Federal Communications Commission Washington, D.C. 20554	Approved by OMB 3060-0506 (June 2002)	FOR FCC USE ONLY
FCC 302-FM		
APPLICATION FOR FM BROADCAST STATION LICENSE Read INSTRUCTIONS Before Filling Out Form		FOR COMMISSION USE ONLY FILE NO. BMLED - 20081016ADN

Section I - General Information

1.	Legal Name of the Applicant MINNESOTA PUBLIC RADIO			
	Mailing Address 480 CEDAR STREET			
	City ST. PAUL		State or Country (if foreign address) MN	ZIP Code 55101 -
	Telephone Number (include area code) 6512901259		E-Mail Address (if available) FCCFILING@MPR.ORG	
	FCC Registration Number: 0002642510	Call Sign KSJN	Facility Identifier 42911	
2.	Contact Representative (if other than Applicant) TODD STANSBURY		Firm or Company Name WILEY REIN LLP	
	Telephone Number (include area code) 2027194948		E-Mail Address (if available) TSTANSBURY@WILEYREIN.COM	
3.	If this application has been submitted without a fee, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114): ○ Governmental Entity ◉ Noncommercial Educational Licensee/Permittee ○ Other ○ N/A (Fee Required)			
4.	Facility Information:			
	a. ○ Commercial	◉ Noncommercial		
	b. ○ Directional	◉ Nondirectional		
	c. Community of License:			
	City: MINNEAPOLIS		State: MN	
5.	**Program Test Authority:**			
	○ Requesting program test authority.			
	◉ Station operating pursuant to automatic program test authority (47 C.F.R. Section 73.1620(a)(1)).			
6.	**Purpose of Application:**			
	○ Cover construction permit (list most recent construction permit file number -- starts with the prefix BPH, BNPH, BMPH, BPED, BMPED, or BMPED):			-
	◉ Modify an authorized license (list license file number -- starts with the prefix BLH, BMLH, BLED, or BMLED):			BMLH-19990902AAS
	○ Amend a pending application If an amendment, **submit as an Exhibit** a listing by Section and Question Number the portions of the pending application that are being revised.			[Exhibit 1]

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

Section II - Legal and Financial

1.	**Certification.** Applicant certifies that it has answered each question in this application based on its review of the application instructions and worksheets. Applicant further certifies that where it has made an affirmative certification below, this certification constitutes its representation that the application satisfies each of the pertinent standards and criteria set forth in the application instructions and worksheets.	(●) Yes ( ) No
2.	Licensee/Permittee certifies that all terms, conditions, and obligations set forth in the underlying construction permit have been fully met.	( ) Yes ( ) No See Explanation in [Exhibit 2]
3.	Licensee/Permittee certifies that, apart from changes already reported, no cause or circumstance has arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect.	( ) Yes ( ) No See Explanation in [Exhibit 3]
4.	**Character Issues.** Applicant certifies that neither licensee/permittee nor any party to the application has or has had any interest in, or connection with: a. any broadcast application in any proceeding where character issues were left unresolved or were resolved adversely against the applicant or party to the application; or b. any pending broadcast application in which character issues have been raised.	(●) Yes ( ) No See Explanation in [Exhibit 4]
5.	**Adverse Findings.** Applicant certifies that, with respect to the applicant and any party to the application, no adverse finding has been made, nor has an adverse final action been taken related to the following: any felony; mass media-related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination.	(●) Yes ( ) No See Explanation in [Exhibit 5]
6.	**Anti-Drug Abuse Act Certification.** Applicant certifies that neither licensee/permittee nor any party to the application is subject to denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862.	(●) Yes ( ) No

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith. I acknowledge that all certifications and attached Exhibits are considered material representations. I hereby waive any claim to the use of any particular frequency as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and request an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.)

Typed or Printed Name of Person Signing THOMAS J KIGIN	Typed or Printed Title of Person Signing EXECUTIVE VICE PRESIDENT
Signature	Date 10/16/2008

SECTION III - PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name MICHAEL HENDRICKSON		Relationship to Applicant (e.g., Consulting Engineer) RADIO NETWORK ENGINEERING SUPERVISOR
Signature		Date 10/16/2008
Mailing Address MINNESOTA PUBLIC RADIO 480 CEDAR STREET		
City ST. PAUL	State or Country (if foreign address) MN	Zip Code 55101 -
Telephone Number (include area code) 6512901328	E-Mail Address (if available)	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001),

AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

Section III - Engineering

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1.	Channel: 258	
2.	a. Effective Radiated Power:	32.6 kW(H) 32.6 kW(V)
	b. Maximum Effective Radiated Power:	kW(H) kW(V)
	(Beam-Tilt Antenna ONLY) ☑ Not Applicable	
3.	Transmitter Power Output: 10.5 kW	
4.	Antenna Data	

Manufacturer	Model	Number of Sections	Spacing Between Sections (wavelength)
ERI	SHPX-12BC-HW-SP	12	0.5

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

All applicants must complete this section.

5.	**Main Studio Location.** The main studio location complies with 47 C.F.R. Section 73.1125.	◉ Yes ○ No See Explanation in [Exhibit 6]
6.	**Transmitter Power Output.** The operating transmitter power output produces the authorized effective radiated power.	◉ Yes ○ No See Explanation in [Exhibit 7]

APPLICATIONS FILED TO COVER A CONSTRUCTION PERMIT.

Only applicants filing this application to cover a construction permit must complete the following section.

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

7.	**Constructed Facility .** The facility was constructed as authorized in the underlying construction permit or complies with 47 C.F.R. Section 73.1690.	○ Yes ○ No See Explanation in [Exhibit 8]
8.	**Special Operating Conditions.** The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit.	○ Yes ○ No See Explanation in [Exhibit 9]
	An exhibit may be required. Review the underlying construction permit.	[Exhibit 10]

APPLICATIONS FILED PURSUANT TO 47 C.F.R. SECTIONS 73.1675(c) or 73.1690(c).

Only applicants filing this application pursuant to 47 C.F.R. Sections 73.1675(c) or 73.1690(c) must complete the following section.

9.	**Changing transmitter power output.** Is this application being filed to authorize a change in	

	transmitter power output caused by the replacement of omnidirectional antenna with another omnidirectional antenna or an alteration of the transmission line system? See 47 C.F.R. Sections 73.1690(c)(1) and (c)(10).	(•) Yes ( ) No
10.	**Increasing effective radiated power.** Is this application being filed to authorize an increase in ERP for a station operating in the nonreserved band (Channels 221-300)? See 47 C.F.R. Sections 73.1690(c)(4), (c)(5) and (c)(7). If "Yes" to the above, the applicant certifies the following:	( ) Yes (•) No
	a. **Spacing Requirements.** The increase in ERP was authorized pursuant to MM Docket 88-375 (Class A stations) OR the facility complies with the spacing requirements of 47 C.F.R. Section 73.207.	( ) Yes ( ) No See Explanation in [Exhibit 11]
	b. **International Coordination.** The transmitter site is greater than 320 km from the Canadian or Mexican borders OR coordination for the station's international class is complete.	( ) Yes ( ) No See Explanation in [Exhibit 12]
	c. **Interference.** The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied OR are not applicable.	( ) Yes ( ) No See Explanation in [Exhibit 13]
	Exhibit required. If the proposed facility must be notified to the entities set forth in 47 C.F.R. Section 73.1030, the applicant must provide a copy of the written approval for the ERP increase from the affected entity.	[Exhibit 14]
	d. **Multiple Ownership Showing.** The increase in ERP will not require the consideration of a multiple ownership showing pursuant to 47 C.F.R. Section 73.3555.	( ) Yes ( ) No See Explanation in [Exhibit 15]
	e. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (i.e., the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.**	( ) Yes ( ) No See Explanation in [Exhibit 16]
	By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	
11.	**Increasing vertically polarized effective radiated power.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(4) to authorize an increase in the vertically polarized ERP for a station operating in the reserved band (Channels 200-220)? If "Yes" to the above, the applicant certifies the following:	( ) Yes (•) No
	a. **TV Channel 6 Protection Requirements.** The facility complies with the spacing requirements of 47 C.F.R. Section 73.525(a)(1).	( ) Yes ( ) No See Explanation in [Exhibit 17]
	b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (i.e., the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and u ncontrolled environments). Unless the applicant can determine compliance through the use o f the RF worksheets in Appendix A, an **Exhibit is required.**	( ) Yes ( ) No See Explanation in [Exhibit 18]

	By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	
12.	**Decreasing effective radiated power (non-reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the nonreserved band (Channels 221-300)? If "Yes" to the above, the applicant certifies the following:	(•) Yes ( ) No
	a. **Community Coverage .** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.315 where the distance to the 3.16 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313.	(•) Yes ( ) No See Explanation in [Exhibit 19]
	b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a).	(•) Yes ( ) No See Explanation in [Exhibit 20]
	c. **Multiple Ownership Showing.** The decrease in ERP is not requested or required to establish compliance with 47 C.F.R. Section 73.3555.	(•) Yes ( ) No See Explanation in [Exhibit 21]
13.	**Decreasing effective radiated power (reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the reserved band (Channels 200-220)? If "Yes" to the above, the applicant certifies the following:	( ) Yes (•) No
	a. **Community Coverage .** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.1690(c)(8)(i) where the distance to the 1 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313.	( ) Yes ( ) No See Explanation in [Exhibit 22]
	b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a).	( ) Yes ( ) No See Explanation in [Exhibit 23]
14.	**Replacing a directional antenna.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(2) to replace a directional antenna with another directional antenna? If "Yes" to the above, the applicant certifies the following:	( ) Yes (•) No
	a. **Measurement of Directional Antenna.** The composite measured pattern and measurement procedures comply with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.**	( ) Yes ( ) No See Explanation in [Exhibit 24] [Exhibit 25]
	b. **Installation of Directional Antenna.** The installation of the directional antenna complies with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.**	( ) Yes ( ) No See Explanation in [Exhibit 26] [Exhibit 27]
15.	**Deleting contour protection status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(6) to delete contour protection status (47 C.F.R. Section 73.215) for a station operating in the nonreserved band (Channels 221-300)?	( ) Yes (•) No
	If "Yes" to the above, the applicant certifies that the facility complies with the spacing	( ) Yes ( ) No

	requirements of 47 C.F.R. Section 73.207.	See Explanation in [Exhibit 28]
16.	**Use a formerly licensed main facility as an auxiliary facility.** Is this application being filed pursuant to 47 C.F.R. Section 73.1675(c)(1) to request authorization to use a formerly licensed main facility as an auxiliary facility and/or change the ERP of the proposed auxiliary facility? If "Yes" to the above, the applicant certifies the following:	○ Yes ◉ No
	a. **Auxiliary antenna service area.** The proposed auxiliary facility complies with 47 C.F.R. Section 73.1675(a).	○ Yes ○ No See Explanation in [Exhibit 29]
	b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (i.e., the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.**	○ Yes ◉ No See Explanation in [Exhibit 30]
	By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	
17.	**Change the license status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(9) to change the license status from commercial to noncommercial or from noncommercial to commercial?	○ Yes ◉ No
	If "Yes" to the above, submit an exhibit providing full particulars. For applications changing license status from commercial to noncommercial, include Section II of FCC Form 340 as an exhibit to this application.	[Exhibit 31]

PREPARERS CERIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

Exhibits

Exhibit 1
Description: EXH. 1 / ENGINEERING STATEMENTS

THIS EXHIBIT CONSISTS OF ENGINEERING STATEMENTS DESCRIBING MODIFICATIONS MADE TO THE MASTER ANTENNA LOCATED AT THE IDS BUILDING IN MINNEAPOLIS, MINNESOTA. IT IS A COMMON SITE FOR A GROUP OF 9 BROADCASTERS, AND THESE SAME EXHIBITS WILL BE FILED WITH EACH STATION'S LICENSE APPLICATION.

THE ANTENNA WAS REPLACED WITH NO CHANGES TO THE TECHNICAL PARAMETERS. ATTACHMENT 1 IS AN INTERMODULATION REPORT. ATTACHMENT 2 IS A FIELD SERVICE REPORT.

Attachment 1

Description
Exh. 1 Attachment 1 / Intermodulation Report
Exh. 1 Attachment 2 / Field Data Report

Exhibit 18
Description: EXH. 18 / RF EMISSIONS

THIS EXHIBIT CONSISTS OF RFR MEASUREMENTS FOR THE COMMON ANTENNA SITE.

Attachment 18

Description
Exh. 18 / RFR Measurements

Exhibit 20
Description: AUXILIARY ANTENNA 60 DBU CONTOUR

Attachment 20

Description
KSJN Auxiliary Antenna Contours

Exhibit 30
Description: RF RADIATION STUDY

Attachment 30

Description
RF Radiation Study

ENGINEERING EXHIBIT
IN SUPPORT OF
APPLICATION FOR LICENSE

Intermodulation Product Measurements

Common Antennna Site
IDS Building, Minneapolis Minnesota

KQRS-FM - 92.5 MHz. **KXXR-FM - 93.7 MHz.**
KTCZ-FM - 97.1 MHz. **KTIS-FM - 98.5 MHz.**
KSJN-FM - 99.5 MHz. **KTLK-FM - 100.3 MHz.**
KDWB-FM - 101.3 MHz. **KEEY-FM - 102.1 MHz.**
KZJK-FM - 104.1 MHz.

June 26, 2008

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All statements, calculations and exhibits have been prepared to be in compliance with all known FCC rules, policies and procedures in effect at the time of preparation. The applicant agrees to comply with all statements and representations contained herein, at such time as the proposed facilities are constructed and/or operated.

Commsulting, Inc. or its employees assume no liability for any errors and omissions in the information hereby provided, and shall not be liable for any injuries or damages (consequential or otherwise) which may result from the use of the information contained herein.

The filing of this engineering statement with the FCC constitutes acceptance of these terms and conditions by

Please direct any questions or correspondence to:

Commsulting, Inc.
4833 East Lake Harriet Parkway
Minneapolis, MN 55419
(612) 285-9995
(612) 285-9994 FAX
gwerl@commsulting.com

AFFIDAVIT

HENNEPIN COUNTY

STATE OF MINNESOTA | **SS:**

GEORGE H. WERL, JR., being duly sworn upon oath deposes and says:

That his qualifications are a matter of record with the Federal Communications Commission;

That he is President of Commsulting, Incorporated, a Minnesota corporation;

That Commsulting, Incorporated has been retained by to prepare this declaration and engineering statement;

That he has either prepared or directly supervised the preparation of all technical information contained in this engineering statement and that the facts stated in this engineering statement are true of his knowledge, except as to such statements as are herein stated to be on information and belief, and to such statements he believes them to be true.

George H. Werl, Jr.

Subscribed and sworn to before me on July 10, 2008

MAREN E. JENKINS
NOTARY PUBLIC-MINNESOTA
My Commission Expires Jan. 31, 2010

Maren E. Jenkins
Notary Public

My Commission expires 1-31-2010

ENGINEERING EXHIBIT IN SUPPORT OF APPLICATION FOR LICENSE

Intermodulation Product Measurements

Common Antennna Site
IDS Building, Minneapolis Minnesota

KQRS-FM - 92.5 MHz. **KXXR-FM - 93.7 MHz.**
KTCZ-FM - 97.1 MHz. **KTIS-FM - 98.5 MHz.**
KSJN-FM - 99.5 MHz. **KTLK-FM - 100.3 MHz.**
KDWB-FM - 101.3 MHz. **KEEY-FM - 102.1 MHz.**
KZJK-FM - 104.1 MHz.

NARRATIVE STATEMENT: This engineering statement and exhibits have been prepared by George H. Werl, Jr., President of Commsulting, Inc., on behalf of KQRS-FM, KXXR-FM KTCZ-FM, KTIS-FM, KSJN-FM, KTLK-FM, KDWB-FM, KEEY-FM and KZJK-FM (herein refered to as "the IDS Stations"), in accordance with the Rules and Regulations of the Federal Communications Commission following the replacement of a master antenna located at the IDS Building in Minneapolis, Minnesota. These facilities constitute a common auxilliary transmission site for the stations specified, the main site for all of these stations being located at Shoreview, Minnesota.

ANTENNA SYSTEM DESCRIPTION: Nine FM stations utilize the master antenna located at the IDS Building in Minneapolis, Minnesota as a backup site. The new antenna installed at the site, an Electronics Research 12 bay AXIOM, replaces a 14 level Shively Labs Lindenblad design installed some 10 years ago. Only the antenna and the short feedline section above the roof level was replaced, the combiner system originally installed with the previous Shively antenna and all feedlines internal to the building remain unchanged. There was no change in the antenna center of radiation.

To provide isolation among the nine FM transmitters present at the combined facility, an RF combining system designed and built by Shively Labs is employed. This RF combining

system is of the constant impedance type utilizing dual four cavity bandpass filters and four-port hybrids for each FM station input. The original design criteria for the combining system required that sufficient attenuation to spurious emissions be provided by the combiner without regard for whatever protection might be present in any particular installed transmitter. Performance of the combining system concerning attenuation of spurious emissions has therefore been excellent.

