

## **DataHost II RB Antenna Characterization**

November 14, 2002

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## 1 DataHost II RB Antenna Measurements

### 1.1 Scope

Perform swept signal measurements to characterize various antennas installed in common setups. These measurements will be used in conjunction with in-system characterization to determine the overall performance of each antenna.

## 1.2 Required Equipment

- 1 Network Analyzer (Agilent 8753D)
- 1 3.5mm Calibration Kit (Agilent 85033D)
- 1 RFU (with ASY-0520-05 RFU Backplane installed)
- 2 iDEN RBs (RFN P/N 101-0620-05)
- 1 Piece of RF absorptive foam (R&F Products P/N 4502)
- 1 DataHost II (DH2) RB Mechanical Mockup using RFN PCB-0700-01

Miscellaneous RF cables and connectors

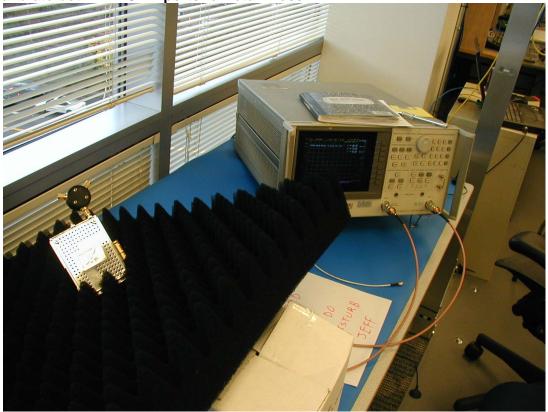
## 1.3 DH2 Assembly and Calibration

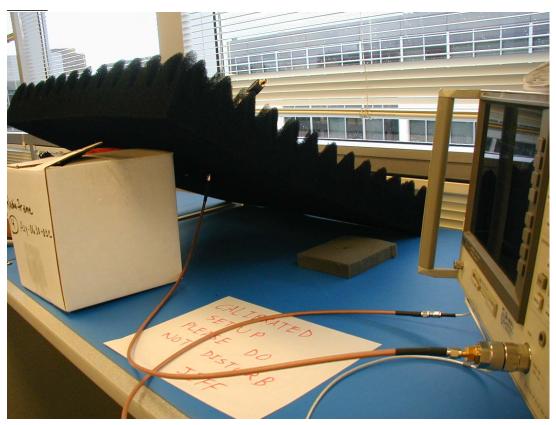
### 1.3.1 Assemble the DH2 RB Mechanical Mockup

1.3.1.1 Connect some semi-rigid cable to both DH2 SMA connectors.



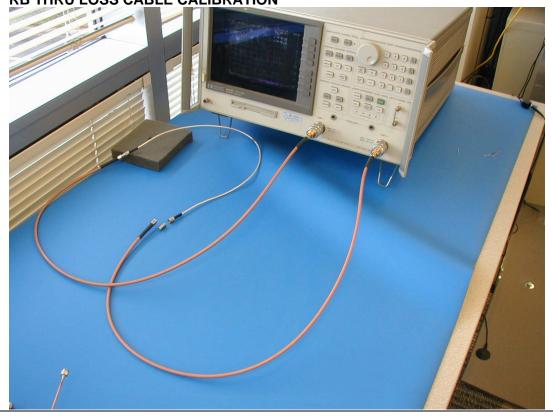
- 1.3.1.2 Install the shield on the DH2 so that it can be removed again if needed. Route the semi-rigid cable connected to the DH2 SMA connector closest to the RB edge connector so that it exits from the corner of the RB closest to the edge connector. Route the semi-cable connected to the DH2 SMA connector furthest from the RB edge connector so that it exits from the corner of the RB that is farthest away from the DH2 SMA connectors.
- 1.3.2 Calibrate the DH2 RB Mechanical Mockup
  - 1.3.2.1 Calibrate both DH2 SMA ports for return loss.

