

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

WORK ORDER

CERTIFICATE # 24750 ASSET # 001890 DATE 18 Mar 97

ITEM DATA:
Manufacturer Orion Model EA 900
Description expandable analyzer Serial # 500M
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Dir. Ed. David Damm

Turned in by: _____ Phone 609c

CHARGE # 20-578561 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 interval
_____ Reliability code

24750

ACTION TAKEN: (Calibration/Repair/Parts) calibrate

CAL ENVIRONMENT:
Temperature 74 °F Humidity 48 %RH

CALIBRATED/REPAIRED:
By ADL Cal Procedure 5352
Date 2 APR 97 Accuracy _____
Cal Interval 12 Time to complete: _____
Next Cal due 2 APR 98 Cal 2 Repair _____
Standards used (Asset#) _____
115, 168

DATE COMPLETED _____
DATE PICKED UP 4/14/97 PICKED UP BY David D

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

WORK ORDER

CERTIFICATE # 28772 ASSET # 101800 DATE 25 Feb 98

ITEM DATA:

Manufacturer Oxion Model EA920
Description Ion Analyzer Serial # S001A
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN DIV 70, Donald Durr

Turned in by: _____ Phone 6090

CHARGE # 20. Nov 591 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 _____ Date _____

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) _____

CAL ENVIRONMENT:
Temperature 72 °F Humidity 32 %RH

CALIBRATED/REPAIRED:
By 1cthuhs Cal Procedure CCP P11-001
Date 27 Feb 98 Accuracy MEGR
Cal Interval 12 mo Reliability Code: 5
Next Cal due 27 Feb 98 Cal Time 1.8 Repair Time _____
Standards used (Asset#) 182

DATE COMPLETED 27 Feb 98
DATE PICKED UP 3/2/98 PICKED UP BY [Signature]

28772

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

WORK ORDER

CERTIFICATE # 33577 ASSET # 001880 DATE 08 March 99

ITEM DATA:

Manufacturer Oxion Model EA920
Description expandable ion analyzer Serial # 30014
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN Dr. D. D. Daniel Dunn

Turned in by: _____ Phone 6090

CHARGE # 20-440-571 OH 03/99 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 MAD Date 03-25-99

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. ^{Cal} mv use only

CAL ENVIRONMENT: Temperature 73 °F Humidity 40 %RH

CALIBRATED/REPAIRED:
By VM Cal Procedure CLCP-PH-001
Date 24 MAR 99 Accuracy MFS
Cal Interval 12 Reliability Code: _____
Next Cal due 24 MAR 00 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 6413

DATE COMPLETED 24 MAR 99
DATE PICKED UP 3/24/99 PICKED UP BY [Signature]

33577

CALIBRATION CHECK FORM

Date Calibrated 24 MAR 99 Work Order 33577
 Technician J Morales
 Unit Under Test pH Meter
 Manufacturer Orion Model 290A/520A/720A/920A SN S001A ASN 1880

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE	MEASURED VALUES		P/F
			MIN - MAX	AS FOUND	RELEASED	
1	Absolute Millivolts					
	Channel 1	-1500.0 mV	-1499.2 mV to -1500.8 mV	-1500.2mV		Pass
		-1000.0 mV	-999.5 mV to -1000.5 mV	-1000.2mV		
		-500.0 mV	-499.7 mV to -500.3 mV	-500.2mV		
		000.0 mV	-000.2 mV to +000.2 mV	-0.2mV		
		+500.0 mV	499.7 mV to 500.3 mV	499.8mV		
		+1000.0 mV	999.5 mV to 1000.5 mV	999.7mV		
		+1500.0 mV	1499.2 mV to 1500.8 mV	1499.8mV		
	Channel 2	-1500.0 mV	-1499.2 mV to -1500.8 mV	-1500.2mV		
		-1000.0 mV	-999.5 mV to -1000.5 mV	-1000.2mV		
		-500.0 mV	-499.7 mV to -500.3 mV	-500.2mV		
		000.0 mV	-000.2 mV to +000.2 mV	-0.2mV		
		+500.0 mV	499.7 mV to 500.3 mV	499.8mV		
		+1000.0 mV	999.5 mV to 1000.5 mV	999.7mV		
		+1500.0 mV	1499.2 mV to 1500.8 mV	1499.8mV		
2	Relative Millivolts					
	Channel 1	1500 mV	1499.1 mV to 1500.9 mV	1500.0mV		↓
	Channel 2	1500 mV	1499.1 mV to 1500.9 mV	1499.9mV		

WORK ORDER 38599

Date Received 4/10/00

Asset No. 001880 Manufacturer ORION Model EA 920
Description EXPANDABLE IONANALYZER Serial Number S001A
Accessory Received/Required NONE
Div/CC ID NONE Accessory to Asset No. N/A Accuracy MFG SPECS
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 O.K.
Delivered By DARRELL DUNN Tel. 6090

