



Shared Problems

The Lessons of AirLand Battle and the 31 Initiatives for Multi-Domain Battle

David E. Johnson

Since the end of the Cold War, the U.S. Army and the U.S. Air Force have pursued separate and sometimes competing visions of how air and ground power should be employed to win wars. This interservice rivalry was allowed to simmer while the nation focused on low-intensity counterinsurgency operations and did not face a peer adversary. However, the emergence of Russia and China as great-power competitors has brought new urgency to the question of how the United States leverages its air and ground—not to mention sea, space, and cyber—power to prevail against a formidable adversary. The National Security Strategy and National Defense Strategy envision the need for greater coordination across warfighting domains to meet future threats. The Army, in collaboration with the Air Force, is developing the concept of Multi-Domain Battle to better coordinate air and ground forces to meet shared challenges.¹ Yet this is not the first time that the Army and the Air Force have sought closer collaboration: In the 1980s, the Army's 31 Initiatives and AirLand Battle

doctrine were similarly focused on closer Army and Air Force cooperation to counter a perceived overmatch in Warsaw Pact capabilities. How did these efforts proceed? Why did they not continue? What lessons do they offer for today's Multi-Domain Battle?

Multi-Domain Battle

Multi-Domain Battle is intended to wrest the advantage from potential adversaries and restore a credible conventional deterrent and warfighting capability against peer competitors.² General David G. Perkins, until recently the commander of the U.S. Training and Doctrine Command (TRADOC), and General James M. Holmes, commander, Air Force Combat Command (ACC) coauthored the article "Multidomain Battle: Converging Concepts Toward a Joint Solution," stating that "TRADOC and ACC are working collaboratively today to blend their warfighting concepts into a joint doctrine for the future."³ In an earlier article, "Multi-Domain Battle: The Advent of Twenty-First Century War," General

Perkins, pointing to a way forward in developing Multi-Domain Battle, highlighted the need for interservice collaboration “in the spirit of the 31 Initiatives” from the 1980s.⁴ Given the importance of the 31 Initiatives as a precedent for current efforts, it is worth understanding their history.

The Origins of the 31 Initiatives

The 31 Initiatives arose from a mutual understanding between the Army and the Air Force that they were not prepared for the military challenge that the Warsaw Pact posed for NATO. This problem became glaringly apparent during the 1973 Yom Kippur War, when Syrian and Egyptian forces, armed with Soviet equipment and following Soviet doctrine, put the state of Israel and its vaunted defense forces in peril. The sudden realization of how some Soviet offensive capabilities had evolved while the United States was focused on Vietnam galvanized the Army and the Air Force around meeting the challenge of the defense of NATO.⁵

Defending Western Europe, conventionally, from Soviet aggression was a particularly acute problem for the Army and the Air Force in the 1970s and 1980s. The Warsaw Pact had significant quantitative advantages and, as the 1973 war had demonstrated, some overmatching capabilities. And this mutual understanding that the Warsaw Pact posed a shared problem that could not be resolved independently by the Army or the Air Force resulted in perhaps the one moment in Army and Air Force history when there was consensus regarding the need for fundamental collaboration.

To address the shared problem, on May 22, 1984, General John A. Wickham, Jr., U.S. Army Chief of Staff, and General Charles A. Gabriel, Air Force Chief of Staff, signed a memorandum of agreement, “U.S. Army-U.S. Air Force Joint Force

Development Process,” commonly referred to as the 31 Initiatives.⁶ The opening paragraph makes clear the breadth of the agreement:

The Army and the Air Force affirm that to fulfill their roles in meeting the national security objectives of deterrence and defense, they must organize, train, and equip a compatible, complementary, and affordable Total Force that will maximize our joint combat capability to execute airland combat operations. To that end, broad, across-the-board, war-fighting issues have been addressed.⁷

As the historian Harold Winton observed astutely, the close collaboration between the Army and the Air Force from 1973 to 1990, which included the 31 Initiatives, was a product of a specific unifying problem: “the ability to defeat a Warsaw Pact invasion of western Europe below the nuclear threshold.” This problem offered “the unifying effect of the NATO defense mission.”⁸ Winton also noted that other factors were in play, including “the close cooperation of personalities at or near the top of each service,” the ascendance of fighter pilots to top Air Force leadership positions, and “the clarity of the Army’s vision of how it intended to fight a future war that tended to pull the Air Force in its wake.”⁹ All of these factors combined to temporarily assuage the deep cultural antipathies and fundamental conceptual differences between ground and air officers about how to win wars that had existed since the days of Billy Mitchell, the famous post-World War I advocate for an independent U.S. air arm.¹⁰

