



MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 1/56

RETRACTABLE ANTENNA SPECIFICATION

(MRT-05300)

TX-170S



MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 2/56

⦿ Contents ⦿

1. Specification

1.1 Electrical Specification

1.2 Mechanical Specification

1.3 Packing Specification

2. Test Equipments

3. Electrical Specification

3.1 V.S.W.R

3.2 Radiation Pattern

3.3 Gain

4. Mechanical Specification

4.1 Dimension

4.2 Bending Test

4.3 Extracting and Retraction Force

4.4 Drop Test

4.5 Pull Test

4.6 Torque Test

4.7 Cycle Test

5. Environmental Specification

5.1 Thermal Shock

5.2 Temperature Cycling

5.3 Low temp. Test

5.4 High temp. Test

5.5 Humidity

5.6 Vibration

5.7 Salt Spray Test

Appendix A. : Reference of test methods



MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 3/56

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



MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 4/56
Retractable Antenna		

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.



MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 5/56

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

MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 6/56

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

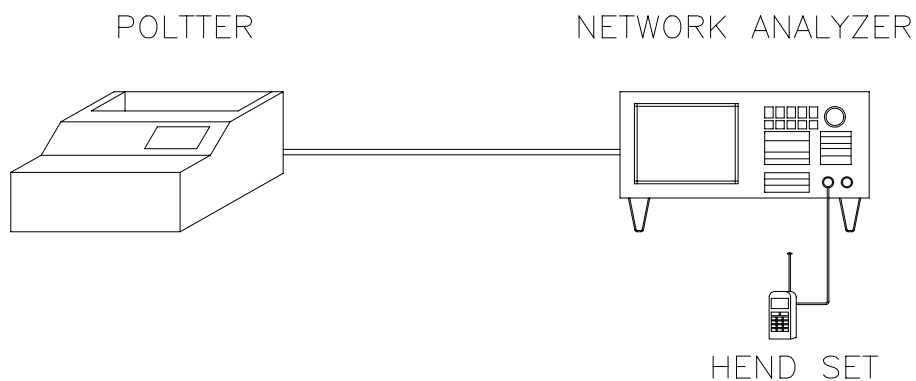


Figure 1 V.S.W.R Measurement System



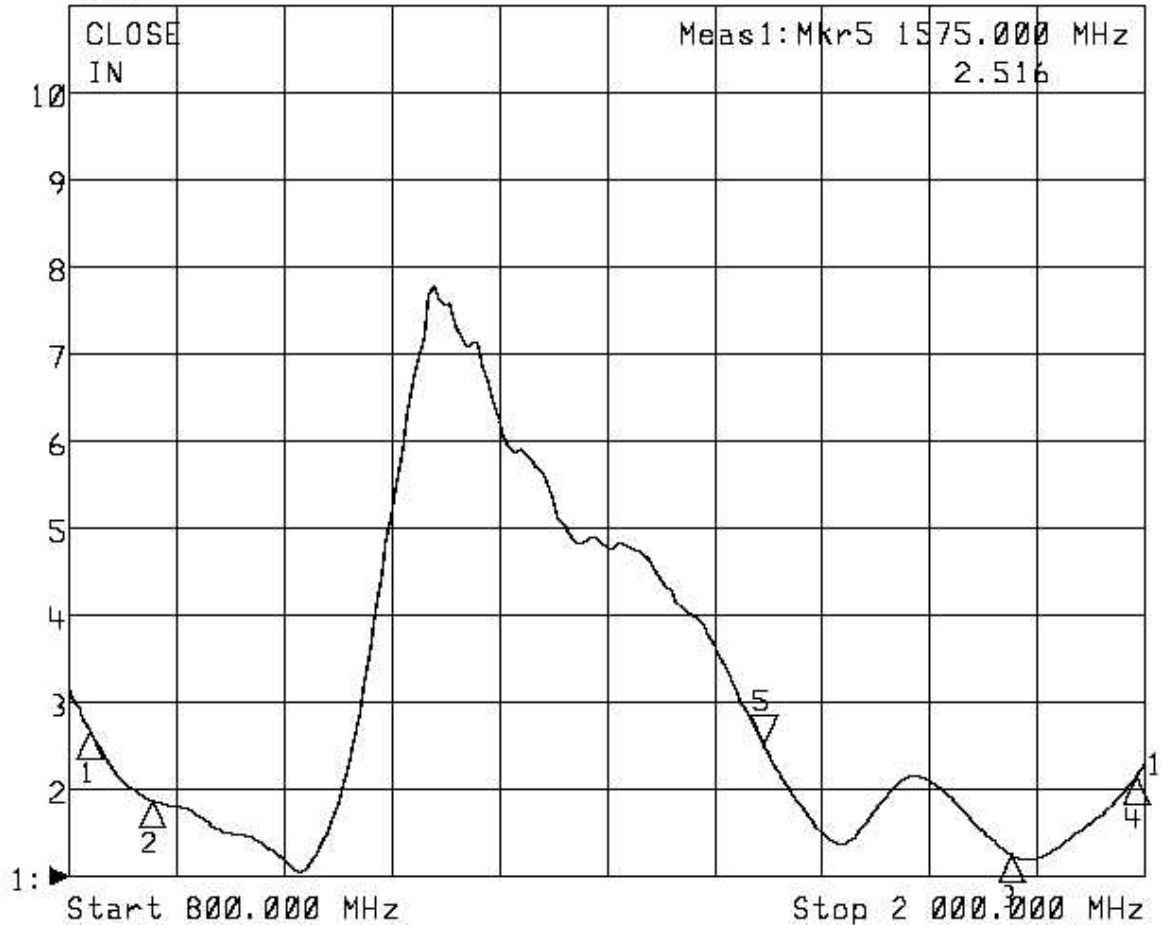
MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 7/56

Retractable Antenna

CLOSE IN

►1:Reflection /M SWR 1.0 / Ref 1.000 C?

