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had significant strategic implications for the Gulf War as well as future conflicts. In particular, airpower advocates increasingly refer to Khafji as the example of airpower's emerging role in halting armored offenses, a traditional Army mission. What really happened at Khafji? Did this three-day battle signify a shift toward the pre-eminence of airpower over land warfare? Are those citing Khafji as evidence of airpower's new role in joint warfare reaching too far? Did airpower alone halt a significant Iraqi attack into Saudi Arabia? This study examines the available unclassified evidence to determine the tactical and operational effects of airpower at Khafji. First, it first addresses the Iraqis' intentions at Khafji, presuming that no accurate judgement of Coalition effectiveness can be determined independently of what the Iraqis were trying to achieve. Next, the study seeks to conclude the overall effectiveness of Coalition forces by comparing Iraqi intentions with actual results. Finally, airpower's role is analyzed to determine the extent to which airpower contributed to the successful Coalition defense. The study concludes that because Iraqi army was so outmatched at Khafji, airmen should be cautious about overstating the effects of airpower. It also concludes that airpower delivered the overwhelming number of lethal kills at Khafji and was primarily responsible for repulsing the attack, however feeble. Finally, the study argues that Marine air provided the preponderance of force until the fourth day of the battle, when the JFACC brought a significant portion of the entire Coalition air assets to bear against the already retreating Iraqis.

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AIRPOWER AND THE BATTLE OF KHAFJI:
SETTING THE RECORD STRAIGHT

MAJOR JOHN F. NEWELL III

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

ABSTRACT

General Norman Schwarzkopf, Commander of Coalition forces in the Gulf War, summarized the Iraqi offensive at Khafji as “about as significant as a mosquito on an elephant.” In subsequent years, Gulf War analysts have increased their focus on Khafji, arguing that this relatively minor engagement had significant strategic implications for the Gulf War as well as future conflicts. In particular, airpower advocates increasingly refer to Khafji as the example of airpower’s emerging role in halting armored offenses, a traditional Army mission. What really happened at Khafji? Did this three-day battle signify a shift toward the pre-eminence of airpower over land warfare? Are those citing Khafji as evidence of airpower’s new role in joint warfare reaching too far? Did airpower alone halt a significant Iraqi attack into Saudi Arabia?

This study examines the available unclassified evidence to determine the tactical and operational effects of airpower at Khafji. First, it first addresses the Iraqis’ intentions at Khafji, presuming that no accurate judgement of Coalition effectiveness can be determined independently of what the Iraqis were trying to achieve. Next, the study seeks to conclude the overall effectiveness of Coalition forces by comparing Iraqi intentions with actual results. Finally, airpower’s role is analyzed to determine the extent to which airpower contributed to the successful Coalition defense.

The study concludes that because Iraqi army was so outmatched at Khafji, airmen should be cautious about overstating the effects of airpower. It also concludes that airpower delivered the overwhelming number of lethal kills at Khafji and was primarily responsible for repulsing the attack, however feeble. Finally, the study argues that Marine air provided the preponderance of force until the fourth day of the battle, when

the JFACC brought a significant portion of the entire Coalition air assets to bear against the already retreating Iraqis.

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Chapter 1

Introduction

On January 29, 1991, the twelfth day of the Operation Desert Storm air war, Allied Coalition ground and air forces clashed with Iraqi armored units at four locations along the eastern Saudi-Kuwait border. Known now as the battle of Khafji, this three-day Iraqi offensive was the first sustained ground fighting of the Gulf war—a relatively small battle that may have had large strategic implications.¹ For reasons unclear, elements of three Iraqi heavy divisions moved south to the Saudi border and engaged U.S. Marine observation posts along the border.

Surprised by the Iraqi attack, the marines withdrew from their observation posts, while two light armored infantry (LAI) battalions moved forward to delay the attacking Iraqis. Believing an Iraqi attack unlikely, the Marines had gambled and established a large logistics base far forward near the Kibrit airfield, less than 30 miles from the Kuwait border.² Facing an unexpected attack by Iraqi tanks and possessing only light armored vehicles (LAV), the outgunned marines quickly called for air strikes against the advancing Iraqis. Iraqi radio jamming initially delayed the marines' repeated close air support (CAS) requests from reaching the Tactical Air Control Center (TACC) in

¹ This argument is stated most clearly by Michael R. Gordon and Gen Bernard E. Trainor in *The General's War: The Inside Story of the Conflict in the Gulf* (Boston, Mass.: Little, Brown, and Co., 1995), 267-290. Gordon and Trainor argue that the Battle of Khafji was “the war’s defining moment,” due to General Schwarzkopf’s and Powell’s failure to grasp the significance of the crushing Iraqi defeat. Gordon and Trainor argue that had he understood the implications of Khafji, Schwarzkopf would have realized that allowing his ground forces to attack north into Kuwait would quickly collapse the Iraqi military front and allow the Republican Guard to escape north to Iraq. In other words, the Coalition’s “Left Hook” ground operation assumed that the Iraqi army would stay and fight until the XVIII Airborne Corps had completed its envelopment from the west. Khafji should have demonstrated the fallaciousness of this assumption. Some airpower advocates have misrepresented Gordon and Trainor’s “defining moment” comment as a resounding endorsement of airpower’s decisive role at Khafji.

² Gordon and Trainor, 276.

Riyadh, whose battle staff initially failed to grasp the magnitude and urgency of the situation.

Though surprised by the scope of the Iraqi ground offensive at Khafji, the TACC quickly recovered, diverting a Joint Strategic Target Attack Radar System (JSTARS) surveillance aircraft, as well as Air Force, Navy and Marine attack jets to assist the outgunned marines.³ During the course of the three-day battle, Coalition ground forces and airpower counterattacked, defeating the first-echelon Iraqi forces, and preventing additional armor from reinforcing the battered Iraqis. Saddam Hussein clearly suffered a humiliating defeat, but the larger significance of Khafji emerged slowly.

Immediately following the battle, neither the military services nor the Coalition leadership diverted their attention from the upcoming ground war to reflect on the events at Khafji. Both air and land forces had been surprised by the attack, resulting in confusion that arguably contributed to two fratricide incidents.⁴ But in the aftermath of the Gulf war, airpower advocates quickly claimed that Khafji symbolized the dawn of a new age in warfare, where precision-guided munitions (PGM) so increased the lethality of airpower that U.S. air forces alone could halt and defeat a significant armored offensive.⁵

This study examines the available unclassified evidence to determine the tactical and operational effects of airpower in the battle of Khafji. Because warfare is conducted on the battlefield and not in a laboratory, separating airpower's contribution to the Coalition victory is difficult, and requires inferences about the Iraqi forces as well as airpower's role in the Coalition defense. In order to deduce the *effects* of airpower, it is first necessary to determine the size, capability and intentions of the Iraqi offensive force at Khafji; and second, to infer the probable consequences of Iraqi success, however speculative this process might be. The difference between what actually occurred at Khafji, and what might have occurred with a hypothetical Iraqi victory, is the *effect* of the

³ Gordon and Trainor, 273-79.

⁴ Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War* (Boston, Mass.: Houghton Mifflin Co., 1993), 207.

⁵ For an elaboration of this argument, see numerous articles by Price T. Bingham, including, Price T Bingham, "The Battle of Khafji and the Future of Surveillance Precision Strike," (Unpublished report, 1996.) Also see Rebecca Grant, "The Epic Little Battle of Khafji," *Air Force Magazine* 81, no. 2 (February 1998).

total Coalition defensive effort. In other words, the *effect* of the Coalition defense at Khafji is what did not occur because of its actions.

In spite of the data from an array of overhead intelligence gathering assets, knowledge of Iraqi doctrine, and observations of the unfolding battle, assessing the size and objectives of the Iraqi force is difficult. Where ground forces were engaged, numerous accounts by marines and airmen present a clear picture of the contributions of land and airpower to the Iraqi defeat. However, analysts of the Khafji battle disagree about the size and intent of the Iraqi second-echelon forces. Not surprisingly, some air advocates argue that these forces were significant, up to brigade-size and larger.⁶ “The Iraqi plan appears to have been as follows:” observed Air Force Col John Warden, “On the first night, [the Iraqis would] take over the lightly defended town of Khafji; on the second night, strike south with a *corps* to provoke a coalition counteroffensive...[emphasis added]”⁷ Considering the variety of opinions about the size of second-echelon forces, this study examines the available evidence and determine if it is sufficient to make reasonable inferences about Iraqi force size.

Once the difference between Iraqi objectives and the actual outcome at Khafji has been deduced, the analysis assesses airpower’s contribution to the Coalition defense. What weapon systems brought the most destruction upon Iraqi forces? How did non-lethal airborne assets such as the Airborne Battle Command and Control Center (ABCCC) and JSTARS influence the battle? Was Khafji the first example of airpower’s ability to halt and defeat a major ground offensive by an enemy armored force? The last question looms particularly large, with both the Army and Air Force having a serious stake in the answer.

