RETRACTABLE ANTENNA SPECIFICATION

(MRT-05300)

TX-170SA

⊙ Contents ⊙

1. Specification

1.1 Electrical Specification

Frequency Range	CELLULAR 824Mhz – 894 MHz GPS 1575 MHz US-PCS 1850MHz – 1990MHz	
V.S.W.R	CELLULAR CLOSE IN	< 3.0 : 1
	CELLULAR CLOSE OUT	< 2.0 : 1
	CELLULAR OPEN IN	< 2.8 : 1
	CELLULAR OPEN OUT	< 2.5 : 1
	GPS CLOSE IN	< 3.0 : 1
	GPS CLOSE OUT	< 6.7 : 1
	GPS OPEN IN	< 4.0 : 1
	GPS OPEN OUT	< 7.6 : 1
	US-PCS CLOSE IN	< 2.5 : 1
	US-PCS CLOSE OUT	< 4.0 : 1
	US-PCS OPEN IN	< 4.1 : 1
	US-PCS OPEN OUT	< 3.1 : 1
Impedance	50Ω	
Radiation Pattern	Omni-directional	
Polarization	Vertical	
Max power	2W	

CELLULAR GAIN (PEAK)	TX	849Mhz	2.15dBi	ELEVATION-1	CLOSE OUT
	RX	894Mhz	2.45dBi	ELEVATION-1	CLOSE OUT
US - PCS GAIN (PEAK)	TX	1850Mhz	2.19dBi	ELEVATION-1	CLOSE OUT
	RX	1990Mhz	2.21dBi	ELEVATION-2	CLOSE OUT
GPS GAIN (PEAK)	1575Mhz		0.96dBi	ELEVATION-1	CLOSE IN

1.2 Mechanical Specification

Length	See the drawing
Temperature	−40 °C − +70 °C
Connector type	Screw

1.3 Packing

Description	Q'ty	Material	Remark
Tray	150EA	P.P	
Air Vinyl	−	Polyester	
Inner Box	1,500EA	SW 1 (A)	17.4Kgf/50mm min.
Master Carton Box	7,500EA	DW 1(A)	25.4Kgf/50mm min.

2. Test Equipment

Description	Purpose
Network Analyzer	V.S.W.R, Impedance
Standard Dipole	Gain, Impedance
Digital Calipers	Dimension
Torque Driver	Torque Test
Push Pull Gauge	Force Test
Temp. Chamber	Temperature Test
Thermal Shock Chamber	Thermal Shock
Vibration Shaker	Vibration
Dummy Set	Drop Test

3. Electrical Specification

3.1 V.S.W.R

The performance of this antenna shall be in accordance with the best V.S.W.R requirements as followings over the entire band.

V.S.W.R	CELLULAR CLOSE IN	< 3.0 : 1
	CELLULAR CLOSE OUT	< 2.0 : 1
	CELLULAR OPEN IN	< 2.8 : 1
	CELLULAR OPEN OUT	< 2.5 : 1
	GPS CLOSE IN	< 3.0 : 1
	GPS CLOSE OUT	< 6.7 : 1
	GPS OPEN IN	< 4.0 : 1
	GPS OPEN OUT	< 7.6 : 1
	US-PCS CLOSE IN	< 2.5 : 1
	US-PCS CLOSE OUT	< 4.0 : 1
	US-PCS OPEN IN	< 4.1 : 1
	US-PCS OPEN OUT	< 3.1 : 1

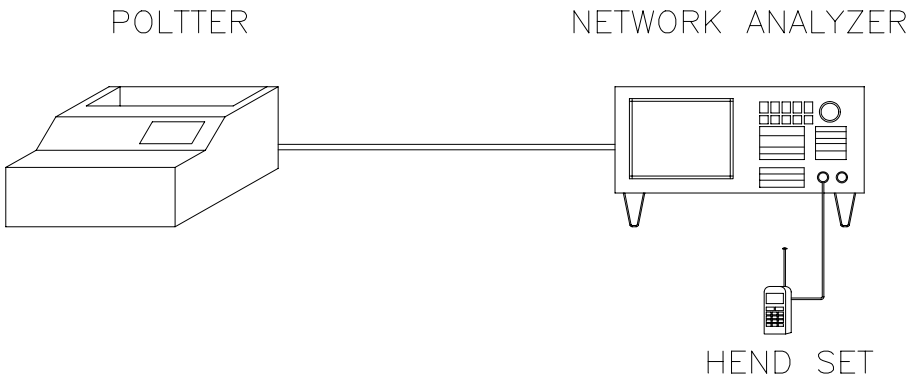
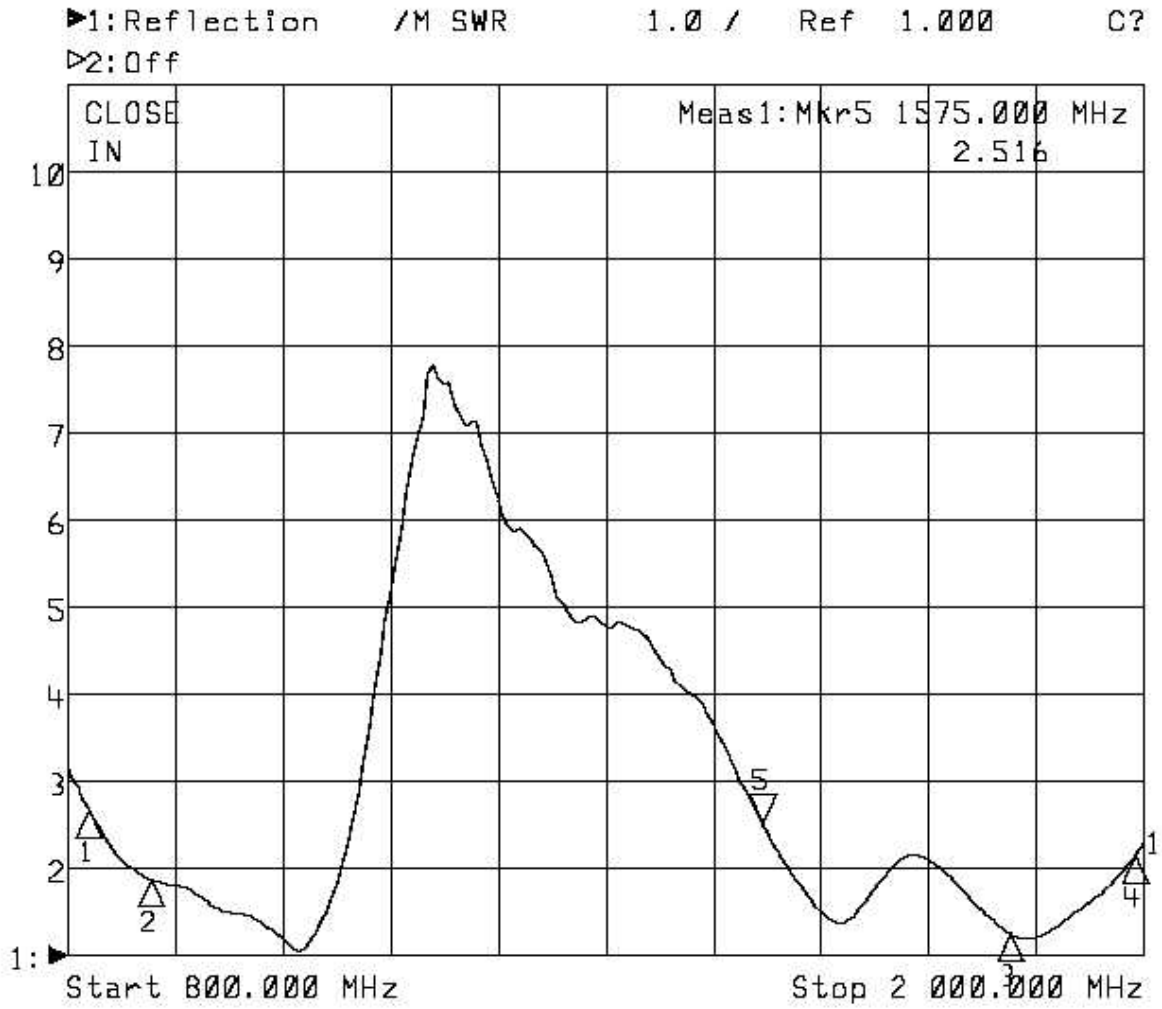


