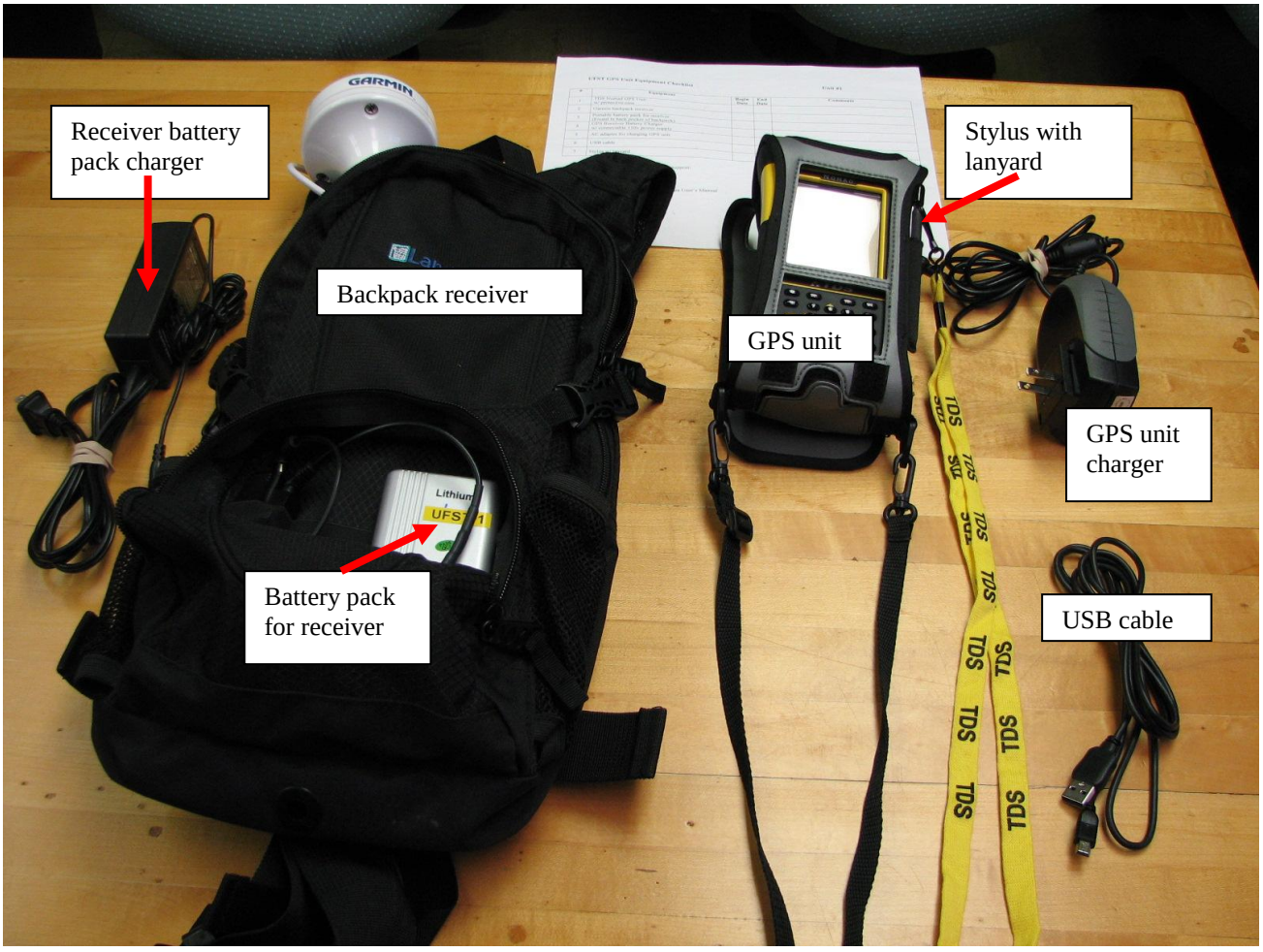
Quick Start Guide for Using TDS NOMAD GPS Equipment

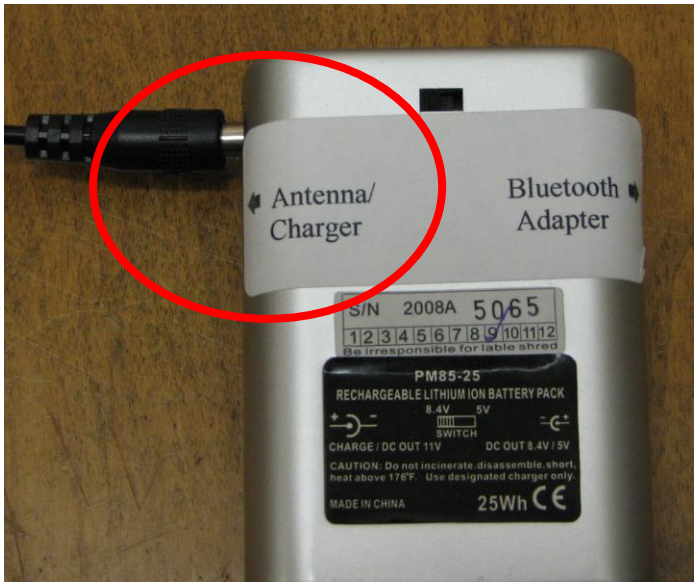
Initial Unit Check

For each GPS unit, ensure you have:

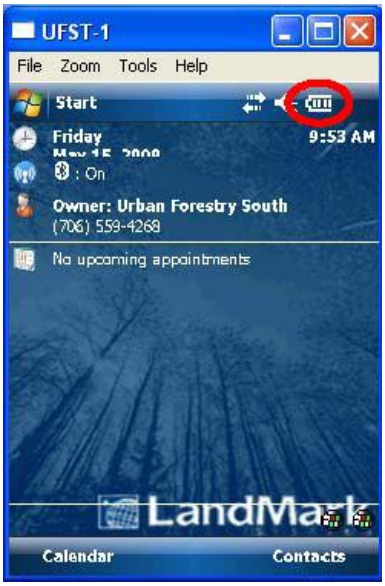
- TDS NOMAD GPS Unit
- Garmin backpack receiver (antenna)
- Portable battery pack for receiver (usually found in the back pocket of backpack)
- GPS Receiver Battery Charger w/ connectable 110v power supply
- AC adapter for charging your GPS unit
- USB cable for data transfer
- Stylus with a lanyard to enter data from unit display (do not use a ballpoint pen)

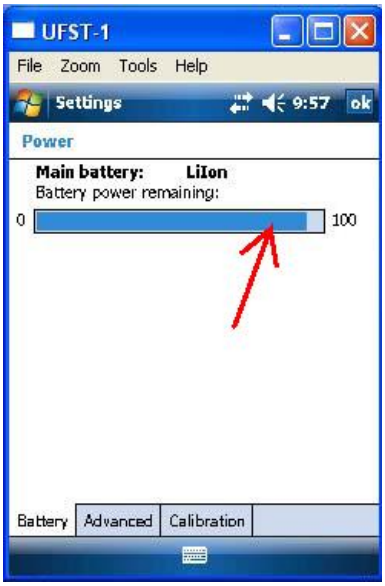


Make sure the GPS receiver battery is charged by depressing the "TEST" button on top of the battery. All four lights should come on when the battery is completely charged. If charging is needed, plug the barrel adapter into the large port on the side of the battery pack labeled "Antenna/Charger" and then plug the charger into an electrical outlet for several hours.

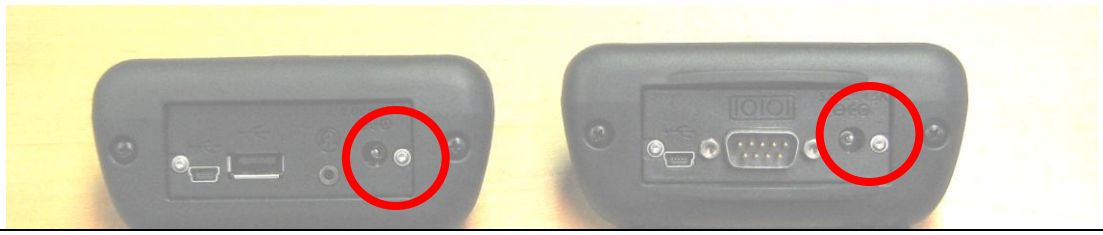


Make sure the GPS unit is charged by depressing the green on/off button in the lower, left-hand portion of the unit, tap on the display screen to minimize the Owner Information screen, and tap on the battery icon in the upper, right-hand portion of the display.





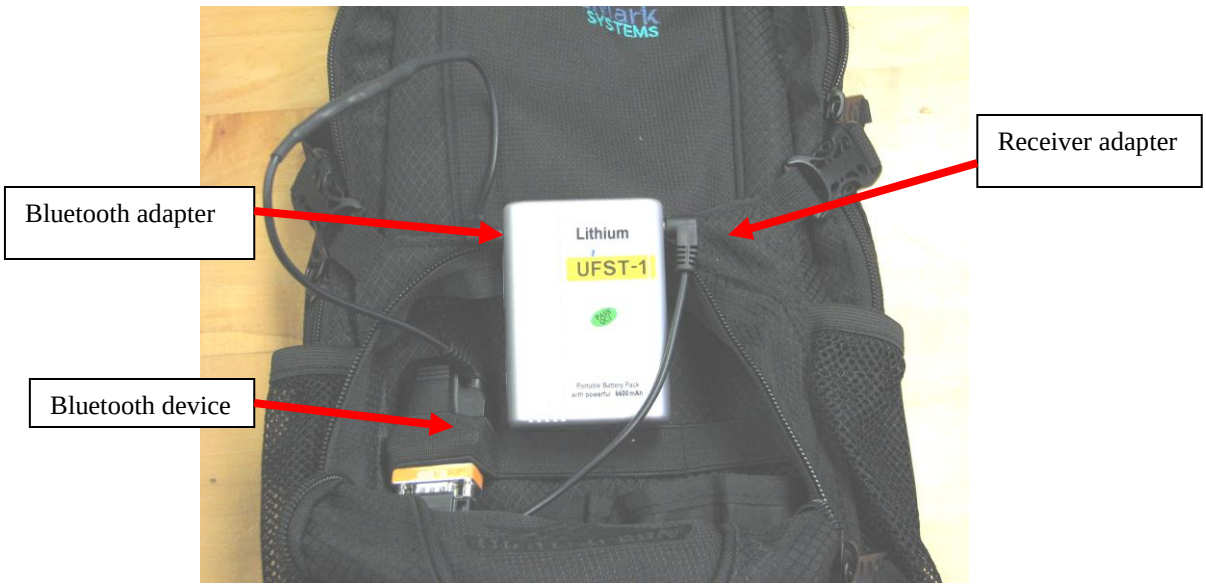
The main battery display box should be light blue from 0 to 100. If not, charge the unit for several hours using the AC charging adapter. The barrel adaptor from the charger plugs into the port on the bottom of the unit.



