SEA-BIRD ELECTRONICS, INC.
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SERVICE REPORT

Service Request 1005501814
Date 06-MAY-2017

PRODUCT INFORMATION

Item: SLOCUM.LEGACY
Item Description: (LEGACY) Slocum Glider
Serial: 9085

Special Notes
Services Requested:
Evaluate/Repair Instrumentation.
Perform Routine Calibration Service.
Replace Antifoulant Device(s).

Services Performed:
Perform initial diagnostic evaluation.
Performed pressure calibration.
Performed "POST" cruise calibration.
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

Unbilled Items

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

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SENSOR SERIAL NUMBER: 9085
CALIBRATION DATE: 28-Apr-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

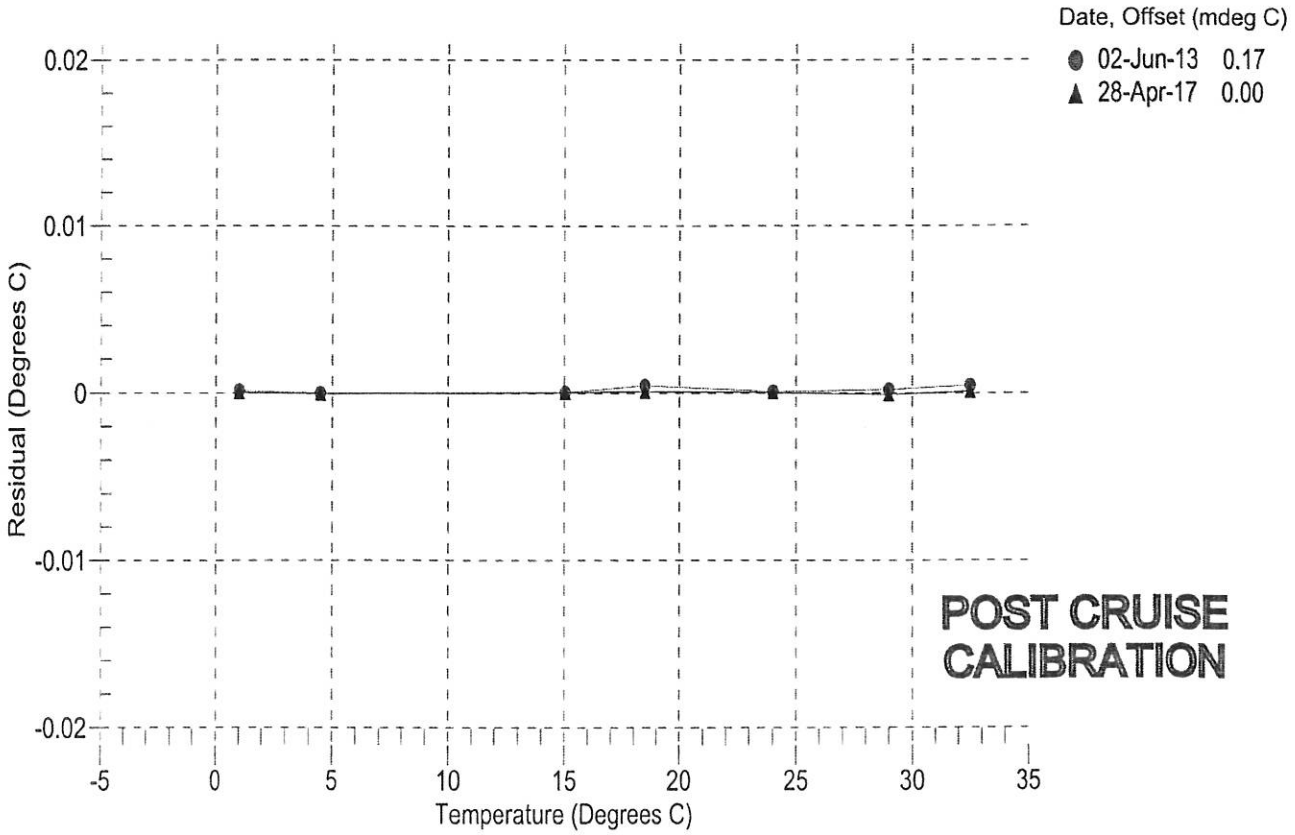
a0 = -3.852659e-005
a1 = 2.934099e-004
a2 = -3.460815e-006
a3 = 1.749545e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	566317.4	1.0000	0.0000
4.5000	484141.6	4.4999	-0.0001
15.0000	308505.8	15.0000	0.0000
18.5000	267144.8	18.5001	0.0001
24.0000	214344.6	24.0000	0.0000
29.0000	176536.0	28.9999	-0.0001
32.5000	154626.4	32.5001	0.0001

n = Instrument Output (counts)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 9085
CALIBRATION DATE: 28-Apr-17

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

COEFFICIENTS:

```
g = -9.906300e-001
h =  1.367170e-001
i = -2.738901e-004
j =  3.950898e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  3.0905e-007
```

