

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
11/08/94**

Issued to: NARASI SRIDHAR DIV20 ,B57
Manufacturer: SWRI
Nomenclature: RESISTOR BOX
Serial Number: 171001

Asset Number: 003096
Model Number: 1000 OHM
SwRI Capital Number: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 70.0F

Relative Humidity: 38 %

CALIBRATION INFORMATION

Location: CAL1
Procedure Number: SWRI
Remarks: ACCURACY IS +/- 10.0 OHMS (+/- 1%)
MEASURED VALUE IS 1000.4 OHMS

Technician: 10004
Accuracy: +/- 1%
Received IN Tolerance

**Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Tech-
nology. Inspection and test data are on file and available for inspection.**

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001505	2823A07741	HP	3458A	SYSTEM MULTIMETER	05/04/94	12	05/04/95

Certified by : 

Certificate#: 15595

Calibration Date: 11/08/94
Interval: 6 months
Next Calibration Due: 05/08/95

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION
05/11/95

Issued to: DARRELL DUNN
Manufacturer: SWRI
Nomenclature: RESISTOR BOX
Serial Number: 171001

DIV20 ,B57

Asset Number: 003096
Model Number: 1000 OHM
SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 70.0F

Relative Humidity: 48%

CALIBRATION INFORMATION

Procedure Number: SWRI
Remarks: MEASURED VALUE IS 1000.46 OHMS

Accuracy: +/- 1%
Received IN Tolerance

Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
000115	2201A08306	HP	3456A	DIGITAL VOLTMETER	11/29/94	6	05/29/95

Certified by :



Certificate#: 17391

Calibration Date: 05/11/95
Interval: 6 months
Next Calibration Due: 11/11/95

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory
CERTIFICATE OF CALIBRATION
11/22/95

Issued to: DARRELL DUNN DIV20 ,B57
Manufacturer/Model: SWRI /1000 OHM
Nomenclature: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: 72.0F Relative Humidity: 42%

CALIBRATION INFORMATION

Procedure Number: SWRI Accuracy: +/- 1%
Remarks: Received IN Tolerance

Calibration was in accordance with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001505	2823A07741	HP	3458A	SYSTEM MULTIMETER	05/11/95	12	05/11/96

Certified by : *Carly Plana*

Certificate#: 19321

Calibration Date: 11/22/95
Interval: 6 months
Next Calibration Due: 05/22/96



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

14 June 1996

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

Environmental Conditions

Temperature: 73.0 Humidity: 44%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

Calibration Date: 13 Jun 96 Calibration Procedure: CLCP-OR-001
Interval: 6 months Accuracy: +/- 1%
Next Calibration Due: 13 Dec 96 Received: In Tolerance

Remarks:

Certificate # 21451

Signed: 

LAST PAGE OF REPORT
Total Pages Printed: 1



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San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

17 December 1996

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

Environmental Conditions

Temperature: 70.0 Deg. F Humidity: 34%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

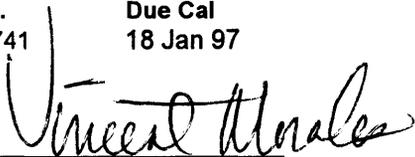
Calibration Date: 17 Dec 96 Calibration Procedure: CLCP-OR-001
Interval: 6 months Accuracy: +/- 1%
Next Calibration Due: 17 Jun 97 Received: In Tolerance

Remarks: AVERAGE MEASURED VALUE OVER 10 SAMPLES:
1.000439 KOHMS

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
001505	HP	3458A	SYSTEM MULTIMETER	2823A07741	18 Jan 97

Certificate # 23526

Signed: 

LAST PAGE OF REPORT
Total Pages Printed: 1



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Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

21 July 1997

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

Environmental Conditions

Temperature: 75.0 Deg. F Humidity: 44%

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

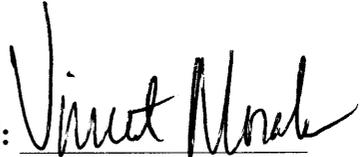
Calibration Date: 21 Jul 97 Calibration Procedure: CLCP-OR-001
Interval: 6 months Accuracy: +/-1%
Next Calibration Due: 21 Jan 98 Received: In Tolerance

