

The B-21 and Tactical Creativity

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Combat air forces tacticians and operational planners have yet to understand the B-21 Raider's potential capability. Leadership's vision is clear, but service-level parochial interests, insular platform cultures, and competition for resources are creating unhealthy tensions within the combat air forces, Department of the Air Force, and across the Joint force. Such tensions could severely hamper tactical creativity, operational planning, and strategic competition, ultimately undermining the US Air Force's effectiveness against a peer adversary. Amid the move toward pulsed operations, a rift has emerged between standoff and stand-in tactical philosophies. Yet the B-21 Raider's family of systems at a minimum operates in both areas, likely demanding a reconsideration of these concepts. Such a reconsideration can also help the Air Force transcend stealth/nonstealth and fighter/bomber debates to embrace new levels of tactical creativity.

Secretary of the Air Force Frank Kendall III established operational imperatives for the US Air Force in recognition that adversaries have “capabilities designed to defeat the United States’ ability to project power.”¹ These imperatives state that diverse capabilities are necessary, but translating Secretary Kendall’s vision to the tactical level may prove difficult. Amid the combat air forces’ (CAF) move toward pulsed operations, a rift has emerged between standoff and stand-in tactical philosophies.² Additionally, as the B-21 Raider’s family of systems has capabilities in both areas, the service will soon need to reconsider these concepts.

As a unique, sixth-generation platform, the B-21 can help the Air Force transcend the stealth-versus-nonstealth and fighter-versus-bomber debates and embrace new levels of tactical creativity. Cultural shifts are necessary for the CAF to accept the idea of a bomber leading—and providing persistence—during pulsed operations. The B-21 and its family of systems would not just be a lead striker; it would be a platform enabling pulsed operations or even utilizing pulsed strike packages as dynamic employment options.

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1. Frank Kendall III, “Department of the Air Force Operational Imperatives,” infographic, US Air Force (USAF), March 31, 2022, <https://www.af.mil/>.

2. “Air Force Future Operating Concept Executive Summary” (Washington, DC: USAF, March 6, 2023), <https://www.af.mil/>.

This article is not about one aircraft being more important than another; rather, it argues a shift in perspective is necessary due to the cultural problems surrounding aircraft specialization, which can lead to a narrowed focus regarding other platforms. Because of the smaller bomber community, without a cultural shift that recalibrates CAF operations in great power competition, the service might not employ the B-21 to a level sufficient to achieve Secretary Kendall's vision. Even worse, absent a proper and persistent demand signal from the CAF, the B-21, like any burgeoning acquisition program, might be vulnerable to budget cuts and risk becoming a redux of the reduced B-2 Spirit fleet.³

Combat air forces tacticians and operational planners tend to reduce the operational imperatives and the concept of pulsed operations to embrace standoff tactics while largely ignoring stand-in advantages, thus leaving holes in operational plans. The B-21 Raider family of systems addresses these challenges by unlocking the Joint force with stand-in capabilities and addressing current Indo-Pacific region shortfalls. Through a reconsideration of the standoff and stand-in concepts, the CAF can move past current debates and misconceptions to materialize unprecedented levels of tactical creativity and operational planning.

The authors draw from considerable experience in the Pentagon, with Congress, and in all levels of war. The B-21's initial cadre have returned to the combat air forces after staff tours that revealed the propensity for budget advocacy to split along platform lines. While Secretary Kendall's initiatives are encouraging, and despite the fascinating and potentially revolutionary aspects of the B-21, CAF planners and tacticians are not prepared to think differently, given immediate challenges and parochial attitudes. This article thus analyzes the key issues afflicting combat air forces—most notably, the ongoing lack of tactical creativity and an adherence to rigid operational maneuver—and offers recommendations to mitigate them.

Standoff versus Stand-in Debate

Secretary Kendall's operational imperatives emphasize that resilient and redundant operations are necessary to compete with peer adversaries.⁴ In light of aggressive statements from China and the enduring risk of escalation in Ukraine, the US Air Force faces a significant challenge in preparing to fight now while simultaneously planning for future operations.⁵ By focusing on the most immediate threats at the expense of future considerations, combat air forces resist tactical creativity—the ability to consider novel solutions based on emerging capabilities potentially dissimilar to established techniques and procedures.

3. Sebastien Roblin, "The U.S. Air Force's Biggest Mistake: Only 20 B-2 Stealth Bombers in the Force," *National Interest*, February 23, 2024, <https://nationalinterest.org/>.

4. Charles Pope, "Kendall Details 'Seven Operational Imperatives' & How They Forge the Future Force," USAF, March 3, 2022, <https://www.af.mil/>.

5. Dave Lawler, "Xi Vows China and Taiwan Will 'Surely Be Reunified' in New Year's Speech," *Axios*, January 1, 2024, <https://www.axios.com/>.

