

# **Field Service Report**

## **FM Combiner and Antenna System**

Minneapolis, MN. IDS Center  
SHPX-12BC-HW-SP Axiom Auxiliary Site  
Shively Combiner and ERI Antenna System

92.5 MHz. ~ 93.7 MHz.  
97.1 MHz. ~ 98.5 MHz.  
99.5 MHz. ~ 100.3 MHz.  
101.3 MHz. ~ 102.1 MHz.  
104.1 MHz.

ERI Project # 20853

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## **INTRODUCTION**

Listed below is a summary of the data and attached are the plots collected from the IDS Center transmission site in Minneapolis, MN. by Jeff Taylor May 29, 2008. The reason for this Field Service Trip was to measure and tune the Axiom antenna.

- The antenna is an SHPX-12BC-HW-SP and ERI MACXLine (6 1/8").
- The combiner is a Shively (Constant Impedance)
- Equipment used for testing is an HP8753 Network Analyzer (High RF setup)
- All antenna measurements were taken at the elbow located five feet away from the combiner.
- All measurements are in VSWR format per George Werl.
- All filter to antenna measurements were taken at the input of the fine tuners for each combiner module. All adjustments on the fine tuners were made by George Werl.

## **SUMMARY and RECOMMENDATIONS**

No tuning was completed at this time due to an insufficient amount of feed line for multi slug tuning. Improvements on the antenna match were calculated as shown in figure #1 by installing forty feet of line at the ice bridge and another hundred and twenty feet at the output of the combiner. The additional lines need to be installed in these specific areas to allow access to install the tuning slugs.

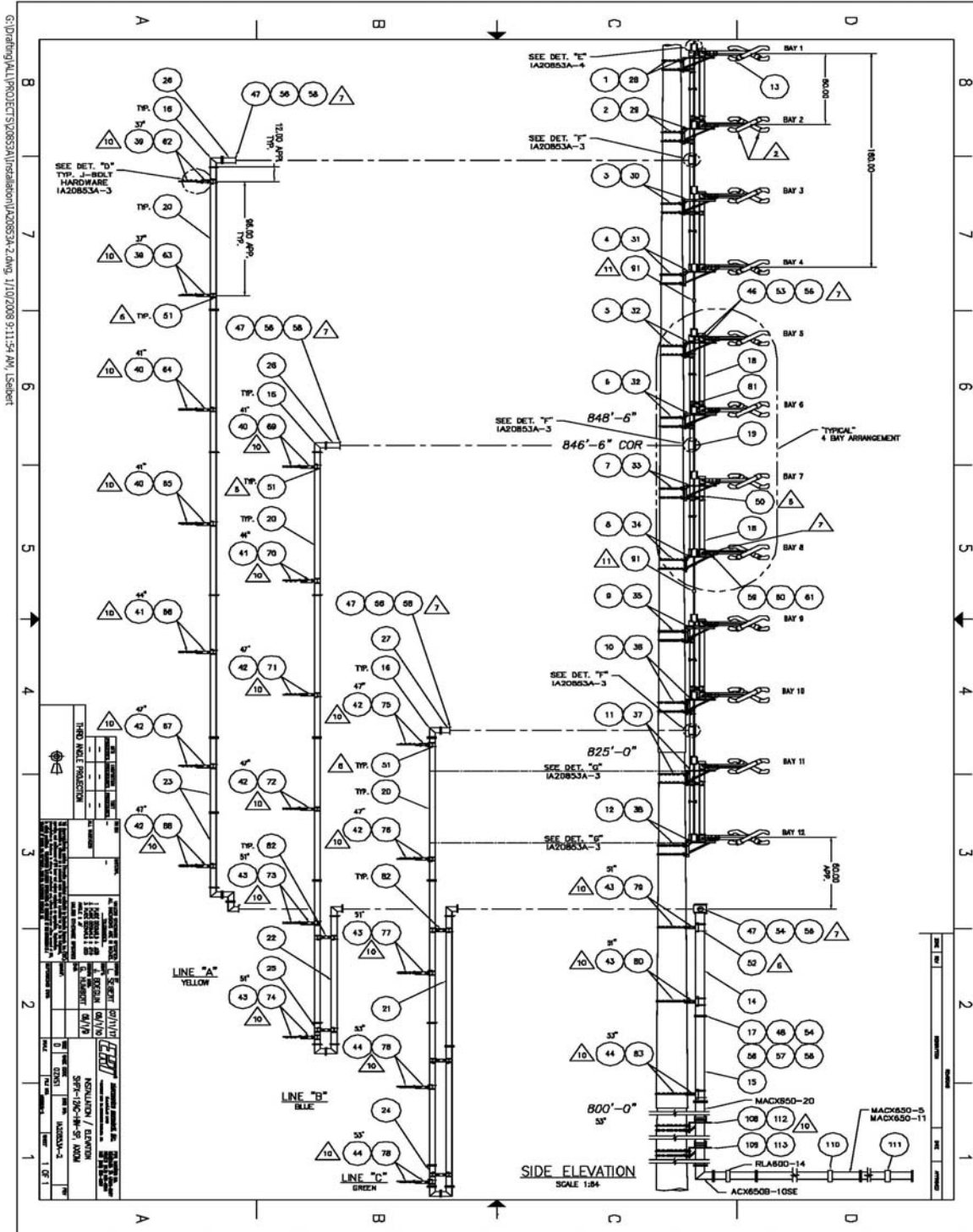
All measurements were taken by Jeff Taylor of Electronics Research Inc. May, 2008.

Sincerely

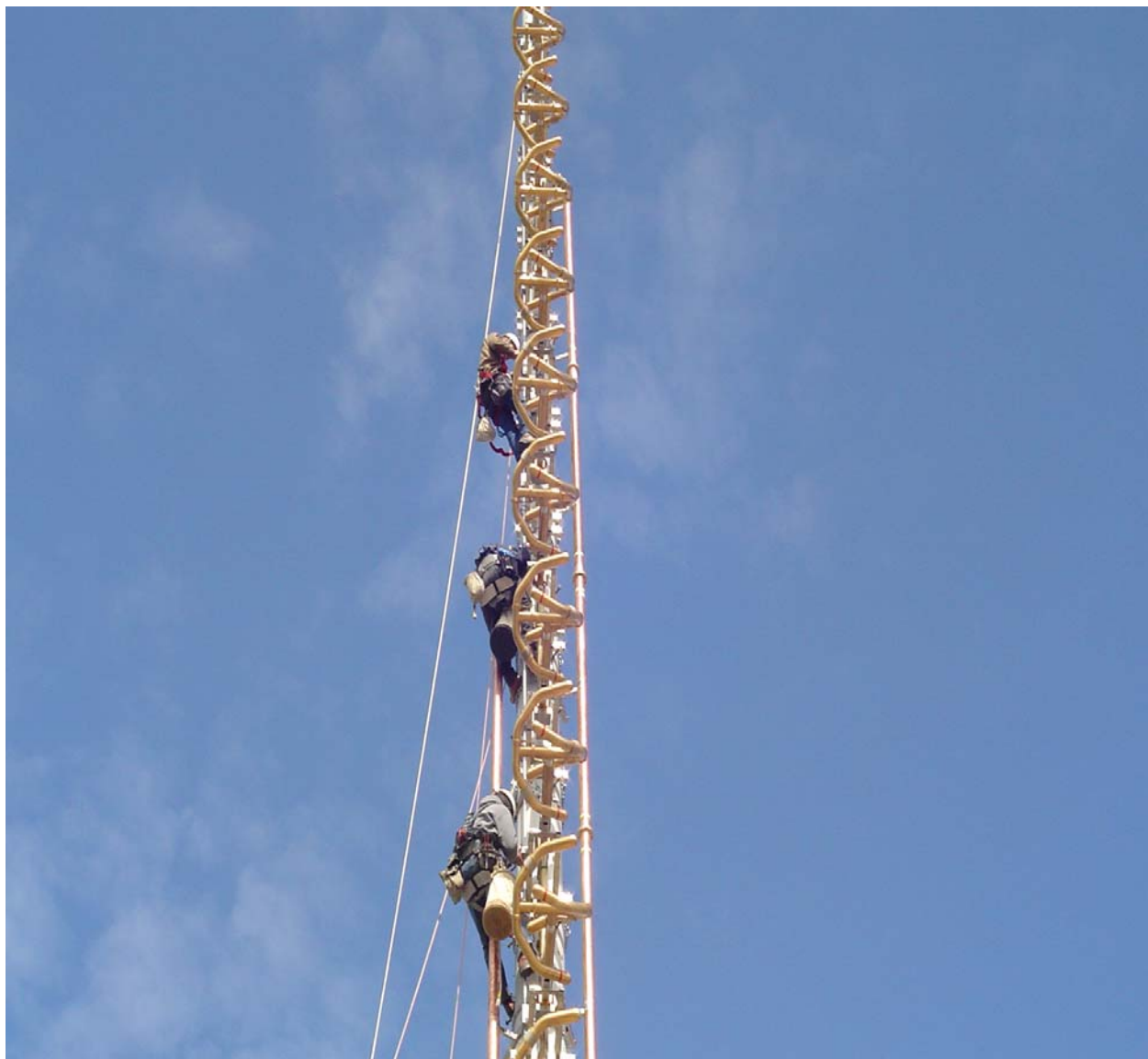
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Jeff Taylor

