AT Commands for SHOUT ns

Version D

April 21, 2023

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REVISION HISTORY

Revision	Date	Description
1.0.3	10/15/2018	Initial version
1.1	11/09/2021	Engineering update
A	09/20/2022	Formal release
B	10/24/2022	• Added **AT^BTPWR**, **^BTPASSEN** • Updated **AT&V,** and **&V**
C	03/09/2023	Updated section 12.1 ^IGPS – INCLUDE GPS IN MESSAGES Was: Read Command: +IGPS Now: Read Command: ^IGPS
D	04/21/2023	Removed Read Command AT^WMF? From section 6.45 ^WMF – Write Message Format

TABLE OF CONTENTS

ACRONYM LIST

ADC............................Analog to digital converter

DCE ....Data Communications Equipment. In this product, DCE refers to the

SHOUT ns

DTE ....Data Terminal Equipment. In this product, DTE refers to the FA

ESS ....ETC SBD Subsystem (synonymous with GSS)

ETC ....Earth Terminal Controller, part of the Iridium Gateway

FA ....Field Application, the "host" of the SHOUT ns

GND ....Ground

GSS ....Gateway SBD Subsystem (synonymous with ESS)

IMEI ....International Mobile Equipment Identity

LBT.............................L-Band Transceiver

MO ....Mobile Originated

MOMSN.....................Mobile Originated Message Sequence Number

MT ....Mobile Terminated

MTMSN ....Mobile Terminated Message Sequence Number

NMEA ....National Marine Electronics Association

Rx...............................Data line from DCE to DTE

SBD ....Short Burst Data

Tx...............................Data line from DTE to DCE

UART..........................Universal Asynchronous Receiver Transmitter

UTC............................Universal Time Coordinated

1   INTRODUCTION

This document is intended as a reference guide to the usage of AT command set for the SHOUT ns Iridium satellite tracker. Note that AT commands may be periodically modified, removed or added and, therefore, users should always check for the latest revision by logging on NAL Research's anonymous ftp site (under RESOURCE CENTER of website www.nalresearch.com).

The SHOUT ns communicates to computer equipment using a standard A-Type Male USB connector which is located on the SHOUT cable harness.

The SHOUT ns has two modes of operation—Command mode and Tracking mode. When in Command mode, the SHOUT ns operates as a standard modem with GPS. AT commands can be entered to configure the SHOUT ns's operating profiles, send or receive SBD messages, or get GPS positions. When in Tracking mode, the SHOUT ns automatically transmits GPS reports defined by parameters in the active general and tracking profiles. The SHOUT ns is factory-set to power up in Command mode, which can be re-programmed with the AT^START command to power up in Tracking mode.

2   AT COMMANDS

An AT command is a string of characters sent by the DTE to the SHOUT ns while the SHOUT ns is in Command mode. During Tracking mode, the only AT command accepted by the SHOUT ns is a sequence of three pluses (+++). All other commands are ignored. An AT command string has a prefix, a body, and a terminator. The prefix consists of the ASCII upper case characters AT or lower case characters at. The body is a string of commands restricted to printable ASCII characters. The terminator is the carriage return <CR> character.

2.1   COMMAND ENTRY

- AT command syntax is critical and the following rules apply:

- All commands (apart from A/ and +++) begin with the prefix of AT or at.

- The commands in a command string (apart from A/ and +++) are executed only after the return or enter key is pressed.

- Use of upper or lower case letters are allowed, but not a combination of both.

- The maximum number of characters in a command string is 128.

- If the numeric parameter n is omitted from the basic command entry, a value of zero is assumed for n.

- If an optional parameter is omitted from an extended command, the current value is implied. Optional parameters are enclosed by square brackets ([...]) in this document.

- Multiple commands can be concatenated into a single command line by separating the additional non-prefixed commands with a space or a semicolon or with no separator.

- Spaces entered into a command string for clarity between the AT prefix and the body of the command are ignored. Likewise, spaces entered for clarity within the command body between alpha characters and decimal parameters are ignored.

- Backspace can be used to edit AT commands.

- The single quotes (') are used to enclose sensitive information such as passwords. When an entry is enclosed by the single quotes and the SHOUT ns is set to echo, the entry is replaced with asterisks (*) instead of the actual value.

- For the commands requiring the Crypto Officer Password or the ^ID command, all characters values may be entered. For passwords containing the single quote ('), a backslash must be entered in front of it. Similarly, for passwords containing a backslash (\), an additional backslash must be entered in front of it as well. For example the password Qt3&\v'3 would be entered as 'Qt3&\\v\'3'. If underscore (_) is used in the ID field, it will appear as spaces in NAL Research's provided PC software because of backwards compatibility issues with the A3LA-DGS and the A3LA-TSS.

- For the ^ID command with the static identifiers containing the double quote ("), they must be entered with a backslash (\) in front of it. For static identifiers containing a backslash (\), an additional backslash must be entered in front of it as well. For example, for static identifier The "fast" ship\boat would be entered as "The \"fast\" ship\\boat". All entries with \\, \' and \" are treated as single character in length.

- Characters that proceed the AT prefix are ignored.

- CTRL-X will abort a command line input.

2.2 COMMAND RESPONSES

A result code is sent to the DTE by the SHOUT ns in response to the execution of an AT command. It may also occur unsolicited from other conditions such as an SBDRING alert. Responses returned as a result of a query are called information responses.

Result codes can be represented by text if the SHOUT ns is in verbose mode or with numbers if in numeric mode. The command ATV informs the SHOUT ns whether to respond in verbose or numeric mode. Responses can be suppressed by setting the command ATQ to ATQ1. The table below shows the difference in format between these modes.

Difference in format between modes

	Numeric Mode ATQ0 ATV0	Verbose Mode ATQ0 ATV1
Result codes	<NUMERIC_CODE><CR>	<CR><LF><VERBOSE_MODE><CR><LF>
Information Responses	<TEXT><CR><LF>	<CR><LF><TEXT><CR><LF>

Invalid input for certain types of commands will cause the SHOUT ns to return a short description of failure before returning the information response and error message. Command entries to the SHOUT ns with invalid syntax typically cause the SHOUT ns to respond with an ERROR. Command entries of valid syntax with an out-of-range parameter can cause the SHOUT ns to respond in one of the three ways:

- Disallow out-of-range entry and respond with ERROR

- Disallow out-of-range entry and respond with OK

- Disallow out-of-range entry, accept the closest in-range value, and respond with OK.

3   GENERAL COMMANDS

3.1   AT – ATTENTION

This is the prefix for all commands except A/ and +++. When entered on its own, the SHOUT ns will respond with OK.

3.2   A/ – REPEAT LAST COMMAND

Repeats the last command issued unless power was interrupted or the SHOUT ns is reset. A/ is not followed by a carriage return.

3.3   +++ – ENTER COMMAND MODE

Forces the SHOUT ns to enter Command mode from Tracking mode. After +++ is entered but before command mode will accept user input, the device will send the information response of "COMMAND MODE: Started". Once command mode is ready to accept commands the response "COMMAND MODE: Ready for Input" is sent.

NOTE: The SHOUT ns is factory-set to power up in Command mode. It can be reprogrammed to power up in either Command mode or Tracking mode with AT^START. If the SHOUT ns is powered up in Tracking mode and AT^CAL is set to "Sleep between reports", then the SHOUT ns will ONLY accept the +++ command when it is not sleeping. If the SHOUT ns is in Tracking mode and AT^CAL is set to "Callable between reports", then the SHOUT ns will accept the +++ command at any time to transition from Tracking to Command mode.

3.4   E – ECHO

EXEC COMMAND: E[<N>]

Turns echo on or off.

<n>:   If omitted, 0 will be used.

  0   Off. Characters are not echoed to the DTE

  1   On. Characters are echoed to the DTE (Default)

READ COMMAND: E?

Indicates the current value.

3.5   I – IDENTIFICATION

EXEC COMMAND: I[<N>]

Request the device to display information about itself.

<n>:   If omitted, 0 will be used.

    0   "2400" (for compatibility only)

    1   "0000" (for compatibility only)

    2   "OK" (for compatibility only)

    3   "SHOUT ns VX.X.XrXXXX-XXXXrXXX" (software revision level of micro-
controller)

             "TAXXXXX" (software revision level of 9603 RF board)

    4   "NAL Research Corporation: SHOUT ns" (product description)

    5   "8816" (for compatibility only)

    6   "XXX" (9603SHOUT ns RF board factory identity)

    7   "XXXXXXXX" (9603SHOUT ns RF board hardware specification)

3.6   Q – QUIET MODE

EXEC COMMAND: Q[<N>]

Turns quiet mode on or off.

<n>:   If omitted, 0 will be used.

    0   Off. Responses are sent to the DTE (Default)

    1   On. Responses are not sent to the DTE

READ COMMAND: Q?

Indicates the current value.

3.7   V – VERBOSE MODE

EXEC COMMAND: V[<N>]

Turns verbose mode on or off.

<n>:   If omitted, 0 will be used.

0	Off. Numeric responses
1	On. Textual responses (Default)

READ COMMAND: V?

Indicates the current value.

3.8   Z – SOFT RESET ACTIVE GENERAL PROFILE

EXEC COMMAND: Z[<N>]

Soft resets the device's active general profile to a user-defined general profile that has been previously stored using &Wn. The active general profile will revert back to the user-defined general profile designated under the &Yn command at power reset.

<n>:   If omitted, 0 will be used.

0	Restores user-defined general profile 0
1	Restores user-defined general profile 1

3.9   ZT – SOFT RESET ACTIVE TRACKING PROFILE

EXEC COMMAND: ZT[<N>]

Soft reset the device's tracking profile to a user-defined tracking profile that has been previously stored using &WT. Valid values for <n> are 0 through 11.

3.10   &F – RESTORE FACTORY SETTINGS TO ACTIVE GENERAL PROFILE

EXEC COMMAND: &F[<N>]

Soft resets the device's active general profile to the factory-default general profile. The active general profile will revert back to the user-defined general profile designated under the &Y command at power reset. This does not reset ^RUP, encryption/decryption keys or the crypto officer password.

<n>:   If omitted, 0 will be used.

0	Recall factory-default general profile

3.11 &FT – RESTORE FACTORY SETTINGS TO ACTIVE TRACKING PROFILE

EXEC COMMAND: &FT[<N>]

Soft reset the device's active tracking profile to factory-default tracking profile.

<n>:   If omitted, 0 will be used.

0   Recall factory-default tracking profile

3.12 &V – VIEW ACTIVE AND STORED GENERAL PROFILES

EXEC COMMAND: &V[=<N>]

Displays all or one of the active and stored general profiles.

<n>:   Which general profile to display. If omitted, the active general profile and all stored general profiles will be displayed.

"A"   The active general profile will be displayed.

0-1   The specified stored general profile will be displayed.

EXEC RESPONSE:

<label>:

<profile>

…

<label>:   Either ACTIVE PROFILE, or STORED PROFILE #, where # is the number of the profile.

<profile>:   A list of settings for a general profile. The profile has the following format, where pound signs (#) are used as place holders for the values of each command. The pound signs do not necessarily indicate the number of digits in a value.

E# Q# V# *R# *S# +CIER###### +PG#,#,###,#### +PNAV# +PP# +SBDAREG#

+SBDMTA# ^BTPWR#,## ^DLTRK# ^ERQM### ^GAO# ^ICV### ^ID# ^TRKDEBUG#

^ECOM# ^LEDS#,#,#,#,#,#,#,#,# ^MSB##,##,## ^MSE## ^MSR#,# ^MSW####

^OBN# ^PARSELIMIT# ^PARSERU# ^PR# ^PUPT###,#####.# ^RMF# ^RUTC#

^SSI# ^SSR# ^START# ^TPE## ^TPN## ^TRKE# ^UE# ^MBXCHK#####.# ^MBXCHKE#

^TRKBLKOUT# ^GFN# ^IGPS# ^TMF# ^BTPASSEN# ^BTRANGE### ^BREV##

^PWRAO#,## ^POSFMT#

NOTE: Even though a command appears in the response, if it is not documented in this document, it may not be implemented or have any function.

TEST COMMAND: &V=?

Returns a fixed message indicating the range of acceptable values.

&V:[("A"|0-1)]

3.13 &VT – VIEW ACTIVE AND STORED TRACKING PROFILES

EXEC COMMAND: &VT[=<N>]

Displays all or one of the active and stored tracking profiles.

<n>: Which tracking profile to display. If omitted, the active tracking profile and all stored tracking profiles will be displayed.

"A" The active tracking profile will be displayed.

0-11 The specified stored tracking profile will be displayed.

EXEC RESPONSE:

<label>:

<profile>

…

<label>: Either ACTIVE PROFILE, or STORED PROFILE #, where # is the number of the profile.

<profile>: A list of settings for a tracking profile. The profile has the following format, where pound signs (#) are used as place holders for the values of each command. The pound signs do not necessarily indicate the number of digits in a value.

^BIGR# ^CAL# ^DFR# ^DFRA# ^ERQ#,# ^GFCF#,#.# ^LNK#,"#" ^MSA# ^RF#

^SPSR#,#,#,# ^TBR#.# ^TBRA#.# ^TTKT# ^TTKTA#

^UAMS#

NOTE: Even though a command appears in the response, if it is not documented in this document, it may not be implemented or have any function.

TEST COMMAND: **&VT=?**

Returns a fixed message indicating the range of acceptable values.

&VT:[("A"|0-11)]

3.14 &W – STORE ACTIVE GENERAL PROFILE

EXEC COMMAND: **&W[<N>]**

Stores the active general profile as a user-defined general profile in non-volatile memory for later use.

<n>: If omitted, 0 will be used.

 0 Store active general profile as user-defined general profile 0
 1 Store active general profile as user-defined general profile 1

3.15 &WT – STORE ACTIVE TRACKING PROFILE

EXEC COMMAND: **&WT[<N>]**

Stores the active tracking profile as a user-defined tracking profile in non-volatile memory for later use.

<n>: 0-11. If omitted, 0 will be used.

3.16 &Y – DESIGNATE DEFAULT RESET PROFILE

EXEC COMMAND: **&Y[<N>]**

Selects the user-defined general profile to use after power-up.

<n>: If omitted, 0 will be used.

0   Select user-defined general profile 0 (Default)

1   Select user-defined general profile 1

READ COMMAND: &Y?

Indicates the current value.

3.17   *F – FLUSH TO EEPROM

EXEC COMMAND: *F

Responds with "OK". Included for compatibility.

3.18   *R – RADIO ACTIVITY

EXEC COMMAND: *R[<N>]

Enables or disables radio activity.

<n>:

0   Disable

1   Enable (Default)

While radio activity is disabled:

- SBD sessions cannot be initiated; they will fail immediately.
- No SBD RING alerts will be issued for automatic-MT messages.
- No location updates will be performed.
- The baseband circuitry is still active and the Data Transceiver still accepts AT commands.

This command allows the FA (field application, the "host" of the SHOUT ns) to reduce detectable emissions from the RF circuitry during the idle periods between SBD sessions, and also provides a degree of power saving in cases where it may be inconvenient for the FA to power down the data transceiver.

READ COMMAND: *R?

Returns the current value.

TEST COMMAND: *R=?

Returns a fixed message indicating the range of acceptable values.

*R:(0-1)

3.19 *S – IRIDIUM RF POWER STATE

EXEC COMMAND: *S<N>

Control power state of the 9603 transceiver in Command mode. The Iridium transceiver power is controlled automatically for Tracking mode. When the 9603 is OFF, commands which require use of the 9603 will respond with "LBT OFF".

<n>:

0	Change the state of the Iridium transceiver board to off
1	Change the state of the Iridium transceiver board to on (Default)

READ COMMAND: *S?

Returns the current value.

TEST COMMAND: *S=?

Returns a fixed message indicating the range of acceptable values.

*S:(0-1)

3.20 *W – WAIT

EXEC COMMAND: *W=<W>,<M>,<S>

Power down most circuits in the SHOUT ns for <m> minutes and <s> seconds. This is equivalent to a tracking mode sleep. The unit can only be woken early by the power button, an input trigger, or the motion sensor.

<w>:

0	the motion sensor is disabled during wait time.
1	detection on the motion sensor will stop the wait immediately

<m>:   Number of minutes to wait. Valid values are between 0 and 99.

<s>:   Number of seconds to wait. Valid values are between 0 and 59.

NOTE: If <m> and <s> are both 0 an ERROR will be returned.

NOTE: Since the active general profile is not preserved over a sleep period the unit will revert back to the stored general profile when it wakes up.

COMMAND RESPONSE:

This will return OK, the unit will go into Sleep mode, and nothing else will be returned.

TEST COMMAND: *W=?

Returns a fixed message indicating the range of acceptable values.

*W:(0-1),(0-99),(0-59)

3.21 +CGMI/+GMI – MANUFACTURER IDENTIFICATION

EXEC COMMAND: +CGMI/+GMI

Queries the manufacturer.

3.22 +CGMM/+GMM – MANUFACTURER MODEL

EXEC COMMAND: +CGMM/+GMM

Queries the model.

3.23 +CGMR/+GMR – MANUFACTURER REVISION

EXEC COMMAND: +CGMR/+GMR

Queries the revision.

3.24 +CGSN/+GSN – SERIAL NUMBER

EXEC COMMAND: +CGSN/+GSN

Queries the Iridium serial number (IMEI).

3.25 +CIER – INDICATOR EVENT REPORTING

EXEC COMMAND: +CIER=[<MODE>[,<SIGIND>[,<SVCIND>[,<ANTIND>[<RESERVED>[<URCIND>]]]]]

Enables or disables sending of the +CIEV unsolicited result code from the SHOUT ns to the DTE in case of indicator state changes.

<mode>:   Controls the processing of the +CIEV unsolicited result codes.

0	Disable indicator event reporting. +CIEV unsolicited result codes will not be sent to the DTE. Rather, the most recent indicator event for each indicator is buffered in the data transceiver (default).
1	Enable indicator event reporting. The most recent +CIEV unsolicited result code for each indicator will be buffered when the modem interface is reserved (e.g. in SBD data mode) and then flushed to the DTE after reservation. Otherwise the result code will be forwarded directly to the DTE.

<sigInd>:	Controls reporting of "signal quality" indicator changes. The reported signal strength is the same value that would be returned by the +CSQ command. When enabled, the signal quality indicator is reported only when the signal strength changes.
0	No "signal quality" indicator reporting (default).
1	Enable "signal quality" indicator reporting using result code +CIEV:0,<value> where <value> is:

0	Equivalent to 0 bars on the signal strength indicator
1	Equivalent to 1 bars on the signal strength indicator
2	Equivalent to 2 bars on the signal strength indicator
3	Equivalent to 3 bars on the signal strength indicator
4	Equivalent to 4 bars on the signal strength indicator
5	Equivalent to 5 bars on the signal strength indicator

<svcInd>:	Controls reporting of "service availability" indicator changes. Network service availability is equivalent to a signal strength greater than 0. The service availability indicator provides a way for the FA to wait until the SHOUT ns can start an SBD session without receiving continual notifications of changes in signal strength.
0	No "service availability" indicator reporting (default).
1	Enable "service availability" indicator reporting using result code +CIEV:1,<value> where <value> is:

0   Network service is currently unavailable.

1   Network service is available.

<antInd>:   Controls reporting of "antenna fault" indicator changes. An antenna fault indicates that the antenna is not correctly attached, and in order to protect the transmitter no more transmissions are permitted. On seeing an antenna fault, the user should check the antenna connection; the fault will be automatically cleared once the SHOUT ns detects network service availability again.

