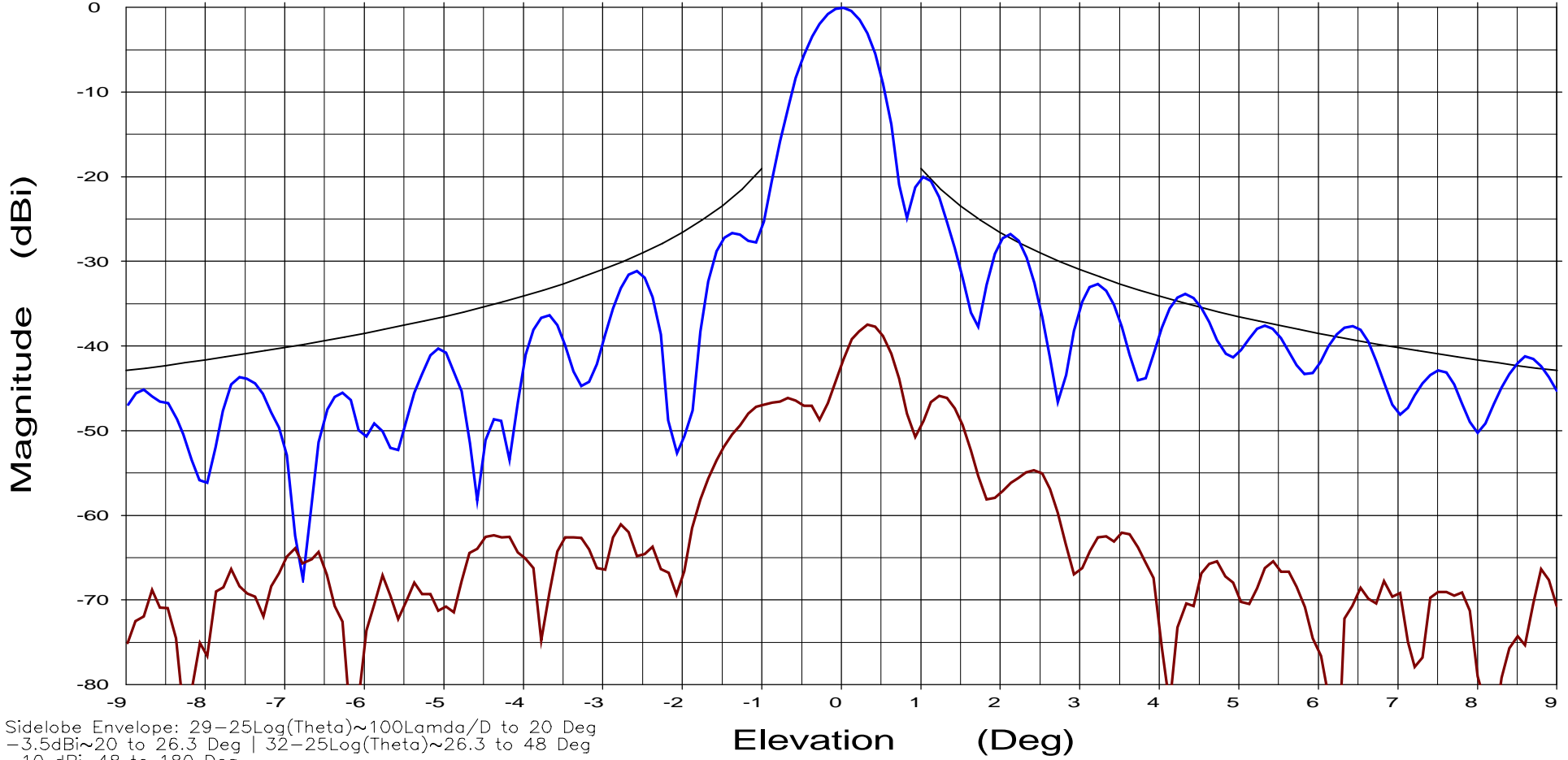
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 12.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-13.dat-ant_under_test	1519-13.dat	dBi
1519-15.dat-ant_under_test	1519-15.dat	dBi

File: 1519-12.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

Calibration status:  
File: 1519-12.dat  
Chan. nch1  
Table: SGH-110  
Units: dBi

Frequency : See Legend

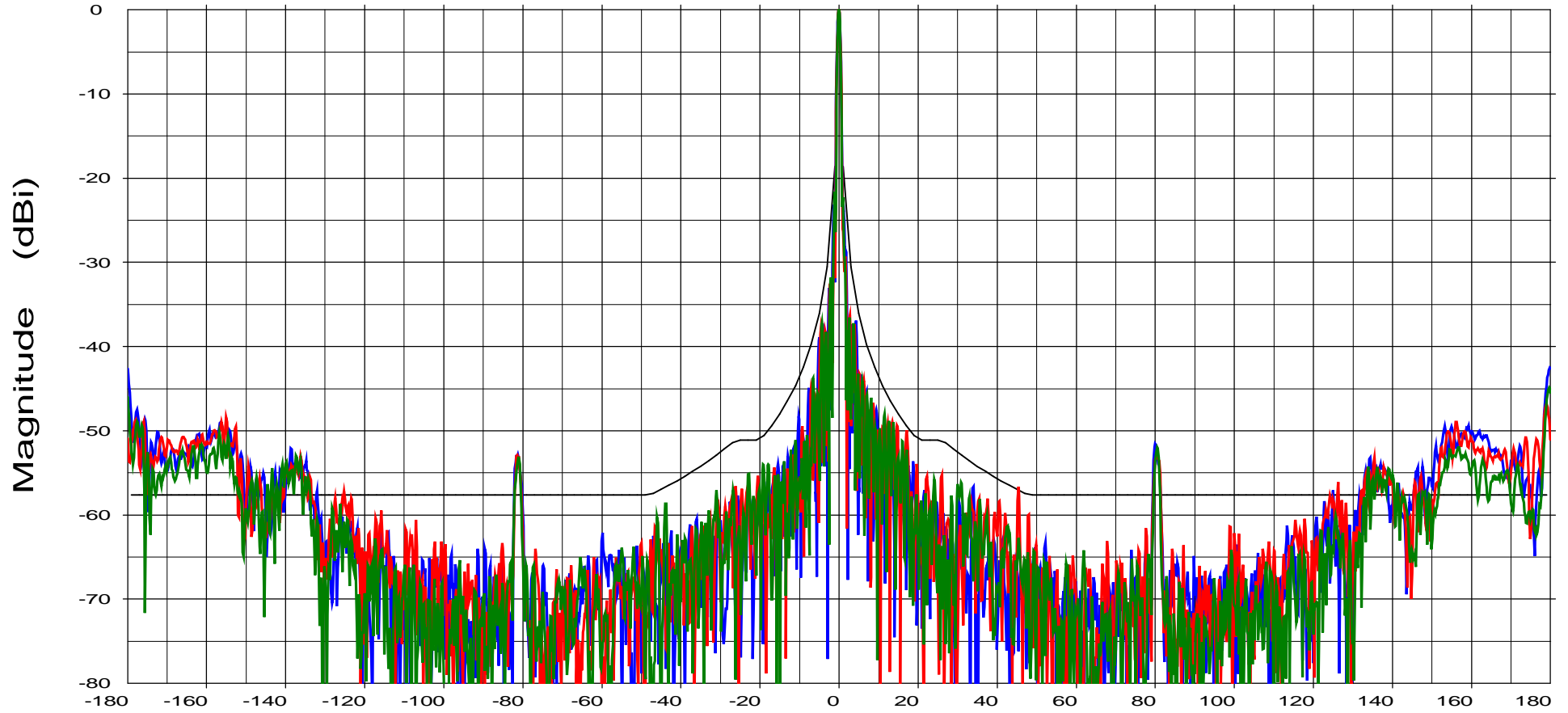
Operator: Dwight B. Lutz

Ser. no.: Sys #3

Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

Frequency : 10.950 GHz — blue  
Frequency : 11.950 GHz — red  
Frequency : 12.750 GHz — green



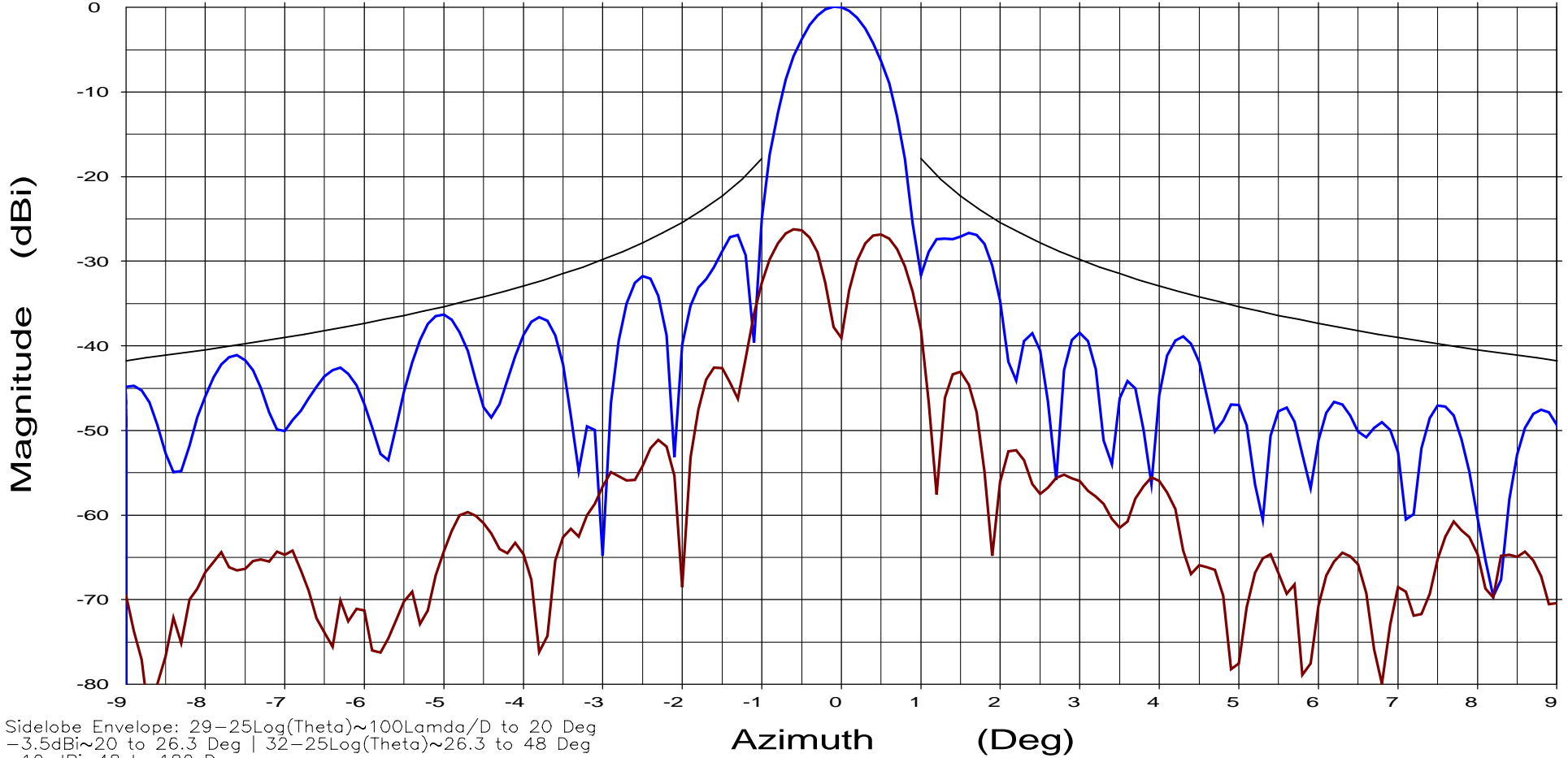
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 10.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-17.dat-ant_under_test	1519-17.dat	dBi
1519-19.dat-ant_under_test	1519-19.dat	dBi

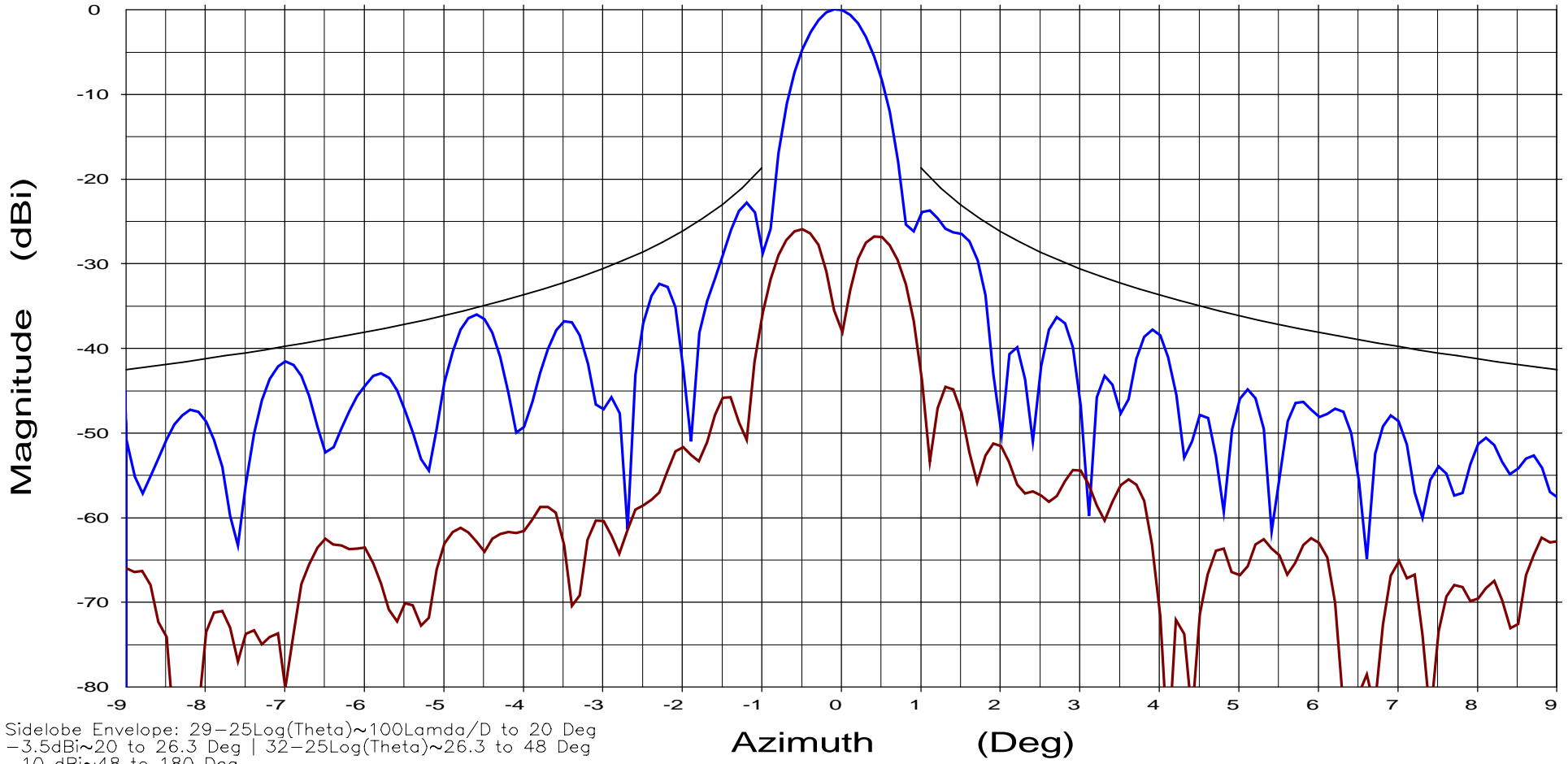
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 11.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-17.dat-ant_under_test	1519-17.dat	dBi
1519-19.dat-ant_under_test	1519-19.dat	dBi

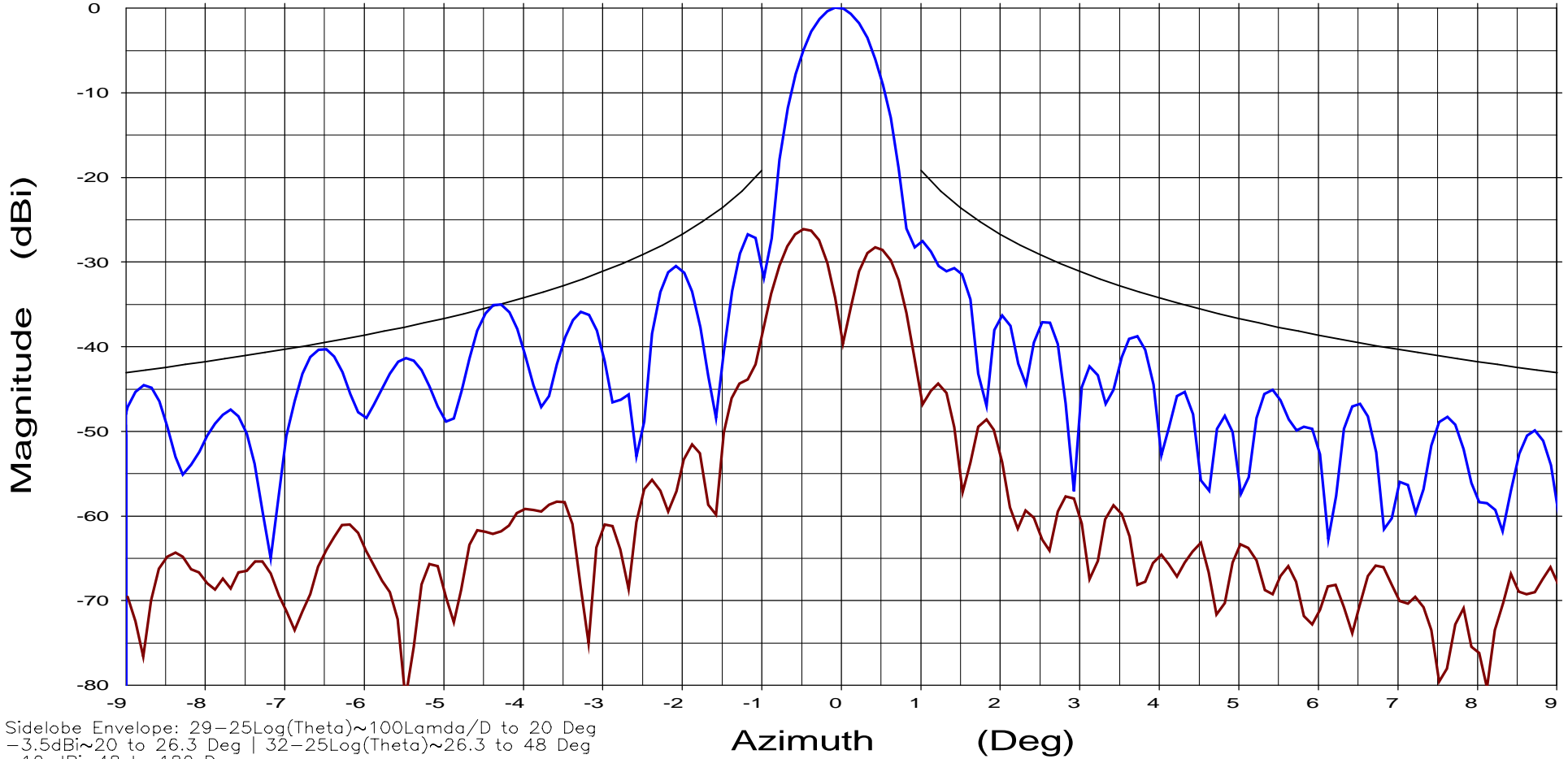
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 12.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-17.dat-ant_under_test	1519-17.dat	dBi
1519-19.dat-ant_under_test	1519-19.dat	dBi

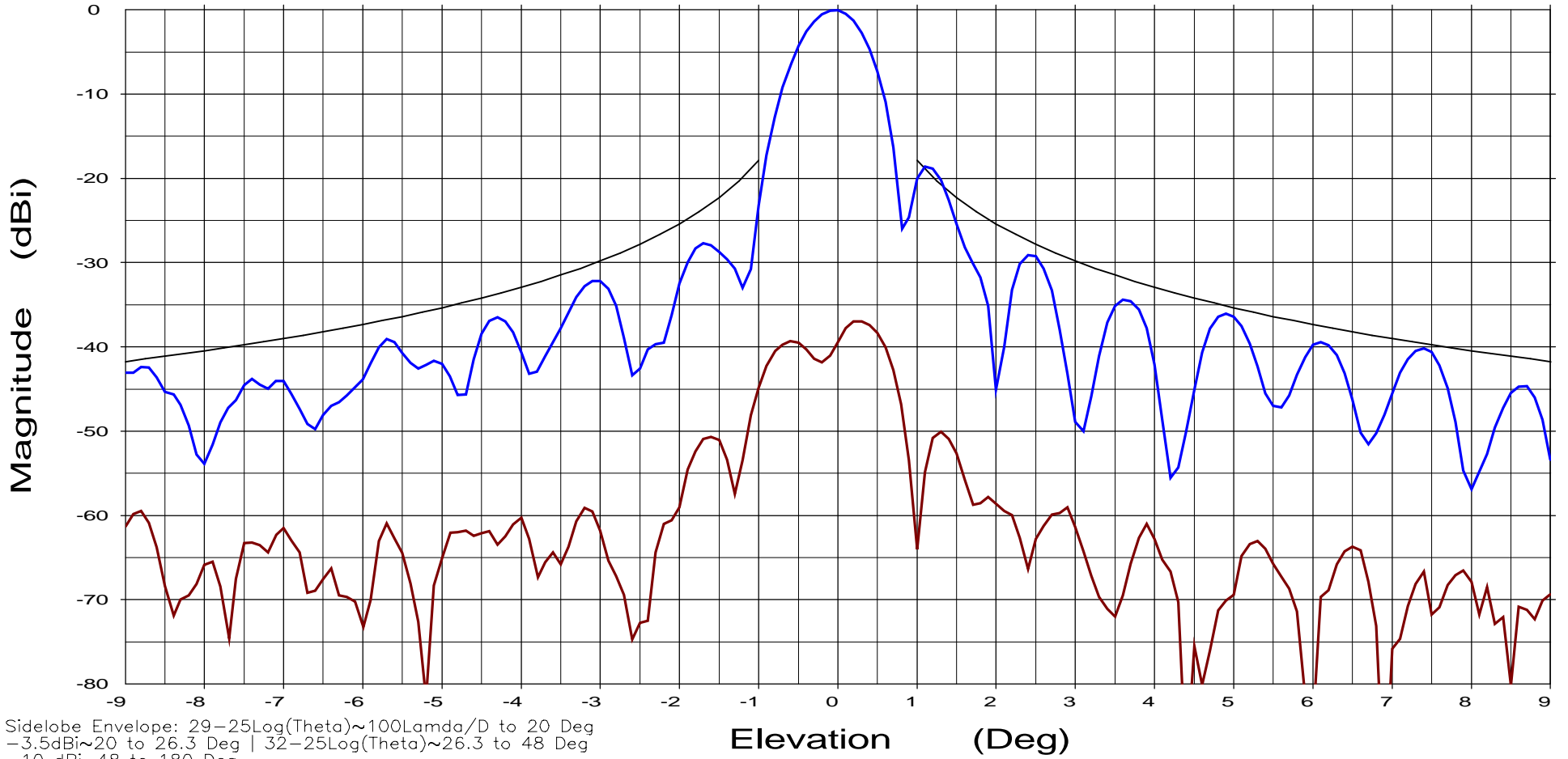
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 10.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

	Cal. file	units
1519-18.dat-ant_under_test	1519-18.dat	dBi
1519-20.dat-ant_under_test	1519-20.dat	dBi

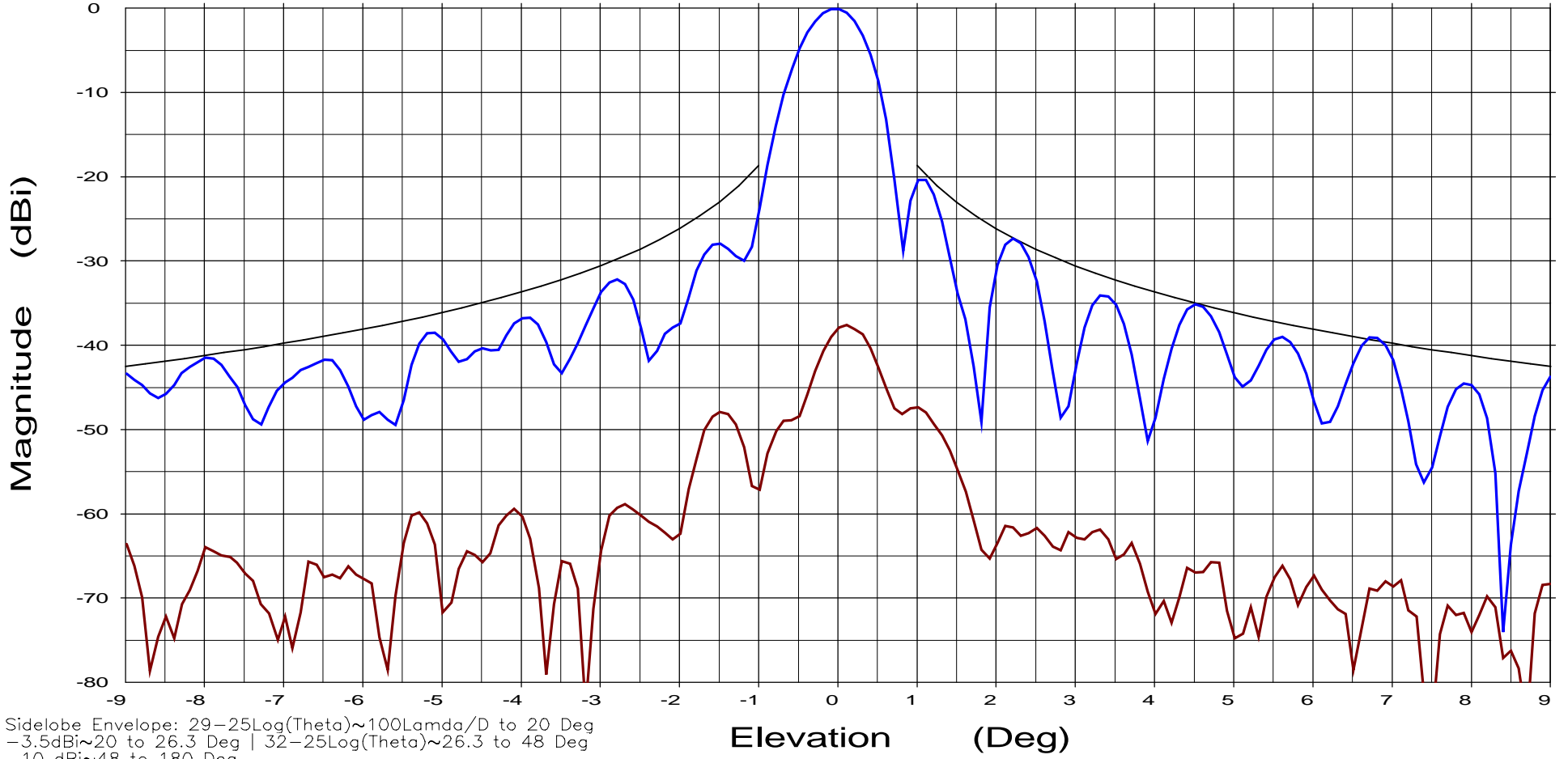
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 11.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-18.dat-ant_under_test	1519-18.dat	dBi
1519-20.dat-ant_under_test	1519-20.dat	dBi

