

Military And Other Uses of Space

Space Policy and Law Course 2017

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Scope

- Outer Space Treaty
 - OST Peaceful Use of Space
 - Prohibition of Weapons In Space
- Military Applications of Space Systems
- Missile Technology Control Regime
- International Code of Conduct against Ballistic Missile Proliferation
- Wassenaar Arrangement

Scope Continued

- UNSCR 1540
- PPWT
- Other Attempts to 'control' space activities
- Current and Future Military Space Activities

About Me



ROYAL AIR FORCE



NorSS Ltd



Reflecting Space

Outer Space Treaty

The Treaty On Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies



Article III...

Article IV...

Peaceful Use Of

Article III

- Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding

Weapons In Space

Article IV

- Parties to the Treaty undertake **not** to place in orbit around the earth any **objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons** on celestial bodies, or **station such weapons** in outer space in any other manner.
- The moon and other celestial bodies shall be **used** by all States Parties to the Treaty **exclusively for peaceful purposes**. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.

Military Applications

JCN 1/17
Future
Force
Concept



JDP 0-30
UK Air &
Space
Doctrine



The UK Military Space
Primer (redraft)



US Military Space
Primer

JDP 0-30
UK Air &
Space
Doctrine
(redraft)



JP 3-14
US Space
Operations
Doctrine
(redraft)



Doctrine

The UK recognises three space roles:

- **Space Force Enhancement** – enables and enhances the effectiveness of other military and non-military capabilities.
- **Space Support** – launches and supports our assets in space
- **Space Control** – assures our access to space and, if necessary, deceives, disrupts or denies our adversaries their freedom of manoeuvre.

Space Support

- Space lift operations:
 - Delivery of satellites, payloads and material into space
- Satellite operations:
 - Telemetry and tracking
 - SoH monitoring
 - Maintenance
 - Payload operation

Space Control

- Space Situational Awareness (SSA)
 - Foundation of all space operations
 - Covered in greater depth later in UK context
- Space control operations
 - Defensive counter-space
 - Offensive counter-space

Space Situational Awareness

- Understand what's going into, coming out of and happening in space.
- Fusion:
 - Space Surveillance and Tracking (SST)
 - Intelligence
 - Space Environment (Space Weather)
- Missing one...

Space Control Operations

- Defensive Counter-Space Operations
 - Space Deterrence
 - Counter Space
 - Mitigation and Recovery
- Offensive Counter-Space Operations
 - Ground segment attack
 - Space segment attack

Space Force Enhancement

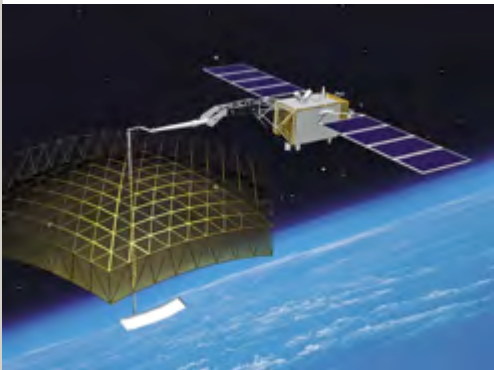
“To enable and enhance the effectiveness of our other military and non-military capabilities”

JDP 0-30

- Intelligence, surveillance and reconnaissance from space.
- Missile warning.
- Environmental monitoring.
- Satellite communications.
- Position, navigation and timing

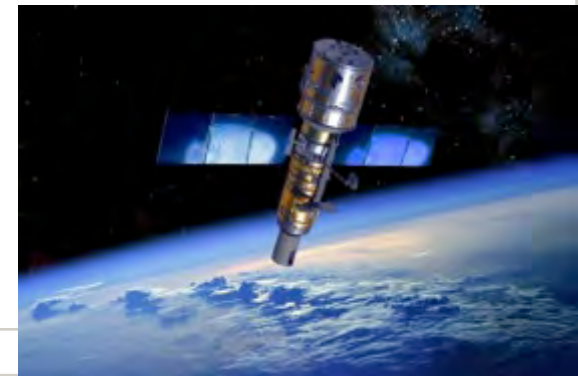
Intelligence, Surveillance and Reconnaissance from Space

