Garmin GPSMap 76CSx
Model Overview & Data Collection Procedures

Session Objectives: At the conclusion of this session, you will be able to:

- Utilize the keypad and raised buttons to maneuver through screen pages
- Differentiate screen pages, describe their uses and access screen specific options
- Setup and configure the GPS unit for data collection
- Create waypoints (e.g., points) and tracks (e.g., line and polygon features)
- Navigate to a waypoint
- Delete saved waypoints and tracks

Materials created by: Eric Kelchlin, June 2009

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Notes: GPS Map76SCx OS version = 3.20

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NOTE: The instructions for this device were created using software version 3.20. It is always a good idea to update your Garmin GPS device with the latest software. You can download the latest software version for your Garmin device along with detailed instructions on how to perform the installation from the following website.

http://www.garmin.com/support/download.jsp

Keypad Usage/Button Overview

POWER - Turns the unit on and off. With a quick press of the button you can "pop-up" a slide bar to adjust the backlighting.

PAGE/*COMPASS* - Allows you to sequentially scroll through six main display pages. Press, hold, and release to turn the electronic compass on or off.

MENU – Press and release this button to view an Options Menu pop-up screen to modify the setting on a current page. Press twice to access the **Main Menu Page**.

FIND/*MOB* - Press this button to open the **Find Menu Page** where you can select waypoints to edit or navigate too. Press and hold down to create man overboard (MOB) point.

ENTER/*MARK* – Press to create a waypoint, activate selected fields, confirm menu options and select keyboard keys.

QUIT - Returns you to a previous page and allows you to restore a data field's previous value.

IN & OUT ZOOM – Press to increase or decrease the scale (i.e., zoom in or out) of a map.

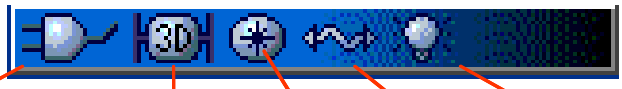
ROCKER - Press the edges of this button to move the cursor up, down, left or right.

Default Screen Pages

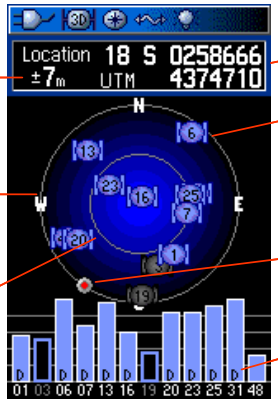
Scrolling through the screens: use the **PAGE** button to scroll forward or the **QUIT** button to scroll backwards through the screen pages.

Page customization: nearly all screen pages can be customized by accessing the Options Menu within each page. Press **MENU** once while on a screen page you want to modify and a page specific **Options Menu** will pop-up. Use the **KEYPAD** to highlight desired fields and **ENTER** to make selections.

Screen Status Bar – at the top of each screen page, the status bar provides status information for multiple unit features.



Satellite Page - This page contains useful satellite status information, as well as your estimated accuracy, direction of travel, and current coordinates.



Error estimate

Outer circle – Represents the horizon

Inner circle – Represents 45 degrees from the horizon

Current location

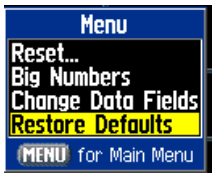
Satellite icon – Solid color is an acquired satellite, blinking empty icon is not acquired

Heading bug – Indicates direction of travel

Satellite signal strength bar – Higher is better. A "D" will appear In bar when WAAS is received

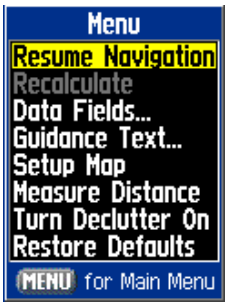
Options Menu

Trip Computer Page – Provides many useful statistics while traveling on a long hiking or road trip, such as a trip odometer, current speed, and much more.



Options Menu

Map Page – Track your movements and measure distances in real-time. The built-in base maps show lakes, highways, rivers, towns and points of interest (POI). You can also purchase topographic maps from Garmin that can be uploaded into this GPS device. Use the **IN** or **OUT** buttons to change the map scale.



Options Menu

Active Route Page - This page is used when navigating routes or Gotos. Use routes when you want to establish a sequence of intermediate waypoints to get to a final destination. This page is visible only when you have an active route.

