“Azercosmos” Open Joint Stock Company

UNITED NATIONS/LATVIA WORKSHOP ON THE APPLICATIONS OF GLOBAL NAVIGATION SATELLITE SYSTEMS

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Context

- “Azercosmos” Open Joint Stock Company
- Azerspace/Africasat-1A satellite
- Azerspace/Africasat-1A and GNSS application
- Attitude determination using GNSS
- Cooperation and training

Azercosmos OJSC

Azercosmos Open Joint Stock Company was established in:

• 3th May 2010 by the Decree of the President of the Republic of Azerbaijan

to:

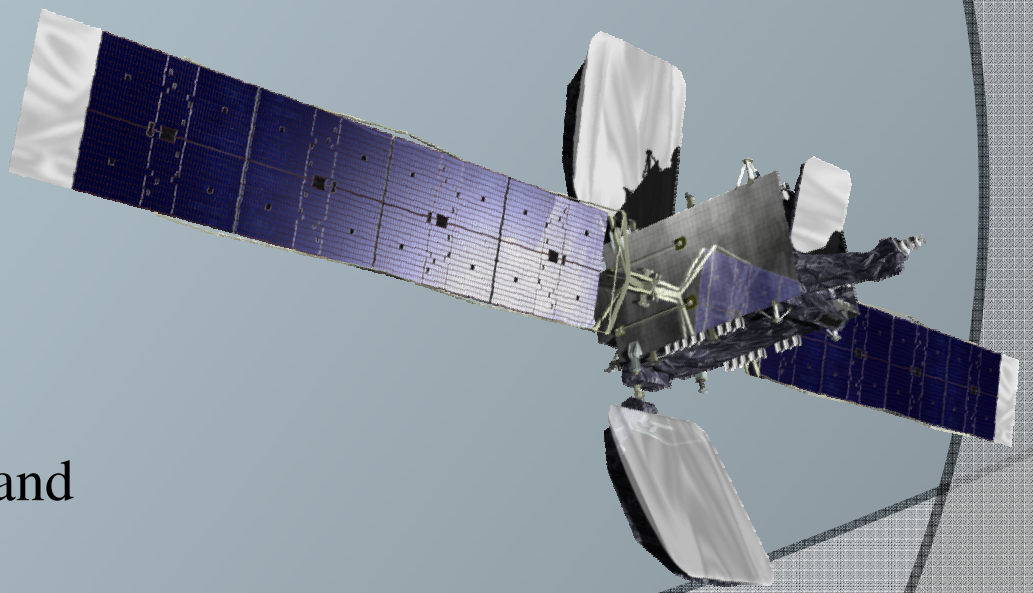
• Launch the Azerbaijani telecommunication satellites into orbit
• Organize further management and operation
• Provide satellite communications services

Azercosmos is also responsible for:

• Launching the remote sensing satellites
• Launching other telecommunications satellites

