



ACTION TEAM X:  
GNSS



## **GNSS- The International Future:**

**Building upon the synergy between the work of COPUOS and  
Capacity-building activities of the  
UN Programme on Space Applications**

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**IGS Symposium**

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## BACKGROUND

- Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III): July 1999, Vienna, Austria
- “The Space Millennium: Vienna Declaration on Space and Human Development” (Vienna Declaration)
  - ◆ GNSS related recommendation:  
*“To improve the efficiency and security of transport, search and rescue, geodesy and other activities by promoting the enhancement of, universal access to and compatibility of space-based navigation and positioning systems”*

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## ESTABLISHMENT OF GNSS ACTION TEAM

- 12 Action Teams have been established by UN Committee on the Peaceful Uses of Outer Space (COPUOS)

Action Team Nr. 1 (Environmental Monitoring Strategy); Action Team Nr. 9 (Knowledge-sharing)  
Action Team Nr. 2 (Management of Natural Resources) Action Team Nr. 10 (GNSS)  
Action Team Nr. 4 (Weather and climate monitoring) Action Team Nr. 11 (Sustainable Development)  
Action Team Nr. 6 (Public health) Action Team Nr. 14 (Near-Earth objects)  
Action Team Nr. 7 (Disaster management) Action Team Nr. 17 (Capacity building)  
Action Team Nr. 18 (Awareness increase)  
Action Team Nr. 32 (Innovative funding sources)

- Recommendation on GNSS: one of the UNISPACE III recommendations that have been assigned highest priority by Member States of the United Nations
- GNSS Action Team chaired by the United States and Italy





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## PARTICIPATING COUNTRIES & ORGANIZATIONS

- 38 countries (membership open to Member States of the UN)



Australia  
Austria  
Belarus  
Brazil  
Bulgaria  
Canada  
Chile  
China

Colombia  
Czech Rep.  
Egypt  
France  
Germany  
Hungary  
India  
Iran



Iraq  
Italy  
Japan  
Lebanon  
Malaysia  
Mexico  
Mongolia  
Morocco

Nigeria  
Pakistan  
Philippines  
Poland  
Portugal  
Republic  
of Korea  
Romania



Russian Federation  
Saudi Arabia  
Syria  
Turkey  
Ukraine  
United States of  
America  
Zambia

- 15 organizations

- ◆ **3 UN entities:** ESCAP, ICAO, ITU
- ◆ **4 IGOs:** ESA, European Commission, Eurocontrol, BIPM
- ◆ **8 Non-governmental organizations:** CGSIC, EURISY, AIAA, IAG, IAIN, ICA, FIG, IGS



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## OBJECTIVES OF THE ACTION TEAM

1. Survey current international and regional efforts to achieve a seamless multi-modal satellite based radio navigation and positioning system throughout the world
2. Assess current institutional models of international cooperation and coordination and identify those with potential applicability to evolving GNSS systems and services and GNSS users' interests
3. Propose specific recommendations for the UN, Member States and other international organizations on actions that should be taken to promote GNSS user interests, increase the level of awareness, improve the quality and to facilitate utilization of GNSS services, particularly in developing countries
4. Propose specific recommendations on global coordination and cooperation





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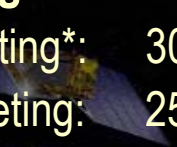
## CONDUCT OF WORK

- **Meetings:**

- 1st meeting\*: 30 November 2001, Vienna, Austria
- 2nd meeting: 25 January 2002, Rome, Italy
- 3rd meeting: 27 February 2002, Vienna, Austria
- 4th meeting: 4 June 2002, Vienna, Austria
- 5th meeting\*: 15 November 2002, Vienna, Austria
- 6th meeting: 18 February 2003, Vienna, Austria
- 7th meeting: 10 June 2003, Vienna, Austria
- 8th meeting\*: 11 December 2003, Vienna, Austria
- 9th meeting: 27 February 2004, Vienna, Austria

