



A Special Report by The Mitchell
Institute for Aerospace Studies

DESERT 30 YEARS LATER STORM



Lessons from the 1991 Air
Campaign in the Persian Gulf War

DESERT STORM: 30 YEARS LATER

Lessons from the 1991 Air Campaign
in the Persian Gulf War

The Mitchell Institute for Aerospace Studies

The Air Force Association

Arlington, VA

March 2021

About the Mitchell Institute for Aerospace Studies

The Mitchell Institute for Aerospace Studies is an independent, nonpartisan policy research institute established to promote understanding of the national security strategy advantages of exploiting the domains of air, space, and cyberspace. The Mitchell Institute's goals are 1) educating the public about the advantages of aerospace power in achieving America's global interests; 2) informing key decision-makers about the policy options created by exploiting the domains of air, space, and cyberspace, and the importance of necessary investment to keep America as the world's premier aerospace nation; and 3) cultivating policy leaders to understand the advantages of operating in air, space, and cyberspace.

About the Authors

This report was prepared by the Mitchell Institute for Aerospace Studies with contributions from John T. Correll, Richard T. Reynolds, Douglas Birkey, Marc Schanz, David A. Deptula, John A. Warden, Donald B. Rice, John Michael Loh, Charles A. Horner, and Benjamin S. Lambeth.

Contents

| | |
|---|----|
| THE IMPERATIVE TO REMEMBER | 1 |
| DESERT SHIELD/DESERT STORM | 2 |
| FIVE KEY PERSPECTIVES ON DESERT STORM | 15 |
| PLANNING AND EXECUTING THE AIR CAMPAIGN | 18 |
| THE FIRST GULF WAR—FUTURE LESSONS | 23 |
| LEADING WITH AIRPOWER | 27 |
| DESERT STORM: A VIEW FROM THE FRONT | 36 |
| LESSONS TAUGHT, LESSONS FORGOTTEN | 43 |
| EPILOGUE | 51 |

The Imperative to Remember

Thirty-years has passed since the Persian Gulf War of 1991. Nearly all of us who were there are retired now, and knowledge about what took place varies considerably among the new generation of the military now serving.

According to the U.S. Government Accounting Office, “It was perhaps the most successful war fought in the 20th Century.” Operation Desert Storm was arguably the most successful air campaign the world has ever known. Beginning at 0239 on Jan. 17, 1991, a Coalition air armada of nearly a thousand aircraft in the first day of the air campaign attacked more targets than all of the Eighth Air Force aircraft hit in the entire European theater during the years 1942 and 1943. For 43 days, coalition air forces were brought to bear against the centers of gravity of Saddam Hussein's Iraqi regime. Only on the last four days of this monumental air campaign effort were allied ground forces committed to combat in what became known in Army parlance as the “100-hour war.” At the time, Iraq had the fourth-largest military in the world—fully modernized, trained, and equipped—and yet it was driven out of Kuwait in disarray and disgrace in little more than a month and half. By February 28, it was over.

It is important to remember Desert Storm, not only for the definitive revelations and demonstrations about airpower, but also because of valuable insights that apply to our current and future wars. The strategy executed in Desert Storm stands in stark contrast to the wars of attrition and occupation that followed the initial successes of Operations Enduring Freedom and Iraqi Freedom in the nearly 20 years subsequent to the attacks on our homeland in 2001. Desert Storm also represented a far more joint style to strategy development. Instead of a ground-centric dominated set of perspectives, the commander of Desert Storm—Army General Norman Schwarzkopf—used airpower as the centerpiece of his strategy in a truly joint approach applying the right forces at the right places at the right times to advance effective, unique concepts that proved pivotal to developing what became one of the most successful military engagements in history. We must remember these key points if today and tomorrow’s generations of military leaders are to benefit from the lessons of this seminal conflict.

In aid of that objective, the Mitchell Institute has assembled this 30-year retrospective, which opens with a summary of how the crisis arose in the Gulf in 1990 and how the Coalition responded. The second part of this report presents five key perspectives from speakers originally presented at a day-long Mitchell Institute program on the Desert Storm air campaign held on March 19, 2016, at the historic Cosmos Club in Washington, D.C.



Lt Gen David A. Deptula, USAF (Ret.)
Dean, The Mitchell Institute for Aerospace Studies
January 17, 2021



Desert Shield/Desert Storm

Airpower Responds to the Crisis in the Gulf

In the summer of 1990, the Cold War was almost over. The Berlin Wall had fallen and the Soviet Union was on its last legs. The United States was drawing down its armed forces and cutting its defense budget. A headline in the *New York Daily News*, “Pentagon Needs a Few Good Enemies,” expressed the prevailing belief that military danger was fading away. In particular, there were questions about the need for a strong Air Force in the coming era of peace. Nobody in a position of senior authority at the Pentagon, the State Department, or the CIA saw Iraq as a serious concern, even when Iraqi dictator Saddam Hussein threatened to invade Kuwait to resolve oil rights issues and other grievances. The State Department objected when US Central Command cast Iraq (thinly disguised as “a country to the north”) as the aggressor in a wargame. The scenario for the game was an Iraqi invasion of the Arabian Peninsula. Despite the oil crises of the 1970s, the Middle East was regarded as a military theater of secondary importance, after Europe and Pacific.

On Aug. 2, Saddam invaded Kuwait. It was not clear he was going to stop there. He was in a position to invade Saudi Arabia as well and to catastrophically disrupt the international oil supply. The United States demanded that Saddam withdraw from Kuwait and began marshaling support from allied countries.

Iraq had the world’s fourth largest army with 900,000 troops. Armored divisions had Soviet T-72 tanks. Iraq also had the world’s sixth largest air force. Many of its airplanes were old, but Iraq also had contemporary MiG-29 interceptors, MiG-27 and Mirage F-1 fighters, Su-24 strike aircraft, Tu-16 and Tu-22 bombers, Soviet-built Scud surface-to-surface missiles, and an integrated air defense system (IADS) with surface-to-air missiles (SAMs) and anti-aircraft guns.

After the war, it would be popular to claim that Iraq had been a pushover, but it certainly did not seem so beforehand. Senior military officials expected a violent clash of land armies, with some casualty estimates running as high as 45,000.

Desert Shield

In the US military scheme of things, Iraq and Saudi Arabia lay within the area of responsibility of US Central Command (CENTCOM), a joint command that grew out of the old Rapid Deployment Joint Task Force. CENTCOM consisted full time of a headquarters and staff in Tampa, Fla., and drew its fighting strength, when needed, from its Air Force component, 9th Air Force at Shaw AFB, S.C., and its Army component, 3rd Army at Ft. McPherson, Ga. The CENTCOM commander was Army Gen. H. Norman Schwarzkopf, often called “Stormin’ Norman,” an apt description of his demeanor. The Gulf War would be the first war since the passage in 1986 of the Goldwater-Nichols Act, which had empowered theater commanders to organize and employ their forces as they saw fit.



Ground crews prepare F-117A's of the 37th Tactical Fighter Wing as they stage to deploy to Saudi Arabia during Operation Desert Shield. (DOD)

The first requirement was to defend Saudi Arabia. Iraq had 27 divisions in Kuwait and there was not much to stop them from heading south. The first US armored divisions would not arrive until Sept. 24, 1991, so Schwarzkopf turned to

his airpower. On Aug. 8, the first C-141 arrived in the Gulf, carrying an airlift control element. It was closely followed by F-15s and a contingent of the Army's 82nd Airborne Division. Thirty-eight hours after they were notified to deploy, F-15s were flying defensive patrols along the Iraqi-Saudi border, 7,000 miles from home. On Aug. 10, the Pentagon announced the name of the operation as “Desert Shield.” By Aug. 12, USAF had 120 fighters in the theater. Within 35 days, coalition fighter forces were equivalent in size to Iraq's.

Saddam made a critical mistake. He allowed the US and its allies time to respond and prepare, and they made the most of it. Meanwhile Saddam did what he did best: boast and bluster. In August, he told an Iraqi newspaper that the “US depends on the Air Force. The Air Force has never decided a war in the history of war.” In September, he told his minions to “prepare for war with the United States. Let everybody understand that this battle will become the mother of all battles.”

The Air Bridge

It did not take long for USAF airlifters and tankers to set up an air bridge from the United States to Saudi Arabia, providing for a steady flow of aircraft, equipment, and personnel to the theater. It required 80 percent of the Military Airlift Command's (MAC) C-141s and 90 percent of the C-5s, and even that was not enough. For the first time, the Air Force activated the Civil Reserve Air Fleet, mobilizing commercial cargo and passenger airplanes to augment the military airlifters.

Supplies and equipment are unloaded through the nose of C-5A Galaxies during the “air bridge” effort in support of Operation Desert Shield. (DOD)



The Desert Shield/Desert Storm airlift still stands as the largest in history, 10 times more ton-miles per day than the Berlin Airlift. Before it ended, the airlift had moved more than 482,000

passengers and 513,000 tons of cargo into the war zone—the equivalent of moving Oklahoma City, all of its people, all of its vehicles, all of its food, and all of its household goods—halfway around the world. MAC also operated the “Desert Express,” overnight airlift to the Gulf of critical items. Pressure on the air bridge was moderated by supplies aboard pre-positioned cargo ships and by sea-lift, which began deliveries several weeks into the crisis.

USAF Strategic Air Command’s KC-135 tankers and KC-10 cargo tankers provided the aerial refueling part of the air bridge. Ultimately, about 300 SAC tankers, approximately half of the total fleet, were used in the Gulf War operation. It took nearly 100 tankers operating from en route bases to create the Atlantic air refueling bridge and a less frequently used Pacific bridge. For fighter aircraft, requirements for the trip ranged from seven refuelings (for F-15Es) to 15 (for F-4Gs).

Tankers also provided local air bridges within the theater, where 60 percent of the attack sorties required refueling. The demand was intense, but more tanker aircraft would not have helped. The limitation was airspace available for refueling tracks. Along the Saudi Arabian border, each tanker was stacked 500 feet below the one ahead of it. Other nations provided some of the coalition refueling capability, mostly for their own aircraft, but SAC tankers were the main resource.

The Coalition

From the beginning, the United States sought international support and participation in the effort to roll back the invasion. Saddam made the task easier Aug. 8, when he declared Kuwait to be the 19th province of Iraq and took foreigners hostage in Iraq and Kuwait. The next day, the UN Security Council declared Iraq’s annexation of Kuwait null and void. Subsequently, the Security Council authorized use of force to expel Iraq from Kuwait.

The coalition eventually grew to 38 nations, with 13 of them providing combat aircraft. A dual chain of command evolved, with Schwarzkopf as head of the non-Islamic forces. The senior commander of the Arab forces was Prince Khalid Bin Sultan, a lieutenant general and commander of the Royal Saudi Air Defense Forces. Khalid had degrees from Sandhurst military academy in England and Auburn University in Alabama, and got along well with Schwarzkopf and USAF Lt. Gen. Charles A. Horner, the commander of 9th Air Force and US Air Forces Central Command. Relationships were made easier still because the Saudi ambassador to the United States was Prince Bandar bin Sultan, a former F-15 pilot.



A multinational formation of fighters fly a sortie during Operation Desert Shield. From left to right, the group includes a Qatari F-1 Mirage, a French F-1C Mirage, a US Air Force F-16C, a Canadian CF/A-18A Hornet and a Qatari Alpha Jet. (SSgt Lee Corkran)

By the end of December 1990, the coalition fielded 2,614 aircraft, of which 1,990 were American. The United States contributed the largest share of combat aircraft (1,193) and support aircraft (897). Saudi Arabia was next in the number

of combat aircraft (216), followed by the United Kingdom (90) and France (48). Among the coalition aircraft were various models of the Tornado, which was flown by the U.K., Saudi Arabia, and Italy. American-made F-16s, F-15s, and F-5s were flown by other coalition nations, as were Anglo-French Jaguars and various models of French Mirages.

Among the nations sending support aircraft was South Korea, which provided four C-130s. The aircraft themselves were of value, but the commitment was special in another way: It was the first time the Republic of Korea Air Force had ever deployed for a foreign operation.

At the peak of the conflict, non-US air forces flew about 100 combat sorties a day. Allied aircraft flew 14 percent of the total sorties in the Gulf War, and of the 38 coalition aircraft lost in combat, 11 were from allied nations.

Airpower Opens the Fight

Shortly before 3 a.m. local time on Jan. 17, 1991, the Gulf War began. Operation Desert Shield gave way to Operation Desert Storm. Hundreds of coalition aircraft streamed through the night, including some helicopters that opened a hole in the Iraqi air defenses. The purpose was to allow a flight of F-15Es to penetrate undetected into Iraq 21 minutes before the first bomb was dropped in Baghdad. Their mission was to hit Scud targets in western Iraq aimed at Israel at the same time as F-117s were dropping their first bombs on Baghdad. At 2:39 a.m.—21 minutes before H-Hour—USAF MH-53J Pave Low special operations helicopters acting as pathfinders guided US Army AH-64 Apache gunships to destroy two early warning radar sites. USAF F-117s had already crossed the border to knock out the key interceptor operations center to which the early warning sites reported.

As H-Hour approached, air boss Horner's staff at the command post in Riyadh, Saudi Arabia watched the CNN telecast live from Baghdad. When CNN went off the air in midsentence, they knew that an F-117 had struck the Iraqi International Telecommunications Center with a 2,000-pound laser guided bomb. Minutes later, the lights went out in Baghdad and did not come on again until the ceasefire.

At H-Hour plus six minutes, the first of 53 US Navy cruise missiles hit Baghdad. Close behind them came air launched cruise missiles delivered by USAF B-52s. That first night, 669 coalition aircraft, 530 of them from the US Air Force, took part in the attack. By sunrise, Saddam Hussein had lost control of his forces, and Iraq was well on the way toward losing the war. In the first 24 hours, the coalition flew 2,775 sorties. The F-117, combining stealth and precision, hit 31 percent of the targets the first day.

For the first time in a major armed conflict, the entire enemy target base was struck simultaneously from the beginning rather than in gradual increments. Coalition airpower went after Iraqi air forces and airfields, command and control centers, radar sites, key military infrastructure, and Iraqi ground forces.

On the evening of Jan. 17—confident that Iraqi surveillance would not detect his actions—Schwarzkopf began a “left hook” redeployment of his ground forces to the west, putting them into position to turn the Iraqi right flank in a classic military envelopment when the ground operations began.

A Strategy that Surprised

In July 1943 Army Field Manual 100-2 acknowledged that “land power and air power are co-equal and interdependent forces; neither is an auxiliary of the other.” However, most of the Army never believed it, even after the Air Force became a separate military service. The Air Force gained ascendancy during the Cold War because of the strategic nuclear mission, but tactical airpower remained in the shadow of the Army. In the 1980s, Tactical Air Command—which spoke for the tactical air forces—concurred in the Army’s AirLand Battle doctrine, which regarded conventional airpower’s job as supporting the Army.

When the Gulf War loomed in 1990, therefore, the expectation was that the land forces would take the lead and play the main role with airpower as a secondary element. It was assumed that the war would play out in the traditional sequential order, rolling back enemy defenses before attacking the deep targets. It was not obvious ahead of time that the Gulf War would be a rout. High casualties were anticipated. The Center for Strategic and International Studies forecast 15,000 US casualties, and Schwarzkopf estimated 5,000.

It didn’t happen that way. Early on, Schwarzkopf realized that he had no ground options available and would not have any for many months. In a decision that would prove pivotal, he asked the Air Force to plan a strategic air campaign with hopes that it would inflict attrition of as much as 50

Then-Lt Col David Deptula (right) briefs US Central Command boss Gen H. Norman Schwarzkopf the air strategy hours before the start of Operation Desert Storm. (Lt Col Bob Eskridge)



percent on the Iraqi force. As late as December, Army Gen. Colin Powell, Chairman of the Joint Chiefs of Staff, warned Congress against being misled by “experts, amateurs, and others” who promised an easy victory with airpower.

