

Possum

User Guide v11.0



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Overview

Detects interactions between possums using inbuilt UHF transceivers.

A duty cycle is used to limit interaction detection to between 1600 and 0600, to save power.

The 51 most recent interactions are stored on board and can be “dumped”.

The store on board data can be “dumped” (or downloaded) using the UHF link to data loggers (snarks) in the field or by field workers when close to an animal.

A summary of the 4 most recent interactions is broadcast over the VHF signal.

A battery weeks of life remaining counter (BLR) keeps track of remaining run time for the transmitter.

When the BLR counter = zero all UHF function is disabled to save power. The VHF transmitter is unaffected.

The Tx's run a duty cycle to save power.

Interaction detection is only enabled over night and VHF audible telemetry is only enabled during the day.

Time setting at turn on synchronises the Tx to true time and thus allows it to fall in to the correct duty cycle phase.

Turn on and Turn off

Turn on and off requires a magnet to be placed over the silver dot above the label on the Tx.

The process is as follows:

1. Turn on a receiver and set the channel or frequency to that of the Tx.
2. Place the magnet over the silver dot until the tone on the receiver turns off (*in the case of Tx turn off move the magnet away permanently at this stage and skip the next steps*).
3. Move the magnet away (for about 1 second) and return it to the silver dot and count every beep you hear to set the current time in number of hours after midnight.
4. Move the magnet away permanently.
5. Listen to the outputs to check that the time set is correct.

After ten minutes the Tx will fall in to it's correct duty cycle regime.

Outputs after turn on.

1. Battery week of life remaining BLR
2. Software version number (should be 11.0 ie 13,2)
3. Time set in hours after midnight

Note that the 2nd and 3rd outputs after turn on hijack the first 2 output slots for event 1.

Also note that the software version and time set only do this once immediately after turn on.



VHF Audible Telemetry

VHF audible telemetry is enabled between 0600 and 1600 each day and interrupts the normal background pulse rate of 30ppm.

The audible telemetry gives the BLR and a summary of the four most recent interactions (*three bits of information for each interaction*).

The audible telemetry starts every 10 minutes and comprises 13 outputs. Each output is a two digit number separated by 5 normal background pulses. Each digit is transmitted as a series of fast countable beeps with a 3 second pause to signify the start and end of each digit.

The fast countable beeps have to have 2 subtracted from them to get the true decimal value. ie a new transmitter will have 52 weeks of life remaining but the output for battery life will be 7,4.

Immediately after turn on assuming the time set was 1400 the outputs would be.

7,4/13,2/3,6/2,2/2,2/2,2/2,2/2,2/2,2/2,2/2,2

List of outputs

1. Battery weeks of life remaining
2. Interaction 1 UID
3. Interaction 1 age in hours before now
4. Interaction 1 duration in minutes
5. Interaction 2 UID ■
-
-
13. Interaction 4 duration in minutes

The ages and durations saturate at 255 and 250 respectively.

Remember

Always write down what you hear in the field, never attempt to subtract 2 on the fly. It is surprisingly easy to make mistakes, so work it out latter.

This is the standard way to write down the outputs

Interaction detection

Interactions can be detected between **1600 and 0600**, during which time the UHF transceiver is enabled. Over a maximum **range of 10-15m**.

Interaction events are initialised on receipt of a valid UHF UID from another possum and it is at this stage the event is assigned an event ID.

The event is started if more than one valid UID is received within 60 seconds of the first UID.

Once started, events time out and end if no valid UID is detected for more than 5 minutes.

The duration for each event is recorded in minutes and always rounded down to the nearest minute.

The time stamp for each event is in days and 10 minute periods since midnight of the day the Tx was turned on.

A maximum of 4 events can be recorded simultaneously.

An event that lasts for **50 seconds** will be recorded as **0 minutes** long.

No event record will be made in the case where only one valid UID is received within the first minute. But an event ID will be assigned so it may on occasion appear in the event logs that an event ID has been missed.

The event time stamp is corrected back to midnight of the day of turn on.

ie if a Tx was turned on at **11:19** with the time set as **1100** then the Tx would believe that **00:19** was midnight.

Therefore an event that started at **01:00** the next day would be recorded as starting at **001** days and **004** ten minute periods since midnight of the day of turn on.

Mortality

Mortality is recorded in days.

The mortality signal is a constant 80ppm pulse rate between 0600 and 1600, broken only by the audible telemetry.