Depending on the type of boot the GPS unit has on the bottom of the unit, the charger will plug into the circular port on the right-hand side of the boot.

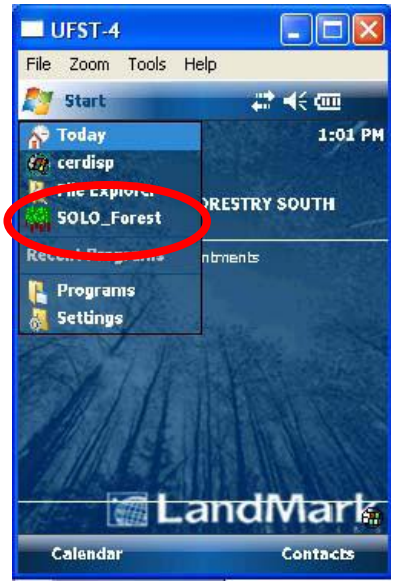
Preparing the GPS Unit for Data Collection

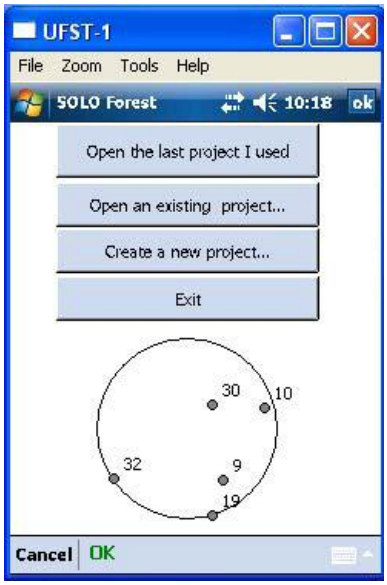
Connect battery and Bluetooth cables to receiver. In the back pocket of the backpack, insert the larger, barrel adapter into the receiver battery pack located on the side and labeled "Antenna/Charger". Insert the smaller barrel adapter into the port labeled "Bluetooth Adapter". Ensure that the adapters are fully seated in the battery.



Turn on GPS unit. Depress the green on/off button in the lower, left-hand portion of the unit.

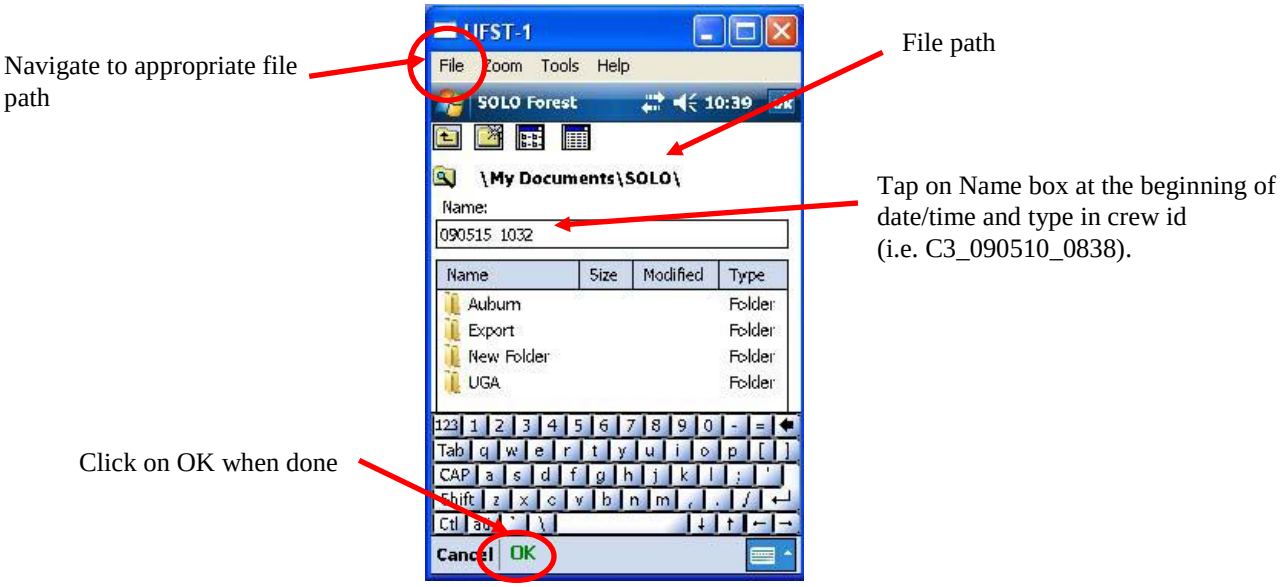
Start SOLO_Forest software. Tap on the display screen to minimize the Owner Information screen. Tap on the "Start" icon in the upper, left-hand corner of the display window, and then tap on "SOLO_Forest".