0   No "antenna fault" indicator reporting (default).

1   Enable "antenna fault" indicator reporting using result code +CIEV:2,<value> where <value> is:

     0   No antenna fault detected, or antenna fault cleared.

     1   Antenna fault detected, further transmission impossible.

NOTE: In <mode> 1, the DTE may miss some indicator state changes if they occur while the modem interface is reserved. However, the buffering mechanism ensures that the most recent change for each indicator during reservation will be flushed to the DTE after reservation; thus the DTE is always made aware of the latest state of each indicator.

NOTE: The DTE may initiate an SBD session even if service is unavailable; In this case, the Data Transceiver makes an immediate search for the network and, if successful, starts the SBD session, otherwise the SBD session fails.

<urcInd>: Controls reporting of a variety of different URCs. These URCs include: Gps Strength, Charging State, Iridium Power State, GPS Power State, and Inbox Incomming Message. When enabled, these URCs will be outputted to the console. Below is a list of the URCs associated with this setting.

GPS Signal Strength: Indicator reporting using result code +CIEV:25,<value> where <value> is:

0: no bars

1: 1 bar

2: 2 bars

3: 3 bars

4: 4 bars

Charging On/Off State: Indicator reporting using result code +CIEV:26,<value> where <value> is:

0: Charging Off

1: Charging On

Iridium On/Off State: Indicator reporting using result code +CIEV:27,<value> where <value> is:

0: Iridium Off

1: Iridium On

GPS On/Off State: Indicator reporting using result code +CIEV:28,<value> where <value> is:

0: GPS Off

1: GPS On

Inbox New Message: Indicator reporting using result code +CIEV:29,<value> where <value> is the number of unread messages in the Inbox.

READ COMMAND: +CIER?

Indicates the current values.

TEST COMMAND: +CIER=?

Returns a fixed message indicating the range of acceptable values.

+CIER:(0-1),(0-1),(0-1),(0-1),,(0-1)

3.26   +CRIS – RING INDICATION STATUS

EXEC COMMAND: +CRIS

Queries the ring indication status, returning the cause for the latest assertion of the ring indicator.

EXEC RESPONSE:

+CRIS:<tri>,<sri>

<tri>:   Indicates the telephony ring indication status (for compatibility with 9522A applications).

     0   No telephony ring alert received.

<sri>:   Indicates the SBD ring indication status.

     0   No SBD Ring Alert received.

     1   SBD Ring Alert received.

3.27   +CSQ[F] – SIGNAL QUALITY

EXEC COMMAND: +CSQ[F]

Returns the received signal strength indication from the ISU.

EXEC RESPONSE:

+CSQ[F]:<rssi>

<rssi>:   The received signal strength indication.

     0   Equivalent to 0 bars displayed on the signal strength indicator

     1   Equivalent to 1 bar displayed on the signal strength indicator

     2   Equivalent to 2 bars displayed on the signal strength indicator

     3   Equivalent to 3 bars displayed on the signal strength indicator

     4   Equivalent to 4 bars displayed on the signal strength indicator

     5   Equivalent to 5 bars displayed on the signal strength indicator

NOTE: The +CSQ form waits for an updated signal strength response to become available. This will usually be within two seconds of issuing the command. If the SHOUT ns is in the process of acquiring the system or in a satellite handoff, a delay in response of up to 10 seconds may be experienced. If the SHOUT ns has not proceeded to successful registration, the delay in response may exceed the 50 second timeout limit. Under such condition, an ERROR response will be received. To avoid a delayed response due to registration problems, issue the +CREG command to verify registration prior to entering the +CSQ command to obtain signal strength.

NOTE: The +CSQF form returns immediately, reporting the last known signal strength.

TEST COMMAND: +CSQ[F]=?

Returns a fixed message indicating the range of possible response values.

+CSQ[F]:(0-5)

3.28   ^CHKIRD – CHECK IRIDIUM

EXEC COMMAND: ^CHKIRD = <C>

Turns on Iridium to allow monitoring of signal strength in the +CIEV messages. Will not turn on and return signal strength while acquiring GPS for tracking.

 <c>: Setting to turn on Check Iridium (1) On (0) Off.

3.29   +CULK – UNLOCK

EXEC COMMAND: +CULK=<KEY>

Unlocks the SHOUT ns's Iridium transceiver. While the transceiver is locked, it is unable to perform any SBD sessions. Any attempts to start a session will return an error code indicating that the transceiver is locked.

<key>:   The key to unlock the transceiver. The unlock key must be obtained by contacting NAL's customer support. Must be a string of 16 hexadecimal digits.

EXEC RESPONSE:

+CULK:<status>

<status>:   Indicates the lock status of the transceiver following the unlock attempt.

0   Unlocked. Transceiver is not locked and is permitted to perform SBD sessions.

1   Locked. Transceiver is locked and unable to perform SBD sessions. It must be unlocked by supplying the correct unlock key to the +CULK command.

2   Permanently locked. Transceiver is locked and unable to perform SBD sessions. It cannot be unlocked and must be returned to the supplier.

READ COMMAND: +CULK?

Queries the current lock status of the transceiver. The response is in the following form.

+CULK:<status>

<status>:

    0   Unlocked

    1   Locked

    2   Permanently locked

3.30 -MSGEO – REQUEST GEOLOCATION

EXEC COMMAND: -MSGEO

Query the geolocation grid code received from the network in the last Access Decision Notification message.

-MSGEO: <x>,<y>,<z>,<systemTime>

<x>,<y>,<z>: This is a geolocation grid code from an earth centered Cartesian coordinate system, using dimensions x, y, and z.

<systemTime>: This is assigned by the SHOUT ns when the geolocation grid code received from the network is stored to the SHOUT ns internal memory. Current Iridium system time, which is a running count of 90 millisecond intervals, is used for the timestamp. The Time stamp is formatted as an ASCII hexadecimal number. (See -MSSTM command description for additional information on Iridium system time.)

3.31 -MSSTM – REQUEST SYSTEM TIME

EXEC COMMAND: -MSSTM

Queries for the latest system time received from the network.

EXEC RESPONSE:

-MSSTM: <systemTime>

<systemTime>:   This could be "no network service", which means that the SHOUT ns has not yet received the system time from the Iridium network. Otherwise, the value will be the current Iridium system time available from the network. The system time as received through the Iridium Air Interface, is a 32-bit integer count of the number of 90 millisecond intervals that have elapsed since the

epoch. The return value is formatted as an ASCII hexadecimal number. The counter will rollover approximately every 12 years.

Iridium system time epoch: March 8, 2007, 03:50:21.00 (GMT)

Previous Epoch: June 1, 1996, 00:00:13 (GMT)

Iridium system time source: The system time is available and valid only after the SHOUT ns has registered with the network and has received the Iridium system time from the network. Once the time is received, the SHOUT ns uses its internal clock to increment the counter. In addition, at least every 8 hours, or on location update or other event that requires re-registration, the SHOUT ns will obtain a new system time from the network.

Time localization: None. The system time value is always expressed in GMT time.

Resolution and accuracy: The resolution of the system time is one Iridium frame tick, or 90 ms. Accuracy as measured by the difference between the time reported and the actual time it is sent out the SHOUT ns serial port should not exceed 4 frame ticks (.36 seconds) and in most cases will be one frame tick (.09 seconds) or less.

3.32　^BATTLVL – BATTERY LEVEL

EXEC COMMAND: ^BATTLVL

Queries the current battery level (updated every 5 seconds). The level returned is the whole number percentage of battery life remaining (0-100).

NOTE: Also available in Tracking mode.

3.33　^BATTTEMP – BATTERY TEMPERATURE

EXEC COMMAND: ^BATTTEMP

Queries the current battery temperature. The temperature returned is in degrees Celsius with up to two decimal places.

NOTE: Also available in Tracking mode.

3.34   ^BREV – SET BREVITY VALUE

EXEC COMMAND: ^BREV=<N>

This command sets the brevity value from 0 to 15.

READ COMMAND: ^BREV?

Returns the current value of <n>.

TEST COMMAND: ^BREV=?

Returns a fixed message indicating the range of acceptable values.

^BREV:(0-15)

3.35   ^ECOM – ENABLE AT COMMANDS IN OTHER MODES

EXEC COMMAND: ^ECOM=<N>

This command sets whether AT commands are allowed to be entered in modes other than Command mode. The following commands (as shown below) are enabled in Tracking Mode when ^ECOM is set to 1.

^BATTLVL	^DLTRK	^MBXCHK	^MSIE	^OBN	^TRKLR	&F
^BATTTEMP	^EMRE	^MBXCHKE	^MSIR	^POSFMT	^TRKDEBUG	&FT
^BTPWR	^ERQ	^MBXCHKM	^MSOA	^PWRAO	^TTN	&W
^BTRANGE	^FFW	^MCMR	^MSOD	^RMF	^UE	&WT
^BIGR	^GFM	^MSDA	^MSOE	^RPRT	^WPM	I
^BREV	^GFN	^MSDD	^MSOQ	^RST	^WPE	Z
^COA	^GFR	^MSDE	^MSOR	^SHUTDOWN	^WPR	ZT
^COD	^IGPS	^MSDR	^MSSD	^STR	+CHKGPS	
^COR	^LEDS	^MSIA	^MSSE	^TIME	+CIER	
^CHKIN	^LNK	^MSIC	^MSSR	^TPN	+GSN	
^CHKIRD	^MABR	^MSID	^MUSR	^TRKBLKOUT	+PNAV	

<n>:

  0   Disabled

  1   Enabled (default)

READ COMMAND: ^ECOM?

Returns the current value of <n>.

TEST COMMAND: ^ECOM=?

Returns a fixed message indicating the range of acceptable values.

^ECOM:(0-1)

3.36   ^PARSELIMIT – LIMIT PARSING OF INCOMING MESSAGES

EXEC COMMAND: ^PARSELIMIT=<ENABLE>

Sets whether to limit parsing of incoming messages. When enabled, only message types enabled by AT^PARSE* commands will be parsed for. Accepted values for <enable> are 0 (default) or 1.

READ COMMAND:

Returns the current value as ^PARSELIMIT:<enable>.

TEST COMMAND: ^PARSELIMIT=?

Returns a fixed message indicating the range of acceptable values.

^PARSELIMIT:(0-1)

3.37   ^PARSERU – PARSE REMOTE UPDATES WHEN LIMITING PARSING

EXEC COMMAND: ^PARSERU=<ENABLE>

Sets whether to parsing remote updates when AT^PARSELIMIT is enabled. Accepted values for <enable> are 0 (default) or 1.

READ COMMAND:

Returns the current value as ^PARSERU:<enable>.

TEST COMMAND: ^PARSERU=?

Returns a fixed message indicating the range of acceptable values.

^PARSERU:(0-1)

3.38   ^EDC – ERROR DETECTION CODE

EXEC COMMAND: ^EDC

Returns the error detection code stored in flash memory.

EXEC RESPONSE:

^EDC:<code>

<code>:   a 4-character uppercase hex string

3.39   ^PUPD – POWER UP DELAY

EXEC COMMAND: ^PUPD=<M>,”<T>”

Sets the device to power up at the specified date and time when in tracking. If emergency is activated, the device will power up and begin emergency mode tracking. Once emergency is cleared the power up delay will resume.

<m>:   mode – 0-1, 0 is disabled and 1 is enabled

<t>:   time – YYYY/MM/DD hh:mm:ss

READ COMMAND: ^PUPD?

Query the current Power Up Delay setting.

TEST COMMAND: ^PUPD=?

Returns a message indicating the range of acceptable values.

^PUPD:(0-1),”YYYY/MM/DD hh:mm:ss”

3.40   ^PUPT – POWER UP DELAY TIMEOUT

EXEC COMMAND: ^PUPT=<STO>,[<RIT>]

Set power up delay timeout. If the device does not have a valid GPS time fix and a power up delay (^PUPD) set, a GPS time fix will be periodically attempted. The retry interval time <rit> starts after the GPS search time out <sto> expires. When a valid GPS time fix is achieved, the power up delay will be scheduled utilizing the newly acquired GPS time fix.

<sto>:   GPS search time out – the period to search for valid GPS signal in seconds.

<rit>:   Retry interval time – the time in minutes to wait if the previous valid GPS time fix attempt did not succeed within the specified GPS search time out.

READ COMMAND: ^PUPT?

Query the current Power Up Delay Timeout

TEST COMMAND: ^PUPT=?

Returns a Message indicating the range of acceptable values

^PUPT:(15-255),(0-10080)

3.41   ^PWRAO – POWER ALWAYS ON SETTING

EXEC COMMAND: ^PWRAO=<MODE>[, <DELAY>]

This feature keeps the SHOUT ns turned on while it is operating in tracking mode and Bluetooth or USB are connected. When both become disconnected, it will remain turned on for a minimum period of time to allow the user to reconnect. Other settings or activities may be running that could keep the SHOUT ns turned on. The power button can always be used to turn off the device.

<mode>:

0   The feature is disabled. There is a minimum on time of 30 seconds when in tracking mode to allow the user to connect to Bluetooth or USB and run commands if needed. It may power off when USB or Bluetooth are connected. <delay> is ignored.

1   The feature is enabled. When in tracking mode, the SHOUT ns will stay turned on as long as Bluetooth or USB is connected. Once both USB and Bluetooth are no longer connected, a countdown is started for a number of minutes set with the <delay> parameter. When the timer counts to zero the SHOUT ns will be allowed to shutdown. This is the default setting.

2   The feature is enabled with no timeout. Only the power button can turn off the SHOUT ns. <delay> is ignored.

<delay>:   Can be a value 0 to 10 minutes. 0 sets a minimum count down of 30 seconds. The default setting is 10 minutes.

3.42   ^RST – RESET

EXEC COMMAND: ^RST

Firmware will perform a soft reset, meaning it will restart execution as though it had been power cycled.

3.43   ^SHUTDOWN – SHUTDOWN THE DEVICE

EXEC COMMAND: ^SHUTDOWN

Powers off the device when executed. It is equivalent to pressing and holding the power button to initiate a device shutdown.

3.44   ^SSI– SEND START UP INFORMATION

EXEC COMMAND: ^SSI=<N>

Set the device to display start up information upon power cycle

<n>:

0	Disabled
1	Enabled (default)

READ COMMAND: ^SSI?

Returns the current value of <n>.

TEST COMMAND: ^SSI =?

Returns a fixed message indicating the range of acceptable values.

^SSI:(0-1)

3.45   ^STARTUP – STARTUP

EXEC COMMAND: ^STARTUP=<N>

Powers on the device.

<n>:   1-120 seconds. The minimum amount of time the device will stay on before being allowed to power down because of idling.

TEST COMMAND: ^STARTUP=?

Returns a fixed message indicating the range of acceptable values.

^STARTUP:(1-120)

NOTE: Only available in Charger mode.

3.46   ^STR – SELF TEST RUN

EXEC COMMAND: ^STR

Causes the SHOUT ns to run self-tests and report the status. This is the same self-tests that the SHOUT ns runs at start up, which include a self-test of the AES encryption and whether the calculated EDC (Error Detection Code) matches with that which is stored in memory.

3.47   ^TIME – DISPLAY TIME

EXEC COMMAND: ^TIME

Displays the date and time if the device has a valid time or ERROR if it does not.

EXEC RESPONSE:

Displays date and time as YYYYMMDDHHMMSS if the device has a valid time

Displays ERROR if the device does not have a valid time.

READ COMMAND: ^TIME?

Indicates whether the device has a valid time or not.

0   Device does not have a valid time

1   Device has a valid time.

TEST COMMAND: ^TIME=?

Returns a fixed message indicating the range of acceptable values.

^TIME:[(0-1)]

4 GPS COMMANDS

4.1 +PA – ALL OF NMEA MESSAGE

EXEC COMMAND: +PA=<N>

Returns a complete NMEA message with no modifications.

<n>:   The NMEA or proprietary u-blox message to return.

1	GGA
2	GLL
3	GSA
4	GSV
5	GRS
6	RMC
7	VTG
8	ZDA
9	GST
A	PUBX,00: Latitude && Longitude (Vertical Velocity)
B	PUBX,01: UTM Position Data
C	PUBX,04: Time && Clock Information

4.2 +PD – DATE (UTC)

EXEC COMMAND: +PD

Returns the UTC date with the format shown below. "Invalid Position Fix" will appear only if the GPS receiver could not acquire a position fix.

+PD:

UTC Date=<mm>-<dd>-<yyyy>

[Invalid Position Fix]

Satellites Used=<ss>

<mm>:   Month (01-12)

<dd>:   Day (01-31)

<yyyy>:	Year (0000-9999)
<ss>:	Number of satellites used to obtain information

4.3 +PG – PROVIDE GPS

EXEC COMMAND: +PG=<CD>[,<MODE>[,<RATE>[,<MSG>]...]]

Causes the SHOUT ns to provide GPS information to the connected DTE equipment. The GPS information will be sent in NMEA format and will be delivered at certain timed intervals. Omitted parameters will not be changed.

<cd>:	States of CD line for which to send GPS information.
0	Neither when CD is low or high (default)
1	When CD is low
2	When CD is high
3	When CD is low or high.

<mode>:	Modes for which to send GPS information.
1	Command mode (default)
2	Tracking mode
3	Both tracking and command mode

<rate>:	Rate at which to send GPS information in seconds. The default is 1.
<msg>:	Message to send. This parameter may be repeated to cause the unit to send multiple messages.

1	GGA (default)
2	GLL
6	RMC
7	VTG
8	ZDA
A	PUBX,00: Latitude && Longitude (Vertical Velocity)
B	PUBX,01: UTM Position Data

Examples:

AT+PG=2,2,1,1

Sends the GGA message every second when CD is high (during a data call) in tracking mode.

AT+PG=3,2,10,6,7

Sends the RMC and VTG messages every 10 seconds at all times in tracking mode.

READ COMMAND: +PG?

Indicates the current values. The response is in the following form: <cd>,<mode>,<rate>,<msgs>

<msgs>:   A four digit hex number whose value represents the selected messages. This value is computed using the following formula. 2^<msg> + 2^<msg> + 2^<msg>... Therefore, if messages 1, 6, and A were selected, <msgs> would be 2^1 + 2^6 + 2^A = 2 + 64 + 1024 = 1090 = 0x0442.

TEST COMMAND: +PG=?

Returns a fixed message indicating the range of acceptable values.

+PG:(0-3,1-3,1-255,(1,2,6,7,8,A,B))

4.4   +PL – POSITION

EXEC COMMAND: +PL

Returns the position with the format shown below. "Invalid Position Fix" will appear only if the GPS receiver could not acquire a position fix. The AT+PLOC command is recommended to obtain GPS information.

+PL:
Latitude=<ll>:<mm>.<nnnn> <N/S>
Longitude=<ooo>:<pp>.<qqqq> <E/W>
Altitude=<#> meters
[Invalid Position Fix]
Satellites Used=<ss>

<ll>:   Latitude in degrees (00 - 90)
<mm>:   Latitude minutes (00 - 59)

<nnnn>:   Fraction of latitude minutes (0000 - 9999)

<N/S>:   North or South depending on the direction

<ooo>:   Longitude in degrees (000 - 180)

<pp>:   Longitude minutes (00 - 59)

<qqqq>:   Fraction of longitude minutes (0000 - 9999)

<E/W>:   East or West depending on the direction

<#>:   The height of the antenna. This number has 1 digit after the decimal point.

<ss>:   Number of satellites used to obtain information

4.5   +PLOC – MORE ACCURATE POSITION

EXEC COMMAND: +PLOC

Returns the position with the format shown below.

