deployments	*This table describes each use of a particular SRDL on a particular animal. Both SRDL's and PTT numbers can be used more than once, so each REF describes the use of an SRDL with a given PTT number over the specified period of time*
REF	A three-part code (e.g. rs3-Fred-07) : The first part identifies the batch of tags, the second part is the name or number of the animal, the third part is the year
PTT	Argos PTT number used
BODY	Serial number of the SRDL
ON_DATE	The date of attachment to the animal
OFF_DATE	The end of the experiment because of tag loss, removal etc
TEST_DATE	Any transmissions between this date and ON_DATE are for test purposes. For GPS tags: the home location is replaced with St Andrews if TEST_DATE is the same as ON_DATE.
SPECIES	
LOCATION	Approximate geographical name
NAME	Human-friendly identifier for the deployment of this tag
HOME_LAT	The approximate position of the SRDL at the start of the deployment
HOME_LON	
VMASK_THRESHOLD	The animal's maximum reasonable speed over the surface of the earth, used for the location filtering algorithm. In units of decimetres per second. Usually 20 (i.e. 2 m/s)
PROG	Version number of the SRDL software
PARMS	The parameter settings used
COMMENTS	
N_PTTS	The number of PTT numbers used by the SRDL. Can be up to 3 in special cases
T_OFFSET	GPS tags only: correction for clock drift, required for calculation of location
T_SCALE	

diag	*This table records Argos locations, along with other diagnostic information provided by Argos*
REF	As for **deployments**
PTT	
D_DATE	The time assigned to the location by ARGOS (UTC)
LQ	The Location Quality assigned by Argos (-1 = class A, -2 = class B, -9 = class Z)
LAT	Preferred position estimate (WGS 84 datum)
LON	
ALT_LAT	Alternative solution to position equations (this may have been swapped with LAT,LON by the location filtering algorithm). These fields are simply copies of LAT,LON when Kalman location processing is operating.
ALT_LON	
N_MESS	Number of uplinks received during the satellite pass
N_MESS_120	Number of uplinks received with signal strength > -120 dB
BEST_LEVEL	Signal strength of strongest uplink (dB)
PASS_DUR	Duration of satellite overpass (s)
FREQ	Measured frequency of SRDL signal at the satellite (Hz)
V_MASK	Result of the location filtering algorithm: 0 = accepted, 20 = rejected at the 20 dm/s level (see VMASK_THRESHOLD in **deployments** table). The first and last two points of the track are excluded from the algorithm and are assigned -1
ALT	= 1 if the LAT,LON and ALT_LAT, ALT_LON were swapped by the location filter's initial plausibility check
SOURCE	Identifier of the satellite
EST_SPEED	Speed across the surface estimated by the location filtering algorithm (m/s)
KM_FROM_HOME	Great-circle distance to the HOME_LAT,HOME_LON position specified in the **deployments** table (km). This is simply the shortest distance between the two points: the path may cross land.
IQ	A two-digit code which gives further information about the location calculation for poor quality locations (see Argos documentation for a complete explanation)
DELETED	The value "Y" here causes this position to be ignored by the location filtering algorithm. Normally used to remove a very poor position occurring at the beginning of the track
ACTUAL_PTT	When a single SRDL is programmed to use several different PTT numbers, the SMRU system overrides the PTT field to present all the data as if it had been transmitted under a single PTT number. This field records the true PTT number associated with this location.