►2:Off



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

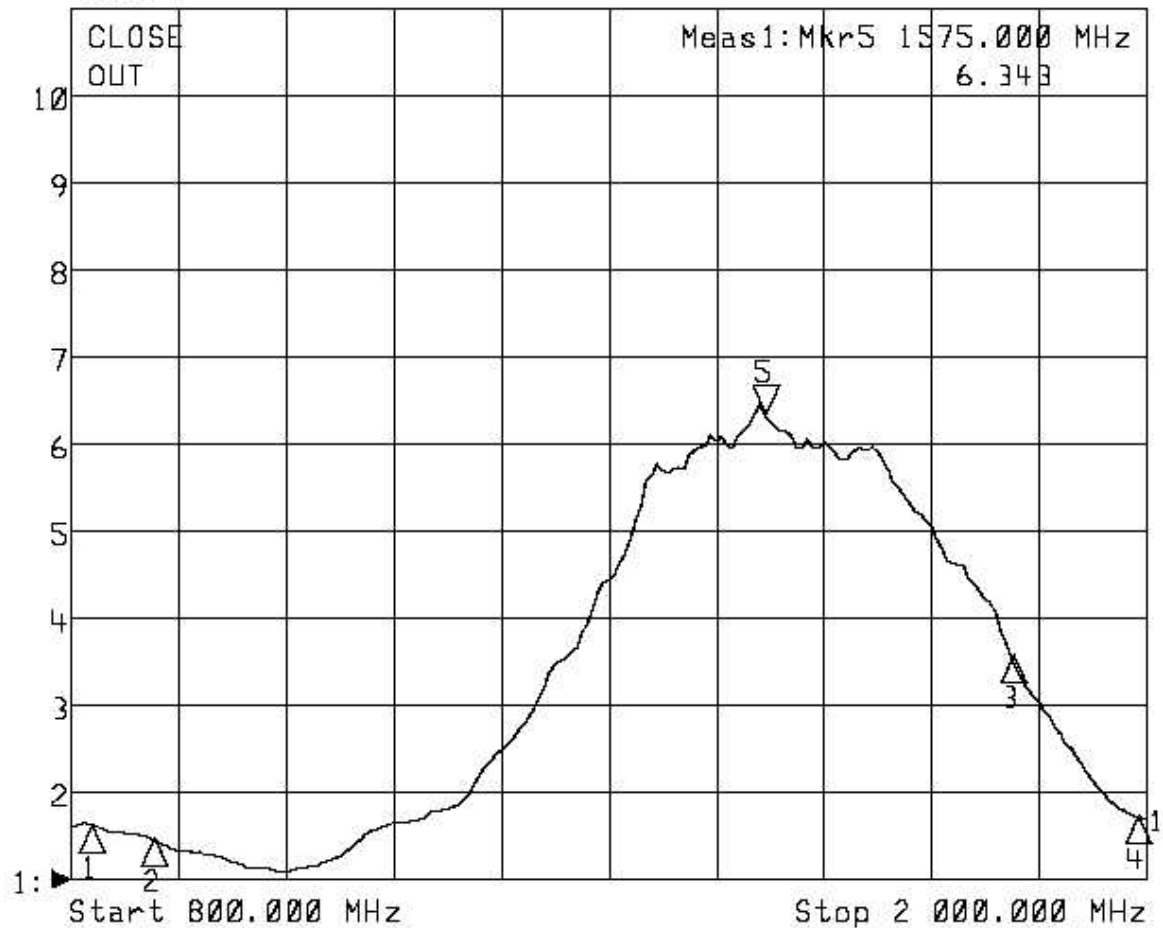


MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 8/56
Retractable Antenna		

CLOSE OUT

►1:Reflection /M SWR 1.0 / Ref 1.000 C?

►2:Off



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



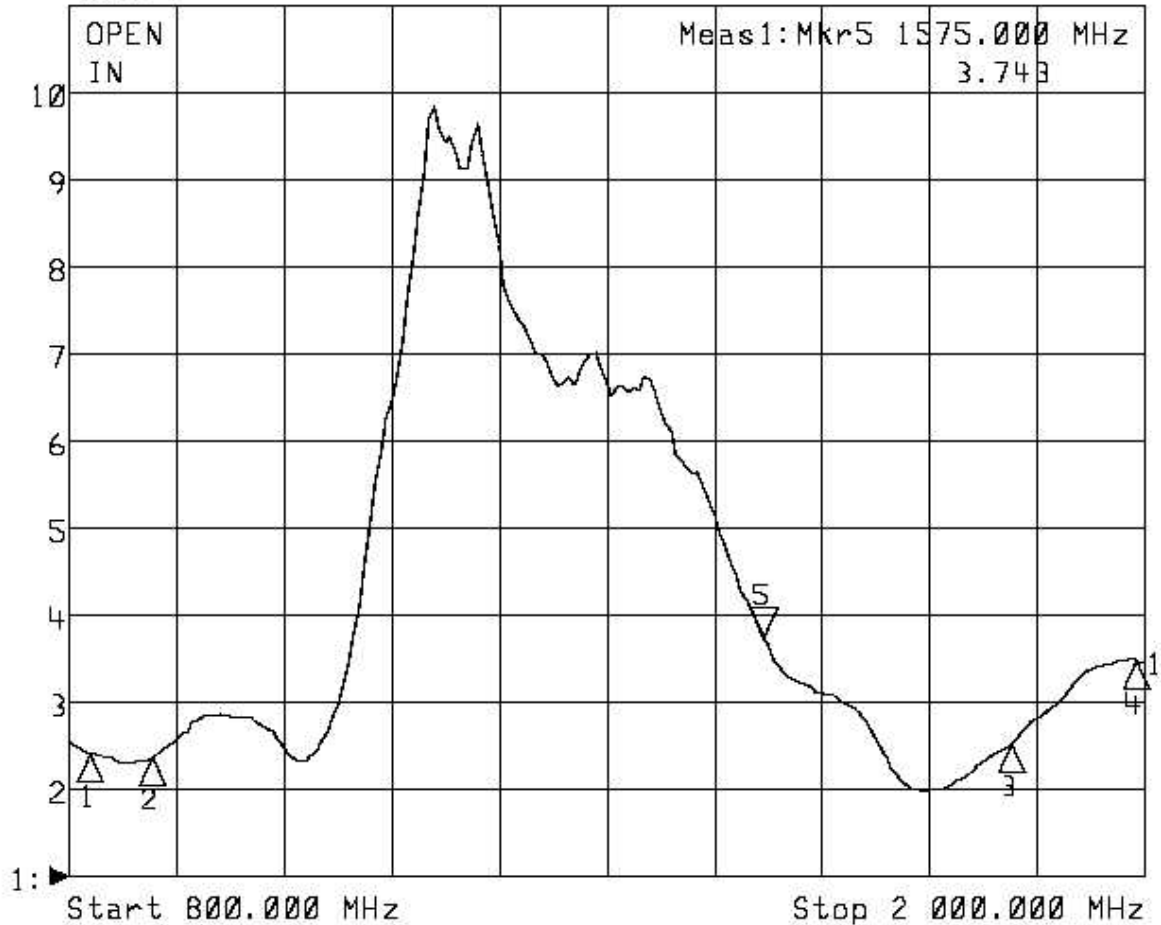
MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 9/56

