



## **The Desert War**

Marine Corps Aviation in Desert Storm, January–February 1991

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**Abstract:** When Iraqi military forces under Saddam Hussein invaded Kuwait on 2 August 1990, U.S. Marine Corps Aviation went to war on short notice and in a big way. More than 40 squadrons deployed to the Persian Gulf to participate in Operation Desert Shield (2 August 1990–17 January 1991), a buildup of troops in Saudi Arabia by a Coalition of 35 nations led by the United States, and Operation Desert Storm (17 January–28 February 1991), the combat phase of the Coalition's campaign to liberate Kuwait. Desert Storm tested new Marine aviation procedures, doctrine, equipment, weapons, aircraft, and training that had been introduced after the end of the Vietnam War almost two decades earlier. It also tested a new Joint way of fighting that was established by the Goldwater-Nichols Department of Defense Reorganization Act of 1986.

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In response to Iraqi president Saddam Hussein's invasion of Kuwait on 2 August 1990, the U.S. Marine Corps deployed the I Marine Expeditionary Force (I MEF) to the Persian Gulf. An integral part of I MEF was its aviation combat element, the 3d Marine Aircraft Wing (3d MAW). Marine Corps warfighting doctrine held that a close air-ground synthesis existed to maximize combat success through the application of Marine Aviation's six functions: offensive air support, air reconnaissance, control of aircraft and missiles, antiair warfare, electronic warfare, and assault support.<sup>1</sup> More than 40 squadrons, which included some 15,000 Marines and nearly 400 aircraft, deployed to the Gulf to make this happen.<sup>2</sup> An additional mission was to support Joint operations mandated by the Goldwater-Nichols Department of Defense Reorganization Act of 1986, in which all U.S. aviation became organized under the control of a Joint forces air component commander (JFACC).<sup>3</sup>

Marines arrived in theater quickly and were ready to fight, thanks to prewar logistics planning that included maritime prepositioned ships and logistic support ships. Marine tank-busting gunship squadrons were the first of their type into the theater; they were essential to protecting Saudi Arabia, which shares borders with both Iraq and Kuwait, and its expansive oil resources. Expeditionary operations were smoothly facilitated by Marine

wing support groups that provided rapid refueling and rearming at forward desert bases as well as main bases. Aviators were well-trained for a desert fight, imbued with professional tactical training during the preceding decade, thanks to the efforts of Marine Aviation Weapons and Tactics Squadron 1 (MAWTS 1).

A five-month waiting period followed, known as Operation Desert Shield, during which the United States and the United Nations negotiated with Iraq and imposed sanctions, all of which failed to convince Iraq to peacefully evacuate forces from Kuwait.<sup>4</sup> Marine Aviation remained on high alert, established bases and lines of communication, and trained continuously. Few Marine aviators had seen prior combat, but they were ready and looked forward to a fight.

### **Desert Storm Begins**

The United Nations Security Council established 15 January 1991 as the deadline for Iraqi troops to vacate Kuwait.<sup>5</sup> That day came and went with no action on the part of Iraq or the Coalition nations. Not wanting to appear hasty, U.S. president George H. W. Bush waited more than a day after the deadline to strike. Saddam might have mused that he was right about the Americans, that they did not have the stomach to fight the “mother of all battles.”<sup>6</sup> Marine Corps leaders, however, knew that war was imminent.

Major General Royal N. Moore Jr., commanding 3d MAW, met with his group and squadron commanders and staff officers on the afternoon of 16 January, telling them that at 0300 the next morning a U.S. Air Force Lockheed F-117 Nighthawk stealth bomber would drop a 2,000-pound bomb on a major aviation command and control node in Baghdad. This would

initiate Operation Desert Storm, the campaign to liberate Kuwait. Marine McDonnell Douglas F/A-18 Hornet fighters and Grumman A-6E Intruder attack aircraft, supported by Grumman EA-6B Prowler electronic warfare aircraft and Lockheed KC-130 tanker aircraft, would launch close after this strike at 0400. Moore was upbeat but serious, fully aware of the gravity of the moment. One squadron commander thought he saw a tear in the general's eye as he shook hands with his Marines.<sup>7</sup>

### Map 1.



A 1991 map of Kuwait, depicting its borders with Iraq to the north and Saudi Arabia to the south. Source: U.S. Central Intelligence Agency

Desert Storm lasted 42 days, a 38-day air campaign followed by a short, quick-hit ground operation. The air campaign aimed to disable Iraq's massive military apparatus. Iraq boasted a sophisticated and robust integrated air-defense system, modeled after that of the Soviet Union, which included a varied and ample supply of antiaircraft weaponry as well as about 500 radar components to track aircraft and guide antiaircraft guns and missiles. Iraq's arsenal of surface-to-air missiles (SAM) included the Soviet SA-2 Guideline, SA-3 Goa, SA-6 Gainful, SA-7 Grail, and SA-8 Gecko, as well as French-German Roland short-range missiles.<sup>8</sup> The Iraqis also possessed a large quantity of antiaircraft guns of various caliber. Tying it all together was a French-made computerized command and control system called *Kari*.<sup>9</sup>

Iraq possessed a substantial air force of nearly 1,000 aircraft, including fighters, strike jets, and helicopters. There were then five divisions of Iraqi troops in the I MEF zone of operations, located in the south and southwestern part of Kuwait, with two armored divisions farther north in reserve and four more divisions along the coast between Saudi Arabia and the Kuwaiti town of al-Jahra, about 32 kilometers (km) northwest of Kuwait City. The Iraqis were particularly well-equipped with tanks; surface-to-surface rockets; and, most threatening, an abundance of artillery, primarily the daunting Soviet D-20 152mm gun-howitzer. Lieutenant General Walter E. Boomer, commanding I MEF, considered Iraqi artillery the biggest threat to his formations, since it could outrange American artillery and deliver chemical weapons.<sup>10</sup>

On the first night of Desert Storm, 17 January, Marine Aircraft Group 11 (MAG 11) delivered the first Marine blows in Iraq. The first strike

consisted of 48 aircraft launched close on the heels of the initial F-117 strikes. It was the first of five waves that the Coalition flew that day. At 0400, the F/A-18s and A-6Es, loaded with bombs and high-speed antiradiation missiles (HARM), and EA-6Bs all roared off the long runway at Shaikh Isa Air Base on Bahrain, while the KC-130s rumbled out of Manama. The KC-130s headed for nearby refueling tracks and in the dark refueled fighters on the way north. The Marines' targets were inside Iraq, including Scud missile shelters near an-Nasiriyah and SAM sites near Shaibah. Aviators stayed off the radios to minimize the chance of alerting the enemy. Strike aircraft were divided into groups or flights consisting of bombers, either F/A-18s or A-6Es, and their escorts, also F/A-18s. The escorting fighters were tasked with defending the bombers from both Iraqi fighter aircraft and Iraq's potent air defense system; the F/A-18s carried air-to-air missiles to counter enemy fighters and HARMs for the Iraqi air defense system. Also flying with MAG 11's first strike, alongside the EA-6Bs of Marine Tactical Electronic Warfare Squadron 2 (VMAQ 2), were U.S. Air Force McDonnell Douglas F-4G Wild Weasel V aircraft and British Royal Air Force Panavia GR1 Tornado strike aircraft.<sup>11</sup>

Penetrating Iraqi airspace above 25,000 feet, Marine aviators were greeted with an incredible light show of missile and gun fire arching toward them. Most of it was unaimed and inaccurate, but it was nevertheless daunting. Lieutenant Colonel W. Beamon Cummings, commanding Marine All-Weather Attack Squadron 533 (VMA[AW] 533), was leading a flight of A-6Es when he saw "continuous lines of red and orange tracers [that] covered the black void below. . . . It seemed like every Iraqi who could put his finger on a trigger had pressed down and wouldn't let it go."<sup>12</sup> Another A-6E pilot

looked down and observed what looked like strings of car headlights on freeways but was actually antiaircraft fire. Captain Jay A. Stout, an F/A-18 pilot with Marine Fighter Attack Squadron 451 (VMFA 451), described a SAM launch from an aviator's 29,000-foot perspective:

What we saw was a brilliant flash at launch, and then a brilliant bluish white or yellow streak as the missile climbed toward us. The most terrifying moments followed rocket motor burnout when, unsure of whether I was being tracked or not, I scrunched down in the cockpit and waited for the SAM to hit.<sup>13</sup>

**Figure 1.**



Marines load AGM-88A high-speed antiradiation missiles under the wings of an F/A-18A Hornet strike fighter of Marine Fighter Attack Squadron 451 (VMFA 451) during Operation Desert Storm. Source: Courtesy of Sgt Jeff Wright, Defense Imagery DA-ST-92-07699

Interspersed with the enemy fire and every bit as startling—though certainly less harmful to the Marine aviators—were the streaks from HARMs angling down toward enemy radar equipment, launched by escort F/A-18s that flew behind and above the bombing jets. Marines fired 100 HARMs at Iraqi radars on the first day of Desert Storm, which, along with the hundreds of others fired by Coalition aircraft, took a serious bite out of Iraq’s air-defense system. Meanwhile, the EA-6Bs used electrons to confuse and clog the Iraqi radar and tracking systems.<sup>14</sup>

The Marines flying that night did not know war; fewer than 1 percent had ever been in combat. The amount of enemy fire, however, would have gained the respect of even the most jaded combat veterans. Planning, briefing, and leading this successful first strike was a young Marine captain, David W. Deist, an A-6E bombardier/navigator of VMA(AW) 224, who received a Distinguished Flying Cross. Later that day, another Marine aviator, Major Robert E. Schmidle Jr., executive officer of VMFA 333, also received a Distinguished Flying Cross for leading a 50-plane Marine air strike on the Basrah oil refinery inside Iraq.<sup>15</sup>

