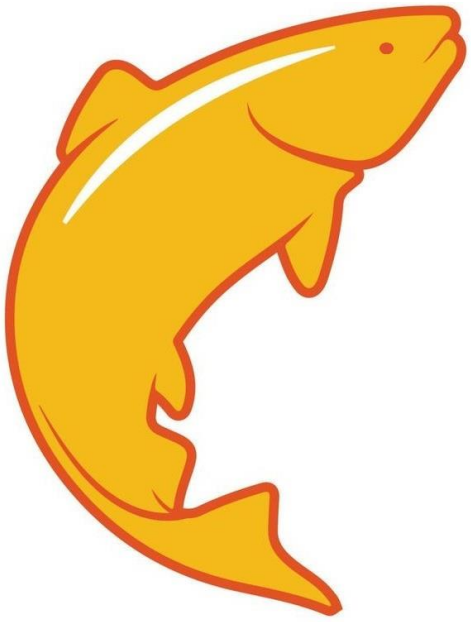

Triton

Acoustic Receiver Software Manual

ADVANCED TELEMETRY SYSTEMS

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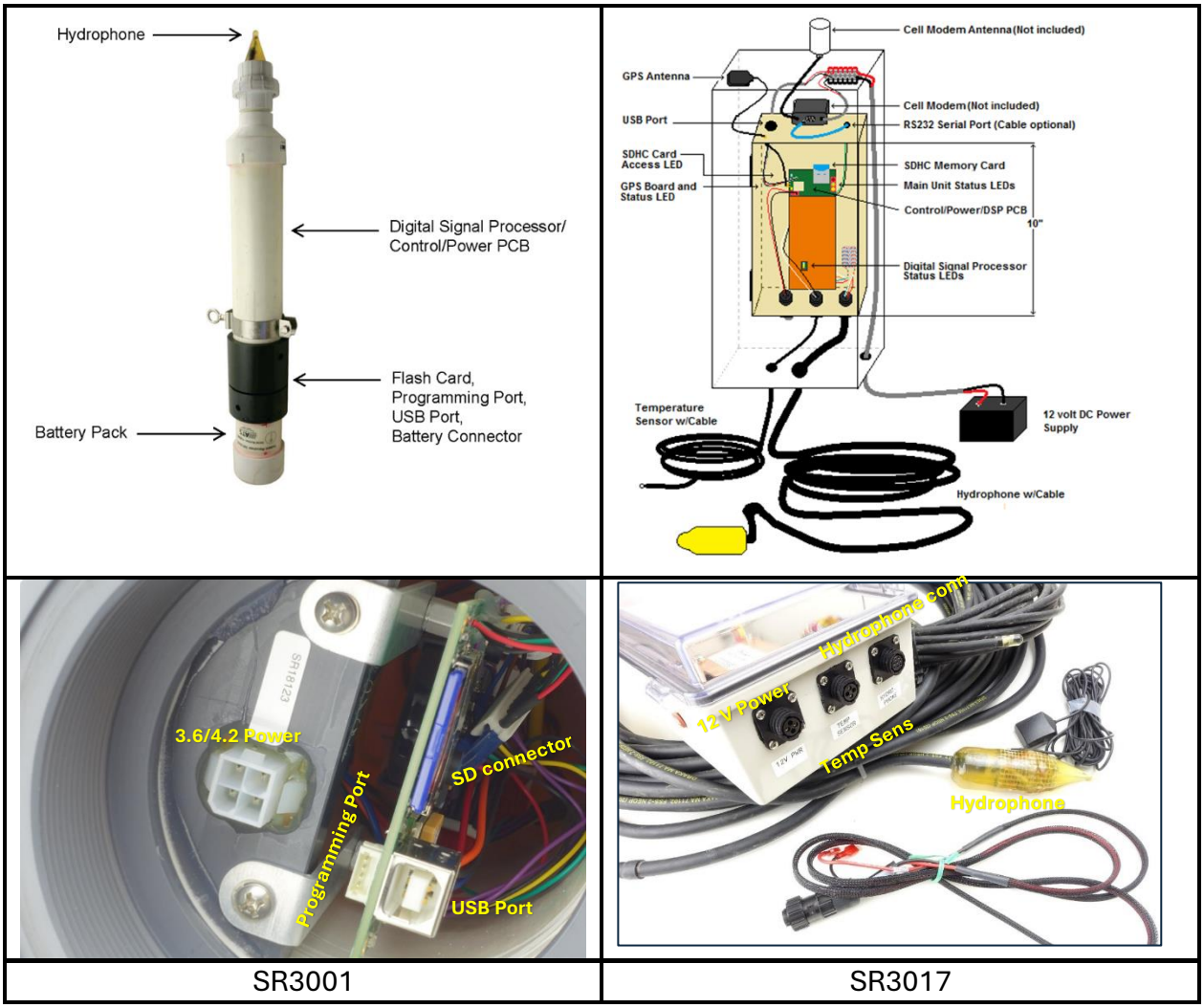
The ATS Triton Interface Software is required for interfacing with the receiver whenever a USB connection is used (USB 2.0B is recommended). It is intended for receivers using firmware versions 11 and above. Any receiver using a firmware version below version 11 will have limited communication when using the Triton software. Such receivers should either use legacy software (*Trident Acoustic Receiver*) or have their firmware updated to version 11 or higher.

1.0 Getting Started

1.1 Housing Diagrams



SR3001	SR3017

Figure 1A – Connection Diagrams

1.2 Quick Start Procedure

Step 1) Ensure that the receiver is powered with the correct battery/voltage. A SR3017 uses ~12 Volts, and a SR3001 uses ~3.6 Volts. If using a battery pack the receiver's life will depend on the battery's size, see section ***4.2 Model Specifics on Powering the Device*** for more information.

Step 2) After powering the device, it should be connected to the appropriate receiver software via USB or RS232 (more information on RS232 connections later).

The software will automatically attempt to detect and make the first USB connection, but the connection can also be manually controlled using the USB controls near the lower right corner of the main window (circled in red below).

