



**SEA-BIRD  
SCIENTIFIC**

**SEA-BIRD ELECTRONICS, INC.**  
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**SERVICE REPORT**

**Service Request** 1005501447  
**Date** 25-MAR-2017

**PRODUCT INFORMATION**

**Item:** SLOCUM.LEGACY  
**Item Description:** (LEGACY) Slocum Glider  
**Serial:** 9024

**Special Notes**

Services Requested:  
Evaluate/Repair Instrumentation.  
Perform Routine Calibration Service.

Problems Found:  
No problems found

Services Performed:  
Perform initial diagnostic evaluation.  
Performed "POST" cruise calibration.  
Performed pressure calibration.  
Performed complete system check and full diagnostic evaluation.  
Installed NEW AF24173 Anti-foulant cylinder(s).

Item	Item Description	Qty
CAL_SLOCUM	CALIBRATE SLOCUM CONDUCTIVITY AND TEMPERATURE SENSORS (FRRF)	1
CNCRTSLOCUM	CONFIRM & RE-CERTIFY WEBB SLOCUM GLIDER CTD (FRRF)	1
REPLACEAF	EXTRA CHARGE TO INSTALL ONE ANTIFOULANT DEVICE, INCLUDES ONE 801542.1. (FRRF)	1
PCAL_SLOCUM	CALIBRATE SLOCUM PRESSURE SENSOR (FRRF)	1

**Unbilled Items**

Item	Item Description	Qty
801542.1	AF24173 ANTI-FOULANT, SINGLE CYLINDER, V2	1

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SENSOR SERIAL NUMBER: 9024  
CALIBRATION DATE: 26-Feb-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

**COEFFICIENTS:**

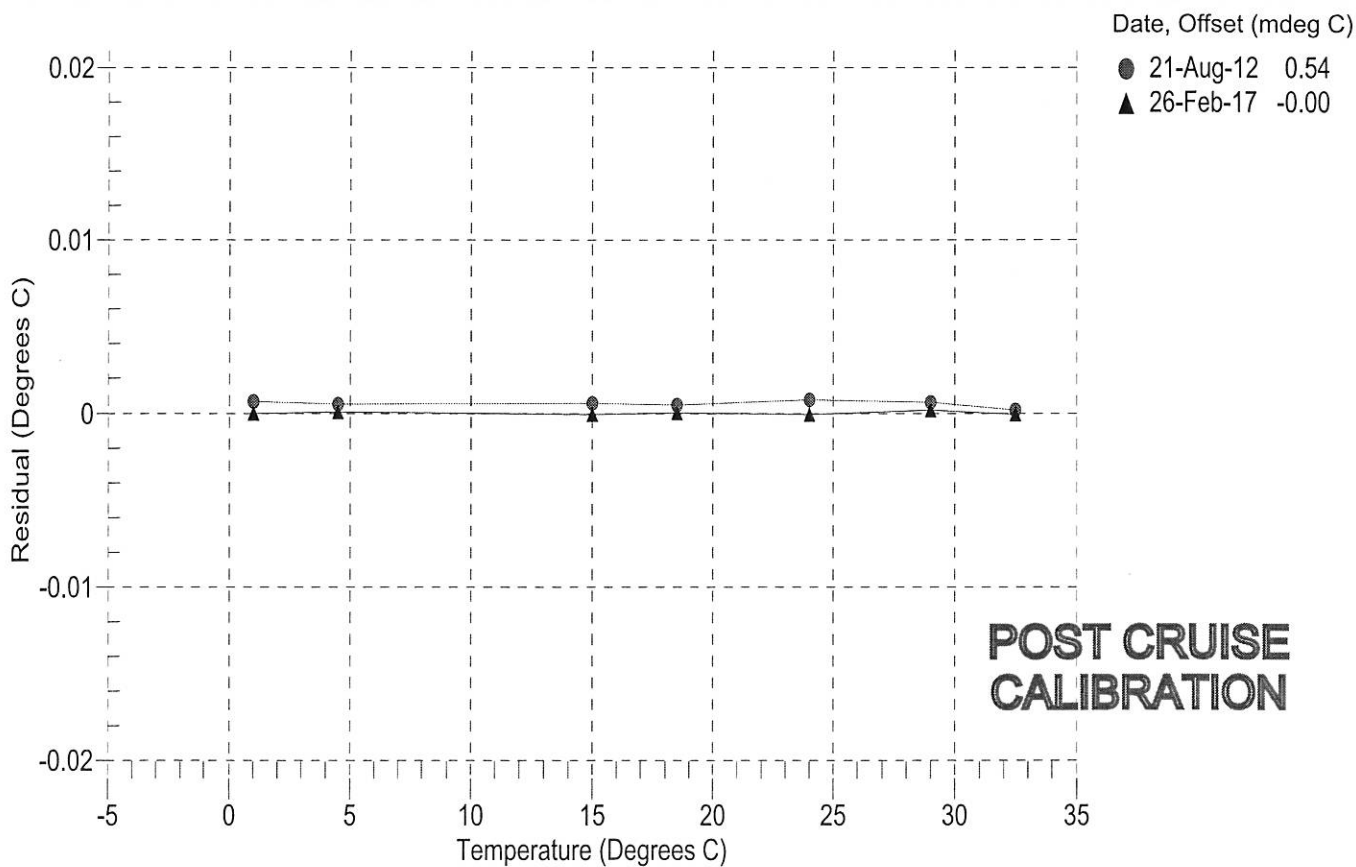
a0 = -7.369371e-005  
a1 = 3.014670e-004  
a2 = -4.080283e-006  
a3 = 1.904027e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	568697.8	1.0000	-0.0000
4.5000	486120.8	4.5001	0.0001
15.0000	309681.8	14.9999	-0.0001
18.4999	268141.0	18.4999	0.0000
24.0000	215117.4	23.9999	-0.0001
29.0000	177153.6	29.0002	0.0002
32.5000	155161.6	32.4999	-0.0001

