

Technology in the Persian Gulf War of 1991

by Robert Citino

In August 1990, the Iraqi army invaded Kuwait. Five short months later, a powerful coalition led by the United States would launch Operation Desert Storm, one of the most rapid, decisive, and bloodless victories of all time. In just over four days of combat, the Coalition would liberate Kuwait, demolish the Iraqi army, and take hordes of Iraqi prisoners, all at a minimal cost in casualties. Iraqi losses in the course of this brief “100-hours war” were massive—some 20,000 killed and 60,000 wounded or captured. US forces, by contrast, suffered just 148 battle deaths, alongside another ninety-nine suffered by their coalition partners, one of the most lopsided results in military history. The Pentagon’s prewar estimates for friendly casualties had run into the tens of thousands.

In the wake of these dramatic events, a great deal of hyperbole filled the air. Desert Storm, many argued, had been a defining historical moment like Hannibal’s triumph at Cannae in 216 BCE or the Allied victory over the German Wehrmacht in World War II. Within the defense establishment, a narrative soon coalesced that focused on the role of new military technologies in the victory, particularly those that exploited the microchip and the digital revolution. Desert Storm, therefore, was not an isolated event, but the harbinger and first fruits of a “revolution in military affairs” (RMA).

There certainly is some truth to the claim. Superior technology had enabled the Coalition victory at every turn. Preceding the ground campaign had been a solid month of aerial bombardment of Iraqi frontline positions, the supply lines leading up to them, and strategic, economic, and political targets far behind the lines. Such things had occurred before in twentieth-century warfare, of course, most notably in World War II. What set this bombing campaign apart was the use of precision guided munitions (PGMs). These so-called “smart bombs” relied on laser guidance systems and were steered onto their targets, quite different from the “dumb” munitions used in World War II, Korea, and Vietnam. Other innovations included Tomahawk cruise missiles launched from great distances and F-117 Stealth fighter-bombers whose design made them all but invisible to Iraqi radar. If we may speak of the campaign’s defining moment, it may well have come in the opening minutes of the air offensive with the destruction of the Iraqi National Air Defense Center in Baghdad by a precision guided bomb dropped from an F-117. The pilot apparently managed to deliver his bomb directly down one of the structure’s ventilator shafts, a video-game-like scene that American television audiences would see broadcast over and over.

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The land campaign was more of the same. Once bombing had degraded Iraqi capabilities both materially and psychologically, a powerful Coalition army went into action under the command of General Norman Schwarzkopf. The US forces he led into action were arguably the best equipped and trained in the



2d Squadron, 4th Cavalry (24th Infantry Division) live fire exercise, December 19, 1990. XVIII Airborne Corps History Office, photograph by SGT Randall M. Yackiel, DS-F-062-03. (Courtesy of the US Army Center of Military History)

nation's history. The immense military build-up during Ronald Reagan's presidency now showed its worth. On the hardware side, a new generation of weapons had come off the drawing board and into the field. We usually speak of the "Big Five"—the M-1 Abrams main battle tank; the M-2 Bradley infantry fighting vehicle; the AH-64A Apache attack helicopter; the UH60A Black Hawk transport helicopter; and a new air defense system called the Patriot, a missile capable of shooting down incoming missiles. Each of these new weapons took advantage of the microcomputer revolution, with the M-1 tank, for example, employing a laser rangefinder and fire-guidance system. Finding the target and aiming the gun, formerly the province of years of training and a tank commander's practiced eye, was now the job of the laser and the computer. Each of the big five, singly, was more than a match for its Iraqi counterpart. Taken together, they gave US forces a nearly irresistible advantage in 1991.