+PLOC:

Latitude=<ll>:<mm>.<nnnnn> <N/S>

Longitude=<ooo>:<pp>.<qqqqq> <E/W>

Altitude=<#> meters

<Position Fix>

Satellites Used=<ss>

<ll>:   Latitude in degrees (00 - 90)

<mm>:   Latitude minutes (00 - 59)

<nnnnn>:   Fraction of latitude minutes (00000 - 99999)

<N/S>:   North or South depending on the direction

<ooo>:   Longitude in degrees (000 – 180)

<pp>:   Longitude minutes (00 - 59)

<qqqqq>:   Fraction of longitude minutes (00000 - 99999)

<E/W>:   East or West depending on the direction

<#>:   The height of the antenna. This number has 1 digit after the decimal point.

<Position Fix>: Invalid Position Fix, Valid Position Fix, or Dead Reckoning

<ss>:   Number of satellites used to obtain information

4.6   +PNAV – GPS: Navigation Settings

Exec Command: +PNAV=<n>

This command increases the accuracy of the GPS receiver by specifying the environment.

<n>:

0	Portable
2	Stationary
3	Pedestrian
4	Automotive
5	Sea
6	Airborne low dynamics (< 1g)
7	Airborne medium dynamics (< 2g)
8	Airborne high dynamics (< 4g)

Read Command: +PNAV?

This command lists the current setting of the +PNAV command.

Test Command: +PNAV=?

This command lists the supported settings of the +PNAV command.

+PNAV:(0,2-8)

4.7   +PP – Turn GPS On/Off

Exec Command: +PP=<n>

Turns the GPS receiver on or off. This only has an effect in command mode.

<n>:

0	Turn off
1	Turn on (default)

Read Command: +PP?

Indicates the current value.

4.8 +PT – TIME (UTC)

EXEC COMMAND: +PT

Returns the UTC time with the format shown below. "Invalid Position Fix" will appear only if the GPS receiver could not acquire a position fix.

+PT:

UTC Time=<hh>:<mm>:<ss>.<xxx>

[Invalid Position Fix]

Satellites Used=<zz>

<hh>:	Hours (01 - 24)
<mm>:	Minutes (00 - 59)
<ss>:	Seconds (00-59)
<xxx>:	Hundredths (000-999)
<zz>:	Number of satellites used to obtain information

4.9 +PV – VELOCITY

EXEC COMMAND: +PV

Returns the velocity (consisting of speed in km/h and direction) with the format shown below. "Invalid Position Fix" will appear only if the GPS receiver could not acquire a position fix. The AT+PVEL command is recommended to obtain velocity information because it also lists the vertical velocity and will sometimes indicate dead reckoning instead of Invalid Position Fix.

+PV:

Ground Velocity=<#g> km/h, <#h> degrees from true North

[Invalid Position Fix]

Satellites Used=<ss>

<#g>:	Speed displayed
<#h>:	Heading in degrees from true north ranging from 0 to 360
<ss>:	Number of satellites used to obtain information

4.10 +PVEL – VELOCITY WITH VERTICAL COMPONENT

EXEC COMMAND: +PVEL

Returns the velocity (consisting of speed in km/h, direction, and vertical speed in m/s) with the format shown below.

+PVEL:

Ground Velocity=<#g> km/h, <#h> degrees from true North

Vertical Velocity=<#v> m/s

<Position Fix>

Satellites Used=<ss>

<#g>:   Speed displayed

<#h>:   Heading in degrees from true north ranging from 0 to 360

<#v>:   Vertical component of velocity. Value may be negative.

<Position Fix>:Invalid Position Fix, Valid Position Fix, or Dead Reckoning

<ss>:   Number of satellites used to obtain information

4.11 +PSREG – SBD REGISTRATION UTILIZING GPS

EXEC COMMAND: +PSREG

Internally issues the +SBDREG command with a location obtained from the GPS receiver.

NOTE: When encryption is enabled the +PSREG command will be disabled.

EXEC RESPONSE:

The response is the same as the response for the +SBDREG command except that if there is an invalid position fix, the unit will respond with "No GPS Fix" before issuing the response of the +SBDREG command. In this case, no location is added.

4.12 +PSIX[A] – INITIATE EXTENDED SBD SESSION UTILIZING GPS

EXEC COMMAND: +PSIX[A]

Internally issues the +SBDIX[A] command with a location obtained from the GPS receiver.

NOTE: When encryption is enabled the +PSIX[A] command will be disabled.

EXEC RESPONSE:

The response is the same as the response for the +SBDIX[A] command except that if there is an invalid position fix, the unit will respond with "No GPS Fix" before issuing the response of the +SBDIX[A] command. In this case, no location is added.

4.13   ^POSFMT – POSITION FORMAT

EXEC COMMAND: ^POSFMT=<N>

Changes the output of the Lattitude and Longitude of the CheckGPS, Test Reports, and Waypoints output data.

<n>

    0 (dd.dddddd)

    1 (dd:mm.mmmm)

    2 (dd:mm:ss.s)

    3 (MGRS)

4.14   +CHKGPS – CHECK GPS

Exec Command: +CHKGPS=<s> - this command can either send a test report to the outbox or can be used to check GPS at a 1 second rate.

<s> Below are the following settings for +CHKGPS.

0. AT+CHKGPS=0 stops Check GPS.

1. AT+CHKGPS=1 starts Check GPS and sending the command again stops Check GPS. If Iridium is in the process of sending Check GPS will stop displaying GPS. Once Iridium is done sending Check GPS will display the proper GPS again.

2. AT+CHKGPS=2 sends a test report to the outbox.

3. AT+CHKGPS=3 grabs the next available GPS data and displays it to the console. GPS will poll once a second and a message to the console will signal the completion. The grabbed GPS data will be stored into a temporary buffer to be interacted with other commands, used by the buttons.

4. AT+CHKGPS=4 resets the ephemeris

Note: In order to send a test report, AT+CHKGPS=3 must be called first, after it is done getting a fix, then the AT+CHKGPS=2 can be called. Calling the test report before grabbing the GPS will result in the message not being added to the outbox.

4.15 ^ICV – INVALID COURSE VALUE

EXEC COMMAND: ^ICV=<v>

When the GPS receiver is unable to determine the course, this value is sent in GPS reports to indicate an invalid course. If the set value is too large for the GPS report, the value will be truncated to the maximum that the field in the report can hold.

<v>:   0 – 999. Default is 0.

READ COMMAND: ^ICV?

Returns the current value.

TEST COMMAND: ^ICV =?

Returns a fixed message indicating the range of acceptable values.

^ICV:(0-999)

5   SHORT BURST DATA COMMANDS

5.1   +SBDRB – SHORT BURST DATA READ BINARY

EXEC COMMAND: +SBDRB

Transfers the contents of the single mobile terminated buffer in the SHOUT ns to the DTE with a length and a checksum. The mobile terminated buffer can contain only one message at a time.

NOTE: For security reasons this command is not allowed when encryption is enabled and the decryption key is all 0s.

NOTE: The mobile terminated buffer will be empty upon power-up.

EXEC RESPONSE:

<msgLength><message><checksum>

<msgLength>: A two byte field that represents the length, in bytes, of the following SBD message. This length does not include the length of the checksum after the message. The high order byte will be sent first. The maximum mobile terminated SBD message length is 270 bytes (256 with encryption).

<message>:   The SBD message, which is the contents of the mobile terminated buffer.

<checksum>: The least significant two bytes of the summation of each byte of the SBD message. The high order byte will be sent first. For example, if the ISU were to send the word "hello" encoded in ASCII to the DTE, the binary stream in hex would be 00 05 68 65 6c 6c 6f 02 14.

NOTE: If the mobile terminated buffer is empty, the message length and checksum fields will be zero.

5.2   +SBDRT – SHORT BURST DATA READ TEXT

EXEC COMMAND: +SBDRT

Transfers the contents of the single mobile terminated buffer in the SHOUT ns to the DTE. The mobile terminated buffer can contain only one message at a time. This command is similar to +SBDRB but does not provide a length or checksum. The intent of this command is

to provide a human friendly interface to SBD for demonstrations and application development. It is expected that most usage of SBD will be with binary messages.

NOTE: For security reasons this command is not allowed when encryption is enabled and the decryption key is all 0s.

NOTE: The mobile terminated buffer will be empty upon power-up.

EXEC RESPONSE:

+SBDRT:<CR><message>

<message>:   The SBD message, which is the contents of the mobile terminated buffer. The maximum mobile terminated SBD message length is 270 bytes (256 with encryption).

5.3   +SBDWB – SHORT BURST DATA WRITE BINARY

EXEC COMMAND: +SBDWB=<MSGLENGTH>

Transfers a binary SBD message from the DTE to the single mobile originated buffer in the SHOUT ns. If any data is currently in the mobile originated buffer, it will be overwritten.

<msgLength>: The length, in bytes, of the SBD message to be entered. This length does not include the length of the checksum, which will be entered after the message. Must be from 1 to 340 (336 with encryption).

Once the command is entered, the SHOUT ns will indicate that it is prepared to receive the message by sending "READY<CR><LF>" (hex 52 45 41 44 59 0D 0A) to the DTE. Once the DTE receives the READY indication, the SBD message must be sent from the DTE followed by a two byte checksum. The checksum is the least significant two bytes of the summation of each byte of the SBD message. The high order byte must be sent first. For example, if the DTE were to send the word "hello" encoded in ASCII to the SHOUT ns, the binary stream, in hex, would be 68 65 6c 6c 6f 02 14.

NOTE: The mobile originated buffer will be empty upon power-up.

EXEC RESPONSE:

    0   SBD message successfully written to the SHOUT ns.

1	SBD message write timeout. An insufficient number of bytes were transferred to the SHOUT ns during the transfer period of 60 seconds.
2	SBD message checksum sent from DTE does not match the checksum calculated at the SHOUT ns.
3	SBD message length is not correct. Check that the <msgLength> parameter is in range.

5.4 +SBDWT – SHORT BURST DATA WRITE TEXT

EXEC COMMAND: +SBDWT[=<MESSAGE>]

Transfers a text SBD message from the DTE to the single mobile originated buffer in the SHOUT ns. If any data is currently in the mobile originated buffer, it will be overwritten. The message may be entered as part of the command or separately.

To enter the message as part of the command...

- Use the +SBDWT=<message> form of the command.
- The message is terminated when the carriage return is entered.

To enter the message separately...

- Use the +SBDWT form of the command.
- Once the command is entered, the SHOUT ns will indicate that it is prepared to receive the message by sending "READY<CR><LF>" (hex 52 45 41 44 59 0D 0A) to the DTE.
- Once the DTE receives the READY indication, the text message must be sent, terminated by a carriage return.

Regardless of the way the message is entered, it must be from 1 to 340 (336 with encryption) bytes in length.

NOTE: The mobile originated buffer will be empty upon power-up.

EXEC RESPONSE:

When the message is entered as part of the command:

OK   SBD message successfully stored in mobile originated buffer.

ERROR   An error occurred while trying to store the SBD message in the mobile originated buffer.

When the message is entered separately:

0   SBD message successfully stored in mobile originated buffer.

1   SBD message write timeout. No terminating carriage return was sent within the transfer period of 60 seconds.

5.5   +SBDTC – SHORT BURST DATA TRANSFER MO BUFFER TO MT BUFFER

EXEC COMMAND: +SBDTC

Transfers the contents of the mobile originated buffer to the mobile terminated buffer. Developers of DTE can use this command to test reading and writing to the SHOUT ns without actually initiating SBD sessions with the ESS.

NOTE: For security reasons this command is not allowed when encryption is enabled.

EXEC RESPONSE:

0   Mobile originated buffer transferred successfully

1   An error occurred while transferring the mobile originated buffer.

5.6   +SBDD – SHORT BURST DATA DELETE MESSAGE BUFFER(S)

EXEC COMMAND: +SBDD<N>

Clears the mobile originated buffer, mobile terminated buffer, or both.

<n>:   Identifies which buffers to clear.

0   Mobile originated buffer

1   Mobile terminated buffer

2   Both the mobile originated and mobile terminated buffers

NOTE: Using this command or power cycling the phone are the only means by which both buffers are cleared. Sending a message from the SHOUT ns to the ESS does not clear the mobile originated buffer. Reading a message from the SHOUT ns does not clear the mobile

terminated buffer. However, the mobile terminated buffer will be cleared when an SBD session is initiated.

EXEC RESPONSE:

0   Buffer(s) cleared successfully.

1   An error occurred while clearing the buffer(s).

5.7   +SBDLOE – SHORT BURST DATA: TRAFFIC MANAGEMENT STATUS

EXEC COMMAND: +SBDLOE

This command returns the remaining time, in seconds, to the end of the current SBD traffic management period. The command may not return immediately, as it will wait if necessary up to 10 seconds to try to acquire the Iridium system time.

EXEC RESPONSE:

+SBDLOE:<status>,<time>

<status>:   The status indicates whether the time to the end of the current SBD traffic management period could be determined. This requires the SSD to know the Iridium system time and hence may fail if the Iridium network is not currently visible.

0   <time> is valid

1   <time> could not be determined

<time>:   This is the time, in seconds, to the end of the current SBD traffic management period. If no traffic management period is active this will be zero.

During a traffic management period, SBD sessions attempted will result in error code 38. The DTE application may use the +SBDLOE command to determine the time left until the end of the traffic management period.

NOTE: Power cycling the ISU has no effect on the traffic management period.

NOTE: This command only exists when the Iridium module version is 11002 or higher.

5.8 +SBDREG – SHORT BURST DATA REGISTRATION

EXEC COMMAND: +SBDREG[=<LOCATION>]

This command initiates an SBD session to perform a manual SBD registration, consisting of an attach and location update. This session does not transfer any MO or MT messages.

NOTE: The SHOUT ns restricts the number of manual and automatic registrations to one every 3 minutes. Successive attempts within 3 minutes will return an error code indicating that the FA should try again later (see error 36 below).

NOTE: A user can send an MO SBD message and register at the same time by using the +SBDIX command. The +SBDIX command always performs a registration attempt and should be used for an application requiring SBD ring alerts. The +SBDI command never includes an SBD registration and should be used for an application that does not require SBD ring alerts.

<location>:   The location of the SHOUT ns. This will be used to more efficiently route SBD ring alerts to the unit. The location must be in the format:

[+|-]<DD><MM>.<MMM>,[+|-]<ddd><mm>.<mmm>

The optional sign indicators specify latitude North (+) or South (-), and longitude East(+) or West(-). If omitted, the default is +. For example, 5212.483,-00007.350 corresponds to 52 degrees 12.483 minutes North, 0 degrees 7.35 minutes West.

    <DD>:   Degrees latitude (00-89)

    <MM>:   Minutes latitude (00-59)

    <MMM>:   Thousandths of minutes latitude (000-999)

    <ddd>:   Degrees longitude (000-179)

    <mm>:   Minutes longitude (00-59)

    <mmm>:   Thousandths of minutes longitude (000-999)

NOTE: For security reasons the optional position will not be allowed when encryption is enabled.

EXEC RESPONSE: +SBDREG:<STATUS>,<ERROR>

<status>:   Indicates the resulting registration status of the ISU.

0   Detached. The SHOUT ns is detached as a result of a successful +SBDDET or +SBDI command.

1   Not registered. The SHOUT ns is attached but has not provided a good location since it was last detached.

2   Registered. The SHOUT ns is attached with a good location. Note that this may be the case even when the most recent attempt did not provide a good location.

3   Registration denied. The GSS is denying service to the SHOUT ns.

<error>:   Values < 16 are gateway-reported whereas values >= 16 are SHOUT ns-reported.

0   No error.

2   Session completed but the requested Location Update was not accepted.

3..14   Reserved, but indicate Location Update failure if used.

15   Access is denied.

16   SHOUT ns has been locked and may not make SBD calls. (see +CULK command)

17   Gateway not responding (local session timeout).

18   Connection lost (RF drop).

19   Link failure (A protocol error caused termination of the call).

20..31   Reserved, but indicate failure if used.

32   No network service, unable to initiate call.

33   Antenna fault, unable to initiate call.

34   Radio is disabled, unable to initiate call (see *R command).

35   SHOUT ns is busy, unable to initiate call.

36   Try later, must wait 3 minutes since last registration.

37   SBD service is temporarily disabled.

38   Try later, traffic management period (see +SBDLOE command).

39..63   Reserved, but indicate failure if used.

64	Band violation (attempt to transmit outside permitted frequency band).
65	PLL lock failure; hardware error during attempted transmit.

READ COMMAND: +SBDREG?

Queries the current SBD registration status of the SHOUT ns. The response is of the form +SBDREG:<status>.

<status>:

0	Detached
1	Not registered
2	Registered
3	Registration denied

NOTE: The registration status is stored in the SHOUT ns non-volatile memory, and can therefore be queried by the FA after powering up.

5.9   +SBDAREG – SHORT BURST DATA AUTOMATIC REGISTRATION

EXEC COMMAND: +SBDAREG=<MODE>

Sets the SHOUT ns's auto-registration mode.

<mode>:

0	Disable automatic registration (default).
1	Set the auto-registration mode to "Automatic"
2	Set the auto-registration mode to "Ask"

NOTE: During auto registration, the location of the unit is sent out unencrypted regardless of whether encryption is enabled.

When auto-registration is enabled, mode 1 or 2, the SHOUT ns monitors its current location and triggers an SBD auto-registration when it determines that the SHOUT ns has moved sufficiently far away from its last registered location. Note that auto-registration runs only while the SHOUT ns is attached to the GSS, i.e. the registration status is "Not registered" or "Registered"

Auto-registration may only be used with system-provided location. If the FA is providing its own location (e.g. GPS), the FA should use the manual registration command, +SBDREG or +PSREG.

Upon triggering in mode 1, "Automatic", the SHOUT ns autonomously initiates an SBD session in order to perform a registration with the updated location of the SHOUT ns. This session does not transfer any MO or MT messages.

Upon triggering in mode 2, "Ask", the SHOUT ns reports to the FA that it should register with the system because the SHOUT ns location has changed (see <event> below). It is then the responsibility of the FA to register via +SBDREG or +SBDIX. +SBDIX allows the FA to register while including an MO message and/or retrieving any MT message that is pending at the GSS. In tracking mode, if the decryption key is set to all 0s the auto-registration will be disabled.

When auto-registration is enabled, mode 1 or 2, the SHOUT ns reports relevant events to the FA by issuing an unsolicited result code of the following format.

+AREG:<event>,<error>

<event>:

0	Suggest FA makes a registration attempt (mode 2 only).
1	Auto-registration has been performed successfully (mode 1 only).
2	Auto-registration has failed and will be retried after a delay (mode 1 only).

<error>: Values < 16 are gateway-reported whereas values >= 16 are SHOUT ns-reported.

0	No error.
2	Session completed but the requested Location Update was not accepted.
3..14	Reserved, but indicate Location Update failure if used.
15	Access is denied.
16	SHOUT ns has been locked and may not make SBD calls (see +CULK command).
17	Gateway not responding (local session timeout).
18	Connection lost (RF drop).
19	Link failure (A protocol error caused termination of the call).

20..31	Reserved, but indicate failure if used.
32	No network service, unable to initiate call.
33	Antenna fault, unable to initiate call.
34	Radio is disabled, unable to initiate call (see *R command).
35	ISU is busy, unable to initiate call.
36	Try later, must wait 3 minutes since last registration.
37	SBD service is temporarily disabled.
38	Try later, traffic management period (see +SBDLOE command)
39..63	Reserved, but indicate failure if used.
64	Band violation (attempt to transmit outside permitted frequency band).
65	PLL lock failure; hardware error during attempted transmit.

