



SEA-BIRD

SEA-BIRD ELECTRONICS, INC.
13431 NE 20th Street
Bellevue, Washington 98005 USA

Phone +1-425-643-9866
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www.seabird.com

SERVICE REPORT

Service Request 1005501814
Date 06-MAY-2017

CUSTOMER INFORMATION

Name: TELEDYNE WEBB RESEARCH
Account : 40280819
CHARLES STILL
charles.still@teledyne.com
508-563-1000

PO Number:

Bill To Address

ATTN: ACCOUNTS PAYABLE;49 EDGERTON DRIVE;
NORTH FALMOUTH,MA,02556,US

Ship To Address

BUSINESS UNIT OF TELEDYNE INSTRUMENT INC;49
EDGERTON DRIVE;
NORTH FALMOUTH,MA,02556,US

PRODUCT INFORMATION

Item: SLOCUM.LEGACY
Item Description: (LEGACY) Slocum Glider
Serial: 9023

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.
Replaced lithium back up battery.
Installed NEW AF24173 Anti-foulant cylinder(s).

Item	Item Description	Qty
22096	LITHIUM COIN BATTERY, WITH TABS, BR1632A/HA	1
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: 9023
 CALIBRATION DATE: 28-Apr-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

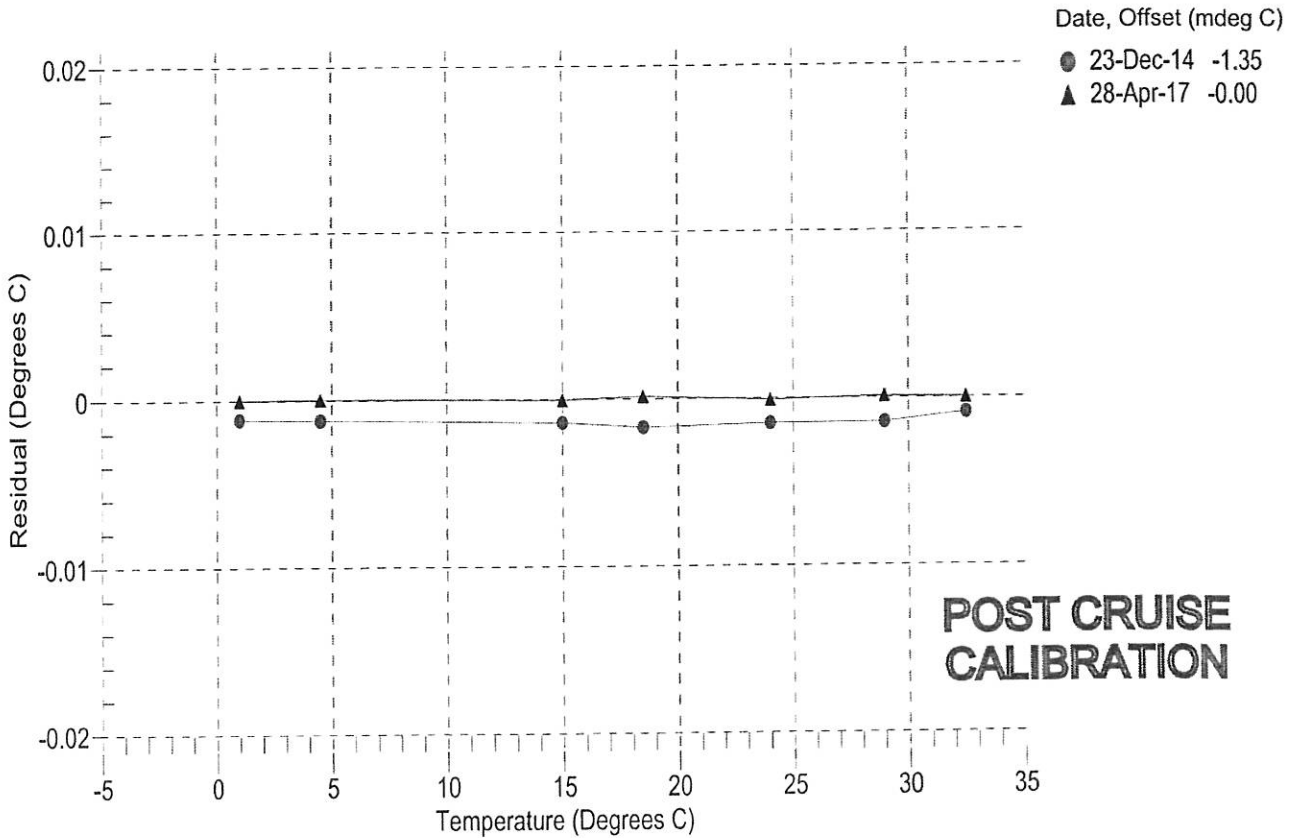
a0 = -1.466313e-004
 a1 = 3.168976e-004
 a2 = -5.250714e-006
 a3 = 2.212577e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	572944.6	1.0000	-0.0000
4.5000	489939.4	4.5000	0.0000
15.0000	312447.4	14.9999	-0.0001
18.5000	270626.2	18.5001	0.0001
24.0000	217228.4	23.9999	-0.0001
29.0000	178977.6	29.0001	0.0001
32.5000	156811.0	32.5000	-0.0000

n = Instrument Output (counts)