Remarks: AVERAGE OHM VALUE OVER 10 SAMPLES:
1.0004566 KOHM

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
001505	HEWLETT-PA	3458A	SYSTEM MULTIMETER	2823A07741	1 Feb 98

Certificate # 26040

Signed: 

LAST PAGE OF REPORT
Total Pages Printed: 1



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Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

19 February 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 10 OHM
Description: RESISTOR BOX
Serial Number: 171002
Asset Number: 003095

Environmental Conditions

Temperature: 73.00 Deg. F Humidity: 34 % RH

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 19 Feb 98 Calibration Procedure: CLCP-OR-001
Interval: 6 months
Next Calibration Due: 19 Aug 98 Received: In Tolerance
Remarks: MEASURED VALUE: 10.048114 OHMS

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
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Signed:

Title:

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 28681



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

19 February 1998

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

Environmental Conditions

Temperature: 73.00 Deg. F

Humidity: 34 % RH

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 19 Feb 98

Calibration Procedure: CLCP-OR-001

Interval: 6 months

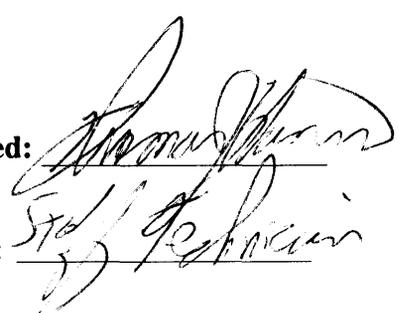
Next Calibration Due: 19 Aug 98

Received: In Tolerance

Remarks: MEASURED VALUE: 1.0004661K OHMS

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
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Signed: 

Title: Steve Robinson

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 28682



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

1 April 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 74.0 Degrees Fahrenheit Humidity: 40 % RH

Calibration Date: 1 Apr 99 **Calibration Procedure:** CLCP-OR-001

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

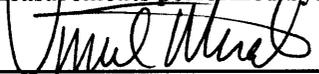
Remarks: MEASURED RESISTANCE VALUE: 1.000529 KOHMS
STANDARD MEASUREMENT UNCERTAINTY: +/- .0079%

Approved by:



Jim Patterson, Supervisor or Walt Hill, Metrologist

Measurements performed by:



Vince Morales, Technician

Certificate # 33573

Page 1 of 1



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

28 September 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial Number: 171001
Asset Number: 003096

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 74.0 Degrees Fahrenheit Humidity: 40 % RH

Calibration Date: 20 Sep 99 **Calibration Procedure** CL-70, JUN 99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks: AVERAGE MEASURED VALUE: 1.000464 KOHMS
MEASUREMENT UNCERTAINTY: +/- 24 MILLIOHMS

Approved by:

Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 36051

m:\a2la.rpt Rev date 10 Mar 99

Measurements performed by:

Vince Morales, Technician

Page 1 of 1



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: SWRI 1000 OHM

Description: RESISTOR BOX

Serial No: 171001

Asset No: 003096

Procedure: CL-70, JUN 99

Work Order: 444050663

Date Issued: Oct 15, 2002

Calibration Date: Oct 15, 2002

****Calibration Due:** Apr 15, 2003

Calibration Location: N/A

Environment: Temp. 72.0°F Hum. 40 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
007001	HEWLETT-PACKARD	3458A/OPT-002	MULTIMETER	Jan 06, 03

Approved by: Walt Hill
Metrology Group Leader
m:\Nona21a1.rpt Rev date 15, August 02

Measurements by: Tony Planas
Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Sheet

Work Order: 444050663	Mfr. SWRI	Technician Tplanas
Asset No. 3096	Model 1000 OHM	Procedure CL-70 06/99
Serial No. 171001	Type. Resistors	Cal Date. 15-Oct-02
Remarks:		

Function/Range	Test Point	TI Reading	Difference	Test Limits+/-	Uncertainty	Found/Left
Resistance	Ohm 1000.00	Ohm 1000.44	Ohm 0.44	Ohm 10.00	Ohm >4:1	Results Pass



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Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: SWRI 1000 OHM

Description: RESISTOR BOX

Serial No: 171001

Asset No: 003096

Procedure: CL-70, JUN 99

Work Order: 444053506

Date Issued: May 1, 2003

Calibration Date: May 1, 2003

****Calibration Due:** Nov 1, 2003

Calibration Location: Bldg. 64

Environment: Temp. 68.0°F Hum. 42 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

