ATS
G2110E Iridium/GPS Location Collar

User's Manual

IMPORTANT: Your G2110E Collar HAS NOT BEEN PROGRAMMED for operation. You must program it in order for it to function. In addition, the Iridium data service for the collar is not active. Please contact ATS to activate the service.

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Section 1   Introduction

Thank you for purchasing an ATS Iridium/GPS Collar. The collar you have received has not had a fix schedule program downloaded to it. You will need to load a fix schedule program into the GPS Collar to control the collar's operation. The software you received with the GPS Collar, ATSFixes for Satellite Collars, will guide you through this process. Complete *help*

documentation is available within the different software pages, indicated by the [?] icon. Click on the icon for *help* details.

The magnet you see attached to the GPS Collar keeps it running at a lower current. While you are not using your GPS Collar, leave the magnet attached.

Section 2   Theory of Operation

The ATS GPS Collar model G2110E consists of five different assemblies:

1) the collar belting, or attachment mechanism, 2) an electronics housing, which is attached to the collar belting, and which includes the collar release mechanism, 3) a VHF antenna, 4) a GPS antenna, and 5) an Iridium satellite modem antenna.

The electronics housing consists of two separate battery packs- a primary battery and a backup battery. These batteries power the electronics located inside the housing: a VHF transmitter, like those found on traditional VHF beacon collars, a GPS receiver chipset, and an Iridium satellite modem. Each has its own antenna, as noted above.

The collar is shipped with a magnet taped into place with yellow vinyl tape. When the magnet is in this position, the collar is running at the its lowest current drain. Removing the magnet from the collar will result in an automatic 5 minutes of VHF beeps regardless of the collar's program.

The model G2110E stores all the location data in the flash memory of the collar's electronics. Location data is sent periodically to the Iridium satellite, where it is down- linked to Iridium Corporation's ground based reception and processing center, thence sent via the web to ATS's Hosting Computer. The data is then automatically emailed to you according to the schedule you chose.

The data may also be retrieved by connecting the collar to a PC and downloading the data via the ATSFixes software. The VHF transmitter is used to locate the animal in order to retrieve the collar. The collar may be refurbished at ATS's facility.

The G2110E uses a drop-off mechanism, known as a firing "squib" to break the collar off of the animal. It can be activated when a command is sent via the Iridium satellite or when low battery mode is reached if this option was enabled during programming.

Section 3   Using ATS*Fixes* for Satellite Collars Software

Installing ATS*Fixes* for Satellite Collars Software

To install ATS*Fixes* for Satellite Collars Software, double click on the setup file located on the CD supplied with the collar. The software will be installed on your computer, and you can find it later under the programs list on your computer.

The installation for the ATS*Fixes* for Satellite Collars software will create some folders on the C: (hard) drive of your computer. Every time you upload a program to a collar, two files will be created and added to the folders. These files contain all the information for the program you uploaded to the collar, including the serial number of the collar. If you ever have doubts about how you programmed a collar or what VHF frequency the collar is transmitting on, you can look up the information in these files. These files are stored in the C:/Advanced Telemetry Systems, Inc./GPS/GPS_COLLAR_PROGRAMS folder.

Programming Your GPS Collar

The fix schedule program you create for the GPS Collar will control the GPS fix schedule, the maximum GPS attempt duration, when the VHF transmitter is on, the satellite transmission rate, the mortality period, and the time zone setting of the data. The program will also determine if the collar will release when the main battery is low and when to observe activity for the collar.

Saving GPS Collar Programs

If you have several collars that need to be programmed using an identical program, you may compose and save a program, and load it into additional collars. Once a program has been saved, it is listed under the GPS Collar Programs. Simply choose the program that you wish to load into the collars.

Life Estimation

The ATSFixes for Satellite Collars Programming Software will estimate the life that you can expect from your GPS Collar. If you need more life from your GPS Collar than what is estimated, you can go back and adjust the program to give your GPS Collar a longer life. You might decide to take fewer fixes each day, or you might program the VHF beacon to operate on a limited basis, also called a transmitter duty cycle.

Important Note: calculations for Life estimates assume that the batteries are new.

