

This presentation describes the usage of the inReach GPS/Satellite Texting device as carried by team members.

A PDF user's guide for the device may be downloaded from the Garmin website. Will work in most phones if you need to look something up in the field

A separate presentation describes how to view the inReach information on a PC.

GPS and Iridium Satellites

GPS satellites for navigation

- High orbit for simultaneous reception of many satellites

Iridium satellites for data receive and transmit

- Low orbit for strong signal and short time delay
- Usually only one satellite in view at a time
 - Any obstruction will give time gaps in coverage
 - Expect an average of 10 minute time delays in send and receive
 - Move away from rock walls and dense foliage to improve satellite visibility
 - Carry the unit on the top outside areas of your pack
 - Inside the pack cover will protect the screen from scratches when you take your pack off
 - Unit has icons to indicate if it is in contact with the satellites and if a message that you sent made it to a satellite

CCSAR South Use Cases

Track points

- Log of track points kept in unit
 - May be downloaded to computer over USB cable
 - Must eventually be deleted to make room for more
- Track points sent to web through satellites
 - Stored online for viewing on maps and download to PC
 - Shows location of the team in real time (delayed 10 minutes or so)
- Track must be checked at start of mission to insure it is turned on

Text messaging

- To/from other inReach devices, SMS (cell phone number), email
- Contact list in the inReach device will have most needed, can enter any address by hand, Bluetooth to cell phone gets phone contacts

GPS navigation

- Has medium detail maps, waypoint entry, navigation, etc

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Track points show where we have been to better plan multi-day searches and to document completeness to terminate a search

Text messaging as backup for radio when out of range

Prefer to not use SOS as it will take awhile to get back to the bay

Send email text to the bay, or text IC's cell phone instead

Layout



| | |
|---|------------------------------------|
| ① | Internal Iridium® antenna |
| ② | SOS key (under protective cap) |
| ③ | Status LED |
| ④ | Keys |
| ⑤ | Power key |
| ⑥ | Mounting spine |
| ⑦ | Micro-USB port (under weather cap) |



| | |
|---|------------------------------------|
| ① | Internal Iridium® antenna |
| ② | Keys |
| ③ | Micro-USB port (under weather cap) |
| ④ | SOS button (under protective cap) |
| ⑤ | Power key |
| ⑥ | Mounting screw |

We have two newer InReach Explorer+ ,one older inReach Explorer and two inReach Minis.

Keys



| | |
|---|--|
| ✕ | Select to cancel or return to the previous page. |
| ⚡ | Select to open the shortcut menu. |
| — | Select to zoom out on the map. |
| + | Select to zoom in on the map. |
| ☰ | Select to open the menu for the current page. Select twice to open the home page. |
| ✓ | Select to choose an option or to acknowledge a message. |
| 🔄 | Select to view menu options or to move the map cursor. |



| | |
|----|--|
| ▲ | Select to scroll through menus, pages, and settings. |
| ▼ | |
| ↶ | Select to cancel or return to the previous page. |
| OK | Select to choose an option or to acknowledge a message. From the home page, select to open the main menu. |

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The older unit does not have the + and -, nor the quick and menu and power keys

Has a few less menus and features but the features that it has operate very similar to the new unit

The Mini has only four keys along the sides. An up arrow, a down arrow, a cancel button and an OK button.

Fewer screens and fewer modes.

Linking to a phone will give a better user experience.

Four digit number on the unit is the last four digits of its id. You will pick it on the menu on the phone to link to the correct inReach device if more than one is near your phone.

Status

Status LED

| LED Activity | Status |
|-----------------------------------|---|
| Flashing green | You have an unread message. |
| Flashing red | The device does not have a clear view of the sky. The device is below 10% battery power. |
| Alternating red and green | The device is in SOS mode. |
| Alternating red and green rapidly | The device is canceling an SOS rescue. |

Status Icons

| | |
|--|---------------------------------|
| | 3D GPS signal acquired |
| | 2D GPS signal acquired |
| | Searching for GPS signal |
| | Sending and receiving data |
| | Unable to send and receive data |
| | Unread messages |
| | Tracking enabled |
| | Bluetooth® technology status |
| | Charging battery |
| | Charging complete |

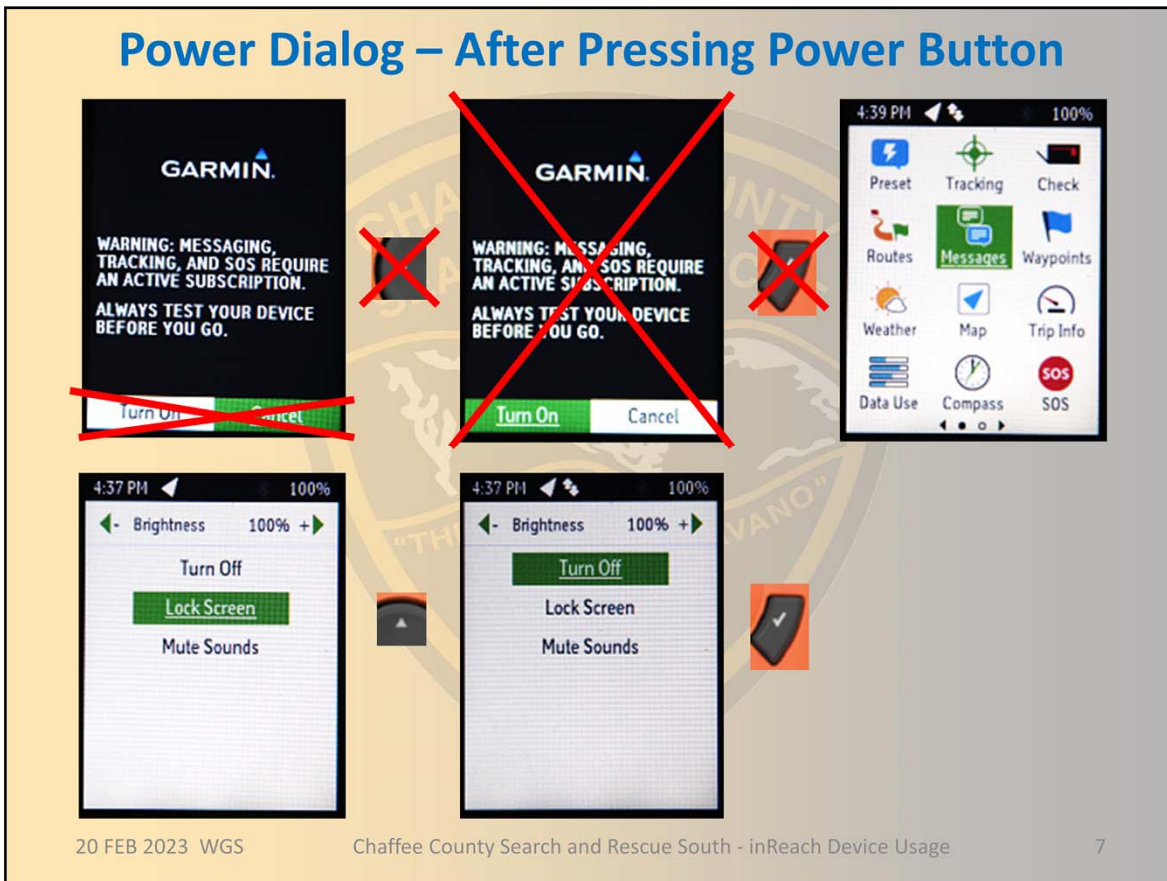
Status Icons

| | |
|--|---|
| | Sending and receiving data |
| | Unable to send and receive data |
| | Tracking enabled |
| | Bluetooth® technology connection status |
| | Charging battery |
| | Charging complete |

Mini

Can also hear beeps, rings, whistles, and ascending and descending tones.