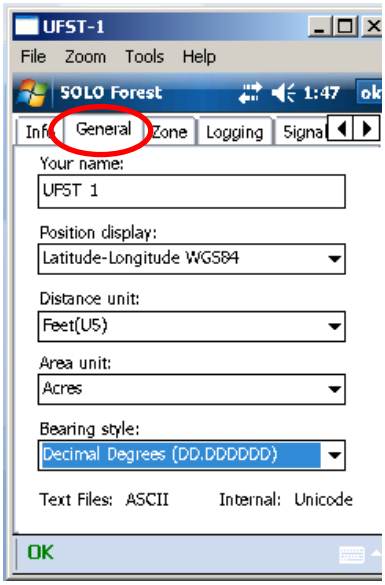
After a few moments, the application will appear on the display showing the present satellite configuration and giving you the option of opening an existing project, creating a new project, or exiting.

Create a new project. Tap on "Create a new project…" to reveal a screen that will allow you to name your file. The file path will be displayed near the top of the screen. Ensure that it reads "\My Documents\SOLO\". All files should be stored in "\My Documents\SOLO\". If another path is displayed, navigate to it by tapping on the icon with the up-arrow in the folder until the path name reads "\My Documents\SOLO\". In the Name box, the date and time will appear by default in the form of yymmdd_tttt (military time). **Always keep this date and time in the file name**. This will help organize the data files. If the curser is not flashing at the beginning of the date and time in the box, tap on the box near the beginning of the date and move it to the beginning using the directional arrows on the screens pop-up keyboard. Type in the crew number (i.e. C3_) which should also be the number on the GPS unit label. Use an underscore or hyphen to separate the crew id number from the date/time. Tap on the green "OK" at the bottom of the screen when you are done naming your file.

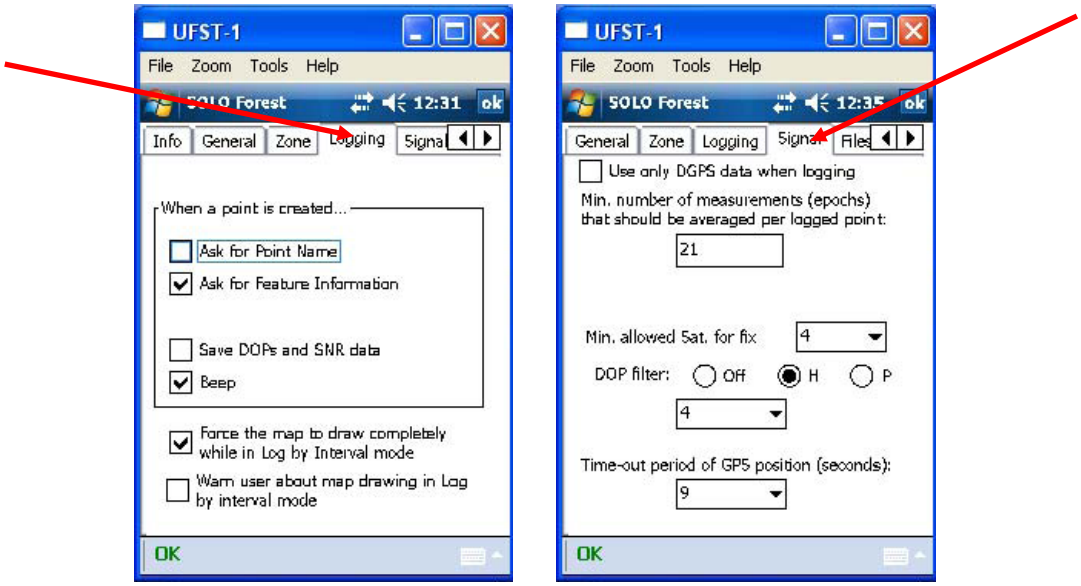


Set up GPS Configuration. Before the start of a project, you need to set certain parameters on the GPS unit, and these parameters will not change again unless you manually change them. After giving your project a name, SOLO_Forest displays a series of screens giving you the opportunity to change parameters. Tabs on the upper portion of the screen allow you to navigate among the screens to change these parameters.

General: In the box labeled "Your name:", ensure that the GPS unit number (found on a label on the unit) matches that of this box. Ensure that the Position display is set to Latitude-Longitude WGS84 and the Distance unit is set to Feet(US). The Bearing style should also be set to Decimal Degrees (DD.DDDDDD).