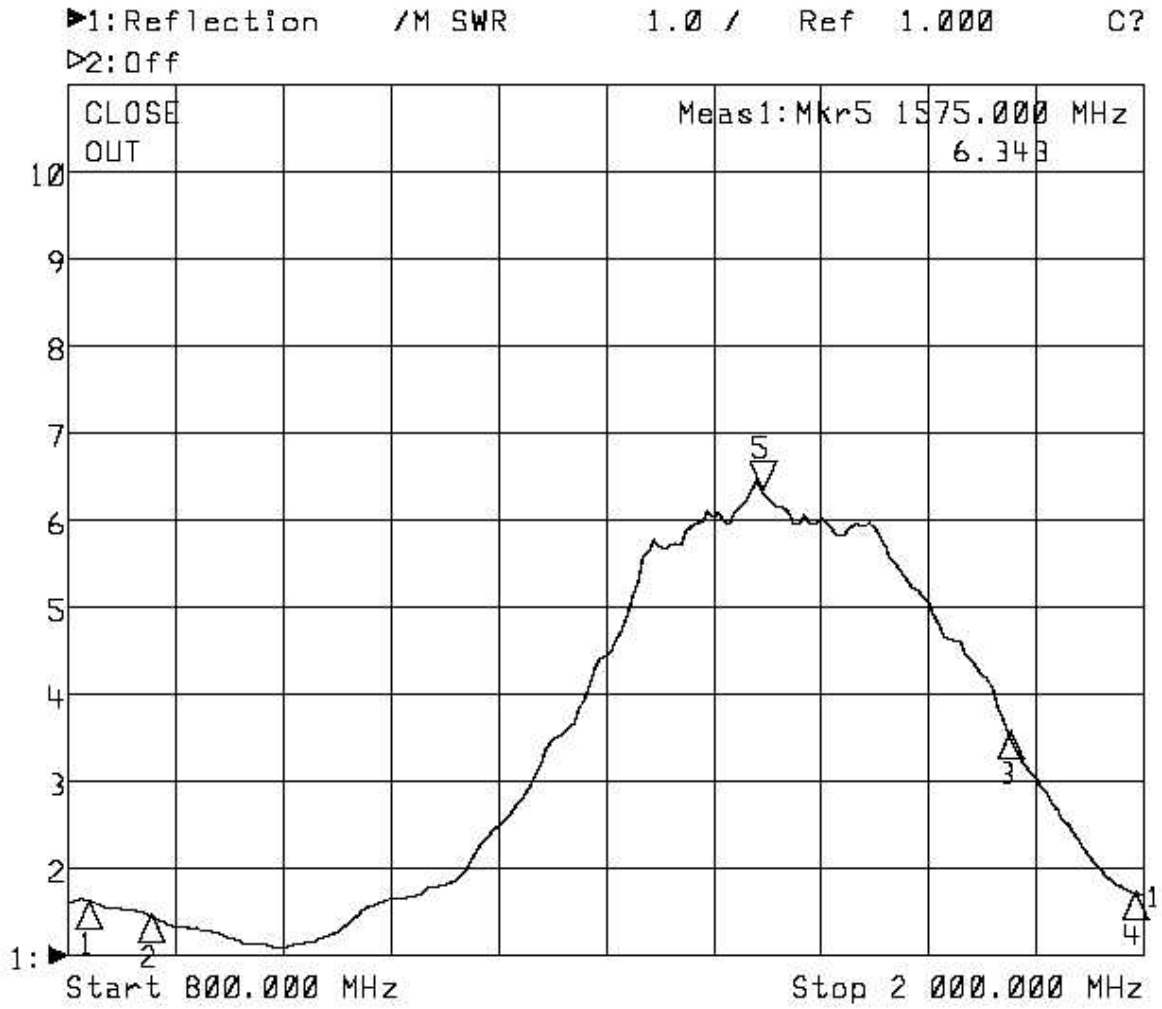
Figure 1 V.S.W.R Measurement System

CLOSE IN



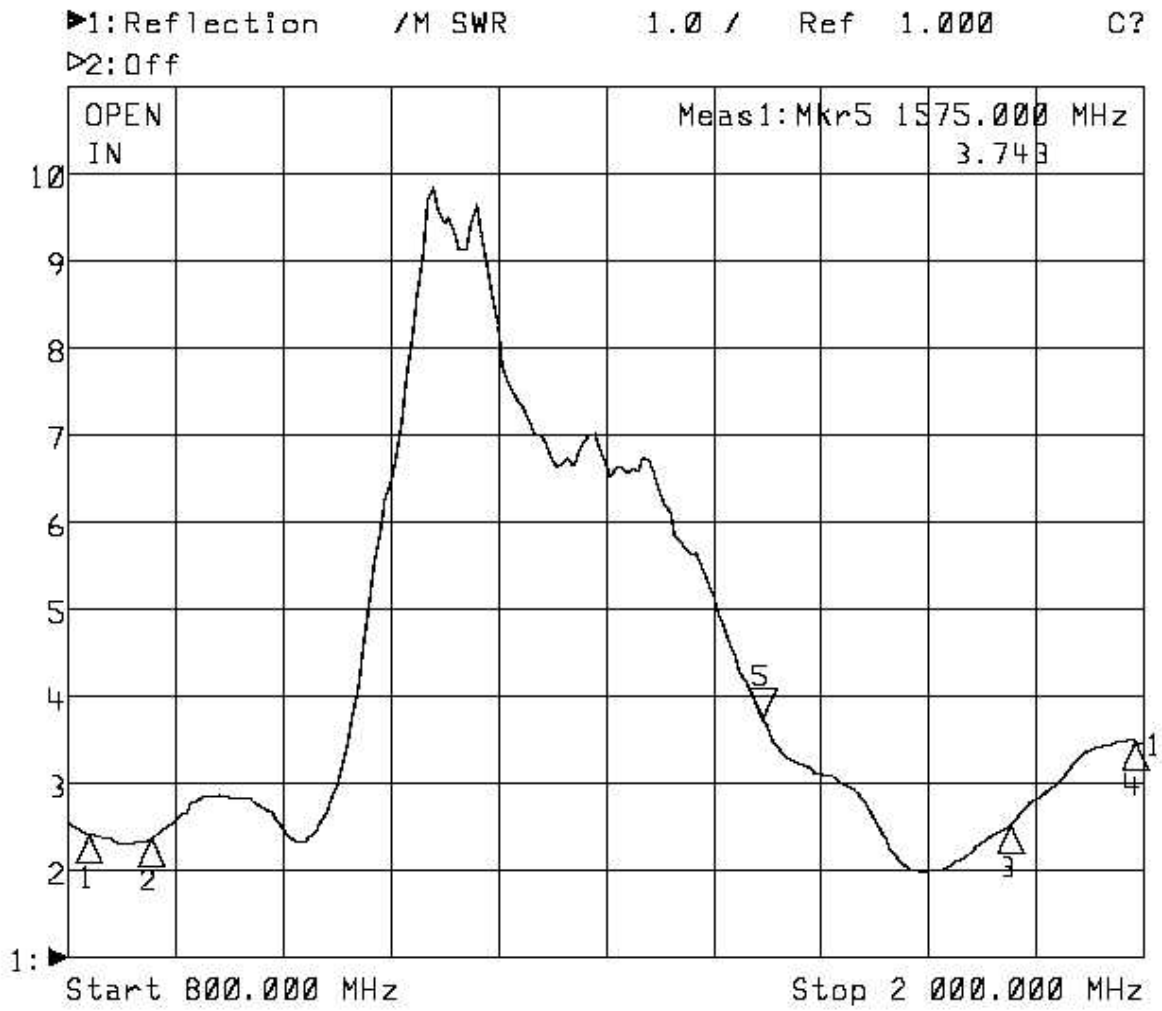
1:Mkr (MHz)		2:Mkr (MHz)
1:	824.0000	2.680
2:	894.0000	1.871
3:	1850.0000	1.251
4:	1990.0000	2.146
5>	1575.0000	2.516