Steps to Start GPS Collar Programming
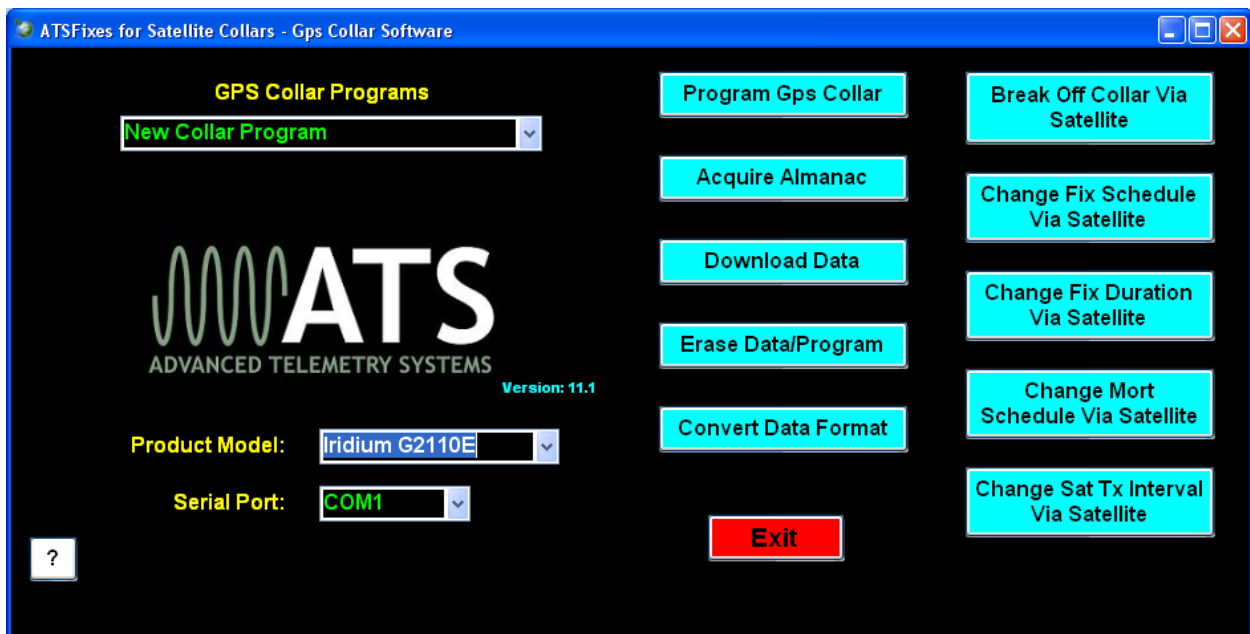
To load a program into the GPS Collar, it will need to be connected to the serial port of your computer (see steps 2-5 below). If you will only be creating a program to be saved for later use, then connecting the serial port cable is not necessary. Note: Remove magnet prior to programming.

1. Open the ATS*Fixes* for Satellite Collars*Software. The software will recognize all serial ports available when starting.

2. Expose the communication port of the GPS collar. The communication port is located under the collar belting, on the side opposite the release mechanism. To get to it, remove the lock nuts and lift the collar's lift flap on that side. Then remove the port cover with a screwdriver.

3. Gently connect the supplied yellow cable (GPS Offload Cable, PN16491) to the communication port of the GPS collar being careful to line up the connector keys.

4. Plug the other end of the yellow download cable into the serial (com) port of your computer. If your computer doesn't have a serial port, then use a USB to Serial Port converter cable.

5. Click on the Program GPS Collar button to start creating a program for the GPS Collar. If you are copying a previously stored program then you will need to pick that program from the list of programs, otherwise the GPS Collar Program will be shown as New Collar Program.

6. Fill in the information in each step of the ATS*Fixes* for Satellite Collars software. Each screen has a Help button, if needed. Note that no offset exists to distinguish between standard time and daylight savings time. Even if your study area has daylight savings time during all or part of your study, the resulting data results will be in local time, without daylight savings time taken into account.

7. After the fix schedule program has been configured with the ATS*Fixes* for Satellite Collars *S*oftware, it will need to be loaded into the GPS Collar. To start this process, click on the Program Collar button in the Step 3: Life, Breakoff, Activity Data window. Click OK on the following dialog box. When 'Connecting to the Gps Collar' appears across the bottom of the window, touch/slide the supplied magnet across the two white dots on the case and remove. Touching the magnet to the collar tells the collar that the PC will be sending information to it.

