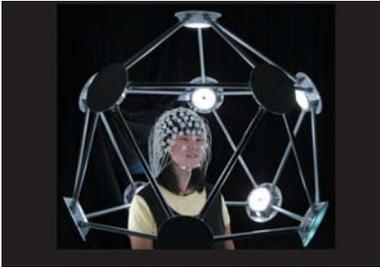


Geodesic Photogrammetry System Quick Start



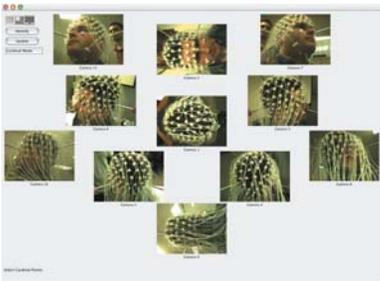
This placard offers an overview of how to use the Geodesic Photogrammetry System (GPS) for routine operations. The GPS provides an elegant, convenient way to register sensor positions, but it requires careful practice to do it successfully. The purpose of this placard is to get you started, and it assumes that the system is set up and calibrated. For full instructions and troubleshooting hints, please consult the *Geodesic Photogrammetry System Technical Manual*; references to the manual in this placard are to the December 10, 2004, version of the *Geodesic Photogrammetry System Technical Manual*.

Step 1: Prepare the subject (see pp. 95–97 of the manual)



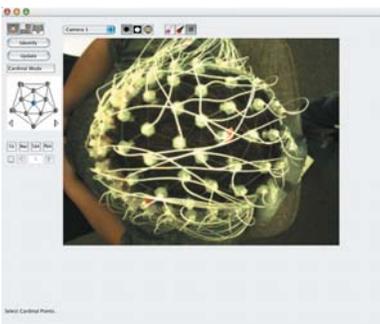
- If using a GSN 200, make sure the pedestal tops of the cardinal points are colored (these points are already colored in the HydroCel GSN).
- Apply the Geodesic Sensor Net correctly to the subject, following the instructions in the *Geodesic Sensor Net Technical Manual*.
- Position the subject in the GPS dome so that he or she is laterally centered.

Step 2: Acquire the images (see pp. 98–101 of the manual)



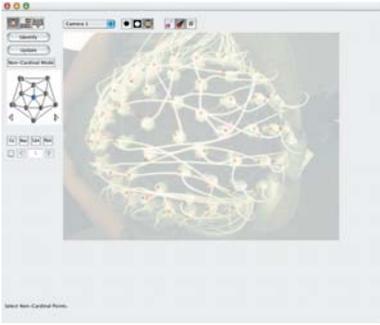
- Choose the correct GSN model from the Photogrammetry dialog when creating the new GPS file (which entails selecting the output destination for the file).
- Click the Capture Images button in the Photogrammetry dialog.
- View images in 1-, 3-, and All-Up modes with streaming video to ensure that the head is centered in all camera views, the cardinal points and preauricular points are visible, no pedestals are cut off from view, and the glare from the room lighting is minimal. Make adjustments as necessary.
- When satisfied, click the Take Pictures button to acquire still images.
- Review the pictures and if satisfied, click the Accept Pictures button to save the pictures to disk. If unsatisfied, click the Start Streaming button, make adjustments, and click the Take Pictures button; repeat until satisfied and then click the Accept Pictures button.

Step 3: Mark the sensors: cardinal points (see pp. 109, 111–112, 116–119 of the manual)



- Open the GPS file and view in 1-Up mode.
- In camera view 1, locate the cardinal points and click on the center of their pedestal tops to mark them. Mark only **clearly** visible cardinal points (not those obliquely visible) and in any order. The sensor layout map may be helpful when you are marking the cardinal points.
- Do not number the points.
- Mark clearly visible cardinal points in the remaining 10 camera views, saving often.
- Click the Identify button, which triggers the triangulation process and assigns the GSN sensor numbers to the points.