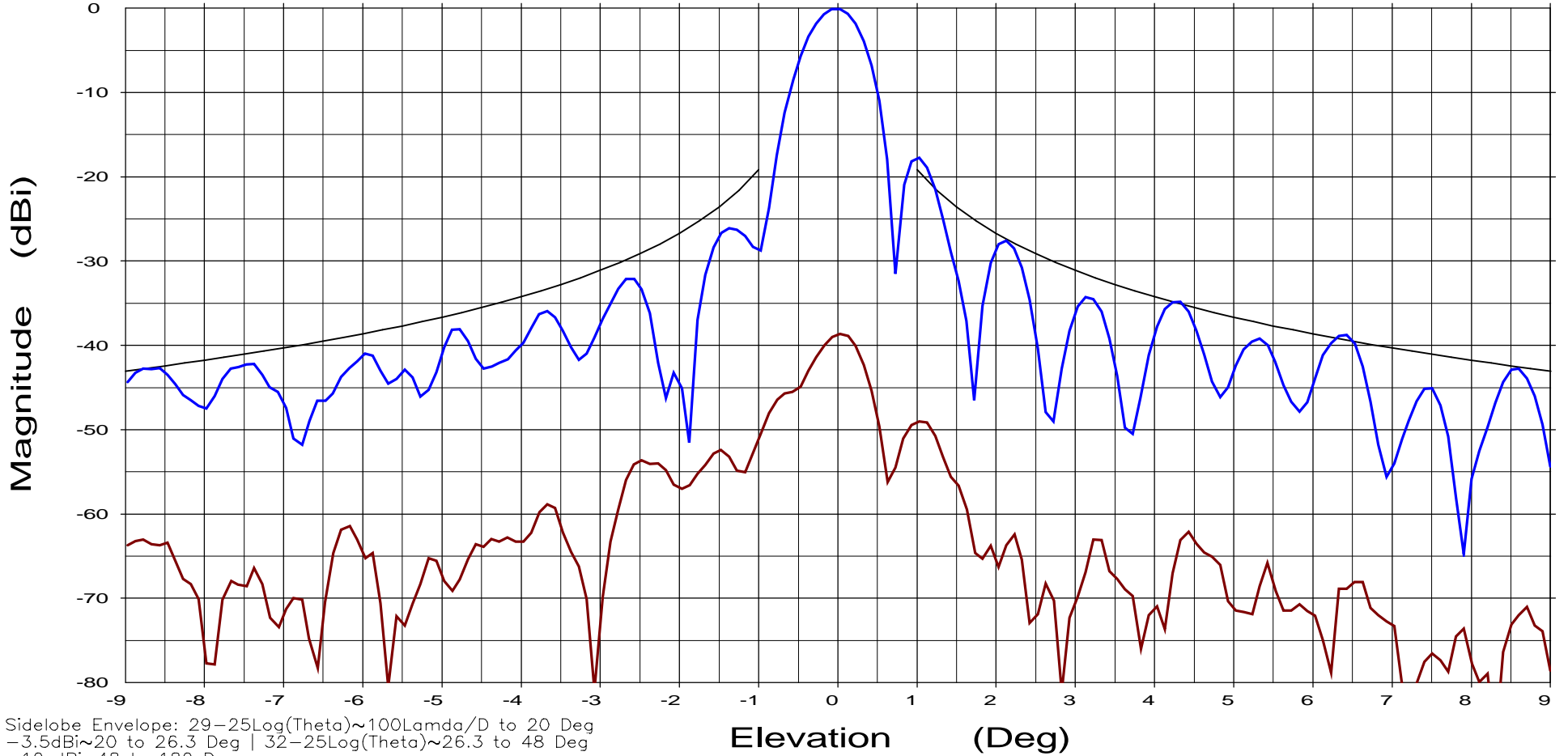
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 12.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Overlays	Cal. file	units
1519-18.dat-ant_under_test	1519-18.dat	dBi
1519-20.dat-ant_under_test	1519-20.dat	dBi

File: 1519-17.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:

Calibration status:  
File: 1519-17.dat  
Chan.: ch1  
Table: SGH-110  
Units: dBi

Frequency : See Legend

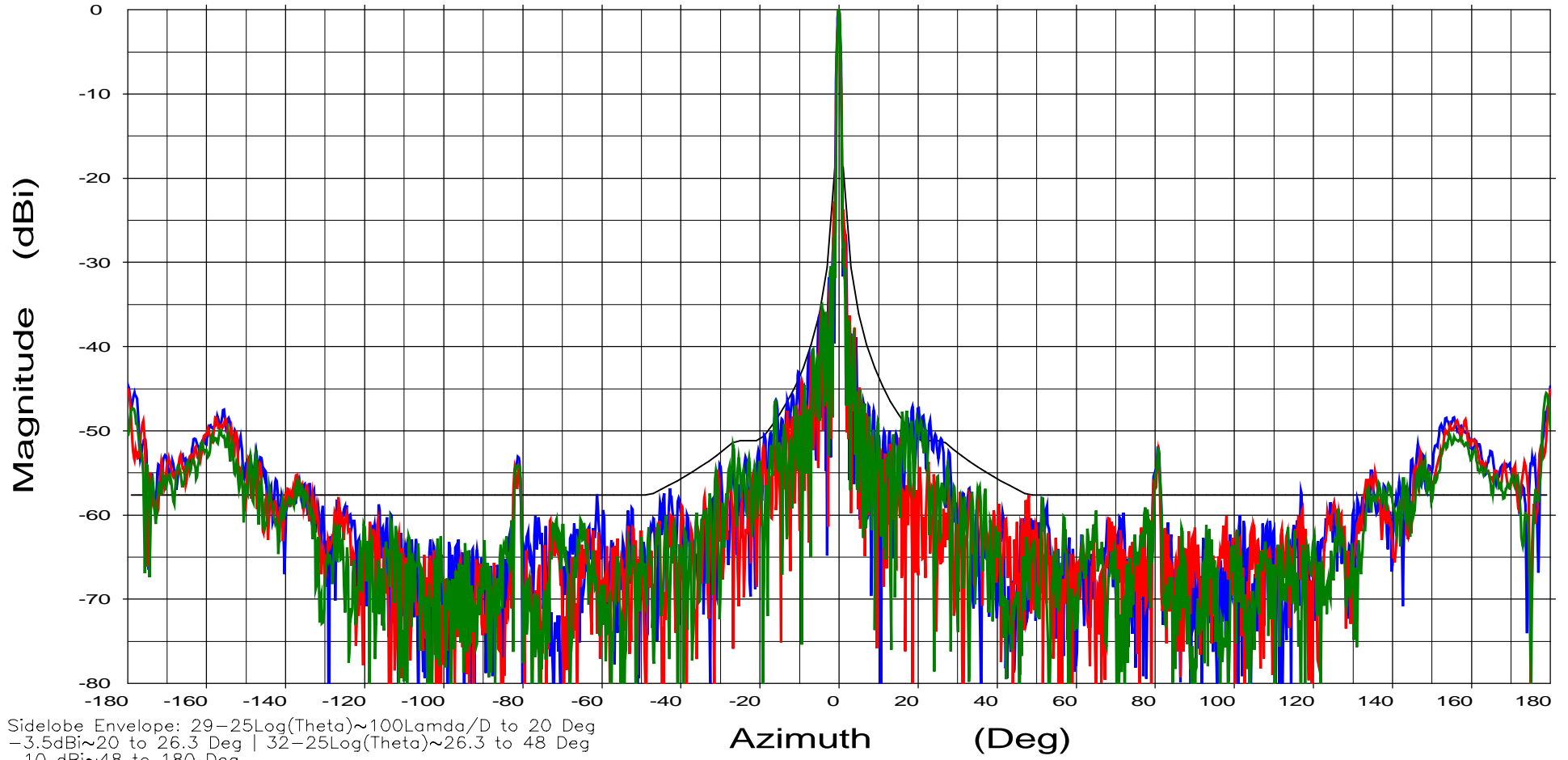
Operator: Dwight B. Lutz

Ser. no.: Sys #3

Channel: ch1

Tx pol: Horiz.

Rx pol: Horiz.



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays

- Frequency : 10.950 GHz — blue line
- Frequency : 11.950 GHz — red line
- Frequency : 12.750 GHz — green line

## 2.4 X-Band Patterns



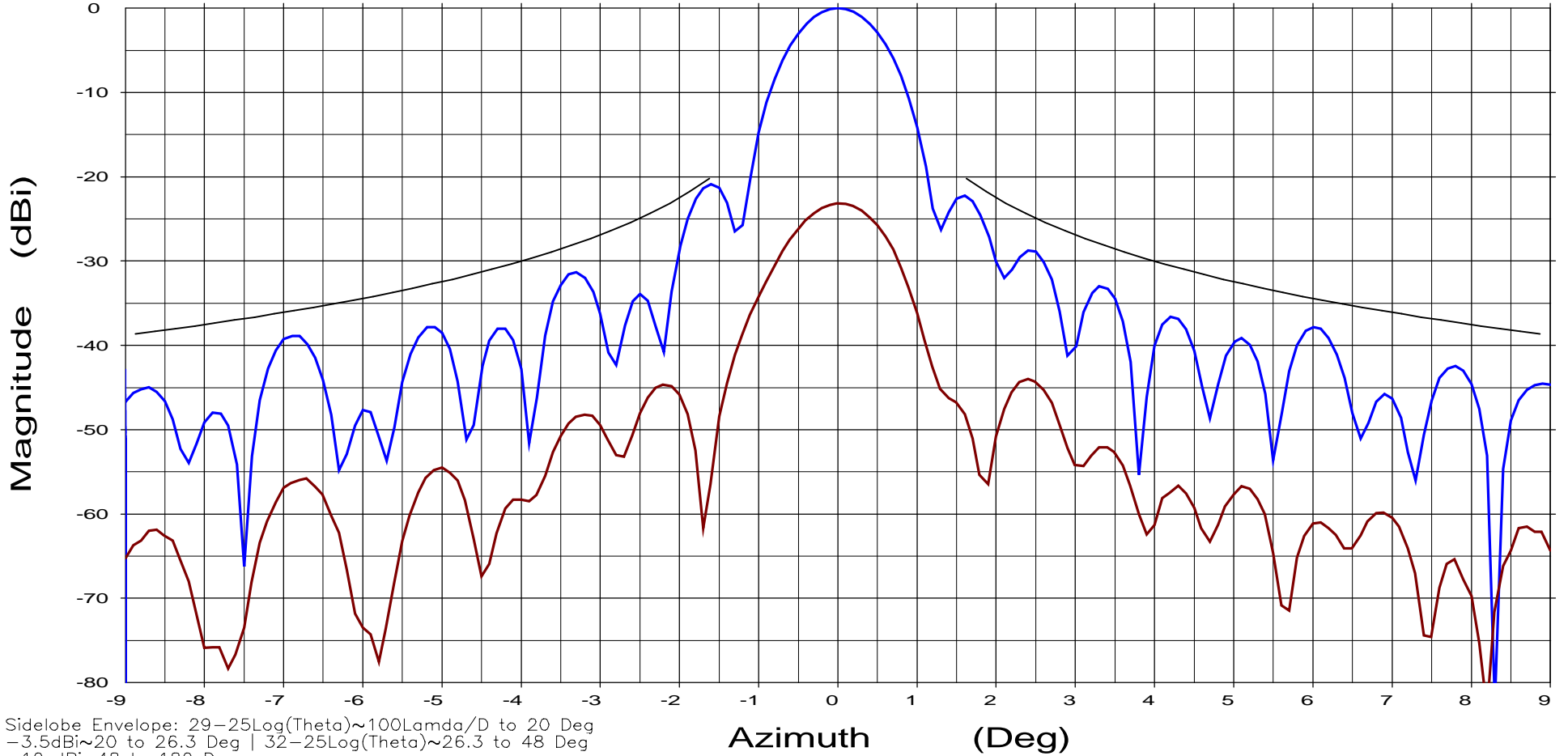
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.900 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

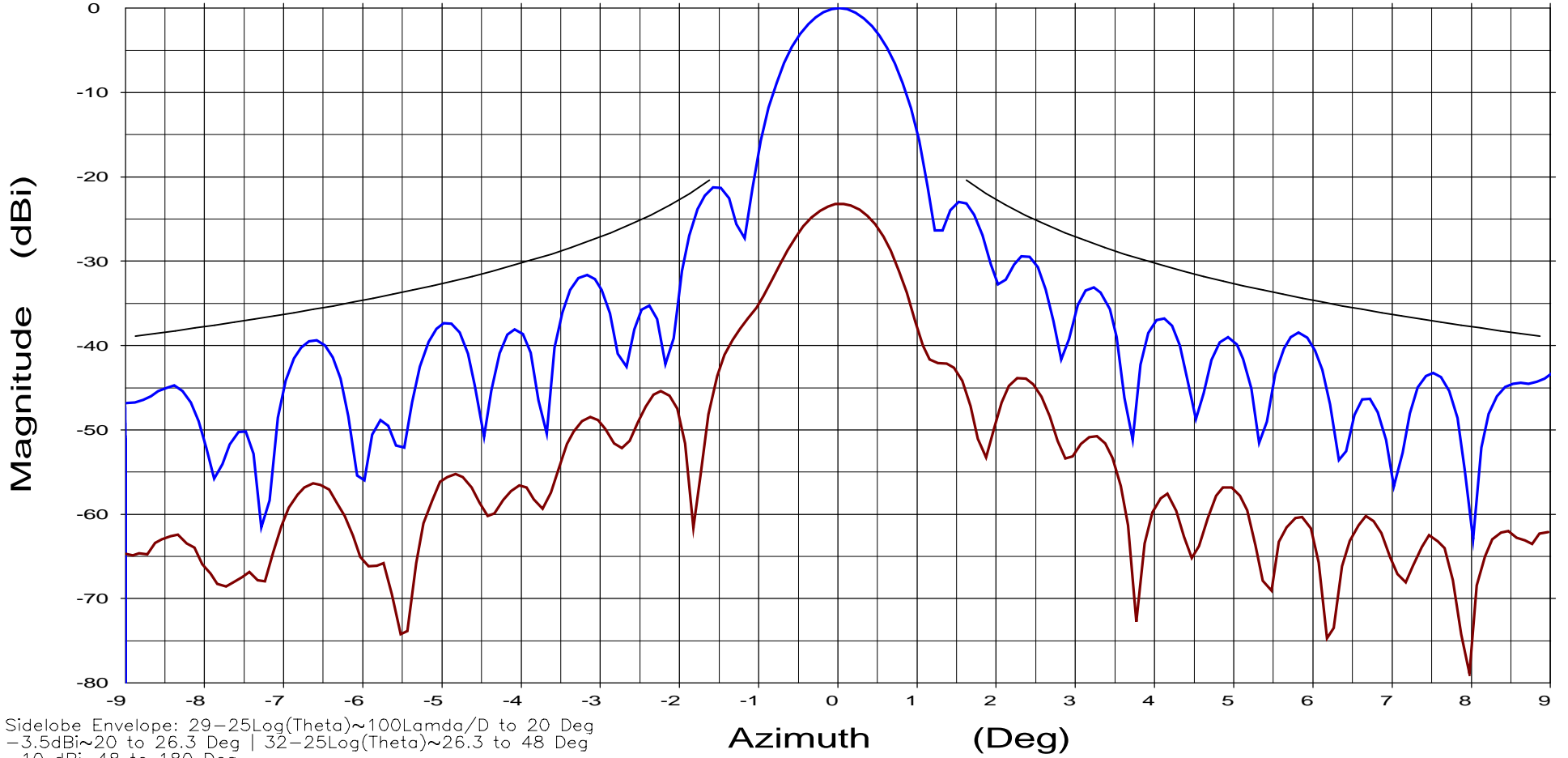
Overlays	Cal. file	units
1519-25.dat-ant_under_test	1519-25.dat	dBi
1519-27.dat-ant_under_test	1519-27.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 8.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

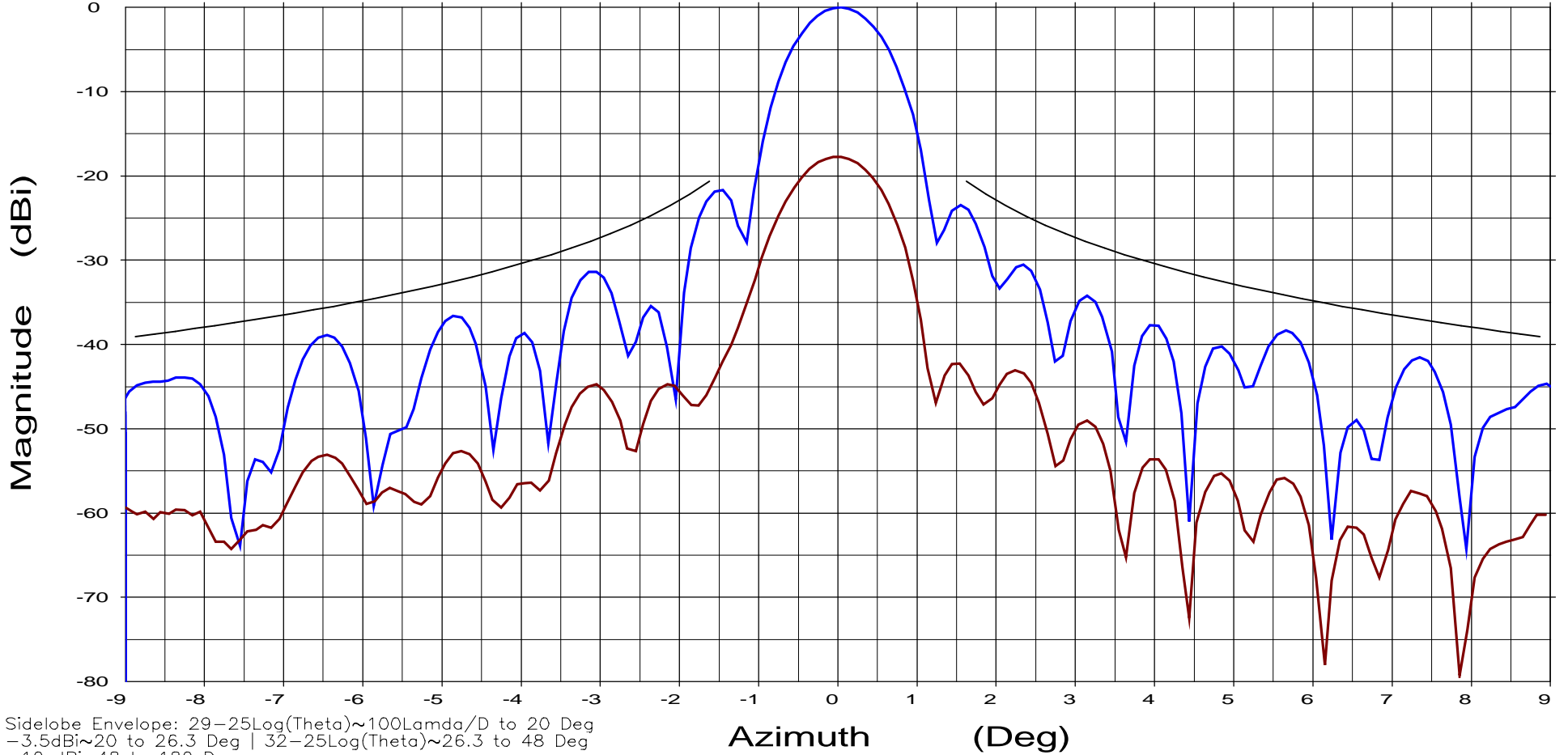
Overlays	Cal. file	units
1519-25.dat-ant_under_test	1519-25.dat	dBi
1519-27.dat-ant_under_test	1519-27.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 8.400 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-25.dat-ant_under_test	1519-25.dat	dBi
1519-27.dat-ant_under_test	1519-27.dat	dBi

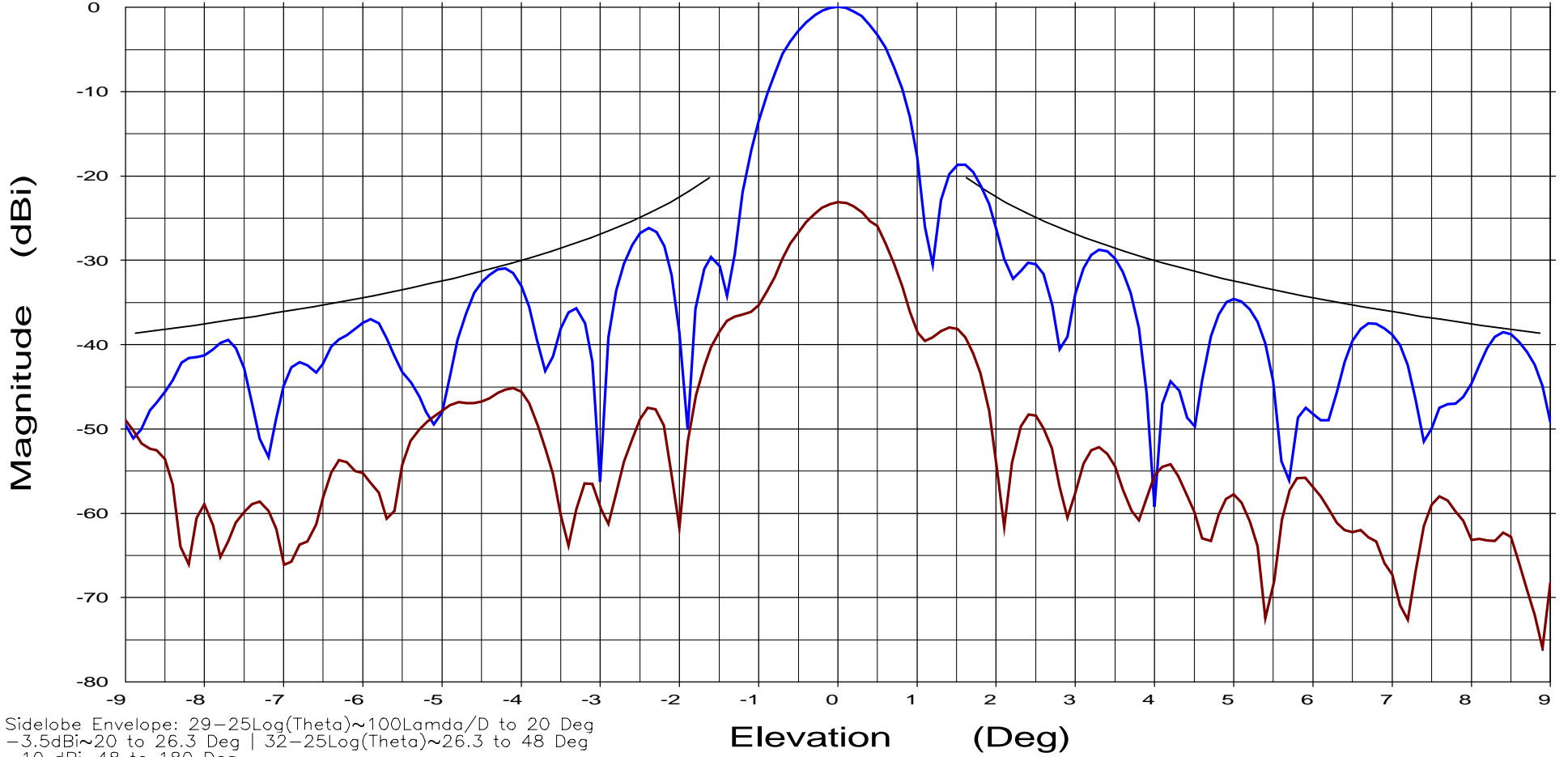
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.900 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

