Trends and Developments on the Nature of Threats to Space Systems

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UNODA-UNOOSA Webinar
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Orbits

Low Earth orbit (LEO): 160-2000 km; Earth observation, telecom, weather, missile warning/ISR satellites

Medium Earth orbit (MEO): 2000-35,786 km; navigation, missile warning/ISR satellites

Geosynchronous Earth orbit (GEO): 35,786 km; telecommunications, weather, missile warning/ISR, Earth observation satellites

High Earth orbit (HEO): >35,786 km; communications satellites
Elements of a Space Capability

- **Space segment**
- **Ground segment**
- **User segment**

Internet

UNODA-UNOOSA Responsible Behavior in Space
May 17, 2021
Many Ways to Attack Satellites

Soviet IS killer satellite (1960-1987)

Commercially-available GPS jammer (2014)

Satellite jamming

Normal Ops

Uplink Jamming

Downlink Jamming
Sources of RFI Interference

Source: Eutelsat briefing to the ITU (2013)
SWF’s Counterspace Threat Assessment

- Space domain undergoing significant changes
- Existence of counterspace capabilities is not new, but the circumstances surrounding them are
- Discussions of space capabilities often veer quickly into classified territory
- Global Counterspace Capabilities: An Open Source Assessment
  - Significant research and development of a broad range of kinetic (i.e. destructive) and non-destructive counterspace capabilities in multiple countries: direct ascent, co-orbital, electronic warfare, directed energy, cyber
  - US, Russia, China, Iran, North Korea, India, France, and Japan
  - Policy, organizations, military utility, Space Situational Awareness (SSA)
  - Only non-destructive capabilities are actively being used in current military operations
- https://swfound.org/counterspace; French-, Spanish-, Mandarin-, and Russian-language versions of the executive summary available
## Global Assessment of Counterspace Capabilities

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**Legend:**
- none $\text{R}$
- some $\text{Y}$
- significant $\text{G}$
Questions?

Thanks.

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