READ COMMAND: +SBDAREG?

Indicates the current value.

TEST COMMAND: +SBDAREG=?

Returns a fixed message indicating the range of acceptable values.

+SBDAREG:(0-2)

5.10   +SBDDET – SHORT BURST DATA DETACH FROM GATEWAY

EXEC COMMAND: +SBDDET

Initiates an SBD session to instruct the gateway to disable (detach) SBD ring alerts for the calling SHOUT ns. Successful completion of the detach command implies that the gateway has performed the requested detach action and the SHOUT ns is no longer registered for SBD ring alerts. This session does not transfer any MO or MT messages.

NOTE: A user can send an MO-SBD message and request a detach at the same time by using the +SBDI command. The +SBDI command always requests a detach.

EXEC RESPONSE:

+SBDDET:<status>,<error>

<status>:

0	Detach successfully performed
1	An error occurred while attempting the detach

<error>:	Values < 16 are gateway-reported, whereas values >= 16 are SHOUT ns-reported.

0	Detach successfully performed.
1..4	Reserved, but indicates success if used.
5..14	Reserved, but indicate failure if used.
15	Access is denied.
16	SHOUT ns has been locked and may not make SBD calls (see +CULK command).
17	Gateway not responding (local session timeout)
18	Connection lost (RF drop).
19	Link failure (A protocol error caused termination of the call).
20..31	Reserved, but indicate failure if used.
32	No network service, unable to initiate call.
33..34	Reserved, but indicate failure if used.
35	SHOUT ns is busy, unable to initiate call.
36..	Reserved, but indicate failure if used.

5.11   +SBDI – SHORT BURST DATA INITIATE SESSION

EXEC COMMAND: +SBDI

Initiates an SBD session between the SHOUT ns and the gateway. If there is a message in the mobile originated buffer it will be transferred to the gateway. Similarly if there is one or more messages queued at the gateway the oldest will be transferred to the SHOUT ns and placed into the mobile terminated buffer.

This command will always perform an SBD detach. Therefore, FAs wishing to use SBD ring alerts should use the +SBDIX command instead of this command.

For SBD sessions invoked with this command...

* The SBD session type is fixed at type 0 (MO call).
* The SBD delivery short code will be the value specified by the +SBDDSC command.

- An SBD detach is performed.

- No SBD location update is performed.

EXEC RESPONSE:

+SBDI:<moStatus>,<momsn>,<mtStatus>,<mtmsn>,<mtLength>,<mtQueued>

<moStatus>: MO session status provides an indication of the disposition of the mobile originated transaction. The field can take on the following values:

    0   No SBD message to send from the SHOUT ns.

    1   SBD message successfully sent from the SHOUT ns to the gateway.

    2   An error occurred while attempting to send SBD message from SHOUT ns to gateway.

<momsn>: The Mobile Originated Message Sequence Number (MOMSN) is a value assigned by the SHOUT ns when sending a mobile-originated message to the gateway. This value is incremented each time an SBD session is successfully completed between the SHOUT ns and the gateway. This wrap around counter can range from 0 to 65535.

<mtStatus>: The MT status provides an indication of the disposition of the mobile terminated transaction. The field can take on the following values:

    0   No SBD message to receive from the gateway.

    1   SBD message successfully received from the gateway.

    2   An error occurred while attempting to perform a mailbox check or receive a message from the gateway.

<mtmsn>: The Mobile Terminated Message Sequence Number (MTMSN) is assigned by the gateway when forwarding a message to the SHOUT ns. This value is indeterminate if the field <MT status> is zero. This wrap around counter can range from 0 to 65535.

<mtLength>: The length in bytes of the mobile terminated SBD message received from the gateway. If no message was received, this field will be zero.

<mtQueued>: A count of mobile terminated SBD messages waiting at the gateway to be transferred to the SHOUT ns.

5.12 +SBDIX – SHORT BURST DATA INITIATE EXTENDED SESSION

EXEC COMMAND: +SBDIX[A][=<LOCATION>]

Initiates an SBD session between the SHOUT ns and the gateway. If there is a message in the mobile originated buffer it will be transferred to the gateway. Similarly if there is one or more messages queued at the gateway the oldest will be transferred to the SHOUT ns and placed into the mobile terminated buffer.

This command will always attempt an SBD registration, consisting of attach and location update, during the SBD session in order to support SBD ring alerts. If this is not desired, the +SBDI command should be used. The FA should append an 'A' to the command, i.e. +SBDIXA, when the SBD session is in response to an SBD ring alert.

For SBD sessions invoked with this command...

- The SBD session type is set according to the type of command +SBDIX or +SBDIXA.
- The delivery short code will be the value specified by the +SBDDSC command.
- An SBD registration is attempted.
- A location update is preformed.

<location>:   The location of the unit. This will be used to more efficiently route SBD ring alerts to the unit. The location must be in the format:

[+|-]<DD><MM>.<MMM>,[+|-]<ddd><mm>.<mmm>

The optional sign indicators specify latitude North (+) or South (-), and longitude East(+) or West(-). If omitted, the default is +. For example, 5212.483,-00007.350 corresponds to 52 degrees 12.483 minutes North, 0 degrees 7.35 minutes West.

<DD>:   Degrees latitude (00-89)

<MM>:   Minutes latitude (00-59)

<MMM>:   Thousandths of minutes latitude (000-999)

<ddd>:	Degrees longitude (000-179)
<mm>:	Minutes longitude (00-59)
<mmm>:	Thousandths of minutes longitude (000-999)

NOTE: For security reasons the optional position will not be allowed when encryption is enabled.

NOTE: If encryption is enabled and the decryption key is set to all 0s, in tracking mode, a session will only be initiated with the +SBDI command.

EXEC RESPONSE:

+SBDIX:<moStatus>,<momsn>,<mtStatus>,<mtmsn>,<mtLength>,<mtQueued>

<moStatus>: MO session status provides an indication of the disposition of the mobile originated transaction. Values < 16 are gateway-reported, whereas values >= 16 are SHOUT ns-reported.

0	MO message, if any, transferred successfully.
1	MO message, if any, transferred successfully, but the MT message in the queue was too big to be transferred.
2	MO message, if any, transferred successfully, but the requested Location Update was not accepted.
3..4	Reserved, but indicates MO session success if used.
5..8	Reserved, but indicated MO session failure if used.
10	GSS reported that the call did not complete in the allowed time.
11	MO message queue at the gateway is full.
12	MO message has too many arguments.
13	Gateway reported that the session did not complete.
14	Invalid segment size.
15	Access is denied.
16	SHOUT ns has been locked and may not make SBD calls (see +CULK command).
17	Gateway not responding (local session timeout).
18	Connection lost (RF drop).
19	Link failure (A protocol error caused termination of the call).

20..31	Reserved, but indicate failure if used.
32	No network service, unable to initiate call.
33	Antenna fault, unable to initiate call.
34	Radio is disabled, unable to initiate call (see *R command).
35	SHOUT ns is busy, unable to initiate call.
36	Try later, must wait 3 minutes since last registration.
37	SBD service is temporarily disabled.
38	Try later, traffic management period (see +SBDLOE command).
39..63	Reserved, but indicate failure if used.
64	Band violation (attempt to transmit outside permitted frequency band).
65	PLL lock failure; hardware error during attempted transmit.

<momsn>:   The Mobile Originated Message Sequence Number (MOMSN) is a value assigned by the SHOUT ns when sending a mobile-originated message to the gateway. This value is incremented each time an SBD session is successfully completed between the SHOUT ns and the gateway. This wrap around counter can range from 0 to 65535.

<mtStatus>:   The MT status provides an indication of the disposition of the mobile terminated transaction. The field can take on the following values:

0	No SBD message to receive from the gateway.
1	SBD message successfully received from the gateway.
2	An error occurred while attempting to perform a mailbox check or receive a message from the gateway.

<mtmsn>:   The Mobile Terminated Message Sequence Number (MTMSN) is assigned by the gateway when forwarding a message to the SHOUT ns. This value is indeterminate if the field <MT status> is zero. This wrap around counter can range from 0 to 65535.

<mtLength>: The MT length is the length in bytes of the mobile terminated SBD message received from the gateway. If no message was received, this field will be zero.

<mtQueued>: MT queued is a count of mobile terminated SBD messages waiting at the gateway to be transferred to the SHOUT ns.

5.13   +SBDC – SHORT BURST DATA CLEAR MOMSN

EXEC COMMAND: +SBDC

Clears (sets to 0) the mobile originated message sequence number (MOMSN) stored in the SHOUT ns.

NOTE: The MOMSN is maintained even after power cycle.

EXEC RESPONSE:

| 0 | The MOMSN was cleared successfully. |
| 1 | An error occurred while clearing the MOMSN. |

5.14   +SBDDSC – SHORT BURST DATA DELIVERY SHORT CODE

EXEC COMMAND: +SBDDSC=<N>

Sets the Delivery Short Code (DSC), which provides dynamic routing or control information for MO or MT messages. This is an 8-bit value providing the ability to set individual fields. Value 0x80 (hexadecimal) sets the most significant bit. Value 0x01 sets the least significant bit. Flag values can be added together to achieve a combination of settings. Some fields are overridden during certain SBD sessions (e.g. an +SBDREG registration sets flag 0x80).

<n>:   DSC to be used for subsequent uploaded messages. Must be from 0 to 255. Default is 0. The bits are interpreted as follows.

0x80	Hold MT message deliveries
0x40	Leave MT message in queue after delivery
0x20	Destination in MO payload

READ COMMAND: +SBDDSC?

Indicates the current value.

5.15   +SBDGW[N] – SHORT BURST DATA GATEWAY

These commands will read back the Iridium gateway that the Short Burst Data messages are configured to be sent to, giving either a textual or numeric result.

EXEC COMMAND: +SBDGW

The command produces a response of the form "+SBDGW: <Gateway_text>"

<Gateway_text>: 'EMSS' or 'non-EMSS'.

Due to an inaccurate specification for this command, 'EMSS' is used here to indicate the default commercial gateway, although this is actually the name of a different gateway. The error will not be corrected, to maintain backward compatibility.

EXEC COMMAND: +SBDGWN

The command produces a response of the form "+SBDGWN: <Gateway_numeric>"

<Gateway_numeric>:

1	The default commercial gateway
2	EMSS gateway

In future software releases, other <Gateway_numeric> values may be output to indicate specific gateways, so for future compatibility the FA should treat any value other than 1 as meaning 'not the default commercial gateway'.

5.16   +SBDMTA – SHORT BURST DATA MOBILE-TERMINATED ALERT

EXEC COMMAND: +SBDMTA=<MODE>

Enables or disables ring indications for automatic Mobile-Terminated SBD messaging.

<mode>:

0	Disable ring indication
1	Enable ring indication (default)

When ring indication is enabled, the Data Transceiver asserts the RI line and issues the unsolicited result code SBDRING when a ring alert is received.

READ COMMAND: +SBDMTA?

Indicates the current value.

TEST COMMAND: +SBDMTA=?

Returns a fixed message indicating the range of acceptable values.

+SBDMTA:(0-1)

5.17   +SBDS – SHORT BURST DATA STATUS

EXEC COMMAND: +SBDS

Returns the current state of the mobile originated and mobile terminated buffers.

EXEC RESPONSE:

+SBDS:<moFlag>,<momsn>,<mtFlag>,<mtmsn>

<moFlag>:   The MO flag indicates the existence of a message in the mobile originated buffer. The response from the SHOUT ns is one of the following numeric codes:

  0   No message in mobile originated buffer

  1   Message in mobile originated buffer

<momsn>:   The MOMSN identifies the sequence number that will be used during the next mobile originated SBD session.

<mtFlag>:   The MT flag indicates the existence of a message in the mobile terminated buffer. The response from the SHOUT ns is one of the following numeric codes:

  0   No message in mobile terminated buffer

  1   Message in mobile terminated buffer

<mtmsn>:   The MTMSN identifies the sequence number that was used in the most recent mobile terminated SBD session. This value will be -1 if there is nothing in the mobile terminated buffer.

5.18   +SBDSX – SHORT BURST DATA STATUS EXTENDED

EXEC COMMAND: +SBDSX

Returns the current state of the mobile originated and mobile terminated buffers and the SBD ring alert status.

EXEC RESPONSE:

+SBDSX:<moFlag>,<momsn>,<mtFlag>,<mtmsn>,<raFlag>,<msgWaiting>

<moFlag>:   Indicates the existence of a message in the mobile originated buffer.

0	No message in mobile originated buffer
1	Message in mobile originated buffer

<momsn>: The MOMSN identifies the sequence number that will be used during the next mobile originated SBD session.

<mtFlag>: Indicates the existence of a message in the mobile terminated buffer

0	No message in mobile terminated buffer
1	Message in mobile terminated buffer

<mtmsn>: The MTMSN identifies the sequence number that was used in the most recent mobile terminated SBD session. This value will be -1 if there is nothing in the mobile terminated buffer.

<raFlag>: The RA flag indicates whether an SBD ring alert has been received and still needs to be answered. The RA flag is set whenever the SHOUT ns receives an SBD ring alert. This happens even if the +SBDMTA setting specifies that SBD ring indications are disabled. The RA flag is cleared only on successful completion of an SBD mailbox check, i.e. an SBD session invoked with +SBDI[X[A]] in which the returned MT status indicates that no error occurred. The value of the RA flag is stored in non-volatile memory so it is preserved across power cycling of the SHOUT ns.

0	No SBD ring alert
1	SBD ring alert has been received and needs to be answered

<msgWaiting>: The message waiting flag indicates how many SBD mobile terminated messages are currently queued at the gateway awaiting collection by the SHOUT ns. This flag is updated after every SBD session, including +SBDI, +SBDIX, +SBDIXA, +SBDREG and +SBDDET.

6 TRACKING COMMANDS

6.1 ^BIGR – BLOCK INVALID GPS REPORTS

EXEC COMMAND: ^BIGR=<N>

Sets whether periodic GPS position reports with an invalid fix will be blocked or sent. This will only block tracking reports with an invalid fix; callouts are unaffected.

<n>:

0	Do not block (default)
1	Block

READ COMMAND: ^BIGR?

Indicates the current value for this command

TEST COMMAND: ^BIGR=?

Returns a fixed message indicating the range of acceptable values.

^BIGR:(0-1)

6.2 ^CAL – CALLABLE

EXEC COMMAND: ^CAL<N>

The SHOUT ns sends GPS reports at a pre-defined frequency. In between GPS reports, the unit can put all internal electronic circuits in power-saving states known as "Sleep between reports" (Mode 0). It can also leave the primary communication link on in between GPS reports to listen for remote update requests known as "Callable between reports" (Mode 1). A third option is that the unit runs Mode 0 when it is not in motion and Mode 1 when in motion. In Mode 1, the primary link is also always turned on to receive incoming alerts and data. Mode 0 uses the least power. Mode 1 uses the most power.

<n>:

0	Sleep between reports
1	Callable between reports (Modem stays on) (Default)
2	Sleep while not in motion and callable while moving

NOTE: ^CAL2 works differently than with earlier NAL trackers. The functionality that utilized ^TBRA and ^TTKTA has been broken out into the command ^UAMS

READ COMMAND: ^CAL?

Indicates the current value for this command.

TEST COMMAND: ^CAL=?

Returns a fixed message indicating the range of acceptable values.

^CAL:(0-2)

6.3   ^DFR – DELAY FIRST REPORT

EXEC COMMAND: ^DFR=<N>

Delays the first report by the 'time between reports' (^TBR) value when switching between tracking modes or when tracking is started. ^DFR delay time takes precedence over ^RF such that Report Flooding will occur AFTER the ^DFR time cycle defined by ^TBR.

<n>:

> 0   Do not delay any reports (default)
>
> 1   Delay report

READ COMMAND: ^DFR?

Indicates the current state for this command

TEST COMMAND: ^DFR=?

Returns the range of acceptable values

^DFR: (0-1)

6.4   ^DFRA – AWAKE DELAY FIRST REPORT

EXEC COMMAND: ^DFRA=<N>

Delays the first report by 'awake time between reports' (^TBRA) value when ^UAMS is enabled and motion has started.

<n>:

0	Do not delay any reports (default)
1	Delay report

READ COMMAND: ^DFRA?

Indicates the current state for this command

TEST COMMAND: ^DFRA=?

Returns the range of acceptable values

^DFRA: (0-1)

6.5   ^DLE – DATA LOG ERASE

EXEC COMMAND: ^DLE

Erases all of the logged GPS reports.

6.6   ^DLR – DATA LOG READ

EXEC COMMAND: ^DLR[=<AMOUNT>]

Displays the stored GPS reports.

<amount>:   The maximum number of reports from the data log to display. If omitted, all report from the data log will be displayed.

EXEC RESPONSE:

Each report will be returned in the following format. In this format, () specifies a list of possible values separated by |, [] specifies an option value, and <> specify a variable. The formats for the date, time, latitude, and longitude are specified without any special syntax.

(Emergency|Normal)

UTC Time=hh:mm:ss.f

UTC Date=mm-dd-yyyy

Latitude=dd:mm.ffff (South|North)

Longitude=ddd:mm.ffff (West|East)

Altitude=<alt> meters

Ground Velocity=<gndVel> km/h at <course> degrees from True North

Vertical Velocity=<verVel> m/s

Position Fix=(Valid|2D|Invalid)

Satellites Used=<ss>

HDOP=<hdop>

VDOP=<vdop>

Motion=(Yes|No)

Emergency Acknowledged=(Yes|No)

READ COMMAND: ^DLR?

Query the number of logged reports. The response is in the form:

^DLR: <count>

TEST COMMAND: ^DLR=?

Returns a fixed message indicating the range of acceptable values.

^DLR:(0-4000)

6.7 ^DLTRK – DATA LOG TRACKING

EXEC COMMAND: ^DLTRK=<N>

Sets whether to log GPS reports during tracking.

<n>:

0	GPS reports are not stored in the data log
1	GPS reports are stored in the data log (default)

READ COMMAND: ^DLTRK?

Indicates the current value for this command.

TEST COMMAND:^DLTRK=?

Returns a fixed message indicating the range of acceptable values.

^DLTRK:(0-1)

6.8   ^EMRCLR – EMERGENCY CLEAR

EXEC COMMAND: ^EMRCLR

This command causes the unit to forget that it was in an emergency state by clearing the emergency indication in memory. When the unit is power cycled, it will no longer be in an emergency state.

6.9   ^EMRE – EMERGENCY MODE ENABLE

EXEC COMMAND: ^EMRE=<N>

Controls the Emergency state for the device.

<n>:

0	Disables Emergency Mode (equivalent to pressing and holding the emergency button for canceling Emergency mode.)
1	Enables Emergency Mode (equivalent to pressing the emergency button for initiating Emergency mode.)

READ COMMAND: ^EMRE?

Indicates the current Emergency state of the device as described by <n> above.

TEST COMMAND: ^EMRE=?

Returns a fixed message indicating the range of acceptable values.

^EMRE:(0-1)

6.10   ^ERQ – ENABLE REPORT QUEUES

EXEC COMMAND: ^ERQ=<R>[,<F>]

Sets whether to queue restricted and failed tracking reports.

<r>:   Whether to queue restricted tracking reports (reports that are scheduled to send while all communication links are disabled)

0	Do not queue
1	Queue

<f>:   Whether to queue failed tracking reports (reports that fail all attempts in the allowed retry period)

    0   Do not queue

    1   Queue

READ COMMAND: ^ERQ?