Mortality is activated after 24 hours of no movement of the Tx, and is not therefore a reliable measure of point of death, since it is quite common for scavenging of carcasses to take place.

When in mortality event logging remains enabled between the usual hours of 1600 and 0600 so that visits to the carcass are recorded. During this period the pulse rate will be the usual 30ppm.

The output for the number of days since death hijacks (ie is placed in) the output slot that normally indicates battery weeks of life remaining.

Mortality is latching and can only be reset buy turning the Tx off and on again.

Data “dumping”

Historical interaction data can be dumped in to (capable) field deployed data loggers (snarks?) or a field worker's PC using a special USB transceiver see picture below.

The range for data dumping is the same as that for event detection, roughly 10-15m.

Between 1600 and 0600 the data dump feature will complete within approximately 15 seconds.

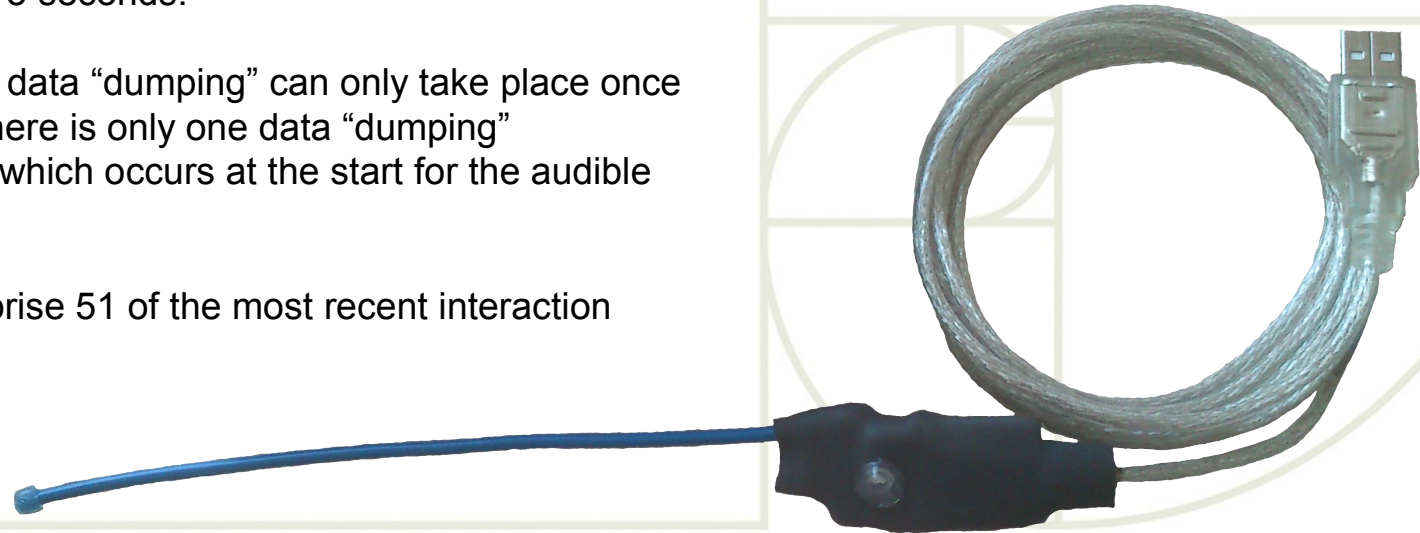
Between 0600 and 1600, data “dumping” can only take place once every 10 minutes since there is only one data “dumping” handshaking opportunity which occurs at the start for the audible telemetry outputs.

Each data “dump” will comprise 51 of the most recent interaction events.

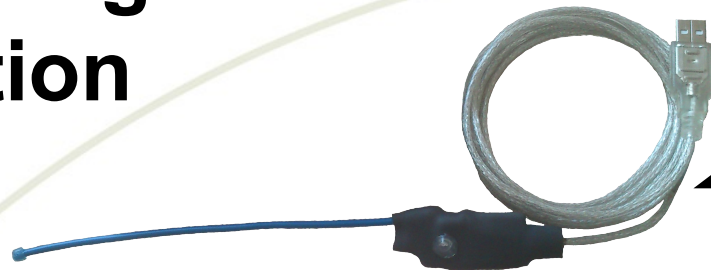
Data dumping is possible at the start of the first set of outputs after turn on.