When the Desert Storm shooting war opened on Jan. 17, 1991, the conventional expectations and concepts were blown away. The ground forces did not engage until a 38-day air campaign had whittled the Iraqis down to size and paralyzed their ability to act effectively. The early plans had been for a sequential air campaign in graduated phases. What actually occurred was an air strategy of parallel operations, in which all of the target sets were struck the first night. Everything went down at once. The Iraqis had no opportunity to adjust, recover, or react.

Iraq had hoped for a battle of attrition on the ground in which the coalition’s advantages—airpower and technology—would be nullified or minimized. Instead, coalition airpower just kept coming. On Feb. 24, coalition ground troops, in conjunction with continued airpower, surged into Kuwait and in four days rounded up the Iraqis who wanted to surrender—some trying to do so to aerial drones—and drove out the remaining Iraqi forces who had been crushed by airpower in “the mother of all retreats,” as then-Secretary of Defense Dick Cheney described the pullback.

The Army wanted to call it the “four-day war” and would later insist that the ground action had been decisive, but it was obvious that the air campaign had been the decisive part of the effort. The Gulf War experience was confirmed in other regional conflicts and contingencies of the 1990s.

For a brief time, it appeared that the manifest change in the character of warfare would take root in doctrine. Joint Vision 2010, published in 1996, stated: “Instead of relying on massed forces and sequential operations, we will achieve massed effects in other ways.” That was too much for the old guard of the Army to swallow. The offending language was stripped out of the next edition of the “Joint Vision,” followed by a renewed advocacy of “boots on the ground.” It has again become popular to deny the achievements of airpower in the Gulf, and a great many people who weren’t around then—and airpower apologists—are ready to believe the deniers.

The Longest Mission

The first aircraft to launch against Iraq—because they had the longest distance to go—were seven B-52Gs from the 2nd Bomb Wing at Barksdale AFB, La. They took off at 6:35 a.m. on Jan. 16, nearly 12 hours before H-Hour. Up to that point in time, it was the longest combat mission in history. Each of the B-52s would be refueled in the air four times and fly more than 14,000



A B-52G Stratofortress of the 1708th Bomb Wing (Provisional) takes off on a mission during Operation Desert Storm. (SrA Chris Putman)

miles and 35 hours before returning to land back home at Barksdale. The Pentagon waited for a full year to reveal this mission publicly. The B-52s were carrying a secret weapon: the AGM-86C Conventional Air Launched Cruise Missile (CALCM). It was a new capability that the Department of Defense was not eager to disclose. The CALCM re-placed the nuclear warhead of the AGM-86B ALCM with a 1,000-pound blast fragmentation warhead and GPS satellite-based navigation for greater accuracy. However, the first cruise missiles to strike Baghdad, shortly after H-Hour, were US Navy Tomahawk land attack missiles, or TLAMs, launched by the cruisers and battleships in the Red Sea and the Persian Gulf. Ninety minutes after H-Hour, the B-52s launched their CALCMs from outside the Iraqi air defense network against high-priority targets. Of the 35 missiles fired, 31 hit their targets, better than 88 percent accuracy for the new weapon in its first combat test.

Later that night, about 4 a.m., B-52s based at Diego Garcia in the Indian Ocean, flew low-level strikes with non-precision guided iron bombs against airfields in Iraq. The long mission from Barksdale was a one-time event, but the Diego Garcia B-52s and others from Moron AB, Spain, the United Kingdom, and Jeddah in southern Saudi Arabia played a continuing role. They flew 1,624 missions and delivered 38 percent of all the bombs dropped by the Air Force in the Gulf War. As they had in Vietnam, the B-52s had a tremendous psychological effect on the enemy ground forces. Between 20 and 40 percent of Iraqi deserters said they were influenced in their decisions to run by fear of B-52 attacks.

Precision and Stealth

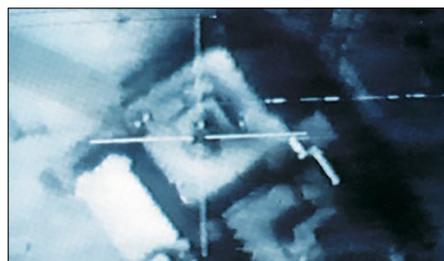
Desert Storm marked the first major use of stealth aircraft, and extensive use of precision-guided munitions (PGMs) in warfare. This was mainly the doing of the US Air Force, which dropped 90 percent of the PGMs, and at the time owned the only stealth warplanes on earth. Of 17,000 PGMs expended in the Gulf War, 9,342 were laser-guided bombs (LGBs). The others included 5,448 air to surface missiles (mostly Mavericks); 2,039 anti-radiation missiles (mostly high-speed anti-radiation missiles); and 333 cruise missiles.

The most spectacular combination was the stealthy F-117 and its principal weapon, the 2,000-pound GBU-27 laser guided bomb. The F-117 had made a brief appearance in Operation Just Cause in Panama in 1989, but the Gulf War was its primary debut. Its forward-looking infrared targeting system was so good that orders specified a particular part of a building—a corner, a vent, a door—to be hit. The first night, an F-117 rolled



An F-117 Nighthawk releases a pair of GBU-27 laser guided bombs, above. The pairing of stealth aircraft and precision weapons were key to the air campaign strategy. (TSgt Marvin Lynchard)

Below: The elevator shaft of an Iraqi headquarters building is seen through the nose of a laser guided bomb. These images of extreme precision in air strikes became iconic of the Gulf War. (DOD)



in on Iraqi air force headquarters at Al Muthana airfield in Baghdad, put a smart bomb neatly down the airshaft, and blew out the sides of the building. Millions of people watched it happen on television. Because of its stealth characteristics, the F-117 was able to operate in the most hazardous airspace, even before air supremacy was established and could, with less risk than other aircraft, maintain laser lock on the target while the GBU-27 homed in.

Another PGM star was the F-111F, credited with destroying more than 1,000 tanks and armored vehicles with the 500-pound GBU-12 LGB and the Pave Tack infrared targeting pod. When Iraq began dumping Kuwaiti oil into the Gulf, the oil-pumping manifold was knocked out by F-111Fs from 20 miles away, using GBU-15 electro-optical glide bombs. The F-15E also gained the ability to deliver PGMs when LANTIRN navigation and targeting pods were installed less than a month before the war started.

Precision-guided munitions brought on a great leap in targeting accuracy. In World War II, the circular error probable—the standard measure of accuracy—for a B-17 bomber was 3,300 feet. For an F-117 with a laser-guided bomb in the Gulf, it was 10 feet.



A four-ship formation of F-15 Eagles of the 33rd Tactical Fighter Wing from Eglin AFB, Florida fly a sortie over the Persian Gulf. (USAF)

Air Supremacy

The Iraqi Air Force never really got off the ground after the first day of the battle, when it took heavy losses. It tried to ride out the war

in hardened shelters, but coalition aircraft began attacking Iraqis in their bunkers. Soon the Iraqi Air Force “flushed” to Iran and ceased to be a factor.

Air supremacy—which Schwarzkopf declared on Jan. 27—required not only the defeat of Iraqi warplanes but also destruction or neutralization of the French-built Kari (Iraq spelled backwards in French) integrated air defense system, the surface-to-air missiles, anti-aircraft artillery (AAA), and the Iraqi air bases. In the early rounds, the coalition lost nine aircraft to AAA and 23 to SAMs. Iraqi radar activity and shooting by the AAA and SAMs dropped abruptly after the first day as F-4G Wild Weasels attacked and destroyed the radar sites guiding the fire.

The air battle, such as it was, was a one-sided affair. The coalition shot down 35 fixed wing aircraft—USAF accounted for 31 of them—and five helicopters. F-15s were responsible for every USAF fixed wing aircraft destruction; the AIM-7 missile was the weapon of choice in 23 of the shootdowns; 16 of the shootdowns were from beyond visual range, guided by the E-3 Airborne Warning and Control System (AWACS) aircraft. It was a stunning repudiation of the prewar claims of the military “reform” movement, which disparaged the F-15 and the AIM-7 and said that beyond visual range engagements were unlikely to happen.

The coalition had no air-to-air losses. Part way through the war, some fighters, including the Saudi F-15s and the Canadian CF-18s, switched to dropping bombs. Iraq, which began the war with 724 aircraft, had 316 left when it ended.

The most unusual shoot down, not credited in some counts, was by an F-15E that destroyed a Hind helicopter with a laser-guided bomb. Before engaging the Hind with an AIM-9 missile, the F-15 launched an LGB against enemy troops on the ground. The Hind rose up into the path of the 2,000-pound bomb with devastating results.

Eyes and Ears of the Storm

Never before in warfare did one combatant have so much information about the forces and activities of the other. The Iraqi military was not able to do anything in secret. E-3 AWACS aircraft, flown by the United States and Saudi Arabia, tracked everything that moved in the air. The E-8 Joint STARS (surveillance target attack radar system) tracked everything moving on the ground. RC-135 Rivet



A US Air Force E-3 Sentry airborne warning and control system (AWACS) aircraft flies over the desert during Operation Desert Shield. (DOD)

Joint picked up the signals from electronic emitters. TR-1/U-2 and RF-4C aircraft conducted visual reconnaissance. Attack aircraft with infrared targeting pods scanned the desert for heat signatures from tanks at night. Defense Support Program satellites provided warning data on Scud B missile launch plumes within two minutes of launch.

E-3s flew along the border, three at a time, maintaining continuous coverage of the air picture from the Red Sea to the Persian Gulf throughout the war. The pulse-doppler radar, housed in the rotating dome atop the E-3, spotted enemy aircraft hundreds of miles away. The RC-135 signals intelligence aircraft helped identify the aircraft seen by the E-3. All of this translated into a composite picture displayed on a large screen in the Coalition Tactical Air Control Center. Similarly, radar in the Joint STARS aircraft found anything that moved on the ground. Joint STARS was still in development, but two aircraft were pressed into service and flew every night of the war.

Meanwhile, Saddam Hussein was left without information about his own forces and knew nothing of coalition operations. Air attacks concentrated on 78 command and control nodes whose elimination would paralyze Iraq. Twenty-eight minutes after the war began, Iraqi units were shut off from higher echelons, with no intelligence or direction. Schwarzkopf was free to begin his massive shift of ground forces to the west for his "left hook" attack without concern the movement would be detected. The Iraqi communications infrastructure was also destroyed. Two weeks into the war, Saddam was reduced to sending orders from Baghdad to Kuwait by messenger, a trip that took at least 48 hours under the prevailing conditions.

Extraordinary Support

When US forces deployed to the Gulf, they had to bring their support with them or import it from the United States or bases in Europe. By any standard, the results were extraordinary.

In one instance, Air Force civil engineers built a base from the ground up in 40 days. When they arrived, the tallest things standing had been two-inch-high taxiway lights. The first of 15 air transportable hospitals arrived in theater the first week of Desert Shield and was ready to receive patients in 24 hours. Even the Army and Air Force Exchange Service was there, operating out of tents to provide snack food, T-shirts, toothpaste, and soda. Troops who could not get to the tents in person could order electronically with their laptop computers.

At the peak of operations, a strategic airlifter was landing every 11 minutes. In addition, Military Airlift Command had about 150 C-130 tactical transports—almost a third of the fleet—in the theater. Their sortie rate during the war ranked second only to that of interdiction fighters. Intratheater C-130 “Camel” missions handled cargo and “Star” missions carried passengers. Nine thousand Air Force ground vehicles were in operation when the war began.

Support forces, working under wartime conditions, often exceeded peacetime performance standards. For example, ground crews turned F-15s around for their next mission in 17 minutes. Standard for a “hot pit” turn was 20-25 minutes. Mission capable rates across the board were higher than in peacetime.

Back in the United States, Air Force Logistics Command accelerated operations and rebuilt engines in 20 to 60 days, faster than in peacetime. Expedited repair and overhaul of aircraft gave the force 931 days of additional flying service during the conflict. At Langley AFB, Va., a “CENTAF rear” command and control center coordinated stateside support for forces in the Gulf.

Air Force Space Command repositioned a Defense Satellite Communications System II satellite from over the Pacific to a new geostationary orbit 22,300 miles above the Indian Ocean. At the peak of hostilities, military satellites were handling about 85 percent of the communications for the force.



Total Storm

Desert Storm was the first war since the adoption in the 1970s of the Total Force policy, which made the services far more dependent than previously on the National Guard and the Reserves. In the intervening years, the Air Force had allocated many resources and responsibilities to its Air National Guard and Air Force Reserve components.

A US Air Force F-16C from the 401st Tactical Fighter Wing refuels from a KC-135 as another F-16 waits in formation during Operation Desert Storm. (SSgt Lee Corkran)

Military Airlift Command had about half of its airlift flight crews in the Guard and Reserve. Other Air Force concentrations in those components included tactical airlift, air refueling squadrons, aeromedical evacuation, communications, security forces, and civil engineers.

When the crisis broke in the Gulf, the Air Force called for volunteers. In the next 72 hours, 15,000 Guardsmen and Reservists stepped forward. On Aug. 8, the first airplane into Saudi Arabia was an active duty C-141 flown by an Air Force Reserve crew. By the end of August, the Guard and Reserve were flying 42 percent of the strategic airlift missions and 33 percent of the aerial refueling.

In late August, the largest mobilization of Guard and Reserve forces since World War II began. Eventually, 231,000 members from all services were called up and 116,000 served in the Kuwait theater of operations.

The Air Guard and Reserve accounted for 17 percent of USAF's deployed wartime force, not counting many reservists who remained in the US. Some 30,000 members of the Air National Guard and Air Force Reserve handled a wide variety of critical missions at one time or another during Desert Shield and Desert Storm.

Many of those who served, especially in flying units, were seasoned veterans with years of valuable experience. Most of the flight crews called up were airlift and tanker crews, but several fighter units were mobilized as well. Among them was the 169th Tactical Fighter Group from South Carolina, a Guard F-16 unit that had won the "Gunsmoke" fighter competition in 1989. On Feb. 6, 1991, an Air Force Reserve pilot, Capt. Robert Swain, achieved the first-ever A-10 air-to-air victory, shooting down an Iraqi helicopter with a long burst from his 30 mm anti-tank cannon, which obliterated the helicopter.



A five-ship formation of F-16As, an F-15C, and F-15Es fly over burning oil fields during Operation Desert Storm. (USAF)

End Game

Around the clock, USAF-led coalition air forces pounded Iraqi armor, artillery, infantry vehicles, the Republican Guard, logistics installations, command posts, and command and control facilities. Before ground operations began on Feb. 24, casualties and desertions had reduced Iraqi troop strength by at least half. F-111Fs and F-15Es, using laser guided bombs, made smoking ruins of Iraqi tanks, as did F-16s and A-10s using Maverick missiles.

In the first 38 days of the 43-day campaign, airpower destroyed 39 percent of the Iraqi tanks, 32 percent of the armored personnel carriers, and 47 percent of the artillery. In the aggregate, airpower met the goal of 50 percent attrition of Saddam's ground force. Between 50 and 75 percent of the two Iraqi front echelons

in Kuwait were either casualties or taken prisoner, although the attrition was lower for the Republican Guard divisions. At the beginning of the war, there were 54 railroad and highway bridges in Iraq, most of them running southeast from Baghdad into Basra and Kuwait. At the end of the war, 41 of them had been dropped by airpower. Thirty-two pontoon bridges hastily put up as replacements were destroyed as well.

Attack on surface forces accounted for 56.3 percent of coalition sorties. “Tank plinking”—picking off individual tanks from medium altitude at night with precision weapons—began in February, with most of the missions flown by F-111Fs, F-15Es, and A-6s. The workhorse of the air campaign was the F-16, which flew almost 13,500 sorties, the highest sortie total of any system in the war. One squadron of F-16s equipped with the LANTIRN attack system, delivered Maverick PGMs, but the F-16 did not have laser designation capability and (according to the USAF) flew primarily as a “dumb bomb dropper.” A-10s operated mostly along the border, attacking the Iraqi Army on the front lines. F-117s, F-111s, and F-15Es flew mainly by night and the F-16s and A-10s mainly by day.