## DRAWINGS



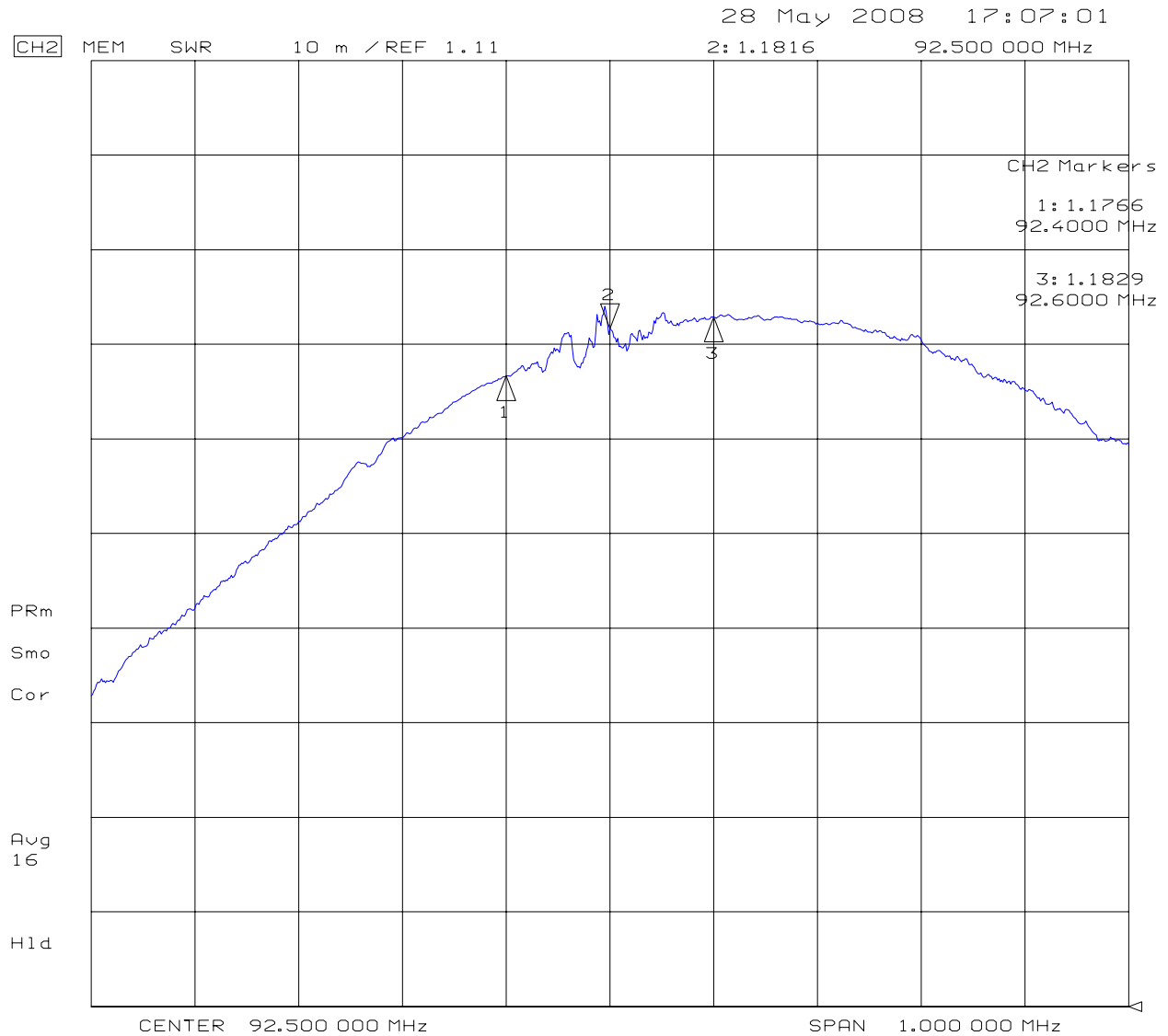
**Photo 1: Antenna Stacked on Pole**



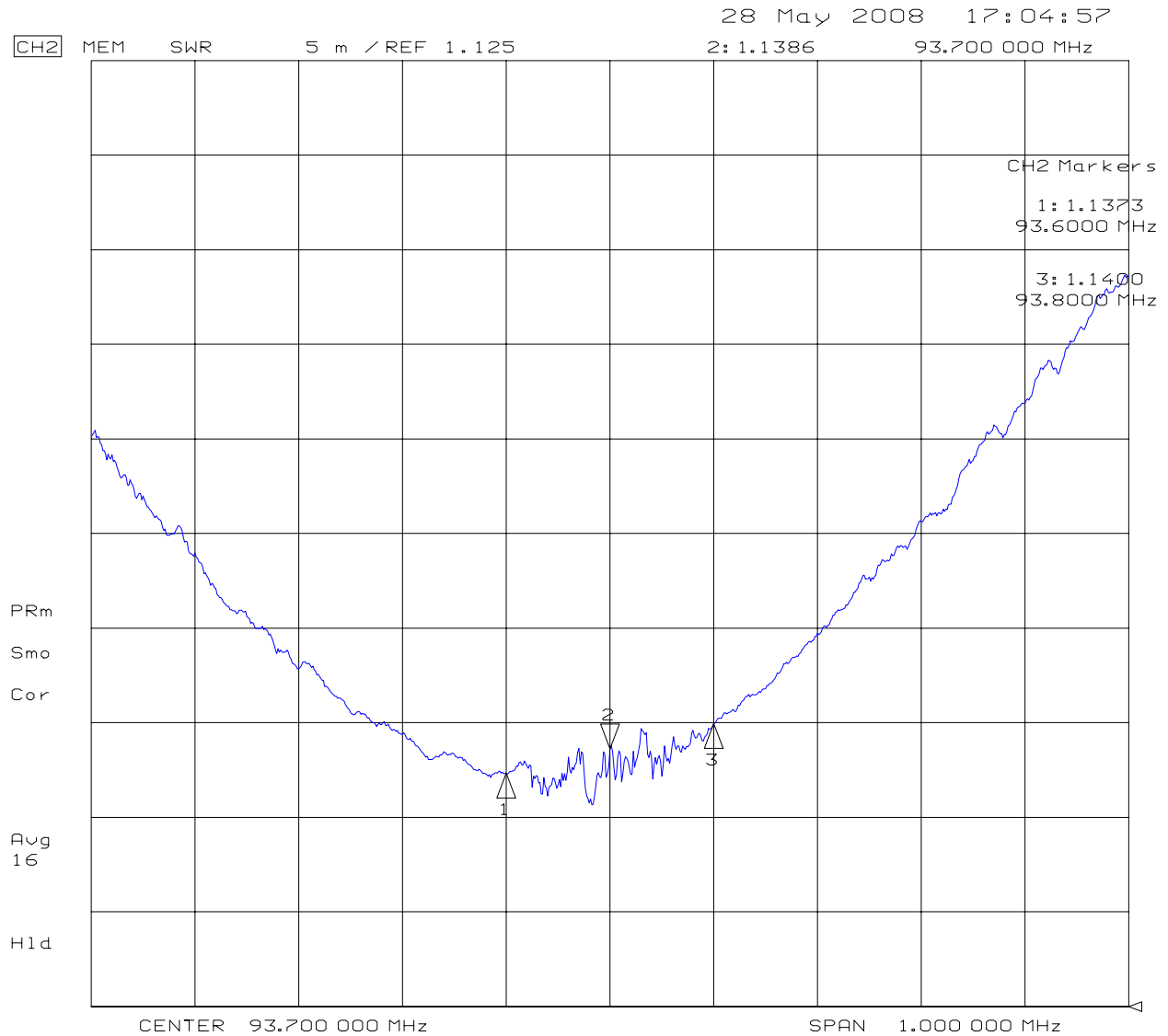
**Photo 2: Final assembly of antenna ~ deicer wiring.**



## Measurement 1: Final Antenna Match of 92.5 MHz.



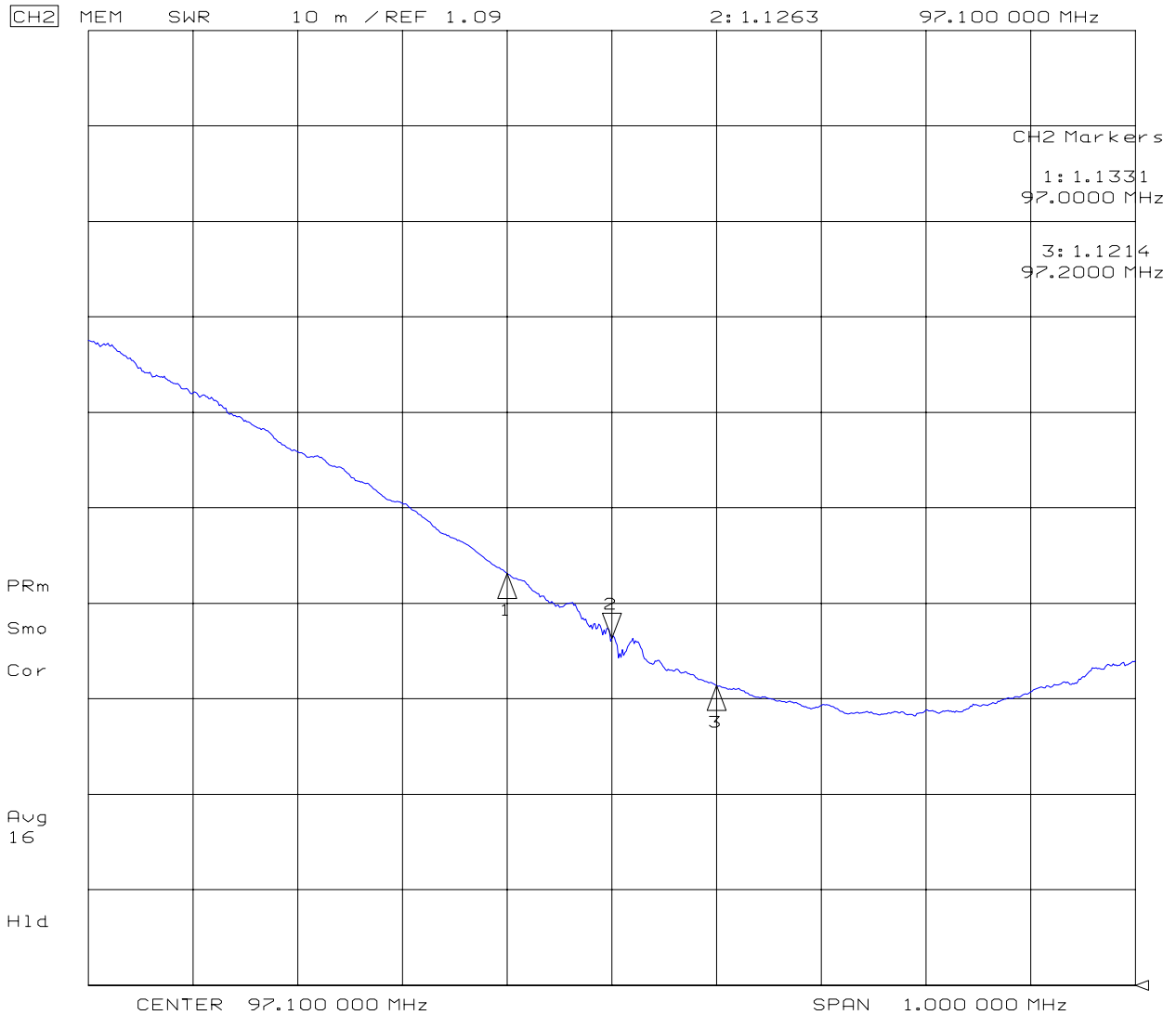
## Measurement 2: Final Antenna Match of 93.7 MHz.