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

Residual (°C) = instrument temperature - bath temperature



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CALIBRATION DATE: 28-Apr-17

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

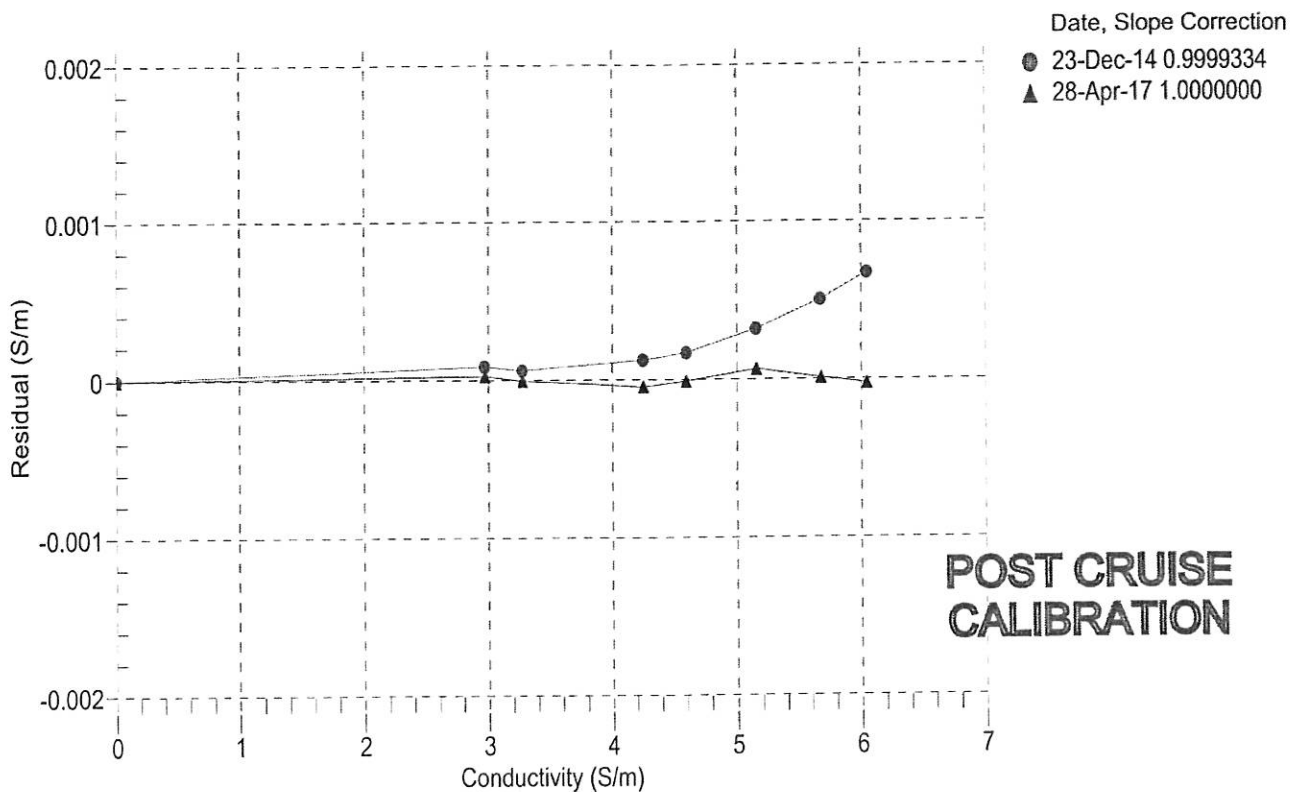
COEFFICIENTS:

g = -9.938492e-001
h = 1.402825e-001
i = -2.669599e-004
j = 3.956920e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = -3.4385e-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	2665.80	0.00000	0.00000
1.0000	34.7294	2.96924	5320.87	2.96927	0.00002
4.5000	34.7100	3.27568	5522.11	3.27567	-0.00001
15.0000	34.6684	4.25539	6120.53	4.25534	-0.00005
18.5000	34.6595	4.59981	6317.19	4.59980	-0.00001
24.0000	34.6497	5.15658	6622.46	5.15664	0.00006
29.0000	34.6438	5.67724	6895.31	5.67725	0.00001
32.5000	34.6395	6.04864	7083.31	6.04861	-0.00003

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 * f² + i * f³ + j * f⁴) / 10 (1 + δ * t + ε * p)
Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9023
CALIBRATION DATE: 24-Apr-17

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 3647167

COEFFICIENTS:

PA0 = -7.964976e-002
PA1 = 4.572634e-003
PA2 = -2.566314e-011
PTEMPA0 = -6.926813e+001
PTEMPA1 = 5.253060e-002
PTEMPA2 = -6.532111e-007

PTCA0 = 5.236800e+005
PTCA1 = -1.165958e+000
PTCA2 = 1.718346e-002
PTCB0 = 2.539625e+001
PTCB1 = -3.500000e-004
PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.47	526854.7	1797.2	14.52	0.00
301.46	589595.7	1798.0	301.39	-0.00
588.71	652474.1	1798.9	588.69	-0.00
875.91	715390.1	1799.2	875.96	0.00
1163.15	778343.6	1799.4	1163.19	0.00
1450.25	841289.2	1799.8	1450.19	-0.00
1163.16	778342.4	1799.3	1163.19	0.00
875.89	715381.7	1799.1	875.92	0.00
588.71	652474.0	1799.0	588.69	-0.00
301.50	589602.2	1798.7	301.42	-0.01
14.47	526848.8	1799.1	14.50	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1986	526930.00
29.00	1916	526933.40
24.00	1816	526933.80
18.50	1707	526934.40
15.00	1638	526936.80
4.50	1430	526947.00
1.00	1361	526949.60

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.40
35.00	25.38

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)
● 24-Apr-17 -0.00