CLOSE OUT



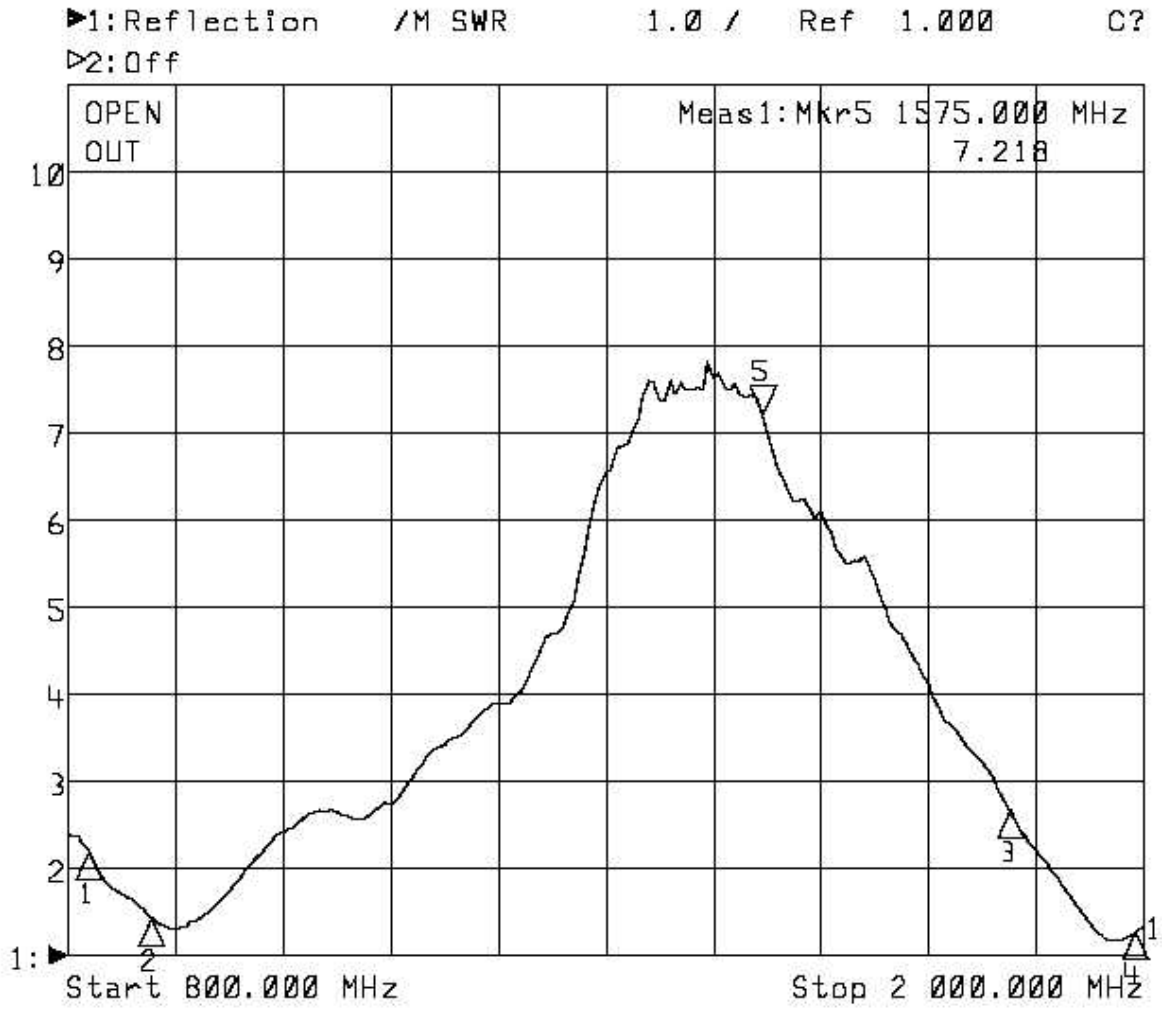
1:Mkr (MHz)		2:Mkr (MHz)
1:	824.0000	1.633
2:	894.0000	1.475
3:	1850.0000	3.581
4:	1990.0000	1.728
5>	1575.0000	6.343

OPEN IN



1:Mkr (MHz)		2:Mkr (MHz)
1:	824.0000 2.403	
2:	894.0000 2.367	
3:	1850.0000 2.516	
4:	1990.0000 3.480	
5>	1575.0000 3.743	

OPEN OUT

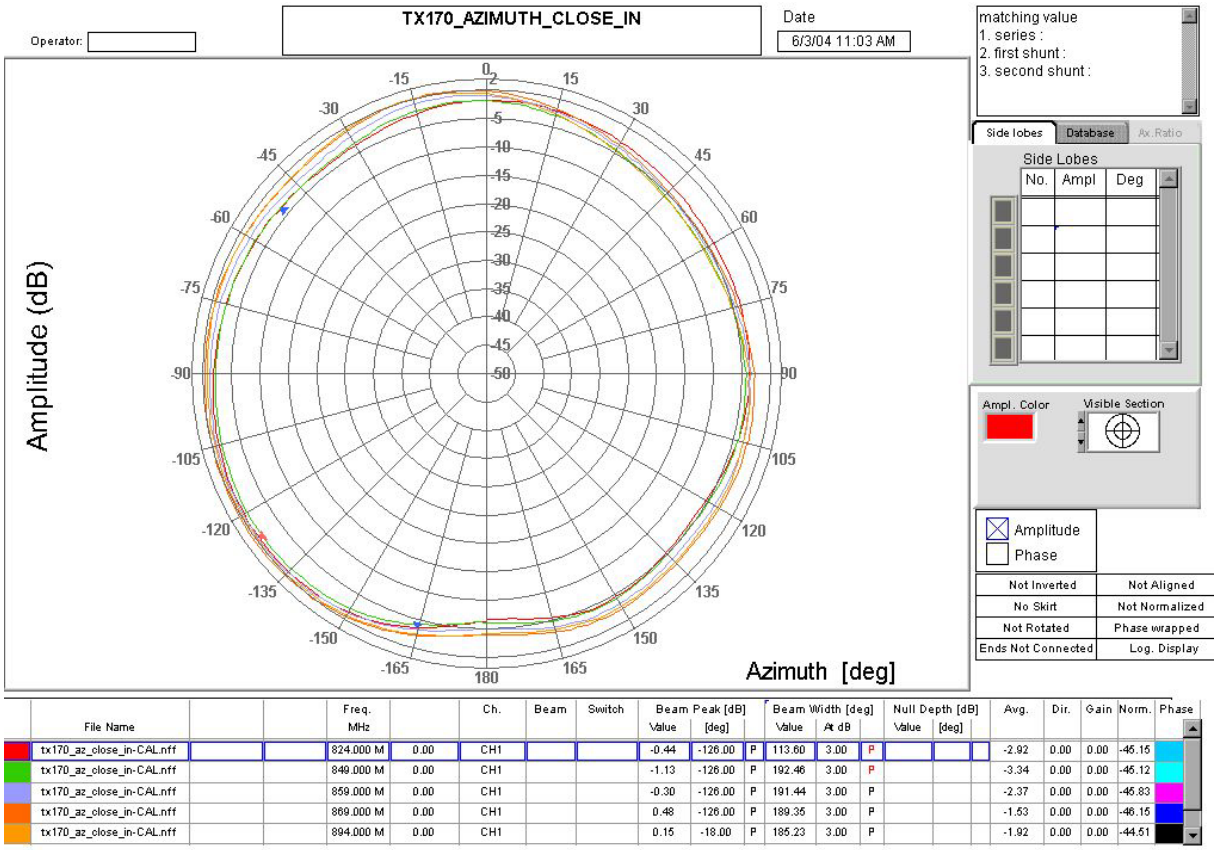


1:Mkr (MHz)		2:Mkr (MHz)
1:	824.0000 2.191	
2:	894.0000 1.432	
3:	1850.0000 2.673	
4:	1990.0000 1.263	
5>	1575.0000 7.218	

