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Geospatial Extension Program

On Target Training

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Using the Garmin GPSmap 60

This pamphlet is designed to acquaint you with your GPS unit and learn how to utilize it in every day business and farm solutions. It is not meant to give you all of the answers to all possible scenarios and instances when a GPS unit can come in handy. For more detailed descriptions of the capabilities of the Garmin GPSmap 60, refer to the owner's manual included in the packaging with the GPS unit (a digital version is available from Garmin at <http://www.garmin.com/products/gpsmap60/>. Click on manuals on the left hand side of the screen).

The Garmin GPSmap 60 was chosen in conjunction with an iPaq because of its versatility and ease of use.

First, some precautions:

- Never try to operate a vehicle and look at a GPS unit at the same time. Such a distraction can result in an accident.
- Always carry extra batteries. You never know when the GPS unit will lose power, an inconvenience when you're in the middle of something.
- You might think that because the GPS unit is rugged, it doesn't need to be handled with care. The GPS unit is its own computer and should be treated as such.

- Never leave the GPS unit in extreme heat or direct sunlight, like on your dashboard.
- The GPS unit is waterproof, but that does not mean it will float. Do not submerge it for long periods.
- The GPS unit has an antennae that locates the satellites, but it needs an unobstructed view of the sky. The unit does not work inside, underground, or underwater. Tree cover increases the variance, increasing the margin of error.
- Your GPS unit comes with a detachable cable, allowing you to attach it to your computer so you can download coordinates and other pertinent information.





Getting to know your GPS unit



Key Functions

1. Power button: Located at the top of the GPSmap 60 near the antennae
 - Press and hold to turn power on or off
 - Press briefly while turned on to turn on backlight or adjust screen contrast
2. Rocker button: Works similar to a computer mouse
 - Scrolls through menus
 - Moves cursor, or arrow, in desired direction
 - Highlights different icons
3. Out button:
 - Can zoom out in the map page
 - Scroll down a page in any other mode



4. Page:

- Cycles through the main pages

Pages include:

Satellite

Trip Computer

Map

Compass

Main menu

Area calculator

- Press while using the on-screen keyboard to close

5. Menu:

- Press once to see options for a particular page
- Press twice to see main menu options

6. Enter: Acts similar to click stick from Legend, but separate button from Rocker

- Highlights and selects certain options and commands
- Confirm on-screen messages