8. When the GPS Collar is done loading up the user's program, there will be a beep and a message to the PC's screen.

9. Disconnect the yellow cable from the collar and replace the port cover. This connector is fully sealed and serves to keep debris out, ensuring a reliable connection will be made in order to download data, once the collar is recovered. Refasten the collar flap to the case and tighten the nuts securely using the supplied nut driver.

Note: Should an unintentional firing of the release mechanism occur at any point, please contact ATS for additional instructions.

Reprogramming a GPS Collar

If you want to change the program of a GPS Collar, you will need to first erase the current program (and any stored data). Use the Erase Data/Program button to erase the GPS Collar program and data before reprogramming it. **Be sure that you have first downloaded any stored data you wish to keep.**

Section 4   Operating the GPS Collar

Acquiring the GPS Almanac

Almanac data, which is constantly transmitted by each satellite, contains important information about the status of the orbiting GPS satellites (healthy or unhealthy), and the current date and time. This part of the signal is essential for determining a position.

Before the GPS Collar can log its first GPS fix, it will need to acquire almanac data. The GPS Collar will do this automatically when it tries to log a GPS position fix. If it determines that it doesn't have valid almanac data, it will abandon trying to log a fix and it will get an almanac instead.

Alternately, you have the option to force the GPS Collar to get current almanac data by clicking the Acquire Almanac button in the ATS*Fixes* software. The collar will need at least twelve minutes while receiving satellite information to receive almanac data. Make sure the GPS antenna is pointing towards the open sky during this process.

Interpreting the VHF Beacon Beep Patterns

The GPS Collar includes a VHF transmitter that can be used to locate the collar and/or determine its status. The VHF transmitter can be scheduled to run continuously or only during a certain interval of the day. It can be programmed to stay off for up to 23 hours each day in order to extend GPS Collar life. The VHF transmitter also has some obligatory beep patterns which you will hear regardless of whether the transmitter was scheduled to be active or not.

The different beep patterns the VHF transmitter uses are based on either a 48 pulses per minute (ppm) rate, or a 27 ppm rate. To your ear, 48 ppm will sound like one beep per second. The 27 ppm rate will sound like one beep per every two seconds. Some beep patterns have double or triple pulses, which are used to indicate various operating conditions to the listener.

If the VHF transmitter is scheduled to operate, the collar operating condition is indicated by the beep patterns below:

Normal VHF = 48 ppm.

Mortality VHF = 27 ppm (double pulse and then single pulse, repeating).

Last GPS fix successful = Normal VHF (48 ppm) with a double pulse on the 6th pulse.

Last GPS fix failed = Normal VHF (48 ppm).

Obligatory beep patterns indicate the following operating conditions:

Reset/Startup/Not programmed Collars = Slow triple pulse and then single pulse at 48ppm.

Collar attempted break off and failed = Double pulse at 27 ppm (much slower than normal VHF beep pattern).

Collar attempted break off and succeeded = 27 ppm. If activity is detected during this time, there will be a double pulse on every 3rd pulse.

After pulling off magnet = Double pulse VHF at 48 ppm for a period of 5 minutes *only*. After the 5 minutes have elapsed, the collar will revert to its regularly scheduled VHF beep pattern.

Collar is at Low Battery or Collar Failed Tests = Triple pulse at 27 ppm, continuously (much slower than normal VHF beep pattern).

If the GPS Collar has a VHF duty cycle, the 'Mortality,' 'Last GPS fix successful,' and 'Last GPS fix failed' VHF patterns will only be active during the on portion of the duty cycle. All other VHF patterns will be active regardless of the duty cycle, if applicable.

GPS Operation

During a GPS fix attempt, the VHF transmitter will be silent. A GPS attempt may last as long as the setting that was selected during programming but may also be shorter depending on the collar's view of the sky. Whether the fix attempt was successful or not will be indicated by the VHF beep pattern that follows the attempt.