- Freedom of manoeuvre
- Global access



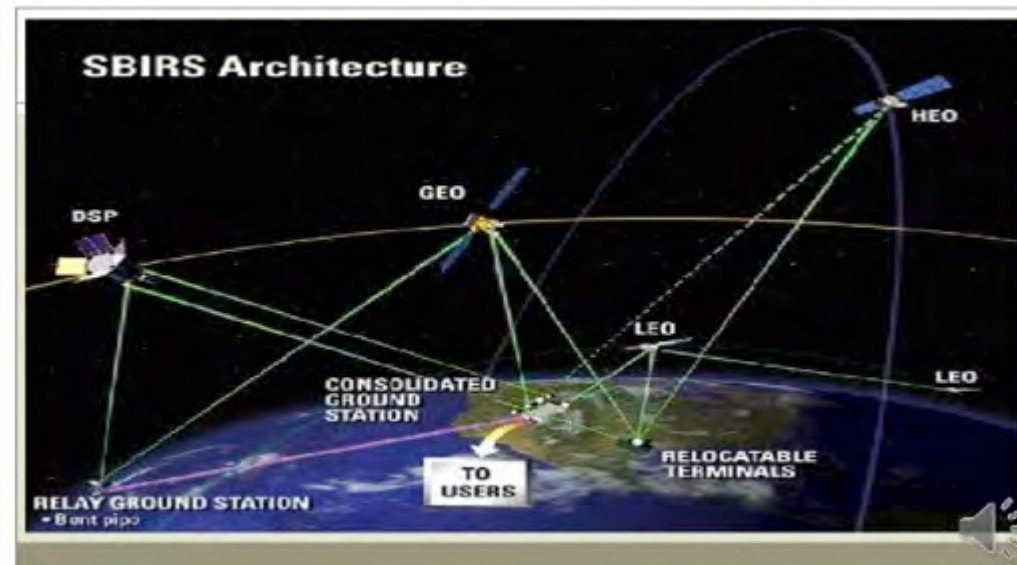
- Electro-optical
- Radar
- Signal Intelligence

- Dual use
- Commercial accessibility
- SAR, NUDET, AIS



Missile Warning

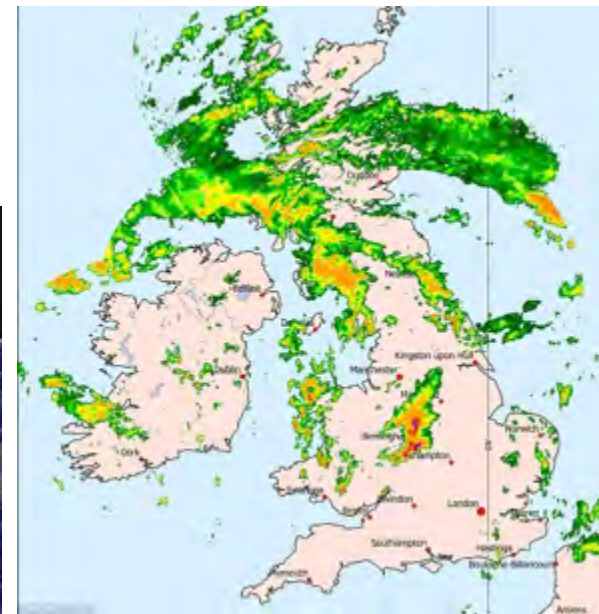
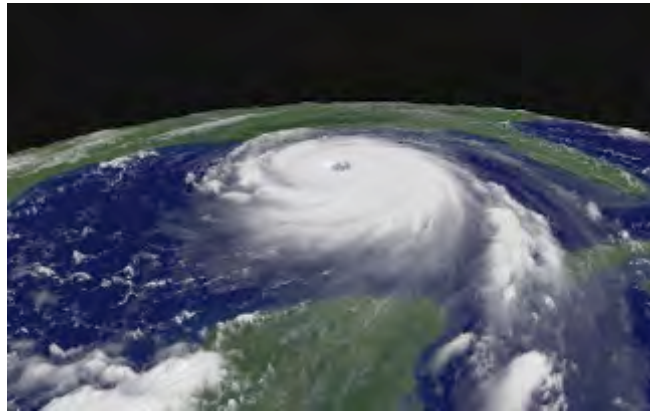
- Space-Based Infra-Red System in conjunction with ground based sensors.
- Supporting both Strategic and Tactical ops
- Global coverage predicting:
 - Missile flight paths
 - Likely target areas
 - Time to impact from initial detection data