gps	*This table records GPS locations, derived from ranges to GPS SV's (space vehicles – i.e satellites!) measured and transmitted by the tag*
REF	As for **deployments**
PTT	
D_DATE	The time that the fix was obtained (UTC)
NSATS_DETECTED	The number of SV's detected by the tag
NSATS_TRANSMITTED	The number of ranges to SV's transmitted by the tag. SRDL's normally transmit only the 8 strongest signals when more than 8 are detected. Only 5 SV's are required to generate a location and error estimate.
GPS_MODE	
PSEUDORANGES	
MAX_CSN	The carrier-to-noise ratio of the strongest SV
CNT	The number of times that this record was received
LAT	Position estimate (WGS 84 datum)
LON	
RESIDUAL	A measure of the uncertainty of the location.
TIMESHIFT	Estimated discrepancy between the tag's real-time clock and the atomic clock maintained on board the GPS satellites. This value should drift steadily (about 0.1s / day)
SUBMITTED	Date that the fix was processed at SMRU
NSATS_HEALTHY	The number of SV's for which valid ephemeris data was available.
NBITS	Resolution of the transmitted pseudoranges
DELETED	The value "Y" here causes this position to be ignored by the location filtering algorithm.
V_MASK	Result of the location filtering algorithm: 0 = accepted, 20 = rejected at the 20 dm/s level (see VMASK_THRESHOLD in **deployments** table). The first and last two points of the track are excluded from the algorithm and are assigned -1. This field is expected by the automated map drawing routines, but it almost a dummy field in the GPS case. It is very unusual for GPS locations to be excluded by the filter.
KM_FROM_HOME	Great-circle distance to the HOME_LAT,HOME_LON position specified in the **deployments** table (km). This is simply the shortest distance between the two points: the path may cross land.
EST_SPEED	Speed across the surface estimated by the location filtering algorithm (m/s)

dive	*A dive occurs when the depth remains below a threshold for a specified time and ends when the depth returns above a (possibly different) threshold.*
REF	As for **deployments**
PTT	
CNT	The number of times that this record was received
DE_DATE	Dive end: the time at which the depth crossed the threshold on the return to the surface
SURF_DUR	Surface duration (seconds): the length of time following DE_DATE before the next dive or other event began.
DIVE_DUR	Dive duration (seconds): the length of time between the crossing of the dive-start threshold on the descent and DE_DATE
MAX_DEP	The maximum dive depth recorded
D1 – D9	Intermediate depth points (metres) in the dive. For most deployments one of these is guaranteed to be the maximum depth (so MAX_DEP is not transmitted)
V1 – V5	Speeds (metres/second) in each section of the dive. If there is one more V- value than D- values then V1 is the speed up to D1, V2 between D1 and D2, etc. The last V- value is the speed between the last D- value and the surface. If there are three V- values then V1 is the speed from the surface to the D1 point, V3 is the speed from the last depth point to the surface, and V2 is the speed over the remainder of the dive between D1 and the last depth point.
LAT	An approximate position for the end of the dive, interpolated along the track joining the filtered positions either side of the dive in time.
LON	
TRAVEL_R	An estimate of speed-over-ground, based only on filtered Argos locations not the turbine speed (metres/second)
HOMEDIST	Great-circle distance from the home point in the **deployments** table*
START_LAT	As for LAT,LON but for the start of the dive
START_LON	
BOTTOM	An estimate of the ocean depth derived from the Smith and Sandwell gridded dataset (metres)
T1 – T9	The percentage of DIVE_DUR elapsed since the beginning of the dive at each of the intermediate depth points
D_SPEED	The average speed recorded in the dive (metres/second)
N_DEPTHS	The number of intermediate dive points present
N_SPEEDS	The number of intermediate speeds present
DEPTH_STR	The D1,D2,D3,… values as a comma-separated string
SPEED_STR	The V1,V2,V3,… values as a comma-separated string
PROPN_STR	The T1,T2,T3,… values as a comma-separated string
PERCENT_AREA	Used to calculate the TAD dive index (see separate explanation)
SUNALT	* replaced by the function sun_alt()
SUNRISE	* replaced by the function sun_rise()
SUNSET	* replaced by the function sun_set()
RESIDUAL	
GRP_NUMBER	Shows which dives were sent in the same transmission

The sun position functions can be used in queries to calculate day length and the position of the sun at any time and place:
sun_alt(dtm, latitude, longitude) gives the altitude of the sun at time “dtm”
sun_rise(dtm, latitude, longitude) and **sun_set(dtm, latitude, longitude)** give the times of sunrise and sunset of the solar day containing “dtm”

A query **sun_example** is provided to show these functions being used to find the sun’s behaviour around the midpoint of each haulout.