Satellite Transmission Operation

During a satellite data transmission attempt, the VHF transmitter will be silent for up to 30 seconds. If the transmission is successful, an email will be sent to the email address registered for the collar. If the transmission is not successful, the collar will attempt another transmission in twelve minutes (provided that the transmission attempt does not conflict with a GPS fix attempt). If the collar fails to transmit data for ten consecutive attempts, the collar will enter **Satellite Transmission Suppression** (see Section 8 for more details).

Remote Scheduling

The GPS fix schedule of your GPS Collar can be adjusted remotely via satellite to a regular interval **(available on collars with serial number greater than 030420)**. Available intervals are (in minutes): 10, 20, 30, 90, 120, 360, 480, 720, and 1440. The schedule can also be adjusted from these intervals back to the original schedule. Note: Adjusting the fix schedule may interfere with the programmed frequency of the email transmissions.

The GPS fix attempt duration can be adjusted remotely via satellite to one of three options: 60 seconds, 120 seconds, or 180 seconds **(available on collars with serial number greater than 031040)**.

The mortality setting of the GPS collar can be adjusted remotely **(available on collars with serial number greater than 031040)**. Available settings are four hours, six hours, eight hours, ten hours, twelve hours, and mortality disabled.

The satellite email schedule can be changed remotely **(available on collars with serial number greater than 031040)**. Available intervals are every 4, 6, 8, 12, 24, 48, 72, 96, 120, 144, or 168 hours.

For all remote requests, the changes will take place after the next email transmission, not when the remote command is issued. See Section 9 for more details regarding remote programming.

Mortality

If you choose to use mortality when you program the collar with the ATS*Fixes* for Satellite Collars software, the collar will immediately initiate an email transmission sequence if the collar goes into mortality. If successful, you will receive an email to let you know that the collar is in mortality. In the event of a false mortality, it is possible that the collar may get out of mortality before a successful transmission takes place. The email transmission will still be attempted until ten attempts are reached and if successful will indicate mortality was *not* reached. Also, if the satellite antennas do not have an adequate view of the sky, no email may be received.

NOTE: The aforementioned mortality transmission sequence applies to collars with serial numbers 032371 and higher or refurbished/repaired after 02/27/2013. For collars that do not meet either of these criteria, please contact ATS for exact mortality transmission operation.

In addition to mortality emails, the VHF will change to the Mortality VHF and, if a duty cycle was created during programming, will follow the duty cycle until activity is detected or a higher priority event occurs (such as a low battery or a collar release attempt).

In order for the GPS Collar to exit mortality mode, the collar must undergo thirty seconds of activity. (The thirty seconds of activity does not have to be consecutive but should be within the mortality period chosen.)

Collar Break-Off

Your GPS Collar can be remotely broken off whenever you choose (if the collar is not in low battery). Once you break-off your GPS Collar and recover it, you can download the data it contains. In addition to breaking off the collar whenever you choose, you can also program the GPS Collar to break-off on low battery condition (the program defaults to this option). Once the GPS Collar goes into low battery condition, the GPS Collar will be broken off automatically. This option is useful if the GPS Collar's batteries become low before the collar has been broken off.

Battery

Your GPS Collar has two batteries, a main battery and a backup battery. Once the GPS Collar has depleted the main battery, it will switch to using the backup battery. It is considered to be in low battery mode once it has switched to the battery backup.

The collar may also be declared in low battery mode if the main battery has been depleted enough to not be able to send data to the satellite. The emails received by the customer will include a note about the battery starting to reach the end of its ability to send data to the satellite. You can then decide whether to send an email to blow off the collar.

A collar in low battery mode will no longer take GPS fixes, nor will it transmit its data to a satellite. There is a low battery mode VHF beep pattern which lets the customer know the collar is in a low battery condition.

If the collar was programmed to break-off on low battery, it will perform the break-off immediately after going into low battery. Depending on the outcome of the break-off, the VHF transmitter will indicate that the break-off activation was successful or not. If you have programmed your GPS Collar not to break-off in low battery mode, then it will run the VHF transmitter continuously with a triple pulse at 27 ppm.

