SR5000 “Trident” JSATS Autonomous Node Receiver Manual

Version 1.9

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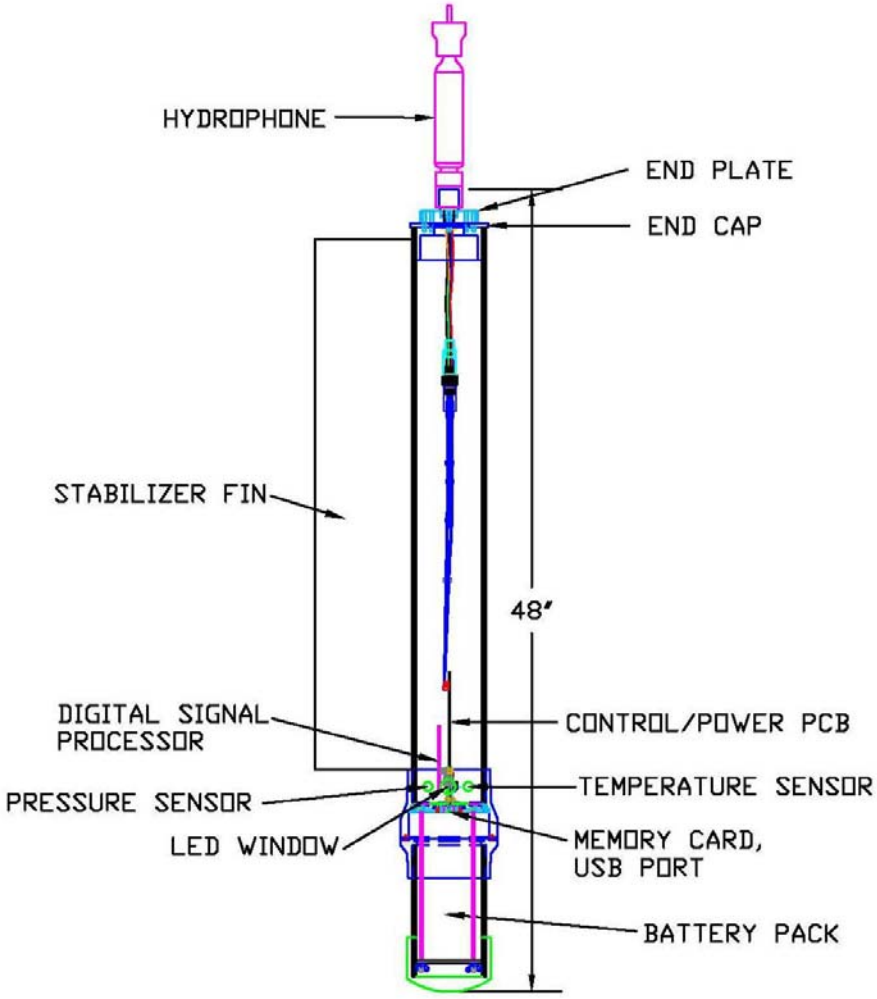
1.0 Functionality

The autonomous node receiver is designed to be a self-sufficient, data-logging unit anchored to the bottom of marine and freshwater environments. The major components of the receiver are shown in the following drawing:



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

The DSP board converts the incoming filtered signals to digital numbers for use by the DSP in its detection and decoding algorithm. The detection algorithm looks for the

existence of a tag and the decoding algorithm determines what specific tag code is present.

When a valid code is verified by the DSP it sends the code and the time of decode to the Control/Power board for storage on the CF (Compact Flash) card. The supervisory processor on the Control/Power board manages the storage of data on the CF card as well as communication with the external computer's USB connection. The Control/Power board also supplies power for the many different voltage requirements of the system.

The receiver is optionally equipped with sensors for pressure, temperature, and tilt to obtain environmental information as well as the orientation of the receiver. If the optional sensor(s) are not included the data read will be displayed as "N/A". The receiver is currently set to query the sensors and voltage every 15 seconds. If no tags are present this data will be saved to be written to the flash card as a dummy tag data at a user defined interval.

The receiver is equipped with a USB port that can be used to see real-time data. This port can be accessed when the housing is open and uses a standard USB cable. The receiver software checks for a USB connection once every 30 seconds. **If the USB connection should hang up, unplug and re-plug the connection to reestablish communication.**

The receiver is powered through the means of an on-board battery pack. The battery pack yields approximately 7.2V and comes as either a rechargeable or non-rechargeable package.

Notes:

1. The power consumption of the receiver is 55 milliamps during normal operation. Under normal operation the 15 D-cell battery pack will yield a theoretical life of 66 days. The 46800mAh rechargeable pack will last approximately 30 days.

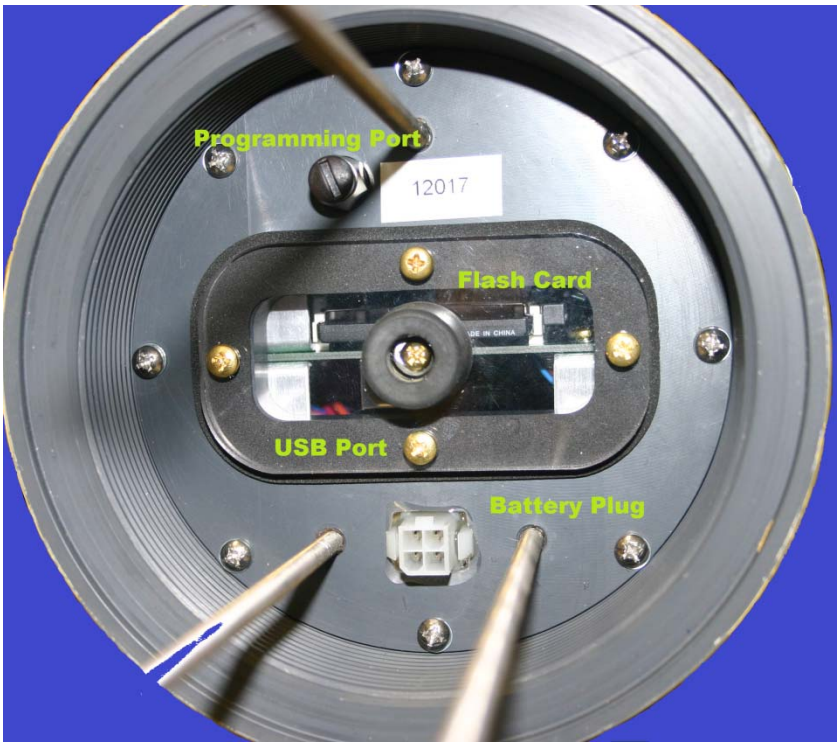
2. The recommended compact flash card is the SanDisk Ultra II, which has 2GB of capacity. **Important Note: Make sure the flash card has been formatted using the FAT16 (FAT) and not the FAT32 file system.**