The most recent effort focused on near-term conflicts revolves around the concept of pulsed operations. The Air Force Future Operating Concept argues winning “six critical and concurrent fights” requires “‘pulsed airpower,’” or “concentrating of airpower in time and space to create windows of opportunity for the rest of the force.”⁶ Pulsed operations are a significant shift within CAF culture. Previously, establishing a relative level of enduring air superiority was an assumed objective.⁷ The shift is, of course, a sober reaction to realities: US adversaries, having observed the Air Force’s dominance and ability to unlock Joint force capabilities, have invested incredible resources into making air supremacy impossible and even temporary air superiority as difficult as possible for the United States and its Allies and partners near hostile territories.⁸

Pulsed operations might be wise under certain constraints, but the fact remains that embracing such a mindset de facto cedes control over a given area to the enemy for the majority of a conflict. Pulsing is a concept driven primarily by geography, not threats. Given more forgiving distances, the CAF might entertain more traditional methods to continually contest airspace control: the lack of a persistence-capable platform denies comprehensive takedowns of adversary defenses that require constant pressure to suppress. Furthermore, an inclination to employ standoff tactics in the execution of pulsed operations risks treating potential conflicts as anti-access/area denial (A2/AD) problems in which more sustainable tactics are not possible.

Evidence from wargames and acquisitions suggests pulsed operations are evolving into standoff-dependent tactics. Most recently, an unclassified wargame found standoff weapons were “war-winning” weapons, although the United States won—at a great cost—only a “Pyrrhic victory” in 2026.⁹ The same wargame also found that China would continue to evolve and target bombers employing standoff weapons, if not the weapons themselves.¹⁰

Regarding acquisitions, weapons priorities in the president’s Fiscal Year 2024 budget, approximately \$15.1 billion worth, were all standoff munitions—Standard Missile (SM)-6, Air Intercept Missile (AIM)-120D Advanced Medium-Range Air-to-Air Missile (AM-RAAM), Long-Range Anti-Ship Missile (LRASM), and Joint Air-to-Surface Standoff Missile (JASSM)-ER.¹¹ Furthermore, to counter the decades-long effort to “install

6. “Future Operating Concept.”

7. Elliot M. Bucki, “Flexible, Smart, and Lethal,” *Air & Space Power Journal* 30, no. 2 (Summer 2016).

8. Jeff Hagen et al., *The Foundations of Operational Resilience—Assessing the Ability to Operate in an Anti-Access/Area Denial (A2/AD) Environment: The Analytical Framework, Lexicon, and Characteristics of the Operational Resilience Analysis Model (ORAM)* (Santa Monica, CA: RAND Corporation, July 7, 2016), <https://doi.org/>.

9. David Axe, “3,600 American Cruise Missiles versus the Chinese Fleet: How One U.S. Munition Could Decide Taiwan’s Fate,” *Forbes*, January 9, 2023, <https://www.forbes.com/>; and Mark F. Cancian and Eric Heginbotham, “The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan,” CSIS: Center for Strategic & International Studies, January 9, 2023, 4, <https://www.csis.org/>.

10. Cancian and Heginbotham, 140.

11. *Program Acquisition Cost by Weapon System: US Department of Defense Fiscal Year 2024 Budget Request* (Washington, DC: Office of the Under Secretary of Defense [Comptroller]/Chief Financial Officer, March 2023), iii, <https://comptroller.defense.gov/>.

thickets of surface-to-air missiles” posing a “wicked problem for U.S. forces,” the Pentagon is ramping up standoff acquisitions.¹²

The change in acquisition strategies reflects threats in which the “defense is inherently the stronger form of air warfare, and new and emerging technologies and tactics are only strengthening the defender’s advantage.”¹³ Whether or not this argument is valid, the combination of unclassified wargames and acquisitions reflects how planners and tacticians prioritize standoff tactics during pulsed operations. They are not necessarily proclaiming a standoff dependency; they are just planning based on the understanding of the threat and weapons provided during ongoing acquisition debates.

This planning methodology creates artificial tactical limits and critical dependencies. As Israel and Russia are learning today, standoff weapons cannot achieve full military objectives, which then limits national leaders’ decision space and cedes the adversary significant advantages.¹⁴ The further back the combat air forces launch weapons, the more complicated the kill chain required. Forces must locate, destroy, and verify targets that might be mobile or fleetingly observable while defeating systems finely tuned toward the destruction of standoff munitions and platforms. Correlating pulsed operations with standoff tactics makes those tactical problems inherently more complicated by removing pressure and playing to the adversary’s strengths; namely, that by 2030, “stronger Chinese conventional capabilities and a survivable nuclear deterrent” complicate potential US theories of victory.¹⁵

Furthermore, the move toward pulsed operations might be feeding a dangerous perspective within the CAF, where it is believed a large-scale peer conflict will likely be short. To be clear, the “wish-casting” associated with a short war is hardly the predominant view in the Pentagon or literature, but behind the scenes, this viewpoint is surprisingly common within the CAF. This belief contravenes most expert opinions and belies an ignorance of the “fragmented authoritarianism” within China, which persists under President Xi Jinping. Considering the consensus necessary within China to make

12. Christopher Woody, “The US Air Force Is Training to Take Down Chinese Warships, but China’s Military Has Built a ‘Wicked’ Problem for It to Overcome,” *Business Insider*, November 13, 2023, <https://www.businessinsider.com/>; and Inder Singh Bisht, “Pentagon Wants to Ramp-Up Ship-Killing Missile Procurement,” *Defense Post*, April 7, 2023, <https://www.thedefensepost.com/>.