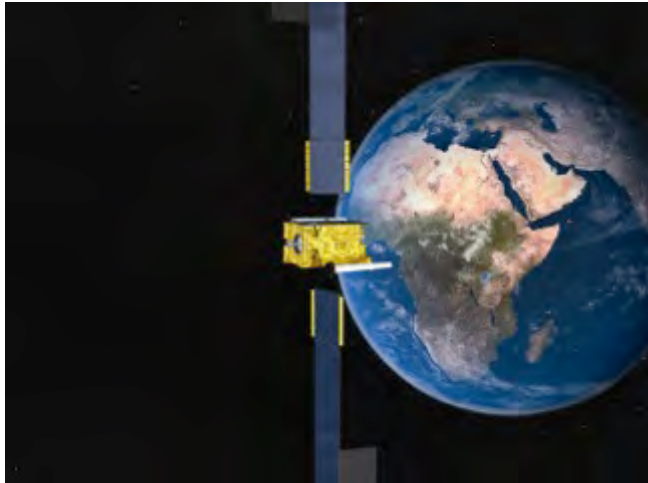
Environmental Monitoring



Space-based capabilities provide data on meteorological, oceanographic and space environment factors for operational planning.....



Satellite Communications



- The ability to communicate beyond line-of-sight.
- Effective and timely reach back.
- Susceptible to space weather

- Deployed forces backbone
- RPAS control
- Broadcast
- Dissemination
- Blue Force Tracker
- Welfare

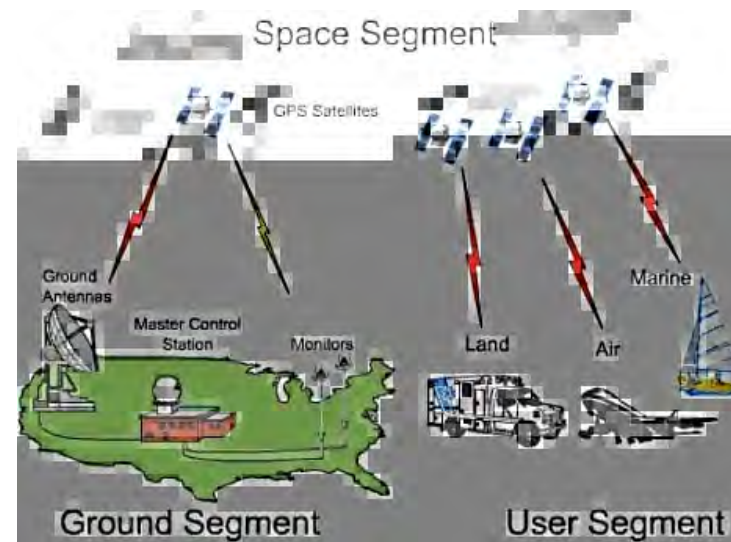


Position, Navigation and Timing



- Almost all of modern military capabilities depend on GNSS.

- All weather precision weapons guidance
- Personnel and platform navigation
- Automatic location
- Mine location, fixing and clearing
- Crypto and anti-jam
- Radar timing
- Data links