3. A card reader (not supplied) is required for the CF.

2.0 Start-up

With the housing open, place a compact flash card in the slot. Connect the power by inserting the male end connector from the battery pack into the female end connector from the electronics on the top end of the receiver. See the picture at the end of this section for the location of the memory card and top end battery connection. Observe the LEDs on the outside of the receiver housing. See the table below…

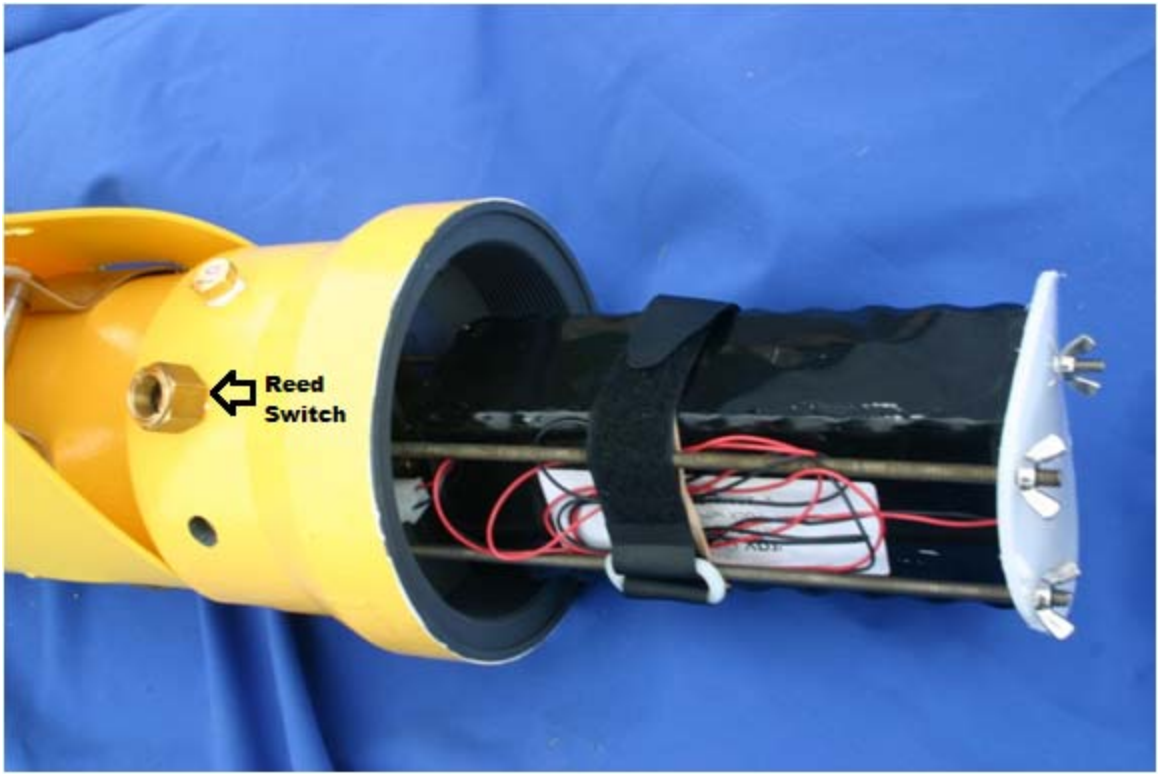
Sequence	Yellow LED	Green LED	Red LED	Event	Description
Initialization Sequence					
1	x	On	On	Power Up	Short Flash.
2	x	_	_	Port Initialization	The Green and Red LEDs are in undefined states.
3	x	On	Off	Waiting on DSP for Version information	Flashing Green.
4	x	On	Off	DPS version retrieved	
5	On	_	Off	CF functionality initialization	
6	Off	Off	Off	Main Routine starting	
Main Routine					
1	On	On	Off	Writing data to the CF Card	This will happen for CF card insertion, the start of the main routine after power up and whenever there is data to be written. Data will be written at least once every two minutes and more often when lots of tags are present.
2	Off	On	Off	Reading sensors and voltage values	This happens every fifteen seconds
3	Off	Off	On	Tag data decoded	
x = Yellow will be on only if CF card is inserted					



Notes: The programming port can be used to update the software that is on the supervisory board. The clear cover over the flash card port can be left off if quicker access during deployment is desired.

Place battery as shown below. The setup is designed to allow the primary or rechargeable packs to be used as desired without having to the battery wire running between the top and bottom parts of the receiver case. Alternatively, the threaded rods could be removed and the battery pack placed in the bottom part of the housing with a plug.

Secure the housing for deployment. Ensure the #429 EPDM o-ring is seated in the flange groove and the sealing area is clean. Use five inch spanner wrenches to firmly seat the o-ring. It should not be possible for the o-ring to squeeze from the groove.



Placement of the hydrophone is shown below. Use of the eyebolt is optional if you feel support is needed in addition to the cover.

3.0 Status Check

While the housing is closed, a basic status check shown below can be initiated. To start swipe the housing with a magnet near the LED bezel.

- Reed switch triggered.
- Green and red LEDs turn on.
- Checks if it is logging to the CF card.
- Checks if battery voltage is >=6 volts.
- Checks basic sensor functionality.
- Green LED flashes multiple times, the yellow LED may flash once and the red LED remains solid, while system check is in progress.
- If the test is a fail, it will turn keep the red LED on. (Note: The red LED may flash off momentarily at this point if tag data is being decoded.) If it is a pass, both LEDs are off and start flashing as defined by the main routine section in section 2.

4.0 Interface Software

The ATS Trident Receiver interface software is contained on a compact disk sent as part of the receiver package. The software is compatible with Windows XP, Vista and Windows 7 operating systems. Load the CD, click on the setup executable and follow the instructions.

USB Driver Installation: After the interface software has been installed the USB driver will need to be installed as a separate step. The driver installation can be initiated from the Start Menu by going to ‘Advanced Telemetry Systems, Inc \ ATS Trident Receiver’ and selecting the option to install the USB driver.