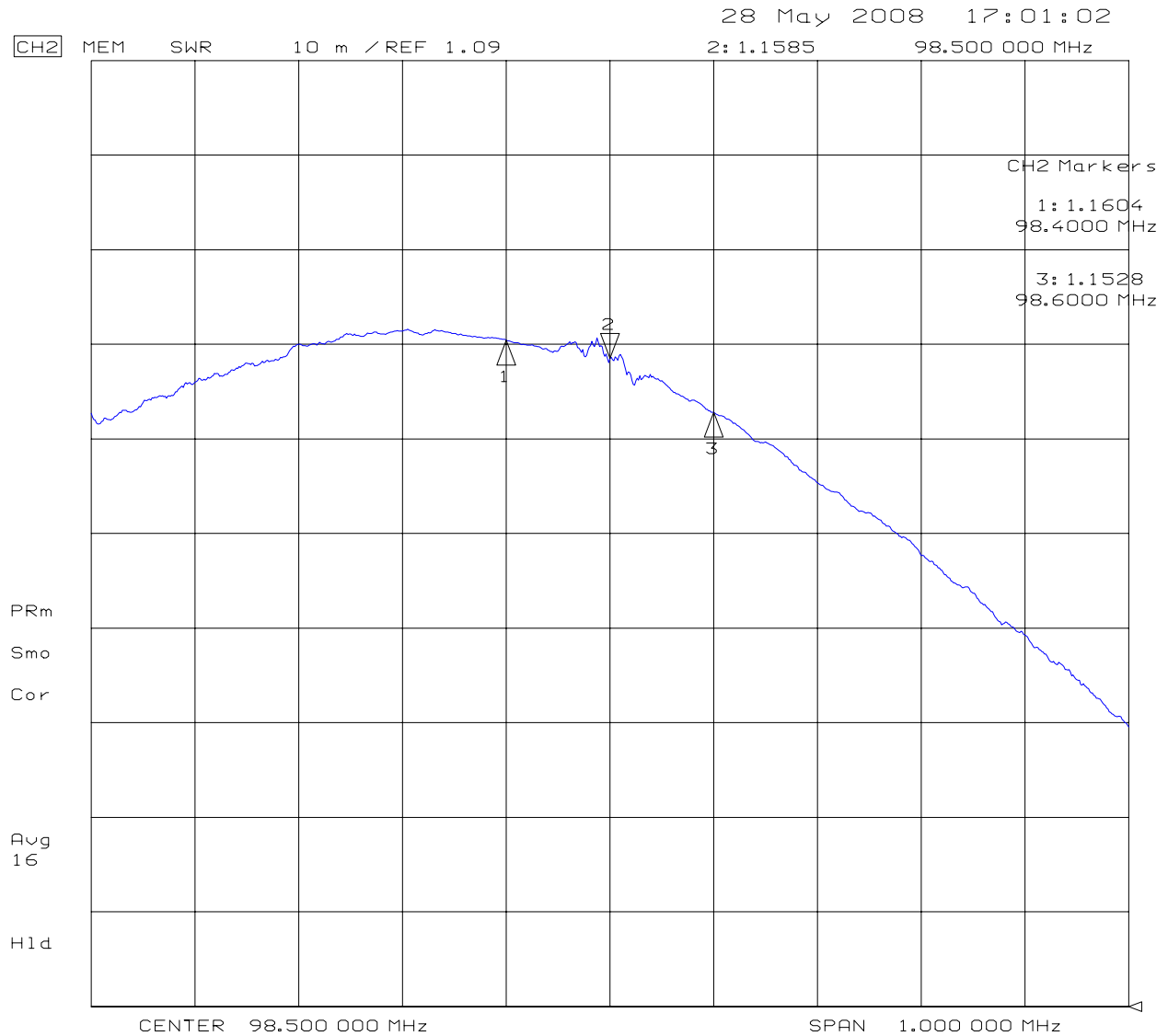


### Measurement 3: Final Antenna Match of 97.1 MHz.

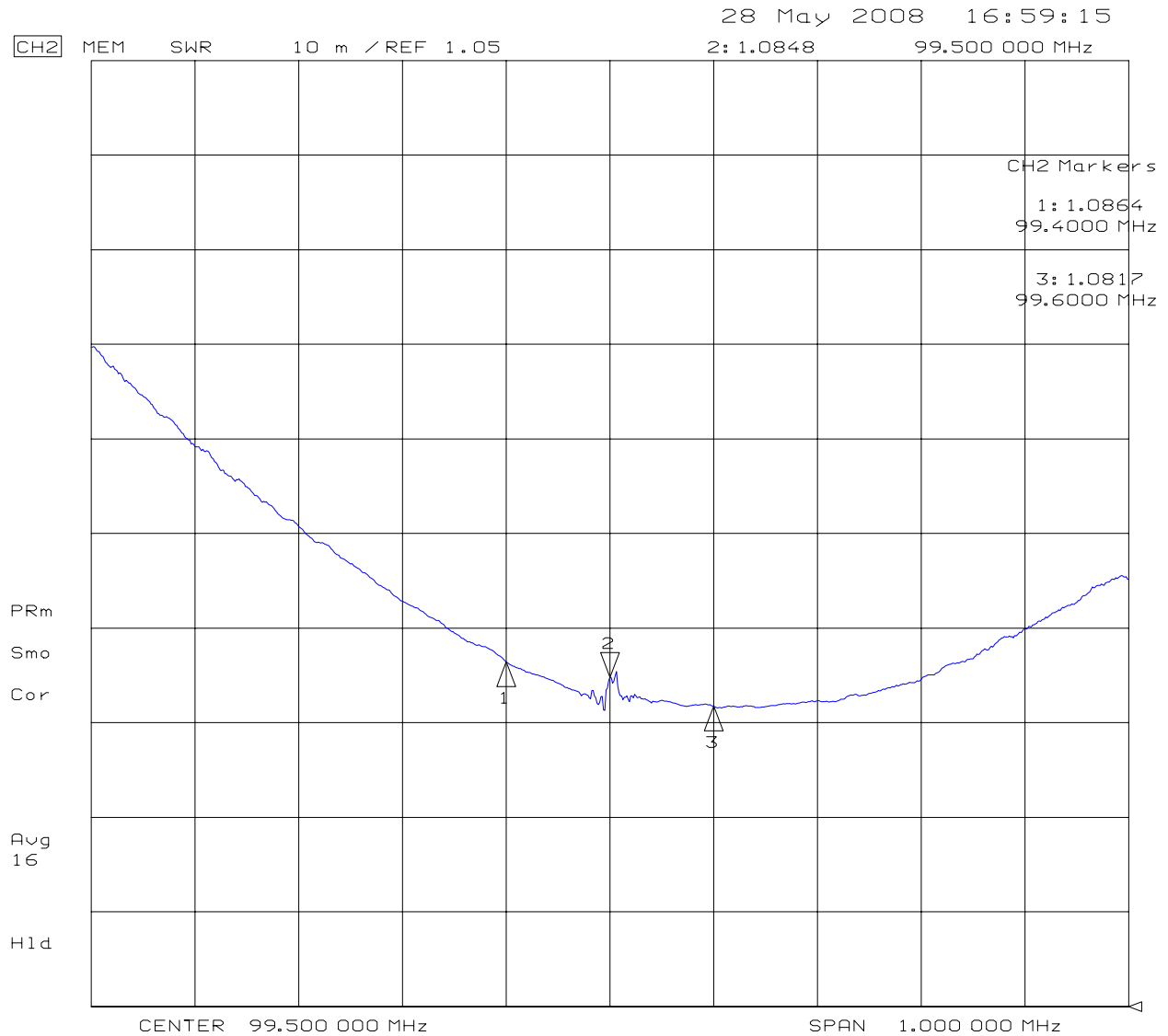
28 May 2008 17:02:58



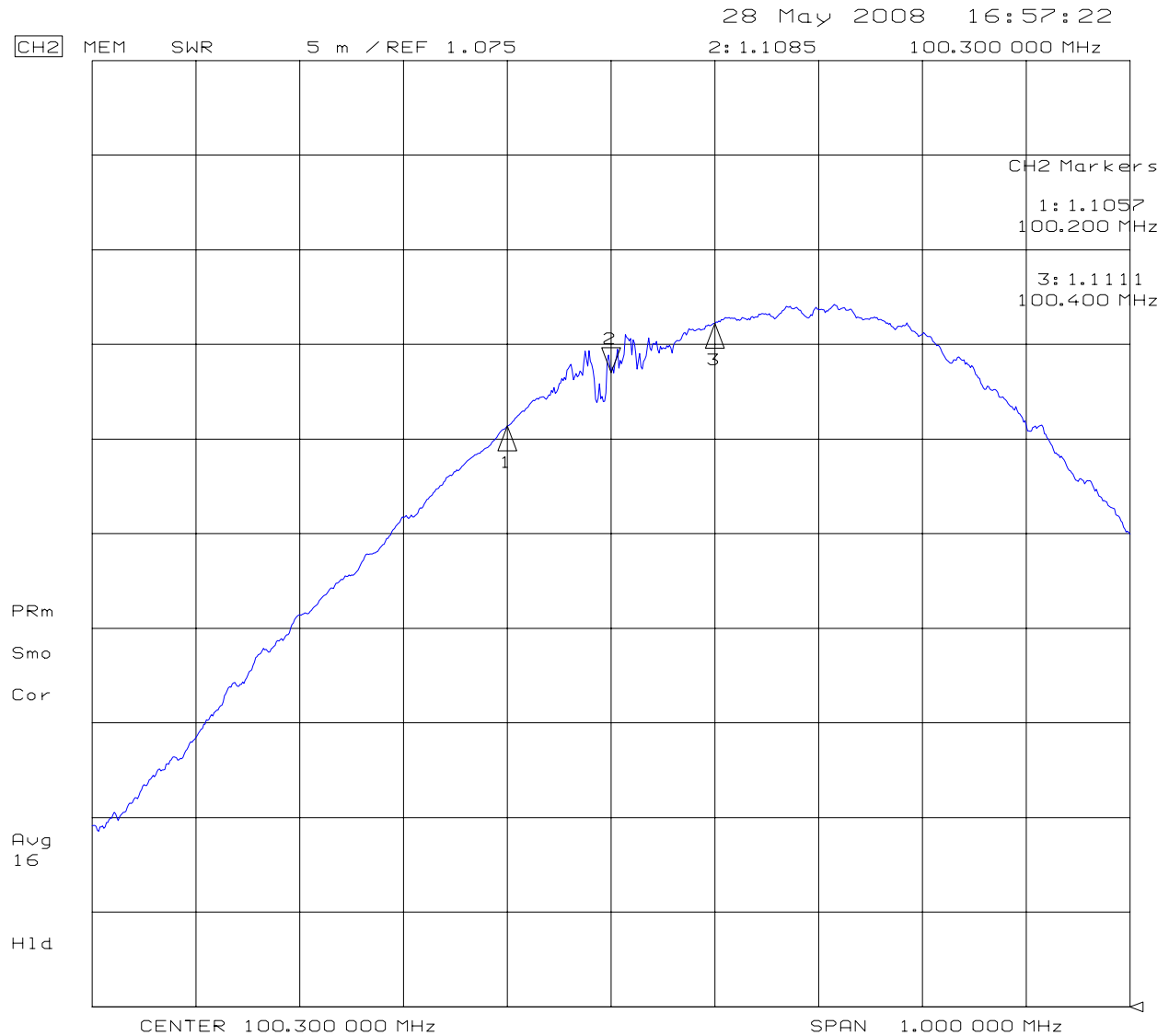
### Measurement 4: Final Antenna Match of 98.5 MHz.