Logging / Signal: The logging and signal screens should look like this –



Files: The Files screen is where you choose the feature file that will allow you to assign attributes to the trees. You may need to search for the appropriate feature file by tapping on the "Browse…" box under "Feature file" and selecting it. In most cases, you will be using the UFST_risk.FEA as the feature file.

Browse to find the appropriate feature file

The other screens (Info, Zone, Receiver, Laser, Com, and Raw Data) should not need to be altered. Avoid changing anything in these screens.

Tap on the green OK at the lower, left-hand side of the display to save these changes and begin collecting data.

FYI- File Types in Solo_Forest

Several different file types will be saved in the target folder (i.e. My Documents\SOLO) in Solo_Forest. Each is briefly explained below:

*.UDF – This is the project file that Solo_Forest sets up when you create a project. It contains all of the information that you set in the above series of screens. **Never delete the UDF file.**

*.FEA – This is the feature file that is used to assign attributes to features.

*.TXT – Various text files can be imported to the target folder and may be used to edit a feature file if needed.

*.SHP – This is a shape file that gives the spatial location of the trees or stumps assessed.

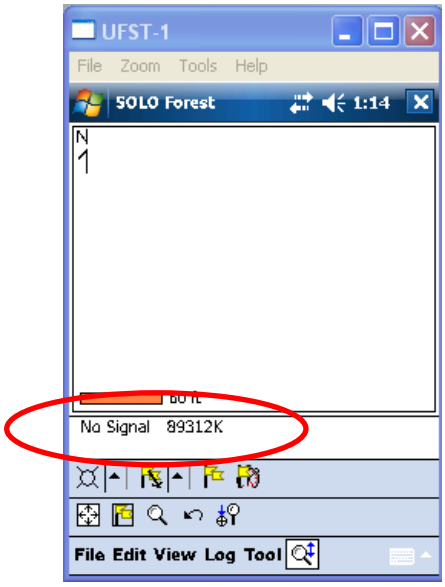
*.DBF – This is the database file that holds the attributes for the trees or stumps in the shape file.

*.SHX – This is the index file that links the shape file (*SHP) with the database file (*.DBF).

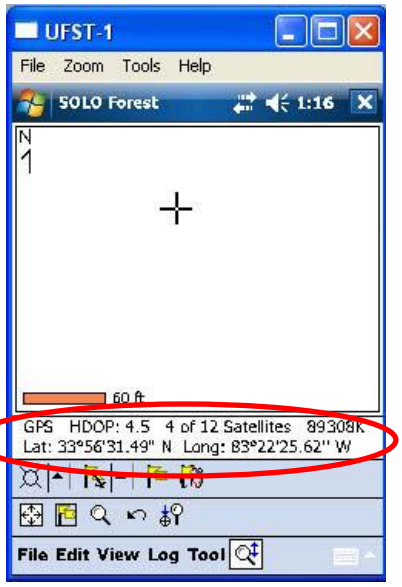
*.PRJ – This is the projection file needed in the GIS project to correctly geo-reference the assessed trees' or stumps' spatial location.

Collecting GPS Data

Verify GPS precision. If your GPS unit has a lock on the appropriate number of satellites that you designated in your Signal set-up (usually 4 satellites), you should have a blinking crosshairs on your display. Underneath that box with the blinking crosshairs will be displayed GPS precision information such as HDOP, the number of satellites locked, and latitude/longitude coordinates. If you do not see any of these, your GPS unit does not have an adequate lock onto satellites. You may need to move to an area that will give you an open view of the sky (i.e. an open parking lot or a ball field). Occasionally, the Bluetooth cable connections from the battery pack become loose. Ensure the cable connections are fully seated.

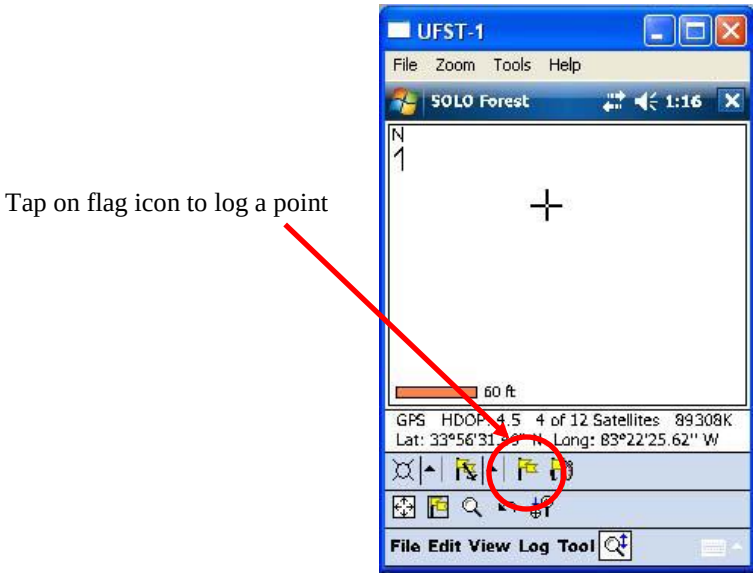


Example of GPS unit without an adequate lock on satellites. No cross-hairs nor GPS precision information.