Space Command and Control



UK Space Operations
Centre

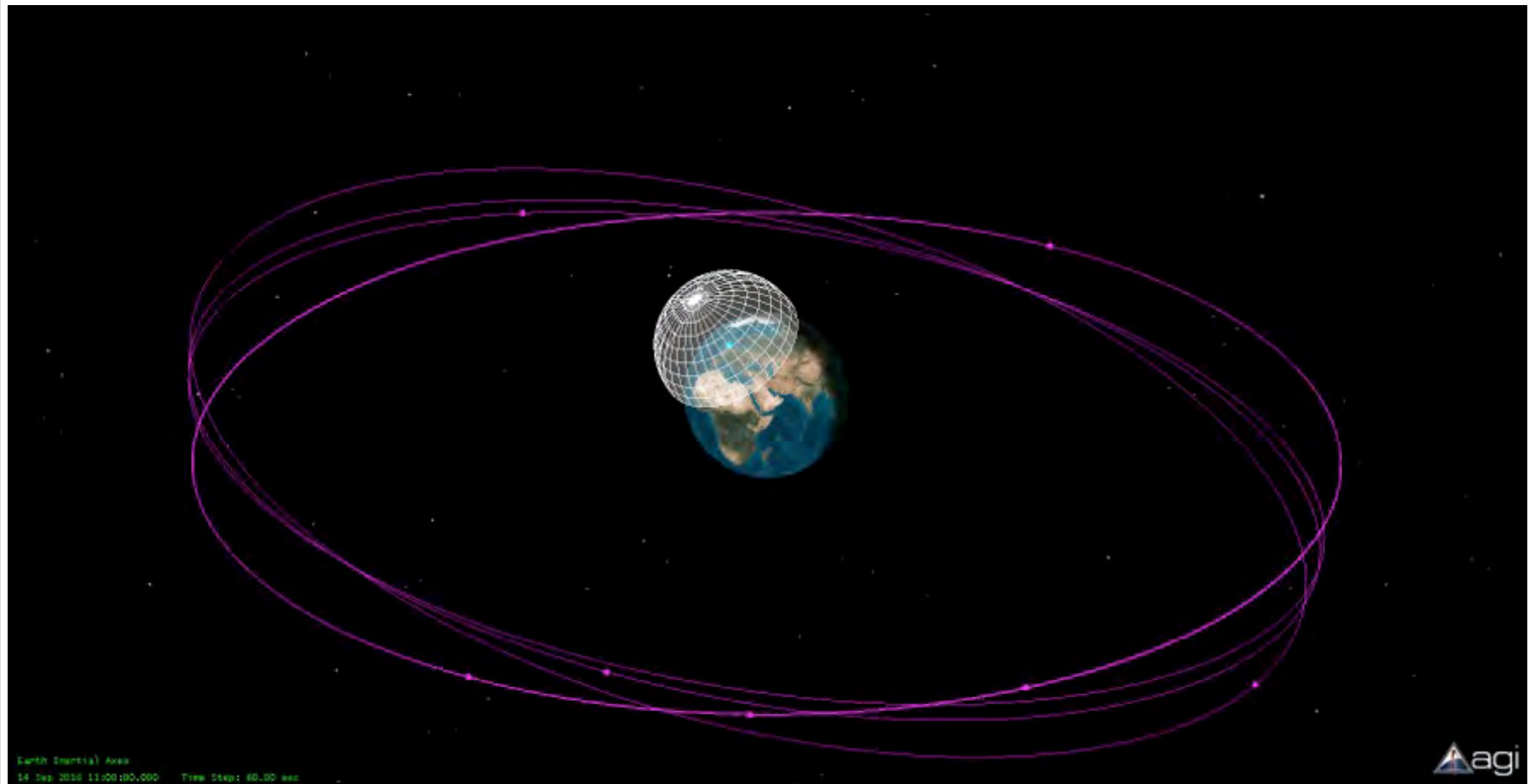
(UK SpOC)



Mission

To deliver AIR's space control and space force enhancement support capability to
UNDERSTAND and EXPLOIT the space domain, to PROTECT our access to critical space capabilities, DEFEND our national interests and integrate space control into UK military operations.

Area of Responsibility



UK SSA

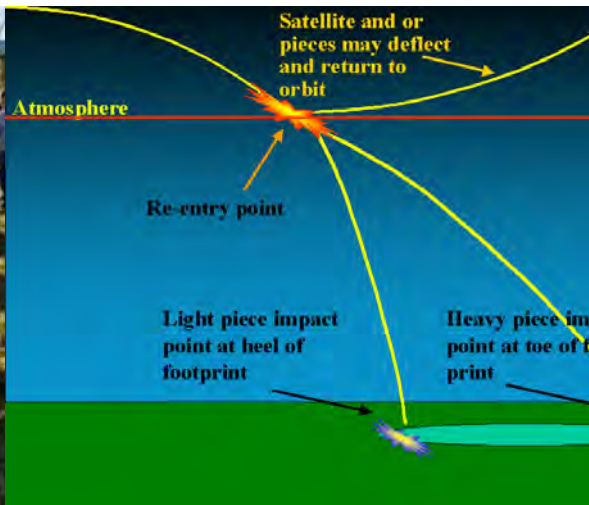
- SSA key to effective Space Control
- Identification of Space Objects
 - Objects in decay look like a Missile Attack
 - Space Surveillance Network (SSN)
 - Satellite Catalogue
 - Conjunction Analysis (collision potential)
- Radar for LEO
 - Fylingdales
 - Chilbolton
- Optical for MEO/HEO
 - STARBROOK
 - Herstmonceux