The air campaign continued for three days, systematically dismantling the Iraqi command and control system and sweeping the skies of any Iraqi fighters that might challenge Coalition aircraft, though enemy planes were rare. However, on the first night of the war, Marine captain Charles J. Magill, flying a McDonnell Douglas F-15 Eagle fighter with the Air Force’s 58th Tactical Fighter Squadron, got a kill. On a vector toward a pair of Iraqi Mikoyan MiG-29 fighters, Magill’s flight obtained radar locks on the enemy aircraft that were well beyond visual range. The MiG-29s were headed north, and Magill’s flight sped up to run them down. When the Iraqi aircraft, flying



low at about 1,500 feet, turned south, Magill and another F-15 pilot, Captain Rhory R. Draeger, unleashed AIM-7 radar-guided Sparrow missiles at the them. The Sparrows ripped into the MiG-29s, and the planes flamed and tumbled into the desert.<sup>16</sup>

On the first day of battle, Marine McDonnell Douglas AV-8B Harrier II attack aircraft had their missions canceled because of a lack of EA-6Bs to provide electronic warfare support. That quickly changed when Iraqi artillery along the border between Saudi Arabia and Kuwait hammered at Coalition positions. A North American Rockwell OV-10 Bronco observation plane of Marine Observation Squadron 1 (VMO 1) that was scouting the border shortly after dawn on 17 January spotted Iraqi artillery shelling al-Khafjī, a Saudi coastal town about 9.6 km south of the Kuwait border. The artillery hit near Marine positions and even closer to Coalition Arab troops. The OV-10 pilot made a call for air support. Though they had been notified that they would not fly in the first strikes, the Marine AV-8B pilots at King Abdulaziz Air Base in Saudi Arabia were on alert. Once the call came for air support, Major General Moore called Colonel John R. Bioty Jr., commanding MAG 13, and told him to launch his birds to take out the Iraqi artillery. Four AV-8Bs of Marine Attack Squadron 311 (VMA 311) carrying 1,000-pound bombs launched within 15 minutes, with Major Terry C. Branch, the squadron executive officer, leading the strike. Streaking down in dives, the Harriers quickly silenced the Iraqi cannons. The crew of the OV-10, watching the attack through binoculars, saw artillery tubes tumbling through the air.<sup>17</sup>

This was perhaps the same artillery that shelled Lieutenant Colonel Richard M. Barry's detachment of Coalition troops serving with the 1st Surveillance, Reconnaissance, and Intelligence Group at an outpost north of

al-Khafjī. When Barry called for an air strike, two Air Force A-10s checked in but declined the mission because of low clouds and reports of a nearby SA-8 missile threat. As the artillery continued to hammer the Marines on the ground, a division of AV-8Bs checked in and advised that they were “looking for work.” Once Barry described the target, the Harriers attacked, dropping bombs and strafing in high-angle dives. The weather forced them to fly low and therefore directly through Iraqi antiaircraft fire. Their bombs blasted the battery out of its positions and enemy soldiers, bleeding from their noses and ears, were taken prisoner. Barry credited this strike with saving his outpost and 34 Coalition personnel.<sup>18</sup> After the first day of Desert Storm, the Marine AV-8Bs became, as Colonel Bioty attested, “very much a part of the war” and turned southern Kuwait into a “Harrier hunting ground.”<sup>19</sup>

Marine Bell AH-1 SuperCobra attack helicopters also went into action on the first day, launching in response to calls for air support from Marines and Navy SEAL personnel positioned along the border. At 0400 on 17 January, the same time that MAG 11 aircraft were taking off, AH-1s of Marine Light Attack Helicopter Squadron 369 (HMLA 369) launched to investigate reports of Iraqi tanks on the border north of al-Khafjī. Unable to locate the tanks, the helicopters instead took Iraqi observation posts, which were used to direct artillery fire, under fire with BGM-71 TOW (tube-launched, optically tracked, wire-guided) antitank missiles and AGM-114 Hellfire air-to-ground missiles. The next day, a division of AH-1s of HMLA 369 responded to a request for air support again in the vicinity of al-Khafjī. Flying from a forward base at Ras al-Mishab, they destroyed mortar tubes, ammunition trucks, and two buildings in a barrage of TOW missiles, rockets, and 20mm cannon rounds.

That same day, Lieutenant Colonel Michael M. Kurth, at the controls of a Bell UH-1 Iroquois utility helicopter, worked with a SEAL team and an OV-10 forward air controller, airborne (FAC-A) to direct multiple AH-1 strikes on observation posts along the border.<sup>20</sup> Now that the battle was joined, all Marine combat and support aircraft flew at an intense pace. Marine F/A-18s were relieved from the northern Persian Gulf combat air patrol to focus instead on attacking the Iraqi military. Additionally, the 3d MAW was able to negotiate better command and control arrangements with the JFACC, smoothing air operations for the Marine Corps.

### **Executing the Air Campaign**

For Marine aviators, the air war boiled down to supporting the troops on the ground by destroying as many Iraqi troops, weapons, and equipment as possible in the I MEF zone in Kuwait.<sup>21</sup> Major General Moore wanted to preserve his aviation force for this mission and not have it depleted in a strategic air campaign. This was a source of ongoing tension and friction between the 3d MAW and JFACC staff at ar-Riyadh, the capital of Saudi Arabia, as Desert Storm was fought.

Marines also considered the primary JFACC controlling document, the air tasking order (ATO), too restrictive and a hindrance to their style of fluid, tactically driven operations. This massive document, hundreds of pages long, represented the daily flight schedule for the entire air war. It was built during a 40-hour cycle by the special planning group (nicknamed the “Black Hole”) at the headquarters of U.S. Air Force lieutenant general Charles A. Horner, who commanded all U.S. and allied air operations during Desert Storm.<sup>22</sup> The Marines could make their desires known regarding what

missions they wanted to fly, but they competed with all other desired missions throughout the theater. The 3d MAW had capable officers, Major Jeffrey L. Olsen and Captain Rolf A. Siegel, working in the Black Hole, where they served Marine interests and fed 3d MAW leaders information on the targeting process. To build flexibility into the ATO, the Marines stuffed it with more sorties than they would require to reserve places in the schedule. If there were no warranted targets to strike, they canceled the flight, but the additional ATO slots allowed surging of sorties if necessary. Major General Moore commented:

We talked to [the JFACC staff] all the time and said, “You have any troubles with it? We’re executing it.”—we didn’t worry about it from there on, because we knew we had enough flexibility in that system that we could do anything we wanted. . . . It was a *fait accompli* evolution.<sup>23</sup>

The JFACC, however, saw the Marine’s effort to “game” the ATO in a different light. To the Air Force, the ATO was meant to be a realistic flight schedule, a means to control and evaluate the air war and thus best able to determine target priorities.<sup>24</sup> Brigadier General Granville R. Amos, assistant wing commander of the 3d MAW, commented on the interaction between the Air Force and Marine Corps regarding the ATO:

We would write the ATO and then we’d cancel [some sorties] and [the JFACC staff] would ask, ‘Why are you canceling?’ Well, we don’t have any targets, we’re not going. They were into sortie counts and we didn’t give a shit. We wanted to make sure that we were after valid targets and if they couldn’t get to the

target for weather or whatever we didn't just drop the bombs in the desert, we'd bring the bombs back.<sup>25</sup>

At the onset of Desert Storm, the Marines agreed to give the JFACC about one-half of their F/A-18 sorties and all their A-6E and EA-6B sorties in support of the strategic air campaign and suppression of Iraq's air defense system.<sup>26</sup> However, Major General Moore refused an Air Force proposal to consolidate all tactical electronic warfare aircraft, Marine EA-6Bs and Air Force General Dynamics-Grumman EF-111A Ravens, into an Air Force-controlled unit. Moore believed that by so doing his own aircraft might not receive adequate tactical electronic warfare support.<sup>27</sup> He remembered when he was a young aviator flying electronic warfare aircraft in Vietnam; in those days, Marine fixed-wing aircraft had often flown into North Vietnam without tactical electronic warfare support because the central tasking of missions done by the Air Force and Navy had soaked up all the Marine electronic warfare sorties.<sup>28</sup>

A principal issue between I MEF leadership and the JFACC concerned the Iraqi threat in the I MEF battlespace of Kuwait, located forward of the fire support coordination line (FSCL). There was no issue inside the FSCL, since the Marines controlled this area. Air strikes were controlled by the Marines' direct air support center (DASC) and FAC-As in OV-10s or UH-1s. But the Marines wanted to kill targets beyond the FSCL, rightly believing that once the ground war began they would have to face the Iraqi forces there. This area, however, was controlled by the JFACC, principally by an Air Force airborne air command and control center (ABCCC) in a Lockheed C-130 Hercules transport aircraft. To enhance aircraft control in this zone, Marines

were allowed to place liaison officers aboard the Air Force ABCCC, which ultimately smoothed the interface between Marine aircraft and Air Force control.

Major General Moore later created a Marine variant of the ABCCC, an airborne DASC mounted in a KC-130 of Marine Aerial Refueler Transport Squadron 352 (VMGR 352). Controllers came from Marine Air Support Squadron 3 (MASS 3). This further improved command and control in the deep air battle space beyond the FSCL.<sup>29</sup> Though the 3d MAW continued to fly JFACC sorties, these decreased as Moore kept the pressure on the JFACC staff to allow him to use his strike aircraft to hit targets in the Marine zone. As a result, Marine aircraft systematically bloodied the Iraqi military in southern Kuwait. Coalition aircraft also hit targets in the Marine zone, as Moore and Lieutenant General Horner occasionally swapped sorties. Strikes in southern Kuwait continued day and night, with Marine A-6s flying almost exclusively at night. Those planes, flying with VMA(AW) 224 and VMA(AW) 533, possessed excellent night instrumentation and targeting capability, which included laser-guided weapons. Control of strike aircraft in the forward zone was dramatically enhanced with the arrival at Shaikh Isa Air Base of Marine All-Weather Fighter Attack Squadron 121 (VMFA[AW] 121), the “Green Knights,” an F/A-18D Hornet squadron commanded by Lieutenant Colonel Stephen F. Mugg. This made the first operational deployment of F/A-18Ds a combat deployment. Half of VMFA(AW) 121’s aircraft, six Hornets, arrived only two days before Desert Storm began; the other half arrived two weeks later.

