SG-114

SEA-BIRD ELECTRONICS, INC.

1808 136th Place N.E., Bellevue, Washington, 98005 USA
Phone: (425) 643 - 9866 Fax (425) 643 - 9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 0038
CALIBRATION DATE: 18-Dec-07

GliderAPL TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

g = 4.41308051e-003
h = 6.52980936e-004
i = 2.72422545e-005
j = 2.94665615e-006
f0 = 1000.0

IPTS-68 COEFFICIENTS

a = 3.64763607e-003
b = 5.99590778e-004
c = 1.64258376e-005
d = 2.94832954e-006
f0 = 3409.868

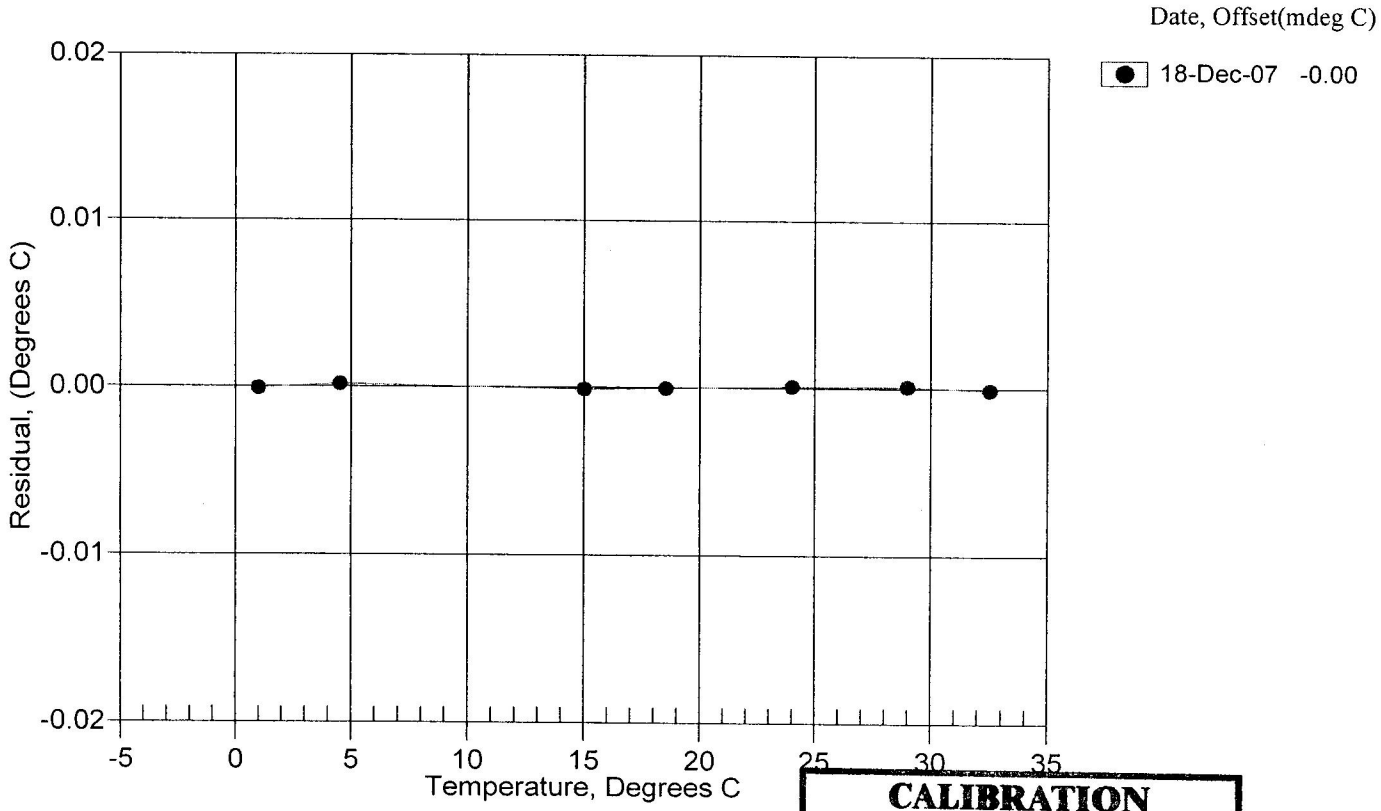
BATH TEMP (ITS-90)	INSTRUMENT FREQ (Hz)	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	3409.868	0.9999	-0.00008
4.5000	3682.325	4.5002	0.00015
15.0000	4593.379	14.9999	-0.00011
18.5000	4929.638	18.5000	-0.00004
24.0000	5492.322	24.0001	0.00008
29.0000	6041.167	29.0001	0.00009
32.5001	6447.018	32.5000	-0.00008