In addition to the nine FM stations being combined, a tenth FM station at 105.7 MHz. has recently been added to the site on another mast some 87 feet distant from the FM master antenna. This individual station employs a separate bandpass filter manufactured by Shively Labs. The FM facility using this separate antenna is being included with the FM facilities operating on the master antenna for purposes of the measurements described herein.

MEASUREMENT METHODOLOGY: Due to the large number of high power carriers present within the combined antenna system, the use of notch filters to reduce potential undesired overload problems within the measurement instrument (in this case a Tektronix 2712 spectrum analyzer) is not practical. Fortunately, the method for mathematical prediction of the probable spurious intermodulation products is well known. Where these products were predicted to lie within or adjacent to the FM band (2 x A - B mix) a tunable bandpass cavity was employed to attenuate all but the spurious frequency of interest. Where these products were predicted to lie well outside of the FM band (A + B mixes) a Tektronix 2706 preselector was employed to attenuate the FM carriers. Including the individual 105.7 MHz. facility in the calculation of the potential products there are 66 distinct predicted intermodulation product frequencies within and/or adjacent to the FM band (2 x A - B mixes) and 38 distinct predicted intermodulation product frequencies well above the FM band (A + B mixes).

Careful attention was given to the signal level presented to the input of the spectrum analyzer, both in the case of individual carriers and multiple carriers. As the maximum input power limit of the analyzer is specified at +20 dbm, for protection of the analyzer the total aggregate power for all carriers was limited to under +10 dbm. As measured by the HP Power Meter, the actual total aggregate power to the analyzer was +8 dbm. Attenuation pads were introduced as appropriate to limit the maximum signal level present at the input of the spectrum analyzer while extending the instrument measurement capability. In this manner, the normal 70 decibel on-screen dynamic range of the Tektronix 2712 spectrum analyzer was extended to over 100 decibels below the FM carriers. Block diagrams of the setups and details of the instruments used appear elsewhere in this report.

It is noted that the lowest four 2A - B predicted intermodulation products (79.3, 80.9, 81.7 and 82.9 MHz.) fell outside of the range of the Celwave tunable bandpass filter, thus the dynamic range of the analyzer could not be extended for these four measurement frequencies by the means described above. However, with the combination of appropriate attentator pads and running the analyzer with the operating carrriers slightly off-screen, a noise floor of better than -80dbc could be observed at these frequencies with no evidence of intermodulation products.

It can be noted from the block diagrams that a Hewlett Packard signal generator was used in conjunction with a Narda directional coupler to inject a marker into the measurement system ahead of the tunable bandpass cavity. This was used as a tuning aid in setting the bandpass cavity precisely to the predicted spurious product frequency.

The tunable bandpass cavity was also measured with the spectrum analyzer and a Tektronix 2707 tracking generator. This was done to establish rejection characteristics of the passband as well as the insertion loss at the selected frequency. Plots of the tunable bandpass cavity performance are included herein as well.

CONCLUSIONS: In general, measurements made within and adjacent to the FM band with the tunable bandpass cavity exhibited a dynamic range (to the noise floor) of between -85 and -103 decibels as referenced to the FM carriers. The dynamic range was compromised somewhat as measurements were made within 400 KHz. of operating carriers, however in no case was any spurious identified in excess of -80 dbc (as per FCC Rules), and generally much better than -90 dbc. Where measurement within 400 KHz. of an operating carrier was rendered impossible due to the operating carrier, a brief cut of the particular operating carrier was employed as necessary to make the measurement.

Measurements made well above the FM band also included attenuation pads to protect the spectrum analyzer input from overload from the aggregate power level of the multiple carriers. Data are included to indicate FM carriers measured at the combiner output directional coupler port as well as 185 MHz. through 210 MHz. (A + B mixes and second harmonics). An analyzer scan was made with the preselector through 1300 MHz. Although carriers from other communications services at the IDS site were noted, no spurious identifiable to the FM stations were found. Measurement capability was better than -90 dbc.

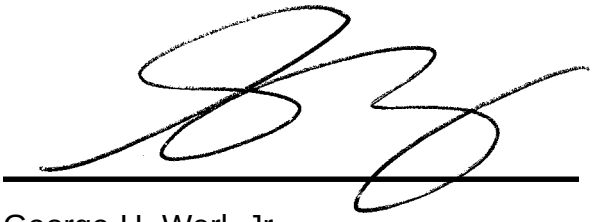
These measurements were performed the evening of Thursday, June 26, 2008. All FM stations involved in these measurements were operating as licensed with normal analog

modulation. No spurious emissions in excess of FCC Rules could be found. The measurement capability (to the noise floor) was generally better than -95 dbc.

PREPARER'S CERTIFICATION: George H. Werl, Jr. holds a Bachelor of Science from The Pennsylvania State University as well as a Bachelor of Electrical Engineering from the University of Minnesota. He has had numerous matters before the Federal Communications Commission, his qualifications are a matter of record;

He supervised the construction and equipment installation of this combined antenna system at the IDS Building and has been associated with this site since FM facilities began broadcasting from this site in 1977. Over the years he has performed these types of spurious and intermodulation product measurements demonstrating FCC compliance many times at this site and other sites.

He is President of Commsulting, Incorporated, a Minnesota corporation; and he has either prepared or directly supervised the preparation of all technical information contained in this engineering statement. The facts stated in this engineering statement are true of his knowledge, except as to such statements as are herein stated to be on information and belief, and as to such statements he believes them to be true.



George H. Werl, Jr.
President, Commsulting, Inc.

ENGINEERING EXHIBIT A

IDS Building Master Antenna, Minneapolis, Minnesota

Antenna System Data:

The folowing FM facilities operate from the IDS master antenna.

KQRS -FM	92.5 MHz.
KXXR-FM	93.7 MHz.
KTCZ-FM	97.1 MHz.
KTIS-FM	98.5 MHz.
KSJN-FM	99.5 MHz.
KTLK-FM	100.3 MHz.
KDWB-FM	101.3 MHz.
KEEY-FM	102.1 MHz.
KZJK-FM	104.1 MHz.

The folowing FM facilities also operate from the IDS Building.

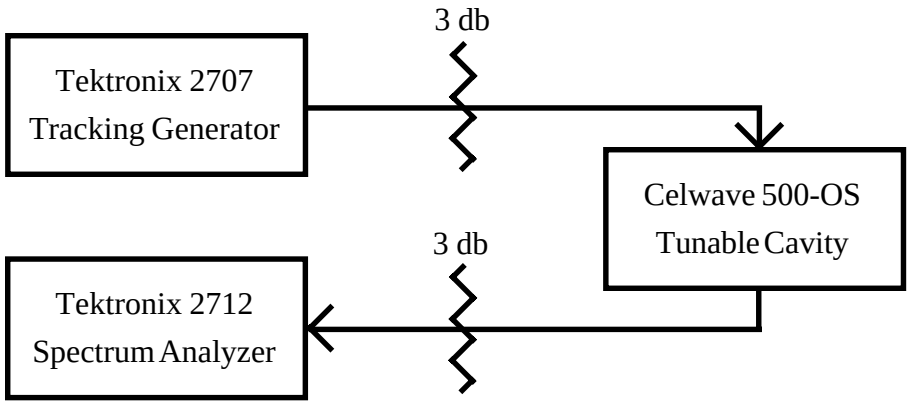
WGVZ-FM	105.7 MHz.

ENGINEERING EXHIBIT B1

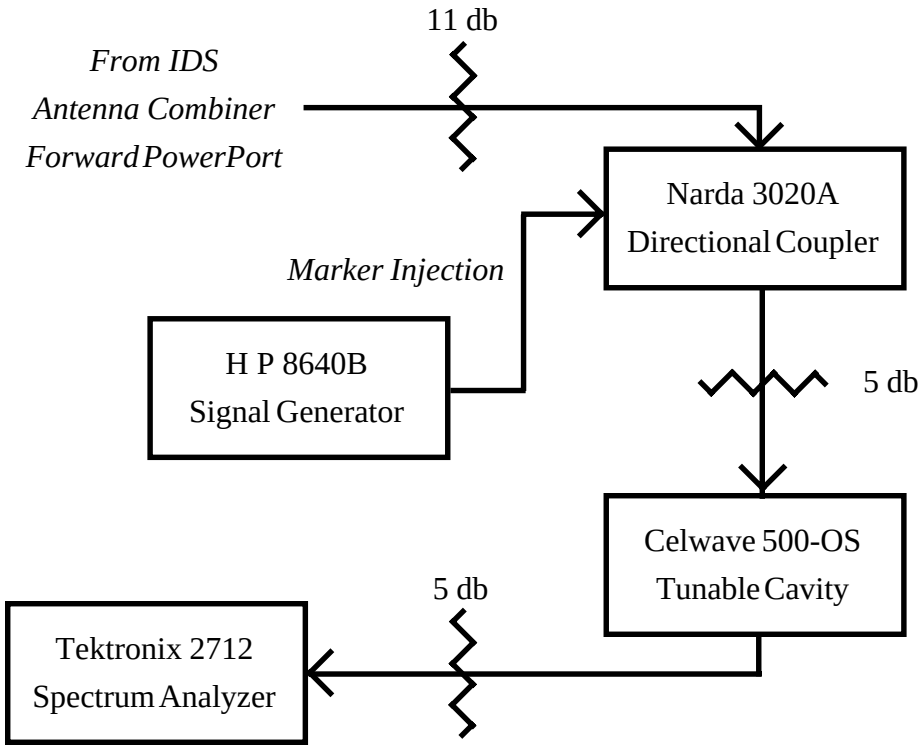
IDS Building Master Antenna, Minneapolis, Minnesota

Measurement Equipment Details:

Tuneable Bandpass Cavity Measurement:



Measurements with Tuneable Bandpass Cavity at Combiner Output Port:

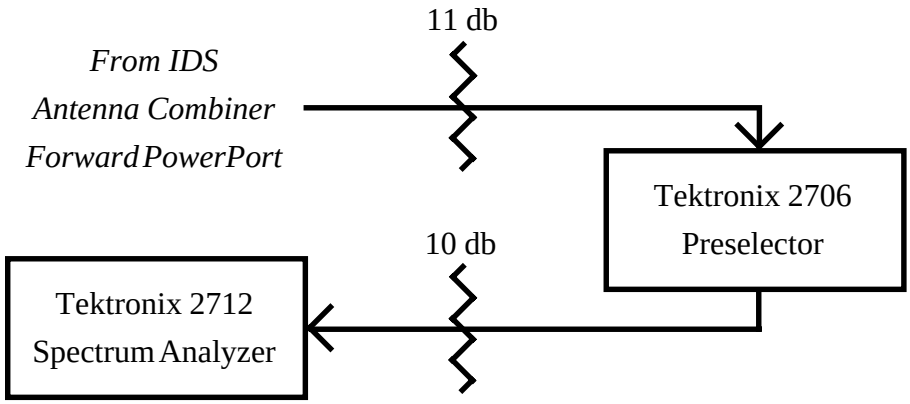


ENGINEERING EXHIBIT B2

IDS Building Master Antenna, Minneapolis, Minnesota

Measurement Equipment Details:

Measurements with Tektronix 2706 Preselector at Combiner Output Port:



ENGINEERING EXHIBIT B3

IDS Building Master Antenna, Minneapolis, Minnesota

Measurement Equipment Details:

Equipment Data:

Tektronix model 2712 Spectrum Analyzer,S/N B022803
Tektronix model 2707 Tracking Generator, S/N B010208
Tektronix model 2706 RF Preselector, S/N B010655
Hewlett Packard model 8640B Signal generator, S/N 1814A08347
Schlumberger model SM110C Frequency Counter, S/N 00256
Hewlett Packard model 435B RF Power Meter, S/N 2072A17593
Hewlett Packard model 8482A RF Power Meter Sensor, S/N 2652A19449
Celwave model 500-OS Tuneable Bandpass Cavity, S/N 34954 (see note 1)
Narda model 3020A Directional Coupler, S/N 32470
Attenuator Pads as needed, Bird Electronics and JFW Electronics

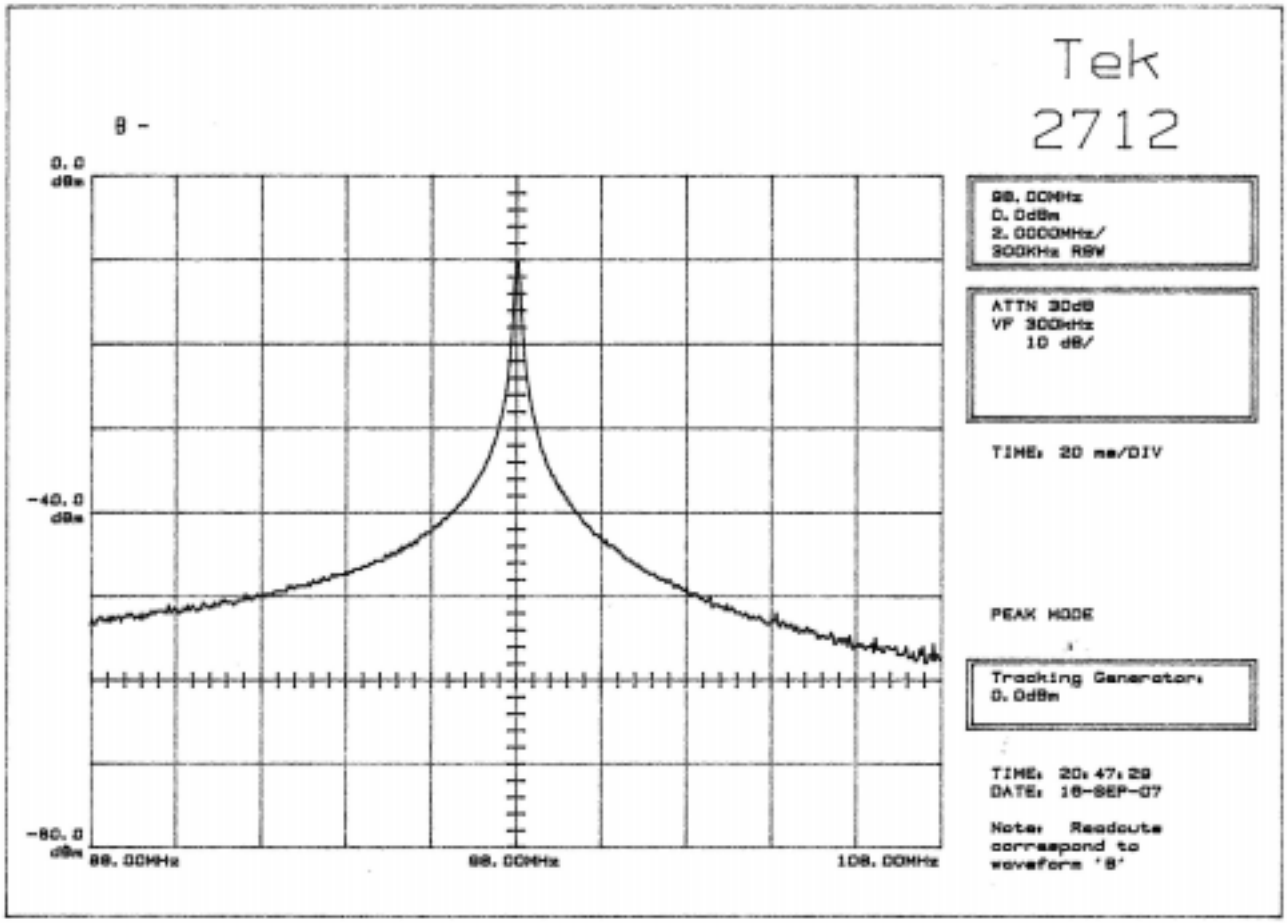
Notes:
1) Celwave Tuneable Bandpass Cavity provided by James Stanley, KZJK.