UK SSA Outputs

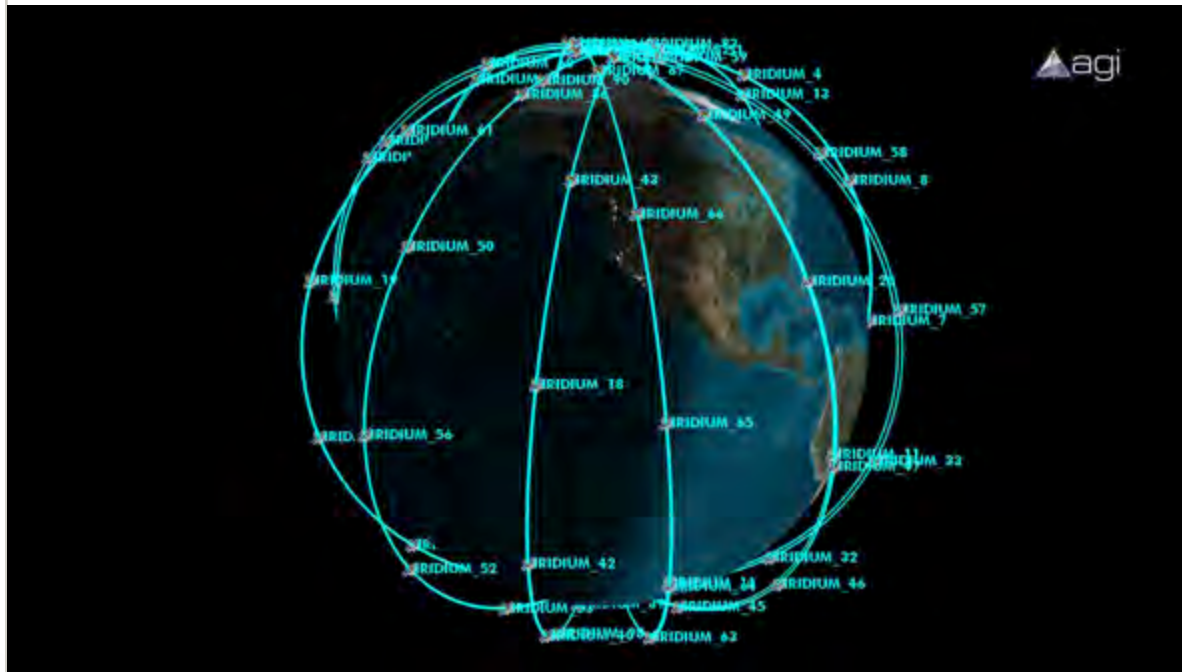
Re-entry Warning

- Space object re-entry predictions
- Advice to Civil Contingencies Secretariat of Cabinet Office
- Warning to UK CT & Resilience