Retractable Antenna

OPEN IN

►1:Reflection /M SWR 1.0 / Ref 1.000 C?

►2:Off

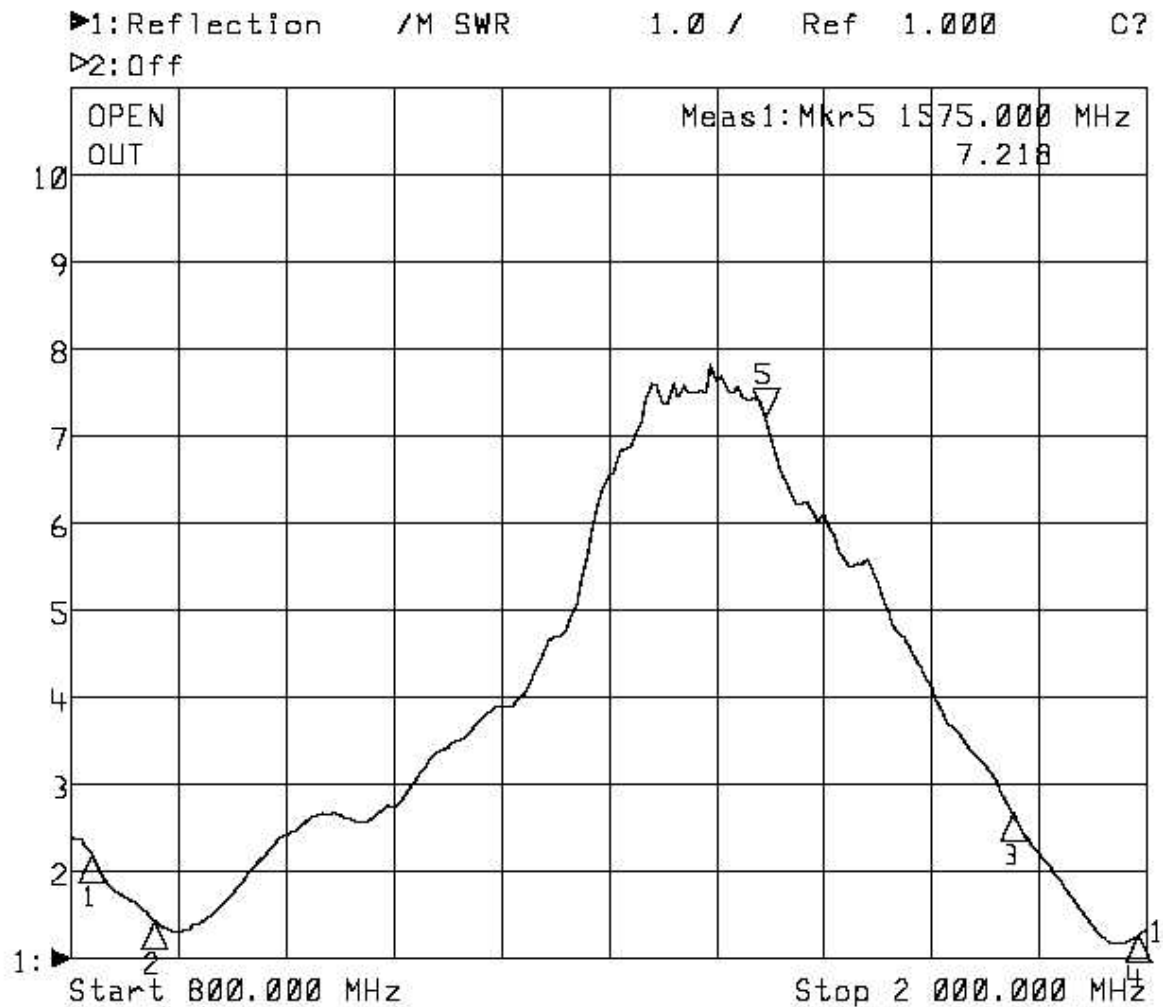


1: Mkr (MHz)		2: Mkr (MHz)
1:	824.0000	2.403
2:	894.0000	2.367
3:	1850.0000	2.516
4:	1990.0000	3.480
5:	1575.0000	3.743



MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 10/56
Retractable Antenna		

OPEN OUT



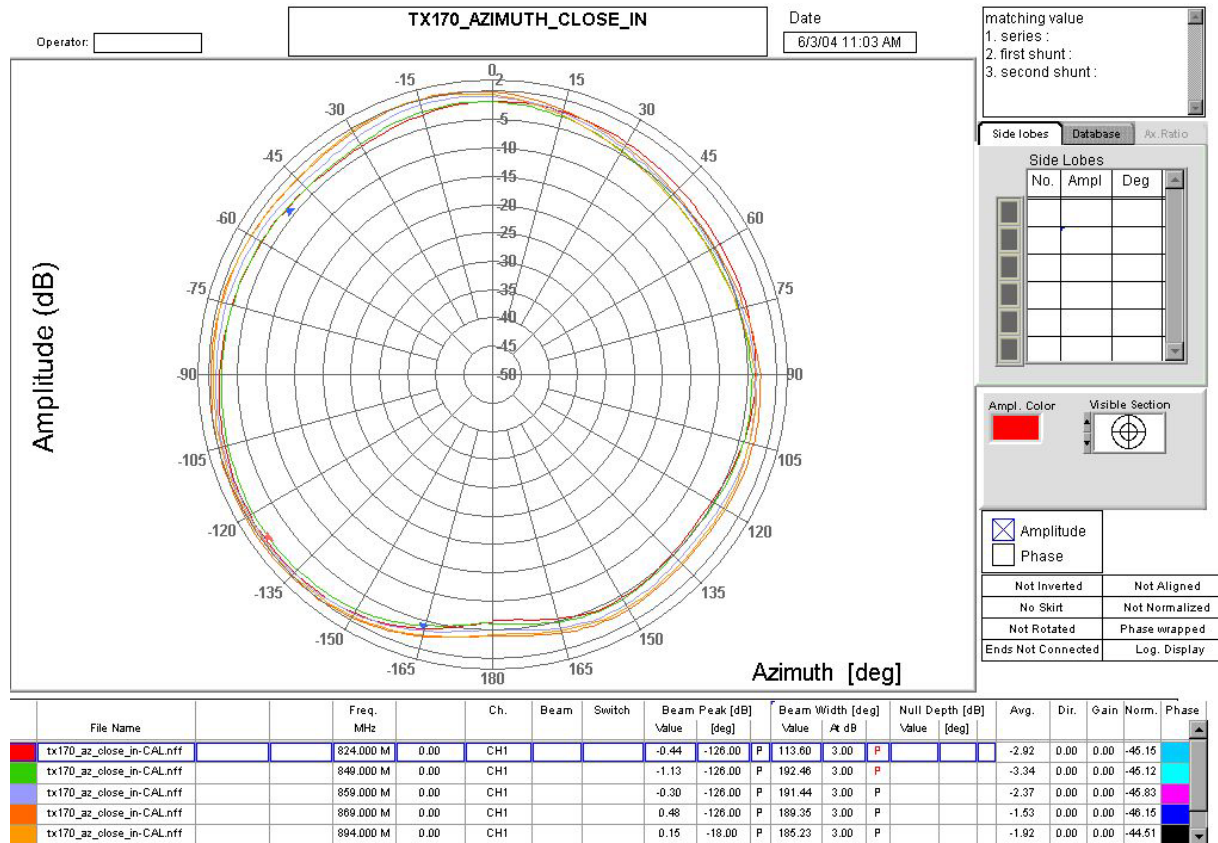
1: Mkr (MHz)	2: Mkr (MHz)
1: 824.0000 2.191	
2: 894.0000 1.432	
3: 1850.0000 2.673	
4: 1990.0000 1.263	
5: 1575.0000 7.218	

 MRW Technologies Ltd. MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 11/56

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.