ENGINEERING EXHIBIT C1

IDS Building Master Antenna, Minneapolis, Minnesota

Plot, Tunable Bandpass Cavity Characteristics:

Filter Performance, Swept Over 20 MHz.:

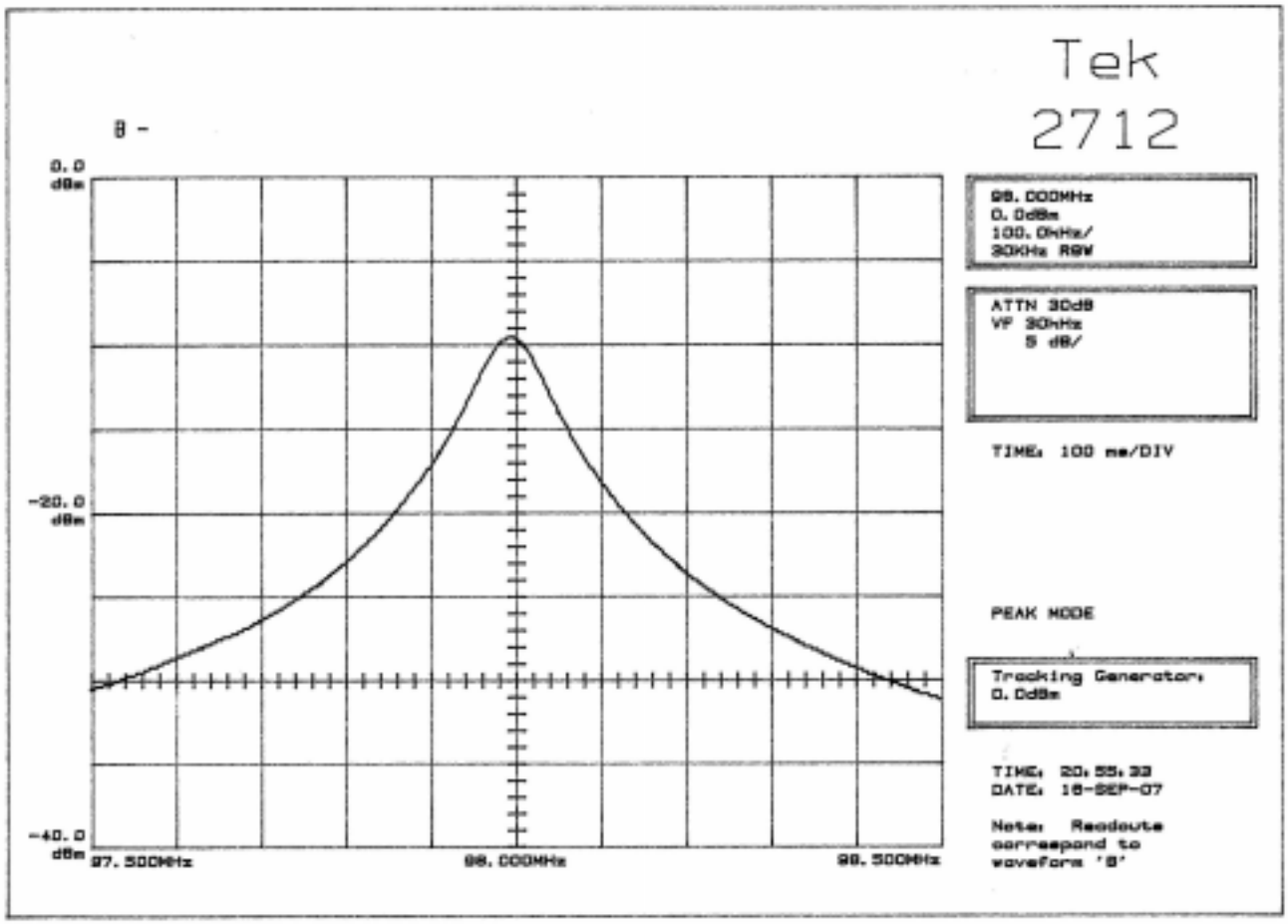


ENGINEERING EXHIBIT C2

IDS Building Master Antenna, Minneapolis, Minnesota

Plot, Tunable Bandpass Cavity Characteristics:

<u>Filter Performance, Swept Over 1 MHz.</u>:

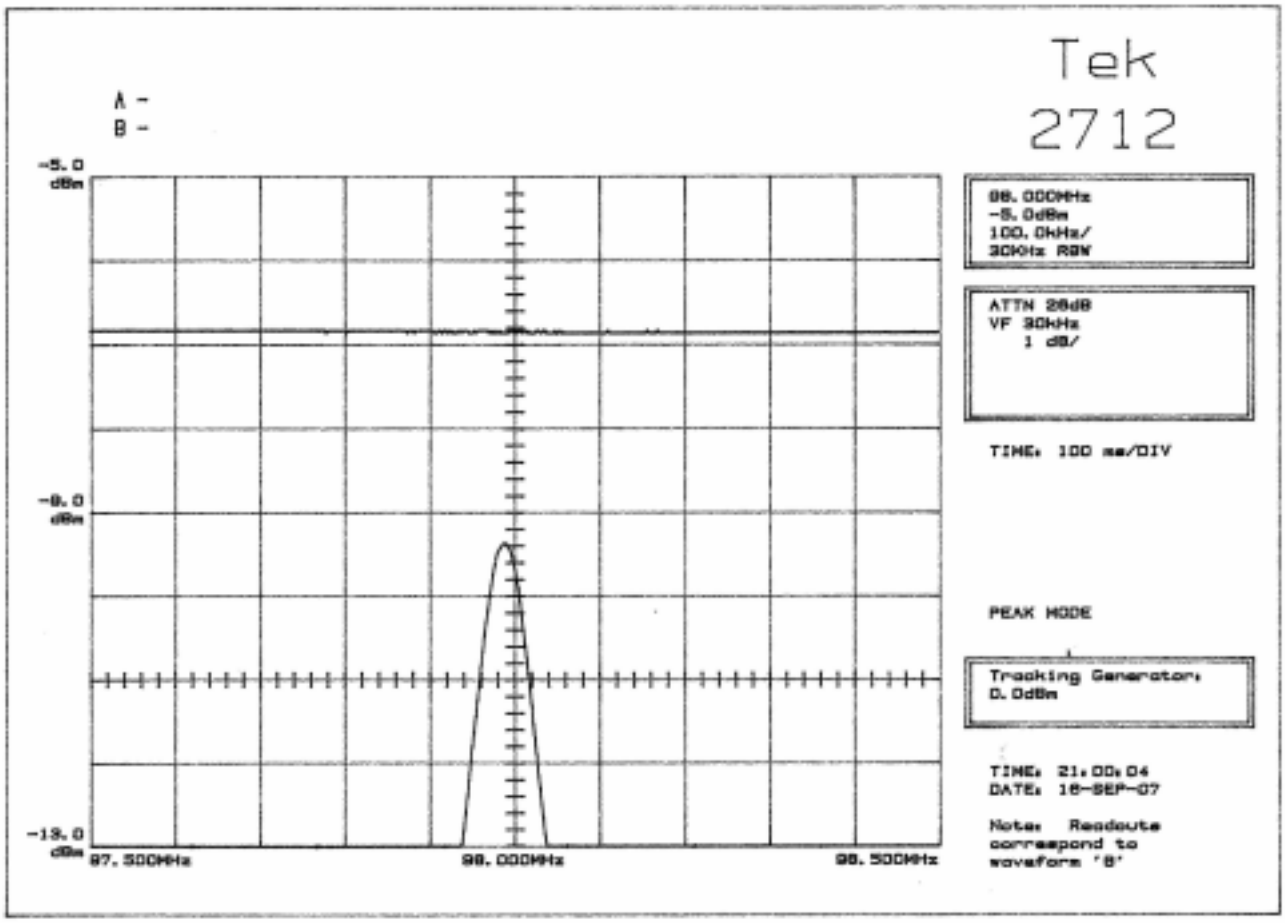


ENGINEERING EXHIBIT C3

IDS Building Master Antenna, Minneapolis, Minnesota

Plot, Tunable Bandpass Cavity Characteristics:

Filter Insertion Loss:



Note: Upper trace is output of tracking generator with attentation pads only. Lower trace is with tunable bandpass cavity inserted between pads. Measured insertion loss is therefore 2.6 db.

A (MHz.)	B (MHz.)	2A - B mix (MHz.)	Measured Spurious (dbm)	Tunable Filter Cavity Loss (db)	Reference Carrier (dbm)	Calculated Spurious (dbc)
92.5	105.7	79.3	See Narrative			<-80
92.5	104.1	80.9	See Narrative			<-80
93.7	105.7	81.7	See Narrative			<-80
92.5	102.1	82.9	See Narrative			<-80
93.7	104.1	83.3	-107	-2.6	-2.4	-102.0
92.5	101.3	83.7	-107	-2.6	-3.0	-101.4
92.5	100.3	84.7	-107	-2.6	-3.0	-101.4
93.7	102.1	85.3	-107	-2.6	-2.4	-102.0
92.5	99.5	85.5	-107	-2.6	-3.0	-101.4
93.7	101.3	86.1	-107	-2.6	-2.4	-102.0
92.5	98.5	86.5	-106	-2.6	-3.0	-100.4
93.7	100.3	87.1	-106	-2.6	-2.4	-101.0
92.5	97.1	87.9	-106	-2.6	-3.0	-100.4
93.7	99.5	87.9	-106	-2.6	-2.4	-101.0
97.1	105.7	88.5	-105	-2.6	-2.0	-100.4
93.7	98.5	88.9	-106	-2.6	-2.4	-101.0
97.1	104.1	90.1	-105	-2.6	-2.0	-100.4
93.7	97.1	90.3	-105	-2.6	-2.4	-100.0
92.5	93.7	91.3	-105	-2.6	-3.0	-99.4
98.5	105.7	91.3	-105	-2.6	-1.7	-100.7
97.1	102.1	Note (1) 92.1	-97	-2.6	-2.0	-92.4
97.1	101.3	Note (1) 92.9	-98	-2.6	-2.0	-93.4
98.5	104.1	Note (1) 92.9	-98	-2.6	-1.7	-93.7
99.5	105.7	Note (2) 93.3	-92	-2.6	-3.4	-86.0
97.1	100.3	Note (3) 93.9	-105	-2.6	-2.0	-100.4
97.1	99.5	94.7	-104	-2.6	-2.0	-99.4
93.7	92.5	94.9	-104	-2.6	-2.4	-99.0
98.5	102.1	94.9	-104	-2.6	-1.7	-99.7
99.5	104.1	94.9	-104	-2.6	-3.4	-98.0
100.3	105.7	94.9	-104	-2.6	-2.4	-99.0
97.1	98.5	95.7	-104	-2.6	-2.0	-99.4
98.5	101.3	95.7	-104	-2.6	-1.7	-99.7
100.3	104.1	96.5	-103	-2.6	-2.4	-98.0
98.5	100.3	96.7	-103	-2.6	-1.7	-98.7
99.5	102.1	Note (4) 96.9	-105	-2.6	-3.4	-99.0
101.3	105.7	Note (4) 96.9	-105	-2.6	-1.0	-101.4
98.5	99.5	97.5	-103	-2.6	-1.7	-98.7
99.5	101.3	97.7	-104	-2.6	-3.4	-98.0
100.3	102.1	Note (5) 98.5	-105	-2.6	-2.4	-100.0
101.3	104.1	Note (5) 98.5	-105	-2.6	-1.0	-101.4
102.1	105.7	Note (5) 98.5	-105	-2.6	-1.7	-100.7
99.5	100.3	98.7	-105	-2.6	-3.4	-99.0
100.3	101.3	Note (6) 99.3	-91	-2.6	-2.4	-86.0
98.5	97.1	99.9	-102	-2.6	-1.7	-97.7
102.1	104.1	Note (7) 100.1	-92	-2.6	-1.7	-87.7
97.1	93.7	Note (7) 100.5	-91	-2.6	-2.0	-86.4
99.5	98.5	Note (7) 100.5	-91	-2.6	-3.4	-85.0
101.3	102.1	Note (7) 100.5	-91	-2.6	-1.0	-87.4

A (MHz.)	B (MHz.)	2A - B mix (MHz.)	Measured Spurious (dbm)	Tunable Filter Cavity Loss (db)	Reference Carrier (dbm)	Calculated Spurious (dbc)
100.3	99.5	Note (8) 101.1	-105	-2.6	-2.4	-100.0
97.1	92.5	101.7	-95	-2.6	-2.0	-90.4
99.5	97.1	Note 9) 101.9	-105	-2.6	-3.4	-99.0
100.3	98.5	Note (9) 102.1	-105	-2.6	-2.4	-100.0
101.3	100.3	Note (9) 102.3	-105	-2.6	-1.0	-101.4
104.1	105.7	Note (10) 102.5	-89	-2.6	-1.3	-85.1
102.1	101.3	102.9	-104	-2.6	-1.7	-99.7
101.3	99.5	103.1	-105	-2.6	-1.0	-101.4
98.5	93.7	103.3	-105	-2.6	-1.7	-100.7
100.3	97.1	103.5	-104	-2.6	-2.4	-99.0
102.1	100.3	103.9	-102	-2.6	-1.7	-97.7
101.3	98.5	Note (11) 104.1	-105	-2.6	-1.0	-101.4
98.5	92.5	104.5	-104	-2.6	-1.7	-99.7
102.1	99.5	104.7	-105	-2.6	-1.7	-100.7
99.5	93.7	105.3	-104	-2.6	-3.4	-98.0
101.3	97.1	105.5	-99	-2.6	-1.0	-95.4
102.1	98.5	105.7	-101	-2.6	-1.7	-96.7
104.1	102.1	106.1	-105	-2.6	-1.3	-101.1
99.5	92.5	106.5	-105	-2.6	-3.4	-99.0
100.3	93.7	106.9	-105	-2.6	-2.4	-100.0
104.1	101.3	106.9	-105	-2.6	-1.3	-101.1
102.1	97.1	107.1	-105	-2.6	-1.7	-100.7
104.1	100.3	107.9	-105	-2.6	-1.3	-101.1
100.3	92.5	108.1	-106	-2.6	-2.4	-101.0
104.1	99.5	108.7	-105	-2.6	-1.3	-101.1
101.3	93.7	108.9	-106	-2.6	-1.0	-102.4
104.1	98.5	109.7	-106	-2.6	-1.3	-102.1
101.3	92.5	110.1	-106	-2.6	-1.0	-102.4
102.1	93.7	110.5	-106	-2.6	-1.7	-101.7
104.1	97.1	111.1	-107	-2.6	-1.3	-103.1
102.1	92.5	111.7	-107	-2.6	-1.7	-102.7
104.1	93.7	114.5	-107	-2.6	-1.3	-103.1
104.1	92.5	115.7	-107	-2.6	-1.3	-103.1

Note (1): Measured with 92.5 operating.
Note (2): Measured with 93.7 operating.
Note (3): Measured during 93.7 carrier cut.
Note (4): Measured during 97.1 carrier cut.
Note (5): Measured during 98.5 carrier cut.
Note (6): Measured with 99.5 operating.
Note (7): Measured with 100.3 operating.
Note (8): Measured during 101.3 carrier cut.
Note (9): Measured during 102.1 carrier cut.
Note (10): Measured with 102.1 operating.
Note (11): Measured during 104.1 carrier cut.

A (MHz.)	B (MHz.)	A + B mix (MHz.)	Measured Spurious (dbm)	Preselector (TEK 2706) Loss (db)	Reference Carrier (dbm)	Calculated Spurious (dbc)
92.5	**92.5**	**185**	**-94**	**-0.2**	**-2.7**	**-91.1**
92.5	93.7	186.2	-94	-0.2	-2.7	-91.1
93.7	92.5	186.2	-94	-0.2	-2.0	-91.8
93.7	**93.7**	**187.4**	**-94**	**-0.2**	**-2.0**	**-91.8**
92.5	97.1	189.6	-94	-0.2	-2.7	-91.1
97.1	92.5	189.6	-94	-0.2	-2.0	-91.8
93.7	97.1	190.8	-94	-0.2	-2.0	-91.8
97.1	93.7	190.8	-94	-0.2	-2.0	-91.8
92.5	98.5	191	-94	-0.2	-2.7	-91.1
98.5	92.5	191	-94	-0.2	-1.7	-92.1
92.5	99.5	192	-94	-0.2	-2.7	-91.1
99.5	92.5	192	-94	-0.2	-3.0	-90.8
93.7	98.5	192.2	-94	-0.2	-2.0	-91.8
98.5	93.7	192.2	-94	-0.2	-1.7	-92.1
92.5	100.3	192.8	-94	-0.2	-2.7	-91.1
100.3	92.5	192.8	-94	-0.2	-2.0	-91.8
93.7	99.5	193.2	-94	-0.2	-2.0	-91.8
99.5	93.7	193.2	-94	-0.2	-3.0	-90.8
92.5	101.3	193.8	-94	-0.2	-2.7	-91.1
101.3	92.5	193.8	-94	-0.2	-1.0	-92.8
93.7	100.3	194	-94	-0.2	-2.0	-91.8
100.3	93.7	194	-94	-0.2	-2.0	-91.8
97.1	**97.1**	**194.2**	**-94**	**-0.2**	**-2.0**	**-91.8**
92.5	102.1	194.6	-94	-0.2	-2.7	-91.1
102.1	92.5	194.6	-94	-0.2	-1.3	-92.5
93.7	101.3	195	-94	-0.2	-2.0	-91.8
101.3	93.7	195	-94	-0.2	-1.0	-92.8
97.1	98.5	195.6	-94	-0.2	-2.0	-91.8
98.5	97.1	195.6	-94	-0.2	-1.7	-92.1
93.7	102.1	195.8	-94	-0.2	-2.0	-91.8
102.1	93.7	195.8	-94	-0.2	-1.3	-92.5
92.5	104.1	196.6	-94	-0.2	-2.7	-91.1
97.1	99.5	196.6	-94	-0.2	-2.0	-91.8
99.5	97.1	196.6	-94	-0.2	-3.0	-90.8
104.1	92.5	196.6	-94	-0.2	-1.3	-92.5
98.5	**98.5**	**197**	**-94**	**-0.2**	**-1.7**	**-92.1**
97.1	100.3	197.4	-94	-0.2	-2.0	-91.8
100.3	97.1	197.4	-94	-0.2	-2.0	-91.8
93.7	104.1	197.8	-94	-0.2	-2.0	-91.8
104.1	93.7	197.8	-94	-0.2	-1.3	-92.5
98.5	99.5	198	-94	-0.2	-1.7	-92.1
99.5	98.5	198	-94	-0.2	-3.0	-90.8
92.5	105.7	198.2	-94	-0.2	-2.7	-91.1
97.1	101.3	198.4	-94	-0.2	-2.0	-91.8
101.3	97.1	198.4	-94	-0.2	-1.0	-92.8
98.5	100.3	198.8	-94	-0.2	-1.7	-92.1
100.3	98.5	198.8	-94	-0.2	-2.0	-91.8
99.5	**99.5**	**199**	**-94**	**-0.2**	**-3.0**	**-90.8**