Any unclassified study of a Gulf War operation undoubtedly has limitations. To understand the plodding pace of military declassification, one must consider that only now are significant volumes of Vietnam war records becoming available to researchers. Decades may pass before enemy prisoner of war (EPW) reports and other classified documents offer conclusive evidence of Iraqi intent at Khafji. Researchers also lack

⁶ See Richard P. Hallion, *Storm Over Iraq: Airpower and the Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992), 221.

access to Iraqi archives, which might offer insight into the Iraqi leadership's decision-making about events surrounding Khafji. An eventual change in the Iraqi government may result in a flood of new information relevant to the battle. A second limitation of the study is caused by the lack of U.S. Air Force data available to researchers. For whatever reason, the Air Force has been unable to assemble a complete and detailed database that includes sorties flown, munitions employed, and pilot observations of battle damage.⁸

The following analysis attempts to lead the reader through a series of small steps to achieve some conclusions about airpower's role at Khafji. The lack of unclassified data may at times force an "inferential leap of faith." While historians search for evidence that leads them to incontrovertible conclusions, the available data may not allow such concrete inferences about airpower's role at Khafji. But if this analysis does nothing more than restrain thoughtful military professionals from overreaching the available evidence, it will have served a useful purpose.

⁷ Col John A. Warden III, "Employing Airpower in the Twenty-first Century," in *The Future of Airpower in the Aftermath of the Gulf War*, ed. Richard H. Shultz, Jr. and Robert L. Pfaltzgraff, Jr. (Maxwell AFB, Ala.: Air University Press, July 1992), 77.

⁸ Despite the nearly heroic efforts of several researchers to assemble comprehensive records of air missions flown in the Gulf, the data remains fragmented and incomplete. And one must recall that even the U.S. Strategic Bombing Survey of World War II, which had on-the-ground access to every target, was unable to produce conclusive results.

Chapter 2

Iraq's Intent at Khafji

Assessing the effectiveness of Coalition forces at Khafji requires an understanding of Iraqi intentions. While one may assume that the Iraqis did not intend to decimate their own 5th Mechanized Division, as evidence suggests was the result at Khafji, Iraq's true objectives for the battle have implications for measuring Coalition's success.⁹ For example, did the Iraqis plan to reinforce Khafji with a large second-echelon force to exploit their success? If so, that they were unable to do so has significant implications for airpower's effectiveness. If they did not, then Khafji simply cannot be cited as an example of airpower defeating a determined enemy armored force.

Khafji in the Context of Desert Storm

To understand Iraqi actions at Khafji, one must study the battle within the context of the larger war. While Saddam Hussein initiated a tactical operation in Southern Kuwait, it is reasonable to assume that he did so in hopes of achieving strategic objectives. To understand the strategic calculus that may have driven Saddam's decision-making, one must identify the significant aspects of the war prior to Khafji. For example, when did Khafji occur within the phases of the overall Coalition campaign plan? How was the air war against Iraq progressing? What was the state of the Iraqi military? How were Scud launches influencing decision-making on both sides? The answers to these questions provide the basis for determining Iraqi intentions.

⁹ Eliot A. Cohen et al., *Gulf War Airpower Survey* [hereafter *GWAPS*], Vol. II, Pt. 1, *Operations* (Washington, D.C.: Government Printing Office, 1993), 240.

U.S. Central Command (CENTCOM) executed Operation Desert Storm on 17 January, a plan consisting of three overlapping air phases followed by a final ground offensive to liberate Kuwait and diminish Iraq's future military threat. First, a strategic air campaign attempted to incapacitate the Iraqi regime by destroying key military command and control centers, telecommunication facilities, and power production sites.¹⁰ Concurrently, phase two quickly achieved air superiority over Iraq by disabling the French-built "Kari" integrated air defense system and destroying the Iraqi air force. After achieving air superiority, Coalition air forces initiated phase three of the campaign plan—battlefield preparation. On 26 January, three days before the Khafji battle, CENTCOM announced a shift in the air campaign's emphasis to attacks against Republican Guard units.¹¹ Phase three had two objectives: (1) isolate and defeat the Iraqi army in Kuwait by destroying armored equipment and interdicting logistics trains; and (2) reduce the fighting strength of the Republican Guard forces through direct attack and destruction of key bridges necessary for its escape north.¹²

Strikes against the Iraqi Air Force and its integrated air defense system (IADS) established the Coalition's complete dominance over Iraqi skies by the end of the first week. By then, thirty-nine Iraqi aircraft had been destroyed by Coalition air forces, convincing Iraqi pilots to avoid contact with the enemy at all cost. CENTAF Commander Lt Gen Charles Horner declared that air superiority had been achieved over Iraq on 22 January.¹³ Unable to force an air battle, Horner stalked the Iraqi Air Force on the ground on by directing strikes against their hardened aircraft shelters on 23 January. Foreseeing the inevitable demise of his Air Force, Saddam Hussein directed the first of an eventual one hundred Iraqi aircraft to flee to the Iranian border on 24 January, apparently preferring internment by a hostile Iran to certain destruction by the Coalition. The French-built Kari air defense system suffered similar destruction during the opening week of the air campaign. By the third day of the war, emissions by Iraqi SAM and AAA

¹⁰ James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Airpower in the Gulf War* (Santa Monica, Calif.: RAND, 1994), 74.

¹¹ Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare?: Airpower in the Persian Gulf* (Annapolis Md.: Naval Institute Press, 1995), 234.

¹² Winnefeld, 76.

¹³ Keaney and Cohen, 233.

radars were reduced by ninety percent.¹⁴ The radar-guided missile threat was so reduced by 20 January that Horner directed all bombing missions be conducted from medium altitude (ten to fifteen thousand feet).¹⁵ This kept Coalition aircraft above the AAA and infrared surface missile threat, thereby allowing free transit across Iraq and Kuwait.¹⁶ With threats to its own aircraft reduced, the Coalition unleashed the full fury of its air forces on the Iraqi army.

By the second week of the air war, CENTCOM Commander Gen Norman Schwarzkopf directed Horner to shift the air campaign's focus to the Iraqi Army—especially the Republican Guard. While some in the Tactical Air Operations Center (TACC) were not convinced that the objectives of the strategic air campaign were met, Horner made clear his intention to shift the air war's focus to the KTO (Kuwaiti Theater of Operations) and the Republican Guard.¹⁷ Reflecting his priorities, Horner began dedicating air tasking order (ATO) days to the various Republican Guard units.¹⁸ For example, 27 January became "Hammurabi Day", referring to a Republican Guard division located on the Iraqi-Kuwait border.¹⁹ The target distribution of the second week's strike sorties illustrates the shift in emphasis to the Iraqi army. During week one of the air campaign, the Coalition flew 750 sorties against Iraqi army units. By week two, that number had increased to over 2,800.²⁰ Republican Guard units were the hardest hit during the second week. Two of these unfortunate divisions received over 88 B-52 strikes and 579 F-16 sorties.²¹ The implications of repeated pounding could not have been missed on Saddam Hussein: The air campaign against his most effective fighting units would be sustained, effective, and relatively painless for the Coalition.²² Attempting to change the direction of the war, Saddam responded to the repeated attacks with his one remaining air weapon.

¹⁴ Department of Defense, *Conduct of the Persian Gulf War: Final Report to Congress* (Washington, D.C.: Government Printing Office, April 1992), 202.

¹⁵ Keaney and Cohen, 233.

¹⁶ Ibid.

¹⁷ *GWAPS*, Vol. II. Pt. 1, 203.

¹⁸ The ATO was a daily operations order that assigned missions to the preponderance of air assets in the theater. An "ATO day" simply referred to the 24 hour period covered by a single ATO—usually 0600L to the next morning at 0600L.

¹⁹ Keaney and Cohen, 247

²⁰ *GWAPS*, Vol. II. Pt. 1, 271.

²¹ Keaney and Cohen, 250.

In the weeks leading up to the Khafji attack, Scud launches directed at Israel became a serious concern to leaders in both Washington and Riyadh. During the two-week period of 18-27 January, Iraq launched twenty-five Scuds at Israel and another twenty-four toward Saudi Arabia and other Gulf states.²³ Calculating that attacks on Israel would provoke a direct military response, Saddam saw Scuds as a vehicle to force the Israelis into the war, possibly fracturing the Coalition. In Washington, the Bush administration countered with a diplomatic and military initiative to defeat the Scud threat while at the same time convincing the Israelis to show restraint.²⁴ Stopping Scud launches required locating the mobile launchers, which intelligence sources estimated to number approximately three or four dozen. Post-war analyses determined the number to be much higher—around 225.²⁵ Horner, feeling the pressure from Washington, diverted substantial resources from the original air campaign plan, placing 24-hour F-15E and F-16 orbits over likely Scud launch sites.²⁶ As the Scud hunt intensified, launches declined. During week two, Iraq fired only eighteen Scuds (down from forty-nine in week one). During the Khafji battle itself, Iraq fired only four missiles.²⁷ Saddam appears to have concluded that Scud launches would not alter the war's strategic balance as he had hoped. As poorly as the air war had gone for Baghdad, the Iraqis could not have been optimistic about their prospects in the approaching ground war. With each passing day, additional Coalition forces arrived at Saudi ports and moved northwest into assembly areas along the Iraqi border, making final preparations for a massive land offensive against Iraq.

²² Ibid., 250.

²³ Gordon and Trainor, 247.

²⁴ Ibid., 229-235.