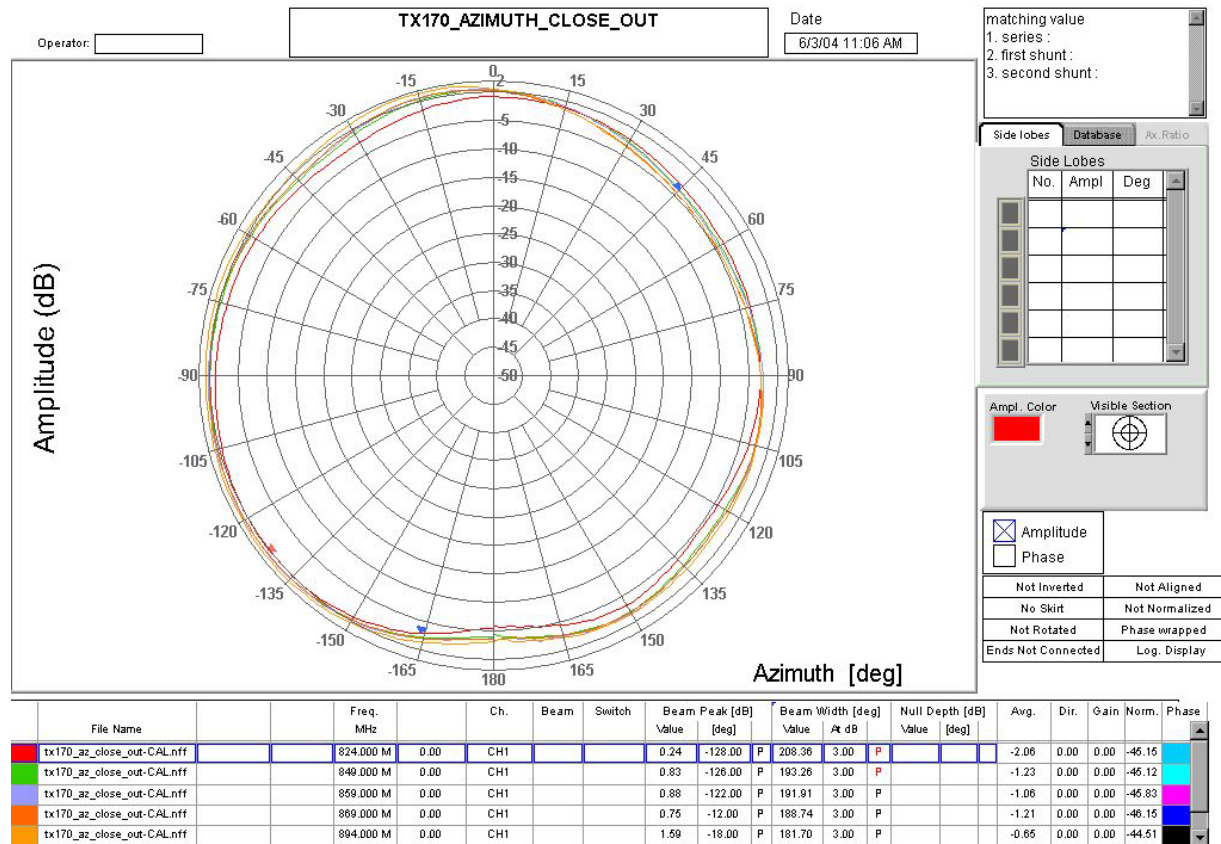
CELLULAR, AZIMUTH, CLOSE IN





MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 12/56
Retractable Antenna		

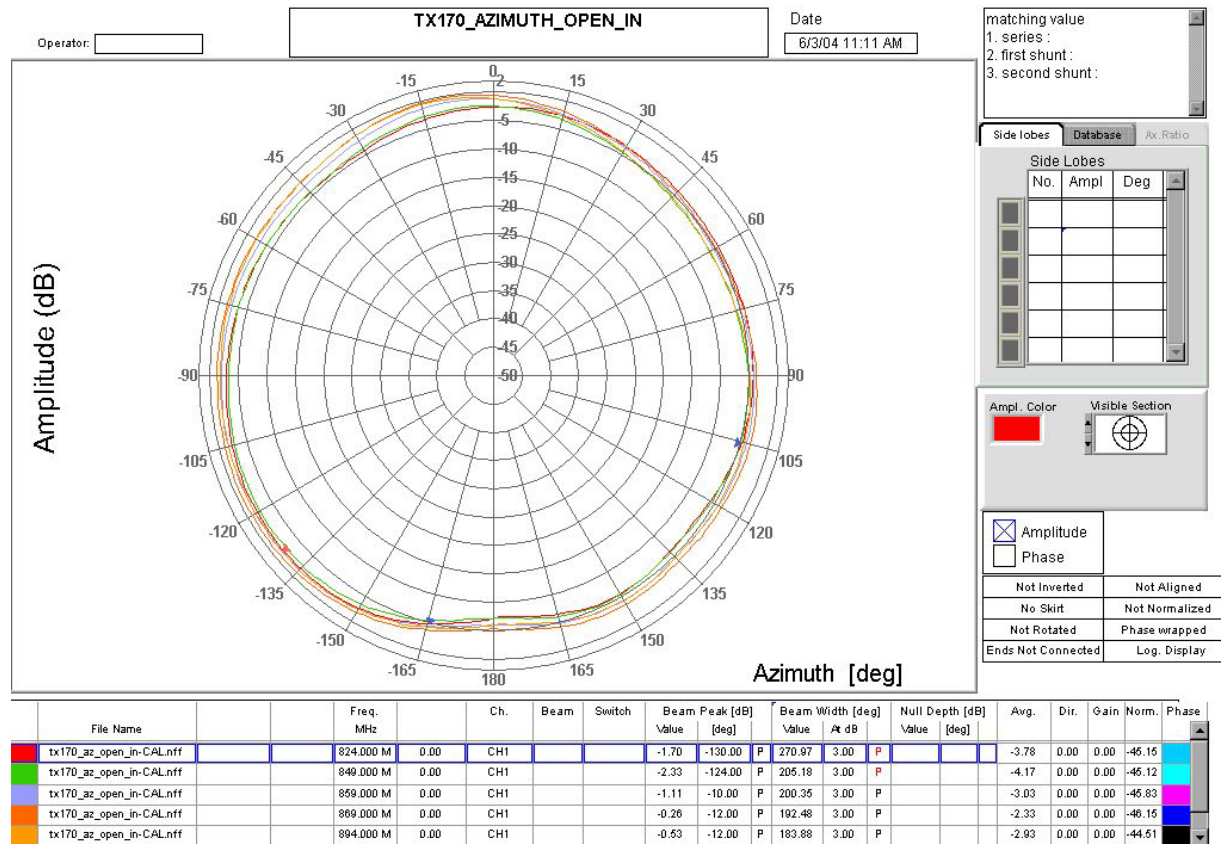
CELLULAR AZIMUTH CLOSE OUT





MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 13/56
Retractable Antenna		

