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Dr. Philipp C. Bleek works on the causes, consequences, and enhancement of chemical, biological, radiological, and of nuclear weapons threats, and certain emerging technologies, at the intersection of academia, non-governmental organizations, and government.

He is Associate Professor of Nonproliferation and Terrorism Studies. He is currently serving as an expert on the 2022-23 U.S. Congressionally-mandated, Department of Defense-sponsored, National Academies of Science, Engineering, and Medicine study “Assessing and Improving Strategies for Preventing, Countering, and Responding to Weapons of Mass Destruction Terrorism,” on the subgroup focused on chemical threats.

He previously served as Senior Advisor to the Assistant Secretary of Defense for Nuclear. He holds a bachelor’s degree, in public and international affairs, from Princeton University; a Master’s degree, in public policy, from Harvard University’s Kennedy School; and a PhD, in international relations, from Georgetown University.

Drone Terrorism

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Bottom lines up front (BLUF)

- “Drones” pose new terrorism threats that states cannot afford to ignore
- New threats more evolutionary than revolutionary, for foreseeable future
- Aid terrorists in supporting, carrying out, and/or publicizing attacks
- States have a robust response toolkit, but also face challenges



Agenda

- Where am I coming from?
- Defining “drones”
- Brief history of drone terrorism
- Drone terrorism: Why? What? How?
- Scenarios
- Responding to the threat
- Future developments
- Threat assessment
- Bottom line
- Further information
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Where am I coming from?

- Chemical, biological, radiological, and nuclear (CBRN) weapons policy generalist
- Also work on various so-called “emerging technologies”
- Initial work on implications of drones for CBRN threat and response broadly
- Grew into broader work on drone terrorism

- Bridge academic, think tank, and government domains



Defining “drones”



DJI Mavic 3



General Atomics MQ-9 Reaper/Predator B



Defining “drones”

- Uncrewed (or unmanned)
- Guided
- Multi-use capable?
- Non-ballistic?
- Aerial, but also potentially ground, and both surface and underwater?
 - UAV: Uncrewed Aerial Vehicle
 - UGV: Uncrewed Ground Vehicle
 - UST: Uncrewed Surface Vehicle
 - UUV: Uncrewed Underwater Vehicle
- **Set of technologies that have some things in common and many differences**



Brief history of drone terrorism

- Not a novel technology, but developing rapidly
- Growing accessibility to non-state actors
- Limited terrorist employment to date, but increasing, e.g.
 - 1994, Japanese cult Aum Shinrikyo considered
 - 2016, ISIS attacks during Mosul battle
 - 2018, Russian Khmeimim Air Base attack
 - 2019, Abqaiq-Khuras attack (although Houthis took credit, Iran more likely)
- Potential for dramatic increases



Drone terrorism: Why?

- Terrorists' desire to innovate depends on relative advantage gained
 - Most feasible, often only, access to aerial platforms
 - Ground and water-based systems generally *less* accessible than crewed options
 - Standoff capabilities and various other nuances
 - But various limitations, e.g. payload, range, guidance, etc.



Drone terrorism: What?

- Intelligence, surveillance, reconnaissance (ISR)
 - Cameras
 - Other sensors
- Attack
 - Kinetic (i.e. slam into or mere presence)
 - Explosive (or other conventional weapon)
 - CBR
 - EW
 - Hoaxing



Drone terrorism: How?

- Systems:
 - Improvised
 - Crewed platforms modified to operate uncrewed
 - Commercial off-the-shelf (as-is or modified)
 - Military-grade
- Characteristics:
 - Payloads
 - Ranges
 - Control systems
- Applications:
 - Individual
 - *En masse*, i.e. multiple drones in parallel
 - Swarms, i.e. interdrone communication fuses into single weapons system



Scenarios

- Aerial drone operates near airport, temporarily halts traffic
- Aerial drone swarm targets aircraft at take-off, causes crash
- Aerial drone provides ISR to support rocket attack on ship in port
- Aerial drone with explosives bypasses ground-based security, targets outdoor crowd
- Surface-based drones *en masse* swarm ship, deliver explosive(s)
- Aerial drone swarm overwhelms defenses, delivers explosive(s) for targeted assassination
- Aerial drone swarm (differentiated) with chemical agent targets indoor crowd



Responding to the threat

- **Left of boom:**
 - Understanding, tracking, and impeding potential threats before they manifest
- **Boom:** Counter-drone kill chain requires diverse, layered, threat-specific capabilities
 - Detect
 - Identify
 - Track
 - Defeat
- **Right of boom:**
 - Consequence management, resilience
- **Both ends of threat spectrum entail challenges**
 - Crude: low, slow, small
 - Sophisticated: both individual platforms and especially swarms



Future developments

- More drones
- More autonomous
- More domains
- More often

- Better defenses



Threat assessment

- Potential threats to both soft and harder targets
- Spectrum of threats, bracketed by two extremes:
 - Highly asymmetric: small, cheap, accessible
 - Sophisticated: individual systems and especially swarming, mostly domain of states, with possible state-sponsorship caveat
- Threat also hinges on responses to it, and potential responses to those responses, i.e. analysis needs to avoid fallacy of the first move



Bottom line

- A manageable threat, but one that needs to be managed
- Even (especially?) crude drones pose challenges
- More sophisticated attacks possible, especially with state sponsorship
- The devil is in the details in terms of threat assessment and appropriate response
- Emerging threat; need assessments, TTXs, wargames, etc. to better understand



Further information

- [“A Plague of Locusts? A Preliminary Assessment of the Threat of Multi-Drone Terrorism”](#) (with Zachary Kallenborn and Gary Ackerman) *Terrorism and Political Violence* (May 2022).
- [“Swarming Terror”](#) (with Zachary Kallenborn and Gary Ackerman) *Small Wars Journal* (June 2022).
- [“Swarming Destruction: Drone Swarms and Chemical, Biological, Radiological, and Nuclear Weapons”](#) (with Zachary Kallenborn), *Nonproliferation Review* (2019).
- [“Drones of Mass Destruction: Drone Swarms and the Future of Nuclear, Chemical, and Biological Weapons”](#) (with Zachary Kallenborn), *War on the Rocks* (February 14, 2019).
- [“Fellowship of the Drone”](#) (with Zachary Kallenborn) *CBRNe World* (February 2019).



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