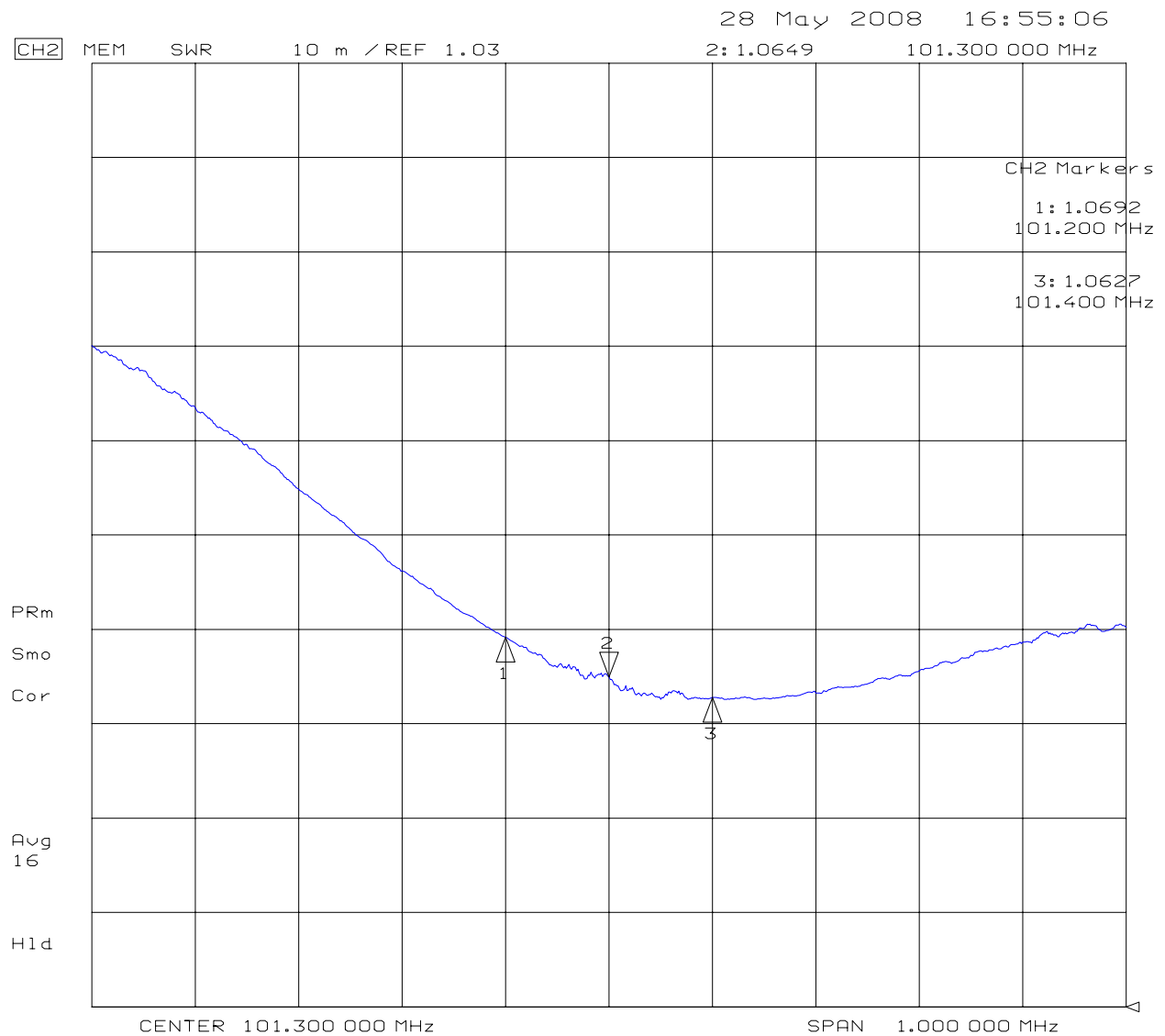
### Measurement 5: Final Antenna Match of 99.5 MHz.



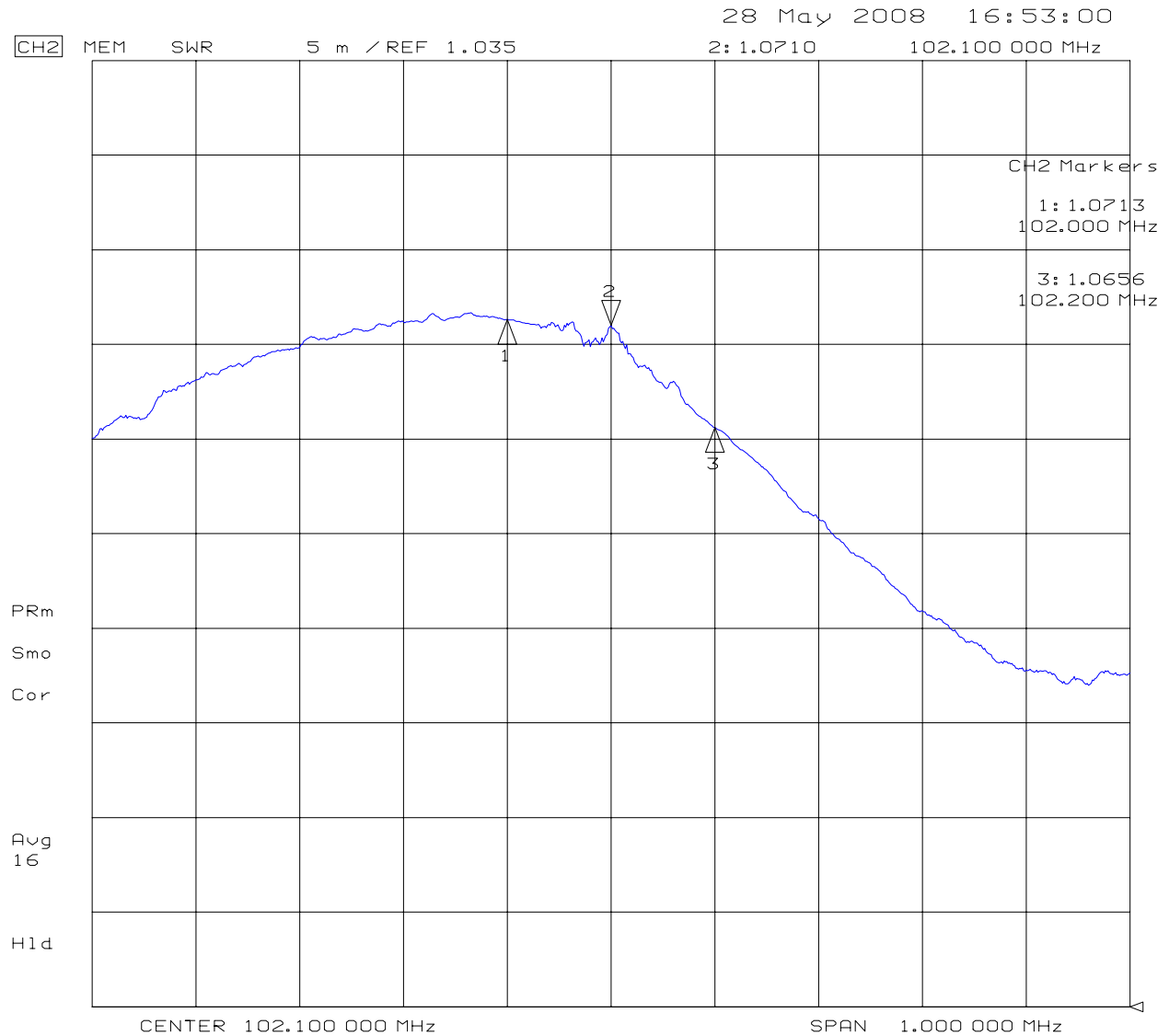
## Measurement 6: Final Antenna Match of 100.3 MHz.



