Checklists

Each morning

- ❏ Battery level is okay (at least 1 green bar)
- ❏ Device settings are correct

Each plot

- ❏ The device has a GPS signal
- ❏ Waited 60 seconds after it acquired a signal before proceeding
- ❏ Cleared the current track immediately before starting to walk the plot
- ❏ Saved the current track with the farmer ID as a name immediately after walking the plot
- ❏ Verified that the saved file exists and checked the map to make sure it is the right shape

Using the Garmin eTrex 30x

Initial Configuration

To install or replace the batteries (2 AA), flip the unit over and pull up the metal loop. Rotate the metal piece 90 degrees to the right as shown in the picture, and pull to remove the back.

Remove the back and install the batteries, making sure to align the + on the battery with the + indicated on the device. Then reattach the back, turn the metal piece to lock it, and push the metal piece down.

After installing the batteries, hold the light/power button to turn on the unit. If this is the first time using the device, it will prompt you to select a language. Please select English using the joystick (press the joystick in when you are on the correct selection) so that the menu options are the same as in this guide.

After it has powered on and you have selected a language, you may tap the light button to bring up a menu displaying the screen brightness, the battery level, and GPS signal strength. When this screen is visible, tap the light button again to change the brightness. Please keep the brightness at the lowest comfortable setting to maintain battery. In addition, please check the battery level each morning to make sure that it is not critically low (one green bar is okay, 0 is too low).

Settings

Next, we will configure the device settings. It should only be necessary to check these once. However, maintain battery **please verify that these settings are correct each morning and after changing or removing the batteries**.

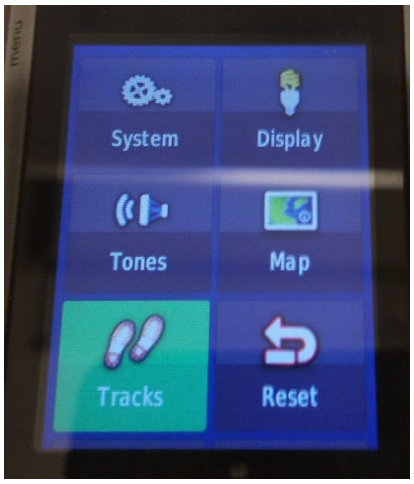
Use the joystick to navigate to the *setup* tile and select it.

Now navigate to and select *system*.

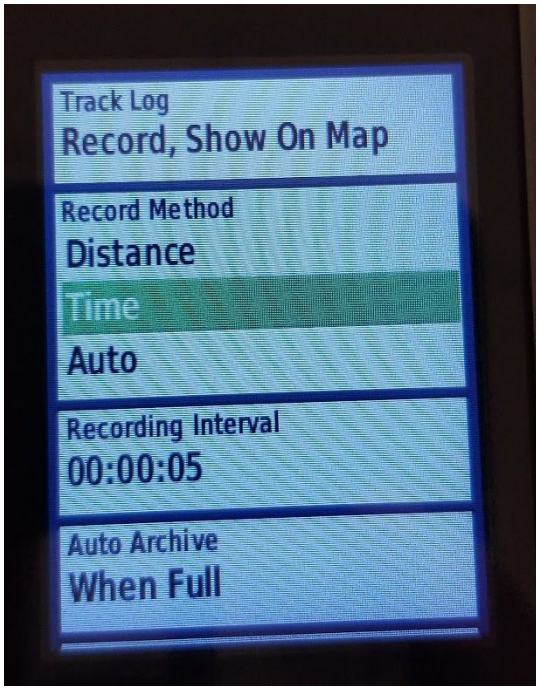
Click on *satellite system* and make sure that *GPS* is selected, **not** *GPS + GLONASS*.

Next select *WAAS/EGNOS* and turn it to *on*.

