



SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL COORDINATION OFFICE

Improving GPS.gov

Jason Y. Kim

**Civil GPS Service Interface Committee
Portland, Oregon
September 20, 2011**



- **Central pillar of U.S. GPS outreach campaign**
- **Partnership between NCO and NAVCEN/CGSIC since 2006**
- **Website re-launched in March 2011**
 - Enhanced user interface
 - New content
 - Monthly updates



Homepage for General Public



Welcome to GPS.gov

www.gps.gov

English Español Français 中文 عربي

GPS.gov

Official U.S. Government information about the Global Positioning System (GPS) and related topics

Search

- HOME
- WHAT'S NEW
- SYSTEMS
- APPLICATIONS
- POLICY & FUNDING**
- MULTIMEDIA
- SUPPORT

For General Public

- For News Media
- For Congress
- For Internationals
- For Professionals

GPS Map Errors E

Does your GPS device show your house in the wrong place? Does it suggest inappropriate routes? Don't blame the GPS satellites... contact the map makers! We'll tell you how.

[READ MORE... →](#)

- U.S. Policy Overview
- Federal Agencies
- GPS Modernization
- International Cooperation
- Interference Mitigation
- Legislation ▶
- Program Funding ▶
- Congressional Materials ▶

Previous Feature Stories

- Did You Know? GPS Jamming Is Illegal

Looking for LightSquared Information?

If you are seeking official U.S. government information related to the planned LightSquared 4G wireless network and its potential interference to GPS users, you'll find it at our sister site, www.PNT.gov.

[GO THERE... →](#)

Hello, Canada! GPS Adventures Is Migrating North

The traveling GPS Adventures exhibit will close down at the Adventure Science Center in Nashville, Tennessee, on September 5 and reopen at the Ontario Science Centre in

GPS User Support

What is GPS?

Who Pays For GPS?

Other Common Questions

Delta IV GPS IIF-2 Launch High

Successful Launch of Second GPS IIF Satellite on July 16

A Delta IV rocket successfully launched the GPS IIF-2 spacecraft into orbit on July 16, 2011. The Air Force completed its checkout

www.gps.gov/policy/



Chinese Homepage



Welcome to GPS.gov
www.gps.gov/chinese.php

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GPS.GOV

美国政府有关全球定位系统(GPS)及相关事项的官方信息

Search

首页 | WHAT'S NEW | 系统 | GPS的应用 | POLICY & FUNDING | MULTIMEDIA | SUPPORT

For General Public
For News Media
For Congress
For Internationals
For Professionals

全球定位系统 为全世界服务

用下列语种浏览本网站:
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Español
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ACTIONS:
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Get help and support

全球定位系统 (GPS) 是美国以空间为基地的无线电导航系统, 在全世界范围内为民间用户提供不间断的定位、导航和定时服务, 而且对所有人免费。任何人只要有一个接收机, 这个系统就可以为他提供位置和时间。GPS可在任何气候条件下, 在白天或夜间, 在世界任何一个地方为无限数量的人提供准确的位置和时间信息。

GPS由三部分组成: 围绕地球的卫星; 地面上的监控站; 以及用户拥有的接收机。GPS卫星从空间发射可由接收机收到和识别的信号。每个接收机可以给出三维位置(经度, 纬度和海拔)外加时间。

人们可以从商店里随时买到GPS手持机。配备有这种GPS接收机, 用户就可以精确地知道他们的位置并且很容易找到他们要去的地方, 不论是步行、驾车、飞行或开船。GPS已经成为全世界交通系统的支柱, 为航空、地面交通及航海提供导航。救灾和紧急救援的救生任务也依赖GPS的定位和定时能力。日常的活动比如银行业务、行动电话甚至电力网控制都受益于GPS提供的精确时间。农民、测绘人员、地质学家和不计其

什么是全球定位系统?