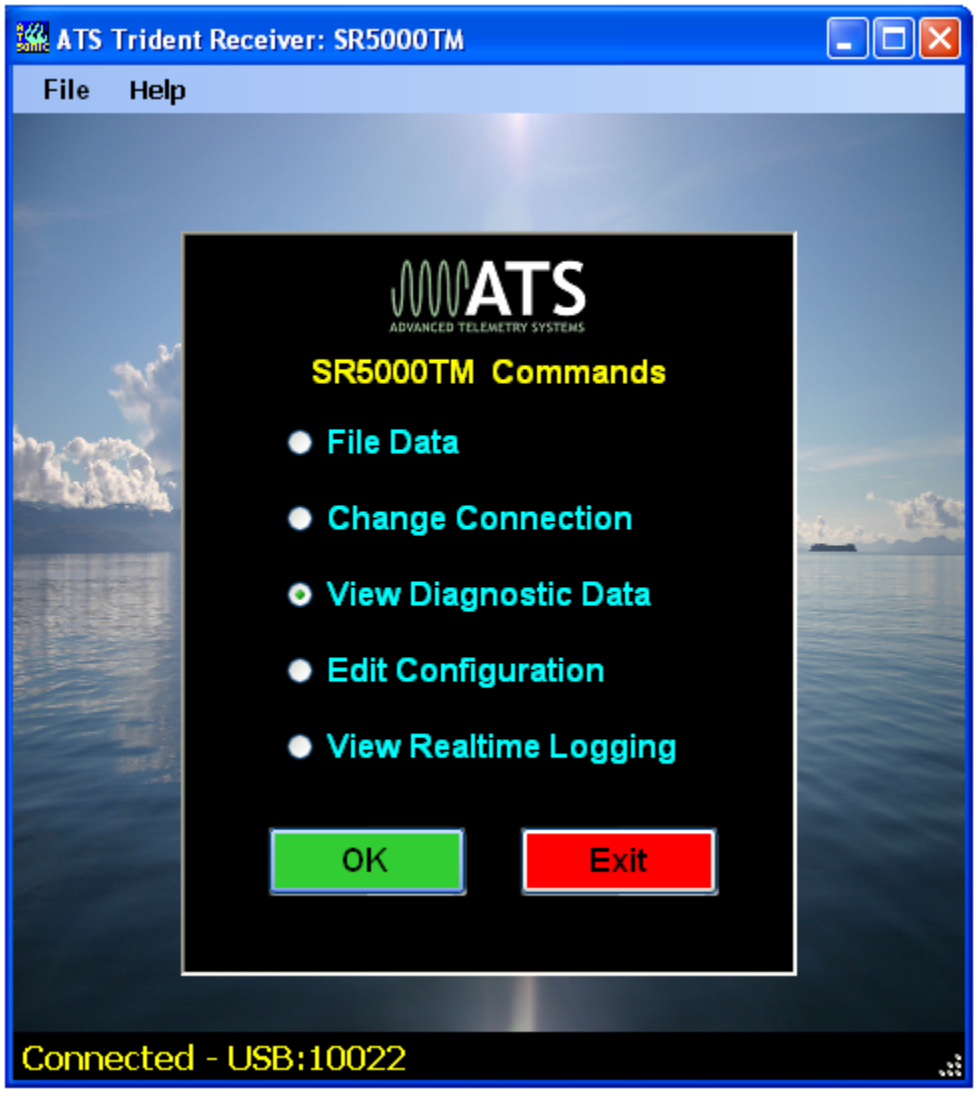
4.1 Select Communication Method (Change Connection):

The first screen that appears when the software is run is shown below:

The USB Communication mode allows for real-time data viewing while the housing is open. Enter the serial number of the receiver and click OK.

4.2 Main Command Window:

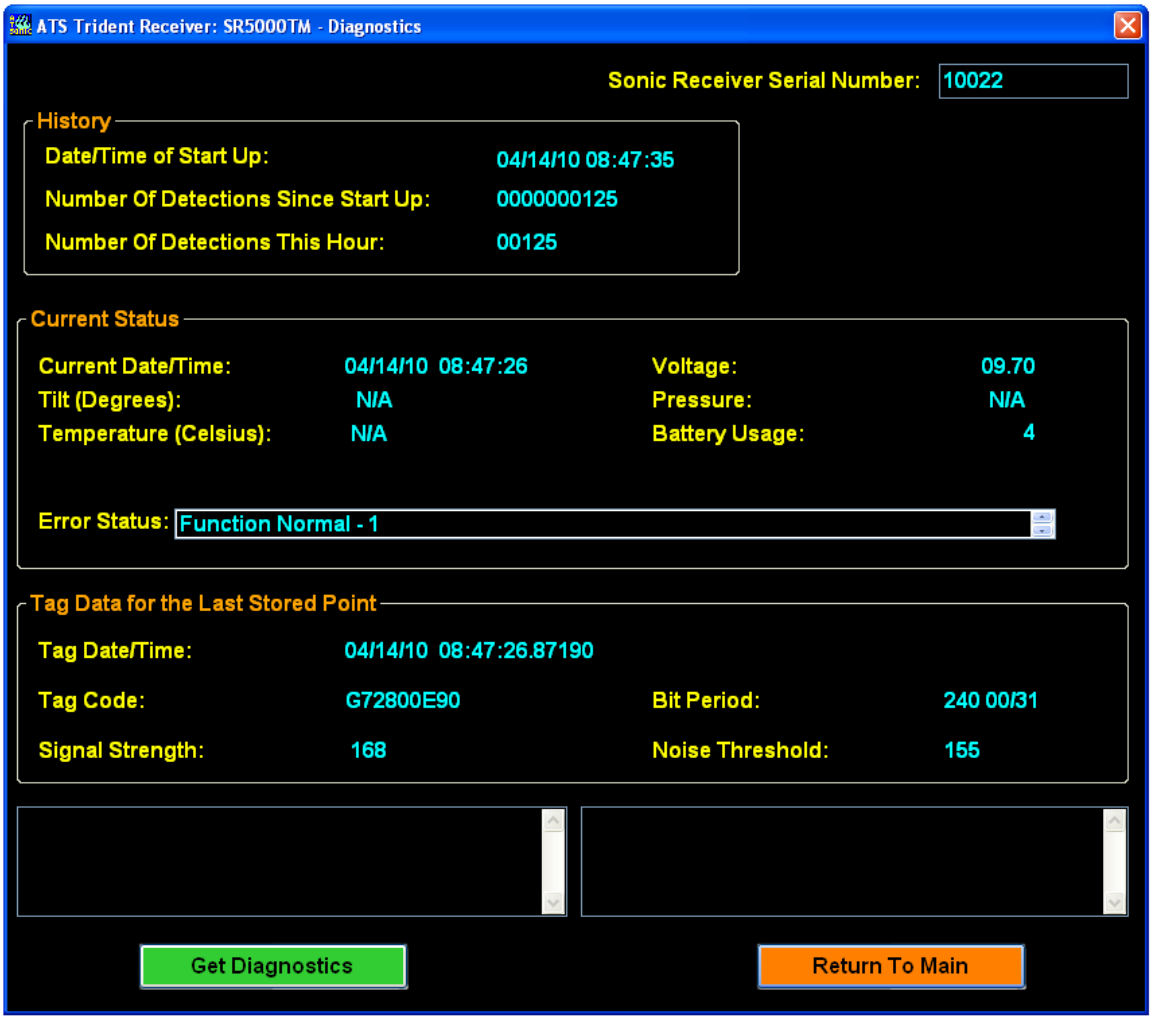
The following screen appears:



The USB connection allows you to update the configuration - “Edit Configuration” , view the tags as they are being decoded - “View Realtime Logging” and view runtime information - “View Diagnostic Data” .