Populated with experienced Marine aviators, VMFA(AW) 121 accelerated its transition process with an eye toward going to war. While the

two-seat F/A-18Ds served in a battlefield air-interdiction or deep air support role, controlling air strikes, Green Knight aviators adapted FAC-A techniques to their mission. With two Marines operating the aircraft and enhanced systems for night and all-weather flight, the F/A-18Ds had the capability to locate targets, mark them, and provide on-site control of strike aircraft.<sup>30</sup> This latter role of F/A-18Ds, finding and marking targets for other strike jets, was their priority function. The F/A-18D did not carry a bomb load, though it did carry a load of 2.75-inch or 5-inch white phosphorous rockets that, once fired at a target, would mark it with smoke.

After taking off from bases in Saudi Arabia, Green Knight crews would top off their fuel tanks from a Marine KC-130 and head into Kuwait. They were often escorted by a single-seat Hornet carrying HARMs to suppress enemy radars, while an EA-6B, operating higher, jammed enemy communications and radars. Flying day and night, F/A-18Ds were assigned a kill box, a 15-by-15-mile gridded square, with preassigned targets, though they could also work targets of opportunity.

F/A-18D crews used binoculars and night vision goggles to spot targets. Once located, the aviators called strike jets out of holding "stacks" to begin an attack. Target priority was as follows: artillery and rocket launchers, armor, troops, and finally trench lines. The F/A-18Ds remained on station for two 30-minute periods, interspersed with a trip to the KC-130 for more fuel. On a single mission, they might control as many as 21 strikes by other tactical jets.<sup>31</sup> Even with a two-person crew and sophisticated equipment, however, it was still a challenge getting aircraft to hit the right target, for there was a lot of Iraqi equipment strewn about, some of it fake; targets were often camouflaged; the terrain was nondescript; dust, smoke, and

darkness often obscured visibility; and enemy ground fire was a distinct possibility.<sup>32</sup>

### **Learning the Battlefield**

As the Marine part of the air campaign increasingly focused on Kuwait and southern Iraq, targeting became a problem because of weak intelligence information, especially bomb damage assessments. This information indicated what targets have been destroyed and which ones needed more attention. Aviators might report a target that did not make it on the ATO, or because the ATO operated on a 40-hour cycle, by the time the target was scheduled, it might no longer be there.

Colonel Manfred A. Rietsch, commanding MAG 11, commented: We were being sent on . . . targets of questionable value and that we were in fact not able to concentrate on the area that affected our Marines. As we drew close [to the ground campaign] one of our frustrations also was [that] there were certain areas where there was a lot of enemy activity that appeared to be untouched by the JFACC central planning—and I'm primarily talking about areas of northern Kuwait—that never seemed to be hit where you had reinforcements and resupply activities that we could see and could not get targeted for.<sup>33</sup>

Lieutenant General Boomer attested that "it demonstrated to me how much [tactical reconnaissance is] needed. It was not, and could not be compensated for by CentCom [United States Central Command], the U.S. Air



Force or Navy. I'm talking about good battle-damage assessment, pictures for the lieutenant who needs them for his attack."<sup>34</sup>

Tactical photo reconnaissance was certainly not helped by the decommissioning of Marine Tactical Reconnaissance Squadron 3 (VMFP 3), which flew the RF-4B, the photo reconnaissance version of the McDonnell F-4B Phantom II fighter, shortly before Iraq's invasion of Kuwait in August 1990. Although there was a large number of intelligence-gathering systems deployed with the Coalition, including Air Force F-4Gs and the new Air Force Joint Surveillance Target Attack Radar System (JSTARS), Marines found it difficult to obtain timely intelligence to support either air or ground operations.<sup>35</sup>

The deployment of AAI RQ-2B Pioneer remotely piloted vehicles (RPVs) with I MEF, operated by the 1st Surveillance, Reconnaissance, and Intelligence Group, helped fill the gap. As it turned out, Marine aviators provided some of the best intelligence as they reported on what they had seen in flights over Kuwait. Aviators of VMFA(AW) 121 kept a "hot target" list. Many targets were discovered at night by use of enhanced night equipment and improved night vision goggles. By week three of the air campaign, VMFA(AW) 121 was flying a few sorties every night for this express purpose.<sup>36</sup>

Artillery raids became a successful method to eradicate Iraqi artillery and highlighted close Marine air-ground interaction. As noted above, enemy artillery was a prime concern of Lieutenant General Boomer, the I MEF commander. It populated the area around the two-berm barrier on the Kuwait border, hidden or camouflaged and difficult to destroy once located. Artillery presented a small target with little mass, and a near-direct hit was

required to destroy it. Marines believed a way to neutralize Iraqi artillery beyond destroying it was to simply keep Iraqi gunners off their cannons. That became a primary objective of artillery raids.

First, the Iraqi artillery had to be pinpointed. A Marine artillery battery would open fire in order to draw Iraqi counterbattery fire. An EA-6B jammed the Iraqis' ground surveillance radars until the Marine artillerymen had finished their barrage. As the Marine artillerymen began their withdrawal, the EA-6B would stop jamming to allow the Iraqis to detect the withdrawal and begin counterbattery fire. The EA-6Bs then began to jam again to confuse their computers and radars. In the meantime, FAC-As in an F/A-18D or OV-10 overhead, linked to the artillery personnel by Quickfire radio and counterbattery radar, fixed the Iraqi firing positions. The location of the Iraqi artillery was then passed to a "wolf pack" of F/A-18s, AH-1s, or AV-8Bs, which quickly attacked. The artillery raid had the desired effect, as RPV videos later showed Iraqi gunners abandoning their positions after a raid.<sup>37</sup>

As Desert Storm progressed, Iraqi forces were systematically attacked and beaten down in the MEF zone by air strikes. Targets were abundant and packed into a small area; the length or breadth of Kuwait could be crossed in a strike jet in just seven or eight minutes. There were hundreds of Coalition aircraft in action at any one time. The challenges came as much from poor weather and cluttered and bureaucratic communications as enemy fire. Nevertheless, enemy antiaircraft fire was a danger.

To reduce the dangers of enemy small arms fire or antiaircraft missiles, most Marine pilots initiated their attack dives at around 30,000 feet, established a 30- to 45-degree dive, and released their bombs above 15,000 feet. Harrier pilots made 45- to 60-degree dives and released at

about 10,000 feet. The vast majority of bombs were “dumb bombs,” slang for conventional bombs without precision guidance, though A-6Es used laser-guided bombs and some F/A-18s fired laser-guided AGM-65 Maverick missiles. AV-8B pilots were delighted to find that their 25mm cannon and gunsights brought devastating results even in high-angle dives and at altitudes above 10,000 feet.<sup>38</sup> Training tables had been optimized for 10-degree strafing, but aviators, upon seeing that the enemy anti-aircraft fire was not as accurate as previously thought, increasingly dropped lower to enhance the accuracy of ordnance fired or dropped.

Marine aviators also became increasingly confident as they gained familiarity with the battlefield, substituting place names for latitude/longitude coordinates, such as the “Ice cube tray,” the “Elbow,” the “Crotch,” the “Jacks,” and the “National Forest.”<sup>39</sup> This facilitated navigation and orientation. Headquarters’ communications issues between airfields and commands steadily improved as landlines, satellite communications, and commercial telephone lines supplemented organic Marine communications equipment.

Ordnance to maintain the intense air campaign became and remained a worrisome issue for the 3d MAF. Once the decision to conduct offensive action was made, regulations required a 60-day supply be maintained. The Navy’s ordnance supply system did not, however, compensate for the expansive deployment to the Persian Gulf. The much-expanded 3d MAF required about 1,300 bombs per day, or about total 80,000 bombs, to maintain a 60-day supply for wartime operations. The Navy’s standard for the 3d MAF was only about 50,000 bombs, which created a deficit and concerned Marine leaders. In frustration, Major

General Moore passed the issue to a higher command, Lieutenant General Duane A. Wills, the deputy chief of staff for Marine Aviation at Headquarters Marine Corps (HQMC). Wills took it up with his Navy counterparts, while U.S. Army General H. Norman Schwarzkopf Jr., commander of United States Central Command (CENTCOM), also got involved.<sup>40</sup>

Eventually, the shortages were diminished as the Air Force gave the Marine Corps bombs and Marine aviators were ordered to conserve ordnance, being instructed to bring their bombs back if they did not have good targets on which to drop. Aircraft were also loaded at times with less-than-optimum bombs for the scheduled mission. Often, Mk-20 Rockeye cluster bombs were used instead of general-purpose bombs such as the 500-pound Mk-82s or 1,000-pound Mk-83s. The Mk-20, an effective weapon for hard targets such as armor and vehicles, was designed for low-altitude drops, but Marine ordnance officers and aviators developed the parameters so that they could be used for high-altitude release.<sup>41</sup> The 3d MAW never ran out of bombs, and it ended the war with a 14-day supply remaining.

### **The Battle of al-Khafjī**

After 12 days of air attacks, Saddam Hussein decided that he needed to stimulate a ground war to save his army, which was being slowly destroyed by the aerial onslaught. By invoking a ground war, he believed a stalemate would result, bogging the United States and its allies down in an unwinnable, bloody quagmire. This, he reasoned, would cause a loss of public support at home in the United States, just as had happened during the Vietnam War.

On 29 January, Saddam sent powerful armored formations into al-Khafjī, a Saudi coastal town about 16 km south of the Kuwait border. Instead of bogging down the Coalition, however, this surprise attack exposed the Iraqi forces to ravaging air attacks and hastened their demise. Nevertheless, for Marines on the ground serving in Air Naval Gunfire Liaison Companies (ANGLICO) and reconnaissance units who were trapped in or near al-Khafjī, the Iraqi attack proved a dicey situation.<sup>42</sup>

Marine Pioneer RPVs and the Air Force Northrop Grumman E-8 Joint STARS aircraft spotted the first enemy movements. Captain Douglas A. Kleinsmith's 1st ANGLICO, positioned with a Saudi unit just south of al-Khafjī, heard the Iraqis the morning before the attack. From the north and over the horizon came the deep rumble of hundreds of engines. Once the offensive was underway, the JFACC command center redirected scheduled sorties off targets in Iraq and toward al-Khafjī instead. Air attacks that night and the following day stopped the armored columns, with FAC-As in OV-10s locating targets and directing strikes in support of ANGLICO units.