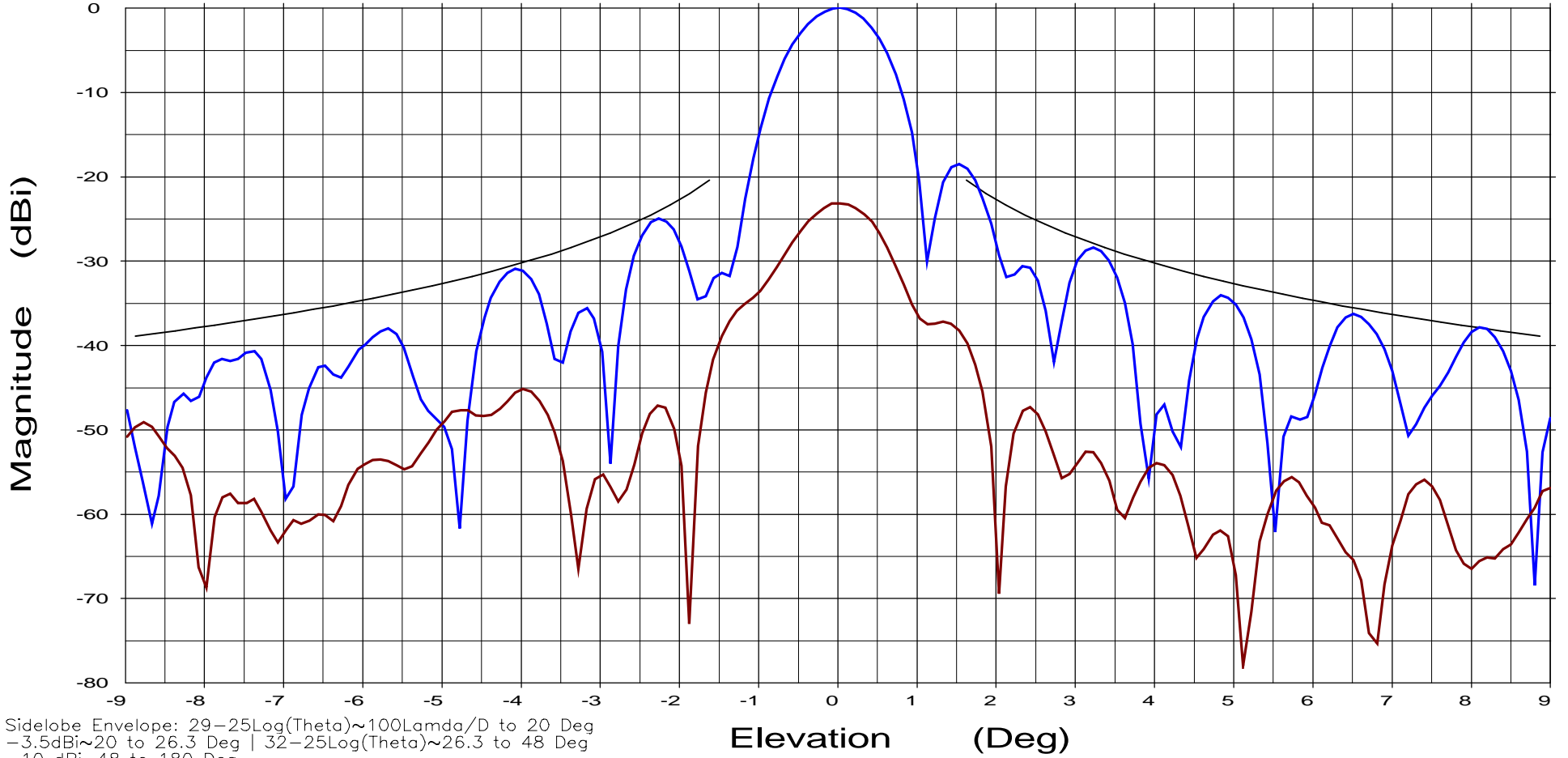
Overlays	Cal. file	units
1519-26.dat-ant_under_test	1519-26.dat	dBi
1519-28.dat-ant_under_test	1519-28.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 8.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

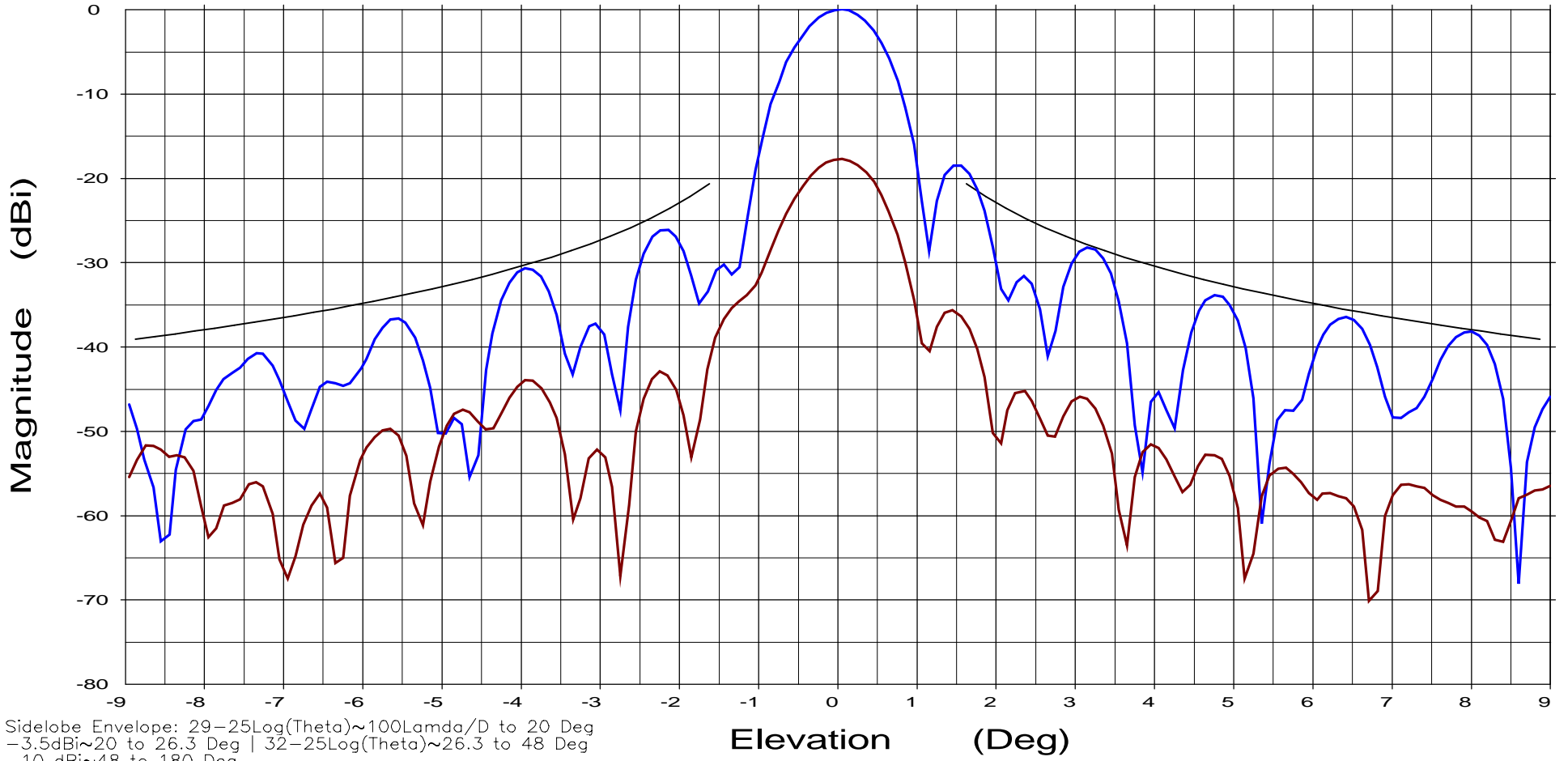
Overlays	Cal. file	units
1519-26.dat-ant_under_test	1519-26.dat	dBi
1519-28.dat-ant_under_test	1519-28.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 8.400 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-26.dat-ant_under_test	1519-26.dat	dBi
1519-28.dat-ant_under_test	1519-28.dat	dBi

File: 1519-25.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

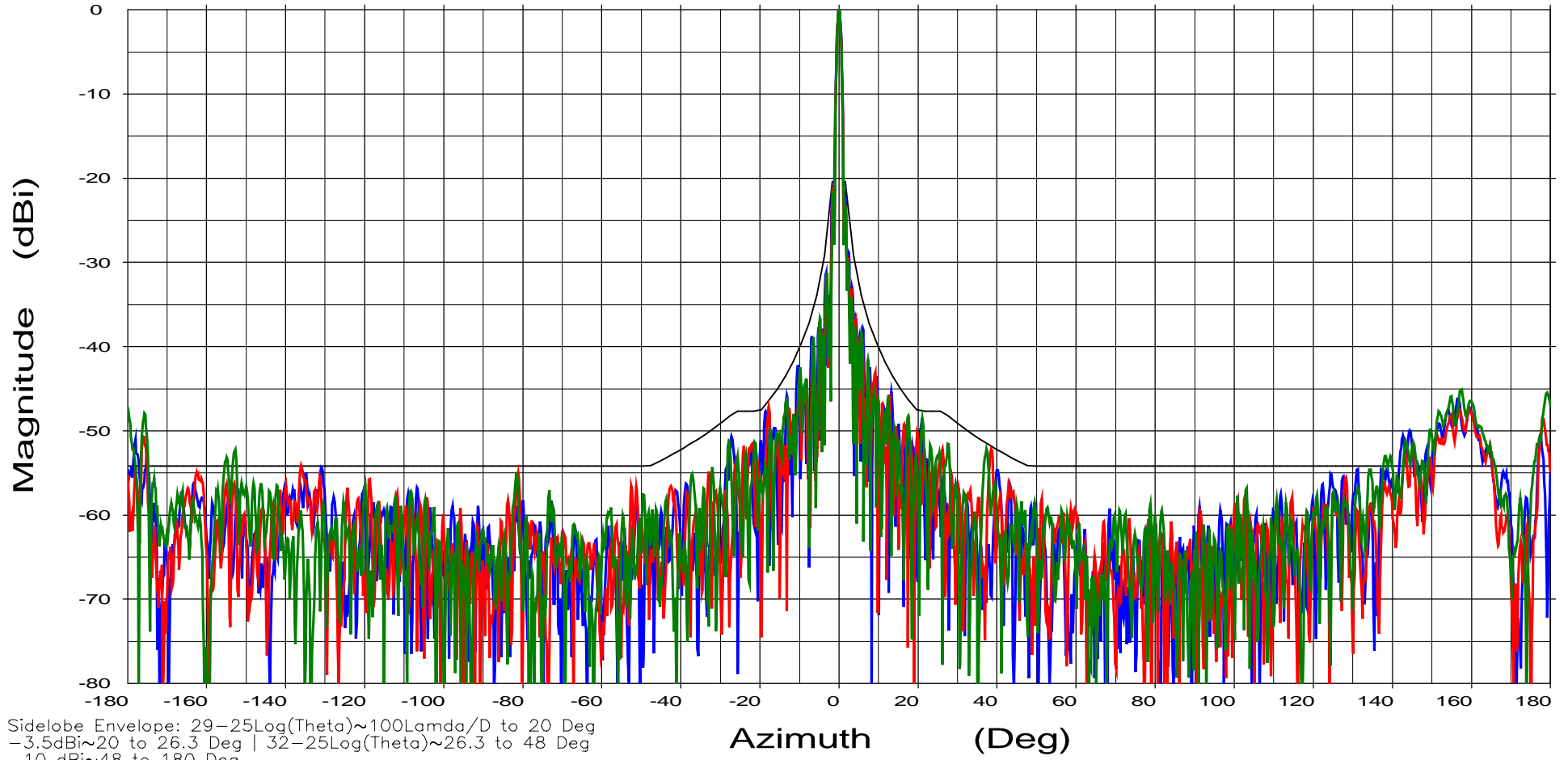
Calibration status:  
File: 1519-25.dat  
Chan.: nch1  
Table: 2.4mx-band  
Units: dBi

Frequency : See Legend

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

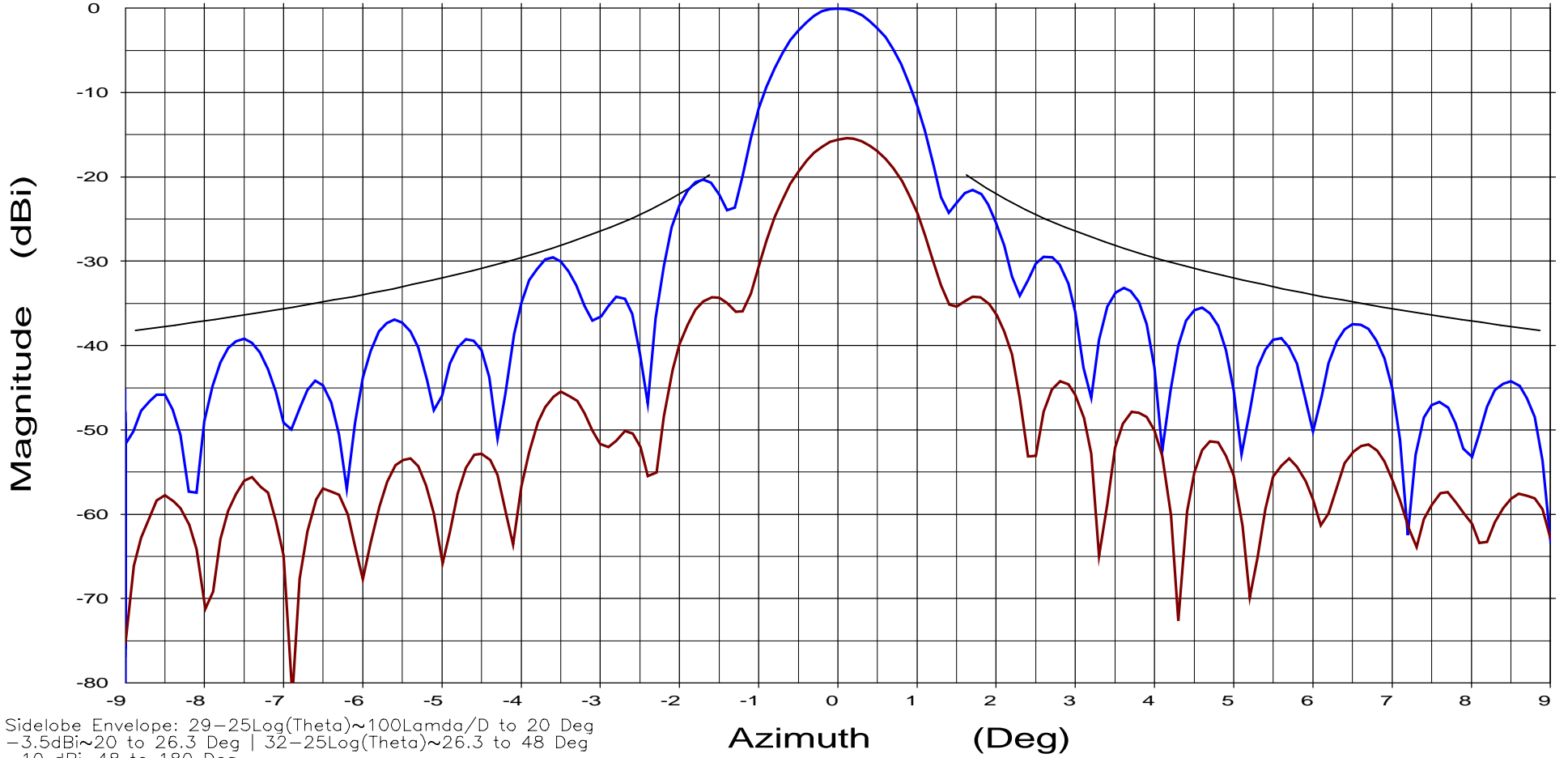
Frequency : 7.900 GHz — blue  
Frequency : 8.200 GHz — red  
Frequency : 8.400 GHz — green

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.250 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-21.dat-ant_under_test	1519-21.dat	dBi
1519-23.dat-ant_under_test	1519-23.dat	dBi

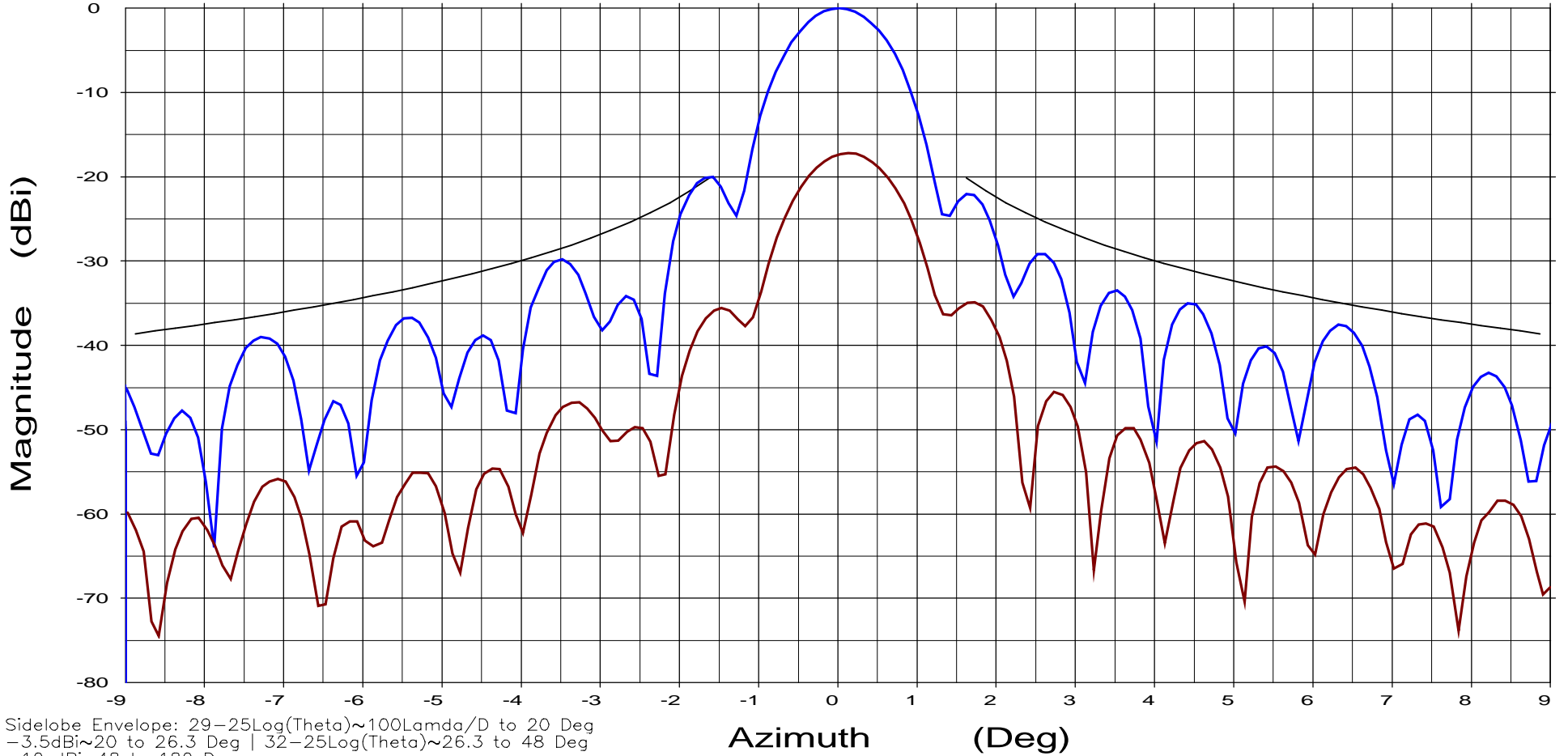


Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

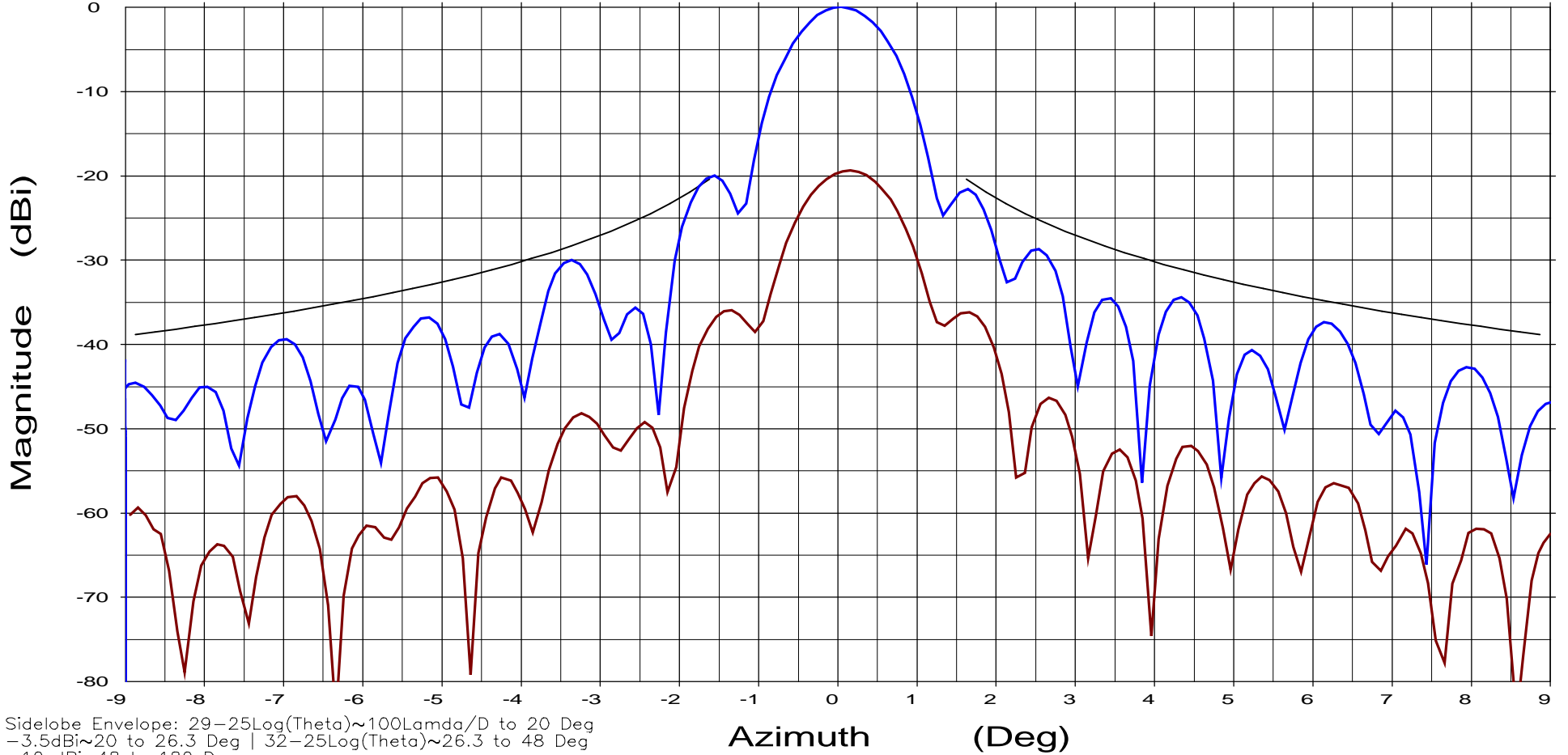
Overlays	Cal. file	units
1519-21.dat-ant_under_test	1519-21.dat	dBi
1519-23.dat-ant_under_test	1519-23.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

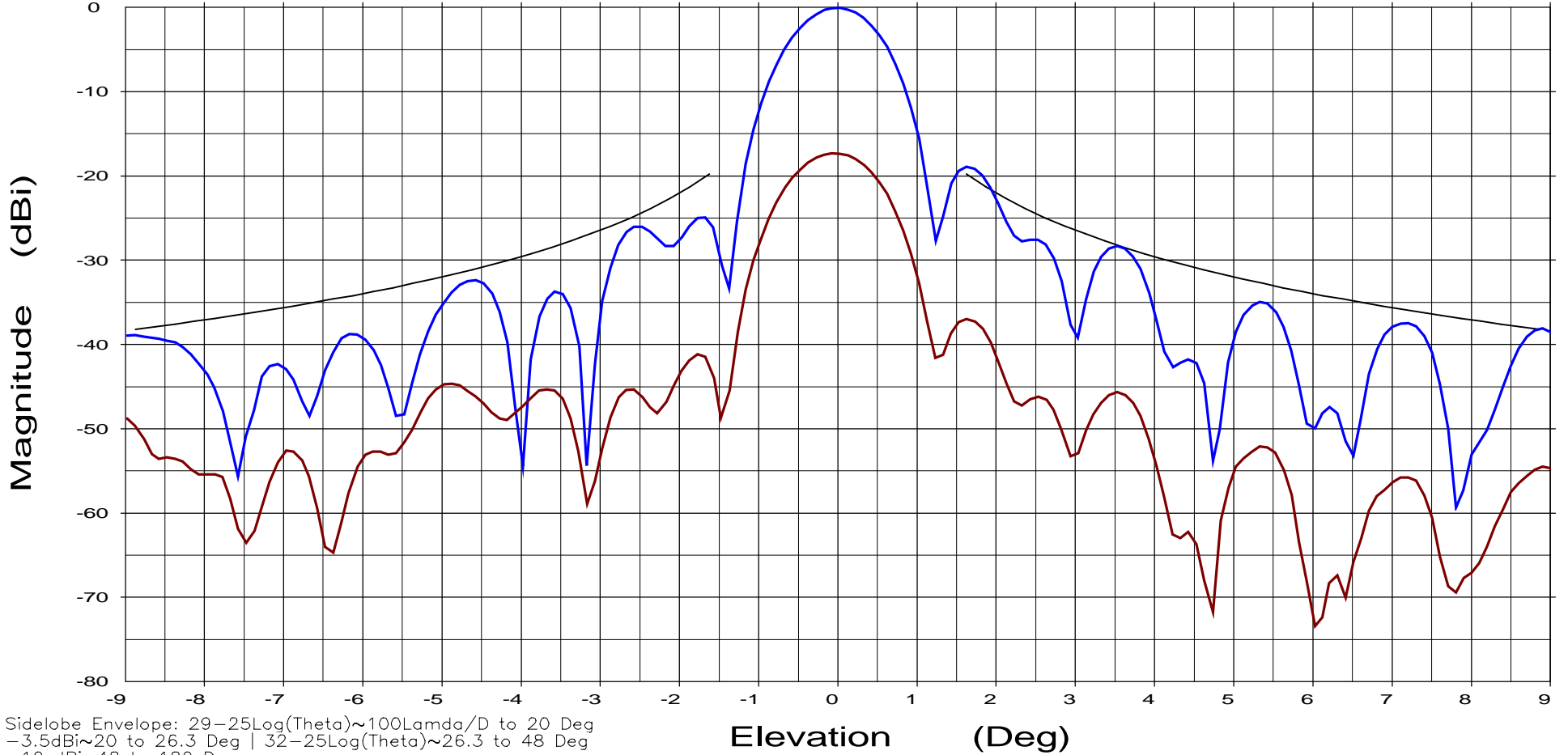
Overlays		Cal. file	units
1519-21.dat-ant_under_test	—	1519-21.dat	dBi
1519-23.dat-ant_under_test	—	1519-23.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.500 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\Theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\Theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