13. Maximillian Bremer and Kelly Grieco, “Assumption Testing: Airpower Is Inherently Offensive, Assumption #5,” Policy Paper, Stimson, January 25, 2023), <https://www.stimson.org/>.

14. Ron Tira, *The Limitations of Standoff Firepower-Based Operations: On Standoff Warfare, Maneuver, and Decision* (Tel Aviv: Institute for National Security Studies, 2007), <https://www.jstor.org/>; Gregory Weaver, “The Role of Nuclear Weapons in a Taiwan Crisis,” *Atlantic Council* (blog), November 22, 2023, <https://www.atlanticcouncil.org/>; and Alex Vershinin, “The Challenge of Dis-integrating A2/AD Zone: How Emerging Technologies Are Shifting the Balance Back to the Defense,” *Joint Force Quarterly* 97 (2nd Quarter, 2020), <https://ndupress.ndu.edu/>.

15. Jacob L. Heim, Zachary Burdette, and Nathan Beauchamp-Mustafaga, *U.S. Military Theories of Victory for a War with the People’s Republic of China* (Santa Monica, CA: RAND Corporation, February 21, 2024), 5, <https://doi.org/>.

critical state decisions, it is highly unlikely a war would be started on such a whim that initial failure would lower national resolve.¹⁶

Completing long-range kill chains to meet pulsed operation objectives in a short series of battles seems feasible, but doing so in a long, potentially escalating war will likely prove much more difficult. If operators base their training on winning a short-term fight, painful—or even catastrophic—lessons might ensue.

Pulsed operations are a rational response to peer threats. Yet the implicit correlation of this concept with standoff tactics in a short conflict reduces the capacity for tactical creativity and fails to meet the higher-level guidance provided by Secretary Kendall's operational imperatives or the tough operational problems any ensuing service leader would face. Even worse, the defensive advantage—nothing new in modern warfare—has not made peer adversary defenses invulnerable, but it has made, in most cases, the term standoff inaccurate for many threats. The CAF will likely be employing weapons within threat rings, and the weapons themselves are possible to target.¹⁷ In other words, standoff implies a level of safety or lower risk, combined with mission success, that is misleading. Moreover, the logic of perpetual standoff is unsustainable; at some point, a platform or weapon must enter a threat area.

Meanwhile, while the CAF uses the term stand-in for penetrating assets, the truth is more nuanced. The B-21's capabilities allow it to be much closer to targets but still outside threat capabilities. The shorter distance makes weapons considerably more survivable and the process of striking fleeting or mobile targets more realistic. The reduced distances necessary for future weapons allow for acquisitional strategies favoring smaller, faster systems with advanced seekers that provide the mass and persistence lacking with large, exquisite—and expensive—hypersonics.

A stand-in capability, including a platform such as the B-21, could enable the long-range kill chain standoff tactics currently favored by the CAF or act as an organic firing solution—thus not requiring offboard support—for critical threats in GPS and space-denied environments.¹⁸ The organic targeting aspect is important, as the combination of limited penetrative assets and rapidly improving adversary threats is pushing the CAF into long-range kill chain tactics that are inherently inorganic.

These kill chains require players both in and outside of the Department of Defense to strike highly contested targets. The Joint force has made laudable efforts to acquire the resources necessary to implement long-range kill chain tactics. Yet an inescapable issue remains: each link is a vulnerability, and the more links required for mission success, the

16. Andrew Mertha, "Fragmented Authoritarianism 2.0: Political Pluralization in the Chinese Policy Process," *China Quarterly* 200 (December 2009), <https://doi.org/>.

17. Susie Blann, "Russia Fires 30 Cruise Missiles at Ukrainian Targets; Ukraine Says 29 Were Shot Down," AP, May 19, 2023, <https://apnews.com/>.

18. Eric Heginbotham et al., *The U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power, 1996–2017* (Santa Monica, CA: RAND Corporation, September 14, 2015), 241, <https://www.rand.org/>.

more opportunities an adversary has to disrupt or delay the targeting process.¹⁹ The CAF can compensate for those vulnerabilities by creating contingency solutions or lobbying for redundancies, but the latter are not free and require acquisition resources in a contentious spending environment.

The B-21 and its stand-in capabilities can fill operational shortfalls and address the tenuous assumptions on which pulsed operations with standoff tactics depend. As adversary systems improve, the B-21 and its family of systems can enable legacy standoff platforms by eliminating the most critical threats to fifth-generation platforms and weapons. Most importantly, the B-21 can help address significant hurdles facing the CAF in theaters requiring pulsed operations. Given the standoff, fighter-centric approaches currently preferred or required, planners must reckon with four specific challenges.

Limited Fuel

The first assumption Indo-Pacific-region plans rely on is that air and ground refueling will be available. Given China's A2/AD capabilities and the so-called tyranny of distance, the idea that refueling tankers will be able to support fighters even in pulsed operations is tenuous at best. Tankers will require levels of escort that detract from difficult targeting operations and depend on accessible basing, not to mention willing Allies and partners and vulnerable supply chains.²⁰

Vulnerable Bases

If adversaries choose to employ the full weight of their ballistic arsenal against US regional bases, those operational headquarters are unlikely to survive. Dispersed ops are a potential answer, but those tactics have limitations and are still vulnerable to follow-on strikes.²¹ It is telling that wargames in the last decade have focused on whether the United States will target mainland China in a conflict over Taiwan.²²

Notwithstanding this welcome dose of political realism into planning assumptions, a decision not to target China seems to be driven by the recognition that if China uses its substantial missile arsenals to attack US bases in the Indo-Pacific—if not the US mainland—the Air Force will struggle mightily to counter an invasion of Taiwan. The combat air forces are not declining to target the Chinese mainland due to potential

19. Heather Penney, "Scale, Scope, Speed & Survivability: Winning the Kill Chain Competition," *Mitchell Institute Policy Paper* 40 (May 2023), <https://mitchellaerospacepower.org/>.