Power Dialog – After Pressing Power Button



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Top row of slide is how to turn the unit on and the bottom row is how to turn the unit off

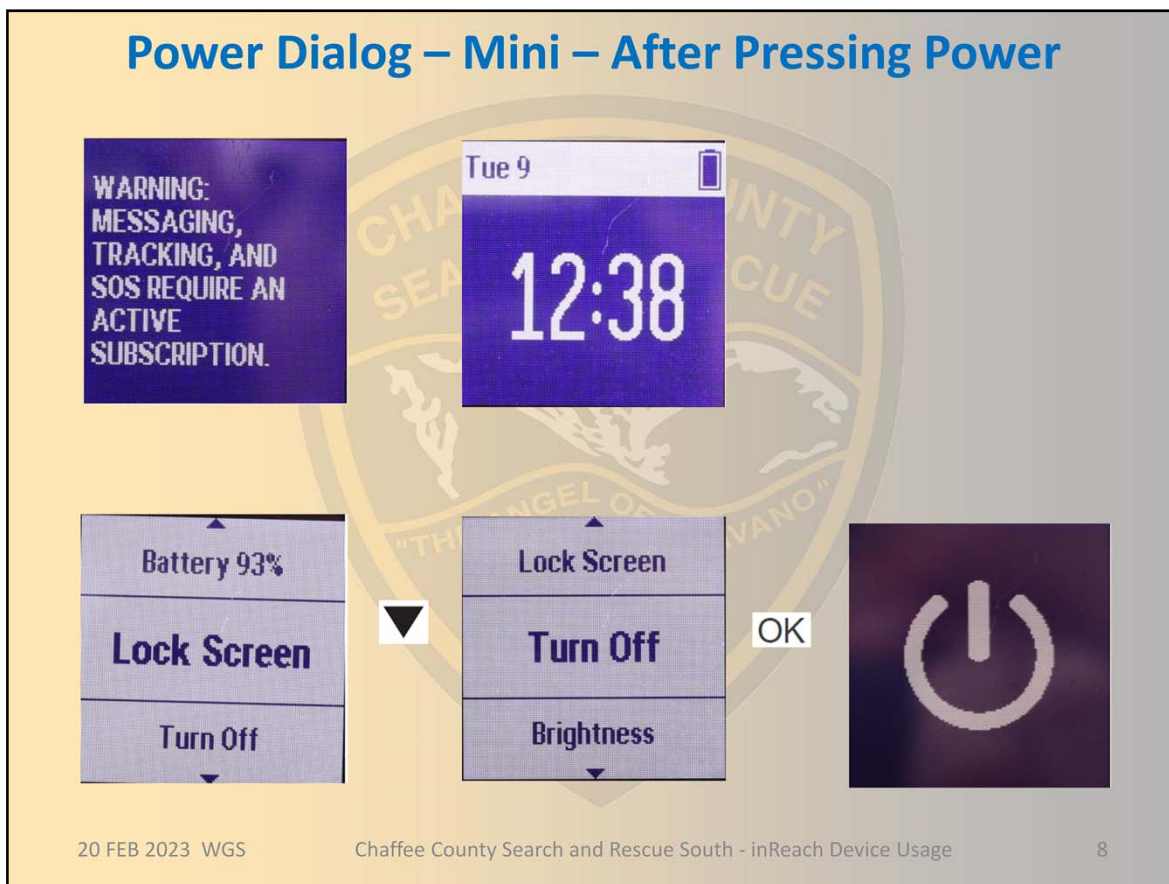
Firmware 4.2 - Released April 24, 2020 Removed power on confirmation screen as shown by red x's

Pictures of the buttons show what to press to get to the next screen

Dialogs are in place to prevent accidental turn-off of the unit in your pack

The left and right arrows adjust the display brightness – good to know if display is too dim to read

Power Dialog – Mini – After Pressing Power



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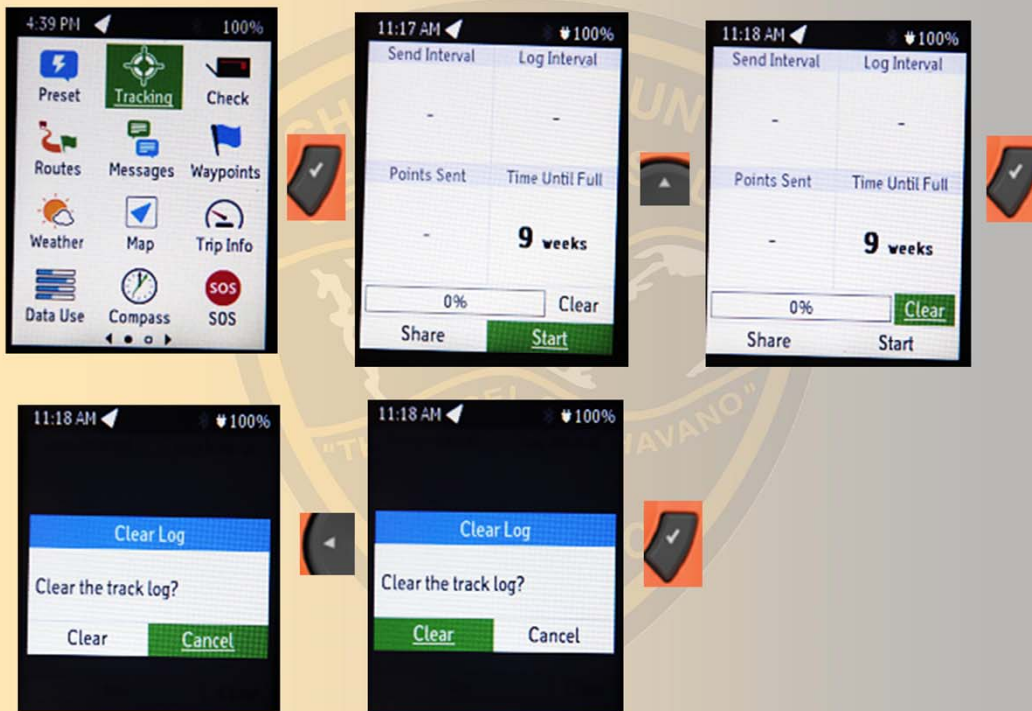
Top row of slide is how to turn the unit on and the bottom row is how to turn the unit off

Pictures of the buttons show what to press to get to the next screen

Dialogs are in place to prevent accidental turn-off of the unit in your pack.

