

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

WORK ORDER

CERTIFICATE # 22387 ASSET # 1441 DATE 14 Aug 96

ITEM DATA:

Manufacturer Orion Model 720A
Description PH / ISF Meter Serial # 003368
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN Darrell Dunc Div 20

Turned in by: _____ Phone _____

CHARGE # 205708-573 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

ACTION TAKEN: (Calibration/Repair/Parts) (limited to MV only)

CAL ENVIRONMENT:
Temperature 74 °F Humidity 45 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure mg (limited to MV)
Date 16 AUG 96 Accuracy MS
Cal Interval 12 Time to complete: _____
Next Cal due 16 AUG 97 Cal 1.5 Repair _____
Standards used (Asset#) 182

DATE COMPLETED 16 AUG 96
DATE PICKED UP 8/21/96 PICKED UP BY [Signature]

22387

CALIBRATION CHECK FORM

Date Calibrated 12/06/51 Work Order 22387
 Technician JW
 Unit Under Test 720A 2D 1441
 Manufacturer OKLON Model 7204 SN 03368 ASN _____

WI-9-30-
 Rev _____ Chg _____
 Page _____ of _____

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
	MILLIVOLT RANGE				OK	OK	
	-1600 to +1600	1500 mV		± 2	1500.3	1500.3	
	tol ± 0.2 mV or ± 0.05%	1200 mV		± 6	1200.0	1200.1	
	whichever is greater	1000 mV		± 5	1000.0	1000.0	
		800		+ 4	800.0	800.0	
		600		± 3	600.0	599.9	
		400		± 2	400.0	399.9	
		200		± 2	200.0	199.9	
		00		± 2	0.0	0.0	
		-200			-199.9	-200.0	
		-400			399.9	-400.0	
		-600			600.0	600.0	
		-800			800.0	800.1	
		-1000			-1000.0	-1000.1	
		-1200			-1200.0	1200.2	
		-1500			1500.0	1500.3	

SOUTHWEST RESEARCH INSTITUTE
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WORK ORDER

CERTIFICATE # 26575 ASSET # 0014111 DATE 25 Sept 97

ITEM DATA:

Manufacturer Orica Model 120A
Description PH/15% METER Serial # 003308
Accessories 20.5708 SOL

ACTION REQUESTED Cal

CUSTODIAN DV.20, Donnell Davis + 241%

Turned in by: _____ Phone 6010

CHARGE # 20-5708 SOL 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) Limited Calibration: Per 97-CD-35

CAL ENVIRONMENT: Temperature 72 °F Humidity 39 %RH

CALIBRATED/REPAIRED: By Monroe Penner Cal Procedure CLCP-PH-061
Date SEPT 25, 97 Accuracy ME38
Cal Interval 12 mo Reliability Code: 4
Next Cal due Sept 25, 98 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 182

DATE COMPLETED SEPT 25, 97
DATE PICKED UP 9/30/97 PICKED UP BY Donnell Davis

26575

CALIBRATION CHECK FORM

Date Calibrated _____ Work Order _____
 Technician _____
 Unit Under Test _____
 Manufacturer ORION Model 720A SN _____ ASN _____

WI-9-30- _____
 Rev _____ Chg _____
 Page _____ of _____

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
	MILLIVOLT RANGE						
	-1600 to +1600	1500	± .7mV		1500.1mV		
	Tol ± 0.2mV or ± 0.05% whichever is greater	1200	± .6mV		1200.0mV		
		1000	± .5mV		999.9mV		
		800	± .4mV		799.9mV		
		600	± .3mV		599.9mV		
		400	± .2mV		399.9mV		
		200	± .2mV		199.9mV		
		0.0	± .2mV		0.0mV		
		-200	± .2mV		-199.9mV		
		-400	± .2mV		-399.9mV		
		-600	± .3mV		-599.9mV		
		-800	± .4mV		-800.0mV		
		-1000	± .5mV		-1000.1mV		
		-1200	± .6mV		-1200.1mV		
		-1500	± .7mV		-1500.1mV		

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

WORK ORDER

CERTIFICATE # 31713 ASSET # 1441 DATE 21 Oct 98

ITEM DATA:

Manufacturer Orion Model 720A
Description pH/ISE meter Serial # 603368
Accessories power supply
ACTION REQUESTED cal

CUSTODIAN Darrell Dunn

Turned in by: _____ Phone 6090

CHARGE # 70-1402-571 Date Required _____

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

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

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

By _____ Date _____

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

31713

ACTION TAKEN: (Calibration/Repair/Parts) Limited Calibration - calibrated for mv
USE ONLY.