20. Andrew Tilghman, *Guam: Defense Infrastructure and Readiness*, R47643 (Washington, DC: Congressional Research Service, August 3, 2023), <https://crsreports.congress.gov/>.

21. Patrick Mills et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts* (Santa Monica, CA: RAND Corporation, April 16, 2020), <https://doi.org/>.

22. John Speed Meyers, *Mainland Strikes and U.S. Military Strategy towards China: Historical Cases, Interviews, and a Scenario-Based Survey of American National Security Elites* (Santa Monica, CA: RAND Corporation, December 20, 2019), <https://doi.org/>.

political realities. Instead, planners hope China will reciprocate by declining to target Guam, Japan, or other nations due to Xi's concerns "about the PLA's ability to fight and win wars" and the risk of undermining Chinese Communist Party control.²³

Especially since an invasion of Taiwan will already be occurring under devastating political and economic conditions, it seems beyond fanciful to hope China will cede its greatest advantage in what would already be a war with the highest stakes imaginable.²⁴ Even the assumption that there is a meaningful distinction between the First and Second Island Chains might be problematic: it is unlikely China would be content to eliminate only Okinawa if the United States could continue meaningful operations from Guam.²⁵ Given the fallout from an invasion of Taiwan, it is logical to assume a Chinese Communist Party leader who orders such a drastic action would face regime-threatening implications upon failure.²⁶

Assuming an inherently limited conflict disfavoring the enemy—to enable a preferred set of tactics—is dangerous. Agile combat employment might mitigate risks to short-range aircraft, but unless such efforts are flawless, fighters—and tankers, to an extent—cannot reach the fight or seriously affect it without convenient basing. The 2022 *National Defense Strategy* explicitly states that regional base protection, specifically Guam, is a priority, but the Air Force has largely assumed that the missile defense emphasis and expeditionary constructs will somehow ensure base viability.²⁷

Unpredictable Precision Navigational Timing

Despite years of acknowledgment that GPS may not be available or effective before or during a war, the Joint force remains critically reliant on GPS to employ weapons, especially against standoff targets. JASSM, for example, requires GPS to reach a final point where an infrared seeker combined with anti-GPS jamming is effective.²⁸ This assumption is dangerous because US adversaries continue to invest heavily in GPS-jamming technology, not to mention the ability to shoot down the satellites themselves.²⁹

23. Mark Cozad et al., *Gaining Victory in Systems Warfare: China's Perspective on the U.S.-China Military Balance* (Santa Monica, CA: RAND Corporation, 2023), 113, vi, <https://doi.org/>.

24. "Invading Taiwan Would Be a Logistical Minefield for China," *Economist*, November 6, 2023, <https://www.economist.com/>.

25. Derek Grossman, "America Is Betting Big on the Second Island Chain," *RAND Blog*, September 8, 2020, <https://www.rand.org/>.

26. Andrew Mertha, "Stressing Out': Cadre Calibration and Affective Proximity to the CCP in Reform-era China," *China Quarterly* 229 (March 2017), <https://doi.org/>.

27. Anthony H. Cordesman, "The New U.S. National Defense Strategy for 2022," CSIS, October 28, 2022, <https://www.csis.org/>.

28. John Keller, "Lockheed Martin to Test and Integrate Extreme-Range Air-to-Ground Missile with GPS and Infrared Guidance," *Military + Aerospace Electronics*, June 5, 2023, <https://www.militaryaerospace.com/>.

29. Sandra Erwin, "U.S. Military Doubles Down on GPS despite Vulnerabilities," *SpaceNews*, August 9, 2021, <https://spacenews.com/>.

Contested Space Domain

The threat to GPS satellites is clearly not restricted to navigation.³⁰ The previously mentioned tactical problem of targeting would be virtually impossible without the space layer and tactics that allow for target identification and actual weapon targeting—thus the intricacies and inherent vulnerabilities of long-range kill chains. Difficult enough as a standoff tactic, these kill chains, without the space layer, which includes much more than GPS, might prove impractical, at best.³¹ The electromagnetic spectrum is also necessary to complete kill chains, even with a pristine space capability.³² The recent concern over the possible Russian deployment of nuclear weapons in space highlights this vulnerability.³³

Given the reality of these four challenges and the nuances of standoff versus stand-in, embracing the B-21 and discovering how to unlock its tactical creativity can unleash a devastating physical and psychological weapon. The B-21 does not solve every tactical problem, but it counters multiple airpower weaknesses and the investments adversaries have made to defeat the United States.

