SEA-BIRD ELECTRONICS, INC.
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SERVICE REPORT

Service Request 1005500364
Date 03-JAN-2017

PRODUCT INFORMATION

Item: SLOCUM.LEGACY
Item Description: (LEGACY) Slocum Glider
Serial: 9036

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

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

Unbilled Items

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

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SENSOR SERIAL NUMBER: 9036
CALIBRATION DATE: 25-Nov-16

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

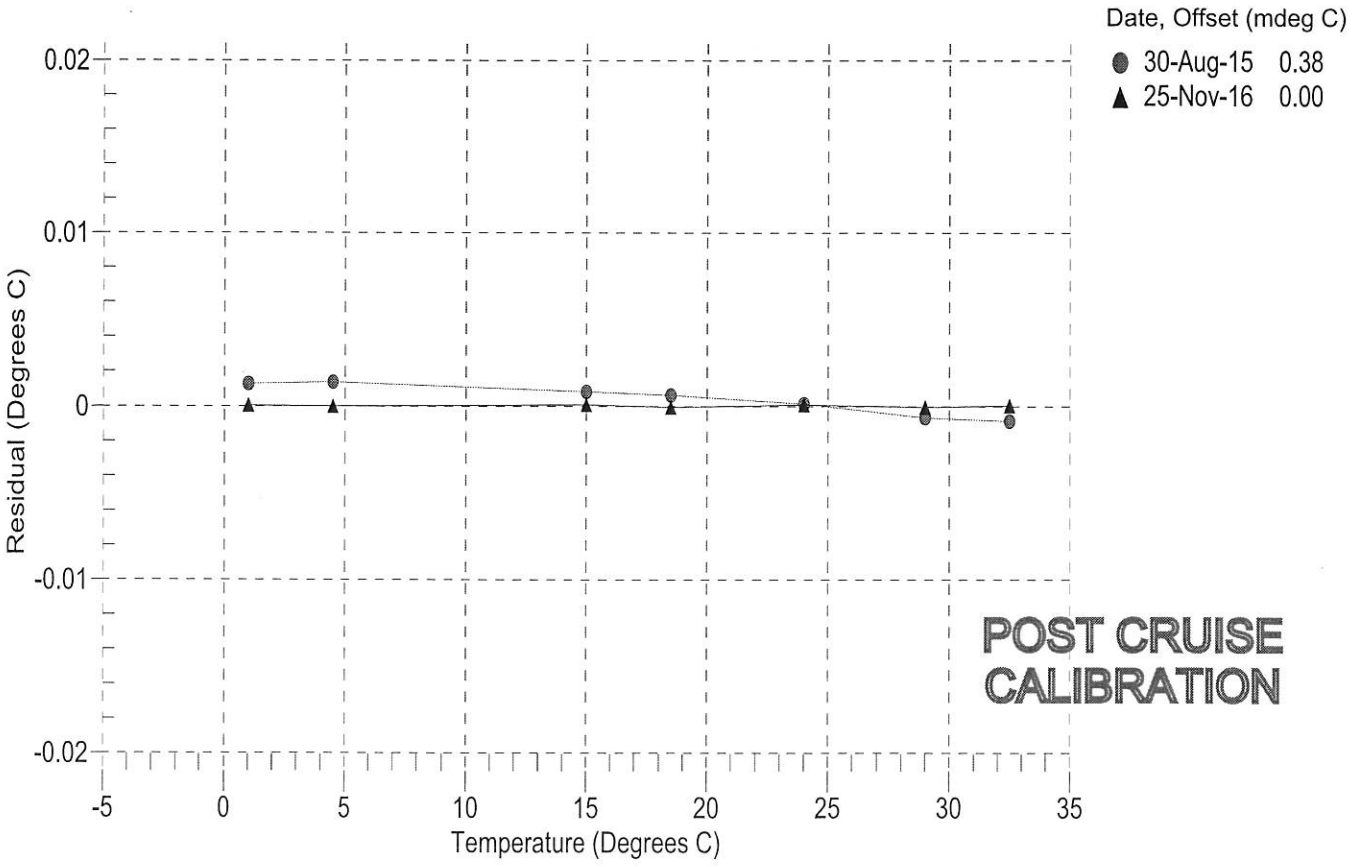
a0 = -1.583068e-004
a1 = 3.121165e-004
a2 = -4.639810e-006
a3 = 2.082906e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0001	568926.4	1.0001	0.0000
4.5000	487662.4	4.5000	-0.0000
15.0000	313122.0	15.0001	0.0001
18.5000	271804.2	18.4999	-0.0001
24.0000	218895.8	24.0001	0.0001
29.0000	180879.4	28.9999	-0.0001
32.5000	158789.8	32.5000	0.0000

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: 9036
CALIBRATION DATE: 25-Nov-16

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

COEFFICIENTS:

```
g = -9.829032e-001
h =  1.339055e-001
i = -1.554009e-004
j =  2.824595e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -9.2197e-008
```