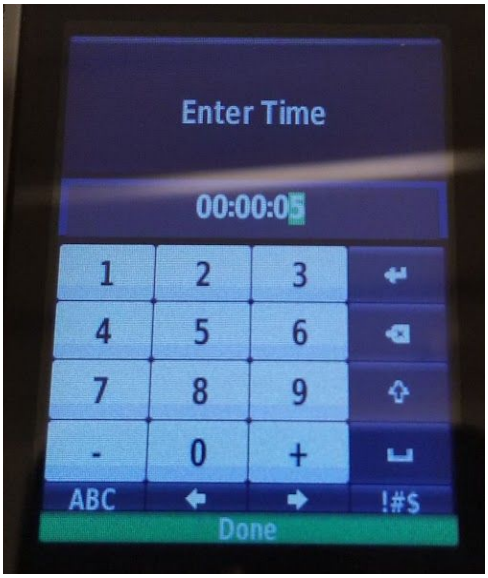
Now navigate back to the *setup* menu and select the *tracks* tile (make sure you are in the *setup* menu, there is also a *tracks* tile in the main menu which you do not want).



Change *record method* to *time*.



Go to *recording interval* and change it to *5 seconds*.



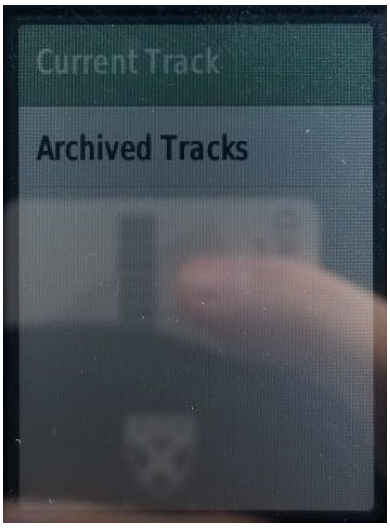
How to map a plot

This section describes how to map a plot on the Garmin device. Please see the section “Plot mapping procedure” for detailed instructions about how to walk the plot boundary correctly.

First, tap the light button to verify that you have a GPS signal. After a signal is acquired, **please wait 60 seconds** before proceeding. This step is important because it allows the device to locate itself which dramatically improves accuracy.

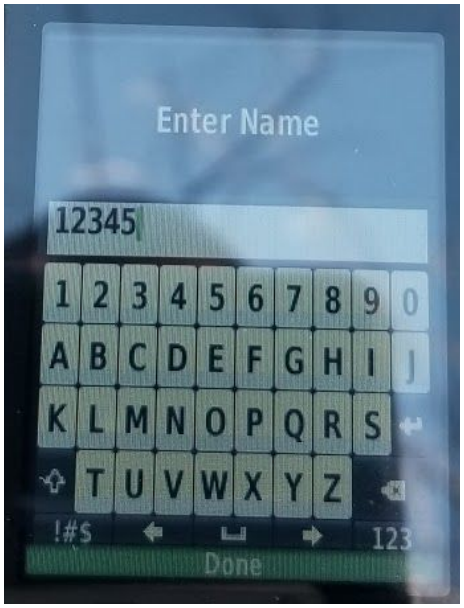
From the **main menu** (not the *setup* menu), navigate to and select the tile *Track Manager*.

Select *Current Track.*



Now go to *clear current track*. Make sure that you are at the location where you wish to start mapping the plot, then select this option, wait 2-3 seconds, then start walking the plot.

After you have arrived back at your starting point, return to the *Current Track* menu (the device may still be on this menu) and select *save track* (do not select save portion). Enter the plot ID as the name. For instance, if the plot ID were 12345 the screen would look like this.



When you select done, it will ask you if you want to clear the current track. You may select either option.

Go back to the *Track manager* menu (main menu then *Track manager*) and make sure that there is a file with the farmer ID name somewhere below *Archived tracks*. Select this and then *view map* to see the track that you recorded and make sure that the shape is consistent with the route you just walked.

If the shape is clearly wrong (for instance, it is a triangle and you walked in a rectangle), please delete the track and remap the plot. Otherwise, you may hold the light/power button to turn off the device and proceed to the next plot.

Transferring data from the Garmin device to a computer

At the end of each day, we ask that all of the plot maps get transferred from the Garmin units to a Dropbox folder.

First, plug the mini USB cable into the port below the rubber flap on the back of the unit as shown below.

Then plug the other end of the cable into a USB port on a computer.

After several seconds, a Garmin eTrex 30x folder should show up under This PC. Select it.

