



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

11 August 1999

**Issued to:** TROY MAXWELL DIV20 B189  
**Manufacturer/Model:** FLUKE 2620A  
**Description:** HYDRA DATA LOGGER  
**Serial Number:** 5777650  
**Asset Number:** 007455

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: 75.0 Degrees Fahrenheit Humidity: 42 % RH

**Calibration Date:** 11 Aug 99

**Calibration Procedure:** FLUKE 2620A HYDRA:(1 YEAR)5720A V

**Condition as Received:** IN TOLERANCE

**Condition as Released:** IN TOLERANCE

**Remarks:**

**Approved by:**

Jim Patterson, Supervisor or Walt Hill, Metrologist

**Measurements performed by:**

Vince Morales, Technician

**Certificate #**

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

WORK ORDER

WORK ORDER # 37230 ASSET # 007455 DATE 29 Dec. 99

ITEM DATA:

Manufacturer Flyke Model 262SA  
Description hydra data logger Serial # 5797650  
Accessories module # 2620A-100

ACTION REQUESTED performance check - operational failure

CUSTODIAN W. J. Green and Troy Maxwell

Turned in by: Wayne Halbardier Phone 2012

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 MAH Date 12-29-99

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 36 %RH

CALIBRATED/REPAIRED:  
By Monahan Cal Procedure Flyke 262SA 5720A  
Date 6 JAN 00 Accuracy Mfg  
Cal Interval 6 Reliability Code 2  
Next Cal Due 6 JUL 00 Cal Time 2.0 Repair Time \_\_\_\_\_  
Standards used (Asset #) 182

DATE COMPLETED 6 JAN 00

DATE PICKED UP 01/10/99 PICKED UP BY Wayne Halbardier

37230



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## Certificate of Calibration

6 January 2000

**Issued to:** TROY MAXWELL DIV20 B189  
**Manufacturer/Model:** FLUKE 2620A  
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**Serial Number:** 5777650  
**Asset Number:** 007455

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**Ambient Conditions:** Temperature: 72.0 Degrees Fahrenheit Humidity: 36 % RH

**Calibration Date:** 6 Jan 00 **Calibration Procedure:** FLUKE 2625A HYDRA:(1 YEAR)5720A VER

**Condition as Received:** IN TOLERANCE

**Condition as Released:** IN TOLERANCE

**Remarks:**

**Approved by:**

  
\_\_\_\_\_  
Jim Patterson, Supervisor, or Walt Hill, Metrologist

**Certificate # 37230**

m:\a2la.rpt Rev date 14 Dec 99

**Measurements performed by:**

  
\_\_\_\_\_  
Vince Morales, Technician

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# SOUTHWEST RESEARCH INSTITUTE

## Calibration Laboratory

### WORK ORDER

Processed by RCRUZ at 11:12:16AM on 5/14/01

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

Work Order **444043575**

Arrived 5/14/01

Asset No. 007455 Manufacturer FLUKE

Model 2620A

Instrument Type/Class HYDRA DATA LOGGER

Serial No. 5777650

Accessory No. \_\_\_\_\_ Calibration Procedure \_\_\_\_\_

Location B189

Div/Client DIV20

Custodian TROY MAXWELL

Mail Stop B189 Tel. \_\_\_\_\_

Charge/Project No. 20.00751.006

Delivered By / Telephone TROY MAXWELL X2012

**IN4CAL**

Special Instructions \_\_\_\_\_

### WORK NOTES

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

### REPAIR PARTS

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

### WORK SUMMARY

Failure Description \_\_\_\_\_

Repair Action \_\_\_\_\_

Calibration Procedure Metroack 5720 FLUKE 2620A Temp 73 F Hum. 37 %

Tech ADP Totals Cal Hours 2 Repair Hours \_\_\_\_\_ Parts Cost \_\_\_\_\_

Standards Used 182

Date Picked Up 6-4-01

Picked Up By [Signature]

43575

# Calibration Results

## SwRI Calibration Laboratory

UUT: FLUKE 2620A  
 HYDRA DATA LOGGER  
 Serial No: 5777650  
 Asset No. 007455

Result: **PASS**  
 Performed on: 5/21/01 at 09:19:47  
 Performed by: Anthony Planas  
 Environment: Temp. 73.0°F Humid. 37 %  
 Condition F/L: FOUND-LEFT  
 Procedure Completed: YES

Notes:

### Standards Used

Asset	Mfg	Model	Description	Cal. Date	Due Date
000182	FLUKE	5700A/EP	CALIBRATOR	28-Mar-01	28-Jun-01

### Test Data

TEST#	STD PARAMETER	TRUE VALUE	----- READING	UNIT UNDER TEST TOLERANCE	----- UUT ERROR	ERROR in (% of Tol)	NOTIFY TUR USER
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#### DIRECT VOLTAGE PERFORMANCE VERIFICATION

2	0.00mV		-0.01	20uV	-10uV	50	
3	150.00mV		150.00	70uV	0V	0	
4	290.00mV		290.01	110uV	10uV	9	
5	2.9000V		2.9000	1.2mV	0V	0	
6	-2.9000V		-2.9003	1.2mV	-300uV	25	
7	29.000V		29.000	10mV	0V	0	
8	150.00V		150.00	60mV	0V	0	
9	290.00V		290.00	100mV	0V	0	
10	0.000mV		0.000	7uV	0V	0	
11	90.000mV		90.001	380uV	1uV	0	
12	900.00mV		900.03	220uV	30uV	14	

#### ALTERNATING VOLTAGE PERFORMANCE VERIFICATION

13	20.00mV @ 1kHz		19.99	290uV	-10uV	3	
14	20.00mV @ 100kHz		20.04	1.5mV	40uV	3	
15	290.00mV @ 1kHz		289.97	740uV	-30uV	4	
16	290.00mV @ 100kHz		297.46	15mV	7.46mV	50	
17	2.9000V @ 1kHz		2.8995	6.6mV	-500uV	8	
18	29.000V @ 1kHz		28.992	69mV	-8mV	12	
19	290.00V @ 1kHz		289.97	660mV	-30mV	5	

#### RESISTANCE PERFORMANCE VERIFICATION

20	0.00 Ohm		0.01	90 mOhm	10 mOhm	11	
21	190.00 Ohm	189.994	190.00	200 mOhm	5.58 mOhm	3	
22	0.0000 kOhm		0.0000	300 mOhm	0 Ohm	0	
23	1.9000 kOhm	1.89988	1.8999	1.4 Ohm	18.1 mOhm	1	
24	19.000 kOhm	18.9986	18.999	13 Ohm	388 mOhm	3	
25	190.00 kOhm	190.002	190.01	130 Ohm	8.49 Ohm	7	
26	1.9000 MOhm	1.89994	0.0000	1.4 kOhm	-1.8999448 MOhm	>500	*
26	1.9000 MOhm	1.89994	1.9001	1.4 kOhm	155.2 Ohm	11	

#### FREQUENCY PERFORMANCE VERIFICATION

27	10.000kHz		10.000	6Hz	0Hz	0	
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TEST#	STD PARAMETER	TRUE VALUE	UNIT UNDER TEST			ERROR in (% of Tol)	NOTIFY TUR USER
			READING	TOLERANCE	UUT ERROR		
CHANNEL 28	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 29	RESISTANCE	VERIFICATION	0.01	90 mOhm	10 mOhm	11	
CHANNEL 30	RESISTANCE	VERIFICATION	0.01	90 mOhm	10 mOhm	11	
CHANNEL 31	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 32	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 33	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 34	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 35	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
CHANNEL 36	RESISTANCE	VERIFICATION	0.00	0 Ohm	0 Ohm	0	0.0
THERMOCOUPLE 37	MEASUREMENT RANGE	ACCURACY TEST	-0.001	7uV	-1uV	14	
38	0.000mV		90.000	38uV	0V	0	
39	900.00mV		900.03	220uV	30uV	14	

**End of Test Data**



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21 May 2001

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**Serial Number:** 5777650  
**Asset Number:** 007455  
**Work Order Number:** 444043575

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**Ambient Conditions:** Temperature: 73.0 Degrees Fahrenheit Humidity: 37 % RH

**Calibration Date:** 21 May 01 **Calibration Procedure:** FLUKE 2620A 5720ARS-232C 1YR JUNE 2000

**Condition as Received:** IN TOLERANCE

**Condition as Released:** IN TOLERANCE

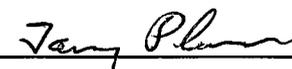
**Remarks:**

**Approved by:**

  
\_\_\_\_\_

Walt Hill, Supervisor  
Institute Calibration Laboratory

**Measurements performed by:**

  
\_\_\_\_\_

Tony Planas, Technician