GPS的应用

Images and Multimedia



Arabic Homepage



Welcome to GPS.gov x +

www.gps.gov/arabic.php

English Español Français 中文 عربي

Search

معلومات رسمية من الحكومة الأمريكية عن نظام التموضع العالمي، وموضوعات ذات صلة بهذا النظام

GPS.GOV

SUPPORT MULTIMEDIA POLICY & FUNDING تطبيقات النظام نظم WHAT'S NEW الصفحة الرئيسية

**نظام التموضع العالمي
يكبح العالم**

For General Public
For News Media
For Congress
For Internationals
For Professionals

ما هو نظام التموضع العالمي؟

تطبيقات النظام

Images and Multimedia

نظام التموضع العالمي هو نظام أمريكي للملاحة اللاسلكية يتخذ من الفضاء قاعدة له، وهو نظام يوفر لجميع مستخدمي المدنيين في جميع أنحاء العالم على نحو مستمر ودون انقطاع خدمات مجانية لتحديد الموقع وتحديد الوقت والملاحة، إذ باستطاعة أي شخص لديه جهاز استقبال لنظام التموضع العالمي أن يحصل على معلومات تحدد له الموقع والتوقيت، حيث يوفر هذا النظام لعدد غير محدد من الأشخاص معلومات دقيقة عن الموقع والوقت، ويوفر النظام هذه المعلومات ليلاً ونهاراً في أي مكان من العالم وبغض النظر عن الظروف الجوية.

يتكون نظام التموضع العالمي من ثلاث أجزاء: الأقمار الصناعية التي تدور حول الأرض، ومحطات السيطرة والرمصد الثابتة على الأرض، وأجهزة استقبال يملكها مستخدمو نظام التموضع العالمي، وهي الأجهزة التي تتلقى الإشارات التي تنبأها من الفضاء الأقمار الصناعية التابعة للنظام وتترقب عليها، ومن ثم تعرضها على المستخدم في صورة مجسمة تقدم له معلومات ثلاثية الأبعاد (خط العرض وخط الطول والارتفاع) عن الموقع وعن الوقت.

باستماع الأفراد شراء أجهزة يدوية صغيرة لاستقبال المعلومات من نظام التموضع العالمي، فهي معرضة للتبليغ في المتاجر، وباستطاعة من يحصل على مثل هذا الجهاز تحديد موقعه بدقة وتحديد خط سيره ونسبة له إلى الموقع الذي يريد التوجه إليه، وذلك سواء كان يسير على قدميه أو يقود

اطع على هذا الموقع باللغة:

English
Español
Français
中文

ACTIONS:

Share this page via Facebook, Twitter, etc.

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Get help and support



Multimedia



The screenshot shows a web browser window with the address bar displaying "www.gps.gov/multimedia/". The page features the "GPS.GOV" logo and the tagline "Official U.S. Government information about the Global Positioning System (GPS) and related topics". A navigation menu includes "HOME", "WHAT'S NEW", "SYSTEMS", "APPLICATIONS", "POLICY & FUNDING", "MULTIMEDIA", and "SUPPORT". The "MULTIMEDIA" section is active, showing a grid of five multimedia options: "Video Messages", "Launch Videos", "Image Library", "Exhibits", and "Handouts". A sidebar on the left lists "ACTIONS" such as "Share this page via Facebook, Twitter, etc.", "Get website updates via RSS", "Comment on this page", and "Get help and support". The footer contains a disclaimer: "This page was updated on July 5, 2011. This U.S. government website has been developed by the National Coordination Office for Space-Based Positioning, Navigation, and Timing and the Civil GPS Service Interface Committee. It is hosted by the Coast Guard Navigation Center. Privacy policy. Contact webmaster."



Modernization Information



The screenshot shows the GPS.gov website with the following content:

- Header:** GPS.gov Official U.S. Government information about the Global Positioning System (GPS) and related topics. Includes a search bar.
- Navigation:** HOME, WHAT'S NEW, SYSTEMS (highlighted), APPLICATIONS, POLICY & FUNDING, MULTIMEDIA, SUPPORT.
- Breadcrumbs:** Home » Systems » GPS » GPS Modernization
- Left Sidebar:**
 - SYSTEMS:** GPS Overview, Space Segment, Accuracy, **Modernization** (highlighted), New Civil Signals, Augmentation Systems, Technical Documentation.
 - ACTIONS:** Share this page via Facebook, Twitter, etc.; Get website updates via RSS; Comment on this page; Get help and support.
- Main Content:**
 - Image:** Illustration of GPS satellites in orbit.
 - Section Header:** GPS Modernization
 - Text:** It is the policy of the United States to maintain U.S. leadership in the service, provision, and use of satellite navigation systems. The U.S. government has additional policy goals to meet growing demands by improving the performance of GPS services, and to remain competitive with international satellite navigation systems. [LEARN MORE...](#)
 - Text:** The GPS modernization program is an ongoing, multibillion-dollar effort to upgrade the GPS space and control segments with new features to improve GPS performance. These features include new civilian and military signals.
 - Image:** A bar chart with green bars of varying heights, representing signal strength or performance.
 - Text:** [LEARN ABOUT THE NEW CIVIL SIGNALS...](#)
 - Text:** In addition to the specific new features noted above, GPS modernization is introducing modern technologies throughout the space and control segments that will enhance overall performance. For example, legacy computers and communications systems are being replaced with a network-centric