\* Held in conjunction with the UN/USA Regional Workshops on GNSS for Eastern Europe (26-30 November 2001), UN/USA International Expert Meeting on GNSS (11-15 November 2002) and UN/USA International Workshop on GNSS (8-12 December 2003)

- **E-mails and web board (<http://forum.itu.int/~gnss>)**





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## CONTRIBUTIONS OF THE UN/USA WORKSHOPS AND INTERNATIONAL MEETINGS 2001-2003

- Participation of experts from developing countries:
  - ◆ **Cumulative total number of participants = 760**
    - Workshops/meetings held in 2001-2003:
      1. Regional Workshop for the benefit of countries in Asia and the Pacific (Kuala Lumpur, Malaysia, 20-24 August 2001);
      2. Regional Workshop for the benefit of countries in Eastern Europe (Vienna, Austria, 26-30 November 2001);
      3. Regional Workshop for the benefit of countries in Latin America and the Caribbean (Santiago, Chile, 1-5 April 2002);
      4. Regional Workshop for the benefit of countries in Africa (Lusaka, Zambia, 15-19 July 2002);
      5. International Expert Meeting (Vienna, Austria, 11-15 November 2002);
      6. International Workshop (Vienna, Austria, 8-12 December 2003).



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## CONTRIBUTIONS OF THE UN/USA WORKSHOPS AND INTERNATIONAL MEETINGS 2001-2003 (continued)

- Inputs for the work of the Action Team:
  - ◆ Information on GNSS applications and training opportunities
  - ◆ Requirements of developing countries and identification of gaps in meeting those requirements
  - ◆ Recommendations to be made by the Action Team



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## PRODUCT: Report to COPUOS

- Information on relevant national and international activities on promoting use, access to and quality of GNSS services
- Proposals for specific recommendations for COPUOS and other relevant UN entities, non-governmental entities as well as UN Member States and international organizations concerning development, coordination and increased use of GNSS, particularly for the benefit of developing countries
  - ◆ Summary version of the report has been submitted to the Scientific and Technical Subcommittee of COPUOS
  - ◆ Full report to be shortly finalized, incorporating comments received at the 9th meeting of the Action Team (27 February 2004).





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## MAIN FINDINGS

- GNSS and their augmentations are generally recognized as being useful for a wide range of societal, civil and commercial applications. System providers are working to increase awareness among policy makers of the benefits of this technology, but the task is beyond the resources of any individual operator. A coordination mechanism involving operators of GNSS and their augmentations, as well as appropriate international organizations, could easily be established for this purpose.
- While current and future GNSS operators are in a competitive mode, it is fully expected that collaboration will increase in order to serve the user community better. Outreach efforts must move beyond simple awareness among the general public and experts to provide assistance in the integration of GNSS into the basic infrastructure (government, commercial and scientific) of countries, particularly in the developing world.





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## MAIN FINDINGS (Continued)

- GNSS signal security and integrity are one of the top priorities for the global user community, regardless of application. There is an urgent need for assistance to national and regional authorities, in particular in developing countries, to establish mechanisms for identifying and eliminating sources of interference that could degrade signals from GNSS and their augmentations.





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## MAIN RECOMMENDATIONS

### 1. Establishment of an International Committee on GNSS (ICG)

#### Objectives:

- (a) To benefit users of navigation services through consultations among members of the Committee;
- (b) To encourage coordination among providers of GNSS core systems and augmentations in order to ensure greater compatibility and interoperability;
- (c) To encourage and promote the introduction and utilization of satellite navigation services, in particular in developing countries, through assistance with the integration of GNSS services into their infrastructure;
- (d) To assist both the members of the Committee and the international user community by, *inter alia*, serving as the focal point for the international exchange of information related to GNSS activities;
- (e) To better address future user needs in the GNSS development plans and applications





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## MAIN RECOMMENDATIONS

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

- **Members and observers:**

(a) GNSS system providers: GPS (United States), GLONASS (Russian Federation), GALILEO (European Union)

(b) GNSS augmentation system providers: GAGAN (India), EGNOS (European Union), WAAS (United States), MSAS (Japan) and other compatible systems