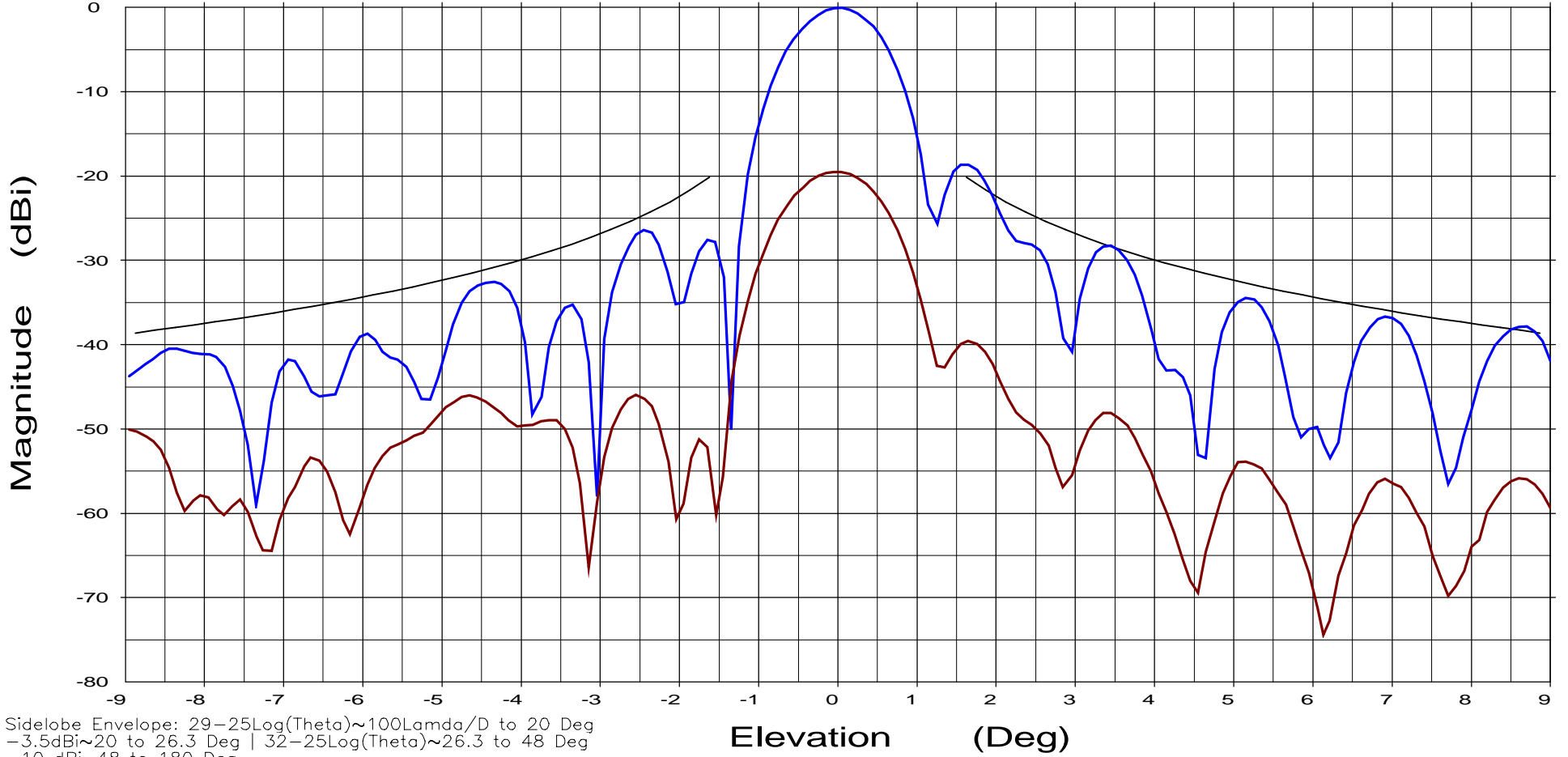
Overlays	Cal. file	units
1519-22.dat-ant_under_test	1519-22.dat	dBi
1519-24.dat-ant_under_test	1519-24.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

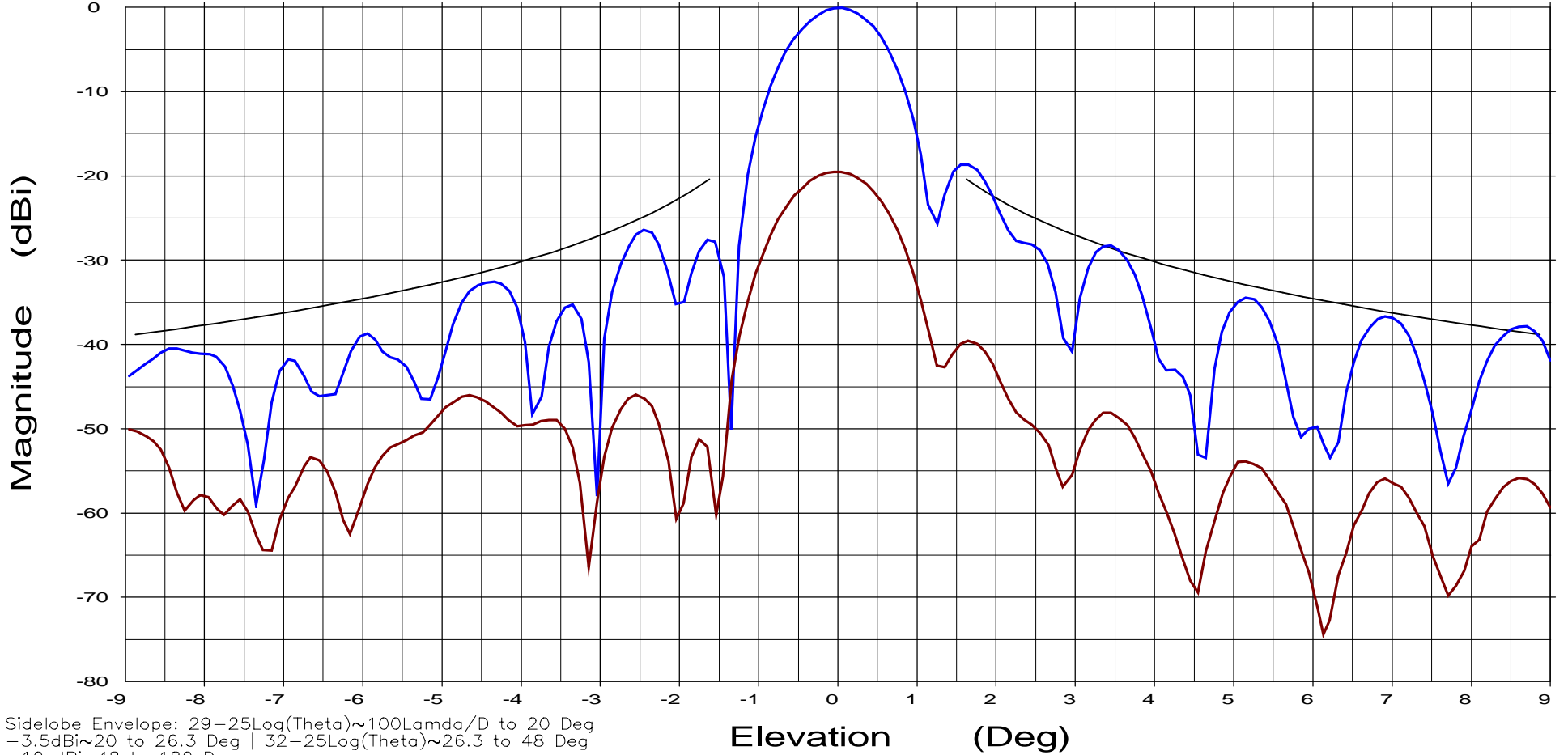
Overlays	Cal. file	units
1519-22.dat-ant_under_test	1519-22.dat	dBi
1519-24.dat-ant_under_test	1519-24.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 7.750 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-22.dat-ant_under_test	1519-22.dat	dBi
1519-24.dat-ant_under_test	1519-24.dat	dBi

File: 1519-21.dat

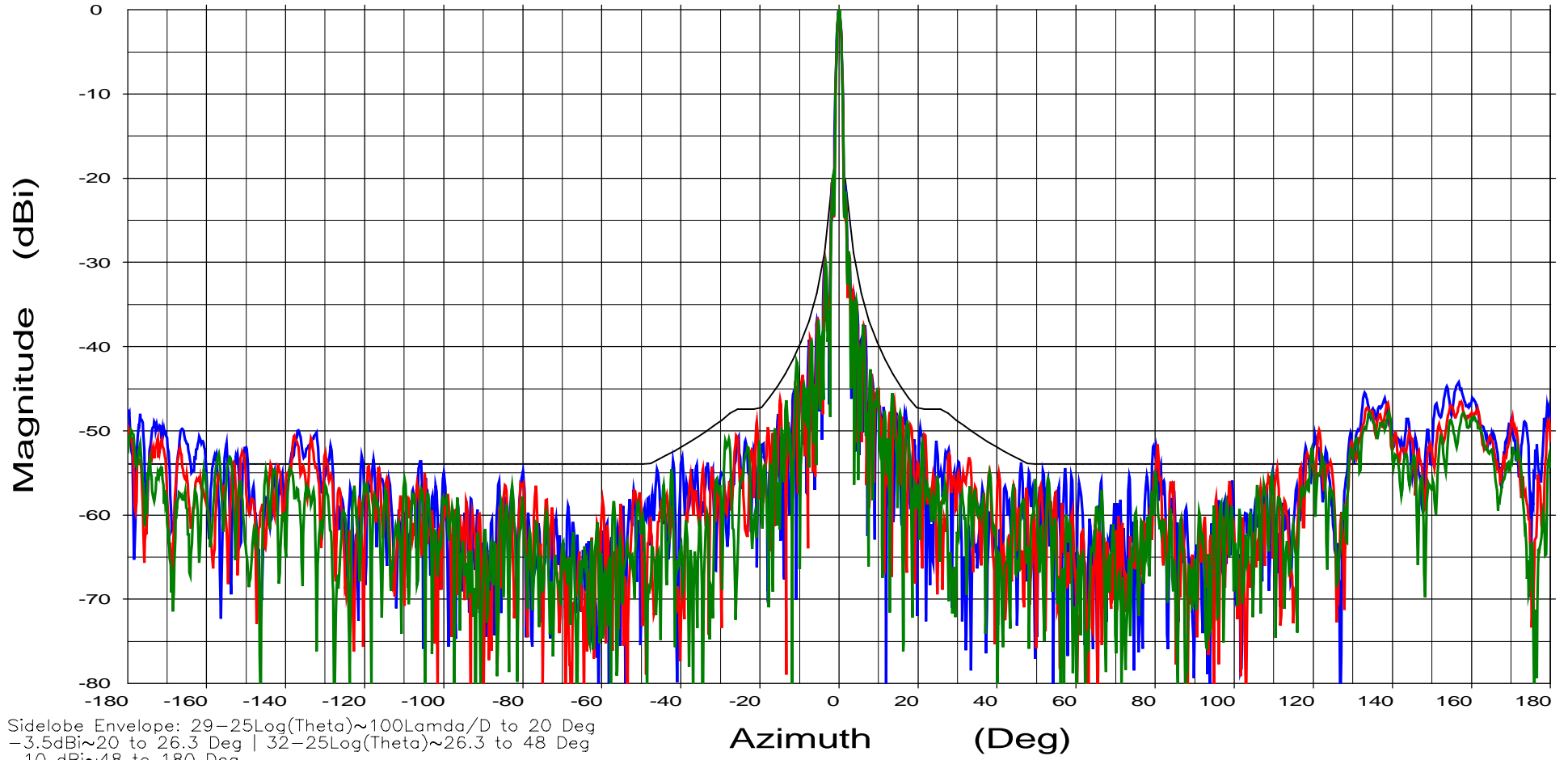
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:

Calibration status:  
File: 1519-21.dat  
Chan: ch1  
Table: 2.4mx-band  
Units: dBi

Frequency : See Legend

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays  
Frequency : 7.250 GHz — blue  
Frequency : 7.500 GHz — red  
Frequency : 7.750 GHz — green

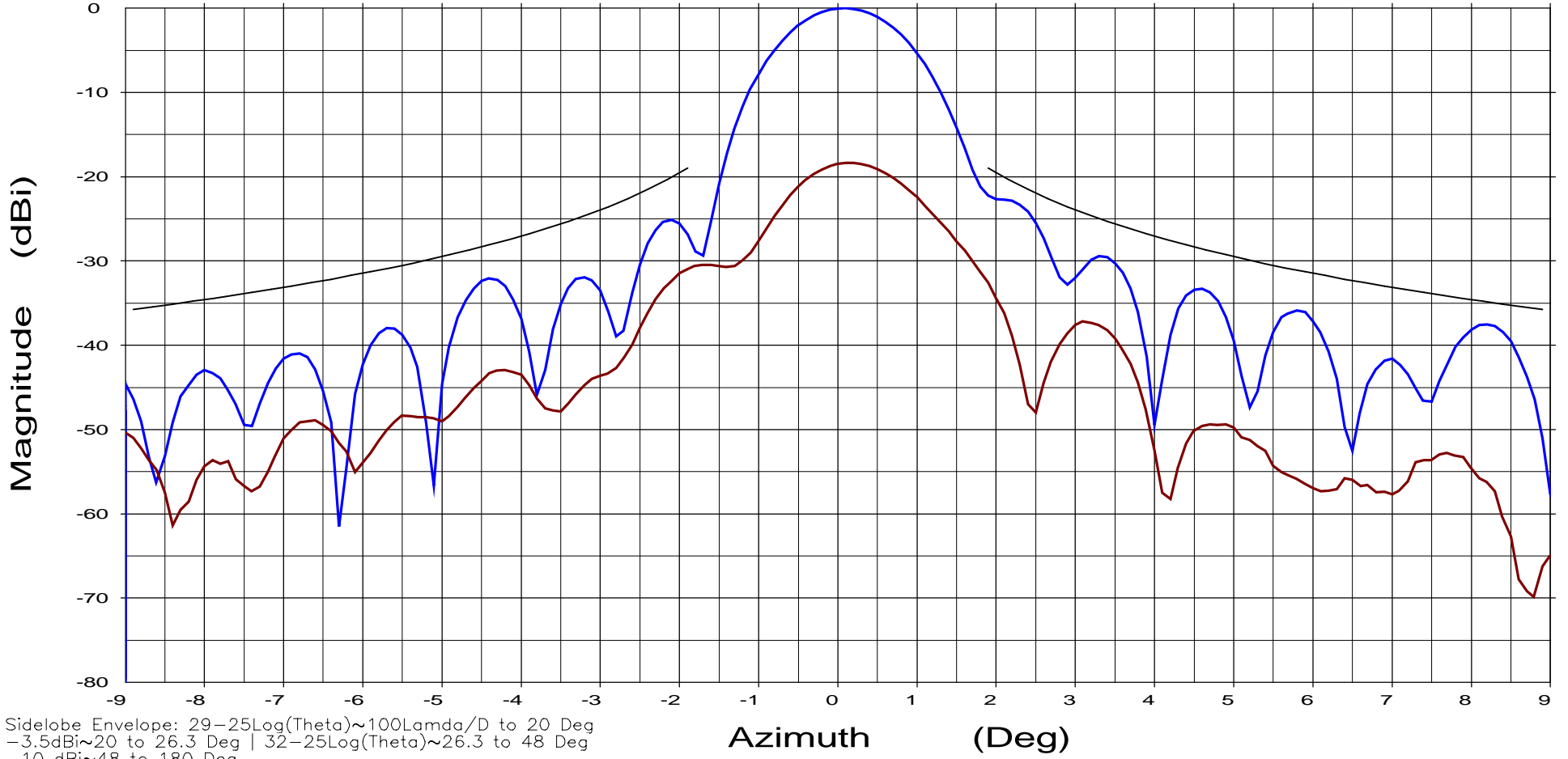
## 2.5 C-Band Patterns

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 5.850 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-43.dat-ant_under_test	1519-43.dat	dBi
1519-45.dat-ant_under_test	1519-45.dat	dBi

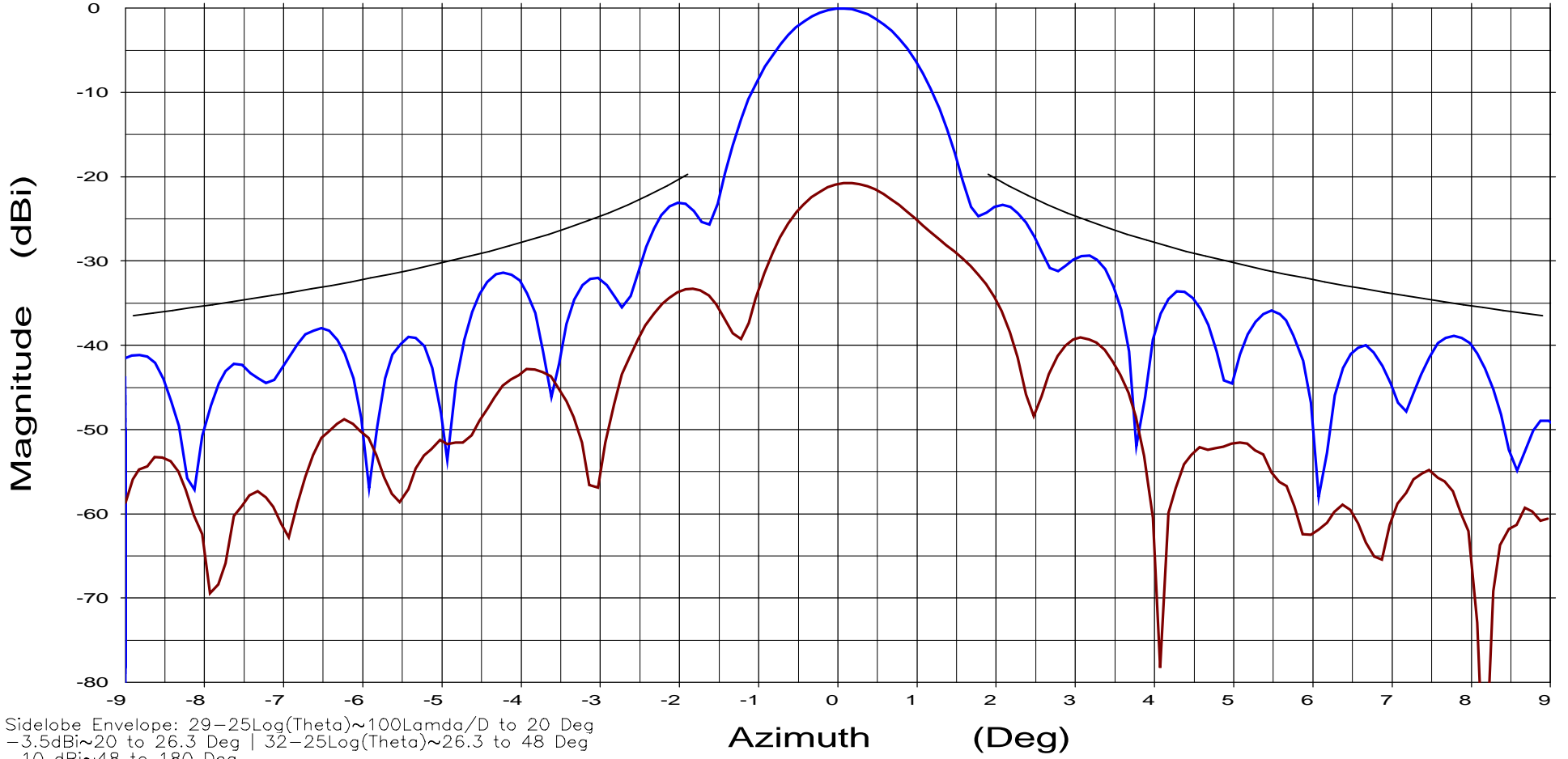


Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.138 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

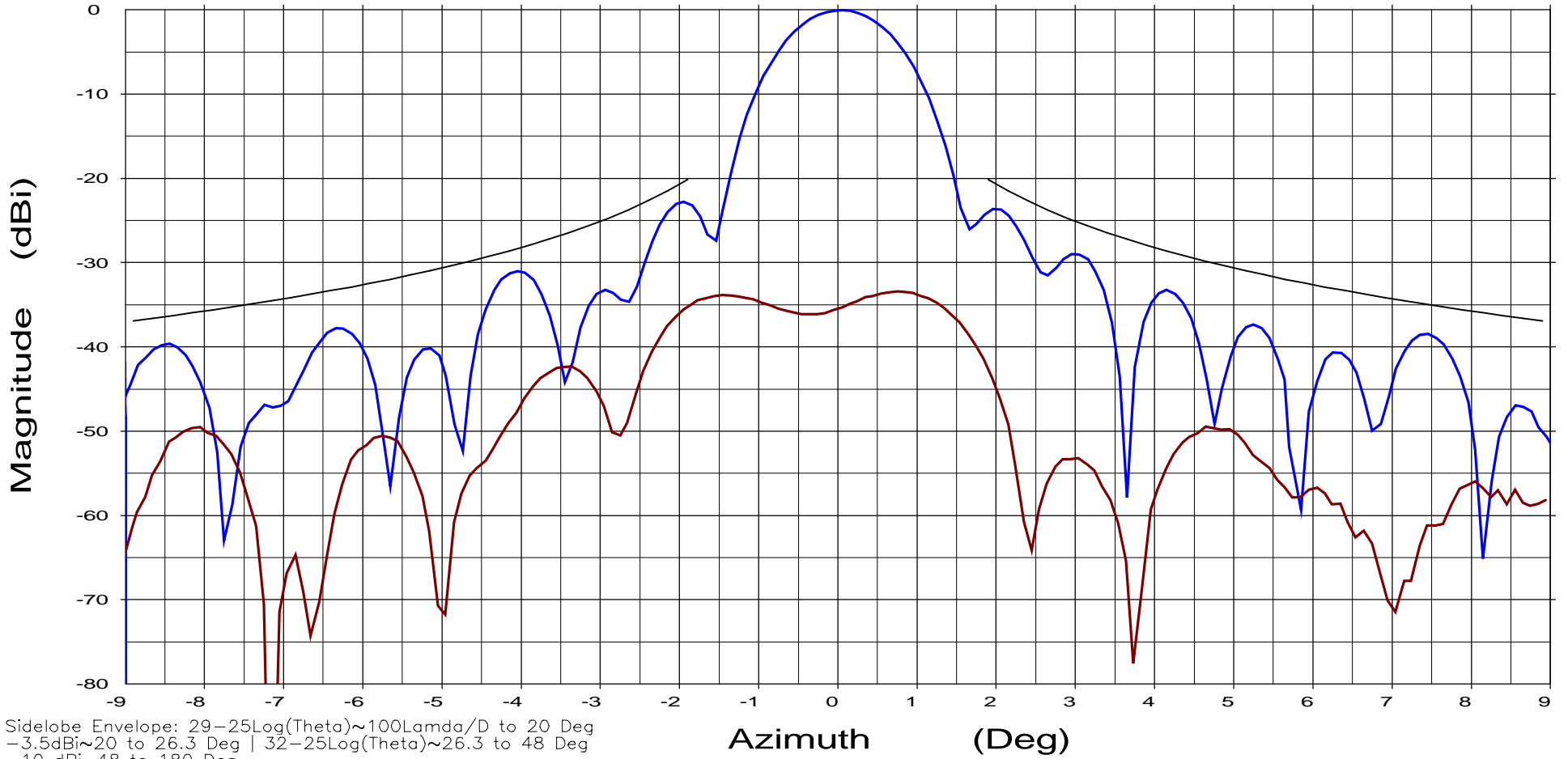
Overlays	Cal. file	units
1519-43.dat-ant_under_test	1519-43.dat	dBi
1519-45.dat-ant_under_test	1519-45.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.425 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

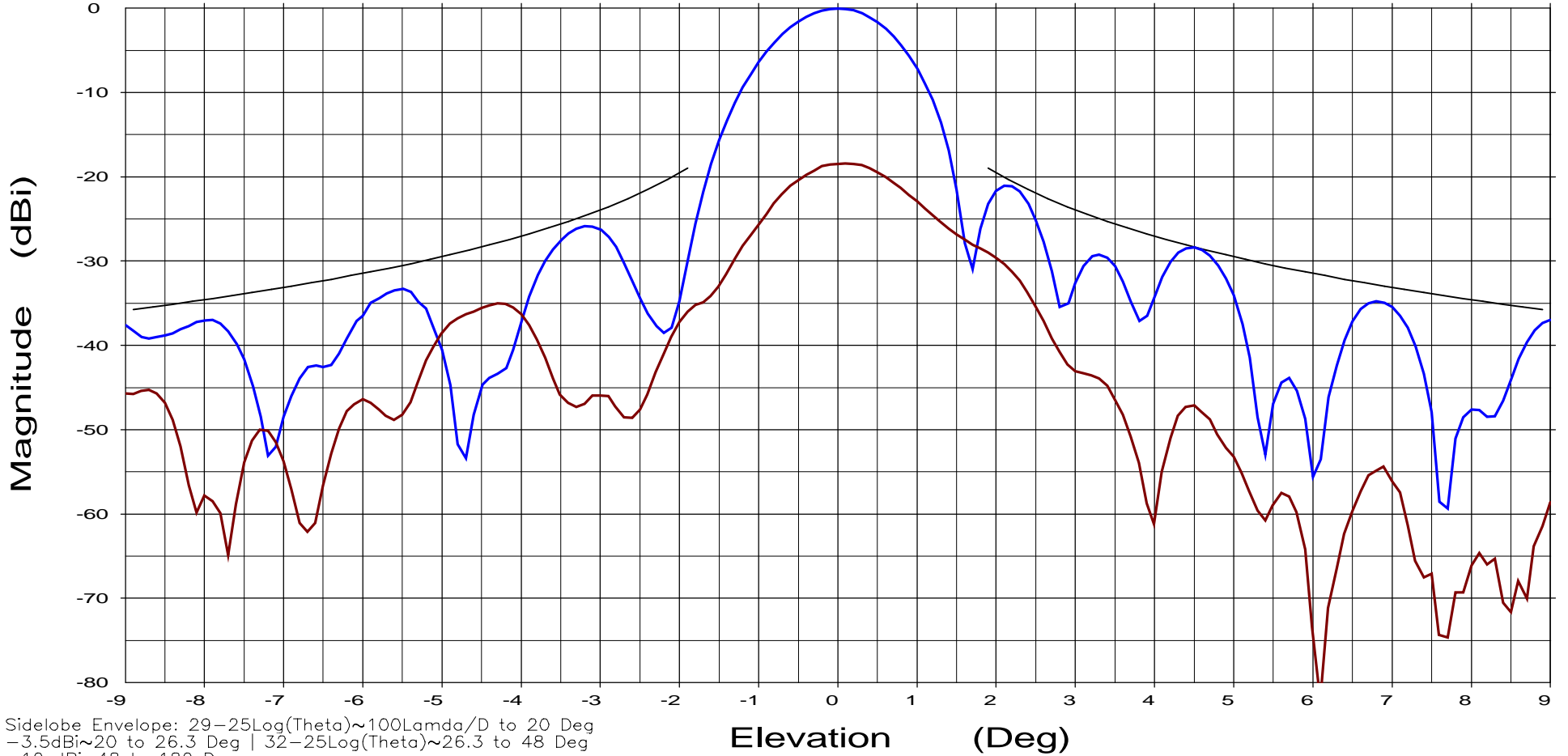
Overlays	Cal. file	units
1519-43.dat-ant_under_test	1519-43.dat	dBi
1519-45.dat-ant_under_test	1519-45.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 5.850 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