Indicates the current value for this command.

TEST COMMAND: ^ERQ=?

Returns a fixed message indicating the range of acceptable values.

^ERQ:(0-1)[,(0-1)]

6.11   ^ERQC – REPORT QUEUE COUNT

EXEC COMMAND: ^ERQC

Returns the number of queued restricted and failed reports

6.12   ^ERQM – MAXIMUM QUEUED REPORTS

EXEC COMMAND: ^ERQM=<I>

Sets the max number of restricted and failed reports that can be queue.

<i>:   Number of reports

TEST COMMAND: ^ERQM=?

Returns a fixed message indicating the range of acceptable values.

^ERQM:(0-1000)

6.13   ^GAO – GPS ALWAYS ON

EXEC COMMAND: ^GAO<N>

Controls whether or not the GPS receiver "goes to sleep" between reports. If battery life is not a concern, it is recommended that this option is on to give more accurate and faster GPS position acquisition.

NOTE: The GPS receiver will be turned off if the SHOUT ns is allowed to sleep or turn off.

<n>:

0   GPS Receiver is off between reports.

1   GPS Receiver is always on.

READ COMMAND: ^GAO?

Responds with the current setting of the ^GAO command

6.14   ^ID – CHANGE THE IDENTIFIER

EXEC COMMAND: ^ID=<N>[,<ID>]

Allows a unique static identifier to be entered and added to the GPS report. When <n> takes on a value of 1, an<id> of up to 50 characters long must appear immediately after and enclosed inside two double quotes (" ").

<id>:   The static identifier to be included in every GPS report, enclosed by " ", and can be up to 50 characters long.

READ COMMAND: ^ID?

Indicates the current ID status and displays the static identifier if available

IMPORTANT: Iridium charges a minimum of 30 bytes for each SBD message. The SHOUT ns compresses each GPS report to 30 bytes, not including the static identifier, to minimize airtime cost. Thus, keeping static ID short will reduce per message cost.

NOTE: The ID is only included in reports when ^RMF is set to 1, 2 or 3.

6.15   ^MBXCHK – MAILBOX CHECK

EXEC COMMAND: ^MBXCHK=<N>

This command specifies the time between mailbox checks. The default is 10 minutes.

<n>:   May take on a value between 0 to 10080 minutes in increments of 0.5 minute (30 seconds)

READ COMMAND: ^MBXCHK?

Returns the current value for this command.

TEST COMMAND: ^MBXCHK=?

Returns a fixed message indicating the range of acceptable values.

^MBXCHK:(0-10080)

6.16   ^MBXCHKE – MAILBOX CHECK ENABLE

EXEC COMMAND: ^MBXCHKE=<N>

Sets whether the unit will perform mailbox checks in Tracking mode.

<n>:

0	Mailbox checks disabled (default)
1	Mailbox checks enabled

READ COMMAND: ^MBXCHKE?

Returns the current value for this command.

TEST COMMAND: ^MBXCHKE=?

Returns a fixed message indicating the range of acceptable values.

^MBXCHKE:(0-1)

6.17   ^MBXCHKM – CHECK MAILBOX

Exec Command: ^MBXCHKM

Command used to initiate a check of the mailbox.

6.18   ^MSA – MOTION SENSOR AWAKE

EXEC COMMAND: ^MSA=<ENABLED>

This command determines whether to monitor activity on the motion sensor. When enabled, internal motion start (see ^MSB) and end events (see ^MSE) are triggered. These events drive other motion features including ^CAL2, ^UAMS, and ^MSR.

<enabled>:

0	Disables motion sensor. (Default)
1	Enables the motion sensor.

READ COMMAND: ^MSA?

Returns the current value for Motion Sensor awake

TEST COMMAND: ^MSA=?

Returns a fixed message indicating the range of acceptable values.

^MSA:(0/1)

6.19 ^MSB – MOTION SENSOR BEGIN

EXEC COMMAND: ^MSB=<WC>,<S>,<WS>

This determines the criteria under which the motion start event triggers. The motion detection is broken into three different parameters: the search window duration, search window count, and sensitivity. For a detection to occur the sensitivity (number of detected motions) must be satisfied for a number of consecutive search windows.

<wc>:   Window Count – Required number of consecutive search windows. The range is 0 – 60 with default being 3 windows. A value of 0 indicates that the unit wakes up after sensing a single motion.

<s>:   Sensitivity – Number of motions that must be detected in a single search window. For each detection there is a (ws / 30) ignore period where activity of the motion sensor is ignored. The range is 1 – 26 where 1 requires the least motion and 26 require the most motion.

<ws>:   Window Size – Number of seconds in each search window. The range is 1 – 60 seconds with default being 60 seconds.

READ COMMAND: ^MSB?

Returns the current state for this command

TEST COMMAND: ^MSB=?

Returns a fixed message indicating the range of acceptable values.

^MSB:(0-60),(1-26),(1-60)

6.20   ^MSE – MOTION SENSOR END

EXEC COMMAND: ^MSE=<M>

This sets the criteria under which the motion end event is triggered. The motion end event will trigger if <m> minutes go by where no motion is detected, and the motion start event has previously occurred.

<m>:   Number of minutes of no motion that must pass before the motion end event triggers. The range is 1 – 60 with default being 3.

NOTE: While the device is awake, the countdown to the end is extended anytime the motion sensor detects motion. However, while sleeping, the count is only extended when the criteria defined by ^MSB is satisfied.

READ COMMAND: ^MSE?

Returns the current state for this command

TEST COMMAND: ^MSE=?

Returns a fixed message indicating the range of acceptable value.

^MSE:(1-60)

6.21   ^MSR – MOTION SENSOR REPORTING

EXEC COMMAND: ^MSR=<N>[,<M>]

This command determines whether to send a report when a motion start and/or end event triggers. This setting requires that ^MSA is enabled and ^MSB, ^MSE, ^MSW are set to desired values. When motion start reporting is enabled and a motion start event triggers, a GPS version 6 report is sent with short code 20, Motion Start Notice. When motion end reporting is enabled and a motion end event triggers, a GPS version 6 report is sent with short code 21, Motion End Notice. In the case of ^CAL0 and motion end reporting is enabled, if the unit sleeps before ^MSE minutes of no motion, the unit will wake when ^MSE expires and send a motion end report. In the case of ^CAL2 and motion end reporting is enabled, the unit will not sleep until motion ends, according the behavior of ^CAL2, and the motion end report will be sent at expiration of ^MSE minutes of no motion.

<n>:

0	Don't send a notice when a motion start event occurs. (Default)
1	Send a notice when a motion start event occurs.

<m>:

0	Don't send a notice when a motion end event occurs. (Default)
1	Send a notice when a motion end event occurs.

READ COMMAND: ^MSR?

Returns the current state for this command.

TEST COMMAND: ^MSR=?

Returns a fixed message indicating the ranges this can be set to.

^MSR: (0-1),(0-1)

6.22 ^MSW – MOTION SENSOR WAIT

EXEC COMMAND: ^MSW=<M>

This determines how long to ignore the motion sensor when a transition to sleep occurs.

<m>:   Number of minutes to wait. Default is 0.

READ COMMAND: ^MSW?

Returns the current state for this command

TEST COMMAND: ^MSW=?

Returns a fixed message indicating the range of acceptable value.

^MSW:(0-1440)

6.23 ^RF – REPORT FLOOD

EXEC COMMAND: ^RF=<N>

This determines how many reports will be sent out continuously when first entering tracking mode or when the modem state changes in tracking mode (for instance, entering and leaving a geofence or activating and deactivating emergency). The report flooding can be delayed by using the ^DFR and ^DFRA settings. Report Flooding will occur AFTER a ^DFR time cycle

defined by ^TBR. After <n> reports have been sent the interval value set by ^TBR will take effect. If <n> is zero, the tracker will use ^TBR to determine the rate at which reports are sent. The range is 0 to 255 and the default value is 0.

READ COMMAND: ^RF?

Indicates the current value for this command

TEST COMMAND: ^RF=?

Returns a fixed message indicating the range of acceptable values.

^RF:(0-255)

6.24   ^RMF – REPORT MESSAGE FORMAT

EXEC COMMAND: ^RMF=<N>

Sets the format of reports that will be sent to the recipient.

<n>:

1	GPS version 3 (format used on older A3LA series tracking units)
2	GPS version 4 (includes HDOP, VDOP, Motion)
3	GPS version 5 (includes input and output pin states)
4	PECOS P3
5	PECOS P4
6	GPS version 6 (includes short codes and free text)
7	10 byte GPS version 0

READ COMMAND: ^RMF?

Indicates the current value.

TEST COMMAND: ^RMF=?

Returns a fixed message indicating the range of acceptable values.

^RMF:(1-7)

6.25 ^SPSR – SAME PLACE, SKIP REPORTS

EXEC COMMAND: ^SPSR=<N>[,<D>[,<B>[,<C>]]]

If the unit is not moving this will limit the number of GPS reports that are sent out. When enabled, ^SPSR causes the unit to be bounded by a sphere with radius <d>. Report sending is halted when the unit remains in the sphere for a time specified by <b>. Report sending will resume once the unit has left the sphere. Upon leaving the bounding sphere, a new boundary will be created at the current location of the unit. If the unit remains in the boundary for an extended period of time a report may be sent depending on the mode <n> and the number of cycles specified by <c>. An example of how ^SPSR may be useful is if used on a truck the number of reports sent when the truck is parked would be limited

<n>:

0	Turn of the feature
1	Enable this feature for a set number of reports
2	Never send another report until it movies

<d>: The radius of a 3D sphere to not send reports in meters. Range is 10 to 65535. Depending on GPS signal conditions, the position may drift some point to point. The radius should be selected such that the expected drift does not exceed the radius.

<b>: Number of reports to send while stationary before skipping takes effect. Range is 0 to 65535.

<c>: The number of cycles to skip sending out GPS reports if the unit has not moved. Range is 1 to 65535.

NOTE: <b> and <c> are measured in report cycles. In general, report cycles last ^TBR seconds. For example, if the unit is to be configured to wait 10 minutes before report skipping begins and ^TBR is set to 2 minutes, <b> should be set to 5 cycles. (Desired time / ^TBR = <b>)

NOTE: If SPSR is enabled and the SHOUT ns attempts to send a report without a valid GPS fix, SPSR will not process its report skipping logic. The command ^BIGR must be used to block reports with an invalid GPS fix from being sent.

READ COMMAND: ^SPSR?

Returns the current settings for this command

TEST COMMAND: ^SPSR=?

Returns a fixed message indicating the range of acceptable values and an explanation of what they mean.

^SPSR:(0-2)[,(10-65535)[,(0-65535)[,(1-65535)]]]

6.26   ^SSR – SUCCESSFUL SEND REQUIRED

EXEC COMMAND: ^SSR=<N>

Sets when to allow switching between normal, test, geofence, and emergency modes.

<n>:

0	Disabled. Tracking mode will switch immediately (default)
1	Must attempt one report before switching
2	Must successfully send one report before switching

READ COMMAND: ^SSR?

Indicates the current value for this command

TEST COMMAND: ^SSR=?

Returns a fixed message indicating the range of acceptable values.

^SSR:(0-2)

6.27   ^START – START UP MODE

EXEC COMMAND: ^STARTN

Set the operation at power up and when waking up from sleep. This will be reset by &F.

<n>:

0	Start in command mode
1	Start in tracking mode (default)

READ COMMAND: ^START?

Indicates the current value.

TEST COMMAND: ^ START =?

Returns a fixed message indicating the range of acceptable values.

^START:(0-1)

6.28   ^STATS – VIEW STATISTICS

EXEC COMMAND: ^STATS

Displays statistics related to tracking.

6.29   ^STATSE – ERASE STATISTICS

EXEC COMMAND: ^STATSE

Erases the statistics.

6.30   ^TBR – TIME BETWEEN REPORTS

EXEC COMMAND: ^TBR=<N>

Sets the time between reports (TBR).

<n>:   Time between reports in minutes. May take on a value between 0 to 10080 minutes in increments of 0.5 minute (30 seconds). Default is 5.

When TBR is set to a value between 0.5 minute and 10080 minutes, an additional parameter called Time To Keep Trying or TTKT dictates how long the device tries to acquire a fix and send a report in a single reporting cycle. The value of TTKT can be changed using the ^TTKT command. The device will attempt to acquire a valid GPS fix up to 30 seconds before the end of the TTKT time window. Once the device acquires a fix or there are only 30 seconds left in the TTKT window, the device will then wait for an acceptable signal strength and send the report. If the device fails to send the report, it will retry until the TTKT time expires. Therefore, there are three possible outcomes of a reporting cycle as shown below:

- A tracking report with a valid position fix is transmitted
- A tracking report with an invalid position fix is transmitted
- No tracking report is transmitted

When TBR is set to 0, the device will send reports as described above, but there is no idle time between reports. After a report transmits, another acquisition and transmission cycle is started immediately. The device will never go into power-saving mode, but will keep all its electronic circuits on to allow the fastest possible transmission rate.

READ COMMAND: ^TBR?

Indicates the current value.

TEST COMMAND: ^TBR=?

Returns a fixed message indicating the range of acceptable values.

^TBR:(0-10080) 0 means continuous, otherwise minutes

6.31 ^TBRA – AWAKE TIME BETWEEN REPORTS

EXEC COMMAND: ^TBRA=<N>

Overrides ^TBR when the unit is in motion and ^UAMS is set to 1. The syntax is the same as the ^TBR command. The default value is 3.

READ COMMAND: ^TBRA?

Returns the current time between reports value.

TEST COMMAND: ^TBRA=?

Returns a fixed message indicating the range of acceptable values.

^TBRA:(0-10080) 0 means continuous, otherwise minutes

6.32 ^RPRT – REPORT RATE SETTINGS

Exec Command: ^RPRT =<TRKE>, <TBR>, <TBRA>

Sets the report rate settings TBR, TBRA, and enable and disable tracking. (TRKE). After settings are applied, it will restart tracking with updated settings. To change individual settings, use ^RPRT? First to query original settings.

<TRKE> Tracking Enable (0-1)

<TBR> Time between reports (0 – 10080) minutes.

<TBRA> Awake Time Between Reports (0 – 10080) minutes.

Read Command: ^RPRT?

Returns the current values for Report Rate Settings.

TEST COMMAND: ^TBRA=?

Returns a fixed message indicating the range of acceptable values.

^RPRT:(0-1),(0-10080),(0-10080)

6.33 ^TMF – TEXT MESSAGE FORMAT

EXEC COMMAND: ^TMF=<N>

This command sets the format of text messages that will be sent to the recipient.

<n>:

4,5   PECOS

6   NAL Version 6 (default)

READ COMMAND: ^TMF?

Indicates the current value for this command

TEST COMMAND: ^TMF=?

Returns a fixed message indicating the range of acceptable values.

^TMF:(4-6)

6.34 ^TTN – TIME TO NEXT REPORT

Exec Command: ^TTN=<n>

Outputs the time left until the next report. Value is based on the time between reports (TBR) value.

<n>

0   Disables displaying TTN values.

1   Enables displaying TTN values.

6.35 ^TTKT – TIME TO KEEP TRYING

EXEC COMMAND: ^TTKT=<N>,<INCSORMINS>[,<SECS>]

Sets the time window to obtain a valid GPS position fix and to send a GPS report successfully.

<n>:   Whether the time to keep trying is being entered in 5 second increments or minutes and seconds.

0   The time to keep trying is being entered in 5 second increments.

<incsOrMins>: The number of 5 second increments to keep trying.

<secs>:   Must be left out.

1   The time to keep trying is being entered in minutes and seconds.

<incsOrMins>: The minutes component of the time to keep trying

<secs>:   The seconds component of the time to keep trying. Must be divisible by 5.

The time to keep trying can be set to one of the following values regardless of the way it is entered.

- 0 seconds: The current time between reports will be used as the time to keep trying. However, the unit will only attempt a single transmission. If no signal is available for the selected comm link by the end of the time period, no attempt will be made.
- 90 - 1270 seconds: The entered value will be used as the time to keep trying.
- 1275 seconds: The current time between reports will be used as the time to keep trying.

The default value is 1275 seconds.

READ COMMAND: ^TTKT?

Indicates the current value in 5 second increments.

TEST COMMAND: ^TTKT=?

Returns a fixed message indicating the range of acceptable values.

^TTKT:0,(0-255) or 1,(0-21),(0-55)

6.36   ^TTKTA – AWAKE TIME TO KEEP TRYING

EXEC COMMAND: ^TTKTA=<N>,<INCSORMINS>[,<SECS>]

Overrides ^TTKT when the unit is in motion and ^UAMS is set to 1. The syntax is the same as the ^TTKT command. The default value is 1275 seconds.

READ COMMAND: ^TTKTA?

Indicates the current value in 5 second increments.

TEST COMMAND: ^TTKTA=?

Returns a fixed message indicating the range of acceptable values.

^TTKTA:0,(0-255) or 1,(0-21),(0-55)

6.37 ^TPE – TRACKING PROFILE EMERGENCY

EXEC COMMAND: ^TPE=<N>

Specifies which tracking profile to use for emergency state.

<n>:   Tracking profile. 0 – 11. Default is 2.

READ COMMAND: ^TPE?

Returns the current setting for this command

TEST COMMAND: ^TPE=?

Returns a fixed message indicating the range of acceptable values.

^TPE:(0-11)

6.38 ^TPN – TRACKING PROFILE NORMAL

EXEC COMMAND: ^TPN=<N>

Specifies which tracking profile to use for normal state.

<n>:   Tracking profile. 0 – 11. Default is 0.

READ COMMAND: ^TPN?

Returns the current setting for this command

TEST COMMAND: ^TPN=?

Returns a fixed message indicating the range of acceptable values.

^TPN:(0-11)

6.39　^TRK – Enter Tracking Mode

EXEC COMMAND: ^TRK

Causes the SHOUT ns to leave Command mode and enter Tracking mode. Must be the last command in an AT command String.

6.40　^TRKBLKOUT – Block Modem Command Output

EXEC COMMAND: ^TRKBLKOUT=<n>

Suppresses modem command output in tracking mode.

<n>:

  0　　　　　Disable. (Default)

  1　　　　　Enable.

READ COMMAND: ^TRKBLKOUT?

Indicates the current state for this command.

TEST COMMAND: ^TRKBLKOUT=?

Returns a fixed message indicating the range of acceptable values.

^TRKBLKOUT:(0-1)

6.41　^TRKDEBUG – Tracking Positional Information Debugging

EXEC COMMAND: ^TRKDEBUG=<n>

Enables debug output in tracking mode.

<n>:

  0　　　　　Disable. (Default)

  1　　　　　Enable.

When enabled, the following will display in tracking mode indicating the phase of the tracking cycle.

^TRKDEBUG: <msg>

<msg>: Each message can be one of the following: "Acquiring GPS", "Idle", "Acquiring Link", or "Sending"

READ COMMAND: ^TRKDEBUG?

Indicates the current state for this command.

TEST COMMAND: ^TRKDEBUG=?

Returns a fixed message indicating the range of acceptable values.

^TRKDEBUG:(0-1)

6.42   ^TRKE – ENABLE TRACKING

EXEC COMMAND: ^TRKE<N>

Sets whether to enable the periodic tracking while in Tracking mode.

<n>:

0   Disable periodic tracking in Tracking mode

1   Enabled periodic tracking in Tracking mode (Default)

READ COMMAND: ^TRKE?

Indicates the current value for this command and returns the current TRKDEBUG state.