²⁵ Richard Mackenzie, "A Conversation with Chuck Horner," *Air Force Magazine* 74, no. 6 (June 1991): 64.

²⁶ By the end of the war, approximately 1,500 strike sorties were flown against ballistic missile targets. These sorties unquestionably diverted resources away from other campaign objectives. They included nearly 20 percent of F-15E sorties, 2 percent of A-10 sorties, 4 percent of F-16 sorties, and 3 percent of F-111F sorties. See Williamson Murray, *Air War in the Persian Gulf* (Baltimore, Md.: Nautical and Aviation Publishing Company of America, 1995), 174-75.

²⁷ Gordon and Trainor, 240.

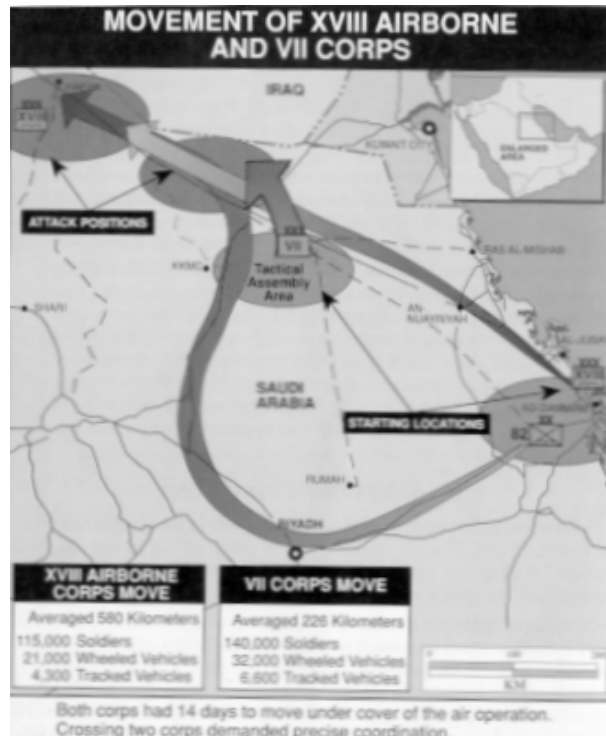


Figure 1: Movement of XVIII and VII Corps

Source: Robert H. Scales, *Certain Victory: The U.S. Army in the Gulf War* (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College Press, 1994).

As the Iraqis made final preparations for the Khafji attack, the U.S. 3rd Army was executing a massive westward shift into attack positions (see Figure 1). Prior to the air war, both the VII Corps and the XVIII Airborne Corps assembled in eastern Saudi Arabia to deceive the Iraqis into believing that the Coalition main thrust would attack north into Kuwait. The actual CENTCOM campaign plan called for Coalition forces to bypass Kuwait completely, which required both corps to move into attack positions in western Saudi Arabia.²⁸ Fearful of compromising his plan, Schwarzkopf refused to allow either corps to move west of Wadi al-Batin until the air war blinded Saddam to Coalition ground movements. This presented Schwarzkopf with the dilemma of moving 64,000 vehicles and 255,000 soldiers across three hundred miles of desert in only two weeks.²⁹ The XVIII Airborne Corps began the westward movement on 20 January. The scope and complexity of this massive shifting of ground forces is difficult to grasp. For the next

²⁸ Robert H. Scales, *Certain Victory: The U.S. Army in the Gulf War* (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College Press, 1994), 138.

²⁹ *Ibid.*, 145.

month, eighteen vehicles per minute passed along the east-west Pipeline Road repositioning the Coalition ground force. As the dust cloud created by the soldiers and armor of 3rd Army moved westward from the KTO, CENTCOM had little reason to expect trouble in the relatively quiet coastal town of Khafji.

In the days leading up to the Khafji attack, Schwarzkopf and his senior commanders clearly focused on issues other than a possible Iraqi attack in the KTO. Much of their attention was directed toward suppressing Scud launches. Nevertheless, Secretary of Defense Richard Cheney sensed that Schwarzkopf had not grasped the gravity of the Scud threat, and expressed his dissatisfaction with CENTCOM's efforts to combat it. General Colin Powell, Chairman of the Joint Chiefs of Staff, intervened and managed to calm the Secretary; but then quickly passed to Schwarzkopf the sense of urgency emanating from Washington.³⁰ With the Pentagon turning up the heat, Schwarzkopf directed Horner to devise an air operation to suppress Scud launches—one that eventually consumed over one third of his air assets.³¹ In spite of the pressure from Washington, Schwarzkopf nevertheless insisted that the air campaign remain focused on destroying the Republican Guard. Sensitive to his boss's priorities, Horner reviewed the immediate goals for the air campaign in a 29 January meeting with his CENTAF staff. Just three hours prior to the attack on Khafji, he stated:

We're well into our attack on the Republican Guards. It is not going to be spectacular. It's going to be a lot of work. It should not be inordinately hazardous. We are not going to get a lot of feedback until suddenly they're defeated. We'll fight the weather the next couple of days but keep the pressure on the Republican Guards. It's the target. When we have the Republican Guards in the bag, *then we'll turn our attention to the ground forces in Kuwait.* (emphasis added)³²

As the third week of the air war began, several developments caused the Iraqi leadership little room for optimism. Most importantly, Coalition air supremacy over Iraq marked the beginning of a progressive, systematic destruction of the Iraqi army from the air. Saddam Hussein could not escape the conclusion that time offered him no advantage. To maintain a static, defensive posture along the Saudi border would lead to the eventual

³⁰ Gordon and Trainor, 234.

³¹ H. Norman Schwarzkopf with Peter Petre, *It Doesn't Take a Hero* (New York: Linda Grey, Bantam Books, 1992), 418.

and complete destruction of his army. The air war's shift in focus to the Republican Guard clearly threatened Saddam's most capable and loyal forces. Iraq's rapid retreat during the ground war would later demonstrate Saddam's belief that although front line forces were expendable, Republican Guards were not. Scud missiles had also proved to be of limited value to Iraq. Having failed to provoke the Israelis into a military response, Scuds lost their strategic value and served only as a diversion of Coalition forces from attacks on the Republican Guard. Saddam could not have known the extent to which the hunt for Scud missiles consumed air assets, but the sheer number of aircraft in the theater allowed CENTAF to pursue Scuds as well as its other objectives. Finally, Schwarzkopf and Horner were focused on events outside the KTO. Although the marines defending eastern Saudi Arabia were assigned to the land component commander, the Marine plan was not integrally tied to the Army's "left hook". As a result, Schwarzkopf took a "hands off" approach to the Marines; and this inevitably allowed his focus on the KTO to stray. Not tied to the 3rd Army's scheme of maneuver, the U.S. Marine Corps devised its own plan for the Coalition offensive—an operation requiring a direct thrust into a heavily defended Iraqi position.

Orders of Battle

In order to make determinations about Iraqi intent, one must consider both the air and land orders of battle for Coalition and Iraqi forces. Iraqi leaders undoubtedly considered the size and strength of Coalition forces in the KTO before embarking on the Khafji offensive. Unfortunately for the Iraqis, they did not capitalize on the advantage of having their ground forces largely in place by September 1990. In contrast, the mammoth Coalition ground force that would eventually attack north was not fully deployed until a few days before the ground war began on 24 February.³² As for the Iraqis, there is general consensus on the location of their ground forces, as they conducted little maneuvering once positioned in southern Iraq and Kuwait.

The Iraqi army conducted a massive buildup of forces in Kuwait, preparing four defensive echelons (See Fig A-1 and Table A-2). At its peak, this force grew to a size

³² Daily Comments of Lt Gen Horner, 29 January 1991, 1700 Brief, HQCENTAF, Office of History, 20 March 1991, GWAPS, Horner File. Quoted in Murray, 188.

³³ Atkinson, 255.

equivalent to four corps, with more than 500,000 soldiers.³⁴ The first echelon was arrayed along the Saudi border and comprised twenty-seven light infantry divisions positioned behind an elaborate obstacle belt. This barrier contained minefields, anti-tank ditches, berms, barbed wire, and fire trenches. These relatively static front-line divisions were supported by five heavy mechanized divisions, which would maneuver to contain a breakthrough of the front line. Four additional heavy divisions formed a third-echelon theater reserve. Finally, seven Republican Guard divisions constituted the strategic reserve, positioned to reinforce rapidly a defense of either Kuwait or southern Iraq.³⁵ Each progressive Iraqi echelon had better arms, training, professionalism, and morale. But across Saudi border, a smaller, tougher and better-equipped Coalition force was preparing for offensive operations.

The 1st Marine Expeditionary Force (I MEF), consisting of two divisions, formed the eastern line of the Coalition land force, defending the Saudi-Kuwait border (See Table A-1 and Figure A-3). The I MEF, under the operational control of the land component commander, was assigned the role of fixing the Iraqi forces in Kuwait while the 3rd Army enveloped them from the west. At the time of Khafji, the Marine operation plan was far from complete, with both divisions in assembly areas well south of the border.³⁶ The Marines positioned reconnaissance platoons at eight outposts (OP) along the Kuwait border to gather intelligence as well as detect a surprise attack.³⁷ The Marines' first line of defense against an Iraqi offensive consisted of two light armored infantry battalions (LAI), whose task was to delay the attack sufficiently to enable heavier Marine forces to prepare a defense. Anticipating the need to project logistical support during the Coalition's offensive, the Marines established a large logistics base at Kibrit, only 30 miles from the Kuwait border.