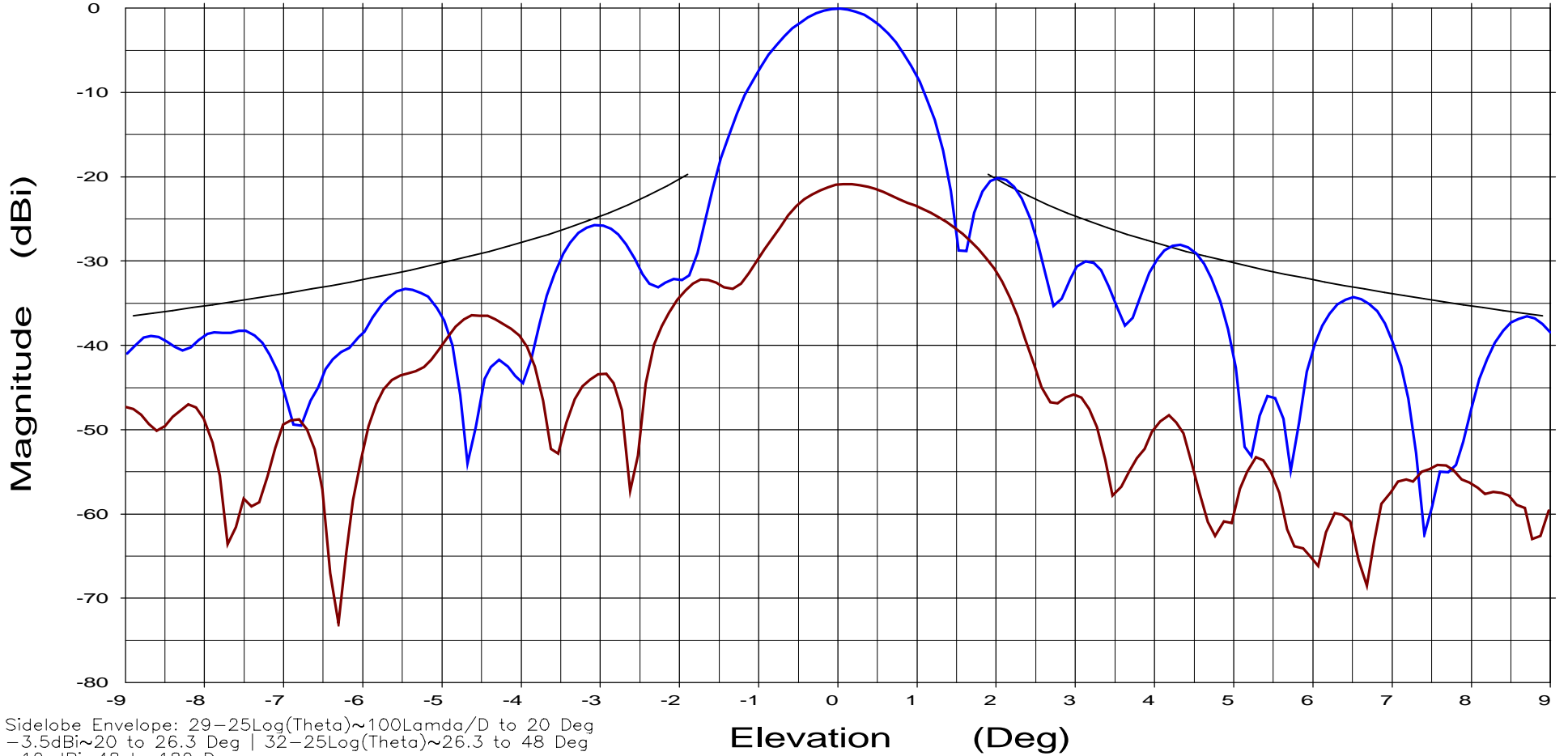
Overlays	Cal. file	units
1519-44.dat-ant_under_test	1519-44.dat	dBi
1519-46.dat-ant_under_test	1519-46.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.138 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

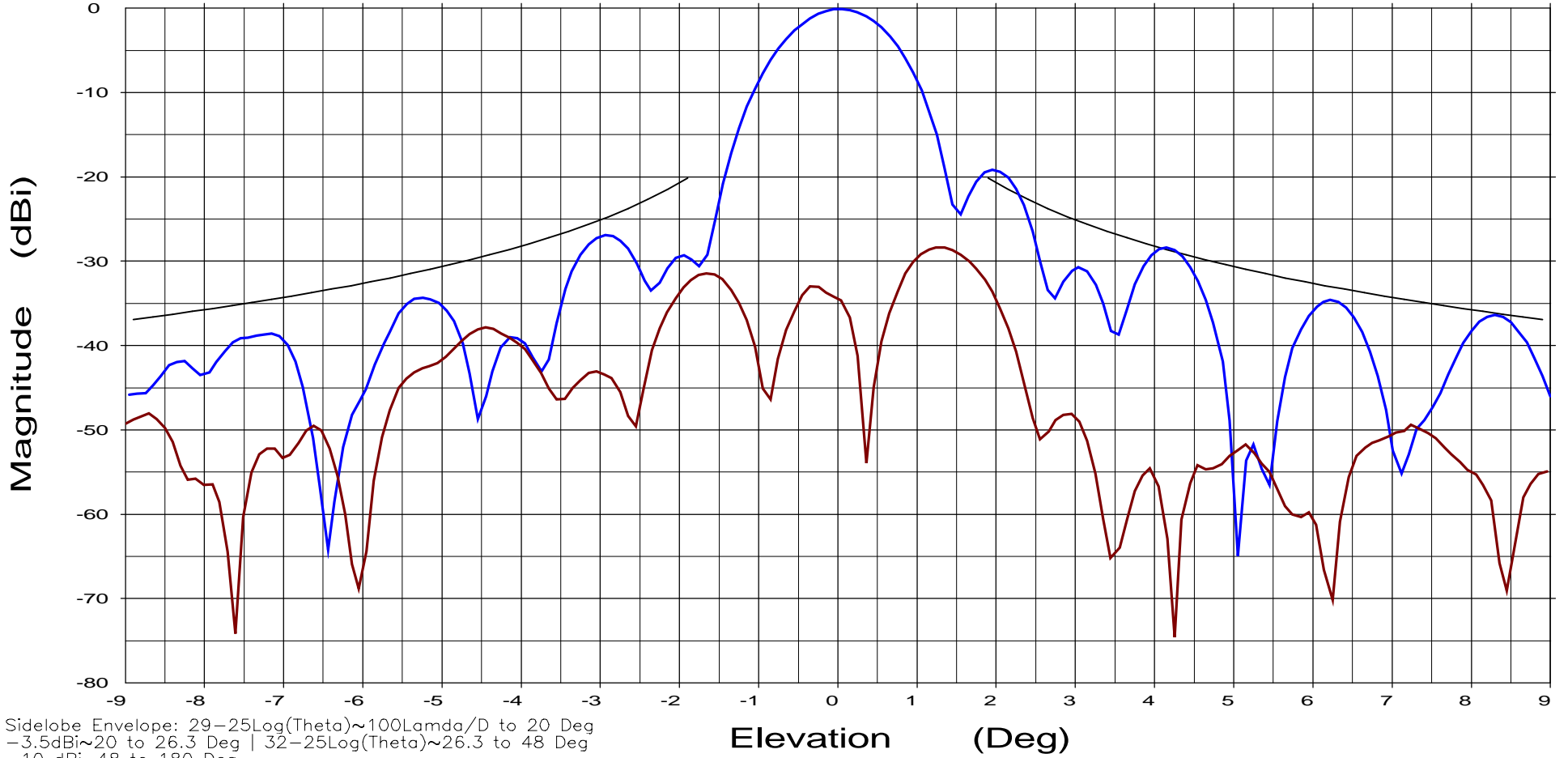
Overlays	Cal. file	units
1519-44.dat-ant_under_test	1519-44.dat	dBi
1519-46.dat-ant_under_test	1519-46.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.425 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-44.dat-ant_under_test	1519-44.dat	dBi
1519-46.dat-ant_under_test	1519-46.dat	dBi

File: 1519-43.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

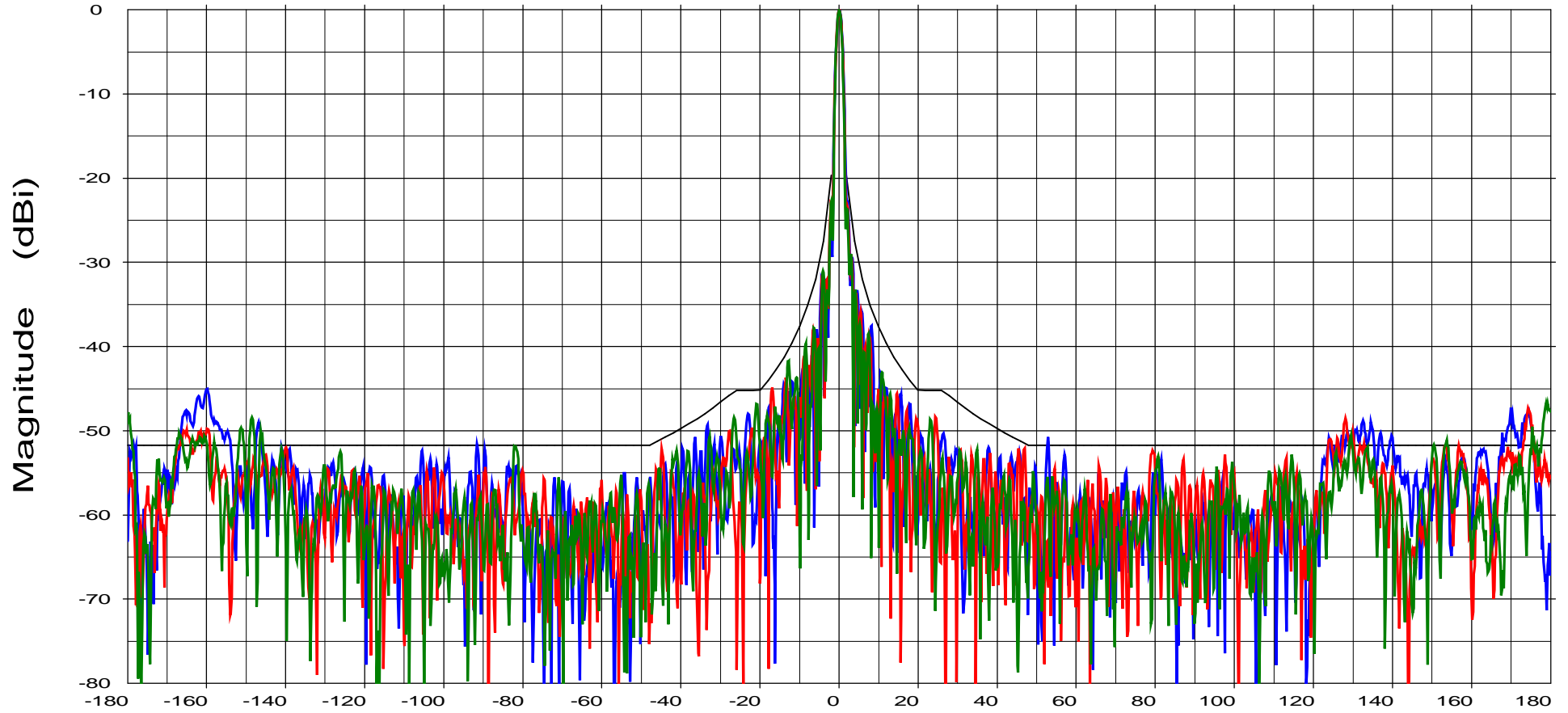
Calibration status:  
File: 1519-43.dat  
Chan.: nch1  
Table: Reference  
Units: dBi

Frequency : See Legend

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays

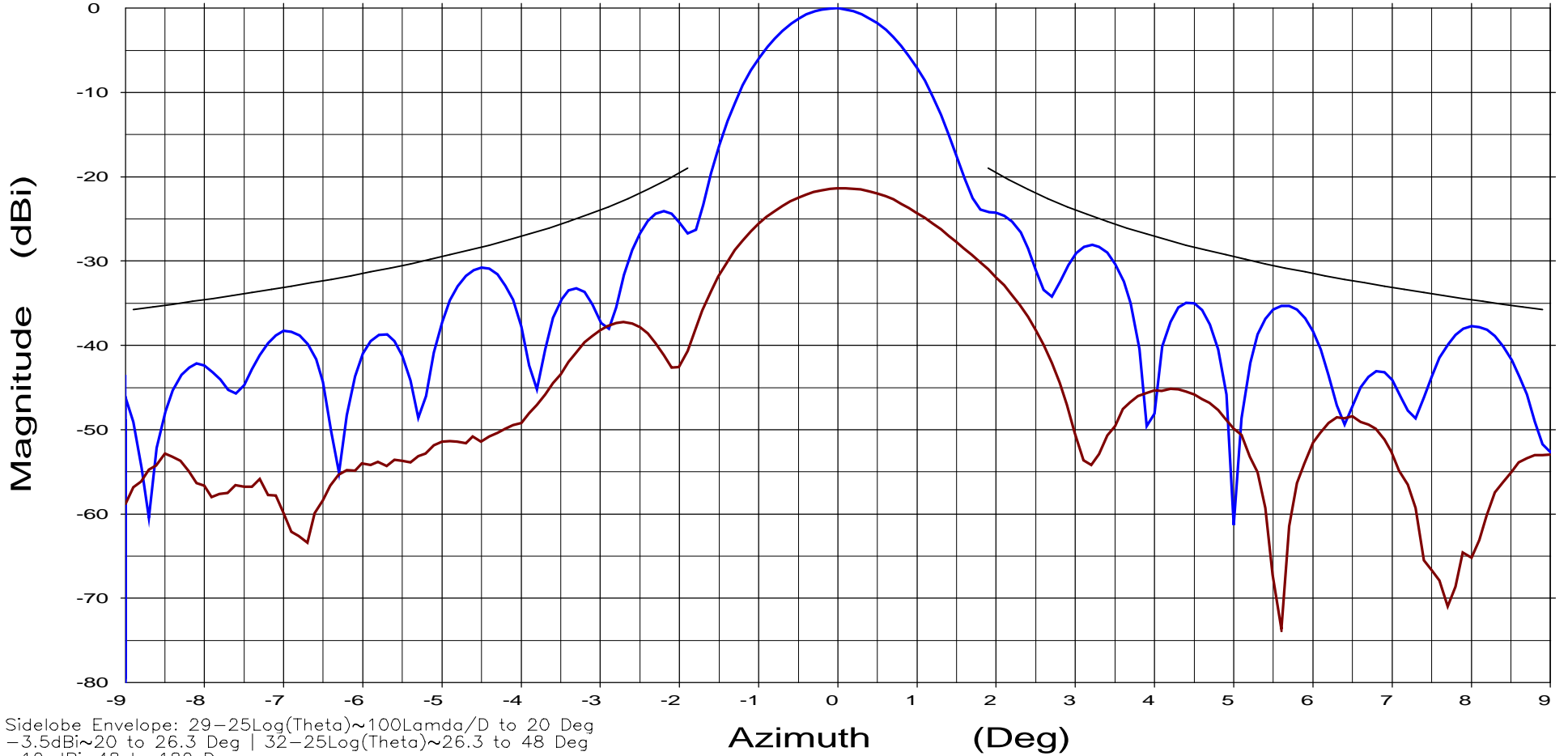
- Frequency : 5.850 GHz —
- Frequency : 6.138 GHz —
- Frequency : 6.425 GHz —

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 5.850 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

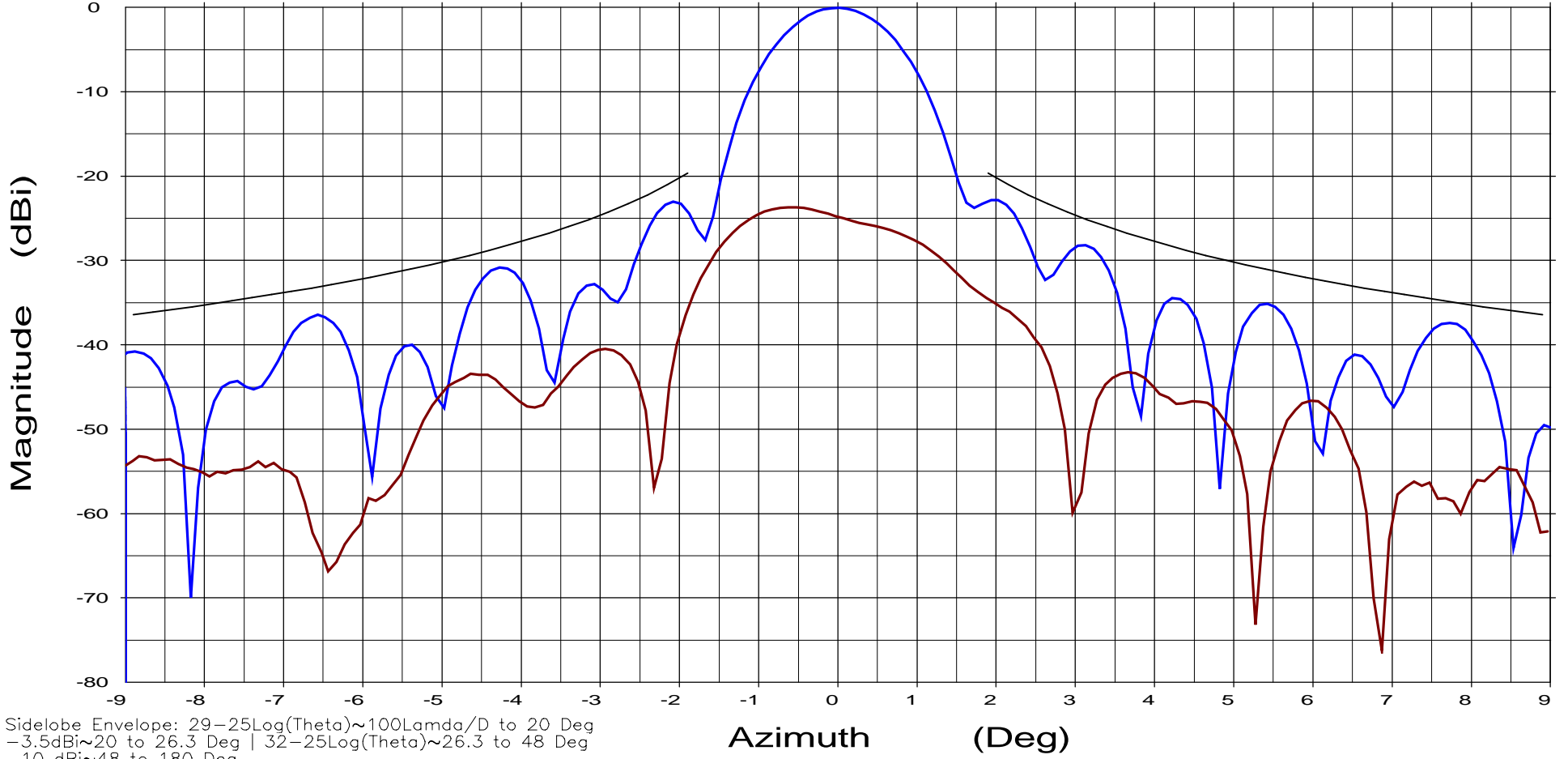
Overlays		Cal. file	units
1519-29.dat-ant_under_test	—	1519-29.dat	dBi
1519-31.dat-ant_under_test	—	1519-31.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.138 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-29.dat-ant_under_test	1519-29.dat	dBi
1519-31.dat-ant_under_test	1519-31.dat	dBi

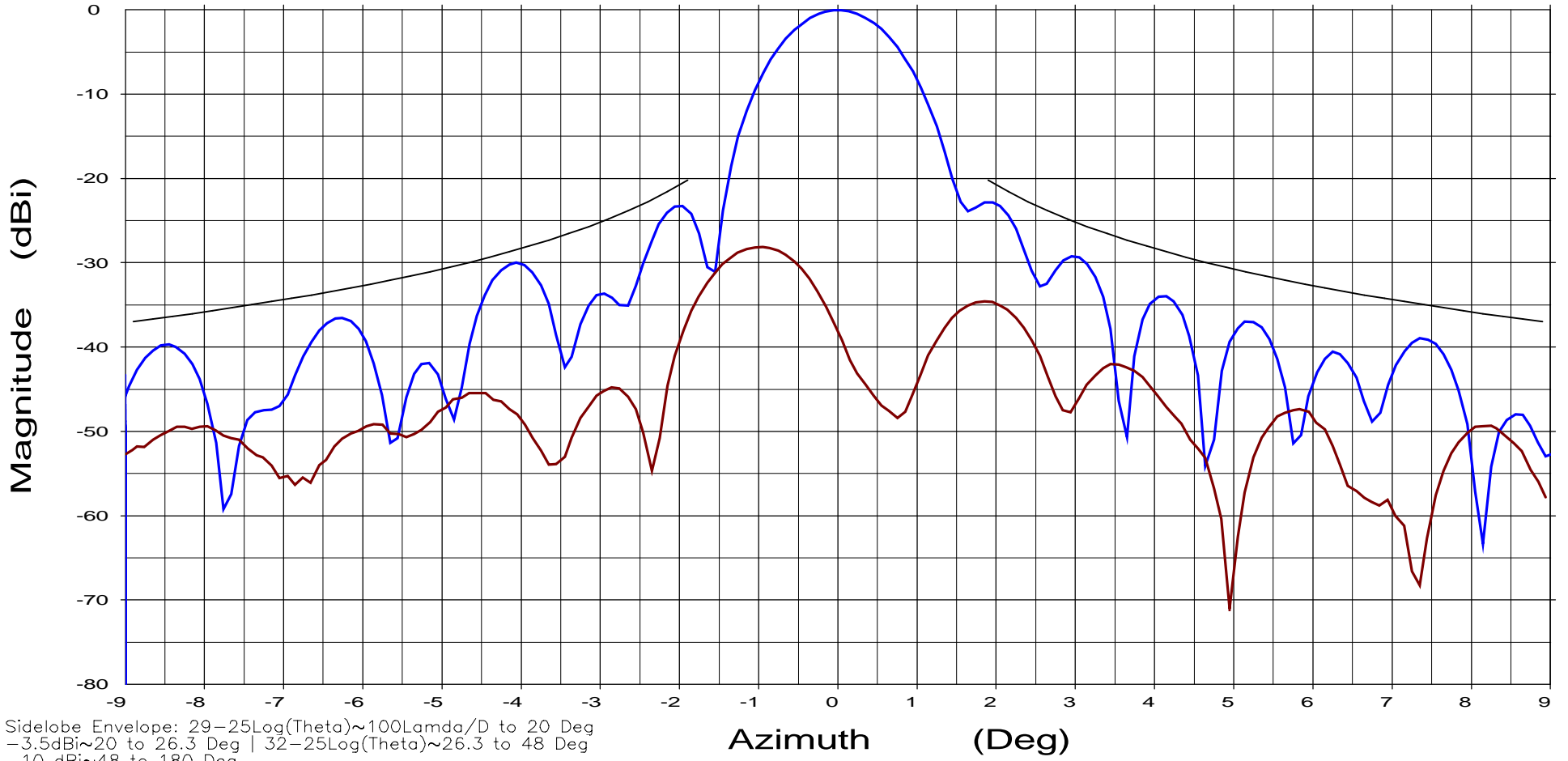


Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.425 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

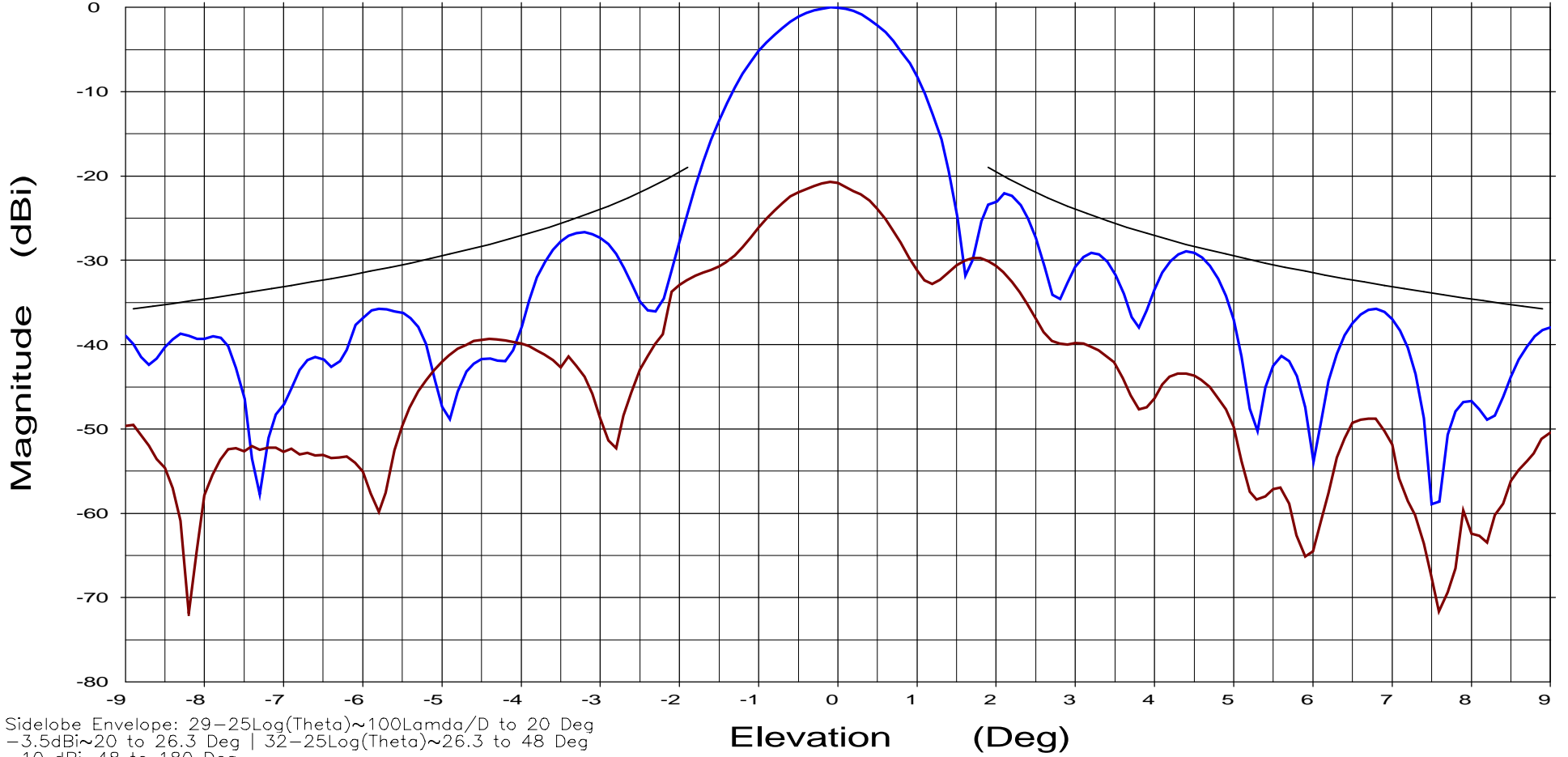
Overlays	Cal. file	units
1519-29.dat-ant_under_test	1519-29.dat	dBi
1519-31.dat-ant_under_test	1519-31.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 5.850 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-30.dat-ant_under_test	1519-30.dat	dBi
1519-32.dat-ant_under_test	1519-32.dat	dBi