In one instance, an OV-10 spotted an Iraqi tank column on the move south of al-Khafjī and passed the coordinates to orbiting FA-18s, which pressed an attack. The lead tank was hit first, causing the entire column to stop, which made the pilots' job easier.<sup>43</sup> In another, a flight of four AV-8Bs from VMA 542 were directed by an ANGLICO controller to a convoy of Iraqi BMP armored infantry fighting vehicles moving through the middle of al-Khafjī.<sup>44</sup> As pilot Major Jim M. Lee Jr. rolled into his attack, he noticed that for a split second al-Khafjī looked like the downtown of a U.S. city in his windscreen. His bombs hit Iraqi vehicles and stirred up a respectable volume of SAMs, none of which scored a hit. The Marine AV-8Bs made

repeated bomb runs and destroyed several of the BMPs, while the surviving vehicles retreated north.<sup>45</sup>

A-6E crews of VMA(AW) 224 used their capable weapons systems to find a convoy of enemy trucks on the move at night. They dropped their loads of Mk-20 cluster bombs and watched as bomblets enveloped the entire column of trucks, rippling into full flame as they flashed down the column.<sup>46</sup>

Lieutenant Colonel Richard Barry used an STU-III encrypted phone to place a call directly to Lieutenant Colonel Michael Kurth, commander of HMLA 369, to report the Iraqi attack and the withdrawal of his reconnaissance forces. Kurth relayed this information to the TACC and, after receiving permission to launch, went hunting for the enemy in his UH-1N with a division of AH-1s. Using his forward-looking infrared (FLIR), he located six Iraqi BMPs on the road north of al-Khafjī. Kurth directed the AH-1 division to attack based on a mark with his infrared searchlight, and the pilots fired into the armored vehicles with 2.75-inch rockets and 20mm cannons, flaming two of them. Operating overhead that night was an Air Force Lockheed AC-130 gunship with the call sign "Ghost 19," which proved to be a godsend. Its crew located Iraqi anti-aircraft guns along the beach north of al-Khafjī and took them out, and they also provided situational awareness to Marine crews. Ghost 19 was replaced on station by another AC-130 that was shot down later that morning.<sup>47</sup>

Captain Kleinsmith of 1st ANGLICO recalled that a section of AH-1s were first to show up when he called for air support. They were much appreciated. Four-aircraft divisions of AH-1s from HMLA 369 were launched the on evening of the 29 January to al-Khafjī and the southwest corner of

Kuwait (the “Elbow”), where they supported the 1st Light Armored Infantry Battalion and reconnaissance Marines who were in the process of withdrawing.<sup>48</sup>

**Figure 2.**



Marines of Marine Light Attack Helicopter Squadron 369 (HMLA 369) rush TOW missile tubes toward an AH-1W helicopter. Source: Courtesy of TSgt Rose S. Reynolds, USAF, Defense Imagery DF-ST-92-06956

Major Gary D. Shaw led a section of AH-1s from HMLA 367 to the same area, circled, and awaited targets until they ran low on fuel. Attempting to return to base, the Marines overflowed an Iraqi column that fired at them. They evaded the fire, but in the process their navigational equipment failed. Hoping to reach Ras al-Mishab, they instead found themselves over al-Khafji, where they landed conveniently at an oil refinery. The Marines found what appeared to be suitable fuel for a helicopter and

pumped it into their fuel tanks. As Iraqis marched into the city, they started their engines and flew out.

Captain Randall W. Hammond's division of AH-1s from HMLA 367 was scrambled from Ras al-Mishab when Iraqi forces attacked the Marines at the "Elbow," where the Kuwaiti-Saudi border turns from east-west to north-south. His three AH-1s screened Marine infantry by flying three miles to their front. In the process, Hammond's division destroyed four Iraqi tanks with TOW missiles. Captain Steven R. Rudder, flying with Hammond's division, hit a fleeing T-62 medium tank at long range, more than 3 km. When the missile hit the tank, its turret catapulted straight up, flipped over, and smashed down on the tank's body "like tiddlywinks."<sup>49</sup> Ultimately, the Iraqi assault on al-Khafjī did not instigate the massive ground war as Hussein hoped; instead, his army was turned back after losing a substantial amount of personnel and military equipment.

### **The Air Campaign Continues**

After the battle at al-Khafjī, the pounding of Iraq's war machine continued unabated. The destructive power of the Coalition's air armada had become quite apparent to the Iraqi soldiers. One of them, a veteran of the Iran-Iraq War (1980–88), said after al-Khafjī that Coalition aircraft "imposed more damage on his brigade in half an hour than it had sustained in eight years of fighting against the Iranians."<sup>50</sup>

Although the Iraqi integrated air defense system had been ravaged early on, antiaircraft guns, cannons, and infrared-guided SAMs remained a serious low-altitude threat. During Desert Storm, 37 Coalition fixed-wing aircraft were lost; of these, 7 were Marine aircraft, including 5 AV-8Bs and 2



OV-10s. The OV-10 was particularly vulnerable since it had to fly low to be effective and, as a turboprop aircraft, was slower than other aircraft. To minimize the danger to OV-10s, they were restricted from flying north of the Kuwait border before the ground war began. The AV-8B was certainly fast, but it was vulnerable because it had only one engine and many vital components were located around the heat source of its engines at the aircraft's center. Engine exhaust is what infrared or heat-seeking missiles guided on. On the other hand, the F/A-18's design, which placed the engine exhaust well aft, made it less vulnerable to heat-seeking missiles. While some F/A-18s were hit by gunfire and infrared missiles, none were lost.<sup>51</sup> Coalition forces also lost five helicopters in combat; the Marines lost none, although three were lost in operational accidents. On 2 February, an AH-1J of VMA 775 that was flying escort for a casualty evacuation crashed with the loss of both pilots. The next night, a UH-1 of HMLA 369 crashed, resulting in the deaths of the four crew members.<sup>52</sup> Finally, on 20 February, a Marine Boeing Vertol CH-46 Sea Knight transport helicopter was involved in an operational accident, though no casualties resulted.

Fratricide incidents were especially troubling. The most serious occurred on 29 January, when an Air Force Fairchild Republic A-10 Thunderbolt II attack aircraft fired an AGM-65 missile into a Marine light armored vehicle and killed seven Marines. In another instance, the crew of an A-6E who thought they were over Iraq bombed a Marine artillery convoy, killing one Marine and wounding three others. Lieutenant General Boomer commissioned a team of experts to investigate and produce recommendations. They found that a lack of situational awareness over a

dynamic, dark, and ill-defined battlefield—both in regards to terrain and friendly troop positions—was the chief culprit of the fratricides.<sup>53</sup>

Pilot situational awareness and Marine Air-Ground Task Force (MAGTF) training prevented many fratricides even on a dynamic and confusing battlefield. During the ground war, Major Donald E. Fleming of VMA 231 was directed by a Marine on the ground to engage a nearby unit that he believed was an Iraqi formation. As the brief conversation went on, Fleming concluded that the Marine directing him was confused and refused to engage on the column, turning to return to base with his bombs. Just before leaving the frequency, the Marine on the ground confirmed Fleming's situational awareness that precluded a potential fratricide.<sup>54</sup>

Recommendations were implemented to enhance aviators' situational awareness by better navigation, marking and updating friendly lines, and improving navigation equipment and procedures. Colonel Rietsch noted that no F/A-18s had been involved in fratricides and "attributed this to the improved situational awareness provided by the Hornets' moving map display."<sup>55</sup> Later in the war, a HARM fired at an Iraqi radar by an EA-6B guided instead on a Marine counterbattery radar. It destroyed the radar, killing one Marine and wounding another.<sup>56</sup>

Five Marine aviators became prisoners of war during Desert Storm: Lieutenant Colonel Clifford M. Acree, Major Joseph J. Small III, Captain Michael C. Berryman, Captain Russell A. C. Sanborn, and Chief Warrant Officer 4 Guy L. Hunter Jr. In an attempt to procure intelligence and develop propaganda, the prisoners were beaten, tortured, and starved by their Iraqi captors. Despite the beatings, which in some cases left prisoners permanently impaired, the Marines yielded little useful information.

Meanwhile, two AV-8B pilots, Captains James N. Wilbourn and Reginald C. Underwood, and an OV-10 observer, Captain David M. Spellacy were unable to escape their aircraft after being hit by antiaircraft fire and died in the subsequent crash.<sup>57</sup>

### **The Assault into Kuwait**

In early February, Lieutenant General Boomer shifted the Marines' plan for an invasion into Kuwait from a one-division breach to a two-division breach, including the 1st and 2d Marine Divisions and supporting elements. This strategic change meant a westward shift of the Marine assault and a massive thrust into Kuwait. Consequently, the forward bases at the Ras al-Mishab and Ras at-Tanajib airports were now at too great a distance from the main Marine effort to optimize helicopter employment. The creation of a forward logistics base and airfield was required to support this shift. The 2d Force Service Support Group (2d FSSG) built an expansive logistics base in the midst of the desert called al-Khanjar, while a large airfield for rotary-wing operations called Lonesome Dove was built nearby.<sup>58</sup>

Lonesome Dove was constructed in less than two weeks by personnel from Marine Wing Support Squadron 273 (MWSS 273), Marine Aviation Logistics Squadron 29 (MALS 29), and MAG 26 working alongside U.S. Navy Seabees. Barren desert was converted into an expansive airfield that had more than 800,000 square feet of aluminum matting surface area, three separate fuel pits, and an arming area for aircraft. It became the main helicopter base for the ground war, with MAG 26 and parts of MAG 16 being stationed there, and functioned 24 hours a day from 18 February to 4 March. Lonesome Dove was located about 8 km from al-Khanjar, which had

a dirt airstrip from which KC-130s operated. Although most logistics materiel was moved overland by truck, helicopters from MAG 16 and MAG 26, especially Sikorsky CH-53 Sea Stallion/Super Stallion heavy-lift helicopters, transported a tremendous amount of cargo and personnel into al-Khanjar.