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**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001505	HEWLETT-PACKARD	3458A/OPT-002	MULTIMETER	Apr 14, 04

Approved by: Walt Hill

Metrology Group Leader

m:\Nona21a1.rpt Rev date 15, August 02

Measurements by: Tom Hannon

Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Report

Work Order:	444053506	Mfr.	SWRI	Technician	Thomas Hannon
Asset No.	003096	Model	1000 OHM	Procedure	CL-70 06/99
Serial No.	171001	Type.	Resistors	Cal Date.	1-May-03
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Resistance	Ohm	Ohm	Ohm	Ohm	Ohm	Results
	1000.00	1000.48	0.48	10.00	0.016	Pass

END OF REPORT



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692



Certificate of Calibration

0972-01

Submitted By: DIV20
Address: B57
Contact: DARRELL DUNN
Manufacturer Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial No: 171001
Asset No: 003096
Procedure: CL-70, JUN/99

Work Order: 444056169
Date Issued: Nov 5, 2003
Calibration Date: Nov 5, 2003
****Calibration Due:** May 5, 2004
Calibration Location: Bldg. 64
Environment: Temp. 72.0°F Hum. 36 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NC SL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of k=2 to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001505	HEWLETT-PACKARD	3458A/OPT-002	MULTIMETER	Apr 14, 04

Approved by: Walt Hill
Metrology Group Leader
m:\a2la\l.rpt Rev date 15, August 02

Measurements by: Vince Morales
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Calibration Report

Work Order:	444056169	Mfr.	SWRI	Technician	Vmorales
Asset No.	3096	Model	1000 OHM	Procedure	CL-70 06/99
Serial No.	171001	Type.	Resistors	Cal Date.	5-Nov-03
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Resistance	Ohm	Ohm	Ohm	Ohm	Ohm	Results
	1000.00	1000.46	0.46	10.00	0.016	Pass

END OF REPORT



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692



Certificate of Calibration

0972-01

Submitted By: DIV20
Address: B57
Contact: DARRELL DUNN
Manufacturer Model: SWRI 1000 OHM
Description: RESISTOR BOX
Serial No: 171001
Asset No: 003096
Procedure: RESISTORS JAN/04

Work Order: 444058929
Date Issued: May 12, 2004
Calibration Date: May 12, 2004
****Calibration Due:** Nov 12, 2004
Calibration Location: Bldg. 64
Environment: Temp. 73.0°F Hum. 33 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCSL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of k=2 to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001505	HEWLETT-PACKARD	3458A/OPT-002	MULTIMETER	Mar 19, 05

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Scott Kester
Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Report

Work Order:	444058929	Mfr.	SWRI	Technician	SRK
Asset No.	3096	Model	1000 OHM		
Serial No.	171001	Type.	Resistors	Cal Date.	12-May-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Resistance	Ohm 1000.00	Ohm 1000.50	Ohm 0.50	Ohm 10.00	Ohm 0.016	Result Pass
END OF REPORT						



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692



Certificate of Calibration

0972-01

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: SWRI 1000 OHM

Description: RESISTOR BOX

Serial No: 171001

Asset No: 003096

Procedure: RESISTORS JAN/04

Work Order: 444061749

Date Issued: Nov 19, 2004

Calibration Date: Nov 19, 2004

****Calibration Due:** May 19, 2005

Calibration Location: Bldg. 64

Environment: Temp. 72.0°F Hum. 40 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of k=2 to approximate a 95% confidence level. See Remarks or attached Calibration Report with the same Work Order number for calibration data.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: 1000.45 Ohms Unc +/- 0.016 Ohm

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
010465	FLUKE	8508A-01	MULTIMETER	Jun 10, 05

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Bob Trollinger
Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Measurement Report

Work Order:	444061749	Mfr.	SWRI	Technician	blt
Asset No.	003096	Model	1000 OHM		
Serial No.	171001	Type.	Resistors	Cal Date.	19-Nov-04
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Resistance	Ohm 1000.00	Ohm 1000.45	Ohm 0.45	Ohm 10.00	Ohm 0.016	Result Pass

END OF REPORT