Unique Capabilities of the B-21

The US Air Force will soon possess an unparalleled and novel asset capable of creating effects that manipulate the enemy and shape its reactions before or during pulsed operations. Despite its appearance, the B-21 is not, as some derisively refer to it, a B-2.1. While both platforms are highly survivable in contested environments, the B-21 earns its sixth-generation moniker by representing an evolutionary leap in stealth technology.³⁴ As Secretary of Defense Lloyd J. Austin III stated, “Fifty years of advances in low-observable technology have gone into this aircraft . . . Even the most sophisticated air-defense systems will struggle to detect a B-21 in the sky.”³⁵ The CAF must wisely integrate the B-21 into tactical and operational plans to engender the best possible combat outcomes.

30. Kevin L. Pollpeter, Michael S. Chase, and Eric Heginbotham, *The Creation of the PLA Strategic Support Force and Its Implications for Chinese Military Space Operations* (Santa Monica, CA: RAND Corporation, November 10, 2017), 9, <https://doi.org/>.

31. Courtney Albon, “Space Force Seeking \$1.2B for ‘Long Range Kill Chains’ Target Tracking,” *Defense News*, March 20, 2023, <https://www.defensenews.com/>.

32. Raj Agrawal and Christopher Fernengel, “The Kill Chain in Space: Developing a Warfighting Mindset,” *War on the Rocks*, October 24, 2019, <https://warontherocks.com/>.

33. David Sanger and Julian Barnes, “US Fears Russia Might Put a Nuclear Weapon in Space,” *New York Times*, February 17, 2024.

34. Mark Gunzinger, *Understanding the B-21 Raider: America’s Deterrence Bomber* (Arlington, VA: Mitchell Institute for Aerospace Studies, March 2023), <https://mittchellaerospacepower.org/>.

35. C. Todd Lopez, “World Gets First Look at B-21 Raider,” Department of Defense (DoD) News, December 3, 2022, <https://www.defense.gov/>.

Furthermore, the B-21 is far more flexible, adaptable, and dynamic than the B-2.³⁶ Organic firing capabilities allow the B-21 to operate, if necessary, without significant preplanning, and switching targets or missions airborne is no more difficult than what the CAF became accustomed to in decades of close air support and dynamic targeting. Therefore, the B-21 can enable the long-range kill chain standoff tactics preferred by the CAF or be an organic firing solution for critical targets in GPS- and space-denied environments.³⁷

The B-21's organic capabilities will not make long-range kill chain tactics obsolete; indeed, the bomber's sixth-generation characteristics, combined with its unique payload, offer the ultimate defense against adversary defensive efforts to deplete these kill chains. A fully resourced B-21 fleet will be able to operate in areas previously considered A2/AD protected. Stopping the Raider would significantly drain adversary resources and require an incredible degree of focus in the chaos of battle, both factors that enable current and future long-range kill chain efforts.

Even if an adversary did discover a way to counter the platform, the Raider's most important feature is its modularity. Specifically designed with the space and capability to integrate emerging systems rapidly, the B-21 is not only a response to current adversary decisions but also an inherent counter to future enemy plans.³⁸ Even among the Joint force, the B-21's modularity and organic firing capabilities make it the most efficient form of adapting to a war's unknowns and adjustments while acting as a backstop for long-range kill chain effectiveness.

Additionally, just as the B-21 directly contradicts adversary decisions and capabilities in the electromagnetic spectrum, this sixth-generation jet addresses the CAF's four major challenges mentioned in the previous section. A B-21's inherent fuel efficiency and range drastically reduce the fuel bill, enabling a contiguous US strike capability and lowering the dependency on forward bases. The Raider's nuclear-hardened nature mitigates any loss of GPS because nuclear-hardened jets are inherently resilient against GPS jamming, and its full suite of sensors only strengthens its redundancy.³⁹ Similarly, due to its dynamic and organic firing capabilities, the B-21 is not dependent on the space layer usually necessary to execute kill chains against fleeting targets.⁴⁰

36. Tara Copp, "Pentagon Debuts Its New Stealth Bomber, the B-21 Raider," AP, December 3, 2022, <https://apnews.com/>.

37. Cameron Hunter, "The Forgotten First Iteration of the 'Chinese Space Threat' to US National Security," *Space Policy* 47 (February 2019), <https://doi.org/>.

38. Stefano D'Urso, "New Photo and Details about B-21 Raider Program and Progress Released," *Aviationist*, September 18, 2023, <https://theaviationist.com/>.

39. Inder Singh Bisht, "USAF Tests B-2 Bomber System for GPS-Denied Environments," Defense Post, July 13, 2022, <https://www.thedefensepost.com/>; and Greg Hadley, "What Happens If GPS Goes Dark? The Pentagon Is Working on It, Space Force General Says," *Air & Space Forces Magazine*, May 12, 2022, <https://www.airandspaceforces.com/>.

