



# Rothe Development Inc.

## Metrology Services Division

4614 SINCLAIR RD., SAN ANTONIO, TEXAS 78222 512-648-3131 FAX 512-648-4091

# Certificate of Calibration

# 20102

CAL DATE: 01/17/91

ISSUED TO: Southwest Research Institute  
6220 Culebra Blds. 68/Division 5  
San Antonio, TX 78284  
684-5111 \* 2702

DUE DATE: 07/17/91  
(5)

MFG Keithley

MODEL 602

SERIAL # 19831

CONTROL: 114 - 936

TYPE Electromtr

PROCEDURE/TOL: MFG SPECS

RECEIVED IN-SPECS   
OUT-OF-SPECS

All Calibration measurements performed at ROTHE DEVELOPMENT INC. METROLOGY SERVICES meet the requirements of MIL-STD-45662A, and are traceable to the National Institute of Standards and Technology through Primary NIST Calibration or Secondary Calibration performed by other Metrological facilities. Ambient conditions: Temperature 72.0oF , Relative Humidity 31%

### Test Report Number and Calibration Standards Used

Ref #	Model #	Mfgr	Serial #	Description	Cal Date	Int
TR 20	5700A	FLUKE	4605002	CALIBRATOR	12/07/90	3
TR 125	1644-A	GR	1011	MEG OHM BRIDGE	10/11/90	12

### Test Report Numbers

DCV FLUKE CERT# DH70  
ACV FLUKE CERT# 658637  
OHM NIST TEST# 244645  
TEMP CERT# 245046  
Hz WWVB Transmission

INSPECTED BY  
COMMENTS:



# Rothe Development, Inc.

4614 SINCLAIR RD. SAN ANTONIO, TEXAS 78222-2099

512-648-3131 FAX: 512-648-4091

METROLOGY SERVICES DIVISION  
PRECISION MEASUREMENT EQUIPMENT LABORATORY  
TRACEABLE TO NIST

CHARGE # 107

CONTROL # 114 - 938

WORK ORDER # 24261

RECEIVED FROM **Southwest Research Institute** (5) DATE **11/12/90**  
ADDRESS **6220 Culebra, Bldg. 68/Division 5** PHONE# **684-5111 \* 2702**  
CONTACT (NAME) **Mr. Jim Patterson** FAX# **684-3133**

MFG **Keithley**  
MODEL **602**  
SERIAL # **19831**  
TYPE **Electromtr**  
ACCES. RCVD. **Manual**

PURCHASE ORDER # **ST# 152108**

CUSTOMER COMMENTS **NON TAXABLE**

- REPAIR
- OPERATIONAL CHECK
- CALIBRATION

CALIBRATION DATE 17 Jan 91  
DATE DUE 17 Jul 91

CALIBRATION INTERVAL **6 mo.**

- RECEIVED IN SPECS.
- RECEIVED INOPERATIVE
- RECEIVED OUT OF SPECS.

T REF #	QTY.	MFG PART #	DESCRIPTION	COST	ROTHE TECH.	OUR P.O. #
	1	R-287-106	Res	18 74	PIS	
					REPAIR LABOR HRS.	SERVICE CODE
					2	F
					PARTS TOTAL	18 74
					REPAIR LABOR	68 00
					SHIPPING	
					TEAR DOWN CHARGE	
					TAX	
					CALIBRATION	68.00
					TOTAL	154 74

s 20, 125

### MENTS

### K PERFORMED:

Temp 10-10 476 low, Res 10-10 Read high  
Reported 10-10 range &

72 °F

31 %

CAZ

2002

SHIP VIA: \_\_\_\_\_ DATE: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_

# SOUTHWEST RESEARCH INSTITUTE

POST OFFICE DRAWER 28810 • 6220 CULEBRA ROAD • SAN ANTONIO, TEXAS, USA 78284 • (512) 684-6111 • TELEX 76-7367

Division 05 - Instrument Repair and Calibration Laboratory

## Calibration Record

ITEM KEYWAY ELECTROMETER  
MODEL 202 SN 19831 SWRI NO. \_\_\_\_\_  
PLUG-INS, ETC. NONE  
TOLERANCE MPGR SPECS

### STANDARDS

Standard No.	MPGR Model	Description	S/N	Cal. Due	Cal. Rec. No.
* SEE CERTIFICATE OF CALIBRATION,		ROTHE DEVELOPMENT INC	#	20102	