Mini uses scrolling circular menus – scroll using the up and down buttons until what you want is in bold text and then press OK button

Clear Track Log



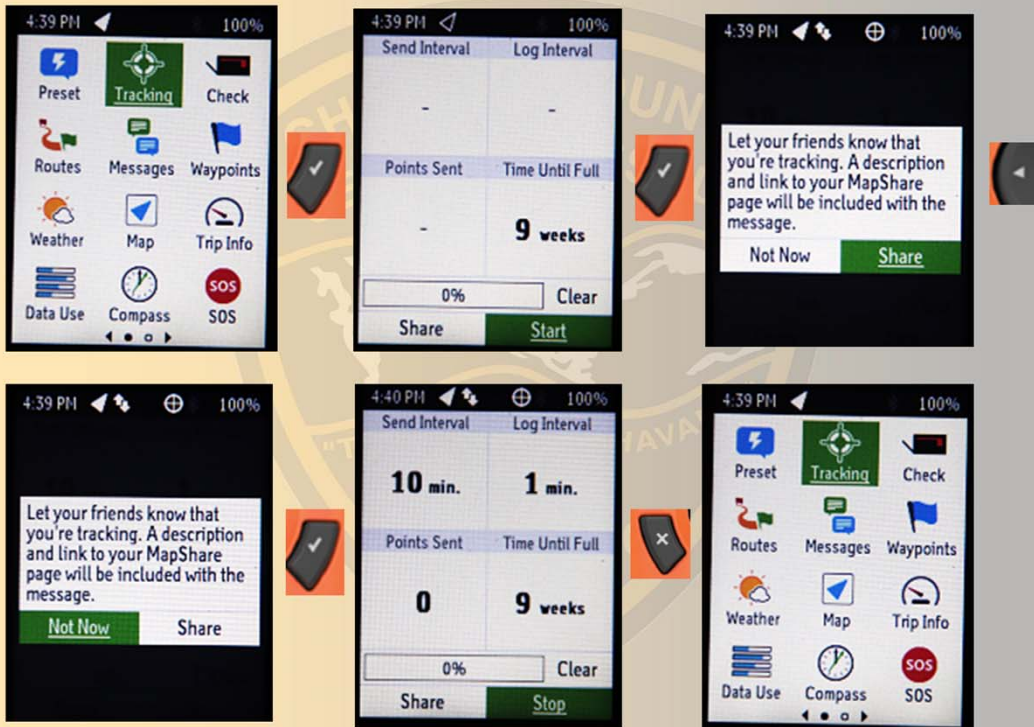
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A single track log file is kept in the unit. Data is added to the end each time track logging is started. Clear the track log before beginning a new mission.

Start Track Logging



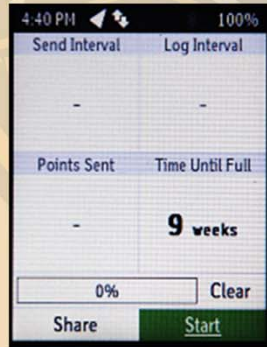
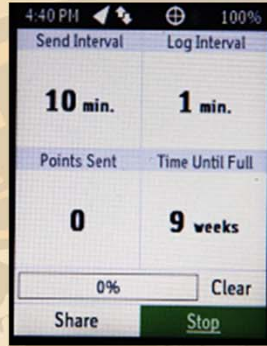
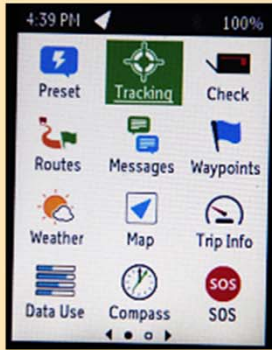
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- Check that track logging is on in the vehicle or at the trail head
- Send interval is how often the track point is sent through the satellites to the internet
 - 10 min is our fastest free rate – do not set it faster than this
 - Menu key is used to change the rate – can even turn it off here
- Log interval is how often the location is logged to internal memory of the device
 - 1 min is fast enough for hiking
 - Menu key is used to change the rate
- Recommend not turning track off to save time at beginning of next mission

Stop Track Logging

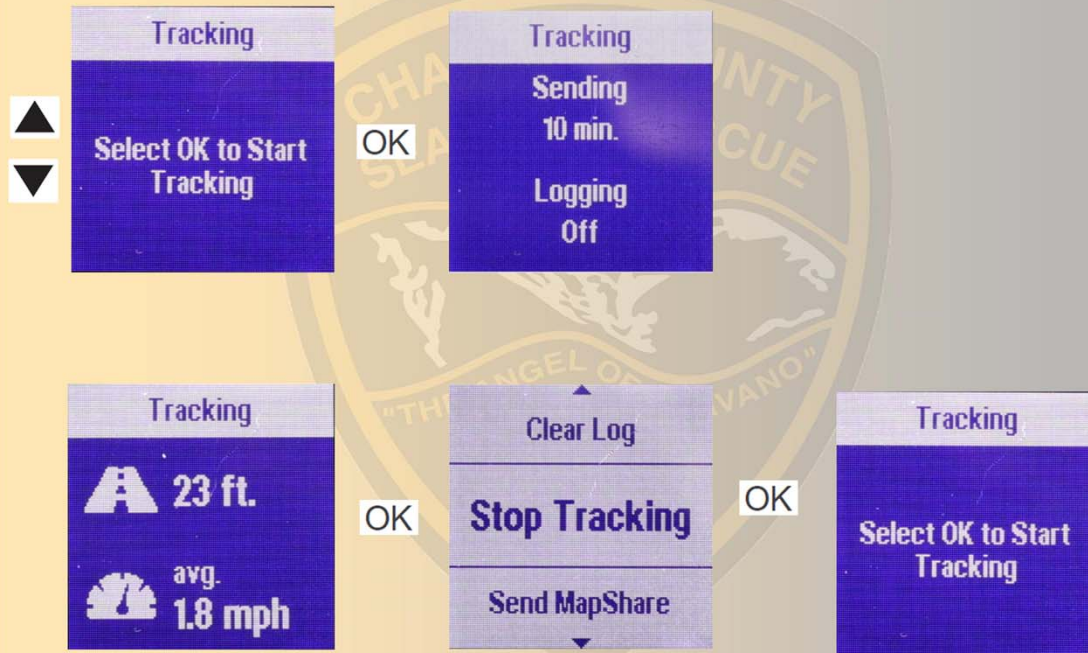


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Start / Stop Track Log – Mini



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Top row of slide is how to start tracking and the bottom row is how to stop tracking
Pictures of the buttons show what to press to get to the next screen
Note that logging internal to the unit is turned off and should be turned on using the Setup – Tracking on the Main Menu – Typically we use one minute

Clear Track Log – Mini



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Track log clearing is found on the stop tracking path. So must be tracking before can clear the log.