The air campaign was devastating and decisive, but Army officials regarded it as preliminary to the ground attack. In reality, it was the main event.

The Last 100 Hours

Airpower alone could have ground the Iraqi force down further and—according to Iraqi leadership debriefs—caused their complete collapse, but pressure by the Army in the Pentagon had built to launch the ground phase of the war. After all, what would have been the demands to reduce the Army in the aftermath of the collapse of the Soviet Union if they had deployed over 500,000 personnel to fight in Iraq, and they had not been used?

H-Hour for the ground offensive was 4 a.m., local time, on Feb. 24. Coalition ground forces struck powerfully, especially on the western flank in the Iraqi desert. Air strikes continued. Within a day, the Iraqis were in general retreat.

Following their instructions from Schwarzkopf, though, soldiers and airmen continued to destroy as many enemy tanks as possible so they could not be used in some future conflict. In a 45-minute battle on Feb. 27, the day before the cease-fire, US armor struck a Republican Guard division at Medina Ridge and destroyed 60 Iraqi T-72 tanks. The outcome of the war was not in doubt, and the White House and the Pentagon were getting nervous about news reports of a “turkey shoot” on the “highway of death” leading out of Kuwait. US forces could have completed the destruction, but the coalition had formed to liberate Kuwait, not to press for regime change in Iraq, and the United States was not prepared to continue the war alone.

The ceasefire took effect at 8 a.m. local time Feb. 28. The epic clash of land armies, anticipated by a Pentagon leadership dominated by ground officers as recently as December, did not happen. The ground operation had lasted only four days and four hours. Casualties from Desert Storm did not reach the level of 45,000 predicted by some. The total loss of US forces was 148 dead and 467 wounded. The coalition allies had 99 dead, 434 wounded.

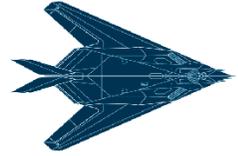


Demolished vehicles line Highway 80, the route fleeing Iraqi forces took out of Kuwait, which became known as the “highway of death.” (TSgt Joe Coleman)

The fighting was barely ended before some Army partisans circled the propaganda wagons and insisted that it was the final 100 hours in the Gulf that were decisive—not the 43-day air campaign that brought Iraq to its

knees. The air effort, they said, was merely an “operation,” not a “campaign.” However, President George H. W. Bush got it right. “Gulf lesson one is the value of airpower,” he said on May 29. “It was right on target from Day One. The Gulf War taught us that we must retain combat superiority in the skies.”

“Desert Shield/Desert Storm” is adapted from an Air Force Association special report, *The Air Force and the Gulf War* by John T. Correll, first published in 2009. For the full AFA report, which includes more information and a detailed chronology, see the original at: <https://higherlogicdownload.s3.amazonaws.com/AFA/192c0f2c-be11-4344-af3b-ade3d08e953c/UploadedImages/Mitchell%20Publications/AFandGulfWar.pdf>



Five Key Perspectives on Desert Storm

The five perspectives that follow were presented at the Mitchell Institute program at the Cosmos Club in Washington, DC, March 9, 2016. The success of that event also owed much to a number of others who contributed their views and insights. Among them were Generals Bruce Wright, Greg Biscone, Greg Feest, and Ron Bath, all of who participated in the war as pilots. They shared their individual and squadron exploits flying and fighting respectively the F-16, B-52, F-117, and RF-4C—all key elements of the air campaign. Former Secretary of the Air Force Donald Rice provided the “View from Washington.” Airpower analyst Chris Bowie provided an independent assessment of the war, and what occurred afterward. General David Goldfein, then Air Force Vice Chief of Staff, who soon after became the 21st Air Force Chief of Staff, and also a pilot in the campaign, spoke. The event concluded with observations from Deputy Secretary of Defense Bob Work on the significance of the Desert Storm air campaign today.

The first of the five contributions to this volume is by **Lt. Gen. David A. Deptula, USAF (Ret.)**. Then-Lt. Col. Deptula was the only individual who participated in every stage of the planning and execution of the Desert Storm air campaign—from concept development of the original “Instant Thunder” plan in the Pentagon; to the building of the initial air attack plans that Gen. Horner presented to Schwarzkopf; to the building of the master air attack plans for each day of campaign execution.

Deptula coordinated with Air Force Col. John Warden and his team in the Pentagon that acted as an information fusion center throughout the Gulf War. If Warden provided the “spark” for the Gulf War air campaign, then surely Deptula was the engine. It was Deptula who quickly gained the confidence of air component commander Horner, and established and led the combat planning cell that became known as the “Black Hole;” credited with creating and designing the air campaign. He not only convinced Horner what targets to hit, when, and why, but also armed the mercurial and politically savvy Air Force Brig. Gen. Buster Glosson with the information he needed to whisper into General Schwarzkopf’s ear: exactly what the Black Hole targeting cell was doing in his name, and why it was the right thing for the war effort.

The second entry is by **Col. John A. Warden III, USAF (Ret.)**, a man many credit with creating the foundation—the “Instant Thunder” plan—that later was built upon to form the basis of the air campaign. Warden provided the “big idea” that the Black Hole later developed into plans that paralyzed a rogue nation’s dictator and his military, allowing the legitimate government of Kuwait to be restored without destroying the country in the process.

While a student at National Defense University (NDU) during the 1985–1986 academic year, Warden wrote a book titled *The Air Campaign – Planning for Combat*. In it he directly challenged the prevailing Army doctrine, known as AirLand Battle, which held that airpower must always play a subordinate role to ground operations, and was not a strategic instrument in and of itself. The book was a hit with some in the Air Force establishment, including Gen. Chuck Donnelly Jr., Commander-in-Chief of US Air Forces Europe (USAFE), who wrote the foreword, saying the book “is the start of something very important—it integrates historical experience into a clear, visionary set of conclusions and guidelines for using air forces to achieve strategic goals in a war.... It is a book about art—operational art—as it should be practiced by an air component commander, and ties directly to the enduring principles of war.”

The 1991 Gulf War air campaign validated many of the points Warden made in his book. No ivory tower academic, Warden threw himself into the Gulf War planning and execution effort just days after Iraq invaded Kuwait. Over time, from the “Checkmate” offices in the basement of the Pentagon, Warden assembled an informal team of hundreds of “volunteers” consisting of military and civilian personnel with a wide range of expertise. Warden channeled their energies into 24/7 support to the war planners in Riyadh’s “Black Hole,” working mostly through the Black Hole’s chief architect, Dave Deptula. This unorthodox, informal, non-traditional lash-up created the brilliant Desert Storm air campaign that has not been repeated since.

The third paper in this series is by **Gen. John Michael (“Mike”) Loh, USAF (Ret.)**, who during the lead-up to the 1991 Gulf War served as the Vice Chief of Staff of the Air Force. Later he was the acting Chief of Staff of the Air Force after the firing of Gen. Mike Dugan by the Secretary of Defense, Dick Cheney, for remarks Dugan made on a flight back from Riyadh with *Washington Post* journalist Rick Atkinson. It was Loh who took the call from Schwarzkopf, the CENTCOM commander, and his deft handling of the situation allowed the fledgling plan put together by Warden and a small cadre of Air Staff folks in the early days after Iraq’s invasion of Kuwait to kick start the air campaign planning effort and legitimize Air Staff involvement. Loh’s leadership and intellectual acumen ensured the survival of the Air Force planning effort at a critical time and gave the President the military options he needed to secure his objectives in the Gulf War despite pressure within, and without the Pentagon to do otherwise.

The fourth paper is by the man who was ultimately responsible for planning and executing the entire Gulf War air campaign: **Gen. Chuck Horner, USAF (Ret.)**. The tough-talking but low-key general who always carried his own flight bag is a shrewd student of human nature whose military career, exploits, decision-making, and demeanor were captured in his collaborative work with renowned author Tom Clancy, *Every Man A Tiger*. As the air campaign conductor, Horner worked closely with the Black Hole team, and

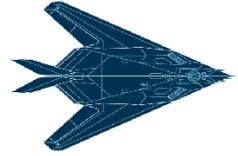
Glosson in particular. Horner was a “people person,” and so was Glosson—and they both achieved their ends through careful manipulation of the carrot and the stick. Horner knew full well that Deptula was putting the plan together but it was more effective for him to control the plan by using his influence over the ambitious Glosson than to get down in the trenches with those who were actually crafting the sorties and determining the target sets. Horner’s well-documented clash with Warden in the early planning days of the Gulf War amply illustrates Horner’s penchant for people versus ideas.

Horner’s long history as a commander makes him an ideal observer in this situation. He is naturally suspicious of airpower ideas and those who promulgate them, preferring instead to use the deceptive, “aw shucks, we were just doing our job” vernacular, and eschewing terms such as “strategic” and “tactical.” His world requires unswerving allegiance to commanders, whoever they are, and he took great pains not to step on the toes of anyone superior in rank to himself, especially his boss, Schwarzkopf. Horner never confronted Schwarzkopf in public, but always in his office, in private or with another person Schwarzkopf trusted.

The last section of this volume is by airpower historian, analyst, and strategic thinker **Dr. Benjamin S. Lambeth**, whose many works on airpower have served to enlighten generations of airmen, military scholars, and military professionals the world over. He has written more than six dozen books and articles on airpower and defense related subjects. He also has lectured widely on these subjects, including at all of the US senior military service schools. His contributions to the body of knowledge on airpower while serving as a senior research associate at RAND as well as his current work at the Center of Strategic and Budgetary Assessments has done much to increase the understanding of how and why air and space power are important to every nation’s survival. Lambeth is a leading airpower proponent with impeccable academic credentials, and helps synthesize the lessons learned in the first Gulf War and warn of their fading from recent memory.

Virtually all of these perspectives lament that the US and its allies have engaged for over a decade in regional conflicts focused on “boots-on-the-ground” strategies that have neglected our aerospace advantages, drained national commitment, and have not resulted in the achievement of strategic American objectives. These authors warn that we have lost our way when it comes to the proper application of air and space power. We are at risk of devolving into an Air Force that does little more than service targets dictated by the Army. The authors point out the need for senior Air Force personnel to forcefully make the case for the correct application of airpower, and not simply “go along to get along” with the surface warfare leadership that dominates the Pentagon. Every Active Duty airman, Reservist, and Air Guardsman owe it to themselves and to generations yet to come to ensure that options for the optimal use of air and space power are presented, considered, and applied to defend the nation and its interests.

These authors warn that we have lost our way when it comes to the proper application of air and space power. We are at risk of devolving into an Air Force that does little more than service targets dictated by the Army.



Planning and Executing the Air Campaign

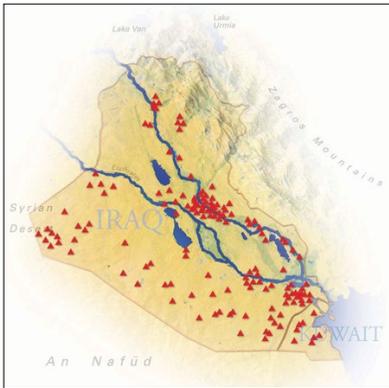
Lt. Gen. David A. Deptula, USAF (Ret.)

January 17, 2016, at 0239 Baghdad time marked the 25th anniversary of the start of Operation Desert Storm. Desert Storm was a turning point in the conduct of warfare as it set the conditions for modern warfare in five major ways: 1) it set expectations for low casualties—on both sides of the conflict; 2) it presaged precision in the application of force for all future conflicts; 3) it introduced prosecution of a combined/joint air campaign integrating all coalition/service air operations under the functional command of an airman, 4) it established desired effects as the focus of strategy and in the planning and conduct of operations, and 5) for the first time in history, airpower was used as the key force—or centerpiece—in the strategy and execution of a war.

Desert Storm was a 43-day war—airpower operated throughout the conflict from start to finish. Ground forces acted as a blocking force for almost the entire war, as airpower destroyed enemy forces and achieved desired effects against key systems from above. Only in the final days of the conflict were ground forces committed to combat and used to re-occupy Kuwait. In this respect, Desert Storm saw an inversion in the paradigm of traditional force application. Long-time military expert Dr. Ben Lambeth has observed that today, “... the classic roles of airpower and land power have changed places in major combat. ... Fixed-wing airpower has, by now, proven itself to be far more effective than ground combat capabilities in creating the necessary conditions for rapid offensive success.”



Lt Gen David A. Deptula, USAF (Ret.)
(NOVA)



A map of Iraq depicting where over 150 separate airstrikes occurred in the first 24 hours of the Desert Storm air campaign. (Aerospace Education Foundation)

The opening attacks of Desert Storm signaled a radical departure in the conduct of war. Over 150 discrete targets—in addition to regular Iraqi Army forces and surface-to-air missile (SAM) sites—made up the master attack plan for the opening 24 hours. The war began with more targets attacked in one day than the total number of targets hit by all of the Eighth Air Force in 1942 and 1943 combined—more separate targets attacked in less time than ever before in history.

Twenty-five years ago, those involved in the Desert Storm air campaign applied force not only across the entire breadth and depth of Iraq geographically, but also across all the key strategic and operational level centers of gravity. How was that accomplished? And what was different from previous conflicts?

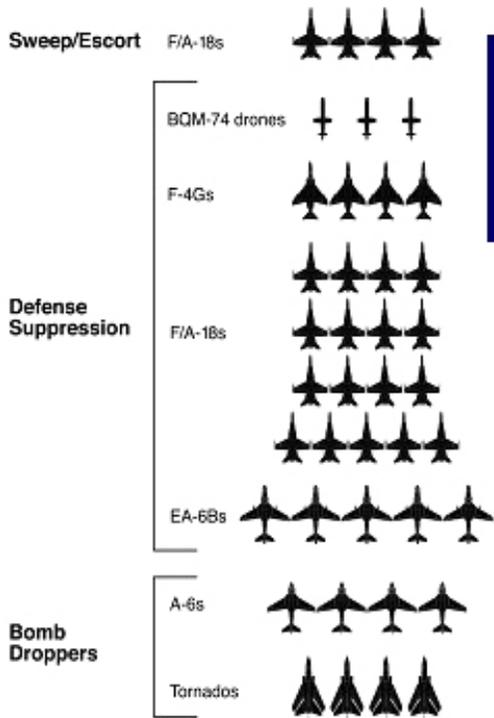
Advances in technology, in conjunction with an effects-based approach to planning and execution, allowed us to institute a new concept of operations that has been described as “parallel” war—the simultaneous application of force across the totality of the enemy system.

While simultaneous attack has always been a desired element of offensive warfare, it had never evolved into the parallel war demonstrated in Desert Storm for three reasons. One, the requirement for mass to compensate for a lack of precise weapons delivery; two, the large number of resources required to suppress enemy air defenses; and three, the absence of a focus on effects rather than destruction to achieve control over an opponent.

The first two challenges required technological solutions, and were simply not mature before the mid-1980s. Those two solutions were stealth and precision. To provide insight into the significance of those two elements, in the first 24 hours of Desert Storm stealth, precision, and effects-based planning allowed targeting 36 stealth aircraft armed with precision-guided munitions against more separate targets than the complete non-stealth/non-precision air and missile force launched from the entire complement of six aircraft carriers and all the other ships in the theater combined. The stealthy F-117 force flew less than 2 percent of the combat sorties, but struck over 40 percent of the fixed targets.

The leverage that stealth demonstrated in the first Gulf War is further illustrated by the following example that involves the first non-stealthy attack on one target with three aim points in the Basra area—Shaiba Airfield to be exact. The attack package consisted of four US Navy A-6s dropping bombs, along with four Saudi Tornado bomb droppers; five US Marine EA-6Bs jamming acquisition radars; 4 US Air Force F-4Gs taking out one type of SAM system; 17 US Navy F-18s taking out another SAM system; 4 F/A-18s as escorts; and three drones to cause the enemy radars to radiate. That is a total of 41 aircraft—8 dropping bombs, on three aim points, on one target.