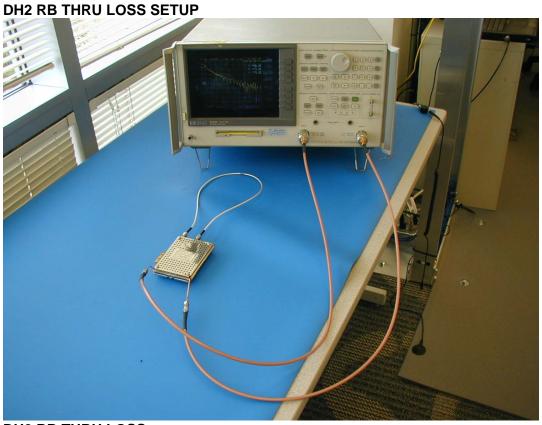




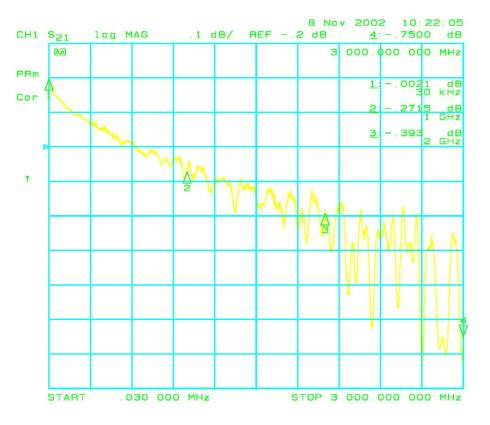
1.3.2.2 Calibrate both DH2 SMA ports for thru loss. RB THRU LOSS CABLE CALIBRATION

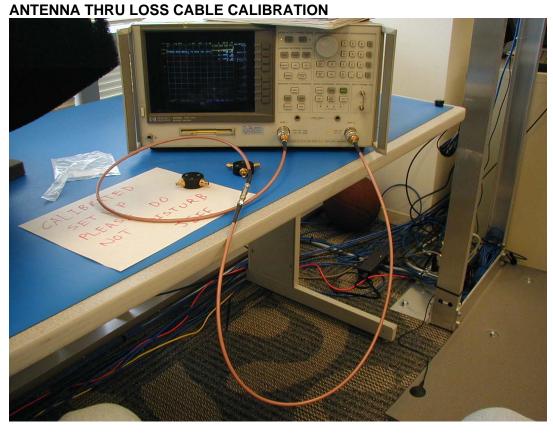






**DH2 RB THRU LOSS** 





### 1.4 Stand-Alone DH2 RB Measurements

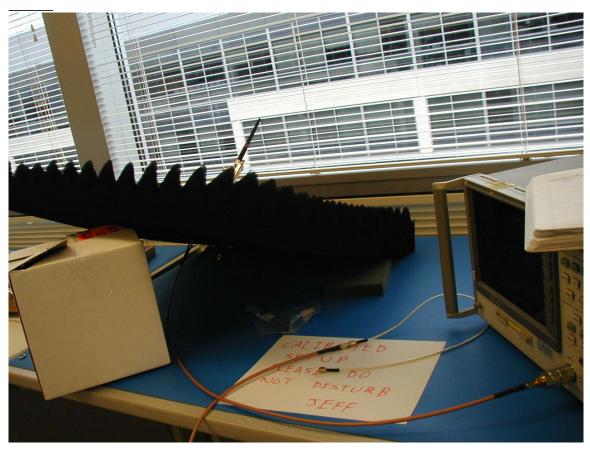
- 1.4.1 Route the semi-rigid cable from the DH2 SMA connectors thru the RF absorptive foam.
- 1.4.2 Install one antenna on the DH2 SMA connector closest to the RB edge connector and measure the return loss with the other terminated into 50 ohms.