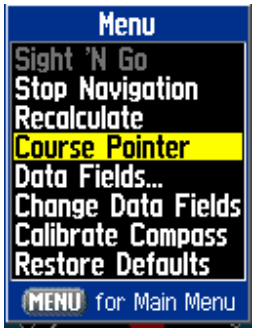
Options Menu

Compass Page – Great for navigation! When the bearing pointer on the compass points up, then you are headed in the right direction. A course pointer can also be used to show how far off course you are from the target (i.e., transect). The Sight 'N Go option allows you to set a course to an object in the distance and navigate to that object. Current velocity, distance to destination and many other statistics can be shown to help guide you to your target.

Bearing Pointer

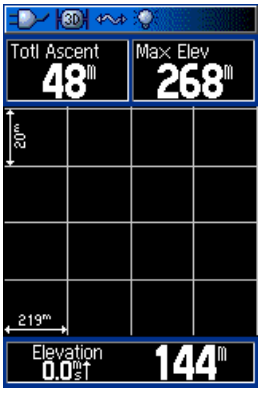
Course Pointer

Sight 'N Go



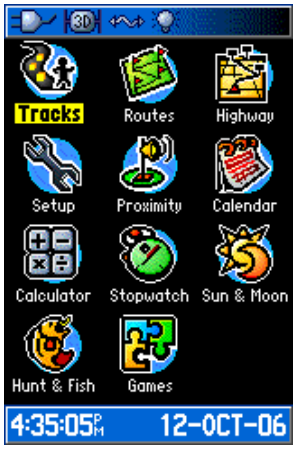
Options Menu

Altimeter Page – Shows the current elevation, rate of ascent/descent, a profile of elevation changes over distance or time, or a profile of pressure changes over time. Use the **Reset** field on the **Options Menu** for an easy way to delete all point, line, and polygon data on the GPS receiver.



Options Menu

Main Menu Page – This page allows you to access some very useful hidden pages, especially the **Setup Page** where you configure all the settings and the **Tracks Page** where you create lines and polygons.



Initial Setup and Configuration

Customizing Your Screen Pages

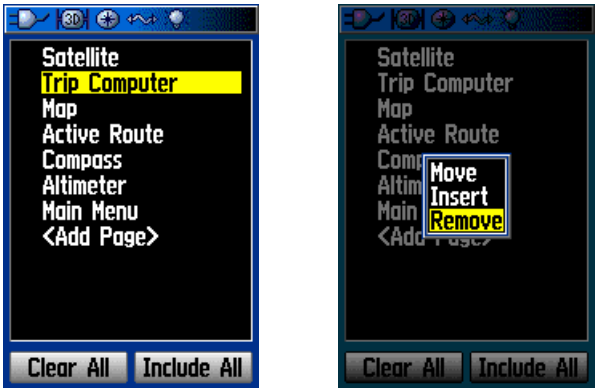
The following steps document how to remove unwanted screen pages and add those you're more likely to use in the field (i.e., Satellite, Map, Compass, Track and Area Calculation pages)

How to Remove a Page

1. Hit **MENU** twice, or scroll through the pages until you find the **Main Menu** Page.
2. Use the **KEYPAD** to scroll down and highlight the **Setup**

icon and press **ENTER** to access the **Setup Menu**.
3. Use the **KEYPAD** to scroll down and highlight the **Page Sequence**

icon and press **ENTER** to access the **Page Sequence Setup** screen.
4. Highlight the page you want to remove and press **ENTER**. A popup menu will appear, highlight **Remove** and press **ENTER** to delete the page.



Page Sequence Setup screens

How to Add a Page

1. Repeat steps 1-3 above to get to the **Page Sequence Setup** screen. Scroll down and highlight the <Add Page> field and press **ENTER** to access the Add Page popup menu. Highlight the page you want to add and press **ENTER**. The **Area Calculation** page and the **Tracks** page are the best pages to add to your default screen page selection.

System, Time and Unit Settings

You will need to ensure that several critical parameters are set before going out into the field to capture GPS points. These include System, Time and Unit settings. Once you set these parameters, they will become your default settings. However, it is wise to make a habit of checking these parameters each time you begin data collection. This is especially true if others have unknowingly changed a critical setting which could affect an entire day's worth of data collection.

Access the Setup Menu

- Press the **MENU** button twice. Use the **ROCKER** key to select the **SETUP** icon and press **ENTER**.