³⁴ Lt Gen Edward M. Flanagan Jr., "The 100-Hour War", *Army* 41, no. 4, (April 1991): 18.

³⁵ Stephen T. Hosmer, *Effects of the Coalition Air Campaign Against Iraqi Ground Forces in the Gulf War, MR-305-AF* (U), (Santa Monica, Calif.: RAND, 1994), 14-16. (Secret) Information extracted is unclassified.

³⁶ The Marines did not settle on a final operations plan for the ground offensive until after the Khafji battle. The original plan to conduct a single breach was replaced by a two simultaneous division breaches. For a full account, see Gordon and Trainor, 289-309.

³⁷ Capt Steven A. Ross and SSgt G. L. Gillispie, "OP-4 Once More", *Marine Corps Gazette* 76, no. 7, (July 1992): 11-12.

On both flanks, the Marines were bounded a diverse mixture of Arab forces. To the east, Joint Forces Command East (JFCE) was a division-sized mixture of Saudi, Kuwaiti, and Gulf Cooperation Council forces. U.S. Marine air naval gunfire liaison companies (ANGLICO) manned the outposts in the JFCE sector, and several U.S. Marines served as liaison personnel to Arab units.³⁸ These relatively lightly-equipped Marines depended far more on air for their combat power than did the heavier 3rd Army to the west.

The timing of the Iraqi attack at Khafji was ideal for the Coalition to bring the full weight of its airpower to bear on the Iraqi army. Two weeks of air strikes against Iraq had provided aircrews critical combat experience as well as sufficient time for TACC planners to optimize the intricate ATO planning cycle. Over twelve hundred Coalition strike aircraft were in the CENTCOM area of operations, with the vast majority within striking distance of the KTO (see Figure A-2).³⁹ Over one hundred Air Force A-10s at King Fahd Air Base could easily reached lucrative targets inside Kuwait, while sixty Marine AV-8B Harriers at King Abdul Aziz Naval Base and seventy-eight F/A-18 Hornets at Shaikh Isa Air Base were also well positioned to strike into Kuwait. Forty AH-1 Cobra gunship helicopters based at Jubayl Naval Airfield also provided Marines and Coalition forces near Khafji with critical close air support (CAS).⁴⁰ Six Naval carrier battle groups in the theater conducted nearly continuous flight operations. The *USS Midway* and *Roosevelt* offered a combined total of eighty-four strike aircraft from their close proximity in the Persian Gulf.⁴¹

Possible Motives for the Iraqi Attack

Because there is no single obvious explanation for the Iraqi attack, it is useful to explore a range of possible motives. Iraqi officials have rarely discussed openly their strategy during the war, but their occasional public statements about Khafji may offer insights into

³⁸ Atkinson, 201.

³⁹ Winnefeld, 290.

⁴⁰ John D. Parsons, Benjamin T. Regala, and Orman H. Paananen, *Marine Corps Desert Storm Reconstruction Report, Vol. IV: Third Marine Aircraft Wing Operations, CRM 91-229*, (U), (Alexandria, Va.: Center for Naval Analysis, 1992), 4-5. (Secret) Information extracted is unclassified.

⁴¹ Eliot A. Cohen et al., *GWAPS*, Vol. V, Pt. 1, *Statistics* (Washington, D.C.: Government Printing Office, 1993), 35, 42.

the Iraqi leaderships' thoughts. Also, various Gulf war participants and analysts who viewed the war from unique vantage points offer possible explanations. Finally, Iraqi prisoners of war (EPW) provide some insight into Iraqi motives. This section explores possible motives for the Iraqi attack at Khafji.

In an interview with an American journalist in November 1996, Iraqi Foreign Minister Tariq Aziz offered the following assessment of the Khafji battle:

Q: And Khafji..? I read that the purpose of the attack on Khafji was to take prisoners to use as hostages—true?

Aziz: No, the purpose was to have a direct contact with the other side on the ground. We were waiting for them to come but they came late when they inflicted on us a lot of casualties and especially in the civilian area, so it was an attack an offensive in which we tried to make what you call in Arabic—a touch you see between the two armies, but they avoided that.

Q: You wanted to see if you could inflict some casualties, a little like in Vietnam?

Aziz: Yes... but they withdrew from Khafji, it was almost vacant, they used the Air Force and we had to withdraw our tanks and people from there, otherwise they would be eliminated. There was no person to fight. Only a few Arabs and that was not significant to stay there to continue...

Aziz: ...You speak about the war. It was an air attack...

Q: Well there was a land war, it lasted three days, and took 80,000 prisoners.

Aziz: Yes, but that was after the preparations made by the air attack. It was not a conventional war, you see, between two armies.⁴²

These comments are in stark contrast with Saddam Hussein's pre-war prediction that, "The United States depends on the Air Force. The Air Force has never decided a war."⁴³ Aziz's comments seem to express the idea that Iraqis had been surprised by the

⁴² Tariq Aziz, Iraqi Foreign Minister, interviewed by Public Broadcasting System, 12 November 1996, n.p.; on-line, Internet, available from <http://www.pbs.org/wgbh/pages/frontline/gulf/oral/aziz/1.html>.

⁴³ Saddam Hussein, Iraqi President, interviewed by Dan Rather for CBS News, 29 August 1990. Quoted in Murray, 58.

effectiveness of the air attacks and that they wanted to initiate the ground war in hopes of fighting on a more equal footing.

Gulf War participants and authors have offered numerous assessments of Iraqi intent. These include:

- Michael R. Gordon and General Bernard E. Trainor, in *The General's War*, speculate that Iraq attempted to provoke the U.S. into a grinding war of attrition that would be politically unacceptable at home. With no incentive to initiate the ground war, ground operations would have to be thrust upon the Coalition. Iraq would draw the Coalition land force into a battle by attacking Khafji and then retreating to defensive positions in Iraq.⁴⁴
- Schwarzkopf believed that Khafji attack was a “propaganda ploy” designed to demonstrate Iraqi resolve in the face of Coalition bombing.⁴⁵
- Brig Gen Robert H. Scales, Jr., in his book *Certain Victory: The U.S. Army in the Gulf War*, concluded that the Khafji attack was simply “a division-level reconnaissance-in-force.” Saddam hoped to embarrass the Allies by inflicting casualties and then withdrawing to Iraq. Interestingly, Scales speculates that Saddam may have been lured into the attack by an elaborate deception effort orchestrated by the XVIII Airborne Corps. The deception attempted to convince the Iraqis that the XVIII Airborne Corps was not moving west, but instead preparing for an attack north into Kuwait.⁴⁶
- A recent Air War College study concluded that the Khafji attack was simply a large-scale raid to gather intelligence by capturing American POWs. The Iraqis had detected the massive movement by Coalition ground forces and needed further intelligence to assess the Coalition plans.⁴⁷

Enemy prisoner of war accounts also offer clues about Iraqi intent.⁴⁸ Some captured soldiers explained the overarching Iraqi strategy to defend Kuwait. According

⁴⁴ Gordon and Trainor, 269-70.

⁴⁵ Schwarzkopf, 424-25.

⁴⁶ Scales, 190.

⁴⁷ Lt Col Peter J. Palmer, "Battle of Khafji: A Gulf State Perspective," Research Report (Maxwell AFB, Ala.: Air War College, 1998), 5.

⁴⁸ While EPW reports sometimes provide detailed and useful information about the inner workings of the Iraqi military, information provided by prisoners must be carefully filtered. EPWs may have limited knowledge, as well as motives for passing false information. EPW reports generally remain classified, but

to these sources, Saddam mistakenly believed that he could defeat the Coalition by the same strategy used in the war with Iran. One senior Iraqi EPW claimed that “Iraq had decided to fight the Coalition the same way it had fought Iran.” This strategy entailed employing static defenses to slow the attacking force and then responding with a concentrated counterattack.⁴⁹ These statements support the hypothesis that Saddam embarked on the Khafji attack as a ploy to initiate the ground war.

Other EPWs suggest alternate motives. Several accounts describe the attack at Khafji as a botched attempt to capture prisoners. Within the first days of the air war, Saddam announced a reward of 10,000 dinar (\$20,000 dollars) for captured pilots, threatening to use them as human shields against Coalition attacks. Saddam appears to have placed a high value on the political benefits of prisoners, exploiting them as bargaining chips and morale-boosters for the Iraqi people.⁵⁰ If capturing prisoners was Saddam’s motive, he attacked in several locations to increase the likelihood of success.

The Iraqi Concept of Operation

In attempting to determine Iraqi strategic and operational intent at Khafji, one must also examine the hard evidence surrounding the battle. What did the marines at the various outposts actually see? What did pilots observe that might reveal Iraqi intentions? How did JSTARS depict the battle? How did the Iraqis maneuver their forces? By examining the evidence suggesting the size of the Iraqi force and the concept of operations, Iraqi intent may possibly be inferred.