CAL ENVIRONMENT: Temperature 72 °F Humidity 42 %RH

CALIBRATED/REPAIRED:
By M. Ward Cal Procedure CLCP-PH001
Date 28 Oct 98 Accuracy Mfg
Cal Interval 12 Reliability Code: _____
Next Cal due 21 Oct 99 Cal Time 2.0 Repair Time _____
Standards used (Asset#) 4164

DATE COMPLETED 28 Oct 98
DATE PICKED UP 10/30/98 PICKED UP BY [Signature]

CALIBRATION CHECK FORM

Date Calibrated 28 Oct 98 Work Order 31713
 Technician V. Morales
 Unit Under Test pH Meter
 Manufacturer Orion Model 520A/720A/920A SN 003368 ASN 1441

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	-1500.1mV	-1500.1mV	Pass
			-1000.0 mV	-999.5 mV to -1000.5 mV	-1000.2mV	-1000.1mV	
			-500.0 mV	-499.7 mV to -500.3 mV	-500.0mV	-500.0mV	
			000.0 mV	-000.2 mV to +000.2 mV	0.0V	0.0V	
			+500.0 mV	499.7 mV to 500.3 mV	500.0mV	499.9mV	
			+1000.0 mV	999.5 mV to 1000.5 mV	999.9mV	999.9mV	
			+1500.0 mV	1499.2 mV to 1500.8 mV	1500.2mV	1500.2mV	
		Channel 2	-1500.0 mV	-1499.2 mV to -1500.8 mV	-1500.4mV	-1500.3	
			-1000.0 mV	-999.5 mV to -1000.5 mV	-1000.3mV	-1000.2mV	
			-500.0 mV	-499.7 mV to -500.3 mV	-500.2mV	-500.0mV	
			000.0 mV	-000.2 mV to +000.2 mV	- .2mV	0.0mV	
			+500.0 mV	499.7 mV to 500.3 mV	499.8mV	499.9mV	
	+1000.0 mV	999.5 mV to 1000.5 mV	999.7mV	1000.0mV			
	+1500.0 mV	1499.2 mV to 1500.8 mV	1499.9mV	1500.2mV			
2	Relative Millivolts						
		Channel 1	1500 mV	1499.1 mV to 1500.9 mV	1499.9mV	1500.0	✓
		Channel 2	1500 mV	1499.1 mV to 1500.9 mV	1500.1mV	1500.0	

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

WORK ORDER

WORK ORDER # 36852 ASSET # 001441 DATE 17 Nov 99

ITEM DATA:

Manufacturer Orion Model 1201
Description ph meter Serial # 003368
Accessories AC adaptor

ACTION REQUESTED cal

CUSTODIAN Du. 20 Darrell Dunn

Turned in by: _____ Phone 6090

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 MDJ Date 11-17-99

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

CONDITION RECEIVED: Out of tolerance
 In tolerance
 Damaged (Contact customer)
 Contact _____ Date _____
 Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) _____

CAL ENVIRONMENT:
Temperature 72 °F Humidity 38 %RH

CALIBRATED/REPAIRED:
By Michael Cal Procedure CL-78, June 99
Date 30 Nov 99 Accuracy MFS
Cal Interval 12 Reliability Code 6
Next Cal Due 30 Nov 00 Cal Time 1.5 Repair Time _____
Standards used (Asset #) 182

DATE COMPLETED 30 Nov 99
DATE PICKED UP 12/14/99 PICKED UP BY [Signature]

