



Promoting Cooperative Solutions for Space Sustainability

Potential Counterspace Capabilities Around the World

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Note: This briefing is compiled entirely from public, unclassified sources

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
- SWF's Global Counterspace Capabilities: An Open Source Assessment
 - Significant research and development of a broad range of kinetic (i.e. destructive) and non-kinetic counterspace capabilities in multiple countries: direct ascent, co-orbital, electronic warfare, directed energy, cyber
 - US, Russia, China, Iran, North Korea, India
 - ***Only non-kinetic capabilities are actively being used in current military operations***
- <https://swfound.org/counterspace>



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Resurgent Russian counterspace capabilities

- Once a space superpower, Russia appears to be recapitalizing some of its Cold War-era counterspace capabilities
 - Multiple flight tests of “Nudol” BMD/ASAT missile
 - Multiple tech demos of on-orbit rendezvous and proximity operations (RPO), which have links to Naryad-V co-orbital ASAT program
 - Tests of the tracking component of air-launched ASAT missile (Kontakt)
 - Test of an airborne laser dazzler (Sokol Eshelon, aka A-60) against satellite, possible new ABL platform
- Also indications of operational electronic warfare/cyber capabilities
 - Multiple reports of GPS and mobile communications jamming in eastern Ukraine impacting UAV ops
 - Some additional reports coming from Syria



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Rising Chinese space capabilities

- China is on a path to develop a “full spectrum” of space capabilities over next two decades
 - National prestige (human spaceflight, exploration)
 - Support to military ops on Earth (PNT, ISR, satcom)
 - Economic development/industrial base
 - Counterspace/missile defense, RPO activities
- China has been more forceful in asserting its regional power, but has (so far) refrained from outright military aggression

Date of Test	Target Object	Interceptor Object	Interceptor Type	Amount of Trackable Debris Created	Notes
7/5/2005	None known	SC-19	direct ascent	0	Likely rocket test
2/6/2006	None known	SC-19	direct ascent	0	Likely flyby of an unknown orbital target
1/11/2007	FengYun 1C	SC-19	direct ascent	3,280	Successful intercept and destruction of an orbital target
1/11/2010	CSS-X-11 (ballistic)	SC-19	direct ascent	0	Successful intercept and destruction of a suborbital target
1/27/2013	Unknown (ballistic)	SC-19	direct ascent	0	Successful intercept and destruction of a suborbital target
5/13/2013	None known	DN-2	direct ascent	0	Likely rocket test of a new system capable of reaching GEO
7/23/2014	None known	SC-19	direct ascent	0	Non-destructive test
10/30/2015	None known	Possible upgraded SC-19	direct ascent	0	Non-destructive test
Total Amount of Trackable Debris				3,280	

Source: [“ASAT testing in space: The Case of China”](#),
SWF Fact Sheet

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Demonstrated U.S. Counterspace Capabilities

- Conducted multiple tests of technologies for close approach and rendezvous in both LEO and GEO, along with tracking, targeting, and hit-to-kill intercept technologies that could lead to a co-orbital ASAT capability
 - No acknowledged program to develop co-orbital weapon system
 - Discussion among policymakers on developing new offensive counterspace capabilities that could lead to a capability in the near future
- Demonstrated a basic direct-ascent ASAT capability
 - No active programs specifically to develop this sort of weapon system
 - Interest expressed by US officials in initial R&D for a space-based interceptor
- Stand up Space Command, interest in creating Space Force



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New Entrant: Indian ASAT Capabilities

- Historically, Indian space program focused on civil applications
- Changes in recent years have given its military a larger role
 - Concerns about being “grandfathered in” as a space weapons state
- March 27, 2019: PM Modi announced Indian ASAT test
 - Since then, established a Defence Space Agency and Defence Space Research Organisation
- Growing SSA capabilities



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Very Limited Iranian Space Program

- Space program in early stages
- Unlikely to have the capacity to build on-orbit or direct-ascent ASAT weapons
- Minimal SSA capabilities
- Demonstrated ability to interfere with commercial satellite signals



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Extremely Limited DPRK Counterspace Capabilities

- May have some limited direct-ascent ASAT capability, but not threatening yet
- Minimal space launch vehicle and satellite capabilities
- Counterspace not mentioned by DPRK officials
- C2, SSA capabilities minimal
- Multiple public reports of GPS interference and jamming
- EMP unlikely

- France
 - July 2019, PM Macron announced the creation of a space command within the French air force
 - Also announced creation of anti-satellite laser weapons
 - Came after remarks in 2018 by French officials about close approaches to French satellites
 - Part of EU Space Surveillance Tracking system
- Japan
 - Changing role of how space is viewed in Japan
 - Interest in developing satellite interceptor by mid-2020's
 - Increased discussions of resiliency of Japanese satellites
 - MoD start SSA program in 2023

Cyber as a Counterspace Option

- Space capabilities become an attractive target for counterspace efforts
 - Kinetic attacks less likely option
 - Electronic warfare/cyber attack seen as more usable
- Destabilizing because laws of armed conflict for space are unclear
 - International law and military rules of engagement still being worked out
 - Manual on International Law Applicable to Military Uses of Space (MILAMOS) and Woomera Manual being developed

- Possible cyberattacks: jamming, spoofing, attacks on ground infrastructure
 - Can be done by state and non-state actors
- Already seeing interference with satellites
- New entrants to space means new entry points for attacks
- Blurring of lines between different types of satellites means hard to ensure resiliency
 - Example: hosted national security payloads on commercial launch vehicles

- Many satellites are old and based on even older technology
- Increased use of commercial-off-the-shelf allows for possible entry
- Internet of Things (IoT) means that a lot more devices are going to be connected



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Questions?

Thanks.

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