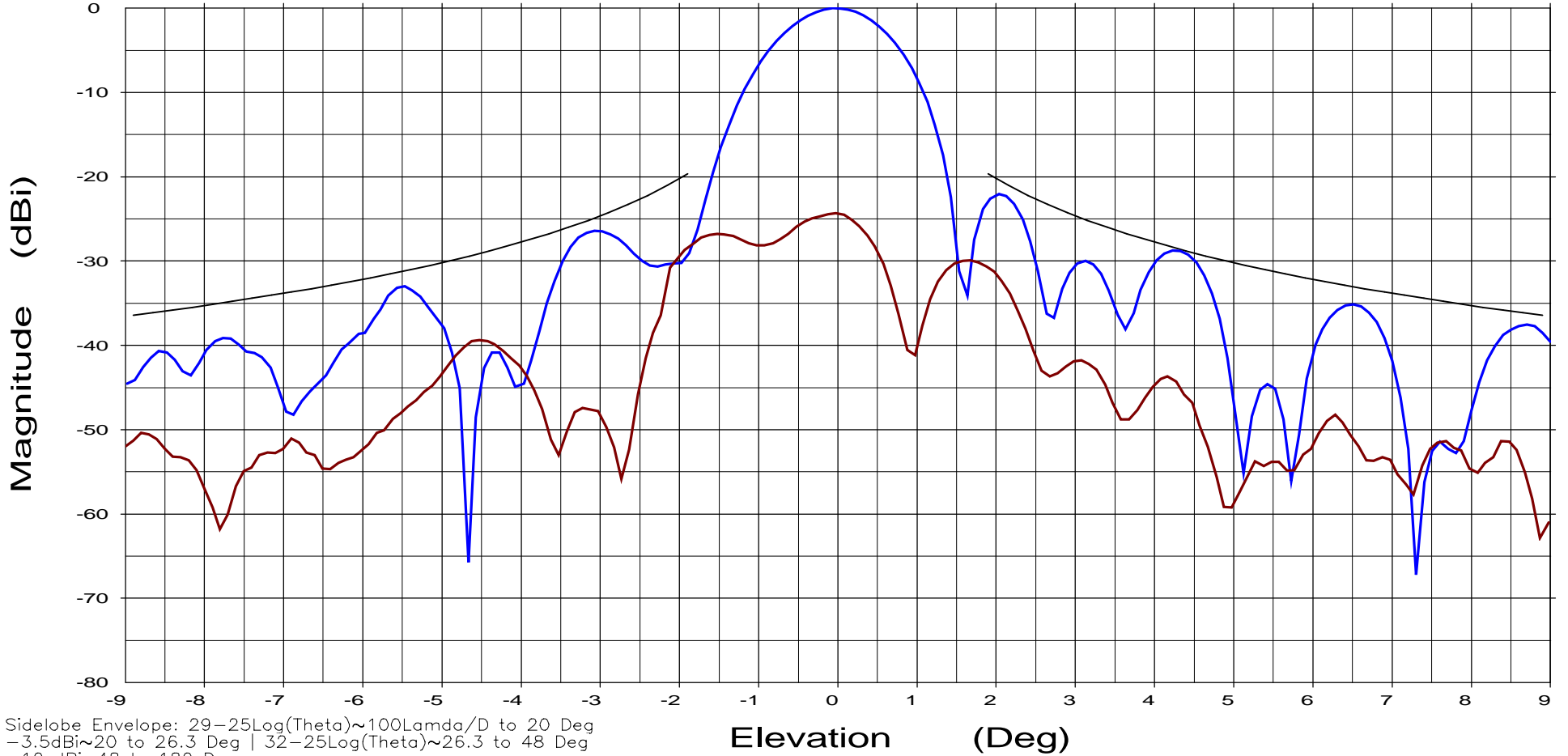
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.138 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP

Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-30.dat-ant_under_test	1519-30.dat	dBi
1519-32.dat-ant_under_test	1519-32.dat	dBi

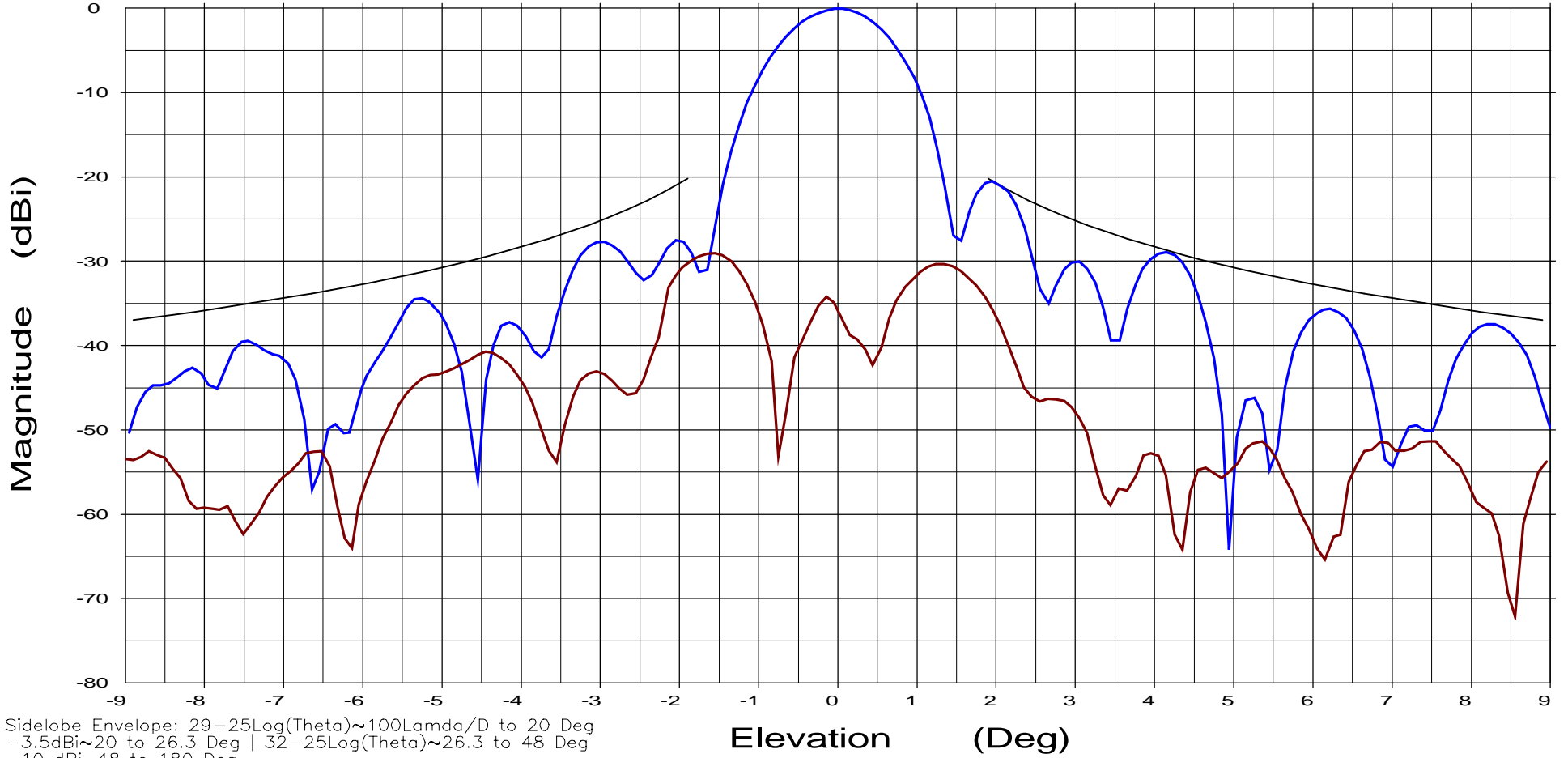
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 6.425 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP

Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-30.dat-ant_under_test	1519-30.dat	dBi
1519-32.dat-ant_under_test	1519-32.dat	dBi

File: 1519-29.dat

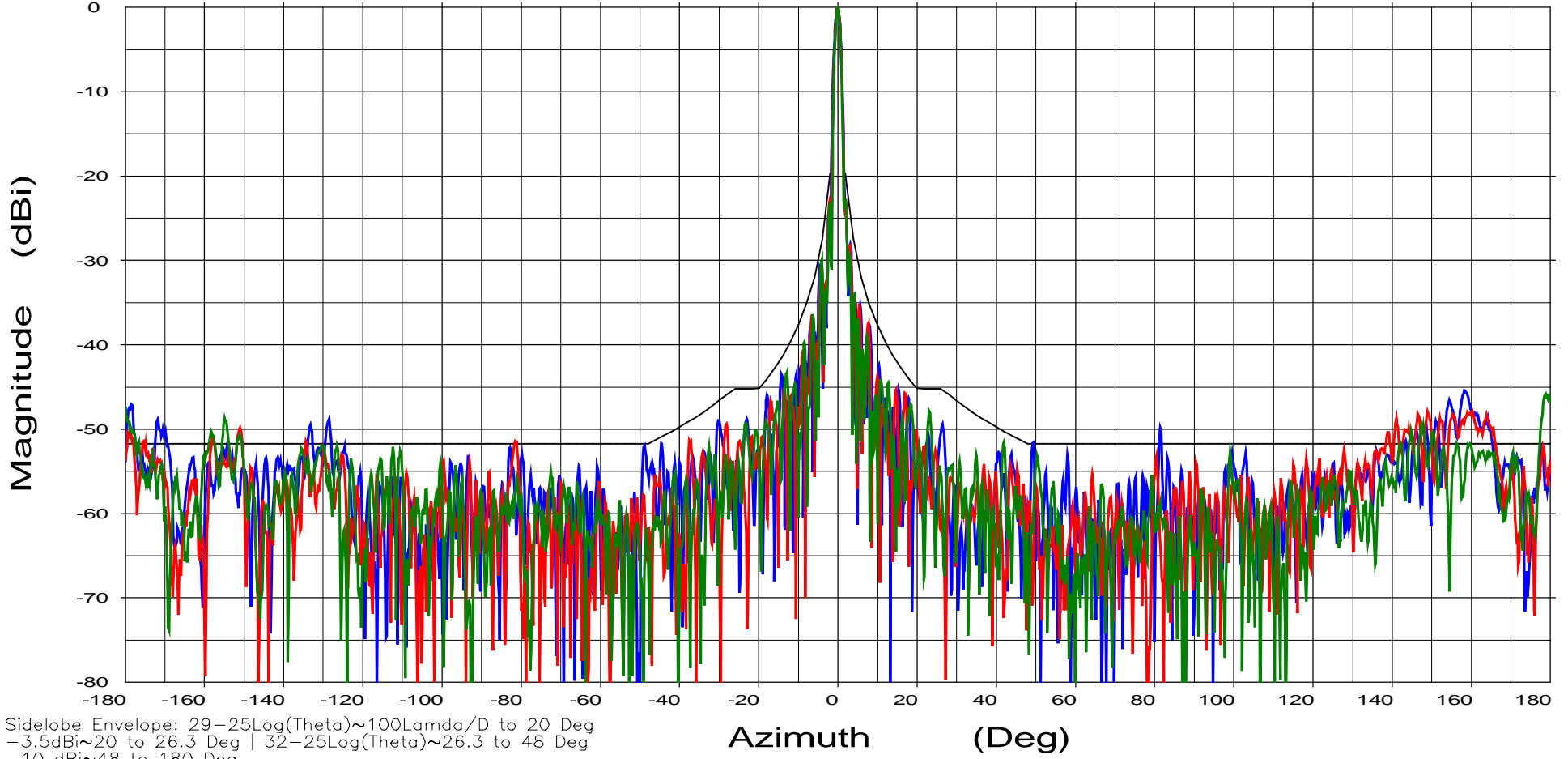
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

Calibration status:  
File: 1519-29.dat  
Chan.: nch1  
Table: Reference  
Units: dBi

Frequency : See Legend

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

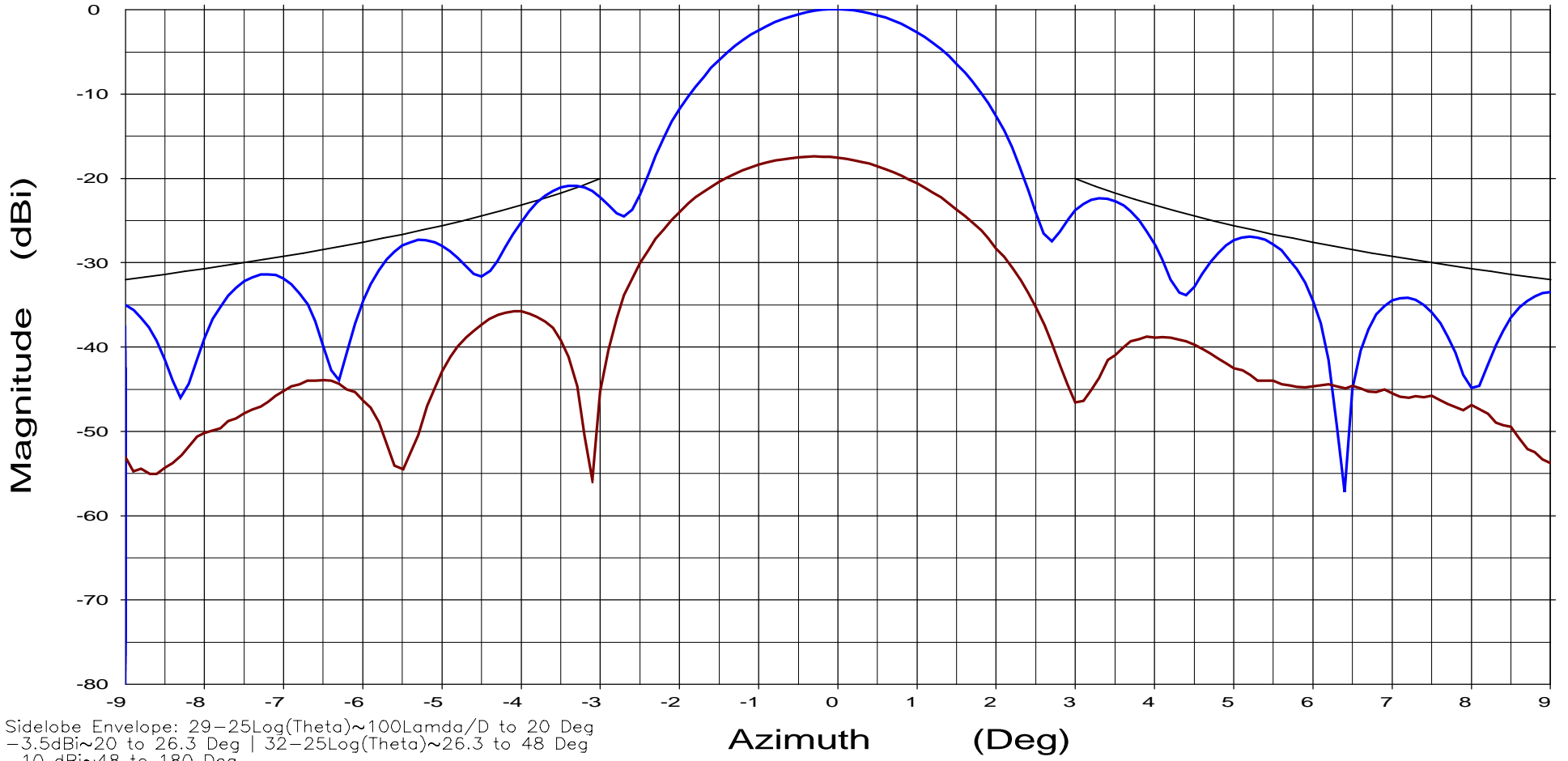
Overlays  
Frequency : 5.850 GHz — blue line  
Frequency : 6.138 GHz — red line  
Frequency : 6.425 GHz — green line

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.625 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

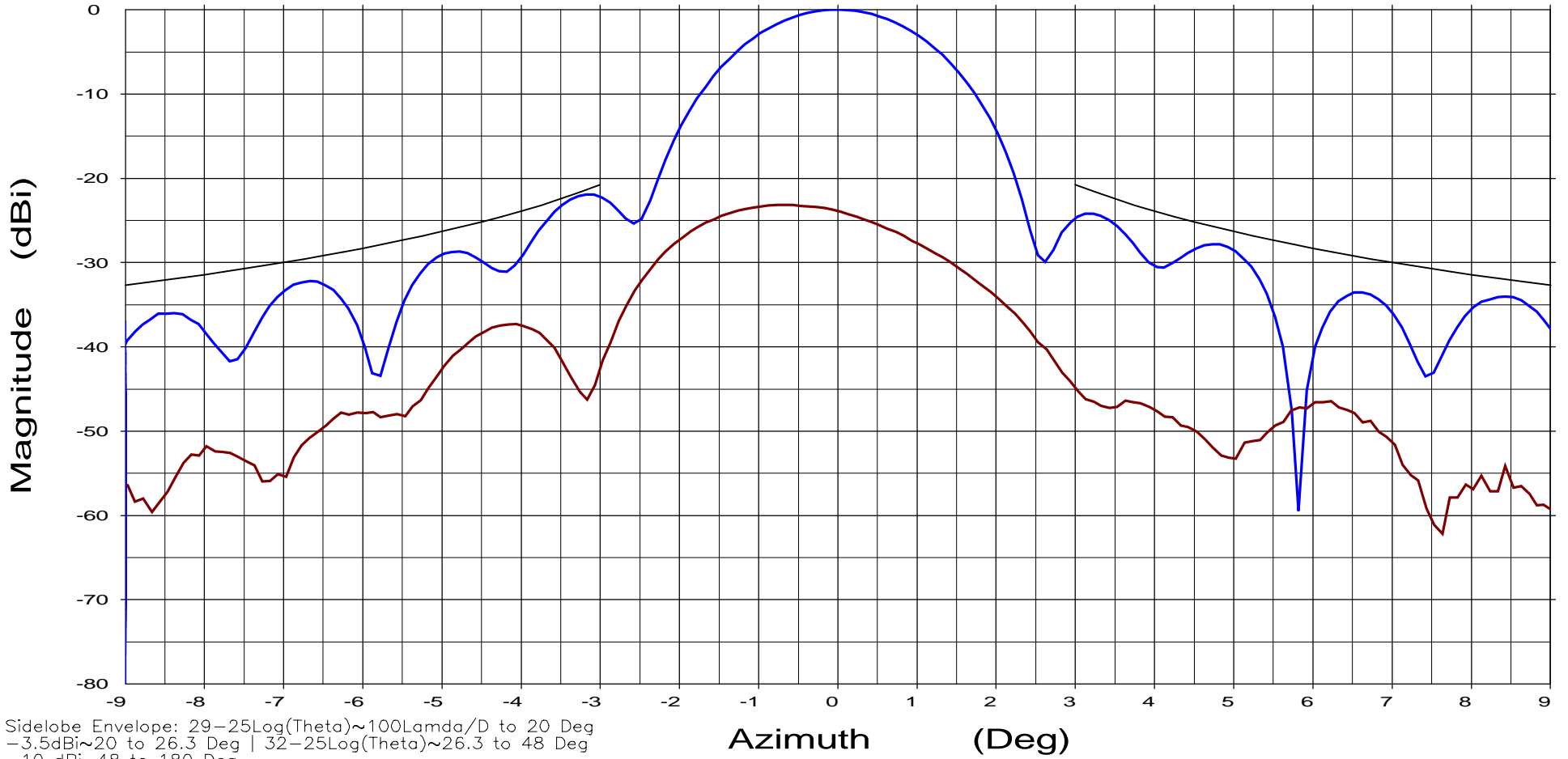
Overlays	Cal. file	units
1519-34.dat-ant_under_test	1519-34.dat	dBi
1519-36.dat-ant_under_test	1519-36.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-34.dat-ant_under_test	1519-34.dat	dBi
1519-36.dat-ant_under_test	1519-36.dat	dBi

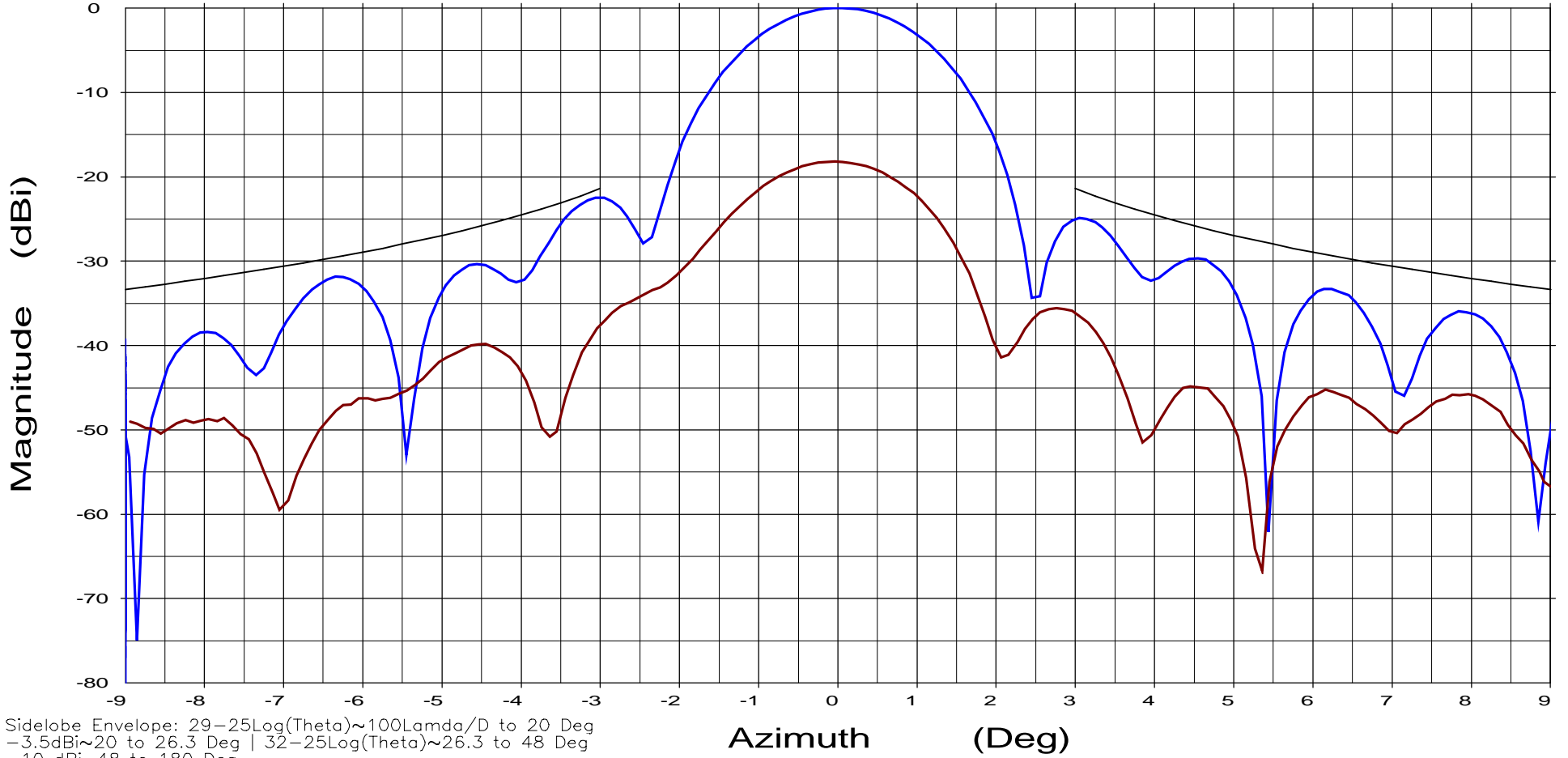
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 4.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-34.dat-ant_under_test	1519-34.dat	dBi
1519-36.dat-ant_under_test	1519-36.dat	dBi