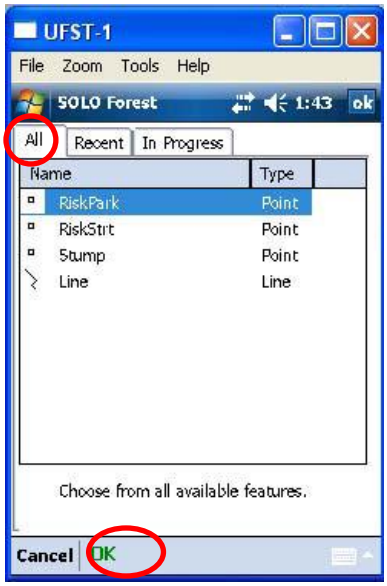


Example of GPS unit with an adequate lock on satellites. Crosshairs and GPS precision information are displayed.

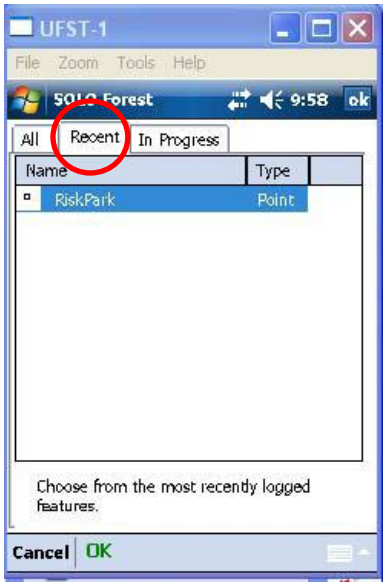
Log a point. To begin collecting data on a feature (i.e. damaged tree), place the backpack receiver next to the tree, on the south side if possible, and tap the icon at the bottom of the screen that looks like a flag.



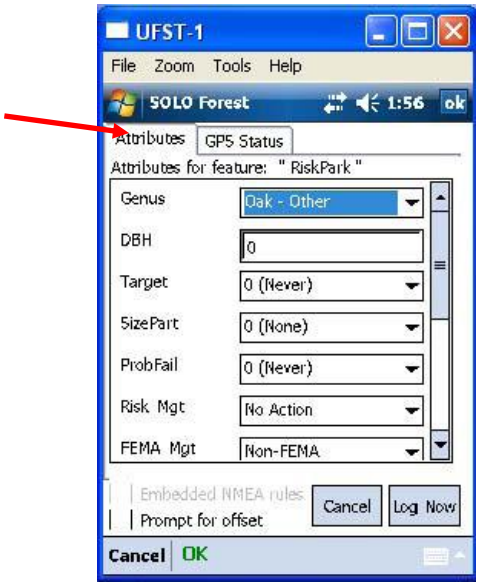
Select your feature. The feature log screen has three tabs at the top of the display from which to choose. For the first point logged in a new project, all available features will be displayed automatically under the "**All**" tab. Choose the feature you wish to record (i.e. park tree, street tree, or stump) by tapping on it, and then tapping on the green OK at the bottom of the screen.

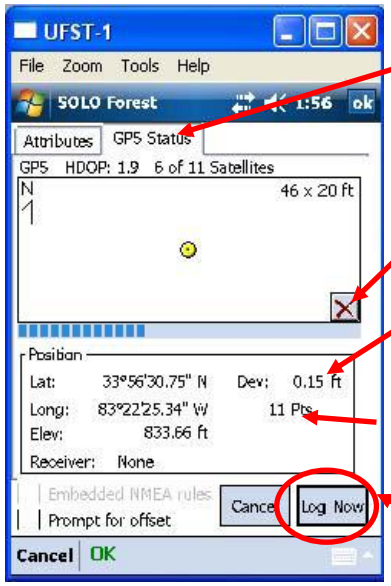


With each subsequent feature that will be logged, the most recently logged feature will be displayed under the "**Recent**" tab. **CAUTION:** The attributes assigned to the previous tree will be displayed, so ensure that all of the feature's attributes represent the current tree.



Assign attributes and ensure GPS precision. The two tabs at the top of the display labeled "Attributes" and "GPS Status" allow you to assign attributes to the damaged tree and monitor the precision of its spatial location. Tap on the "Attributes" tab to complete the on-screen survey. For the first feature of a new project, make sure each crew enters their team and crew number (i.e. T1C3). This will help the GIS technician keep track of the data. After completing the attribute survey, tap on the "GPS Status" tab to ensure its spatial integrity. If the precision is adequate (Dev: < 10 ft) and you have collected 21 points, tap on the "Log Now" box to save the data. If the precision is not acceptable, tap on the  icon at the lower, right-hand portion of the point display screen to restart the GPS point averaging.