7. Quit: Similar to an escape key

- Cancel data entry
- Exit a page

8. Mark:

- Mark current location as a waypoint

9. Find:

- Press at any time to view the find page
- Press and hold for Man Overboard

10. In: Similar to the out button

- Zoom in
- Page up

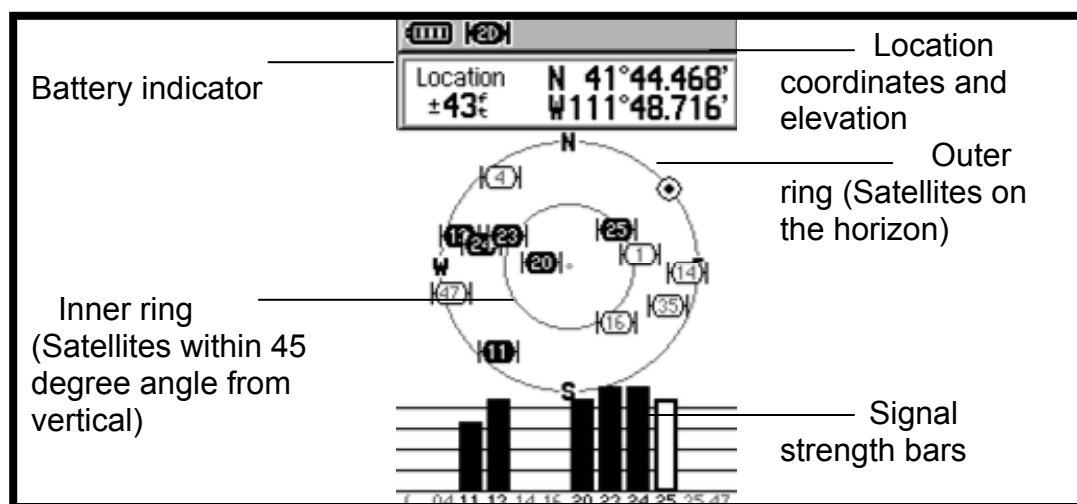


Getting Started: Using your GPS Receiver

This section of the publication is to show you how to get started using your GPS unit and some of its basic functions and capabilities. After familiarizing yourself to the basic functions and designs of the GPS unit, you might want to consult your owner's manual for a more in-depth and thorough discussion of the functions of your unit.

Getting Started...

- Turn on your GPS receiver by pushing the power button (located on top by the antennae). The **Satellite page** should be the first screen the GPSmap 60 loads.



It normally takes a couple of minutes for the GPS receiver to obtain the signals from the satellites to determine the location. Initially, the status window reads: Acquiring satellites. The GPS unit can not be used until it displays the locations and the satellites are no longer blinking.

Once the GPS unit is ready, a location should appear in the upper section of the satellite page, along with the elevation.

Your GPS unit has now warmed up and can now be utilized in such methods as:

- identify and mark areas within fields for future reference
- estimate area measurements of a field
- estimate perimeter of a field

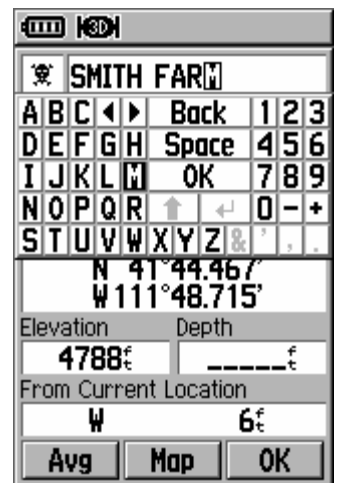
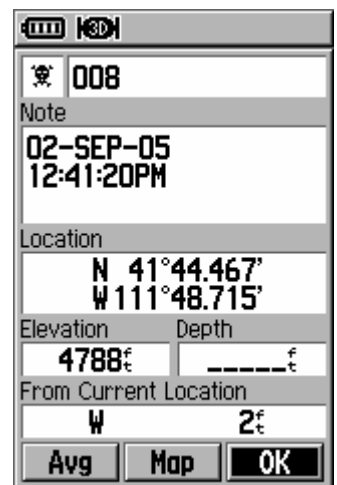


Application #1: Marking and Saving Waypoints

Waypoints allow you to mark and record a current location as a waypoint. A waypoint is a virtual marker. Once a waypoint is recorded and saved, you can easily navigate back to the waypoint using the GPS. This can be useful to locate research plots in a large field, identify and relocate potential pollution sources, or to identify and mark specific areas within a field that have been impacted by blight or disease. It is also possible to upload waypoints to a desktop or an iPAQ.

To mark and save your current location as a waypoint:

1. Make sure that the GPS receiver is ready to navigate, by going to the **Satellite page** and looking at the status window (it should display available satellites and current location).
2. Walk to the point where you want to obtain a waypoint
3. Press down the **Mark** button
4. The GPS unit automatically assigns 3-digit numbers to waypoints. You can customize the name of the waypoint. To change the name of the waypoint, use the cursor to highlight the waypoint name field.
5. Type the new name of the waypoint, using the cursor to select and enter characters from the on-screen keyboard. When finished with name, click on ok.
6. You can change the marker symbol associated with the waypoint by selecting the marker (with the cursor) and scrolling through the different options, pressing enter to select the desired symbol.
7. Use the cursor to scroll down to the ok button and press **Enter** to save the waypoint.

