



# SEA-BIRD ELECTRONICS, INC.

1808 - 136th Place Northeast, Bellevue, Washington 98005 USA

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

## Temperature Calibration Report

**Customer:** ExplorOcean

**Job Number:** 29758R **Date of Report:** 22-Jul-02

**Model Number:** SBE 03Plus **Serial Number:** 03P2366

*Temperature sensors are normally calibrated 'as received', without adjustments, allowing a determination sensor drift. If the calibration identifies a problem, then a second calibration is performed after work is completed. The 'as received' calibration is not performed if the sensor is damaged or non-functional, or by customer request.*

*An 'as received' calibration certificate is provided, listing coefficients to convert sensor frequency to temperature. Users must choose whether the 'as received' calibration or the previous calibration better represents the sensor condition during deployment. In SEASOFT enter the chosen coefficients using the program SEACON. The coefficient 'offset' allows a small correction for drift between calibrations (consult the SEASOFT manual). Calibration coefficients obtained after a repair apply only to subsequent data.*

**'AS RECEIVED' CALIBRATION**  **Performed**  **Not Performed**

**Date:** 19-Jul-02 **Drift since last cal:** +.00045 **Degrees Celsius/yr**

**Comments:**

**'CALIBRATION AFTER REPAIR'**  **performed**  **Not Performed**

**Date:**  **Drift since last cal:**  **Degrees Celsius/yr**

**Comments:**

SENSOR SERIAL NUMBER = 2366  
 CALIBRATION DATE: 19-Jul-02s

TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

g = 4.31950826e-03  
 h = 6.43754128e-04  
 i = 2.32220252e-05  
 j = 2.19161783e-06  
 $f_0 = 1000.000$

IPTS-68 COEFFICIENTS

a = 3.68120921e-03  
 b = 6.03176021e-04  
 c = 1.65051511e-05  
 d = 2.19319377e-06  
 $f_0 = 2789.377$

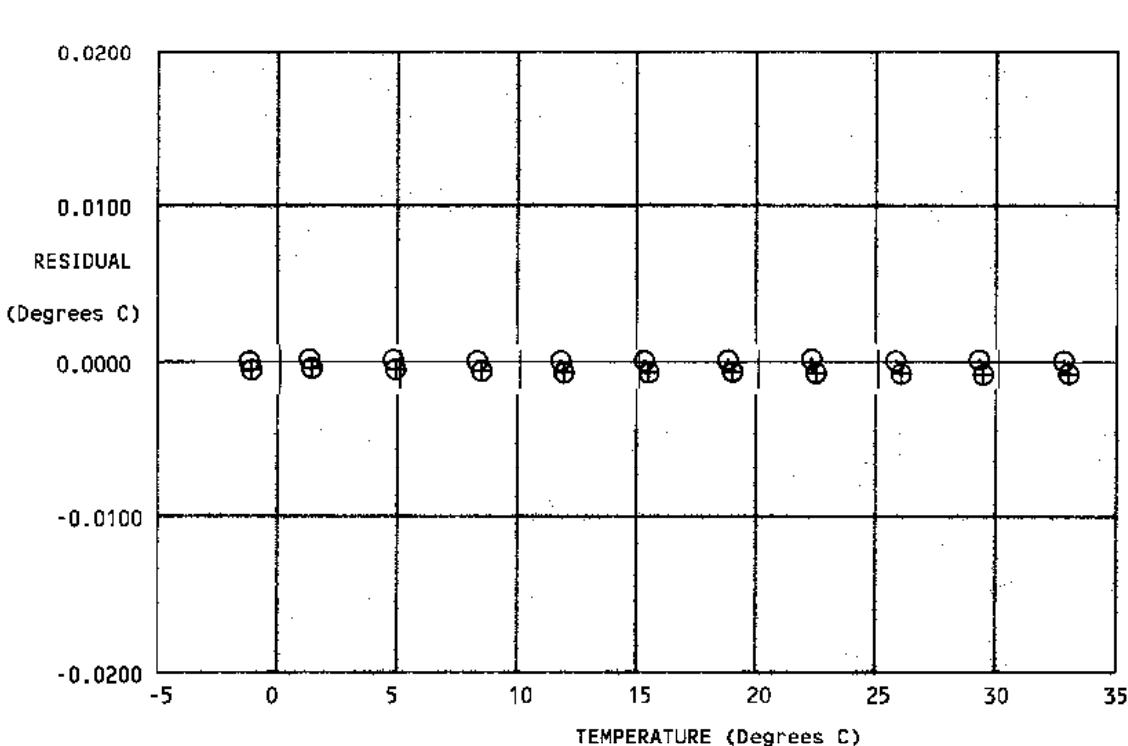
BATH TEMP (ITS-90 °C)	INSTRUMENT FREQ (Hz)	INST TEMP (ITS-90 °C)	RESIDUAL (ITS-90 °C)
-1.4997	2789.377	-1.4998	-0.00007
1.0003	2949.318	1.0004	0.00010
4.5004	3184.233	4.5004	0.00004
8.0004	3432.311	8.0003	-0.00006
11.5003	3693.920	11.5003	-0.00001
15.0004	3969.411	15.0004	-0.00005
18.5004	4259.109	18.5004	0.00001
22.0003	4563.329	22.0004	0.00007
25.5004	4882.396	25.5004	-0.00003
29.0003	5216.602	29.0003	0.00003
32.5004	5566.248	32.5004	-0.00002

Temperature ITS-90 =  $1/\{g + h[\ln(f_0/f)] + i[\ln^2(f_0/f)] + j[\ln^3(f_0/f)]\} - 273.15$  (°C)

Temperature IPTS-68 =  $1/\{a + b[\ln(f_0/f)] + c[\ln^2(f_0/f)] + d[\ln^3(f_0/f)]\} - 273.15$  (°C)

Following the recommendation of JPOTS:  $T_{68}$  is assumed to be  $1.00024 * T_{90}$  (-2 to 35 °C).

Residual = instrument temperature - bath temperature



**POST CRUISE  
 CALIBRATION**

# SEA-BIRD ELECTRONICS, INC.

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

SENSOR SERIAL NUMBER = 2366  
 CALIBRATION DATE: 27-Nov-00s

SBE 3 TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

### ITS-90 COEFFICIENTS

g = 4.31947760e-03  
 h = 6.43692053e-04  
 i = 2.31689591e-05  
 j = 2.17752072e-06  
 $f_0 = 1000.000$

### IPTS-68 COEFFICIENTS

a = 3.67987564e-03  
 b = 6.03105818e-04  
 c = 1.64810931e-05  
 d = 2.17909224e-06  
 $f_0 = 2795.516$

BATH TEMP (ITS-90 °C)	INSTRUMENT FREQ (Hz)	INST TEMP (ITS-90 °C)	RESIDUAL (ITS-90 °C)
-1.4013	2795.516	-1.4013	-0.00006
1.1074	2956.273	1.1074	0.00008
4.6000	3191.066	4.6000	0.00005
8.1983	3446.692	8.1983	-0.00005
11.6326	3704.022	11.6326	-0.00007
15.1893	3984.621	15.1893	-0.00002
18.6933	4275.429	18.6933	0.00007
22.1927	4580.403	22.1927	0.00002
25.7520	4905.837	25.7520	-0.00000
29.1673	5232.846	29.1673	-0.00003
32.7002	5586.590	32.7002	0.00000

Temperature ITS-90 =  $1/[g + h[\ln(f_0/f)] + i[\ln^2(f_0/f)] + j[\ln^3(f_0/f)]] - 273.15$  (°C)

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