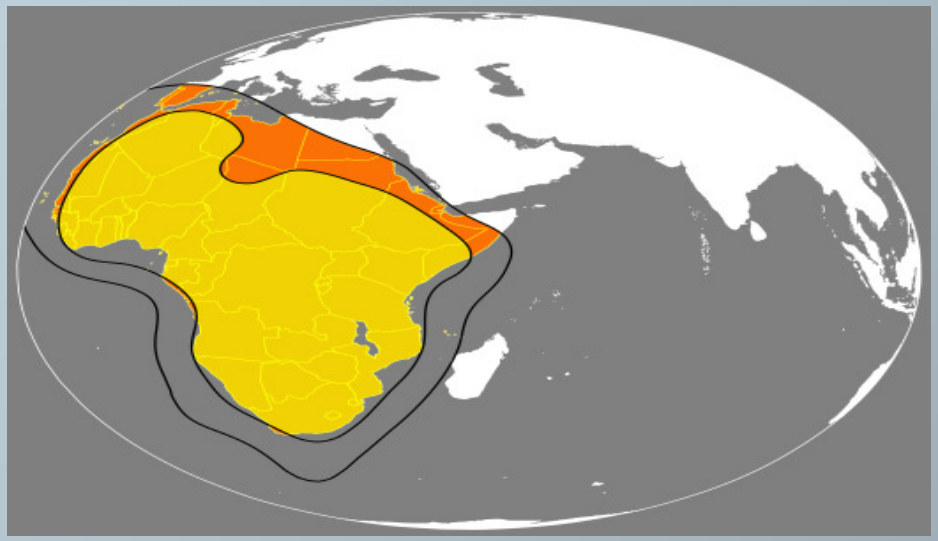
AzerSpace/Africasat-1A

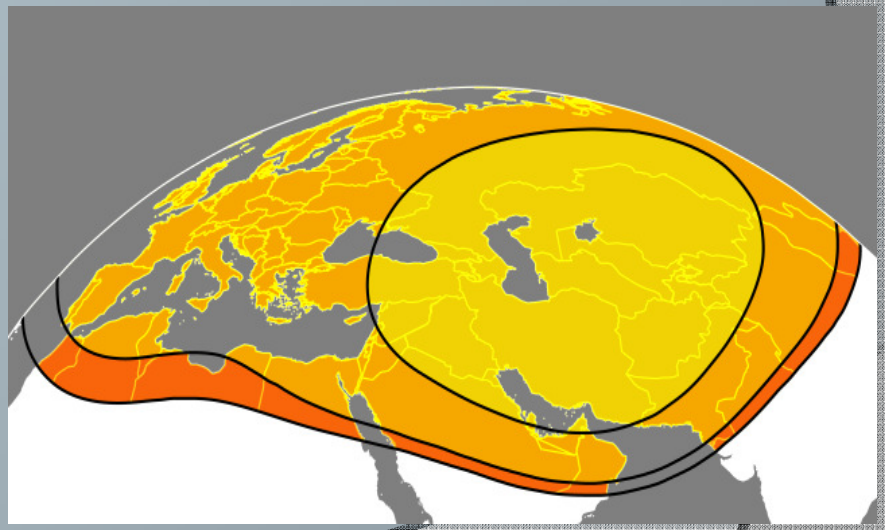
Satellite manufacturer: Orbital Sciences Corporation
Bus: STAR – 2.4
Stabilization: 3-axis stabilized
Launch vehicle: Ariane – 5 ECA
Site: Kourou, French Guiana
Launch date: Q4 2012
Service life: 15 years (designed)
Payload power: 5 KWt
Transponders: 24 C-band, 12 Ku-band
Location: 46 degrees East longitude



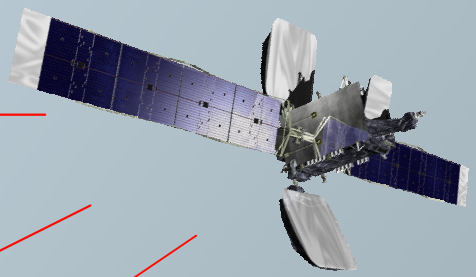
AzerSpace/Africasat-1A

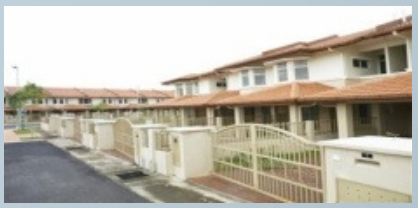
The Azerspace/Africasat-1a satellite will provide services to Azerbaijan, Central Asia, Europe and Africa.





Azerspace/Africasat-1A





Azerspace/Africasat-1A and GNSS application

Modern telecommunications networks use highly accurate primary reference clocks. Many systems often rely on this precise timing to synchronize RF generating equipment, network equipment, and multiplexers by use GNSS as a source of accurate time.

