<table>
<thead>
<tr>
<th><strong>Eventlabel</strong></th>
<th>JUB2010_sel_a_m_15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campaign</strong></td>
<td>King George Island 2010</td>
</tr>
<tr>
<td><strong>Species</strong></td>
<td>Southern elephant seal (<em>Mirounga leonina</em>)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>Adult; &gt;6 years ~8</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>Male</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>4260 cm</td>
</tr>
<tr>
<td><strong>Girth</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
</tr>
<tr>
<td>[estimated]</td>
<td>1900</td>
</tr>
<tr>
<td>[calculated]</td>
<td>1949 kg [estimated]</td>
</tr>
<tr>
<td>[measured]</td>
<td>1949 kg</td>
</tr>
<tr>
<td><strong>ARGOS PTT ID</strong></td>
<td>78104</td>
</tr>
<tr>
<td><strong>Transmitter type</strong></td>
<td>SMRU/Series 9000 SRDL/CTD</td>
</tr>
<tr>
<td><strong>Manufacturer</strong></td>
<td>SMRU</td>
</tr>
<tr>
<td><strong>PTT Serial Number</strong></td>
<td>10670</td>
</tr>
<tr>
<td><strong>PTT Software</strong></td>
<td>Software specification for CTD_GEN_07B deployment (MEOP: Temp+Salinity share 2 tx)</td>
</tr>
<tr>
<td><strong>Setting protocol</strong></td>
<td>Transmitting via ARGOS Page transmission sequences:</td>
</tr>
<tr>
<td></td>
<td>Until day 1464: 0 0 1 0 0 2 3 0 0 4 5 using 1 PTT numbers</td>
</tr>
<tr>
<td><strong>Satellite availability (UTC):</strong></td>
<td></td>
</tr>
<tr>
<td>00:</td>
<td>-- on --</td>
</tr>
<tr>
<td>01:</td>
<td>-- on --</td>
</tr>
<tr>
<td>02:</td>
<td>-- on --</td>
</tr>
<tr>
<td>03:</td>
<td>-- on --</td>
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<tr>
<td>04:</td>
<td>-- on --</td>
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<td>05:</td>
<td>-- on --</td>
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<td>06:</td>
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<td>08:</td>
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<td>09:</td>
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<td>10:</td>
<td>-- on --</td>
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<td>11:</td>
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<td>-- on --</td>
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<td>18:</td>
<td>-- on --</td>
</tr>
<tr>
<td>19:</td>
<td>-- on --</td>
</tr>
<tr>
<td>20:</td>
<td>-- on --</td>
</tr>
<tr>
<td>21:</td>
<td>-- on --</td>
</tr>
<tr>
<td>22:</td>
<td>-- on --</td>
</tr>
<tr>
<td>23:</td>
<td>-- on --</td>
</tr>
<tr>
<td><strong>Transmission targets:</strong></td>
<td></td>
</tr>
<tr>
<td>56000 transmissions after 365 days</td>
<td></td>
</tr>
<tr>
<td>In Haulouts: ON (one tx every 1 min 20 secs) for first 5 hours then cycling OFF for 6 hours, ON for 1 hour</td>
<td></td>
</tr>
</tbody>
</table>
Check sensors every 4 secs
When near surface (shallower than 10m), check wet/dry every 1 sec
Consider wet/dry sensor failed if wet for 7 days or dry for 99 days
Dives start when wet and below 6m for 8 secs
and end when above 6m for 0, or dry at any time
No separation of 'Deep' dives
A cruise begins if there has been no dive for 9 mins
A haulout begins when dry for 10 mins
and ends when wet for 40 secs

Dive shape (normal dives):
  4 points per dive using broken-stick algorithm

Dive shape (deep dives):
  none

CTD upcasts: max 2000 dbar up to 6 dbar in 2 dbar bins.
  17 cut points per profile
  Send the deepest 1 upcasts in each 6-hour period.
  Minimum depth to trigger collection of cast:
    1000m in hour 1
    600m in hour 2
    300m in hour 3
    100m in hour 4
    50m in hour 5
    25m in hour 6
  or 20% greater than current maximum.