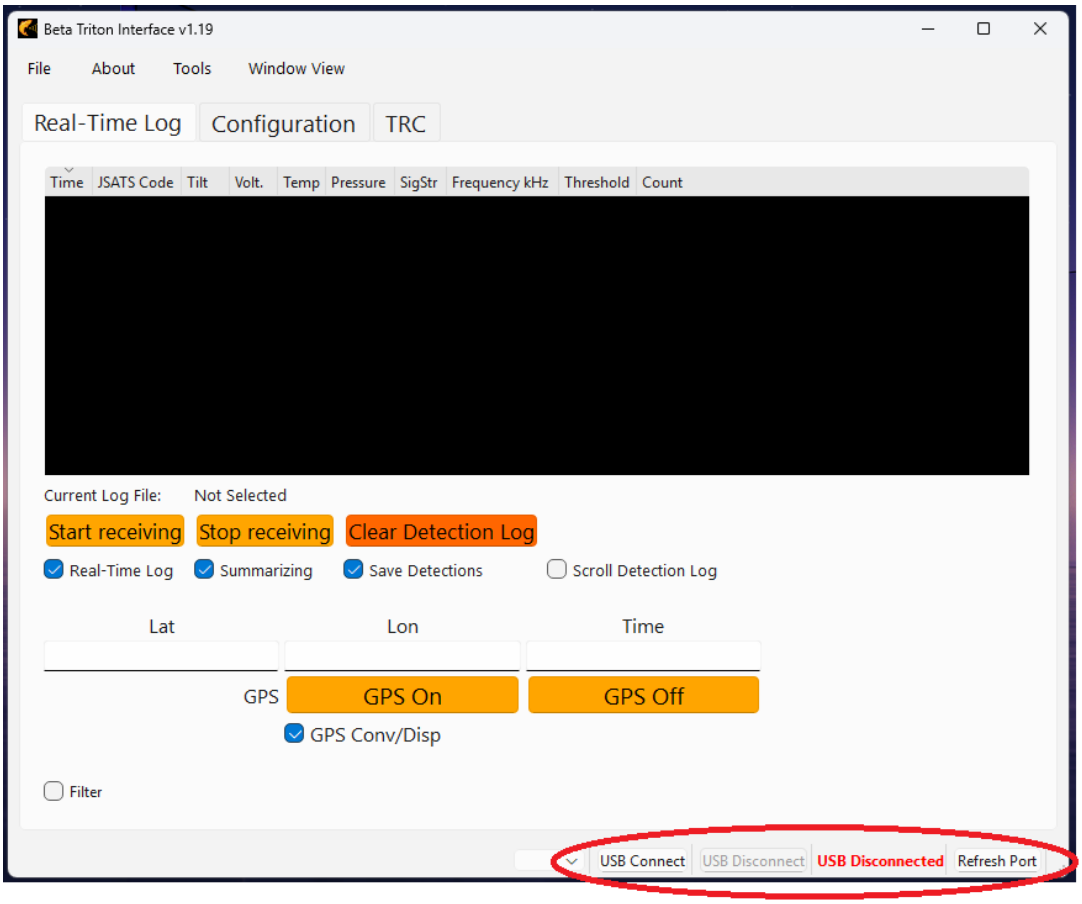


Figure 1B – Real-time logging tab with USB connection circled in red.

Note: The software only auto connects one time when a receiver is found. Disconnecting from a receiver will require manual reconnection using the buttons.

Step 3) After the receiver connects, set the receiver time and date. This is done by going into the configuration tab and synchronizing the receiver clock to the PC clock (red arrow).

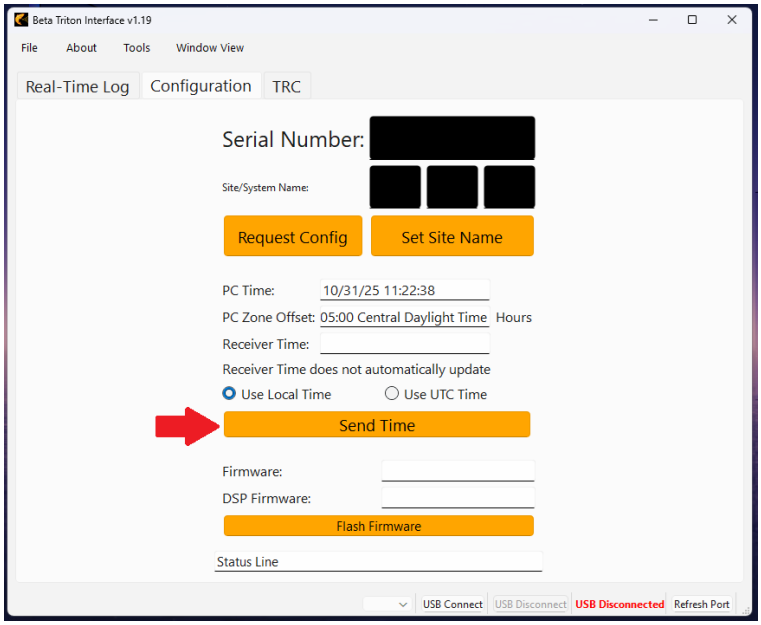


Figure 1C – Configuration tab showing how to set the Receiver Time

Step 4) Once the time is set, return to the Real-Time Log tab and click the "Start Receiving" button. The software will create a log file when the first detection is received and is now ready for Real-Time logging. At this point a reference tag can be placed by the hydrophone tip, and detections should begin appearing in the logging window. This verifies the receiver's functionality and demonstrates how real-time logging is displayed.

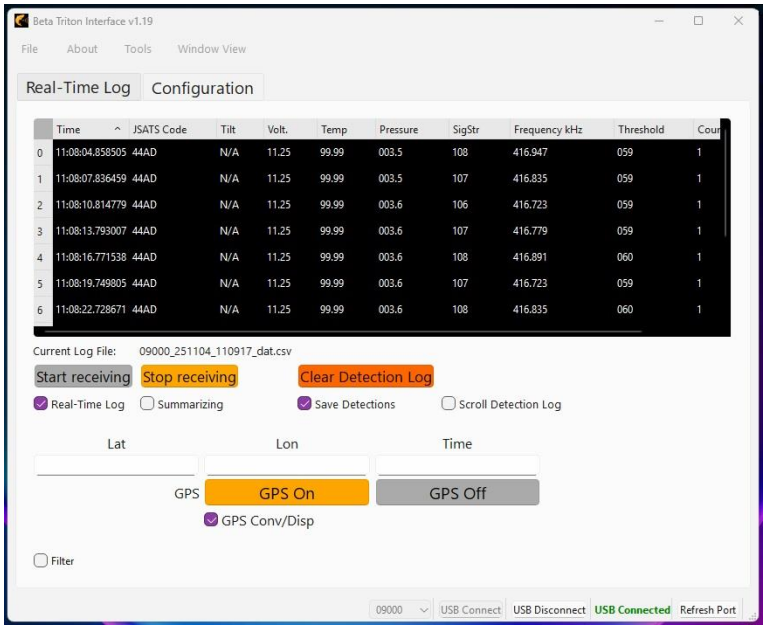


Figure 1D. Real-Time logging in progress

Step 5) Once the receiver's functionality has been confirmed (reference tag detections), it is recommended to set up the SD card. See ***4.2 Model Specifics on Powering the Device*** for SD card recommendations (Formatting info for SD card is in model manuals). Due to the environmental and study conditions where receivers operate, there are different configuration options for how the data can be saved to the SD card. These are covered in the section ***3.0 File Format***. The receiver's default file configuration is one continuous file.

Step 6) The receiver should now be set up for basic data-logging of tags.

2.0 Additional Controls and Features

2.1 Drop-Down Menu Controls

File – Allows creation, selection, de-selection, or deletion of Log files, Code files, and other .CSV files.

> .CSV (comma-separated values) files are a common form of data files that can be viewed using Microsoft Excel or other spreadsheet applications.
>
> The Log file is a .CSV file created to store data from transmitter signals detected and interpreted by the receiver.
>
> A Log file is required for recording data to the PC. If the user does not create and/or designate a file, a file will be automatically created using the default format 'SR#####_yymmdd_hhmm##_dat.csv' (see ***3.0 File Format*** for more details) and stored in the subfolder "...Generated Files\Realtime output". This subfolder will be created in the same location where the original application is executed from. The "dat" in this filename distinguishes it from files stored on the SD card, which have a more substantial header before the data.
>
> A Code file is a .CSV file created with a list of transmitter IDs that the software is set up to search for specifically. These files are typically created manually by the user using Excel and contain a single column of transmitter IDs organized in a single column of cells (column A). Creating a Code file using the software will create an empty .CSV file and fill "column A" with the header "Code". The software requires the first row to be the header "Code" (See Figure 3.4.2 for an example Code file).

About – Contains summary explanations and brief instructions about various software features.

Tools – Features options for filtering or graphing .CSV data files created by the receiver software. See **3.4 Filtering** for more information.

Window View – Allows the user to turn on or turn off displaying various functions in the software.

2.2 Real-Time Log Tab

This is the main operational tab. It allows the user to view active detections as they occur and provides options for displaying them. It can show GPS satellite fixes and terminal information as the data is received and provides the user with several options for controlling or filtering the incoming data.