A (MHz.)	B (MHz.)	A + B mix (MHz.)	Measured Spurious (dbm)	Preselector (TEK 2706) Loss (db)	Reference Carrier (dbm)	Calculated Spurious (dbc)
97.1	102.1	199.2	-94	-0.2	-2.0	-91.8
102.1	97.1	199.2	-94	-0.2	-1.3	-92.5
93.7	105.7	199.4	-94	-0.2	-2.0	-91.8
105.7	93.7	199.4	-94	-0.2	-1.3	-92.5
98.5	101.3	199.8	-94	-0.2	-1.7	-92.1
99.5	100.3	199.8	-94	-0.2	-3.0	-90.8
100.3	99.5	199.8	-94	-0.2	-2.0	-91.8
101.3	98.5	199.8	-94	-0.2	-1.0	-92.8
98.5	102.1	200.6	-94	-0.2	-1.7	-92.1
100.3	**100.3**	**200.6**	**-94**	**-0.2**	**-2.0**	**-91.8**
102.1	98.5	200.6	-94	-0.2	-1.3	-92.5
99.5	101.3	200.8	-94	-0.2	-3.0	-90.8
101.3	99.5	200.8	-94	-0.2	-1.0	-92.8
97.1	104.1	201.2	-94	-0.2	-2.0	-91.8
104.1	97.1	201.2	-94	-0.2	-1.3	-92.5
99.5	102.1	201.6	-94	-0.2	-3.0	-90.8
100.3	101.3	201.6	-94	-0.2	-2.0	-91.8
101.3	100.3	201.6	-94	-0.2	-1.0	-92.8
102.1	99.5	201.6	-94	-0.2	-1.3	-92.5
100.3	102.1	202.4	-94	-0.2	-2.0	-91.8
102.1	100.3	202.4	-94	-0.2	-1.3	-92.5
98.5	104.1	202.6	-94	-0.2	-1.7	-92.1
101.3	**101.3**	**202.6**	**-94**	**-0.2**	**-1.0**	**-92.8**
104.1	98.5	202.6	-94	-0.2	-1.3	-92.5
97.1	105.7	202.8	-94	-0.2	-2.0	-91.8
101.3	102.1	203.4	-94	-0.2	-1.0	-92.8
102.1	101.3	203.4	-94	-0.2	-1.3	-92.5
99.5	104.1	203.6	-94	-0.2	-3.0	-90.8
104.1	99.5	203.6	-94	-0.2	-1.3	-92.5
98.5	105.7	204.2	-94	-0.2	-1.7	-92.1
102.1	**102.1**	**204.2**	**-94**	**-0.2**	**-1.3**	**-92.5**
100.3	104.1	204.4	-94	-0.2	-2.0	-91.8
104.1	100.3	204.4	-94	-0.2	-1.3	-92.5
99.5	105.7	205.2	-94	-0.2	-3.0	-90.8
101.3	104.1	205.4	-94	-0.2	-1.0	-92.8
104.1	101.3	205.4	-94	-0.2	-1.3	-92.5
100.3	105.7	206	-94	-0.2	-2.0	-91.8
102.1	104.1	206.2	-94	-0.2	-1.3	-92.5
104.1	102.1	206.2	-94	-0.2	-1.3	-92.5
101.3	105.7	207	-94	-0.2	-1.0	-92.8
102.1	105.7	207.8	-94	-0.2	-1.3	-92.5
104.1	**104.1**	**208.2**	**-94**	**-0.2**	**-1.3**	**-92.5**
104.1	105.7	209.8	-94	-0.2	-1.3	-92.5

Note: Measurements in **boldface** type are second harmonics. Noise floor at -94 dbm.

ELECTRONICS RESEARCH, INC. ERI

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

May 29, 2008

Submitted By:

Jeff Taylor
7777 Gardner Rd.
Chandler, In. 47610
TX: 812-926-6000 Ext. 276
Cell: 812-459-6544
EM: JTaylor@eriinc.com

TABLE OF CONTENTS

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

_____

Jeff Taylor

DRAWINGS

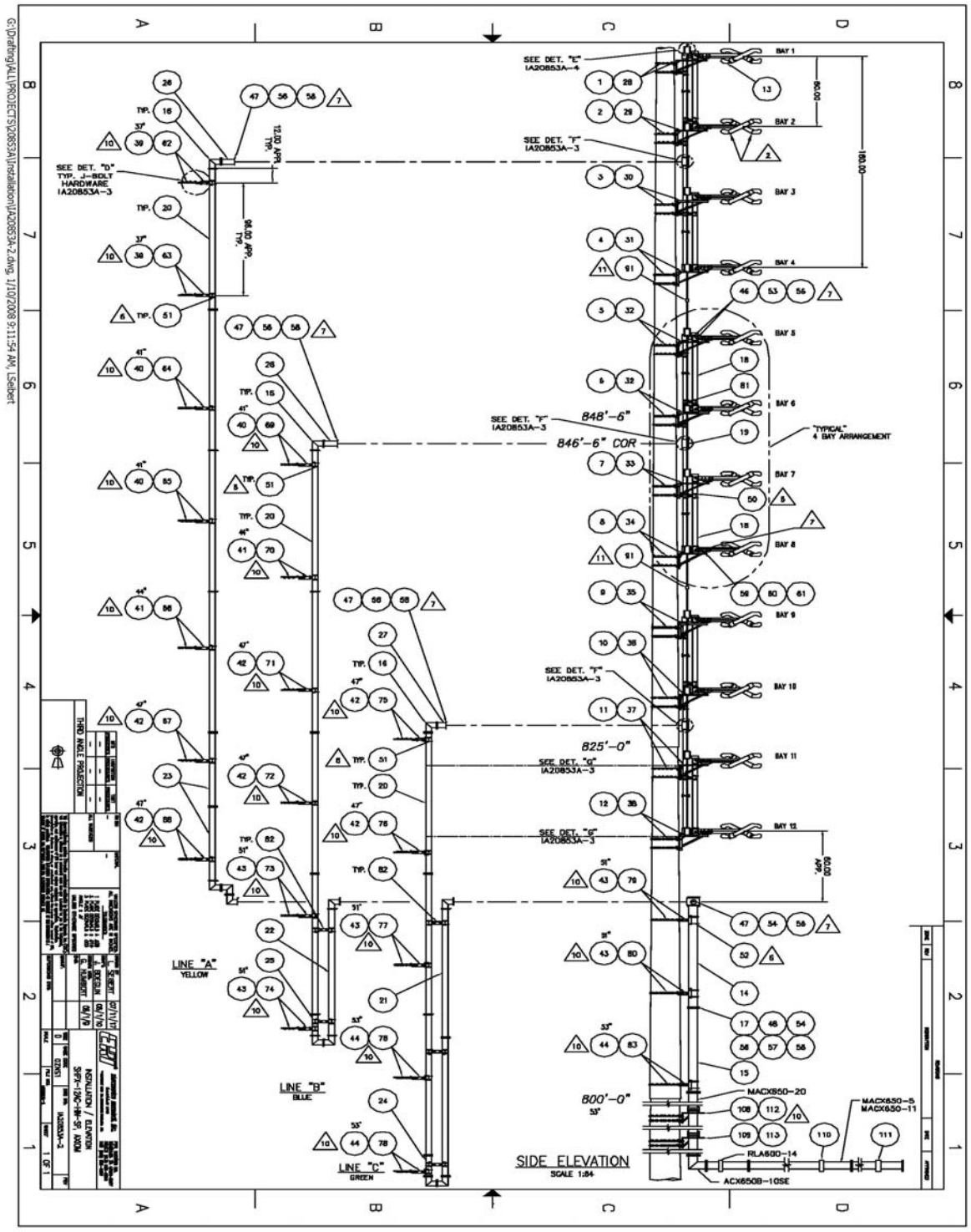

SIDE ELEVATION
SCALE 1:84
LINE "A"
YELLOW
LINE "B"
BLUE
LINE "C"
GREEN
848'-6"
846'-6" COR
825'-0"
800'-0"
"TYPICAL" 4 BAY ARRANGEMENT
MACX650-20
MACX650-5
MACX650-11
RLA600-14
ACX650B-10SE

Photo 1: Antenna Stacked on Pole

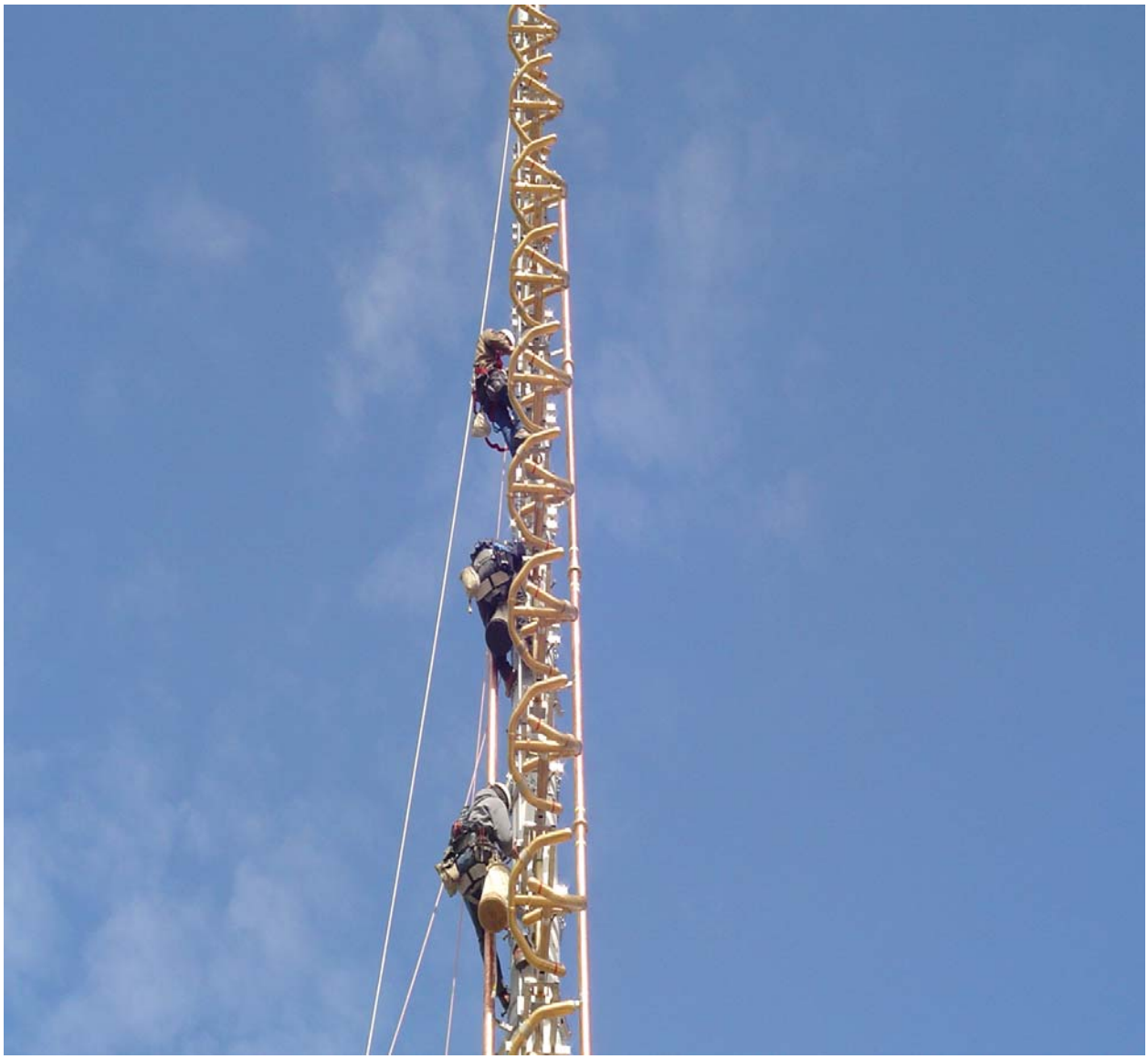
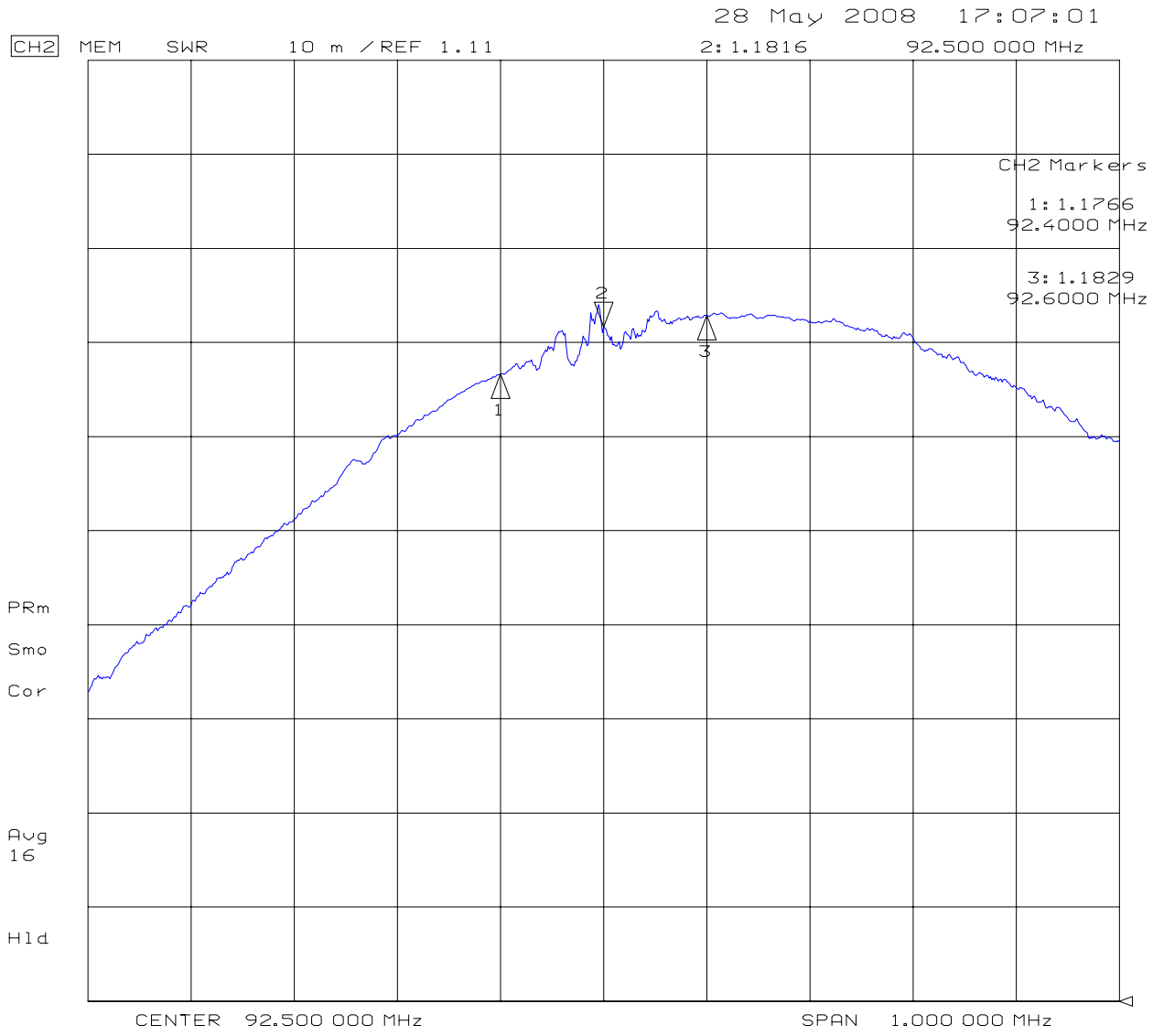
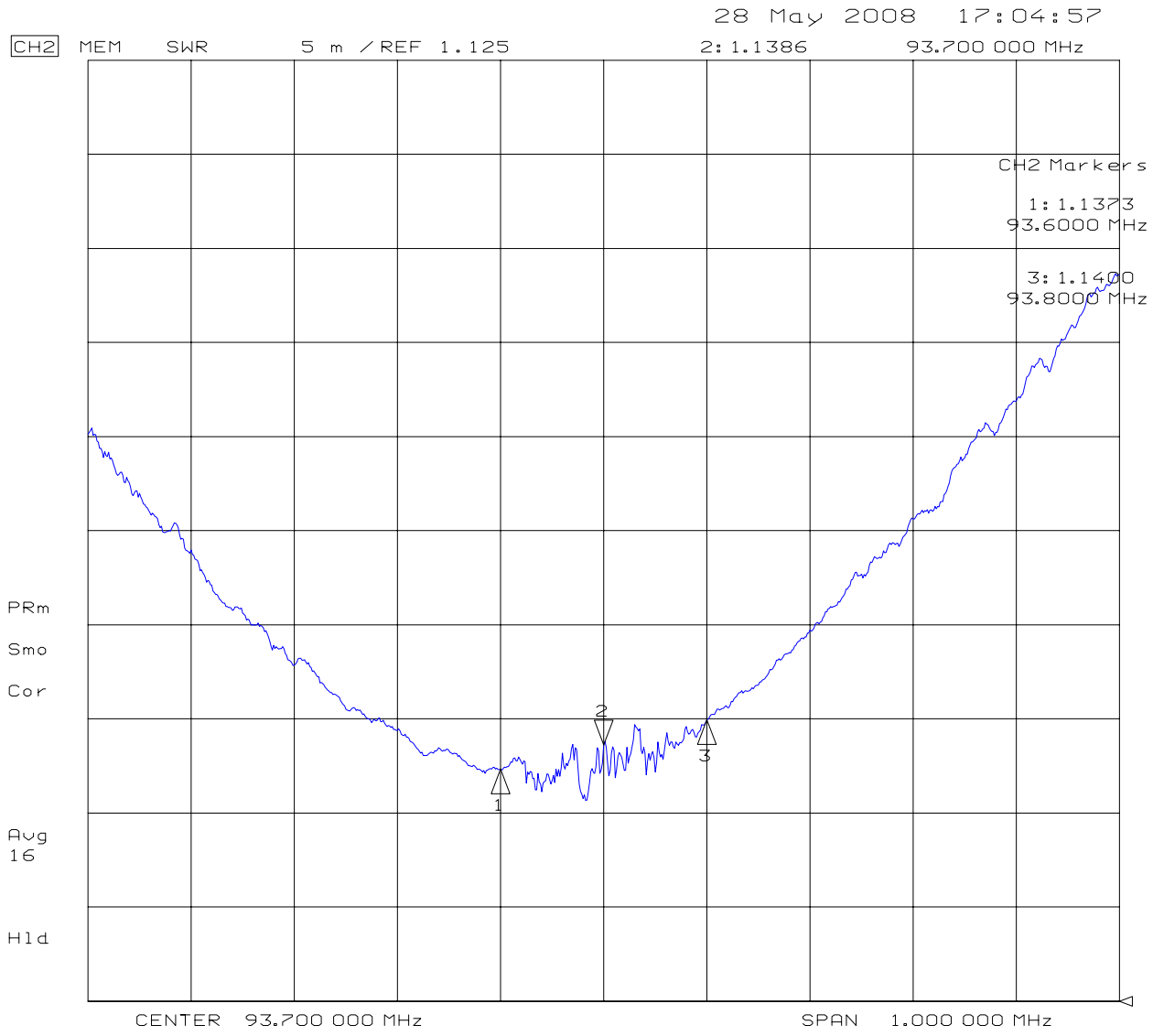