While helicopters were displaced to Lonesome Dove, Ras at-Tanajib remained an important forward base for Harriers, cutting transit times to the battlefield by half or more. The airport had a 10,000-foot runway, from which AV-8Bs needed only a small part. They made vertical landings, turned, and taxied immediately to the rearming/refueling area. While pilots grabbed a drink of water, visited the restroom, or had a bite to eat, their planes were rearmed and refueled. Takeoff, even when loaded with bombs and fuel, required only a couple thousand feet, and it was back to war. Kuwait was just 20 minutes north.<sup>59</sup> Although the al-Khafji incursion was the only Iraqi offensive against Marine positions, vigilance was required at forward bases such as Lonesome Dove and Ras at-Tanajib. Here, Marine aviation mechanics embodied the “every Marine a rifleman” mantra, as they not only serviced and repaired aircraft but also manned fighting holes.

As the ground war approached, the Marine network for command and control became increasingly more efficient and responsive. A large number of aircraft were going to be fed into a small area, for the Marines had about 400 planes that would be supporting the assault. A DASC was established at I MEF headquarters with air support elements with each division.

As it turned out, this was not the best arrangement, since the DASC became a tool of MEF headquarters instead of the 3d MAW's command center. A helicopter tactical air command center (TACC) was established at

Lonesome Dove with the assistant wing commander, Brigadier General Granville R. Amos, in charge there. It ran helicopter operations through coordination with the TACC at al Jubayl. The airborne DASC was used to control deep air support while the ground DASC controlled air support for the close-in fight within the fire-support coordination line. I MEF also obtained from the JFACC high-density air control zones (HIDACZ) over its ground divisions a few days before the ground war. The HIDACZ gave the Marines airspace to operate over the Marine regiments engaged in battle without coordination with the JFACC. Essentially, the Marines owned that airspace.<sup>60</sup>

Details on the parameters of the HIDACZs had to be worked out daily and in sometimes fractious coordination between 3d MAW and the JFACC staff. Further refinements allowed Marines to operate in the I MEF zone on search and destroy missions without being assigned to specific targets. The first three days of the ground assault were prescribed in detail so that everyone knew the plan even if communications were lost.<sup>61</sup> OV-10s were scheduled to fly over both ground divisions and serve as tactical air controllers or forward air controllers and radio relays to facilitate better air-ground communications.

On the eve of the ground war, Major General Moore once again visited his group and squadron commanders and told them, "This is the time to start earning your flight pay. Now we have Marines in contact. We have to start pressing." He had been conserving his resources for this event; now was the time for a maximum effort.<sup>62</sup>

At 0400 on 24 February, the I MEF attack commenced, initiated by the 1st Marine Division assault across the first Iraqi berm at the "Elbow." Ninety

minutes later, the main attack began when the 2d Marine Division pushed east into Kuwait. The critical assault across the first berm and into the area between the first and second was completed with alacrity, precision, and less opposition than expected. Supporting the assaults was the entire arsenal of Marine Aviation beginning with EA-6Bs, which electronically clobbered Iraq's battlefield surveillance radars. Marine UH-1s carried ground commanders aloft to observe the battlefield action and gain situational awareness. However, oil well fires that had been set a week prior and unusually bad weather, which included low clouds and a cold rain, severely impaired the utility of those flights.<sup>63</sup>

Despite the miserable weather, AH-1s provided the best Marine Corps traditional combat air support (CAS). Lieutenant Colonel James N. Mattis, commanding 1st Battalion, 7th Marines, attested that "they were the greatest force multiplier out there . . . and we couldn't have won without them."<sup>64</sup> AH-1 pilots coordinated closely with ground units either by radio or by landing and briefing face-to-face with ground officers. Major General James M. Myatt, commanding the 1st Marine Division, related, "There is no substitute for the pilots actually coming down and talking to my folks."<sup>65</sup>

Major General William M. Keys, commanding the 2d Marine Division, confirmed that Marine aviators offered a lot of information regarding enemy disposition in front of his division. AH-1s killed the enemy and destroyed Iraqi weaponry with efficiency. They were readily available, since they could quickly refuel and rearm at Lonesome Dove or forward arming and refueling points, which support squadrons moved forward as the war progressed. UH-1s kept in close contact with ground units and provided radio relay, command and control, battle damage assessment, reconnaissance and

occasionally psychological warfare operations by flying over the enemy and appealing to him to surrender, either through leaflets or recorded broadcasts.<sup>66</sup>

After the first day's fight, a four-aircraft division of AH-1s led by Captains Randall Hammond and Steven Rudder went hunting at night for Iraqi tanks out in front of Marine positions. Environmental conditions were so obscured that the heat signatures from the exhaust of their fellow Marine helicopters were all that was visible. They stayed in formation by watching that glow through night vision goggles. In that hellish smoke and haze, they went deep into "bad guy country." Punching temporarily into the clear, they got oriented on Iraqi T-72 battle tanks, thanks to OV-10 aviators overhead who had been tracking the tanks on their FLIR cameras.

When the AH-1s arrived, the OV-10 pilots put a laser mark on a couple of Iraqi tanks, and the fight—or, rather, the turkey shoot—was on. In rapid succession, Hammond's aviators put all eight of their Hellfire missiles into the T-72s, turning them into blazing mounds of molten metal spewing tank ammunition. Hammond's section then fired flares over the Iraqi tanks, while Rudder's section shot TOWs into them. In the meantime, Hammond noticed enemy fire coming up from the ground. Some of the missile launches appeared to be bigger than shoulder-fired SA-7s. He turned hard away while Rudder rolled in and sprayed the Iraqis with 20mm cannon fire, covering Hammond's escape.<sup>67</sup>

While bad weather did not keep the Marine F/A-18s, AV-8Bs, and A-6Es out of the war, it kept them from flying true CAS. Instead, they flew many deep support missions. The 3d MAW strike jets were "pushed" for CAS, which meant that after takeoff, F/A-18s and AV-8Bs went to holding "stacks"

near the Kuwaiti border at the rate of two aircraft every seven and a half minutes. From there they could be directed to conduct CAS missions, execute deep air strikes, or work with an F/A-18D on targets of opportunity well forward of advancing friendly troops. Artillery raids using QuickFire radio continued to be used in conjunction with Marine ground artillery units. Major General Myatt reported that there were 42 instances of Iraqi artillery being fired on the 1st Marine Division during the first morning alone. Counterbattery fire from the 11th Marines, the division's artillery unit, quieted the Iraqis in 28 instances; in the other 14 cases, AV-8Bs neutralized them.<sup>68</sup>

To support the ground war, 3d MAW surged sorties. AV-8Bs from a detachment of VMA 513, led by Major Eddie L. Holcomb, soon joined MAG 13 at King Abdulaziz Air Base. Harriers with VMA 331, commanded by Lieutenant Colonel Jerry W. Fitzgerald, also began flying Desert Storm missions from the USS *Nassau* (LHA 4), marking the first instance of combat fixed-wing air strikes flown from an amphibious assault ship.<sup>69</sup>

Feint amphibious exercises were conducted to deceive the Iraqis, such as that flown on 26 February, in the midst of the ground war, by a heliborne force of CH-46s and CH-53s from Marine Medium Helicopter Squadron 263 (HMM 263), HMM 365, and HMM 461. In another instance, six AH-1s from HMLA 269 flew into Lonesome Dove to bolster the CAS assets for Marines, while other AH-1s flew a harassment mission against Iraqi positions on Failaka Island. Additionally, UH-1s from HMLA 169 and HMLA 269 flew in front of U.S. Navy ships as they moved closer to land to spot mines.<sup>70</sup>



By executing their varied missions, Marine aircraft supported the fire and maneuver of the Marine ground divisions of I MEF as they sliced through Kuwait. Iraqi troops involved in the ground war either fought and died or surrendered and lived. Many more than expected chose the latter.

### **Supporting the Ground Campaign**

Transport helicopters remained extremely busy once the ground war commenced. CH-46s flew evacuation missions and carried vast numbers of Iraqi prisoners of war to rear holding areas. CH-53s, meanwhile, carried vehicles that had been hampered by bad weather, poor communications, and less-than-optimal navigation equipment.<sup>71</sup>

On top of these missions, MAG 16 and MAG 26 were notified to marshal helicopters to lift a company of Marines into position to protect the left flank of the 1st Marine Division's Task Force Papa Bear.<sup>72</sup> Although just a single company was to be lifted, it was to be the largest Marine combat heliborne operation since Vietnam, and Lieutenant General Boomer and Major General Moore were concerned that there would not be enough helicopters to support the operation and meet the needs of other I MEF units.<sup>73</sup> Plan specifics were not finalized until two days before the onset of the ground war. Furthermore, briefing and planning was undercut by poor communications between various headquarters. In some cases, squadrons were notified just one day before that they were to provide aircraft and crews for the lift.

The 52 helicopters (totaling about one-fourth of all Marine helicopters in theater) assembled at Landing Zone Sandy near Lonesome Dove on the morning of 24 February, the day the ground war began. A final briefing—for

some, the first and only briefing—was made with all participants. The mission was to be flown in daylight, though pilots and crews, wearing chemical protective suits, waited hour after hour for the launch command. The order finally came at 1730, turning the day mission into a night one. This dramatically escalated its complexity and risk, especially since some pilots were not qualified with night vision goggles.<sup>74</sup>

Updated intelligence on the route of flight was not available, and poor communications with the helicopter TACC, just 16 km away, added an extra level of confusion. The mission commander, Lieutenant Colonel Marvin D. Hall, who led HMM 165, suggested canceling the mission but instead received indications from the 1st Marine Division that the mission was to be flown. It was a daunting proposition, involving 52 helicopters flying an unpracticed mission, in the dark and with bad visibility, into a hostile landing zone. Nevertheless, the pilots cranked their engines, 132 infantry Marines loaded, and the waves of helicopters took off.