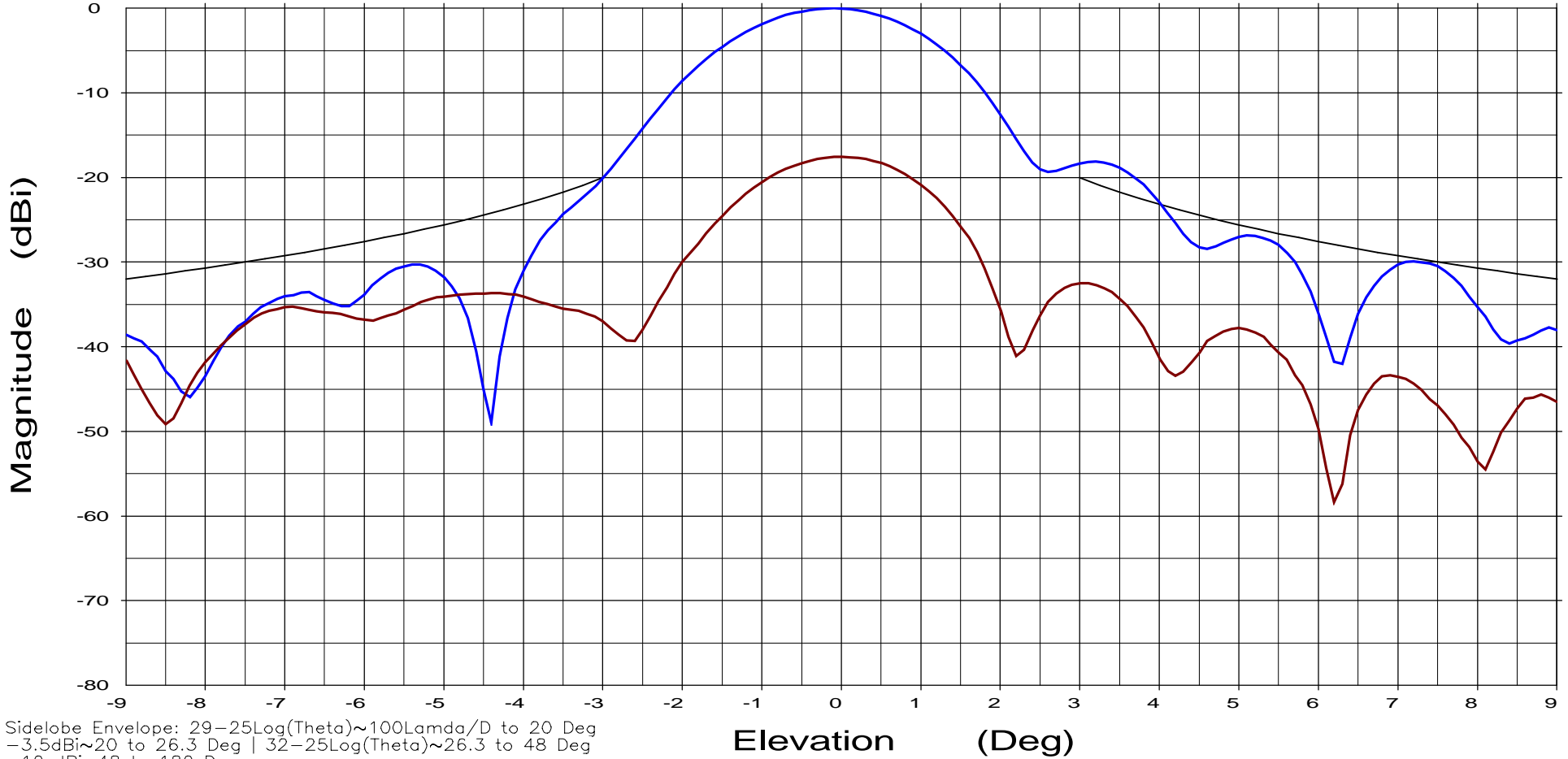


Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.625 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays	Cal. file	units
1519-35.dat-ant_under_test	1519-35.dat	dBi
1519-37.dat-ant_under_test	1519-37.dat	dBi

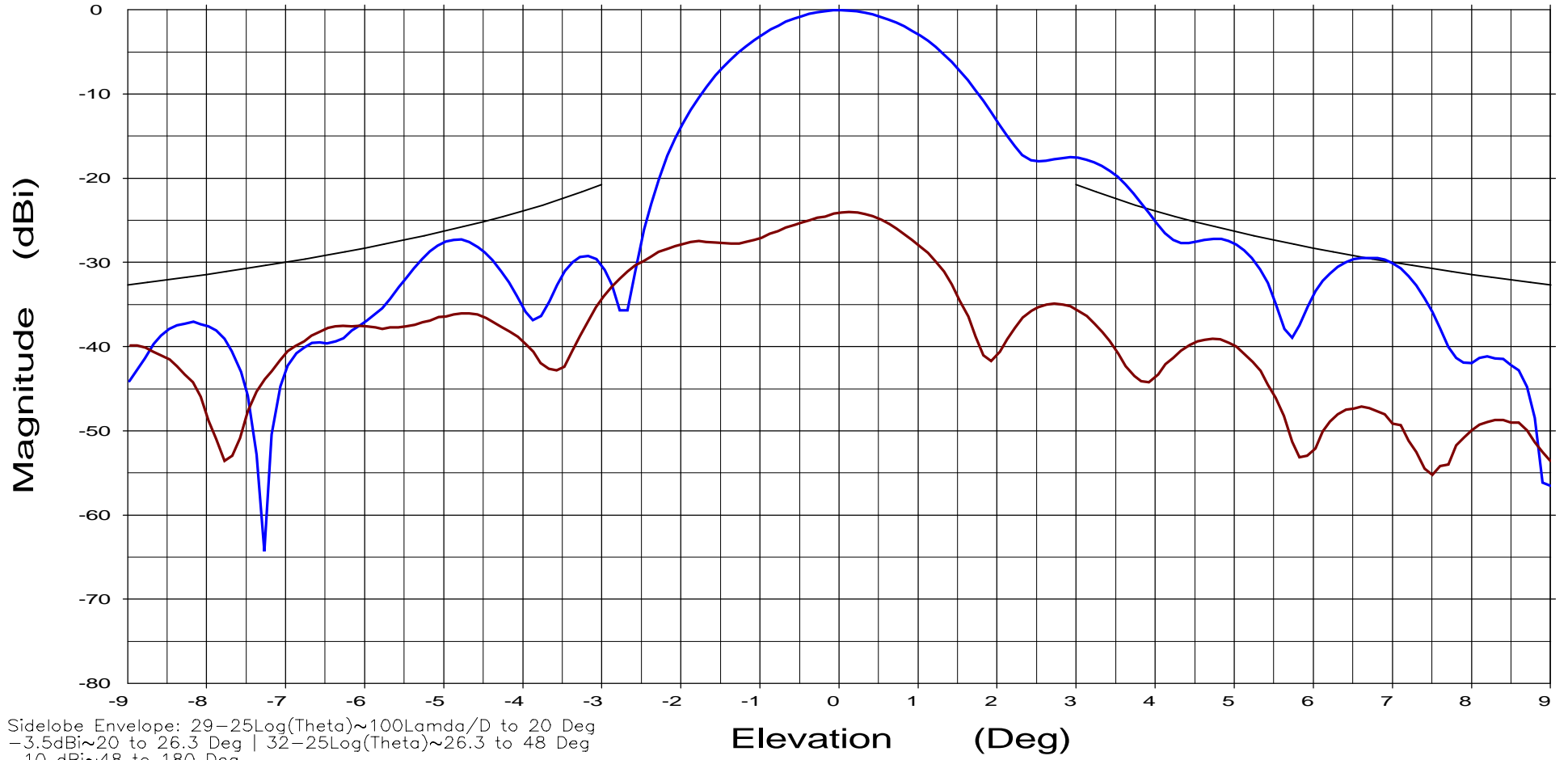
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

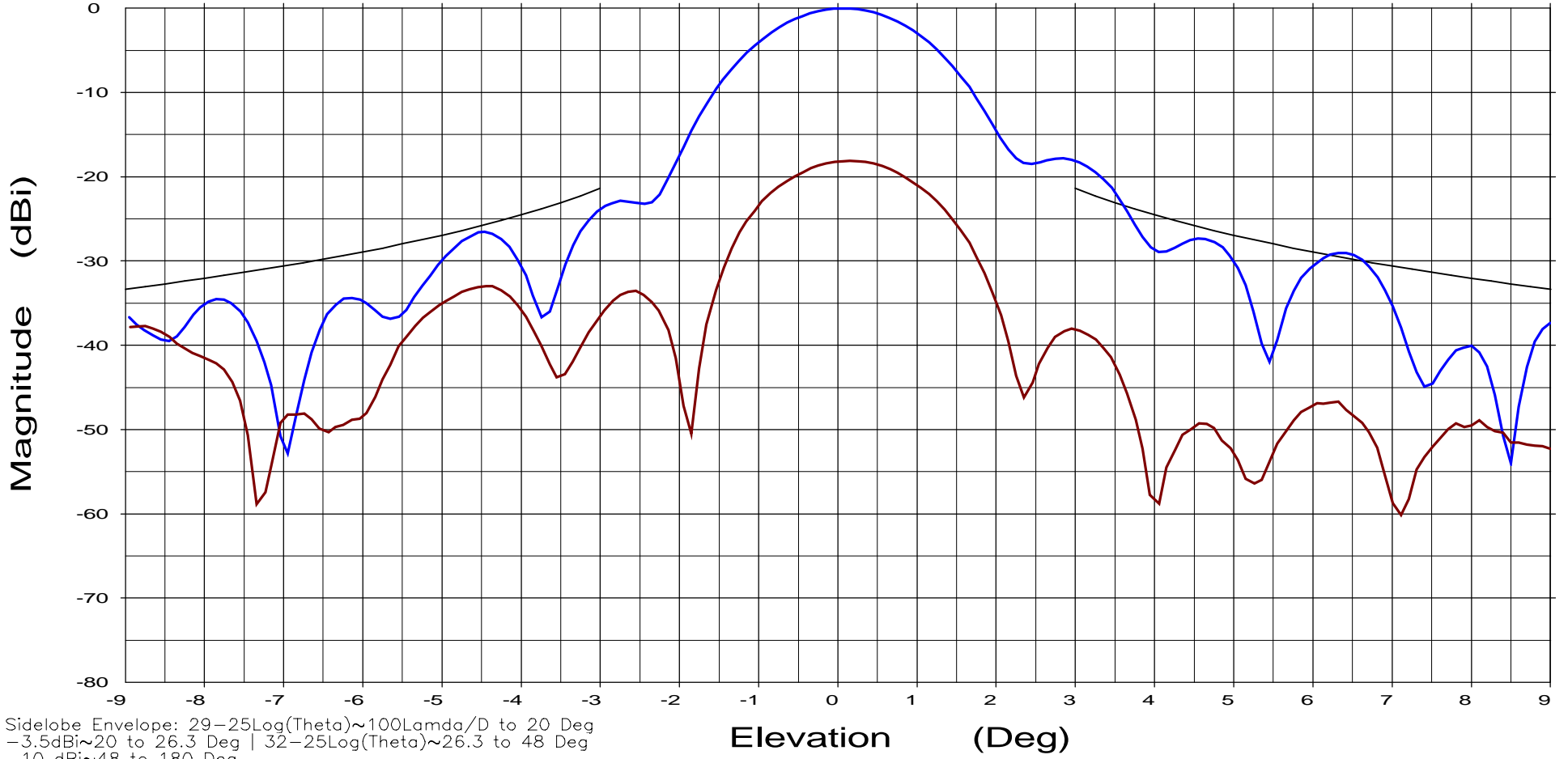
Overlays		Cal. file	units
1519-35.dat-ant_under_test	—	1519-35.dat	dBi
1519-37.dat-ant_under_test	—	1519-37.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 4.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: LHCP Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-35.dat-ant_under_test	1519-35.dat	dBi
1519-37.dat-ant_under_test	1519-37.dat	dBi

File: 1519-34.dat

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan. nch1

Calibration status:  
File: 1519-34.dat  
Chan.: nch1  
Table: Reference  
Units: dBi

Frequency : See Legend

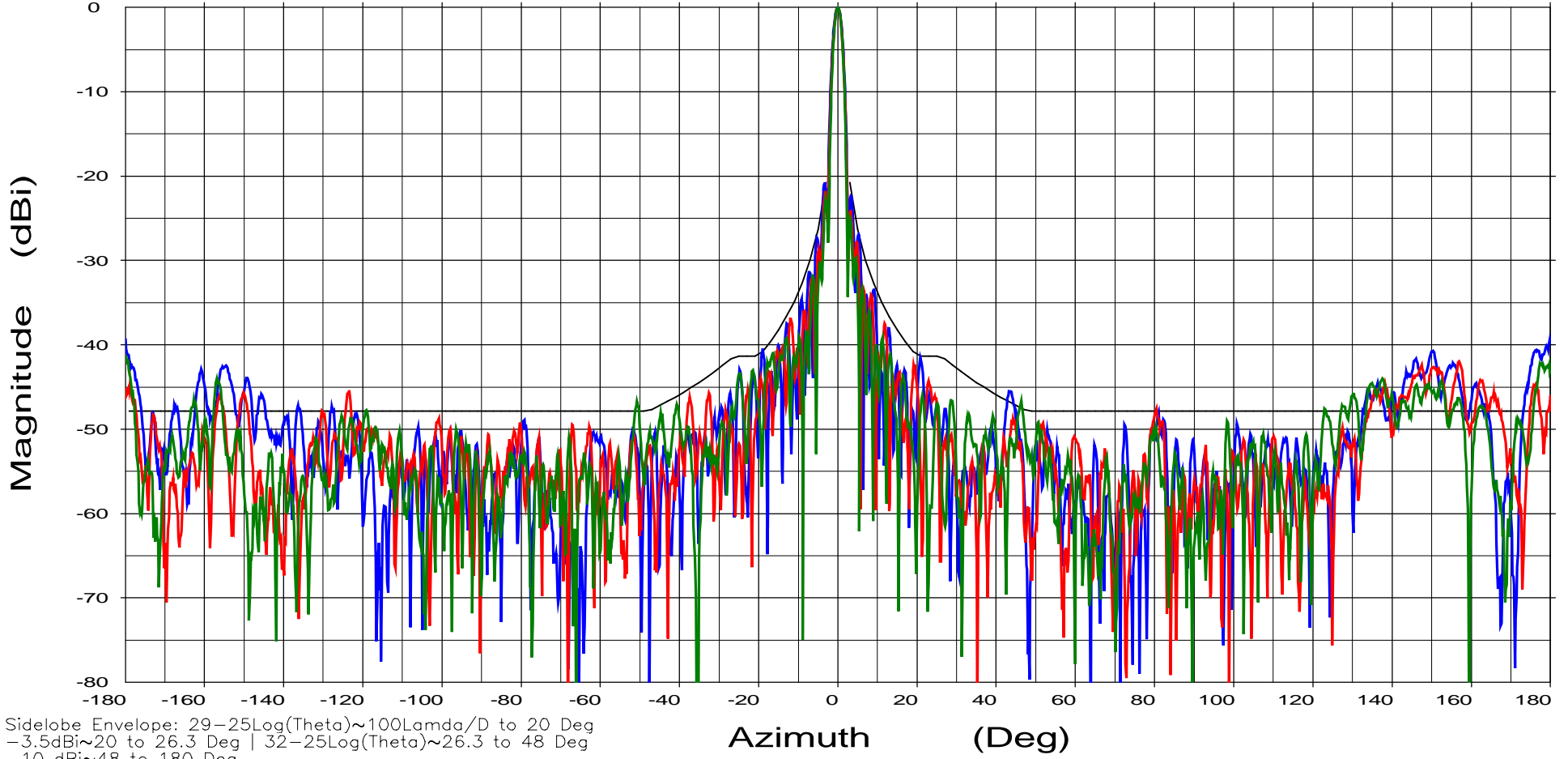
Operator: Dwight B. Lutz

Ser. no.: Sys #3

Channel: ch1

Tx pol: LHCP

Rx pol: LHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays

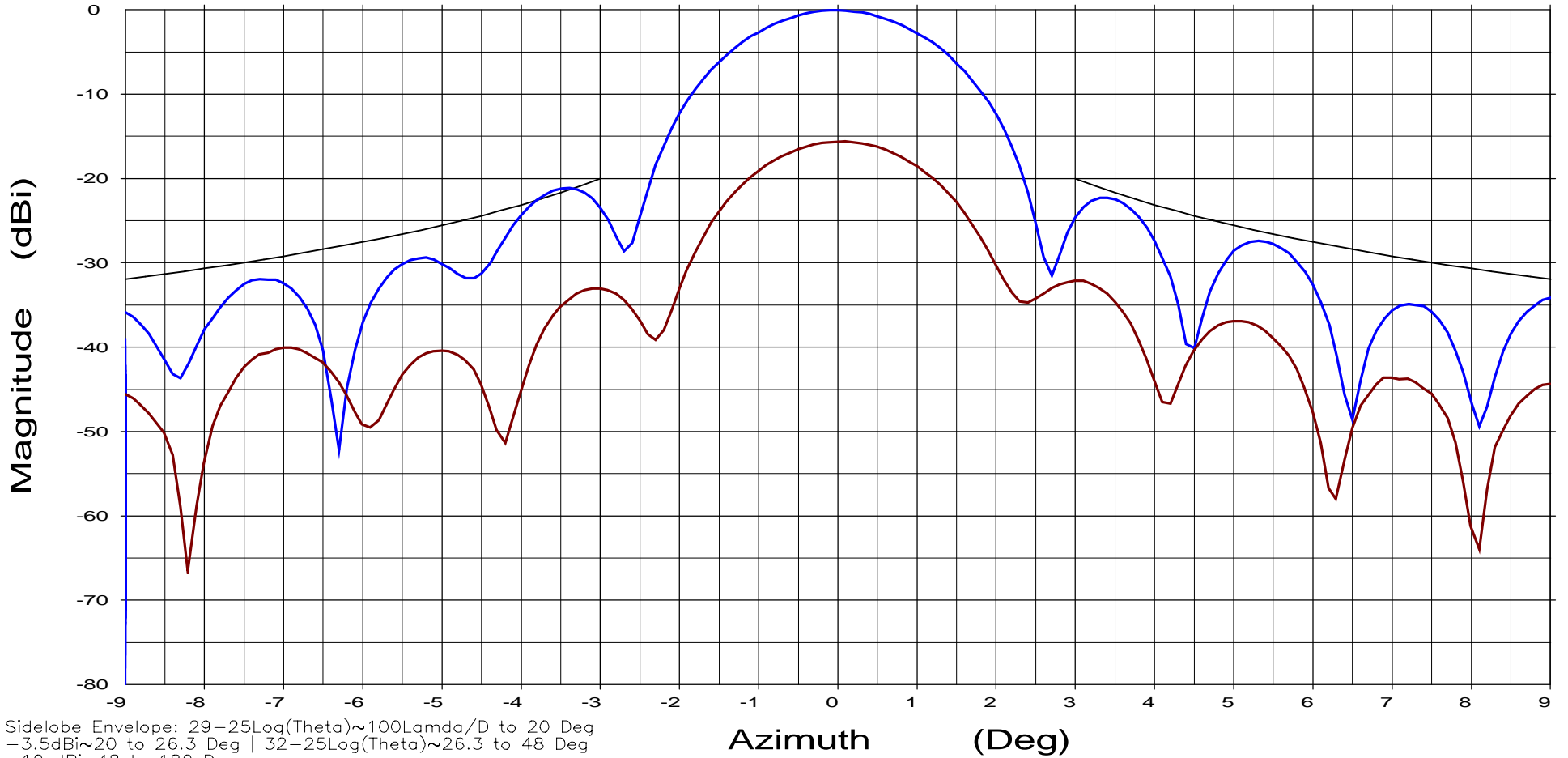
- Frequency : 3.625 GHz (blue line)
- Frequency : 3.950 GHz (red line)
- Frequency : 4.200 GHz (green line)

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.625 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

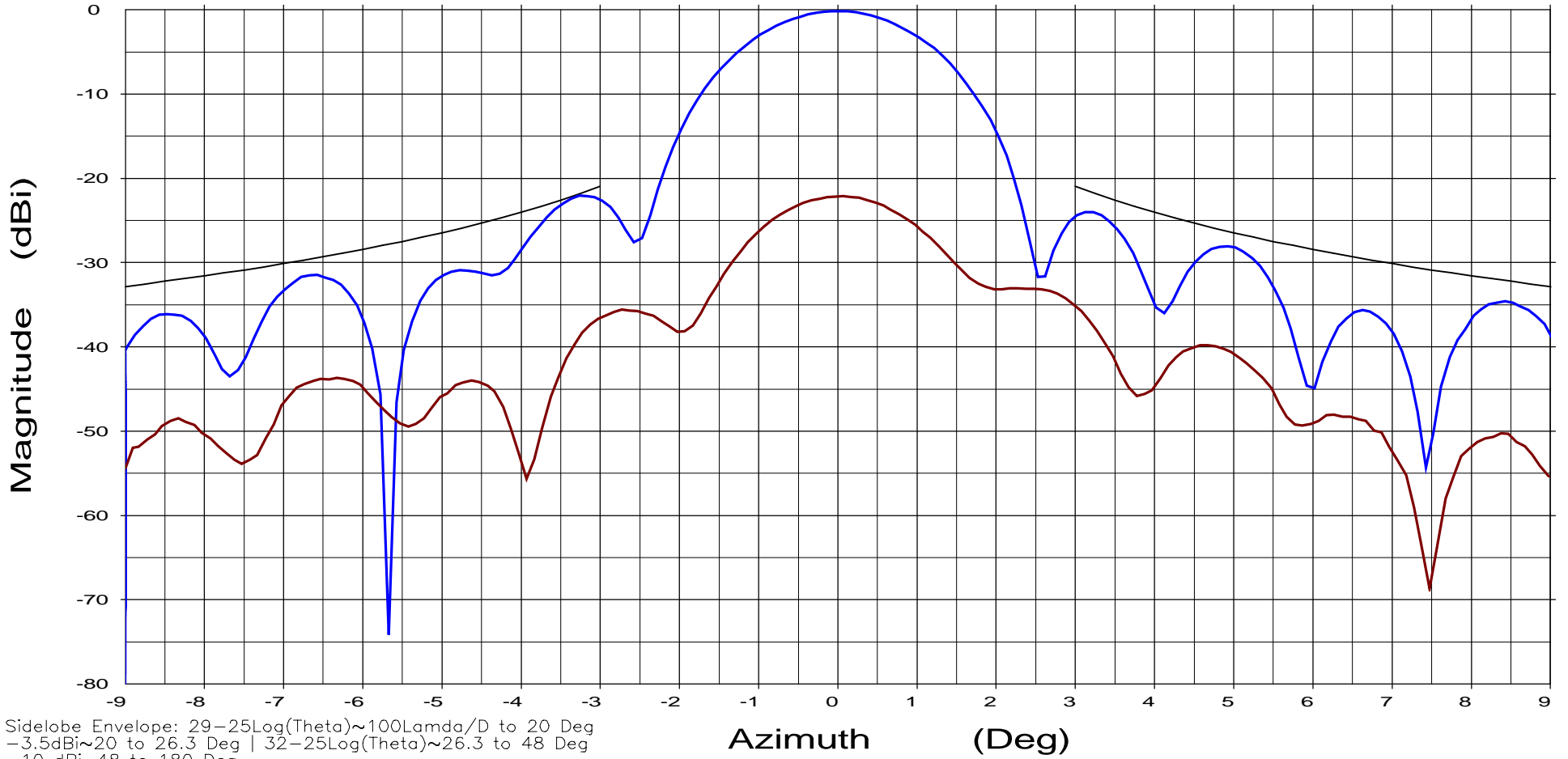
Overlays	Cal. file	units
1519-38.dat-ant_under_test	1519-38.dat	dBi
1519-40.dat-ant_under_test	1519-40.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

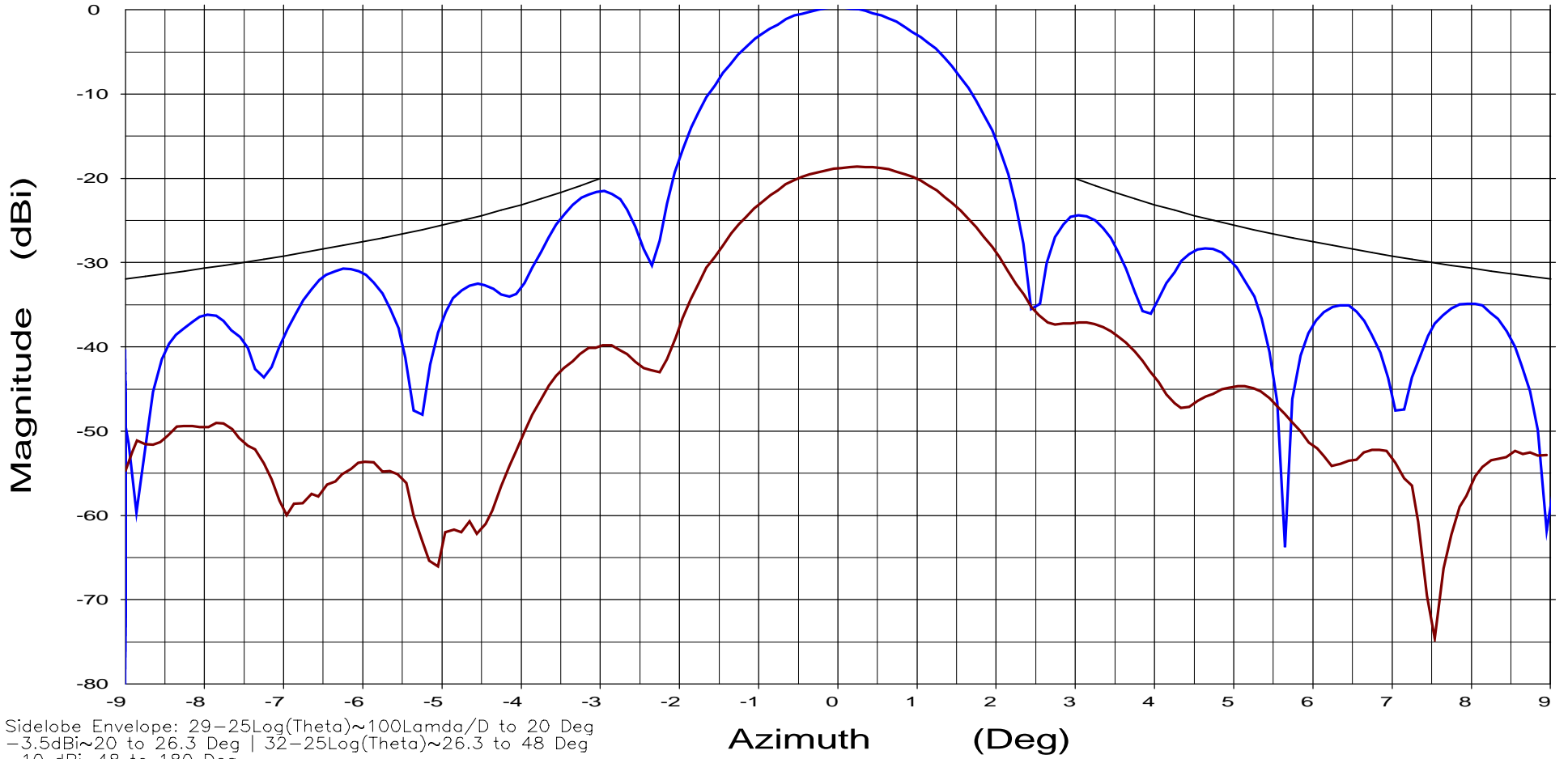
Overlays	Cal. file	units
1519-38.dat-ant_under_test	1519-38.dat	dBi
1519-40.dat-ant_under_test	1519-40.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 4.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