Open the Garmin folder (inside of the Garmin eTrex 30x folder). Next, open the folder called GPX.

There may be some files such as “BirdsEye Demo.gpx” that were placed there by Garmin. We are not interested in these, but it’s okay to copy them to Dropbox if you are unsure if they were placed there by Garmin or by us.

We are interested in the files of the structure Track_ then the farmer ID, then .gpx. For instance, “Track_12345.gpx” is there from earlier in the instructions. Copy all of these to the appropriate Dropbox folder.

After **you are certain** that all of these files have been copied to Dropbox (please double check the Dropbox folder to make sure that they are there), please delete them from the GPX Garmin folder to create space on the device.

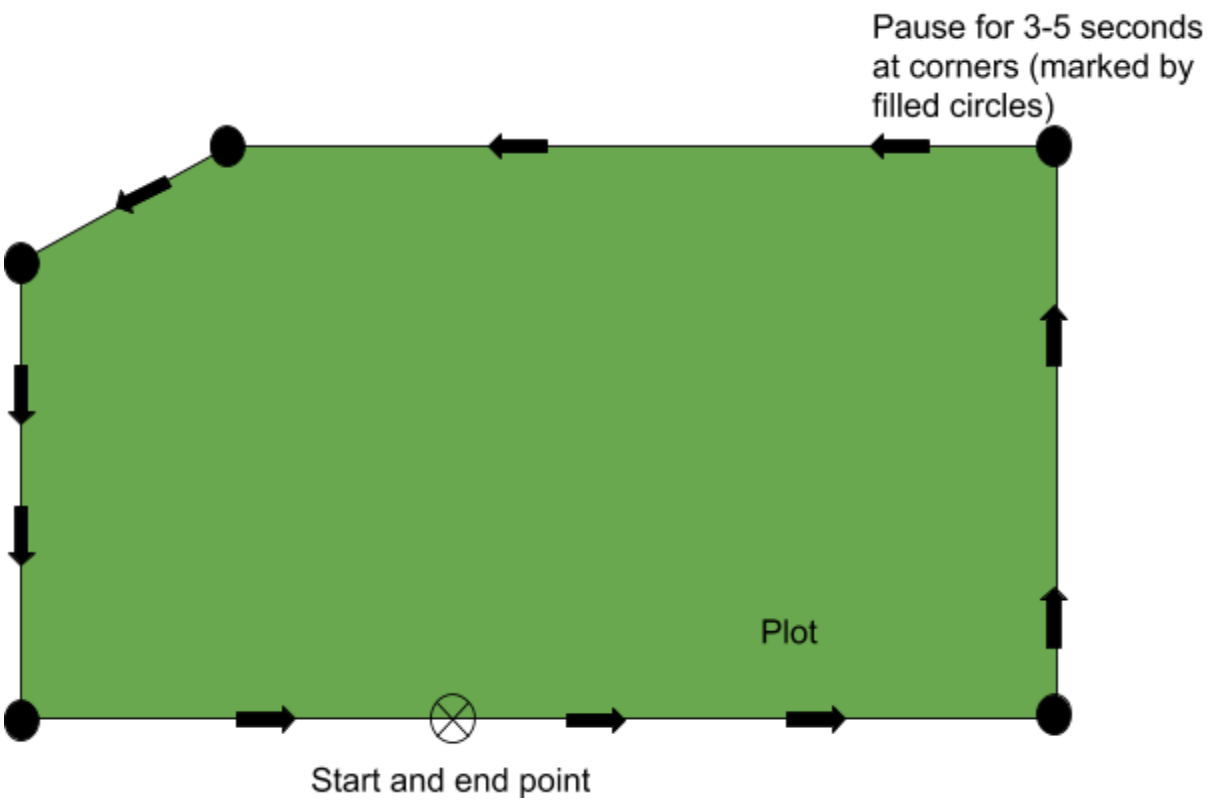
Finally, eject the Garmin unit (do so from the lower right of your computer) and then unplug it. Make sure that the Garmin device is turned off.