A wind shift affected the takeoff, causing one CH-46 to roll over, though no one was hurt. The transport helicopters, led by UH-1s and AH-1s, flew in close formation through the black toward the landing zone. They received reports of artillery fire in the landing zone; indeed, as the Marines closed on the zone, they could see flashes of fire. Timing was slightly off and escorting AH-1s turned into the approaching transport helicopters. Avoidance calls cluttered the radio as aircraft dove, climbed, and turned to avoid one another. Aboard the command UH-1, the ground mission commander, Lieutenant Colonel Michael V. Maloney, made the call to abort the mission. The return to Lonesome Dove was just as perilous as the flight into enemy country. The formation had broken up, and pilots flew through

the gloom unsure of where the other aircraft were. Some CH-46s ran low on fuel and had to land in the desert. It was miraculous that there were no midair collisions. The executive officer of MAG 16 observed, "Only because of individual aviator skills did we avoid multiple mid-air collisions. . . . Oh, there were a lot of people that came back with religion [after that mission]." The next day, a smaller task force, flying in the light of day, inserted Marines near Task Force Papa Bear.<sup>75</sup>

At the end of the first day, Major General Myatt had set up his 1st Marine Division command post in the only grove of trees around and right next to the burning oil well fires of the Burgan oil field. The next day, with the visibility almost nil and the sky black from oil smoke, the command post was attacked by an Iraqi mechanized brigade. Visibility precluded fixed-wing CAS, and the enemy was so close that use of artillery was considered dangerous.

Marine command post administrators and clerks shouldered firearms to fight off the Iraqis. Brigadier General Thomas V. Draude, the assistant division commander, ordered the sides of the operations tent rolled up so that his Marines could see the battle; the Iraqis were within a few hundred yards. At this critical juncture, AH-1s of HMLA 367 and HMLA 369 arrived. Just 50 feet above the command post, they began firing into the Iraqi armored vehicles, with shells from their 20 mm cannons raining down on the Marines at the command post below. Other AH-1s supported Task Force Papa Bear as it beat off an armored attack. Myatt recalled that, at the end of the day, "burning Iraqi BRDMs and BMPs littered the battlefield near my [command post] and burning Iraqi T-54/55 and T-62 tanks were all around

Task Force Papa Bear.” Indeed, 75 enemy tanks were destroyed, 24 of them by Marine AH-1s.<sup>76</sup>

Captain John S. Walsh, a VMA 542 pilot, had the closest of calls. While attacking an Iraqi armored column, his AV-8B was hit amidships by an infrared-guided SAM. At about 8,000 feet, the blast perforated the Harrier’s right wing and blew off the flap. It also set fire to the fuel in the right-wing tank, producing a trail of fire three times the length of his jet. Walsh was determined to get out of enemy territory, but the Harrier was coming apart around him. Realizing that the Ahmad al-Jaber Air Base in Kuwait had ostensibly fallen to Marines, he hoped to land there and save himself and his jet.

Once over al-Jaber, Walsh tried to lower the landing gear, but it would not come down. As he tried to decide the best place to eject from his jet, the controls froze up and the plane flipped on its back. Though flying at only 900 feet above ground, he ejected. The seat performed perfectly, getting him right-side up just before ground impact. The only human activity that Walsh saw from his location was a cloud of dust on the horizon that fortunately turned out to be a Marine patrol. He was rescued and found his way back to King Abdulaziz Air Base within a few days.<sup>77</sup>

As Marine ground units surged forward and secured al-Jaber on 26 February, Marine aviators established a forward DASC, positioned an Raytheon MIM-23 Hawk missile battery, and set up forward arming and refueling there for helicopters to support I MEF’s final push to Kuwait International Airport. The 5th Marine Expeditionary Brigade (5th MEB) came ashore to handle the masses of surrendering Iraqi troops. Helicopters from its aviation element, MAG 50, flew into Tanijib, Saudi Arabia, and from there

carried the 3d Battalion, 1st Marines, to the “Ice-tray” area, where they processed and secured prisoners. Strike jets hit targets at and around I MEF’s final objective—the Kuwait International Airport. In some cases, Iraqi soldiers surrendered upon hearing the noises of jets.

A few large civilian airliners were parked at the airport; rumors spread that these were being readied by Iraqi military commanders to flee with Kuwaiti treasure. One pilot with VMFA 212, Captain William F. Guilfoyle, reported one of them to the Marine control agency. They cleared him to bomb the big airliner, which he proceeded to do, though it took several more strikes before it and the other planes were destroyed. Advice on where to place a bomb so as to flame the big airliners was provided by Colonel Charles J. Quilter II, a Marine Reservist then on assignment to document the war for the Marine Corps History Division. Quilter was especially qualified to give such advice because as a civilian he flew the same type of airliner that the Marines were trying to destroy.<sup>78</sup>

In an outstanding example of close support in the worst conditions, Lieutenant Colonel Michael Kurth, flying a UH-1N, led AH-1 gunships through the smoke and haze of burning oil fields to the front lines on 26 February. There, they provided CAS for Marine infantry units. The dense smoke and dust haze forced Kurth to fly extremely low to the ground, even under power lines, “feeling his way” forward while the AH-1s followed in tight formation. Once in the battle area, he coordinated with a FAC of Task Force Ripper and flew in front of friendly lines.<sup>79</sup> He then employed a recently installed and experimental forward-looking infrared device called “Night Eagle,” which featured a laser-designator to guide the AH-1’s Hellfire missiles onto Iraqi targets. The Marine helicopters systematically destroyed

a number of Iraqi tanks, with Kurth repeating the process during a 10-hour period. When low on fuel, he returned to the rear to refill, sometimes from a Marine tanker truck in the desert, and picked up another flight of gunships to lead them back into the fray. Kurth also dispatched a division of AH-1s to support the 1st Battalion, 5th Marines, which had the very difficult job of managing the boundary between the 1st and 2d Marine Divisions. That support and coordination was critical to maintaining momentum and avoiding fratricide. Kurth received the Navy Cross for his actions.<sup>80</sup>

In the early hours of 26 February, Lieutenant Colonels James L. Whitlow and John A. Keenan, standing watch in the I MEF combat operations center, received reports of massive vehicular traffic moving out of Kuwait City. They were concerned initially that it was an Iraqi attack. Later intelligence coming from JSTARS and an F/A-18D indicated that it was actually a massive retreat. Lieutenant General Boomer chose to slam the door on the retreating Iraqis, and Major General Moore ordered as many night-capable attack jets as possible to launch an attack.<sup>81</sup>

After an A-6E air-dropped CBU-78/B Gator mines across the freeway, making it impassable, the Iraqis barreling home in stolen Kuwaiti vehicles stuffed with war plunder were forced to abandon the main road for the desert, where their vehicles quickly bogged down in the soft sand. There were several roads out of town that were clogged with Iraqis fleeing for home, but there was one main “Highway of Death”—the road from Kuwait City to Safwan, Iraq—that contained thousands of vehicles. Here, the Iraqis were caught and ravaged by I MEF tanks and Coalition strike jets, which continued their attacks into the following day.<sup>82</sup> Pilots flocked to the highway and waited for clearance into the area from overworked air

controllers. Once cleared to attack, they dropped all their bombs and shot all their bullets into the massed vehicles.

One F/A-18 pilot from VMFA 314 described a typical strike on the Highway of Death. His testimony also shows how F/A-18D aviators adroitly controlled numerous aircraft in a tight area:

Aircraft were darting and diving over the entire area. Sharks at a feeding frenzy. . . . [The F/A-18D] put a mark down on a stretch of road and told me and Toss [his wingman] to work that point and stay east of the highway. They had another two-ship work the same point, except that they stayed west of the highway. It was like a dream come true . . . it was all laid out right in front of us. Kids in a candy store.<sup>83</sup>

Another depiction of this iconic episode of the Gulf War came from Colonel Michael B. Parkyn, an A-6E pilot, who called the road a “highway to hell”:

It was like, if you could, putting your head inside a Weber grill with the coals red and glowing. We’re punching [down] through the clouds at night, using our radar to guide on the target until we’re clear underneath, then [we] sweeten the dive using the FLIR; outside its incredible, hellish, red, orange glow off the fires . . . a ribbon or road, cars and vehicles on both sides, on fire, you could see movement, people scattering. Oil well smoke created an overcast, you dropped all your bombs then climbed above the clouds heading home. It was clear, cool and quiet, behind you the clouds were glowing red.<sup>84</sup>

**Figure 3.**



A tight formation of F/A-18C strike fighters of Marine Fighter Attack Squadron 212 (VMFA 212). Led by LtCol James M. Collins II, VMFA 212 was one of the many Marine squadrons that went to war in Operations Desert Shield and Desert Storm. Source: Courtesy of SSgt Scott Stewart, USAF, Defense Imagery DF-ST-92-07396

Early on 27 February, Marines made the final push into Kuwait City. By 0645 their last objective, Kuwait International Airport, was secured and the American and Marine Corps flags flew in front of the terminal building. Not far behind the Marine riflemen, troops of MWSS 271 established a refueling



and arming point at the airport.<sup>85</sup> Local Kuwaitis were jubilant and expressed their appreciation, shouting in Arabic that “God is great.”

