Space Mission Areas

Force Enhancement

Support

Control

Force Application

Components of EOP

Universal Time

Coordinates of the Pole

Celestial Pole Offsets

Astrometry

Relates to Precise Measurements and explanations of the positions and movements of stars and other celestial bodies

Atmospheric Drag

Causes Satellite Errors

Results from Expansion of Atmosphere

Atmsophere expands due to Bombarding of charged Particles

Space Situtational Awareness - SSA

Current and predictive Knowledge of everything happening in the space environment relating to space operations

Geosynchronous Orbit

A satellite that completes one revolution per day (e.g. the moon)

Ineffective at the Poles

Used for some communications

the Sun

Fueled by Nuclear Fusion

Has the biggest effect on the Space Env't

By-product is Electromagnetic Radiation

By-product is Electrically Charged Particles

Network Synchronization

Keeps GPS computers automatically updated and on the exact same time

Key Objectives of SSA

Ensure Space Operations and Spaceflight Safety

Implement Int'l Treaties and Agreements

Protect Space Capabilities

Protect Military Operations and Nat'l Interests

Disadvantages of Space ISR

Access Limitations

Predictable Fly-over Schedule

Atmospheric Disturbances & Weather

Administrative Limitations

Polar Orbit

Passes over the Entire surface of the Earth

Imagery Satellites

90 degree inclination

Low Earth Orbit - LEO

150 to 800 miles above the Earth

2 Space Launch Facilities

Vandenberg Air Force Base, California

Cape Canaveral Kennedy Space Center, Florida

Advantages of Space ISR

Coverage of AOIs w/o detection and w/o sanctions

More Precise Targeting

Enhanced Planning from Imagery

Medium Earth Orbit - MEO

22, 300 miles above the Earth

Between LEO and GEO orbits

Offer better Round-trip Time than GEO satellites

Components of SSA

Intelligence

Surveillance

Reconnaissance

Environmental Monitoring

Space Common Operating Picture

GPS Satellites

21 Active, 3 Spare

Each contains: Computer, Atomic Clock, Radio

Receiver on the Ground Triangulates w/ 3 Satellites

Solar Winds

Stem from the Sun's Corona and are Responsible for Geomagnetic Storms that: Knock out Power Grids and cause the Auroras

Global Positioning System - GPS

Global Navigation Satellite System

Advantages of GPS

Accuracy

Accessibility

Graceful Degradation

Jamming

Anti Spoofing

High Earth Orbit - HEO

Higher than 22,300 miles above the Earth

Useful for Communications Satellites

Van Allen Radiation Belts

Impacts Comms Satellites in Geosynchronous Satellite Orbit

Earth Orientation Parameters - EOP

Describes Earth's Irregularities due to uneven rotation by providing Earth's rotation as a function of time

Solar Cycle

11 year Cycle

4 year Rise to Maximum

7 year Decline to Minimum

Geo-location

Wireless detection of the physical location of a remote device