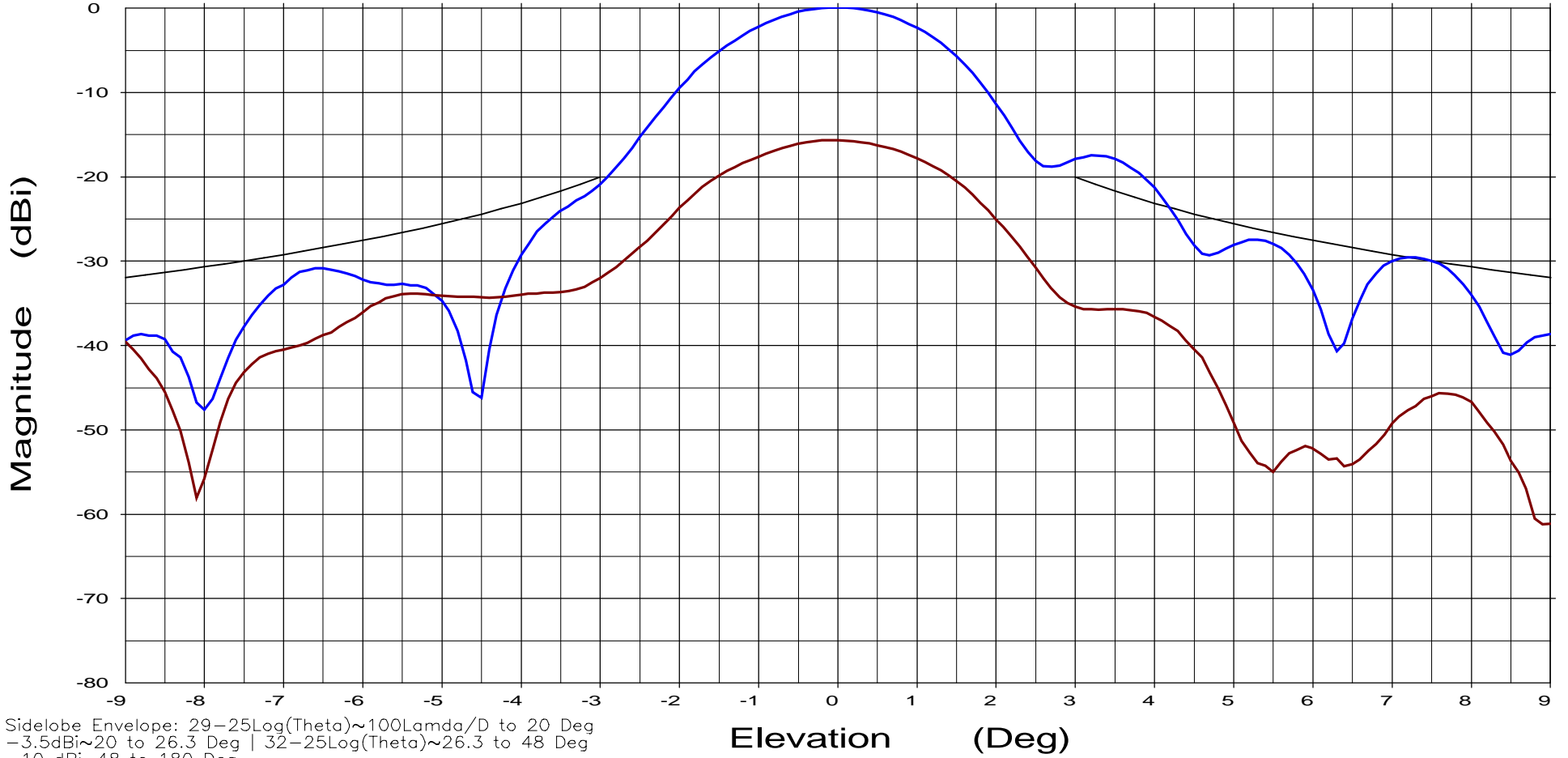
Overlays	Cal. file	units
1519-38.dat-ant_under_test	1519-38.dat	dBi
1519-40.dat-ant_under_test	1519-40.dat	dBi

Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.625 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays		Cal. file	units
1519-39.dat-ant_under_test	—	1519-39.dat	dBi
1519-41.dat-ant_under_test	—	1519-41.dat	dBi

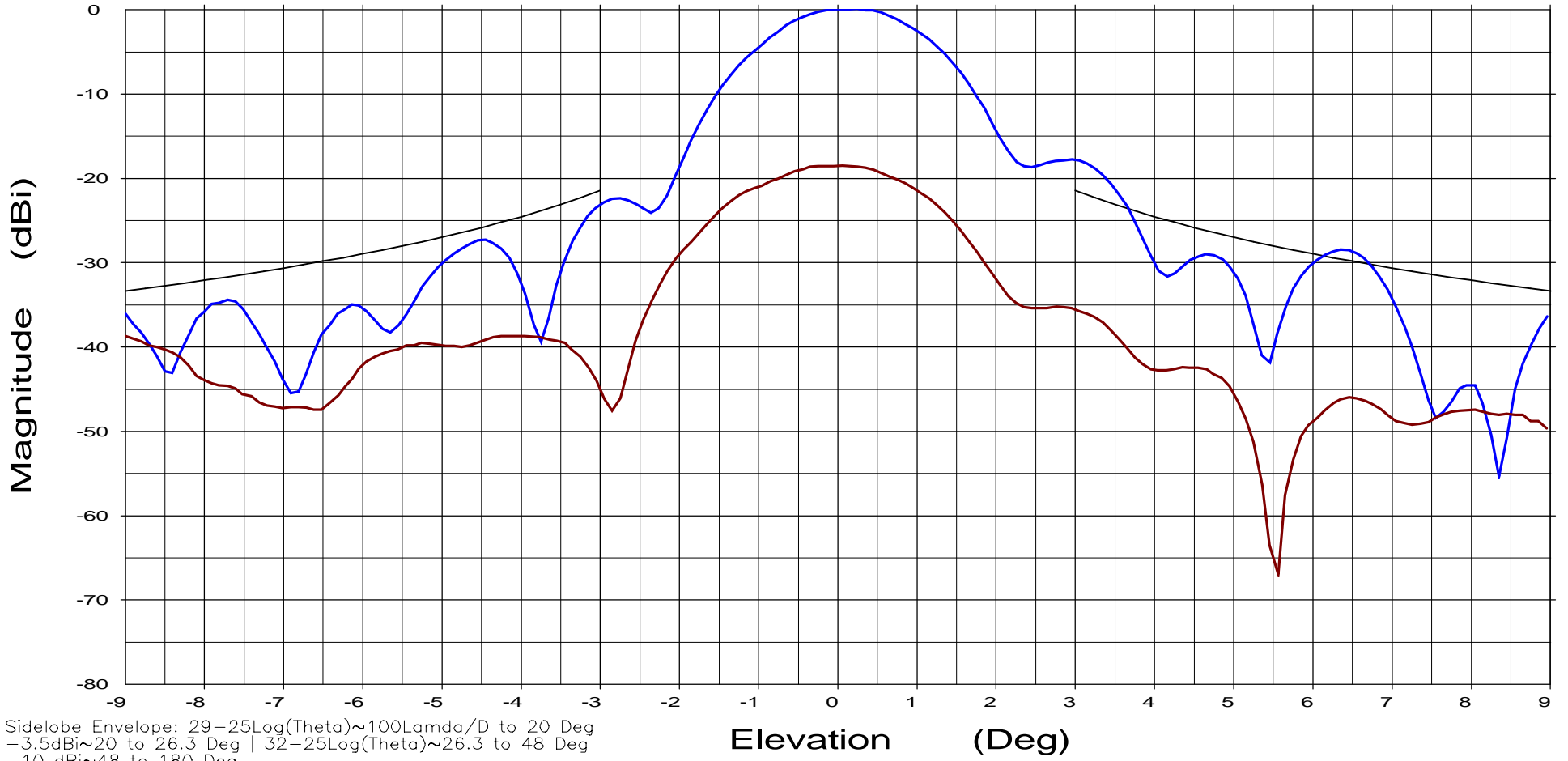


Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 4.200 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays		Cal. file	units
1519-39.dat-ant_under_test	—	1519-39.dat	dBi
1519-41.dat-ant_under_test	—	1519-41.dat	dBi

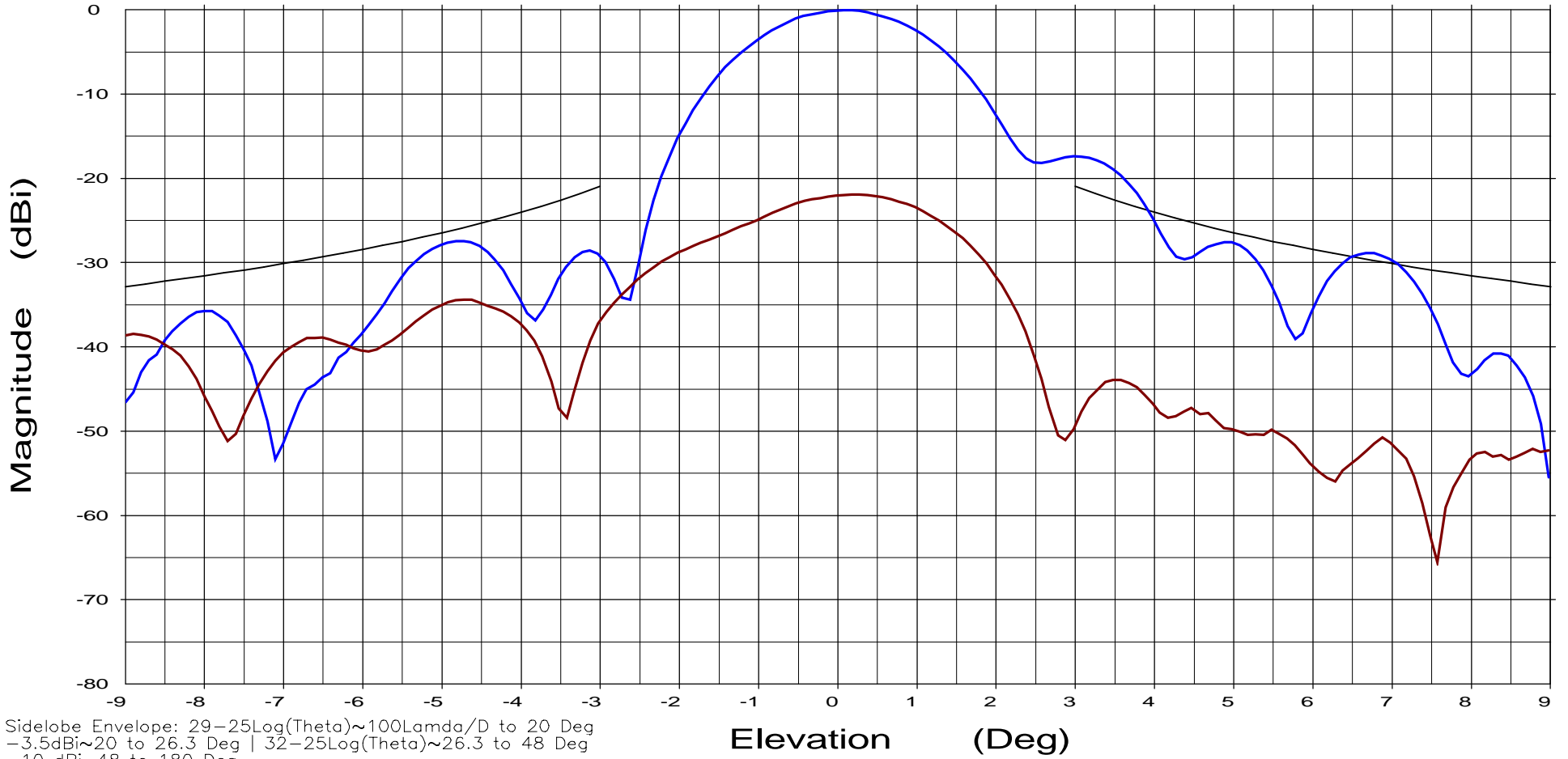
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Restoration

Frequency : 3.950 GHz

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP

Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
 $-3.5 \text{ dBi} \sim 20$  to  $26.3$  Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
 $-10 \text{ dBi} \sim 48$  to 180 Deg

Overlays	Cal. file	units
1519-39.dat-ant_under_test	1519-39.dat	dBi
1519-41.dat-ant_under_test	1519-41.dat	dBi

File: 1519-38.dat

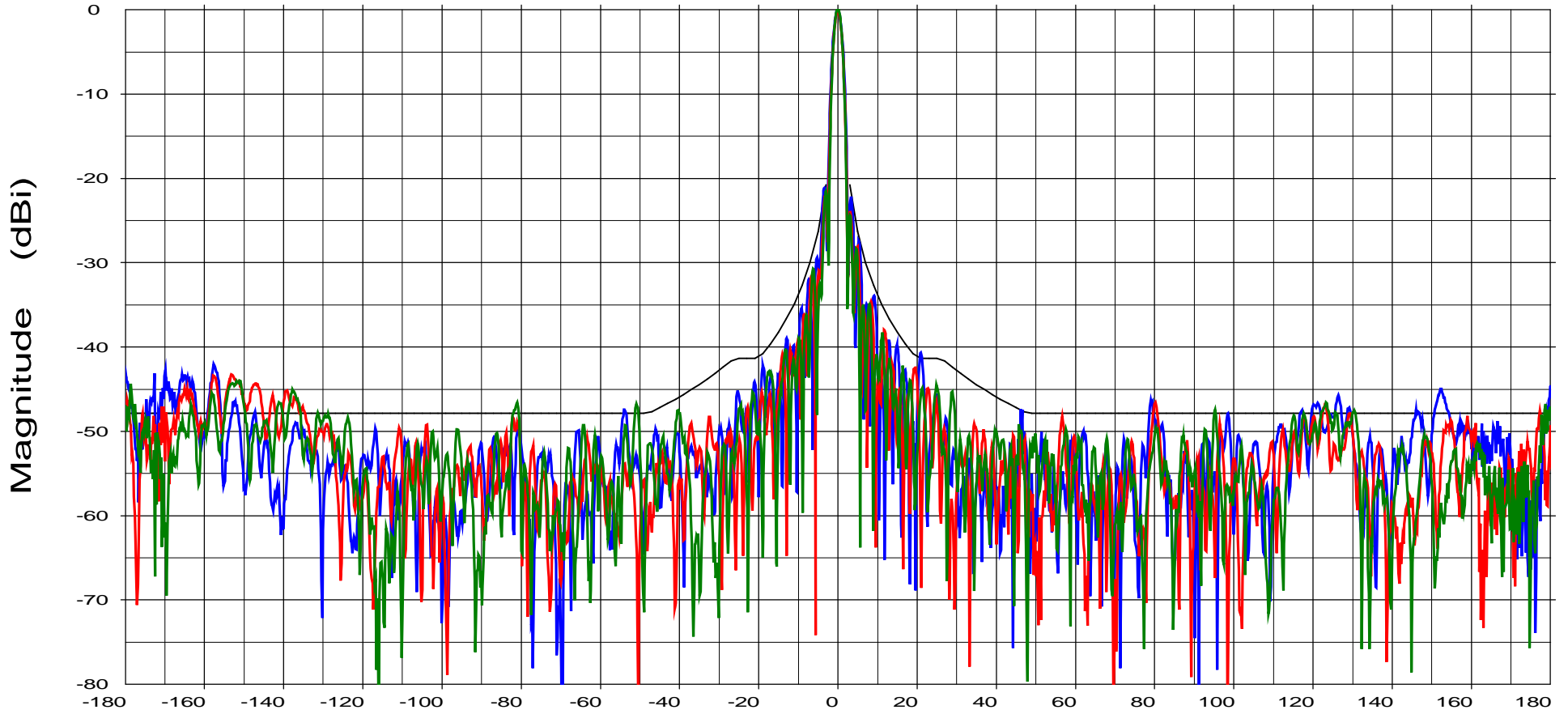
Prodelin Corporation - Series 1259-800  
2.4M Quick Deploy Tri-Band Antenna System  
Electrical Verification Testing Following Mechanical Re:Chan.anch1

Calibration status:  
File: 1519-38.dat  
Table: Reference  
Units: dBi

Frequency : See Legend

Operator: Dwight B. Lutz  
Ser. no.: Sys #3  
Channel: ch1

Tx pol: RHCP Rx pol: RHCP



Sidelobe Envelope:  $29 - 25 \log(\theta) \sim 100 \lambda / D$  to 20 Deg  
-3.5 dBi ~ 20 to 26.3 Deg |  $32 - 25 \log(\theta) \sim 26.3$  to 48 Deg  
-10 dBi ~ 48 to 180 Deg

Overlays  
Frequency : 3.625 GHz — blue line  
Frequency : 3.950 GHz — red line  
Frequency : 4.200 GHz — green line

### **3.0 G/T Noise Temperature Measurement and test setup**

Antenna noise temperature was measured based on System Power Test Method recommended by Intelsat document SSOG 210 Section 5.

The noise temperature formula is defined as:

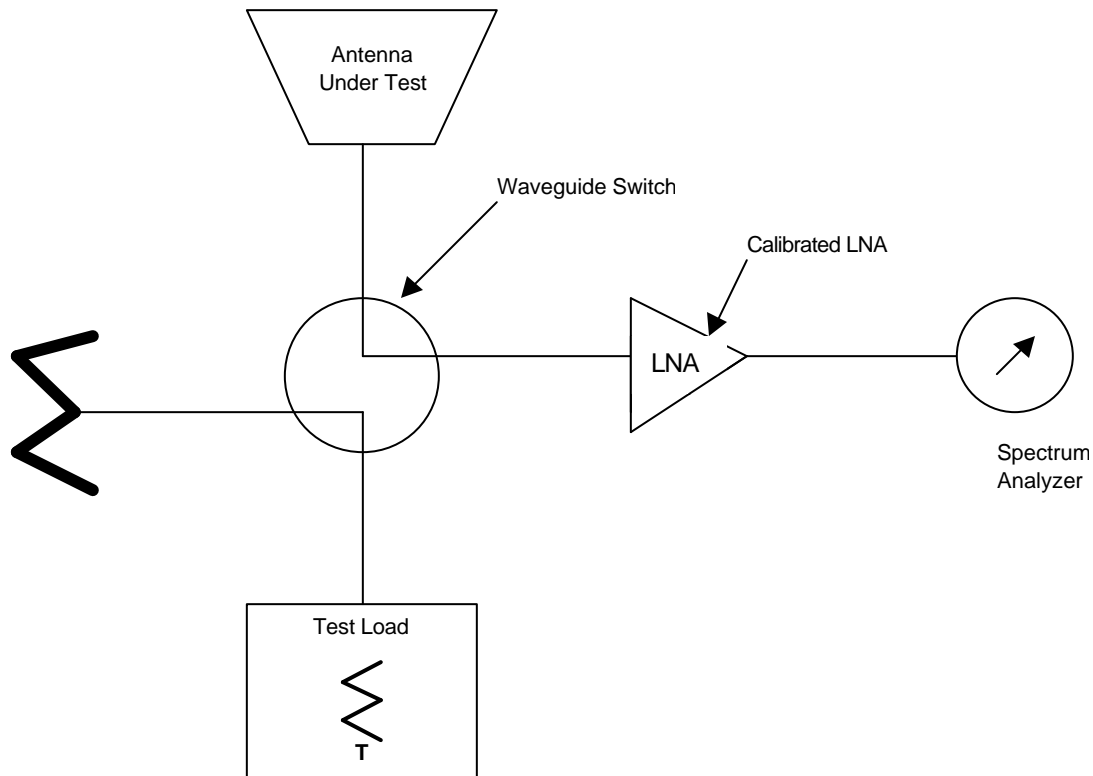
$$T(\text{system}) \text{ dB} = 10\log [T(\text{test load}) (K) + T(\text{LNA}) (K)] - Y(\text{dB})$$

Where,

T(system) is the system noise temperature indB

T(Test Load) is given noise temperature of the matched load used in the measurement

T(LNA) = is the calibrated LNA noise temperature



- Test Equipment Arrangement for Receive System Noise Power Measurement

### **3.1 Summary of Test Results**

## 3.2 Ku-Band

## ANTENNA G/T TEST RESULTS

Test No 1519		Elevation Angle (Degrees)	30	<b>GENERAL DYNAMICS</b> C4 Systems	
Date of Test 25 Apr 06		Weather Conditions (Downlink)	Clear Sky 42% Relative Humidity*		
Earth Station under test	Series 1249-800 2.4m QD Tri-Band	Polarization (Downlink)	Vertical	Ambient Temperature (degrees Celsius)	29
Frequency (GHz)	Antenna Gain (dB)	T load (K)	T LNA (K)	T system (K)	Y (dB)
10.95	46.88	302.00	75.62	142.91	-4.22
11.95	47.63	302.00	72.60	139.50	-4.29
12.75	48.07	302.00	75.14	138.20	-4.36

## ANTENNA NOISE TEMPERATURE SUMMARY

Frequency (GHz)	Antenna Gain (dB)	System Noise Temperature (K)	Antenna Noise Temperature (K)	G/T (dB/K)
10.95	46.88	142.91	<b>67.29</b>	<b>25.33</b>
11.95	47.63	139.50	<b>66.90</b>	<b>26.18</b>
12.75	48.07	138.20	<b>63.06</b>	<b>26.66</b>

Calibrated Test LNA: Maxtech LKE -12080 S/N C714602

\*Reported at IJP regional airport



### 3.3 C-Band

## ANTENNA G/T TEST RESULTS

Test No 1519		Elevation Angle (Degrees)	30	<b>GENERAL DYNAMICS</b> C4 Systems	
Date of Test 25 Apr 06		Weather Conditions (Downlink)	Clear Sky 42% Relative Humidity*		
Earth Station under test	Series 1249-800 2.4m QD Tri-Band	Polarization (Downlink)	LHCP	Ambient Temperature (degrees Celsius)	29
Frequency (GHz)	Antenna Gain (dB)	T load (K)	T LNA (K)	T system (K)	Y (dB)
3.625	37.14	302.00	27.90	83.25	-5.98
3.950	37.86	302.00	27.98	80.63	-6.12
4.200	38.49	302.00	29.51	82.70	-6.03

## ANTENNA NOISE TEMPERATURE SUMMARY

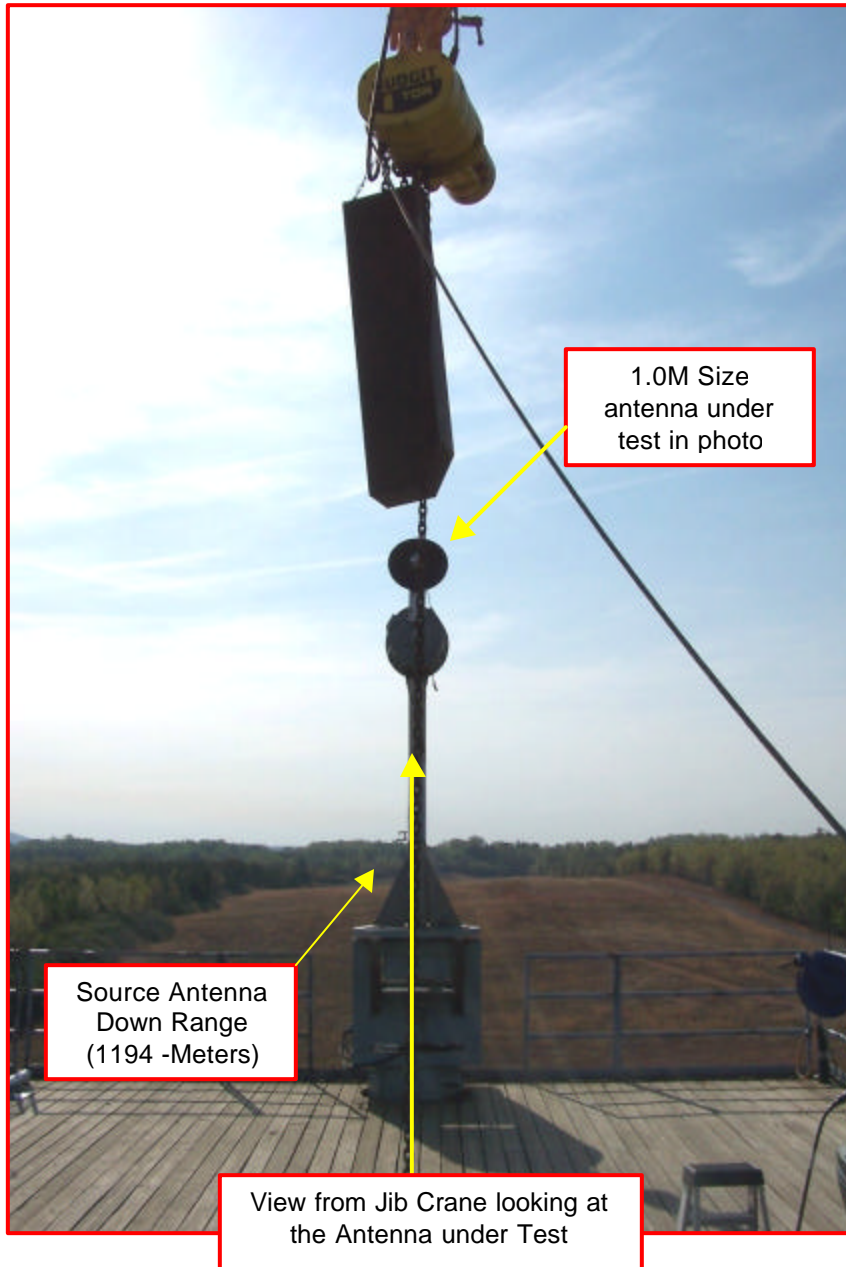
Frequency (GHz)	Antenna Gain (dB)	System Noise Temperature (K)	Antenna Noise Temperature (K)	G/T (dB/K)
3.63	37.14	83.25	<b>55.35</b>	<b>17.94</b>
3.95	37.86	80.63	<b>52.65</b>	<b>18.80</b>
4.20	38.49	82.70	<b>53.19</b>	<b>19.32</b>

Calibrated Test LNA: Maxtech LCD 4040.0002 S/N: C685101

\*Reported at IJP regional airport

#### 4.0 Statement on reflections in +/- 180-deg patterns

Photo diagram to show position of the jib-crane in relationship to antenna under test. This metal structure causes reflections visible in our test data when AUT is pointed +/- 165 to 180-degrees from the source antenna. The jib-crane is a permanent structure necessary to lift large antenna systems to the top of platform for testing.





Jib-Crane

Antenna Under Test

PRODELIN



## 5.0 Photo Documentation