The 3d MAW continued to strike targets in Kuwait on 27 February, as the war neared its end. That day, Captain Reginald Underwood’s AV-8B was hit during an attack on targets in northern Kuwait, and he died in the subsequent crash. In the I MEF command center early the next day, Major General Richard D. Hearney, deputy commander of I MEF, called staff officers to listen to a radio broadcast of President Bush announcing a cessation of hostilities to go in effect at 0800. Desert Storm was over.<sup>86</sup>

## **Epilogue and Lessons Learned**

With the Iraqi army retreating and Kuwait liberated, it was time for many Marines to go home, and the retrograde out of Kuwait began in earnest. There were numerous warm and jubilant homecomings awaiting Marines in the United States. Lieutenant Colonel Russell Jones, commanding VMA 231, recalled flying toward the East Coast of the United States:

We see Cape Hatteras [North Carolina] and it’s sure kind of a sweet sight, as you’re flying in. I had been trying to contact air traffic control and finally get somebody to answer me and it’s a female operator. I give her our flight information, tell her where we’re going, etc. . . . and she said, “Roger Zero One, welcome home.” And I couldn’t say anything. I choked up immediately. All I could do—you know as an aviator when you roger something you can just click the mic twice. So I just give her a double mic click and to this day I hope I didn’t insult her, but I

couldn't talk. That had more meaning than just about any single welcome home.<sup>87</sup>

Operation Desert Storm proved the viability of changes that had been introduced into Marine Aviation after the Vietnam War and pointed to the future of air warfare, which included night operations, precision weapons and navigation, and unmanned aerial systems. Little has been mentioned in this article about them, but the RQ-2B RPVs got the attention of all who saw their capability, resulting in their much-expanded use after the Gulf War. Marine Aviation also possessed some of the latest equipment, as well as its corresponding capability, but did not have enough of it. For example, only 2 percent of ordnance dropped by Marine and Navy aviators was precision guided.<sup>88</sup>

The importance of standardized and realistic training within Marine Aviation was proven by the performance of combat-ready Marine aviators; 99 percent had never seen combat, yet they flew with professionalism and tactical proficiency from day one. They also exhibited a proactive attitude toward integrating with Marine ground units to determine how aviation could best integrate with the ground scheme of maneuver. Aircraft maintenance had also drastically improved. The overall 3d MAW mission-capable aircraft availability was 90 percent, which marked a vast improvement over rates during the Vietnam War (which were at about 70 percent at best).<sup>89</sup> This increase was abetted by new aircraft in the Marine Corps inventory. Desert Storm marked the first large-scale combat use of the F/A-18 Hornet and AV-8B Harrier. Although the Harriers suffered losses, their performance was impressive, in spite of their lack of precision

targeting or night-enhanced systems. The AV-8B's ability to get into the battle fast was facilitated by its ability to operate from forward bases such as King Abdulaziz Air Base and especially the forward arming and refueling pad at Ras at-Tanajib.

The FA-18's performance was outstanding. It flew more sorties than any other Marine or Navy jet, maintained a high readiness rate, proved deadly accurate as a bomber, was survivable, and carried a respectable ordnance load.<sup>90</sup> This first combat outing of the F/A-18D revealed its ability to locate targets and manage air strikes as a FAC-A in the deep air support role. Future operations would reveal the value of this capability for F/A-18D squadrons. While precision targeting and digital systems proved their worth, traditional CAS was still viable, especially in poor environmental conditions and a dynamic battlefield environment in which changes occurred rapidly. The performance of AH-1s, especially, during the ground war made this clear. There were also many occasions when strike jets depended on FAC "talk-ons" to find targets that had been marked with smoke rather than laser marks.

The integration of Marine Aviation command and control (MACCS) with the JFACC was accomplished, although not without difficulty. Compromise on the part of both Marine and Air Force leaders made it work. The JFACC accepted flexibility in the system, which allowed Marines to operate closer to their doctrine and reduced demands for Marine tactical aviation to fly non-Marine missions. The MACCS was hard-pressed to handle the high volume of sorties coming from a large region into a small operating zone in Kuwait. Lighter, more-capable equipment that allowed for better dispersion of command and control throughout the region would help solve

this problem in the future. Better communications equipment would likewise improve connectivity between Marine units spread across a large area of operations. The performance of Marine wing support squadrons was a resounding success, as they built, operated, and maintained bases of varying degrees of sophistication, from the modern Shaikh Isa Air Base to the primitive austerity of Lonesome Dove.

Desert Storm revealed that the U.S. military had the ability to neutralize the daunting Soviet air defense system that had been a prime concern in the years after Vietnam. This allowed American aviation to systematically attrite and demoralize the enemy. Airpower was considered by many to be the decisive factor in the Gulf War, and Marine aviators were full partners in that, flying 18,000 missions during Desert Storm.<sup>91</sup>

Difficulties regarding navigation proved that the Marine Corps needed to invest in global-positioning navigation equipment and continue to push for night flying competency in all its aviators. The Coalition air campaign during Desert Storm emphasized destroying the enemy and prepping the battlefield. In this key assessment, the Marines were less successful in eliminating Iraqi tanks, armored personnel carriers, and artillery in the I MEF zone than was the Air Force in the Army's zone. The Air Force, which had four times the number of tactical aircraft and a greater precision capability, neutralized 73 percent of the enemy's resources in the Army's zone, compared to 43 percent in the Marines' zone. The Air Force also flew more than 23,000 interdiction missions compared to the Marines' 4,700, which suggests that Marine Aviation could have used more strike aircraft to whittle down the enemy in the I MEF zone, or that the 3d MAW commander, Major

General Moore was correct in protecting his tactical aviation from U.S. Air Force efforts to use it in strikes on Baghdad.<sup>92</sup>

Finally, the emphasis that Marine Aviation placed on CAS—one of the most important missions of a MAGTF aviation combat element—was also apparent. During the ground war, Marine aviators flew 2,932 CAS missions, compared to the 1,361 by the Air Force and none by the Navy.<sup>93</sup>

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<sup>1</sup> *Aviation Operations*, Marine Corps Warfighting Publication (MCWP) 3-20 (Washington, DC: Headquarters Marine Corps, 2018), 2-1-2-6.

<sup>2</sup> BGen Edwin H. Simmons, USMC (Ret), "Getting Marines to the Gulf," *U.S. Naval Institute Proceedings* 117, no. 5 (May 1991): 60-61; and Louis G. Caporale, "Marine Corps Historical Notes from the Gulf War," *Marine Corps Gazette* 75, no. 12 (December 1991): 44.

<sup>3</sup> Goldwater-Nichols Department of Defense Reorganization Act of 1986, Pub. L. 99-433, 100 Stat. 992 (1986).

<sup>4</sup> Paul W. Westermeyer, *U.S. Marines in the Gulf War, 1990-1991: Liberating Kuwait* (Quantico, VA: History Division, Headquarters Marine Corps, 2014), 55.

<sup>5</sup> United Nations (UN) Security Council, Resolution 678, Authorizing Member States to Use All Necessary Means to Implement Security Council Resolution 600 (1990) and All Relevant Resolutions (29 November 1990).

<sup>6</sup> Paul W. Westermeyer, *U.S. Marines in Battle: Al-Khafji, 28 January-1 February 1991* (Washington, DC: History Division, Headquarters Marine Corps, 2008), 3. Saddam Hussein was convinced that the United States would not fight to liberate Kuwait because of the muted American response to the Iraqi Exocet missile attack on the USS *Stark* (FFG 31) in 1987. He also believed that the United States feared a Soviet response to an attack on Iraq.

<sup>7</sup> Col James M. Collins II, interview with Fred H. Allison, 21 May 2010, recording (Quantico, VA: Oral History Section, History Division), hereafter Collins interview; and Williamson Murray, *Air War in the Persian Gulf* (Baltimore, MD: Nautical & Aviation Publishing Company of America, 1995), 109. According to this latter reference, the bombs actually fell at 0251.

<sup>8</sup> The North Atlantic Treaty Organization (NATO) reporting names of Soviet surface-to-air missiles are used here.

<sup>9</sup> Murray, *Air War in the Persian Gulf*, 68-69. *Kari* is the French spelling for *Iraq* backward.

<sup>10</sup> Col Charles J. Quilter II, USMCR, *U.S. Marines in the Persian Gulf, 1990-1991: With the I Marine Expeditionary Force in Desert Shield and Desert Storm* (Washington, DC: History and Museums Division, Headquarters Marine Corps, 1993), 15.

<sup>11</sup> LtCol LeRoy D. Stearns, *U.S. Marines in the Persian Gulf, 1990-1991: The 3d Marine Aircraft Wing in Desert Shield and Desert Storm* (Washington, DC: History and Museums Division, Headquarters Marine Corps, 1999), 106; Collins interview; Marine Attack Squadron 224 (VMA 224) Command Chronology (ComdC), 1-31 January 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 1-2; and Quilter, *With the I Marine Expeditionary Force in Desert Shield and Desert Storm*, 49.

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<sup>12</sup> LtCol W. Beaman W. Cummings Jr., "Around the World to the Storm," *Marine Corps Gazette* 76, no. 5 (May 1992): 58–59.

<sup>13</sup> LtCol Michael B. Parkyn, interview with Fred H. Allison, 16 June 2010, recording (Quantico, VA: Oral History Section, History Division), hereafter Parkyn interview; and Jay A. Stout, *Hornets over Kuwait* (Annapolis, MD: Naval Institute Press, 1997), 80–81.

<sup>14</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 106–7; and Stout, *Hornets over Kuwait*, 79–81.

<sup>15</sup> Westermeyer, *Liberating Kuwait*, 78; and Stout, *Hornets over Kuwait*, 74–81.

<sup>16</sup> SSgt Robert M. Sexton, USAF, "Marine Aviator Scores Aerial Victory," *Marines* 21, no. 5 (May 1992): 4–6.

<sup>17</sup> Stout, *Hornets over Kuwait*, 42–43.

<sup>18</sup> LtCol Richard M. Barry, "In Praise of Close Air Support," *Marine Corps Gazette* 76, no. 5 (May 1992): 56.

<sup>19</sup> Col John T. Bioty, interview with Col Charles J. Quilter II, USMCR, 15 May 1995, transcript (Quantico, VA: Oral History Section, History Division), 5, hereafter Bioty interview; and Lon Nordeen, "The Marines AV-8B Gulf Deployment," *AirForces Monthly*, February 1992, 42–43.

<sup>20</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 110–11.

<sup>21</sup> MajGen Royal N. Moore Jr. and BGen Granville R. Amos, interview, 18 March 1991, transcript (Quantico, VA: Oral History Section, History Division), 12, hereafter Moore and Amos interview. Moore wanted it said that the "ground war was won before we kicked off [the ground war]."

<sup>22</sup> Westermeyer, *Liberating Kuwait*, 69. For more on the air tasking order (ATO) as a tool of the JFACC, see *Joint Air Operations*, Joint Publication (JP) 3-30 (Washington, DC: Joint Chiefs of Staff, 2019).