TIME AND FREQUENCY REFERENCE SYSTEM

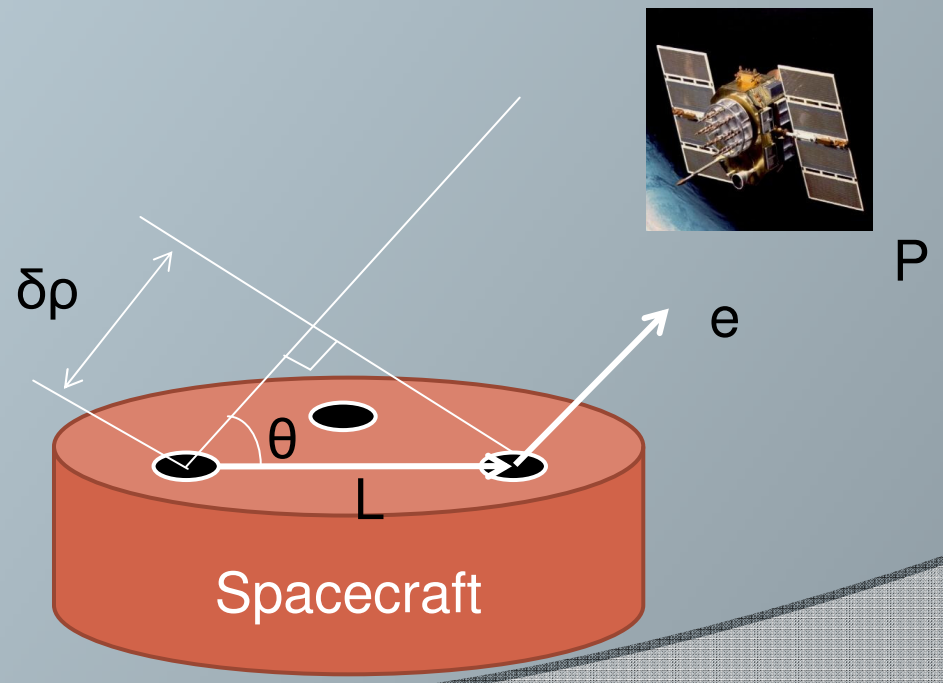
GPS ANTENNA

GPS RECEIVER

Attitude determination using GNSS

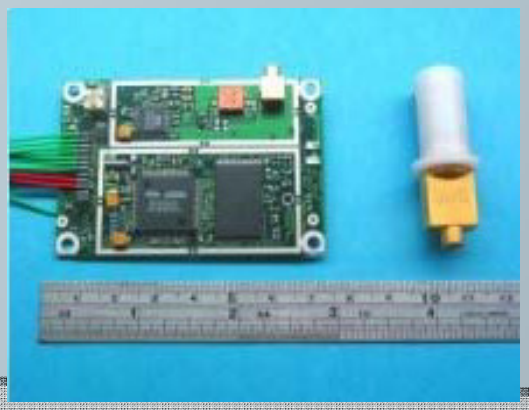
If L is the baseline vector between two such antenna, and e is the unit vector along the line of sight to a GPS satellite P, then the range from P to each of the antenna differs by an amount

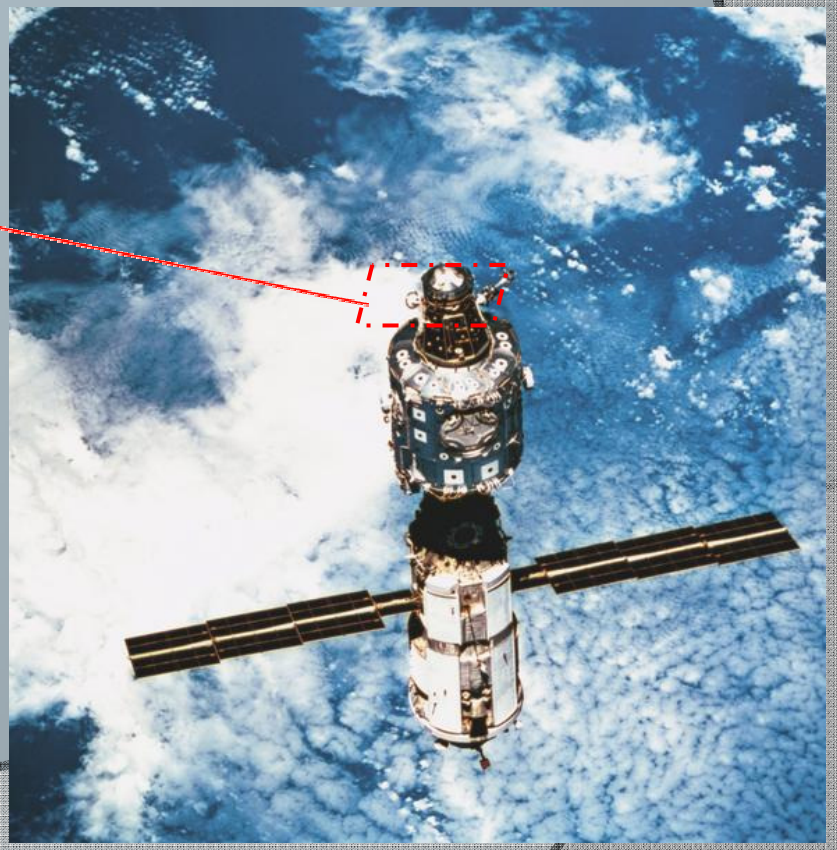
$$\delta\rho = \mathbf{L}.\mathbf{e} = L\cos\theta$$