Main Menu **Setup Menu**

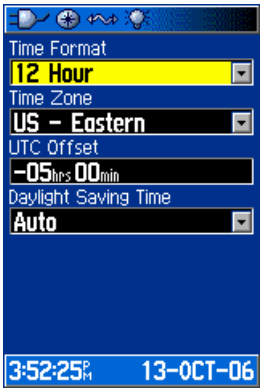
Key System Settings

- Make sure the following key parameters are set before you collect field data.

GPS – while outside operate in **Normal** or **Battery Saver** mode. Change to **GPS off** while in the office to save battery life.

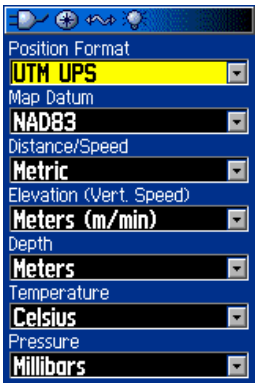
WAAS/EGNOS – stay on **Enabled** mode to ensure that the satellite based differential correction is being used.

Battery Type – choose between **Alkaline** (most common type), **NIMH** or **Lithium Ion**.



Time Format – 12 Hour or 24 Hour modes.

Time Zone – select the correct time zone for your area.



Position Format – select **UTM UPS**, this is the USFWS standard projection format.

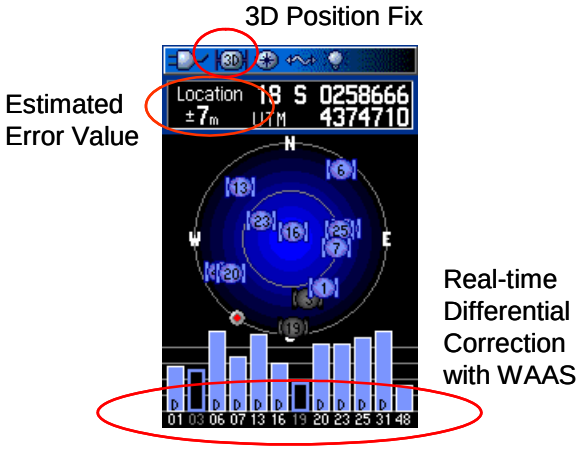
Map Datum – select **NAD83**, this is the USFWS standard datum format.

*All units should follow the metric system.

Field Data Collection Procedures

<u>Before you start taking data</u> - look at the **Satellite** screen page to make sure that:

- You have a 3D position fix,
- You have the <u>lowest possible error value</u> for your application, and
- <u>If possible</u>, you have a "D" in the satellite signal strength bars. This "D" indicates that you are receiving real-time differential correction signals from the geostationary WAAS satellite (Wide Area Augmentation System). However, you must have a clear view of the sky to get the WAAS signal, so you may not always get WAAS.



Once you have a 3D GPS position fix and the error level is within the range required for your application, then you are ready to begin collecting data. ***Be sure that you know your particular project's standard operating procedure for the maximum allowed error value before you begin using the unit to collect data!***

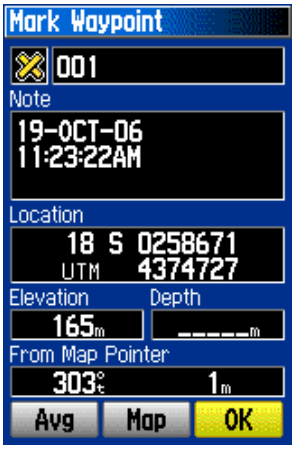
NOTE: Before the GPS receiver can begin tracking satellites and determine its location, it internally downloads a current "almanac" file from the closest satellite. This file updates the receiver's internal clock and provides information on the satellite constellation.

Creating a Waypoint

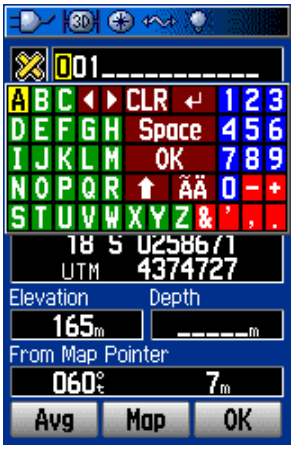
This is the quick method for collecting a waypoint:

1. Hold the unit over the point you wish to record. Keep the unit away from your body for better reception. If your error level bounces up to an unacceptable range, you can rotate your body so the unit can try locking onto another satellite configuration which may provide a better fix.