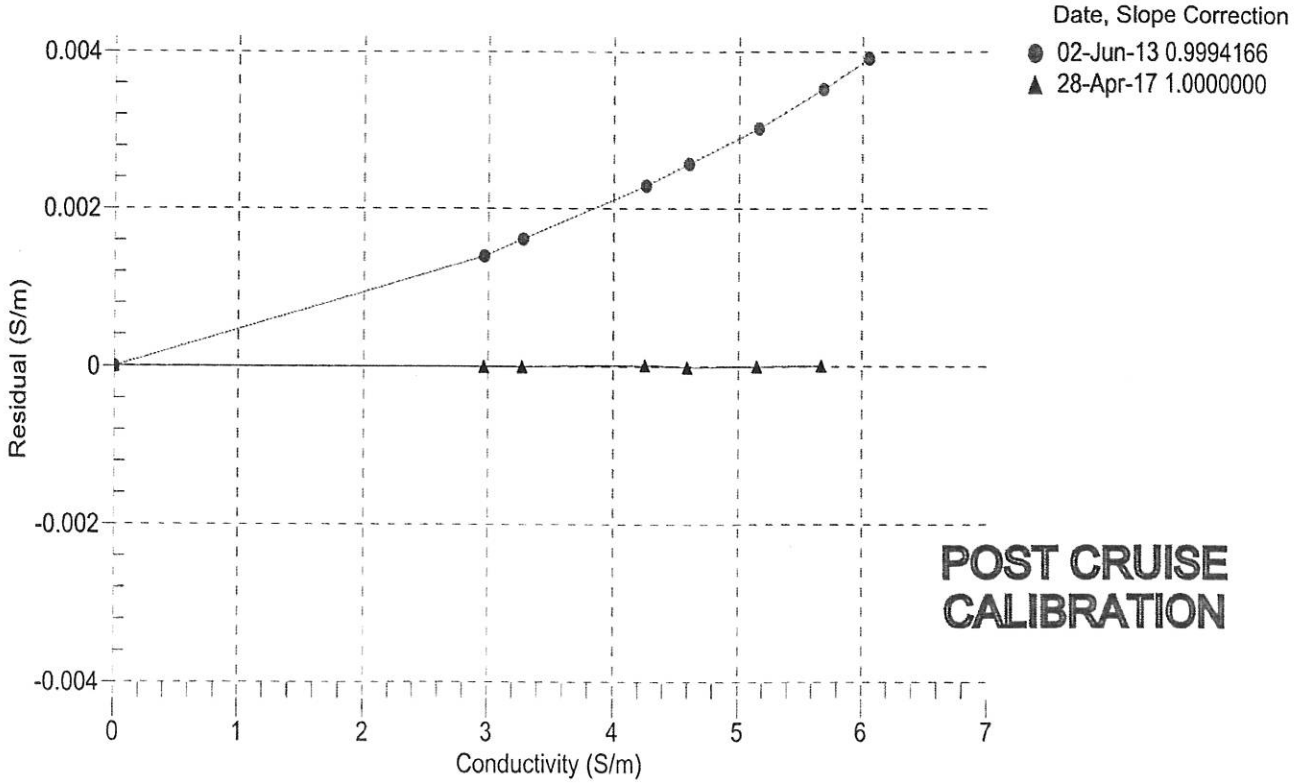
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2696.26	0.00000	0.00000
1.0000	34.7294	2.96924	5388.31	2.96924	-0.00000
4.5000	34.7100	3.27568	5592.27	3.27568	-0.00000
15.0000	34.6684	4.25539	6198.65	4.25540	0.00001
18.5000	34.6595	4.59981	6397.87	4.59980	-0.00001
24.0000	34.6497	5.15658	6707.10	5.15657	-0.00000
29.0000	34.6438	5.67724	6983.54	5.67724	0.00000
32.5000	34.6395	6.04864	7173.47	6.04760	-0.00104

f = Instrument Output(Hz) * sqrt(1.0 + WBOTC * t) / 1000.0

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

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

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



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SENSOR SERIAL NUMBER: 9085
CALIBRATION DATE: 24-Apr-17

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 3846544

COEFFICIENTS:

PA0 =	1.027209e-001	PTCA0 =	5.246226e+005
PA1 =	4.493376e-003	PTCA1 =	6.052008e-001
PA2 =	-2.049231e-011	PTCA2 =	1.561417e-002
PTEMPA0 =	-7.320175e+001	PTCB0 =	2.545600e+001
PTEMPA1 =	5.141549e-002	PTCB1 =	-6.000000e-004
PTEMPA2 =	-5.890481e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.47	527864.7	1916.6	14.58	0.01
301.48	591681.1	1917.5	301.39	-0.01
588.74	655646.1	1918.5	588.71	-0.00
875.95	719642.1	1918.8	876.00	0.00
1163.18	783659.7	1919.1	1163.22	0.00
1450.34	847677.6	1919.4	1450.27	-0.00
1163.17	783660.7	1919.0	1163.22	0.00
875.90	719628.7	1918.9	875.94	0.00
588.74	655645.2	1918.6	588.71	-0.00
301.47	591688.0	1918.3	301.42	-0.00
14.47	527834.9	1918.1	14.44	-0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	2107	527933.00
29.00	2035	527930.00
24.00	1934	527923.80
18.50	1821	527913.20
15.00	1751	527909.60
4.50	1538	527902.60
1.00	1468	527898.20

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.46
35.00	25.43

y = thermistor output (counts)

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

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

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

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

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range