

SEA-BIRD ELECTRONICS, INC.

13431 NE 20th Street, Bellevue, Washington, 98005-2010 USA

Phone: (425) 643 - 9866 Fax (425) 643 - 9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 0073
CALIBRATION DATE: 20-Jun-11

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

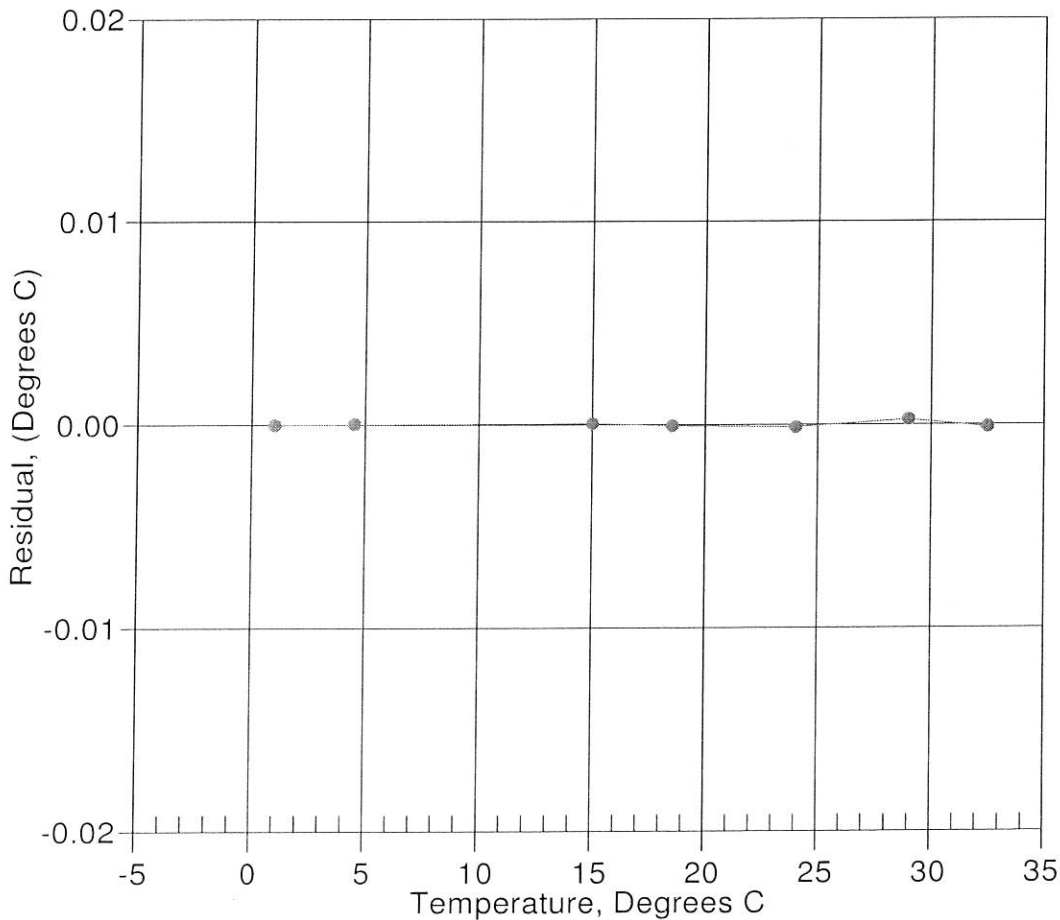
a0 = -9.125100e-005
a1 = 3.043745e-004
a2 = -4.279747e-006
a3 = 1.960290e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	570559.8	1.0000	-0.0000
4.4999	487874.2	4.4999	0.0000
15.0000	311081.6	15.0001	0.0001
18.5000	269433.0	18.4999	-0.0001
24.0000	216251.4	23.9999	-0.0001
29.0000	178156.8	29.0002	0.0002
32.4999	156083.6	32.4998	-0.0001

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

$$\text{Residual} = \text{instrument temperature} - \text{bath temperature}$$

Date, Delta T (mdeg C)



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

COEFFICIENTS:

g = -9.901721e-001
h = 1.506566e-001
i = -4.111043e-004
j = 5.281092e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 1.5241e-006

BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2569.66	0.00000	0.00000
1.0000	34.9252	2.98438	5148.56	2.98439	0.00000
4.4999	34.9052	3.29227	5343.77	3.29227	0.00000
15.0000	34.8617	4.27659	5924.09	4.27659	-0.00001
18.5000	34.8525	4.62265	6114.76	4.62265	-0.00000
24.0000	34.8421	5.18204	6410.68	5.18205	0.00001
29.0000	34.8364	5.70524	6675.23	5.70523	-0.00001
32.4999	34.8332	6.07859	6857.58	6.07859	0.00000