The increase in military spending during the Reagan years also poured more money into training. In 1981, the Army opened up a National Training Center (NTC) at Fort Irwin, California, in the Mojave Desert. In order to give soldiers experience in fighting the forces of the Soviet Union (the putative enemy of the day), it came complete with an opposing force (OPFOR)—US personnel with training, equipment, and uniforms modeled after the Soviets. During the maneuvers, a laser-based engagement system, the forerunner to the commercial game Laser Tag, determined hits and kills. Trained umpires (observer-controllers, or OCs) blanketed the unit undergoing training, advising, criticizing, and generally making life miserable for the friendly force. Finally, each maneuver ended with an After-Action Review, a final discussion where the OCs pointed out every mistake the unit had made. Every single radio transmission was recorded, for example, so one's worst moments could later be played back for all to hear. It was (and still is) murderous training; since OPFOR lived at Irwin, they knew every nook and cranny of its 300,000 acres, and they rarely lost. Win or lose, however, the simulation of an actual enemy in training was something new, a conceptual leap forward linking doctrine and training. The NTC's Mojave location also meant that US forces were well acclimated to the terrain and temperature conditions they would meet in Desert Storm. Indeed, they proved far more ready to fight in the desert than the Iraqis were.

Given these advantages, the fighting on land was no contest. Most frontline Iraqi soldiers wanted nothing so much as to surrender, and thousands of them did at the first sign of the assault. But here, too, we can see the edge of superior technology. Maneuvering toward the enemy is never easy in an empty desert devoid of towns or terrain formations of any sort. The introduction of early GPS systems, once again the forerunner of our Garmins and Tom-Toms, helped to solve this problem. Reading data from orbiting satellites, they relayed precise coordinate locations to the user on the ground, allowing him to plot artillery fire, to compute bearings to his objective, to measure an aircraft's angle of descent, and much more. Satellite technology also provided intelligence to headquarters at all levels, gathering, processing, and transmitting it almost instantaneously through the new Joint Surveillance Target Attack Radar System (JSTARS). In general, the US Army seemed to have solved what, for centuries, had been the central problem of military operations: imprecise information, or metaphorically, the fog of war.

Once battle had been joined, the combination of M-1 tank, highly trained crews, and laser rangefinders proved impossible to stop. The main gun on US tanks fired a depleted uranium round that easily penetrated the armor of Iraq's Soviet-made tanks, sometimes passing through and destroying a second tank as well. For US tankers in the desert, the "pop top" phenomenon was something they would always remember: Iraqi tank turrets literally exploding off the vehicle and popping into the air. Not even the coming of night, usually a time when an army at a disadvantage can draw breath and recover, made much difference. Virtually every US tank or fighting vehicle, along with the Apache helicopters, possessed thermal-sight mounts that picked up heat differentials, let US crews see at night as clearly as day, and allowed the destruction to continue. The numbers still boggle the mind. Of 4,280 Iraqi tanks, Coalition forces destroyed no fewer than 3,847 in combat.

Quite a package, then, and no wonder that exultation suffused so much of the postwar analysis! More than twenty years on, however, it is time for students to study the campaign with a sharper, perhaps even more cynical, eye. The role played by technology, in particular, deserves close analysis. Profitable classroom approaches to the alleged “military revolution” might begin with its steep cost. The Reagan military buildup was hugely expensive, tax revenues never really caught up to spending, and the problem has continued to bedevil successive administrations (of both political parties).

Students might consider a few figures. During Desert Storm, precision guided munitions cost approximately ten times as much as other forms. In the course of the fighting, 8 percent of all ordnance fired was precision guided, but it accounted for 84 percent of the total cost. A single Joint Air to Surface Standoff Missile (JASSM) cost \$400,000 in the 1990s, a single Tomahawk cruise missile no less than \$730,000, and the price tag has done nothing but skyrocket since then. The costs of a month of fighting were acceptable; whether they would be sustainable over the course of a longer war is another question, as is the question of whether or not the United States should continue to spend more money on defense than the rest of its friends and enemies combined—a truly unprecedented situation in world history.

A second worthwhile point of discussion asks the question: How much of this dramatic victory was actually due to technology? Let us forgo discussions of wonder weaponry for a moment and look to issues of generalship and strategy. In the run-up to the ground campaign, Schwarzkopf grew increasingly concerned about launching a drive directly into Kuwait. Frontal assaults remove the possibility of surprise, they play into the enemy’s strengths, and even when they work they usually result in unacceptable casualties. The Iraqis seemed to be expecting just this sort of attack, their defenses were oriented facing almost due south, and the highest quality formations in the Iraqi order of battle, the Republican Guard mechanized divisions, were prepared to drive south to counter it.