2. FIRMLY press down and hold the **ENTER/MARK** button for about 1 second, then release. This is a toggle switch that brings-up the **Mark Waypoint Page**.



3. Select **OK** (highlighted by default) and press **ENTER**. Your waypoint has been saved. That's it!



NOTE: The next sequential unused waypoint number is the ID for your new waypoint. However, <u>you can change the waypoint ID before saving</u> by scrolling up with the **ROCKER** to highlight the **Waypoint ID** field, and press **ENTER**. A keypad will appear that you can use to create your own waypoint ID.

<u>You can change the waypoint symbol before saving</u> by scrolling up with the **ROCKER** to highlight the **symbol** field, and press **ENTER.** A list of symbols will appear that you can select from. The new symbol will be the default for all waypoints until you make a new selection.

Creating a Waypoint Using Averaging

This method involves remaining stationary at your position for a set length of time. The GPSMap 76CSx will average all of the readings together to calculate your position. Averaging will achieve a much higher level of accuracy.

1. Repeat steps 1 and 2 as listed above. Before you hit the **OK** button, scroll over to highlight the Avg button and press **ENTER.** The **Averaging Location** screen will appear. Do not move while in averaging mode. Watch the value in the **Estimated Accuracy** field change as the device averages. The value in the **Measurement Count** field lets you know how many waypoints are being used in the to calculate the average (1 waypoint/Sec). When the measurement count reaches what you have established for your application, press **ENTER** to save.

2. Use the **ROCKER** to highlight **OK** and press **ENTER**. Your average waypoint has been saved.

NOTE: When establishing standards for your office, you may want to test using different lengths of time for averaging. Most applications benefit from a 10, 30, or even 60 second average; depends on the level of accuracy you're trying to achieve.

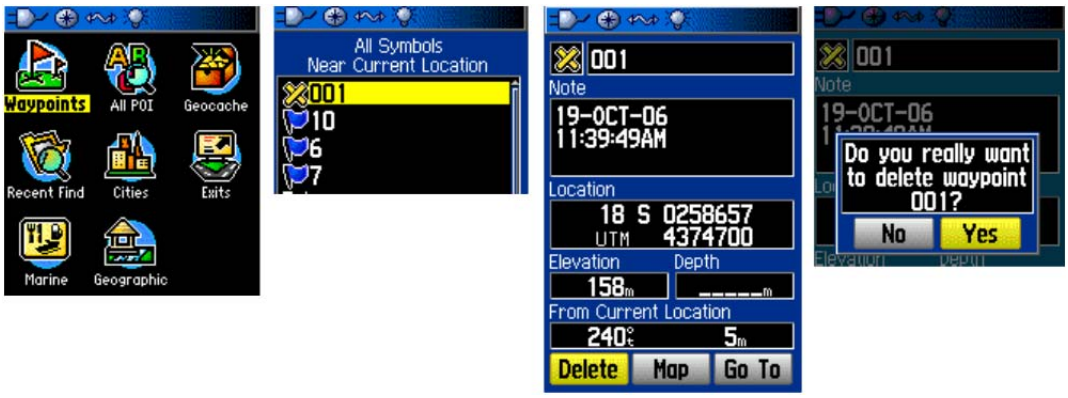
Deleting a Single Waypoint

1. Press the **FIND/MOB** button to access the **Find Page**.

2. Use the **ROCKER** key to highlight the **Waypoints** icon and press **ENTER**.

3. Highlight the waypoint to delete and press **ENTER**.

4. Highlight the **Delete** button and press **ENTER**. A screen will appear asking you if you really want to delete the waypoint, select **Yes** and press **ENTER**.



Deleting All Waypoints

1. Repeat steps 1 and 2 above, but instead of pressing **ENTER**, press the **MENU** button.

2. Use the **ROCKER** key to select **Delete…** and press **ENTER**.

3. Select **All Symbols** and press **ENTER**. A screen will appear asking you if you really want to delete all waypoints, select **Yes** and press **ENTER.**

Manually Entering Coordinates

Coordinates can be obtained from a topographic map, your GIS, or other sources and entered into your GPS unit. You enter waypoints individually from the **Waypoint page**. *You must ensure you have the proper datum and coordinate system specified in your setup parameters*.