#### 1.4.2.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (Unzip and install this HP-GL viewer-> Then double-click on files to view.)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	Antenna #1:	Antenna #1: -15.0dB at 2.4GHz and -21.3dB at 2.5GHz  Antenna #2: -14.3dB at 2.4GHz and -21.8dB at 2.5GHz
Centurio n	WCR2400SM	Antenna #1: 11.00 and 11.0	Antenna #1: -14.2dB at 2.4GHz and -8.5dB at 2.5GHz Antenna #2: -16.6dB at 2.4GHz and -9.7dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1:	Antenna #1: -11.4dB at 2.4GHz and -11.8dB at 2.5GHz Antenna #2: -13.8dB at 2.4GHz and -11.0dB at 2.5GHz
Nearson	S141AM-2450	Antenna #1: 511,00,000,00,000,000,000,000,000,000,00	Antenna #1: -10.2dB at 2.4GHz and -14.4dB at 2.5GHz

Antenna #2: Antenna #2: -12.6dB at 2.4GHz and -18.5dB at 2.5GHz

# 1.4.3 Install one antenna on the DH2 SMA connector furthest from the RB edge connector and measure the return loss with the other terminated into 50 ohms.



1.4.3.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	Antenna #1: Antenna #2:	Antenna #1: -13.0dB at 2.4GHz and -21.3dB at 2.5GHz Antenna #2: -12.8dB at 2.4GHz and -21.2dB at 2.5GHz
Centurio n	WCR2400SM	Antenna #1: alacamaca antenna #1: alacamaca antenna #1: alacamaca antenna #1: alacamaca antenna #2: alacamaca antenna #2: alacamaca antenna #2: alacamaca antenna #2: alacamaca antenna antenna #2: alacamaca antenna	Antenna #1: -9.6dB at 2.4GHz and -5.7dB at 2.5GHz Antenna #2: -10.3dB at 2.4GHz and -6.3dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1: ***********************************	Antenna #1: -12.0dB at 2.4GHz and -12.7dB at 2.5GHz Antenna #2: -14.5dB at 2.4GHz and -11.7dB at 2.5GHz

Nearson	S141AM-2450	Antenna #1: SILLOC RONG, N 571.2C. RONG, NU ARCOC, STRIANS RE RECOL, STRIANS RECOL.	Antenna #1: -10.1dB at 2.4GHz and -16.5dB at 2.5GHz
		Antenna #2: 11100 Rame, 18 11.02 Ram	Antenna #2: -12.5dB at 2.4GHz and -21.9dB at 2.5GHz

# 1.4.4 Install Antenna #1 on the DH2 SMA connector closest to the RB edge connector and Antenna #2 on the DH2 SMA connector furthest from the RB edge connector.

# 1.4.4.1 Measure the return loss at the DH2 SMA connector closest to the RB edge connector with the other terminated into 50 ohms.

#### 1.4.4.1.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	STANDARD TO SECTION AND WILLIAMS AND	-16.8dB at 2.4GHz and -13.4dB at 2.5GHz
Centurio n	WCR2400SM	51 LEC (Blook) 7 131 X; SBON) TW WO_ANT, CANTED 0_ANT, CENTROLS	-10.0dB at 2.4GHz and -7.8dB at 2.5GHz
Nearson	S331AM-2450	STL DOS PROBLET STL SC. Eller (P. TW WO, ANT C. MONTON C. ANT S. MARSON.)	-19.4dB at 2.4GHz and -8.2dB at 2.5GHz
Nearson	S141AM-2450	STLUCK, SHOW, T STLER, SHOW, TW WO, WITE, MARKSON O, ANTE, MARKSON J	-9.8dB at 2.4GHz and -20.2dB at 2.5GHz

## 1.4.4.2 Measure the return loss at the DH2 SMA connector furthest from the RB edge connector with the other terminated into 50 ohms.

### 1.4.4.2.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	IN THE PARTY OF TH	-12.2dB at 2.4GHz and -15.5dB at 2.5GHz
Centurio n	WCR2400SM	\$1,1,0,0,000,7 311.54,0000,700 wip,pers_carries 0_pers_carries	-9.4dB at 2.4GHz and -5.9dB at 2.5GHz
Nearson	S331AM-2450	STL_LOC, Standy_T STL_ST, Standy_TW WO_ANTS_NEARGOO O_ANTS_NEARGON,	-42.6dB at 2.4GHz and -7.9dB at 2.5GHz
Nearson	S141AM-2450	51 (1.65 (mm), 7 st. 55 (mm), 70 (m),	-11.9dB at 2.4GHz and -27.3dB at 2.5GHz