The battle of Khafji is best understood by subdividing it into three nearly simultaneous Iraqi ground attacks with a concurrent air battle against Iraqi second-echelon forces. The three Iraqi probes occurred near OP-4, the Al Wafra Forest, and the deserted town of Khafji (See Fig A-3). The western Iraqi force attacked OP-4 at 2030 local time on 29 January. The marines of Task Force (TF) Shepherd, the 1st Marine Division screening force, responded to the incursion and through the thermal sights of

the newly declassified reports are regularly made available to the public. See *Gulflink*, on-line, Internet, available from <http://www.fas.org/irp/gulf/index.html>; For the best account of airpower’s contribution to the Gulf War from the perspective of EPWs, see Stephen T. Hosmer, *Effects of the Coalition Air Campaign Against Iraqi Ground Forces in the Gulf War, MR-305-Air Force* (U) (Santa Monica, Calif.: RAND, 1994). (Secret).

⁴⁹ Hosmer, 11. (Secret) Information extracted is unclassified.

their light armored vehicles (LAV), counted seventy-five Iraqi armored vehicles—one half of which were tanks.⁵¹ A standard Iraqi mechanized infantry battalion consists of thirty-nine infantry fighting vehicles (IFV), while an Iraqi armored battalion is equipped with thirty-five tanks and seven infantry fighting vehicles (IFV).⁵² The vehicle count at OP-4 suggests that the Iraqis attacked with an armor and mechanized task force of approximately two battalions. The following morning, I MEF intelligence assessed that the incursion at OP-4 was an attack by the 6th Armored Brigade of the 3rd Armor Division.⁵³

While the marines exchanged fire with the Iraqis at OP-4, the central Iraqi attacking force crossed the border at the Al Wafra Forest near OP-1 and OP-2. I MEF Intelligence concluded that the 26th Armored Brigade of the 5th Mechanized Infantry Division had concentrated in the Al Wafra forest and launched a company-sized attack against the Marine outposts.⁵⁴ Near Khafji, the eastern column moved south along the coast road and encountered little resistance. Initial Saudi reports suggested an Iraqi force of less than thirty armored vehicles, but its size grew with subsequent accounts. By the time the Saudis mounted their final counteroffensive on the morning of 31 January, they claimed to be facing the entire 15th Mechanized Brigade of the 5th Mechanized Infantry Division, a force of 1500 soldiers.⁵⁵ In sum, Marine intelligence and subsequent Saudi analyses generally agreed that each probe was a brigade-sized force including both tanks and mechanized infantry.

⁵⁰ Hosmer, 20. (Secret) Information extracted is unclassified.

⁵¹ The account of the battle at OP-4 has been described in detail by a TF Shepherd company commander. present. See Capt Roger L. Pollard, “The Battle for OP-4: Start of the Ground War,” *Marine Corps Gazette* 76, no. 3, March 1992. The 1st and 2nd Marine Divisions chose different organizational structures in Operation Desert Storm. The 1st Marine Division “task organized” into several multi-battalion task forces (TF), such as “TF Shepherd”, “TF Ripper”, etc. The 2nd Marine Division retained its traditional Marine regimental organization. See Appendix A.

⁵² National Training Center Handbook 100-91, *The Iraqi Army: Organization and Tactics*, 3 January 1991, 23-24.

⁵³ Minutes of I MEF Daily Command Briefing, 31 January 1991, A.M., U.S. Marine Corps Historical Center, Washington, D.C. [hereafter I MEF Briefing]

⁵⁴ Ibid.

⁵⁵ HRH General Khaled bin Sultan with Patrick Seale, *Desert Warrior: A Personal View of the Gulf War by the Joint Forces Commander* (New York: Harper Collins, 1995), 369, 373.

Despite its limited presence in the KTO prior to the Iraqi attack, JSTARS radar imagery indicated a possible Iraqi scheme of maneuver.⁵⁶ JSTARS detected vehicle movement on the night of 29 January that may have revealed elements of the Iraqi plan (See Figure B-3). Vehicle columns from the 3rd Armor Division appeared to move south toward Al Wafra, while vehicles from the 5th Mechanized Division traveled south along the coast road toward Khafji. To the west, armor from 1st Mechanized Division seemed to move southwest toward OP-6. On the following night (24 hours into the battle), JSTARS imagery portrayed a new pattern (See Figure B-4). While the general movement of Iraqi traffic remained north to south, fewer vehicle columns appeared to move through central Kuwait.⁵⁷ Although JSTARS imagery supports the assertion that Iraqi second-echelon forces were attempting to advance down the coast road toward Khafji, no such claim can be made toward OP-4 or Al Wafra.⁵⁸

In spite of the 30 January JSTARS data depicting vehicles moving toward Khafji, there is little evidence to suggest that the Iraqis moved significant numbers of artillery south to support the Khafji attack. In the days prior to Khafji, Lt Gen Walter E. Boomer, I MEF Commander, repeatedly inquired about the movement of Iraqi artillery, but I MEF intelligence did not detect artillery moving south.⁵⁹ Though the Marines failed to detect it prior to the battle, the Iraqis did move some artillery to support the incursion into Khafji. On 30 January, I MEF intelligence briefed that the “RPV [remotely piloted vehicle] noted that there was artillery moving into the area behind the first obstacle belt where it could deploy to range Khafji... This consisted of a 122mm, a D-30, and a D-

⁵⁶ JSTARS' employment in Operation Desert Storm must be viewed within the context of its embryonic stage as a USAF surveillance platform. The aircraft was six years away from its initial operations capability. There was no detailed concept of operations for its employment. During the battle of Khafji itself, JSTARS transitioned from the role of intelligence gathering to actually directing aircraft onto targets. For a thorough analysis of JSTARS' role in the Battle of Khafji, see *Joint Stars Data Analysis of "The Battle of Khafji," Final Report* (Washington D.C.: Air Force Studies and Analysis Agency, May 1997).

⁵⁷ *Joint Stars Data Analysis of "The Battle of Khafji," Final Report* (Washington D.C.: Air Force Studies and Analysis Agency, May 1997) [hereafter *JSTARS Final Report*], 44-48.

⁵⁸ Lacking other hard evidence of Iraqi force movements, researchers must guard against extrapolating too much information from the brief glimpses of the KTO during the nights of 29-30 January. Lacking any clear picture of ground movement, JSTARS' simple portrayal of lines of communication (LOC) toward Khafji leads one to the compelling conclusion that Khafji was the only important objective. Possibly, movement on the coast road toward Khafji reflects that Iraqi units were in possession of the town of Khafji, where as the other probes were repulsed. Undoubtedly, the picture of vehicle movement was much more complicated than the JSTARS picture reveals; this is especially true on 30 January, when the full air interdiction effort was underway.

⁵⁹I MEF Briefing, 30 January 1991, A.M.

121.”⁶⁰ I MEF intelligence later detected movement of Frog missiles on the coastal road; but there were no subsequent sightings and apparently they were not employed in the battle.⁶¹ During the entire three-day incursion, the Iraqis used artillery sparingly. I MEF accounts of the battle do not mention artillery, though the Saudis reported Iraqi artillery and multiple-launch rocket system (MLRS) fire as they counterattacked into the town of Khafji.⁶² In sum, there is little evidence to suggest a large buildup of artillery in the southern Kuwait.

In the days leading up to the Khafji attack, the Iraqis appeared to construct additional defensive positions in front of their second-echelon forces. On 26 January, JSTARS imagery detected parallel lines of vehicle movement near the “elbow” region, possibly indicating the preparation of defensive positions (see Figure B-1). These defenses may simply have been a response to the Iraqi army’s perception of vulnerability near the “elbow”. Deployed within twenty miles of Kuwait City, a determined Coalition thrust northeast from the elbow could have cut off six Iraqi divisions in southern Kuwait. The following day, JSTARS data revealed a large arc formed by a series of erratic movements in central Kuwait (See Figure B-2). This appeared to be earthmoving equipment constructing a new defensive line.⁶³ Whether these defensive preparations foreshadowed Iraqi plans is debatable, but they did reveal that at least some Iraqi units were focused on defensive, not offensive action.

While the Iraqi scheme of maneuver at Khafji remains a mystery, accumulated evidence allows some inferences to be drawn. First, there is little doubt that the plan was a coordinated effort by several Iraqi divisions including 3rd Armor, 5th Mechanized Infantry, possibly 1st Mechanized Infantry, and Iraqi Special Forces. The Iraqis conducted determined attacks at three distinct locations in southern Kuwait, *but evidence substantiating the existence of substantial second-echelon forces is inconclusive.*⁶⁴ The

⁶⁰ Ibid.

⁶¹ I MEF Briefing, 31 January 1991, A.M.

⁶² Khaled, 385.

⁶³ *JSTARS Final Report*, 32, 36.

⁶⁴ The GWAPS database includes numerous pilot reports of vehicle movements, but the data is insufficient to identify a coherent vehicle movement pattern. There several explanations for this. First, the GWAPS database is incomplete. Second, short sortie duration (with the exception of Marine OV-10s) hindered pilots from gaining sufficient situational awareness to determine the Iraqi scheme of maneuver. In other words, individual pilot reports were snapshots of the battlefield at a given time. Finally, reports of vehicles do not necessarily reflect the movement of second-echelon forces. Iraq supported (marginally) twenty-

body of evidence points to Khafji as the attack's true objective. The ease with which the Iraqis seized Khafji masked their actual determination to obtain it. Unlike Al Wafra and OP-4, the Iraqis supported the armored thrust into Khafji with artillery and special forces.