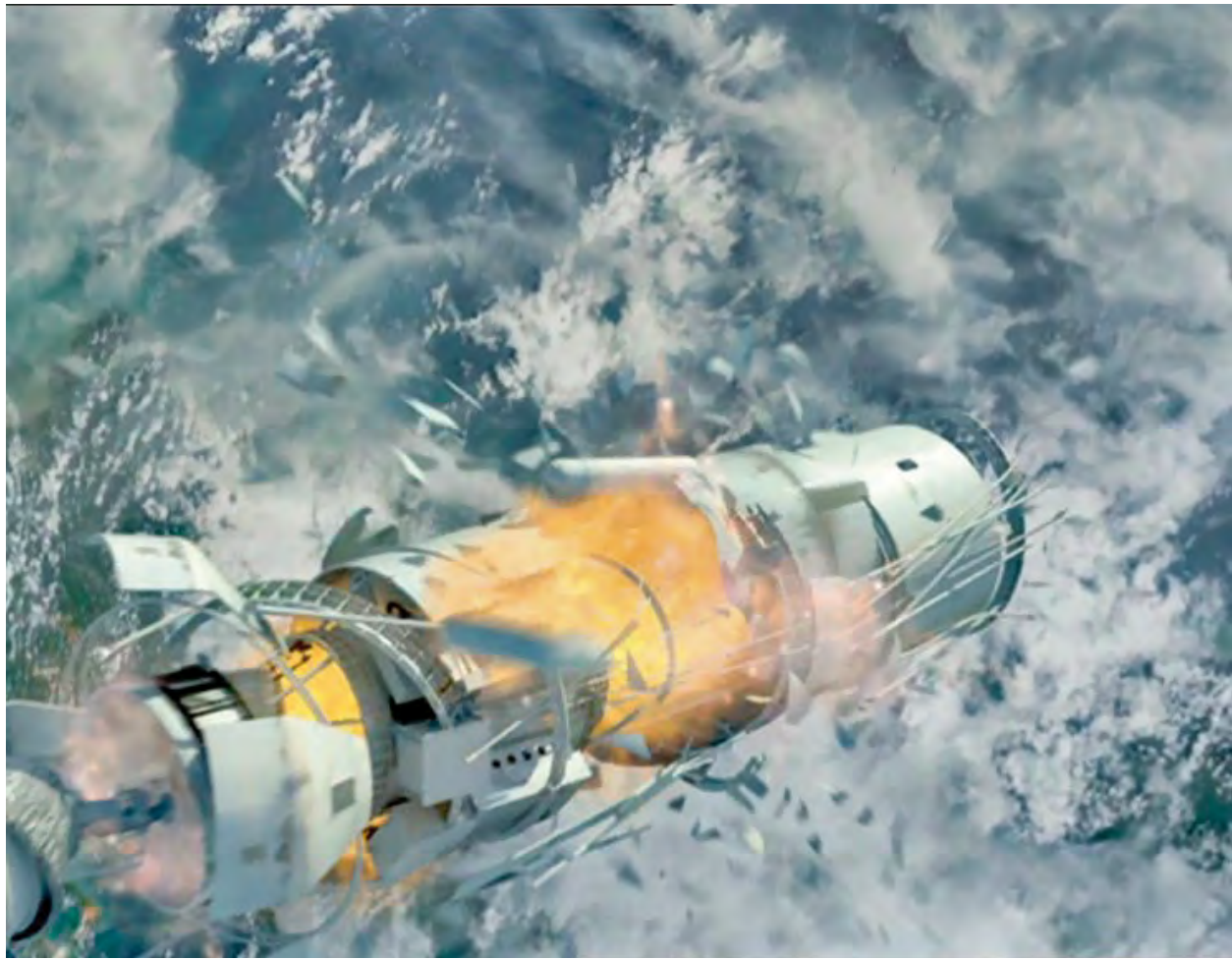
UK SSA Outputs

- Conjunction Analysis Support
- Hazard getting ever greater
- UK Satellite Owner Operators
- EU SST Support



UK SSA Outputs

- Fragmentation Analysis
- Reliant on US
- EU Service



Arms Control

- Missile Technology Control Regime
- International Code of Conduct against Ballistic Missile Proliferation
- Wassenaar Arrangement
- UNSCR 1540
- PPWT

Missile Technology Control Regime

- Aims to limit the spread of ballistic missiles and other unmanned delivery systems that could be used for chemical, biological and nuclear attacks.
- Established April 1987
- How does it affect UK launch aspirations?

Hague Code of Conduct

- International Code of Conduct against Ballistic Missile Proliferation
- Aimed at bolstering efforts to curb ballistic missile proliferation worldwide
- Meant to supplement the MTCR
- Adopted 2002

Wassenaar Arrangement

- Export Controls for Conventional Weapons and Dual-Use Goods and Technologies
- Established to contribute to regional and international security and stability.
- Export controls
- What's defined as dual use?

UNSCR 1540

- Security Council Resolution 1540
- Prevent the proliferation in all aspects of all weapons of mass destruction
- Adopted by the Security Council on 28 April 2004

PPWT

- Treaty on the Prevention of the Placement of Weapons in Outer Space.
- Russian, Chinese submission to the Conference of Disarmament 2008
- Redrafted 2014

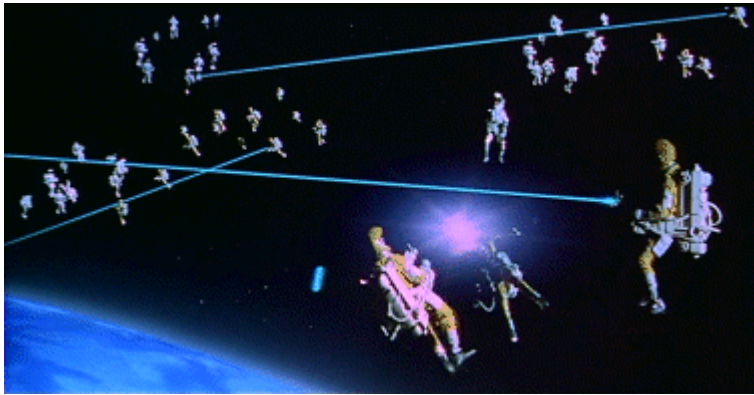
Other Controls

- International Code of Conduct for Outer Space Activities (ICoC)
- United Nations Conference on Disarmament
- SALT I Treaty 1972
- START I
- Anti-Ballistic Missile Treaty

Future Mil Space



- Space planes
- Warfare in space
- Space Traffic Control



- Space Force
- ??????????????



Questions?



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