Photo 2: Final assembly of antenna ~ deicer wiring.

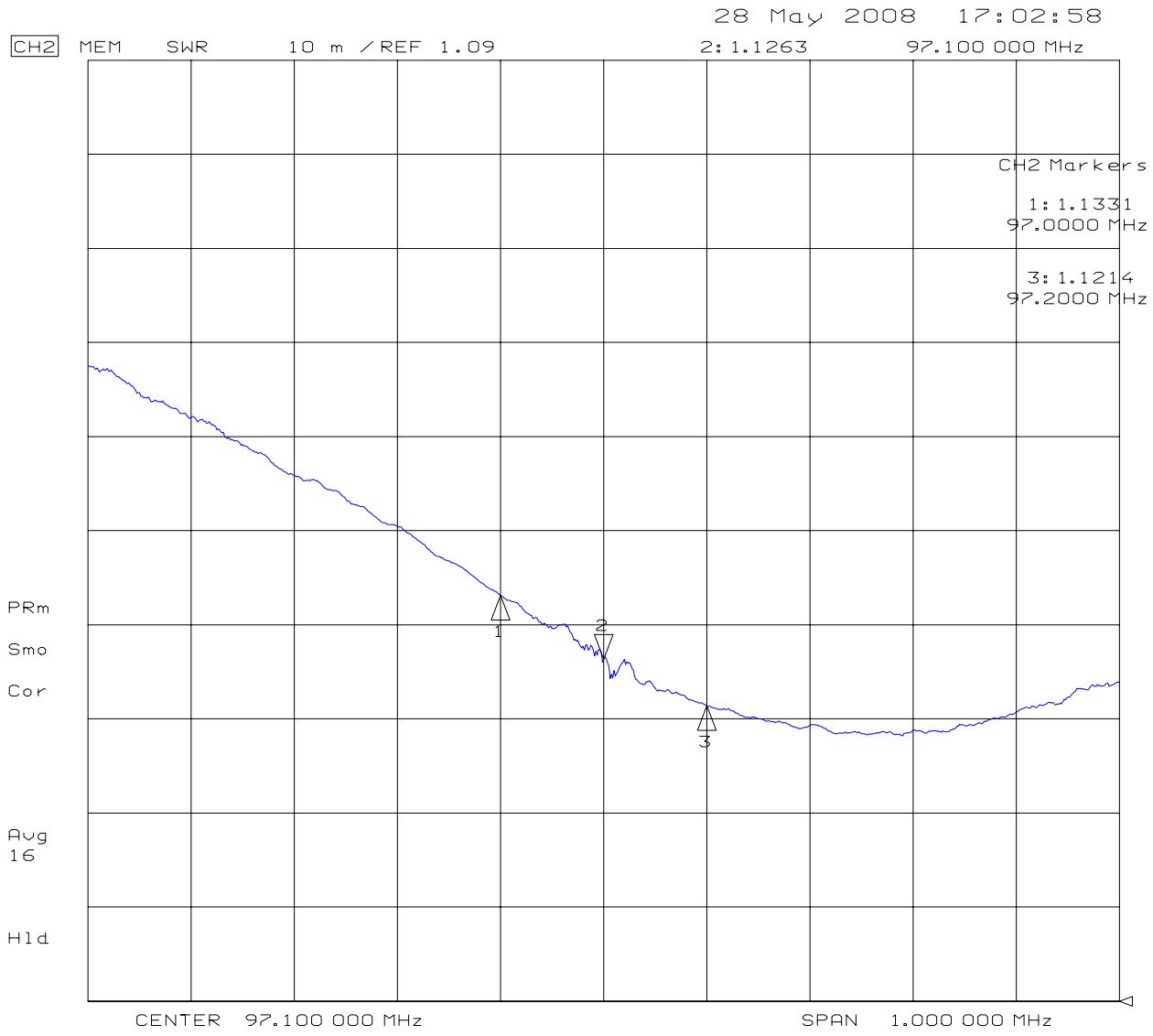
Measurement 1: Final Antenna Match of 92.5 MHz.



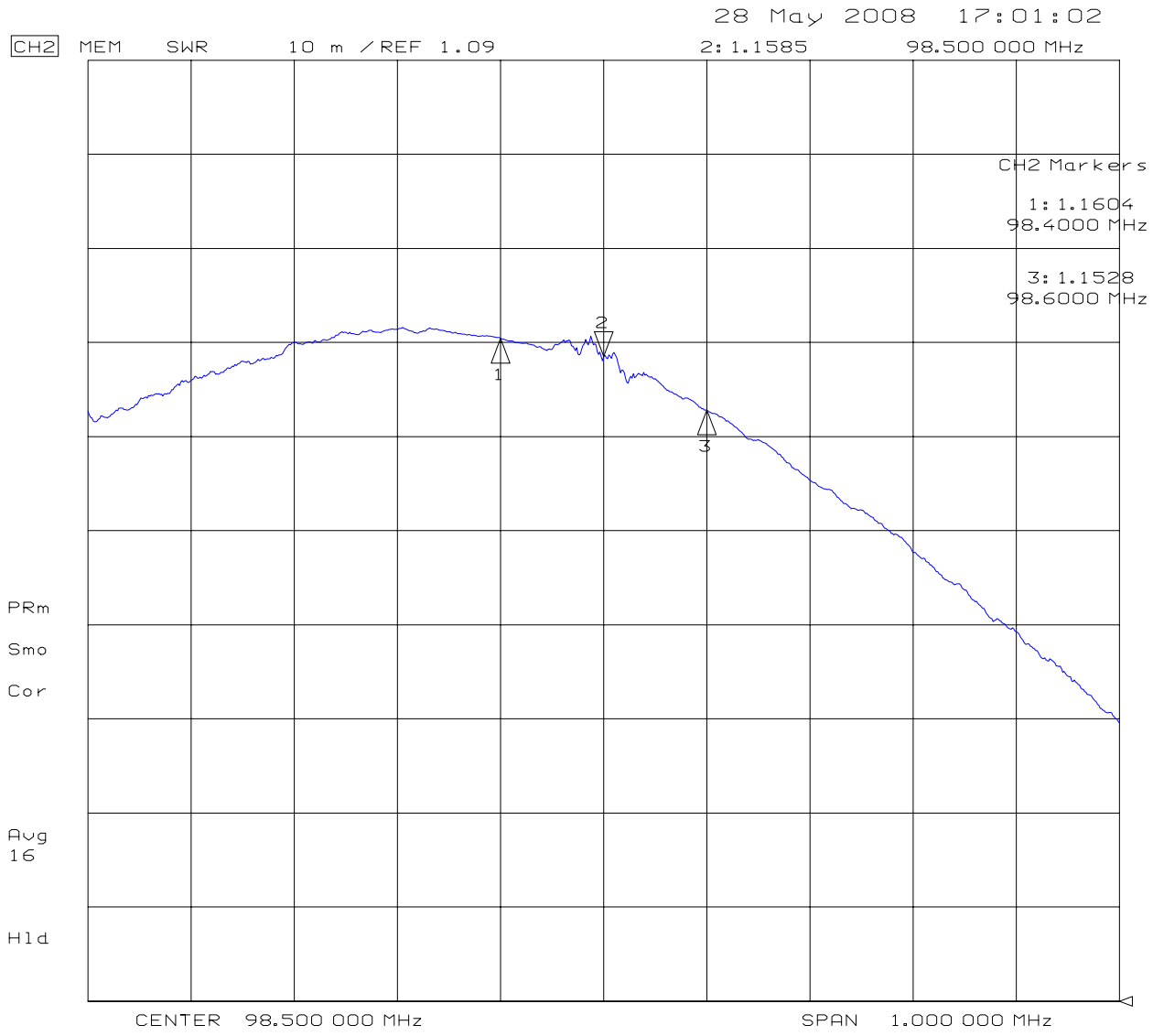
Measurement 2: Final Antenna Match of 93.7 MHz.



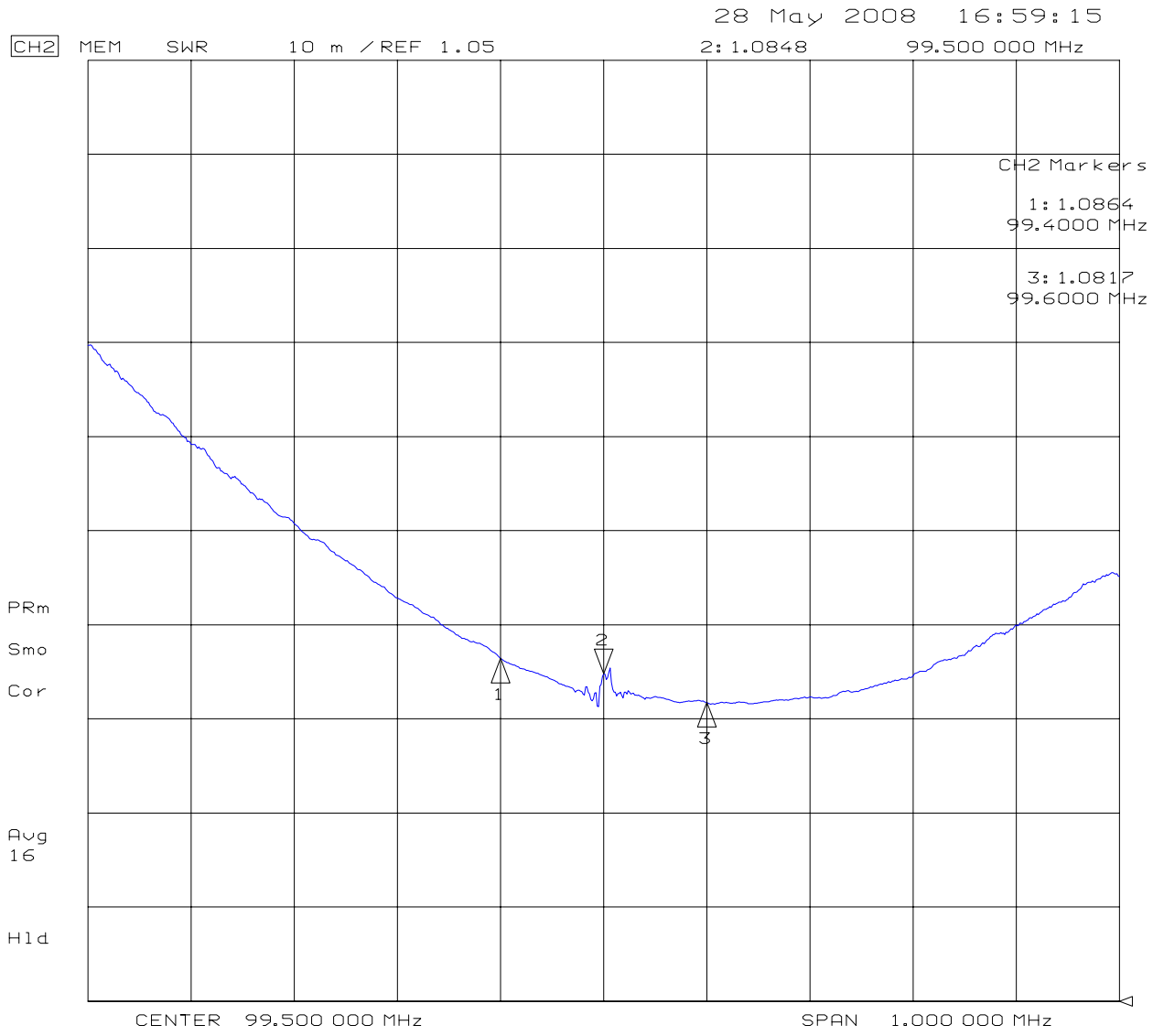
Measurement 3: Final Antenna Match of 97.1 MHz.



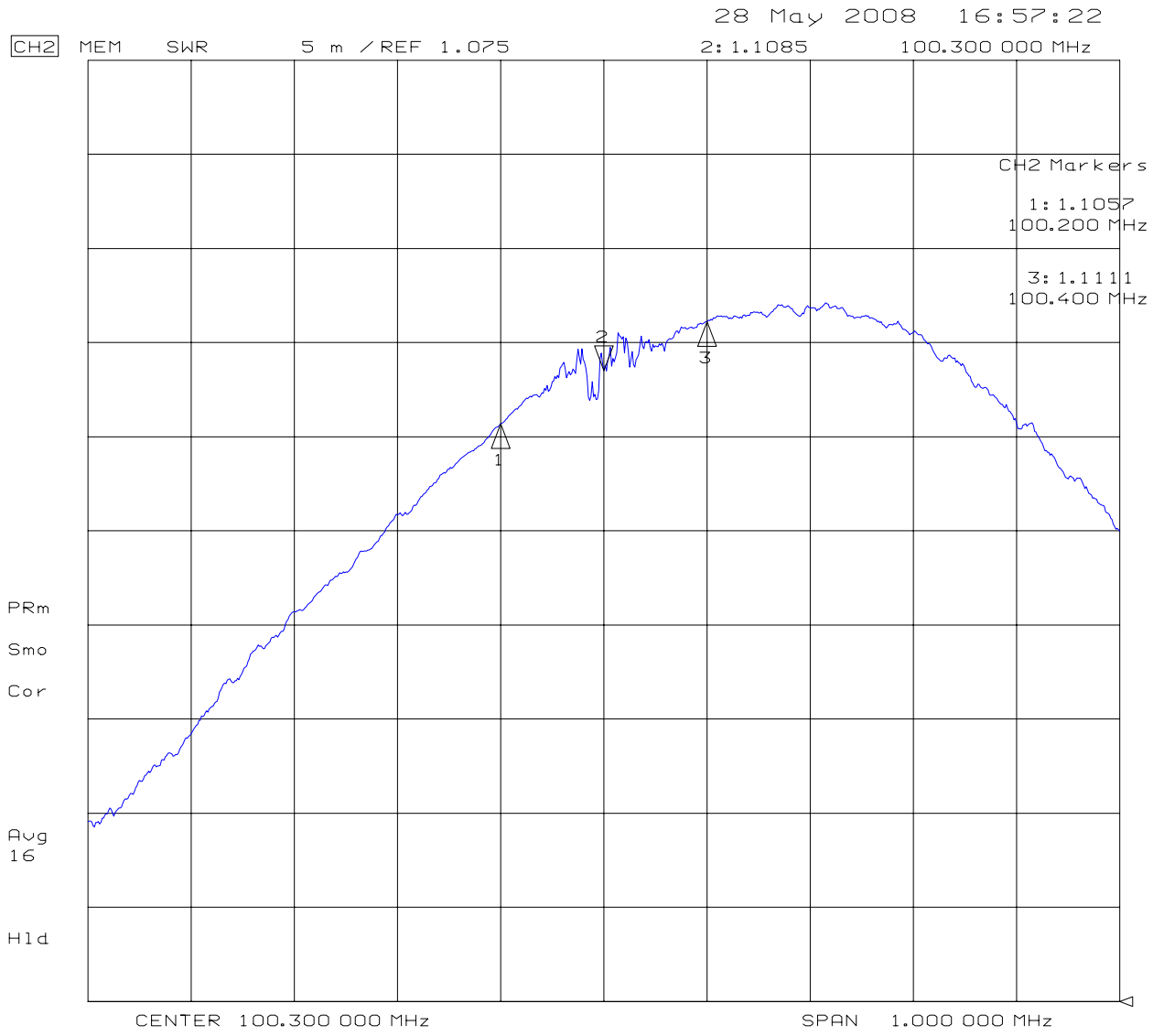
Measurement 4: Final Antenna Match of 98.5 MHz.



