1 Introduction

In June 2002, the United States commenced an air campaign to roll back Iraqi air defenses. US air forces responded when radars illuminated their fighters by adjusting the rules of engagement for self-defense, attacking not only those specific sites but the entire Iraqi air defense system.[1] By the time of the ground invasion in March 2003, the United States had long achieved air superiority. In anticipation of facing an air-only campaign, the Iraqi Army dispersed rather than concentrated its forces at strategic choke points. As a result, the ground forces of the US-led coalition met little resistance in what quickly turned into a race to Baghdad. By deterring the enemy army from massing and maneuvering, air power had made its most significant contribution to the war before the first pair of American boots touched Iraqi soil.[2] The invasion would have taken on a different character without air power overhead. Allowed to fight from prepared defenses, the Iraqis could have slowed the invasion and inflicted more casualties, similar to how nineteen years later the Ukrainians stalled the Russian advance on Kyiv.[3]

The invasion of Iraq demonstrates how air power works when directly attacking fielded forces. Under a lethal air threat, enemy armies disperse and hide, which provides friendly ground forces a significant advantage. Coordinated air and ground attacks place an army on the horns of a dilemma. Does it concentrate and maneuver, as the North Vietnamese Army (NVA) did at Khe Sanh and again in the Easter Offensive, only to be decimated by airstrikes? Or does it disperse and hide, as the Iraqi Army did, and be overrun?

Threatened armies usually choose the latter course, with air power deterring them from massing and maneuvering. When most effective, air

[1] Throughout this book US air forces refer to the Air Force, Navy, and Marine fixed-wing aviation.

[2] Benjamin Lambeth, *The Unseen War: Allied Air Power and the Takedown of Saddam Hussein* (Annapolis, MD: Naval Institute Press, 2013), 66–71.

[3] The argument is not that the Iraqis would have stopped the invasion, as the Ukrainians did, but that it could have imposed more costs.

forces do not destroy armies, with Khe Sanh and the Easter Offensive being exceptions, but instead deny the enemy army its preferred strategy of concentrating at the decisive point.[4] Just as the better measure of a police force is not the total arrests made but the number of crimes committed, an air force should be evaluated not by the number of targets destroyed but by how air power affects the enemy's decision-making.[5] Carl Von Clausewitz, in *On War*, understood the significance of enemy actions not taken when he argued that one must account for the consequences of the engagements not waged.[6]

This book introduces a theory of tactical air power (TAP) to explain why, how, and when modern air power works. After World War II, two technologies changed the character of air warfare. First, in the Cold War the proliferation of thermonuclear weapons and the exorbitant costs anticipated from nuclear war deterred the United States and the Soviet Union. Given the risk of escalation, the United States fought wars not against other nuclear-armed nations but against weaker state and non-state actors. Nuclear rivals have competed through their allies and proxies by supplying weapons, training, and diplomatic support, as in Vietnam, Afghanistan, and Ukraine. The asymmetric nature of these wars has, in turn, shaped how US air power has been employed.

The second technology characterizing modern air warfare has been the proliferation of radar- and infra-guided air-to-air and surface-to-air missiles. Since the early 1960s, the lethality of these systems has significantly increased the risks of combat in contested air space. To survive such hostile conditions, US air forces transitioned from bombers to tactical aircraft (tacair) as their primary combat platform. B-52s continued to provide strategic deterrence as part of the US nuclear triad, and later, stealth bombers armed with precision-guided weapons conducted strategic bombing. In addition, conventionally armed bombers have also flown in lower-threat areas, such as over South Vietnam. However, overall tacair has been the workhorse of modern air combat, utilized for air superiority, strategic bombing, air interdiction, and direct attack.

This book examines modern US air warfare, conflicts where non-nuclear nations, protected by integrated air defense systems (IADS), have,

[4] Carl Von Clausewitz, *On War* (Princeton, NJ: Princeton University Press, 1976), 195; This also follows Sun Tzu's advice of attacking the enemy's strategy. Sun Tzu *The Art of War* (Oxford: Oxford University Press, 1983), 77.