It is advisable to obtain a data “dump” prior to any re-deployment of the transmitters so that data relating to previous deployments can be accounted for.

Note it is not possible to delete any of the store on board interaction records.



Data “dumping” PC application



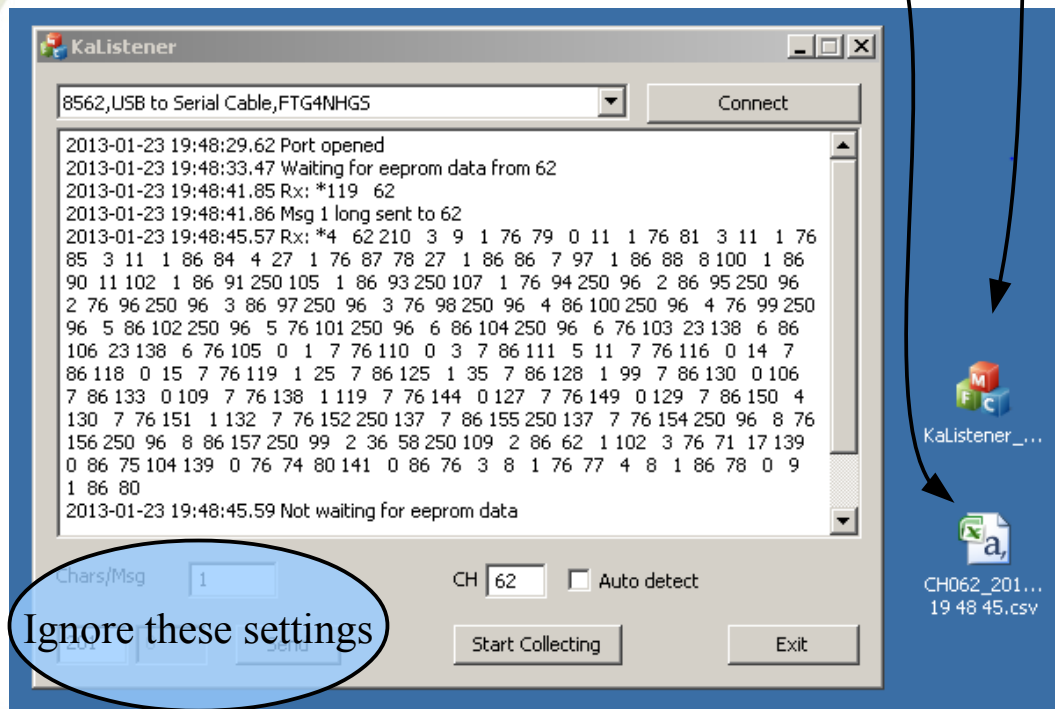
Connect the USB transceiver to your PC.

“Dump” files are written to the folder the application is run from, in this case the “desktop” and named [ChXX_‘reverse date’ ‘time’]

Start “KaListener_1184.exe”

Press the connect button.

Choose the TX channel you want to collect from or select “Auto detect” and click “Start collecting”. Once a log file has been successfully retrieved the system will revert to “Not waiting for eeprom data”. You can change the channel (or use “Auto detect”) and press “start collecting” again if you wish to download another log file.



Note: The FTDi drivers for the USB transceiver, should auto install or already be installed but Windows7 can try to connect this device as a serial mouse in which case you'll need IT support to prevent this device ID from auto installing.

Data “dumping” log files

An event ID is assigned on contact with another TX but not logged until it is over, so events will not necessarily be in order. Remember two contacts in 1 minute are required for an event to make it in to the event log” so if fleeting interactions occur event IDs will be “missing”.

	A	B	C	D
1	Event ID	UID	Time stamp	duration
2	44	89	0.7569	250
3	45	86	0.7569	250
4	42	36	0.6875	250
5	56	76	1.9583	4
6	53	89	1.7569	250
7	54	86	1.7569	250
8	51	36	1.6875	250
9	63	76	2.7778	0
10	66	76	3.1319	1
11	67	76	3.1597	0
12	61	89	2.7569	250
13	58	36	2.6875	250
14	62	86	2.7569	250
15	71	76	3.7083	1

Event IDs roll over at 255 back to 0 and start counting up again.

UID is the identity of the “other” TX that formed the interaction.

The “Time stamp” is in decimal days timed from midnight of the day of turn on.

The “Duration” is in minutes ie 250 = 4:10