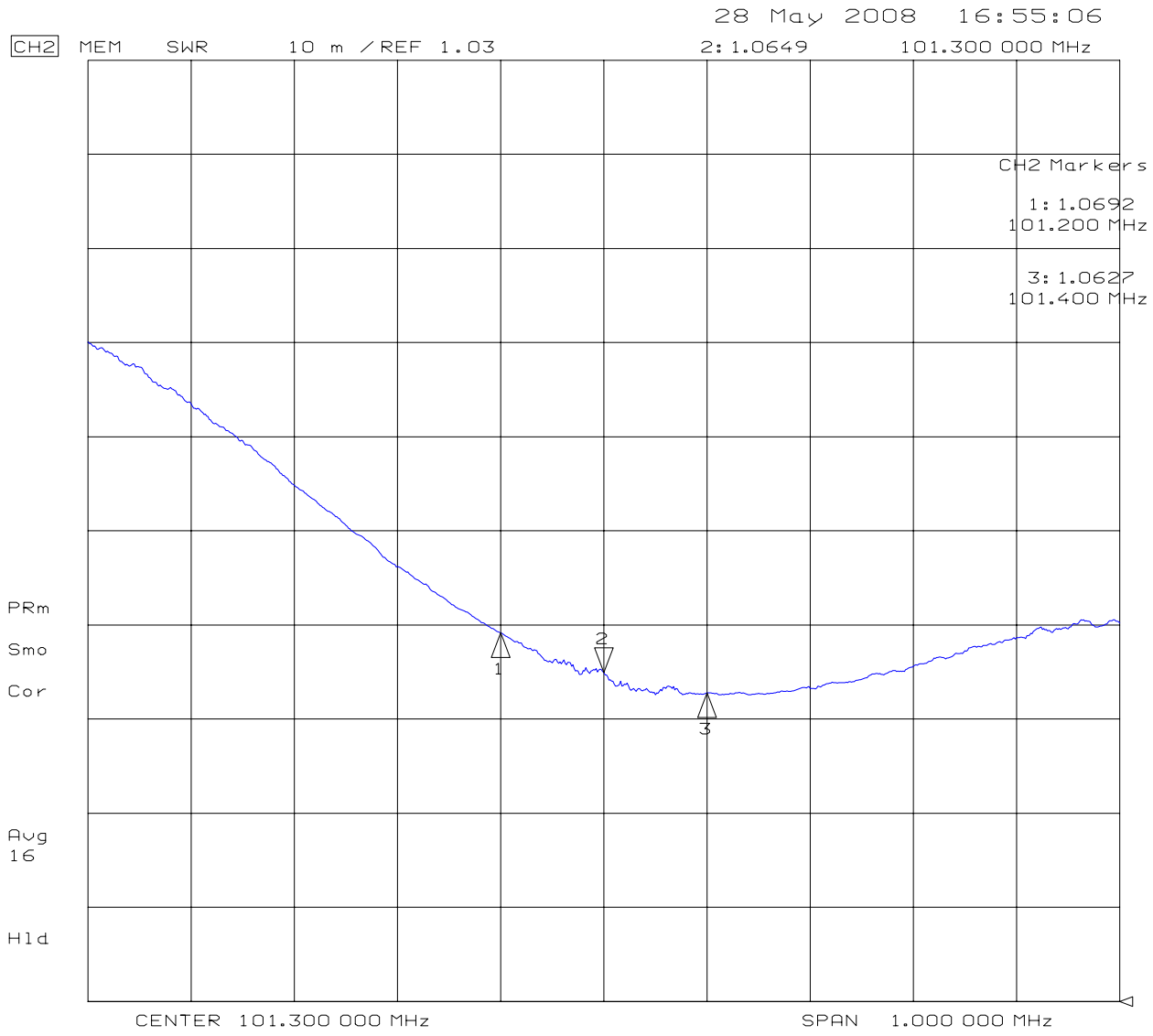
Measurement 5: Final Antenna Match of 99.5 MHz.



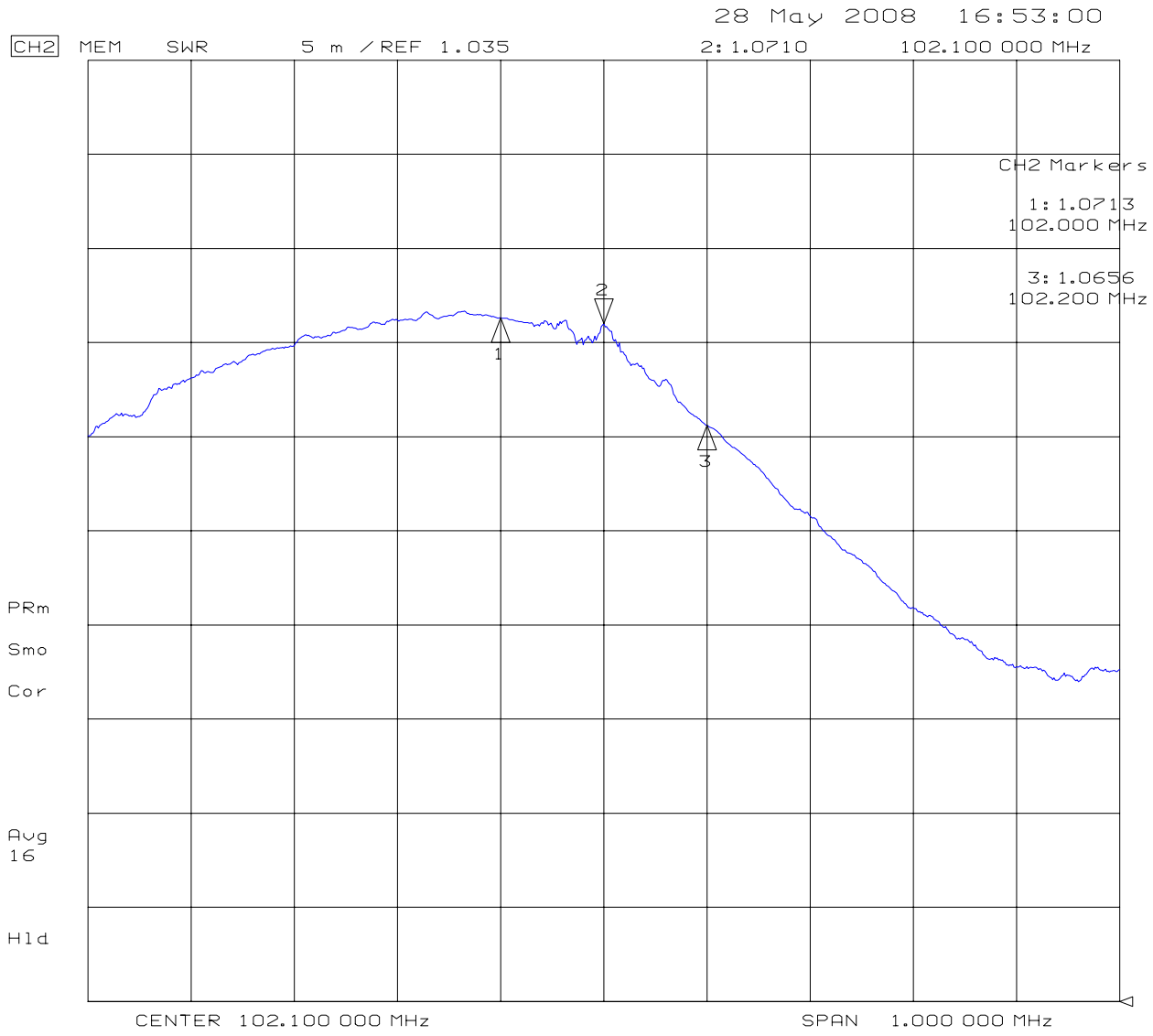
Measurement 6: Final Antenna Match of 100.3 MHz.



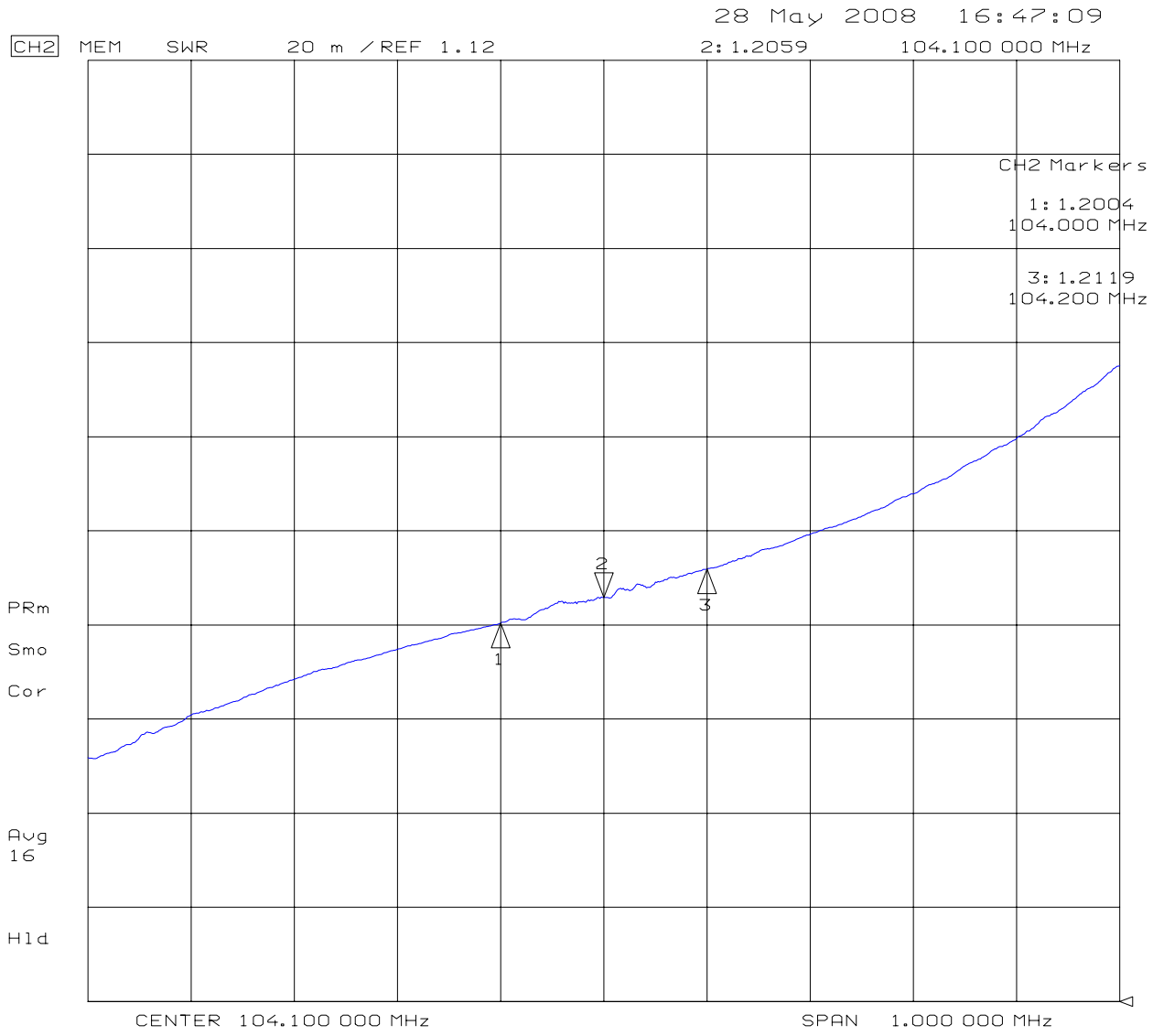
Measurement 7: Final Antenna Match of 101.3 MHz.



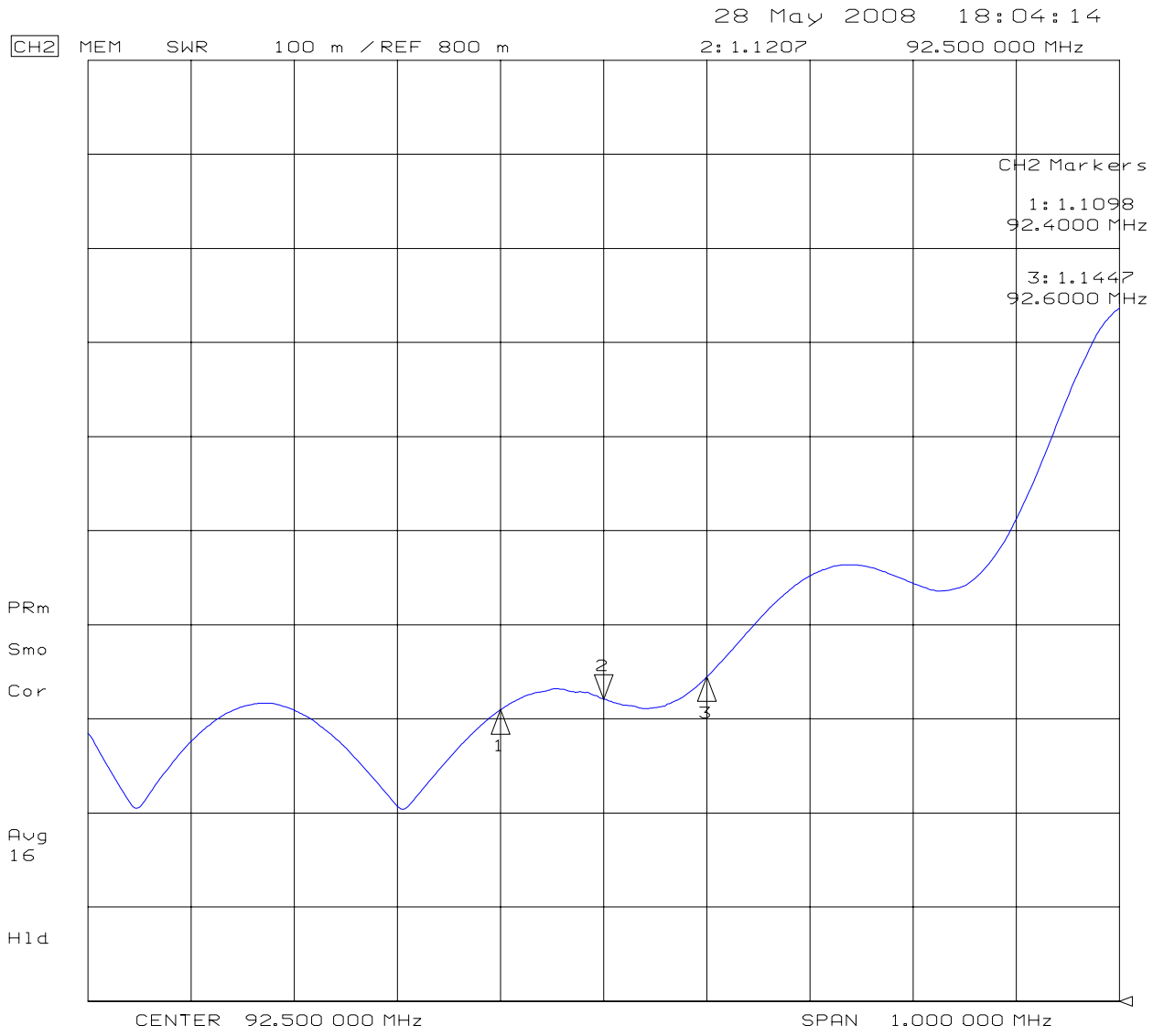
Measurement 8: Final Antenna Match of 102.1 MHz.