The I MEF intelligence briefing on 31 January provided the best unclassified account of the Iraqi units involved in the attack. They were:

OP-4:	6 th Armored Bde of the 3 rd Armor
Al Wafra	26 th Armored Bde of the 5 th Mech
Khafji	20 th Mech Bde of the 5 th Mech ⁶⁵

Lessons from the Iran-Iraq War

To determine Iraqi intentions in the Khafji attack, it is also useful to examine Iraqi military experience and strategy in the Iran-Iraq War.⁶⁶ By 1984, the introduction of Soviet military hardware allowed the Iraqis to adopt a strategy of mobile defense. Soviet armor gave the Iraqis a highly mobile reserve force to respond to Iranian attacks. Once the Iranians had penetrated the front lines and committed their reserves to the breakthrough, Iraqi artillery and airpower pinned the Iranian forces in place while concentrated armor and mechanized attacks destroyed the Iranian force.⁶⁷ To prepare for such a defense, the Iraqis placed relatively static infantry divisions on the front lines to channel a breakthrough and prepared defensive positions to achieve interlocking fields of fire. These tactics allowed the outnumbered Iraqis to defend effectively against the numerically superior Iranian forces.⁶⁸

By examining Iraqi offensives in the Iran-Iraq War, one can make some general observations about how the Iraqis might conduct an attack during the Gulf War. As the Iraqis gained the initiative in 1988, a series of corps-sized offenses revealed a pattern.

seven front-line divisions, each requiring some logistical support. In summary, any conclusions drawn from GWAPS-compiled pilot reports are extremely speculative.

⁶⁵ I MEF Briefing, 31 January 1991, P.M.; HRH General Khaled bin Sultan disputes this account slightly. He argues that the Iraqi 15th Mechanized Brigade attacked at Khafji, instead of the Iraqi 20th Mechanized Brigade. See Khaled, 369.

⁶⁶ A thorough analysis of the Iraqi military's role in the Iran-Iraq war is beyond the scope of this paper. For a detailed examination of Iraqi military strategy and tactics in the Iran-Iraq war, see Anthony H. Cordesman and Abraham R. Wagner, *The Lessons of Modern War, Vol. II, The Iran-Iraq War*. (Boulder, Colo.: Westview Press, 1990).

⁶⁷ David Segal, "The Iran-Iraq War: A Military Analysis," *Foreign Affairs* 66, no. 5 (Summer 1988): 956-57.

Regular army corps (1st, 3rd, 4th, or 7th) typically spearheaded Iraqi attacks, which were then exploited by Republican Guard divisions.⁶⁹ Using this strategy, on 24 May, the Iraqi 3rd Corps and the Republican Guards conducted a joint offensive, seizing terrain south of Fish Lake in Southern Iraq. On 25 June, 3rd Corps and the Republican Guards executed a decisive attack, recapturing the Majoon Islands following an eight-hour battle. The events of 1988 demonstrated that Iraq possessed the will and capability to mount effective offensive operations. It also provided the Iraqi leadership a blueprint for a successful offensive—an attack by 3rd Corps exploited by the Republican Guards.⁷⁰

In August 1990, the Strategic Studies Institute of the U.S. Army War College analyzed the Iran-Iraq War to predict Saddam's military strategy in the upcoming Gulf War.⁷¹ The authors concluded that an Iraqi attack will have the following characteristics:

- An attack will be preceded by a deception operation, usually conveying the inaccurate movement of artillery and unit headquarters.
- Movement of reserves should be visible, but the build-up will be brief
- Units will rehearse extensively if able, and will move directly into attack positions from their training areas.
- The attack will occur between midnight and 3:00 AM, tending toward the latter.
- Very heavy artillery preparation will precede an attack. This may include conventional or chemical munitions and long-range multiple rocket fires in order to isolate the battlefield.⁷²

The attack at Khafji lacked many of these characteristics. There are no indications in unclassified sources of a deception effort, unless attacks along the border were intended to deceive the Coalition into believing a major attack would occur at a place other than Khafji. Whether significant reserves were moved south is unclear, partly

⁶⁸ Ibid.

⁶⁹ Richard Jupa and Jim Dingeman, "How Iran lost/Iraq Won the Gulf," *Strategy & Tactics*, no. 133, (March-April 1990): 53-55.

⁷⁰ Ibid.

⁷¹ This work provided U.S. soldiers a timely analysis of Iraqi military characteristics and doctrine to help them prepare for their inevitable combat with the Iraqis. See Stephen C. Pelletiere and Douglas V. Johnson II, *Lessons Learned: The Iran-Iraq War* (Carlisle Barracks, Penn.: Strategic Studies Institute, U.S. Army War College, 1991).

⁷² Ibid., 104-05.

because airpower disrupted Iraqi second-echelon movement once the battle began. The Iraqis chose to attack at night, although earlier than predicted. Is the timing of the attack significant? If the operation was intended to move into and out of Khafji before daylight, then an attack soon after dark was required. Finally, there was no artillery preparation prior to the attack. If the Iraqis intended for Khafji to be major offensive, then the absence of artillery must be explained. By comparing observed Iraqi behavior at Khafji with Iraqi doctrine and experiences, some conclusions can be drawn about Iraqi intentions.

Conclusions: What was the Iraqi Intent ?

At this time, there is insufficient evidence at the unclassified level to determine Iraqi intent definitively. One must be wary of attempting to “get inside the head” of Saddam Hussein and speculate about his decision-making. While Saddam undoubtedly made rational decisions (from his perspective), imposing an American perspective on his dilemma may lead to false conclusions. For example, how would Saddam assess the value of an Iraqi army corps versus his personal honor? Would he allow the corps to be decimated to avoid even the hint of personal disgrace? Western analysts simply cannot interject themselves into the mind of Saddam Hussein. Nevertheless, the available evidence points toward some tentative conclusions about Iraqi intentions at Khafji.

After two weeks of continuous pounding from the air, Saddam concluded he must change strategies to avoid complete decimation of his army. His air force was incapacitated, and his prized air defense system was blind and ineffective. As a result, he had no defense against the air onslaught. One can reasonably assume that Saddam believed his own words when he predicted that the U.S. Air Force would not decide this war. Tariq Aziz’s comments seem to indicate, however, that as the war progressed, Saddam came to the conclusion that airpower indeed could determine the outcome of the war. With this new realization, Saddam altered his strategy.

Given this progressive destruction of his military forces from the air, perhaps Saddam reasoned that initiating the ground war would put Iraq on a more equal footing with the Coalition forces. He had prepared for the defense of Kuwait, so he concluded that a defensive fight would be to his advantage. During the war with Iran, Saddam was

not forced to provoke offensives. Because the Coalition seemed to be in no hurry to initiate the ground war, Saddam would have force its hand.

The coordinated attack on Khafji and border of southern Kuwait was likely an attempt to engage Coalition land forces and begin the ground war. The attacking forces intended to inflict casualties and take prisoners. Saddam hoped that Coalition forces would counterattack along the entire width of the KTO and push north. The placement of defensive belts throughout the KTO supports this conclusion. Lacking clear evidence of the commitment of second-echelon forces, one may conclude that the Khafji attack was not intended to be deep or sustained.

Why did the Iraqis choose Khafji for the attack? Very simply, they believed that their best chance for a successful defense lay in Kuwait. First, Iraqi forces in Kuwait faced a comparatively light force of U.S. Marines and Arab forces. The 1st Mechanized Division was likely tasked with protecting the right flank of Iraqi forces in Southern Kuwait while the 3rd Armor Division and the 5th Mechanized Division conducted an attrition-oriented delaying action against the Coalition. Saddam may have speculated that he would relinquish southern Kuwait, but in the process he would inflict significant casualties on U.S. forces. By forcing these events, he calculated that American will might dissolve. But as the battle unfolded, Schwarzkopf and Horner proved unwilling to cede the initiative to Saddam. And the results were vastly different from the Iraqi leader's intent.

Chapter 3:

The Battle's Outcome

Whatever his true intentions, Saddam Hussein executed his Khafji battle plan on 29 January. CENTCOM Intelligence officers believed that Saddam himself traveled to Basra just days before the battle to review the plan personally with his generals.⁷³ In spite of this detailed planning and high-level interest, the Iraqis quickly lost control of the battle, which ended in a rout. This section analyzes the actual events at Khafji to determine the overall effectiveness of the Coalition defense. First, the battle's chronology will be explored, focusing on ground actions and the battle's final outcome. Next, the Coalition's effectiveness will be determined by comparing Iraqi intent with the battle's actual outcome.

A Battle Chronology

Although the ground war would not begin for weeks, the border region separating the Coalition forces from the Iraqis was anything but quiet in the days leading up to Khafji. After the air war began on 17 January, the 1st Marine Division regularly probed the Iraqi front-line forces with "roving gun" artillery raids designed to provoke counter-fire. The Iraqis, now pinpointed by their return fire, were easy targets for Marine OV-10s, which directed air strikes and artillery onto the exposed Iraqis.⁷⁴ Army psychological operations teams attached to the Marines aimed high-power speaker systems toward Iraq, broadcasting deafening rock music interrupted occasionally with

⁷³ Gordon and Trainor, 269.