TEST COMMAND:^TRKE=?

Returns a fixed message indicating the range of acceptable values.

^TRKE:(0-1)

6.43   ^TRKLR – LAST REPORT SENT

EXEC COMMAND: ^TRKLR

Displays the last report sent by the modem.

6.44   ^UAMS – USE ALTERNATE MOTION SETTINGS

EXEC COMMAND: ^UAMS=<ENABLED>

Sets whether to use the 'Awake' (^TBRA, ^TTKTA, ^DFRA) tracking settings when the device is in motion. When enabled, tracking will switch to use the 'Awake' settings once the motion

start (^MSB) event occurs. The 'Awake' settings will continue to be used until the motion end event (^MSE) occurs.

NOTE: This feature when combined with ^CAL2 functions similarly to the ^CAL2 setting on earlier NAL trackers like the 9602-LP v1.

<enabled>:

    0   Does not use alternate motion settings. (Default)

    1   Use alternate motion settings.

READ COMMAND: ^UAMS?

Indicates the current value.

TEST COMMAND: ^UAMS=?

Returns a fixed message indicating the range of acceptable values.

^UAMS:(0-1)

6.45 ^WMF – WRITE MESSAGE FORMAT

EXEC COMMAND: ^WMF=<N>

This writes to the SBD buffer a GPS report in the format determined by <n>.

NOTE: This command must be executed in its own AT command string. After this is done a message similar to a GPS report can be sent by sending the +SBDI or the +SBDIX command.

<n>:

    1   GPS version 3 (format used on older A3LA series tracking units)

    2   GPS version 4 (includes HDOP, VDOP, Motion)

    3   GPS Version 5 (includes input and output pin states)

    4   PECOS P3

    5   PECOS P4

    6   GPS version 6 (includes short codes and free text)

    7   10 byte GPS version 0

COMMAND RESPONSE

"Invalid Position Fix" will be displayed to indicate an invalid fix. In this case, a report is still written to the SBD buffer.

7 REMOTE UPDATE COMMANDS

7.1 ^RUP – REMOTE UPDATE PASSWORD

EXEC COMMAND: ^RUP='<PASSWORD>'

The SHOUT ns operating parameters can be changed and saved from a remote site while the SHOUT ns is deployed in the field. A Remote Update password is required each time a remote update is made and can be set with the ^RUP command. There is no requirement to change the factory default password. In order to initiate remote update on the SHOUT ns, the password of an incoming message from a remote site must match with the Remote Update password. The Remote Update password also provides a way to identify field units when making mass remote updates.

<password>:   Must be enclosed by single quotes (') and must be 8 printable keyboard characters. (Default is "12345678").

READ COMMAND: ^RUP?

Returns the current remote update password.

7.2 ^RUTC – REMOTE UPDATE TIMESTAMP CHECK

EXEC COMMAND: ^RUTC=<ENABLED>

Enables or disables the remote update time check. When the remote update time check is enabled, remote updates with a time less than or equal to the last remote update time are not applied. Version 0, 1, and 2 remote updates can bypass the time check by providing a time equal to the Unix epoch. Version 3 remote updates can bypass the time check by not providing a time in the first tag.

<enabled>:

   0   Disable this feature (default)

   1   Enable this feature

READ COMMAND: ^RUTC?

Returns the current remote update password.

TEST **C**OMMAND: **^RUTC=?**

Returns a fixed message indicating the range of acceptable values.

^RUTC:(0-1)

8   CALLOUT COMMANDS

8.1   ^COA – ADD CALL OUT

EXEC COMMAND: ^COA="<I>"[,<E>]

Adds an entry to a list of call outs. A call out is specified with a communication link and time. If during tracking mode one or more callouts are present, a report will be sent daily at each specified time using the specified communication link.

<t>:   Time – "hh:mm:ss"

<e>:   Sets if the call out is enabled or not. If this parameter is omitted, the call out will be added as enabled. Sending this command again for the same call out will enable and disable that call out.

   0   Callout is added disabled

   1   Callout is added enabled

TEST COMMAND: ^COA=?

Returns a message indicating the range of acceptable values

^COA:"hh:mm:ss",[0-1]

8.2   ^COD – DELETE CALL OUT

EXEC COMMAND: ^COD=<I>

Deletes the call out at the specified index. Use the index from the ^COR command. After deleting, the indexes are updated. To delete multiple, run ^COR before each delete.

<i>:   Call Out Index

8.3   ^COE – ERASE CALL OUT

EXEC COMMAND: ^COE

Erases all call outs

8.4   ^COR – READ CALL OUT

EXEC COMMAND: ^COR

Reads out all entries in the call out list sorted by time.

Response format : <i>, "<t>", <e>

<i>:   Index of call out entry

<t>:   Time of day schedule for the entry

<e>:   Whether or not the call out is enabled

READ COMMAND: ^COA?

Returns 1 or 0 based on if any call outs are enabled.

9 GEOFENCING COMMANDS

9.1 ^GFAP – ADD GEOFENCE POINT

EXEC COMMAND: ^GFAP=<LAT>,<LNG>

Adds a point to a geofence. This can only be run after ^GFS and before ^GFF. At least 3 points must be added before a fence can be completed with the ^GFF command.

<lat>:   latitude of the point. (-90.0 to 90.0)

<lng>:   longitude of the point. (-180.0 to 180.0)

TEST COMMAND: ^GFAP=?

Returns a message indicating the range of acceptable values

^GFAP:(-90.0 - 90.0),(-180.0 - 180.0)

9.2 ^GFCF – GEOFENCE CHECK FREQUENCY

EXEC COMMAND: ^GFCF=<STO>[,<CFT>]

Sets the GPS search timeout <sto> and the check frequency timeout <cft>. The search timeout is the period to search for valid GPS signal in seconds. The check frequency timeout determines when the next geofence check occurs.

When a geofence check cycle begins, the check frequency timer starts and the GPS will try to acquire a valid signal until the search timeout expires. If no GPS signal is acquired, the next geofence cycle will begin after the frequency timer expires. If GPS signal is acquired, the check frequency timeout is restarted and the next geofence cycle will begin after it expires.

The minimum time between geofence checks will be equal to the check frequency timeout in the event of no GPS signal. The maximum time in between geofence checks will occur when there is a valid GPS fix, in which the time between geofence checks will be the time to acquire GPS signal + the check frequency timeout.

Defaults to ^GFCF = 30, 5.0

<sto>:   GPS search time out - the period to search for valid GPS signal in seconds.

<cft>:   check frequency timeout - the time until the next geofence check in minutes. Entered in 0.5 minute increments.

READ COMMAND: ^GFCF?

Indicates the current value for this command

TEST COMMAND: ^GFCF=?

Returns a message indicating the range of acceptable values

^GFCF:(15-255),(0-10080)

9.3   ^GFD – DELETE GEOFENCE

EXEC COMMAND: ^GFD="<ID>"

Delete a geofence

<id>:   Geofence identifier

TEST COMMAND: ^GFD=?

Returns a message indicating the range of acceptable length of identifier

^GFD:"(1-8)"

9.4   ^GFE – ERASE GEOFENCE

EXEC COMMAND: ^GFE

Erase all geofences.

9.5   ^GFF – FINISH ADDING GEOFENCE POINTS

EXEC COMMAND: ^GFF

Save the information entered with ^GFAP and ^GFS

9.6   ^GFM – MODIFY GEOFENCE

EXEC COMMAND: ^GFM="<O>",["<N>"],[<OP>],[<P>],[<I>]

This command is used to modify an existing geofence.

Where

<o>:   Old identifier

<n>:   New identifier

<op>:   New options – Enable, Arrival notice, Depart notice

<p>:   New tracking profile (0 – 11)

<i>:   Image ID

TEST COMMAND: ^GFM=?

Returns a message indicating the range of acceptable values

^GFM:"(1-8)",["(1-8)"],[(0-255)],[(0-11)],[(0-4294967295)]

9.7   ^GFN – GEOFENCE NOTIFICATIONS ENABLE

EXEC COMMAND: ^GFN[<N>]

Sets whether to display Geofence related URC messages to the console.

<n>:   If omitted, 0 will be used.

   0   No Geofence URCs will be displayed.

   1   Geofence URCs are displayed to the console.

READ COMMAND: ^GFN?

Indicates the current value.

9.8   ^GFR – READ GEOFENCE POINTS

EXEC COMMAND: ^GFR=["<ID>"]

Display a list of stored geofences.

<id>:   If present, only the geofence with the specified identifier will be displayed.

TEST COMMAND: ^GFR=?

Returns a message indicating the range of acceptable value. Also, if a geofence is active, it will state which geofence is active.

^GFR:["(1-8)"]

9.9 ^GFS – START GEOFENCE

EXEC COMMAND: ^GFS = "<I>",<O>,<P>

This command is the first command to be used to save a Geofence. It should be followed by

^GFAP to add a point to the fence.

<i>:	Text identifier, can be up to 8 characters long.
<o>:	This is a bit field of options. For each option wanted, sum the values below:

1	Enable
2	Arrival notice
4	Depart notice

<p>:	Tracking profile (0 – 11) that will be used while inside the fence

TEST COMMAND: ^GFS=?

Returns a message indicating the range of acceptable values

^GFS:"(1-8)",(0-255),(0-11)

10 LINK COMMANDS

10.1 ^LNK – LINKS ALLOWED

EXEC COMMAND: ^LNK=<I>

Sets which communication link is used to send data in tracking mode. If the selected primary link is not an allowed link, the remaining allowed link will be used as the primary link. If there are no links allowed, the Primary link is not applicable.

<i>:   Links allowed

   0   None

   1   IRIDIUM

READ COMMAND: ^LNK?

Indicates the current links set.

TEST COMMAND: ^LNK=?

Returns a message indicating the range of acceptable values

^LNK:(0-3),[("IRIDIUM")]

11 ENCRYPTION COMMANDS

11.1 ^CCOP – CHANGE CRYPTO OFFICER PASSWORD

EXEC COMMAND: ^CCOP='<OLD>','<NEW>'

Changes the Crypto Officer's password from a factory-set/old value to a new value. The password must include only printable keyboard characters. The password will not be reset by the AT&F command. When the device is set to echo, all entries are replaced with asterisks (*) instead of the actual typed values. All passwords must be between 8 and 16 characters in length. The factory-set password is 'temp password' and must be changed before encryption can be used.

<old>:   The old password.

<new>:   The new password.

11.2 ^KD – KEY FOR DECRYPTION

EXEC COMMAND: ^KD='<PASSWORD>','<KEY>'

Sets the AES decryption key. The password and key will not be reset by the &F command. The password and key will not be echoed. This command must be entered twice before an update is made.

NOTE: The decryption key must match the encryption key at the network operation center (NOC).

<password>: The Crypto Officer password. The Crypto Officer password must be changed from its factory-set value before this command will work.

<key>:   The decryption key. This can only have characters 0-9 or A-F and must be 64 bytes long. Every two hexadecimal characters represent the value of one byte in the key.

11.3   ^KE – KEY FOR ENCRYPTION

EXEC COMMAND: ^KE='<PASSWORD>','<KEY>'

Sets the AES encryption key. The password and key will not be reset by the &F command. The password and key will not be echoed. This command must be entered twice before an update is made.

NOTE: The encryption key must match the decryption key at the NOC.

<password>:   The Crypto Officer password. The Crypto Officer password must be changed from its factory-set value before this command will work.

<key>:   The encryption key. This can only have characters 0-9 or A-F and must be 64 bytes long. Every two hexadecimal characters represent the value of one byte in the key.

11.4   ^KZ – KEY ZEROIZATION

EXEC COMMAND: ^KZ='<PASSWORD>'

Resets or zeroizes the encryption and decryption keys and stops encryption until the keys are re-entered with the ^KD and ^KE commands. The Crypto Officer password must be changed from its factory-set value before this command will work.

<password>:   The Crypto Officer password.

11.5   ^UE – USE ENCRYPTION

EXEC COMMAND: ^UE='<PASSWORD>',<N>

Sets whether to use encryption at power up. Setting the ^UE command will take effect only after power has been cycled. This command will return an error if the encryption password has not been set.

<password>:   The Crypto Officer password.

<n>:

   0   Do not use encryption at power up (default)

   1   Use encryption at power up

READ COMMAND: ^UE?

Returns whether <n> is set to 0 or 1 and then one of the following messages will appear:

- "Encryption Disabled No Keys Entered"

- ("Encryption Currently Enabled" OR "Encryption Currently Disabled") AND ("Set to be Enabled Next Power Cycle" OR "Set to be Disabled Next Power Cycle")

- "Encryption Feature Not Included"

12 UNIT SETTINGS COMMANDS

12.1 ^IGPS – INCLUDE GPS IN MESSAGES

EXEC COMMAND: ^IGPS[<N>]

Sets whether GPS information will included in messages. Position reports will always include GPS information regardless of this setting.

<n>:	If omitted, 0 will be used.
0	No. GPS information will not be included. (default)
1	Yes. GPS information will be included.

READ COMMAND: ^GPS?

Indicates the current value.

12.2 ^LEDS – LEDS

EXEC COMMAND: ^LEDS=<S>,<A>,<I>,<G>,<BAT>,<BT>,<T>,<E>,<EA>,<C>

Enables or disables the LEDs.

<s>:	Blink power LED when the unit is sleeping
0	Off
1	On (default)

<a>:	Power LED while awake
0	Off
1	Solid (default)

<i>:	Iridium LED
0	Disabled
1	Enabled (default)

<g>:	GPS LED
0	Disabled
1	Enabled (default)

<bat>:   Battery LED

  0   Disabled

  1   Enabled (default)

<bt>:   Bluetooth LED

  0   Disabled

  1   Enabled (default)

<t>:   Status LED

  0   Disabled

  1   Enabled (default)

<e>:   Power LED emergency behavior while asleep (Only applies in tracking mode)

  0   None (Power LED behavior while asleep is defined by the <s> parameter)

  1   Blink (Overrides the <s> settings when emergency is enabled) (default)

<ea>:   Emergency Awake LED Sequence

  0   Disabled

  1   Enabled (default)

<c>:   Charging LED Sequence

  0   Disabled

  1   Enabled (default)

READ COMMAND: ^LEDS?

Indicates the current value.

TEST COMMAND: ^LEDS=?

Returns a fixed message indicating the range of acceptable values.

^LEDS:[(0-1)],[(0-1)],[(0-1)] ,[(0-1)] ,[(0-1)] ,[(0-1)] ,[(0-1)] ,[(0-1)] ,[(0-1)],[(0-1)]

13 MEMORY COMMANDS

13.1   ^CHKIN – CHECK-IN

EXEC COMMAND: ^CHKIN

Adds a check-in report to the outbox.

NOTE: Also available in Tracking mode.

13.2   ^MABD – ADDRESS BOOK DELETE

EXEC COMMAND: ^MABD=<CODE>

Deletes an address book entry by code.

TEST COMMAND: ^MABD=?

Returns a fixed message indicating the range of acceptable values.

^MABD:(2-65535)

13.3   ^MABE – ADDRESS BOOK ERASE

EXEC COMMAND: ^MABE

Erases all of the address book entries.

13.4   ^MABM – ADDRESS BOOK MODIFY

EXEC COMMAND:

^MABM=<CODE>,"<NAME>","<EMAIL>","<PHONE>","<LOCATION>"[,"<GROUP>"]

Adds or modifies an address book entry for a particular code.

<code>:	Address short code. Sent with message. Must be 2 – 65535.
<name>:	Should be synchronized with the server. 1 – 30 characters long.
<email>:	Should be synchronized with the server. 0 – 50 characters long.
<phone>:	Should be synchronized with the server. 0 – 30 characters long.
<location>:	Should be synchronized with the server. 0 – 30 characters long.
<group>:	Should be synchronized with the server. 1 – 30 characters long.

TEST COMMAND: ^MABM=?

Returns a fixed message indicating the range of acceptable values.

^MABM:(2-65535),"(1-30)","(0-50)","(0-30)","(0-30)"[,"(1-30)"]

13.5   ^MABR – ADDRESS BOOK READ

EXEC COMMAND:

^MABR[=[<CODE>],["<NAME>"],["<EMAIL>"],["<PHONE>"],["<LOCATION>"],["<GROUP>"]]

Displays the address book entries that match all of the given parameters. Omitted parameters will match anything. Quoted parameters will match substrings. Trailing commas may be omitted.

EXEC RESPONSE:

Each matched entry will be returned in the following format.

^MABR:<code>,"<name>","<email>","<phone>","<location>"

<code>:	Address short code. Sent with message. 2 – 65535.
<name>:	Should be synchronized with the server. 1 – 30 characters long.
<email>:	Should be synchronized with the server. 0 – 50 characters long.
<phone>:	Should be synchronized with the server. 0 – 30 characters long.
<location>:	Should be synchronized with the server. 0 – 30 characters long.
<group>:	Should be synchronized with the server. 0 – 30 characters long.

READ COMMAND: ^MABR?

Returns the number of address book entries.

TEST COMMAND: ^MABR=?

Returns a fixed message indicating the range of acceptable values.

^MABR:[(2-65535)],["(1-30)"],["(0-50)"],["(0-30)"],["(0-30)"],["(0-30)"]

NOTE: Also available in Tracking mode.

13.6   ^MAME – ALL MEMORY ERASE

EXEC COMMAND: ^MAME

Erases all of the memory on the device. This includes all queued messages, GPS report log, geofences, temporary SMS messages, configuration settings, etc.

13.7   ^MCMD – CANNED MESSAGE DELETE

EXEC COMMAND: ^MCMD=<CODE>

Deletes a canned message entry by code.

TEST COMMAND: ^MCMD=?

Returns a fixed message indicating the range of acceptable values.

^MCMD:(30-99)

13.8   ^MCME – CANNED MESSAGE ERASE

EXEC COMMAND: ^MCME

Erases all of the canned message entries.

13.9   ^MCMM – CANNED MESSAGE MODIFY

EXEC COMMAND: ^MCMM=<CODE>,<INDEX>,"<LABEL>","<TEXT>"

Adds or modifies a canned message entry for a particular code.

<code>:   Canned Message short code. Sent with message. 30 – 99.

<index>:   Index used for sorting messages. 0 - 999.

:   Should be synchronized with the server. 1 – 100 characters long.

<text>:   Text. Sent with the message. 0 – 309 characters long.

TEST COMMAND: ^MCMM=?

Returns a fixed message indicating the range of acceptable values.

^MCMM:(30-99),(0-999),"(1-100)","(0-309)"

13.10   ^MCMR – CANNED MESSAGE READ

EXEC COMMAND: ^MCMR[=[<CODE>],[<INDEX>],["<LABEL>"],["<TEXT>"]]

Displays the canned message entries that match all of the given parameters. Omitted parameters will match anything. Quoted parameters will match substrings. Trailing commas may be omitted.

EXEC RESPONSE:

Each matched entry will be returned in the following format.

^MCMR:<code>,<index>,"<label>","<text>"

<code>:   Canned Message short code. Sent with message. 30 – 99.

<index>:   Index used for sorting messages. 0 - 999.

:   Should be synchronized with the server. 1 – 100 characters long.

<text>:   Text. Sent with the message. 0 – 309 characters long.

READ COMMAND: ^MCMR?

Returns the number of canned message entries.

TEST COMMAND: ^MCMR=?

Returns a fixed message indicating the range of acceptable values.

^MCMR:[(30-99)],[(0-999)],["(1-100)"],["(0-309)"]

NOTE: Also available in Tracking mode.