[5] There are other reasons why crime rates may be low that have little to do with the effectiveness of the police force. The problem of showing causation when the only proof is the lack of evidence is like the problem of assessing the effectiveness of deterrence. How does one know that it was the threat of air strikes that deterred enemy action?

[6] Clausewitz, *On War*, 181.

to varying degrees, contested air superiority.[7] Omitted from examination are conflicts with states without viable air defenses, including Grenada, Panama, and Afghanistan. Also excluded are counterinsurgency and counterterrorism operations. Over the past two decades, US air forces have targeted non-state actors in the Middle East, Central Asia, and Africa. In these cases, where air supremacy has been assumed, the type of aircraft and tactics utilized have differed markedly from the modern air wars considered in this book. How best to employ air power to counter insurgencies and terrorists remains an important topic, but not one examined in detail here.[8]

Strategic Bombing, Air Interdiction, and Direct Attack

The United States has fought numerous modern air wars over the past six decades, facing North Vietnamese, Iraqi, Bosnian Serb, Serbian, and Libyan air defenses. In several of these conflicts, the United States conducted multiple air campaigns.[9] For instance, the United States initiated the Rolling Thunder air campaign over North Vietnam while simultaneously fighting a joint, combined arms campaign in South Vietnam.

The type of air campaign can be categorized by its theory of victory for how air power achieves military and political objectives. There are three general types of air campaigns: strategic bombing, air interdiction, and direct attack. Strategic bombing aims to obtain political goals by coercing the enemy nation to make concessions. Air forces conduct strategic bombing independent of surface forces, overflying the battlefield to target the enemy's population, economy, or leadership.

Air interdiction, by contrast, indirectly targets the enemy military by cutting off its supply lines and reinforcements. Air interdiction can weaken the enemy as part of a denial strategy to coerce the enemy to make concessions, as the United States failed to do in Rolling Thunder. Also, air interdiction can contribute to a brute-force ground invasion, as

[7] Prior to Desert Storm Iraq procured its KARI (Iraq spelled backwards in French) air defense system from France.

[8] See James Corum and Wray Johnson, *Air Power in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003); Anthony Schinella, *Bombs without Boots: The Limits of Airpower* (Washington, DC: Brookings, 2019); Phil Haun, Colin Jackson, and Tim Schultz, eds., *Air Power in the Age of Primacy: Air Warfare since the Cold War* (Cambridge: Cambridge University Press, 2021).

[9] A campaign is defined as a series of related operations constrained by time and space to achieve military or strategic objectives. Department of Defense, *Dictionary of Military and Associated Terms* (November 2021), 29, www.supremecourt.gov/opinions/URLs_Cited/OT2021/21A477/21A477-1.pdf.

attempted in Desert Storm in 1991. Airstrikes may occur deep in enemy territory, targeting the source of the enemy's military capabilities. During Linebacker I, the United States bombed North Vietnamese railways and harbors to prevent imports from China and the Soviet Union. These air interdiction missions struck large, fixed structures such as bridges, railway stations, and port facilities. Alternatively, air interdiction may attack mobile transports, such as the trucks traversing the Ho Chi Minh Trail through southern Laos.

Direct attack is the third type of air campaign, usually as part of a combined arms operation, as occurred in South Vietnam. The 1999 US-led NATO (North Atlantic Treaty Organization) air war against the Serbian Army in Kosovo was an exception. Serbian soldiers initially responded to direct air attacks by dispersing and hiding. However, without the credible threat of an opposing ground force, the Serbs soon swapped their military vehicles for civilian automobiles. They continued their ethnic cleansing while NATO tacair circled helplessly overhead.[10] As this book will demonstrate, direct air attack missions are more often and more effectively coordinated with friendly armies.