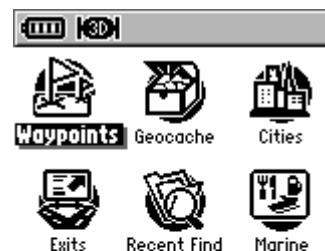




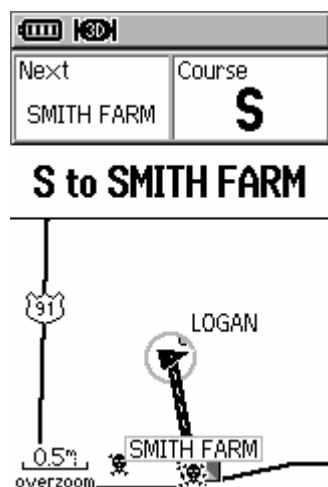
Application #2: Finding (navigating to) a Waypoint

Your GPS unit can act as a compass and navigate you back to a previously defined waypoint. To find the waypoint, follow these steps:

1. Press the **Find** button on the left side of the GPS unit.
2. On the Find menu, select **Waypoints** using the cursor.
3. Use the cursor to select the beginning letter of the desired waypoint, press **ok**, and then select the waypoint by selecting **ok** again.
4. Select the **GOTO** option to create a direct line of travel to the Waypoint.



Note: The direct line is only applicable when the "off road" option is applied. To do this: select setup: Routing: Guidance method menu, then select the off-road option. The other option, "Follow Road" will take you along the roads to get to your destination. This is convenient for when you're driving trying to get to a particular waypoint.





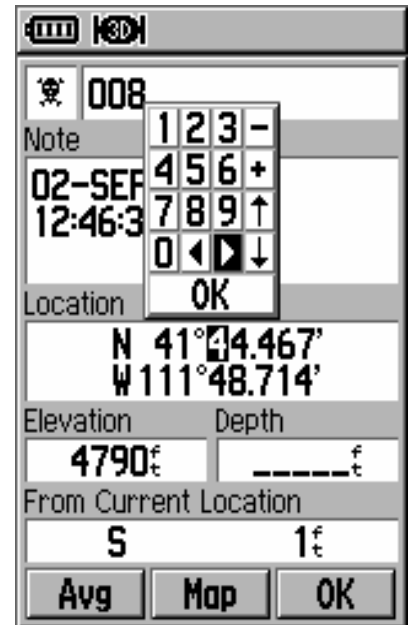
Application #3: Finding a waypoint that was defined by someone else

You might need to navigate to a waypoint that has been previously defined by someone else (i.e. a landowner, an extension agent, or other colleagues). This person may have used a different model of GPS unit and only provided you with the coordinates (or you can obtain the location off of a Geographic Information System, more commonly known as GIS, or other map).

Your GPS unit can not guide you to a coordinate pair if the coordinates are not stored in your GPS unit as a waypoint. There is a way around this problem by simply manually entering the coordinates of the waypoint into your GPS unit.

To create a waypoint manually:

1. Press the mark button to access the **Mark waypoint** screen.
2. Using the cursor, highlight the **Location** field on the **Mark waypoint** page
3. Enter the new coordinates using the numerical keyboard on the screen. Highlight and press ok when finished.



Note: In the United States, the first (latitudinal) coordinate will always be an “N” as a prefix (as we live in the northern hemisphere). The second (longitudinal) coordinate will always have a “W” as a prefix (we live in the western hemisphere.) If you are on the east coast of the United States and trying to find a waypoint through coordinates, then a zero goes right after the “W”. Also, if coordinates are given in UTM instead of latitude and longitude, then it is easily changed to allow for this. Click on Menu twice to access the main menu and then select setup. Then select units, press enter with position format highlighted, and then select UTM UPS option.

4. Once the waypoint coordinates have been manually entered and saved, you can then use the **Goto** or **Find** function (see previous page) to navigate to that waypoint.