13.11 ^MSDA – DRAFT BOX ADD

Exec Command: ^MSDA = <"ab">, <"e">, <cm>, <"t">

Adds a message to the draft box and can be read using AT^MSDR.

<"ab"> Address book codes separated by commas

<"e"> Emails separated by commas

- <cm> Canned message code
- <"t"> Entered Text

Test Command: AT^MSDA=?

Returns a fixed message indicating the range of acceptable values.

NOTE: Also available in Tracking mode.

^MSDA:["(0-119)"],["(0-308)"],[3,30-99],["(0-309)"]

13.12 ^MSDD – DRAFTS DELETE

EXEC COMMAND: ^MSDD=<N>

Deletes a draft message by index.

TEST COMMAND: ^MSDD=?

Returns a fixed message indicating the range of acceptable values.

NOTE: Also available in Tracking mode.

^MSDD:(0-4294967295)

13.13 ^MSDE – DRAFTS ERASE

EXEC COMMAND: ^MSDE

Erases all of the draft messages.

13.14 ^MSDR – DRAFTS READ

EXEC COMMAND: ^MSDR

Displays all of the draft messages.

EXEC RESPONSE:

Each matched entry will be returned in the following format.

^MSDR:<index>,<abCode>,"<emails>",<cmCode>,"<text>"

<index>:   Unit assigned unique key for the drafts box.

<abCode>:   Address book code.

<emails>:   User entered emails.

<cmCode>:   Canned message code.

<text>:   User entered text.

READ COMMAND: ^MSDR?

Returns the number of draft messages.

NOTE: Also available in Tracking mode.

13.15 ^MSIA – INBOX ADD

EXEC COMMAND: ^MSIA=["<T>"],[<R>],[<A>],[<C>],["<M>"]

Adds a message to the inbox.

<t>:   Time received formatted as YYYYMMDDHHmmSS.

<r>:   0 - 1. Whether the message has been read. 0 - unread (default), 1 - read.

<a>:   0 - 65535. Address book code. 0 is the default.

<c>:   0 - 99. Canned message code. 3 is the default.

<m>:   0 - 259. Message text.

NOTE: Default values will be used for parameters that are left out. For string parameters, the default value is a blank string except for the <t> parameter which defaults to the current system time.

NOTE: If adding a message to the inbox from Tracking mode, '+' characters must be escaped using '\' to avoid escaping to Command mode.

TEST COMMAND: ^MSIA=?

Returns a fixed message indicating the range of acceptable values.

^MSIA:["YYYYMMDDHHmmSS"],[0-1],[(0-65535)],[(0-99)],["(0-259)"]

NOTE: Also available in Tracking mode.

13.16 ^MSID – INBOX DELETE

EXEC COMMAND: ^MSID=<N>

Deletes an inbox message by index.

TEST COMMAND: ^MSID=?

Returns a fixed message indicating the range of acceptable values.

^MSID:(0-4294967295)

NOTE: Also available in Tracking mode.

13.17 ^MSIE – INBOX ERASE

EXEC COMMAND: ^MSIE

Erases all of the inbox messages.

13.18 ^MSIR – INBOX READ

EXEC COMMAND: ^MSIR

Displays all of the inbox messages.

EXEC RESPONSE:

Each matched entry will be returned in the following format.

^MSIR:<index>, "<time>",<read>,<abCode>,<cmCode>,"<text>"

<index>:   A number (0 - 4294967295) that is unique for the current inbox box messages.

<time>:   The time that the message was received formatted as YYYYMMDDHHmmSS. If the date is invalid, "????????" will output in place of YYYYMMDD. If the time is invalid, "??????" will be output in place of HHmmSS.

<read>:   1 if the read, 0 if unread.

<abCode>:   Address book code.

<cmCode>:   Canned message code.

<text>:   User entered text.

READ COMMAND: ^MSIR?

Returns the number of inbox messages.

NOTE: Also available in Tracking mode.

13.19 ^MSIC – INBOX UNREAD COUNT.

Exec Command: ^MSIC= <"i">, <r/u>

Can be used to mark messages read or unread.

<"i"> Outbox indices separated by commas.

<r/u> Read (1), Unread (0).

Read Command: ^MSIC?

Returns the current unread count.

13.20 ^MSOA –OUTBOX ADD

EXEC COMMAND: ^MSOA=[<P>],[<Q>], ["<A>"],["<E>"],[<C>],["<M>"]

Adds a message to the outbox.

<p>:   0 - 3. Priority. 0 - Critical, 1 - High, 2 - Medium, 3 - Low (default).

<q>:   0 - 1. Queued indicator. 0 - Not queued, 1 - Queued (default).

<a>:   Address book codes, separated by commas. Max of 20 codes. Codes must be 0-119.

<e>:   Emails, separated by commas.

<c>:   3 (default), 30 - 99. Canned message code.

<m>:   0 – 309. Message text.

NOTE: Default values will be used for parameters that are left out. For string parameters, the default value is a blank string.

NOTE: If the combined length of the emails, canned message text, and message text are too long, ERROR is returned. The max combined length varies depending on encryption and PECOS settings. If adding a message to the outbox from Tracking mode, '+' characters must be escaped using '\' to avoid escaping to Command mode.

TEST COMMAND: ^MSOA=?

Returns a fixed message indicating the range of acceptable values.

^MSOA:[0-3],[0-1],["(0-119)"],["(0-308)"],[3,30-99],["(0-309)"]

NOTE: Also available in Tracking mode.

13.21 ^MSOD – DELETE A SINGLE MESSAGE FROM THE MESSAGE OUTBOX

EXEC COMMAND: ^MSOD=<N>

Deletes a single message from the Outbox. When <n> is a valid Outbox message number, the command will delete the specified message from the Outbox and respond "OK", otherwise it will respond "ERROR".

<n>:   A valid message number from the Outbox.

TEST COMMAND: ^MSOD=?

Returns a fixed message indicating the range of acceptable values.

^MSOD:(0-4294967295)

13.22 ^MSOE – OUTBOX ERASE

EXEC COMMAND: ^MSOE

Erases all of the outbox messages.

13.23 ^MSOQ – Outbox Enqueue and Dequeue

Exec Command: ^MSOQ = <"i">, <e/q>

Sets Enqueue and Dequeue status of outbox messages.

<"i"> Outbox indices separated by commas. All outbox messages can be selected by passing in just double quotes ("").

<e/q> Enqueue (1), Dequeue (0).

TEST COMMAND: ^MSOD=?

Returns a fixed message indicating the range of acceptable values.

^MSOQ:["(0-2000)"],[0-1],

13.24 ^MSOR – Outbox Read

EXEC COMMAND: ^MSOR

Displays all of the outbox messages.

EXEC RESPONSE:

Each message will be displayed in the following format.

^MSOR:<i>,<pri>,<queued>,<type>,"<text>",<gps>

<i>:   Index. Unit assigned unique key for the outbox. Will be >= 0.

<pri>:   Priority. 0 - 3. Lower numbers have higher priority.

<queued>:   1 - Queued, 0 - Not queued

<type>:   An integer representing the message type

0	Standard Report
1	Polled Report
2	Queued Report
3	Callout Report
4	Free Text
5	Checkin
6	Waypoint
7	Update Response

8	Signal Pins
9	Cancel Emergency
10	Statistics
11	Geofence Arrive Notice
12	Geofence Depart Notice
13	Motion Start Notice
14	Motion End Notice
15	Man Down

<text>:   User entered text.

<gps>:   0 – Does not have GPS, 1 – Has GPS

NOTE: While in tracking mode, if the Outbox changes contents while this command is outputting, the command will terminate the message output listing and return ERROR.

READ COMMAND: ^MSOR?

Returns the number of outbox messages.

13.25 ^MSSD – SENT BOX DELETE

EXEC COMMAND: ^MSSD=<N>

Deletes a sent box message by index.

TEST COMMAND: ^MSSD=?

Returns a fixed message indicating the range of acceptable values.

^MSSD:(0-4294967295)

NOTE: Also available in Tracking mode.

13.26 ^MSSE – SENT BOX ERASE

EXEC COMMAND: ^MSSE

Erases all of the sent box messages.

13.27 ^MSSR – Sent Box Read

Exec Command: ^MSSR

Displays all of the sent box messages.

Exec Response:

Each matched entry will be returned in the following format.

^MSSR:<index>,"<time>",<abCode>,"<emails>",<cmCode>,"<text>"

<index>:   A number (0 - 4294967295) that is unique for the current sent box messages.

<time>:   The time that the message was sent formatted as YYYYMMDDHHmmSS. If the date is invalid, "????????" will be output in place of YYYYMMDD. If the time is invalid, "??????" will be output in place of HHmmSS.

<abCode>:   Address book code.

<emails>:   User entered emails.

<cmCode>:   Canned message code.

<text>:   User entered text.

Read Command: ^MSSR?

Returns the number of sent box messages.

NOTE: Also available in Tracking mode.

13.28 ^OBN – Outbox Noficiations Enable

Exec Command: ^OBN[<n>]

Sets wheter to display Outbox related URC messages to the console.

<n>:   If omitted, 0 will be used.

   0   No Outbox URCs will be displayed.

   1   Outbox URCs are displayed to the console.

Read Command: ^OBN?

Indicates the current value.

13.29 ^WPM – WAYPOINT MODIFY

EXEC COMMAND: ^WPM=<"L">,<"N">, <S>, <A/D>

This command adds or deletes a waypoint, as well as giving you the option to send the waypoint.

<"l"> Label for the waypoint

<"n"> New label for renaming waypoints.

<s> Send or don't send waypoint. Send (1) / Don't send (0)

<a/d> Choose between adding and deleting the waypoint. Add (1) / Delete (0).

Note: just like test reports the AT+CHKGPS=3 command must be called first and gather a GPS fix, then the AT^WPM command can be used to add a waypoint. However, if the waypoint already exists, then calling this command on the available waypoint will work.

13.30 ^WPR – WAYPOINT READ

EXEC COMMAND: ^WPR

Displays all of the waypoints.

EXEC RESPONSE:

Each waypoint will be returned in the following format. In this format, () specifies a list of possible values separated by |, [] specifies an option value, and <> specify a variable. The formats for the date, time, latitude, and longitude are specified without any special syntax.

Label=<label>

(Emergency|Normal)

UTC Time=hh:mm:ss.ff

UTC Date=mm-dd-yyyy

Latitude=dd:mm.ffff (South|North)

Longitude=ddd:mm.ffff (West|East)

Altitude=<alt> meters

Ground Velocity=<gndVel> km/h at <course> degrees from True North

Vertical Velocity=<verVel> m/s

Satellites Used=<ss>

HDOP=<hdop>

VDOP=<vdop>

[Motion]

13.31 ^MUSNM – SET USER NAME

EXEC COMMAND: ^MUSNM="<NAME>"

Sets the user's name.

READ COMMAND: ^MUSNM?

Returns the current value for the user's name.

TEST COMMAND: ^MUSNM=?

Returns a fixed message indicating the range of acceptable values.

13.32 ^MUSPN – SET USER PHONE

EXEC COMMAND: ^MUSPN="<PHONE>"

Sets the user's phone.

READ COMMAND: ^MUSPN?

Returns the current value for the user's phone.

TEST COMMAND: ^MUSPN=?

Returns a fixed message indicating the range of acceptable values.

13.33 ^MUSAST – SET USER STREET ADDRESS

EXEC COMMAND: ^MUSAST="<STREET>"

Sets the user's street.

READ COMMAND: ^MUSAST?

Returns the current value for the user's street.

TEST COMMAND: ^MUSAST=?

Returns a fixed message indicating the range of acceptable values.

13.34 ^MUSACI – SET USER CITY

EXEC COMMAND: ^MUSACI="<CITY>"

Sets the user's city.

READ COMMAND: ^MUSACI?

Returns the current value for the user's city.

TEST COMMAND: ^MUSACI=?

Returns a fixed message indicating the range of acceptable values.

13.35 ^MUSASA – SET USER STATE OR PROVINCE

EXEC COMMAND: ^MUSASA="<STATEORPROVINCE>"

Sets the user's state or province.

READ COMMAND: ^MUSASA?

Returns the current value for the user's state or province.

TEST COMMAND: ^MUSASA=?

Returns a fixed message indicating the range of acceptable values.

13.36 ^MUSAZP – SET USER ZIP CODE

EXEC COMMAND: ^MUSAZP="<ZIPCODE>"

Sets the user's zip code.

READ COMMAND: ^MUSAZP?

Returns the current value for the user's zip code.

TEST COMMAND: ^MUSAZP=?

Returns a fixed message indicating the range of acceptable values.

13.37 ^MUSACO – SET USER COUNTRY

EXEC COMMAND: ^MUSACO="<COUNTRY>"

Sets the user's country.

READ COMMAND: ^MUSACO?

Returns the current value for the user's country.

TEST COMMAND: ^MUSACO=?

Returns a fixed message indicating the range of acceptable values.

13.38 ^MUSE – USER INFORMATION ERASE

EXEC COMMAND: ^MUSE

Erases all of the user settings.

14 BLUETOOTH COMMANDS

14.1 ^BTPWR – SET BLUETOOTH POWER SETTINGS

EXEC COMMAND: ^BTPWR=<MODE>[,<TIME>]

Sets the Bluetooth power settings. Turning on the Bluetooth receiver by the BT button changes the <mode> to 1. Likewise, turning it off by the BT button changes the <mode> to 0. The Bluetooth radio turns off if the SHOUT ns turns off.

<mode>:

0   Turns off the Bluetooth radio. In this mode, the Bluetooth radio will not turn on when the SHOUT ns powers on. The Bluetooth radio can be turned back on by pressing the BT button or by setting the <mode> to 1. This is the default setting. <delay> is ignored.

1   Turns on the Bluetooth radio. When in tracking mode, the Bluetooth radio will turn on whenever the SHOUT ns turns on. The Bluetooth radio will stay on always if 0 is selected for <delay>, or stay on while it is connected and has activities. If the connection is lost or there has been no activity for 10 minutes, the <delay> countdown timer starts. When the timer counts to zero the Bluetooth radio will be turned off..

<delay>:

0   Bluetooth radio will stay on always as long as the SHOUT ns remains on and awake. There is a minimum on time of 30 seconds when in tracking mode to allow the user to connect to Bluetooth or USB and run commands if needed

1 – 10   Sets a countdown timer for a number of minutes. The default setting is 10 minutes.

14.2 ^BTPASS – BLUETOOTH PASSKEY

EXEC COMMAND: ^BTPASS=<PASSKEY>

Enters the pairing passkey requstested by the Bluetooth Low Energy client. This command should be run after the "ENTER PASSKEY SHOWN ON MASTER DEVICE" URC is received. Pairing must be completed within 30 seconds or the pairing process will need to be restarted.

If a timeout occurs, the "PAIRING TIMEOUT" URC is received. When pairing has completed successfully, the "PAIRING COMPLETED" URC is received.

<passkey>:   Six digit Bluetooth passkey

TEST COMMAND: ^BTPASS=?

Returns a fixed message indicating the range of acceptable values.

^BTPASS:(000000-999999)

14.3   ^BTPASSEN – ENABLE BLUETOOTH PASSKEY

EXEC COMMAND: ^BTPASSEN=<ENABLE>

This setting controls whether a passkey must be entered on the SHOUT ns when pairing with another Bluetooth device. The default value for the <enable> parameter is 0.

<enable>:

0   A passkey is not required when pairing the SHOUT ns with another Bluetooth device. This is equivalent to the Bluetooth "Just Works" mode of pairing.

1   A passkey is required when pairing the SHOUT ns with another Bluetooth device. To enter the passkey, use command ^BTPASS. The passkey must be sent on the USB port to complete the pairing process.

15 SUMMARY OF RESULT CODES

Numeric (V0)	Verbose (V1)	Descriptions
0	'OK'	Acknowledges execution of an AT command
126	'SBDRING'	MT messages present at the Iridium gateway (unsolicited if enabled). See the +SBDMTA command for more details.
4	'ERROR'	AT command is not accepted by the SHOUT ns
127	'HARDWARE FAILURE: <subsys>,<error>'	Issued at initialization in case of a hardware failure
As verbose	'READY'	Ready to receive binary message data from DTE
As verbose	'+AREG:<event>,<reg error>'	Auto-registration event report. See the +SBDAREG command for more details.
As verbose	'+CIEV:<sig>,<value>'	Indicator event report (unsolicited if enabled). See the +CIER command for more details.
As verbose	'^GFN: <state> <fence>'	Displayed when a change in geofence is made. The <state> for arrival will display "Arrived.", while the state for departure will display "Departed." <fence> shows the current geofence interacting with the URC.
As verbose	'+SBDIX: <moStatus>,<momsn>,<mtStatus>, <mtmsn>,<mtLength>,<mtQueued>'	Displayed after completion of +SBDIX command. The field most concerned in this document is <mtQueued> which is used in

Numeric (V0)	Verbose (V1)	Descriptions
		Mailbox Check to determine the queued count.
As verbose	'+CHKGPS: GPS Acquired.'	Displayed after +CHKGPS=3 is finished getting a valid fix.
As verbose	'^TRKDEBUG: <state>'	Displayed while AT^TRKDEBUG is enabled. The <state> is displayed when there is an update in the tracking state. The current ^TRKDEBUG state can also be queried using AT^TRKDEBUG? <state> "Acquiring GPS" Is displayed when tracking is getting GPS. During this time Iridium is off. "Acquiring Link" is displayed when tracking is getting an Iridium Signal. During this time GPS is off. "Sending" is displayed when tracking is currently sending a +SBDIX message. During this time GPS is also off. "Idle" is displayed when tracking is current between reports. Iridium or GPS can be used during this state.
As verbose	'^OBN: <status>,<number>'	<status>: status is "Sending Message" when message begins sending. Status displays "Sending Failed" if message is dequeued. If the message sends successfully, "Sending

Numeric (V0)	Verbose (V1)	Descriptions
		Successful" will be displayed. "Message Added is displayed when an item is added to the outbox. <number>: displays the outbox index number of the message in question.
As verbose	'^TTN: <status>'	<status>: Time: Status displays time to next report when available. Continuous: When time between reports is set to zero or report flood is currently on. This display outputs "Continuous" Pending: When tracking is sending a report but the time has expired. The display will output "Pending". Off: When tracking is off the display outputs "Off".

16 INFORMATIVE EXAMPLES

16.1 SENDING AN SBD MESSAGE TO THE SHOUT ns

Messages can be sent to the SHOUT ns via SBD from almost any e-mail program (Outlook, Outlook Express, etc.).

1. In order to send e-mail messages to a SHOUT ns, the e-mail program must use the standard Multipurpose Internet Mail Extensions (MIME) Base64 encoding as defined in RFC 2045. The following instructions describe how to set this up for Microsoft Outlook Express:

   a. Select "Tools/Options"
   b. Click the "Send" Tab
   c. Under "Mail Sending Format", click "HTML Settings…"
   d. Click MIME
   e. Select "Base 64" for Encode text using
   f. Click OK
   g. Under "Mail Sending Format", click "Plain Text Settings…"
   h. Repeat steps d – f

2. Send all e-mail messages to Data@SBD.Iridium.com

3. Place the IMEI number of the SHOUT ns in the subject line

4. The message should be carried in an attachment, which must have a ".sbd" extension
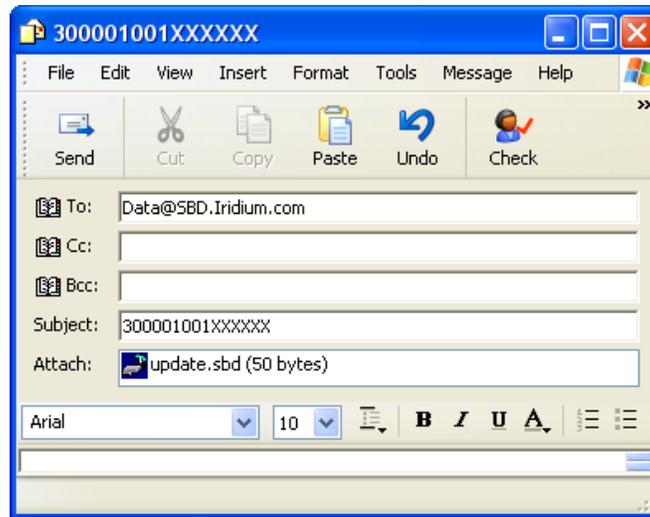
NOTE: Comparable information related to the Iridium DoD gateway is provided upon request.