3.2 Radiation Pattern

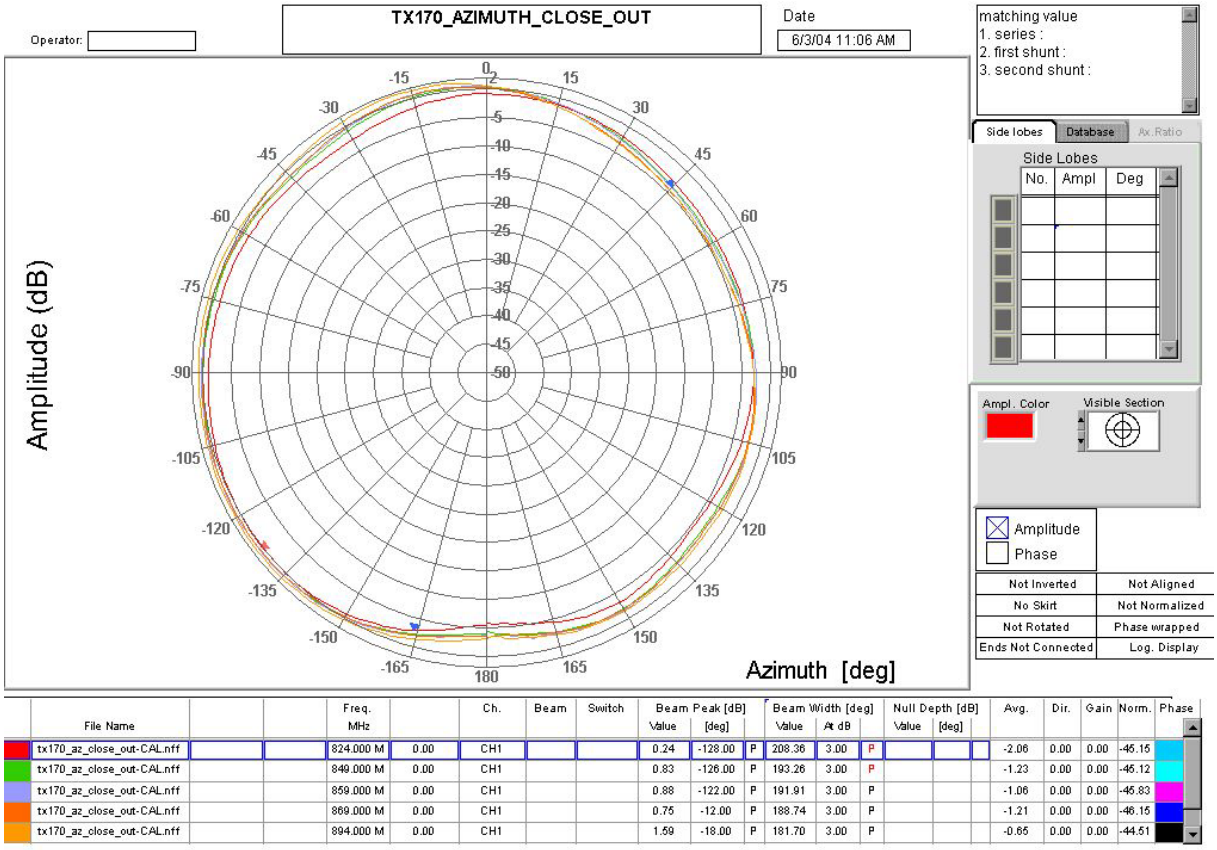
The radiation pattern of this antenna shall be omni-directional for the horizontal plane and bi-directional for the vertical plane in both position of extended and retracted.

CELLULAR, AZIMUTH, CLOSE IN



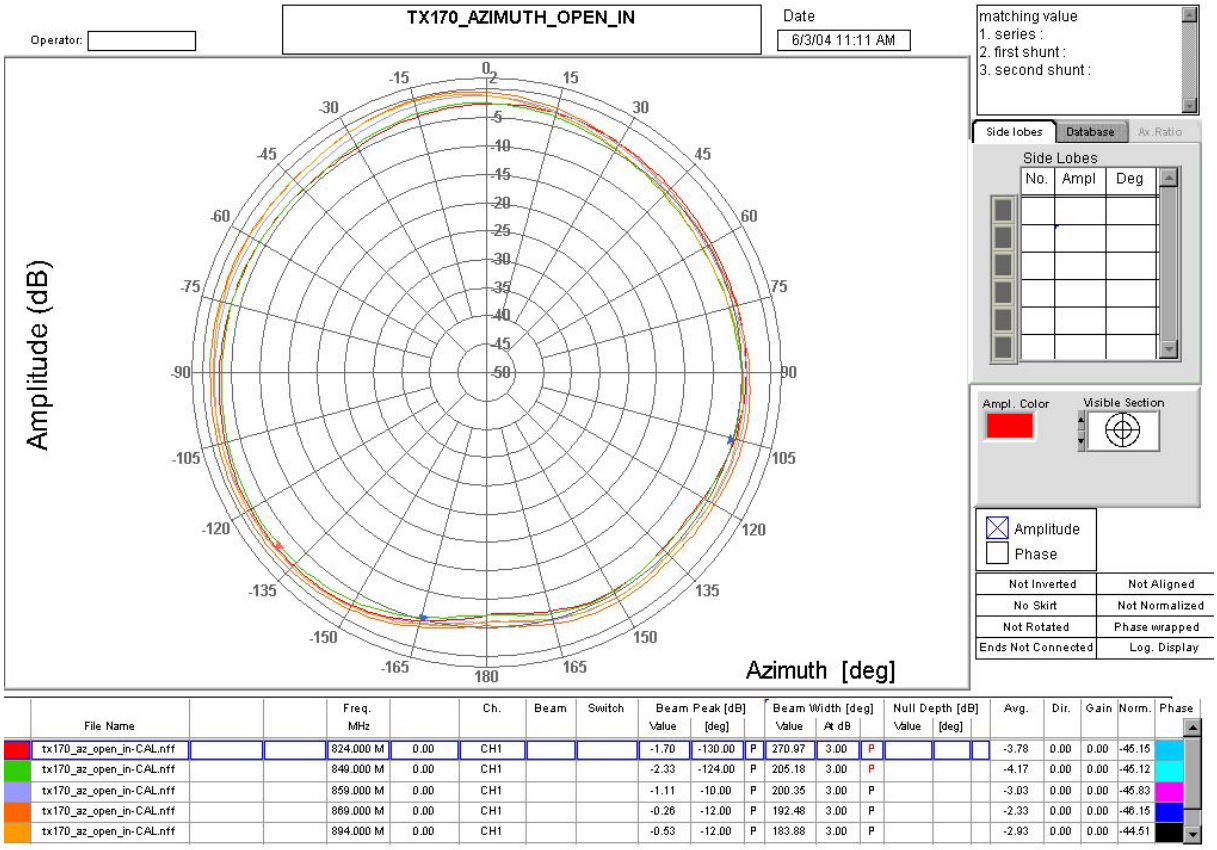
File Name	Freq. MHz	Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]	Beam Width [deg] Value	At dB	Null Depth [dB] Value	[deg]	Avg.	Dir.	Gain	Norm.	Phase
tx170_az_close_in-CAL.nff	824.000 M	CH1			-0.44	-126.00	113.60	3.00			-2.92	0.00	0.00	-46.15	
tx170_az_close_in-CAL.nff	849.000 M	CH1			-1.13	-126.00	192.46	3.00			-3.34	0.00	0.00	-46.12	
tx170_az_close_in-CAL.nff	859.000 M	CH1			-0.30	-126.00	191.44	3.00			-2.37	0.00	0.00	-45.83	
tx170_az_close_in-CAL.nff	869.000 M	CH1			0.48	-126.00	189.35	3.00			-1.53	0.00	0.00	-46.15	
tx170_az_close_in-CAL.nff	894.000 M	CH1			0.15	-18.00	185.23	3.00			-1.92	0.00	0.00	-44.61	