Messages

Messages may be sent to and received from another inReach device, a cell phone, or an email address

Three types of messages may be sent

- Up to three preset messages are created ahead of time online; predefined text and recipient(s)
- Ten or more quick text messages may be defined ahead of time online and sent to any recipient(s)
- Text messages may be entered and sent to any recipient(s) from the device

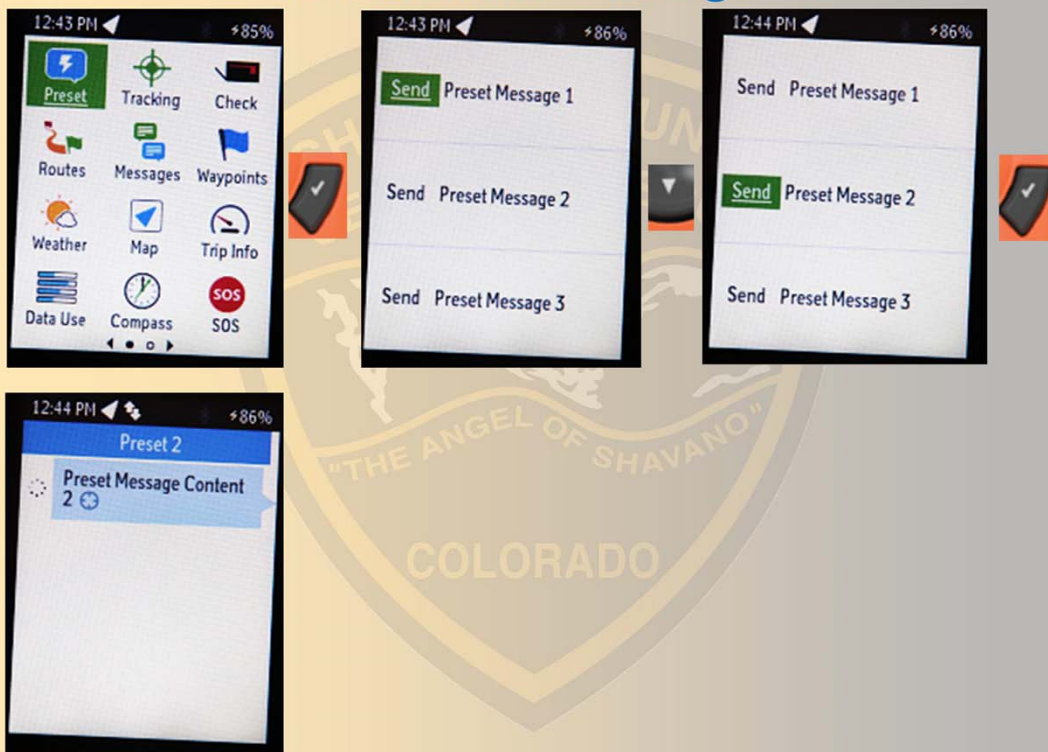
By default the device checks for incoming messages every 10 minutes

- A ringing sound, a flashing green status LED and a status icon with a number in it all indicate a new unread message has come in
- You can see on your map and navigate to the location where a message was sent from another inReach device
- You can include text of your location in your message

When you send a message the device immediately listens for a reply

Including text of your location in your message is only needed if the recipient of your message is not another inReach device or does not have web access to view your location on an online map

Send Preset Message



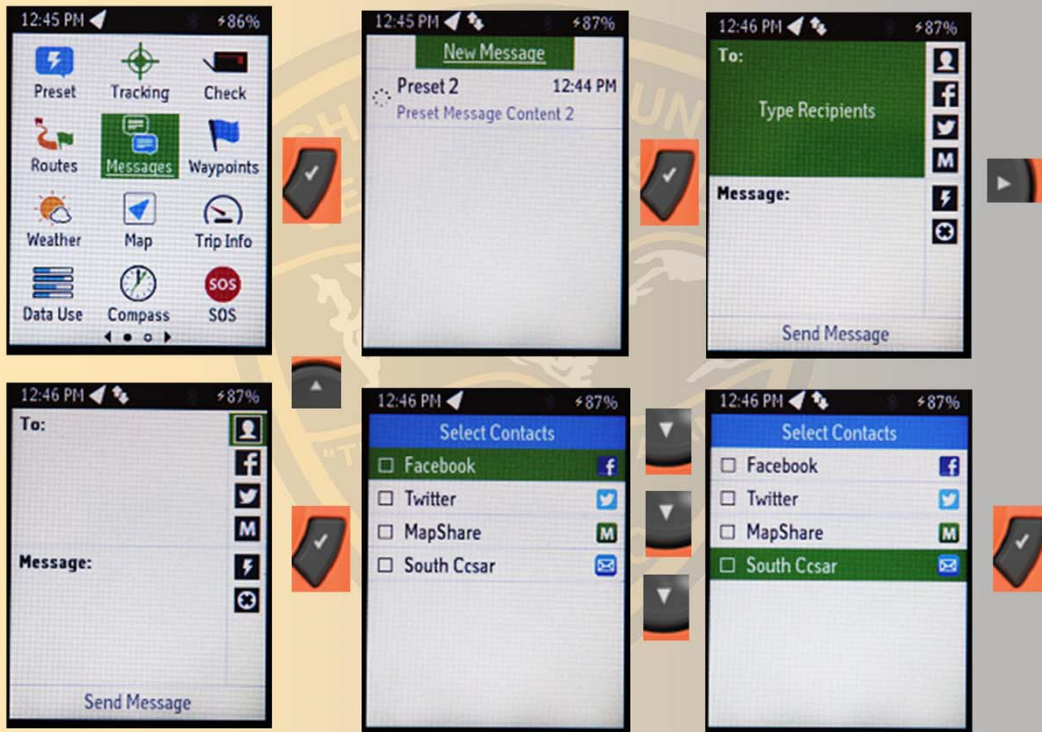
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Once the device is synced with the online account, real message text and real recipients will be shown

Send Quick Text Message (1 of 2)