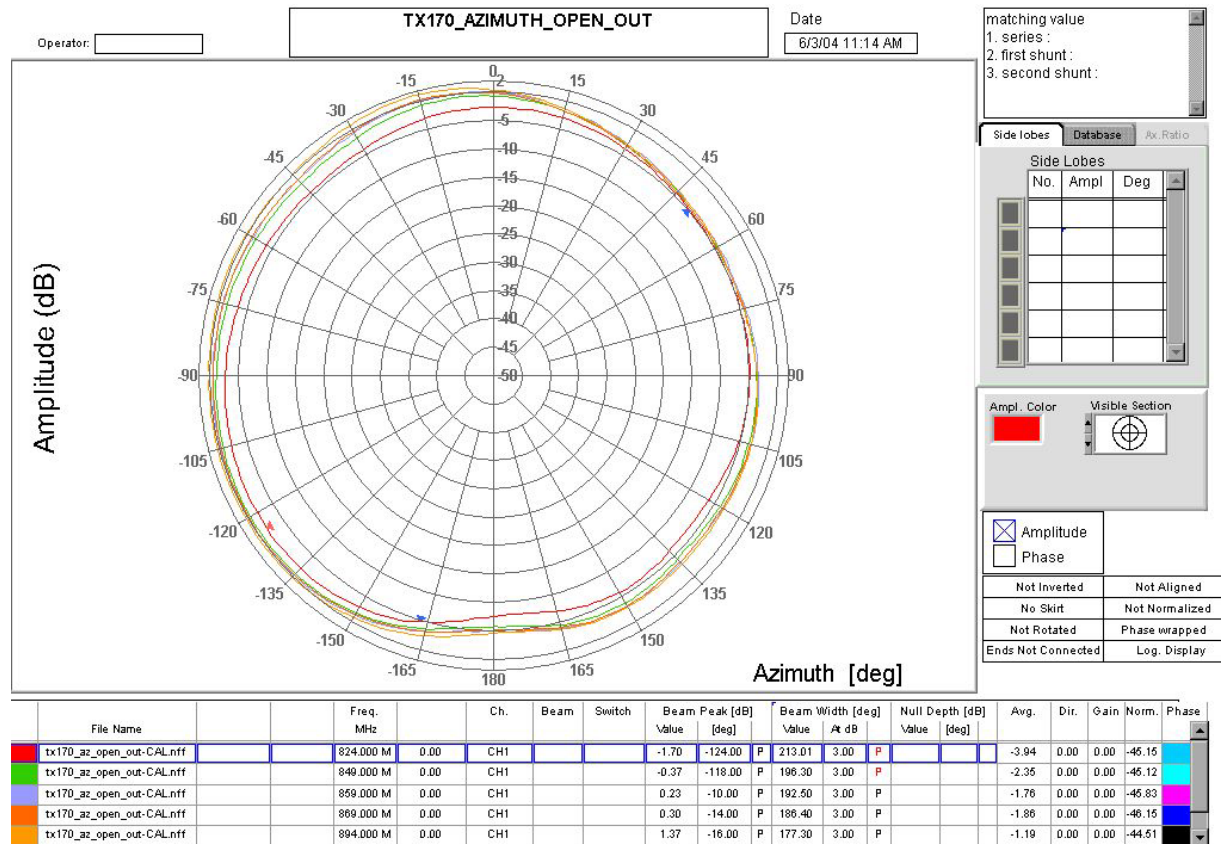
CELLULAR AZIMUTH OPEN IN





MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 14/56
Retractable Antenna		

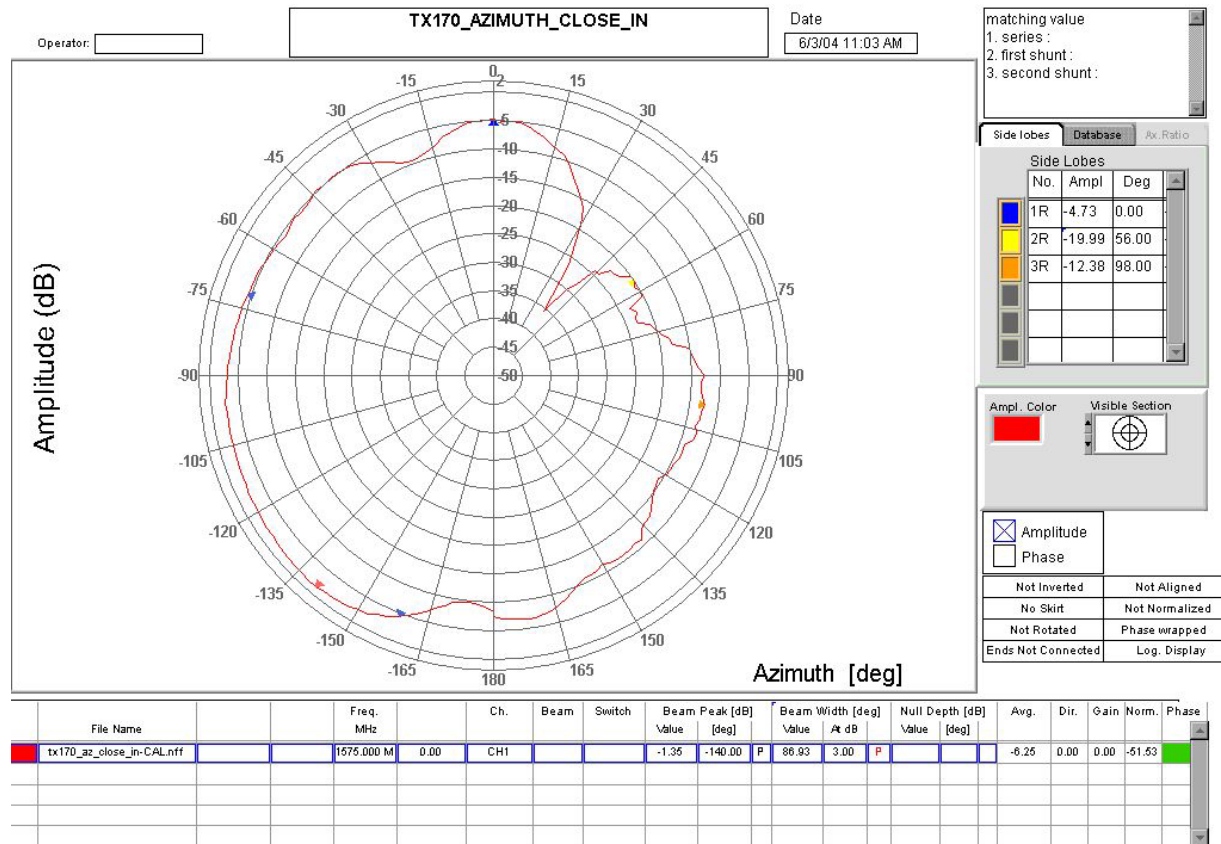
CELLULAR AZIMUTH OPEN OUT



MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 15/56