CELLULAR AZIMUTH CLOSE OUT



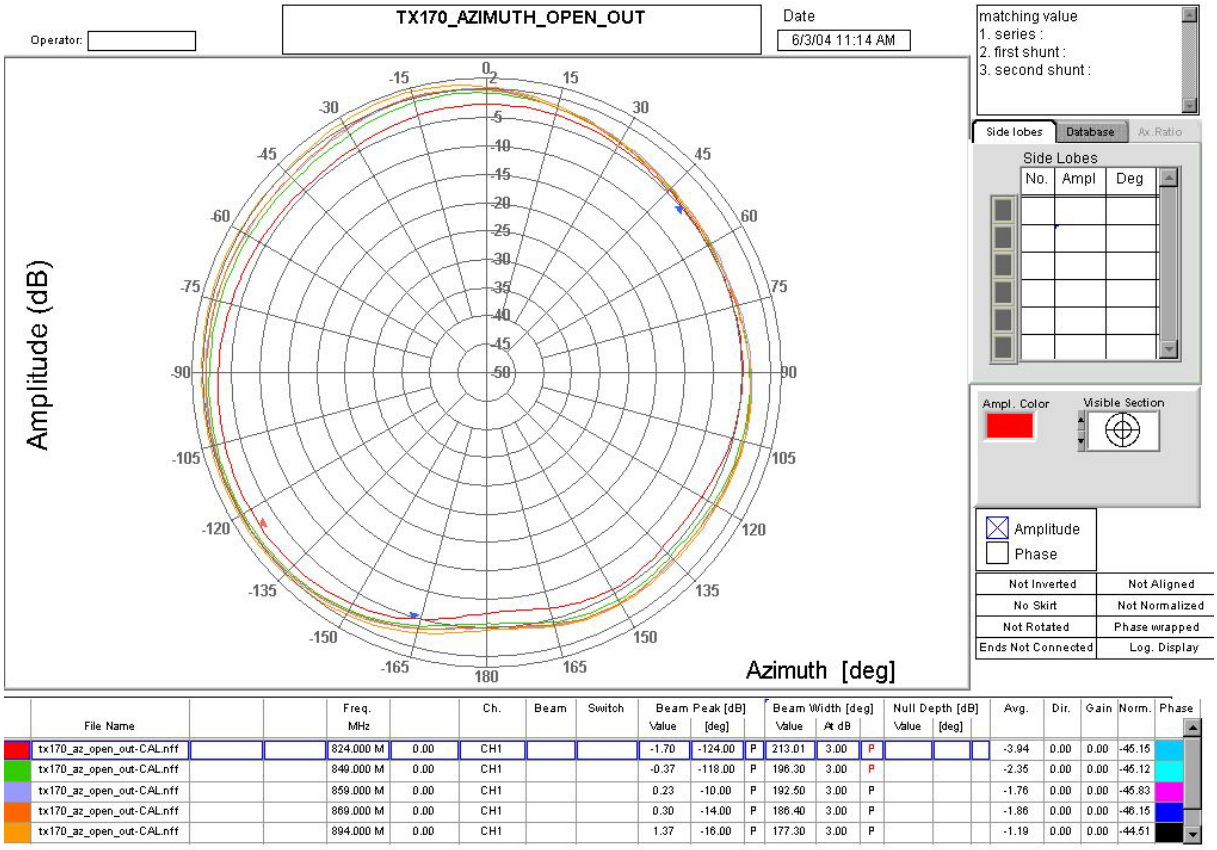
File Name	Freq. MHz	Ch.	Beam	Switch	Beam Peak [dB] Value	Beam Peak [dB] [deg]	Beam Width [deg] Value	Beam Width [deg] At dB	Null Depth [dB] Value	Null Depth [dB] [deg]	Avg.	Dir.	Gain	Norm.	Phase
tx170_az_close_out-CAL.nff	824.000 M	0.00	CH1		0.24	-128.00 P	208.36	3.00 P			-2.06	0.00	0.00	-46.15	
tx170_az_close_out-CAL.nff	849.000 M	0.00	CH1		0.83	-126.00 P	193.26	3.00 P			-1.23	0.00	0.00	-46.12	
tx170_az_close_out-CAL.nff	859.000 M	0.00	CH1		0.88	-122.00 P	191.91	3.00 P			-1.06	0.00	0.00	-46.83	
tx170_az_close_out-CAL.nff	869.000 M	0.00	CH1		0.75	-12.00 P	188.74	3.00 P			-1.21	0.00	0.00	-46.15	
tx170_az_close_out-CAL.nff	894.000 M	0.00	CH1		1.59	-18.00 P	181.70	3.00 P			-0.65	0.00	0.00	-44.51	