n = Instrument Output (counts)

$$\text{Temperature ITS-90 (°C)} = 1 / \{a_0 + a_1[\ln(n)] + a_2[\ln^2(n)] + a_3[\ln^3(n)]\} - 273.15$$

$$\text{Residual (°C)} = \text{instrument temperature} - \text{bath temperature}$$



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SENSOR SERIAL NUMBER: 9024  
CALIBRATION DATE: 26-Feb-17

Slocum Payload CTD CONDUCTIVITY CALIBRATION DATA  
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

## COEFFICIENTS:

g = -9.679829e-001  
h = 1.335730e-001  
i = -2.218973e-004  
j = 3.424392e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = -4.9462e-007

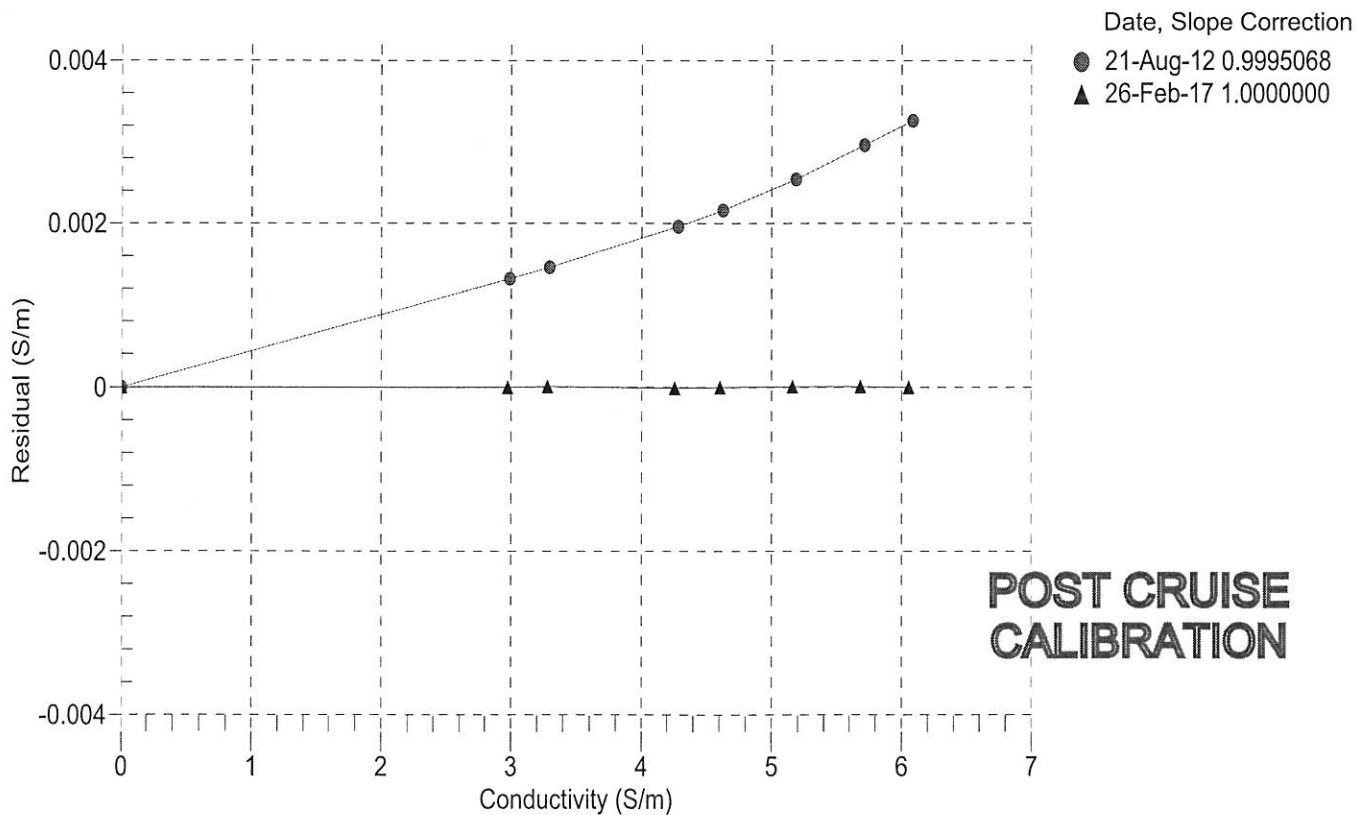
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2695.54	0.00000	0.00000
1.0000	34.7492	2.97078	5434.22	2.97078	-0.00000
4.5000	34.7297	3.27736	5641.10	3.27736	0.00001
15.0000	34.6876	4.25749	6255.92	4.25748	-0.00001
18.4999	34.6792	4.60213	6457.93	4.60213	-0.00000
24.0000	34.6702	5.15929	6771.45	5.15930	0.00001
29.0000	34.6660	5.68047	7051.76	5.68047	0.00001
32.5000	34.6642	6.05246	7244.99	6.05245	-0.00001

$$f = \text{Instrument Output(Hz)} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

t = temperature (°C); p = pressure (decibars);  $\delta$  = CTcor;  $\epsilon$  = CPcor;

$$\text{Conductivity (S/m)} = (g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \epsilon * p)$$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9024  
CALIBRATION DATE: 17-Feb-17

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 3647165