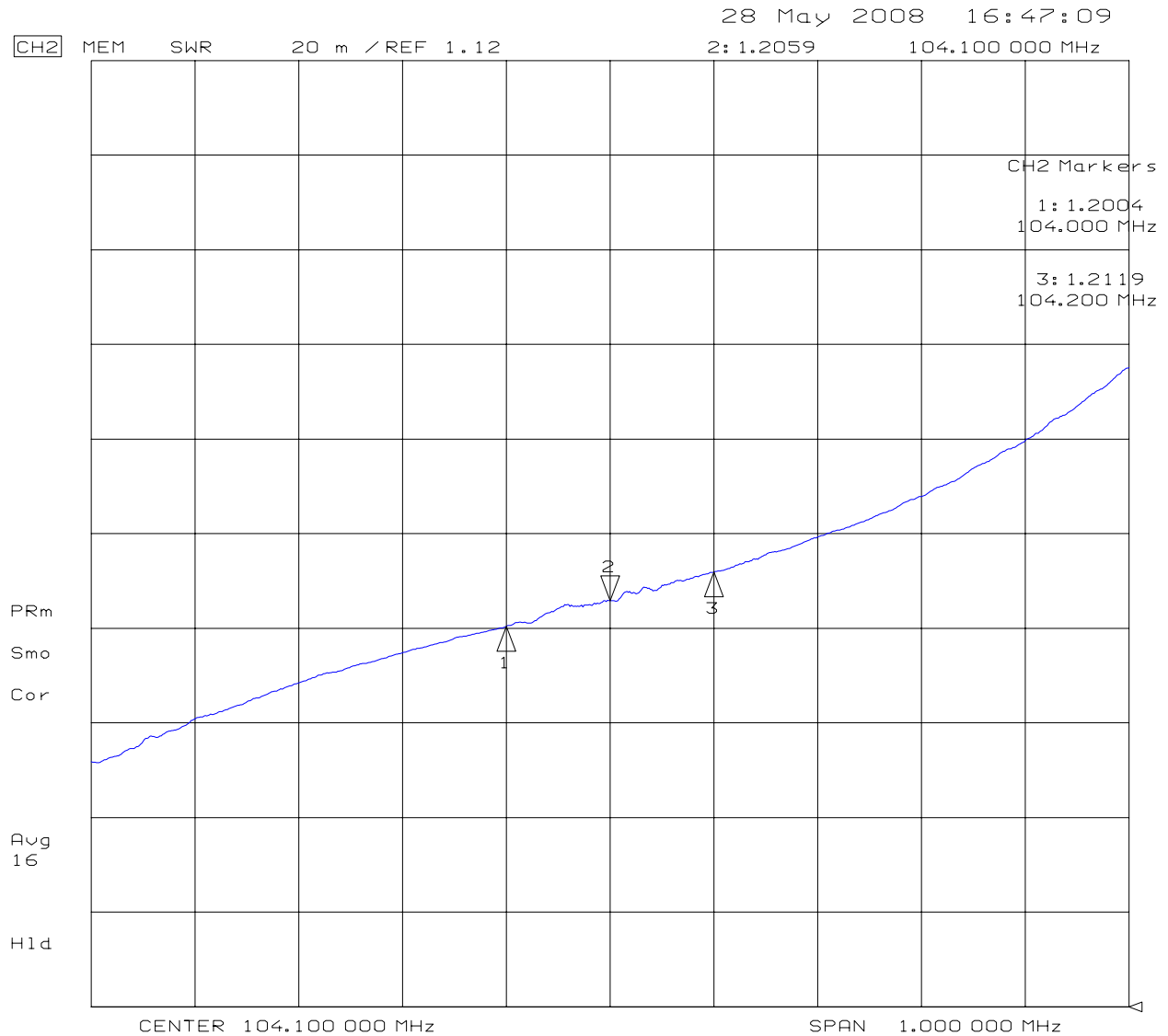
## Measurement 7: Final Antenna Match of 101.3 MHz.



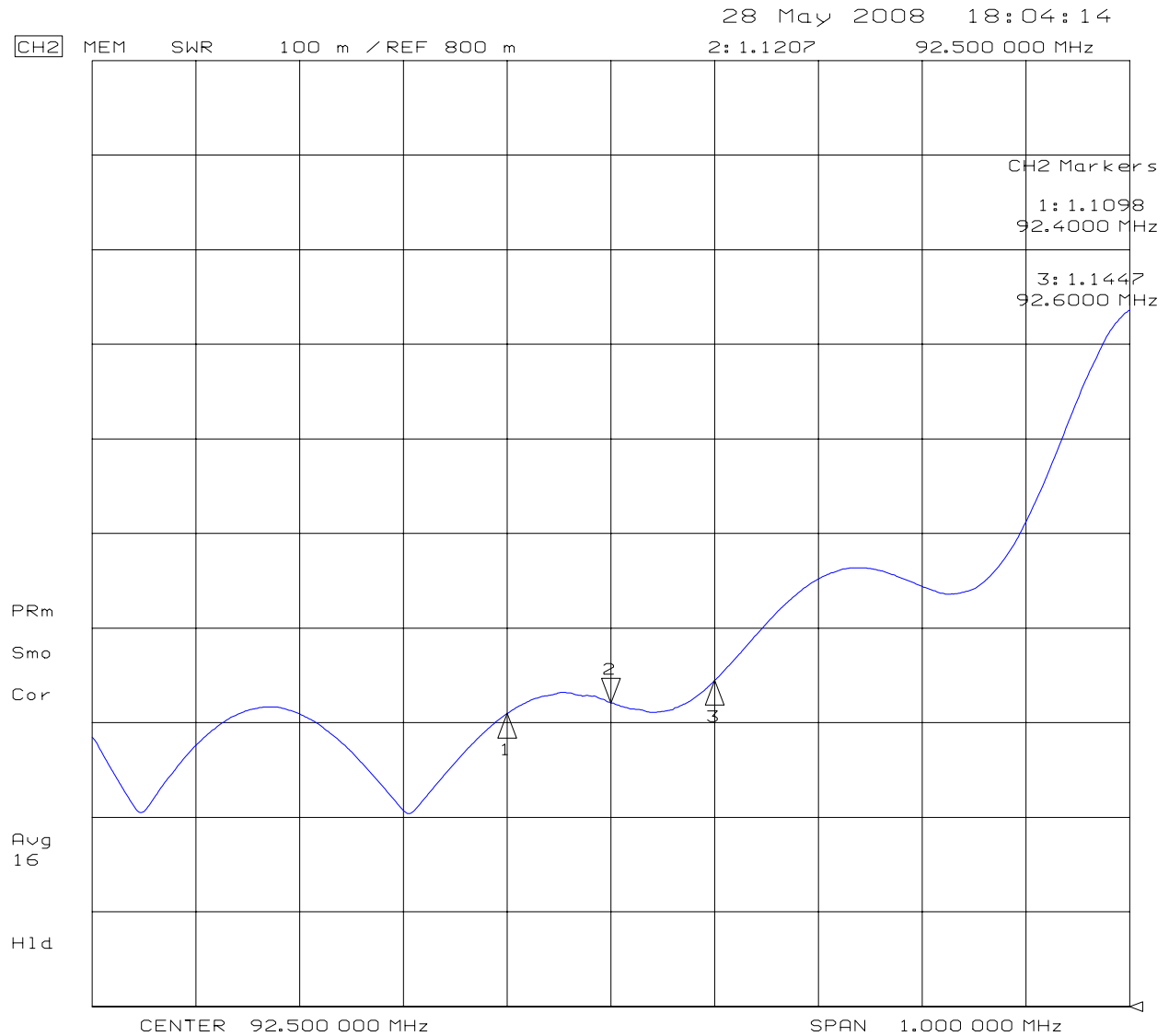
### Measurement 8: Final Antenna Match of 102.1 MHz.