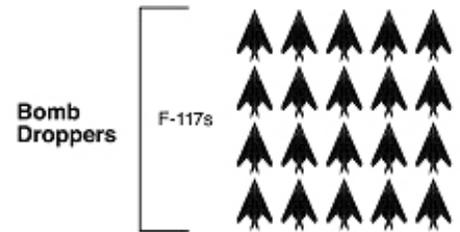
At approximately the same time we had 20 F-117s all dropping bombs on 38 aim points on 28 separate targets. That is less than half the aircraft hitting over 12 times the number of aim points.



**41 Aircraft/ 8 Bombers
1 Target—3 Aimpoints**

The Leverage of Stealth: Non-Stealth vs Stealth Attack*

*Comparison of first conventional attack package in Desert Storm with stealth attacks at same time.



**20 Aircraft/ 20 Bombers
28 Targets—38 Aimpoints**

Stealth Multiplier: (41/3)/(20/38) ~ 19

(Mitchell Institute and Foxbat Graphics)

Stealth and precision facilitated the actualization of the third and perhaps most important component of that conflict: a concept of operations designed to achieve control over an enemy's essential systems. This methodology recognizes that negating an adversary's ability to operate as desired is ultimately as important—or even more so—than the destruction of the forces it relies on for conquest.

We built the air attack strategy of Desert Storm by treating Iraq and the Saddam regime as a system of systems, and designed the operation to achieve paralysis of Saddam's strategic centers of gravity: leadership; key essential systems; infrastructure; information; and fielded military forces. The campaign had five key objectives in this regard:

1. Gain/Maintain Air Supremacy to Permit Unhindered Air Operations
2. Isolate and Incapacitate Hussein Regime
3. Destroy Iraqi Nuclear, Biological, and Chemical Warfare Capability
4. Eliminate Iraq's Offensive Military Capability
5. Render the Iraqi Army in Kuwait Ineffective, Causing Its Collapse

These objectives were all achieved—rapidly, and decisively. The tenets that made Desert Storm such a success were:

1. Strong political will—a President who stated on August 5, 1990, “This will not stand” in response to the invasion of Kuwait. President George H. W. Bush and his military commanders built a strategy; formed a coalition; deployed the forces required to execute that strategy; garnered United Nations backing; executed the strategy; and accomplished its declared objectives by February 28, 1991—seven months from start to finish.

2. A comprehensive, coherent campaign plan that focused on dismantling the key centers of gravity—leadership; key essential systems; infrastructure; population perceptions; and military forces—that paralyzed Iraq as a state along with its military regime;

3. Putting a combined/joint force air component commander in charge of the air campaign, and treating each aircraft, missile, and air defense element according to the capability it brought to the campaign plan, regardless of which service or country from where it came;

4. Reversing the errors of Vietnam by replacing the gradualism of the “Rolling Thunder” air campaign with the “instant thunder” of the Desert Storm air campaign; and

5. Adopting a true combined/joint approach to the effort using the right force at the right place at the right time—not a traditional land-centric plan that singularly focused on fielded military forces.

Today, against the Islamic State, targets selected and ordnance employed go through a lengthy vetting process, and are approved or disapproved by ground commanders. According to an Air Force source, in August 2016 it, “take[s] an average of between 45 to 60 days before [targets] are vetted and approved...” That is longer than the duration of Operation Desert Storm in its entirety. The excessive time factor in Operation Inherent Resolve target development due to of concern of unintended civilian casualties, allows critical Islamic State functions to continue to operate. By not rapidly striking them actually countenances the Islamic State to perpetuate its terror, atrocities, and murder.

What is the morality of a policy that restricts the use of airpower to avoid the possibility of collateral damage while allowing the certainty of the Islamic State’s crimes against humanity? Members of today’s coalition should enter into their casualty avoidance calculus how many of the Islamic State’s intentional murders of innocents would be avoided by rapidly collapsing the organizational elements that allow the Islamic State to function.



Lt Col David Deptula briefs the daily air attack plan to US Air Forces Central Command boss Lt Gen Charles Horner on Feb. 24, 1991. (Lt Col Buck Rodgers)

The current approach to the Islamic State is gradualist, in contrast to Desert Storm—over two years to date, and we face the prospect of years of continuance. It is an anemic approach—an average of only six US strike sorties a day over the first two years of operations; and the campaign is without definition—no comprehensive, focused strategy has been identified to achieve the stated objectives of degrading and destroying the Islamic State. The result is an approach that is fragmented, less than optimal, and yields the advantage of time to the adversary, resulting in expansion and export of its deleterious effects. The enemy, over time, learns how to deal effectively with the gradual use of airpower and grows stronger, while our allies and our citizens lose interest, and our military forces—our brave airmen, soldiers, sailors, and marines—tire of the endless rotations into and out of the fight. Our present is our past: not the swift, decisive past of Desert Storm but rather the quagmire that was the Vietnam War.

Today's generation of airmen must renew the spirit of innovation and creativity enabled by exploiting the virtues of operating in air and space, as did the founders of our Air Force. Those characteristics delivered success in Desert Storm, and can do so again in the future. The innovative application of the tenets of aerospace power is what made Desert Storm such a success, and can be applied to the challenge of the Islamic State. Replace the current desert “drizzle” with a “thunderstorm” aimed not just at the hands and feet of the Islamic State but at its head and heart as well. It is the duty of every Air Force member to understand airpower, advocate and articulate its characteristics and capabilities, and educate those who do not understand. For if they don't, no one else will. Our nation deserves to hear the options allowed by airpower, and will benefit from their proper application.

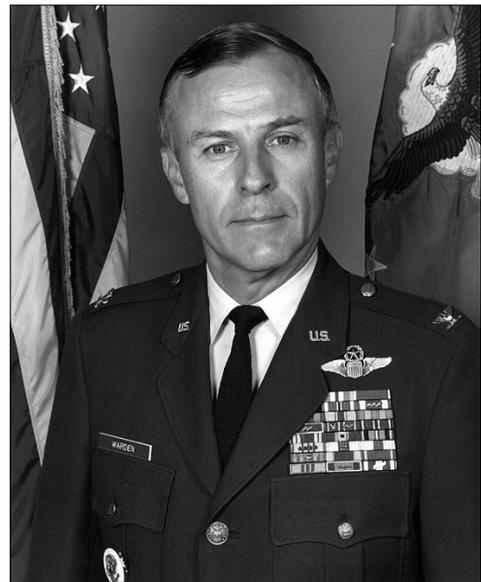


The First Gulf War—Future Lessons

Col. John Warden, USAF (Ret.)

The first Gulf War, also known as Desert Storm, reversed the successful Iraqi invasion of Kuwait, left Iraq functional but incapable of invading any of its neighbors, lasted 43 days, of which 38 were almost exclusively air operations, saw fewer than 150 American die of which about a half were as a result of enemy action, and cost the US taxpayer about \$80 billion. Other American wars since 1950 have been dramatically less satisfactory from the standpoint of results, time, and costs.

For many years prior to the Iraqi invasion of Kuwait on August 2, 1990, US Central Command and its air component, 9th Air Force, had been developing plans and logistical capability for a contingency in the Persian Gulf area. As a result, by 1990 the United States had a network of air bases and logistics available in the region. The planning to this point, however, had assumed that the enemy would be the Soviets or perhaps the Iranians and the combat plans were almost entirely designed as defensive reactions to stop an incursion. Immediately after the Iraqi attack, however, President Bush declared, “this invasion will not stand.” The problem then became one of offense, as a successful defense of Saudi Arabia would not have fulfilled the President’s declaration.



US Air Force Col John Warden, during his tenure as commandant of the Air Command and Staff College in 1994. (USAF)

On the 6th of August 1990, a small group of Air Staff officers assembled in the “Checkmate” offices in the basement of the Pentagon to develop a plan to win a likely war against Iraq, which would ensure that “the aggression would not stand.” The intention was to use airpower to achieve war success. Two days later,

Gen. Schwarzkopf telephoned the Air Force Vice Chief of Staff, Gen. Mike Loh, to ask for help in building what he called a “strategic air campaign.” The vice chief told him work was already underway and that the planners would visit him two days later to present the concept. Schwarzkopf told the planners on August 10 that he was most pleased with the plan and that they should take it to the Chairman of the Joint Chiefs the following day, which they did. The JCS Chairman, Army Gen. Colin Powell, was generally supportive but directed that the other services be brought into the planning. That afternoon, Navy and Marine aviators came to Checkmate, where they worked with Air Force officers to develop a full air campaign plan, which was to be presented to Schwarzkopf the following Friday. After the Friday presentation, Schwarzkopf asked the planners to take the plan to Gen. Horner, who was the Joint Force Air Component Commander in Riyadh, Saudi Arabia. The plan delivered to Horner became the basis of subsequent air operations and the underlying architecture for the war itself, to include the very brief ground attack at the end of the conflict. To the best of our knowledge, this became the first example of a war built around an air campaign as opposed to one built around a land or sea campaign.

The first Gulf War was successful by almost every measure and thus is worth emulating. To do so, however, planners, commanders, and political leaders should consider the lessons of this war for application to those of the future.

Recognize what can and cannot be achieved with military force: President Bush said, “This aggression will not stand,” which framed the problem in a way suitable for military force. Military force can prevent an opponent from doing something such as invading, occupying, governing, or even surviving, but it cannot change fundamental philosophical, religious, or political views. In the case of the Gulf War, the objectives suggested to Schwarzkopf and Powell and shortly thereafter presented to the President were straightforward and susceptible to achievement with military force: Iraq out of Kuwait; Iraqi weapons of mass destruction programs broken; Iraq incapable of another strategic invasion for the foreseeable future, Iraq capable of defending itself against its neighbor, and Iraq not a basket case. Fortunately, the President did not allow these objectives to morph into political conversions, nation building, or any of the other non-military objectives that are difficult or impossible to realize.

Think about war as against an enemy as a system, not as a clash of military forces: In the weeks—and months—after the Iraqi invasion of Kuwait, many in the United States argued that the effort should be against the Iraqi army in Kuwait and that there should be no attack on Iraq itself. Doubtless, we could have defeated and perhaps even destroyed the army in Iraq without crossing into Iraq, but the cost would have been dramatically higher, and at the conclusion we would still have faced a potent and dangerous Iraq that could have quickly rebuilt its lost army. As it was, by attacking Iraq as a system, to include attacks on its strategic centers of gravity, we were able to achieve long-lasting objectives at a very low cost. A force-on-force war in the Clausewitzian tradition would have been pointless.

Keep wars short: Many years ago, Sun Tzu wrote that “no country has ever benefitted from prolonged warfare” and his words remain true today. The longer a war, the more expensive it is in terms of blood and treasure—for all the participants. In addition, the longer a war lasts, the more opportunity there is for

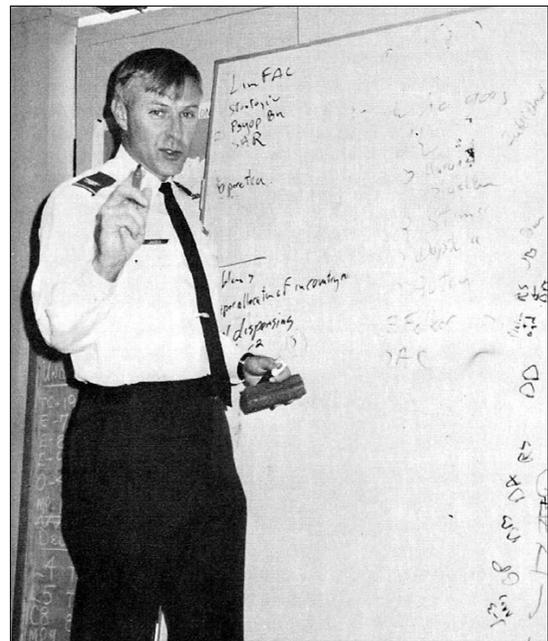
things to go awry. Enemies find new allies; enemies develop new weapons or tactics; domestic and world opinion shifts; and political support fades. In a 43-day war, there is little opportunity for adverse events. Wars can and must be planned to be short.

Attack the enemy in parallel: To keep wars short, it is almost imperative to attack relevant centers of gravity in parallel, which simply means bringing key parts of the enemy system under attack in very compressed time frames. A parallel attack that leads to strategic paralysis—and to operational paralysis—as it did in the Gulf War is almost impossible to withstand and precludes effective reaction. The idea is not to deal with a “thinking, reactive” enemy, but to put the enemy into a position where reaction is simply not possible.

Develop coherent war options: In today’s American military, planning is performed by a joint committee composed of people from all the services with a mélange of experiences, biases, and agendas. One might think this was a good thing, but it almost certainly precludes the examination of plans based on a unique set of capabilities. In the Gulf War, the architecture of the war flowed from a plan developed by airmen with the express idea that it was possible and desirable to fight and win the war with airpower. The theater commander had the opportunity to see an uncontaminated option that he could accept, reject, or modify. In this case, he chose to make minor modifications. With the current practice, however, he would never have heard the unadulterated option.

Identify the key force: Related to the idea of developing a coherent set of war options is the concept of the “key force.” In very broad terms, a war can be fought with air, land, or sea forces or some combination thereof. In a particular situation, however, it is quite likely that one of these forces will either be able to do the job on its own, or will be the most important force. It is also possible that each one will have a dominant role in a phase of the war or, in some cases, there will be separate air, land, and sea wars going on simultaneously in different geographic areas or realms. It is important to think carefully about the key force question and avoid the “jointness” trap of thinking that all components must share equally in planning or participation.

Involve many people from across the government in the planning and in the execution: Starting immediately after Schwarzkopf’s call to Loh, there were far more people involved in the planning than would normally have been the case. It started with many Air Force people, expanded rapidly to include Navy, Marine, CIA, and Defense Intelligence Agency (DIA) officers, and later included people from the



Col John Warden formulating the “Instant Thunder” air campaign plan in the “Checkmate” offices at the Pentagon, August 1990. (Author’s collection)

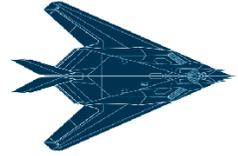
White House, the Office of the Secretary of Defense, the State Department, most of the other national defense agencies, and civilian contractors. Having all of these agencies and people visiting Checkmate and participating at various points helped ensure that everyone knew what was going on and it also helped to avoid mistakes. As an example, US Ambassador to Iraq April Glaspie, while on a fall visit to Checkmate, was able to tell us that a key Iraqi agency had recently changed locations—something that was not part of any database. Too often, we allow an obsession with security to interfere with smart planning. If our planning is not smart because we have prevented participation by the right people, security leaks become the least of our concerns.

Redesign the relations between the President and the Chiefs of Staff: Before the advent of the Goldwater–Nichols Defense Reorganization Act of 1986, all of the Chiefs of Staff were considered to be military advisors to the President and had access to him. In World War II, four senior officers had direct access to the President and gave him distinct options based on their expertise. The President then made the decisions that were his responsibility under the Constitution. Following Goldwater–Nichols, the Chairman became the chief advisor who was supposed to represent the views of the other Chiefs. Although this is theoretically possible, in reality it becomes extremely unlikely that a Chairman will adequately represent the views of a Chief he doesn't like or with whom he disagrees. In the fall before the Gulf War, the President learned that there was disagreement among the Chiefs so he called a special meeting at Camp David to hear directly from each. This kind of a meeting should not depend on happenstance but should be institutionalized.

Technology is the real asymmetric advantage of the United States: Our ability to control the “third dimension” of space and to do so with relative invulnerability allows us to control almost any opponent to an adequate degree. In the first Gulf War, our technological advantages in this realm were so overwhelming that they helped us to win quickly and inexpensively, without destroying Iraq in the process. Although we still have an advantage, it has eroded over the last quarter-century and no longer gives us the margin we previously enjoyed. Reversing this trend should have the highest national priority.