⁷⁴ George Akst and Lt Cmdr Kevin J. Becker, *Marine Corps Desert Storm Reconstruction Report Vol II: Ground Force Operations* (U), (Center for Naval Analyses, October 1991), 27. (Secret) Information extracted is unclassified.

calls for the Iraqi troops to lay down their arms.⁷⁵ Along the border near Khafji, Iraqi artillery batteries occasionally slipped south to launch surprise rocket attacks toward the Marine outposts.⁷⁶ Marine forward air controllers (FAC) easily spotted the exposed batteries, marking them with white phosphorous rockets for awaiting A-10s and AV-8s. On 27 January, the Marines conducted a large raid, sending the 2nd LAI Battalion, together with the artillery and a multiple-launch rocket system (MLRS) battery from the 2nd Marine Division, north to strike an Iraqi logistics site and a truck park in Kuwait.⁷⁷ As the Marines increased their harassment of the front-line Iraqi units, some warning signs forecast the coming Iraqi attack.

During the week preceding the attack, several intelligence reports alerted the Marines to unusual Iraqi activity. On 22 January, Marine intelligence noted a JSTARS report of 320 vehicles massed in the Al Wafra oilfields, just ten miles from the Saudi border.⁷⁸ The same day, the Iraqis raided a small Saudi observation post in the Saudi-Iraqi neutral zone, seizing the reconnaissance team assigned to it—the first report of such an attack.⁷⁹ On 25 January, the CIA reported that a human intelligence source was warning of an impending Iraqi attack into Saudi Arabia.⁸⁰ That report, in conjunction with the increased Iraqi activity, alerted the Marines to the increased threat. “I’ve talked to 1st Division about that [threat],” remarked Boomer. “Call the 2nd, just to give Bill [Maj Gen William Keys, 2nd Division Commander] a heads-up there’s some sort of strange things happening. Just be alert.” Boomer’s “heads-up” to the 2nd Marine Division arrived just in time.⁸¹

The battle of Khafji began at 2030 on 29 January when a Marine reconnaissance platoon monitoring the border at OP-4 spotted thirty-five Iraqi armored vehicles closing on its position (See Figure A-3). Task Force (TF) Shepherd, the 1st Marine Division’s

⁷⁵ Atkinson, 199.

⁷⁶ Atkinson, 201.

⁷⁷ Akst and Becker, 27.

⁷⁸ I MEF Briefing , 22 January 1991, A.M.

⁷⁹ Ibid.

⁸⁰ I MEF Briefing , 25 January 1991, A.M.

⁸¹ Ibid.; Gordon and Trainor accuse the Marines of ignoring the increased Iraqi activity, which consequently left them unprepared for the surprise attack. While the undetected movement of Iraqi armor to the border does raise questions about the quality of intelligence that the Marines were receiving, Boomer was clearly alert to the unusual activity reported during his twice daily briefs. See I MEF Briefings, 22-29 January 1991.

light armored infantry (LAI) battalion screening along the Saudi border, closed to engage the Iraqi mechanized task force composed of a T-62 tank battalion reinforced by BMP-2s and BTR-60s.⁸² Boomer had previously warned the LAI battalions, equipped with Canadian-made light armored vehicles (LAV), not to exchange fire with Iraqi tanks; nevertheless, TF Shepherd moved forward to cover the withdrawal of the besieged reconnaissance platoon and promptly destroyed the first of several Iraqi tanks.⁸³ A number of TF Shepherd's LAVs were equipped with thermal targeting sights, which gave the Marines a distinct advantage in the dark but open desert. Nevertheless, the Marines depended upon on CAS against enemy armor, primarily from Cobra helicopters and AV-8B Harriers. Outnumbered and outgunned, TF Shepherd requested close air support.

At the Tactical Air Control Center (TACC) in Riyadh, the battle staff initially failed to grasp the size and scope of the Iraqi attack. Reports of Iraqi border crossings near Khafji often reached the TACC one hour after the event.⁸⁴ The confused and incomplete information reaching the TACC led Horner to doubt the accuracy of reports claiming that Iraqi tank columns were moving into Kuwait.⁸⁵ By 2300, an AC-130 gunship, two F-15Es, two F-16CGs and four A-10s arrived on station and engaged targets designated by Marine FACs in OV-10s.⁸⁶ Marine AH-1 Cobra gunships engaged Iraqi tanks with TOW missiles, destroying four.⁸⁷

The Marines concluded that airpower reversed the momentum of the attack. "The enemy began to disperse, attempting to flee the battleground," observed Capt Roger Pollard, a Marine LAV company commander. "The air missions were breaking their attack."⁸⁸ TF Shepherd and the airborne FACs continued to direct air strikes onto Iraqi vehicles until the disorganized remnants of the attacking force retreated back across the

⁸² Pollard, 48-49.

⁸³ Ibid., 49; Lt Gen Walter E. Boomer, USMC, COMMARCENT, interviewed by PBS Frontline; on-line, Internet, available from <http://www2.pbs.org/wgbh/pages/frontlin/gulf/oral/Boomer.html>.

⁸⁴ A comparison of 1st Marine Division and 2nd Marine Division logs with declassified TACC notes indicates a significant delay before key events of the unfolding battle reached the TACC.

⁸⁵ TACC Liaison Officer Log (U), entry for 29/1845L January 1991. Air Force Historical Research Agency, [hereafter TACC Log]. (Secret) Information extracted is unclassified; TACC NCO Log (U), TSgt Hosterman's Notes, entry for 29/1931Z, January 1991. Air Force Historical Research Agency, [hereafter Hosterman Notes]. (Secret) Information extracted is unclassified.

⁸⁶ Perry D. Jamieson, *Lucrative targets: The Air Force and the Kuwaiti Theater of Operations* (U), (Washington D.C.: Air Force History Support Office, 1997), 163. (Secret) Information extracted is unclassified.

⁸⁷ Atkinson, 207.

border by morning. Daylight revealed the extent of the Iraqi defeat. Twenty-two abandoned tanks and vehicles burned across the battlefield.⁸⁹

As the outnumbered marines of TF Shepherd battled to contain the Iraqi incursion, two incidents of fratricide illustrated the confusion inherent with airland battle at night. In the first instance, a LAV gunner mistook a sister platoon's LAV for a T-55 tank and engaged it with a TOW missile. The TOW scored a direct hit on the Marine vehicle, killing the crew of four.⁹⁰ It would not be the only friendly fire tragedy of the battle.

For A-10 pilots, the KTO was the perfectly suited for killing tanks. The flat, open terrain of southern Kuwait offered no sanctuary for Iraqi armor, and the air superiority enjoyed by the Coalition air forces allowed the usually vulnerable attack fighter to roam freely in search of targets. The A-10's primary limitation was its inability to locate targets at night. Lacking an internal night sensor, the A-10 relied on the thermal seeker of its Maverick missile to acquire targets. Relying on FACs to identify targets at night, A-10 pilots released flares to serve as a common reference point between themselves and the FAC.⁹¹ On this night at OP-4, the A-10s were achieving limited success with this technique, at one point forcing a marine to bury an errant flare dropped behind friendly LAVs. At 2148, an A-10 under FAC direction acquired a heat source and fired a Maverick. Instead of tracking to the target, the missile nosed down and struck the ground directly behind a LAV, killing seven marines.⁹² This second incident raised the total number of Marine fratricide deaths to eleven. While the first engagement with Iraqi forces occurred near OP-4, it would not be the only outpost encountering the enemy that night.

The Iraqi central force attacked near of the Al Wafra forest soon after the initial incursion at OP-4. The 2nd LAI Battalion, screening the Kuwaiti border in the event of such an attack, moved forward to meet the battalion-size Iraqi task force. The 2nd Saudi Arabian National Guard (SANG) positioned a battalion screening force along the border

⁸⁸ Pollard, 50.

⁸⁹ Jamieson, 163. (Secret) Information extracted is unclassified.

⁹⁰ Atkinson, 200-01.

⁹¹ Ibid., 206.

⁹² Pollard, 50; Eliot A. Cohen et al., *GWAPS*, Vol. II, Pt. 2, *Effectiveness* (Washington, D.C.: Government Printing Office, 1993), 237.

to the east of the Marines, though coordination between the two forces was minimal. As such, when the twenty-nine Iraqi tanks attacked at 2100, the Marines arrayed their LAVs to provide defensive cover both north and east, correctly anticipating that the SANG would retreat at the first sight of Iraqi armor.⁹³ As Iraqi and Marine forces exchanged fire in the darkness, the TACC battle staff struggled to grasp events in the KTO. After numerous conflicting reports failed to provide the TACC staff a coherent picture of the battle, Horner directed the JSTARS to “look that way”—the first use of JSTARS as the real-time “eyes” for the JFACC and TACC.⁹⁴ By 2300, Air Force A-10s and F-16CGs joined several flights of Marine fixed-wing aircraft and helicopters engaging the Iraqis near the Al Wafra. By the morning, LAVs and close air support repulsed the attack, forcing a general Iraqi retreat north to the relative safety of the Al Wafra forest.⁹⁵ Thoroughly battered from their ill-fated probe at Al Wafra, the Iraqis found success to the east in the coastal town of Khafji.