Application #4: Estimating Area Measurements

Estimating area in a field is a necessary task for many application areas of extension including agriculture, business planning, and natural resource management. This GPS receiver has the capability to estimate area measurements, even of curved and irregularly shaped areas. The following procedure will not only generate area measurements, but will also provide perimeter measurements as well.

Estimating Area Measurement: The Track Log Method

As you travel the perimeter of an area, the GPSmap 60 records track points and uses the resulting GPS track log to calculate the size of the enclosed tract. This method works well when you can reasonably transport the receiver directly along the boundary of the tract. On small and irregularly shaped tracts of land, you might want to increase the track log interval—the frequency at which tracks points are recorded. Otherwise, you will lose accuracy when the receiver occasionally “cuts corners” as you travel the boundary. Go to : **Main Menu > Tracks >** highlight and click **Setup menu** button. You have choices here. The default setting is Record Method: Auto (a combination of distance and time) and Interval: Normal. If you choose to keep the Auto setting, you can set the Interval to More often or Most often to increase the frequency of track points. Instead of Auto, you can choose to record by Distance or Time, each with its own Interval settings.

Another attribute of the track log method is track-back of your route and a map. You can tell the GPS to go back to any point in the tracks that you laid, and it will give you a map and a direction of how to get there. However, that is more complicated than we are going to review in this pamphlet, so we're just focusing on the basics.

Follow these steps to estimate area measurements:

1. Generally you should clear the current active track log just before you begin laying tracks. Go to: **Main Menu > Tracks > Clear** (If you wish to save the previous track, then save before clearing the log).
2. Make sure that the GPS receiver is ready to navigate by going to the **Satellite Page** and looking at the status window.
3. When you have confirmed that the GPS receiver is ready to be used, push the **Page** button until you reach the area calculator page.

*Note: The majority of your GPS units will not have the area calculator page accessible through the page button, so to accomplish this, you will need to add the page to the page sequence. To do this, access the **Main menu**, then select **Setup**, then select **Page sequence**. Then you scroll down to get to **<Add Page>**, then just scroll down until you get to the **Area calculator**, then press **Enter**. Now your **Area calculator** is added to your **Page sequence**.*



4 You may need to reset the **Area Calculation**. Hit the **Menu** button once and select reset when the options pop up.

5. Press **<Start>** and begin walking around the perimeter of the field that you want to calculate an area for. The screen displays your progress. Zoom in or out to view your tracks.

6. Slightly before you return to your starting point, click on **STOP**. Your receiver will automatically complete the loop with a straight shot from your current position to your starting point. Both perimeter distance and enclosed area values will be displayed in appropriate units. To change area units, highlight and click on the unit abbreviation to bring up a selectable list of choices.

7. If the calculated solution is of value to you, name and save the track. However, before you hit save, you should record the data elsewhere. Once a track log is saved, the total number of track points is condensed and less precision is displayed.

8. Don't worry if, when you're walking, trees obstruct the satellites' view. they will connect the dots on the tracks and points they were able to obtain before you walked in a "dark area." You still need to view the track to make sure that the whole picture is still the same and no changes need to be made.

9. To view all of the saved tracks, go to **Main Menu > Tracks**

- Note: In the old Legend, one could estimate area and perimeter by a route method, but it does not work in the same way with the GPSmap 60 as it did in the Legend. So with the routes option, the only thing you can do is navigate to a particular point along the way that you marked previously.





Application #5: The Trip Computer Page

The trip computer page can also be used to estimate perimeter, or distance measurements. The trip computer page is not as accurate and easy as the area calculator. However, this function associated with the trip computer page is something that you should be familiar with. To estimate perimeter or distance using the trip computer page, follow these steps:

1. Make sure that the GPS receiver is ready to navigate, by going to the **Satellite page** and looking at the status window.
2. You may need to configure your GPS to ensure that perimeter measurements are calculated in yards (by default, the units of measure are in miles). To change the measurement units, go to the **Main menu page**.