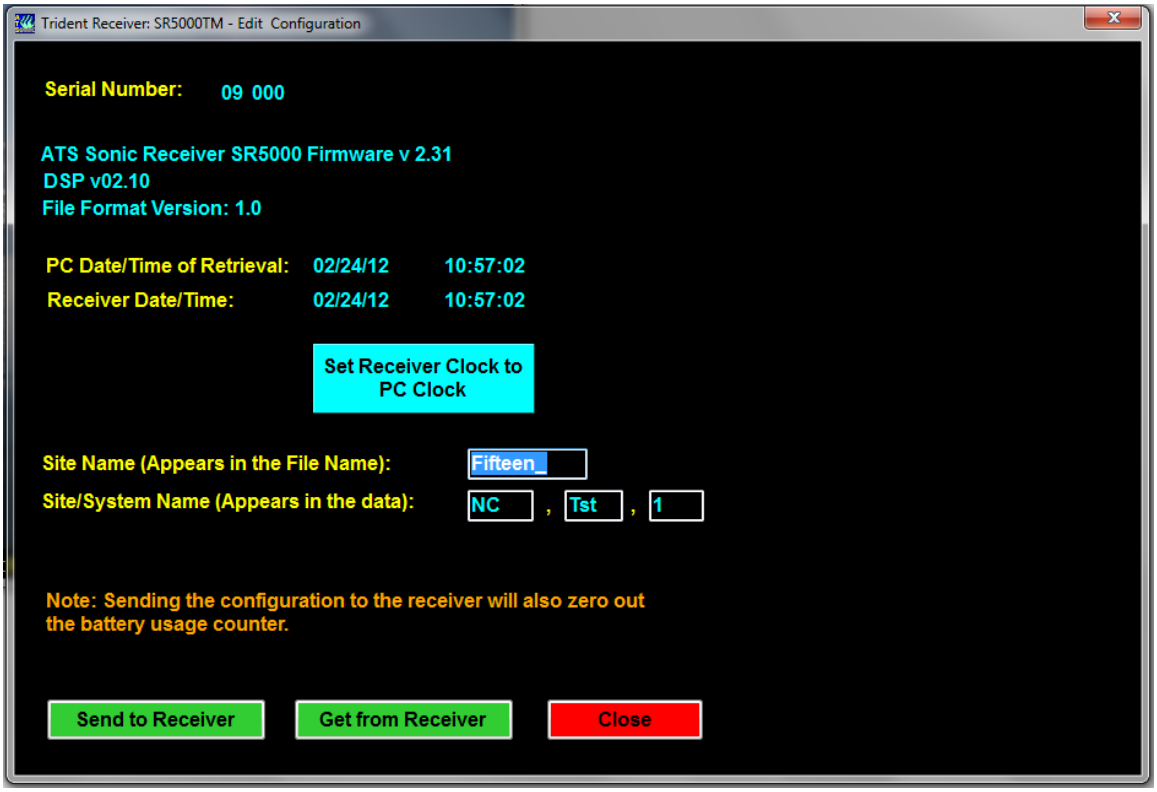
4.3 View Diagnostic Data:

If the Sonic Modem is selected for communication, the main command window will be skipped and instead will open the following:



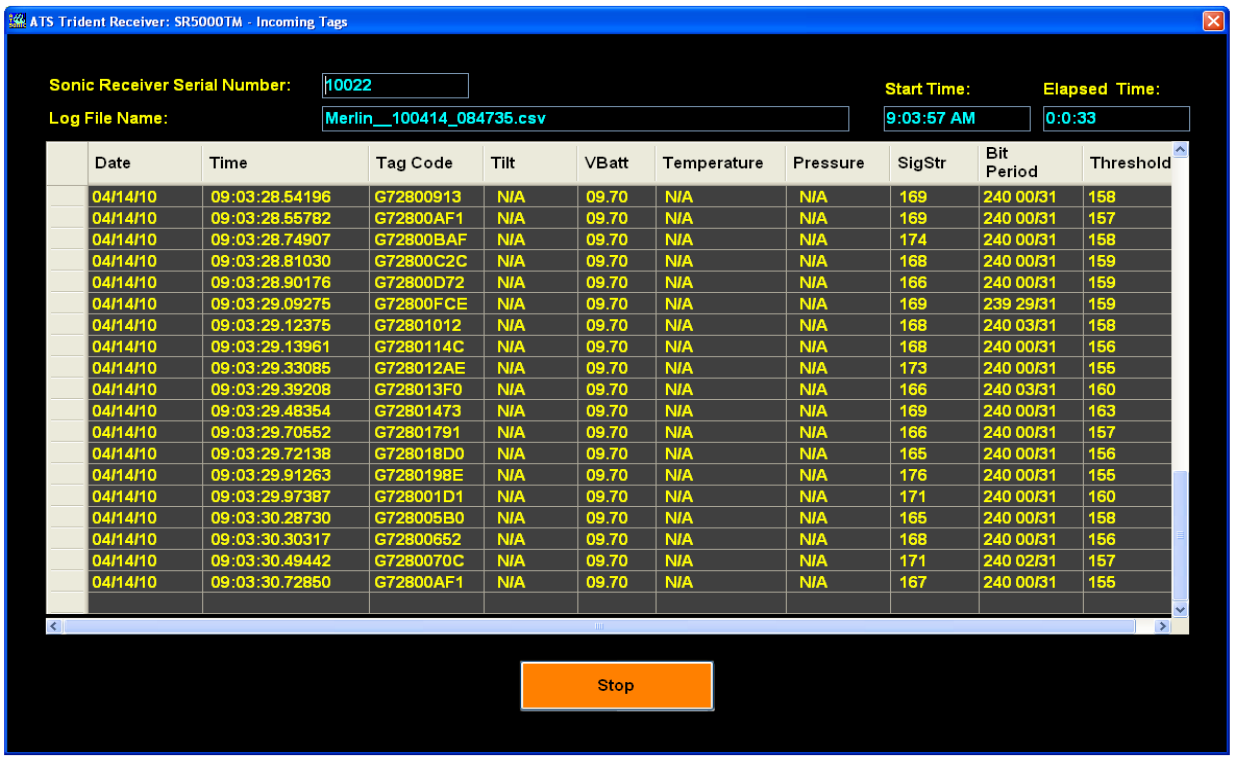
This function provides a snapshot of what the current status of the receiver is. A new log file is opened along with this window that saves a copy of the data shown on the screen. These log files are kept in the 'C:\Program Files\Advanced Telemetry Systems, Inc\ATS Trident Receiver SR5000TM\Log' folder.