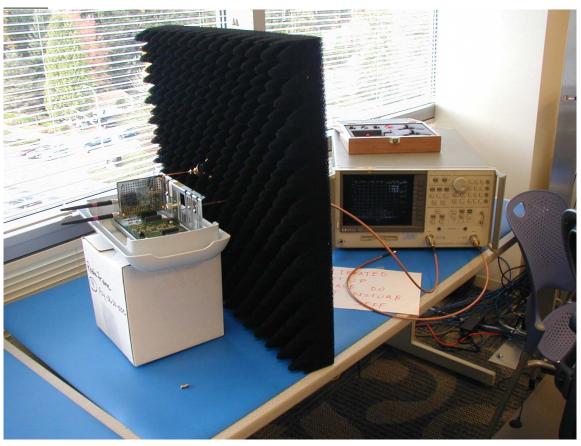
### 1.4.4.3 Measure the thru loss between the two DH2 SMA connectors.

1.4.4.3.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files	Thru Loss Data Summary
		to view)	(Added ~0.5dB due to DH2 RB THRU LOSS)
Linx	ANT-2.4-RCT- SS	to John Too, and United State of the	-11.2dB at 2.4GHz and -10.5dB at 2.5GHz
Centurio n	WCR2400SM	U. Jac., 200, ard U. Jacon, 200 and U. Jacon, 200 and	-8.9dB at 2.4GHz and -11.1dB at 2.5GHz
Nearson	S331AM-2450	SST, LOC, TWO, ANT S, Rikenny, MARSCH	-7.4dB at 2.4GHz and -9.4dB at 2.5GHz
Nearson	S141AM-2450	SET_SOC_TWO_ANT S_BROOK_F_STANDERS	-9.8dB at 2.4GHz and -8.7dB at 2.5GHz

## 1.5 DH2 RB Installed in an RFU without iDEN RBs Measurements

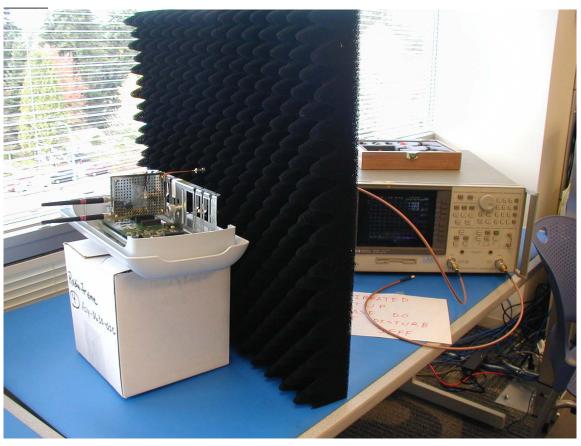
- 1.5.1 Install the DH2 Mechanical Mockup into an RFU.
- 1.5.2 Route the cable or cables connecting the Network Analyzer to the semi-rigid cable or cables thru the RF absorptive foam.
- 1.5.3 Install one antenna on the DH2 SMA connector closest to the RB edge connector and measure the return loss with the other terminated into 50 ohms.



1.5.3.1 Data Table

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Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	Antenna #1:	Antenna #1: -10.8dB at 2.4GHz and -16.6dB at 2.5GHz Antenna #2: -9.6dB at 2.4GHz and -19.5dB at 2.5GHz
Centurio n	WCR2400SM	Antenna #1:	Antenna #1: -12.2dB at 2.4GHz and -6.7dB at 2.5GHz Antenna #2: -13.5dB at 2.4GHz and -8.0dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1:	Antenna #1: -12.3dB at 2.4GHz and -11.1dB at 2.5GHz Antenna #2: -15.3dB at 2.4GHz and -10.0dB at 2.5GHz
Nearson	S141AM-2450	Antenna #1:	Antenna #1: -9.6dB at 2.4GHz and -18.9dB at 2.5GHz Antenna #2: -11.3dB at 2.4GHz and -24.8dB at 2.5GHz

# 1.5.4 Install one antenna on the DH2 SMA connector furthest from the RB edge connector and measure the return loss with the other terminated into 50 ohms.