1. First create a new waypoint by firmly pressing down and holding the **ENTER/MARK** button for about 1 second, then release. The **Mark Waypoint page** will appear.

2. Use the **ROCKER** key to highlight the **Location** field and press **ENTER**. A numeric keypad will appear.

3. With the right arrow key highlighted, press the **ENTER** button to scroll through each coordinate value until you highlight the value you wish to change.

4. Use the **ROCKER** to select the number you want on the numeric keypad, press **ENTER** to add the number to the coordinate in the **Location** field. At the end of coordinate entry, select **OK**

on the keypad and press **ENTER**.

5. Press the **QUIT** or **PAGE** button to accept the coordinate changes and exit the **Waypoint** page.

Navigating to a Waypoint

Use the **FIND** button from the keypad to select a waypoint you wish navigate to. The **Compass Page** or **Map Page** is used to help guide you in the right direction.

1. Press the **FIND/MOB** button to access the **Find Page**.

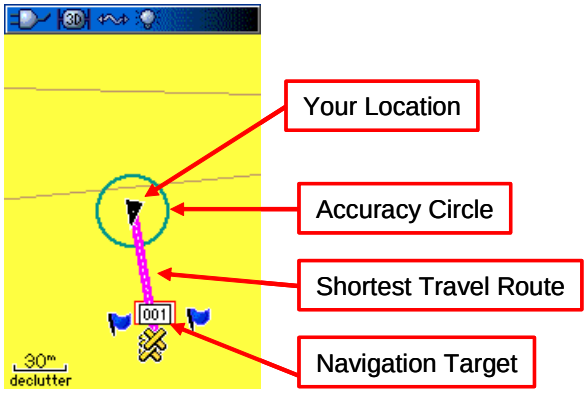
2. Use the **ROCKER** key to highlight the **Waypoints** icon and press **ENTER**.

3. Highlight a waypoint you wish to go to, press **ENTER**.

4. Ensure that the **Go To** button on the bottom right of the screen is selected, press **ENTER**.

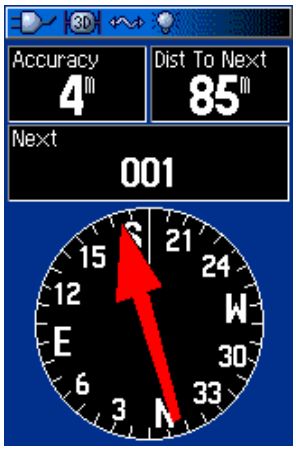
5. The **Map Page** will appear showing the location of your selected waypoint (which will now have the waypoint ID as a text label) relative to YOUR location on the map. Your location on the map is identified by the arrow symbol. The tip of arrow will point in the direction your traveling.

6. Use the **ZOOM IN** and **OUT** buttons to find the general direction that you need to travel before you start walking to your Navigation Target. Y<u>ou must be in motion in order to receive accurate information from your unit on what direction to take</u>! <u>If you stop moving, the GPS unit will be unable to use the satellite signals to calculate your direction and speed of travel; the arrow symbol will spin while your standing still, but it will be useless for navigation.</u>



Map Page

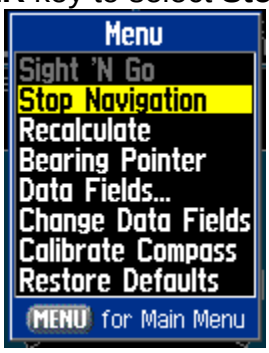
7. Once you find the general direction you need to travel toward, press the **PAGE** button until you find the **Compass Page**. Use the large red compass arrow to identify the direction you should be traveling toward, AND the value displayed in the **Distance to Next** field to determine if you are heading in the right direction and getting closer to your target. <u>When the bearing pointer on the compass points strait up, then you are headed in the right direction.</u>



NOTE: Press the **MENU** button while on the **Compass Page** to add or change the data fields if the **Distance to Next** field is not visible.

8. As you approach your destination, a message will appear letting you know that you are arriving at the location. Once the displayed distance to the waypoint has dropped to less than 5 or 10 meters, then you should begin looking for your feature or marker. Once the distance to the location is less than the accuracy/error value, the navigation information is too general to be accurate.

9. To cancel navigation - press the **MENU** button while on the **Compass** or **Map Page** and use the **ROCKER** key to select **Stop Navigation** and press **ENTER**.