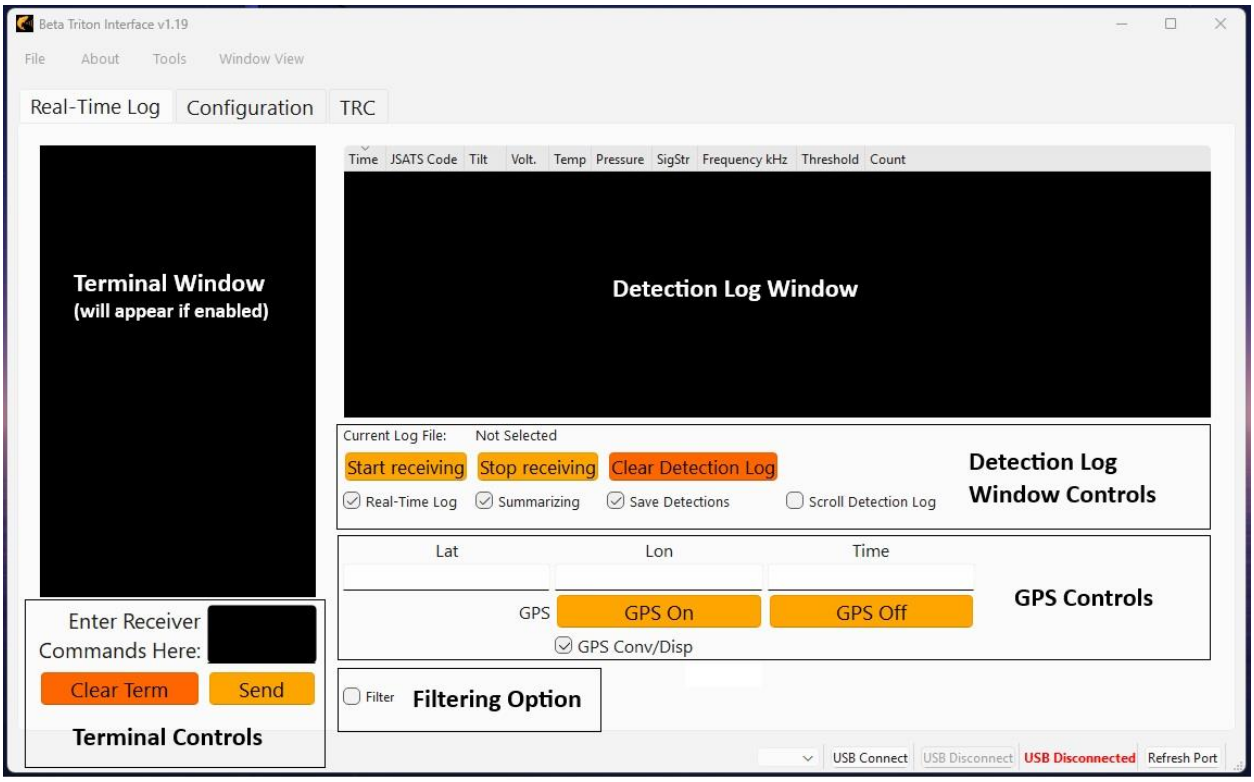


Figure 2A – The Real-Time Log tab controls.

2.2.1 Terminal Window and Command Line Entry

The terminal window can be turned on or off from commands in the **Window View** drop-down menu or press “Ctrl+t” on the keyboard. It allows the user to view data in its raw form as it is being processed by the receiver. Turning this window on also opens the command line entry option, which allows manual entry of text commands. While many commands have a button or control for ease of use, the manual entry line allows for many more options to be used for customizing how the data received is both viewed and/or saved. Sending a ‘?’ to the terminal window will give a list of all available receiver commands. Appendix A also contains the list of available commands.

2.2.2 Detection Log Window and Controls

The detection window displays all incoming detection data in columns to allow the user to identify specific information quickly. It can be customized to show individual detections or summaries of each tag code’s performance. The detection window

controls below the window allow setting the window's display options and can be changed to suit the user's needs. Note: The Clear Detection Log button only clears the visible display. It does not affect the stored files.

2.2.3 GPS Controls

Acoustic receivers come with a built-in GPS modem on board. The GPS feature is primarily intended for shore-based models since GPS signals cannot be received underwater (although GPS fixes can often be obtained on any model when not submerged). All units include a built-in internal GPS antenna, but an external antenna (surface receivers only) is highly recommended for better performance (purchased separately). GPS settings are saved by the receiver.

Since GPS fixes cannot be obtained underwater, the GPS modem should be left off for models deployed underwater to prevent unnecessary power consumption and conserve battery life.

When you first receive the unit, the GPS modem is off by default. To turn the GPS modem on, click the **GPS On** button. The software will send a command to the receiver to activate GPS power. The GPS modem requires a short period of time to initialize, find orbiting GPS satellites, and then acquire a fix (~1-5 minutes depending on environment and antenna). When that occurs, Latitude, Longitude, and Time will appear in the corresponding locations. If the Terminal window is open, then GPS sentences and commands in addition to the tag data will be visible as they are received.

The GPS settings can be viewed by sending the command **gpsMODE.** The images below show the two ways that the GPS status is reported in the terminal window.

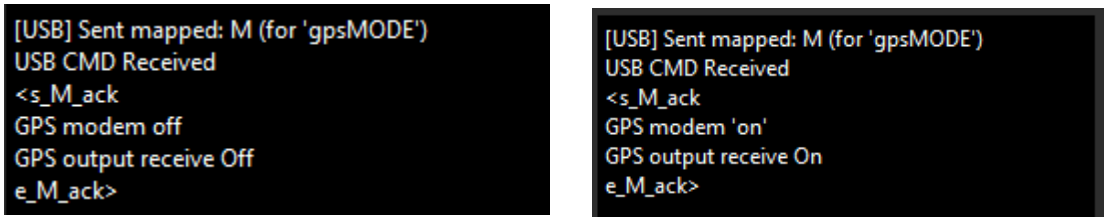


Figure 2B – gpsMODE Terminal Reports

To save GPS fixes to the SD card, use the command **setGPSfreq** HHMMSS (where HH=hours, MM=minutes, and SS=seconds) It is recommended to use '**setGPSfreq** 000100". Functionality can't be guaranteed when set below 3 seconds.

To get GPS fixes in the Triton Interface software, both GPS modem and GPS output need to be on (right image of Figure 2B). The *GPS on* button should handle this. **Turn the GPS OFF when the GPS function is not needed, to save power.**

2.2.4 Filtering Option

The filtering option is a single checkbox that when selected provides several options for filtering the data. Data can be filtered to search for a single tag ID, or a group of tag IDs contained in a Code File. Currently, the filtered file is autogenerated and saved to the same location as the Log file.

2.3 Configuration Tab

This tab allows the user to set, send, or retrieve the receiver's configuration settings, as well as update the receiver's firmware (if required).