Performance Information



GPS.gov: GPS Accuracy x

www.gps.gov/systems/gps/performance/accuracy/

GPS.gov Official U.S. Government information about the Global Positioning System (GPS) and related topics

HOME WHAT'S NEW **SYSTEMS** APPLICATIONS POLICY & FUNDING MULTIMEDIA SUPPORT

Home » Systems » GPS » Performance » Accuracy

SYSTEMS:

- GPS Overview
- Space Segment
- Accuracy**
- Modernization
- Augmentation Systems
- Technical Documentation

ACTIONS:

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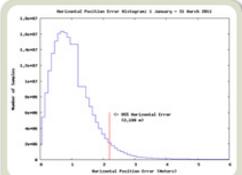
GPS Accuracy

The U.S. government is committed to providing GPS to the civilian community at the performance levels specified in the GPS Standard Positioning Service (SPS) Performance Standard. For example, the GPS signal in space will provide a "worst case" pseudorange accuracy of 7.8 meters at a 95% confidence level. [VIEW DOCUMENT...](#)



What is GPS?

The actual accuracy users attain depends on factors outside the government's control, including atmospheric effects and receiver quality. Real-world data collected by the FAA show that some high-quality GPS SPS receivers currently provide better than 3 meter horizontal accuracy. [VIEW DATA AT FAA.GOV...](#)



FAA data collected in early 2011 shows that the horizontal accuracy of GPS SPS is often within ~1 m (click to zoom)

Higher accuracy is available today by using GPS in combination with augmentation systems. These enable real-time positioning to within a few centimeters, and post-mission measurements at the millimeter level. [LEARN MORE...](#)



Air Force data shows increasing GPS signal-in-space accuracy from 2001 to 2010 (click to zoom)

What About Selective Availability (SA)?

During the 1990s, GPS employed a feature called Selective Availability that degraded civilian accuracy on a global basis. In May 2000, at the direction of President Bill Clinton, the United States ended its use of Selective Availability to make GPS more responsive to civil and commercial users worldwide.

The United States does not intend to ever implement SA again and is committed to preventing hostile use of GPS through regional denial of service, minimizing the impact to



Homepage for Congress



GPS.gov: Congressional Home x

www.gps.gov/congress/

GPS.gov Beta Official U.S. Government information about the Global Positioning System (GPS) and related topics

HOME WHAT'S NEW SYSTEMS APPLICATIONS POLICY & FUNDING MULTIMEDIA SUPPORT

For General Public

For News Media

For Congress

For Internationals

For Professionals

FISCAL YEAR 2012
BUDGET
OF THE U.S. GOVERNMENT

We've identified every line item in the President's FY 2012 budget request related to GPS satellites and augmentations, including programs at the Air Force, FAA, and RITA. It's all right here on one page.

[VIEW NOW... →](#)

LightSquared Interference to GPS

- Sept 8 Hearing of House Science Committee
- June 23 Hearing of House Transportation & Infrastructure Committee
- Proposed Legislation
- Background Information

Program Funding

- President's GPS Budget Request for FY 2012
- GPS Funding in the Final FY 2011 Funding Act
- Background Paper on Civil GPS Funding

Stories of Interest to Capitol Hill

Air Force Successfully Launches Second GPS IIF Satellite into Orbit

(July 29) On July 16, a Delta IV rocket successfully launched the GPS IIF-2 satellite into orbit from Cape Canaveral, Florida. It is the second of twelve GPS Block IIF satellites being built by Boeing to support GPS modernization. The IIF series adds a third civilian GPS signal for increased reliability and accuracy, especially for NextGen and other transportation safety applications. GPS IIF is also essential to constellation sustainment, as many current GPS satellites have greatly exceeded their design life spans. [LEARN MORE... →](#)