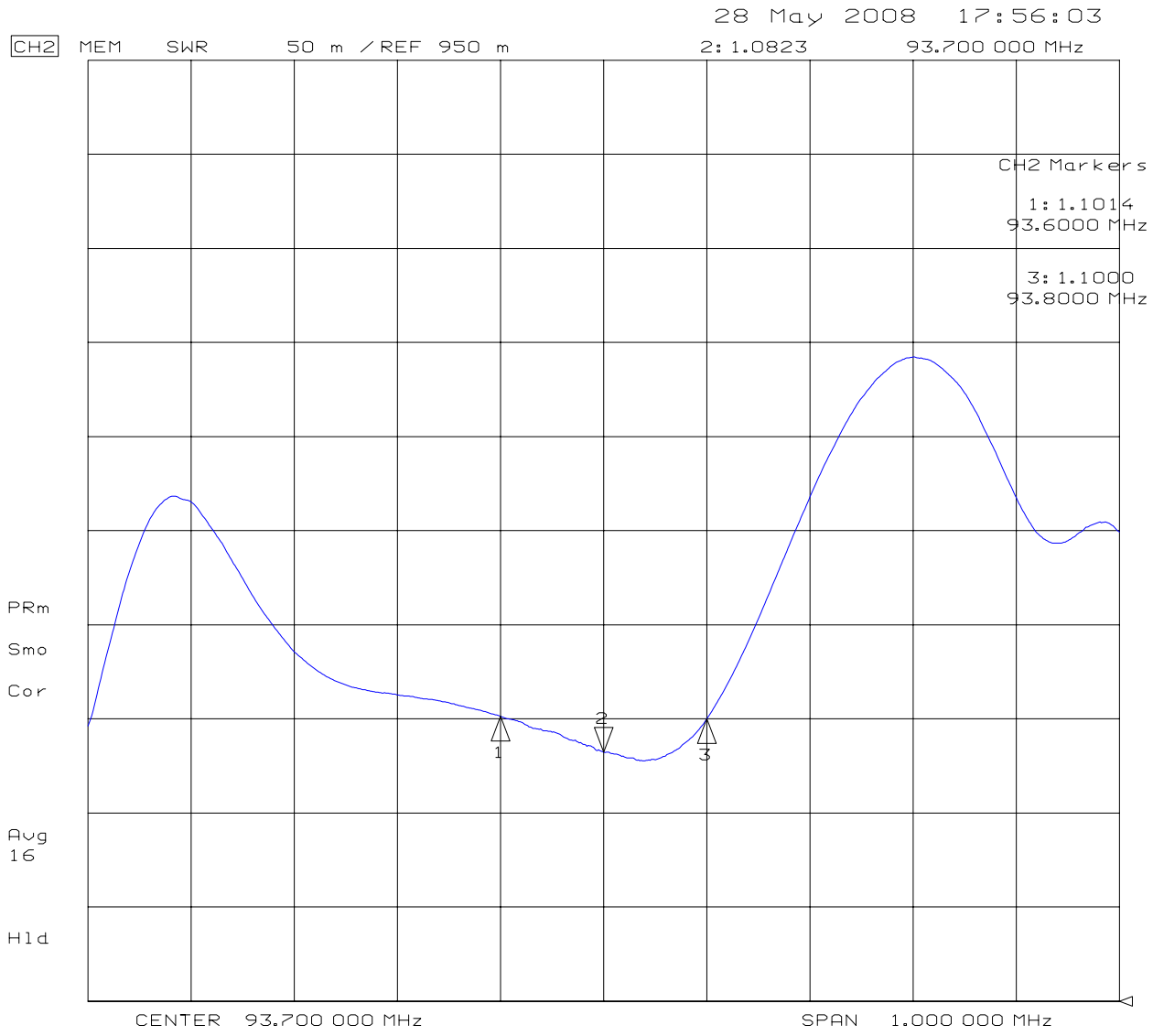
Measurement 9: Final Antenna Match of 104.1 MHz.



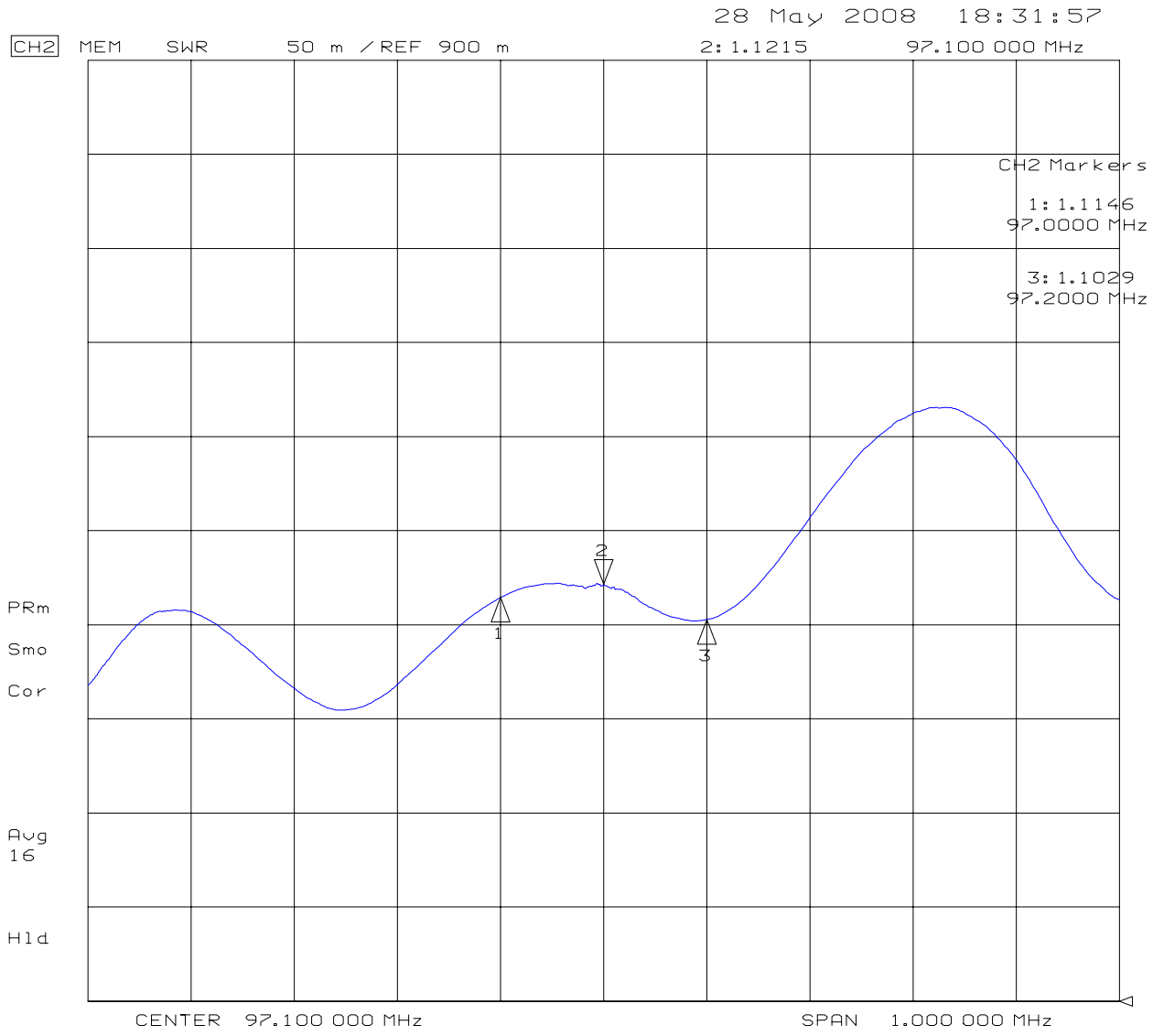
Measurement 10: Filter to Antenna Match of 92.5 MHz.



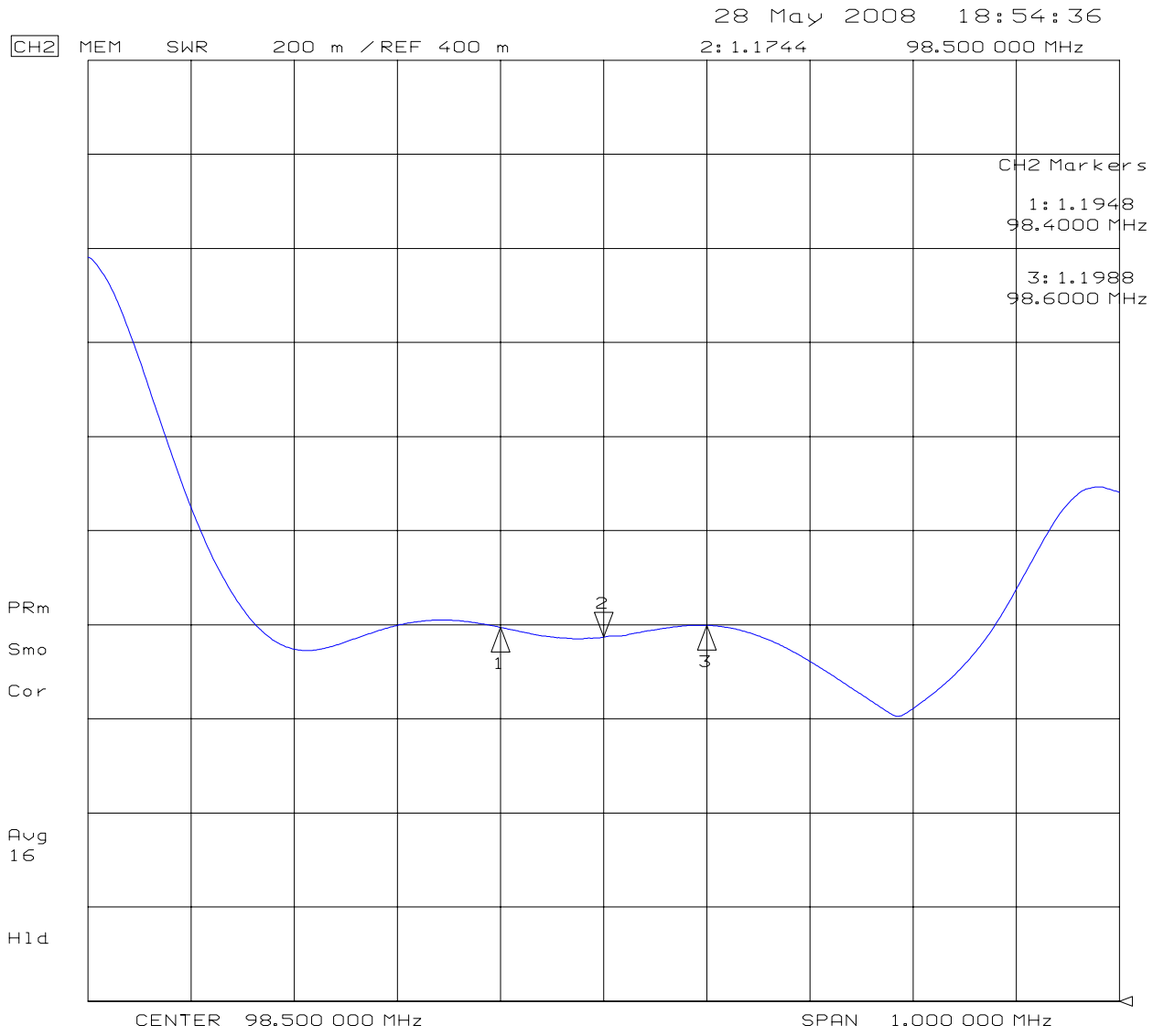
Measurement 11: Filter to Antenna Match of 93.7 MHz.



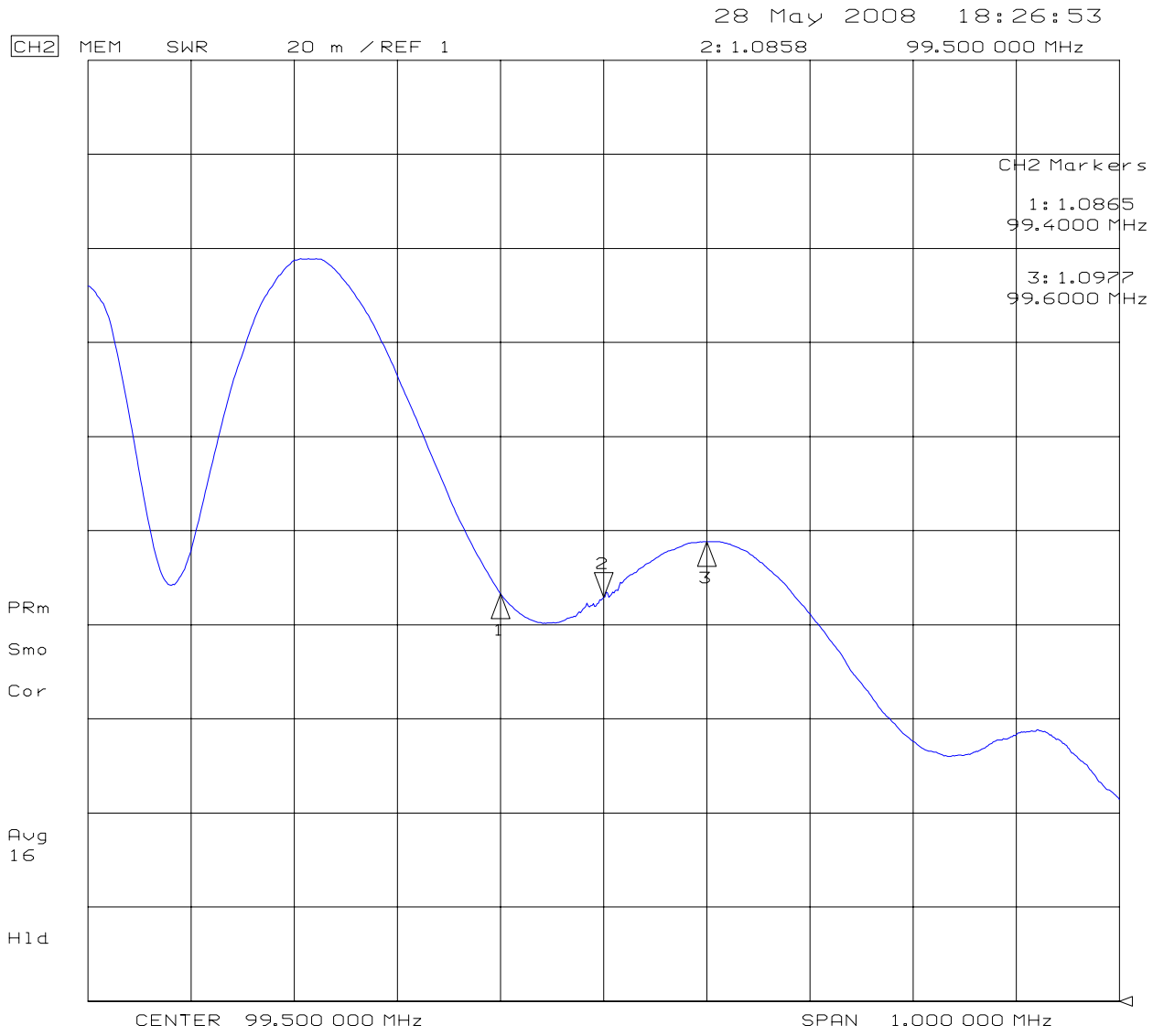
Measurement 12: Filter to Antenna Match of 97.1 MHz.



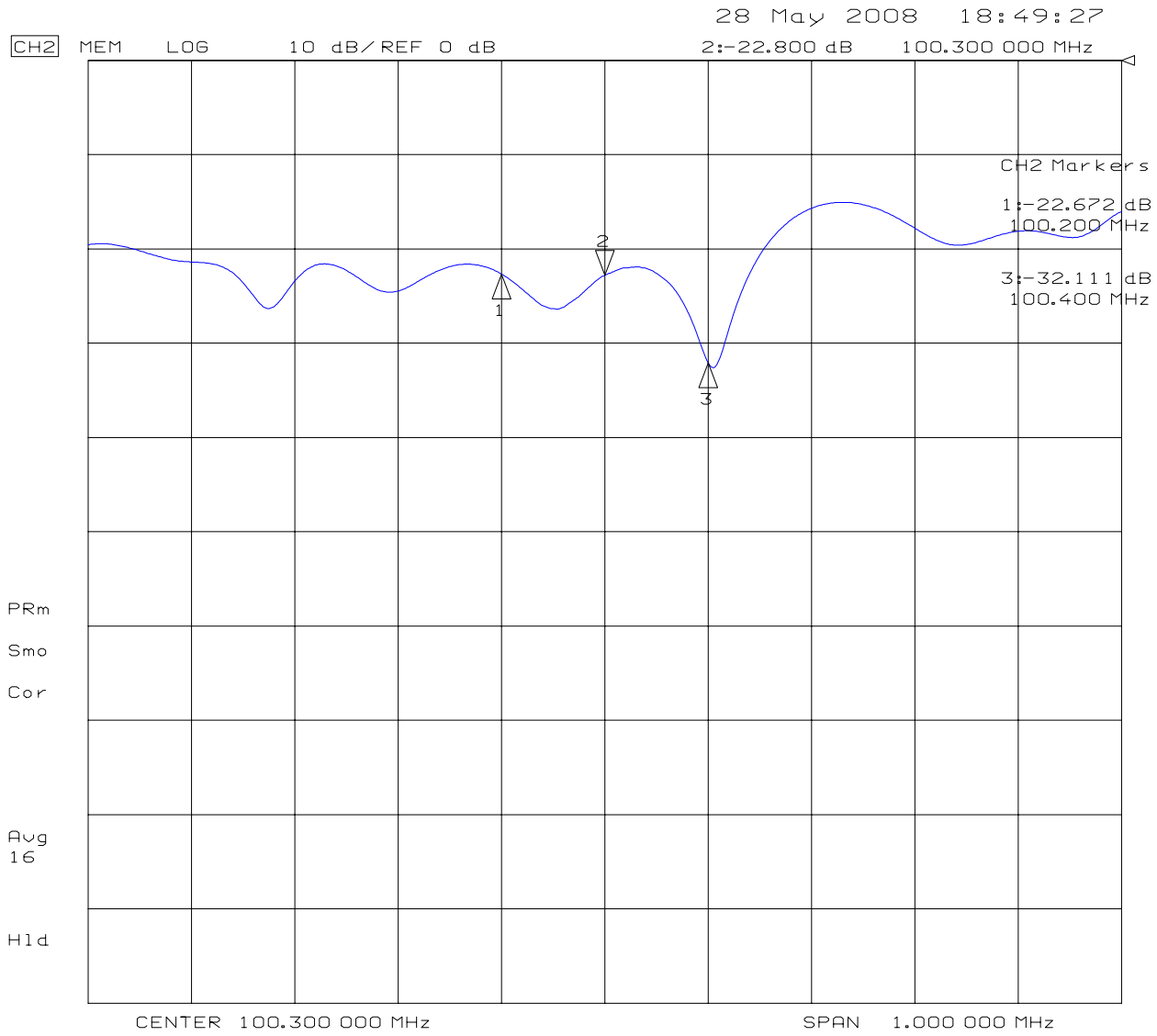
Measurement 13: Filter to Antenna Match of 98.5 MHz.



