



International Engagement Subcommittee Report

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- Members:
 - Matt Higgins, Chair
 - Renato Filjar
Vice-Chair
 - Terry Moore
Vice Chair **
 - Jade Morton
 - Jeffrey Shane
 - Russ Shields
 - Todd Walter
- *Non-US citizens input on issues from international perspective.*
- *Balanced by input from US members on what the US needs from international engagement.*
- Role/ Study Areas:
 - Interfacing with international community (ICG, etc.)
 - Pursue GNSS compatibility & interoperability
 - GNSS service & performance gaps vs. synergies
 - Collaboration vs. competition

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Assessment of Other GNSS Compared to GPS

We have been developing a series of Fact Sheets assessing characteristics of other GNSS that are not currently available on GPS.

System Capability

GEO Satellites

IGSO Satellites

Improved Broadcast Ionosphere Model

Configurable Payload (SDR)

Intersatellite Links

Ground Segment Coverage

Improved Satellite Clocks

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Service Capability

Search and Rescue

Emergency Warning Service

Short Messaging Service

High Accuracy Service

Open Authentication

Commercial Authentication

Template and Example of a Fact Sheet

Topic	Inter-Satellite Links
Description	Already deployed by BeiDou and planned for Galileo 2 nd generation
Advantages	<ul style="list-style-type: none">• Can be deployed as radio or optical links.• Inter-satellite communication improves timeliness of satellite orbit and health information with less reliance on uplink stations.• Inter-satellite ranging improves orbit accuracy with less reliance on monitor stations.
Value for GPS	Would enable increased performance with decreased reliance on ground infrastructure
Planned for GPS	Unsure
Best on GPS or other technology	Deployed on future GPS.
Recommended Response by US	

Assessment of Other GNSS Compared to GPS

System Capability	Progress
GEO Satellites	Needs consideration with LEOs etc
IGSO Satellites	Needs consideration with LEOs etc
Improved Broadcast Iono Model	Draft Complete*
Configurable Payload (SDR)	Further work required?
Intersatellite Links	Draft Complete
Ground Segment Coverage	Further work required?
Improved Satellite Clocks	Further work required?

Assessment of Other GNSS Compared to GPS

Service Capability	Progress
Search and Rescue	Further work required?
Emergency Warning Service	Draft Complete
Short Messaging Service	Further work required?
High Accuracy Service	Being Pursued by ECAS Subcommittee
Open Authentication	Draft Complete
Commercial Authentication	Further work required?

