

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 24332 ASSET # 001893 DATE 17 FEB-97

ITEM DATA:
Manufacturer Fisher Scientific Model 950
Description Accumot pH/ION Meter Serial # 3340
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN Carroll Dunn, Div. 20

Turned in by: _____ Phone _____

CHARGE # 20-5708-561 Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

CONDITION RECEIVED: _____ Out of tolerance, repaired to specifications
_____ In tolerance, minor adjustments/repairs made
 In tolerance, no adjustments/repairs
_____ Out of tolerance, adjusted to specifications
_____ Received into system, introduced or reactivated
_____ Calibration internal
_____ Reliability code

ACTION TAKEN: (Calibration/Repair/Parts) Calibrated per procedure

CAL ENVIRONMENT:
Temperature 74 °F Humidity 42 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure AFG. App. 1893
Date 21 APR 97 Accuracy 4% spec.
Cal Interval 12 Mo. Time to complete: _____
Next Cal due 21 APR 98 Cal 2.5 Repair _____
Standards used (Asset#) 182

DATE COMPLETED 21 APR 97
DATE PICKED UP 4/22/97 PICKED UP BY [Signature]

24332

CALIBRATION CHECK FORM

Date Calibrated 21 APR 97 Work Order 24332

Technician 8216

Unit Under Test 94 METRA QALUMET PA Meter

Manufacturer Fisher Model 950 SN 3340 ASN 1893

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
		AC/DC		AC	AC		
	INPUT "A"	0.2	0.1	0.3	0.2		P
		500.0	499.9	500.1	499.9		P
		1000.0	999.9	1000.1	999.9		P
		1400.0	1399.9	1400.1	1399.9		P
		1700.0	1699.9	1700.1	1699.9		P
		1998.0	1997.9	1998.1	1997.9		P
	INPUT "B"	0.2	0.1	0.3	0.3		P
		500.0	499.9	500.1	499.9		P
		1000.0	999.9	1000.1	999.9		P
		1400.0	1399.9	1400.1	1400.0		P
		1700.0	1699.9	1700.1	1700.0		P
		1998.0	1997.9	1998.1	1998.0		P

SOUTHWEST RESEARCH INSTITUTE
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WORK ORDER

CERTIFICATE # 29656 ASSET # 001893 DATE 08 May 98

ITEM DATA:
Manufacturer Fisher Scientific Model Accumet 950
Description 1/2" Ion Meter Serial # 3346
Accessories _____

ACTION REQUESTED MI

CUSTODIAN D. D. D. D. D.

Turned in by: _____ Phone 6096

CHARGE # 20.1102 S11 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By MDK Date 05-08-98

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) Accurate Repeatability
Limited Calibration - Calibrated for MV use ONLY

CAL ENVIRONMENT:
Temperature 74°F Humidity 46 %RH

CALIBRATED/REPAIRED:
By V. M. M. Cal Procedure CLCP-PH-002
Date 18 MAY 98 Accuracy MFS
Cal Interval 12 Reliability Code: 5
Next Cal due 18 MAR 99 Cal Time 2.0 Repair Time _____
Standards used (Asset#) 182

DATE COMPLETED 18 MAY 98
DATE PICKED UP 6/3/98 PICKED UP BY Walt Macintosh

29656

CALIBRATION CHECK FORM

Date Calibrated 18 MAY 98 Work Order 29656
 Technician V. Morales
 Unit Under Test Accumet pH meter
 Manufacturer Fisher Model 950 SN 3340 ASN 1893