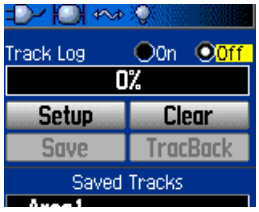
Creating a Line or Area Feature Using Track Logs

1. Obtain a 3D GPS location and ensure your estimated accuracy is within the tolerance you have established for your application.

2. Use the **PAGE** button to scroll to the **Menu Page** (or hit the **MENU** button twice)

3. Use the **ROCKER** key to select the Tracks icon and press **ENTER**. This brings you to the **Tracks Page**. Refer to the "Customizing Your Screen Pages" section on how add this page permanently to your list.

4. Ensure your recording mode is set to **Off.**



5. Use the **ROCKER** key to select **Setup** and press **ENTER**.

6. Insure that **Wrap When Full** box is unchecked. Otherwise your data could be overwritten if you run out of memory space.

7. Set the ***Record Method*** to **Time**.

8. Set the ***Interval*** to an appropriate setting for your application. An interval setting of 3 seconds works well (00:00:03) if walking a trail or weed patch perimeter.

9. Scroll down to the Data Card Setup button and hit **ENTER**. Make sure the ***Log Track To Data Card*** box is checked. (Notice that you can select the **Delete All** Button on this **Track Log Data Card** screen to delete all saved tracks on the card.)

NOTE: Leave the ***Log Track To Data Card*** unchecked if you have a pre-programmed map Data Card from Garmin. The unit has 24 MB of RAM, so you shouldn't run into memory shortage issues.

10. Hit the **QUIT** key twice to get back to the **Tracks Page**.

11. Use the **ROCKER** key and select the Clear button to erase the active track log memory. Select **Yes** when asked "Do you really want to clear the track log?"

12. Move to the starting location of your line or area feature. Select the **On** button and press **ENTER** to begin recording. Feel free to move to the **Map Page** while mapping the feature to monitor your work.

13. When finished delineating the line, go back to the **Tracks Page** and set your recording mode to **Off**. Press **QUIT** to exit the **Tracks Page**.

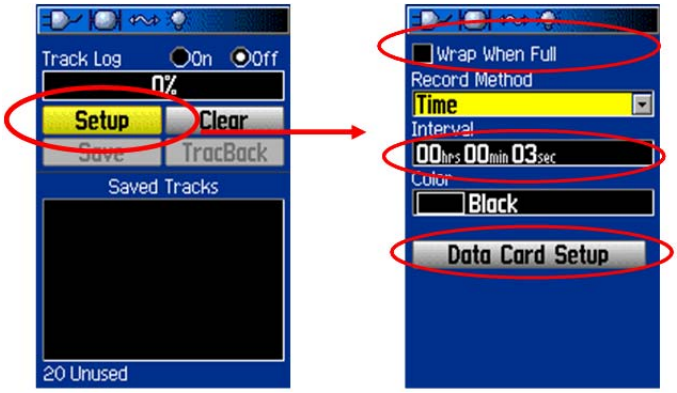
14. Repeat steps 12-13 to record additional line or area features.

NOTE: You can also save the active track log (up to 20 tracks). If saving track logs, be aware that your data will be simplified to save memory space. Keep the logging TIME or DISTANCE interval rate small to avoid oversimplification.

Calculating Area in the Field

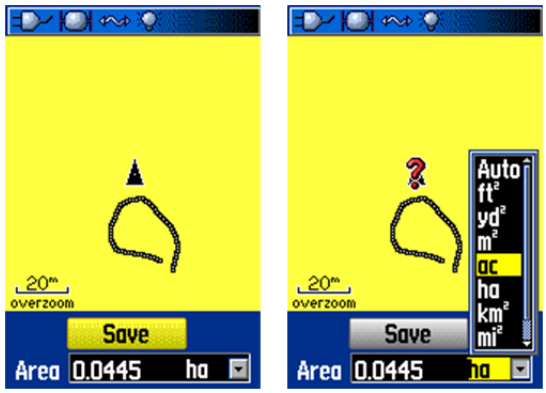
1. Add the **Area Calculation Page** to your default page selection list. Refer to the "Customizing Your Screen Pages" section on how to do this.

2. Ensure your recording mode on the **Track Pages** is set to **Off** and the logging settings are set as shown below (if walking around the perimeter).