Those familiar with combined arms doctrine for direct attack will first think of close air support (CAS), missions conducted near friendly armies. To avoid fratricide, CAS requires detailed coordination and integration with the ground scheme of maneuver. Joint tactical air controllers (JTACs), embedded in ground units, identify targets and control airstrikes. CAS has been referred to as "flying artillery" since it provides the same essential function as artillery supporting ground units. Dedicated CAS aircraft, such as the A-1 Skyraider over Vietnam and the A-10 Warthog over Iraq and Afghanistan, have long been hailed by soldiers. They are appreciated, in part, because the troops can observe the aircraft working overhead. Emergency CAS is particularly valued for troops in contact (TIC) situations where airstrikes may be critical to the soldiers' survival, as occurred throughout the Battle of Khe Sanh and repeatedly during the Easter Offensive. Especially prized is CAS in counterinsurgencies, where dispersed friendly troops rely on the quick response of air power. While popular with soldiers, CAS is limited in its effectiveness by JTAC and target availability. Also, each mission takes significant time to brief inbound aircraft on the target, threats, and restrictions. CAS is also inefficient since usually fewer missions can be executed than the sorties available. Also, by definition, CAS only occurs

[10] The author flew as an A-10 Airborne Forward Air Controller (AFAC) in Kosovo. See Christopher Haave and Phil Haun, eds., *A-10s over Kosovo* (Maxwell AFB, AL: Air University Press, 2003).

when friendlies are near the enemy. As a result, the tacair allocated for CAS is often diverted to strike behind the front lines.

Tacair has more often directly attacked fielded forces beyond the range of CAS. Various names have been used to describe these deeper strike missions in different wars, including armed recce (reconnaissance), BAI (battlefield air interdiction), Kill Box CAS, Killer-Scout, push-CAS, FACA (forward air controller airborne), AFAC (airborne forward air controller), and SCAR (strike coordination and reconnaissance). Before the Vietnam War, the US Air Force referred to this mission as battlefield interdiction but removed the term from its doctrine during the war.[11] Afterward, it reintroduced the role, renamed battlefield air interdiction, to support the US Army's AirLand Battle doctrine. Air Force commanders then refused to call armed recce sorties BAI during Desert Storm and after the war again struck BAI from its doctrine. Armed recce is a challenging mission that requires sharing targeting prioritization with Army commanders.[12] By contrast, US Marine Corps aviation has retained the armed recce mission, which, along with air interdiction, it refers to as deep air support (DAS).[13] This book uses the term armed recce to refer to these direct attack missions flown above the battlefield but beyond the range of CAS.

Unlike air interdiction, armed recce requires coordination with ground forces for strikes inside the bomb line, now referred to as the fire support coordination line (FSCL). In the Vietnam War, the bomb line was a deconfliction measure to reduce fratricide and indicate where air forces needed to coordinate with the ground forces. In modern air warfare, airstrikes against enemy armies have more often been conducted as armed recce. In practice, there have been fewer opportunities to conduct CAS. Tacair assigned to CAS often do not find their assigned JTACs with available targets and are diverted to armed recce to search for targets of opportunity beyond the battlefront. The paradox with direct attack is that from a theater perspective, air power conducts operations jointly to be the hammer for the army's anvil.[14] At the tactical level, however, aircrew more often conduct armed recce missions independently,

[11] Air Force Manual (AFMAN) 1-7, *Theater Air Forces in Counterair, Interdiction and Close Air Support 1 March 1954* (Washington, DC: Department of the Air Force, 1954); Terrance McCaffrey, *What Happened to Battlefield Air Interdiction?* (Maxwell AFB, AL: Air University Press, 2004), 16.

[12] Phil Haun, "Peacetime Military Innovation through Inter Service Cooperation" *Journal of Strategic Studies* 43:5 (2020), 10.

[13] US Marine Corps, *Aviation Operations* MCWP 3–20 (Washington, DC: Marine Corps Headquarters, 2018), 2-1–2-2.

[14] I credit Robert Pape for this analogy.

beyond the control of ground forces. Air power's primary impact on these missions is to cause the enemy to disperse and hide.