Section 5   Attaching the GPS Collar
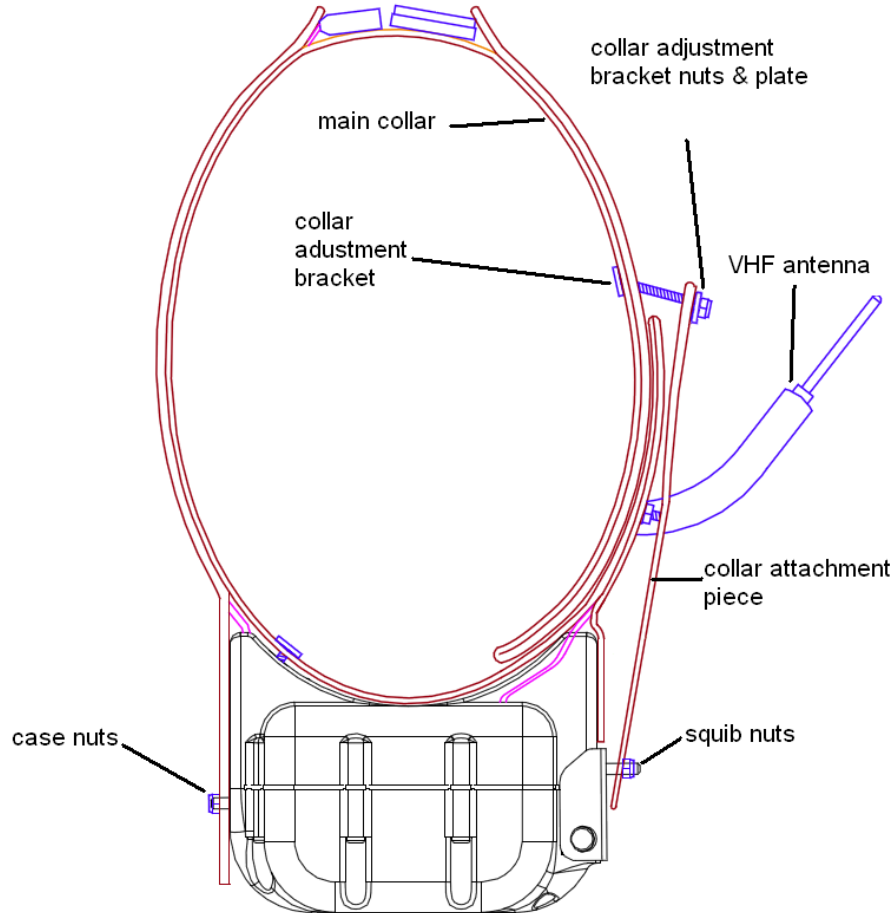
Your GPS collar has had its collar size optimized according to the animal subject(s) of your study. The size of the collar is determined by the collar adjustment bracket, the main collar and the collar attachment piece (see drawing above). To adjust the collar and/or attach the collar to an animal, the procedure is as follows:

1. First remove the collar adjustment bracket nuts and plate from the collar adjustment bracket and remove the collar adjustment bracket from the main collar.

2. Wrap the collar around the animal's neck and back into place making sure the vhf antenna goes through the opening in the collar attachment piece.

3. Observe where the set of holes on the collar attachment piece shows up on the main collar and line up these holes with a set of holes on the main collar such as to maintain a desired tension level on the animal's neck. The collar attachment bracket may or may not be in the set of holes on the main bracket that have been determined to have the desired tension.

4. Place the collar attachment bracket through both sets of holes and through the brass bracket and tighten the collar adjustment bracket nuts using the provided nut driver. Do not over-tighten as this may damage the collar adjustment bracket.

5. Finally ensure that the case nuts and squib nuts have been tightened before releasing the animal.

Section 6   Downloading Data from the GPS Collar

Once GPS position data have been stored in the GPS Collar memory, they can be downloaded to your computer. Data is grouped into two categories: originally programmed schedule data and email adjusted schedule data. You may only download one group of data at a time. Note that during data download, the VHF transmitter will be silent even if it was scheduled to beep.

Steps for Downloading Data

1. Attach the GPS Collar to the PC device via GPS Offload Cable, PN16491.
2. Open the ATS*Fixes* for Satellite Collars Programming software.
3. Click the Download Data button.
4. Choose between Degrees, Decimal Minutes or Decimal Degrees for the data format of the GPS data.
5. Choose between originally programmed schedule data or email adjusted schedule data.
6. Click the Continue button.
7. Touch the magnet to the GPS Collar to initiate communication.