This shared approach to solving the problem of defending NATO was more than a convergence of air and ground concepts: It resulted in new concepts, including the Army's AirLand Battle doctrine, joint suppression of enemy air defenses, battlefield air interdiction, and clarifications of close air support. Indeed, the integration of Army and Air Force capabilities was fundamental to AirLand Battle doctrine. Furthermore, some Army and Air Force programs were canceled or realigned to eliminate duplication of effort, and new capabilities were fielded more rapidly, such as the Joint Tactical Missile System and the Joint Surveillance Target Attack Radar System.¹¹ Finally, the 31st initiative showed the seriousness of the effort by instituting cooperation to decide budget priorities: "The Army and Air Force will formalize cross-service participation in the POM [Program Objective Memorandum] development process."¹² Interestingly, this cooperation began in the 1970s, when budgets were tight, and was not forced by outside pressures, as was the case with the Goldwater-Nichols Department of Defense Reorganization Act of 1986. The Soviet problem was dire enough to demand a joint approach.

Many of the capabilities that evolved from the 31 Initiatives would prove their worth after the Cold War, particularly in Kosovo, Iraq, and Afghanistan. Nevertheless, as the Army and the Air Force grew more capable, they also began drawing apart as each tried to demonstrate its unique utility in winning wars.

The Unraveling of Army–Air Force Cooperation: AirLand Battle Becomes Air and Land Battles

The interservice cooperation that undergirded the Army's AirLand Battle doctrine began fraying as service cultures and views about warfighting clashed during Operation Desert Storm. The Army's

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thinking and doctrine evolved in the 1970s and 1980s, with an increasing focus on the operational level of war. AirLand Battle was the final maturation of Army concepts and was reflected in the 1986 version of Field Manual 100-5, *Operations*. Although the manual recognized the value of air power against the Soviet heartland, a role that the Air Force believed was decisive, it argued that the best use of air power was against the enemy's land forces.¹³ The Army maintained that effects of strategic air "may be delayed because of the inherent momentum of forces actively engaged in combat and those reserve forces ready to enter the action."¹⁴ In other words, the Soviets would win the land war before conventional strategic air attack could be decisive, much as the Army believed was the case in World War II in Europe, when the German Army had been overrun before air power ended the war.¹⁵ Thus, the Army maintained that, as a first priority, "an air commander must exploit the devastating firepower of air power to disrupt that momentum and place an enemy's land forces at risk."¹⁶ This language also reflected a deeply held Army cultural credo, as

noted in Army Doctrine Reference Publication No. 1, *The Army Profession*: “Since 1775, our Army’s vital, enduring role has been to fight and win our Nation’s wars.”¹⁷

Making air power subordinate to a ground commander was the ultimate heresy for an air force whose very independence had hinged on two tenets that were first promulgated in the 1943 Field Manual 100-2, *Command and Employment of Air Power*, which proclaimed in all capital letters that “LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES; NEITHER IS AN AUXILIARY OF THE OTHER.”¹⁸ Furthermore, “CONTROL OF AVAILABLE AIR POWER MUST BE CENTRALIZED AND COMMAND MUST BE THROUGH THE AIR FORCE COMMANDER IF THIS INHERENT FLEXIBILITY AND ABILITY TO DELIVER A DECISIVE BLOW ARE TO BE FULLY EXPLOITED.”¹⁹ A 1948 Army study, *Army Ground Forces and the Air-Ground Battle Team Including Light Aviation*, noted that Field Manual 100-2 was published “without the concurrence of General McNair [head of Army Ground Forces] . . . and viewed with dismay by the Ground Forces—as the Army Air Forces’ ‘Declaration of Independence.’”²⁰

The 1984 version of Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force*, referred back to the 1943 manual, reiterating its fundamental tenets, including the importance of centralized control for air power, the need for air power to operate independently of land and maritime forces, and the belief that “aerospace power can be the decisive force in warfare.”²¹ Thus, again at center stage were the fundamental issues about the control of air power and its best use that had led airmen to fight for an independent air force after World War I. On the eve of Operation Desert Storm, this air-centric thinking was reiterated in

