Potential Counterspace Capabilities Around the World

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

Worldwide Threat Assessment

- Dan Coats, U.S. Director of National Intelligence, Feb. 13, 2018
- "Both Russia and China continue to pursue antisatellite (ASAT) weapons as a means to reduce US and allied military effectiveness. Russia and China aim to have nondestructive and destructive counterspace weapons available for use during a potential future conflict."
- "We assess that, if a future conflict were to occur involving Russia or China, either country would justify attacks against US and allied satellites as necessary to offset any perceived US military advantage derived from military, civil, or commercial space systems."
- "Russian and Chinese destructive ASAT weapons probably will reach initial operational capability in the next few years."
- "Russia and China continue to launch 'experimental' satellites that conduct sophisticated on-orbit activities, at least some of which are intended to advance counterspace capabilities. Some technologies with peaceful applications —such as satellite inspection, refueling, and repair - can also be used against adversary spacecraft."

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 (Kontact)
  - Test of an airborne laser dazzler (Sokol Eshelon, aka A-60) against satellite
- 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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Promoting Cooperative Solutions for Space Sustainability

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
- 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

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

Latent Indian ASAT Capabilities

- Historically, Indian space program focused on civil applications
- Changes in recent years have given its military a larger role
- Its missile defense program could potentially give it a latent ASAT capability
- Growing SSA capabilities
- Unlikely to create an official counterspace program
  - Due both to its increased investment in space capabilities and income bringing in from launching other satellites

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

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

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)

Cyber Threat (1)

- 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

Cyber Threat (2)

- 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

Questions?

Thanks.

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