iPhone GPS reliability in general aviation - 2010

[<Normal page] [**PEREZGONZALEZ Jose D [ed] (2010[2]).** *iPhone GPS reliability in general aviation.* Journal of Knowledge Advancement & Integration (ISSN 1177-4576), 2011, pages 5-6.]

iPhone GPS reliability

The reliability of the iPhone's GPS tracking feature was assessed empirically by Perezgonzalez in 2010[1]. The research used an iPhone and a specialized tracking device (Spidertracks) on the same training flight. At the end of the flight, the data collected by both technologies were compared. More specifically, data regarding four flight parameters were correlated to assess the tracking variability of the two technologies. The results obtained are shown in the table below for each of the four flight parameters of interest.

Table 1. Variability assessment		
flight parameter	**Pearson coefficient**	**significance**
Latitude	0.991	p < 0.000
Longitude	0.997	p < 0.000
Altitude	0.990	p < 0.000
Speed	0.927	p < 0.000

Methods

Sample and procedure

- 76 data points (time intervals) comprising data for two paired subsamples: data for Spidertracks, and data for iPhone (four variables each).
- Data points were collected from a single, one hour and seventeen minutes long flight. Both technologies were onboard a Piper PA-28-161 Warrior during a typical training session. No malfunctioning or other problems were found with the technologies, and non-technological variability did not affect the reliability of technology, either. Therefore, further measurements (in time or space) were deemed not necessary.
- The sample size was limited by the maximum number of data points recorded by Spidertracks (which tracked flight performance less frequently, or once per minute). The iPhone, instead, tracked flight performance per second. Thus, the corresponding 76 data points for the iPhone sample were selected by matching the first data points in the sequence for both technologies, and then collating the remaining data points spaced at regular intervals from the previous data point. Selecting the first data point from the iPhone database was approximate, using a triangulation of measures. Although some uncertainty may remain regarding this first matching, the remaining data points were selected objectively, at exactly one minute intervals from the first one.

Materials

- One Spidertracks unit (a commercial GPS fleet monitoring tracking device).
- One iPhone unit with a GPS flight tracking programme installed. The phone was used without

its phone card.
- A stopwatch.

Data analysis

- The data matrix was assessed as per normality and linearity. Results were adequate for continuing with parametric data analysis.
- Main analyses were t-tests for paired-samples for the four variables under study.

References

1. **PEREZGONZALEZ Jose D (2010).** *Reliability analysis of assisted-GPS technologies for post-flight analysis.* Aviation Education and Research Proceedings (ISSN 1176-0729), volume 2010, pages 53-54.
+++ **Footnotes** +++
2. Reproduced with permission from **PEREZGONZALEZ Jose D [ed] (2010).** *Assisted-GPS reliability.* AviationKnowledge (ISSN 1179-6685), 2010, page 7.

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