### Measurement 9: Final Antenna Match of 104.1 MHz.

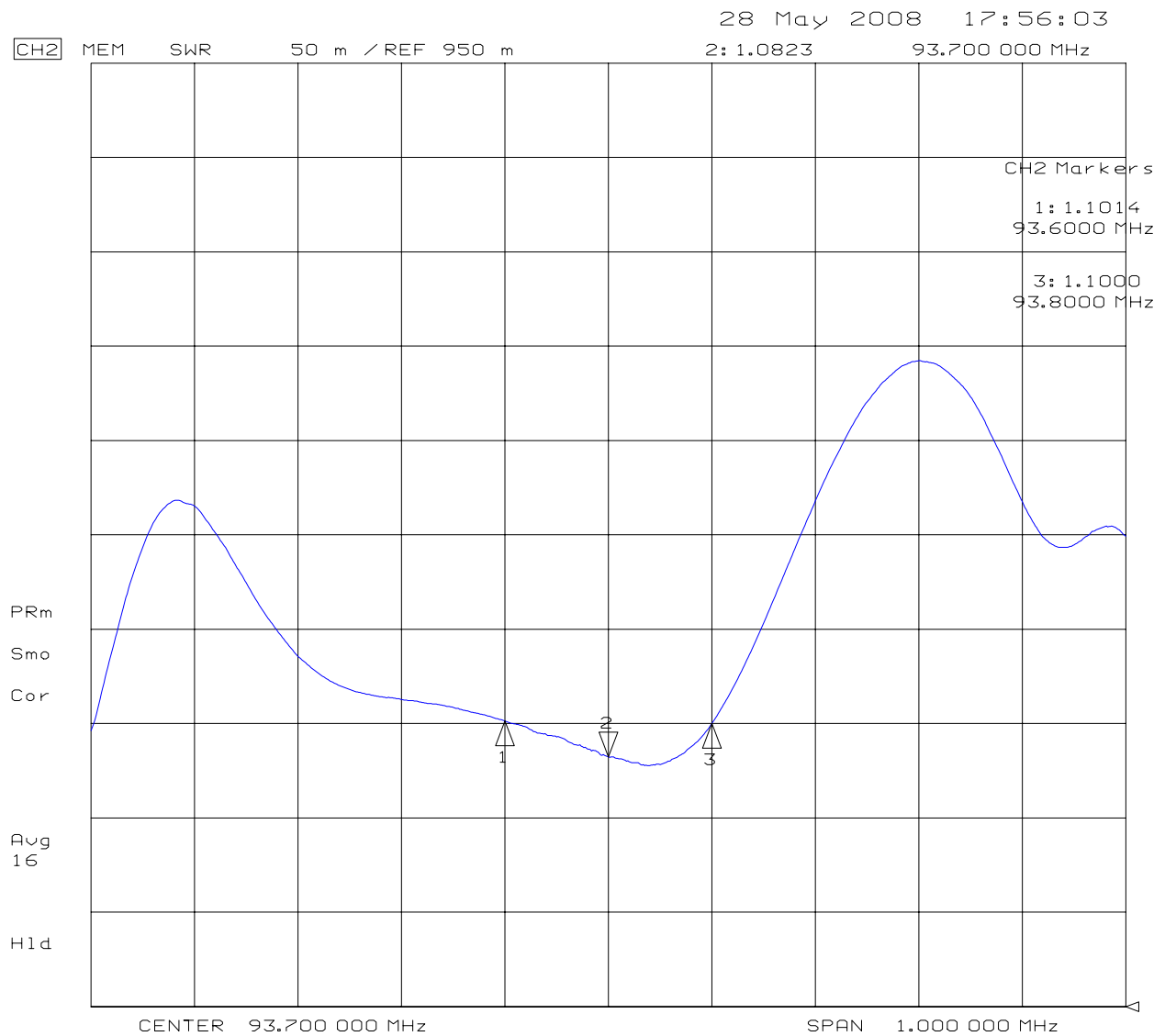


## Measurement 10: Filter to Antenna Match of 92.5 MHz.

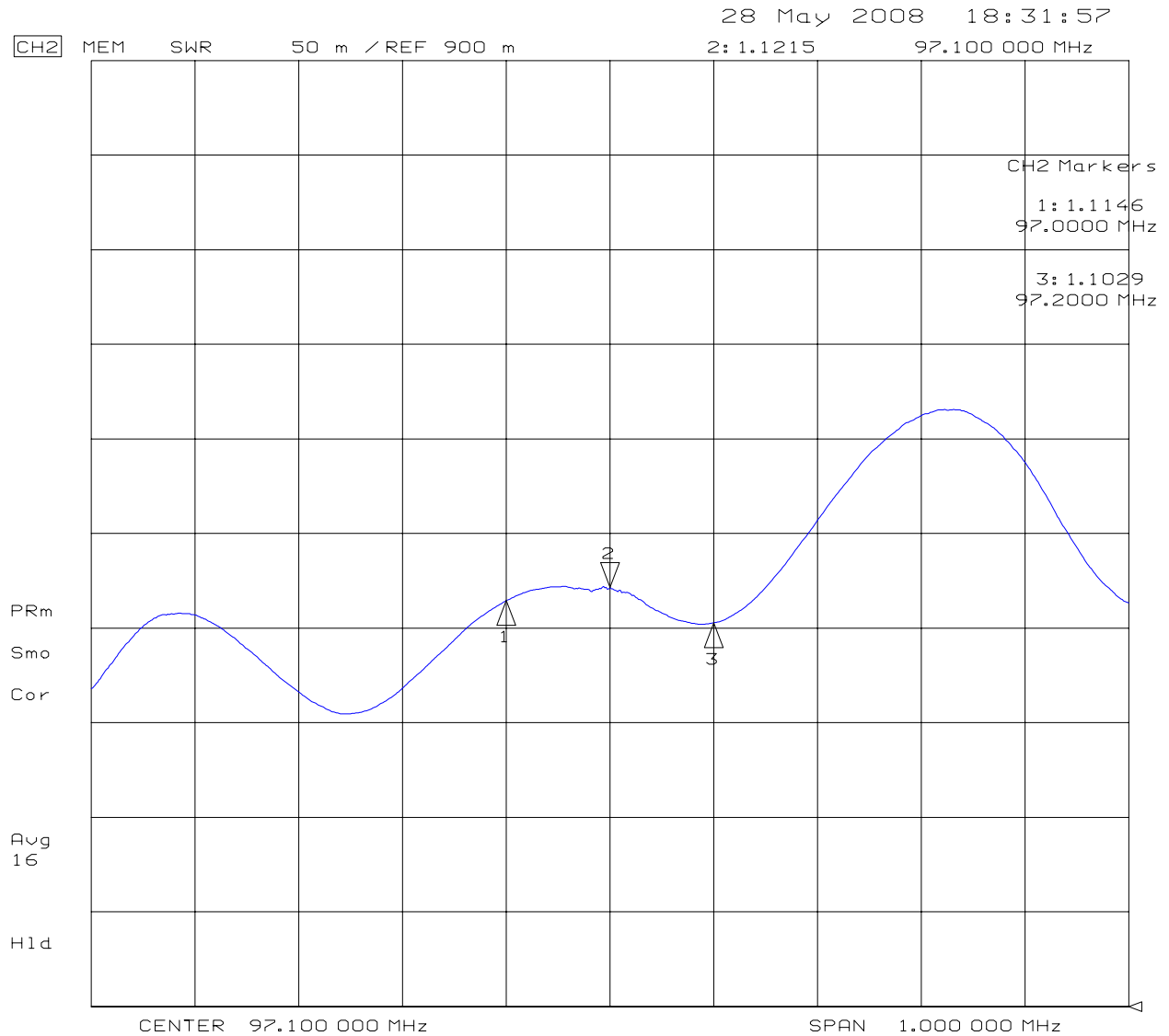




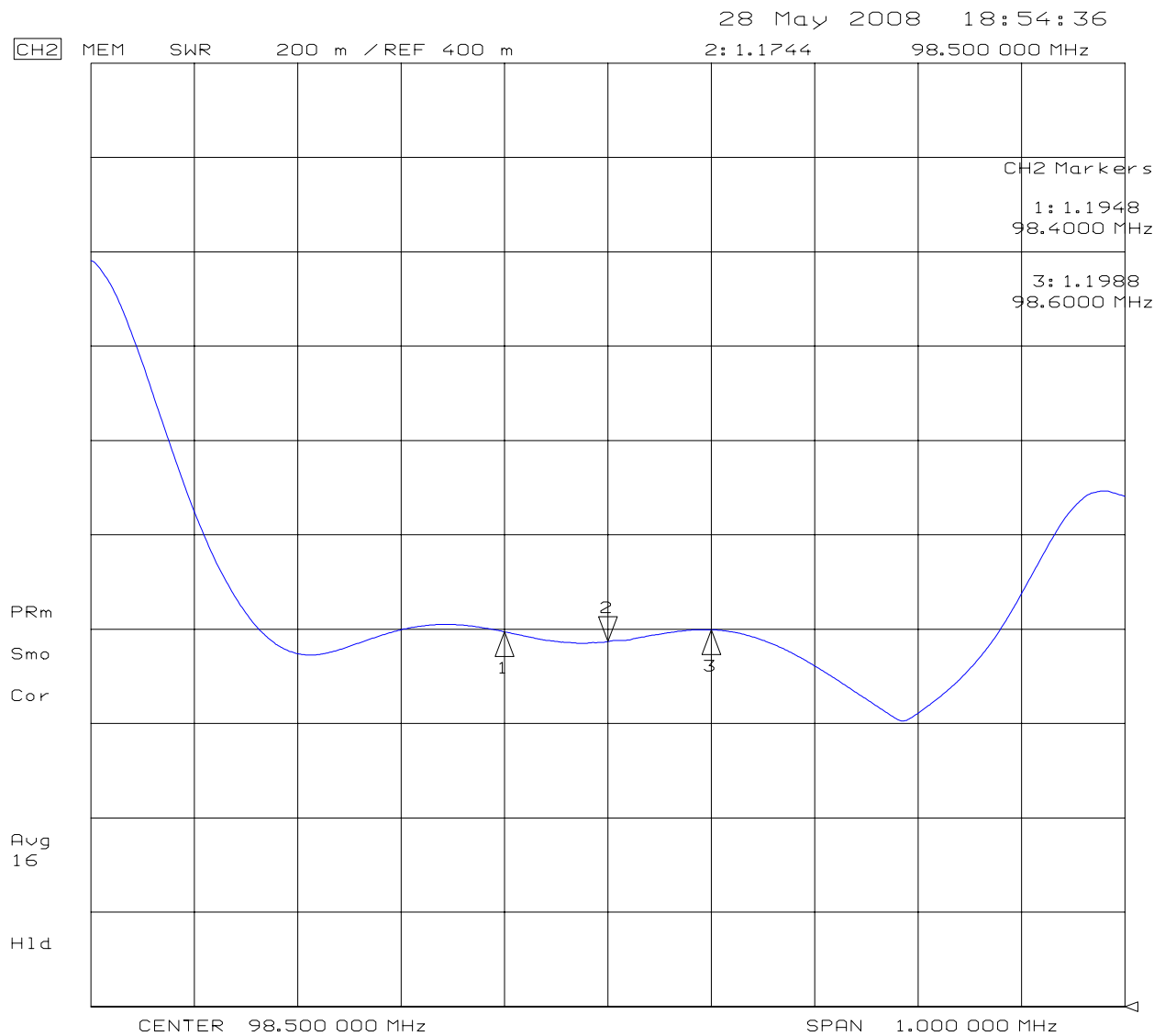
### Measurement 11: Filter to Antenna Match of 93.7 MHz.



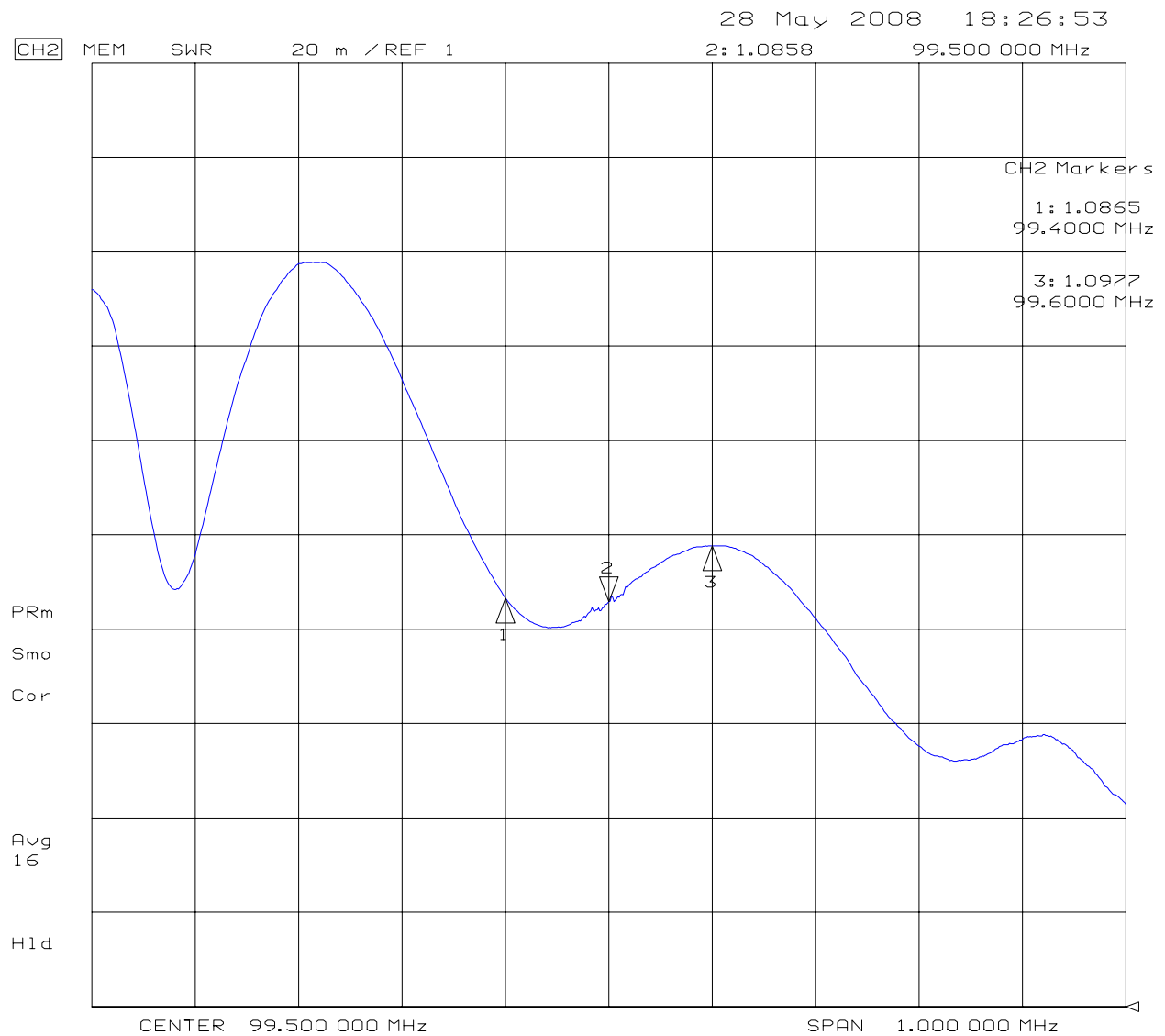
## Measurement 12: Filter to Antenna Match of 97.1 MHz.