WORK HISTORY

Date	Start Time	Stop Time	Notes

PARTS

Part Name	Part Number	Cost	Failure Description

WORK SUMMARY

Failure Description _____
Repair Action _____
Cal Procedure CL-79, Jun 99 Temp 74 F Hum 40 %
Tech V. Merdo Cal Hrs. 1.0 Repair Hrs. _____ Part Cost _____
Action Taken Calibration
Standards Used 182
Date Cal 7 June 00 Int. 0 Mo. Date Due NOT ON Recall Reliability Code _____
Date Picked Up 6/7/2000 Picked Up By M. Nugent
workreq.rpt Rev 30 Jan 00
Melissa Nugent

38599



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

7 June 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION EA 920
Description: EXPANDABLE IONANALYZER
Serial Number: S001A
Asset Number: 001880

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NC SL 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: 40 % RH

Calibration Date: 7 Jun 00 **Calibration Procedure:** CL-79, 6/99

Condition as Received: See Remarks

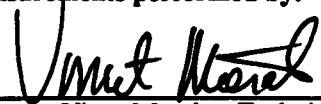
Remarks: FOUND WITHIN TOLERANCE FOR LIMITED CALIBRATION OF MILLIVOLTS ONLY

Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Measurements performed by:



Vince Morales, Technician

Certificate # 38599

m:\a2la.rpt Rev date 22 May 00

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

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

1 10000 00000 00000 00000 00000 00000

Work Order **444044497**

Arrived 7/20/01

Asset No. 001880 Manufacturer ORION

Model EA 920

Instrument Type/Class EXPANDABLE IONANALYZER

Serial No. S001A

Accessory No. Calibration Procedure CL-79, 6/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 00751.006

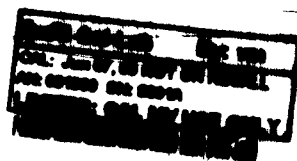
Delivered By / Telephone

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	<u>Limited cal: mV use only.</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



44497

REPAIR PARTS

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

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure CL-79, 6/99 Temp 74 F Hum. 88 %

Tech W. Dunne Anthony Dunne Totals Cal Hours 1.0 Repair Hours _____ Parts Cost _____

Standards Used B2

Date Picked Up 7/31/01 Picked Up By [Signature]



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

23 July 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION EA 920
Description: EXPANDABLE IONANALYZER
Serial Number: S001A
Asset Number: 001880
Work Order Number: 444044497

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: 73.0 Degrees Fahrenheit Humidity: 38 % RH

Calibration Date: 23 Jul 01 **Calibration Procedure:** CL-79, 6/99

Condition as Received: LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

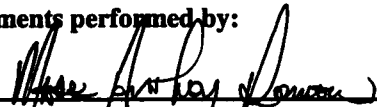
Remarks: LIMITED CALIBRATION: CAL MILLIVOLT USE ONLY.

Approved by:



Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:



Mark Romero, Technician

Southwest Research Institute
Calibration laboratory
Calibration Sheet.

Found/Left

Work Order:	444049295	Mfr.	Orion	Technician	8216
Asset No.	001880	Model	720A and EA920	Procedure	CL-79 7/99
Serial No.	S001A	Type.	pH Meter	Cal Date.	9-Jul-02
Remarks:					
(1) The Difference is equal to TI reading - Test Point reading.					
(2) If no value is listed the uncertainty is >4/1					
The results can be Pass, Fail, or if blank "not determinable". If "not determinable" it is up to the end user to determine if results meet their needs.					

Function/Range	Test Point	TI Reading	Difference (1)	Test Limits+/-	Uncertainty (2)	Results
m Volts	m Volts	m Volts	m Volts	m Volts	m Volts	
Input 1	0.0	0.1	0.1	0.5	0.0	Pass
	1000.0	1000.3	0.3	1.0	0.0	Pass
	-1000.0	-1000.5	-0.5	1.0	0.0	Pass
Function/Range	Test Point	TI Reading	Difference (1)	Test Limits+/-	Uncertainty (2)	Results
m Volts	m Volts	m Volts	m Volts	m Volts	m Volts	
Input 2	0.0	-0.1	-0.1	0.5	0.0	Pass
	1000.0	1000.1	0.1	1.0	0.0	Pass
	-1000.0	-1000.5	-0.5	1.0	0.0	Pass



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

Certificate of Calibration

9 July 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION EA 920
Description: EXPANDABLE IONANALYZER
Serial Number: S001A
Asset Number: 001880
Work Order Number: 444049295

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.

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: 41 % RH

Calibration Date: 9 Jul 02 **Calibration Procedure:** CL-79, 6/99

Condition as Received: LIMITED CALIBRATION


Condition as Returned: LIMITED CALIBRATION

Remarks: LIMITED CALIBRATION: MILLIVOLT USE ONLY.

Approved by:


Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Measurements performed by:


Ken Harp, Technician