<sup>23</sup> LtGen Royal N. Moore Jr., "Marine Air: There When Needed," U.S. Naval Institute *Proceedings* 117, no. 11 (November 1991): 63–64; and James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Air Power in the Gulf War* (Santa Monica, CA: Rand Corporation, 1994), 138, <https://doi.org/10.7249/MR343>.

<sup>24</sup> Moore, "Marine Air," 63; and Col Manfred A. Rietsch, interview with Col Charles J. Quilter II, USMCR, 18 December 1990, transcript (Quantico, VA: Oral History Section, History Division), 17, hereafter Rietsch interview.

<sup>25</sup> BGen Granville R. Amos, interview, April 1991, transcript (Quantico, VA: Oral History Section, History Division), 12, hereafter Amos interview.

<sup>26</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 47–48.

<sup>27</sup> Bioty interview, 4; and Moore, "Marine Air," 69.

<sup>28</sup> MajGen Royal N. Moore Jr., interview with Fred H. Allison, 10 March 19, recording (Quantico, VA: Oral History Section, History Division).

<sup>29</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 103, 144.

<sup>30</sup> Col Stephen F. Mugg, interview with Fred H. Allison, 17 May 2010, recording (Quantico, VA: Oral History Section, History Division), hereafter Mugg interview; and Capt. R. A. Padilla, "F/A-18Ds Go to War," U.S. Naval Institute *Proceedings* 117, no. 8 (August 1991): 40.

<sup>31</sup> Maj James S. Robertson, "FastFACs in the KTO: The First Combat Test of the F/A-18D," *Marine Corps Gazette* 76, no. 5 (May 1992): 90; and Padilla, "F/A-18Ds Go to War," 40.

<sup>32</sup> Robertson, "FastFACs in the KTO," 89–90; Mugg interview; and Padilla, "F/A-18Ds Go to War," 40.

<sup>33</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 121–22.

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- <sup>34</sup> Glenn W. Goodman and John G. Roos, "An Exclusive *AFJ* Interview with Lt. Gen. Walter Boomer, USMC, Commanding General, Marine Corps Combat Development Command," *Armed Forces Journal International* 130 (August 1992): 40.
- <sup>35</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 116.
- <sup>36</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 75–77; and Amos interview, 10–11.
- <sup>37</sup> MajGen J. Michael Myatt, USMC (Ret), "Close Air Support and Fire Support in Desert Shield and Desert Storm," *Marine Corps Gazette* 82, no. 5 (May 1998): 70–72; and Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 122–23, 132–33.
- <sup>38</sup> Marine Fighter Attack Squadron 333 (VMFA 333) Command Chronology (ComdC), 1–31 January 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 3.
- <sup>39</sup> Stout, *Hornets over Kuwait*, 165.
- <sup>40</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 132–33.
- <sup>41</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 76–77; and Moore, "Marine Air," 67.
- <sup>42</sup> Westermeyer, *U.S. Marines in Battle: Al-Khafji*, 12; and Rebecca Grant, "The Epic Little Battle of Khafji," *Air Force Magazine*, 1 February 1998.
- <sup>43</sup> Marine All-Weather Attack Squadron 242 (VMA[AW] 242) ComdC, 1–31 January 1991, pt. 2 (Quantico, VA: Archives Branch, History Division) 2; Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 126; and Grant, "The Epic Little Battle of Khafji."
- <sup>44</sup> BMP refers to *Boyevaya Mashina Pekhoty*, which is Russian for "infantry fighting vehicle."
- <sup>45</sup> Grant, "The Epic Little Battle of Khafji"; and Marine Attack Squadron 542 (VMA 542) ComdC, 1–31 January 1991, pt. 4 (Quantico, VA: Archives Branch, History Division), attachment 1.
- <sup>46</sup> Parkyn interview.
- <sup>47</sup> Col Michael M. Kurth, comments on manuscript, 15 July 2020, hereafter Kurth comments.
- <sup>48</sup> Marine Light Attack Helicopter Squadron 369 (HMLA 369) ComdC, 1–31 January 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 5–6.
- <sup>49</sup> Clifton A. Barnes, "King Cobra in Kuwait," *Leatherneck* 74, no. 8 (August 1991): 16–19; and Westermeyer, *U.S. Marines in Battle: Al-Khafji*, 23.
- <sup>50</sup> Westermeyer, *U.S. Marines in Battle: Al-Khafji*, 32.
- <sup>51</sup> Westermeyer, *Liberating Kuwait*, 143–50.
- <sup>52</sup> The AH-1J pilots were Maj Eugene T. McCarthy and Capt Jonathan R. Edwards. The crewmen of the Huey included Capts David R. Herr Jr. and James K. Thorp and Cpls Kurt H. Benz and Albert G. Haddad Jr. See Westermeyer, *Liberating Kuwait*, 145.
- <sup>53</sup> Westermeyer, *Liberating Kuwait*, 114–15, 141, 150.
- <sup>54</sup> LtCol Russell R. Jones, comments on manuscript, January 2017.
- <sup>55</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 126–28.
- <sup>56</sup> Westermeyer, *Liberating Kuwait*, 160.
- <sup>57</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 111; Kevin M. Woods, *The Mother of All Battles: Saddam Hussein's Strategic Plan for the Persian Gulf War* (Annapolis, MD: Naval Institute Press, 2008), 226–27, 259; and Westermeyer, *Liberating Kuwait*, 83, 88–89, 146, 187, 218.
- <sup>58</sup> The name "Lonesome Dove" came from the popular 1989 Western adventure television miniseries of the same name. See *Lonesome Dove*, directed by Simon Wincer, written by

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William D. Whittliff, featuring Robert Duvall, Tommy Lee Jones, Danny Glover, Diane Lane, and Anjelica Huston, aired 5–8 February 1989 on CBS.

<sup>59</sup> Col William R. Jones, interview with Fred H. Allison, 21 February and 8 March 2002, transcript (Quantico, VA: Oral History Section, History Division), 227, hereafter Jones interview.

<sup>60</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 142–43.

<sup>61</sup> Amos interview, 9.

<sup>62</sup> Moore, “Marine Air,” 66.

<sup>63</sup> Amos interview, 27–28.

<sup>64</sup> Barnes, “King Cobra in Kuwait,” 19.

<sup>65</sup> Marine Light Attack Helicopter Squadron 367 (HMLA 367) ComdC, 1–28 February 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 8–12.

<sup>66</sup> HMLA 367 ComdC.

<sup>67</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 157–58; and Barnes, “King Cobra in Kuwait,” 17–18.

<sup>68</sup> Myatt, “Close Air Support and Fire Support in Desert Shield and Desert Storm,” 71.

<sup>69</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 149; Westermeyer, *Liberating Kuwait*, 149–50.

<sup>70</sup> Marine Aircraft Group 40 (MAG 40) ComdC, 1 January–6 May 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 5–6; and David W. Foster, interview with Fred H. Allison, 7 April 2017, recording (Quantico, VA: Oral History Section, History Division).

<sup>71</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 162–63.

<sup>72</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 60–61. The chief elements of Task Force Papa Bear included the 1st Battalion, 1st Marines; 3d Battalion, 1st Marines; and 1st Tank Battalion.

<sup>73</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 128–31.

<sup>74</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 140, 153–54.

<sup>75</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 153–59.

<sup>76</sup> BRDM refers to the amphibious vehicle *Boyevaya Razvedyvatelnaya Dozornaya Mashina*, or literally “combat reconnaissance patrol vehicle.” BGen Thomas V. Draude, interview with Col Richard D. Camp, USMC (Ret), Paul W. Westermeyer, and Fred H. Allison, 21 June 2006, transcript (Quantico, VA: Oral History Section, History Division), 42–44; Myatt, “Close Air Support and Fire Support in Desert Shield and Desert Storm,” 73; and Barnes, “King Cobra in Kuwait,” 17–18.

<sup>77</sup> Dale R. Cooper, “Young Guns: Harrier Pilots in the Persian Gulf,” *Leatherneck* 74, no. 7 (July 1991): 40–42.

<sup>78</sup> Collins interview.

<sup>79</sup> The chief elements of Task Force Ripper included the 1st Battalion, 5th Marines; 1st Battalion, 7th Marines; and 3d Tank Battalion.

<sup>80</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 163–64; Myatt, “Close Air Support and Fire Support in Desert Shield and Desert Storm,” 73; and Kurth comments.

<sup>81</sup> Quilter, *With the I Marine Expeditionary Force in Desert Shield and Desert Storm*, 97; and Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 162.



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<sup>82</sup> Stout, *Hornets over Kuwait*, 208–11; Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 162; and Quilter, *With the I Marine Expeditionary Force in Desert Shield and Desert Storm*, 97.

<sup>83</sup> Stout, *Hornets over Kuwait*, 211.

<sup>84</sup> Parkyn interview.

<sup>85</sup> Marine Wing Support Squadron 271 (MWSS-271) ComdC, 1 January–30 June 1991, pt. 2 (Quantico, VA: Archives Branch, History Division), 3.

<sup>86</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, 166; and Quilter, *With the I Marine Expeditionary Force in Desert Shield and Desert Storm*, 104.

<sup>87</sup> Jones interview, 269–71.

<sup>88</sup> Dean Simmons et al., “Air Operations over Bosnia,” U.S. Naval Institute *Proceedings* 123, no. 5 (May 1997): 58.

<sup>89</sup> Winnefeld, Niblack, and Johnson, *A League of Airmen*, 237.

<sup>90</sup> Winnefeld, Niblack, and Johnson, *A League of Airmen*, 246.

<sup>91</sup> Stearns, *The 3d Marine Aircraft Wing in Desert Shield and Desert Storm*, iii; and Winnefeld, Niblack, and Johnson, *A League of Airmen*, 275–80.

<sup>92</sup> Winnefeld, Niblack, and Johnson, *A League of Airmen*, 151, 304–5.

<sup>93</sup> Winnefeld, Niblack, and Johnson, *A League of Airmen*, 304–5.