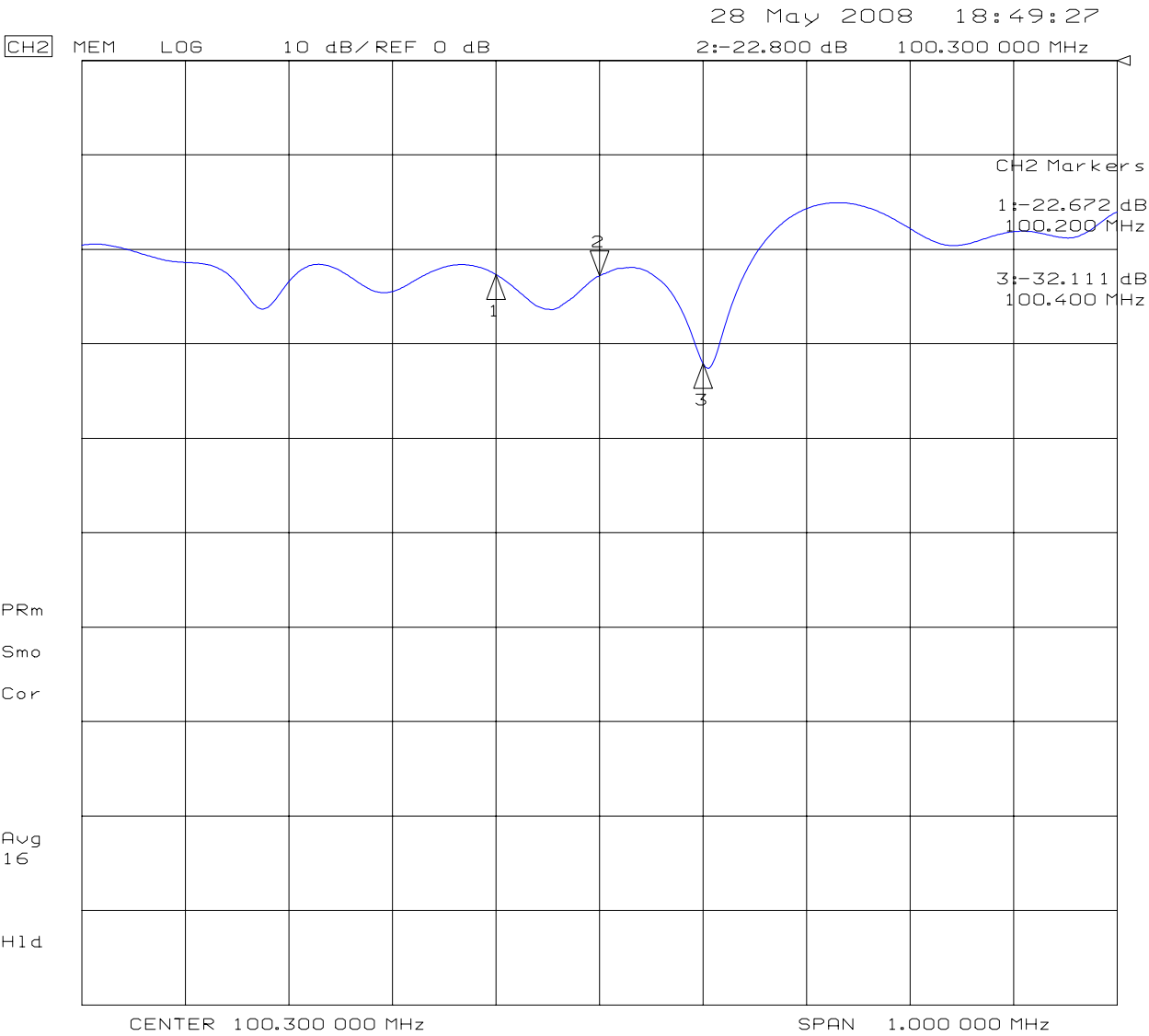
### Measurement 13: Filter to Antenna Match of 98.5 MHz.



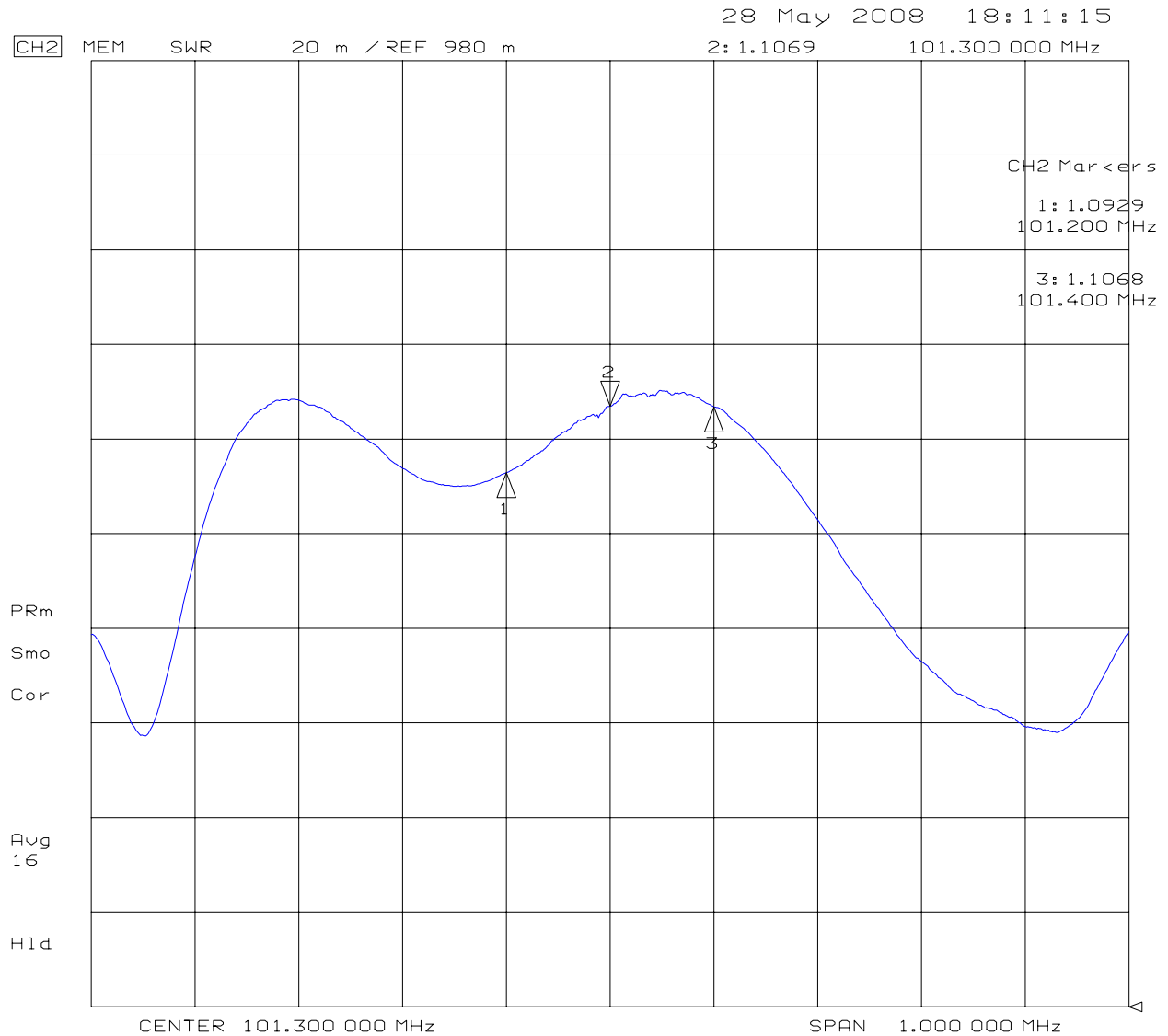
# **Measurement 14: Filter to Antenna Match of 99.5 MHz.**



