

# InsideGNSS

GPS | GALILEO | GLONASS | BEIDOU

ON THE COVER

## 48 First Position Fix with IRNSS

Successful Proof-of-Concept Demonstration

A. S. Ganeshan, S. C. Ratnakaara, Nirmala Srinivasan, R. Babu, Neetha Tirmal, and A. Kartik

Earlier this year, India's regional navigation constellation, IRNSS, demonstrated independent three-dimensional position determination for the first time using a combination of geostationary and geosynchronous satellites now in orbit. The navigation software team from the Indian Space Research Organization describes this achievement.



The PSLV-C27 launcher with IRNSS 1D satellite on board. India Space Research Organisation photo

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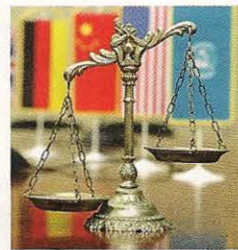
GNSS and World Trade Law:  
Amedeo Arena and Ingo Baumann

Level playing field or national "champions"? This article by two legal scholars examines the legal, economic, and political issues arising from the cross-currents caused by the requirements of international trade agreements and the inclination of nations to favor their own GNSS programs.

## 54 Harnessing the Progress in Computing

Software-Defined GNSS Simulator  
René Jr. Landry and Iurie Ilie

Thanks to advances in the design and capabilities of graphics processing units, the real-time computational capabilities of the conventional PC are significantly improved. This article describes the development and performance of an SDR simulator that combines the real-time computational capabilities of a GPU with universal software radio peripherals.



FEATURE

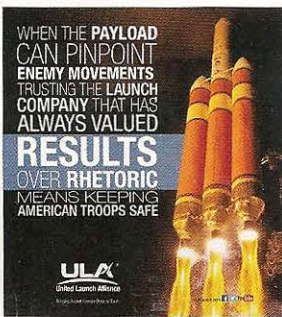
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Valérie Renaudin: Navigating a Life with GNSS  
Peter Gutierrez

A career in GNSS has led her across many borders.







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**LETTERS**  
to the Editor

**Still Not a Thing**

I always enjoy reading your comments. However, I have some comments on your last article ["Thinking Aloud," May/June, *Inside GNSS*]

1. MOPS stands for Minimum Operational Performance Standards, not specifications.
2. ICAO does not produce MOPS; RTCA does.
3. MOPS are not mandatory until ordered by FAA or another nation.

Most airlines that travel over oceans or other areas where there are no ground communications are equipped with ACARS and can communicate with the ground through satellite. The cost of transmissions is too expensive to transmit location info all the time. A line-of-sight link is used domestically that can transmit location info (this operation is called ADS (automatic dependent surveillance)). Several years ago the USAF had a program for a radar in space that could monitor all aircraft in a given coverage area. I

think this may have been cancelled when the threat changed from aircraft to missiles. Plus we have other ground radars (satellite also for missiles) that can detect aircraft and missiles earlier before they reach the US. Bottom line is that the cost of aircraft equipage is not the main problem but the cost of transmission via satellite is. Domestic location is not a problem using secondary radar, Mode S and other links that aircraft have today.

Larry Chesto, Aviation Consultant  
Williamsburg, Virginia USA

**Response to Secretary of Defense**

"I hate GPS. . . . 20 years from now we won't be buying GPS satellites." Ashton Carter in June 2014 podcast [See article on page 14.]

Who would have the audacity to contradict the SecDef? Well, there's always me.

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