Plan to win: Planning to win means having a very clear, desirable objective that is attainable through military operations at an acceptable cost in an appropriately brief time period. It does not permit engaging in desultory operations that have little chance of being decisive or ending satisfactorily. A clear plan to win should be part of every war decision. Without such a plan, there should be no war.

In the first Gulf War, we were able to use lessons from the previous half-century of air warfare, and to take advantage of technology translated into raw capability in that same time period. Using a new approach and new weapons, we won convincingly. For a variety of reasons, however, in most of our subsequent wars, we reverted to models that had failed us in Korea and in Vietnam. It is time to rethink, and to put us back on the right strategic course.



Leading With Airpower

Gen. John Michael Loh, USAF (Ret.)

Desert Storm was the only major war since World War II that ended in victory, with all objectives met; a war dominated by airpower and remarkable for its brief duration—only 43 days. Airpower played the dominant role in Desert Storm. But Desert Storm did not start with airpower in the lead. The air campaign plan had many detractors. The decision to lead with airpower, before and independent of a ground invasion, was a war in itself. I am going to take you through the debates and decisions in Washington that put and kept airpower in the lead in the five months preceding the start of the war, and give you my version of lessons learned from Desert Storm.

The War of the Pentagon

Four battles characterized what I call “The War of the Pentagon.” The first was a phone call from Gen. Norman Schwarzkopf, the commander of US Central Command and the Joint Force Commander for Desert Storm, to me on Wednesday, August 8, asking for help in expanding the existing war plan for a Middle East regional war. The second was the meeting of our Air Staff team, called Checkmate, with Gen. Colin Powell and the Joint Staff that Saturday, seeking the Chairman’s agreement to proceed with our air campaign planning activity. The third were the frequent skirmishes in “The Tank” between me and the other three service chiefs who wanted their service to take the lead and be the dominant player in Desert Storm. I called them the counterattacks. And the fourth was the meeting at the White House on October 11 with President George H. W. Bush, the Commander in Chief, seeking his approval to proceed with the air campaign plan.



US Air Force Gen John Michael Loh, who served as Air Force Vice Chief of Staff during the Gulf War. He went on to serve as the commander of Air Combat Command from 1992 until his retirement in 1995. (USAF)

I will briefly describe each of those four “battles.”

Request from General Schwarzkopf

I received a call from Gen. Schwarzkopf on the morning of August 8. It surprised me because I only knew Schwarzkopf professionally, but not personally. Here’s what he said: “Mike, I need your help in expanding our war plan to include a more robust air campaign that includes strikes against strategic targets as well as tactical targets. The air operations plans here are traditional AirLand Battle scenarios in collaboration with, and tethered to, ground forces, but very little independent air operations that destroy strategic targets around Baghdad and other parts of the country.”

I could hardly believe what I was hearing. Here was an Army commander talking like an airpower advocate. Gen. Schwarzkopf was an airpower champion in a green suit.

Fortunately, our Checkmate planning cell on the Air Staff was already putting together a strategic-level air campaign concept. Checkmate was formed to think ahead about the application of airpower in several scenarios. Checkmate’s leader was Col. John Warden, a bright conceptual thinker, who was already designing an air campaign for the Iraq war.

I could hardly believe what I was hearing. Here was an Army commander talking like an airpower advocate. Gen. Schwarzkopf was an airpower champion in a green suit.

I told Gen. Schwarzkopf, “We have the concept of the air campaign you want. I will take the lead in fleshing it out as best we can and bring it to you ASAP. I need a day or two to make sure it works your problem, and I will bring it to you ASAP.” He said, “Thanks. Please hurry!”

I then called our operations deputy, and told him to get John Warden and his Checkmate team here immediately. I gave Warden strong marching orders and told him, “Get with intel, turn your generic plan into one that begins to address the strategic target set in Iraq, and be prepared to brief General Powell later this week.” I also called Gen. Bob Russ, commander of Tactical Air Command, and Gen. Jack Chain, commander of Strategic Air Command, telling them of Schwarzkopf’s call and asking them to send a few of their air planners to the Pentagon to assist Checkmate. They did.

Briefing to General Powell

The second battle was our meeting with Gen. Powell and the Joint Staff directors on that Saturday, three days after the call from Schwarzkopf. The Joint Staff was dominated by Army officers, not just Powell, but particularly the influence of the J-3 (joint operations), an Army general steeped in land warfare and dismissive of airpower.

A stormy session ensued. Warden briefed and I chimed in from time to time for reinforcement. We emphasized the independent application of airpower against the Iraqi centers of gravity, and our confidence in waging both an air campaign in the greater Baghdad Theater and also tactical-level attacks in the

Kuwaiti Theater. Powell listened for the most part, but let his J-3 argue against a pre-invasion air campaign. His arguments centered on his experiences in Vietnam, and those of others present. They claimed that airpower could not defeat an enemy and could not even interdict effectively. He even cited the World War II air armadas against Germany, claiming they were ineffective. The critiques piled on.

I listened patiently for a while, but after listening to these false claims, I spoke up forcefully with logical arguments countering accusations about airpower. But, mostly, I argued about the renaissance in airpower in the 20 years since Vietnam. I gave a full-throated defense of our plan based on this rebirth of airpower in the Air Force. I challenged critics with information of which they were unaware regarding a new generation of combat aircraft, weapons, and training since Vietnam that changed the nature of air warfare, which made possible the innovative plan for Desert Storm. Stealth, precision weapons with lasers, night attack with FLIR sensors, and Red Flag force-on-force training, the real “second offset strategy” in my opinion, gave us confidence for a dominant air campaign plan.

At the end of this meeting, Powell, under great pressure from Secretary of Defense Dick Cheney and President Bush to devise a winning plan quickly, agreed to let us continue our planning as we briefed it. His only objection was not to the two-theater air campaign and its strategic nature, but that he wanted us to destroy the Republican Guard armies as part of the strategic plan. And he insisted we make it a joint campaign, not just an Air Force campaign. So, I agreed to include Navy and Marine air where it fit. Powell said he would tell Schwarzkopf that he approved.

We briefed Schwarzkopf. He approved and told the team to take it to Chuck Horner and the operational air planners in Riyadh.

Skirmishes in The Tank

The third battle was a series of skirmishes in The Tank, the room where the Joint Chiefs of Staff meet in the Pentagon. While Air Force planners—Lt. Gen. Chuck Horner, Brig. Gen. Buster Glosson, and the Checkmate guys, Col. John Warden and Lt. Col. Dave Deptula—went to Riyadh to plan the specifics of the air campaign, I continued to fight for, and defend, the air campaign as the leading edge of the upcoming war.



The Pentagon, headquarters of the US Department of Defense. (MSgt Ken Hammond)

The Pentagon is the temple of parochialism. Now don't get me wrong. We fight as a joint team. Jointness works beautifully on the battlefield. But it doesn't work as well in the wars of the Pentagon, where each service wants to show how vital it is, and, therefore, how it must be in the vanguard of any major military action, particularly a major regional war.

I vigorously defended our leadership role in the Tank during September and October when the other chiefs realized the Air Force was dominating the plan. Each of the other service chiefs—Army, Navy, and the Marine Corps—had his own ideas for taking the lead.

The Navy wanted to divide the airspace into route packages the way it was done in Vietnam, which, incidentally, was not an efficient way to allocate airpower. The Navy wanted to control all air action in the east from carriers in the Persian Gulf, and in the west from carriers in the Red Sea. The Navy's plan would leave only the middle for the Air Force working with Army forces. We won those skirmishes handily. The Marine Corps commandant argued forcibly that the Marines take the lead with an amphibious landing from the Persian Gulf and then attack through Kuwait. After all, amphibious operations are the Marines' primary competence. But his proposal was shot down eventually.

Now, the Army Chief of Staff did not like the idea of the Air Force operating independently. The Army preferred a simultaneous, dual invasion with the bulk of air sorties tethered to the Army supporting the ground war. Their chief had two motives: position the Army, not the Air Force, as the leading force in the war, and keep most of the air sorties under the AirLand Battle template doing close air support and shallow interdiction.

In the end, Powell sided with our air campaign plan because it made good sense.

President Bush Gives His Approval

The final battle was the meeting with President Bush on October 11. Schwarzkopf sent Gen. Glosson to brief President Bush on the air campaign plan. The evening before, Secretary Cheney, Powell, and the Joint Chiefs previewed both the air and ground plans in the Pentagon. Glosson gave a powerful briefing with detailed information about the air campaign and his confidence in its successful execution. On the other hand, the Army general presented a ground campaign that was unimaginative, lacked detail, and was not a confidence-builder. Powell was displeased with the Army plan, but also wary of the confidence Glosson displayed in his briefing.

After the meeting, Powell stopped Glosson after I had already departed for my office. He told Glosson to tone down his confidence, that the briefing and the air campaign were too optimistic. Glosson hastened to my office and asked what to do. I told him to not change anything in his briefing, but to invoke Schwarzkopf's name several times during the briefing. "Buster, remember this is not your plan, it is not General Horner's plan, it is not an Air Force plan, it is the Joint Force Commander's air plan. So, let the President and all present know you are speaking for General Schwarzkopf and he has approved the essence of the air campaign plan."

Glosson gave his briefing superbly. President Bush, to his credit, knew the value of airpower and was excited about our plan. After hearing the briefing by Glosson, he wanted to begin the war right then. But Powell dissuaded him, arguing that ground operations were necessary to ensure victory, and he wanted to deploy the VII Corps from Germany to Saudi Arabia. President Bush approved. That took more than two months. We won that battle and the air campaign concept spawned in the Pentagon became the vanguard force in Desert Storm.

Then the war began on the morning of January 17 with a massive air attack against strategic targets around Baghdad led by the stealthy F-117, and continued for the next 42 days, followed by a four-day ground

invasion before the Iraqis surrendered. We won Desert Storm quickly, decisively, with overwhelming force and few casualties, by leading with airpower.

Airpower Lessons Learned

So, what are the lessons learned? There are many, but let me give you three macro, “big picture” lessons that I took from Desert Storm, and are still applicable today. One: airpower is consistently underestimated and not well understood, even in the Air Force. Two: computer models and “experts” always over-estimate air attrition. And three: strong, decisive leadership and trust from the top down are essential for success. Let’s look at each one more closely.

Airpower Disparaged

Recognize that others do not necessarily share your enthusiasm about the effectiveness of airpower. Just before Desert Storm the other military services did not recognize the “rebirth of airpower” from 1970 to 1990 in the Air Force. In my opinion, the “second offset strategy” for the Air Force was the investment in three technologies: stealth, precision weapons, and forward looking infrared (FLIR) sensors to take away the sanctuary of night the enemy had enjoyed in Vietnam. We fielded systems that exploited all three technologies: the stealthy F-117 Nighthawk with its FLIR and laser designator; the laser-guided bombs employed by many fighters, and laser designators on the F-11F and F-15E, and going from flares to FLIRs to attack at night. These systems were ready for Desert Storm but most war planners did not appreciate their significance.

Currently, the Army’s zeal to get “boots on the ground” in the war against ISIS has had the unintended effect of disparaging airpower as ineffective in that fight, giving airpower an undeserved bad reputation. The real problem with air attacks against ISIS is the misapplication of airpower, dribbling it out piecemeal, six sorties per day (in Syria, the locus of ISIS) rather than over a thousand strikes a day as in Desert Storm.

In the recent past, our Air Force leaders, seeking to be team players in the joint arena, have promoted airpower tethered to the ground battle rather than having a component of the air campaign in which airpower is employed independent of the ground battle. They have forgotten this valuable lesson of Desert Storm.

And, some seek to promote their own service at the expense of the contribution of air. The Army teaches and preaches Desert Storm as the “100-Hour War.” They deliberately forget that it took only 100 hours to “mop up” after 1,000 hours of airpower put Iraq in shambles and rendered the Iraqi army virtually ineffective as a fighting force.

In the recent past, our Air Force leaders, seeking to be team players in the joint arena, have promoted airpower tethered to the ground battle rather than having a component of the air campaign in which airpower is employed independent of the ground battle.

So, we need to continually learn, and then educate. Now, don't get me wrong: airpower can't do everything. We must have "boots on the ground" to force total victory and surrender. But the right formula should be the Desert Storm formula: lead with relentless, overwhelming airpower, and follow with a massive ground invasion.

Models Over Estimate Air Attrition

Computer models and "experts" always over-predict air attrition. Historically, a mismatch exists between the forecasts versus actual attrition experienced in air campaigns. Models have always erred on the pessimistic side. They predict higher loss rates. This was true for Desert Storm and other major air campaigns.

Why is this so? Well, models cannot replicate the complexity of large-scale air battles. Models are good for evaluating the relative impact of changing one or two parameters of threats or air defense systems, but not for predicting the absolute outcomes of large air battles. Modelers also invariably assume the adversary is "ten feet tall," with systems working at peak performance and 100 percent reliability.

In the first five days, the experts, even Air Force leaders, predicted a loss of approximately 70 aircraft before total air dominance could be achieved. Analyst models predicted much higher attrition.

A brief look at past air campaigns, including Desert Storm, will prove my point and warn you to be wary of attrition analysts. In December 1972, in operation Linebacker II, B-52 raids over heavily defended Hanoi, Vietnam were successful in destroying the state-of-the-art air defenses and other military targets in North Vietnam. This led to the successful negotiation of our exit from Vietnam and the return of our prisoners of war.

Analysts and "experts" predicted we would lose one B-52 out of every three B-52 sorties flown. In the 11-day operation, we lost 15 B-52s in 729 B-52 sorties flown into the teeth of air defense systems—an attrition rate of two percent, not 33. In the June 1982 Bekaa Valley campaign, the Israeli Air Force mounted a mass operation against a modern Soviet-supplied air defense system fielded by Syria in Lebanon. Analysts predicted an attrition rate of 15 percent. In 1,100 fighter sorties, the IAF lost no aircraft—zero percent attrition, not 15 percent.

What about Desert Storm? In the first five days, the experts, even Air Force leaders, predicted a loss of approximately 70 aircraft before total air dominance could be achieved. Analyst models predicted much higher attrition. After all, the IADS around Baghdad was the state-of-the-art French Kari system. Coalition forces flew more than 5,000 combat sorties in those five days and lost 27 fixed-wing aircraft, an attrition rate of less than 0.4 percent—less than half of Air Force estimates, and way below analysts' predictions.

Why are forecasts of air attrition consistently higher than actual results, and why is this important today? Models lose their fidelity when they try to simulate large-scale air campaigns like Desert Storm because they cannot faithfully replicate their enormous complexity. They cannot account for the countermeasures, both electronic and kinematic, the decoys, on-scene decisions by pilots, changes of tactics as the campaign

progresses, or the sheer quantity and swarming tactics air battles. Many models merely extrapolate from a one-versus-one single-engagement to many-versus-many scenarios. That is grossly faulty modeling.

Why is this mismatch important today? Well, today we again hear the predictions of the analysts that manned aircraft cannot penetrate modern “anti-access/area denial” systems in development by Russia, China, and Iran. They tout results of their models to show that air losses would be unacceptable. I have been hearing that argument for more than 50 years. Manned fighters and bombers can negate sophisticated air defense systems and successfully attack heavily defended targets with the same success enjoyed in these three campaigns with a combination of standoff and penetrating aircraft, decoys, drones, and smart tactics.

The lesson is to challenge assumptions of the models, examine the algorithms critically, and use models only where they apply: for limited, relative changes, not absolute outcomes in large air campaigns. Be skeptical and critical of attrition models.

Leadership from the Top Down

The third lesson is that strong, decisive leadership from the top is necessary for success. President Bush provided that leadership. He set clear military objectives and let his military leaders plan the campaign without interference from the White House. He gained the support of both the Congress and the United Nations for the war. He skillfully knitted together a large coalition of international partners in the Middle East, Europe, and Asia from Congress and the U.N. He placed heavy demands on Colin Powell to put together a winning war plan with force sufficient to win quickly. He recognized the problems of a long war without an exit strategy. In short, he wanted to get in, win, and get out after meeting his military objectives.