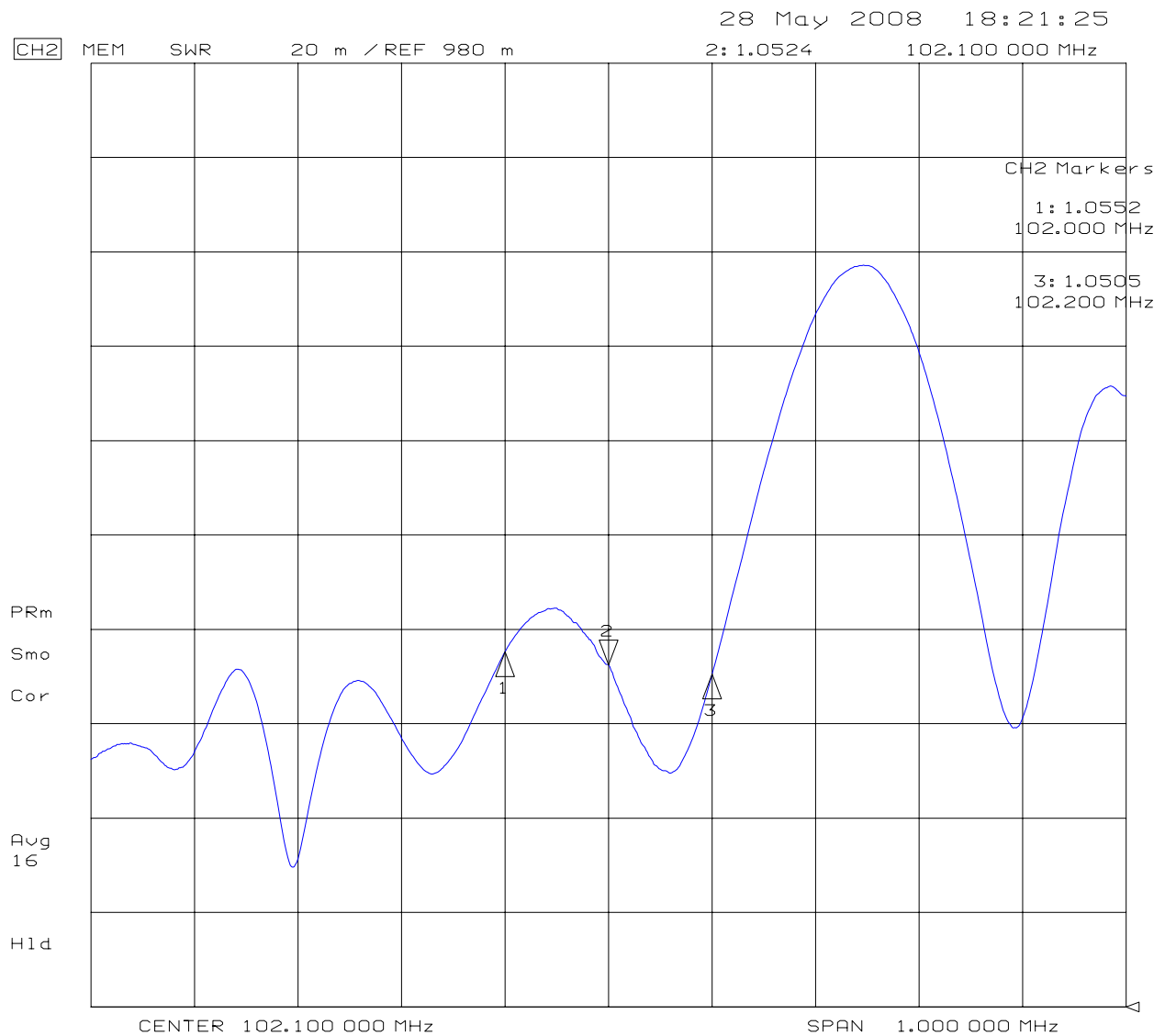
Measurement 15: Filter to Antenna Match of 100.3 MHz.



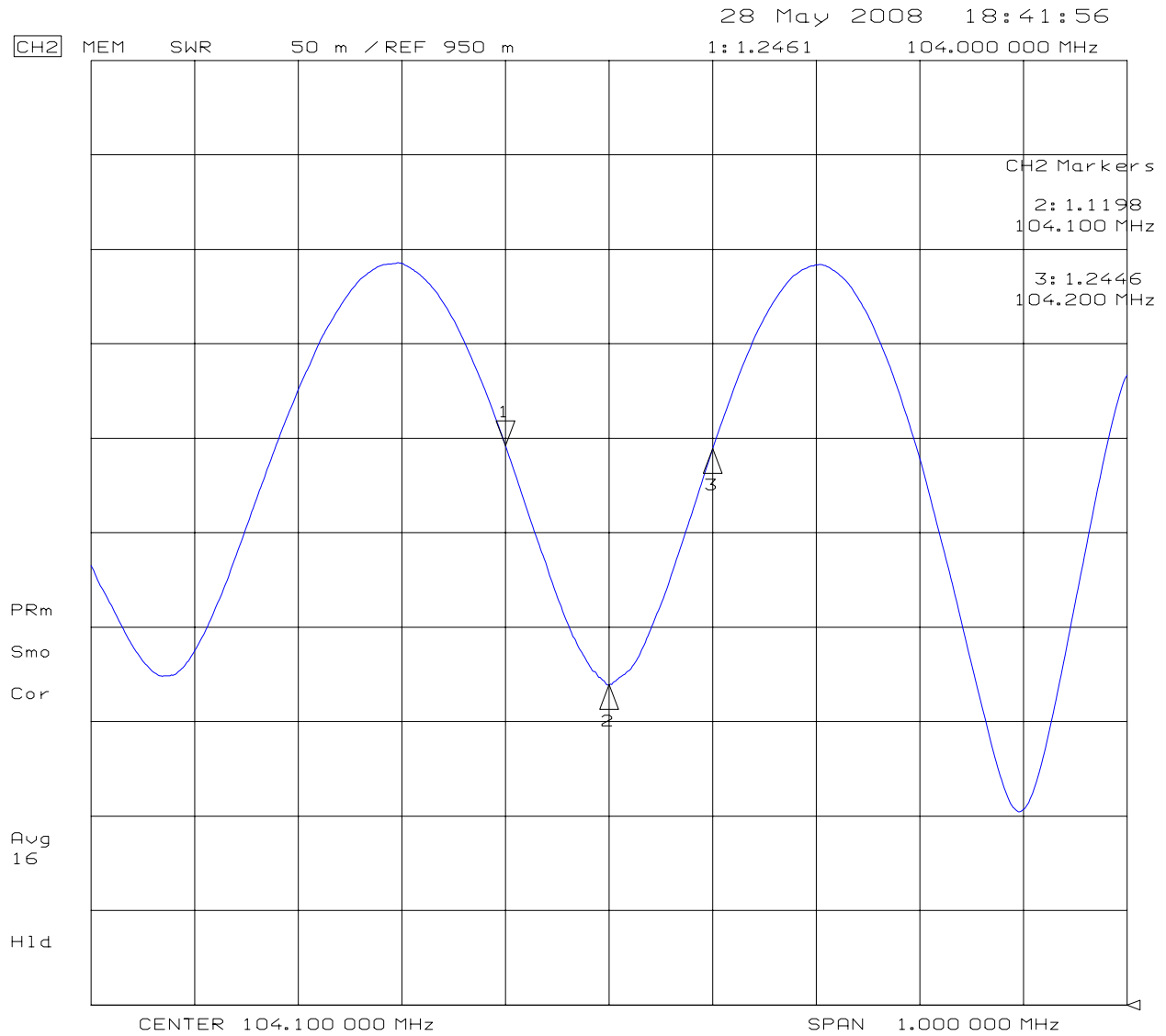
### Measurement 16: Filter to Antenna Match of 101.3 MHz.



### Measurement 17: Filter to Antenna Match of 102.1 MHz.



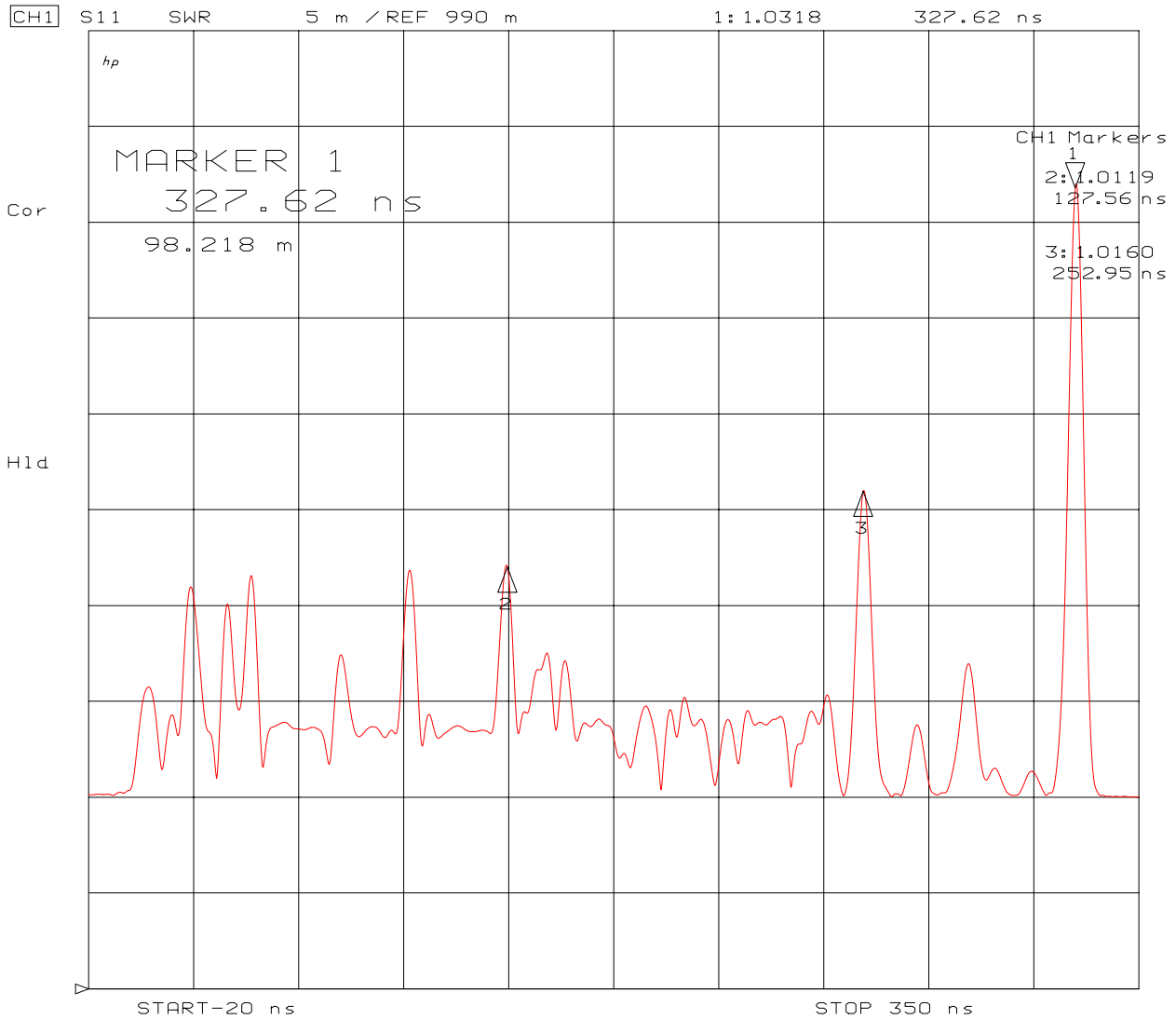
### Measurement 18: Filter to Antenna Match of 104.1 MHz.





# **Measurement 19: TDR of 6 1/8" Feedline with 50 ohm load.**

28 May 2008 13:14:36



**Figure 1: Antenna Solution**