40. Albon, "Space Force."

Stand-in with the B-21 also addresses the issues of available weapons rails and the rising costs of hypersonics and associated upgrades.⁴¹ The Air Force obtains the best strike efficiencies when prioritizing mass at the lowest possible costs, but depending on fighters—with their limited payloads—carrying standoff weapons results in poor costs per effect.⁴² Again, with limited B-2s and aging legacy bomber fleets undergoing difficult upgrades, poor strike efficiencies have been prerequisite costs. Yet the B-21 can start a commitment toward reversing the decades-long trend away from better strike efficiencies.⁴³

Unless the combat air forces embrace tactical creativity or at least understand the B-21's capabilities, however, it will be difficult to inform national leadership how the B-21 could impact the battlefield and adversary decision-making. It is one thing to threaten the full force of US conventional capabilities in a manner the enemy has been preparing for; it is quite another to employ an aircraft capable of operating efficiently at the time and place of its choosing. While hardly a silver bullet, fully realized, the B-21 could unlock Joint capabilities and make more palatable solutions possible in a peer conflict if the CAF can embrace tactical creativity through cultural changes.⁴⁴

Beyond the Debates: Tactical Creativity

The key to translating Secretary Kendall's operational imperatives to the tactical level—or, at a deeper level, increasing national-leader decision space beyond its current tactical limits against a peer adversary—is finding a way for the combat air forces to move beyond the stealth versus non-stealth, fighter versus bomber, and stand-in versus standoff debates. Cultural adjustments are foundational to such an effort. For decades, the Air Force has integrated with varying degrees of success against varying levels of opponents. Leveraging the unique capabilities that fifth- and sixth-generation aircraft bring, however, will require stand-in bombers and their family of systems to play a dynamic and leading role to which fighter-led combat air forces are unaccustomed.⁴⁵

The current emphasis on standoff tactics undergirding pulsed operations is at least some recognition that the Air Force has moved past the alleged successes of the first Gulf War, in which even sympathetic accounts, such as those written by former President George

41. Mikayla Easley, "Physics and Cost Are Shaping Pentagon's Hypersonics Paths," *DefenseScoop*, April 11, 2023, <https://defensescoop.com/>.

42. David Deptula and Douglas A. Birkey, "Resolving America's Defense Strategy-Resource Mismatch: The Case for Cost-Per-Effect Analysis," *Mitchell Institute Policy Paper 23* (July 2020), <https://mitchellaerospacepower.org/>.

43. Mark Gunzinger, "Stand In, Standoff," *Air & Space Forces Magazine*, July 1, 2020, <https://www.airand.spaceforces.com/>.

44. Daniel L. Haulman, "Fighter Escorts for Bombers: Defensive or Offensive Weapons," *Air Power History* 66, no. 1 (2019).

45. S. Rebecca Zimmerman et al., *Movement and Maneuver: Culture and the Competition for Influence among the U.S. Military Services* (Santa Monica, CA: RAND Corporation, February 25, 2019), <https://doi.org/>.

Bush, make it clear that the United States was operating against a vastly inferior opponent.⁴⁶ Yet the transition to pulsed operations supporting standoff tactics has not—at least yet—produced a version of the combat air forces radically dissimilar from the forces that swamped Saddam Hussein in different decades. Furthermore, as numerous pundits and leaders have pointed out, twenty years of close air support has not prepared the CAF for a large-scale conflict against a peer adversary.⁴⁷

Embracing the B-21's full capabilities would not mean rejecting pulsed operations or standoff capabilities. Instead, combat air forces could start to engage the tactical creativity that a persistent stand-in capability permits, whether as an enabler for pulsed operations, a roaming threat that distracts the enemy, or—most tantalizingly—a mission-command platform that dynamically directs pulsed operations against emerging targets. In some respects, the F-35 Lightning II and F-15EX Eagle II communities have already started these conversations by examining how a fourth-generation platform can complement fifth-generation stealth.⁴⁸

This integrated vision might seem an obvious goal, but the idea of dynamic stand-in bombers leading pulsed operations does not exist in current doctrine. This doctrinal proclivity is not inimical. Rather, it is the natural progression of thought given the Air Force's evolution toward fighters in the 1970s. Today, however, the Air Force faces more existential adversaries.⁴⁹ Parochial fights within the service are not unusual, but there is also an ongoing debate over stealth due to the “threat” that stealth platforms present to traditional, nonstealth platforms.⁵⁰

Unfortunately, the combat air forces are starting from a disadvantageous position regarding stealth. The F-117 Nighthawk's “retirement” in 2008 left the service with a de facto niche capability in the B-2 due to its limited numbers, maintenance complications, and nuclear commitments—that is, tacticians must assume that in any peer-to-peer conflict, the B-2 might not be readily available due to nuclear alerts.⁵¹ As a result, even with the

46. George Bush and Brent Scowcroft, *A World Transformed* (New York: Vintage Books, 1999).

47. Thomas Greenwood, Terry Heuring, and Alec Wahlman, “The ‘Next Training Revolution’: Ready the Joint Force for Great Power Competition and Conflict,” *Joint Force Quarterly* 100, 1st Quarter (2021), <https://ndupress.ndu.edu/>.

48. John A. Tirpak, “Joining Up on the F-15EX,” *Air & Space Forces Magazine*, November 1, 2020, <https://www.airandspaceforces.com/>.

49. Zimmerman et al., *Movement and Maneuver*.

50. Mike Worden, *Rise of the Fighter Generals: The Problem of Air Force Leadership 1945–1982* (Maxwell AFB, AL: Air University Press [AUP], 1998); Mike Pietrucha, “Low-Altitude Penetration and Electronic Warfare: Stuck On Denial, Part III,” *War on the Rocks*, April 25, 2016, <https://warontherocks.com/>; Pietrucha, “Rediscovering Low Altitude: Getting Past the Air Force's Overcommitment to Stealth,” *War on the Rocks*, April 7, 2016, <https://warontherocks.com/>; and Pietrucha, “The U.S. Air Force and Stealth: Stuck On Denial Part I,” *War on the Rocks*, March 24, 2016, <https://warontherocks.com/>.

