Everywhere, Without Waiting

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As new and renovated satellite navigation systems arrive and applications and innovative commercial ideas increase, the general expectation of GNSS navigation performance will soon conflict with system limitations.

Some decades ago, a GPS user would necessarily have been a highly educated person, with extensive training and equipped with expensive instruments to estimate and mitigate system limitations. A surveyor used mission-planning software to ensure performance at the time of the test. He knew what to expect of the system and could perform special proce-

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dures, for example, for carrier-phase positioning. Today, millions of new users have arrived who can use a less accurate service, but want it everywhere and without waiting. They expect from the system something it cannot deliver, currently, due to limitations like requirements of unobscured skies, uninterrupted signal reception for some period of time, and tolerable multipath environment. The new user does not want to hear about these limitations. We may — and we should — mitigate them by working on the user segment of the system.

GNSS is calmly but rapidly penetrating mass markets and finds itself in cellular phones, cars, watches, cameras, and golf carts. A general user expects the same availability and ease of use as, for example, a radio. Although not true at radio's inception, today one can just turn a switch and get music in a car, at home, in the street, or inside a shopping center. It does not matter where one is, or what station provides the service. You turn a switch and you've got it.

New users expect the same performance from GNSS navigation today and will expect even more tomorrow. They won't care whether it is GPS or Galileo, or pseudolites of some sort, and they will expect to get their position everywhere, without first looking around and saying, "Oh no, that won't work, have to get out of the woods first, just don't know which way to go."

Today, positioning is merging with communication, as in assisted GPS (AGPS). However, positioning, including that in obscured environments, and especially for such applications as emergency service, should not depend on assistance data provided through a communication channel. We are developing an approach which can enhance GPS availability in a similar fashion as AGPS, but without necessarily requiring immediate assistance information and, consequently, a communication link.

With hundreds of navigation satellites in the sky, and a handful of GNSS-enabled gadgets, the taxpayer would expect to get the resulting service — his instant position at any time and at any place — without becoming a specialist in satellite navigation. This is our challenge today: providing seamless instant positioning at any location, at any time, at the touch of a button. ⊕

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