To check GPS precision

Restart GPS point average

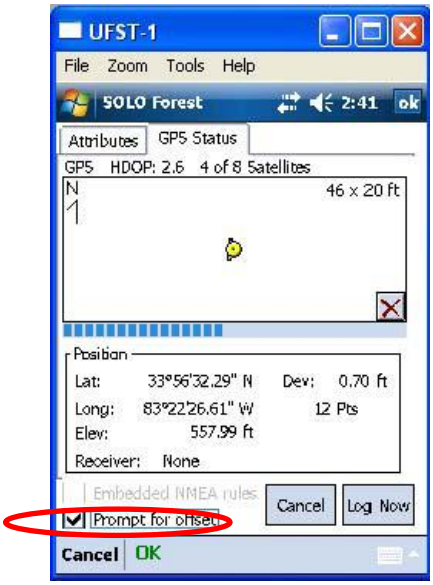
Adequate precision is usually < 5 ft or 1.5 m

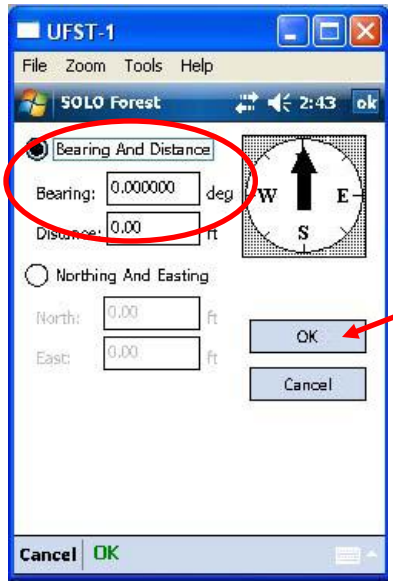
Wait to receive at least 21 points

Log now to save your data

Offsets: Occasionally GPS precision is inadequate due to dense tree canopy or building interference. You may need to place the receiver away from the intended target in order to get a better view of the sky and lock onto satellites. After entering attributes for the target and before logging your point, tap on the "prompt for offset" box. Now when you tap on the "Log Now"

box, an offset dialogue window will appear asking for a bearing and distance. Enter the compass bearing (in degrees) from the receiver to the target and the distance (in feet or meters, whichever is asked for). Tap on the OK box in the dialogue window to log the feature and save the data.

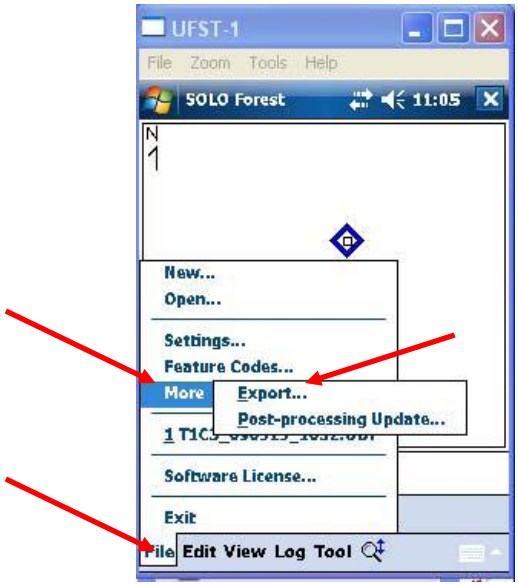


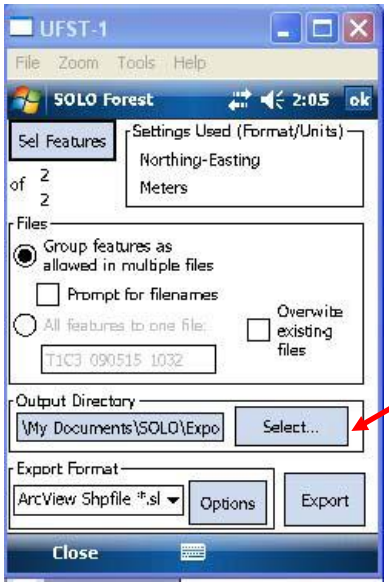


Tap OK after entering distance and direction

Exporting Data to Shape Files

Set up default export features. After collecting data for the day, export the data into a shape file so that the data can be displayed in a GIS project. On your GPS unit while in your current project, tap on File (at the bottom of the display), tap on "More" in the pop-up window, and tap on "Export…" to display the export dialogue window.