After Downloading Data

Data files downloaded from the GPS Collar are stored on your computer in the C:/Advanced Telemetry Systems, Inc/GPS/ folder. The filename is Dxxxxxx_dd_JJJ-HHmm.txt where xxxxxx is the serial number of the GPS Collar, dd indicates whether the data is originally programmed schedule data (FS) or email adjusted schedule data (VS), JJJ is the Julian date the data was downloaded, and HHmm is the hour and minutes data was downloaded. For instance, D030086_FS_313-1134.txt represents a data file for collar with SN 030086 for originally programmed schedule data. The date and time of download was on the 313th day of the year at 11:34 local computer time.

Data Block Formats

Degrees, Decimal Minutes ddmm.mmmm,N/S,dddmm.mmm,E/W (d = deg, m = min)

Yr	Day	Hr	Mn	St	Act	T	Blk	Lat	N/S	Long	E/W
aa	bbb	cc	dd	e	ff	gg	hhhhh	iiii.iiii	j	kkkkk.kkkk	l
09	001	10	21	2	00	30	00001	1743.7810	S	06309.8980	W

Cont..:

Hdop	#Sat	#sec	Dim
mm.m	nn	ooo	p
11.9	3	23	2

Decimal Degrees +/-dd.ddddd,+/-ddd.ddddd (d = degrees)

Yr	Day	Hr	Mn	St	Act	T	Blk	Lat	Long
aa	bbb	cc	dd	e	ff	gg	hhhhh	+/-iiii.iiii	+/-kkkkk.kkkk
09	001	10	21	2	00	30	00001	-17.72968	-63.16497

Cont.:

Hdop	#Sat	#sec	Dim
mm.m	nn	ooo	p
11.9	3	23	2

Where:

aa = Year

bbb = Julian day (001-365, or 366 for leap year)

cc = Hour (00-23)

dd = Minute (00-59)

e = GPS fix status (0 = will never be logged, 1 = attempted but timed out, 2 = attempted and successful, 3 = next fix that will be taken, 4 = fix not taken, collar in low batt)

ff = Activity (00-99%)

gg = Temperature (degrees Celsius)

hhhhh =Block Number of Data Stored (00000-16381)

iiii.iiii = Latitude (DDmm.mmmm, Degrees, minutes, decimal minutes) or (+/-dd.ddddd,
    Decimal degrees)

j = Direction of Latitude (N or S)

kkkkk.kkkk = Longitude (DDmm.mmmm, Degrees, minutes, decimal minutes) or
    (+/-ddd.ddddd, Decimal degrees)

l = Direction of Longitude (E or W)

mm.m = HDop

nn = Number of satellites used in achieving GPS fix

ooo =Number of seconds needed to achieve GPS fix

p = Dimension of GPS fix (2 or 3)

Section 7   Receiving Data via Email

The model G2110E collar transmits its data using the Iridium satellite system. This data will arrive to the user via email. The email will have three files attached to it. One file is a text file that contains all successful GPS fix locations and associated data transmitted by the collar for the life of the collar (i.e. after the collar is shipped and before it returns to ATS for refurbishment/repair). **ATS will not modify this file (i.e. manipulate or delete data).** Another file is a text file that contains the GPS fix locations acquired since the previous email. This text file also contains information such as the GPS on time, the Iridium on time, mortality status, breakoff status, battery voltage, and any applicable warning messages. The last file attached is a .kml file which can be opened in Google Earth to get a visual look of the GPS fixes. Note: All location data is in decimal degree format.

The body of the email will contain some information which you can disregard including MOMSN, MTMSN, Time of Session and Unit Location. This information is provided by the Iridium Satellite System, not the GPS collar.

The data transmitted to the satellite in each transmission will only include successful GPS fixes and can contain a maximum of 22 fixes.

The transmission interval is programmed to the collar using the ATS*Fixes* for Satellite Collars Software. The most frequent transmission rate is every 4 hours while the least frequent is every 7 days. **If the collar has accumulated 22 successful fixes, but is not scheduled for a satellite**

transmission, it will attempt a transmission at the next available opportunity. On the other hand, if it is a scheduled transmission time and the collar has no successful fixes to send, the collar will still transmit on schedule. Any time the collar transmits data to the satellite, you will in turn receive an email with the transmitted data.