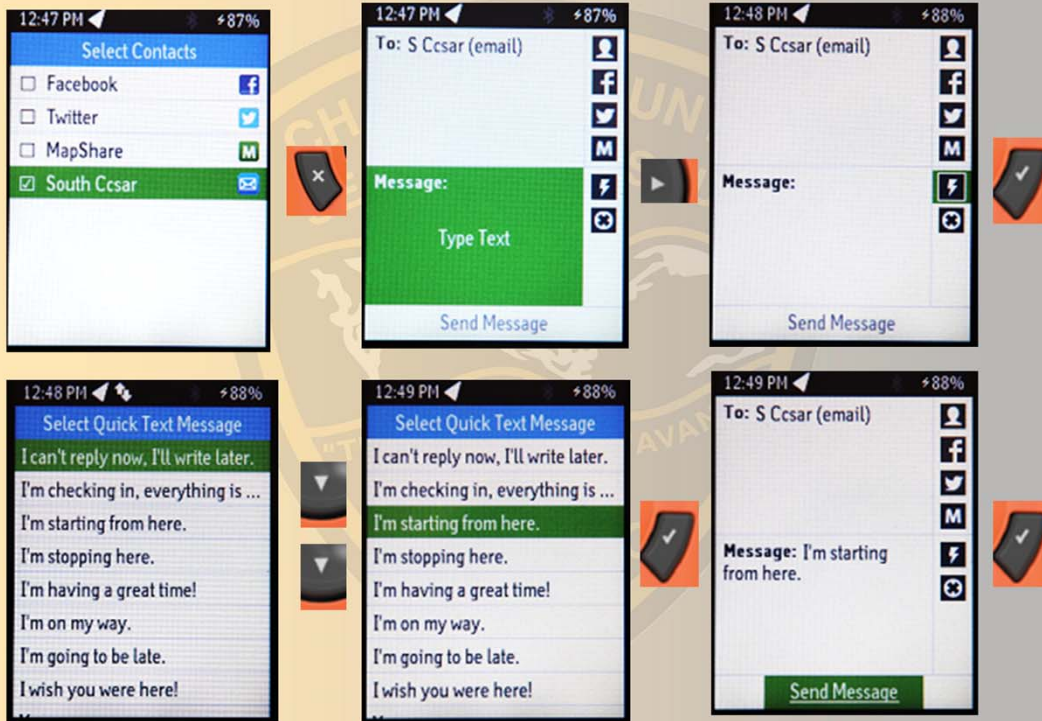


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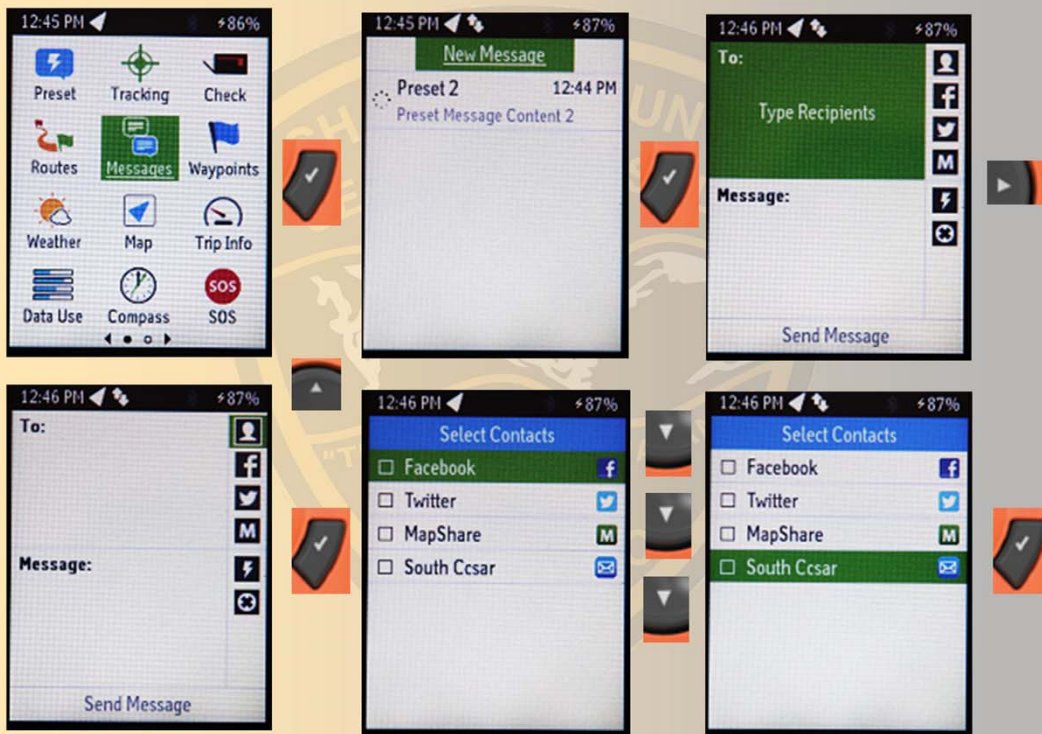
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Send Quick Text Message (2 of 2)



Text Message with Text Location (1 of 2)



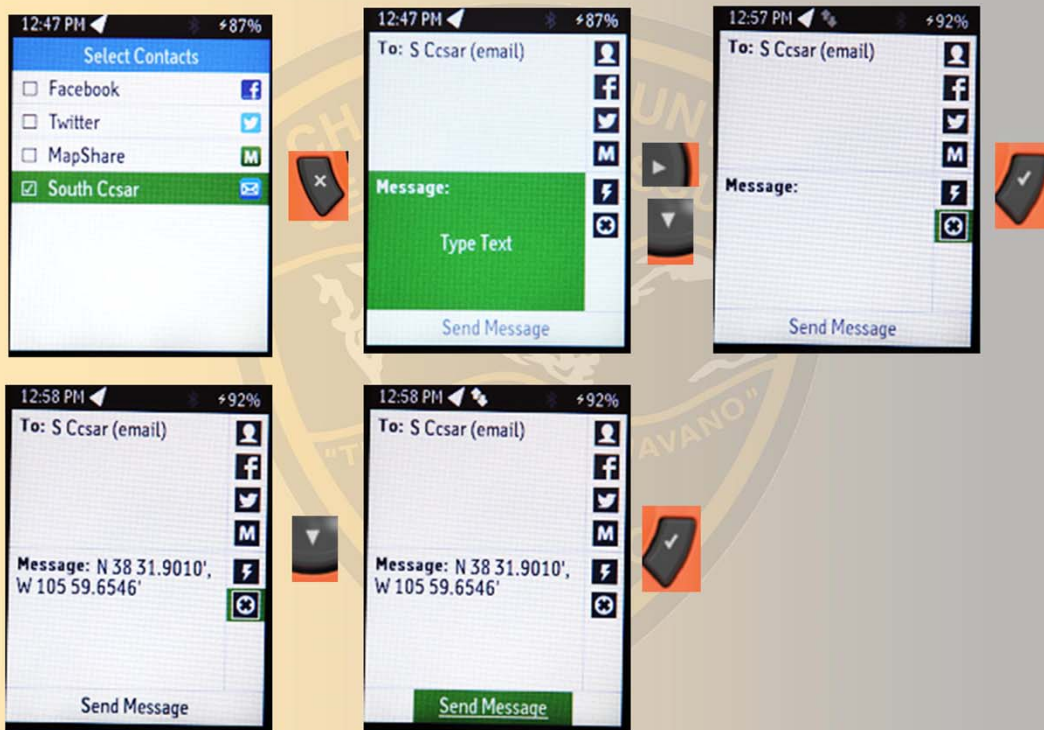
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Begin exactly the same as sending other text messages

Text Message with Text Location (2 of 2)



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Only need to include text location if the recipient is not another inReach device or does not have online access for viewing your location on an online map

SOS

Only use if team is in distress and there is no way to contact anyone in the SAR organization

- Radio or inReach message to IC is preferred as this will be faster
- SOS goes to national dispatch center and will take a while to get back to the Sheriff's department