Direct Attack

In modern warfare, US air power is most effective as direct attack, employed as part of a joint combined arms campaign. For most of its history, however, air force leaders have contended that the true value of air power is squandered when used in such a manner. Early air power advocates argued that the invention of the airplane changed the nature of warfare. An air force could be a substitute for armies and navies. Interwar strategic bombing theorists, including Giulio Douhet, Hugh Trenchard, Billy Mitchell, and, at the end of the Cold War, John Warden, called for air forces to be independent, wielding air power decisively by striking the enemy's population, economy, or leadership.[15] Even those who conceded the necessity of defeating the enemy's military contended that air power is best employed indirectly, neutralizing the sources of enemy war production or interdicting its lines of communication (LOC).[16] Unfortunately, strategic bombing and air interdiction rarely succeed.[17] Conventional strategic bombing campaigns usually do not impose sufficient costs to coerce.[18] While theoretically appealing, air interdiction against enemy land LOC usually fails as enemy armies stockpile supplies, repair roads and bridges, and develop alternate routes. Air power advocates developed their theories based on how they wished air power to be

[15] Giulio Douhet, *Command of the Air 1921* (Washington, DC: Air Force History and Museums Program, 1998); Hugh Trenchard, "Memorandum from Royal Air Force Chief of Air Staff Hugh Trenchard to CHIEFS OF STAFF Subcommittee on the War Objective of an Air Force, 2 May 1928" in Phil Haun, ed., *Lectures of the Air Corps Tactical School and American Strategic Bombing in World War II* (Lexington: University Press of Kentucky, 2019), Appendix 1; John Warden, "The Enemy as a System" *Airpower Journal* X:1 (Spring 1995), 40–55; William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power Economic and Military* (New York: Putnam, 1925).

[16] J. C. Slessor, *Air Power and Armies* (Oxford: Oxford University Press, 1936); Haun, *Lectures of the Air Corps Tactical School*.

[17] Robert Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell University Press, 1995); Phil Haun, *Coercion, Survival & War: Why Weak States Resist the United States* (Palo Alto, CA: Stanford University Press, 2015).

[18] Kosovo is the exception, where Serbian President Slobodan Milosevic likely conceded because of the war's impact on the weakened Serbian economy. There remains some dispute as to the primary cause for Milosevic's decision to concede Kosovo. For examples see contrary assessments by two RAND reports by Stephen Hosmer, *The Kosovo Conflict: Why Milosevic Decided to Settle When He Did* (Santa Monica, CA: RAND, 2001), and Benjamin Lambeth, *NATO's Air War for Kosovo: Strategic and Operational Assessment* (Santa Monica, CA: RAND, 2001).

employed, often to justify independent service status, rather than on how air power has proven most effective in combat. As an alternative to existing air power theories, which look promising on paper but disappoint in practice, this book presents a theory for why, how, and when tactical air power works in modern air warfare.

Since 1965, the United States has waged twenty-three modern air campaigns in Vietnam, Iraq, Bosnia, Serbia, and Libya (Table 1.1). Even though Air Force leaders preferred strategic bombing and air interdiction, they reluctantly supported combined arms operations when ordered to do so. In nearly half of the cases (eleven of twenty-three), US air forces directly attacked the enemy's fielded forces and achieved their military objectives most of the time (nine of eleven). When militarily successful, they further contributed to obtaining US political objectives over half the time (five of nine). By contrast, in just over a quarter of the cases (six of twenty-three), strategic bombing campaigns succeeded only twice (two of six). The United States also attempted air interdiction six times, with all but one campaign failing. In sum, in modern air warfare, though US air power has not always been effective in achieving military and political objectives, the direct attack of military forces has been the strategy most often implemented and that has most often succeeded.

From Table 1.1, the Vietnam War stands out as the first modern air war. By the early 1960s, the rapid growth in the thermonuclear arsenals of the United States and Soviet Union deterred a nuclear war between the superpowers. The concern over escalation, by Chinese or Soviet intervention, constrained US air strikes and dissuaded the United States from a ground invasion of North Vietnam. The introduction of radar-guided surface-to-air missiles (SAMs) increased the lethality of the North Vietnamese air defense system. Heavy bombers could not freely conduct strategic bombing campaigns as the United States had done in World War II and the Korean War. Vietnam is also the longest modern air war, spanning almost eight years. It was here that most modern air warfare took place (thirteen of twenty-three cases), including multiple strategic bombing, air interdiction, and direct attack campaigns. Air superiority was also contested, with the United States losing over 9,000 fixed and rotary-wing aircraft.[19] During the Vietnam War, the character of modern air power was revealed under the crucible of combat, where