When the collar is approaching a low battery condition, this will be reported in the email you receive. Once the collar enters its low battery state it will no longer transmit data to the satellite, and you will no longer receive emails. You will not be able to command a collar break-off at this point either.

Note: If a collar transmits an email containing GPS fix data more than 9 days apart, the Julian day and hour of the later data in the email may be incorrect. However, the data stored on the collar will be correct and the next email should have correct data. This situation may arise if you wish to test the collar and wait more than nine days after initial testing before deploying the collar. If this is a concern, deploy the collar as soon as possible after programming/ reprogramming the collar.

Section 8   Satellite Transmission Suppression

Sometimes a satellite transmission cannot be completed at the scheduled time due to satellite positioning and/or the current environment. In this case, the collar will keep attempting a transmission every 12 minutes. If a transmission cannot be completed for 10 consecutive attempts, the collar will enter Satellite Transmission Suppression (STS). In STS, normal satellite transmission attempts will not be performed. This includes the current scheduled attempt, future scheduled attempts, attempts due to full data buffers, and mortality transmissions (if applicable).

There are two ways a collar can exit STS. First, during STS, GPS fix attempts are still allowed. If a GPS fix is successful, then the collar will return to normal operation including resuming normal satellite transmission attempts. That is the primary mechanism and should work in most cases. If GPS is not functioning, a second method for exiting STS is via a satellite transmission: if the collar is currently in STS and the Julian Day is a multiple of thirty (e.g. Jan 30, Mar 1, Mar 30, etc), the collar will attempt a satellite transmission to determine if the collar's current environment has become more favorable. It will try a maximum of 10 times with attempts spaced 12 minutes apart. If it is successful, normal collar operation will resume, and if it is not, the collar will return to STS.

Note: The first email transmitted after the collar exits STS may contain GPS fix data points with an incorrect Julian day and hour. However the data is stored correctly on the collar and the next transmission should contain correct data. This error is a result of GPS data

points in the transmission buffer that are more than nine days apart as may be the case with prolonged STS periods.

STS is only available on SNs 030534 and higher or collars refurbished after May 1, 2011.

Section 9   Remote Scheduling

There are several scheduling options for the GPS Collar that can be changed remotely: GPS fix schedule, satellite transmission schedule, maximum GPS fix duration, and mortality. To change any of these settings:

1. From the ATSFixes for Satellite Collars main screen, click on the remote command option that applies:

    -Change Fix Schedule Via Satellite: change GPS collar's current GPS fix schedule

    -Change Fix Duration Via Satellite: change the maximum time that the GPS collar will attempt a GPS fix before timing out

    -Change Mort Schedule Via Satellite: change the length of inactivity before mortality is detected/declared

    -Change Sat Tx Interval Via Satellite: change the schedule of email transmission attempts

2. Follow the instructions on the following screen and click on the Done button to proceed. Click on Cancel to cancel the request.

3. Enter the serial number of the GPS Collar you wish to change and click on Done.

4. A dialogue box will open next. If your computer's e-mail client is Microsoft Outlook and it is running under the email account registered for the collar, then no further action is necessary. If this is not the case, the remote command must be manually emailed using the instructions provided in the dialog box using the registered email account.

You should receive an email indicating whether or not request was successfully received. If you receive an error email or no email and need further assistance, please contact ATS.

Once the remote command is received correctly, the GPS Collar will change its schedule the next time the collar successfully transmits an email. Only one remote command can be sent for each email. If you wish, you may send multiple remote commands to be processed later by the collar but you must wait until you receive a confirmation email for each request before you send another request.

Note: Remote fix scheduling is only available on serial numbers greater than 030420. Remote duration, remote mortality, and remote satellite transmission scheduling is only available on serial numbers greater than 031040. Collars with serial numbers outside this range that need these additional remote options must be returned to ATS for upgrading. Please contact ATS for details.

Section 10   Breaking-Off the Collar

There are two ways to break-off the collar. 1) You can send a release command remotely, and 2) you can program the collar to be broken off when its battery becomes low.

ATS*Fixes* for Satellite Collars software defaults to breaking off the collar on Low Battery. If you don't want to use this option you will need to remove the checkmark on the left side of the Step 3 screen. We recommend you implement the low battery, automatic break-off option during programming.