4.4 Edit Configuration:



This function accessed by the USB connection allows access to the Trident receiver's configuration. Apon entering this screen the receiver will also enter a special timekeeping mode so that it can continuously update the time portion of the display in realtime. To update the time and date on the receiver so it matches the PC's click on the blue button and the PC time and date will be sent over to the Trident receiver. This is done separately from the rest of the configuration data which is sent over by clicking on the green button located at the bottom of the screen. When finished make sure to click on the red "Close" button so the receiver will get the command to exit the timekeeping mode. Otherwise dong a power cycle on the receiver will accomplish the same thing.

4.5 View Real Time Logging:



Date	Time	Tag Code	Tilt	VBatt	Temperature	Pressure	SigStr	Bit Period	Threshold
04/14/10	09:03:28.54196	G72800913	N/A	09.70	N/A	N/A	169	240 00/31	158
04/14/10	09:03:28.55782	G72800AF1	N/A	09.70	N/A	N/A	169	240 00/31	157
04/14/10	09:03:28.74907	G72800BAF	N/A	09.70	N/A	N/A	174	240 00/31	158
04/14/10	09:03:28.81030	G72800C2C	N/A	09.70	N/A	N/A	168	240 00/31	159
04/14/10	09:03:28.90176	G72800D72	N/A	09.70	N/A	N/A	166	240 00/31	159
04/14/10	09:03:29.09275	G72800FCE	N/A	09.70	N/A	N/A	169	239 29/31	159
04/14/10	09:03:29.12375	G72801012	N/A	09.70	N/A	N/A	168	240 03/31	158
04/14/10	09:03:29.13961	G7280114C	N/A	09.70	N/A	N/A	168	240 00/31	156
04/14/10	09:03:29.33085	G728012AE	N/A	09.70	N/A	N/A	173	240 00/31	155
04/14/10	09:03:29.39208	G728013F0	N/A	09.70	N/A	N/A	166	240 03/31	160
04/14/10	09:03:29.48354	G72801473	N/A	09.70	N/A	N/A	169	240 00/31	163
04/14/10	09:03:29.70552	G72801791	N/A	09.70	N/A	N/A	166	240 00/31	157
04/14/10	09:03:29.72138	G728018D0	N/A	09.70	N/A	N/A	165	240 00/31	156
04/14/10	09:03:29.91263	G7280198E	N/A	09.70	N/A	N/A	176	240 00/31	155
04/14/10	09:03:29.97387	G728001D1	N/A	09.70	N/A	N/A	171	240 00/31	160
04/14/10	09:03:30.28730	G728005B0	N/A	09.70	N/A	N/A	165	240 00/31	158
04/14/10	09:03:30.30317	G72800652	N/A	09.70	N/A	N/A	168	240 00/31	156
04/14/10	09:03:30.49442	G7280070C	N/A	09.70	N/A	N/A	171	240 02/31	157
04/14/10	09:03:30.72850	G72800AF1	N/A	09.70	N/A	N/A	167	240 00/31	155

Another function accessed by the USB connection. This displays the data as it is being picked up by the Trident Receiver in blocks of fifteen seconds. So every fifteen seconds new tags will be sent out to the screen.

4.6 Data Format

1	Site Name: WW	TN	1											
2	File Name: Isanti___091222_074343.csv													
3	Serial Number: 09011													
4	ATS Sonic Receiver SR5000 Firmware v 1.32													
5														
6	DSP v2.01													
7	File Format Version: 1.0													
8	File Start: 12/22/2009 07:43:43													
9														
10	FileName	SiteName			DateTime	TagCode	Tilt	VBatt	Temp	Pressure	SigStr	Bit Period	Threshold	
11	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:06.328042	G7207E446	6.9	9.76	25.13	123	133	240	28	
12	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:06.963848	G7224C64D	6.9	9.76	25.13	123	126	240 8/31	27	
13	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:07.073702	G722E41A5	6.9	9.76	25.13	123	113	240 10/31	28	
14	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:07.127979	G720B77F8	6.9	9.76	25.13	123	132	240 3/31	28	
15	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:07.262981	G72082837	6.9	9.76	25.13	123	113	239 28/31	28	
16	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:07.503488	G722F1258	6.9	9.76	25.13	123	135	240 4/31	28	
17	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:07.891829	G72137303	6.9	9.76	25.13	123	122	240 6/31	28	
18	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:08.492125	G7207E446	6.9	9.76	25.13	123	133	240	28	
19	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:08.873789	G72137BC1	6.9	9.76	25.13	123	135	239 17/31	28	
20	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:09.949945	G722E41A5	6.9	9.76	25.13	123	112	240 13/31	28	
21	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:09.960588	G722695E5	6.9	9.76	25.13	123	123	240 2/31	29	
22	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:10.062692	G720B77F8	6.9	9.76	25.13	123	132	240 3/31	28	
23	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:10.246740	G7224C64D	6.9	9.76	25.13	123	127	240 8/31	27	
24	Isanti___091222_074343.csv	WW	TN	1	12/22/2009 07:43:10.477437	G722F1258	6.9	9.76	25.13	123	135	240 7/31	28	