Sample CTD sensor every 1 seconds.
  Temperature: Collected, Stored. Valid range: -2.5 to 30.2 degC
  Conductivity: Collected, Not stored.
  Salinity: Calculated, Stored. Valid range: 28.9 to 37.1
  No GPS data

TRANSMISSION BUFFERS (in RAM):
Dive in groups of 3 (6.25 days @ 10mins/dive): 300 = 1200 bytes
No 'deep' dives
Haulout: 30 = 120 bytes
6-hour summaries in groups of 3 (7.5 days): 10 = 40 bytes
No berniegrams
No timelines
Cruise: 30 = 120 bytes
No diving periods
No spot depths
No emergence records
No Duration histograms
No Max depth histograms
CTD casts (7.5 days): 30 = 120 bytes
No GPS fixes

TOTAL 1600 bytes (of about 21000 available)

MAIN BUFFERS (in 6.2 Mb Flash):
Dive in groups of 3 (416.667 days @ 10mins/dive): 20000 x 100 bytes
  = 2000000 bytes
No 'deep' dives
Haulout: 3000 x 16 bytes = 48000 bytes
6-hour summaries in groups of 3 (450 days): 600 x 68 bytes = 40800 bytes
No berniegrams
No timelines
Cruise: 3000 x 16 bytes = 48000 bytes
No diving periods
No spot depths
No emergence records
No Duration histograms
No Max depth histograms
CTD casts (500 days): 2000 x 164 bytes = 328000 bytes
No GPS fixes

TOTAL 2407 kb (from 6333 kb available)

PAGE CONTENTS (256 bits - 9 overhead):

| PAGE 0: |
|------------------|------------------|
| PTT NUMBER OVERHEAD (28-bit code) |
| PAGE NUMBER |
| DIAGNOSTICS in format 0: |
| TX number: wraparound 11 bits in units of 32 (range: 0 to 65504) |
| DIVE group in format 0: |
| Normal dives transmitted in groups of 3 |
| Time of start of last dive: max 5 days 12 hours @ 30 secs= |
| tx as raw 14 bits in units of 1 (range: 0 to 16383) |
| (recommended sell-by 5 days 11 hours) |
| Sell-by range: 5 days |
| Number of records: raw 2 bits in units of 1 (range: 0 to 3) |
| Reason for end: -- not transmitted -- |
| Group number: wraparound 8 bits in units of 1 (range: 0 to 255) |
| Max depth: -- not transmitted -- |
| Dive duration: odlog 1/6 in units of 30 s (range: 0 to 5715 s) |
| Mean speed: -- not transmitted -- |
| Profile data (4 depths/times, 0 speeds): |
| Depth profile: odlog 2/6 in units of 25 dm (range: 0 to 23887.5 dm) |
| Profile times: raw 5 bits in units of 32.2581 permille (range: 0 to 1000 permille) |
| Speed profile: -- not transmitted -- |
| Residual: raw 2 bits in units of 60 (range: 0 to 180) |
| Calculation time: -- not transmitted -- |
| Surface duration: odlog 2/4 in units of 2.5 s (range: 0 to 588.75 s) |
| cf. cruise starts after 9 mins (540 secs) |
| Dive area: -- not transmitted -- |

Available bits used exactly

--- End of page 0 ---

| PAGE 1: |
|------------------|------------------|
| PTT NUMBER OVERHEAD (28-bit code) |
| PAGE NUMBER |
| DIAGNOSTICS in format 1: |
| Max depth ever: odlog 1/4 in units of 500 dm (range: 0 to 23250 dm) |