1.5.4.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT-	Antenna #1: STLOCHINGUE STLOCHINGUE STLOCHINGUE STROCHING	Antenna #1: -11.0dB at 2.4GHz and –29.0dB at 2.5GHz
	SS	Antenna #2:	Antenna #2: -10.0dB at 2.4GHz and -24.9dB at 2.5GHz
Centurio	WCR2400SM	Antenna #1: 51 LOC GREGIUM 511 L.C. SERESTURA	Antenna #1: -11.2dB at 2.4GHz and -5.8dB at 2.5GHz
n		Antenna #2:	Antenna #2: -12.5dB at 2.4GHz and -6.4dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1: x1,10,1 marin 11, 20,10 marin 11,	Antenna #1: -11.8dB at 2.4GHz and -12.7dB at 2.5GHz
		Antenna #2:	Antenna #2: -14.9dB at 2.4GHz and -11.5dB at 2.5GHz
Nearson	S141AM-2450	Antenna #1: structure stru	Antenna #1: -10.0dB at 2.4GHz and -17.9dB at 2.5GHz
		Antenna #2: state to the control of	Antenna #2: -11.5dB at 2.4GHz and -21.3dB at 2.5GHz

# 1.5.5 Install Antenna #1 on the DH2 SMA connector closest to the RB edge connector and Antenna #2 on the DH2 SMA connector furthest from the RB edge connector.

## 1.5.5.1 Measure the return loss at the DH2 SMA connector closest to the RB edge connector with the other terminated into 50 ohms.

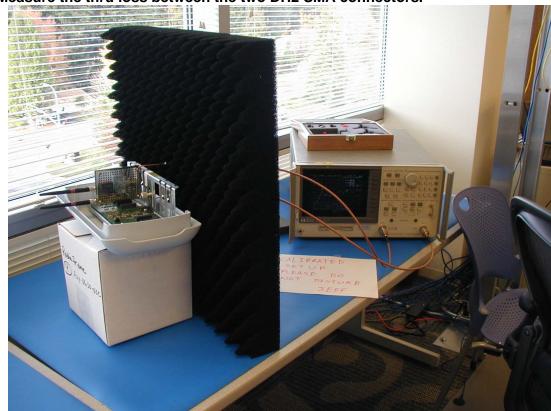
#### 1.5.5.1.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	117, 25 marries 111, 27 marrie	-12.9dB at 2.4GHz and -12.2dB at 2.5GHz
Centurio n	WCR2400SM	STI, Commercion STI, Commissional efficiency, Teccyol Charles, Teccyol Charles, Teccyol St	-9.7dB at 2.4GHz and -5.9dB at 2.5GHz
Nearson	S331AM-2450	STILLE THEFTON STILL STEEL SHARE SHARE AND SHARE AND SHARE SHARE TWO JAN'S	-19.8dB at 2.4GHz and -8.3dB at 2.5GHz
Nearson	S141AM-2450	STI_SCS_SEMBOUND STI_SC_marketed accesses_TWO_MS	-10.0dB at 2.4GHz and -19.9dB at 2.5GHz

## 1.5.5.2 Measure the return loss at the DH2 SMA connector furthest from the RB edge connector with the other terminated into 50 ohms.

#### 1.5.5.2.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	TO AND ADMINISTRATION OF THE PROPERTY OF THE P	-14.3dB at 2.4GHz and -16.5dB at 2.5GHz
Centurio n	WCR2400SM	511 (200, 2000) 200 11 22, 200000000 000000000, 2000, 300 20000, 2000, 2000, 2000, 2000	-10.4dB at 2.4GHz and -5.6dB at 2.5GHz
Nearson	S331AM-2450	511_ECC_UNISTINE 511_SC_EMISTINGS eCCENNE_TWO_ANT CENNER_TWO_ANTS	-26.5dB at 2.4GHz and -8.3dB at 2.5GHz
Nearson	S141AM-2450	511_EGS_SHIPETURE STL_SS_SHIPETURED and COCKRE, TWO_ANT COCKRE, TWO_ANTS.	-11.0dB at 2.4GHz and –27.3dB at 2.5GHz