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
		mVDC	mV		mV		
1	Input "A"	0	-0.2	0.2	0.0mV		Pass
		500.0	499.8	500.2	500.0mV		
		1000.0	999.8	1000.2	999.9mV		
		1400.0	1399.8	1400.2	1399.9mV		
		1700.0	1699.8	1700.2	1699.9mV		
		1998.0	1997.8	1998.2	1997.9mV		
		-500.0	-499.8	-500.2	-499.8mV		
		-1000.0	-999.8	-1000.2	-999.9mV		
		-1400.0	-1399.8	-1400.2	-1399.9mV		
		-1700.0	-1699.8	-1700.2	-1699.9mV		
		-1998.0	-1997.8	-1998.2	-1997.8mV		
2	Input "B"	0	-0.2	0.2	0V		
		500.0	499.8	500.2	499.8mV		
		1000.0	999.8	1000.2	999.9mV		
		1400.0	1399.8	1400.2	1399.9mV		
		1700.0	1699.8	1700.2	1699.9mV		
		1998.0	1997.8	1998.2	1997.8mV		
		-500.0	-499.8	-500.2	-500.0mV		
		-1000.0	-999.8	-1000.2	-1000.0mV		
		-1400.0	-1399.8	-1400.2	-1399.9mV		
		-1700.0	-1699.8	-1700.2	-1699.9mV		
		-1998.0	-1997.8	-1998.2	-1997.8mV		

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 34487 ASSET # 001893 DATE 13 May 99

ITEM DATA:
Manufacturer Fisher Scientific Model 950
Description ph/ion meter Serial # 3340
Accessories _____

ACTION REQUESTED cal

CUSTODIAN DV.20 Darrell Dunn

Turned in by: _____ Phone 6096

CHARGE # 20-04 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By MAR Date 05-13-99

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
 (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) Limited Cal - mv use only

CAL ENVIRONMENT:
Temperature 72 °F Humidity 42 %RH

CALIBRATED/REPAIRED:
By MAR Cal Procedure MFS P/N 1893
Date 2 June 99 Accuracy MFS
Cal Interval 12 Reliability Code: -1
Next Cal due 2 June 00 Cal Time 2.0 Repair Time _____
Standards used (Asset#) 7198

DATE COMPLETED 2 June 99
DATE PICKED UP 6/7/99 PICKED UP BY [Signature]

34487

CALIBRATION CHECK FORM

Date Calibrated 2 June 99 Work Order 34487 Cal By V. M. M. M.

Procedure No./Date: P/N 1893/NO DATE Unit Under Test: PH METER

Mfg.: ORION Model: 950 SN 3340 AN 1893

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
	ABSOLUTE MILLIVOLT						
	CH A	1000.0mV	999.9	1000.1mV	999.8 mV	1000.0mV	F
		1990.0mV	1989.9	1990.1mV	1989.8mV	1990.0mV	F
		-1000.0mV	-999.9	-1000.1mV	-1000.0mV	-1000.0mV	
		-1990.0mV	-1989.9	-1990.1mV	-1990.0mV	-1990.0mV	
	CH B	1000.0mV	999.9	1000.1mV	999.5mV	999.9mV	F
		1990.0mV	1989.9	1990.1mV	1989.6mV	1990.0mV	F
		-1000.0mV	-1000.0	-1000.1mV	-1000.2mV	-1000.0mV	F
		-1990.0mV	-1989.9	-1990.1mV	-1990.1mV	-1990.0mV	

WORK ORDER 39647

Date Received 7/6/00

Asset No. 001893 Manufacturer FISHER SCIENTIFIC Model ACCUMET 950
Description PH/ION METER Serial Number 3340
Accessory Received/Required NONE
Div/CC ID NONE Accessory to Asset No. N/A
Div/CC DIV20 Location B57 Custodian DARRELL DUNN Tel. 6090
Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
Work Requested CALIBRATION
Receiving Inspection
Delivered By DARRELL DUNN Tel. 6090

WORK HISTORY

Date	Start Time	Stop Time	Notes

PARTS

Part Name	Part Number	Cost	Failure Description

39647

WORK SUMMARY

Failure Description _____

Repair Action _____

Cal Procedure Orion 950 5520A 1yr July 2000 Temp 94 F Hum 42 %

Tech Vincent Morales Cal Hrs. 1.0 Repair Hrs. _____ Part Cost _____

Action Taken Calibrated

Standards Used 6413

Date Cal 20 July 2000 Int. 12 Mo. Date Due 20 July 2001 Reliability Code _____

Date Picked Up 7/31/2000 Picked Up By _____

Calibration Results

SwRI Calibration Laboratory

UUT: FISHER SCIENTIFIC ACCUMET 950
 PH/ION METER
 Serial No: 3340
 Asset No. 001893

