GPS POLICY AND PLANNING

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Presented at the IISC Meeting
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Overview

- Overall GPS Management
- GPS Modernization
- International Cooperation
- WAAS and LAAS
- Maritime DGPS
- Nationwide DGPS
- Spectrum Issues
Overall GPS Management

The Interagency
GPS Executive Board

- **Co-Chairs**
  - Department of Transportation
  - Department of Defense

- **Participants**
  - Department of State
  - Department of Commerce
  - Department of Agriculture
  - Joint Chiefs of Staff
  - Department of Interior
  - Department of Justice
  - NASA
Board last met on April 7th, 2000 to discuss:

- GPS Modernization
- International Consultations
- Establishment of Senior Steering Group
  - Assist IGEB in formulating major decision regarding the management of GPS and its U.S. government augmentations

No major system management issues currently identified that require IGEB action
Civil GPS Modernization

- President discontinued Selective Availability May 2nd
  - Accuracy improved from 100m to better than 20m
  - Enables more uses for the GPS basic service than before

- GPS SPS Signal Specification
  - Updating to reflect improved constellation performance and the discontinuance of SA
  - Early 2001 publication date anticipated

- Adding new signals to improve accuracy, availability, and signal redundancy
  - 2\textsuperscript{nd} civil signal beginning in 2003
  - 3\textsuperscript{rd} Civil Signal for aviation and other Safety-of-Life uses beginning in 2005
Civil GPS Modernization

3rd Civil Signal (L5) Implementation

Draft L5 Signal Specification Complete

- Approved by RTCA SC159 Plenary, 6/16/00
- U.S. Government concurrence underway
- Recommended to DoD to provide 1st version of ICD by 2003 and 2nd version of ICD in 2007.

- Advanced Features
  - 6 dB higher power relative to L1 (-154 dBW)
  - 20 MHz (minimum) broadcast bandwidth
  - Longer codes
  - Higher chipping rate
- Developing prototype receivers
Funding for Civil GPS Modernization

President’s FY01 Budget Submission

– Added funds to DoD FY01 budget and beyond for Civil GPS Modernization

• Funds deployment/acceleration of Civil GPS signals

• Funds appropriated as requested
DOT/DoD MOA on Implementing Unique Civil Requirements

- DOT and DoD directed to develop MOA on implementing unique civil requirements
  - Signed August 12, 2000

- MOA Provides:
  - Description of currently agreed to civil signals
  - Mechanism for validating and implementing new unique civil requirements
  - Mechanism for prioritizing elements should appropriations be insufficient
  - IGEB members will participate in development of new unique civil requirements
    - Agencies can sponsor outreach to their constituencies
GPS Modernization

GPS III

– GPS III Architecture Study
  • Contracts awarded to Boeing and Lockheed Martin (12 Month effort)
  • Kickoff meetings held early November at JPO
  • Civil Participation
    – Public Forums will be held through AFSPACEDCOM (Hank Skalski) to solicit civil input

– Flexibility for technology upgrades
International Cooperation

➢ U.S. continuing cooperative efforts to ensure interoperability with GPS and other Space-based Navigation systems

➢ Developed Memorandum of Agreement with EU regarding GPS and Galileo
  – Provided to EU in mid-October
    • Key Elements
    • Awaiting EU response

➢ Talking to Russia, Japan, and others
Principles for Cooperation

- No direct user fees for civil and public safety services
- Ensure open market for GNSS user equipment
- Open signal structure for all civil services
- Protection of spectrum from disruption and interference
- Use of GPS time, geodesy, and signal structure standards
- Seamless, global interoperability
- Recognition of national and international security issues and protecting against misuse
WAAS/LAAS

- **WAAS**: LNAV/VNAV Initial Capability in 2002/2003
- **LAAS/CAT II/III**: Date to begin service uncertain
Coast Guard Maritime DGPS

- Became fully operational on March 15, 1999
- System conforms to ITU standard and been duplicate in 35 other countries
Nationwide NDGPS

- 18 stations operating by end of 2000
- Single coverage by end of 2002
  - May slip to mid-2003
- Dual coverage by end of 2003
  - Likely to slip to end of 2004
Predicted Coverage at end of December 2000

Legend:
- Operating
- Start in 2000
- Planned
WRC 2000 June, 2000 in Istanbul, Turkey

- Highly Successful effort for both U.S. GPS & EU Galileo
- GPS issues were to:
  - Protect against encroachment from other systems
  - Obtain Allocation for 3rd Civil GPS Signal
  - Space-to-space allocation – important to NASA and other space agencies

Need to begin preparing for WRC 2003

- Follow on activities required
  - Proposal for power flux density (PDF) for L2
  - Study impact of proposed L2 power increase on long range radars
  - Complete studies to assure protection for DME/ARNS from Galileo

- GNSS spectrum still vulnerable to attacks
- Maintain international cooperation
Ultra Wide Band (UWB) is new technology
- Low power signal spread over wide area of spectrum
- Effort to maximize use of limited spectrum

UWB Technology may pose threat to use of GPS and other systems used for safety of navigation

Need testing to make determination

Working with NTIA/Stanford to conduct tests
- NTIA requested extension until end of Feb 2001 for currently identified testing

Need broad participation by GPS User Community
SUMMARY

➢ U.S. continues to manage GPS as a joint civil/military system
  – Management structure assures stable, predictable policies that the world user community can rely on
  – Committed to continue to provide GPS to the world community for peaceful, civil uses
    • *Essential element of the navigation and communications infrastructure*
  – No user fees for GPS Services

➢ U.S. remains committed to GPS Modernization
  – Additional Civil Freqs being added
  – GPS III Architectural Study underway

➢ International Cooperation continues

➢ WAAS/LAAS and NDGPS Implementation continues

➢ WRC 2000 Successful for both U.S. GPS and EU Galileo

➢ Need to protect GPS from UWB interference