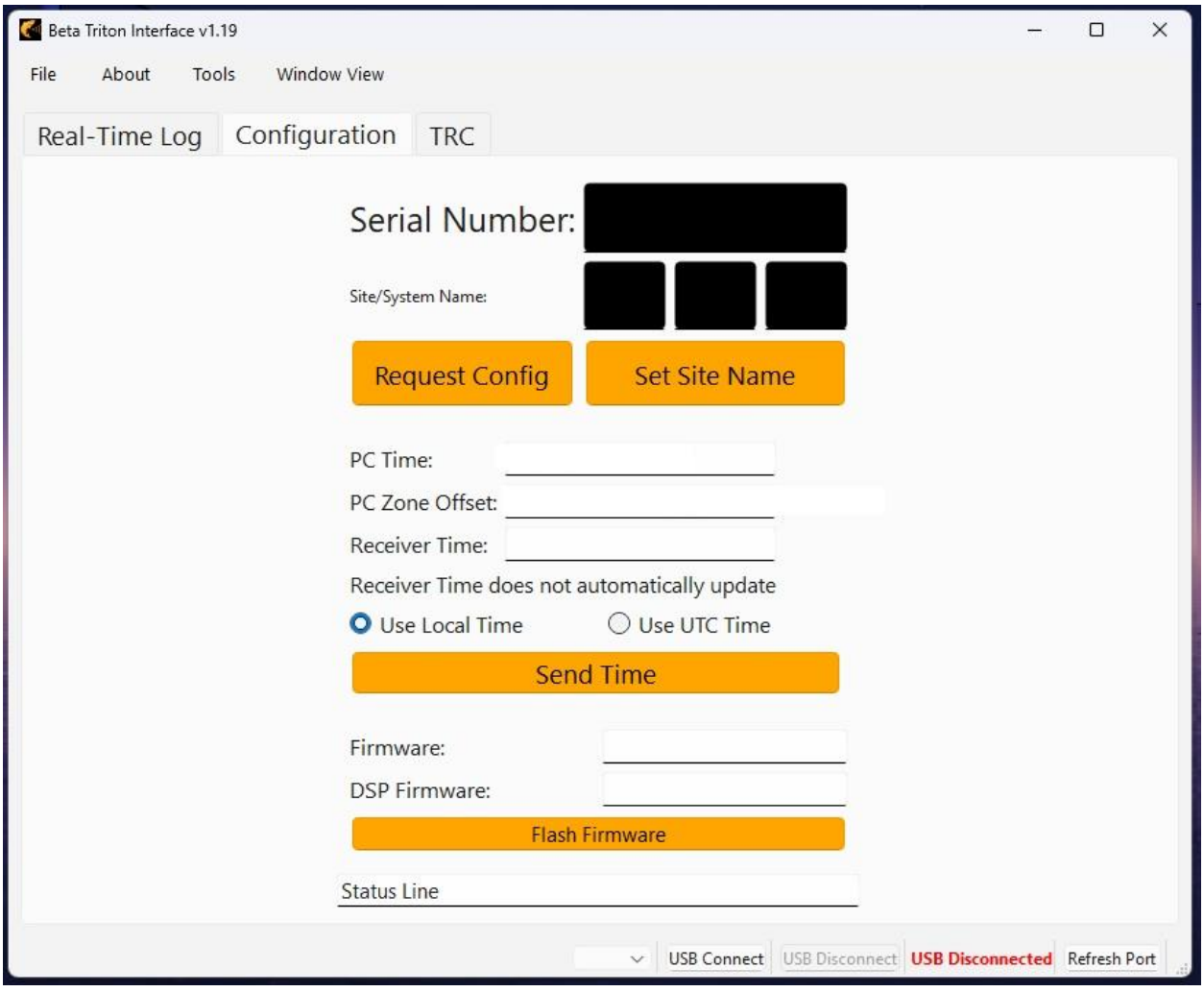


Figure 2C- Configuration Tab

2.3.1 Request Config

This button will retrieve the previously saved configuration settings as well as the date and time from the receiver and display the information in the configuration tab. The date and time from the receiver are a snapshot taken from the receiver and does not continuously update in the configuration tab.

2.3.2 Serial Number

This is a serial number unique to each receiver. It is factory assigned by ATS and cannot be changed. If this number ever changes to '9000', it is an indication of a problem with the receiver and should be reported to ATS for diagnosis and repair. In some instances, this may be resolved without returning the receiver for repair.

2.3.3 Set Site Name

This button allows the user to assign data to the three fields, designating the Site/System name. This can benefit the user primarily for recording the location of the receiver's deployment. For example, the first field might be an abbreviation for a river name, the second field could denote a specific mile (or kilometer) of the river from an established starting point, and the third field could be a number representing the order of receiver(s) set up in that location, or the depth of deployment, or any of many designations. These fields are very flexible and can be used for whatever purpose suits the user's needs. The only restriction is that there is a character limit, (3,2,2 corresponding to each respective field).

2.3.4 Send Time

This button will synchronize the receiver's date and time to the PC's date and time. It is important to make sure that the PC's date, time, and time zone are accurate.

There is an option for selecting UTC Time (Universal Time Coordinated). This can be helpful if the user does not want Daylight Savings Time to have an impact on the data, or if comparing 'live' data recordings from different time zones.

2.3.5 Flash Firmware

This button controls the firmware update functionality, which requires extra hardware and is outside the scope of standard operation. Contact ATS with any questions.

3.0 SD Card File Format

Each data log file will have a header structure and a data structure. These in combination make up the log files saved to the SD card. The extension of this log file designates it as a csv file, so most text editors can open it. It should be noted that Excel can often have trouble opening large csv files. It is recommended that large files be opened using Notepad (Visual Studio Code works very well for this as well). The default file creation of the receiver is just one continuous file separated by headers. There is a daily and hourly file creation option which is recommended for keeping file sizes down (signified with an H or D in the file name).

File name will have the format SR#####_yymmdd_hhmm##.csv

Example: SR23073_250805_115801.csv – Continuous file format

SR23073H250805_115801.csv – Hourly file format

SR23073D250805_115801.csv – Daily file format

Note how these filenames do not have the "dat" designation. This differentiates them from Real-Time Log files created by the software on the PC.

3.1 Header Format

Line Contents	Description
Site/System Name	Descriptive name defined by the user and separated by two commas (e.g. "ATS, NC, 02)
File Name	8-character name which consists of "SR" followed by the serial number then a "_", "H", or "D" depending on whether it is a single, hourly or daily type file. This is followed by date, time of file creation and partition number. (e.g."SRser##_yymmdd_hhmm##.csv")
Receiver Serial Number	A five-character serial number that designates the year of receiver production and three characters that designate sequential production number (e.g. "25107")
Rec. Firmware Version	The name and version of the receiver supervisory firmware and the name
DSP Firmware Version	The name and version of the DSP firmware
File Format Version	Version number of the file format
File Start Date	Date and time of log file creation/opening. (mm/dd/yyyy) Followed by the time zone. (hhz) Ending with the time stamp of when the DSP and RTC synced their times/oscillators. (mm/dd/yyyy) Timestamp is taken whenever time is set or on powerup.
File End Date	Date and time of log file closing. (mm/dd/yyyy) Followed by the timestamp. (mm/dd/yyyy)

Table 3.1 Header Format

3.2 Data Format

Column Name	Description
Internal	Diagnostic and timing information. First 4 characters are the hex counter of the DSP (15 second counter). The following 6 characters are the "second counter" going from 0-15 seconds. Next 4 characters are the DSP address, should be sequential. The last 7 characters are the total time of the DSP and should equal the first 10 characters after conversion. The first character of the 8-character sequence is for indicating GPS status. 'E' for enabled, 'D' for disabled. If the row indicates a GPS fix, then the data in this field will be Latitude & Longitude values.
SiteName	Descriptive name defined by the user and separated by commas (e.g. "ATS , NC, 02").
DateTime	Date recorded as mm/dd/yyyy. Time of detection is defined as the time the signal is detected (TOA) and is recorded with microsecond precision (hh:mm:ss.ssssss). Rows with GPS fixes are only recorded down to the second.
TagCode	9-digit tag code as decoded by receiver (e.g. "G720837eb") "GPS fix" will appear when a fix from the GPS modem is saved to the log file.
Tilt	Tilt of the receiver (degrees). (optional feature) Usually this will appear as "N/A" since this sensor is typically not included.
VBatt	Voltage of the receiver batteries (volts).
Temp	Temperature (celsius). (optional feature) Usually this will read NA or 99.99 since this sensor is typically not included.
Pressure	Pressure outside of receiver (absolute PSI). (optional feature) Usually this will appear as "N/A" if disabled (or a relatively stationary value if enabled with no pressure sensor present)
SigStr	The logarithmic value for signal strength (in DB) "-99" signifies a signal strength value for an absent tag. Not present during GPS fixes.
BitPeriod	Optimal sample rate at 10 M samples per sec. To convert to frequency in kHz divide into 100,000. Not present during GPS fixes.
Threshold	The logarithmic measurement of background noise used for tag detection threshold. Not present during GPS fixes.

