<table>
<thead>
<tr>
<th>Eventlabel</th>
<th>JUB2010_sel_a_m_08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campaign</td>
<td>King George Island 2010</td>
</tr>
<tr>
<td>Species</td>
<td>Southern elephant seal (<em>Mirounga leonina</em>)</td>
</tr>
<tr>
<td>Age</td>
<td>Adult; &gt;6 years ~10</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
</tr>
<tr>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>3780 cm</td>
</tr>
<tr>
<td>Girth</td>
<td></td>
</tr>
<tr>
<td>Weight [estimated]</td>
<td>1800</td>
</tr>
<tr>
<td>Weight [calculated]</td>
<td>1460 kg [<a href="http://doi.pangaea.de/10.1594/PANGAEA.737046">http://doi.pangaea.de/10.1594/PANGAEA.737046</a>]</td>
</tr>
<tr>
<td>Weight [measured]</td>
<td></td>
</tr>
<tr>
<td>ARGOS PTT ID</td>
<td>96503</td>
</tr>
<tr>
<td>Transmitter type</td>
<td>SMRU/Series 9000 SRDL/CTD</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>SMRU</td>
</tr>
<tr>
<td>PTT Serial Number</td>
<td>11251</td>
</tr>
<tr>
<td>PTT Software</td>
<td>Software specification for CTD_GEN_07B deployment</td>
</tr>
<tr>
<td></td>
<td>(MEOP: Temp+Salinity share 2 tx)</td>
</tr>
<tr>
<td>Setting protocol</td>
<td>Transmitting via ARGOS</td>
</tr>
<tr>
<td></td>
<td>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>Satellite availability (UTC):</td>
<td></td>
</tr>
<tr>
<td>00: -- on --</td>
<td></td>
</tr>
<tr>
<td>01: -- on --</td>
<td></td>
</tr>
<tr>
<td>02: -- on --</td>
<td></td>
</tr>
<tr>
<td>03: -- on --</td>
<td></td>
</tr>
<tr>
<td>04: -- on --</td>
<td></td>
</tr>
<tr>
<td>05: -- on --</td>
<td></td>
</tr>
<tr>
<td>06: -- on --</td>
<td></td>
</tr>
<tr>
<td>07: -- on --</td>
<td></td>
</tr>
<tr>
<td>08: -- on --</td>
<td></td>
</tr>
<tr>
<td>09: -- on --</td>
<td></td>
</tr>
<tr>
<td>10: -- on --</td>
<td></td>
</tr>
<tr>
<td>11: -- on --</td>
<td></td>
</tr>
<tr>
<td>12: -- on --</td>
<td></td>
</tr>
<tr>
<td>13: -- on --</td>
<td></td>
</tr>
<tr>
<td>14: -- on --</td>
<td></td>
</tr>
<tr>
<td>15: -- on --</td>
<td></td>
</tr>
<tr>
<td>16: -- on --</td>
<td></td>
</tr>
<tr>
<td>17: -- on --</td>
<td></td>
</tr>
<tr>
<td>18: -- on --</td>
<td></td>
</tr>
<tr>
<td>19: -- on --</td>
<td></td>
</tr>
<tr>
<td>20: -- on --</td>
<td></td>
</tr>
<tr>
<td>21: -- on --</td>
<td></td>
</tr>
<tr>
<td>22: -- on --</td>
<td></td>
</tr>
<tr>
<td>23: -- on --</td>
<td></td>
</tr>
<tr>
<td>Transmission targets:</td>
<td></td>
</tr>
<tr>
<td>56000 transmissions after 365 days</td>
<td></td>
</tr>
<tr>
<td></td>
<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>
</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)
----------------[8 bits: 0 - 7]

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

DIAGNOSTICS in format 0:

65504

TX number: wraparound 11 bits in units of 32 (range: 0 to 65504)
------------[11 bits: 11 - 21]

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 =

15840

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)

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
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)

588.75 s

cf. cruise starts after 9 mins (540 secs)

Dive area: -- not transmitted --
-----------[225 bits: 22 - 246]

Available bits used exactly

=== End of page 0 ===

PAGE 1:

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

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

DIAGNOSTICS in format 1:

Max depth ever: odlog 1/4 in units of 500 dm (range: 0 to 23250 dm)
------------[5 bits: 11 - 15]
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]
Available bits used exactly

=== End of page 1 ===

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)
  Max temperature: raw 15 bits in units of 1 (range: 2500 to 35267)
  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)

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 (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)
----------[235 bits: 11 - 245]
UNUSED
----------[1 bits: 246 - 246]

=== End of page 3 ===
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

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)

Available bits used exactly

=== End of page 5 ===
## Deployment

## Immobilisation

<table>
<thead>
<tr>
<th>Description</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>15:21 12.5ml Zoletil IM@100mg/ml</td>
</tr>
<tr>
<td>Top-up dose</td>
<td>---</td>
</tr>
<tr>
<td>BA</td>
<td>15:30 - 15:55; head down lying, multiple ba &lt;25 min; cyanotic mucosae; mech. stim. Rolling to side; stable side by ice blocks underneath; head lifted to ensure breathing; potentially collapsed airways</td>
</tr>
<tr>
<td>Induction complete</td>
<td>15:36</td>
</tr>
<tr>
<td>Follow-up dose</td>
<td>---</td>
</tr>
<tr>
<td>Deployment</td>
<td>15:40 - 16:05</td>
</tr>
<tr>
<td>BA</td>
<td>16:00 - 16:08</td>
</tr>
<tr>
<td>Onset of recovery</td>
<td>16:50</td>
</tr>
<tr>
<td>End of recovery</td>
<td>17:07</td>
</tr>
<tr>
<td>Anesthesia level</td>
<td>4-5</td>
</tr>
</tbody>
</table>

[http://doi.pangaea.de/10.1594/PANGAEA.737045](http://doi.pangaea.de/10.1594/PANGAEA.737045)

## Comment

- Seal tag: none
- Deployment site: Fermenters
- Prev. deployment: none

## Tag deployed

- 2010-03-28T15:21:00 -62.2516 -58.6749

## Tag retrieved

- 2010-12-23T21:08:54 -63.188 -52.262

## First transmission

- 2010-03-28T17:21:44 -62.236 -58.711

## Last transmission

- 2010-12-23T21:08:54 -63.188 -52.262