At any time, you can send an email to break-off the collar remotely via satellite. The message to break off the collar can only be received by the collar when it is transmitting data to the satellite (a schedule you set up using the ATS*Fixes* for Satellite Collars software). Therefore, when a release request has been made, the collar will not release immediately but rather when the next successful data transmission occurs.

Click on the Break Off Collar Via Satellite button of the ATS*Fixes* for Satellite Collars Software to remotely command a collar break-off. If your computer's e-mail client is Microsoft Outlook, the ATS*Fixes* for Satellite Collars software will automatically send the email for you. If you are not using Outlook or have any other issue, you may manually request a breakoff. Send an email to iridium@atsidaq.com. The subject line of the email should be written exactly as follows: **Breakoff:XXXXXX** . Where XXXXXX is the 6 digit serial number of the collar you are requesting to break-off. No text in the body of the email is necessary. The subject line of the email shouldn't have any extra characters, such as spaces.

The ATS Host Processing computer will confirm that the email is arriving from the same email address as registered with ATS for that collar (the email address that is used for sending out the data for that collar). This is to ensure that no one breaks-off another customer's collar by mistake. If the break-off email contains the correct serial number for this customer, then a confirmation email will be sent to the customer's email confirming that the break-off request was correctly received. If there is an error during the process, an email will be sent to the originating email address and indicate an error has occurred.

If you have trouble sending the email to break-off the collar, contact ATS and we can request the break-off for you.

Once the collar has been broken off successfully, the VHF beep pattern will be changed to the pattern indicating the collar break-off mechanism has been successfully fired. If the break-off mechanism failed to fire properly, the VHF beep pattern will be changed to the pattern indicating a failed break-off. If the break-off attempt is not successful, you can try again to break off the collar by sending another email.

Section 11   Power-on Self Test

As explained in Section 4, Operating the GPS Collar, there is a special start-up beep pattern once the magnet is pulled off the collar. For five minutes the collar will emit a double pulse pattern at 48 ppm. This pattern will occur regardless of whether the collar is programmed to be actively emitting VHF pulses at that time.

Removing the magnet from a collar also forces the collar to perform tests on the main battery, backup battery, and firing squibs. These tests will begin 2 ½ minutes after the magnet is removed, and take about 20 seconds to complete. If any of the tests fail, then the VHF beep pattern will be changed to a low battery pattern (triple pulse at 27 ppm). If the tests all pass, the collar will revert back to the normal beep pattern, unless it is not programmed to be emitting VHF beeps at that time.

Section 12   Data Conversion

ATS*Fixes* for Satellite Collars provides two data conversion processes for users. One is a Julian day to month/day conversion. This conversion is meant to convert an emailed cumulative data file and converts the Julian day of a dataset to the corresponding month (number) and day of the dataset. The other conversion ATS*Fixes* provides is an unsuccessful fixes removal from the data. In this conversion, all data for unsuccessful fixes will be removed from the data. This conversion is intended to work on data files downloaded directly from a collar using the decimal degree format. In both conversions, the actual data file is not modified. Instead, a new file is generated with the filename of OUTPUTjjj-tttt where jjj is the Julian day when the file was created and tttt is the 24 hour time when the file was created.

To perform either of these conversions:

1. Save the file to be converted under the C:\Advanced Telemetry Systems, Inc\GPS folder. (Note the name of the file because it will be needed later.)

2. From the ATS*Fixes* home screen click on Convert Data Format.

3. Choose the conversion type between the 'Convert from Julian Day to Month and Day' and 'Remove all non-successful fixes from dataset' options.

4. Under the 'File Name:' prompt, enter the filename of the data file you wish to convert.

5. Click on Continue.

A new file will be generated with the filename described above under the C:\Advanced Telemetry Systems, Inc\GPS folder.

Section 13   Warranty and Service

The model G2110E collar is warranted for one year from the time of shipment, and for one refurbishment cycle. The unit may be refurbished up to three cycles.

Should you encounter any difficulty during programming or operation of your collars, please contact ATS Sales and Service at 763.444.9267 during normal business hours. This and other ATS User Manuals are available for download from the ATS website, at www.atstrack.com.