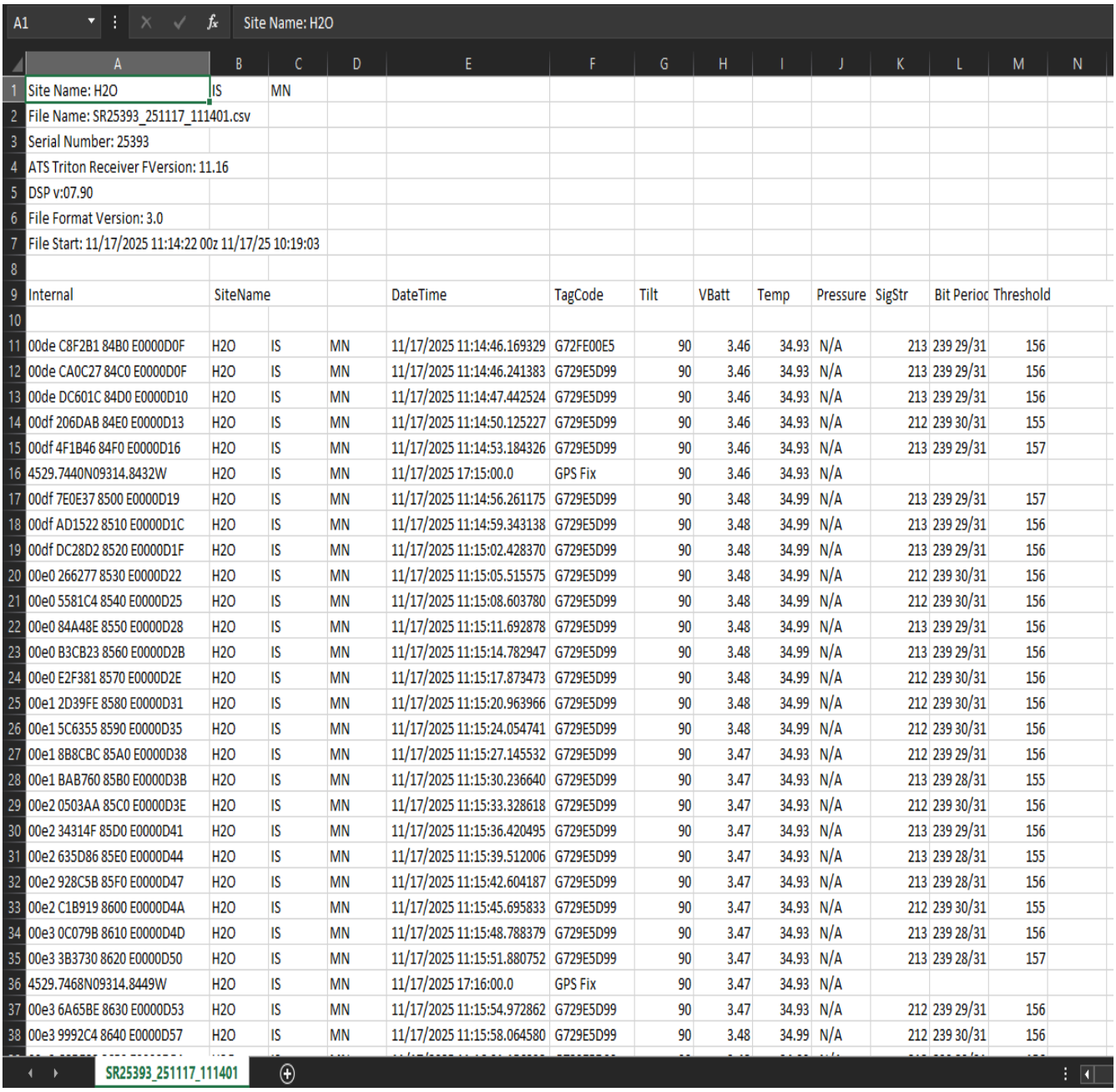
Table 3.2 Data format

3.3 Example file

This example file contains both tag detections and GPS fixes. The GPS frequency save rate was set to three seconds (not typical). The reference tag used had a period of ~3 seconds. With SigStr being loosely correlated to distance from the connection point. Threshold is a relative measurement of the noise level at the receiver input. A threshold level significantly below 100 usually indicates a potential hydrophone problem. The GPS fix format is in DDMM.MMMM (latitude) & DDDMM.MMMM (longitude). To convert to degrees simply use DD + (MM.MMMM/60).

On very rare occasions when the GPS feature turns on and attempts a fix, there can be a lag in establishing its connection with the system processor. This is unavoidable and can sometimes cause random but obvious errors to be saved in the row with the GPS fix data (syntax errors or strange characters). If the errors are saved, it can simply be removed by deleting that entire row of data.

Note that the time of the GPS fix is in UTC time and different than the receiver's time. This is normal and is **not an** indication that the receiver's time is wrong (Figure 3.3.0).



