

Post SA GPS Accuracy Measurements

Introduction

On May 1, 2000 the intentional degradation of GPS signals (called SA) was terminated. With this change a GPS without a DGPS unit attached became almost as accurate as a GPS with a DGPS attached. What follows is the result of 2 separate 24 hour tests, one with DGPS and one without.

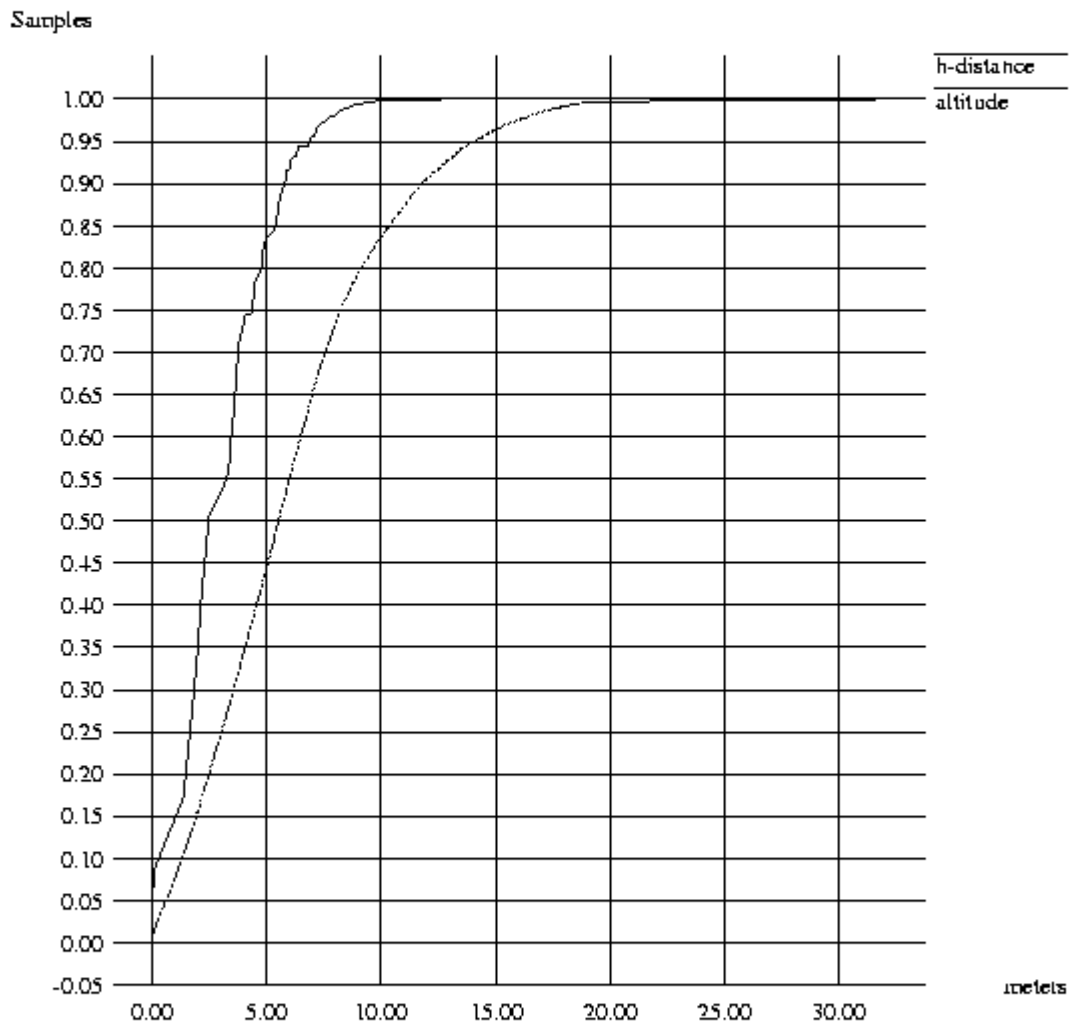
Test setup

The tests were both done using a Garmin 12xl GPS (sw. version 3.53) outputting NMEA data which was logged to an attached NetBSD computer. The GPS antenna was a roof-mounted Trimble/Lowe antenna with 15 meters (50 ft.) of RG58A/U connecting the antenna to the GPS.

For the second test a Garmin GBR-21 DGPS radio tuned to the Point Blunt, CA Coast Guard station was used to provide the DGPS corrections. The Coast Guard station was located a mere 53 km (33 miles) away and provided the faster (thus lower delay) 200 baud corrections.