**COEFFICIENTS:**

PA0 = 1.028847e-001	PTCA0 = 5.234604e+005
PA1 = 4.569535e-003	PTCA1 = 2.639767e-001
PA2 = -2.114119e-011	PTCA2 = 3.204238e-002
PTEMPA0 = -6.855144e+001	PTCB0 = 2.520525e+001
PTEMPA1 = 5.222622e-002	PTCB1 = -3.500000e-004
PTEMPA2 = -5.982142e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)	TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
14.47	526630.0	1775.0	14.49	0.00	32.50	1980	526731.80
314.68	592330.0	1777.0	314.70	0.00	29.00	1910	526726.40
614.68	658021.0	1778.0	614.69	0.00	24.00	1810	526716.20
914.69	723754.0	1778.0	914.69	-0.00	18.50	1700	526704.60
1214.67	789525.0	1779.0	1214.68	0.00	15.00	1630	526700.00
1464.67	844359.0	1780.0	1464.64	-0.00	4.50	1422	526696.40
1214.66	789532.0	1780.0	1214.71	0.00	1.00	1353	526688.00
914.72	723764.0	1780.0	914.73	0.00			
614.72	658020.0	1779.0	614.69	-0.00			
314.75	592332.0	1779.0	314.71	-0.00			
14.46	526623.0	1779.0	14.46	-0.00			

	<b>TEMPERATURE (°C)</b>	<b>SPAN (mV)</b>
	-5.00	25.21
	35.00	25.19

y = thermistor output (counts)

$$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$$

$$x = \text{instrument output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$$

$$n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$$

$$\text{pressure (PSIA)} = PA0 + PA1 * n + PA2 * n^2$$

$$\text{Residual (\%FSR)} = (\text{computed pressure} - \text{true pressure}) * 100 / \text{Full Scale Range}$$

Date, Offset (%FSR)

● 17-Feb-17 -0.00