Colonel John Warden’s 1988 book, *The Air Campaign: Planning for Combat*, which emphasized that air power could independently win wars by attacking the enemy’s system from the inside out.²² Warden was also a “catalyst for the emerging view within the Air Force at the end of the Cold War that ‘the application of air power could, and perhaps even should, be thought of as being independent of ground operations.’”²³

Capability developments on the ground side were also driving a reconsideration of the Army’s view of the role of air power. Previously, the relatively short range of the Army’s field artillery had been the basis for how the battlefield was segmented between ground and air components. As the Army fielded new weapons with far greater ranges—the Army Tactical Missile System (ATACMS), the multiple-launch rocket system (MLRS), and the Apache helicopter—they extended the area that a ground commander could affect with fires from ten to fifteen kilometers beyond the front lines to one hundred kilometers or more. The extended ranges changed where the Army wanted the placement of the fire support coordination line, the demarcation of where air could operate without coordinating attacks with ground forces.²⁴ In the view of the Air Force, moving the fire support coordination line would significantly restrict its operations within what was now Army-controlled battlespace, thus hampering air interdiction and “potentially allow[ing] enemy forces to escape attack by friendly air formations.”²⁵

The end of the Cold War removed the shared problem of a peer adversary as a scenario that required collaboration between the Army and the Air Force. Their inherently different views were reflected in air and ground operations during both Operation Desert Storm and Operation Iraqi Freedom: “At stake was which

service would ultimately have the lead in destroying the enemy at the operational level of war—a fundamental question in deciding the relative roles of ground and air power in American warfighting practice.”²⁶ Additionally, in both Iraq wars, the Air Force believed that its operational and strategic air efforts were fundamental to the outcome, while the Army touted the centrality of ground forces in defeating Iraqi ground forces.²⁷ This Army perspective is perhaps best seen in a quote from Robert H. Scales’s *Certain Victory: The U.S. Army in the Gulf War*: “The defending Iraqi commander later remarked that after losing 2 of his 39 T-72s in five weeks of air attack, the 2d Cavalry had annihilated his entire command in fewer than six minutes in what later became known as the Battle of 73 Easting.”²⁸

Momentary spurts of interservice angst, particularly on the part of the Army, also flared following operations in Bosnia, Kosovo, Afghanistan, and Libya, when air power advocates asserted that air attack, particularly when directed by special operations forces, could win wars independently.²⁹ Nevertheless, it was during and after Operation Desert Storm and Operation Iraqi Freedom I in Iraq that the most interservice discord occurred. This is not surprising, given that these were the only post–Cold War conflicts when there were large-scale ground and air operations at the outset. In the aftermath of operations in both conflicts, there was a vigorous debate over whether air or ground forces made the greatest contribution to Saddam Hussein’s defeat in 2003. As Iraq descended into chaos, the debate went into remission. Both Army and Air Force operations and thinking were dominated by the absence of a peer competitor, the demands of counterinsurgency, high-value target hunting, and the fight against the Islamic State. However, with the return of great-power competition between the United States

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and Russia and China, the potential for a full-fledged relapse into interservice competition and discord is eminently possible. Indeed, creating concepts for multi-domain operations will be harder than for AirLand Battle for many reasons.

Why Multi-Domain Will Be Harder Than AirLand Battle

The history of the 31 Initiatives and the interservice disagreements that erupted afterward offer three key lessons for efforts to develop multi-domain concepts: There is more than one problem that the joint force must solve, no four-star joint agency is responsible for joint concept development and experimentation, and new concepts are about culture as much as convergence.

There Is More Than One Problem to Solve

A key strength of 31 Initiatives and AirLand Battle was that they were designed to solve one problem: the defense of Western Europe against the Warsaw Pact. This enabled the Army and the Air Force to focus their concept- and capability-development efforts on a

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known enemy, in a specific place, with understood weapons. By contrast, the various multi-domain concepts now under development are generic. They focus on domains rather than adversaries. If these concepts are to solve the challenges identified in the National Defense Strategy, they will instead have to focus on Russia and China—which present very different problems for the joint force. Although some concept and capability solutions may be relevant in both theaters, there will surely be unique needs, as there were in World War II in the Pacific and in Europe. The challenge of two peer adversaries will be particularly vexing for the Air Force because air and space power will be in heavy demand in both theaters. Given the nature of the adversaries and the battlespace, the Navy and the Marine Corps will be more focused on the Pacific and the Army on Europe, just as they were in World War II. With the addition of space and cyber to multi-domain warfare, the roles of the services in these two very different theaters will require extensive collaboration to design adversary-relevant concepts.

