
APPENDIX D
NOISE DATA

Certificate of Calibration and Conformance

Certificate Number 2011-144701

Microphone Model 377B02, Serial Number 123292, was calibrated on 09JUN2011. The microphone meets factory specifications per Test Procedure D0001.8167.

New Instrument
Date Calibrated: 09JUN2011
Calibration due:

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	2900	0575	12 Months	18JUN2011	2010-130730
Larson Davis	PRM915	0102	12 Months	17AUG2011	2010-132962
Larson Davis	PRM902	0206	12 Months	17AUG2011	2010-132963
Larson Davis	2559	3034LF	12 Months	18AUG2011	2010-133036
Larson Davis	PRM902	0529	12 Months	08SEP2011	2010-133837
Larson Davis	PRM902	0528	12 Months	08SEP2011	2010-133838
Larson Davis	MTS1000 / 2201	1000 / 0100	12 Months	10SEP2011	SM090910
Hewlett Packard	34401A	3146A62099	12 Months	11NOV2011	4994123
Larson Davis	2559	2504	12 Months	29NOV2011	17865-1
Larson Davis	PRM916	0102	12 Months	23DEC2011	2010-137908
Larson Davis	CAL250	42630	12 Months	04JAN2012	2011-138110

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Environmental test conditions as printed on microphone calibration chart.

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

This calibration complies with the requirements of ISO 17025 and ANSI Z540. The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Signed: Abraham Ortega
Technician: Abraham Ortega



Larson Davis

PCB 1/2" Microphone Calibration Chart

Model: 377B02 Serial Number: 123292

Open Circuit Sensitivity @ 1014.4 mbar & 251.19 Hz

-26.58 dB re 1V/Pascal

46.89 mV/Pascal

+0.56 K_o (-dB re 50 mV/Pascal)

Expanded Uncertainty @ ~95% confidence level

0.18 dB

Capacitance @ 251.2 Hz

11.6 pF

Lower Limiting Frequency

-3 dB @ 1.64 Hz

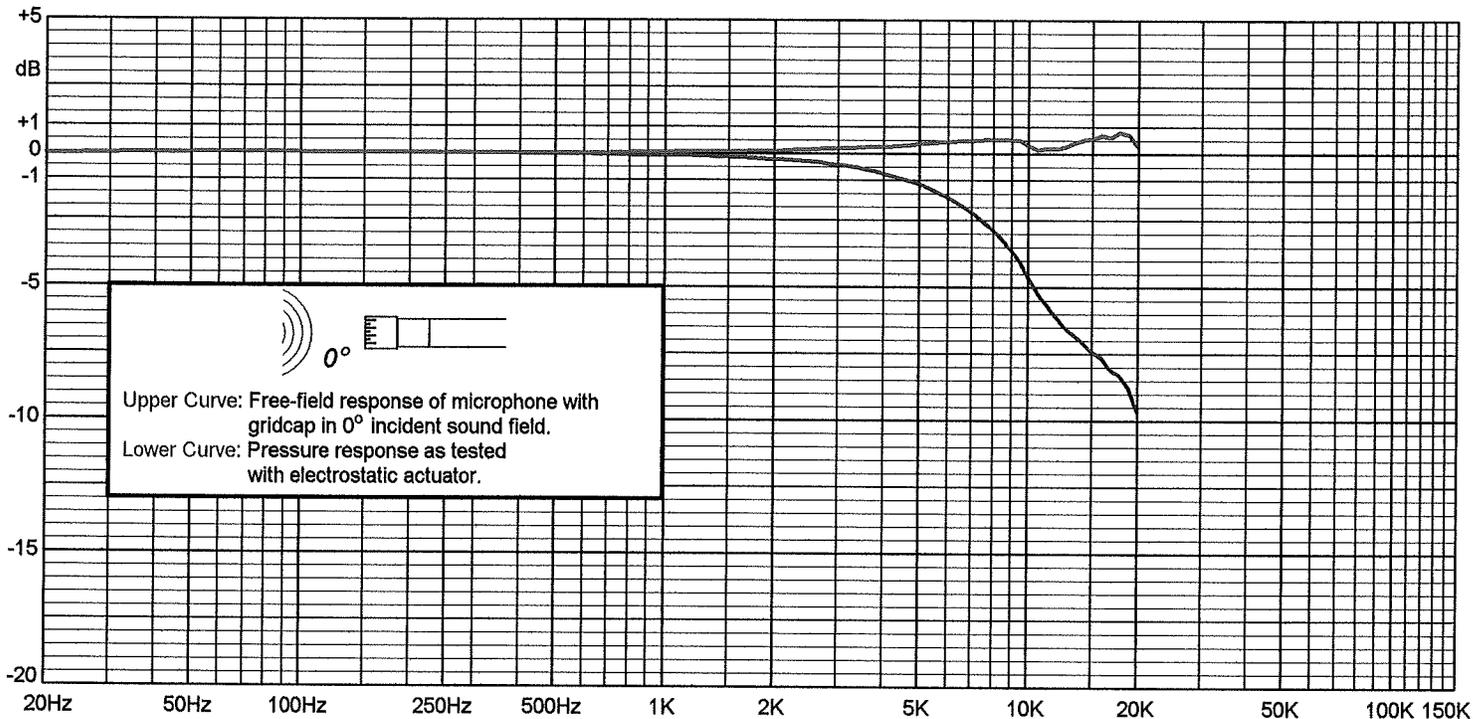
Test Conditions:

Polarization Voltage 0 V

Ambient Pressure 1014.4 mbar

Temperature 23.2 °C

Relative Humidity 37.5 %



Frequency Response (0 dB @ 251.19 Hz)