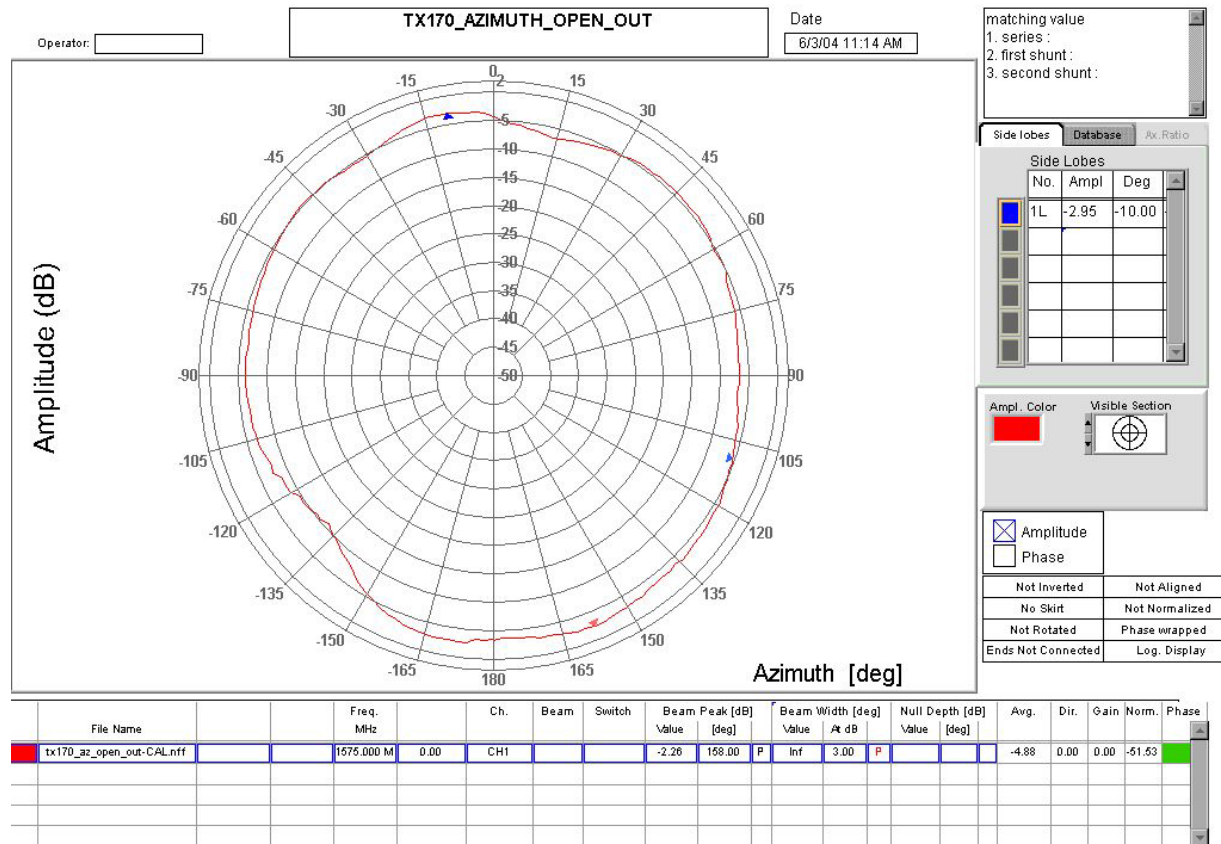
Retractable Antenna

GPS AZIMUTH CLOSE IN



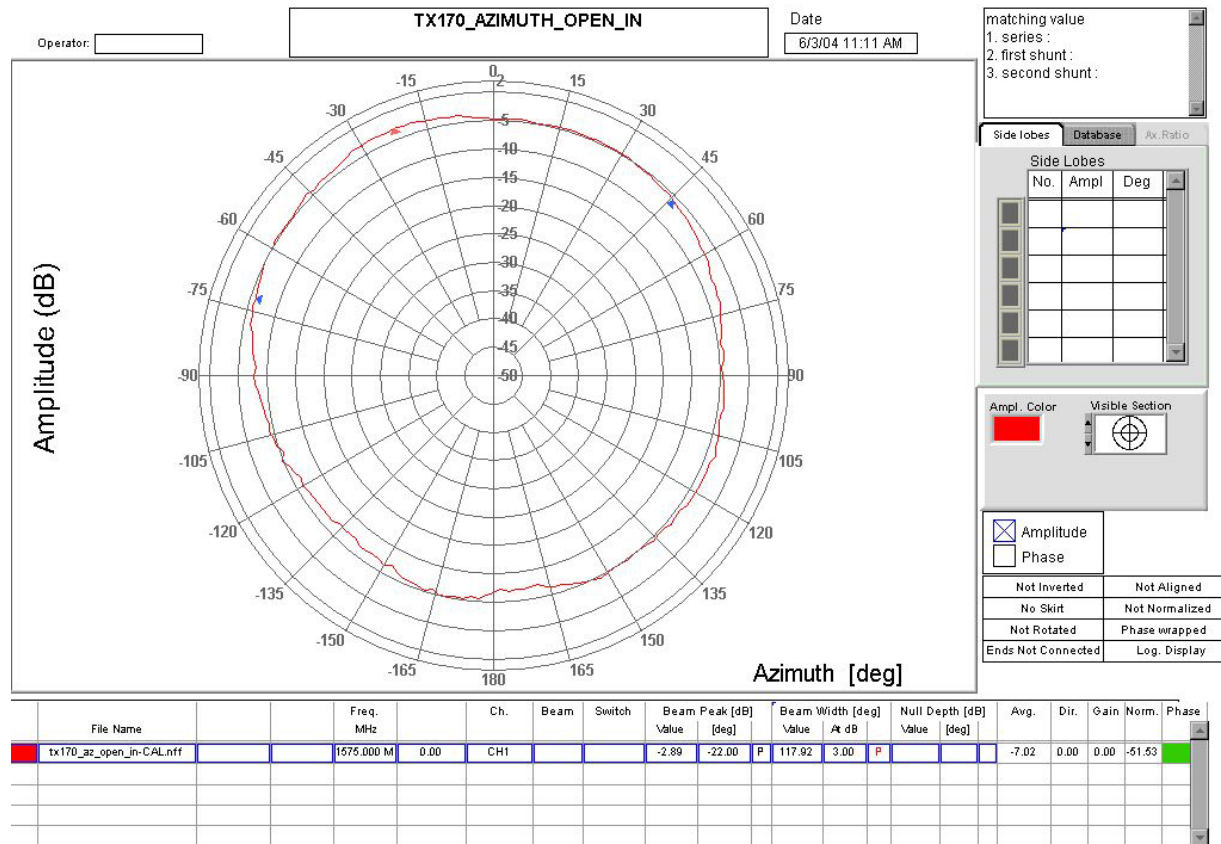
MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 16/56

GPS AZIMUTH CLOSE OUT



MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
Retractable Antenna	Date 2004.06.03	Page 17/56