[19] Combat- and non-combat-related losses included 3,744 fixed-wing and 5,607 helicopters. Chris Hobson, *Vietnam Air Losses: Air Force, Navy and Marine Corps Fixed-Wing Aircraft Losses in Southeast Asia 1961–1973* (North Branch, MN: Specialty Press, 2001); Gary Roush, "Helicopter Losses during the Vietnam War" Vietnam Helicopter Pilots Association (December 2018), vhpa.org/heliloss.pdf.

Table 1.1 *Modern US air campaigns*[1]

Year	Air campaign	Opponent	Strategy	Mil/pol outcome
Mar–Jul 1965	Rolling Thunder	North Vietnam	Strategic bombing	Failure/failure
Mar 65–Dec 66	Rolling Thunder	North Vietnam	Interdiction	Failure/failure
Jul 65–Dec 66	Combined Arms	North Vietnam	Direct attack	Success/failure
Jan 67–Mar 68	Rolling Thunder	North Vietnam	Interdiction	Failure/failure
Jan 67–Mar 68	Khe Sanh/Tet	North Vietnam	Direct attack	Success/failure
Apr–Dec 1967	Rolling Thunder	North Vietnam	Strategic bombing	Failure/failure
Nov 68–Jun 70	Commando Hunt I-III	North Vietnam	Interdiction	Success/failure
Apr–Jun 1970	Cambodia	North Vietnam	Direct attack	Success/failure
Nov 70–Mar 72	Commando Hunt V-VII	North Vietnam	Interdiction	Failure/failure
Feb–Mar 1971	Lam Son 719	North Vietnam	Direct attack	Failure/failure
Mar–Sep 1972	Easter Offensive	North Vietnam	Direct attack	Success/success
May–Oct 1972	Linebacker I	North Vietnam	Interdiction	Failure/failure
Dec 1972	Linebacker II	North Vietnam	Strategic bombing	Success/success
Jan–Feb 1991	Instant Thunder	Iraq	Strategic bombing	Failure/failure
Jan–Feb 1991	Desert Storm	Iraq	Interdiction	Failure/failure
Jan–Feb 1991	Desert Storm	Iraq	Direct attack	Success/success
Apr 91–Oct 98	No Fly Zones, WMD	Iraq	Direct attack	Success/failure
Aug 1995	Bosnia	Bosnian Serbs	Direct attack	Success/success
Mar–Jun 1999	Serbia	Serbia	Strategic bombing	Success/success
Mar–Jun 1999	Kosovo	Serbia	Direct attack	Failure/failure
Mar 2003	Operation Iraqi Freedom	Iraq	Strategic bombing	Failure/failure
Mar 2003	Operation Iraqi Freedom	Iraq	Direct attack	Success/success
Mar 2011	Odyssey Dawn	Libya	Direct attack	Success/success
Total Direct attack			**11/23**	**9/11 Mil success 5/11 Pol success**
Total Strat bombing			**6/23**	**2/6 Pol success**
Total Air interdiction			**6/23**	**1/6 Mil success 0/6 Pol success**

[1] The thirteen cases of the Vietnam War are examined in detail in Chapters 3–7 while the coding for the remaining ten cases are explained in Appendix B.

https://doi.org/10.1017/9781009364201.002 Published online by Cambridge University Press

aircrew refined the operational concepts for modern air warfare, most of which remain valid today.

Because of the Vietnam War's central role in developing modern US air power, the body of this book (Chapters 3–7) analyzes its thirteen air campaigns. Vietnam can be thought of as a historical laboratory used to test the tactical air power theory introduced in the following chapter. In the process, the effectiveness of strategic bombing, air interdiction, and direct attack are measured, and the various operational and environmental factors that place limitations and constraints on air power are identified. However, chapter-length assessments of all twenty-three US modern air campaigns go beyond this single volume's ambitions. Appendix B summarizes the ten modern air campaigns that followed Vietnam. A more detailed analysis is available in *Air Power in the Age of Primacy: Air Warfare since the Cold War*.[20] An evaluation of modern air warfare in the Vietnam War provides a better understanding of why, how, and when to employ air power today and in the future.