Step 4: Model the sensors: cardinal points (see pp. 110, 119–122 of the manual)



- If a message appears about an “incorrect” number of cardinal points, cycle through each camera view to determine if some sensors are imprecisely marked, obliquely visible sensors are marked, or the software incorrectly numbered some sensors.
- Correct as needed using modeling tools such as the camera filters, camera overlays, model view, Sensor Locations window, and Observations window; click the Identify button when finished. If an error message appears, repeat until the cardinal points are successfully triangulated and **identified**. You must successfully **identify** the points once in Cardinal mode.
- If a point is correctly marked and numbered but still appears as “unsolved,” go to the Sensor Locations window, select the point in the list, and click the Marked Solved button.
- If you make edits to the points after they are successfully **identified**, click the Update button (not the Identify button).
- If you want to export the data now (the non-cardinal points are estimated by the Photogrammetry algorithm), go to Step 7.
- If you want to mark and model the remaining sensors, continue to Step 5.

Step 5: Mark the sensors: non-cardinal points (see p. 123 of the manual)

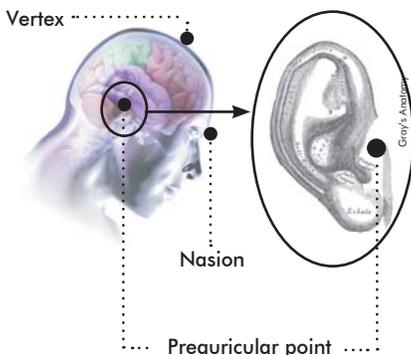
- **Do not change the marks or labels for the cardinal points.**
- Repeat Step 3, except mark the **non-cardinal** points this time (in any order). Do **not** mark the cardinal points again.

Step 6: Model the sensors: non-cardinal points (see p. 123 of the manual)

Number	Cameras	Solved	RMS	Coordinate
1	1, 2, 3	●	0.000	0.000, -0.000, 10.910
35	10, 11	●	0.707	3.103, 9.788, -4.860
24	3, 8	●	1.000	-0.005, -12.124, 2.259
14	1, 4	●	1.000	-1.734, -1.236, 10.057
30	6, 11	●	1.000	6.512, 9.497, 2.533
29	6, 10	●	1.000	-0.053, 11.648, 2.363
17	2, 3	●	1.000	7.131, -6.095, 8.068
27	5, 9	●	1.225	-11.430, 3.276, 1.616
22	2, 7	●	1.225	11.299, -3.736, 2.803

- If a message appears about “unsolved” sensor locations, repeat Step 4, except only for the **non-cardinal** points. Remember: If an error message appears, repeat until the cardinal points are successfully triangulated and **identified**. You must successfully **identify** the points once in non-Cardinal mode.
- If a point is correctly marked and numbered but still appears as “unsolved,” go to the Sensor Locations window, select the point in the list, and click the Marked Solved button.
- If you make edits to the points after they are successfully **identified**, click the Update button (not the Identify button).
- Solving “unsolved” points takes time and practice; for detailed guidance, consult the *Geodesic Photogrammetry System Technical Manual*. You will find the following modeling tools particularly useful: the camera filters, camera overlays, Sensor Locations window, and sensor layout maps.

Step 7: Export the data (see pp. 147–151 of the manual)



- *Explanation: Fiducial points are the nasion, vertex, left preauricular, and right preauricular points. They are reference points that enable you to align data acquired with different imaging systems, and can be marked at anytime during the GPS marking and modeling stages. Because the nasion and vertex are already marked by sensors in the GSN structure—for example, sensor 17 is the nasion in a 128-channel GSN—in most cases, you will need to mark only the preauricular points. Consequently, you will use only six camera views: 3, 6, 7, 8, 10, and 11.*
- In camera view 3, locate the fiducial points, click on the appropriate fiducial button, and mark the corresponding fiducial point.
- Repeat the previous action for the remaining 5 camera views.
- Click the Update button.
- Choose **File > Export** and export as either a BESA sfp or an EMSE elp file.