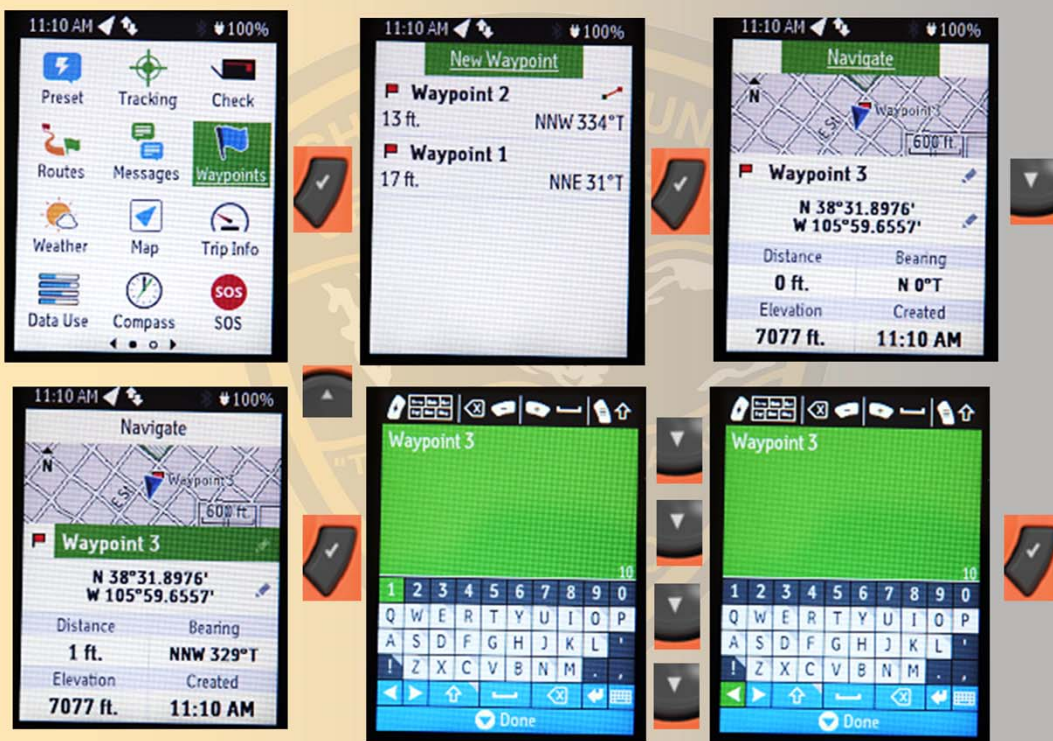
SOS Button

- Push open the protective cover by rotating towards the rear of the unit
- Press the button until the countdown ends
- Reply to the message when it is sent from the response center

SOS Menu

- Select SOS > Emergency > Write SOS, Select Message, Enter a message, Select Send Message
- Reply to the message when it is sent from the response center

Waypoint Creation (1 of 3)



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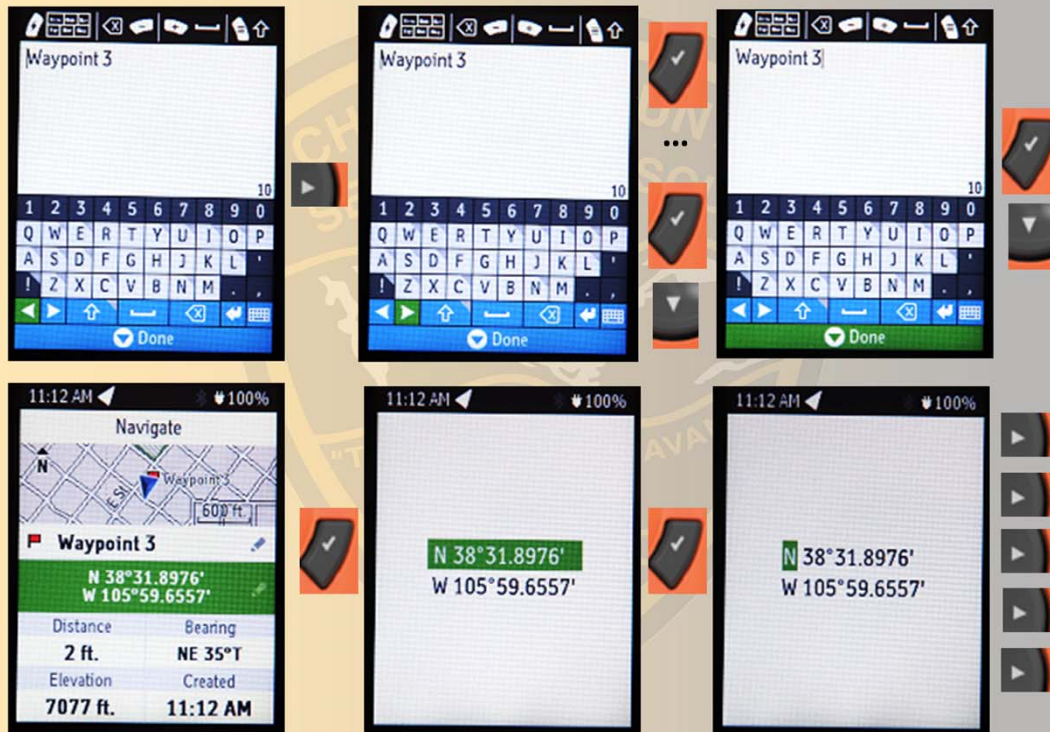
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New waypoints default to your current location and a name of “Waypoint #” with the number higher than the last used number.

You can change the name and the location by selecting the name or location and pressing the check key.

Waypoint Creation (2 of 3)



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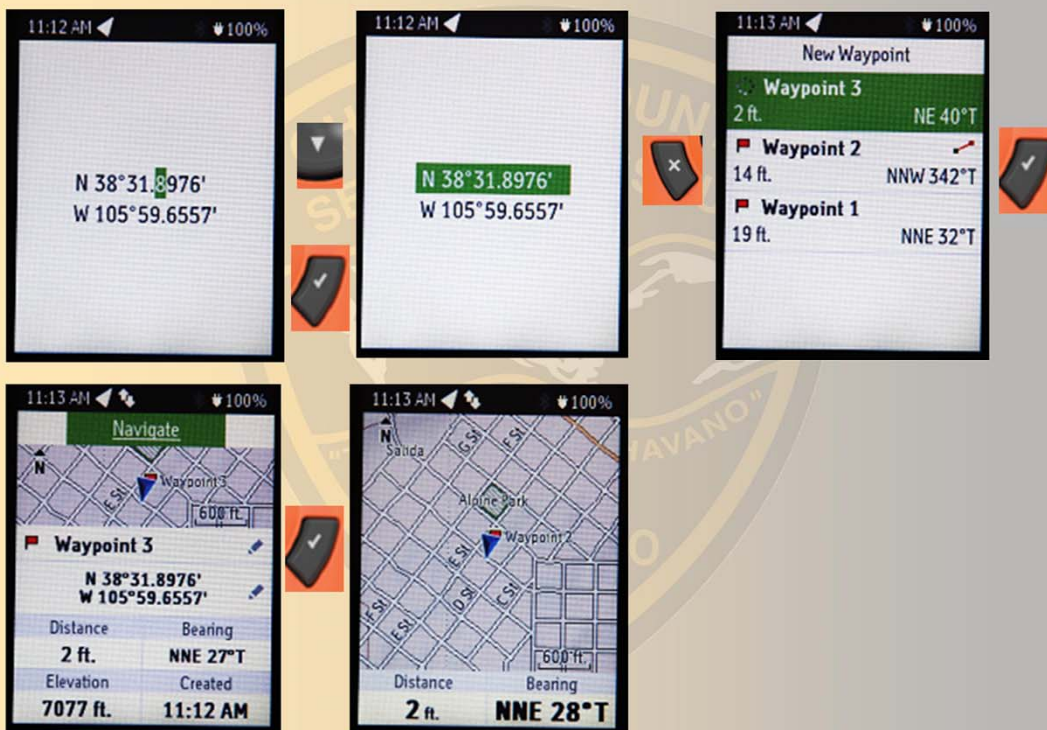
The arrow buttons are used to move through the display fields.

Press the check button to enter a display field.

Select Done when finished.

Latitude and longitude is changed by moving to the character you want to change and using the up and down arrow keys to make the change.

Waypoint Creation (3 of 3)



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After changing the latitude or longitude press the check key to end the entry.