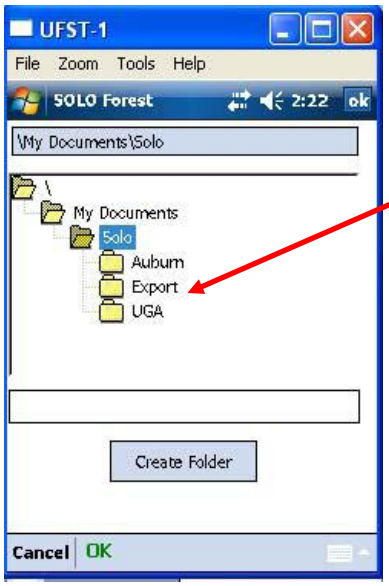




Select a folder in which to store the shape file

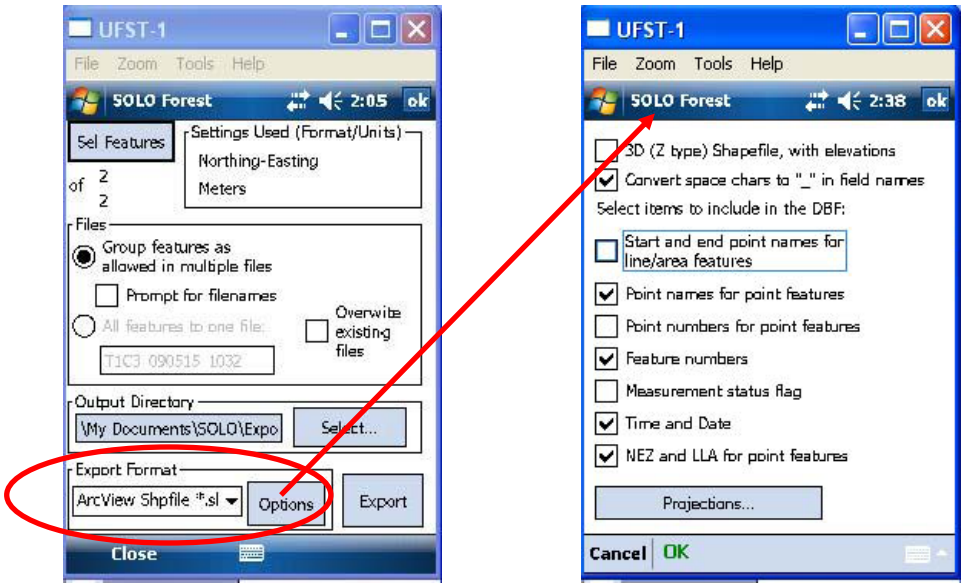
Export dialogue window

In the export dialogue window, tap on the "Select…" box next to the Output Directory to select a folder in which to put the shape file. Shape files should be stored in "My Documents\SOLO\Export". If the file path does not point to the Export folder in Solo, then navigate to and select it, and tap on the green OK at the bottom of the display.

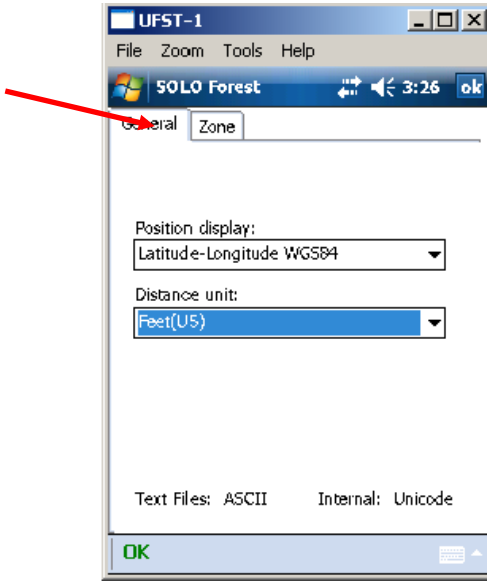


Navigate to the Export folder in My Documents\Solo

Ensure that the data are being stored in an ArcView Shape file by selecting it in the Export Format box, and then tap on the Options box. Make sure the options display looks like the following:

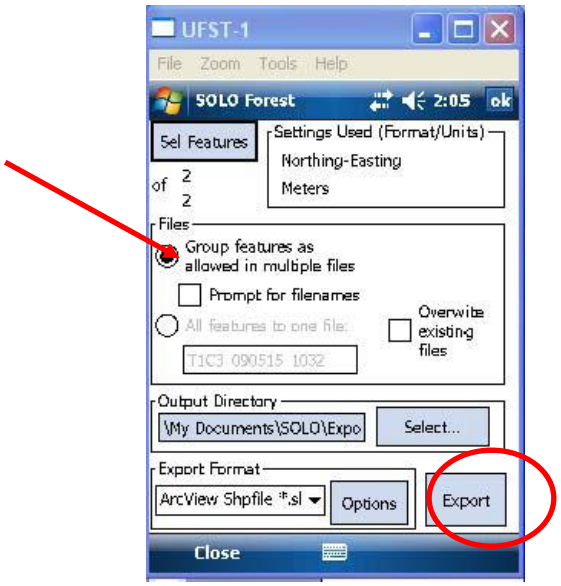


Tap on the "Projections…" box near the bottom of the display. There are two tabs at the top of the display, General and Zone. Under General, set the "Position display" to "Latitude-Longitude WGS84" and the "Distance unit" to "Feet(US)". You do not need to tap on the Zone tab (you should not need to change the Coordinate System or the Horizontal Datum boxes). Tap on the green OK at the bottom of the display.



After making these changes, SOLO_Forest will use them as the default for all subsequent projects, so this procedure needs to be done at the end of the first day's data collection. However, it is always a good idea to recheck occasionally to make sure these settings have not been changed inadvertently.

Export the data. While in the project that you want to export, open the export dialogue window (tap on File, tap on "More", and tap on "Export…") and check that the default export features are accurate (see Set up default export features above). Ensure that the radio button next to "Group features as allowed in multiple files" is populated, and then tap on the "Export" box.



A pop-up window will appear indicating the number of files written to the export folder. Tap OK, and then tap on "Close" at the bottom of the display screen. If you are done with the GPS unit, tap on File and then Exit.