CELLULAR AZIMUTH OPEN IN



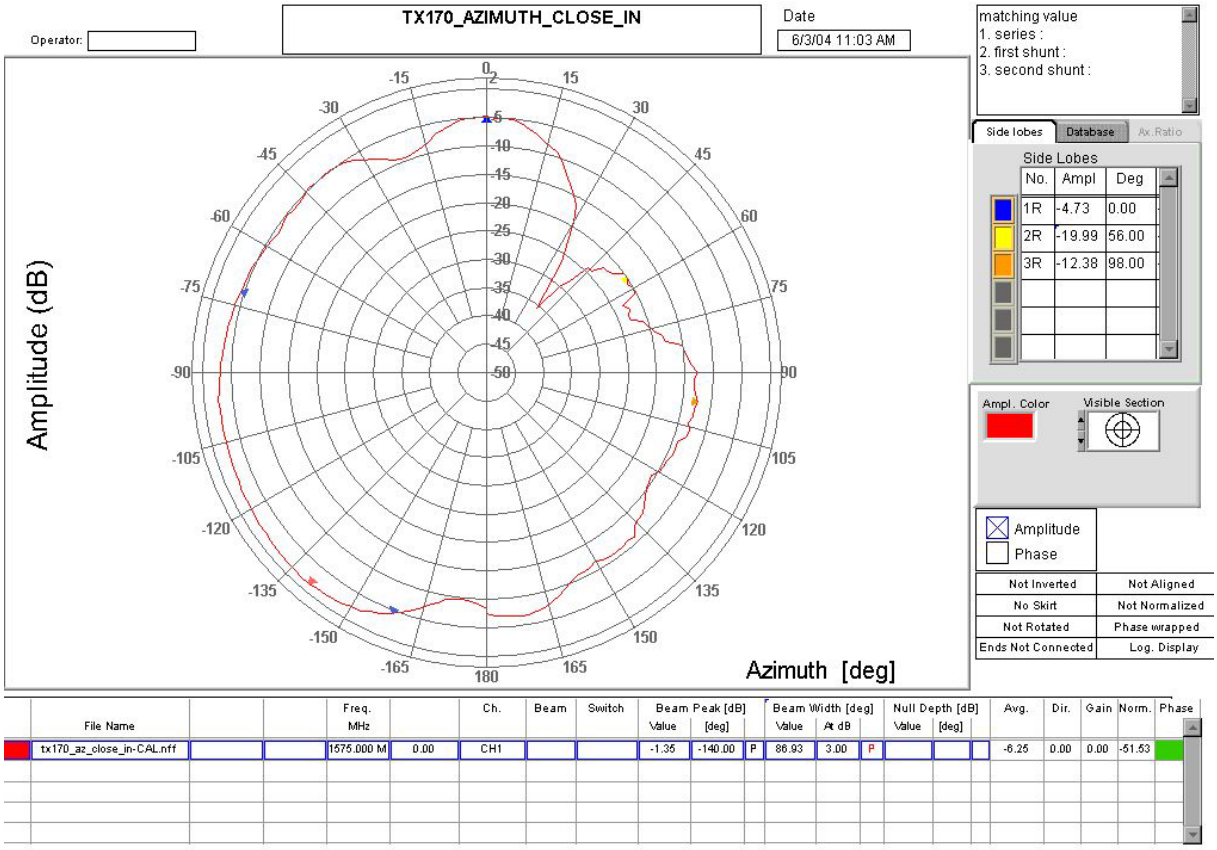
File Name	Freq. MHz	Ch.	Beam	Switch	Beam Peak [dB] Value	Beam Peak [dB] [deg]	Beam Width [deg] Value	Beam Width [deg] At dB	Null Depth [dB] Value	Null Depth [dB] [deg]	Avg.	Dir.	Gain	Norm.	Phase
tx170_az_open_in-CAL.nff	824.000 M	CH1			-1.70	-130.00 P	270.97	3.00 P			-3.78	0.00	0.00	-46.15	
tx170_az_open_in-CAL.nff	849.000 M	CH1			-2.33	-124.00 P	205.18	3.00 P			-4.17	0.00	0.00	-46.12	
tx170_az_open_in-CAL.nff	859.000 M	CH1			-1.11	-10.00 P	200.35	3.00 P			-3.03	0.00	0.00	-46.83	
tx170_az_open_in-CAL.nff	869.000 M	CH1			-0.26	-12.00 P	192.48	3.00 P			-2.33	0.00	0.00	-46.15	
tx170_az_open_in-CAL.nff	894.000 M	CH1			-0.53	-12.00 P	183.88	3.00 P			-2.93	0.00	0.00	-44.51	

CELLULAR AZIMUTH OPEN OUT



File Name	Freq. MHz	Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]	Beam Width [deg] Value	At dB	Null Depth [dB] Value	[deg]	Avg.	Dir.	Gain	Norm.	Phase
tx170_az_open_out-CAL.nff	824.000 M	CH1			-1.70	-124.00 P	213.01	3.00 P			-3.94	0.00	0.00	-46.15	
tx170_az_open_out-CAL.nff	849.000 M	CH1			-0.37	-118.00 P	196.30	3.00 P			-2.35	0.00	0.00	-46.12	
tx170_az_open_out-CAL.nff	859.000 M	CH1			0.23	-10.00 P	192.50	3.00 P			-1.76	0.00	0.00	-46.83	
tx170_az_open_out-CAL.nff	869.000 M	CH1			0.30	-14.00 P	186.40	3.00 P			-1.86	0.00	0.00	-46.15	
tx170_az_open_out-CAL.nff	894.000 M	CH1			1.37	-16.00 P	177.30	3.00 P			-1.19	0.00	0.00	-44.51	