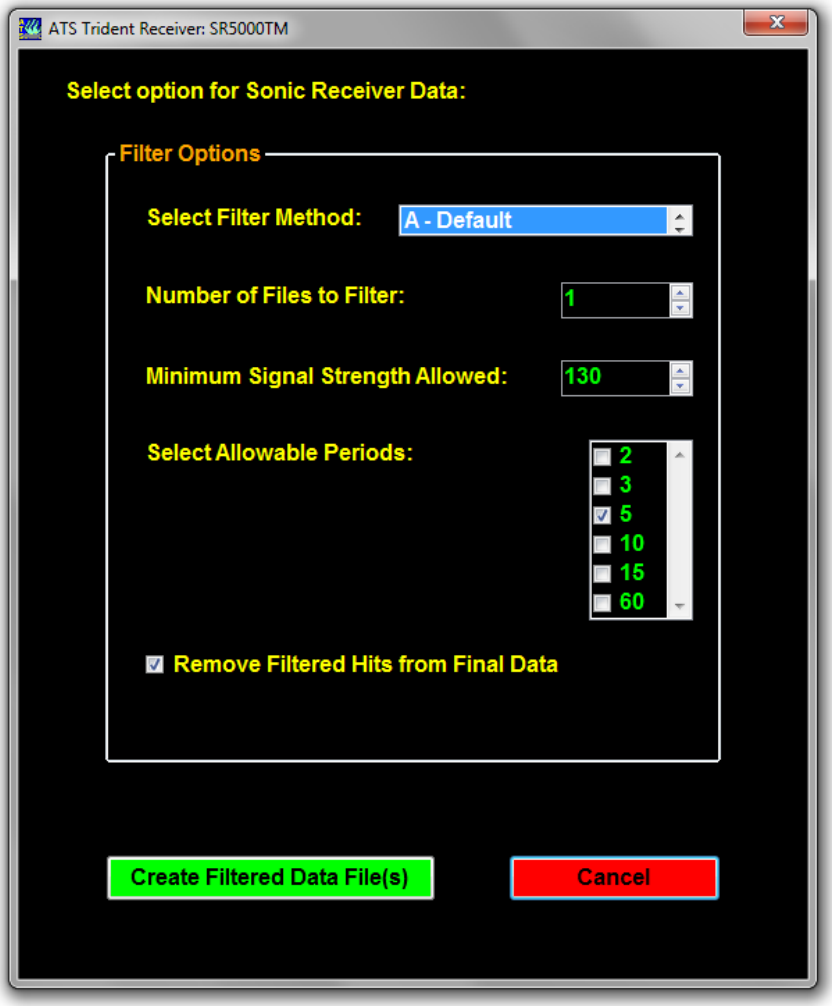
4.6.1 Header Format

Line Contents	Description
Site/System Name	Descriptive name defined by the user and separated by two commas (e.g. “WW , TN, 01).
Data File Name	8 character site name followed by date and time of file creation (e.g. “sitenameyymmdd_hhmmss.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. “09011”)
Firmware Version	The name and version of the receiver supervisory firmware and the name and version of the DSP firmware.
File Format Version	Version number of the file format
File Start Date	Date and time signal acquisition began (mm/dd/yyyy hh:mm:ss)
File End Date	Date and time signal acquisition ended (mm/dd/yyyy hh:mm:ss) Appears at the end of the data set.

4.6.2Data File Format

Column Name	Description
FileName	8 character site name followed by date and time of file creation (e.g. “sitenameyymmdd_hhmmss.csv”
Site Name	Descriptive name defined by the user and separated by two commas (e.g. “WW , TN, 01”).
DateTime	Date recorded as mm/dd/yyyy. Time of detection, defined as the time the signal arrives at the hydrophone (TOA) and shall be recorded with microsecond precision (hh:mm:ss.ssssss)
TagCode	9 digit tag code as decoded by receiver (e.g. “G720837eb”) G72ffffff is used as a dummy tag for data recorded when no tag is present.
Tilt	Tilt of the receiver (degrees). This will appear as “N/A” if the sensor has not been included.
VBatt	Voltage of the receiver batteries (V.VV).
Temp	Temperature (C.CCº). This will appear as “N/A” if the sensor has not been included.
Pressure	Pressure outside of receiver (absolute PSI). This will appear as “N/A” if the sensor has not been included.
Sig Str	The logarithmic value for signal strength (in DB) “-99” signifies a signal strength value for an absent tag
Bit Period	Optimal sample rate at 10 M samples per sec (related to tag frequency)
Threshold	The logarithmic measurement of background noise used for tag detection threshold.

4.7 File Data



This option does not make use of an active USB connection. It takes as input one or more of the Trident Receiver files residing on your computer that have been copied over from the CF card(s). It post processes the data by filtering out invalid data, splitting the files into smaller chunks and summarizing run data. This routine can take awhile to process all the data so it allows a number of files to be processed at a time. As it processes the data summary information will be displayed. Before starting the routine, make sure to check the boxes next to the periods of the sonic transmitters you used.

4.8 Filter Data File Format

When the filter option from the File Data dialog is finished running there will be a number of new files created. They will consist of 4 different types.

Example input file name:

Merlin_100809_092810.csv

4.8.1 Filter File Type 1

Example type 1 output file names:

Merlin_100809_092810_Log1_1.csv
Merlin_100809_092810_Log1_0809_0928_2.csv
Merlin_100809_092810_Log2_0810_0849_1.csv
Merlin_100809_092810_Log2_0810_0849_2.csv
.
.
.

The input file can contain multiple logging sessions which are defined to be a power on off or the insert and removal of a CF card. The input file can be larger than some programs like Excel can handle. Type 1 files are partitioned copies of the input file. These partitions isolate data into files according to the log session and they keep the files smaller than 50,000 lines of data.

4.8.2 Filter File Type 2

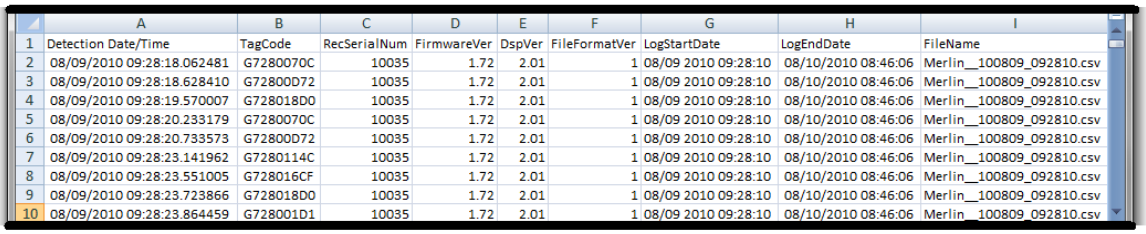
Example type 2 output file names when the “A – Default” selection in the File Data dialog was selected:

Merlin_100809_092810_DData_Log1_0809_0928_1.csv
Merlin_100809_092810_DData_Log1_0809_0928_2.csv
Merlin_100809_092810_DData_Log2_0810_0849_1.csv
Merlin_100809_092810_DData_Log2_0810_0849_2.csv
.
.
.

Example type 2 output file names when the “B – Minimum Mode” selection in the File Data dialog was selected:

Merlin_100809_092810_MData_Log1_0809_0928_1.csv
Merlin_100809_092810_MData_Log1_0809_0928_2.csv
Merlin_100809_092810_MData_Log2_0810_0849_1.csv
Merlin_100809_092810_MData_Log2_0810_0849_2.csv
.
.
.

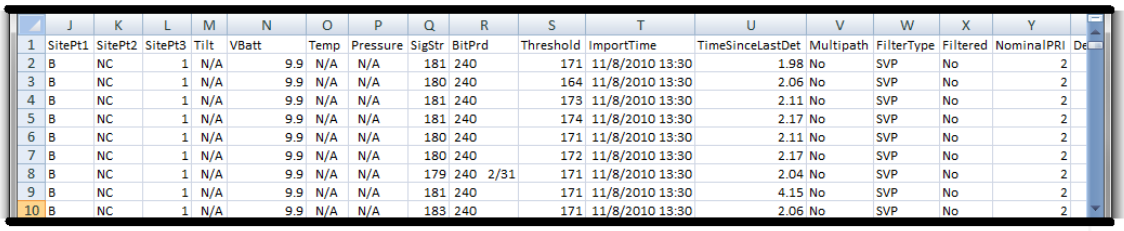
Type 2 files have all the information of the Type 1 files with additional information added on. This file will not include rejected data if the filter was run with the "Remove Filtered Hits from Final Data" checkbox checked from the File Data dialog.