\* ENVIRONMENT: Temperature \_\_\_\_\_ Humidity \_\_\_\_\_  
Location \_\_\_\_\_

### PROCEDURE

\*  Essentially as outlined in MPGRS Service Manual \_\_\_\_\_  
 \_\_\_\_\_

### CONCLUSION

\*  Item within tolerance \_\_\_\_\_  
 Item out of tolerance \_\_\_\_\_  
 Item ADJ/repared to tolerance \_\_\_\_\_  
 \_\_\_\_\_

Calibration was in accord with requirements of MIL-STD-45662A, MIL-Q-9838A, and MIL-I-45208A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

SIGNED [Signature]  
DATE 1-17-91  
RECORD NUMBER: 0006342 NEXT CALIBRATION DUE: 7-17-91

# SOUTHWEST RESEARCH INSTITUTE

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Division 05 – Instrument Repair and Calibration Laboratory

## Calibration Record

ITEM Keithley Electrometer  
MODEL 602 S/N 19831 SWRI NO. \_\_\_\_\_  
PLUG-INS, ETC. none  
TOLERANCE see r/s spec's

### STANDARDS

Standard No.	MFGR Model	Description	S/N	Cal. Due	Cal. Rec. No.
*	SEE CERTIFICATE OF CALIBRATION, ROTHE DEVELOPMENT, INC				#

\* ENVIRONMENT: Temperature \_\_\_\_\_ Humidity \_\_\_\_\_  
Location \_\_\_\_\_

### PROCEDURE

\*  Essentially as outlined in MFGRS Service Manual \_\_\_\_\_  
 \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### CONCLUSION

\*  Item within tolerance \_\_\_\_\_  
 Item out of tolerance \_\_\_\_\_  
 Item ADJ/repaired to tolerance \_\_\_\_\_  
 \_\_\_\_\_

Calibration was in accord with requirements of MIL-STD-45662A, MIL-Q-9858A, and MIL-I-45208A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

SIGNED Jerry D. White

DATE 19 Aug 91

RECORD NUMBER: 00-8172 NEXT CALIBRATION DUE: 15 Aug 92



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METROLOGY SERVICES DIVISION  
PRECISION MEASUREMENT EQUIPMENT LABORATORY  
TRACEABLE TO NIST

CHARGE # 107

CONTROL # 114 - 936

WORK ORDER # 27650

RECEIVED FROM Southwest Research Institute (5) DATE 07/30/91	MFG Keithley
ADDRESS 6220 Culebra, Blds. 68/Division 5 San Antonio, TX 78284	PHONE# 684-5111 * 2702
CONTACT (NAME) Mr. Jim Patterson	FAX# 684-3133
PURCHASE ORDER # ST# 175646	MODEL 602
CUSTOMER COMMENTS NON TAXABLE	SERIAL # 19831
	TYPE Electromtr
	ACCES. RCVD.

- REPAIR
- OPERATIONAL CHECK
- CALIBRATION

CALIBRATION DATE 15 Aug 91 CALIBRATION INTERVAL  RECEIVED IN SPECS.  
 DATE DUE 15 Aug Feb 92 6 mo.  RECEIVED INOPERATIVE  
 RECEIVED OUT OF SPECS.

CKT REF #	QTY.	MFG PART #	DESCRIPTION	COST	ROTHE TECH.	OUR P.O. #
			PIS		PIS	
					REPAIR LABOR HRS.	SERVICE CODE
						J
					PARTS TOTAL	
					REPAIR LABOR	
					SHIPPING	
					TEAR DOWN CHARGE	
					TAX	
					CALIBRATION	68.00
					<b>TOTAL</b>	<b>68 00</b>

TR #'s 1, 72, 125, 75

COMMENTS NOTE: Coulombs Section Not Cal'd

WORK PERFORMED: Coulombs not checked.

*CATE*

TEMP. 73 °F

R.H. 36 %

RDI 2002

SHIP VIA: \_\_\_\_\_ DATE: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_



# Rothe Development Inc.

## Metrology Services Division

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# Certificate of Calibration

# 22168

CAL DATE: 08/15/91

ISSUED TO: Southwest Research Institute  
6220 Culebra, Bldg. 68/Division 5  
San Antonio, TX 78284  
684-5111 \* 2702

DUE DATE: 02/15/92  
(5)

MFG Keithley

MODEL 602

SERIAL # 19831

CONTROL: 114 - 936

TYPE Electromtr

PROCEDURE/TOL: MFG PROCEDURE/MFG SPECS

RECEIVED IN-SPECS   
OUT-OF-SPECS

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### Test Report Number and Calibration Standards Used