haulout_orig	*A haulout begins when the SRDL has been continuously dry for a specified length of time (usually 10 minutes). It ends when continuously wet for another interval (usually 40 seconds).*
REF	As for **deployments**
PTT	
S_DATE	Start date: the time that the haulout started. It takes 10 minutes of uninterrupted dry readings to trigger a haulout – these 10 minutes are included.
E_DATE	End date
HAULOUT_NUMBER	The SRDL assigns an incrementing number to each haulout that occurs. The value stored in this field returns to 0 when it reaches the limit of the resolution used to transmit it (normally 0..31 or 0..63). When two haulouts with consecutive numbers are received we can infer that no other haulout occurred between the end of the first haulout and the beginning of the second one. These periods of "known non-haulout" are shown as narrow grey bars connecting the green haulout bars on the MamVis strip chart display.
CNT	The number of times that this record was received
LAT	An approximate position for the start of the haulout, interpolated along the track joining the filtered locations that occur either side of the start time.
LON	
END_LAT	A similar position for the end of the haulout. Of course this should normally be very close to the start position. Some animals' behaviour does generate occasional at-sea haulouts, but at the usual 4 second sampling rate it is very rare
END_LON	

haulout	*Whenever a haulout exceeds a certain duration (normally 8 hours), the SRDL inserts an artificial end-point and immediately starts a new haulout event. This limits the number of bits required to transmit the data. In cases where the SRDL has fallen off onto dry land it also avoids entering an infinitely long haulout that is never transmitted. In this table, derived from haulout_orig, records that result from this artificial truncation are re-concatenated.*
Other fields as **haulout_orig**	
END_NUMBER	In this table HAULOUT_NUMBER to END_NUMBER give the range of transmitted records that were concatenated to form this record.

cruise	*A cruise is an extended period of time (normally at least 9 minutes) spent above the dive threshold depth. i.e. it is not dry enough to qualify as a haulout nor deep enough to qualify as a dive.*
REF	As for **deployments**
PTT	
S_DATE	Start time
E_DATE	End time
CRUISE_NUMBER	The SRDL assigns an incrementing number to each cruise that occurs. The value stored in this field returns to 0 when it reaches the limit of the resolution used to transmit it (normally 0..31 or 0..63). When two cruises with consecutive numbers are received we can infer that no other cruise occurred between the end of the first cruise and the beginning of the second one. These periods of "known non-cruise" are shown as narrow grey bars connecting the light blue cruise bars on the MamVis strip chart display.
CNT	The number of times that this record was received
LAT	An approximate position for the start of the cruise, interpolated along the track joining the filtered locations that occur either side of the start time.
LON	
END_LAT	A similar position for the end of the cruise
END_LON	

diving period	*A diving_period is analogous to a haulout or cruise: a period of consecutive dives. Some deployments are set up to split dives into "shallow" and "deep" categories according to a threshold depth. In this case there are separate diving periods for each category.*
REF	As for **deployments**
PTT	
S_DATE	Start time
E_DATE	End time
DIVING_PERIOD_NUMBER	The SRDL assigns an incrementing number to each diving period that occurs. The value stored in this field returns to 0 when it reaches the limit of the resolution used to transmit it (normally 0..31 or 0..63). When two diving periods with consecutive numbers are received we can infer that no other diving period occurred between the end of the first diving period and the beginning of the second one. Diving periods are shown as yellow bars (shallow dives) or blue bars (deep dives) on the MamVis strip chart display. Periods of "known non-diving" are shown as narrow grey bars connecting the yellow or blue bars.
CNT	The number of times that this record was received
DEEP	1 if the record refers to a period of deep dives, 0 if shallow dives