No Four-Star Agency Is Responsible for Joint Concept Development and Experimentation

AirLand Battle and the 31 Initiatives were biservice efforts that predated Goldwater-Nichols and were thus unencumbered by the joint concept development process and the Joint Capabilities Integration and Development System (JCIDS). Furthermore, since 2011, the ability of the U.S. joint force to develop concepts to serve as the basis for joint doctrine has been greatly diminished by the disestablishment of the U.S. Joint Forces Command (JFCOM).³⁰ For all its warts, JFCOM was the only four-star command focused on developing joint concepts and conducting experimentation for the future. Concepts are now supposed to be developed through a deliberative, consensus-based process that is managed by the Joint Chiefs of Staff, J-7 (Joint Force Development).³¹ Absent JFCOM, it is not surprising that there is no joint force concept, much less a common lexicon, for multi-domain concepts. Instead, there are multiple competing concepts: Multi-Domain Battle, Multi-Domain Operations, Multi-Domain Command and Control, and Multi-Domain Maneuver, and more are likely in the offing as the services vie to solve challenges posed by Russia and China in ways that are in keeping with their respective service institutional ethos. As an additional complicating factor, concept development for multi-domain operations might require interagency consensus, given the authorities and capabilities for cyber that reside outside the Department of Defense. Joint consensus is hard; interagency is really hard.

New Concepts Are About Culture as Much as Convergence

A clash of fundamental Army and Air Force warfighting cultures caused the demise of AirLand Battle as a shared doctrinal

approach. Ironically, this resulted mainly from the Army's fielding of new capabilities to fight AirLand Battle more effectively and to continue to evolve its operational doctrine to incorporate them. In Army doctrine, the new capabilities resulted in the allocation of battlespace in areas of operations (AO) and changes in which one component was supported or supporting. In 2001, the Army's operational doctrine stated: "AOs should also allow component commanders to employ their organic, assigned, and supporting systems to the limits of their capabilities. Within their AOs, land and naval commanders synchronize operations and are supported commanders."³² During Operation Iraqi Freedom, this meant that the V Corps AO could be extended to the range of ATACMS and Apache helicopters.³³ Army and joint operational doctrine published in 2017 uses language for areas of influence similar to that of the Army 2001 definition for an AO. It defines area of influence as a "geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control."³⁴ Consequently, the friction between Army and Air Force components experienced in Operation Desert Storm and Operation Iraqi Freedom could be amplified by the fielding of Army long-range precision fire systems, some of which are envisioned to have ranges to 500 kilometers. Importantly, these long-range Army fires can play a key role in countering adversary anti-access and area denial systems to facilitate the use of air and space power and other joint force capabilities.³⁵ Nevertheless, for all multi-domain capabilities to operate in concert, the services must develop a mutual under-

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standing of battlespace management, service and intergovernmental domain relationships, and capability allocation (if allocation is relevant in the future) from the homeland through the close fight.

Final Thoughts

The Army and the Air Force are beginning the much-needed dialogue to develop a new warfighting concept, similar to what happened in the 1970s and 1980s, to address the challenges of multi-domain conflict against peer competitors. To be successful, this new multi-domain concept will have to address the fundamental questions of each service's culture and deeply held views about warfighting. Convergence is necessary but not sufficient. Understanding the positive lessons from the 1970s and 1980s from the 31 Initiatives—as well as why AirLand Battle ultimately caused a divergence between the Army and the Air Force, rather than a convergence—is an important place to start. Ultimately, the key lesson of the 31 Initiatives for Multi-Domain Battle is this: When the Army and the Air Force work closely to solve a shared problem—and derive mutually agreed-upon solutions—much can be accomplished.

Endnotes

¹ When this Perspective was written, the Army was using the term *Multi-Domain Battle*. The Army has since renamed the concept *Multi-Domain Operations*. The substance of this Perspective is, however, unchanged.

² U.S. Army Training and Doctrine Command, *Multi-Domain Battle: Evolution of Combined Arms for the 21st Century: 2025–2040*, Fort Eustis, Va., December 2017.

³ David G. Perkins and James M. Holmes, “Multidomain Battle: Converging Concepts Toward a Joint Solution,” *Joint Force Quarterly*, Vol. 88, No. 1, 2018, p. 57.

⁴ David G. Perkins, “Multi-Domain Battle: The Advent of Twenty-First Century War,” *Military Review*, November–December 2017, p. 13.