Ref #	Model #	Mfr	Serial #	Description	Cal Date	Int
TR 1	5100B	FLUKE	2520018	CALIBRATOR	06/25/91	6
TR 72	3490A	HP	1637A05174	DMM	06/20/91	6
TR 125	1644-A	GR	1011	MEG OHM BRIDGE	10/11/90	12
TR 75	NMN	JRL	75	RESISTANCE BOX	12/14/90	12

----- Test Report Numbers -----  
 DCV FLUKE CERT# DH70  
 ACV FLUKE CERT# 658637  
 OHM NIST TEST# 244645  
 TEMP CERT# 245046  
 Hz WWVB Transmission

INSPECTED BY Joe Amendga  
 COMMENTS:  
 coulombs section not calibrated



# Rothe Development Inc.

## Metrology Services Division

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# Certificate of Calibration

# 26801

CAL DATE: 09/21/92

DUE DATE: 03/21/93

ISSUED TO: Southwest Research Institute  
6220 Culebra, Bldg. 68/Division 5  
San Antonio, TX 78284  
684-5111 \* 2702

(5)

MFG Keithley

MODEL 602

SERIAL # 19831

CONTROL: 114 - 936

TYPE Electromtr

PROCEDURE/TOL:MFG SPECS

WORK ORDER #: 34177

CUSTOMER PO #:03602/ST#202084/06-0760

RECEIVED IN-SPECS   
OUT-OF-SPECS

All Calibration measurements performed at ROTHE DEVELOPMENT INC. METROLOGY SERVICES meet the requirements of MIL-STD-45662A, and are traceable to the National Institute of Standards and Technology through Primary NIST Calibration or Secondary Calibration performed by other Metrological facilities. Ambient conditions: Temperature 72.0oF , Relative Humidity 43%

### Test Report Number and Calibration Standards Used

Ref #	Model #	Mfgr	Serial #	Description	Cal Date	Int	Cal Due
TR 20	5700A	FLUKE	4605002	CALIBRATOR	08/11/92	3	11/11/92
TR 13	8860A	FLUKE	3335024	DMM	08/20/92	6	02/20/93
TR 182	1433-H	GEN RAD	32941	DECADE RESISTOR	08/10/92	12	08/10/93

----- Test Report Numbers -----  
 DCV FLUKE CERT# DH70  
 ACV FLUKE CERT# 658637  
 OHM NIST TEST# 244645  
 TEMP CERT# 245046  
 Hz WWVB Transmission

INSPECTED BY Gora A Mendoga  
 COMMENTS:  
 COULOMBS FUNCTION NOT CAL'D.



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METROLOGY SERVICES DIVISION  
PRECISION MEASUREMENT EQUIPMENT LABORATORY  
TRACEABLE TO NIST

CHARGE # 107

CONTROL # 114 - 936

WORK ORDER # 34177

RECEIVED FROM Southwest Research Institute (5) DATE 09/17/92	MFG Keithley
ADDRESS 6220 Culebra, Bldg. 68/Division 5 San Antonio, TX 78284	MODEL 602
CONTACT (NAME) Mr. Jim Patterson	SERIAL # 19831
PURCHASE ORDER # 03602/ST#202084/06-0760	TYPE Electromtr
CUSTOMER COMMENTS NON TAXABLE	ACCES. RCVD.

- REPAIR
- OPERATIONAL CHECK
- CALIBRATION

CALIBRATION DATE 21 SEPT 92  
DATE DUE 21 MAR 93

CALIBRATION INTERVAL  
6 mo.

- RECEIVED IN SPECS.
- RECEIVED INOPERATIVE
- RECEIVED OUT OF SPECS.

CKT REF #	QTY.	MFG PART #	DESCRIPTION	COST	ROTHE TECH.	OUR P.O. #
11-01	6	EN22	9V BATT		<i>[Signature]</i>	
					REPAIR LABOR HRS.	SERVICE CODE
						F
					PARTS TOTAL	
					REPAIR LABOR	
					SHIPPING	
					TEAR DOWN CHARGE	
					CALIBRATION	93.00
					TAX	
					TOTAL	

R #'s 20, 13, 02

COMMENTS comments function not cal'd

WORK PERFORMED:

~~0.003~~ 0.003 & 0.001 ranges - 7% low side ± 1% allowable tolerance.  
cleaned range sw  
replaced battery  
cal'd

TEMP. 72 °F  
H. 43 %

RDI 2002  
SHIP VIA: \_\_\_\_\_ DATE: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_



