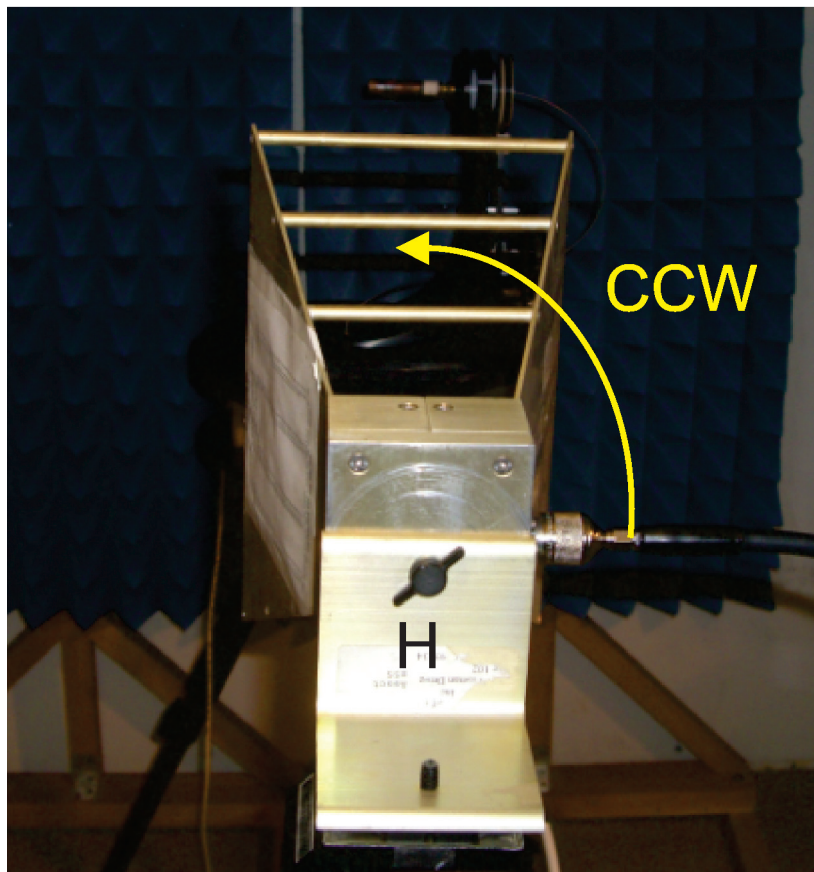


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# Measuring a Left Hand Circular Double Helix

## Application Note

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## Overview

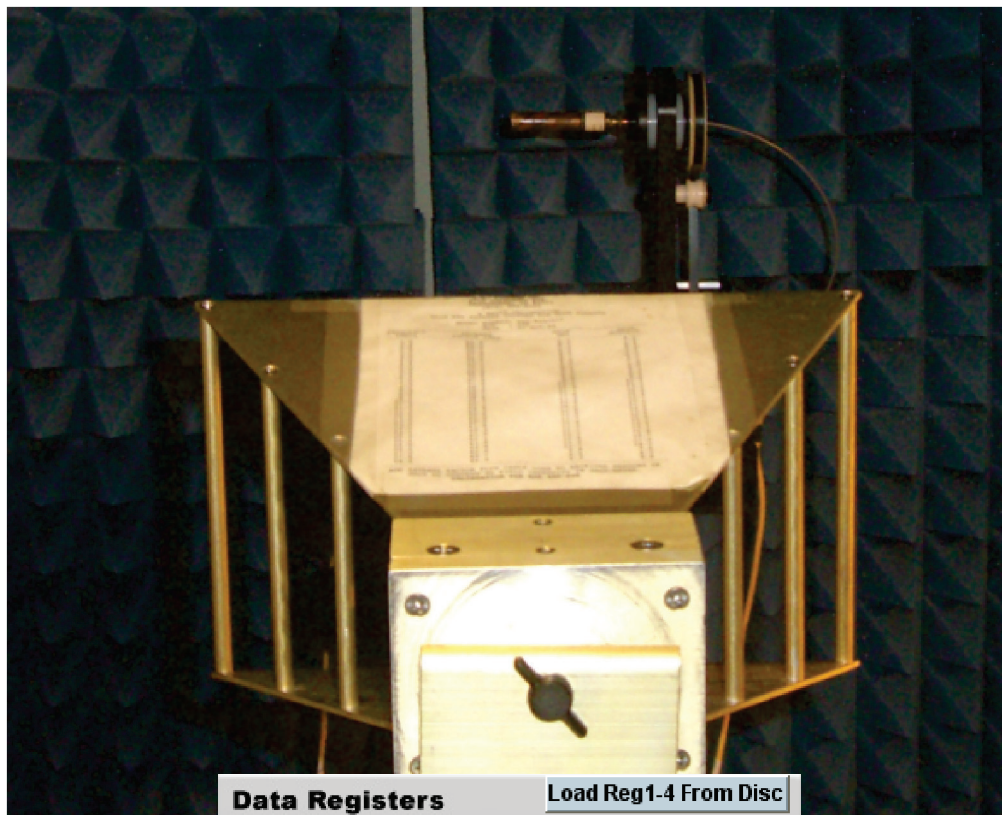
Using the horizontal-vertical (H-V) method the Helix left-hand circle (LHC) and right-hand circle (RHC) will be measured.