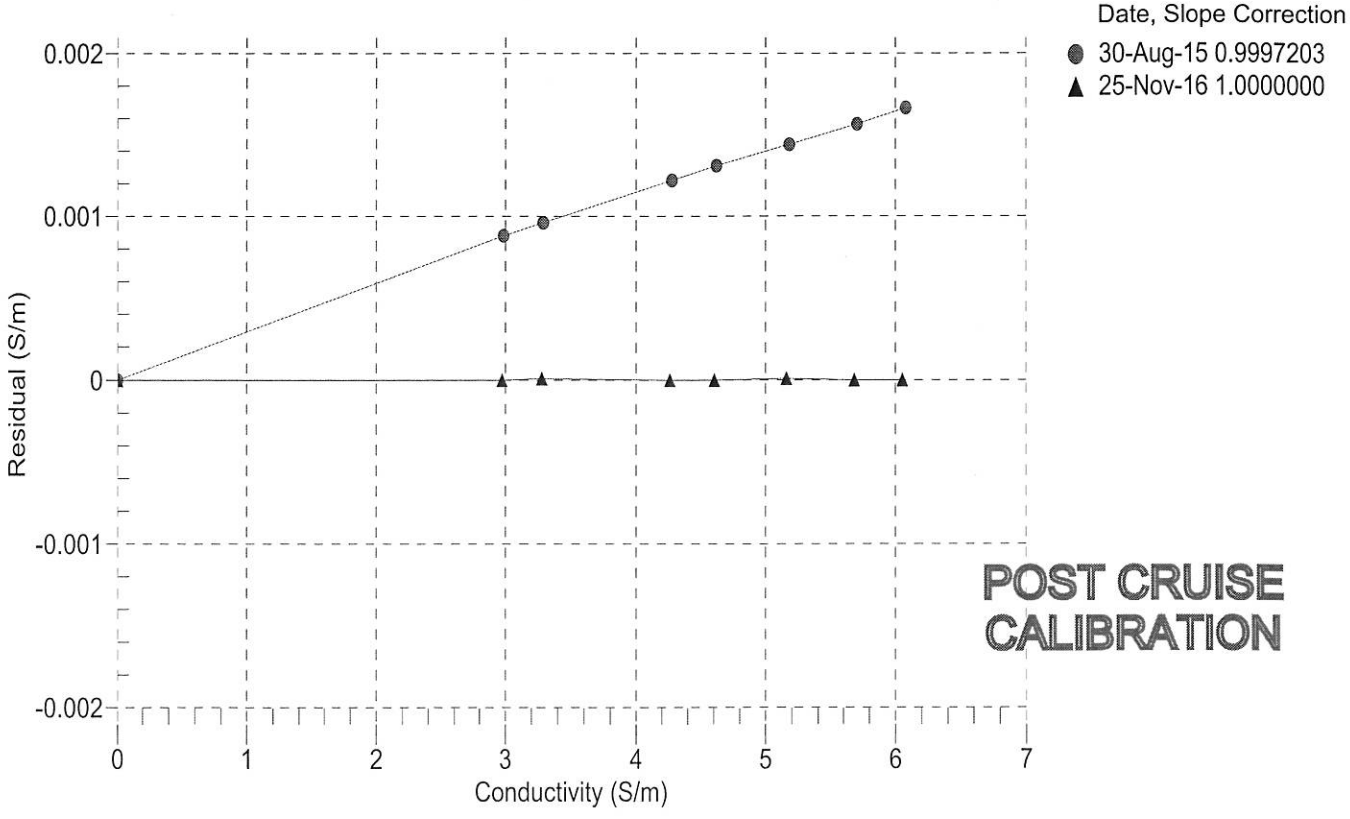
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2711.46	0.00000	0.00000
1.0001	34.7551	2.97124	5434.31	2.97124	-0.00000
4.5000	34.7353	3.27783	5640.40	3.27784	0.00001
15.0000	34.6939	4.25818	6253.24	4.25818	-0.00000
18.5000	34.6852	4.60285	6454.63	4.60285	-0.00000
24.0000	34.6759	5.16004	6767.25	5.16005	0.00001
29.0000	34.6712	5.68122	7046.80	5.68122	-0.00000
32.5000	34.6693	6.05325	7239.58	6.05325	-0.00000

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: 9036
CALIBRATION DATE: 22-Nov-16

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 3648533

COEFFICIENTS:

PA0 =	1.838904e-001	PTCA0 =	5.248504e+005
PA1 =	4.916968e-003	PTCA1 =	3.884699e-001
PA2 =	-2.623294e-011	PTCA2 =	6.092126e-002
PTEMPA0 =	-6.796676e+001	PTCB0 =	2.520137e+001
PTEMPA1 =	5.224756e-002	PTCB1 =	8.750000e-004
PTEMPA2 =	-4.659205e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.53	527813.0	1764.0	14.54	0.00
314.73	588925.0	1767.0	314.68	-0.00
614.34	649943.0	1767.0	614.16	-0.01
914.59	711191.0	1768.0	914.57	-0.00
1214.53	772387.0	1769.0	1214.54	0.00
1464.55	823417.0	1770.0	1464.52	-0.00
1214.65	772416.0	1769.0	1214.68	0.00
914.68	711236.0	1769.0	914.79	0.01
614.71	650064.0	1769.0	614.75	0.00
314.71	588953.0	1769.0	314.81	0.01
14.52	527808.0	1770.0	14.51	-0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1957	527867.00
29.00	1888	527880.60
24.00	1788	527849.80
18.50	1680	527820.40
15.00	1611	527814.40
4.50	1404	527818.80
1.00	1336	527793.80

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.20
35.00	25.23

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