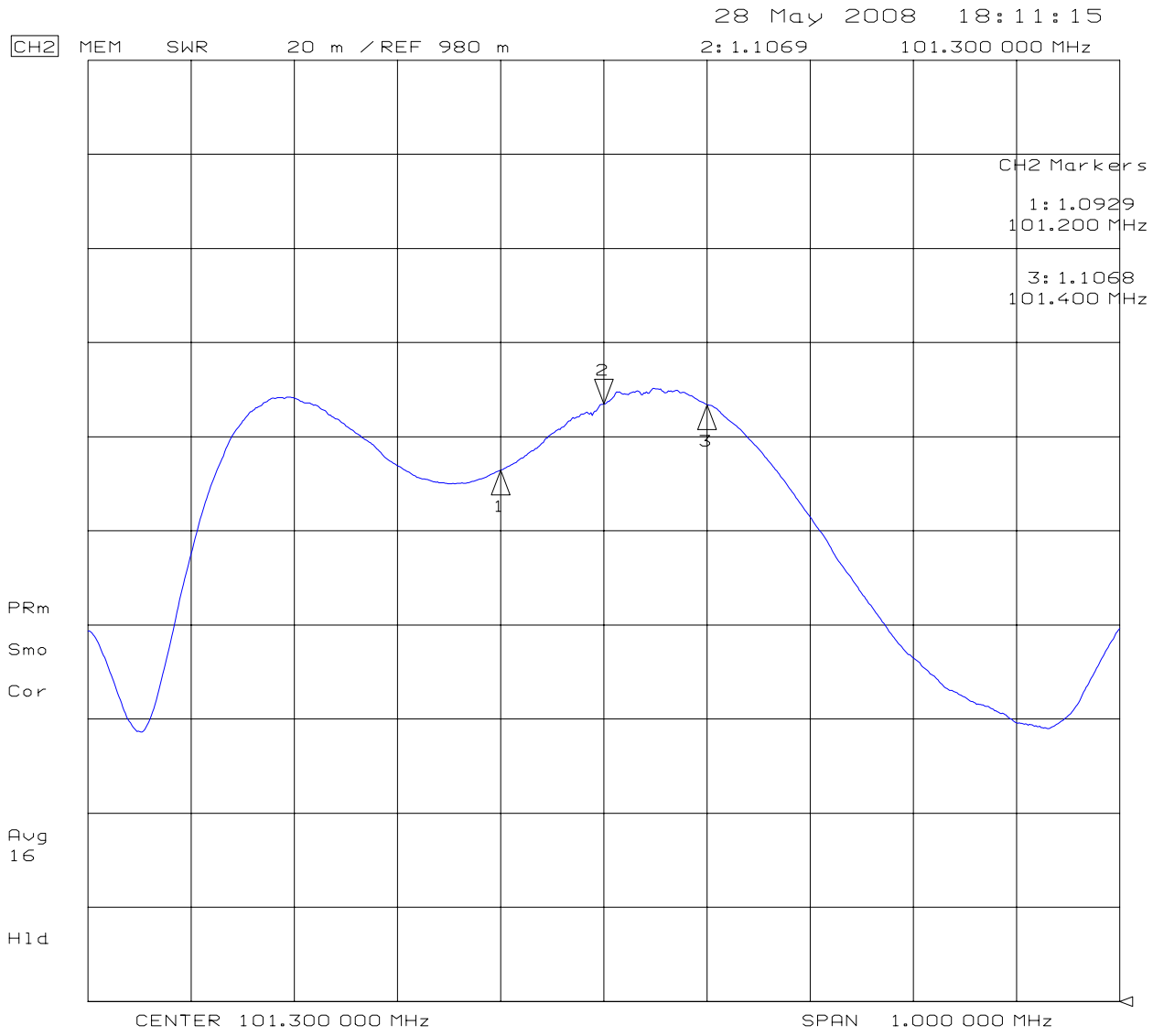
Measurement 14: Filter to Antenna Match of 99.5 MHz.



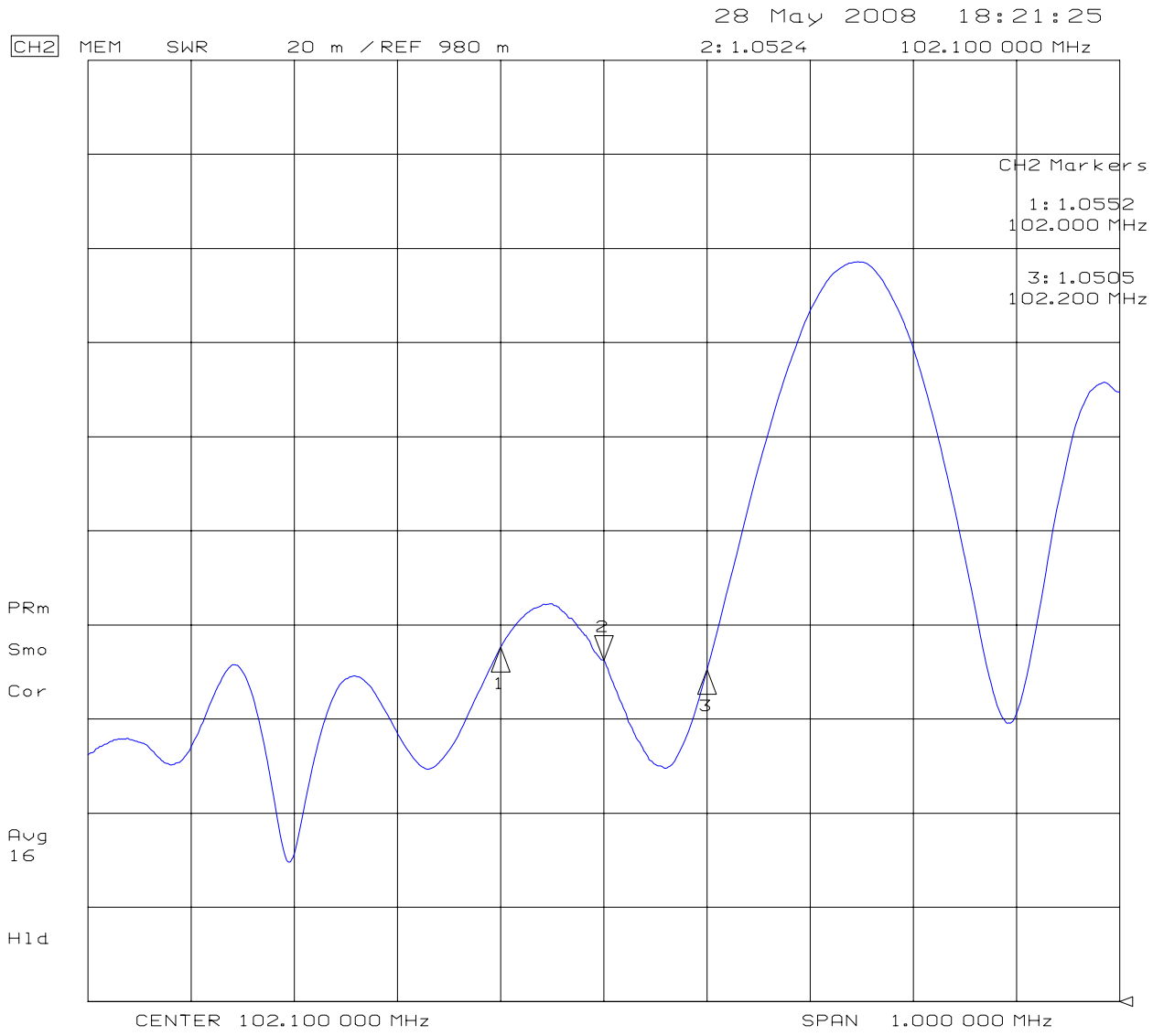
Measurement 15: Filter to Antenna Match of 100.3 MHz.



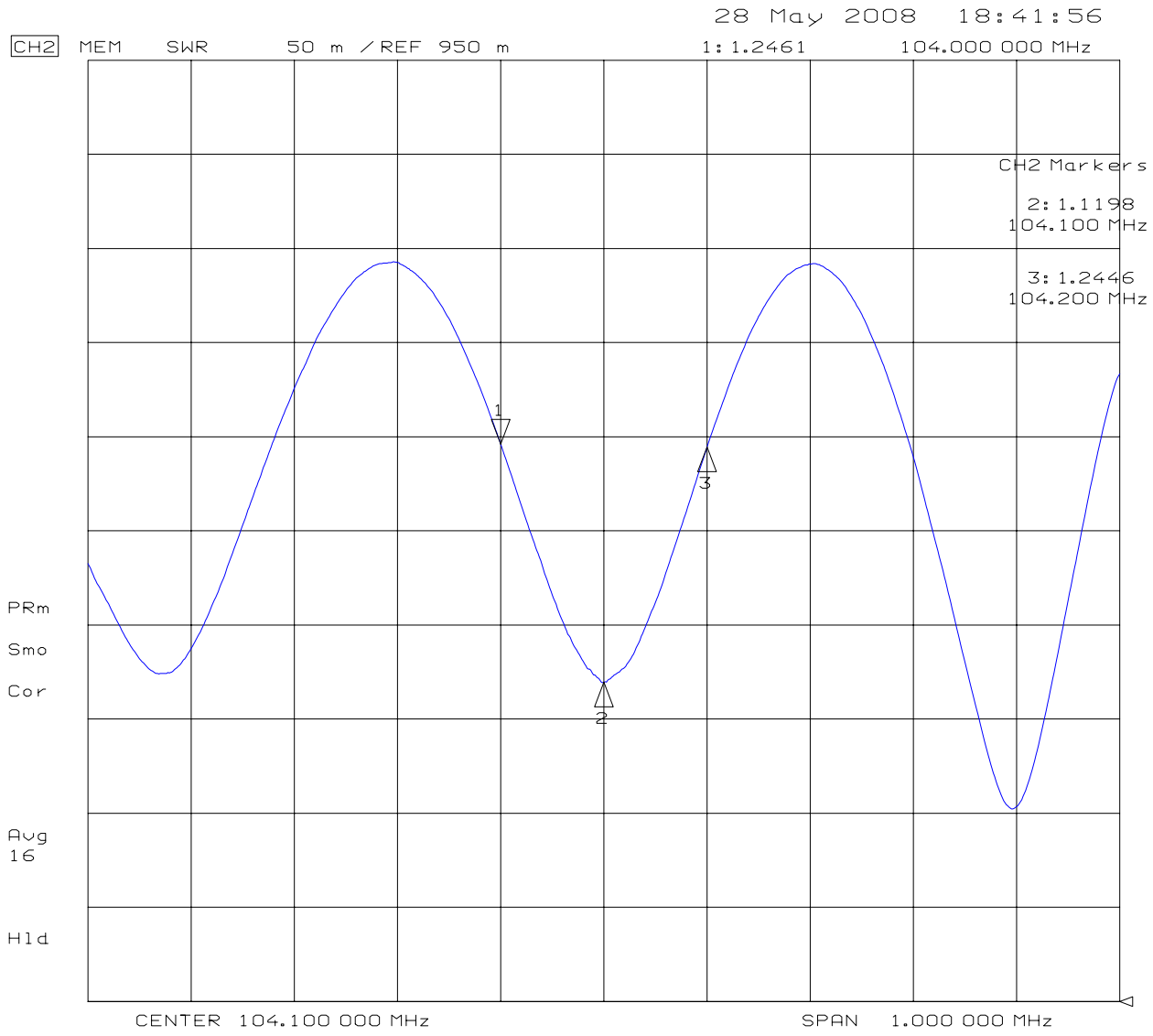
Measurement 16: Filter to Antenna Match of 101.3 MHz.



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.

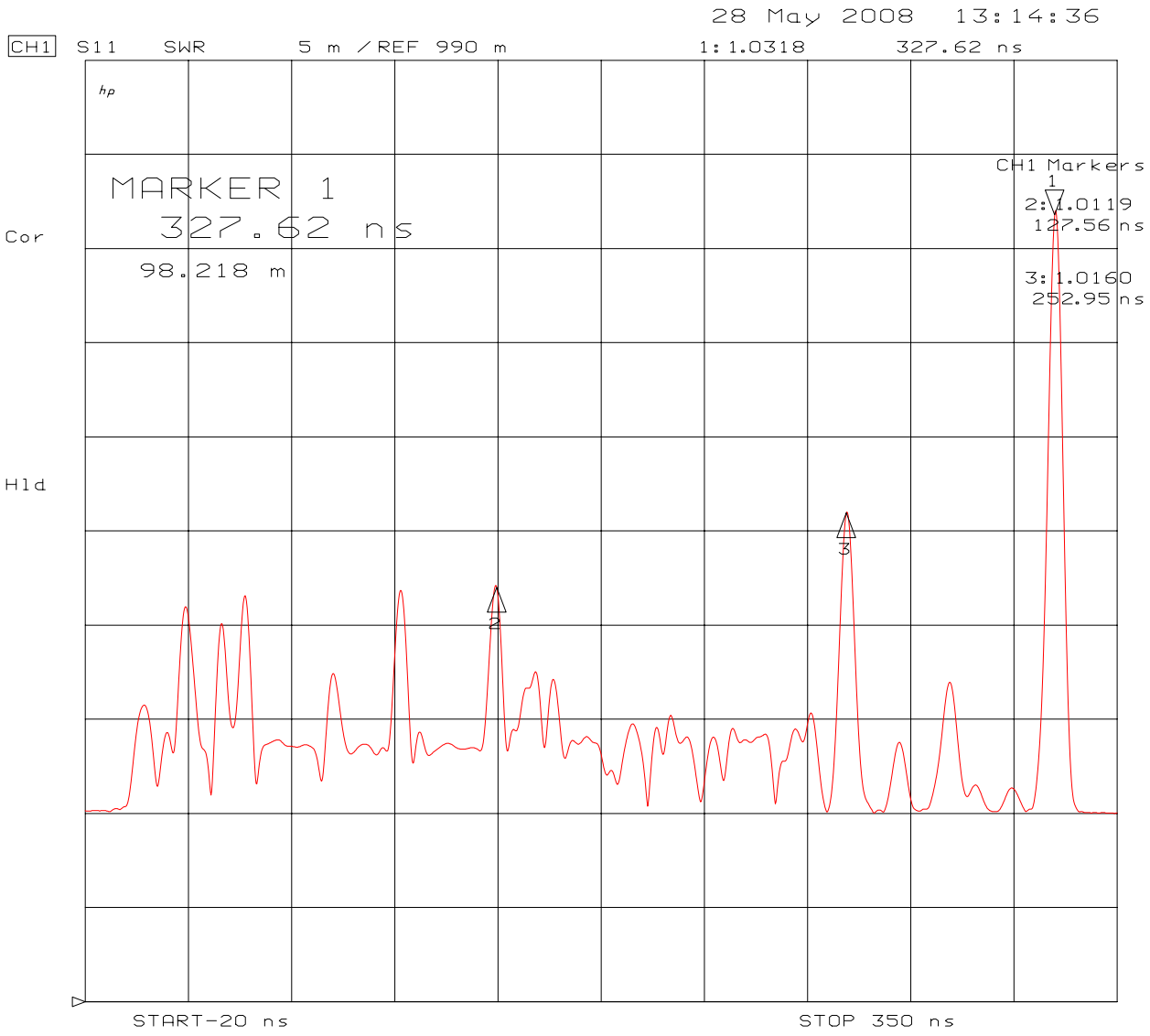


Figure 1: Antenna Solution