Days before the ground forces went into action, therefore, Schwarzkopf called what a football coach might call an audible: a shift by almost all of the heavy forces of the US VII Corps far to the left, deploying them in the deep desert where they could drive around, rather than into, the Iraqi defenses. Day one of the campaign saw almost all US forces heading north. On day two, however, the commander of the VII Corps, General Frederick Franks, carried out a great wheeling maneuver to his right. Now heading due east, an immense phalanx of armor, M-1s, and M-2s, slammed into the Iraqi defenders in Kuwait from an entirely unexpected direction. The Iraqis, including the Republican Guard, never did manage to form a cohesive defensive position, and soon went down to their doom.

Seen from the perspective of this brief campaign sketch, Desert Storm doesn’t look all that new. Indeed, its principals of strategy are very, very old. A better-trained, better-equipped, and more powerful army, enjoying absolute control of the air, launched a flank attack on its hapless adversary. It caught the enemy by surprise, out of position and literally facing the wrong way, and routed him with minimal loss. It was a well-planned operation, to be sure, and US military planners deserve a great deal of credit for it. Given the absolute ineptitude of the Iraqis, however, it might have worked just as well even without all the new technology.

Finally, no classroom discussion of Desert Storm should ignore its legacy. Back in 1991, many thought that a new era had dawned. Traditional US strengths like massive firepower and deep logistics had now linked up with some new ones: digital readouts, smart bombs, and satellite-based intelligence. This new US military could do it all. In World War II terms, it could maneuver like the Germans and pound the enemy like the Soviets, mixing brain and brawn in equal measure. And it played well on television, from its shiny new equipment to its commander, General Norman Schwarzkopf, an aggressively Pattonian figure apparently out of central casting. All in all, it was a highly satisfying experience for a US Army that

since 1945 had experienced frustration in Korea and defeat in Vietnam. Now it had finally gotten things right and once again was breathing the rarified air of decisive victory.

Twenty years later, recalling those days seems like an exercise in nostalgia, more like the end of an era than a new beginning. The attacks of September 11, 2001, led the United States into wars in Afghanistan and Iraq that could not have been more different than Desert Storm, more unsatisfying, or less telegenic. Tank battalions charging forward boldly gave way to skirmishes with small arms, wide-ranging maneuvers in the deep desert, and the drudgery of street-corner patrols. There wasn't much of a role for high technology in either of these wars. The breakout star in both was the low-tech and decidedly unglamorous IED ("improvised explosive device," or roadside bomb). Within the military establishment, discussion of high-tempo mechanized operations gave way to counterinsurgency (COIN) theory. COIN advocates aren't very interested in traditional combat, which they denigrate as simplistic "kinetic" operations. Rather, they emphasize techniques to win the support of local populations in order to sap the strength of insurgents operating among them. COIN worked in Iraq—apparently. It doesn't seem to be working all that well in Afghanistan, and with the wind-down of both these wars (or at least US participation in them), the future is more uncertain now than at any time in recent memory.

This, perhaps, is Desert Storm's real legacy: it reminds us that timing is everything and that all historical events take place within a unique set of circumstances. Back in 1991, the Berlin Wall had fallen, the Soviet Union had vanished, and World War III no longer seemed so imminent. As a result, the United States could turn its entire vast conventional arsenal against Iraq. The absence of a Soviet Union, or any great power determined to back Iraq in the crisis, was more important to the outcome than the presence of GPS or JSTARS. Indeed, the fall of the Soviet Union made Desert Storm possible in the first place.

Desert Storm was not so much a technological marvel, then, as a lesson in the chance events that determine the course of history. Whatever the state of our technology, it will never obviate the need for strategy devised by human beings, clear thinking about goals, a rational balancing of means and ends, and a willingness to make hard choices about war and peace.

Robert M. Citino is a professor of history at the University of North Texas and the Military History Center. His books include *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare (2004)* and most recently, *The Wehrmacht Retreats: Fighting a Lost War, 1943 (2012)*.

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