summary	*As well as sending records of individual events such as dives and haulouts, the SRDL also calculates summary statistics of those events over a specified time period (usually 3, 4 or 6 hours). These statistics are based on all the data recorded by the SRDL and so are not prone to distortion by variations in the efficiency of transmission via Argos.*
REF	As for **deployments**
PTT	
CNT	The number of times that this record was received
S_DATE	The start time of the summary period
E_DATE	The end time of the summary period. Note that dives are assigned to the period in which they ended for the purposes of calculating the summary statistics described below.
DIVE_TM	The proportion of time spent diving (%). This means the time between the detection of the start of the dive and the detection of the end of the dive. The subsequent SURF_DUR time at the surface that is included in the individual dive records does not contribute to DIVE_TM.
SURF_TM	The proportion of time spent at the surface (%). This includes the SURF_DUR periods described above, plus any other periods which were neither dives nor haulouts
HAUL_TM	The proportion of time spent hauled-out (%)
N_CYCLES	The number of dives that finished during the summary period
AV_DEPTH	The average max_depth in the summary period (metres), where max_depth is the maximum depth recorded in a given dive.
MAX_DEPTH	The maximum dive depth (metres)
AVG_SPEED	The average speed recorded during dives (metres/second)
SD_DEPTH	The standard deviation of max_depth (metres)
AV_DUR	The average dive duration (seconds)
SD_DUR	The standard deviation of dive duration (seconds)
MAX_DUR	The maximum dive duration (seconds)
AV_SURF_DUR	The average post-dive surface duration (seconds)
SD_SURF_DUR	The standard deviation of post-dive surface duration (seconds)
MAX_SURF_DUR	The maximum post-dive surface duration (seconds)
DP_AV_DEPTH	These fields will be present where the SRDL has been programmed to separate “deep” from “shallow” dives according to a maximum depth threshold. These fields hold statistics calculated for the “deep” dives, the corresponding fields above hold the values for “shallow” dives.
DP_MAX_DEPTH	
DP_AVG_SPEED	
DP_SD_DEPTH	
DP_AV_DUR	
DP_SD_DUR	
DP_MAX_DUR	
DP_DIVE_TM	The proportion of DIVE_TM that was spent in “deep” dives (%). i.e. the percentage of time in “deep” dives = DIVE_TM x DP_DIVE_TM/100; the proportion of time in “shallow” dives = DIVE_TM x (1 – DP_DIVE_TM/100)

CTD	*The SRDL can collect temperature upcasts on selected dives. The trace of temperature versus pressure is compressed using the broken stick algorithm, which generates 12 (pressure,temperature) coordinate pairs. Some SRDL's can also measure conductivity and calculate salinity. Due to space restrictions these profiles must each be transmitted in a separate uplink, but temperature, conductivity and salinity profiles from the same dive are collected into a single record in this table.*
REF	As for **deployments**
PTT	
END_DATE	The time of the end of the upcast
MAX_DBAR	The maximum pressure (in decibar, approximately 1 metre)
LAT	An approximate position for the end of the upcast
LON	
CNT	The number of times that this record was received
NUM	Upcasts are assigned sequential numbers as they are performed. The SRDL transmits only the deepest casts that occur in each period (usually 6 hours or 12 hours). This means that some earlier upcasts will not be transmitted so these numbers will not be consecutive.
N_TEMP	The number of (pressure,temperature) pairs
N_COND	The number of (pressure,conductivity) pairs
N_SAL	The number of (pressure,salinity) pairs
TEMP_DBAR	A comma-separated list of the pressure coordinates of the (pressure,temperature) profile (decibars)
TEMP_VALS	A comma-separated list of the temperature coordinates of the (pressure,temperature) profile (°C)
COND_DBAR	A comma-separated list of the pressure coordinates of the (pressure,conductivity) profile (decibars)
COND_VALS	A comma-separated list of the conductivity coordinates of the (pressure,conductivity) profile (mS/cm)
SAL_DBAR	A comma-separated list of the pressure coordinates of the (pressure,salinity) profile (decibars)
SAL_VALS	A comma-separated list of the salinity coordinates of the (pressure,salinity) profile

depth_usage_histogram	*The proportion of each summary period (typically 6 hours) spent in each pre-defined depth bin.*
REF	As for **deployments**
PTT	
CNT	The number of times that this record was received
S_DATE	The start and end time of the summary period
E_DATE	
MAX_DEPTH	The maximum depth recorded during the period
PCT_DRY	Percentage time dry
PCT_SURF	Percentage time at the surface (i.e. neither dry nor meeting the criterion for a dive)
PCT01 .. PCT20	Percentage time spent in each depth band. Definition of the depth bands is given in the HIST_BINDEFS table, with hist_type = “USE”
TEMP_DRY	Average temperature when dry
PCT_SURF	Average temperature when at the surface
TEMP01 .. TEMP20	Average temperature in each depth band

dive_depth_histogram	*Frequency distribution of maximum depth of dives that end during each summary period*
REF	As for **deployments**
PTT	
CNT	The number of times that this record was received
S_DATE	The start and end time of the summary period
E_DATE	
BIN01 .. BIN20	Number of dives with maximum depth in each band. Definition of the depth bands is given in the HIST_BINDEFS table, with hist_type = “DEP”