Attitude determination using GNSS

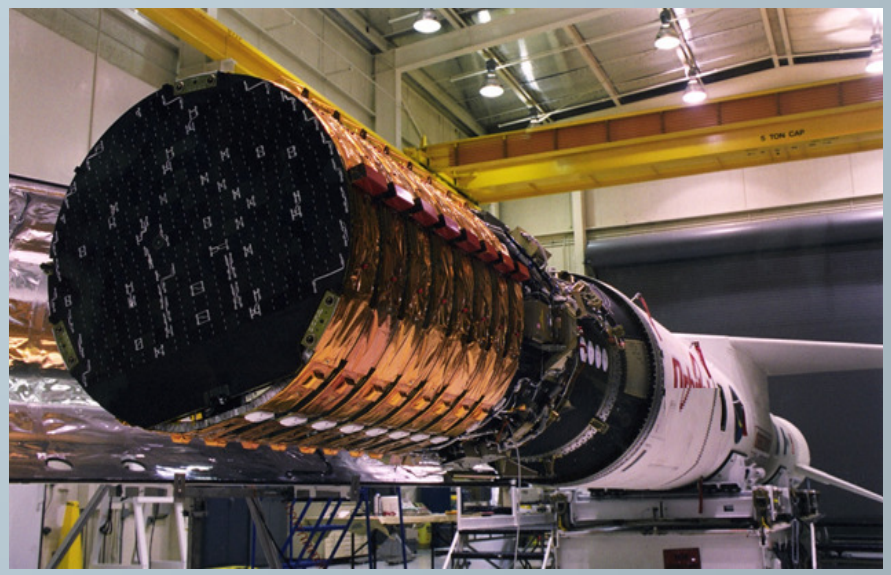
Accuracies of the order of ~0.1 deg are possible, although this will depend on the length of the baseline.

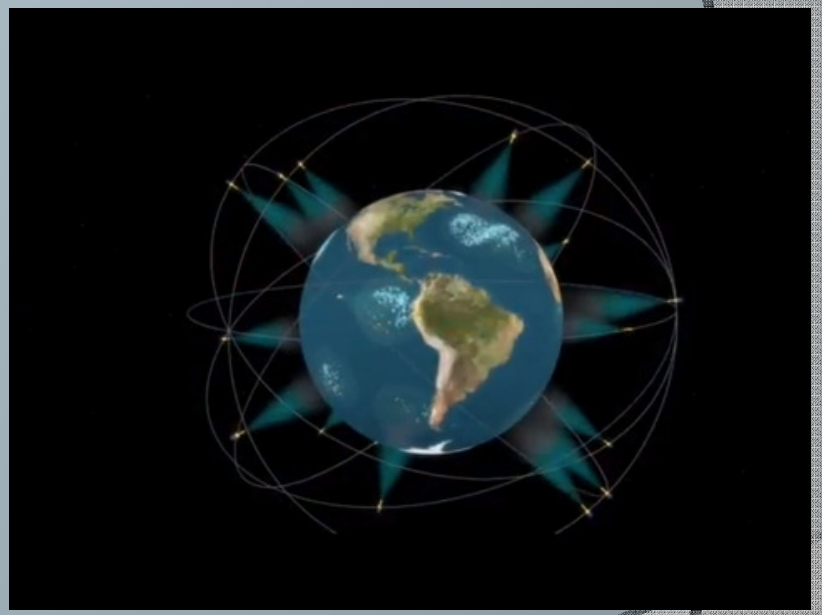




Examples of using GNSS on telecommunication systems

Spacecrafts use the GNSS as a navigational tool. The addition of a GNSS receiver to a spacecraft allows precise orbit determination without ground tracking. This, in turn, enables autonomous spacecraft navigation, formation flying and autonomous rendezvous.





Low earth orbit satellite constellations such as the one operated by Orbcomm uses GPS receivers on all satellites.

Cooperation and Training

Telesat

Orbital

MEASAT

gmv INNOVATING SOLUTIONS

Ernst & Young

arianespace Service & Solutions

Azercosmos pays a particular attention to the cooperation with international partners such as Measat, Arian Space, Orbital, Ernst & Young and GMV.

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