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Map the Campus with GPS

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STEM Earth Central 2007

Map the Campus with GPS

Objective: To use a Global Positioning System device to collect data in order to construct a campus map.

Note: These instructions are for a Garmin 72 GPS. Refer to the **GPS Basics** document, the manual, or an on-line manual at <http://www.garmin.com/products/gps72/> for additional information.

1. Go to an outside location. Turn on the GPS receiver. Press PAGE or ENTER to agree to the Warning message (that you will not hold Garmin responsible for getting lost, hungry, tired, thirsty, etc., etc.).
2. The **GPS Information Page** will appear. Three satellites signals are needed to obtain **2D** information (Latitude and Longitude). A fourth satellite signal is needed to obtain **3D** information (Latitude, Longitude and Elevation). This process may take a few minutes. Vertical bars on the page indicate the number and strength of satellites signals.
3. Once you have obtained sufficient satellite signals, record the Latitude, Longitude, and approximate Elevation of your location in a notebook. If the GPS Information Page disappears, use PAGE to return to it. Also record the indication of the accuracy of the elevation data.
4. Begin the process of naming and saving a "Waypoint" that will serve as your "base station". Press and hold down the **Enter** button until the "**Mark Waypoint Page**" appears. The Waypoint will be assigned a number as a temporary name. Use the **ROCKER** button to scroll up to the temporary name of your new Waypoint that appears in the Name Data Field (e.g., 005, if four Waypoints have already been saved). Press **Enter**.
5. **Name your Waypoint.** Use the **ROCKER** button to scroll back to the first number (numbers will disappear). Then scroll up through numbers and letters to the first letter of a name for your Waypoint. Then scroll to the right and up through the alphabet to create the second letter of the name for the Waypoint. Continue this process until you have named the Waypoint. You need at least three letters in the name. You can also scroll to numbers at the end of the alphabet.
6. Press **Enter** when you have named the Waypoint. (You may also choose a symbol for the small box to the left of the name). Use the **ROCKER** to scroll down to **OK** and press **Enter** to SAVE the Waypoint.
7. Refer to the Table on Page 3 to determine what your approximate **Heading** will need to be as you walk toward your group's assigned building on the UMass campus. You will need to vary your Heading from time to time to avoid obstacles.

8. Use the Page to switch to the **Pointer Page** that includes a compass and two rectangular **Data Fields**.
9. The number of Data Fields and the types of data in the Data Fields can be changed (See Sections G, H, and I of Garmin GPS Basics). One of the Data Fields can indicate **Bearing**. **Bearing** indicates the direction toward a selected **Waypoint** whenever you use the **GOTO** button. Another Data Field can indicate **Distance to Next**. The Distance to Next will indicate your distance from a selected Waypoint.
10. Press **GOTO**. Use the ROCKER to highlight "Waypoint". Press ENTER. You will see a list of Waypoints. You want to select the Waypoint you named and saved in front of Hasbrouck Lab. Use the ROCKER to highlight that Waypoint. Press ENTER. The Pointer Page will appear.
11. Begin walking toward your assigned building. While you are close to Hasbrouck, a message that you are **Arriving at Waypoint** will appear. Press **ENTER** to remove that message or just keep walking and the message will disappear. The short line at the top of the Compass will indicate your **Heading**. The **Black Arrow** will always point directly toward your selected Waypoint (the base station). The numbers on the perimeter of the compass will indicate both Heading and Bearing in degrees.
12. When you arrive at your assigned building, record a description of the location. Use the PAGE button to switch to the GPS information page and record Latitude, Longitude, and Elevation. You can also follow the procedure in Steps 4, 5, and 6 to name and save the location as a new Waypoint.
13. Collect more data as you move to various locations around the perimeter of your building. Aim for at least 3 or 4 additional data points that can be used to describe the "footprint" of your assigned building. If time permits, collect data for another notable landmark.
14. Now it is time to return to the Waypoint (the base stations) at Hasbrouck Lab. Start walking toward Hasbrouck Lab.
15. Record your observations of the performance of the Garmin GPS as you approach the place where you were standing when you saved the base station Waypoint.

Locations to Map

Group No.	Location	Heading from Hasbrouck (Approx.)	Distance from Hasbrouck (Approx.)
1	Fine Arts Center	189°	0.4 km
2	Student Union	241°	0.22 km
3	Goessman	311°	0.16 km
4	Morrill North	151°	92 m
5	Morrill South	142°	0.14 km
6	Skinner	108°	65 m
7	Worcester	024°	0.18 km
8	Library Tower	221°	0.3 km
9	Memorial & Old Chapel	219°	0.34 km
10	Campus Pond	202°	0.15 km

You can also refer to the campus map to locate the campus buildings.

