

SSA and Space Security: An Update

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Space Situational Awareness (SSA) Trends

- Increasing emphasis on commercial actors providing military SSA capabilities
 - Part of this is tied to “maneuver without regret”, dynamic space operations
 - GSSAP: Next iteration (RG-XX) will be provided by a commercial entity
 - Blurred lined between SSA and inspector satellites, aka co-orbital counterspace capabilities
 - Chinese focus on space-based SSA, rather than ground-based SSA
- Deep Space Advanced Radar Capability (DARC) held its first test, delayed
- Traffic Coordination System for Space (TRaCSS) in trouble
 - EU SST stepping up to share SSA data
 - Rise of commercial SSA companies
 - Question: what is “basic” spaceflight safety?



COPUOS' SSA Expert Group

- Created at June 2025 plenary of the UN Committee on Peaceful Uses of Outer Space (COPUOS)
 - “[N]o dedicated mechanism exists to discuss data formats and coordination of global SSA information sharing”
- Proposed by the UAE to facilitate “discussions to improve information sharing and development of best practices within the framework of the Scientific and Technical Sub-Committee (STSC) of COPUOS”
 - Meant to create actionable outcomes that complement existing frameworks and come up with voluntary standards to enhance space traffic coordination and space safety
- Will include private sector actors
- Goal is to have a report by UNISPACE IV in 2027



“Iron Dome for America”

- Jan. 27, 2025, President Donald Trump released Executive Order (EO) 14186, “An Iron Dome for America”
 - Sets out the mission of “deploying and maintaining a next-generation missile defense shield”
 - Calls for the Secretary of Defense to submit within 60 days an architecture, capabilities requirements, and implementation plan for the “Development and deployment of proliferated space-based interceptors capable of boost-phase intercept”
 - By end of February 2025, renamed “Golden Dome for America”



How Golden Dome is Envisioned to Work

- Multilayered defense system that would protect U.S. homeland from all types of threats: ballistic missile, cruise missile, hypersonic weapons, even drones
- System of systems that would incorporate much of existing ballistic missile defense (BMD) system's elements
 - Multiple intercept attempts
 - Defend not just against limited ICBM attack from rogue states but against attacks from peer and near-peer rivals
- Space-based sensor network (including Space Defense Agency's Proliferated Warfighter Space Architecture, PWSA)
- Space-based interceptor (SBI) layer
 - Kinetic interceptors, possibly also directed energy weapons?



Golden Dome's Timeline and Costs (1)

- Driving this all: Trump said that Golden Dome will be fully operational before the end of his term in January 2029, be nearly 100% effective, and cost \$175 billion
 - July 2025 reconciliation bill by Congress gave it \$24.4 billion to start
 - Pentagon has been charged with having an integrated test of the system by early November 2028
- USSF's Gen. Michael Guetlein confirmed by US Senate to be the "Golden Dome czar" July 17; given 60 days to come up with a notional architecture
 - Briefed Congress on Sept. 17
 - 4 integrated layers – 3 land-based, 1 space-based – plus 11 short-range missile defense batteries scattered across the United States
 - Mid-November, must brief Congress on full implementation plan with satellite and ground details



Golden Dome's Timeline and Costs (2)

- Todd Harrison: “iron triangle” of cost, schedule, and performance
- It all truly depends on what is planned and what the threat is anticipated to look like
 - Accelerated homeland defense architecture: cost over 20 years - \$471 billion
 - Limited tactical defense: cost over 20 years - \$252 billion
 - Space-centric strategic defense: cost over 20 years - \$2.4 trillion
 - Balanced all-threat strategic defense: cost over 20 years - \$1 trillion
 - Robust all-threat defense: cost over 20 years - \$3.6 trillion
 - SBIs will be what drives the costs



Issues with Golden Dome (1)

- SBIs' technical challenges
 - Boost phase intercept is very short
 - Absentee problem means that many, many interceptors are needed to ensure coverage; maybe 1000 for each missile launched in a salvo
 - Only have a very short time to make a decision to act; the more time given, the more interceptors will be needed
 - Space traffic management issues but also very high costs to operate and maintain
- SBIs are questionable BMD boost phase interceptors but would be pretty reliable anti-satellite systems
- Introducing actual weapons in space – crossing a line that will have ripple effects we can't fully anticipate



Issues with Golden Dome (2)

- Missile defense – against ICBM-class targets – does not have a great track record
 - Ground-based Midcourse Missile Defense (GMD) system has had a success rate during testing of about 55%
 - Never tested missile defense in a shoot-look-shoot capacity
- Up-end strategic stability
 - During the Cold War, US and USSR negotiated the 1972 Anti-Ballistic Missile (ABM) Treaty due to concerns about missile defense spurring an arms race; US withdrew officially in 2002
 - Russia and China: criticized it in May, then Russia immediately walked it back
 - Hadn't been mentioned in the OEWG on PAROS meetings but **was** called out during UNIDIR space security conference earlier this month



USSF Policy Evolutions

- Space Warfighting Framework – April 2025
 - Saltzman: “In conflict, space will be a contested environment. We are the military Service dedicated to fighting in it”
 - USSF must “be prepared to conduct warfare to deter or compel adversary behavior, undermine adversary intent, and enable joint all-domain application of force, through force or the threat of force in, from, and to the space domain”
- International Partnership Strategy – June 2025
 - US’ “greatest asymmetric strategic advantage is the global network of Allies and partners and like minded nations who remain committed to security and stability in space”
 - Integrate allies into USSF development activities and max opportunities for their participation
 - But GAO report of July 2025 notes issues with classification, overlapping roles, staffing issues that complicates this

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Questions?

Thanks.

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