Once the entire latitude or longitude is highlighted pressing the cancel (X) key will complete the change of location.

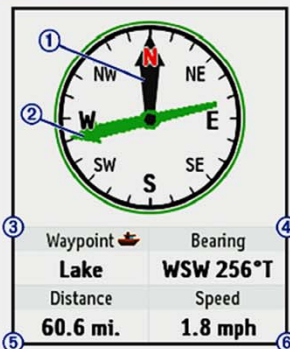
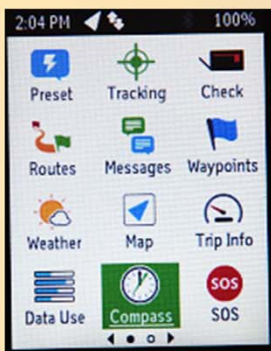
To navigate to a waypoint highlight the waypoint and press the check key .

Confirm the location of the waypoint on the map and the distance, bearing, elevation and time created to insure you have the correct waypoint.

Press the check key to see the waypoint on a large map and view the distance and bearing.

The blue triangle is your location and direction of travel, the red flag is your waypoint

Compass



| | | |
|---|-----------------------------|---|
| ① | Heading pointer | Indicates your directional heading. |
| ② | Bearing pointer | Points in the direction of your destination. |
| ③ | Elevation or destination | Indicates your elevation. When navigating, indicates your destination name. |
| ④ | Course, bearing, or heading | Indicates your course when you are moving. When navigating, indicates your bearing. On inReach Explorer+ devices, indicates your heading when you are not moving. |
| ⑤ | Distance | When tracking, indicates the distance traveled since you started tracking. When navigating, indicates the distance to your destination. |
| ⑥ | Speed | Indicates your speed. |

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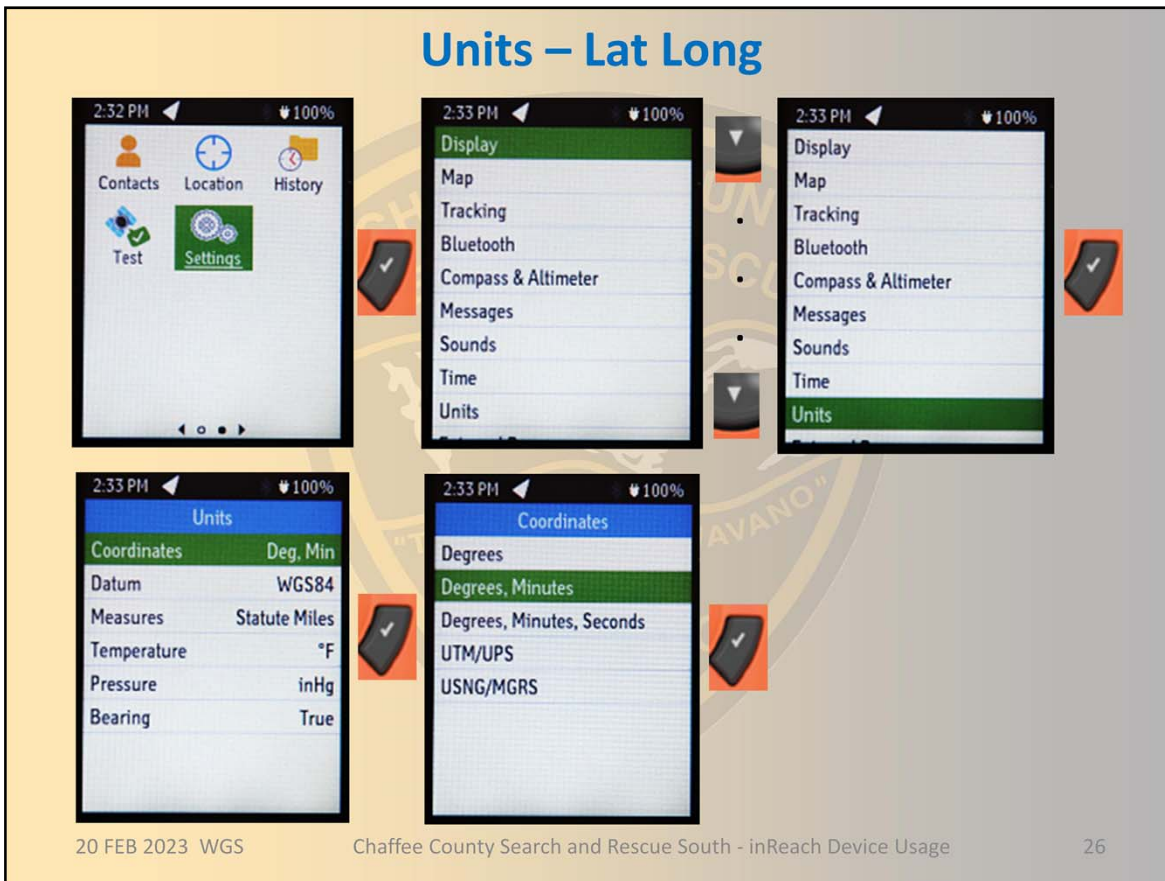
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The compass may require calibration if the unit is taken a long distance from where it was last calibrated – the unit will prompt for this and provide on screen instructions.

Just rotating the device onto all sides until it beeps to tell you to stop

Units – Lat Long



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SAR South uses Degrees (with decimal degrees) as our standard. Other teams and outside resources such as helicopters may use Degrees Minutes (with decimal minutes) or Degrees Minutes Seconds (with decimal seconds).

Degrees (with decimal degrees) is also used for cell phone pings.

If a search subject reads the coordinates to you as they see them on their GPS they could be in either format and you must be sure that you determine which format they are using

Ask them to read the punctuation

Some counties prefer one over the other so you need to know how to use both

Some counties prefer to use UTM (Universal Transverse Mercator) or even USNG (US National Grid)

These are divided into zones the size of a few states and then the number represents the location in meters within the zone,

They don't have punctuation in them

On the radio the easting number is read ,then break is spoken, before reading the northing number

Some teams will also read elevation with the coordinates. Sometimes, along with the coordinates, stating a direction and approximate distance from a prominent point is helpful. Texting the subject the link FindMeSAR.com so they can tap on it will cause their phone to display their coordinates if they do not know how to get them from an app.