President George H.W. Bush, left, and Gen. H. Norman Schwarzkopf walk to the reviewing stand at the beginning of the national victory celebration parade on June 8, 1991 in Washington, D.C. (DOD)

Bush was under enormous pressure politically and from the whole US population to not invade. Instead, political leaders of both parties advised him strongly to allow economic sanctions to continue for another year, hoping that would force Saddam Hussein to withdraw his forces from Kuwait. The pressure against the war was intense. Various studies concluded upwards of 10,000 American lives would be lost. The airwaves and newspapers were replete with comments like “8,000 body bags are being shipped to Saudi.” One hundred forty-eight American lives were lost in Desert Storm—148 lives, not eight or ten thousand.

Eight of the nine living former chairmen of the Joint Chiefs, including one Air Force chairman, wrote a letter and testified before Congress that we should not go to war, but rather let sanctions continue. Senator

Sam Nunn, the chairman of the Senate Armed Services Committee, argued and voted against the war. This doomed his plans to run for president in the 1992 election. The fierce opposition underscored the lack of understanding of the impact of airpower in 1990, and the advances in airpower since Vietnam.

But, throughout it all, President Bush was steadfast and resolute. He displayed undaunted courage, and he placed unprecedented trust in his military leaders. That trust pervaded all the way down the chain of command to the troops engaged in Desert Storm. Trust was the coin of the realm at every level of command from the commander-in-chief to the aircrews and troops on the ground. And trust went both ways: down the chain and back up the chain. The pilots and troops trusted their leaders. They knew their leaders had their back and that confidence allowed them to perform knowing their leaders would support them even if they made an occasional honest mistake in the heat of battle.

Desert Storm and the War Against ISIS

The contrast between Desert Storm and the current war against ISIS could not be sharper. President Bush 41 gave the military clear objectives, gained approval of Congress and the U.N., formed a strong coalition that participated willingly and actively, and won quickly and decisively with few casualties on both sides. None of these principles defining a justified war are present against the Islamic State.

At the start of Desert Storm, airpower was not the leading force. Airpower had to fight its way to take the lead. We had to convince our critics that a rebirth of airpower took place after Vietnam, emphasizing the asymmetric application of stealth, precision weapons, and night attacks.

The trust, so prevalent in Desert Storm, is weak in the ISIS war. Rules of engagement for pilots are so restrictive that the pilots are fearful of retribution and thus too risk averse in combat. Instead of clear military objectives and a defined end state for combat action, attrition of ISIS members appears to be the measure of success. Vietnam taught us the folly of using body count as a measure of success. How soon we forget.

Since Desert Storm, airpower seems to have stepped backward. Current conflicts do not unleash airpower like it was in Desert Storm. Today, critics disparage airpower, but only because it is misapplied against ISIS. That must change.

Closing Observations and Lessons

At the start of Desert Storm, airpower was not the leading force. Airpower had to fight its way to take the lead. We had to convince our critics that a rebirth of airpower took place after Vietnam, emphasizing the asymmetric application of stealth, precision weapons, and night attacks. That took away the sanctuary of night the enemy enjoyed previously. The battles in the Pentagon were waged and won that positioned airpower as the dominant force with compelling arguments and forceful logic.

President Bush let the military plan both the air and ground campaigns without interference, approved the air campaign plan, and never wavered from his support.

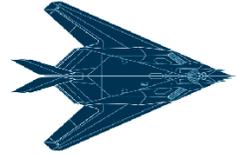
The air campaign became the vanguard force in Desert Storm. Generals Horner and Glosson broadened the conceptual work done in the Pentagon, put together detailed force packages to take down the air defenses, and matched air forces against targets in both the Baghdad and Kuwait theaters. The six-week air campaign allowed the ground forces to complete the victory in just four days.

Three broad lessons emerged. First, we have already forgotten the lesson of Desert Storm that airpower can be applied independent of a ground campaign and in close support of ground forces at the same time. Airpower continues to be misunderstood and misapplied in the War against ISIS.

Second, air attrition is always over-predicted because computer models and “experts” do not understand how airpower is applied in an overwhelming way. The examples of Desert Storm, Linebacker II, and the Israeli Bekaa Valley campaign prove the point. Modelers do not understand and account for the many complex variables in air campaigns that allow for changes in tactics and on-scene decisions. Over-predicting air attrition is happening in models today to declare that manned fighters and bombers cannot penetrate A2/AD air defense systems of Russia, China, and Iran. Airpower advocates need to challenge the assumptions and methodology of air attrition models.

And third, President George H.W. Bush placed enormous trust in his military leaders to plan and wage a decisive two-theater campaign that allowed the coalition to win, quickly, decisively, with overwhelming force, and few casualties. That trust flowed down to the pilots and troops in the cockpits and on the ground. In turn, the pilots and troops trusted that their commanders would support them in the heat of the battle. That mutual trust is not as strong today as it was in Desert Storm.

The lessons of Desert Storm, from inception of the air campaign through its execution that led to victory, must not be forgotten. Rather, as we look forward to future enforcement of deterrence and plans for wars across the spectrum of conflict, airpower should be the leading force, the vanguard to pave the way for the successful conduct of campaigns and victory.



Desert Storm: A View From the Front

Gen. Charles A. Horner, USAF (Ret.)

The 1991 battle to liberate Kuwait was unique in many aspects and should be studied, as in many ways it represented a new way to conduct military operations. As a preamble I must note that I quickly learned not to use the terms “strategic” or “tactical,” as they have such diverse meanings that they only contribute to confusion. In addition I found that the use of “doctrine” to determine courses of action also is dysfunctional as it all too frequently is used to justify doing something that cannot otherwise be justified by common sense.

There were many elements that comprise the Desert Storm story. The first and perhaps the most important one is leadership.

Leadership starts at the top, and in this case it was President George H.W. Bush. General Schwarzkopf and I went to Camp David two days after the Iraq invasion of Kuwait had been fully recognized. The principal attendees included the Secretaries of Defense, State, White House Chief of Staff, National Security Advisor, and Chairman of the Joint Chiefs of Staff.

Gen. Colin Powell provided an overview of his understanding of the current situation in the area of responsibility (AOR). He was followed by the Commander in Chief of Central Command, Gen. Norman Schwarzkopf, who provided a description of ground forces that could be deployed in terms of size, speed, and capability. I followed with similar information concerning airpower. This information was provided so the political leadership could consider options for military action should the Iraqi forces continue on and invade Saudi Arabia.



US Air Force Gen Charles A. Horner. Then-Lt Gen Horner led US Central Command Air Forces during the Gulf War. He was promoted to general in July 1992, and led US Space Command and North American Aerospace Defense Command until his retirement in September 1994. (USAF)

There were many questions asked by various cabinet members and then President Bush began to speak. He noted that the United States would need to first halt any further incursions and inferred that at some point we might have to liberate occupied Kuwait.

From his questioning it became apparent he was concerned about the loss of life from any military actions, not only US lives but also coalition lives, and then I realized he was concerned about Iraqi lives. Next he asked a number of questions about possible coalition partners. No one could provide any answers so he tasked us to go with Secretary Cheney to discuss the situation with the King of Saudi Arabia, as his country was the one most threatened by Iraqi forces in Kuwait.

The lesson to be gained was that from the start it was apparent that any political goals he would direct would be achievable using military force. There was no discussion about bringing some sort of reform to Iraq that has subsequently proven to be unachievable 25 years later. The request that we also consider the value of human life and cooperate as an international coalition was deeply appreciated by those of us in the room that had fought in Vietnam, where the measure of merit was dead bodies and our military leaders discounted the worth of the Vietnamese military as partners.

Next down the Desert Storm chain of command was the Secretary of Defense, Dick Cheney. I don't know the depth of his knowledge in military matters, but he was always fully informed as to our military forces, plans, and strategy and never gave us theater specific guidance. He was a good listener, he asked lots of questions, and was open to our views and arguments for or against suggestion that others might put forward. He was easy to work with, he wanted military views on a broad range of issues, and appeared to have confidence in our opinions and decisions. Our failure to halt Scud ballistic missile attacks on Israel was a serious political problem, on which he flew top cover for us after we explained our capabilities and limitations.

Next down the Desert Storm chain of command was the Secretary of Defense, Dick Cheney. I don't know the depth of his knowledge in military matters, but he was always fully informed as to our military forces, plans, and strategy and never gave us theater specific guidance.

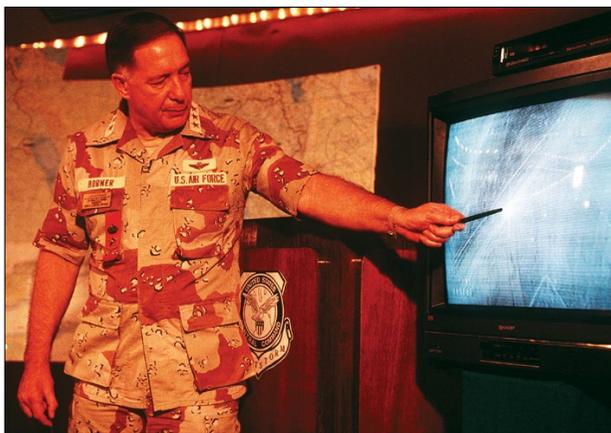
Colin Powell was one of us who fought in Vietnam. He was well aware of the importance of the Goldwater–Nichols defense reorganization concerning the roles of the services and the unified commanders. He was always sensitive to our prerogatives and saw his role as supporting the deployed forces, serving as a buffer from interference from those in Washington not in the chain of command. One such action involved the dismissal of the Air Force Chief of Staff as a result of a newspaper article following a visit to the Middle East.

Schwarzkopf deserves all the credit for our success due to his leadership. He was a very intelligent officer who was aware of his own shortcoming especially in the area of air operations. That is why he had me accompany him to Camp David. He quickly understood new concepts, such as “Push Close Air Support (CAS),” a concept where the ground forces would always receive needed support, but were precluded from

needlessly tying up airpower by requesting ground or airborne alert sorties—another concept that proved wasteful in Vietnam. He allowed dissent from me, but it was only provided in private. He was also very concerned about the lives of his soldiers and his persona post war. He and his predecessor, Gen. George Crist, understood the value of a single air commander and single air strategy executed by a single plan.

Leaders who were not deployed also played an important role. General Bill Creech had retired years before Desert Storm but his legacy contributed greatly to our success. He took the Reagan budgets of the early 1980s and concentrated on organization, equipment, and training of our air forces. The Red Flag air combat training exercises taught airmen of all services to fight as a team. Green Flags were similar exercises that taught us how to fight the electronic warfare battle. Blue Flag—a command and control exercise—was vital to my forces as our unified commanders, Crist and Schwarzkopf, made sure their assigned Army, Navy, and Marine Corps components participated in our Air Force command and control annual exercises where we learned to build air strategy and publish an air tasking order (ATO). The most significant concept Creech taught us was how to decentralize decision authority with its accompanying delegated responsibility. In this way the flight leads challenged the headquarters when they were told to do something stupid. In battle they were expected to decide if the mission could be efficiently prosecuted. They were empowered, as they were on scene—a vital concept that has to be relearned in every conflict.

Last but not least, Brig. Gen. Buster Glosson deserved much of the credit for creating the team known as the “Black Hole” that planned Desert Storm. Since war is chaos we only planned the first two and a half days of operations. Plans can become an anchor, keeping one from the agility needed as new situations arise. So on day one of the war, the Black Hole completed the ATO for the third day and started fresh on



Then-Lt Gen Charles A. Horner points to a display screen as he briefs Operation Desert Storm actions to members of the media. (TSgt Fernando Serna)

the next day. As the war progressed they became more adroit at meeting unforeseen challenges and developing new targeting strategies. Buster was not always easy to work for, but his team proved to be world class.

The second-most important factor in our success was that the airmen were prepared to deploy and fight. I cited the impact of the Reagan defense budgets in terms of equipment and training. One of the most important benefits was high morale. Warriors want to be confident they can whip an enemy. In the Carter budget years, readiness was pencil whipped; ratings were inflated to hide our lack of flying hours. Maintenance and supply

failed to support training; crews got aircraft with broken weapons systems and told to do the best they could. Creech fixed maintenance and supply first. He demanded tough standards of training even if there was an increased risk of accidents. The other services' airmen, due to our joint exercises such as Top Gun and Red Flag, realized this increase in readiness.

The preparation to conduct military operations in our AOR was also a result of a massive pre-positioning of equipment, supplies, munitions, and fuel in the region started by the Joint Rapid Deployment Force in the 1980s. When our aircraft landed at Gulf airfields they were met with spares, fuel, munitions, living facilities, and all the other things they would need to survive and fight. This material had been stored on ships anchored in theater and in leased warehouses throughout the AOR.

It was the organization and personnel that made Desert Storm so different from previous conflicts. I have already cited the Goldwater–Nichols Act, but Vietnam was deeply ingrained in all serving under Schwarzkopf. John Yeosock, 3rd Army, Walt Boomer, United States Marine Corps Central Command, Stan Arthur, Naval Forces Central Command, and I were a team. We could disagree respectfully and work out a solution. For example, the Navy F-14 did not have the systems needed to conduct beyond visual range missile shots. Stan asked that I change the rules, I in turn urged he bring the matter up with Schwarzkopf. He did and the issue was resolved without acrimony.

We had some problems. Initially the Navy wanted to reinstitute the route package system in Iraq. I had flown missions over North Vietnam, and I told Arthur's predecessor I would resign before I would agree to that. He was shocked and left in a huff. Stan, who had also flown over North Vietnam, agreed with my position. Another issue was that the Army did not have doctrine for fighting at levels above Corps. As a result one of the corps commanders thought he was in charge of his share of the battlespace. He would also submit inflated target requests with the idea if he asked for more he would get more, apparently not concerned about the lives of the other soldiers. I didn't ever have to raise these issues with Yeosock or Schwarzkopf. However, to this day there are some Desert Storm Army veterans who firmly believe the Army could have won the war "if only we had been able to get control of the Air Force." Not many, but a few.

Special operations pose special problems. The regular Army and Special Operations Forces (SOF) often are separated by choice. This doesn't work for air, as was found out when on two occasions two insertions were discovered by the Iraqis and F-16s were needed to recover the teams.

Special operations pose special problems. The regular Army and Special Operations Forces (SOF) often are separated by choice. This doesn't work for air, as was found out when on two occasions two insertions were discovered by the Iraqis and F-16s were needed to recover the teams. The separation of forces sought by the special operations meant their teams were not trained nor equipped to work with non-Special Operations Forces aircraft. Fortunately a SOF airman on the inserted team had brought a regular air rescue radio and could communicate with the F-16s that held the Iraqis at bay until they could be rescued.

Because of the international political top cover provided by our President and other national leaders, our military leaders worked well together. At Schwarzkopf's direction we created a co-equal leader from the primary host Saudi Arabia. Lieutenant General Prince Khalid bin Sultan, son of the Saudi Minister of Defense, was in place when Schwarzkopf arrived in mid-August. Their teamwork resolved problems that

could have caused serious disruptions if left to fester. Another lesson from Vietnam was that while our military is well respected, we lose that respect when we try to be the boss. Coalitions have to be built on trust and mutual respect. On the air operations side, all national senior airmen were equal regardless of rank. We met twice a day and discussed any matter from tactics to support. We listened together, supported one another, and often the national military leaders resolved concerns from his national political leadership that could have impacted military operations in a negative manner.

In Vietnam we had strict rules of engagement (ROE), which often assisted our enemy. In Vietnam those of us flying in the North would ignore dysfunctional ROE, and as a result we gave away our integrity

In Vietnam the Secretary of Defense and the President selected our targets in the North. In Desert Storm the captains, majors, and lieutenant colonels—the war planners in the theater— selected them.

in the post-mission debriefs. Afterward I promised if I could I would never let that happen again. As a result I kept a close eye on our ROE. We have the Law of Armed Conflict and that is good guidance, even sufficient. Bad things happen in war, but a responsible empowered force will keep them to honest mistakes. We had mistakes happen, such as the bombing of a command bunker converted into an air raid shelter, but that was a mistake not a crime. Political leaders will try to keep bad things from happening by using ROE to control the military. Such measures do not work and cause those being shot at to lose respect for those who think they are making the battlefield a better place.