GPS AZIMUTH CLOSE IN



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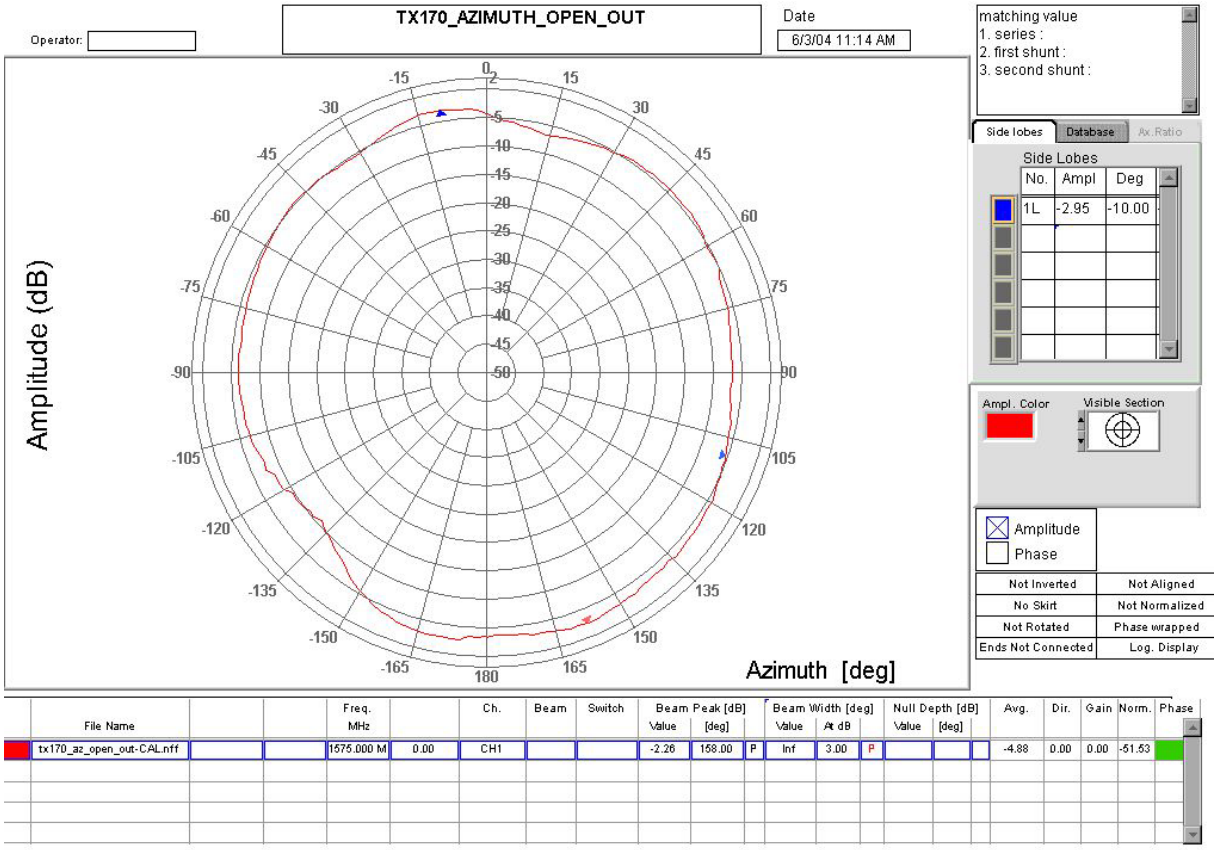
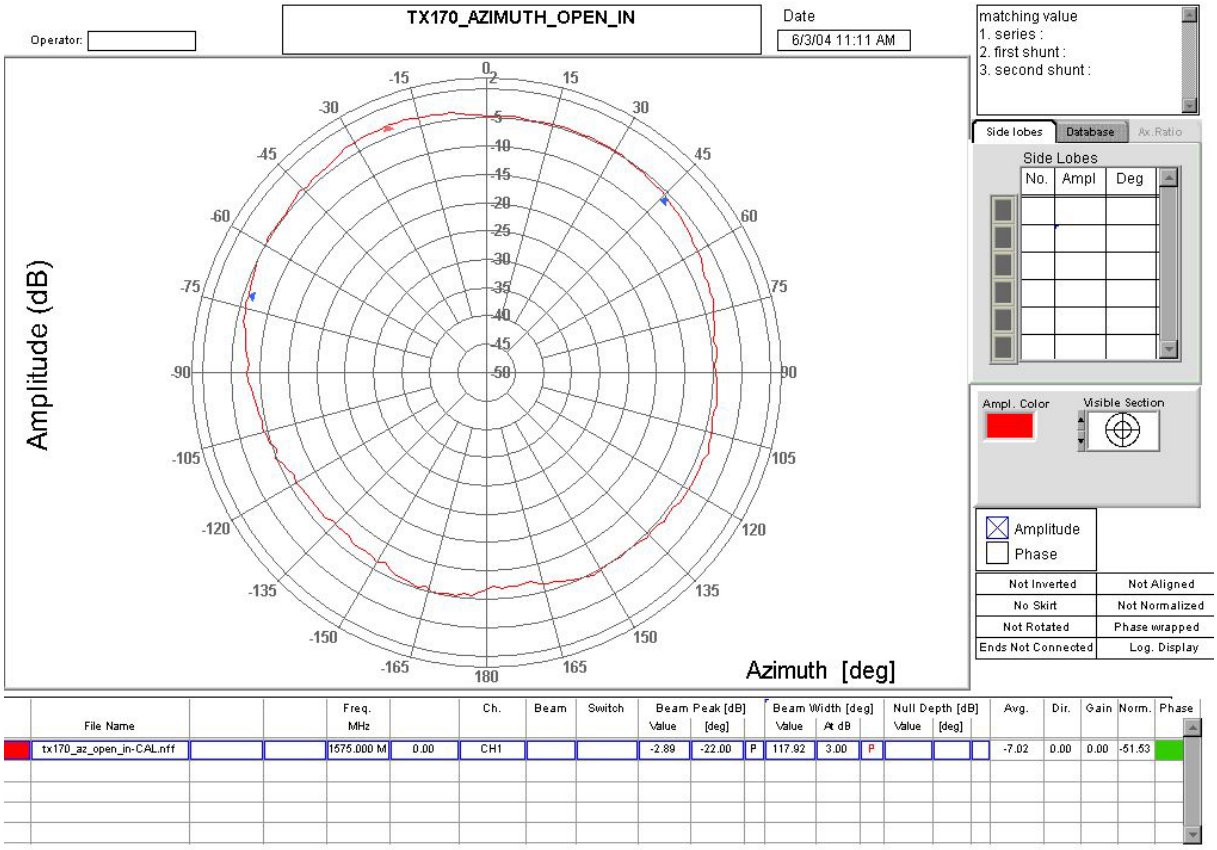
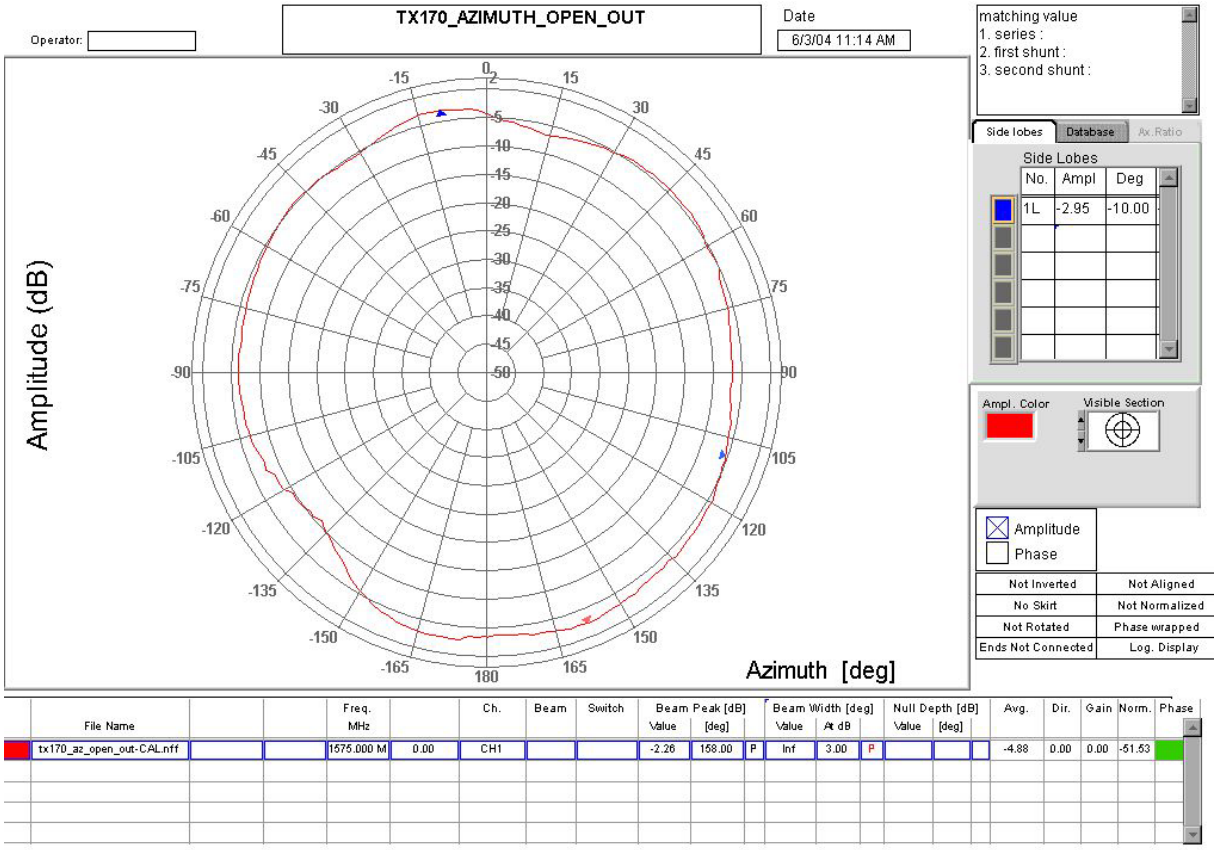


File Name			Freq. MHz		Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]		Beam Width [deg] Value	At dB		Null Depth [dB] Value	[deg]		Avg.	Dir.	Gain	Norm.	Phase
tx170_az_open_out-CAL.nff			1575.000 M	0.00	CH1			-2.26	158.00	P	Inf	3.00	P				-4.88	0.00	0.00	-51.53	