(c) International organizations and associations dealing with global GNSS service and applications (e.g. UN/OOSA, ICAO, IMO, ITU, CGSIC, IAG, IAIN, ICA, IGS, ISPRS, FIG) may participate as members or observers



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## MAIN RECOMMENDATIONS

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

- **Activities that could be undertaken by ICG:**
  - ◆ Address the issues relating to the adoption of and adherence to common standards
    - (ICG itself would not set standards and should instead identify applications where no standards currently exist)
  - ◆ Consider the establishment of user information centres by GNSS providers
    - (UN/OOSA could combine all the web sites into a single site to act as a portal for any user of any GNSS service)
  - ◆ Organize and sponsor regional workshops and other activities to achieve the objectives of ICG
  - ◆ Establish links with national and regional authorities, in particular in developing countries
    - (including establishment of mechanisms to identify and eliminate sources of electromagnetic interference that can degrade signals from GNSS and their augmentations)



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## MAIN RECOMMENDATIONS

### 2. GNSS Activities of the Office for Outer Space Affairs (OOSA)

- ◆ Through the UN Programme on Space Applications, OOSA should continue to hold regional workshops for promoting the use of GNSS their augmentations in developing countries
- ◆ The regional centres for space science and technology education affiliated to the UN should consider including GNSS programmes in their training activities
- ◆ In cooperation with GNSS and augmentation providers, or ICG, OOSA should maintain a web site to be developed.
  - The web site could include information on systems descriptions, recent application developments, training opportunities, sources for assistance in integrating GNSS into national infrastructure as well as in protecting signal reliability and integrity at the national and regional levels.





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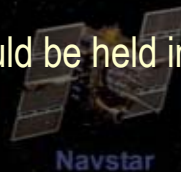
## NEXT STEPS

### 1. Work of the Action Team

- ◆ Members to seek for support within their countries/organizations and at GNSS-related events for the recommendations of the Action Team for inclusion in the report of COPUOS to the General Assembly, for UNISPACE III+5 Review.
  - Next session of COPUOS: 2-11 June 2004
  - General Assembly UNISPACE III+5 Review: October 2004
- ◆ Finalize the full report and disseminate it widely as a reference material (as a special publication and CD-ROM).
- ◆ Plan for a first meeting of the International Committee on GNSS (ICG)
  - Revise the draft terms of reference
  - Discuss actions to be undertaken toward the establishment of ICG

### 2. GNSS Activities through UN/OOSA

- ◆ OOSA to assess the proposals made during the UN/USA International Workshop on GNSS (December 2003) and to present a work plan for 2004-2005, indicating which initiatives/proposals would be supported by OOSA
  - OOSA plans to organize an international meeting on GNSS in November/December 2004 in Vienna
  - A first meeting of ICG could be held in conjunction with that meeting







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## POSSIBLE GNSS ACTIVITIES THAT COULD BE SUPPORTED BY UN/OOSA IN 2004-2005

1. Sponsorship of planned international meetings relating to GNSS e.g. GNSS workshop/seminar planned in Colombia within the framework of the Fourth Space Conference of the Americas with the focus on transportation
2. Organization of expert/technical meetings in developing countries
  - ◆ To provide focused training in such areas as the use and applications of GNSS for, *inter alia*, i) enhancing transport safety; and ii) supporting geo-sciences.
  - ◆ To conduct studies in such areas as: i) development of ionospheric models, including measurements related to GNSS; ii) region-specific phenomena such as the geomagnetic equatorial anomaly
  - ◆ To support the initial phase of implementing projects such as: i) African reference frame (AFREF); ii) European Position Determination System (EUPOS); iii) Geocentric Reference System for the Americas (SIRGAS)



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## POSSIBLE GNSS ACTIVITIES THAT COULD BE SUPPORTED BY UN/OOSA IN 2004-2005 (continued)

3. Support to the establishment of an International Committee on GNSS
4. Support to the establishment of task forces/boards/action teams with focus on specific applications
  - ♦ e.g. in the area of agriculture and management of natural resources