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



CALIBRATION AFTER MODIFICATIONS

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CALIBRATION DATE: 18-Dec-07

GliderAPL CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Seimens/meter

GHIJ COEFFICIENTS

```
g = -1.00024227e+001
h =  1.12273605e+000
i = -1.17295825e-003
j =  1.67865511e-004
CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

ABCDM COEFFICIENTS

```
a =  1.63966690e-005
b =  1.11936086e+000
c = -9.99118418e+000
d = -8.40316269e-005
m =  4.7
CPcor = -9.5700e-008 (nominal)
```

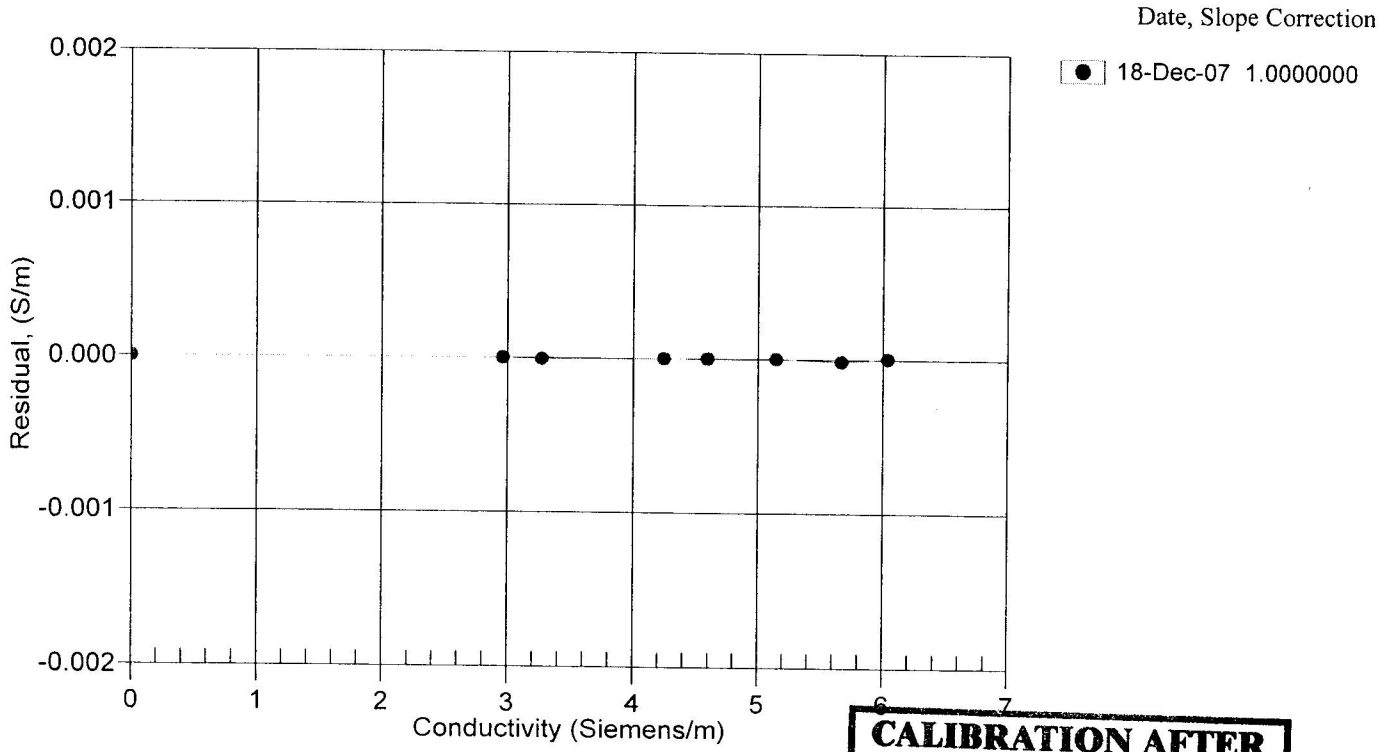
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (kHz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2.98746	0.00000	0.00000
1.0000	34.6365	2.96206	5.94343	2.96206	0.00000
4.5000	34.6193	3.26796	6.16808	3.26796	-0.00000
15.0000	34.5835	4.24607	6.83644	4.24607	0.00000
18.5000	34.5766	4.58999	7.05620	4.58999	0.00000
24.0000	34.5695	5.14596	7.39742	5.14596	0.00000
29.0000	34.5661	5.66593	7.70261	5.66592	-0.00001
32.5001	34.5638	6.03693	7.91302	6.03694	0.00001

Conductivity = $(g + hf^2 + if^3 + jf^4) / 10(1 + \delta t + \varepsilon p)$ Siemens/meter

Conductivity = $(af^m + bf^2 + c + dt) / [10 (1 + \varepsilon p)$ Siemens/meter

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

Residual = (instrument conductivity - bath conductivity) using g, h, i, j coefficients



CALIBRATION AFTER CLEANING AND REPLATINIZING CELL