	A	B	C	D	E	F	G	H	I
1	Detection Date/Time	TagCode	RecSerialNum	FirmwareVer	DspVer	FileFormatVer	LogStartDate	LogEndDate	FileName
2	08/09/2010 09:28:18.062481	G7280070C	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
3	08/09/2010 09:28:18.628410	G72800D72	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
4	08/09/2010 09:28:19.570007	G728018D0	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
5	08/09/2010 09:28:20.233179	G7280070C	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
6	08/09/2010 09:28:20.733573	G72800D72	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
7	08/09/2010 09:28:23.141962	G7280114C	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
8	08/09/2010 09:28:23.551005	G728016CF	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
9	08/09/2010 09:28:23.723866	G728018D0	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv
10	08/09/2010 09:28:23.864459	G728001D1	10035	1.72	2.01	1	08/09 2010 09:28:10	08/10/2010 08:46:06	Merlin__100809_092810.csv

Column Name	Description
Detection Date/Time	Date recorded as mm/dd/yyyy. Time of detection, defined as the time the signal arrives at the hydrophone (TOA) and shall be recorded with microsecond precision (hh:mm:ss.ssssss)
TagCode	9 digit tag code as decoded by receiver (e.g. "G7280070C") G72fffffff is used as a dummy tag for data recorded when no tag is present.
RecSerialNum	A five character serial number that designates the year of receiver production and three characters that designate sequential production number (e.g. "10035")
FirmwareVer	The version of the receiver supervisory firmware.
DspVer	The version of the DSP firmware.
FileFormatVer	Version number of the file format.
LogStartDate	Date and time signal acquisition began for this logging session (mm/dd/yyyy hh:mm:ss)
LogEndDate	Date and time signal acquisition finished for this logging session (mm/dd/yyyy hh:mm:ss)

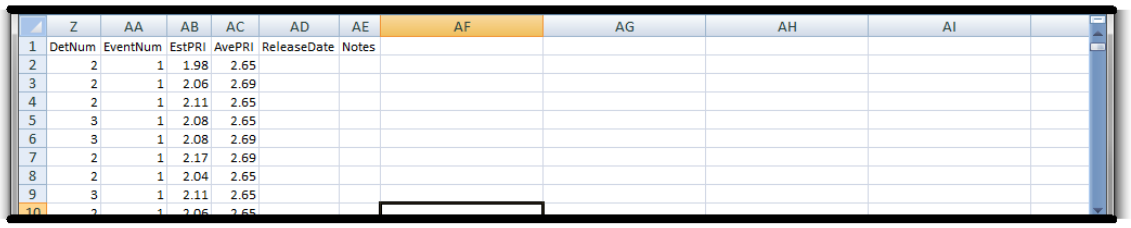
FileName	Data source file name created by the Trident Receiver. 8 character site name followed by date and time of file creation (e.g. “sitenameyymmdd_hhmmss.csv”



	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1	SitePt1	SitePt2	SitePt3	Tilt	VBatt	Temp	Pressure	SigStr	BitPrd	Threshold	ImportTime	TimeSinceLastDet	Multipath	FilterType	Filtered	NominalPRI	De
2	B	NC	1	N/A	9.9	N/A	N/A	181	240	171	11/8/2010 13:30	1.98	No	SVP	No	2	
3	B	NC	1	N/A	9.9	N/A	N/A	180	240	164	11/8/2010 13:30	2.06	No	SVP	No	2	
4	B	NC	1	N/A	9.9	N/A	N/A	181	240	173	11/8/2010 13:30	2.11	No	SVP	No	2	
5	B	NC	1	N/A	9.9	N/A	N/A	181	240	174	11/8/2010 13:30	2.17	No	SVP	No	2	
6	B	NC	1	N/A	9.9	N/A	N/A	180	240	171	11/8/2010 13:30	2.11	No	SVP	No	2	
7	B	NC	1	N/A	9.9	N/A	N/A	180	240	172	11/8/2010 13:30	2.17	No	SVP	No	2	
8	B	NC	1	N/A	9.9	N/A	N/A	179	240 2/31	171	11/8/2010 13:30	2.04	No	SVP	No	2	
9	B	NC	1	N/A	9.9	N/A	N/A	181	240	171	11/8/2010 13:30	4.15	No	SVP	No	2	
10	B	NC	1	N/A	9.9	N/A	N/A	183	240	171	11/8/2010 13:30	2.06	No	SVP	No	2	

SitePt1	Site name part 1. Descriptive name defined by the user.
SitePt2	Site name part 2. Descriptive name defined by the user.
SitePt3	Site name part 3. Descriptive name defined by the user.
Tilt	Tilt of the receiver (degrees). This will appear as “N/A” if the sensor has not been included.
VBatt	Voltage of the receiver batteries (V.VV).
Temp	Temperature (C.CC^{o}). This will appear as “N/A” if the sensor has not been included.
Pressure	Pressure outside of receiver (absolute PSI). This will appear as “N/A” if the sensor has not been included.
SigStr	The logarithmic value for signal strength (in DB) “-99” signifies a signal strength value for an absent tag
BitPrd	Optimal sample rate at 10 M samples per sec (related to tag frequency)
Threshold	The logarithmic measurement of background noise used for tag detection threshold.
ImportTime	Date and time this file was created (mm/dd/yyyy hh:mm:ss)
TimeSince LastDet	Elapsed time in seconds since the last detection of this code.
Multipath	Yes/No value indicating if the detection was from a reflected signal.
FilterType	SVP (Default)/ MinMode value indicating the choice of filtering algorithm used on this data.
Filtered	Yes/No value indicating if this data has been rejected.

NominalPRI	The assumed programmed value for the tag's pulse rate interval.



Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
DetNum	EventNum	EstPRI	AvePRI	ReleaseDate	Notes				
2	1	1.98	2.65						
2	1	2.06	2.69						
2	1	2.11	2.65						
3	1	2.08	2.65						
3	1	2.08	2.69						
2	1	2.17	2.69						
2	1	2.04	2.65						
3	1	2.11	2.65						

DetNum	The current detection number for this accepted code, or if followed by an asterisk, the count of previously rejected hits for this code.
EventNum	This count increases if there is a reacquisition of this code after an acquisition loss. For the SVP method this loss needs to be >= 30 minutes. For MinMode an acquisition loss happens if there are less than 4 hits contained within an acceptance window of 12 nominal PRIs.
EstPRI	The estimated PRI value.
AvePRI	The average PRI value.
ReleasedDate	
Notes	

4.8.3 Filter File Type 3

Example type 3 output file names:

Merlin_100809_092810_FilteredOut_Log1_0809_0928_1.csv
Merlin_100809_092810_FilteredOut_Log1_0809_0928_2.csv
Merlin_100809_092810_FilteredOut_Log2_0810_0849_1.csv
Merlin_100809_092810_FilteredOut_Log2_0810_0849_2.csv
.
.
.