Plain GPS

Garmin 12xl w. Lowe Ant. 43478 Samples



samples: 43478 (24.2 hrs)
ave lat: 37.55 degrees
ave lon: -121.94 degrees
ave alt: 39.474 meters

50.00%	confidence:	2.5 meters
68.27%	confidence:	3.8 meters
95.45%	confidence:	7.0 meters
99.73%	confidence:	9.8 meters

Alt

50.00%	confidence:	5.6 meters
68.27%	confidence:	7.4 meters
95.45%	confidence:	14.4 meters
99.73%	confidence:	21.3 meters

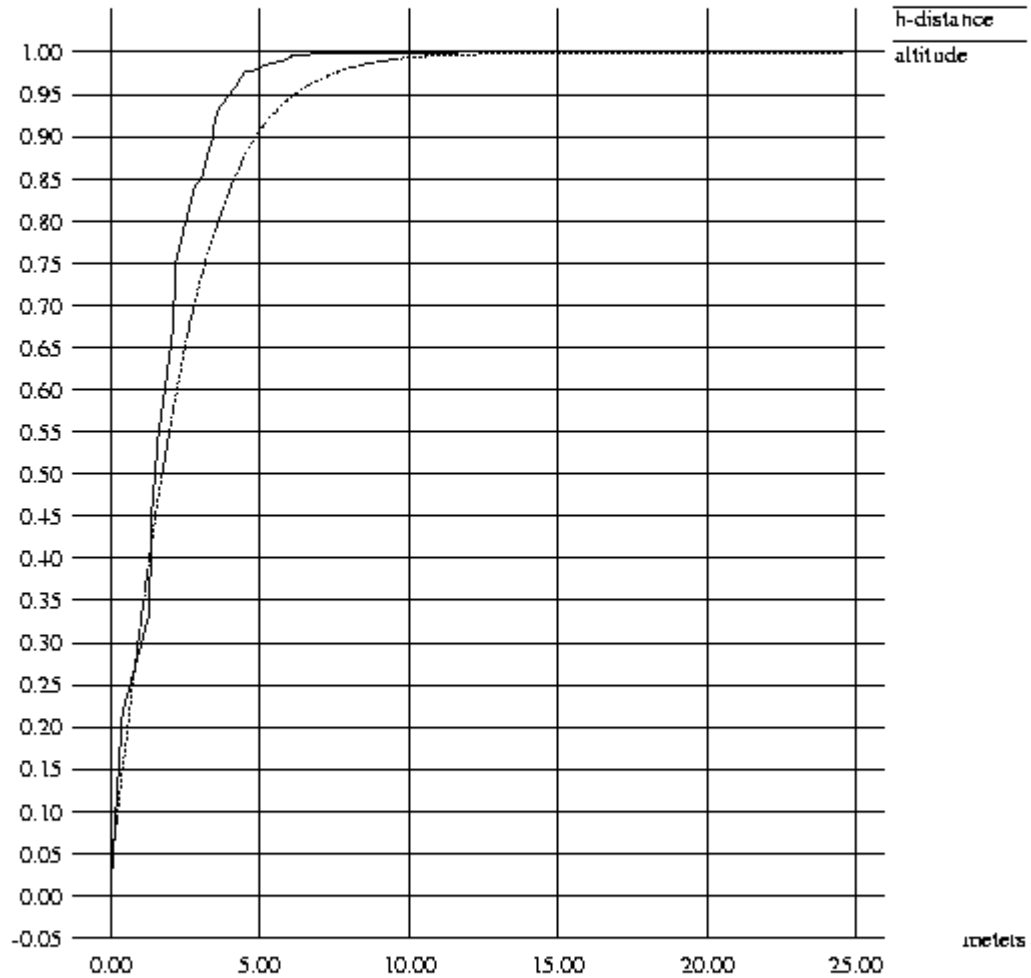
What this means is that a user taking a single non-DGPS correction can expect the reading to fall within 2.5 meters of the correct position 50% of the time. Similarly the reading should fall within 7 meters of the correct position 95% of the time.

The noise level recorded by this test is so low that one should be suspicious that the receiver firmware is pulling a fast one on us. The receiver is probably detecting that it is stationary and using that information to filter the heck out of the lat/lon/alt numbers. I would not expect to get this sort of an accuracy out of a non-stationary test.

GPS with DGPS corrections

Garmin 12xl w. DGPS and Lowe Ant. 43156 Samples

Samples



samples: 43156 (24.0 hrs)
ave lat: 37.55 degrees
ave lon: -121.94 degrees
ave alt: 30.727 meters

50.00%	confidence:	1.6 meters
68.27%	confidence:	2.2 meters
95.45%	confidence:	4.2 meters
99.73%	confidence:	6.7 meters

Alt

50.00%	confidence:	1.8 meters
68.27%	confidence:	2.7 meters
95.45%	confidence:	6.4 meters
99.73%	confidence:	12.0 meters

What this means is that a user taking a single DGPS reading

Fonte: <http://www.wsrcc.com/wolfgang/>