51. “Special Report: Nuclear Posture Review - 2018,” DoD, accessed January 6, 2024, <https://dod.defense.gov/>.

introduction of fifth-generation fighters, planners and tacticians do not appreciate the B-2's penetration capabilities and how many targets the stealth fleet can service.

Ironically, the current B-2 community has enabled tacticians' misperceptions regarding advanced stealth tactics by embracing an insular culture in line with its highly classified programs. Air Force leadership has wisely adopted a more open stance with the B-21: its initial testing has been in broad daylight, and the B-21's special access classifications could—in theory—be downgraded, at least in part.⁵² Unlike the B-2, this would allow more tacticians to understand the B-21's full capabilities and present creative options to operational and strategic leaders.

Yet reducing classifications is no small task. The Air Force has struggled for decades with “keeping a high fence around a small yard” to protect innovation advantages while increasing platform crosstalk.⁵³ The service should consider the lessons of the F-117 and General W. L. “Bill” Creech, whose support of the stealth aircraft was contentious. Warfighters initially could not accept that the F-117 could act “as an enabler of the defense-rollback strategy as well as a means to strike deep targets of high value.”⁵⁴

Above all, the Air Force as a whole must avoid categorical statements such as “stealth is dead” or “stealth is the price of admission.”⁵⁵ The latter statement has been taken out of context: it never meant that nonstealth platforms were unimportant. Additionally, while former Vice Chairman of the Joint Chiefs of Staff Paul Selva acknowledged the constant race between stealth and counterstealth, he also couched those comments with the assertion that training—and by extension, packaging and planning—were what allowed stealth to provide an “advantage over your adversary's detection and targeting systems, not dissimilar to quieting in submarines.”⁵⁶

While sixth-generation stealth assets can still reach stand-in ranges with reduced risk, they are not white knights single-handedly capable of winning a war. Moreover, the stealth of fifth-generation aircraft will struggle outside of pulsed scenarios if the CAF refuses to embrace an integrated approach. Likewise, sixth-generation stealth is only “dead” if unsupported B-21s are expected to behave as invisible platforms, not platforms utilizing a family of systems and classified capabilities to achieve persistent stand-in ranges.⁵⁷

52. John A. Tirpak, “12 Things We Learned from the New B-21's Taxi Tests and First Flight,” *Air & Space Forces Magazine*, November 22, 2023, <https://www.airandspaceforces.com/>.

53. Laskai Lorand and Samm Sacks, “The Right Way to Protect America's Innovation Advantage,” *Foreign Affairs*, October 23, 2018, <https://www.foreignaffairs.com/>.

54. James Slife, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces* (Maxwell AFB, AL: AUP, in collaboration with College of Aerospace Doctrine, Research, and Education, 2004), 59, <https://www.airuniversity.af.edu/>.

55. Pietrucha, “Stuck on Denial”; and Josh Wiitala, “The Price of Admission: Understanding the Value of Stealth,” *War on the Rocks*, June 2, 2016, <https://warontherocks.com/>.

56. Adam Twardowski, “The Future of US Defense Strategy: A Conversation with General Paul J. Selva,” *Brookings*, July 2, 2019, <https://www.brookings.edu/>.

57. Joe Pappalardo, “PM Interview: Air Force Gen. Mark A. Welsh III,” *Popular Mechanics*, April 15, 2014, <https://www.popularmechanics.com/>.

A combat air force culture that embraces an integrated approach should recognize the nuances of stealth, reexamine the roles of traditional bombers versus the B-21, and recapture the ability to balance immediately necessary standoff tactics with an earnest desire for tactical creativity and stand-in capabilities. Part of this cultural change must include the Joint force, namely US Strategic Command, and the recognition that a fully capable B-21 fleet will enable conventional escalation options so influential as to replace tactical nuclear options.

This is not to imply nuclear certification of the platform should be delayed, although if it were to impede conventional capabilities, slightly delaying nuclear capabilities should be acceptable. Rather, agreements should be made now to prevent the type of Strategic Air Command conflicts that bedeviled planners in Vietnam desperate to maximize the B-52's conventional effects when the bombers were committed foremost to the nuclear Single Integrated Operational Plan.⁵⁸

Overall, parochial fights are inevitable given restricted resources and Beltway politics, but arguably, the most significant issue facing CAF warfighters is the rifts that have seeped down to the tactical level. These rivalries are not a luxury the service can afford in a large-scale conflict against a determined peer adversary. While the comparison might be hyperbole, on its current path—embracing standoff/fighter-based tactics at the expense of a platform such as the B-21—the CAF could be replicating the disastrous mistakes plaguing past militaries as they chose precious cultural attitudes over necessary evolutions.⁵⁹

Conclusion and Recommendations

If the B-21 program—which is still in early testing—remains on track, the Air Force has a game-changing asset coming sooner rather than later. To that end, there are three general steps leadership might consider to improve its chances in a near-term conflict.