There is also the concept of datum

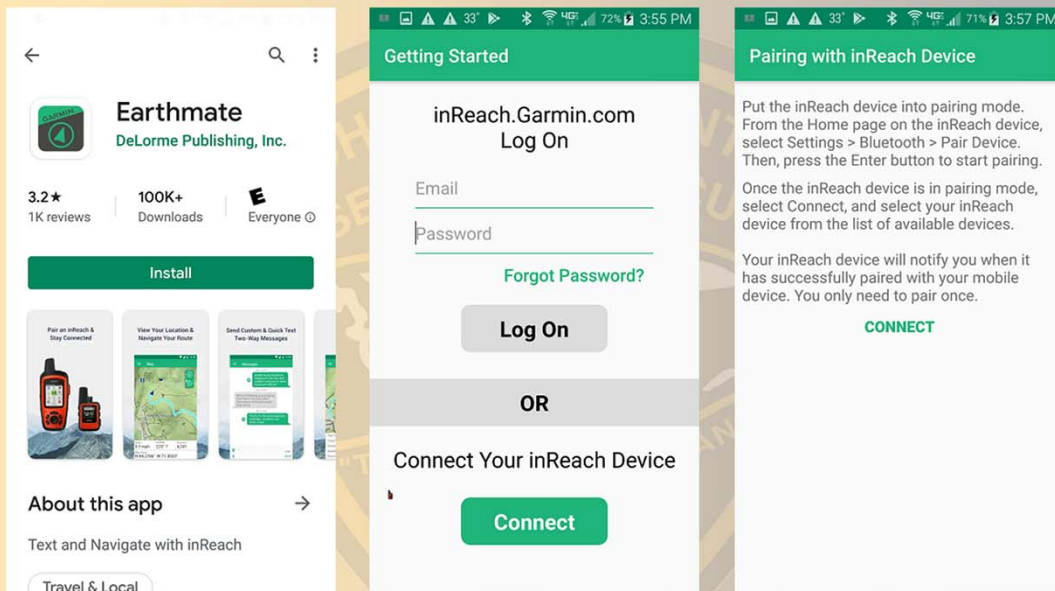
In the US this will normally be the modern WGS 84 (World Geodetic System 1984) or the old NAD 27 (North American Datum 1927)

Use WGS 84 whenever possible

NAD 27 should only be used if working with an old paper map that uses it

Nearly all electronic maps use WGS 84 even if they show a scanned old NAD 27 map
The two may differ by as much as 300 meters

Earthmate Cell Phone App (1 of 3)



Available for Android or IOS - Free

Access inReach features with phones larger screen and keyboard

Once BlueTooth paired will pair anytime phone and inReach or on

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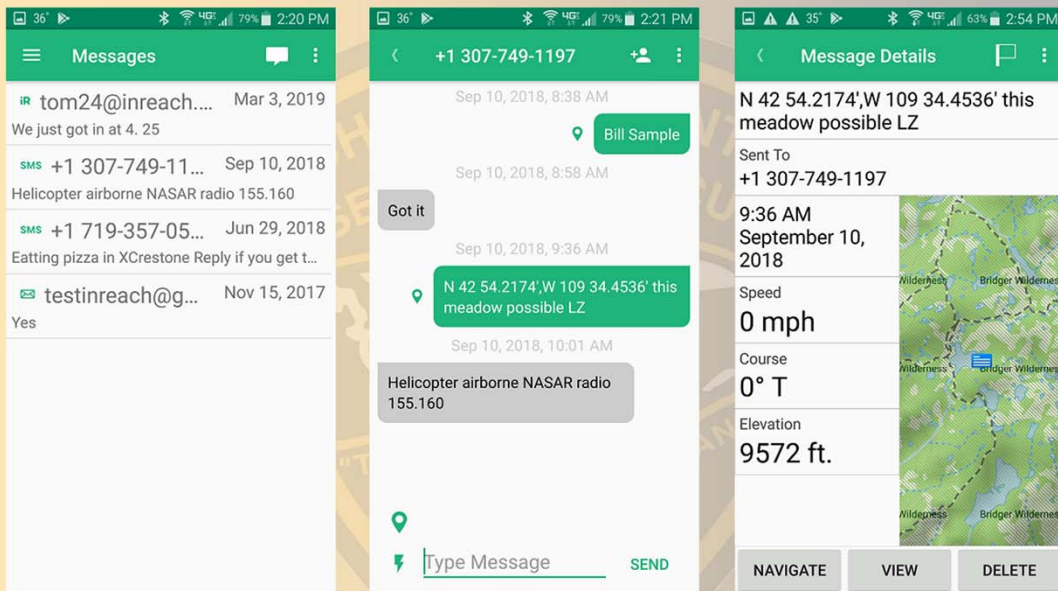
27

Will also ask to pick device type from a list of pictures with names

We have inReach Explorer+ and inReach Mini

This will drain both the phone and inReach battery faster while the two are paired

Earthmate Cell Phone App (3 of 3)



Messages are much easier to read and type on the phone

Type on a message to open it

On the map tapping on a message icon opens message details

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Tap navigate to go to a location where a message was sent

Your sent messages as well as messages from other inReach devices

Power

Built-in Lithium

- Not replaceable
- USB charging

Maximizing Battery Life

- Turn on the **Extended Tracking** setting (*Tracking Settings, page 6*).
- Turn on the **Automatic** backlight brightness setting or reduce the backlight timeout (*Display Settings, page 6*).
- Reduce the message **Listen Interval** setting (*Messages Settings, page 6*).
- Reduce the value of the tracking **Log Interval** and **Send Interval** settings (*Tracking Settings, page 6*).
- Turn off Bluetooth wireless technology (*Bluetooth Settings, page 6*).

Explorer+

| Battery Life | Mode |
|---------------|---|
| Up to 75 hr. | 10-minute tracking send interval and 1-second log interval |
| Up to 100 hr. | Default mode with 10-minute tracking interval and 1-minute log interval |
| Up to 30 days | Extended tracking mode with 30-minute tracking send interval |
| Up to 3 yr. | Turned off |

Mini

| Battery Life | Mode |
|---------------|--|
| Up to 30 hr. | 10-minute tracking send interval and 1-second log interval |
| Up to 50 hr. | Default mode with 10-minute tracking send interval and 5-minute log interval |
| Up to 20 days | Extended tracking mode with 30-minute tracking send interval |
| Up to 1 yr. | Turned off |

Fees

Free

- SOS
- First 40 messages per month
- Preset messages
- 10 minute tracking intervals
- Tracking points
- Location pings

Extra Charge

- More than 40 messages per month
– \$0.50 each
- Don't do the weather

| | |
|------------------------|------------------------|
| | ADVANCED |
| SOS | Unlimited |
| TEXT MESSAGES* | 40 |
| PRESET MESSAGES | Unlimited |
| TRACKING INTERVALS | 10 minutes + |
| TRACKING POINTS | Unlimited |
| LOCATION PINGS | Unlimited |
| BASIC WEATHER | 1 Text Message ea. |
| PREMIUM WEATHER | \$1.00 ea. |
| PREMIUM MARINE WEATHER | \$1.00 ea. |
| | Monthly Charges |
| MONTHLY FLEX FEE | \$34.95 /mo. |
| | Overage Charges |
| MESSAGE OVERAGE FEE* | \$0.50 |
| SUSPEND FEE | \$5.00 /mo. |

The Future - iPhone 14 SOS via Satellite

Began November 15, 2022 for the US

- Free first two years after purchase of new phone, later price TBD
- Slow speed texting only, no voice



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Must point the phone at the satellite as shown on the screen - uses Globalstar LEO satellites

Transmission may take from 15 seconds to a few minutes

Non emergency usage

Can practice for emergency by sending simulated SOS

Can share location with friends

SOS interface ask questions commonly asked by dispatchers and sends the answers in initial message

GPS location, battery level, and other parameters

Will go directly to local dispatcher if they are equipped to receive text directly otherwise to a relay center who will call the dispatcher on the phone

If selected will send the conversation to phone's emergency contact list

Other cell phone manufacturers and service providers are working to provide this feature in future products – Android products are expected in second half of 2023 using Iridium satellites

T-Mobile has partnered with SpaceX to use Starlink satellites

Verizon is working with Amazon's Project Kuiper