Organization of the Book

The book proceeds as follows: Chapter 2 provides a historical account of the development of tactical air power during the interwar period and World War II in Germany, the Soviet Union, Great Britain, and the United States (readers unfamiliar with air power theory may want to read Appendix A first). Air and ground force coordination has largely been ignored in peacetime, and only in combat has a sense of urgency arisen for developing and refining joint doctrine. Even then, the focus has been on defining air and ground command relationships and improving the coordination between an air force's tactical air control systems (TACS) and the army's air-ground systems (AAGS). These doctrinal efforts increased the efficiency of allocating and controlling air power to support ground operations. However, largely left unspoken and unwritten has been an understanding of why, how, and when tactical air power works. TAP theory answers these questions by asserting that air power's asymmetric advantage is its ability to locate and attack massed and maneuvering armies. With air superiority secured, lethal air-to-ground forces threaten armies, causing them to disperse and hide. The enemy's reaction, in turn, provides friendly ground forces an advantage in conducting both offensive and defensive operations. Unfortunately, a theory

[20] Haun et al., *Air Power in the Age of Primacy*.

explaining the primary impact of air power in modern warfare has been absent until now.[21]

The body of the book evaluates TAP theory during the Vietnam War. Chapter 3 examines the first two years of major US combat operations from 1965 through 1966. Over North Vietnam, the Rolling Thunder air campaign failed to either isolate communist forces in South Vietnam or coerce North Vietnam to withdraw its support of the insurgency. Air power proved more effective in the direct attack of the North Vietnam Army and Viet Cong (NVA/VC) in South Vietnam. The US combined arms campaign thwarted an offensive aimed at dividing South Vietnam. Instead, well-executed allied air-to-ground operations compelled the enemy to disperse and hide.

Chapter 4 evaluates US tactical air power from 1967 to 1968. Over North Vietnam, the Rolling Thunder air interdiction campaign struggled to isolate NVA/VC forces. Simultaneously, a strategic bombing campaign could not coerce Hanoi to withdraw its support of the insurgency. The direct attack of the NVA/VC forces in South Vietnam proved more effective, with the ultimate test occurring near the demilitarized zone (DMZ) at the US Marine base at Khe Sanh. Here, the NVA massed two divisions, hoping to overrun the marines to achieve a decisive victory, as the North Vietnamese had against the French in 1954 at Dien Bien Phu. Instead, the American combined arms campaign defeated the NVA. The massing of ground forces at Khe Sanh differed from the NVA's previous tactics of dispersing and taking sanctuary in Laos and Cambodia. Such defensive measures had previously allowed the NVA/VC to survive but had also delayed plans to launch a general offensive and general uprising. When the NVA/VC finally commenced their offensive in early 1968, they failed militarily at Khe Sanh and, more broadly, in the Tet Offensive. However, more importantly, the North Vietnamese succeeded politically as American support for the war evaporated.

Chapter 5 assesses US air power following the Tet Offensive through the cross-border incursion into Cambodia in 1970. The newly elected US president, Richard Nixon, sought an American withdrawal from South Vietnam. However, he initially expanded the conflict into Cambodia to deny the NVA/VC sanctuary and sever their southern supply lines. Leading up to the invasion, the Commando Hunt air interdiction campaign in southern Laos slowed the movement of supplies. It also imposed substantial costs on North Vietnam to keep the Ho Chi Minh Trail open. Commando Hunt could not halt the NVA troops

[21] Pape, *Bombing to Win*, 69.

from making the journey to South Vietnam on foot, but the direct attack of fielded forces in South Vietnam and Cambodia did continue to keep the NVA/VC dispersed and hidden. Keeping the North Vietnamese on the defensive provided the time and space for South Vietnam's pacification program to take root and for the Vietnamization program to generate conventional capabilities for the Army of the Republic of Vietnam (ARVN) to replace withdrawing American combat troops.