Expedite Production and Prioritize Testing

History proves accelerating a successful program is a matter of motivation, faith, and money. The United States famously produced one B-24 per hour at Willow Run during World War II; less effort is probably necessary to embrace a breakout mindset with the B-21.⁶⁰ Leadership can ameliorate developmental testing—a notoriously complicated bureaucratic maneuver in Air Force circles—by prioritizing the B-21 over legacy platforms and the new jet trainer. If testing and funding remain on track, these efforts should yield

58. Gregory Daddis, *Westmoreland's War: Reassessing American Strategy in Vietnam* (Oxford, UK: Oxford University Press, 2014).

59. Jonathan B. A. Bailey, "Military History and the Pathology of Lessons Learned: The Russo-Japanese War, a Case Study," in *The Past As Prologue*, ed. Williamson Murray and Richard Hart Sinnreich, 1st ed. (Cambridge, UK: Cambridge University Press, 2006), 170–94, <https://doi.org/>.

60. Tim Trainor, "How Ford's Willow Run Assembly Plant Helped Win World War II," *Assembly*, January 3, 2019, <https://www.assemblymag.com/>.

operational B-21s able to employ weapons on practice ranges and potentially be conflict-ready in three to five years, or sooner. In short, the B-21 would be impactful before 2030 and dominant no later than 2035.

Reduce Cost per Kill

Critically, the Department of Defense and Congress should continue their laudable acquisition efforts with some relatively inexpensive modifications, but the primary focus must be reducing the target cost per kill. Fully funding next-generation weapons for even a fledgling B-21 force will unlock more strike efficiency than comparable platforms. And part of this equation is the right weapons-to-platform matching. For example, taking full advantage of the B-2 as a stopgap—perhaps by funding GBU-62 integration as soon as possible—would offer planners an area-targeting option and stimulate tactical creativity.⁶¹

The hypersonic attack cruise missile and other specialized efforts can remain a priority, but not at the cost of more affordable capabilities or slowing B-21 investment. Numerous studies have proven that a mostly standoff arsenal is unaffordable, even if the previously mentioned limitations inherent to such a force did not exist.⁶² Concerns expressed in a RAND Corporation 2011 report that “adversaries may make calculations based on the size of the US missile inventory”—especially given the cost increases associated with building increasingly long-range weapons—must still be taken seriously.⁶³

Recalibrate the Combat Air Forces

If the combat air forces are to embrace the unique capabilities of the B-21 in the future, they must destroy the “stealth is dead” mindset, of which the insular B-2 community is partially responsible. Stealth and stand-in platforms are necessary to unlock strike efficiency and affordable mass, and stealth bombers have capabilities their fighter brethren do not. Often when planners think stealth, they typically conflate the B-2 and B-21 with more widely understood fighter characteristics. The remotely piloted aircraft (RPA) community, largely through the RQ-170, has proven the importance of stand-in stealth, but the fighter community is approximately three times larger than the bomber and RPA communities combined.⁶⁴ It is only natural that a fighter-led force coerced into standoff preferences might struggle to embrace a new tool such as the B-21.

61. David Axe, “A Symphony of Bomb Blasts: One after Another, Four Ukrainian JDAMs Apparently Strike Russian Positions in Bakhmut,” *Forbes*, April 23, 2023, <https://www.forbes.com/>.

62. Gunzinger, “Stand In, Standoff.”

63. Thomas Hamilton, “Comparing the Cost of Penetrating Bombers to Expendable Missiles over Thirty Years: An Initial Look,” RAND Working Papers WR-778-AF, March 4, 2011, <https://www.rand.org/>.

64. Johnny Franks, “Famous Stealthy RQ-170 ‘Sentinel’ Drone Teams for Combat with B-2 & F-35,” *Warrior Maven*: Center for Military Modernization, December 15, 2023, <https://warriormaven.com/>; and “2021 USAF & USSF Almanac: Specialty Codes,” *Air & Space Forces Magazine*, June 30, 2021, <https://www.airandspaceforces.com/>.

The Air Force must work now to enable its smart investments in fifth- and sixth-generation stealth fully. Reducing the special accesses required—or easing the read-in process for most tacticians—for current stealth platforms would be an excellent first step. Additionally, directing exercises that require dynamic area targeting in heavily defended airspace is an efficient way to breed tactical creativity and introduce the true level of mission command envisioned by Air Force leadership.

True strategic processes do not begin until combat starts, and history implies wars will not happen where or how leaders expect.⁶⁵ The B-21, thanks to its generational leap in stealth technology and modularity, firmly acknowledges that flexibility and adaptation are key to victory. Unfortunately, the realities of treating China and its A2/AD efforts as the pacing threat have led the combat air forces to minimize operational challenges that will be critical should a war ignite against any capable opponent: gas is limited, basing is as-sailable, GPS might not be available, and the space layer is vulnerable. The B-21 offers a chance to reconsider the relationships between stand-in and standoff and embrace a movement toward tactical creativity. ✈️

65. Shane Praiswater, “Reconsidering the Relationship between War and Strategy,” *RUSI Journal* 168, no. 5 (July 29, 2023), <https://doi.org/>; and Lawrence Freedman, *Strategy: A History* (New York: Oxford University Press, 2013).

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