In Vietnam the measure of success was a body count. In addition to being obscene it didn't provide useful data on how things were going. Under Creech we learned to measure output not activity. It didn't matter how many holes we put in Iraqi runways, the measure of success was how many of our jets were downed by Iraqi fighters or how many pilots were kept from hitting their target because of an Iraqi fighter. People in government capitals, higher headquarters, and the press all want to know how the war is going. They will try and force you to use metrics based on activity rather than output, which is infinitely more difficult to measure.

In Vietnam the Secretary of Defense and the President selected our targets in the North. In Desert Storm the captains, majors, and lieutenant colonels—the war planners in the theater— selected them. We welcomed information and suggestions from any source, but target decisions would remain in theater with all being kept aware of the current plan.

In Desert Storm we did some things very well. For example, building the air tasking order. My Air Force staff was small but, when augmented by other services and coalition airmen, national intelligence members, and team members stationed around the world at communication, space, and logistics hubs it functioned well because it was united by a common cause and vision. We were fortunate to have an evil enemy who posed a significant threat. That made it easy to pull together planning, building, and executing a huge number of activities that are controlled by a single ATO. It too often was delivered to flying units hours late, but it was essential in getting the air armada what they needed to defeat the Iraqis.

Airlift, inter- and intra-theater, was revolutionary. The speed of the initial Iraqi attack meant our response from halfway around the world had to happen within hours. It did. Then our forces were spread out over thousands of miles in an environment where to live off the land you had to be able to eat sand and drink salt water. The initial deployment was frenzied, but in time sustainment of forces in theater was never lacking. That is a key factor that is underappreciated—hard work but few headlines.

We gained control of the air quickly. In Vietnam we chose not to dominate the enemy air defenses and in the north the SAMs and anti-air artillery took a huge toll on aircraft throughout the war. Those of us who flew over North Vietnam swore “never again!” A Navy unit, the Warfare Analysis Center, provided a detailed description of the Iraqi air defense system. Brigadier General Larry Henry, and later Brig. Gen. Glenn Proffitt, constructed a plan based on our anti-SAM efforts in Vietnam, and the Israeli operations in Syria that took the initiative away from radar-guided SAMs, rendering them almost useless. We then flew at medium altitude beyond the range of most conventional artillery.

Our reconnaissance was primarily film based. That was fine for fixed targets, but the Iraqis learned quickly that they could not stay in one spot for very long.

The Iraqi fighter force was modern and posed a deadly threat. In the late 1980s I had dinner in Pakistan with a Pakistani Air Force fighter pilot who had been training the Iraqi Air Force. He had been sent home by the Russians who managed the program, because he was teaching Western air combat tactics. The Russians demanded the Iraqis use close control, with the ground controller even calling when the pilot should launch their weapon. We knew that without contact with the ground controller the Iraqi pilots would be lost, so our first strikes were designed to take away their air picture and ability to control the interceptors from the ground, rendering the Iraqi Air Force impotent. The effort to isolate the battlefield, interdict, and hit point targets such as command bunkers and dug-in tanks was highly efficient because of precision-guided weapons.

The air refueling force was the key element in planning the air effort. The sky was filled with fighters, bombers, and command aircraft all going to or from a coalition tanker. It is a tribute to all the aircrews flying day and night in all weather without external lights that they did so thousands of time without mishap.

We could have done some tasks better. Our reconnaissance was primarily film based. That was fine for fixed targets, but the Iraqis learned quickly that they could not stay in one spot for very long. We were able to shorten the time from target location to putting a weapon on the target by flying F-16 aircraft over a given area on the ground and then the F-16 pilot, called a “Killer Scout,” could lead newly arrived attack aircraft and direct their strike.

We could have done a better job of working with the media. We failed to realize there are different media with different requirements and timelines. Also those of us who flew in Vietnam had reservations as to the integrity of the media and their willingness to truthfully report what they observed.

We failed to think through to post-conflict needs. For example, our ground forces overran large amounts of modern Russian equipment and we did not have an intelligence exploitation plan. Instead soldiers would simply throw a grenade into the cockpit of a parked advanced fighter. Our cyber operations were hampered by a lack of interagency cooperation. The bickering precluded significant opportunity to confront the Iraqis. I see little improvement today, 25 years later.

Perhaps our biggest error was a failure to plan for the end of hostilities. We were directed to cease our attacks and then the military was directed to negotiate the peace. This was something that should have been planned using an interagency political process well beforehand. Schwarzkopf and Prince Khalid bin Sultan met with the Iraqis at Safwan, over the Kuwaiti border in Iraq. Our first concern was the return of prisoners of war and separation of forces to preclude more bloodshed. But there were a number of issues that could have been resolved that may later have caused the need for a second war with Iraq.

Desert Storm created a halo that in some ways may not have been fully justified. The American people had low expectations for our performance due to our experience fighting in Vietnam. We did not make the same mistakes on the political and military level, but one must wonder, given our current combat, if those valuable lessons have to be relearned. Stealth, precision, and high sortie rates were underappreciated by the public in general and even by some of our military. The budgets of the early 1980s, the leadership in Congress that led to the Goldwater–Nichols Act, astute political leaders who set achievable goals, low casualty rates, quick decisive action, and involvement of the total force all helped to make our hometown folks feel great relief. Our allies in the region were surprised by the excellent conduct of our military personnel in their countries. They told me they were ashamed that they harbored concerns about the very negative images they garnered from the media during the Vietnam War.

Saddam offered to withdraw from occupied Kuwait prior to the beginning of ground operations. The armies of the world define war as a ground force fighting a ground force until one prevails, hence the labeling of Desert Storm as the “four-day war.” Every war is likely to be different; to require a different mix of force to accomplish the desired strategy determined to achieve the desired goals. The lesson of Desert Storm is not only an airpower lesson. It is that there are many ways to employ military force. Generals need to do what Norman Schwarzkopf did: temper doctrine with common sense; create cooperation between service components and allies; and connect the needs of the political leadership with those of the people who bear the brunt of the battle.



Air Force personnel, led by then-Lt Gen Charles A. Horner, march in the national victory celebration parade honoring the coalition forces of Operation Desert Storm. Then-Lt Col David Deptula is behind Horner, to the left. (DOD)



Lessons Taught, Lessons Forgotten

Dr. Benjamin S. Lambeth, Center for Strategic and Budgetary Assessments

It is a special honor for me to have been invited to share the podium with this symposium's roster of distinguished speakers to offer some final thoughts on what I believe we all would agree still remains even today—a quarter of a century later—the most epic American combat experience since Vietnam. Having now heard all of the preceding presentations this afternoon, I believe that my charter for my concluding remarks is to try to reinforce the most important and memorable recollections that were voiced earlier by those who were actually there in the fight—both in the war zone in Southwest Asia and back here in Washington, D.C.



Dr Benjamin Lambeth. (RAND Corp.)

A Combat First

To begin with, as most of you all will remember, not long after Operation Desert Storm ended, then-Secretary of the Air Force Don Rice commissioned the Gulf War Air Power Survey, or GWAPS as it is more commonly called. That was an in-depth, five-volume assessment of the air war modeled on the US Strategic Bombing Survey conducted after World War II. Professor Eliot Cohen at the Johns Hopkins School of Advanced International Studies here in Washington led it.

In the preface to their unclassified synopsis of the GWAPS effort, Eliot and his co-author Tom Keaney wrote that one important purpose of the exercise had been to provide “an analytical and evidentiary point of departure for future studies of the air campaign.” Inspired by that enticement, I subsequently sought to try my best to make broader sense of the Gulf War and its meaning in a substantial study of American airpower's evolution since Vietnam that was sponsored by General Ron Fogelman during his tenure as Air Force chief of staff. Cornell University Press eventually published that study as a book in 2000. After much careful consideration, I finally chose as its title, *The Transformation of American Air Power*. I did

so, I will now admit, before what I later came to disparage as the “T-word” became so popularized and devalued by the Donald Rumsfeld-led Pentagon that it eventually ended up meaning almost anything one might want it to mean. But I still have no regrets over having made that title choice, since, if used with all due discretion and discipline, “transformation” remains an uncommonly powerful word. The dictionary defines “to transform” as “to change the nature or character of something radically.” And that is exactly what I believe happened to the substantially improved American air posture after Vietnam that we finally took to war against Saddam Hussein in 1991.

Transformed Airpower in Action

We have already heard abundant first-hand testimony this afternoon as to the main details of the air component’s performance throughout the campaign, so I will not waste time recapitulating any of those events in my own remarks. Let me just say that after the campaign’s cease-fire went into effect, there was no doubt in anyone’s mind about the determining influence that the initial air attacks had in producing the subsequent course and outcome of Desert Storm. Those attacks against Iraq’s air defenses and command and control facilities were uniformly effective, with initially, more than 600 strike sorties launched in radio silence against the country’s most significant targets the first night

and with just one coalition aircraft lost to enemy fire—a Navy F/A-18, presumably to a lucky long-range infrared-guided air-to-air missile fired from an Iraqi MiG-25 that had somehow escaped being detected and identified by our E-3 Airborne Warning and Control System (AWACS) aircraft operating nearby. Over the next three days, the air war struck at the entire spectrum of Iraq’s military assets, gaining unchallenged control of the air and the needed freedom to operate with near-impunity against Iraq’s airfields, ground forces, and other targets of interest. In one of the first serious assessments of the campaign’s air offensive to have appeared in print after the dust settled, the United Kingdom’s most respected commentator on air warfare, retired RAF Air Vice-Marshal Tony Mason, aptly characterized it as “the apotheosis of 20th-century airpower.”

Perhaps the single most important point to be made about the planning approach that underlay Desert Storm’s air effort has to do with its having sought and achieved desired combat effects as a major departure from our earlier targeting practice. For example, there was no assessed need for the air component of US Central Command (CENTCOM) that

conducted the campaign to destroy each and every last Iraqi acquisition and tracking radar and surface-to-air missile (SAM) site. It was enough for it simply to be so effective in its initial SAM-suppression attacks that Iraq’s SAM operators were intimidated from turning on their radars and engaging the coalition’s attacking aircraft, since they had quickly learned from first-hand experience of others that if they did they would invite a high-speed anti-radiation missile (HARM) shot down their throats with the certainty of sunrise.

The dictionary defines “to transform” as “to change the nature or character of something radically.” And that is exactly what I believe happened to the substantially improved American air posture after Vietnam that we finally took to war against Saddam Hussein in 1991.

And, by the same token, there was no assessed need for the air component to destroy each and every last Iraqi fighter aircraft. The coalition was so totally dominating in the air-to-air arena that the Iraqi Air Force soon lost any incentive to turn a wheel. Before long, it was said by some inside observers of the ongoing air war that the three most fearsome words to an Iraqi fighter pilot were “cleared for takeoff.”

What Made it Possible?

To sum it all up in brief, American airpower showed during Operation Desert Storm that it had finally matured in its ability to deliver the kinds of outcome-determining results that its early visionaries had promised in vain years before. Thanks to our exploitation of the latest technology, our pursuit of more realistic aircrew training, and our development of better strategies and concepts of operations after Vietnam, American airpower in all services underwent a nonlinear growth in capability as a result of the advent of stealth and our ability to attack targets consistently with high accuracy around the clock. Only later, with the subsequent advent of the satellite-aided Joint Direct Attack Munition (JDAM), could it do so in any weather conditions as well.

But by the time of Desert Storm, our air assets had finally gained what they needed by way of combat wherewithal to set the conditions for victory in high-intensity warfare. They also ever more steadily came to supplant the traditional role of our ground forces in contributing the bulk of heavy lifting toward achieving joint force combat objectives, with friendly ground forces now fixing enemy ground troops and airpower doing most of the killing of them rather than the other way around, as had been the case in all previous joint air and land operations.

American airpower showed during Operation Desert Storm that it had finally matured in its ability to deliver the kinds of outcome-determining results that its early visionaries had promised in vain years before.

To offer just two examples of this momentous combat role reversal, during the pre-campaign Operation Desert Shield buildup of allied forces in the war zone, CENTCOM shipped nearly 220,000 rounds of M1A1 Abrams main battle tank ammunition to the forward area, of which less than 2 percent were actually fired in combat. For its part, the air component dropped more than 23,000 bombs on Iraq’s ground forces, making for 67 percent of the campaign’s overall air effort.

By the same token, fast-forwarding to the three-week major combat phase of Operation Iraqi Freedom in early 2003, the US Army flew only two deep-attack missions with fewer than 80 of its AH-64 Apache attack helicopters, and it fired only 414 of its high-end MGM-140 Army Tactical Missile Systems (ATACMS) in support of its march northward from Kuwait to the heart of Baghdad. In contrast, CENTCOM’s air component during the same three weeks flew more than 20,000 strike sorties, using 735 fighters and 51 bombers to attack, with devastating effect, more than 15,000 Iraqi target aim points in direct facilitation of CENTCOM’s land offensive, but also mostly ahead of and independent of any friendly ground-force action.

Perhaps the most compelling testimony to what that air capability allowed in Operation Iraqi Freedom came from Lieutenant Nate Fick, a Marine Corps platoon commander during CENTCOM’s land offensive, who

later wrote in his book *One Bullet Away*: “For the next hundred miles, all the way to the gates of Baghdad, every palm grove hid Iraqi armor, every field an artillery battery, and every alley an anti-aircraft gun or surface-to-air missile launcher. But we never fired a shot. We saw the full effect of American airpower. Every one of those fearsome weapons was a blackened hulk.”

Later Airpower Successes

With respect to the air component’s successful performance in beating down Iraq’s ground forces in the Kuwaiti theater of operations in just a little more than a month to a point where they no longer presented a major threat to the coalition’s final four-day land push, some observers tended for a time afterwards to

... in the 12 years that followed Desert Storm, allied airpower prevailed again in four widely dissimilar subsequent cases, starting with NATO’s two air-dominated wars over the Balkans in 1995 and 1999 and followed soon thereafter by Operation Enduring Freedom against the Taliban and al-Qaeda in Afghanistan in late 2001...

dismiss that performance as nothing more than a one-off anomaly. It was, they said dismissively, the open desert setting, or the unusual vulnerability of Iraq’s armored forces to precision attacks from above, or any number of other unique circumstances that somehow made the air war an exception to the familiar time-honored rule that it takes friendly “boots on the ground” in large numbers, and ultimately in head-to-head close combat, to defeat well-endowed enemy forces in high-intensity warfare.

To many people, that argument sounded reasonable enough when American and allied airpower’s rapid rout of the Iraqi Army was something the world had never seen before. Yet in the 12 years that followed Desert Storm, allied airpower prevailed again in four widely dissimilar subsequent cases, starting with NATO’s two air-dominated wars over the Balkans in 1995 and 1999 and followed soon thereafter by Operation Enduring Freedom against the Taliban and al-Qaeda in Afghanistan in late 2001 and then by the major combat phase of Operation Iraqi Freedom in March and April 2003. True enough, in none of those five cases, with the one exception of Kosovo, did airpower produce the sought-after result all by itself. Yet one can

fairly say that in each instance a mature air component was the main enabler of all else that followed by way of producing the desired outcome at such a low cost in friendly and noncombatant enemy lives lost. In so doing, American airpower showed to the world that it had finally come of age, at least for high-intensity wars against well-equipped enemy forces.

