



# *International GNSS Activities*

**International Satellite Navigation Forum**  
***Moscow***

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# *Overview*

- **Global Trends**
- **Multilateral GNSS Cooperation**
  - Regulatory Bodies
  - International Committee on GNSS (ICG)
- **Bilateral GPS Cooperation**
  - EU
  - Japan
  - Russia
  - India
- **Outreach Activities**
- **Summary**



## ***Global Trends***

- Continued rapid expansion of GPS use around the world
- Accelerated development of new civil applications for GPS
- New space-based systems being built or planned; the number of space-based signal providers will grow from two (US and Russia) to possibly six over the next 5-10 years



# ***International Cooperation***

- **Multilateral cooperation reinforced through U.N. International Committee on GNSS**
  - As well as ICAO, IMO, and NATO
- **U.S. Government has engaged in cooperative arrangements with Europe, Japan, India, and Russia**
  - To ensure compatibility (non-interference) and interoperability with foreign systems
  - To maintain and promote a level playing field in the global market
- **Additional efforts ongoing with Australia, Brazil and others**





# ***International Committee on GNSS (ICG)***

- Emerged from 3rd UN Conference on the Exploration and Peaceful Uses of Outer Space July 1999
- Promote the use of GNSS and its integration into infrastructures, particularly in developing countries
- Encourage compatibility and interoperability among global and regional systems
- Membership: GNSS providers (US, EU, Russia, China, India, Japan), international organizations, and international associations
- Unique mix of providers and major user groups
- Held first ICG meeting in Austria Nov. 2006
  - Agreed on TOR, Work Plan and establishing a GNSS Providers Forum to address common issues
  - Next meeting in September 2007 in India



# *Europe*

- In 2004, United States and European Community signed agreement on GPS-Galileo cooperation
  - Recognizes importance of compatibility/interoperability for all parties
- Agreed to spectrally separate signals for military and civilian services
- Agreed to implement a common, open, civil signal on both Galileo and GPS III, free of direct user fees
- Working groups established
- US-EU public affairs initiative to promote the combined GPS-Galileo capability



# Japan

- World's largest consumer of GPS technology
- U.S.-Japan cooperation began in 1998
  - Initially focused on interoperability with MSAS, Japan's GEO-based augmentation system
  - Promotes common principles such as free market access
  - Annual plenary meetings, technical working groups
- Current focus is on Quasi-Zenith Satellite System (QZSS)
  - Regional system to complement, augment GPS over Japan
  - Will improve performance in urban canyons and mountains
  - Will freely broadcast GPS L1C, L2C, L5 signals
  - GPS-QZSS interoperability achieved



MT-SAT used for MSAS





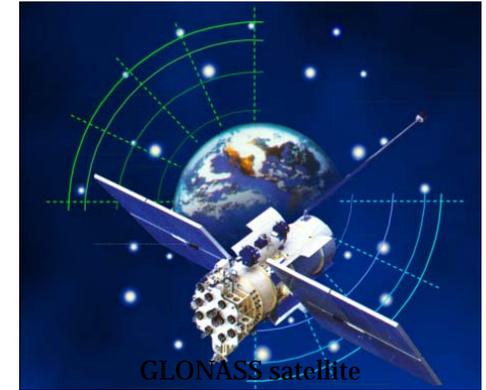
## ***US-Japan Cooperation***

- Japan's status as a world leader in GPS applications and user equipment makes it an important partner
- Regular policy consultations and technical meetings on GPS cooperation have been held since 1998 between the US and Japan
- Recent discussions have focused on ensuring interoperability between GPS and Japan's planned Quasi-Zenith Satellite System (QZSS) navigation satellites



# *Russia*

- Currently pursuing formal cooperation agreement
- Working groups are pursuing GPS-GLONASS interoperability
  - Enhanced PNT availability through common open service civil signals
  - Cooperative search and rescue capabilities





# *GPS-GLONASS Cooperation*

- Negotiation of US-Russia agreement on satellite navigation cooperation underway since late 2005
  - Next meeting is planned for later in 2007
- Several very productive technical working group meetings have been held
  - Focus is on exploring feasibility of making next generation GLONASS and GPS satellites more interoperable
  - Next Plenary planned for late 2007



## ***US-India Cooperation***

- Regular policy consultation meetings on GPS cooperation have been held since 2005 between the US and India
- Agreed on a Joint Statement on Cooperation
- Discussions have focused on ensuring interoperability between GPS augmentation system WAAS and India's planned GAGAN augmentation system based on GPS
- Address ionospheric distortion and solutions
- Next consultative meeting late 2007



## ***Outreach Activities***

- U.S. - U.N. regional GNSS educational workshops in developing countries (China, Chile, Zambia, Colombia, Morocco, Malaysia)
- U.S. participates actively in range of international conferences and meetings (e.g. Munich SatNav Conf., ION, Int'l SatNav Forum, CGSIC)
- U. S. websites, brochures, and information dissemination
  - Fact Sheet on GNSS system
  - Joint GPS-Galileo brochure



## *Summary*

- As new space-based GNSS are emerging globally, interoperability is the key to “success for all”
- Civil GPS modernization will meet growing demands to enhance its performance
- ICG will address GNSS providers and users’ concerns; active participation in the ICG Work Plan implementation will be the key to addressing common issues
- Outreach activities targeted to developing countries
- United States has multi-faceted approach to cooperation



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Presentation and other GPS information available:

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