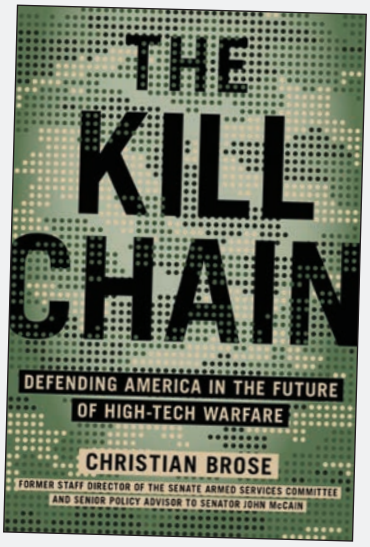
The Kill Chain: Defending America in the Future of High-Tech Warfare

By Christian Brose
Hachette Books, 2020
288 pp $28.00
ISBN: 9780316533539

Reviewed by T. X. Hammes



In the introduction to *Kill Chain,* Christian Brose issues a blunt warning. "Over the past decade, in U.S. war games against China, the United States has a nearly perfect record: we have lost almost every single time." (pp. xii) The statement is meant to be shocking—more so because Brose brings significant credibility and inside information to this work. He served as a member of the Secretary of State's Policy Planning Staff, as a senior policy advisor to Senator John McCain, and as staff director of the Senate Armed Services Committee where he supervised four National Defense Authorization Acts.

How does the United States spend vastly more than China on defense and still end up on the losing side of the war games? Brose contends the United States has "a defense acquisition system that has been optimized for risk aversion and cost accounting, not rapid technology development at scale; a defense industry that has become increasingly consolidated and closed to new entrants; a breakdown in the relationship between the national security and technology communities; and a broader failure of imagination about America's rapidly diminishing military dominance." (pp. 210) In short, the United States prioritizes the present at the expense of the future.

After outlining Department of Defense's (DOD) problems, Brose moves to his central thesis: The side with the fastest, most effective kill chain will win in a modern war, and the United States is not investing accordingly. Brose defines the *kill chain* as the ability of an organization to rapidly and accurately execute all the steps from locating to killing an enemy target. It represents the essential contest in modern warfare. Yet the United States is losing this competition. Even as Russia was demonstrating the value of high-speed kill chains that tied old technology—like artillery—to new drones and cell phones, the major budget increases early in the Trump administration were spent mostly on making new versions of old weapons systems first employed in World War I.

Modern kill chains rely on new technologies. Yet the Pentagon's procurement system drives innovative companies away. Large innovative technology firms spend $70 billion a year on innovation while the Pentagon spends only $5 billion. Apple has more cash on hand than the total worth of all five big defense contractors. Thus, big technology companies see little to be gained by working for the Pentagon. For their part, small innovative

T.X. Hammes is Distinguished Research Fellow, Center for Strategic Research, at National Defense University.

companies cannot deal with the massive paperwork and slow payment systems inherent in DOD's system. As a result, even relatively new systems like the F-35 still rely on computer systems that operate at 1/800th the speed of the most modern systems.

After outlining the problems inherent in our current systems, Brose asks a critical question: "Can militaries innovate and change in the absence of war?" The United States has successfully innovated in the past by defining specific operational problems, dedicating senior leaders to each problem long-term, and promoting aggressive experimentation. Unfortunately, Brose believes that today the U.S. armed services are failing to conduct the kind of innovative experiments that drove change in the past. He states that change can only come when military and civilian leaders believe there is "something" worse than change and postulate that the rapid improvement in the People's Liberation Army is that "something."

With this as background, Brose takes us on a tour of key new technologies that are rendering American platforms obsolete; supersonic cruise missiles, autonomous drone swarms, electro-magnetic, directed energy, and cyber weapons. He highlights how each can improve the kill chain but only if connected by a robust battle network.

Brose proposes a solution that aligns well with the historical record. (see Alan R Millet and Williamson Murray, *Innovation in the Interwar Period*, 1998). Start by designating 5 percent of the military budget—almost $40 billion—for investment in innovation. Then define the specific problems that must be solved. Once they are defined, assign senior leaders and open up the competition for solutions to government labs, services, defense industry, and start-ups. The key standard for judging a solution is whether or not it improves the kill chain's speed, accuracy, and effectiveness.

Brose is adamant that success will require autonomous weapons. He argues that the ethical standards that have been applied to these systems are incorrect. The correct standard for an autonomous weapon is not perfect decisionmaking but simply better decisions than humans make under the stress of combat. Since autonomy is essential to winning the kill chain competition, this is a critically important point. If it adopts this approach and produces large numbers of autonomous weapons connected by a robust battle network, the United States still needs to forward deploy more forces to Asia. Even with these steps, it can only expect to achieve parity with China but this will be sufficient for deterrence in the Pacific.

Brose warns that fixing the problem will not be cheap because of the cumulative cost of the many cheaper systems needed to succeed. But we "have the money the technological base, and the human talent. And our leaders have all of the flexibility and authorities they need both in law and policy, to carry off the transition from the military we have to the military we need. As I have said it come down to incentives. If we want different and better outcomes, we have to create different and better incentives to get them." (pp. 245)

This interesting analysis from an insider is clearly worth the read to understand one potential path forward. However, as indicated by its title, the work focuses almost exclusively on the kill chain. He does not give consideration to other factors that have determined wars historically like strategy, resources, operational concepts, training, etc. And while Brose provides a potential solution for improving DOD's part in developing the kill chain, he makes no suggestions for how to change the incentives that drive Congressional support of legacy systems. Without this key element, no solution can succeed.