Plot mapping procedure

Note: This section covers the procedure for walking the plot, not how to use the Garmin device. Please see the section ***How to map a plot*** above for instructions on using the device. Make sure to wait 60 seconds after it acquires a signal before you begin to improve accuracy.

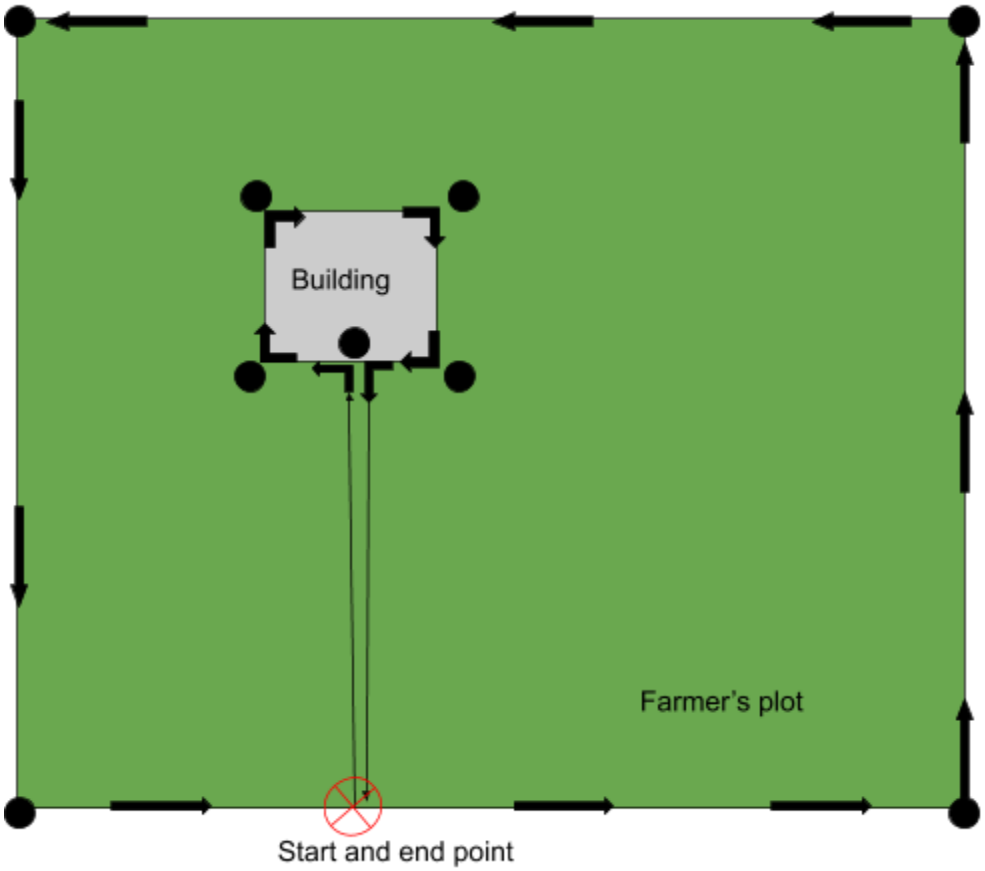
To start mapping a plot, select a start and stop point on the boundary of the plot. This should be a spot that you can remember, so select a corner or mark the spot with a stick or a rock.

After selecting a start point, start mapping on the Garmin device. Walk at a normal walking pace along the perimeter of the plot. When you reach a corner of the plot, pause for several seconds to make sure that a point is recorded and then continue walking the perimeter. When you reach the point where you started, end and save the plot boundary on the Garmin device.



We aim to capture the area of the plot containing crops. Sometimes there may be a building, irrigation system, boulder, or other object that takes up a large amount of space within a plot. In these cases, we will need to map it in a way to exclude the objects.

To do this, start mapping normally until you are perpendicular to the object. Then walk directly to the object, walk around the object in the opposite direction that you are going around the plot, and then walk back to the boundary of the plot following the exact same path that you took to reach the object. See the following diagram which makes this process clearer. In case there are multiple objects that you must avoid, you can repeat this process. Remember to pause for 3-5 seconds at each corner (both corners of the object and the plot).


Pause for 3-5 seconds at solid black circles
Building
Farmer's plot
Start and end point