16.2   FIELD ELEMENTS OF AN SBD MESSAGE (FOR COMMERCIAL GATEWAY ONLY)

The table below displays the field descriptors of each SBD messages sent from the SHOUT ns. This format will appear in the body of every SBD e-mail message.

Field Name	Descriptions	
MOMSN	Mobile Originated Message Sequence Number (0 – 65535)	
MTMSN	Mobile Terminated Message Sequence Number (0 – 65535)	
Time of Session	The UTC Timestamp of the SHOUT ns session between the SHOUT ns and the controller subsystem.	
Session Status	Session Status	Description
	TRANSFER OK	The SBD session completed successfully
	INCOMPLETE CALL	The SBD session did not complete successfully due to a protocol error
	SBD DENIAL	The SHOUT ns is not allowed to access the system
	SBD TIMEOUT	The SBD session did not complete for an unknown reason such as a RF fade

Field Name	Descriptions
Message Size	The size of the attached message in decoded format. This is not the length of the MIME encoded data.
Unit Location	The latitude and longitude of the SHOUT ns. The latitude and the longitude provide a center point and the CEPradius provides the radius of a circle around that center point. The reported position is accurate within 10km at 80% of the time. This location is estimated using Iridium satellites.
CEPradius	An estimate of the accuracy of the unit in kilometers.

Example:

MOMSN: 1

MTMSN: 0

Time of Session (UTC): Tue Dec 7 13:09:43 2004

Session Status: TRANSFER OK

Message Size (bytes): 11

Unit Location: Lat = 38.766516 Long = -77.426262

CEPradius = 2

The actual message sent from the SHOUT ns is in an attachment of the e-mail and the subject line contains the IMEI number of the unit that sent the SBD message.

NOTE: The unit location message in the body of the email may be enabled or disabled by the SBD airtime service provider. If using encryption for the .sbd attachments then this should be disabled for greater security.

APPENDIX A: ENCRYPTED SENDING WITH NO RECEIVING

The SHOUT ns has the ability to ignore all incoming messages when encryption is selected. This is done by setting the decryption key to all 0s or by never setting it since its default value is all 0s. The only AT command that is affected is the ^KD – Key for Decryption command. The ^KE – Key for encryption command works the same way as before and rejects all 0s as an unsafe key and thus forces another key to be entered before encryption can be used. The ^KZ command will reset both the encryption and decryption keys to 0. If only the encryption key is entered after the keys are zeroized with the ^KZ command then all incoming messages will be blocked. If encryption is not selected with the ^UE command then all incoming messages are allowed. In tracking mode, since there are no incoming messages and the +SBDRING alerts are not needed the +SBDI command is used to send GPS reports rather than the +SBDIX command. For this block no change is required in the Encryption Module or any software that uses it. Users just need to be created with IMEI records that have a decryption key but no encryption key.

A.1   Examples of AT Commands to Set-Up blocking all Incoming

INITIAL SETUP BLOCKING ALL INCOMING:

at^ccop='temp password','password'

at^ke='password','000102030405060708090A0B0C0D0E0F101112131415161718191A1B1C1D1E1F'

at^ke='password','000102030405060708090A0B0C0D0E0F101112131415161718191A1B1C1D1E1F'

at^ue='password',1

at&w&y

WITH RESPONSES

at^ccop='*************','*******'

OK

at^ke='*******','***'

Enter Encryption Key again to set.

OK

at^ke='*******','***'

Encryption Key Set

OK

at^ue='********',1

OK

at&w&y

OK

(After power cycle unit will be set to send encrypted messages but to block all incoming)

COMMANDS TO BLOCK INCOMING MESSAGES AFTER SET TO ENCRYPT AND DECRYPT MESSAGES:

at^kd='password','0000000000000000000000000000000000000000000000000000000000000000'

at^kd='password','0000000000000000000000000000000000000000000000000000000000000000'

WITH RESPONSES

at^kd='********','**'

Enter Decryption Key again to set.

OK

at^kd='********','**'

Encryption and Decryption Keys Set

OK

APPENDIX B: NMEA MESSAGE FORMAT

B.1   GGA - GPS Fix Data – AT+PA=1

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPGGA	6		GGA protocol header
UTC Time	hhmmss.ss	175837.40	9		Current Time
Latitude	ddmm.mmmmm	3846.01498	10		Degrees, minutes, and fraction of minutes
N/S Indicator	character	N	1		N = north or S = south
Longitude	dddmm.mmmm	07729.09940	11		Degrees, minutes, and fraction of minutes
E/W Indicator	character	W	1		E = east or W = west
Position Fix Indicator	digit	1	1		0 = Invalid Fix, 1 or 2 = Valid Fix, 3 = Estimated Dead Reckoning
Satellites Used	ss	10	1 or 2		Range 0 to 12
HDOP	numeric	0.85	varies		Horizontal Dilution of Precision
MSL Altitude[1]	numeric	81.2	varies	meters	Altitude
Units	character	M	1		Stands for meters
Altref	numeric	-33.4	varies	meters	Geoid Separation

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[1]   Does not support geodic corrections values are WGS-84 heights

Name	ASCII String		Length	Units	Description
	Format	**Example**			
Units	character	M	1		Stands for meters
Age of Differential Corrections	numeric				Blank
Diff. Referece Station ID	numeric				Blank
Checksum	hex string	*59			
<CR><LF>					End of Message

Example:

$GPGGA,175837.40,3846.01498,N,07729.09940,W,1,10,0.85,81.2,M,-33.4,M,,*59

B.2   GLL - Latitude and longitude with time position fix and status – AT+PA=2

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPGLL	6		GLL Protocol header
Latitude	ddmm.mmmmm	3846.01505	10		Degrees, minutes, and fraction of minutes
N/S Indicator	character	N	1		N = north or S = south
Longitude	dddmm.mmmmm	07729.09766	11		Degrees, mins, and fraction of mins
E/W Indicator	character	W	1		E = east or W = west
UTC Time	hhmmss.xxx	181015.00	9		Current Time
Status	character	A	1		A = data valid or V = data invalid
Mode	character	A	1		N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix, E=Estimated/Dead Reckoning Fix
Checksum	hex string	*7A			
<CR><LF>					End of Message

Example:

$GPGLL,3846.01505,N,07729.09766,W,181015.00,A,A*7A

B.3 GSA - GPS dilution of precision and active satellites – AT+PA=3

| Name | ASCII String | | Length | Units | Description |
	Format	Example			
Message ID	string	$GPGSA	6		GSA Protocol header
SMode	character	A	1		M – Manual – forced to operate in 2D or 3D mode A – 2D Automatic – allowed to automatically switch 2D/3D
Fix Status	1 digit	3	1		1 – Fix not available 2 – 2D position fix 3 – 3D position fix
Satellites Used	numeric	11	variable		SV on Channel 1
Satellites Used	numeric	25	variable		SV on Channel 2
Satellites Used	numeric	30	variable		SV on Channel 3
Satellites Used	numeric	09	variable		SV on Channel 4
Satellites Used	numeric	18	variable		SV on Channel 5
Satellites Used	numeric	14	variable		SV on Channel 6
Satellites Used	numeric	05	variable		SV on Channel 7
Satellites Used	numeric	22	variable		SV on Channel 8
Satellites Used	numeric	35	variable		SV on Channel 9
Satellites Used	numeric	15	variable		SV on Channel 10
Satellites Used	numeric		variable		SV on Channel 11
Satellites Used	numeric		variable		SV on Channel 12

Name	ASCII String		Length	Units	Description
	Format	Example			
PDOP	numeric	1.53	variable		Position Dilution of Precision
HDOP	numeric	0.83	variable		Horizontal Dilution of Precision
VDOP	numeric	1.29	variable		Vertical Dilution of Precision
Checksum	hex string	*02			
<CR><LF>					End of Message

Example:

$GPGSA,A,3,11,25,30,09,18,14,05,22,35,15,,,1.53,0.83,1.29*02

B.4   GSV - Satellites in View – AT+PA=4

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPGSV	6		GSV protocol header
Number of Messages	1 digit	3	1		Range 1 to 3
Message Number	1 digit	1	1		Range 1 to 3
Satellites in View	numeric	10	2		
Satellite ID	ss	11	2		Channel 1 (Range 1 to 32)
Elevation	dd	12	2	degree	Channel 1 (Range 00 to 90)
Azimuth	aaa	304	3	degree	Channel1 (True, Range 000 to 359)
SNR	numeric	36	varies	dBHz	Range 0 to 99, null when not tracking
…					
Satellite ID	ss	15	2		Channel _(Range 1 to 32)
Elevation	dd	15	2	degree	Channel _ (Range 00 to 90)
Azimuth	aaa	199	3	degree	Channel _ (True, Range 000 to 359)
SNR	numeric	40	varies	dBHz	Range 0 to 99, null when not tracking
Checksum	hex string	*76			
<CR><LF>					End of Message

Example:

$GPGSV,3,1,10,11,12,304,36,25,43,237,50,30,43,110,46,09,04,050,37*72

$GPGSV,3,2,10,18,22,141,46,14,68,003,49,05,32,064,49,22,58,147,49*7A

$GPGSV,3,3,10,35,39,145,43,15,15,199,40*76

B.5   GRS - GNSS Range Residuals – AT+PA=5

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPGRS	6		GRS protocol header
UTC Time	hhmmss.ss	183431.80	9		Current Time
Mode	character	1	1		This will always be 1
residual	numeric	1.2	varies	meters	Range residuals for SVs used in navigation. The SV order matches order from the GSA sentence.
…					
residual	numeric		varies	meters	
Checksum	hex string	*64			
<CR><LF>					End of Message

Example: $GPGRS,183431.80,1,1.2,-1.9,-0.8,-0.5,0.5,-2.3,2.5,-3.5,,,,*64

B.6   RMC - Recommended Minimum Data – AT+PA=6

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPRMC	6		RMC protocol header
UTC Time	hhmmss.ss	184232.60	9		Current Time

Name	ASCII String		Length	Units	Description
	Format	Example			
Status	character	A	1		A=data valid or V=data invalid
Latitude	ddmm.mmmmm	3846.01437	9		Degrees, minutes, and fraction of minutes
N/S Indicator	character	N	1		N = north or S = south
Longitude	dddmm.mmmmm	07729.09861	10		Degrees, minutes, and fraction of minutes
E/W Indicator	character	W	1		E = east or W = west
Speed Over Ground	numeric	0.027	varies	knots	
Course Over Ground	numeric	331.95	varies	degrees	True
UTC Date	ddmmyy	300704	6	days, months, years	Current Date
Magnetic Variation	blank			degrees	Not Supported
Magnetic Variation E/W	blank				Not Supported
Mode	character	A	1		N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix,

Name	ASCII String Format	Example	Length	Units	Description
					E=Estimated/Dead Reckoning Fix
Checksum	hex string	*79			
<CR><LF>					End of Message

Example:

$GPRMC,184232.60,A,3846.01437,N,07729.09861,W,0.027,331.95,300704,,,A*79

B.7 VTG - Course over ground and ground speed – AT+PA=7

Name	ASCII String Format	Example	Length	Units	Description
Message ID	string	$GPVTG	6		VTG protocol header
Course (True)	numeric	19.38	varies	degrees	Measured heading
Reference	character	T	1		True
Course (Magnetic)	blank				Measured Heading
Reference	character	M	1		Magnetic
Speed	numeric	0.032	varies	knots	
Units	character	N	1		Knots
Speed	numeric	0.059	varies	km/h	
Units	character	K	1		Kilometers per hour
Mode	character	A	1		N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix, E=Estimated/Dead Reckoning Fix

Name	ASCII String		Length	Units	Description
	Format	Example			
Checksum	hex string	*03			
<CR><LF>					End of Message

Example:

$GPVTG,19.38,T,,M,0.032,N,0.059,K,A*03

B.8   ZDA - Time and Date – AT+PA=8

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPZDA	6		ZDA protocol header
UTC time	hhmmss.ss	185741.80	9	hours minutes seconds	00…23 00…59 00.00…59.99
UTC time: day	dd	30	2	days	01…31
UTC time: month	mm	07	2	months	01…12
UTC time: year	yyyy	2004	4	years	4 digit year
Local zone hours	xx or -xx	00	2		Not used (= 00)
Local zone minutes	zz	00	2		Not used (= 00)
Checksum	hex string	*62			
<CR><LF>					End of Message

Example:

$GPZDA,185741.80,30,07,2004,00,00*62

B.9   GST - GNSS Pseudo Range Error Statistics – AT+PA=9

Name	ASCII String		Length	Units	Description
	Format	Example			
Message ID	string	$GPST	6		GST protocol header
UTC time	hhmmss.ss	190009.60	9	hours minutes seconds	00…23 00…59 00.00…59.99
Range rms	numeric	2.4	varies	meters	RMS value of the standard deviation of the ranges
Std Major	numeric				Standard deviation (semi-major axis) Not supported empty.
Std Minor	numeric				Standard deviation of semi-minor axis Not supported empty.
Heading	numeric				Orientation of semi-major axis Not supported empty.
Std Latititude	numeric	1.4	varies	meters	Standard deviation of latitude
Std Longitude	numeric	1.3	varies	meters	Standard deviation of longitude
Std Altitude	numeric	2.4	varies	meters	Standard deviation of altitude
Checksum	hex string	*79			
<CR><LF>					End of Message

Example:

$GPGST,190009.60,2.4,,,,1.4,1.3,2.4*79

B.10 PUBX0 - Lat/Long Position Data – AT+PA=A

| Name | ASCII String | | Length | Units | Description |
	Format	Example			
Message Start	string	$PUBX	5		Message Header Navstar Proprietary sentences
Message ID	character	00	2		Proprietary Message ID
UTC time	hhmmss.ss	191944.20	9	hours mins secs	00…23 00…59 00.00…59.99
Latitude	ddmm.mmmmm	3846.012485	10		Degrees, mins, and fraction of mins
N/S Indicator	character	N	1		N = north or S = south
Longitude	dddmm.mmmmm	07729.097149	11		Degrees, mins, and fraction of mins
E/W Indicator	character	W	1		E = east or W = west
AltRef	numeric	40.793			Altitude above user data ellipsoid.
NavStat	nn	G3	2	meters	
Hacc	numeric	1.7	varies		Horizontal Accuracy
Vacc	numeric	2.6	varies		Vertical Accuracy
SOG	numeric	0.032	varies		Speed Over Ground
COG	numeric	73.26	varies		Course Over Ground

| Name | ASCII String | | Length | Units | Description |
	Format	Example			
Vvel	numeric	0.009	varies		Vertical Velocity, Ascending is negative and descending is positive
ageC	numeric		varies	secs	Age of most recent DGPS Corrections. 00.0 to 999.9 Empty = none available
HDOP	numeric	0.84	varies		2-D Horz. Dilution of Precision
VDOP	numeric	1.28	varies		Vertical Dilution of Precision
TDOP	numeric	0.68	varies		4-D Geometric Dilution of Precision
# of Satellites	numeric	9	varies		Number of GPS Satellites Used
RU	numeric	0	1		Number of GLONASS satellites used in the navigation solution. Always 0.
DR	numeric	0	varies		Dead Reckoning used (0 or 1)
Checksum	hex string	*79			
<CR><LF>					End of Message

Example:

$PUBX,00,191944.20,3846.012485,N,07729.097149,W,40.793,G3,1.7,2.6,0.032,73.26,0.009,,0.84,1.28,0.68,9,0,0*79

B.11   PUBX1 - Lat/Long Position Data – AT+PA=B

Name	ASCII String		Length	Units	Description
	Format	Example			
Message Start	string	$PUBX	5		Message Header Navstar Proprietary sentences
Message ID	character	01	2		Proprietary Message ID
UTC time	hhmmss.ss	205838.60	9	hours minutes seconds	00…23 00…59 00.00…59.99
Easting	numeric	284099.823	varies	meters	UTM Easting
E/W Indicator	character	W	1		E = east or W = west
Northing	numeric	4293841.170	varies	meters	Degrees, mins, and fraction of mins
N/S Indicator	character	N	1		N = north or S = south
AltMSL	numeric	69.267	varies		Altitude above user datum ellipsoid.
NavStat	nn	G3	2	meters	
Hacc	numeric	2.0	varies		Horizontal Accuracy
Vacc	numeric	3.6	varies		Vertical Accuracy
SOG	numeric	0.023	varies		Speed Over Ground
COG	numeric	173.18	varies		Course Over Ground
Vvel	numeric	0.005	varies		Vertical Velocity

| Name | ASCII String | | Length | Units | Description |
	Format	Example			
ageC	numeric		varies	seconds	Age of most recent DGPS Corrections. 00.0 to 999.9 Empty = none available
HDOP	numeric	1.05	varies		2-D Horizontal Dilution of Precision
VDOP	numeric	2.02	varies		Vertical Dilution of Precision
TDOP	numeric	1.28	varies		4-D Geometric Dilution of Precision
# of Satellites	numeric	8	varies		Number of GPS Satellites Used
RU	numeric	0	1		Number of GLONASS satellites used in the navigation solution. Always 0.
DR	numeric	0	varies		Dead Reckoning used (0 or 1)
Checksum	hex string	*45			
<CR><LF>					End of Message

Example:

$PUBX,01,205838.60,284099.823,W,4293841.170,N,69.267,G3,2.0,3.6,0.023,173.18,0.005,,1.05,2.02,1.28,8,0,0*45

B.12   PUBX4 – Time of Day and Clock Information – AT+PA=C

Name	ASCII String		Length	Units	Description
	Format	Example			
Message Start	string	$PUBX	5		Message Header Navstar Proprietary sentences
Message ID	character	04	2		Proprietary Message ID
UTC time	hhmmss.ss	155727.00	9	hours minutes seconds	00…23 00…59 00.00…59.99
UTC date	ddmmyy	020804	6	days months years	UTC Day, Month and Year
UTC TOW	numeric	143847.00	varies	seconds	UTC Time of Week
Week	numeric	1282	varies		GPS week number continues beyond 1023
Reserved	numeric	143847.00	varies		Reserved for future use
Clk_B	numeric	3448979	varies	ns	Receiver Clock Bias
Clk_D	numeric	-2894.038	varies	ns/s	Receiver Clock Drift
PG	numeric	43	varies	ns	Time Pulse Granularity
Checksum	hex string	*45			
<CR><LF>					End of Message

Example:

$PUBX,04,155727.00,020804,143847.00,1282,143847.00,3448979,-2894.038,43,*3

17 TECHNICAL SUPPORT

For technical support, please contact us at:

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Fax: 703-392-6795

Email: support@nalresearch.com

Technical documents are also available to download on NAL Research's website

www.nalresearch.com in the **Support** > **Documentation & Downloads** section.