### 1.5.5.3 Measure the thru loss between the two DH2 SMA connectors.

1.5.5.3.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Thru Loss Data Summary (Added ~0.5dB due to DH2 RB THRU LOSS)
Linx	ANT-2.4-RCT- SS	ST, LOCATION, AND ST, LOCATION AND ST, MANAGEMENT AND	-11.1dB at 2.4GHz and -10.4dB at 2.5GHz
Centurio n	WCR2400SM	ST, LOC, THE ART S, MINISTERIORS	-10.2dB at 2.4GHz and -11.9dB at 2.5GHz
Nearson	S331AM-2450	SET_MOD_FROM_ARTS  1_ SERVICE CONSTRUCTED	-7.4dB at 2.4GHz and -10.0dB at 2.5GHz
Nearson	S141AM-2450	SST 1, BGC, THER, AND 1 S. Jillin ARR SHOULD SEN SE	-9.2dB at 2.4GHz and -8.7dB at 2.5GHz

### 1.6 DH2 RB Installed in an RFU with iDEN RBs Measurements

- 1.6.1 Install the 2 iDEN RBs into the adjacent slots around the DH2 RB in the RFU.
- 1.6.2 Install one antenna on the DH2 SMA connector closest to the RB edge connector and measure the return loss with the other terminated into 50 ohms.

1.6.2.1 Data Table

ina Antenna P/N HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
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Linx	ANT-2.4-RCT-	Antenna #1: III. SOLUTION IN STILE SANGELINE AND ANTENNA HIGHWAY IN CONTROL LINE AND ANTENNA HIGHWAY I	Antenna #1: -9.1dB at 2.4GHz and -16.9dB at 2.5GHz
	SS	Antenna #2:	Antenna #2: -7.9dB at 2.4GHz and -20.9dB at 2.5GHz
Centurio	WCR2400SM	Antenna #1: 511_LOC REINSTON 311_RC_REINSTON AND REINSTON	Antenna #1: -9.3dB at 2.4GHz and -6.1dB at 2.5GHz
n		Antenna #2:	Antenna #2: -10.3dB at 2.4GHz and -6.7dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1: 11.00.00000 11.000000 11.000000	Antenna #1: -11.7dB at 2.4GHz and -10.4dB at 2.5GHz
		Antenna #2: ##################################	Antenna #2: -14.6dB at 2.4GHz and -9.3dB at 2.5GHz
Nearson	S141AM-2450	Antenna #1:	Antenna #1: -9.7dB at 2.4GHz and -20.1dB at 2.5GHz
		Antenna #2: Maria	Antenna #2: -11.2dB at 2.4GHz and –28.7dB at 2.5GHz

# 1.6.3 Install one antenna on the DH2 SMA connector furthest from the RB edge connector and measure the return loss with the other terminated into 50 ohms.

#### 1.6.3.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT-	Antenna #1: 111,00,780,000 111,00,780,000	Antenna #1: -11.0dB at 2.4GHz and -21.0dB at 2.5GHz
	SS	Antenna #2:	Antenna #2: -9.1dB at 2.4GHz and –25.0dB at 2.5GHz
Centurio	WCR2400SM	Antenna #1: 11 Les Gentles ST. L. MILLER ST. MILLER ST. L. MILLER ST. MILL	Antenna #1: -9.9dB at 2.4GHz and -5.1dB at 2.5GHz
n		Antenna #2:	Antenna #2: -11.1dB at 2.4GHz and -5.5dB at 2.5GHz
Nearson	S331AM-2450	Antenna #1: St. LOG BERGE ST. ST. CO.	Antenna #1: -10.0dB at 2.4GHz and -14.1dB at 2.5GHz
		Antenna #2:	Antenna #2: -11.8dB at 2.4GHz and -12.9dB at 2.5GHz
Nearson	S141AM-2450	Antenna #1: 51,100,84065611 31,4406611	Antenna #1: -9.9dB at 2.4GHz and -18.0dB at 2.5GHz
		Antenna #2:	Antenna #2: -11.5dB at 2.4GHz and -23.0dB at 2.5GHz

# 1.6.4 Install Antenna #1 on the DH2 SMA connector closest to the RB edge connector and Antenna #2 on the DH2 SMA connector furthest from the RB edge connector.