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Site Name: H2O	IS	MN											
2	File Name: SR25393_251117_111401.csv													
3	Serial Number: 25393													
4	ATS Triton Receiver FVersion: 11.16													
5	DSP v:07.90													
6	File Format Version: 3.0													
7	File Start: 11/17/2025 11:14:22 00z 11/17/25 10:19:03													
8														
9	Internal	SiteName			DateTime	TagCode	Tilt	VBatt	Temp	Pressure	SigStr	Bit Perioc	Threshold	
10														
11	00de C8F2B1 84B0 E0000D0F	H2O	IS	MN	11/17/2025 11:14:46.169329	G72FE00E5	90	3.46	34.93	N/A	213	239 29/31	156	
12	00de CA0C27 84C0 E0000D0F	H2O	IS	MN	11/17/2025 11:14:46.241383	G729E5D99	90	3.46	34.93	N/A	213	239 29/31	156	
13	00de DC601C 84D0 E0000D10	H2O	IS	MN	11/17/2025 11:14:47.442524	G729E5D99	90	3.46	34.93	N/A	213	239 29/31	156	
14	00df 206DAB 84E0 E0000D13	H2O	IS	MN	11/17/2025 11:14:50.125227	G729E5D99	90	3.46	34.93	N/A	212	239 30/31	155	
15	00df 4F1B46 84F0 E0000D16	H2O	IS	MN	11/17/2025 11:14:53.184326	G729E5D99	90	3.46	34.93	N/A	213	239 29/31	157	
16	4529.7440N09314.8432W	H2O	IS	MN	11/17/2025 17:15:00.0	GPS Fix	90	3.46	34.93	N/A				
17	00df 7E0E37 8500 E0000D19	H2O	IS	MN	11/17/2025 11:14:56.261175	G729E5D99	90	3.48	34.99	N/A	213	239 29/31	157	
18	00df AD1522 8510 E0000D1C	H2O	IS	MN	11/17/2025 11:14:59.343138	G729E5D99	90	3.48	34.99	N/A	213	239 29/31	156	
19	00df DC28D2 8520 E0000D1F	H2O	IS	MN	11/17/2025 11:15:02.428370	G729E5D99	90	3.48	34.99	N/A	213	239 29/31	156	
20	00e0 266277 8530 E0000D22	H2O	IS	MN	11/17/2025 11:15:05.515575	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	
21	00e0 5581C4 8540 E0000D25	H2O	IS	MN	11/17/2025 11:15:08.603780	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	
22	00e0 84A48E 8550 E0000D28	H2O	IS	MN	11/17/2025 11:15:11.692878	G729E5D99	90	3.48	34.99	N/A	213	239 29/31	156	
23	00e0 B3CB23 8560 E0000D2B	H2O	IS	MN	11/17/2025 11:15:14.782947	G729E5D99	90	3.48	34.99	N/A	213	239 29/31	156	
24	00e0 E2F381 8570 E0000D2E	H2O	IS	MN	11/17/2025 11:15:17.873473	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	
25	00e1 2D39FE 8580 E0000D31	H2O	IS	MN	11/17/2025 11:15:20.963966	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	
26	00e1 5C6355 8590 E0000D35	H2O	IS	MN	11/17/2025 11:15:24.054741	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	
27	00e1 8B8CBC 85A0 E0000D38	H2O	IS	MN	11/17/2025 11:15:27.145532	G729E5D99	90	3.47	34.93	N/A	212	239 29/31	156	
28	00e1 BAB760 85B0 E0000D3B	H2O	IS	MN	11/17/2025 11:15:30.236640	G729E5D99	90	3.47	34.93	N/A	213	239 28/31	155	
29	00e2 0503AA 85C0 E0000D3E	H2O	IS	MN	11/17/2025 11:15:33.328618	G729E5D99	90	3.47	34.93	N/A	212	239 30/31	156	
30	00e2 34314F 85D0 E0000D41	H2O	IS	MN	11/17/2025 11:15:36.420495	G729E5D99	90	3.47	34.93	N/A	213	239 29/31	156	
31	00e2 635D86 85E0 E0000D44	H2O	IS	MN	11/17/2025 11:15:39.512006	G729E5D99	90	3.47	34.93	N/A	213	239 28/31	155	
32	00e2 928C5B 85F0 E0000D47	H2O	IS	MN	11/17/2025 11:15:42.604187	G729E5D99	90	3.47	34.93	N/A	213	239 28/31	156	
33	00e2 C1B919 8600 E0000D4A	H2O	IS	MN	11/17/2025 11:15:45.695833	G729E5D99	90	3.47	34.93	N/A	212	239 30/31	155	
34	00e3 0C079B 8610 E0000D4D	H2O	IS	MN	11/17/2025 11:15:48.788379	G729E5D99	90	3.47	34.93	N/A	213	239 28/31	156	
35	00e3 3B3730 8620 E0000D50	H2O	IS	MN	11/17/2025 11:15:51.880752	G729E5D99	90	3.47	34.93	N/A	213	239 28/31	157	
36	4529.7468N09314.8449W	H2O	IS	MN	11/17/2025 17:16:00.0	GPS Fix	90	3.47	34.93	N/A				
37	00e3 6A65BE 8630 E0000D53	H2O	IS	MN	11/17/2025 11:15:54.972862	G729E5D99	90	3.47	34.93	N/A	212	239 29/31	156	
38	00e3 9992C4 8640 E0000D57	H2O	IS	MN	11/17/2025 11:15:58.064580	G729E5D99	90	3.48	34.99	N/A	212	239 30/31	156	

Figure 3.3.0 Example file output

3.4 Filter Data Tool

Advanced Telemetry Systems provides a tool for post-filtering data files received from ATS acoustic receivers. This is separate from the filter option on the Real-Time Log tab. To use this filter, navigate to the **Tools** drop-down menu and select "Filter File(s)." After clicking "Filter File(s)," a window will pop up with several settings (Figure 3.4.1).

The first line selects the filters that are desired. Both the regular filter and the code filter can be used together or separately. The code filter requires an additional file which is a .CSV file of the codes to be kept (Figure 3.4.2).

The following two options are some direct filter settings: minimum signal strength and PRI. Only one PRI can be selected, so make sure to select the correct PRI. The filter works best when the correct PRI is chosen, otherwise some detections may get filtered or left in when they shouldn't be.

The remaining options are to select if a summary file is desired and select the headers that are to remain in the filtered data output. The summary file isn't required and only shows some basic summary information. If the Apply Code Filter option is selected, then the software will prompt a Code file to be selected. After selecting the Code file, the files that are to be filtered should be selected next.

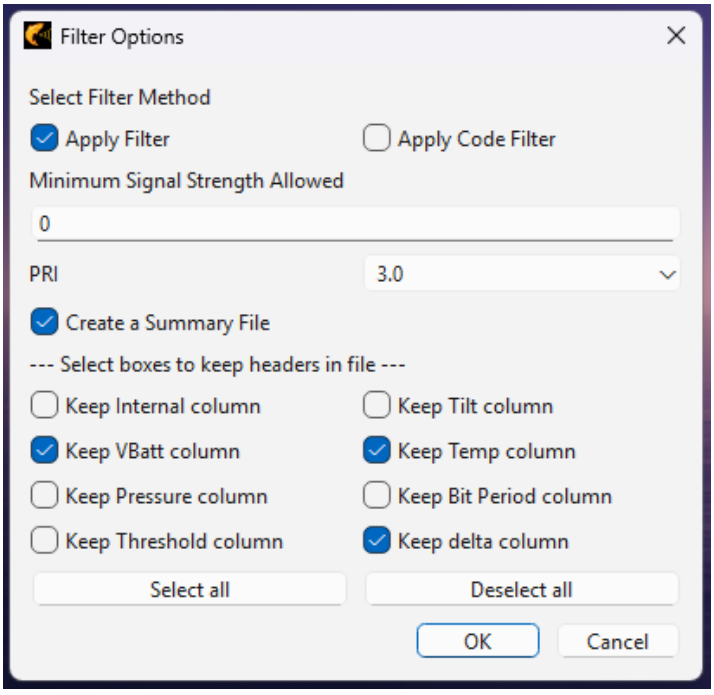


Figure 3.4.1 Filter Settings

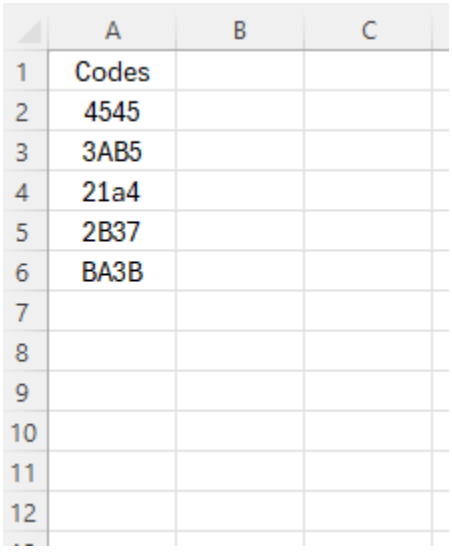


Figure 3.4.2 Code Filter File Example (5 codes)

3.5 Graph Data Tool

Advanced Telemetry Systems also provides a diagnostic tool for visually conducting a quick inspection of sample data files received by ATS acoustic receivers. These diagnostic tests are best done using a close-proximity reference tag to get measurable results.

To use this option, record a data file with the reference tag being detected by the receiver. Afterwards, navigate to the **Tools** drop-down menu and select "Graph File(s)." After clicking "Graph File(s)," a window will pop up with options for Detection Frequency and Delta Graphs (Figure 3.5.1).