--- End of page 1 ---
CRUISE group in format 0:
Number of records: raw 1 bits in units of 1  (range: 0 to 1 )
Cruise number: wraparound 4 bits in units of 1  (range: 0 to 15 )
Start time: -- not transmitted --
End time: max 5 days 12 hours @ 2 mins= 3960
  tx as raw 12 bits in units of 1  (range: 0 to 4095 )
  (recommended sell-by 5 days 11 hours)
Sell-by range: 5 days 4 hours
Duration: raw 9 bits in units of 120 s (range: 0 to 61320 s)
  cf. Max duration is 16 hours
Speed: -- not transmitted --
Reason for end: -- not transmitted --
-----------[26 bits: 16 - 41]

HAULOUT in format 0:
Number of records: raw 1 bits in units of 1  (range: 0 to 1 )
Haulout number: wraparound 3 bits in units of 1  (range: 0 to 7 )
Start time: -- not transmitted --
End time: max 5 days 12 hours @ 2 mins= 3960
  tx as raw 12 bits in units of 1  (range: 0 to 4095 )
  (recommended sell-by 5 days 11 hours)
Sell-by range: 5 days 4 hours
Duration: raw 9 bits in units of 120 s (range: 0 to 61320 s)
  cf. Max duration is 16 hours
Reason for end: -- not transmitted --
Contiguous: -- not transmitted --
-----------[25 bits: 42 - 66]

SUMMARY group in format 0:
Transmitted in groups of 3
Record could be in buffer for 7 days 12 hours
End time: max 7 days @ 6 hours= 28
  tx as raw 5 bits in units of 1  (range: 0 to 31 )
  (recommended sell-by 6 days 17 hours)
Sell-by range: 7 days
Number of records: raw 1 bits in units of 1  (range: 0 to 1 )
Cruising time: -- not transmitted --
Haulout time: raw 6 bits in units of 15.873 permille (range: 0 to 1000 permille)
Dive time: raw 6 bits in units of 15.873 permille (range: 0 to 1000 permille)
Deep Dive time: -- not transmitted --
Normal dives:
  Avg max dive depth: odlog 2/6 in units of 25 dm
  (range: 0 to 23887.5 dm)
  SD max dive depth: odlog 2/4 in units of 50 dm
  (range: 0 to 11775 dm)
  Max max dive depth: odlog 2/6 in units of 25 dm
  (range: 0 to 23887.5 dm)
  Avg dive duration: odlog 1/6 in units of 30 s
  (range: 0 to 5715 s)
  SD dive duration: odlog 1/4 in units of 60 s
  (range: 0 to 2790 s)
  Max dive duration: odlog 1/6 in units of 30 s
  (range: 0 to 5715 s)
  Avg speed in dive: -- not transmitted --
  Number of dives: odlog 1/4 in units of 2  (range: 0 to 93 )
Deep dives:
  Avg max dive depth: -- not transmitted --
  SD max dive depth: -- not transmitted --
  Max max dive depth: -- not transmitted --
  Avg dive duration: -- not transmitted --
  SD dive duration: -- not transmitted --
  Max dive duration: -- not transmitted --
  Avg speed in dive: -- not transmitted --
  Number of dives: -- not transmitted --
Avg SST: -- not transmitted --
-----------[180 bits: 67 - 246]
PAGE 2:

PTT NUMBER OVERHEAD (28-bit code)
-------------[8 bits: 0 - 7]

PAGE NUMBER
-------------[3 bits: 8 - 10]

CTD in format 0:

End time: max 7 days @ 10 mins = 1008
   tx as raw 10 bits in units of 1 (range: 0 to 1023 )
   (recommended sell-by 6 days 23 hours)
Sell-by range: 6 days 18 hours
CTD cast number: -- not transmitted --
Min pressure: -- not transmitted --
Max pressure: raw 10 bits in units of 2 dbar (range: 6 to 2052 dbar)
Min temperature: raw 15 bits in units of 1 (range: 2500 to 35267 °C in steps of 0.001 °C)
Max temperature: raw 15 bits in units of 1 (range: 2500 to 35267 °C in steps of 0.001 °C)
   cf. Valid temperatures: -2.5 to 30.2 degC
Min salinity: -- not transmitted --
Max salinity: raw 12 bits in units of 2 mPSU (range: 28900 to 37090 mPSU)
Min pressure: -- not transmitted --
Max pressure: -- not transmitted --
Min temperature: -- not transmitted --
Max temperature: -- not transmitted --
Min salinity: -- not transmitted --
Number of samples: -- not transmitted --
9 profile points 0 to 8 (from total of 17 cut points):
First 8 pressures are fixed
Min pressure is fixed
Temperature: raw 10 bits in units of 0.977517 permille (range: 0 to 1000 permille)
Temperature residual: -- not transmitted --
Salinity: raw 8 bits in units of 3.92157 permille (range: 0 to 1000 permille)
Salinity residual: -- not transmitted --
Temperature bounds: -- not transmitted --
Conductivity bounds: -- not transmitted --
Salinity bounds: -- not transmitted --
-------------[236 bits: 11 - 246]

Available bits used exactly

=== End of page 2 ===

PAGE 3:

PTT NUMBER OVERHEAD (28-bit code)
-------------[8 bits: 0 - 7]

PAGE NUMBER
-------------[3 bits: 8 - 10]

CTD in format 1:

End time: max 7 days @ 10 mins = 1008
   tx as raw 10 bits in units of 1 (range: 0 to 1023 )
   (recommended sell-by 6 days 23 hours)
Sell-by range: 6 days 18 hours
CTD cast number: -- not transmitted --
Min pressure: -- not transmitted --
Max pressure: -- not transmitted --
Min temperature: -- not transmitted --
Max temperature: -- not transmitted --
   cf. Valid temperatures: -2.5 to 30.2 degC
Min salinity: -- not transmitted --
Max salinity: -- not transmitted --
  cf. Valid salinity: 28.9 to 37.1
Number of samples: -- not transmitted --
  8 profile points 9 to 16 (from total of 17 cut points):
    Max pressure is sent separately
    7 pressure bins: raw 9 bits in units of 1 bin
(range: 0 to 511 bin)
Temperature: raw 10 bits in units of 0.977517
permille (range: 0 to 1000 permille)
    Temperature residual: raw 7 bits in units of 1 mdegC per sample (range: 0 to 127 mdegC per sample)
    Pressure already sent
Salinity: raw 8 bits in units of 3.92157 permille (range: 0 to 1000 permille)
    Salinity residual: raw 7 bits in units of 1 mPSU per sample
    Temperature bounds: raw 2 bits in units of 1 lo/hi (range: 0 to 3 lo/hi)
    Conductivity bounds: -- not transmitted --
    Salinity bounds: raw 2 bits in units of 1 lo/hi (range: 0 to 3 lo/hi)
---------[235 bits: 11 - 245]

UNUSED
---------[1 bits: 246 - 246]

=== End of page 3 ===

PAGE 4:

PTT NUMBER OVERHEAD (28-bit code)
---------[8 bits: 0 - 7]

PAGE NUMBER
---------[3 bits: 8 - 10]

CTD in format 2:

  End time: max 3 days 6 hours @ 10 mins= 468
  tx as raw 9 bits in units of 1 (range: 0 to 511 )
  (recommended sell-by 3 days 5 hours)
  Sell-by range: 3 days
  CTD cast number: -- not transmitted --
  Min pressure: -- not transmitted --
  Max pressure: raw 10 bits in units of 2 dbar (range: 6 to 2052 dbar)

Min temperature: raw 15 bits in units of 1 (range: 2500 to 35267)
    = -2.5 to 30.267 °C in steps of 0.001 °C)
    Max temperature: raw 15 bits in units of 1 (range: 2500 to 35267)
    = -2.5 to 30.267 °C in steps of 0.001 °C)
    cf. Valid temperatures: -2.5 to 30.2 degC