36852

CALIBRATION CHECK FORM

Date Calibrated 30 NOV 99 Work Order 36852 Cal By V. Morales

Procedure No./Date: CL-78, JUNE 99 Unit Under Test: PH METER

Mfg.: ORION Model: 720A SN 003368 AN 1441

STEP	FUNCTION OR RANGE	APPLIED	TOLERANCE		MEASURED VALUES		P/F
			MIN	MAX	AS FOUND	RELEASED	
2.2	MILLIVOLTS						
	INPUT 1	0.000mV	-0.5	+0.5mV	0.0mV		Pass
		1000.0mV	999	1001mV	1000.0mV		
		-1000.0mV	-999	-1001mV	-1000.0mV		
	MILLIVOLTS						
	INPUT 2	0.000mV	-0.5	+0.5mV	0.0mV		Pass
		1000.0mV	999	1001mV	1000.0mV		
		-1000.0mV	-999	-1001mV	-1000.0mV		



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

1 December 1999

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH/ION METER
Serial Number: 003368
Asset Number: 001441

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: 72.0 Degrees Fahrenheit Humidity: 38 % RH

Calibration Date: 30 Nov 99 **Calibration Procedure:** CL-79, JUNE 99

Condition as Received: LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

Remarks: CAL MV USE ONLY

Approved by:




Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 36852

m:\a2la.rpt Rev date 10 Mar 99

Measurements performed by:



Vince Morales, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 8:44:40AM on 10/24/00

I4213

1 10011 0011 0011 1001 0011 0011 1001

Work Order No 444041091

Arrived 10/24/00

Asset No. 001441 Manufacturer ORION

Model 720A

Instrument Type/Class PH/ION METER

Serial No. 003368

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

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 20.00751.006

Delivered By / Telephone DARRELL DUNN

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
<u>Oct 25 2000</u>	<u>2.0</u>	<u>Calibrate / Data Sheet - Limited Calibration: Cal M₁ use only</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

41091

REPAIR PARTS

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

WORK SUMMARY

Failure Description None

Repair Action None

Calibration Procedure CL-79, Jun 99 Temp 72F Hum. 43 %

Tech Dunn Totals Cal Hours 2 Repair Hours _____ Parts Cost _____

Standards Used 182

Date Picked Up 10/26/2000

Picked Up By Dunn



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

25 October 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH/ION METER
Serial Number: 003368
Asset Number: 001441

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCCL 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: 43 % RH

Calibration Date: 25 Oct 00 **Calibration Procedure:** CL-79,6/99

Condition as Received: WITHIN LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

Remarks: CAL MV USE ONLY

Approved by:

Jim Patterson, Supervisor, or Walt Hill, Metrologist
Certificate # 444041091

Measurements performed by:

Tom Hannon, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by RCRUZ, 12/6/01 2:25:38PM

||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||

Arrived 12/6/01

Work Order **444046377**

Asset No. 001441 Manufacturer ORION

Model 720A

Equipment Type PH/ION METER

Serial No. 003368

Accessory No.

Interval 12 M

Calibration Procedure CL-79, 6/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN4CAL

Special Instructions 20.00751.006

Notify before adjustments or repairs. (Provide data with certificate (Certificate Typ _____

Charge/Project No. 00751.006 1.20

Requester / Telephone _____

This information is correct for the work requested. 

WORK NOTES

Date Hours Remarks/Notes

4 Jan 02 / Cal

Date	Hours	Part Name	Part Number	Failure Description	Cost


WORK SUMMARY

Failure Description _____

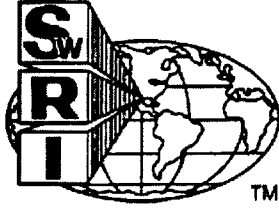
Repair Action _____

Tech CRP Cal Hrs. 1 Repair Hrs. _____ Parts Cost _____ Temp 72 F Hum. 42 %

Standards Used 182

Date Picked Up 1/11/02 Picked Up By 

444046377



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

Certificate of Calibration

4 January 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: ORION 720A
Description: PH/ION METER
Serial Number: 003368
Asset Number: 001441
Work Order Number: 444046377

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: 42 % RH


Calibration Date: 4 Jan 02 **Calibration Procedure:** CL-79, 6/99

Condition as Received: IN TOLERANCE

Condition as Returned: IN TOLERANCE

Remarks: Limited Calibration mVolts Only

Approved by:


Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:


Tony Planas, Technician