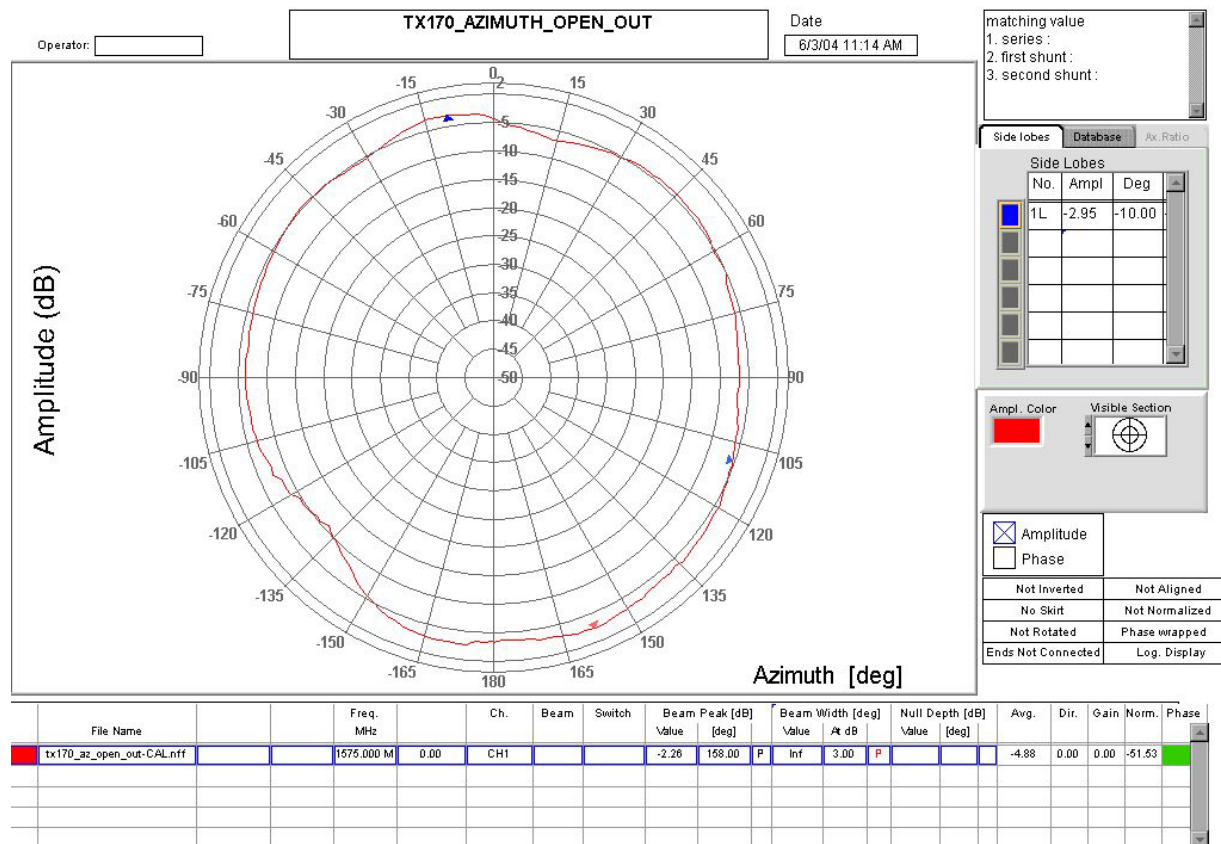
GPS AZIMUTH OPEN IN



MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 18/56

Retractable Antenna

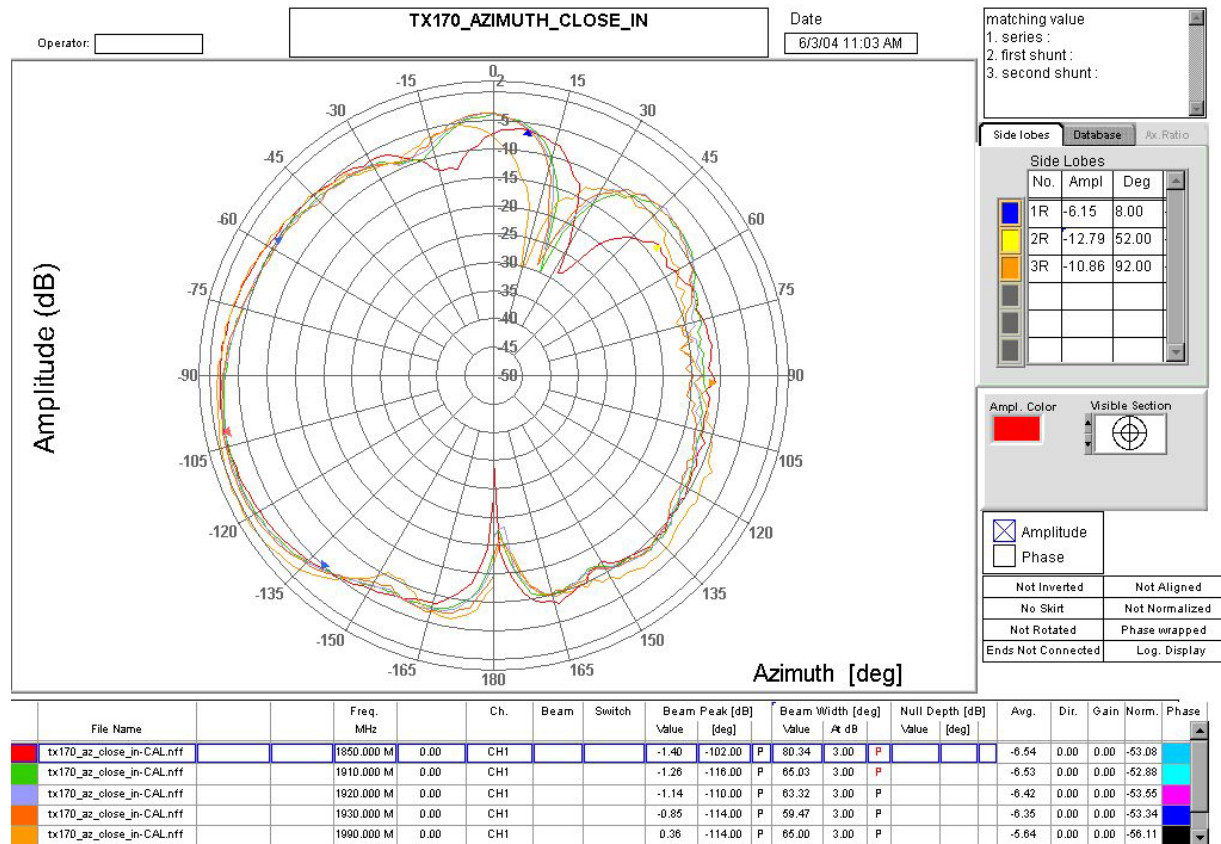
GPS AZIMUTH OPEN OUT





MRW ANTENNA SPECIFICATION	Doc. No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 19/56
Retractable Antenna		

US-PCS AZIMUTH CLOSE IN





MRW ANTENNA SPECIFICATION	Doc.No MRWPQR-14114	Rev. No. 1
	Date 2004.06.03	Page 20/56
Retractable Antenna		

US-PCS AZIMUTH CLOSE OUT