# 1.6.4.1 Measure the return loss at the DH2 SMA connector closest to the RB edge connector with the other terminated into 50 ohms.

1.6.4.1.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	TO LOCK COMMISSION OF LOCK COMMISSION OF STREET OF STREE	-11.5dB at 2.4GHz and -13.0dB at 2.5GHz
Centurio n	WCR2400SM	11 (Section 1) In Section 1	-8.5dB at 2.4GHz and -5.7dB at 2.5GHz

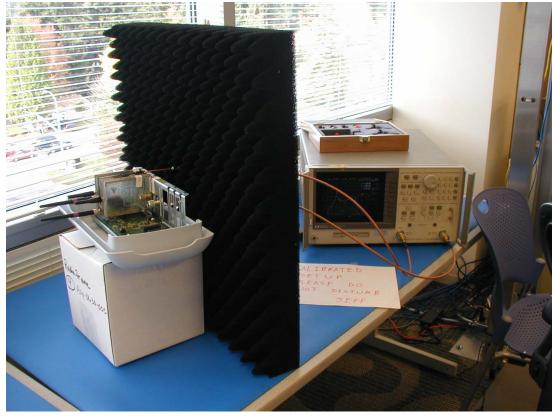
Nearson	S331AM-2450	ST. LEC. GARGINE STILL SECTION AND THE STILL	-19.5dB at 2.4GHz and -8.4dB at 2.5GHz
Nearson	S141AM-2450	ST. SEC. J. CHETCH. ST. S. S. SHOPE-Unit THE CHEST OF THE CHEST OF THE CHEST. TWO, AN	-10.3dB at 2.4GHz and -19.8dB at 2.5GHz

# 1.6.4.2 Measure the return loss at the DH2 SMA connector furthest from the RB edge connector with the other terminated into 50 ohms.

#### 1.6.4.2.1 Data Table

Antenna Supplier	Antenna P/N	HP-GL Data Files (double-click on files to view)	Return Loss Data Summary
Linx	ANT-2.4-RCT- SS	21 (20, 2000) 11 (20, 2000) 9100000, 100, 20 (2000, 700, 20	-11.7dB at 2.4GHz and –15.2dB at 2.5GHz
Centurio n	WCR2400SM	ST LOCATION OF THE ASSESSMENT OF THE STATE O	-10.4dB at 2.4GHz and -5.1dB at 2.5GHz
Nearson	S331AM-2450	511,555, streether 51,55, securities nichtschaft, 7100,34 nichtelle, 7100,34 nichtelle, 7100,34	-18.3dB at 2.4GHz and -9.2dB at 2.5GHz
Nearson	S141AM-2450	511, 365, 50-6850p. 31, 22, 400mmin. 915CA466, 7100, 30 1005A666, 7100, 301	-10.9dB at 2.4GHz and –23.6dB at 2.5GHz

### 1.6.4.3 Measure the thru loss between the two DH2 SMA connectors.



1.6.4.3.1 Data Table

Antenna	Antenna P/N	HP-GL Data Files	Thru Loss Data Summary
Supplier		(double-click on files to view)	(Added ~0.5dB due to DH2 RB THRU LOSS)

Linx	ANT-2.4-RCT- SS	SZ (Jacob Polyage) S. galadi novediča	-9.9dB at 2.4GHz and -9.4dB at 2.5GHz
Centurio n	WCR2400SM	57 (36, 710, AV 5, glood connection	-10.4dB at 2.4GHz and -12.4dB at 2.5GHz
Nearson	S331AM-2450	ST JACK, MIN, AND 3. REMOTERATION	-7.2dB at 2.4GHz and -10.2dB at 2.5GHz
Nearson	S141AM-2450	SZY JOG, THO, JAYT S, RIBINSFOUNDERN	-9.2dB at 2.4GHz and -8.9dB at 2.5GHz