Result: **PASS**
 Performed on: 7/20/00 at 14:28:55
 Performed by: Mark Anthony Romero
 Environment: Temp. 74.0°F Humid. 42 %
 Condition F/L: FOUND-LEFT
 Procedure Completed: YES

Notes: LIMITED CALIBRATION: MV USE ONLY.

Standards Used

Asset	Mfg	Model	Description	Cal. Date	Due Date
006413	FLUKE	5520A	MULTI-PRODUCT CALIBRATOR	14-Oct-99	14-Oct-00

Test Data

TEST#	STD PARAMETER	TRUE VALUE	UNIT UNDER TEST			ERROR in (% of Tol)	NOTIFY	
			READING	TOLERANCE	UUT ERROR		TUR	USER
DC millivolts INPUT 1								
1	0.0mV		0.0	500uV	0V	0		
2	1000.0mV		1000.0	1mV	0V	0		
3	-1000.0mV		-1000.0	1mV	0V	0		
DC millivolts INPUT B								
4	0.0mV		0.1	500uV	100uV	20		
5	1000.0mV		1000.0	1mV	0V	0		
6	-1000.0mV		-1000.0	1mV	0V	0		

End of Test Data



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

Accredited



Certificate #
0972-01

Certificate of Calibration

20 July 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC ACCUMET 950
Description: PH/ION METER
Serial Number: 3340
Asset Number: 001893

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. 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 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: 42 % RH

Calibration Date: 20 Jul 00 **Calibration Procedure:** ORION 950 5520A 1YR JULY 2000

Condition as Received: WITHIN LIMITED CALIBRATIONS REQUIREMENTS

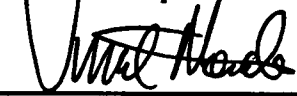
Remarks: LIMITED CALIBRATION: MV USE ONLY.

Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Measurements performed by:



Vince Morales, Technician

Certificate # 39647

m:\a2la.rpt Rev date 22 May 00

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SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 3:14:42PM on 7/20/01

1 10011 0011 0011 0011 0011 0011 0011

Work Order 44404496

Arrived 7/20/01

Asset No. 001893 Manufacturer FISHER SCIENTIFIC

Model ACCUMET 950

Instrument Type/Class PH/ION METER

Serial No. 3340

Accessory No. _____ Calibration Procedure _____

Location B57

Div/Client DIV20

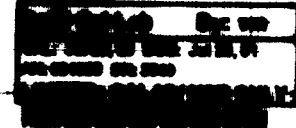
Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 00751.006

Delivered By / Telephone _____



IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure _____

Temp 72 F

Hum. 38 %

Tech Anthony Roman

Totals

Cal Hours 1.0

Repair Hours _____

Parts Cost _____

Standards Used 6413

Date Picked Up 7/31/01

Picked Up By [Signature]

44496



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

24 July 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: FISHER SCIENTIFIC ACCUMET 950
Description: PH/ION METER
Serial Number: 3340
Asset Number: 001893
Work Order Number: 444044496

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. 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 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: 72.0 Degrees Fahrenheit Humidity: 38 % RH

Calibration Date: 24 Jul 01 **Calibration Procedure:** CL-38, MAY 99

Condition as Received: LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

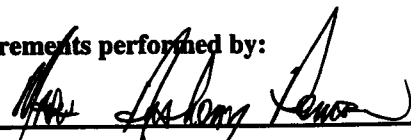
Remarks: LIMITED CALIBRATION: CALIBRATE MILLIVOLT USE ONLY.

Approved by:



Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:



Mark Romero, Technician

