



## The HP iPAQ rx5915 Travel Companion

The USU Geospatial Extension Program has developed the Geospatial Tool Kit. This is a simple set of tools, used by agricultural producers and extension agents, that brings a Pocket PC PDA, GPS and GIS together into one system, all for less than \$1000.

We have, in the past year, recommended the HP iPAQ hx2410 as the PDA in the Tool Kit (coupled to a Garmin GPSmap60). However, the wires used to connect the GPS to the computer can be burdensome. Reliable and high quality Bluetooth (wireless) GPS receivers exist, but the Bluetooth capability of many PDAs has been problematic. Also, the extra power required to communicate with a Bluetooth receiver reduces battery life significantly. For these reasons we have continued to use wires to directly connect a GPS to the PDA.

Recently, HP released the iPAQ rx5915 Travel Companion. While the intent was to compete with automotive navigation systems (such as the Garmin NUVI), the on-board GPS was promising as a replacement for the separate handheld GPS that the Geospatial Tool Kit currently uses. This is a stand-alone system...without wires! This publication presents the results of initial tests. We will shortly be releasing the results of other tests.



HP iPAQ rx5915 Travel Companion

### HP iPAQ rx5915 Specifications:

- SiRFstarIII GPS receiver (WAAS capable)
- TomTom NAVIGATOR 6 and maps of US and Canada pre-installed
- Microsoft® Windows® Mobile™ 5.0 for Pocket PC, Premium Edition
- Samsung® SC32442 400 MHz Processor
- Transmissive TFT QVGA color with LED backlight
- Integrated WLAN 802.11b/g and Bluetooth 2.0/EDR
- 64 MB SDRAM for running applications
- Up to 2.0 GB flash ROM
- 500 MB to 1.5 GB persistent storage
- Support 1-bit/4-bit SDIO, SD/MMC type memory standard, and mini SD memory cards with SD adapters
- Removable/rechargeable 1700 mAh lithium-ion
- PRICE (as of 1/25/07 at [www.hp.com](http://www.hp.com)) \$569

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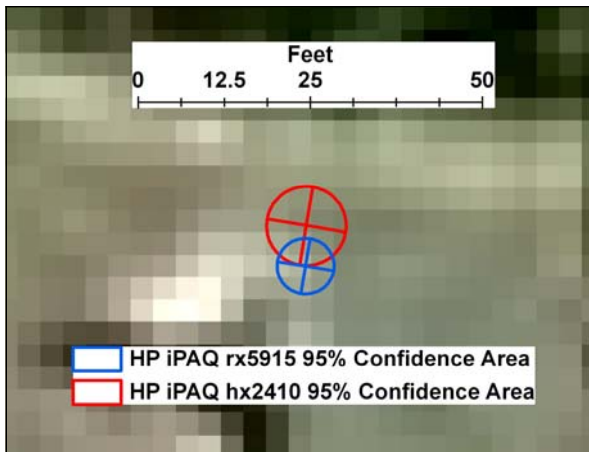
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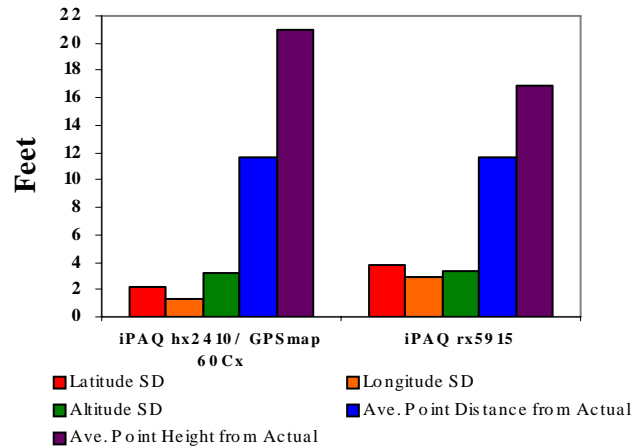
## Testing Precision and Accuracy

The HP iPAQ rx5915 and the HP iPAQ hx2410 (connected to a Garmin GPSmap60 Cx) were placed on a plastic box directly over a known GPS control marker. The software VisualGPSce was used to extract a statistical report of a series of 50 waypoints taken simultaneously. This report gives us the average latitude, longitude and altitude with their standard deviations. See the graph at right:

HGIS v. 8.04 also features a GPS Statistics menu that plots the 2DRMS-95% area. This is a circle plotted on the map, which represents the area in which you can be confident that 95.44% of the time it will contain the actual position. We can compare the size of the circles created and get an idea of the variance of the waypoints recorded for each receiver. See the image below:



While nearly the same, the 2DRMS-95% test has shown that the rx5915 produced a smaller 95% confidence area. However, the VisualGPSce statistics showed that standard deviations of latitude and longitude for the rx5915 were slightly greater. Although there are differences between these systems, the scale of inconsistencies is minimal. These tests have definitely proven the \$569 HP iPAQ rx5915 worthy to be used as a stand-alone PDA/GPS unit in the Tool Kit.



## HP iPAQ rx5915 GPS Activation

Because the TomTom auto navigation software comes pre-loaded on the rx5915, some settings need to be changed before using this new iPAQ in the Geospatial Tool Kit. The “static navigation” setting is disabled by default. When enabled, this causes TomTom to give incorrect directions when the vehicle is stopped at a stop light. This is similar to navigating with a regular GPS while not moving; the arrow only points the correct direction when the receiver is in motion. M-M SiRF Setup (a free download) was used, which allows you to toggle “on/off” the static navigation and WAAS.

The rx5915 GPS uses a 9600 Baud rate on COM1 in standard NMEA format. In addition, because the keyboard is commonly used in HGIS, the screen must be in the vertical position to perform all functions. When these settings are in place, the system is superior to two-piece systems.

This report was written and edited by V. Philip Rasmussen, Ph.D, with the help of Jay Payne and Rachel Horlacher, as part of the ongoing Utah Geospatial Extension Program. This program provides the Utah public with direct access to geospatial technologies, data, and expertise by way of a partnership between NASA and the existing Land Grant Cooperative Extension System located on the campus of Utah State University in Logan, Utah.

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