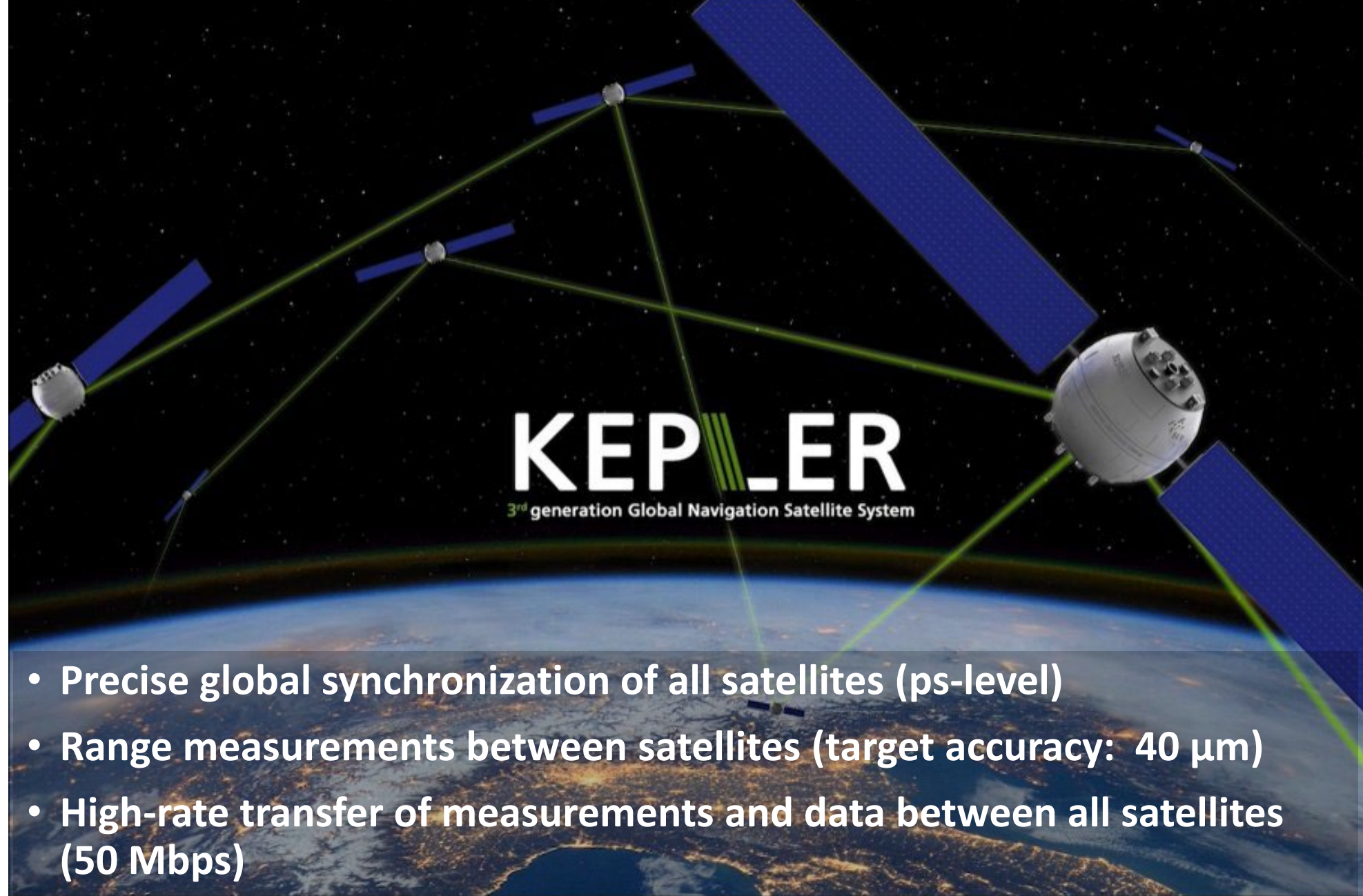
Next Steps

- Decided the existing Draft Fact Sheets are sufficient for initial publication.
- Need to draft introductory pages to pull fact sheets together into a single white paper publication on GPS.gov ~ aim to distribute draft White Paper to wider Advisory Board in coming months.
 - Needs to cover constructive aspects of the role of GPS in setting the stage for development of other GNSS.
- That will be the “What”, we then need to move “So What?”
 - Need assessment by US Govt Agencies on which items are worth progressing?
 - Some might already be planned (NTS-3?) or should be done by Govt.
 - Some may need more development by the Board ~ these should probably go to ECAS SC to be developed as has been done for HARS.

International Developments Continue



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International Developments Continue



- LEOs support intra-system synchronization by establishing optical links to MEO satellites on different orbital planes
- Maintain system time realized via an ensemble of long-term stable clocks.
- Support precise orbit determination by providing atmospheric-free observations of the transmitted navigation signals vs inter-satellite laser ranging measurements

Additional Discussion

- Our meetings are attended by US Government representatives
~ very useful to have direct input to our Fact Finding.
- Agreed role for IE SC to continue to monitor international developments of relevance to the Board.
- Including monitoring international standards activities relevant to PNT
- GPS 50th ~ IE SC can help to make it a truly global celebration.
- Recognition that current GPS is not the only activity for US PNT.
 - NTS-3.
 - Space Development Agency “Proliferated Warfighter Space Architecture”.
 - Commercial players in LEO PNT.
 - Potential policy issues for the Board; not just IE SC.
- We agreed to aim for online meetings every 6 weeks.