CJS Approves Bill Addresses LightSquared-GPS Interference

(July 29) House appropriators included report language in the FY 2012 Commerce, Justice, and Science Appropriations Act (H.R. 2596) directing the National Telecommunications and

Downloadable Newsletters

Late July | [View All](#)

Reports to Congress

- 2010 Federal Radionavigation Plan
- NDGPS Recapitalization Plan (June 2010)
- GAO Report on GPS (May 2009)



Homepage for Professionals – You!



The screenshot shows a web browser window with the URL www.gps.gov/pros/. The page features the GPS.gov logo with a 'Beta' badge and the text 'Official U.S. Government information about the Global Positioning System (GPS) and related topics'. A search bar is located in the top right. A navigation menu includes links for HOME, WHAT'S NEW, SYSTEMS, APPLICATIONS, POLICY & FUNDING, MULTIMEDIA, and SUPPORT. A sidebar on the left offers links for 'For General Public', 'For News Media', 'For Congress', 'For Internationals', and 'For Professionals'. The main content area has a large heading: 'Welcome GPS Experts, Developers, and Professional Users'. Below this, there are several informational boxes: 'Next ICWG Meeting' (September 13-15, 2011), 'Next CGSIC Meeting' (September 19-20, 2011), and 'Technical Documentation'. A 'Get Involved!' section provides information about the 'Civil GPS Service Interface Committee (CGSIC)' and the 'Interface Control Working Group (ICWG)'. On the right side, there are three featured articles: 'GPS User Support', 'President's GPS Budget Request for FY 2012', and 'U.S. Policy on GPS'. A 'SEND COMMENTS...' button is also visible.



Technical Documentation



The screenshot shows a web browser window with the URL www.gps.gov/technical/. The page features the GPS.gov logo and the tagline "Official U.S. Government information about the Global Positioning System (GPS) and related topics". A navigation menu includes links for HOME, WHAT'S NEW, SYSTEMS, APPLICATIONS, POLICY & FUNDING, MULTIMEDIA, and SUPPORT. The main content area is titled "Technical Documentation" and contains the following text:

It is the official policy of the U.S. government to provide open, free access to the information necessary to develop and build equipment to use the civil services of GPS and its augmentations. [LEARN MORE... →](#)

This section of the website provides easy access to all of the relevant technical documentation. Some links on this page lead to content in the Portable Document Format (PDF) and may require you to install PDF software. [GET SOFTWARE... →](#)

The page is organized into four main sections, each with a blue header:

- INTERFACE CONTROL DOCUMENTS**: These documents provide detailed information on the civil GPS signals and codes broadcast at the L1, L2, and L5 frequencies. Enter to access current versions of the GPS Interface Specifications, as well as information about ongoing efforts to update the documents through the Interface Control Working Group (ICWG). [VIEW... →](#)
- PERFORMANCE STANDARDS & SPECIFICATIONS**: These documents specify the levels of technical performance that users can expect from GPS and related systems. Enter to access current and past versions of the performance standards for the civil GPS service (SPS), military GPS service (PPS), Wide Area Augmentation System (WAAS), and U.S. GPS monitoring capabilities. [VIEW... →](#)
- FEDERAL RADIONAVIGATION PLAN**: The Federal Radionavigation Plan (FRP) is the official source of radionavigation policy and planning for the federal government. It covers both terrestrial and space-based, common-use, federally operated radionavigation systems, including GPS and GPS augmentations. This link opens a PDF of the 2010 FRP at the U.S. Coast
- SEMI-CODELESS/CODELESS GPS ACCESS COMMITMENTS**: These documents describe U.S. government commitments to support semi-codeless/codeless civilian access to the current P(Y) signals and the transition to the modernized L2C and L5 signals. Enter to access the 2008 Federal Register notice on semi-

The left sidebar contains a "SUPPORT:" section with links for GPS User Support, Frequently Asked Questions, Civil GPS Service Interface Committee, Technical Documentation (highlighted), Interface Control Documents, Performance Standards & Specifications, Federal Radionavigation Plan, Codeless/Semi-Codeless GPS Access Commitments, About This Website, and Website Feedback. Below this is an "ACTIONS:" section with links to share the page via Facebook, Twitter, etc., and to get website updates via RSS.