⁵ David E. Johnson, “An Army Trying to Shake Itself from Intellectual Slumber, Part I: Learning from the 1970s,” *War on the Rocks*, February 2, 2018.

⁶ Richard I. Wolf, *The United States Air Force: Basic Documents on Roles and Missions*, Washington, D.C.: Office of Air Force History, U.S. Air Force, 1987, pp. 415–423. See also Richard G. Davis, *The 31 Initiatives*, Washington, D.C.: Office of Air Force History, 1987.

⁷ Wolf, 1987, p. 415.

⁸ Harold R. Winton, “An Ambivalent Partnership: US Army and Air Force Perspectives on Air–Ground Operations, 1973–1990,” in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory*, Maxwell Air Force Base, Ala.: Air University Press, 1997, p. 430.

⁹ Winton, 1997, p. 430.

¹⁰ David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945*, Ithaca, N.Y.: Cornell University Press, 1998.

¹¹ Wolf, 1987, pp. 417–423.

¹² Wolf, 1987, p. 423.

¹³ Field Manual 100-5, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 1986, p. 47.

¹⁴ Field Manual 100-5, 1986, p. 47.

¹⁵ U.S. Strategic Bombing Survey, *The United States Strategic Bombing Surveys (European War) (Pacific War) (1945–46)*, Maxwell Air Force Base, Ala.: Air University Press, 1987, p. 37. The U.S. Strategic Bombing Survey for the European

war noted: “Although it brought the economy which sustained the enemy’s armed forces to a virtual collapse[,] . . . the full effects of this collapse had not reached the enemy’s front lines when they were overrun by Allied forces.”

¹⁶ Field Manual 100-5, 1986, p. 47.

¹⁷ Army Doctrine Reference Publication 1, *The Army Profession*, Washington, D.C.: Headquarters, Department of the Army, 2015, Foreword.

¹⁸ Field Manual 100-20, *Command and Employment of Air Power*, Washington, D.C.: U.S. War Department, Field Service Regulations, 1944, p. 1.

¹⁹ Field Manual 100-20, 1944, p. 2.

²⁰ Kent Roberts Greenfield, *Army Ground Forces and the Air-Ground Battle Team: Including Light Aviation Historical Section*, Fort Monroe, Va.: Historical Section, Army Ground Forces, Study No. 35, 1948, p. 47.

²¹ Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force*, Washington, D.C.: Headquarters, Department of the Air Force, 1984, pp. 1–3.

²² John A. Warden III, *The Air Campaign: Planning for Combat*, Washington, D.C.: National Defense University Press, 1988.

²³ David E. Johnson, *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era*, Santa Monica, Calif.: RAND Corporation, MG-405-1-AF, 2007, p. 19, quoting Harold R. Winton, “Partnership and Tension: The Army Between Vietnam and Desert Storm,” *Parameters*, Spring 1996, pp. 100–119.

²⁴ Winton, 1996.

²⁵ Winton, 1996.

²⁶ Johnson, 2007, p. 40.

²⁷ Johnson, 2007, pp. 21–64, 123–136.

²⁸ Robert H. Scales, Terry L. Johnson, and Thomas P. Odom, *Certain Victory: The U.S. Army in the Gulf War*, Washington, D.C.: Office of the Chief of Staff, U.S. Army, 1993, p. 262.

²⁹ Johnson, 2007, pp. 48–103; Karl P. Mueller, ed., *Precision and Purpose: Airpower in the Libyan Civil War*, Santa Monica, Calif.: RAND Corporation, RR-676-AF, 2015.

³⁰ Hugh Lessig, "JFCOM Dissolves, but Many Functions Remain," *Daily Press*, August 4, 2011.

³¹ The process is described in Chairman of the Joint Chiefs of Staff Instruction 3010.02E, *Guidance for Developing and Implementing Joint Concepts*, Washington, D.C.: Chairman of the Joint Chiefs of Staff, August 17, 2016.

³² Field Manual 3-0, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 2001, p. 4-19.

³³ Johnson, 2007, p. 134.

³⁴ Field Manual 3-0, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 2017, pp. 1-29; Joint Publication 3-0, *Operations*, Washington, D.C.: U.S. Joint Chiefs of Staff, 2017, p. GL-6.

³⁵ Sydney J. Freedburg, Jr., "Army Will Field 100 km Cannon, 500 km Missiles: LRRP CFT," *Breaking Defense*, March 23, 2018.