Note: If the default “statute” option is used, you will get Trip Odometer measurements in feet until the distance reaches 528’ (.1 miles), at which time the receiver automatically switches to hundredths of a mile (without yards ever being used).

Trip Odom	Max Speed
200 _y _d	4.0 _m _h
Moving Time	Moving Avg
03:29 _M _T _N	2.0 _m _h
Stopped	Overall Avg
18:43 _M _T _N	0.3 _m _h
Elevation	
4782 _f _t	
Odometer	
0.11 _m _i	

If the “yards” option is selected, you will get Trip Odometer measurements in yards until the distance reaches 1000 yards, at which time the receiver will automatically switch to hundredths of a mile (without feet ever being used). **For these reasons, it is suggested that you use the techniques outlined in Application # 4 for estimating area and perimeter measurements.**

A. While on the **Main menu page**, use the cursor to select **Setup**. On the **Setup menu page**, select **Units**, and the **Units page** will appear.

B. On the **Units page**, use the cursor to scroll down and highlight **Distance/ Speed**. Press **Enter** and a menu will appear. From the menu items, select **YARDS**. This will enable you to view the perimeter measurements in yards (measurements in feet is not an option). You are now ready to use the GPS to calculate the perimeter of an area.





3. After you have made sure that the GPS unit is warmed up and that the units are in yards, push the **Page** button until you reach the **Trip computer page**.
4. To measure the perimeter of an area, you will be working with the trip odometer function of the trip computer page.
5. Make sure that before you begin that the trip odometer is set to "zero." If the odometer is not set to zero, then here are the steps to reset the odometer.

- A. Use the **Menu** button to get the options for the trip odometer page.
- B. Press **Enter** to open the options page. This will open the reset odometer page. If reset trip data is not selected, then highlight it to check it and then scroll down to highlight the **Apply** button. Press **Enter** and this should have reset you odometer.



- C. Press **Quit** to get back to the trip computer page.

Trip Odom 0 _t	Max Speed 0.0 _m _h
Moving Time 00:00 _M _N _S	Moving Avg 0.0 _m _h
Stopped 00:34 _M _N _S	Overall Avg 0.0 _m _h
Elevation 4784 _f _t	
Odometer 0.00 _m _t	

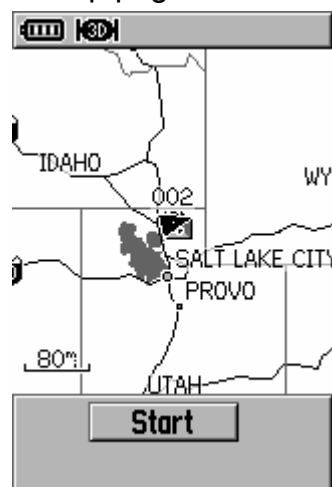
6. Now that the **Trip odometer** is reset, you can start walking around the perimeter of the area of interest. Notice that the odometer changes as you walk, so this is a crude way to see the perimeter of the desired area. Also note that it tells you how fast you are going, how long you've been walking, and how long you have been still.



Map Page

The **Map page** is extremely handy if you want to visualize all of your previously recorded waypoints. This page allows you to zoom in or out for more or less detail, depending on your needs and the distances between all of the waypoints.

Also, it contains maps of virtually any city in the United States and can give you at least a rough estimate of street locations and other landmarks. In fact, it can guide you where you need to go and tell you what exit to use and which direction to turn. For highly detailed maps of cities, you can download them for a certain fee from Garmin's website. (www.garmin.com) This is more complicated stuff than we are going to go over however, so if you want more information about routes, refer to the owners manual. Here is an example of a map from the map page.



- If you were to zoom in, you could see all of the waypoints in the city in which they are located. In this example, it is Logan UT.

We hope this booklet has helped you achieve a better understanding and working knowledge of useful everyday applications that your GPS unit can do for you.

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