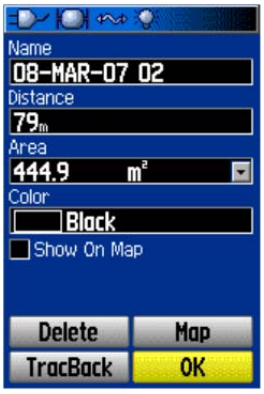


3. Move to the starting location of the feature you want to delineate in the field. With the **Area Calculation Page** open press the **ENTER** key to start logging. The **Start** button at the bottom of the page will change to **Stop.**

4. When your finished walking the perimeter of your field feature press the **ENTER** key to stop logging. The Save button will appear as well as an area calculation. You can change the area units by scrolling through the list.



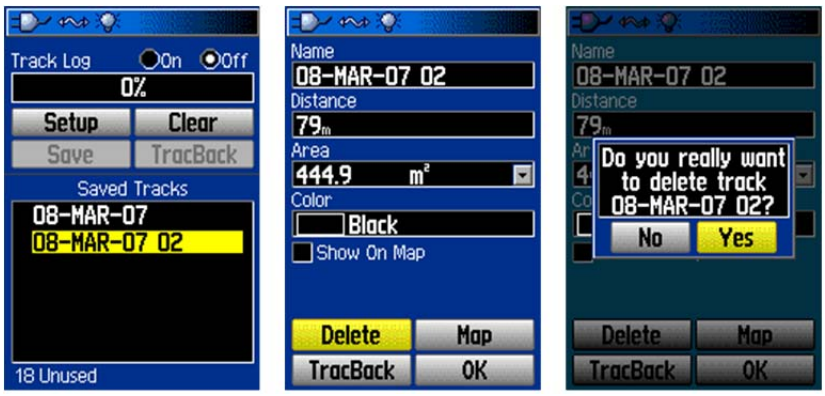
5. Ensure that the Save button is highlighted and press the ENTER key to save the area feature. Rename the feature if necessary, or change the Area units here as well, then scroll down to highlight the OK button to save the area feature. Notice also that this is a quick way to calculate perimeter distance or length of a line.



NOTE: When uploading tracks via DNR Garmin you will see and Active log of the area feature and a saved log of the area feature. The saved log will have the name as listed in the ***Name*** field above, in this case 08-MAR-07 02.

Deleting Saved Tracks

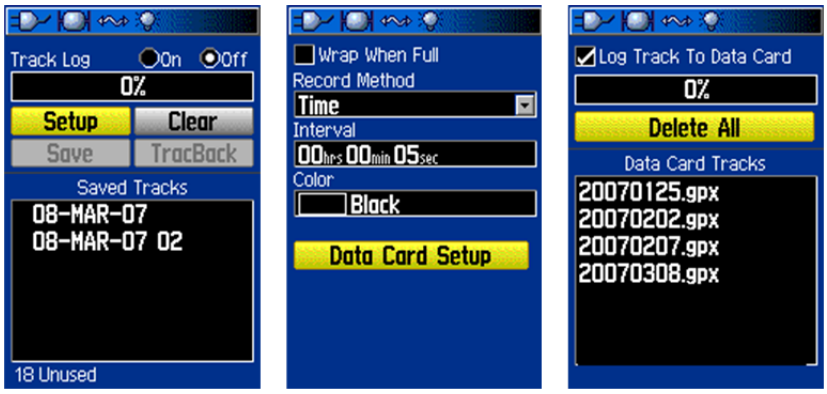
1. From the **Tracks Page**, scroll down using the **ROCKER** key and highlight the track you want to delete and press **ENTER**. Select the **Delete** button and select **Yes** when asked "Do your really want to delete track".



NOTE: To delete all Saved Tracks at once, simply hit the **MENU** button while on the **Tracks Page**, select **Delete All Saved** and press **ENTER**.

Deleting Tracks Saved on Micro SD Card

1. From the **Tracks Page**, scroll to the Setup button using the **ROCKER** key and press **ENTER**. Scroll down to the **Data Card Setup** button and Press **ENTER**. Next, scroll to the **Delete All** button and press **ENTER**.



NOTE: You can also select an individual track to delete, rather than all tracks at once. Simply scroll down and highlighting the track you want to delete, press **ENTER**, select **Yes** and press **ENTER** again.