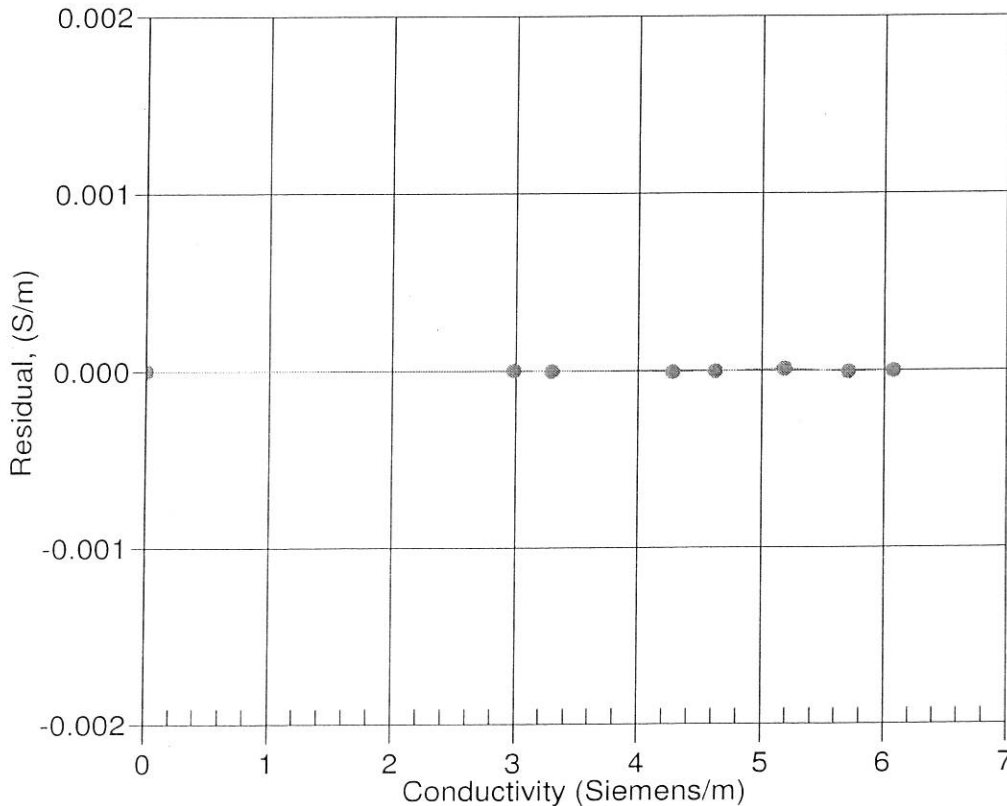
$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

$$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p) \text{ Siemens/meter}$$

$$t = \text{temperature}[^{\circ}\text{C}]; p = \text{pressure}[\text{decibars}]; \delta = \text{CTcor}; \epsilon = \text{CPcor};$$

$$\text{Residual} = \text{instrument conductivity} - \text{bath conductivity}$$

Date, Slope Correction



20-Jun-11 1.0000000

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SENSOR SERIAL NUMBER: 0073
CALIBRATION DATE: 14-Jun-11

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3274633

COEFFICIENTS:

PA0 = 2.044645e-001
PA1 = 4.913324e-003
PA2 = -2.633239e-011
PTEMPA0 = -7.004502e+001
PTEMPA1 = 5.087615e-002
PTEMPA2 = -3.787223e-007

PTCA0 = 5.245280e+005
PTCA1 = 3.088901e+000
PTCA2 = -5.968450e-002
PTCB0 = 2.542563e+001
PTCB1 = -6.750000e-004
PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.73	527522.0	1847.0	14.73	0.00
315.02	588620.0	1849.0	315.00	-0.00
615.05	649701.0	1850.0	614.99	-0.00
915.04	710834.0	1851.0	915.03	-0.00
1215.04	772000.0	1852.0	1215.05	0.00
1465.09	823005.0	1853.0	1465.07	-0.00
1215.02	771998.0	1852.0	1215.04	0.00
914.97	710832.0	1851.0	915.02	0.00
615.01	649707.0	1852.0	615.02	0.00
314.96	588615.0	1853.0	314.97	0.00
14.73	527524.0	1853.0	14.74	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2047	527549.40
29.00	1976	527555.00
24.00	1875	527555.80
18.50	1764	527550.00
15.00	1693	527545.00
4.50	1481	527527.00
1.00	1411	527517.20

TEMP (ITS90)	SPAN (mV)
-5.00	25.43
35.00	25.40

$$y = \text{thermistor output}; t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$$

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

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

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

Date, Avg Delta P %FS

14-Jun-11 0.00