ICWG Meeting Information



The screenshot shows a web browser window with the URL www.gps.gov/technical/icwg/meetings/2011/09/13/. The page header includes the GPS.GOV logo and the tagline "Official U.S. Government information about the Global Positioning System (GPS) and related topics". A navigation menu contains links for HOME, WHAT'S NEW, SYSTEMS, APPLICATIONS, POLICY & FUNDING, MULTIMEDIA, and SUPPORT. The breadcrumb trail reads: Home » Technical Documentation » Interface Control Documents » Public ICWG Meetings » September 13-15, 2011.

ICWG MEETINGS:

- Sep 13-15, 2011** (highlighted)
- Apr 28, 2011
- Mar 10, 2010
- Feb 12, 2010
- Oct 5, 2009
- Oct 1, 2009
- Sep 29, 2009
- Nov 19, 2008
- Nov 18, 2008

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Public ICWG Meeting

September 13-15, 2011

Meeting Announcement (Updated)
Meeting Announcement (Original)

This official public notice in the Federal Register provides information on discussion topics, instructions for registration and comment submission, and points of contact. The updated version provides the meeting location and dial-in information.

Meeting Presentation (Updated August 2011)

August 2011 Version of Documents Under Review:

The GPS Directorate has updated the proposed change packages and will accept public comments on them either before or during the public ICWG event in September.

- Public Document Management (GPS III terminology and SSV group delay)
- Pseudorandom Noise (PRN) Expansion
- User Range Accuracy (URA) Definition
- Almanac Intervals
- Pseudorange Parameters
- Technical Note 36

Relevant Interface Documents:

- IS-GPS-200E
- IS-GPS-705A
- IS-GPS-800A

Some links on this page lead to content in the Portable Document Format (PDF) and may require you to install PDF software. [GET SOFTWARE...](#)



Future Improvements



- More frequent updates
- Merge PNT.gov → GPS.gov
- Constellation status
- Tutorials
- Applications database
 - Migrate data from NASA
 - Leverage CGSIC presentations?
- Professionals homepage
 - Conference presentations
 - Reference documents/links
 - **What would make it more useful to you?**



Please Send Comments & Suggestions



GPS.gov: Professionals Home | x

www.gps.gov/pros/

Portland, Oregon

[LEARN MORE... →](#)

Technical Documentation

- Interface Specifications
 - IS-GPS-200
 - IS-GPS-705
 - IS-GPS-800
 - IS-GPS-870
- Performance Standards
 - SPS
 - PPS
 - WAAS
 - Civil Monitoring
- Federal Radionavigation Plan
- Semi-Codeless/Codeless GPS Access Commitments

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in civil GPS issues. Information from CGSIC members and meetings is provided to U.S. GPS authorities for consideration in GPS policy development and GPS service operation. [LEARN MORE... →](#)

U.S. Policy on GPS

Looking for LightSquared Information?

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Interface Control Working Group (ICWG)

The ICWG serves as a forum to develop and provide technical GPS interface requirements, as well as focus on interface detail definition and issues. [LEARN MORE... →](#)

National Space-Based PNT Systems Engineering Forum (NPEF)

The NPEF consists of engineers and other experts from across the U.S. government. It conducts assessments and makes recommendations on technical issues as tasked by the National Executive Committee for Space-Based PNT. The NPEF accepts external inputs on issues impacting commercial GPS interests. [LEARN MORE... →](#)

National Space-Based PNT Advisory Board

This federal advisory committee consists of experts from outside the U.S. government who provide advice on U.S. space-based PNT policy, planning, program management, and funding profiles. Their meetings are open to the public. They may establish subcommittees and task forces involving experts beyond their core membership. [LEARN MORE... →](#)

www.PNT.gov

Our sister site is the website of the National Coordination Office for Space-Based PNT, the central node within the government for GPS policy matters. It publishes official news items, presentations, and other materials of interest to GPS professionals. It also provides frequent updates on GPS program funding in Congress. [GO THERE... →](#)

SPACE-BASED POSITIONING NAVIGATION & TIMING NATIONAL EXECUTIVE COMMITTEE

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