Airpower’s Triumphant Years

In the wake of that uninterrupted succession of air warfare achievements, the first twelve years that followed Desert Storm looked for the entire world like an unqualified airpower success story. Thanks to its preeminent role in the 1991 Gulf War, it seemed to many that the air weapon had finally become the tool of first choice for US Joint Task Force (JTF) commanders. That impression was further reinforced by the similarly preeminent role played by airpower in shaping the equally successful outcomes of Operations Deliberate Force and Allied Force in 1995 and 1999, respectively. Indeed, as Loren Thompson of the

Lexington Institute remarked at the turn of the 21st century, by the time the second Bush Administration took office in January 2001, “not only did it look like airpower could win wars, but there was a new crop of policymakers ready to embrace that message,” starting with Secretary of Defense Donald Rumsfeld.

That view was further reinforced by the outcomes of the major combat phases of Operations Enduring Freedom and Iraqi Freedom in late 2001 and early 2003, both of which were also largely enabled by the effective use of airpower in making possible the unimpeded ground operations that brought an early end to the existing regimes in Afghanistan and Iraq. In all, by the end of major combat in Iraq in April 2003 after just three weeks of sustained allied air and land operations, the evolved capabilities offered by transformed American airpower seemed finally to have heralded a new style of war for the United States and its coalition partners, at least with respect to high-intensity combat against conventional forces like the ones that Saddam Hussein had fielded.

A New Insurgent Challenge

Unfortunately for that fact-based and well-founded conviction, however, the end of major combat in Iraq heralded a new era of warfare for Americans in not just one way but in two. Just as the Iraqi Freedom experience confirmed our final mastery of high-intensity combat, it also confronted us with a newly emergent wave of counterinsurgency fighting for the first time since Vietnam. That second challenge, for which we were totally unprepared, became clear within just days of the occupation’s onset as coalition ground forces were shown to have been both completely untrained and under-resourced to meet the needs of post-campaign stabilization. A similar challenge arose in Afghanistan after the Bush team took its eye off the ball there, opening up a chance for the Taliban to move back into the ensuing power vacuum in an attempt to regain control of the country.

Before our initial successes in Afghanistan and Iraq went sour and morphed into prolonged land-centric wars of attrition, the main focus of the American defense debate in Washington had been on the relative merits of airpower versus ground power in joint high-intensity combat. By the time we were ready to take on Iraq in 2003, the American “boots on the ground” community had clearly become the more beleaguered of the two in the continuing inter-service tug-of-war over roles and resources. However, the insurgencies that soon thereafter consumed us in Iraq and Afghanistan for half a decade and more entailed enemy wartime conduct of a quite different sort—designed to avoid our greatest strengths and instead to make the most of our vulnerabilities and weaknesses. As a result, the US Army and US Marine Corps gained a new lease on life after 2003 as the challenges of combating newly-emergent insurgencies moved the spotlight from airpower to our ground forces as those bearing the brunt of daily combat losses and accordingly those in greatest need of daily sustenance and funding.

Before our initial successes in Afghanistan and Iraq went sour and morphed into prolonged land-centric wars of attrition, the main focus of the American defense debate in Washington had been on the relative merits of airpower versus ground power in joint high-intensity combat.

Lessons Forgotten in the Fight Against ISIS

Looking now at our current effort against the Islamic State in Iraq and Syria (ISIS), it has already been under way at a lethargic pace for more than two years, with still no end in sight or any truly significant progress achieved so far. The campaign has sunk more than five billion dollars in cost to date, to say nothing of the additional cost in reduced service life for our jets that have flown so many combat sorties for so little gain. To my mind, it has been more than disheartening to see just how far we seem to have regressed in the 25 years since the first President Bush told us after Desert Storm that “we’d finally kicked the Vietnam syndrome.” We are now back to Vietnam all over again, it appears, with the return of the daily body count and CENTCOM’s daily recital of the number of sorties flown, bombs dropped, and targets attacked in the absence of any more meaningful metrics of performance to show how effectively we are actually faring.

I am reminded too in this regard of how we seem to have forgotten the wise counsel of the classic Prussian military philosopher Carl von Clausewitz, who stressed the criticality of correct situation assessment and of duly fighting the war one is actually in rather than the war one believes one is in or would prefer to be in. In

...it has been more than disheartening to see just how far we seem to have regressed in the 25 years since the first President Bush told us after Desert Storm that “we’d finally kicked the Vietnam syndrome.”

that respect as well, it is hardly surprising that a US Army-dominated CENTCOM that has been so deeply habituated to counterinsurgency warfare as a daily diet for more than a decade would naturally roll into this latest fight against ISIS as though it were just a continuation of the counterinsurgency war in Iraq. That unthinking approach has, among other things, occasioned the draconian no-civilian-casualties rules of engagement that have so badly hampered our air effort since it began ever so haltingly in early August 2014.

But ISIS is not an insurgency. On the contrary, it is a self-avowed emerging nation state that is replete with coherent leadership, territory, an infrastructure, an economy, a central nervous system, and the beginnings of a capable conventional army, all of which are eminently targetable by precision airpower. Accordingly, our air assets should engage ISIS as such and not in the more gradualist and ineffectual way in which CENTCOM has pursued the Obama Administration’s half-hearted campaign so far.

Has Airpower Paid a Price for its Precision?

In that regard, before turning to my final reflections on Desert Storm, it behooves us to ask first how the current fight against ISIS may offer the latest telling example of how our very ability to avoid causing noncombatant casualties in warfare almost routinely has increasingly rendered airpower a victim of its own success since 1991. People like most of us in the audience here whose formative images of airpower were steeped in Vietnam had our eyes opened during the first few nights of Desert Storm by watching cockpit weapon system video clips on the nightly TV news showing laser-guided bombs homing down the air shafts of Iraqi bunkers one after the other with unerring precision. Thanks to that substantially improved capability that was first pioneered in Vietnam, avoiding unintended civilian casualties in the course of conducting air strikes naturally became a goal that air campaign planners sought to strive for in future conflicts.

But by the time of Operation Deliberate Force against the Bosnian Serbs in 1995, just four scant years after Desert Storm, American political leaders and rank-and-file citizens alike had become so habituated to such accuracy that what campaign planners once strove for in good faith, because airpower could now generally permit it, had become not just expected but was now a binding precondition for getting an approval to drop a bomb or strafe a target. Even one inadvertent civilian fatality as the result of an errant air attack was now likely to become front-page news, as it has been ever since our would-be air war against ISIS began in early August 2014.

True enough, airpower's heightened ability to minimize unintended civilian casualties in warfare has brought along with it a new responsibility on the part of airmen to make the most of that ability in their target planning in good faith. But at the same time, it has also levied a new challenge on our most senior leaders, both civilian and uniformed, to do better at managing public expectations when even the most stringent laws of armed conflict are not as exacting as our own contemporary self-imposed rules of engagement. Otherwise, collateral damage avoidance will continue to trump mission accomplishment in priority, which is tantamount to the tail wagging the dog in the conduct of war.

What Made Desert Storm Unique

With all of that by way of background, how can we best summarize the main takeaways to be drawn from the 1991 Persian Gulf War? For my money, American airpower between the end of the Vietnam War and the start of Operation Desert Storm had finally evolved to a point where it had become truly strategic in its character, thanks to its by-then proven ability to produce outcome-determining effects. That was not the case before the advent of low observability to enemy radar, precision target attack capability, and vastly better real-time situational awareness in the American air posture. Earlier air wars were limited in the combat successes they could achieve because it simply took too many aircraft and too many losses to achieve too few results at too high a cost. But by 1991, American airpower had finally arrived at a point where it could make its presence felt quickly and could impose effects on an enemy from the very outset of fighting that could have a determining influence on the subsequent course and outcome of a campaign. How? In large part by enabling almost unopposed friendly ground maneuver and thereby establishing the needed conditions for achieving a JTF commander's campaign goals fairly quickly. Or, put more simply, by granting JTF commanders and their subordinate forces freedom from attack and freedom to attack.

American airpower between the end of the Vietnam War and the start of Operation Desert Storm had finally evolved to a point where it had become truly strategic in its character, thanks to its by-then proven ability to produce outcome-determining effects.

This breakthrough in capability, however, was not just about technology. As Congressman Les Aspin rightly remarked after the Gulf War ended when he was still chairman of the House Armed Services Committee: "One, the equipment worked and was vindicated against its critics." But also, he added: "Two, we know how to orchestrate it and use it in a way that makes the sum bigger than all the parts." His

second point in that statement was really the more important of the two by far. For if Desert Storm's ultimate successfulness heralded any "revolution" in warfare, then it was as a result of the campaign's effective exploitation of all the inputs discussed earlier this afternoon, including the critically important and unquantifiable intangibles like training, tactics, proficiency, skilled leadership, concepts of operation, and boldness in execution—in addition to all the technology magic that Americans usually fixate on when considering the main ingredients of military capability.

What the Gulf War Bequeathed to Us

In light of all the foregoing, it is long past time for airmen to stop seeking their intellectual guidance from such outmoded prophets as the Italian General Giulio Douhet, who advocated for airpower at a time in the early 1920s when it was still embryonic and had virtually nothing in common with what it has since become today.

...in Operation Desert Storm, airpower showed, for the first time ever, its ability to achieve strategic effects directly through its increased survivability and lethality.

If we need to identify new sources of such guidance for tomorrow's still-evolving air weapon, then they should be drawn instead from the successor generation of American airmen whose path-breaking insights into force employment allowed the example set by airpower's more recently acquired performance capabilities in 1991. For in Operation Desert Storm, airpower showed, for the first time ever, its ability to achieve strategic effects directly through its increased survivability and lethality. In earlier years, air forces sought to impose the greatest possible pain on enemy populations and industry, as was done against Germany and Japan in World War II and even against North Vietnam

toward that war's end in 1972, because such a strategy was the only one that airpower could then underwrite with any hope of achieving success. Today, however, there is so much more one can do with airpower to produce combat outcomes that more directly affect an enemy's ability—not his will, but his ability—to continue fighting.

Of course, all force elements, including ground forces, have the opportunity in principle to seek the effects of mass without actually having to mass by leveraging modern technology to the fullest in quest of greater precision in force employment. But what was unique about modern airpower as it first showed its hand in 1991 was that it had finally pulled well ahead of surface forces in its relative ability to do this, thanks not only to its newly-gained advantages in stealth, target-attack accuracy, and battlespace awareness, but also to its long-standing and enduring characteristics of speed, range, and flexibility. That, I would suggest, is the main legacy of airpower's transformation since Vietnam that we saw demonstrated for the first time in Operation Desert Storm.

Epilogue

The success of the Desert Storm air campaign was a result of the juxtaposition of technology, planning perspective, organization, leadership, training—all combined in a way that optimized the contribution of each. While every conflict is unique, we must retain the flexibility to capture those elements in the combination that is most relevant in the execution of today’s national security challenges. What are the key takeaways from this campaign?

Takeaway #1 – It was a short war against Iraq, the fourth largest military in the world, with low casualties on both sides, beginning on 17 January 1991 and ending 43 days later. Only on the last four days of the war did ground forces close with the enemy. Air did the bulk of the fighting and winning over those 43 days, not “preparing” the battlespace for the four-day ground reoccupation of Kuwait, but rendering the entire military of Iraq completely ineffective. That outcome was not an accident; it was achieved by the use of an effects-based approach for the use of air and space operations with the application of a system of systems analysis of the adversary. Fundamentally, the point is that desired strategic aims were attained through aligning ends, ways, and means in a fashion that did not project undue liability, cut to core nodes of impact within the enemy’s infrastructure, and was difficult for the enemy to counter.

Takeaway #2 – Desert Storm had two key objectives: 1) Remove Iraqi forces from Kuwait; and 2) Ensure Iraq would not emerge as a regional superpower for the next ten years. We achieved those objectives by applying air and space power against the Iraqis at a rate of thousands of air strikes a day against their leadership (i.e. command and control), their key systems (i.e. oil and electricity), their infrastructure (i.e. roads, rail, and bridges) and their fielded military forces (i.e. land, sea, and air). This effects-based, systems approach worked extraordinarily well, and remains relevant to the conflicts of today and tomorrow. The main takeaway here is to choose your objectives carefully to ensure they are realistically attainable and pursue them relentlessly.

Takeaway #3 – Those responsible for conceiving and executing the effects-based, systems approach to warfare that was the core of success in the first Gulf War air campaign were not generals, but rather field and company grade officers who despite having no mandate or authority to do so, rallied together and made the plan a reality. A small, informal cadre of Air Force officers working out of a room in the basement of the Pentagon started the ball rolling. Generals and senior civilian officials came on board as the plan took shape and more people from all walks of government joined the effort. Personalities and individual initiative mattered in this war. Without them and the career risks they took, Desert Storm would have been something very different and far less effective than it turned out to be. Many years later Air Force Chief of Staff Gen. Mark Welsh coined the phrase, “Every airman an innovator.” The planners and operators of Desert Storm exhibited that exhortation to the max—are we educating, encouraging, and rewarding current and future Air Force leaders to take the risks that yielded the success of the Desert Storm air campaign do the same? Wars are won or lost by people—it is crucial that we educate people to understand how to deliver useful policy options in their respective domains and then allow them to execute them when called to action. People count: train them the right way and empower them to win.

Takeaway #4 – The Desert Storm air campaign worked due to the training, technology investment, force structure and procurement decisions made in the 1970s and early 1980s. It was the existence of that set of capabilities and capacity that enabled the effects-based plan that heralded the success of Desert Storm. No matter how good a plan, it will never work without the bench of resources necessary for its execution. You go to war with the military you have, so preparation and foresight are crucial to future military success.

Takeaway #5 –Desert Storm’s triumph of informal initiative-driven planning, over formal established process-driven planning and reporting structures ended with a methodical discrediting and downplaying of the revolutionary work accomplished by the leaders of the informal group by several key active duty and retired Air Force general officers after the conclusion of the first Gulf War. Their efforts, coupled with wide distribution and acceptance of the Army’s version of the Gulf War, as told in the book *Certain Victory*, ensured the re-establishment of formal and strict control of all planning and execution functions, and the dominance of an Army-centric approach to the use of air and space power. It remains so to this day. Today’s generation of airmen must renew the spirit of innovation and creativity enabled by exploiting the virtues of operating in air and space, as did the founders of our Air Force. Those characteristics delivered success in Desert Storm, and can do so again in the future. The nation deserves to hear the options allowed by airpower, and will benefit from their application. War in the future will only be won if our services are willing to internalize lessons learned from both success and failure, and institute meaningful changes as a result of those lessons. ★



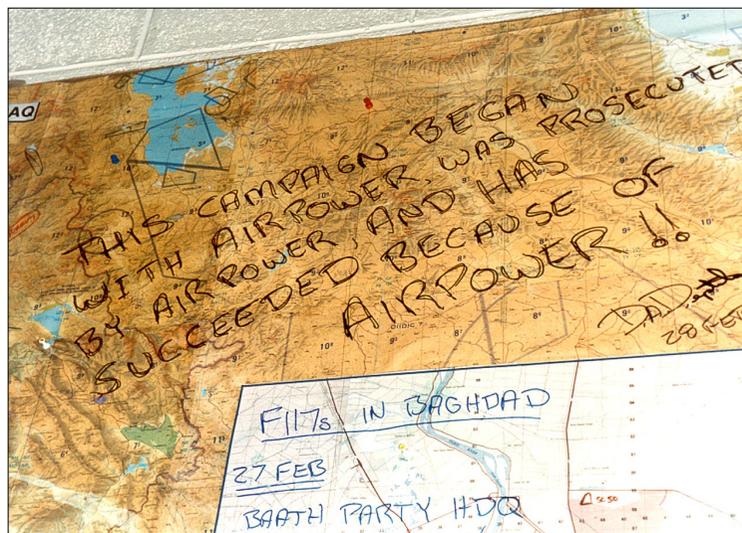
www.mitchellaerospacepower.org

(Rich Cooper, Centre of Aviation Photography)



“THIS CAMPAIGN BEGAN WITH AIRPOWER;
WAS PROSECUTED BY AIRPOWER;
AND HAS SUCCEEDED BECAUSE OF AIRPOWER.”

Lt Col David A. Deptula, in Black Hole, Feb 28, 1991.





An Affiliate of the Air Force Association | www.mitchellaerospacepower.org