*Helix twists clockwise creating a left-hand circle (LHC)*

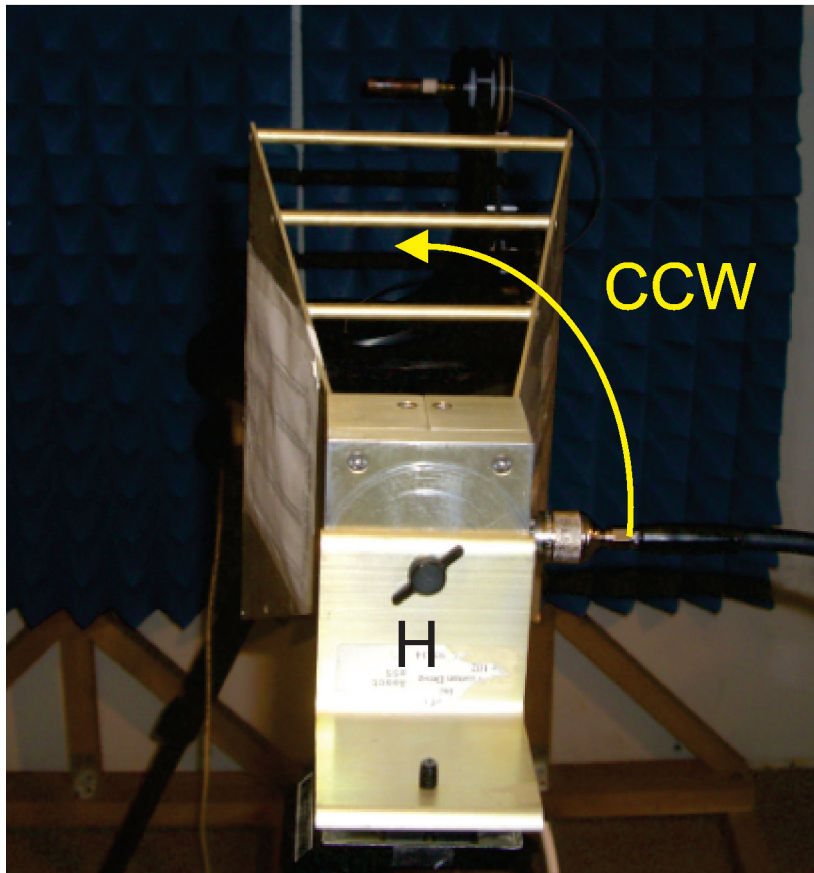
## Instructions

First, measure AUT with Horn in vertical position and save that data to **REG1**.



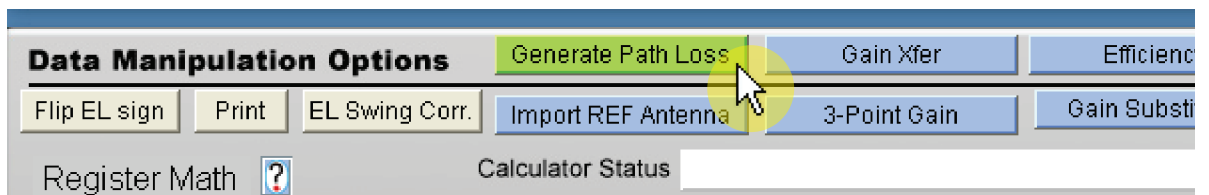
Data Registers			Load Reg1-4 From Disc
REGISTER UTILITIES			Save Reg1-4 To Disc
CLR	Data Storage Reg 1	Recall Reg 1	# Measurements 7437
V 1/27/2010 9:23:11 AM			

Next, Rotate Reference Horn 90 deg counter clock-wise, repeat measurement and save data to **REG2**.