Type 3 files have the detection data for rejected codes.

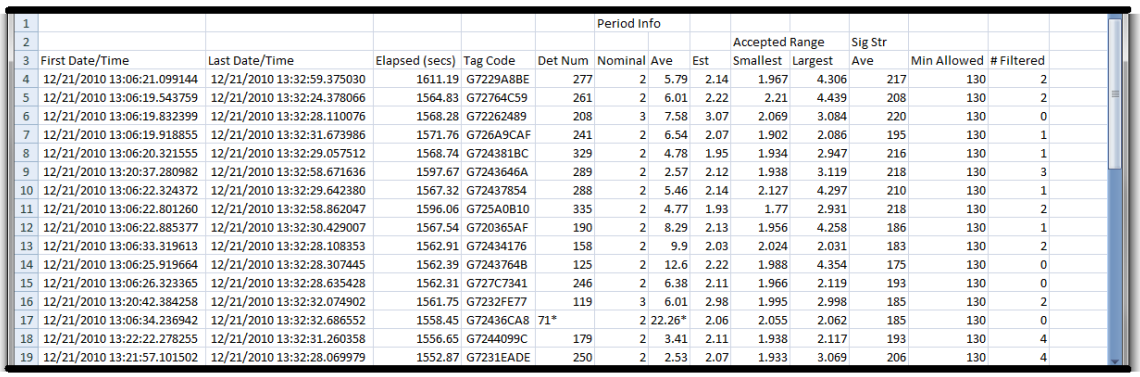
4.8.4 Filter File Type 4

Example type 4 output file names:

Merlin_100809_092810_summary_Log1_0809_0928_1.csv

Merlin_100809_092810_summary_Log1_0809_0928_2.csv
Merlin_100809_092810_summary_Log2_0810_0849_1.csv
Merlin_100809_092810_summary_Log2_0810_0849_2.csv
.
.
.

Type 4 files have the synopsis of data contained in the earlier files.



						Period Info							
								Accepted Range		Sig Str			
First Date/Time	Last Date/Time	Elapsed (secs)	Tag Code	Det Num	Nominal	Ave	Est	Smallest	Largest	Ave	Min Allowed	# Filtered	
12/21/2010 13:06:21.099144	12/21/2010 13:32:59.375030	1611.19	G7229A8BE	277	2	5.79	2.14	1.967	4.306	217	130	2	
12/21/2010 13:06:19.543759	12/21/2010 13:32:24.378066	1564.83	G72764C59	261	2	6.01	2.22	2.21	4.439	208	130	2	
12/21/2010 13:06:19.832399	12/21/2010 13:32:28.110076	1568.28	G72262489	208	3	7.58	3.07	2.069	3.084	220	130	0	
12/21/2010 13:06:19.918855	12/21/2010 13:32:31.673986	1571.76	G726A9CAF	241	2	6.54	2.07	1.902	2.086	195	130	1	
12/21/2010 13:06:20.321555	12/21/2010 13:32:29.057512	1568.74	G724381BC	329	2	4.78	1.95	1.934	2.947	216	130	1	
12/21/2010 13:20:37.280982	12/21/2010 13:32:58.671636	1597.67	G7243646A	289	2	2.57	2.12	1.938	3.119	218	130	3	
12/21/2010 13:06:22.324372	12/21/2010 13:32:29.642380	1567.32	G72437854	288	2	5.46	2.14	2.127	4.297	210	130	1	
12/21/2010 13:06:22.801260	12/21/2010 13:32:58.862047	1596.06	G725A0B10	335	2	4.77	1.93	1.77	2.931	218	130	2	
12/21/2010 13:06:22.885377	12/21/2010 13:32:30.429007	1567.54	G720365AF	190	2	8.29	2.13	1.956	4.258	186	130	1	
12/21/2010 13:06:33.319613	12/21/2010 13:32:28.108353	1562.91	G72434176	158	2	9.9	2.03	2.024	2.031	183	130	2	
12/21/2010 13:06:25.919664	12/21/2010 13:32:28.307445	1562.39	G7243764B	125	2	12.6	2.22	1.988	4.354	175	130	0	
12/21/2010 13:06:26.323365	12/21/2010 13:32:28.635428	1562.31	G727C7341	246	2	6.38	2.11	1.966	2.119	193	130	0	
12/21/2010 13:20:42.384258	12/21/2010 13:32:32.074902	1561.75	G7232FE77	119	3	6.01	2.98	1.995	2.998	185	130	2	
12/21/2010 13:06:34.236942	12/21/2010 13:32:32.686552	1558.45	G72436CA8	71*	2	22.26*	2.06	2.055	2.062	185	130	0	
12/21/2010 13:22:22.278255	12/21/2010 13:32:31.260358	1556.65	G7244099C	179	2	3.41	2.11	1.938	2.117	193	130	4	
12/21/2010 13:21:57.101502	12/21/2010 13:32:28.069979	1552.87	G7231EADE	250	2	2.53	2.07	1.933	3.069	206	130	4	

First Date/Time	Date and Time of first acquisition of the listed Tag Code. Date recorded as mm/dd/yyyy. Time of detection, defined as the time the signal arrives at the hydrophone (TOA) and shall be recorded with microsecond precision (hh:mm:ss.ssssss)
Last Date/Time	Date and Time of last acquisition of the listed Tag Code. Date recorded as mm/dd/yyyy. Time of detection, defined as the time the signal arrives at the hydrophone (TOA) and shall be recorded with microsecond precision (hh:mm:ss.ssssss)
Elapsed	Time difference in seconds between the first two columns.
Tag Code	9 digit tag code as decoded by receiver (e.g. “G7229A8BE”)
Det Num	The number of valid detections for the listed tag code. If an “*” is present the Tag Code was filtered out as a false positive.
Nominal	The assumed programmed value for the tag codes’ pulse rate interval.
Ave	The average PRI value. An adjacent “*” indicates it was > then 7 periods long.
Est	The estimated PRI value.
Smallest	The smallest PRI that was a valid value. The PRIs checked off in the File Data dialog are used to determine the set of acceptable PRIs.

Largest	The largest PRI that was a valid value. The PRIs checked off in the File Data dialog are used to determine the set of acceptable PRIs.
Sig Str Ave	The average signal strength of the valid data for the listed tag code.
Min Allowed	Lower Signal strength values are filtered out.
# Filtered	Number of acquisitions for the listed tag code that have been filtered out.