dive_dur_histogram	*Frequency distribution of duration of dives that end during each summary period*
REF	As for **deployments**
PTT	
CNT	The number of times that this record was received
S_DATE	The start and end time of the summary period
E_DATE	
BIN01 .. BIN20	Number of dives with maximum depth in each band. Definition of the depth bands is given in the HIST_BINDEFS table, with hist_type = “DEP”

hist_bindefs	*Definition of the bin limits for each of the histogram types above*
REF	As for **deployments**
PARMS	The variation of SRDL program used in each tag
HIST_TYPE	“USE” = depth_usage_histogram “DEP” = dive_depth_histogram “DUR” = dive_dur_histogram
MAX00 .. MAX20	The upper limit for each bin. The units are depth in metres for depth_usage_histogram and dive_depth_histogram, duration in seconds for dive_dur_histogram. Bin **n** extends from MAX**n-1** to MAX**n**. There is no bin 0, MAX00 is provided only to supply a lower limit for bin 1.

Also see the supplied queries:

depth_usage_histogram_as_list, dive_depth_histogram_as_list and **dive_dur_histogram_as_list**. These queries produce a separate record for each histogram bin, along with the corresponding bin limits.

tag_info	*Each uplink made by the SRDL contains groups of bits representing a record in one of the tables described in this document. For instance, an uplink may contain 100 bits for a summary record, plus 3 haulout records at 28 bits each. This usually leaves a number of spare bits that are used to send diagnostic information about the current state of the SRDL. Each field holds the latest value available at the time the transmission is made*
REF	As for **deployments**
PTT	
U_DATE	The time that the uplink was transmitted (UTC)
TX_NUMBER	The number of transmissions made since the SRDL was last reset. This may reset to 0 when it reaches the value 65535. Under most circumstances SRDL's should be able to make about 80,000 transmissions in their lifetime.
OCLOCK	The date and time (up to the hour) according to the SRDL's internal clock.
TAG_TIME	The minutes and seconds of the current time according to the SRDL's internal clock.
MAX_DEPTH	The maximum depth recorded so far
N_RESETS	The number of times the SRDL has been reset (either by the magnet or by its own failsafe system that "reboots" if the program stops responding)
ADC_OFFSET	Whenever the wet-dry sensor detects "dry" the current pressure reading taken by the depth sensor is used to define the zero depth point. This value is recorded to check for drift in the pressure transducer.
N_WD_FAIL	The SRDL can monitor its wet-dry sensor to check for unfeasibly long periods of continuous dry or continuous wet. This may indicate a failure of the wet-dry circuitry or, more likely in the case of continuous "wet" readings, fouling of the sensor pins. In this case the program can switch to a backup system using only depth readings to try to estimate when it is at the surface. Because there is no longer any way to recalibrate the depth sensor this process is susceptible to drift which could mean that the tag fails to realise it is at the surface. The program therefore continues to monitor the wet-dry sensor and reverts to its normal behaviour as soon as the wet-dry sensor begins to work again. N_WD_FAIL counts the number of times that this has happened.
N_ODO_FAIL	A similar monitoring routine exists for the speed-sensing turbine/odometer. N_ODO_FAIL counts the number of failures detected.
DRY_COND	Maximum and minimum values recorded by the conductivity sensor on the previous day. In ideal laboratory conditions "wet" should be 0 and "dry" should be about 200. Splashing causes occasional intermediate readings, but a progressive reduction in the "dry" value suggests the build-up of biofouling. SRDL's used in low-salinity areas may have special circuitry with different ideal levels.
WET_COND	
GPS_NONE	The number of attempts to obtain a fix that resulted in no satellites detected
GPS_SUB5	The number of attempts to obtain a fix that resulted in 1-4 satellites detected. i.e. not sufficient to calculate a location
GPS_GOOD	The number of attempts to obtain a fix that resulted in 5 or more satellites detected. i.e. a location can be calculated
GPS_REBOOT	Counts failures of the GPS subsystem that were corrected by the SRDL
TEMPERATURE	Current reading of the temperature sensor
ODOMETER	Current total distance recorded by the speed sensor turbine
BATTERY_MV	Current cell voltage
ELAPSED	This is not a transmitted value. It is simply the calculated number of days since the nominal start date of the deployment.