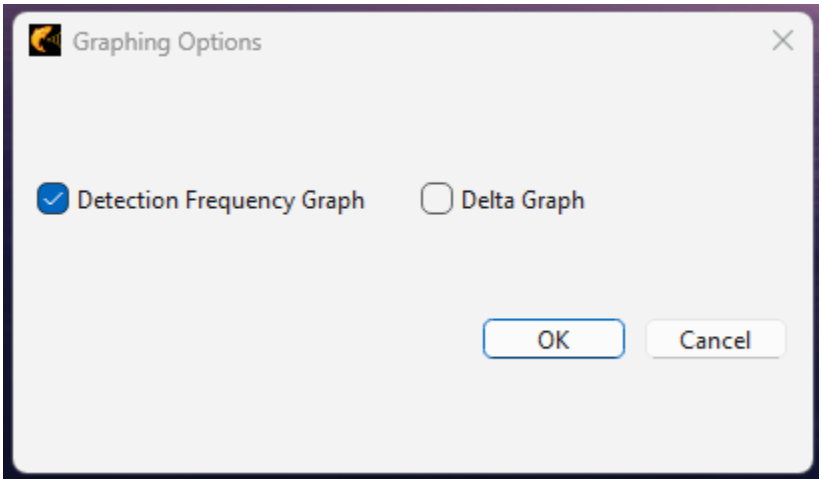


Figure 3.5.1 – Graphing Options

After selecting the desired graph(s), the user will be asked to browse to the desired .csv file. Find the recorded reference tag data and select it. A confirmation prompt will then ask the user to re-confirm the file selection, and then the graph(s) will be created.

> Note: Having GPS fixes in the data file can have unintended results due to the time zone differences. It is better to have GPS fixes turned off when recording data to use with these graphing tools.

The graphs shown in Figure 3.5.2 and Figure 3.5.3 represent data from a test file recorded using a single reference tag. Multiple tags would create a different pattern, and tags in the field would be more chaotic, inconsistent, and less predictable, though the graphing tool would still plot those detections.

The first graph shows a diagonal, upsloping line. This indicates the steady and correct rate of detections over time from the reference tag.

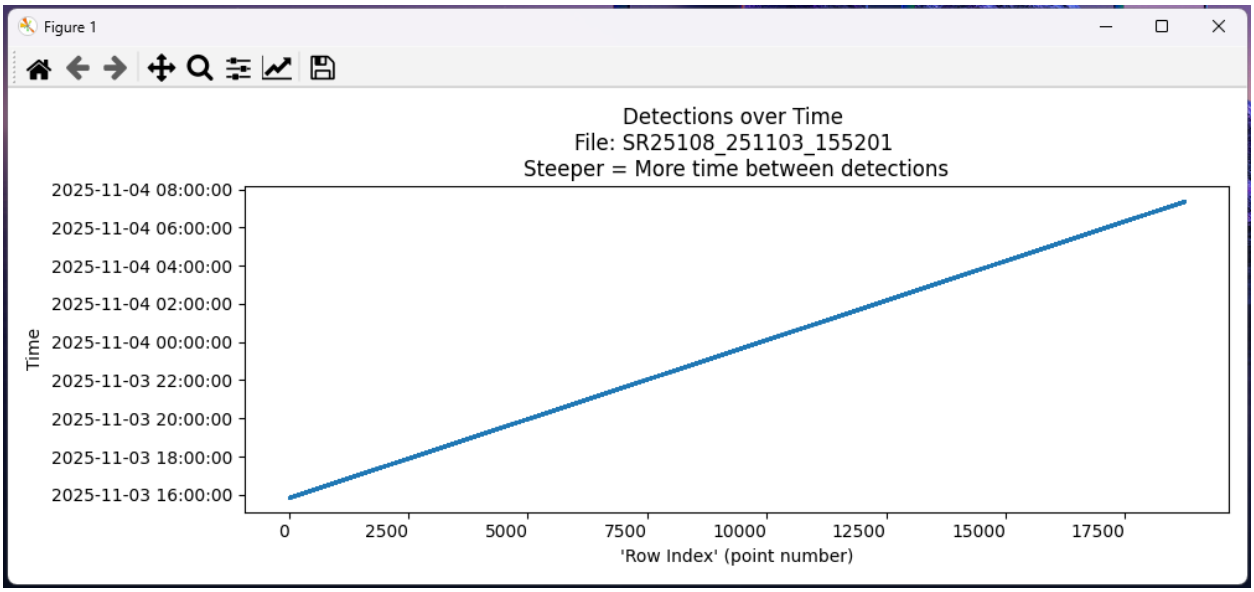


Figure 3.5.2 – Detections over Time Graph

The second graph shows the time between detections. A reference tag running at a 3-second pulse rate interval should produce a nearly flat line like this. Using a reference tag produces a second, less dense line of dots because the receiver picks up the slight variance in pulse rate every fifteen minutes when the tag is re-calibrating.

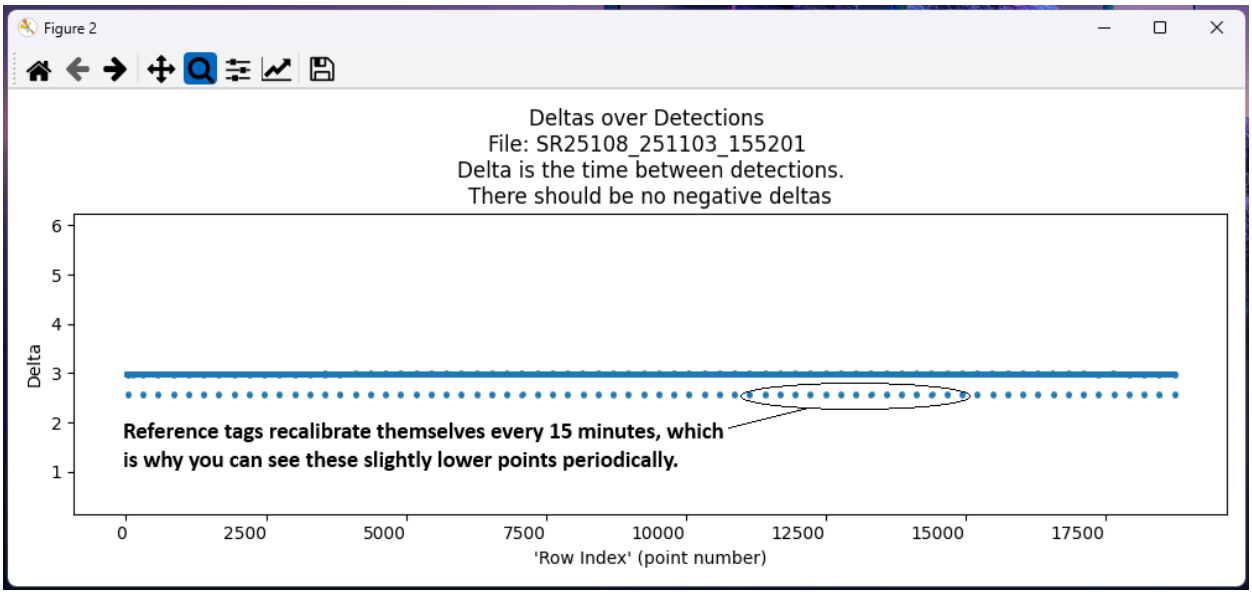


Figure 3.5.3 – Deltas over Detections Graph

4.0 Device Information

4.1 Overview

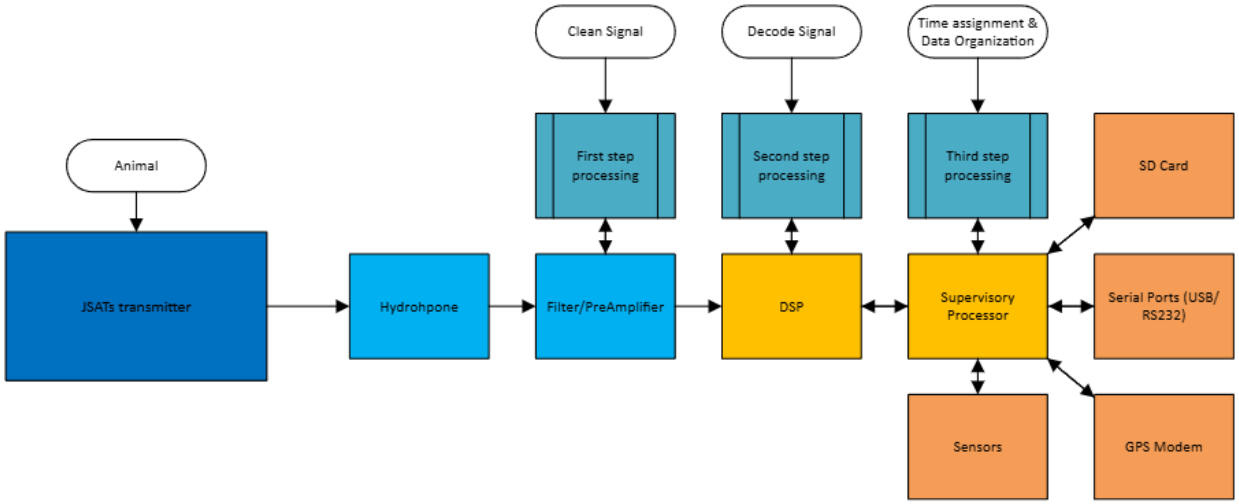


Figure 4.1.0 System Overview

Operational Process:

The hydrophone receives high frequency mechanical vibrations sent through the water by the JSATS transmitter (in fish) and converts them to electrical voltages. These weak voltages are amplified and filtered by the amplifier on the Control/Power board (to reduce noise) and then sent to the Digital Signal Processor (DSP) for processing.

The incoming filtered signals are processed by the DSP using detection and decoding algorithms. The detection algorithm looks for the existence of a tag, and the decoding algorithm decides what specific tag code is present.

After a valid code is verified by the DSP, it is then passed along to the supervisory processor which writes it to an SDHC card (High-capacity). The supervisory processor on the board manages the clocks, sensor measurements, data storage, and communication with the external USB and RS232 connections.

Every receiver is outfitted with a GPS modem. Temperature, tilt, and pressure sensors are available if desired. The GPS is used to obtain the receivers' location.

The data format has added columns for temperature, tilt, and pressure which are optional sensors for acoustic receivers. The data recorded for these sensors will be displayed as

“N/A” which stands for not available if not enabled. The receiver queries sensors (if enabled) and voltage approximately every 15 seconds.

The receiver is equipped with a USB port that can be used to view real-time data. This port can be accessed from the top edge of the housing by unscrewing the cover on the connector (SR3017) with the USB label. It uses a standard USB cable.

The receiver is equipped with an RS232 serial port that can be used to pull or push data stored on the SDHC memory card. This is handy for connecting to a cell modem, a serial RS232 to WIFI Converter or something similar for use in getting your data remotely. This can be done with or without added software provided by ATS. The com port settings are 115200, N, 8, 1 with no hardware handshaking. To see the available commands send ‘?’. This port can be accessed from the top edge of the housing (SR3017) by unscrewing the cover on the connector with the RS232 label. It uses an optional serial cable for use with a cell modem or a serial cable for use with a PC provided on request. Make sure to specify the intended use. The RS232 connector for SR3001s is typically inaccessible due to the casing.

4.2 Model Specifics on Powering the Device

SR3017 -

The receiver is powered using a 12V power supply such as a deep cycle marine battery or solar panel.

Notes:

1. The power consumption of the receiver is ~50 milliamps during normal operation.

2. The recommended SDHC flash card is the SanDisk with a capacity of 32GB or smaller. The maximum data that can be stored on the card by the receiver is 32GB. The maximum file size is ~1GB. Additional files will be created until the 32 GB limit is reached. Important Note: Make sure the flash card has been formatted using the Default format options. The file system usually will be FAT32. DO NOT format using the quick format option.

3. A card reader (not supplied) is required to access data stored on the SDHC card.

SR3001 -

The receiver is powered by an on-board battery pack. The battery pack yields approximately 3.6V and is available as either a rechargeable or non-rechargeable package.

Notes:

1. The power consumption of the receiver is ~80 milliamps during normal operation. Under normal operation, the 6 D-cell lithium battery pack will yield a theoretical life of 50 days.

2. The recommended SDHC flash card is the SanDisk with a maximum capacity of 32GB. The maximum data that can be stored on the card by the receiver is 32GB. The maximum file size is ~1GB. Additional files will be created until the 32 GB limit is reached. Important

Note: Make sure the flash card has been formatted using the Default format options. The file system usually will be FAT32. DO NOT format using the quick format option.

3. A card reader (not supplied) is required to access data stored on the SDHC card.

Appendix A

Terminal commands

It is important to understand that when entering terminal commands, **capitalization matters**.

?

Displays the list of commands. receiver info, file information (hourly, daily, dumps), sensor information.

RequestConfig

Queries the receiver for its hardware information, serial #, RTC time, firmware version, DSP version, site name, file name label, and pressure/temperature calibration values.

SetSiteN ###,##,##

Sets the site name of the receiver. The commas are necessary.

tset MMDDYYHHMMSS

Sets the time of the real time clock chip (RTC). Also sets DSP to the new time.

zone ## or **-**##

Sets the time offset hours from GMT-0.

setGPSfreq HHMMSS

Sets how often the receiver will try to save a GPS fix to the SD card. Information is only saved if the receiver has a valid GPS fix. Avoid setting lower than 3 seconds.

dtag

Outputs the tag detections out via the serial port. Must be on for real time logging.

time

Displays the current RTC time.

timeS

Displays when the DSP was last time synchronized.

gps

Turns on GPS sentences being sent out a serial port, needed for software to know

GPS.

gpsOUT

Toggles internal communications register. Use if GPS sentence communication is frozen.

gpstog

Toggles the GPS modem power and the communication between the GPS modem and supervisory chip.

gpsMODE

displays the current GPS settings such as

power and communication activity.

fileDump filename

Either exports all file contents of the SD card or an individual file (if given a filename) out via the serial port.

dir

Displays file(s) structure/names on the SD card.

dlp

Displays one filename/struct(?) Not fully understood

hon

Turns on hourly files.

hoff

Turns off hourly files. Not recommended for long term usage.

don - doff

Turns on file dumps. Turns off file dumps

dayon

Turns on daily files.

dayoff

Turns off daily files.

debugtog

Additional print information toggles.

resetMain

Forces a software reset of the receiver's main processor.

***** CAPITALIZATION MATTERS *****

Appendix B

LEDs on Acoustic Receivers

1) SR3017s will have always have the three main LEDs active or “enabled”
2) SR3001s will have the three main LEDs active for 5 minutes, then they are disabled to conserve power. They can be re-enabled for two minutes with each magnet swipe.
3) The three main LED states are independent and **DO NOT** depend on each other.

All three LEDs Flashing 	The SD card is not inserted or defective. Other LED states can still be present, but they will be overshadowed by the flashing LEDs.
Green LED flashing 	General: Indicates the health status of the receiver. Good State: This light will continuously flash at one second intervals. If this LED is not flashing for ~30 seconds, there could be an issue with the receiver. Keep in mind that the SR3001 will deactivate all LEDs after five minutes (unless a magnet is swiped).
Yellow On/Off 	General: Indication of data present on the main chip. Good State: Turns on when data is detected, and off when that data is written to the SD card. When using Real-Time Logging, writing to the SD card is immediate, otherwise it’s at 30-second intervals.
Red Flashing 	General: Indicates potential issues with the receiver. Good State: Will usually be off. If the noise threshold reading remains below 100 for too long, this LED will flash a 2 second ON/OFF pattern, indicating a possible hydrophone issue.
Blue Surface mount LED 	If this light is on, then the main processor is interacting (probably writing) with the SD card. This LED is right next to the USB-B port.
Four surface mount LEDs by SN 	Indicates DSP events. If none of these turn on after monitoring for at least 15-30 seconds, there could be an issue with the receiver. These LEDs are visible on the SR3017 Model. However, for the SR3001, these LEDs are difficult to see due to their location.