Free-field and actuator response with reference to level at 251.19 Hz

Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)
19.95	-0.04	-0.04	501.19	0.02	-0.02	1883.65	0.10	-0.18	4216.97	0.28	-0.83	9440.61	0.50	-4.02
25.12	-0.02	-0.02	630.96	0.01	-0.03	1995.26	0.10	-0.21	4466.84	0.31	-0.92	10000.00	0.31	-4.64
31.62	0.00	0.00	794.33	0.05	-0.04	2113.49	0.13	-0.21	4731.51	0.34	-1.03	10592.54	0.15	-5.25
39.81	0.01	0.01	1000.00	0.06	-0.06	2238.72	0.14	-0.23	5011.87	0.38	-1.15	11220.19	0.20	-5.66
50.12	0.02	0.02	1059.25	0.06	-0.07	2371.37	0.15	-0.26	5308.84	0.41	-1.29	11885.02	0.20	-6.12
63.10	0.02	0.02	1122.02	0.07	-0.07	2511.89	0.17	-0.29	5623.41	0.44	-1.44	12589.25	0.25	-6.52
79.43	0.02	0.02	1188.50	0.07	-0.08	2660.73	0.19	-0.32	5956.62	0.46	-1.61	13335.21	0.39	-6.80
100.00	0.01	0.01	1258.93	0.07	-0.09	2818.38	0.19	-0.37	6309.57	0.48	-1.81	14125.38	0.52	-7.07
125.89	0.01	0.01	1333.52	0.08	-0.10	2985.38	0.21	-0.41	6683.44	0.49	-2.03	14962.36	0.56	-7.41
158.49	0.01	0.01	1412.54	0.08	-0.11	3162.28	0.22	-0.46	7079.46	0.51	-2.27	15848.93	0.70	-7.65
199.53	0.00	0.00	1496.24	0.08	-0.12	3349.65	0.23	-0.51	7498.94	0.53	-2.54	16788.04	0.62	-8.10
251.19	0.00	0.00	1584.89	0.08	-0.13	3548.13	0.25	-0.57	7943.28	0.55	-2.84	17782.80	0.81	-8.30
316.23	0.00	-0.01	1678.80	0.08	-0.15	3758.37	0.25	-0.65	8413.95	0.53	-3.20	18836.49	0.72	-8.79
398.11	-0.01	-0.01	1778.28	0.09	-0.16	3981.07	0.25	-0.75	8912.51	0.52	-3.59	19952.62	0.26	-9.67

Abraham Ortega

09JUN2011

Larson-Davis Model 9700 ES Microphone Calibration System



~Calibration Certificate~

3149 East Kemper Rd.
Cincinnati, OH 45241
Ph : 513-351-9919
Fax: 513-458-2172
www.modalshop.com

Description: **Larson Davis Acoustic Calibrator**

Model: **CAL200**

Serial Number: **7309**

Asset Number:

Customer: **TMS Rental**

The subject instrument was calibrated to the indicated specification using standards stated below or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the customer.

This calibration is traceable through : 822/275722-08

Calibration Results: **Measured SPL : 94.05 dB re. 20 μ Pa**
Measured Frequency : 1,000.00 Hz

Measurement uncertainty at 95% confidence level: 0.30 dB

Notes:

The calibration was performed under operating procedures intended to implement the requirements of ISO 9001, ISO 17025 and ANSI Z540. Unless otherwise noted, the reported value is both "as found" and "as left" data. Calibration results relate only to the items calibrated. This certificate may not be reproduced, except in full, without written permission.

Upon receipt for calibration, the instrument was found to be:

WITHIN the stated tolerance of the manufacturer's specification.

Note: As Found / As Left: In Tolerance.

Test Conditions:

Temperature: **24 °C (75 °F)**
Humidity: **36%**
Pressure: **999.0 mbar**

Calibration Date: **4/4/2011 12:35**
Due Date:
Technician: **Ed Devlin**
Approval:

Reference Equipment Used:

<i>Manuf.</i>	<i>Model</i>	<i>Serial</i>	<i>Cal. Date</i>	<i>Due Date</i>
GRAS	40AG	58093	9/15/2010	9/15/2011



~Calibration Certificate~

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Model: **CAL200**

Serial Number: **7309**

Asset Number:

Customer: **TMS Rental**

The subject instrument was calibrated to the indicated specification using standards stated below or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the customer.

This calibration is traceable through : 822/275722-08

Calibration Results: **Measured SPL : 114.03 dB re. 20 μ Pa**
Measured Frequency : 1,000.00 Hz

Measurement uncertainty at 95% confidence level: 0.30 dB

Notes:

The calibration was performed under operating procedures intended to implement the requirements of ISO 9001, ISO 17025 and ANSI Z540. Unless otherwise noted, the reported value is both "as found" and "as left" data. Calibration results relate only to the items calibrated. This certificate may not be reproduced, except in full, without written permission.

Upon receipt for calibration, the instrument was found to be:

WITHIN the stated tolerance of the manufacturer's specification.

Note: As Found / As Left: In Tolerance.

Test Conditions:

Temperature: **24 °C (75 °F)**
Humidity: **36%**
Pressure: **999.0 mbar**

Calibration Date: **4/4/2011 12:44**
Due Date:
Technician: **Ed Devlin**
Approval:

Reference Equipment Used:

<i>Manuf.</i>	<i>Model</i>	<i>Serial</i>	<i>Cal. Date</i>	<i>Due Date</i>
GRAS	40AG	58093	9/15/2010	9/15/2011