References

- Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force*, Washington, D.C.: Headquarters, Department of the Air Force, 1984.
- Army Doctrine Reference Publication 1, *The Army Profession*, Washington, D.C.: Headquarters, Department of the Army, 2015.
- Chairman of the Joint Chiefs of Staff Instruction 3010.02E, *Guidance for Developing and Implementing Joint Concepts*, Washington, D.C.: Chairman of the Joint Chiefs of Staff, August 17, 2016.
- Davis, Richard G., *The 31 Initiatives*, Washington, D.C.: Office of Air Force History, 1987.
- Field Manual 3-0, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 2001.
- Field Manual 3-0, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 2017.
- Field Manual 100-5, *Operations*, Washington, D.C.: Headquarters, Department of the Army, 1986.
- Field Manual 100-20, *Command and Employment of Air Power*, Washington, D.C.: U.S. War Department, Field Service Regulations, 1944.
- Freedburg, Sydney J., Jr., “Army Will Field 100 km Cannon, 500 km Missiles: LRPFCFT,” *Breaking Defense*, March 23, 2018. As of April 16, 2018: <https://breakingdefense.com/2018/03/army-will-field-100-km-cannon-500-km-missiles-lrpf-cft/>
- Greenfield, Kent Roberts, *Army Ground Forces and the Air-Ground Battle Team: Including Light Aviation Historical Section*, Fort Monroe, Va.: Historical Section, Army Ground Forces, Study No. 35, 1948.
- Johnson, David E., *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945*, Ithaca, N.Y.: Cornell University Press, 1998.
- , *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era*, Santa Monica, Calif.: RAND Corporation, MG-405-1-AF, 2007. As of April 16, 2018: <https://www.rand.org/pubs/monographs/MG405-1.html>
- , “An Army Trying to Shake Itself from Intellectual Slumber, Part I: Learning from the 1970s,” *War on the Rocks*, February 2, 2018. As of April 16, 2018: <https://warontherocks.com/2018/02/army-trying-shake-intellectual-slumber-part-learning-1970s/>
- Joint Publication 3-0, *Operations*, Washington, D.C.: U.S. Joint Chiefs of Staff, 2017.
- Lessig, Hugh, “JFCOM Dissolves, but Many Functions Remain,” *Daily Press*, August 4, 2011. As of April 16, 2018: http://articles.dailypress.com/2011-08-04/news/dp-nws-jfcom-closing-20110804_1_jfcom-functions-joint-forces-command-military-spending
- Mueller, Karl P., ed., *Precision and Purpose: Airpower in the Libyan Civil War*, Santa Monica, Calif.: RAND Corporation, RR-676-AF, 2015. As of April 16, 2018: https://www.rand.org/pubs/research_reports/RR676.html
- Perkins, David G., “Multi-Domain Battle: The Advent of Twenty-First Century War,” *Military Review*, November–December 2017, pp. 8–13
- Perkins, David G., and James M. Holmes, “Multidomain Battle: Converging Concepts Toward a Joint Solution,” *Joint Force Quarterly*, Vol. 88, No. 1, 2018, pp. 54–57.
- Scales, Robert H., Terry L. Johnson, and Thomas P. Odom, *Certain Victory: The U.S. Army in the Gulf War*, Washington, D.C.: Office of the Chief of Staff, U.S. Army, 1993.
- U.S. Army Training and Doctrine Command, *Multi-Domain Battle: Evolution of Combined Arms for the 21st Century: 2025–2040*, Fort Eustis, Va., December

2017. As of April 16, 2018:

http://www.tradoc.army.mil/multidomainbattle/docs/MDB_Evolutionfor21st.pdf

U.S. Strategic Bombing Survey, *The United States Strategic Bombing Surveys (European War) (Pacific War) (1945–46)*, Maxwell Air Force Base, Ala.: Air University Press, 1987.

Warden, John A., III, *The Air Campaign: Planning for Combat*, Washington, D.C.: National Defense University Press, 1988.

Winton, Harold R., “Partnership and Tension: The Army Between Vietnam and Desert Storm,” *Parameters*, Spring 1996, pp. 100–119.

———, “An Ambivalent Partnership: US Army and Air Force Perspectives on Air-Ground Operations, 1973–1990,” in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory*, Maxwell Air Force Base, Ala.: Air University Press, 1997, pp. 399–442.

Wolf, Richard I., *The United States Air Force: Basic Documents on Roles and Missions*, Washington, D.C.: Office of Air Force History, U.S. Air Force, 1987.

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