Chapter 6 assesses the impact of US air power as the ARVN shifted its offensive into southern Laos in 1971. After the Cambodian incursion, a Democratic Party-led Congress voted the Cooper–Church amendment into law, forbidding US ground troops beyond South Vietnamese borders. The ARVN objective in Laos was to achieve what US air power alone during Commando Hunt was unable to do: close off the Ho Chi Minh Trail. Instead, the ill-fated Lam Son 719 raid revealed significant shortcomings in allied air–ground coordination. The South Vietnamese, minus their US military advisors and tactical air controllers, could not take advantage of the available air power to prevent the NVA from driving the ARVN from Laos. The NVA's victory encouraged the North Vietnamese to gamble with another general offensive.

Chapter 7 examines air power during the Easter Offensive and the Linebacker I & II air campaigns. When the NVA launched the Nguyen Hue Offensive, referred to in the West as the Easter Offensive, in the spring of 1972, the question remained whether the ARVN could incorporate air–ground coordination lessons from Lam Son 719. The ARVN successfully held on two of three fronts but faltered along the DMZ, where the NVA overran Quang Tri province. Effective US air power and resolute ARVN forces, coordinated by skilled US military advisors and air liaison officers, held off further NVA advances as the ARVN regrouped to launch a counteroffensive to retake Quang Tri. Meanwhile, President Nixon reached détente with China and the Soviet Union such that he felt confident to order an air campaign into North Vietnam without the risk of further escalation. In May, the United States launched Linebacker I to interdict enemy LOC. However, the North had already deployed its forces and stockpiled supplies to overcome any shortfalls. Linebacker I ultimately failed to weaken the NVA as it fought through the summer. Instead, in September the ARVN and US air forces combined arms offensive retook Quang Tri. The decisive defeat of the NVA finally convinced Hanoi to accept a US-offered peace treaty. However, South Vietnamese President Nguyen Thieu, excluded from the secret talks, balked at any deal which allowed NVA troops to remain in the country. After the November 1972 election, President Nixon gave an ultimatum for Thieu to accept the agreement or face the withdrawal of

US aid. To bring the North Vietnamese back to the negotiating table, Nixon ordered Linebacker II, the bombing of Hanoi, which commenced before Christmas. The North Vietnamese, no longer backed by the Soviets or Chinese, agreed to terms once they ran out of surface-to-air missiles. The strategic bombing campaign, which featured B-52 strikes, compelled the North Vietnamese to return to Paris, but only to sign an agreement they had previously accepted in October following their defeat in the Easter Offensive.

Chapter 8 provides a brief history of the development of US air power doctrine after World War II, along with a synopsis of modern air wars since Vietnam. Four operational and five environmental factors that impacted air operations in Vietnam are introduced to help explain when air power is likely to be effective. These nine factors are air superiority, air-to-ground capability, friendly ground force capability, enemy ground force capability, weather, lighting, geography and terrain, civilians, and concealment and cover. A summative assessment follows, which correlates these conditional factors with the military and political outcomes for the twenty-three modern US air campaigns listed in Table 1.1. Finally, nine general observations are provided as to the overall effectiveness of modern air power.

An epilogue explores several topics regarding the future of modern air warfare. The first section offers recommendations for how the United States can better prepare for modern air warfare. The second considers air power in counterinsurgency and counterterrorism operations. The third anticipates the role of air power in extending deterrence to allies. The fourth demonstrates how TAP theory can assess the potential effectiveness of air power by analyzing the Russian Air Force in the Battle of Kyiv. The final section considers additional challenges facing the United States during an emerging era of great power competition.

For those unfamiliar with air power theory, Appendix A presents a brief history of the development of air power. It introduces a typology for four schools of thought on air power, differentiated by targeting priority. A Clausewitzian model of a nation consisting of its people, military, and government is used to explain the differing theories of air power victory.

Finally, Appendix B provides summaries of the ten modern air wars occurring after Vietnam, including the rationale for coding the operational and environmental factors for the air campaigns.[22]

[22] For chapter-length discussions on these cases, see Haun et al., *Air Power in the Age of Primacy*.