

GPS Instrument Validation Report

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Abstract: In this Report, it contains the experiment that was done to test the GPS' precision, accuracy and resolution. It contains the data that was collected during the experiment and what we found to the sources of error.

Instrument: GPS

Purpose:

The purpose of this validation report is to design one or more experiments to validate an instrument (GPS) and then write a professional report fully documenting this information.

We will become familiar with this instrument and find its sources of variance, error, or malfunction. We will also calculate the instruments resolution, precision, and accuracy for future references. This validation report will help us evaluate the usability of this instrument in order to decide whether or not to use it in Balloon Fest.

Method:

The following items will be used to conduct our validation:

- GPS
- Measuring tape
- Calculator
- Pencil and Paper

After choosing an open testing space, we will mark our current location with the GPS (point A). Using the measuring tape, the other member of our team will make another point that will be 30 ft from the GPS marked point (point B). We will then create a route

using the GPS from point A to B then walk to point B. The satellites tracking the GPS will measure how many feet the GPS has moved. We will repeat this process three times.

Data Table:

<u>Trials</u>	<u>GPS Measurement</u>	<u>Tape Measurement</u>
Trial 1	21 ft	30 ft
Trial 2	26 ft	30 ft
Trial 3	24 ft	30 ft
Average	23.6 ft	30 ft

Analysis:

Resolution: ± 1 ft

Accuracy: ± 6.4 ft

Precision: ± 2.6 ft

Sources of Error:

The resolution of the GPS is 1 ft since the GPS cannot give any decimal measurements.

When we marked and remarked point A, our numbers changed every time for the same point. The GPS read that we moved 2 or more feet when we actually didn't move at all.

Also when we stopped, the amount of feet measured varied while we stood at point B.

None of our measurements reached the 30 ft measurement made by the tape.

Conclusion:

The purpose of this validation report is to design one or more experiments to validate an instrument and then write a professional report fully documenting this information. We completed this purpose by conducting our designed experiment to find the instrument's resolution, accuracy, and precision. The instrument's main source of error was most likely the fact that we measured a distance of 30 ft which was probably under the GPS's minimum measurement range. This instrument is best used for long distances over 30 ft. Therefore, the GPS's true accuracy and precision was impaired due to the short distance measured using the measuring tape.