GPS AZIMUTH OPEN IN

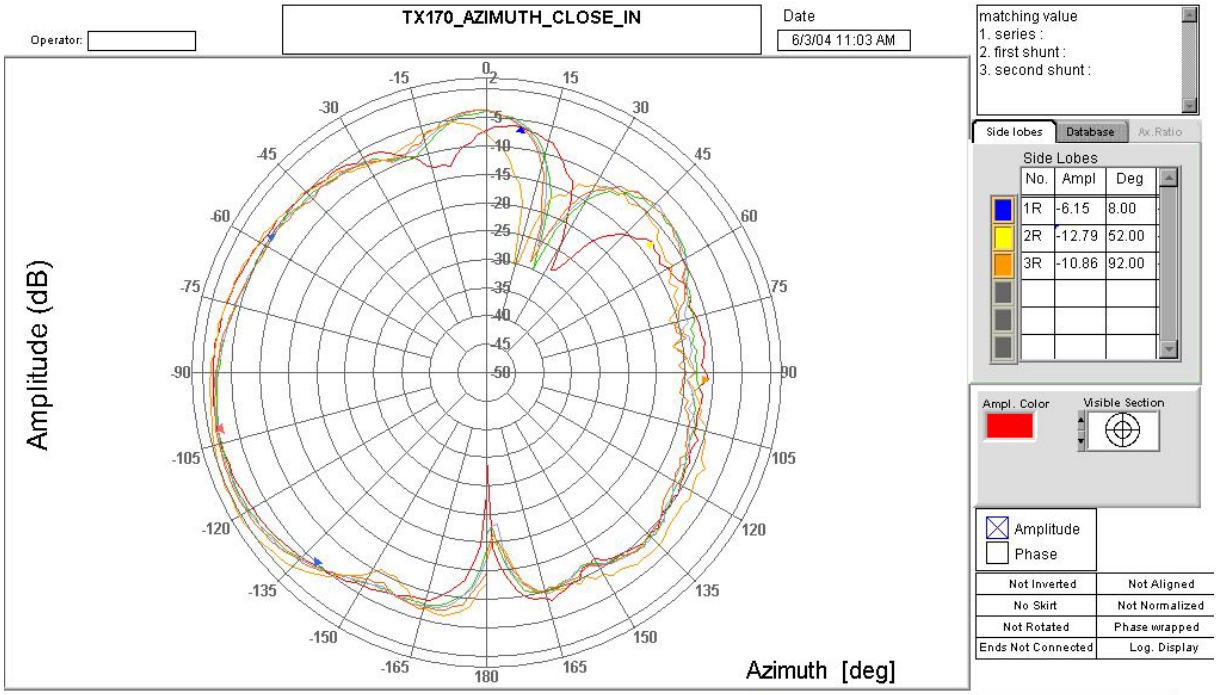


GPS AZIMUTH OPEN OUT



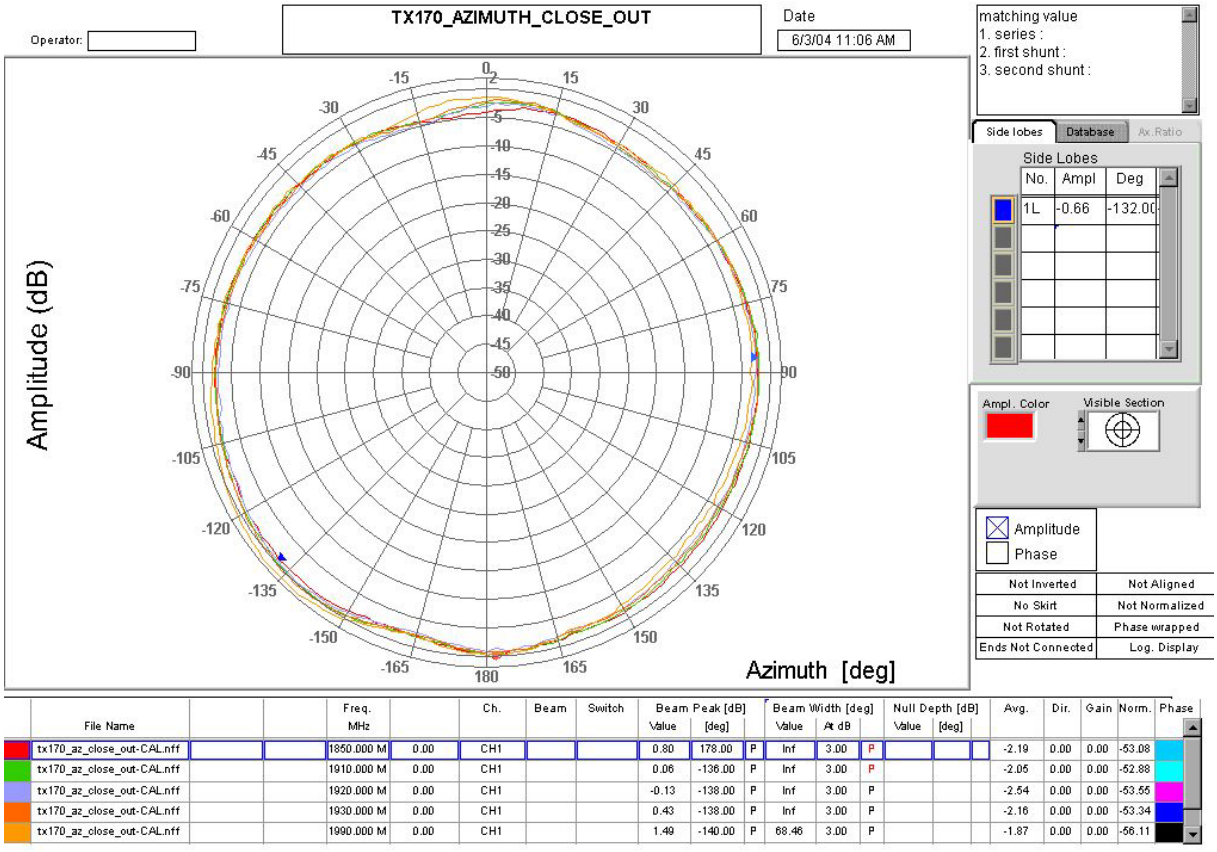
File Name			Freq. MHz		Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]		Beam Width [deg] Value	At dB		Null Depth [dB] Value	[deg]		Avg.	Dir.	Gain	Norm.	Phase
tx170_az_open_out-CAL.nff			1575.000 M	0.00	CH1			-2.26	158.00	P	Inf	3.00	P				-4.88	0.00	0.00	-51.53	

US-PCS AZIMUTH CLOSE IN



File Name			Freq. MHz		Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]		Beam Width [deg] Value	At dB		Null Depth [dB] Value	[deg]		Avg.	Dir.	Gain	Norm.	Phase
tx170_az_close_in-CAL.nff			1850.000 M	0.00	CH1			-1.40	-102.00	P	80.34	3.00	P				-6.54	0.00	0.00	-53.08	
tx170_az_close_in-CAL.nff			1910.000 M	0.00	CH1			-1.26	-116.00	P	65.03	3.00	P				-6.53	0.00	0.00	-52.88	
tx170_az_close_in-CAL.nff			1920.000 M	0.00	CH1			-1.14	-110.00	P	63.32	3.00	P				-6.42	0.00	0.00	-53.55	
tx170_az_close_in-CAL.nff			1930.000 M	0.00	CH1			-0.85	-114.00	P	59.47	3.00	P				-6.35	0.00	0.00	-53.34	
tx170_az_close_in-CAL.nff			1990.000 M	0.00	CH1			0.36	-114.00	P	65.00	3.00	P				-5.64	0.00	0.00	-56.11	

US-PCS AZIMUTH CLOSE OUT



File Name	Freq. MHz	Ch.	Beam	Switch	Beam Peak [dB] Value	[deg]	Beam Width [deg] Value	At dB	Null Depth [dB] Value	[deg]	Avg.	Dir.	Gain	Norm.	Phase
tx170_az_close_out-CAL.nff	1850.000 M	CH1			0.80	178.00	Inf	3.00			-2.19	0.00	0.00	-53.08	
tx170_az_close_out-CAL.nff	1910.000 M	CH1			0.06	-136.00	Inf	3.00			-2.05	0.00	0.00	-52.88	
tx170_az_close_out-CAL.nff	1920.000 M	CH1			-0.13	-138.00	Inf	3.00			-2.54	0.00	0.00	-53.55	
tx170_az_close_out-CAL.nff	1930.000 M	CH1			0.43	-138.00	Inf	3.00			-2.16	0.00	0.00	-53.34	
tx170_az_close_out-CAL.nff	1990.000 M	CH1			1.49	-140.00	68.46	3.00			-1.87	0.00	0.00	-56.11	