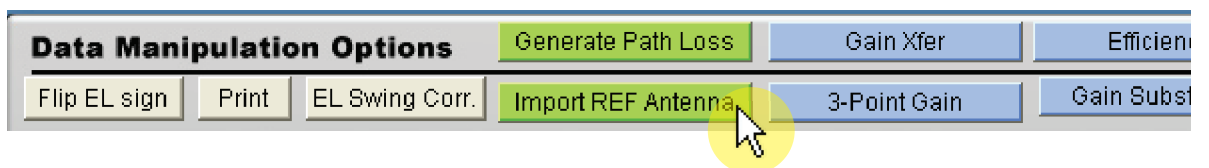


**NOTE:** Incorrect rotation of the reference horn will switch LHC and RHC. The DAMs is set up for CCW rotation. Vertical orientation is arbitrary. The difference between the H and V measurement must be 90 deg.

Now invoke the Path Loss calculator and specify the appropriate figures. Once completed, ensure the "**Generate Path Loss**" button is green as shown below. The green signifies that the data has been saved internally.



Once completed, invoke the "**Import REF Antenna**" button to load the appropriate calibration data. Again, verify this button has also now turned green as shown below:



**Continues next page...**

Invoke Gain Xfer and specify Circular Gain

Gain Transfers

**Calculate Gain(AUT) from Calibrated Reference And Path Loss**

$$G_{AUT} = \frac{[S_{21}^2]}{[G_{REF}]} \left(\frac{\lambda}{4\pi d}\right)^{-2}$$

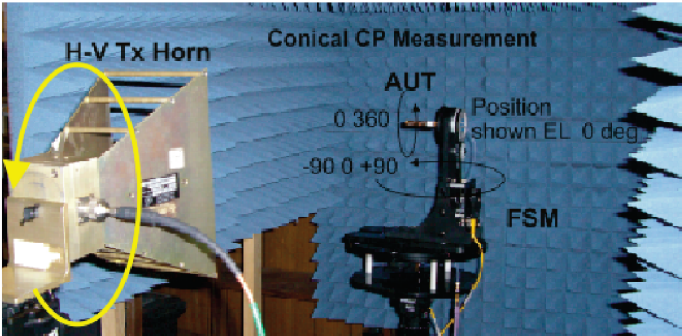
Linear Gain Requirements:

1. Measurement Data Saved to REG1
2. Invoke path loss (Sets internal variable)
3. Import Tx Gain (Sets internal variable)
4. Invoke "Calculate AUT Linear Gain = REG4&0"

Phase: Principal phase ( 0 to 180 and 0 to -180) is also calculated

Circular Gain Requirements Using H-V Linear Tx Horn with FSM Mount:

IMPORTANT: Rotate horn CCW to make H measurement,  
RCH is relevant to the AUT



View Application Note

Calculate Linear AUT Gain = REG4&0

Calculate Circular Gain using H & V Linear Tx

Cancel

Data Registers			Load Reg1-4 From Disc
REGISTER UTILITIES			Save Reg1-4 To Disc
			# Measurements
CLR	Data Storage Reg 1	Recall Reg 1	7437
	REG1 is CCW V (AUT) Linear Gain		
CLR	Data Storage Reg 2	Recall Reg 2	7437
	REG2 is CCW H(AUT) Linear Gain		
CLR	Data Storage Reg 3	Recall Reg 3	7437
	REG3 is CCW LHC Linear Gain		
CLR	Data Storage Reg 4	Recall Reg 4	7437
	REG4 is CCW RHC Linear Gain		

**REG Output of Gain Xfer**

**REG1 is V Gain**

**REG2 is H Gain**

**REG3 is LHC Gain**

**REG4 is RHC Gain**

*Continues next page...*

Use KEEP, Normalize and Don't Plot to compare LHC RHC



Scale to 20Log

Set Marker contour and position markers to measure LHC RHC difference