Min salinity: raw 12 bits in units of 2 mPSU (range: 28900 to 37090 mPSU)
Max salinity: raw 12 bits in units of 2 mPSU (range: 28900 to 37090 mPSU)
    cf. Valid salinity: 28.9 to 37.1
Number of samples: -- not transmitted --
  9 profile points 0 to 8 (from total of 17 cut points):
    First 8 pressures are fixed
    Min pressure is fixed
    Temperature: raw 10 bits in units of 0.977517
permille (range: 0 to 1000 permille)
    Temperature residual: -- not transmitted --
    Salinity: raw 8 bits in units of 3.92157 permille (range: 0 to 1000 permille)
    Salinity residual: -- not transmitted --
    Temperature bounds: -- not transmitted --
    Conductivity bounds: -- not transmitted --
    Salinity bounds: -- not transmitted --
---------[235 bits: 11 - 245]
PTT NUMBER OVERHEAD (28-bit code)

PAGE NUMBER

DIAGNOSTICS in format 2:
Number of resets: wraparound 2 bits in units of 1 (range: 0 to 3)

CTD in format 3:
End time: max 3 days 6 hours @ 10 mins = 468 tx as raw 9 bits in units of 1 (range: 0 to 511)
(recommended sell-by 3 days 5 hours)
Sell-by range: 3 days
CTD cast number: -- not transmitted --
Min pressure: -- not transmitted --
Max pressure: -- not transmitted --
Min temperature: -- not transmitted --
Max temperature: -- not transmitted --
cf. Valid temperatures: -2.5 to 30.2 degC
Min salinity: -- not transmitted --
Max salinity: -- not transmitted --
cf. Valid salinity: 28.9 to 37.1
Number of samples: -- not transmitted --
8 profile points 9 to 16 (from total of 17 cut points):
Max pressure is sent separately
7 pressure bins: raw 9 bits in units of 1 bin
(range: 0 to 511 bin)
Temperature: raw 10 bits in units of 0.977517 permille (range: 0 to 1000 permille)
Temperature residual: raw 7 bits in units of 1 mdegC per sample (range: 0 to 127 mdegC per sample)
Pressure already sent
Salinity: raw 8 bits in units of 3.92157 permille (range: 0 to 1000 permille)
Salinity residual: raw 7 bits in units of 1 mPSU per sample (range: 0 to 127 mPSU per sample)
Temperature bounds : raw 2 bits in units of 1 lo/hi (range: 0 to 3 lo/hi)
Conductivity bounds : -- not transmitted --
Salinity bounds : raw 2 bits in units of 1 lo/hi (range: 0 to 3 lo/hi)

---------[13 - 246 bits]

Available bits used exactly

=== End of page 5 ===
**Deployment**

**Immobilisation**

<table>
<thead>
<tr>
<th>Action</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Blowpipe dart 15ml, 80/2mm needle</td>
</tr>
<tr>
<td>Induction dose</td>
<td>17:31 12.5ml Zoletil IM@100mg/ml</td>
</tr>
<tr>
<td>Top-up dose</td>
<td>---</td>
</tr>
<tr>
<td>Induction complete</td>
<td>17:46</td>
</tr>
<tr>
<td>Follow-up dose</td>
<td>---</td>
</tr>
<tr>
<td>Deployment</td>
<td>17:49 - 18:02</td>
</tr>
<tr>
<td>Onset of recovery</td>
<td>18:12</td>
</tr>
<tr>
<td>End of recovery</td>
<td>18:26</td>
</tr>
<tr>
<td>Anesthesia level</td>
<td>4</td>
</tr>
</tbody>
</table>

*Seal tag: none
Deployment site: Refugio elephante
Prev. deployment: none

**http://doi.pangaea.de/10.1594/PANGAEA.737045**

**Comment**

| Tag deployed | 2010-04-14T17:31:00  -62.2557  -58.6266 |
| Tag retrieved | |
| Last transmission | 2010-04-28T06:24:11  -65.298  -59.122 |