The first contact between Coalition forces and the Iraqis moving toward Khafji occurred not on the coast road, but in the Persian Gulf as seventeen small patrol boats attempted to insert Iraqi special forces teams south of the town.⁹⁶ CENTCOM intelligence had received reports concerning the launching of Iraqi amphibious vessels, but made no connection between them and the attack on Khafji.⁹⁷ Supported by Iraqi TNC 45 patrol boats armed with Exocet missiles, the Iraqi operation provoked a lethal response from the British and U.S. navies, both eager for a naval engagement. U.S. Navy A-6s and F/A-18s attacked the Iraqi boats with precision munitions, while Royal Navy helicopters engaged with Sea Skua missiles. The combined naval response devastated the Iraqi amphibious assault, disabling eleven boats and ensuring that there would be no supporting amphibious attack at Khafji.⁹⁸

In spite of the Iraqi Navy’s dismal performance at Khafji, the Iraqi ground forces encountered little resistance as they attacked south into the coastal town. Timing its

⁹³ 2nd Marine Division Log, entry for 29/2125 January 1991. U.S. Marine Corps Historical Center, Washington D.C.

⁹⁴ Hosterman Notes (U), entry for 29/1931Z, January 1991. (Secret) Information extracted is unclassified.

⁹⁵ Jamieson (U), 165. (Secret) Information extracted is unclassified.

⁹⁶ CENTCOM TACC Briefing (U), 30 January 1991, 1930 hrs. Air Force Historical Research Agency. (Secret) Information extracted is unclassified.

⁹⁷ Gordon and Trainor, 276, 279.

⁹⁸ Murray, 253-54.

attack with that of the central column at Al Wafra, an Iraqi armored column completely surprised the Marine Air Naval Gunfire Liaison Company (ANGLICO) team on the border at OP-8. Barely avoiding capture, the marines sounded the alarm and retreated south toward Khafji. The SANG battalion assigned to delay an Iraqi attack also fled south at the first sight of the enemy, allowing the Iraqis simply to drive down the four-lane highway into the city. Two U.S. Marine reconnaissance teams were so surprised by the Iraqi attack that they became intermixed with the Iraqi force and determined that their escape route south was severed. Lightly armed but equipped with a radio, the marines hid on a rooftop, directing artillery and air strikes onto Iraq armor in the city.

The Iraqis' relatively uncontested entry into Khafji contrasted sharply with their failures at Al Wafra and OP-4. Lt Gen Prince Khalid Bin Sultan al-saud, Joint Force Commander, criticized the TACC and the Marines for failing to honor an agreement to provide the defending Saudi forces with close air support, but the SANG battalion screening force shares much of the blame for the Iraqi success.⁹⁹ In the two western attacks, the Marine screening force accomplished two functions that proved critical to airpower's effective employment: 1) the Marines forced the TACC to respond by reporting the incursions and repeatedly requesting CAS; 2) they delayed the attacking force, providing critical time for the TACC to respond. With no ground force present to accomplish these tasks, the eastern Iraqi column drove untouched into Khafji.¹⁰⁰

By 2200, Horner and his TACC director, Brig Gen Buster Glosson, began to grasp the magnitude of the Khafji attack. JSTARS detected numerous vehicles moving south along the coast road toward Khafji. Horner directed A-10s and an AC-130 gunship to the coast to interdict the advancing columns.¹⁰¹ For the remainder of the night, a AC-

⁹⁹ Khalid, 365-66.

¹⁰⁰ The Iraqis' uncontested seizure of Khafji supports the argument that the absence of ground forces reduced airpower's effectiveness. Airmen generally contend that the presence of friendly troops complicates their attack on enemy armor. At Khafji, one can argue that the Marines were a hindrance for two reasons. First, the Marines asked for the FSCL to be moved five miles north of the political border, apparently without regard for the effects of such a FSCL placement. As a result, the five mile buffer forced every strike aircraft to use a FAC for target assignment--significantly reducing airpower's efficiency. Second, the fear of fratricide surely caused night-limited A-10s to engage targets timidly, further reducing their effectiveness. In sum, the Marines presence at Al Wafra and OP-4 forced the air forces to use CAS command and control procedures instead of the more streamlined interdiction procedures. See Lt Col David Deptula, USAF, Chief of CENTAF Strategy Division during Desert Storm, interviewed by Major Daniel R. Clevenger at Eglin AFB, 18 June 1996.

¹⁰¹ Hosterman Notes, entry for 29/2222L January 1991. (Secret) Information extracted is unclassified.

130 struck Iraqi vehicles moving along the coast road. The lumbering gunship, vulnerable to Iraqi surface-to-air missiles (SAM), minimized its exposure by sprinting into the threat area from the safety of the Persian Gulf, and retreating before Iraqi air defense units could respond.¹⁰² Flights of A-10s, using their Maverick missile seeker heads, attacked southbound columns of Iraqi tanks.¹⁰³ By daylight, the Iraqis in Khafji were isolated from their reinforcements. But they still occupied the town.

Schwarzkopf downplayed the seizure of Khafji. King Fahd, however, considered the seizure of Saudi territory a challenge to his honor and ordered that Khafji be retaken at once, even for the price of leveling the town.¹⁰⁴ While Schwarzkopf was able to dissuade the Saudis from destroying Khafji in order to liberate it, he could not convince them to delay a counterattack until a coordinated military operation was planned. As a result, the Saudis' attempts to retake Khafji led the Marines to question the military competence of their Coalition partners. Monitoring the unfolding battle from his field headquarters, Boomer asked rhetorically, "*This* is the outfit that's going to conduct the breach attack on our flank?"¹⁰⁵

Just after midnight on 31 January, a SANG mechanized infantry battalion, accompanied by a Qatari tank company, drove north into Khafji in a hastily-planned operation to free the trapped U.S. Marines and recapture Khafji. The U.S. Marine liaison personnel, convinced that the counterattack plan was insufficiently developed, urged the Saudis to delay the attack until fire support and CAS could be coordinated. The Saudis, however, chose to accept the risks involved with executing a half-planned attack over the possibility of offending the Crown Prince. The plan called for the Qatari tank force to lead Saudi armored personnel carriers (APC) into the town from the south. Nevertheless, as the disorganized column moved to attack, the Saudis charged ahead of the Qataris, exposing their vulnerable APCs to awaiting Iraqi soldiers equipped with anti-armor

¹⁰² The AC-130 gunships applied Vietnam-era tactics to defend themselves against SAMs and AAA. For example, gunships made no more than three orbits over a threat area before egressing. Gunship crews abided by a second cardinal rule: "Don't duel AAA." In other words, the gunship engaged AAA only if its destruction was required to engage a nearby target. See Maj Paul Havel, USAF, AC-130 gunship pilot, interviewed by Maj Daniel Clevenger, AFSAA; Jamieson, 167. (Secret) Information extracted is unclassified.

¹⁰³ Capt Rob Givens, USAF, A-10 pilot, interview by Maj Daniel Clevenger, AFSAA.

¹⁰⁴ Atkinson, 212; Khalid, 376; Schwarzkopf, 425-26.

¹⁰⁵ Atkinson, 211.

weapons.¹⁰⁶ After several hours of fighting throughout the streets of Khafji, the Iraqis disabled ten Saudi APCs and forced a humiliating retreat.¹⁰⁷ The Saudis regrouped south of Khafji to plan a more effective counterattack.

Finally recognizing the need to integrate airpower and artillery with their ground forces, the Saudis executed a coordinated operation on the following morning. Maneuvering armor and artillery north of Khafji to block Iraqi reinforcements, the Saudis under the cover of Marine Cobras, pushed north and recaptured Khafji. Marine ANGLICOs cycled Cobras against Iraqi forces in Khafji throughout the day, sometimes directing them to land for face-to-face situation updates. The close-in urban fighting was ideal for the Cobras' TOW missiles, which did not require a laser designation from a FAC.¹⁰⁸ With abundant CAS to support the attack, the Saudis quickly routed the disorganized Iraqi force. By 1100, the remaining Iraqis retreated north to Kuwait or surrendered to the Saudis. Seven Iraqi tanks and eleven APCs lay burning in the streets.¹⁰⁹ Prisoner counts varied widely, with the Saudis claiming an amazing 463 Iraqis captured.¹¹⁰ Although by any count the Iraqis were soundly defeated in Khafji, they scored one victory in the air on the final morning.

The air war's largest single Coalition loss occurred on the morning of 31 January when an Iraqi shoulder-fired SAM struck an AC-130 gunship, sending it plunging into the Persian Gulf. Spirit 03, the last of three AC-130s scheduled for the night, had completed a successful interdiction mission along the coastal road in southern Kuwait, when the sensor operator detected an Iraqi Frog missile battery moving toward Khafji. As the AC-130 extended its mission to engage the lucrative target, an alert AWACs crew warned the gunship of the approaching daylight and ordered it to depart. At 0635, after the AWACs' second query to depart, the gunship made its last transmission—a "Mayday" call. Fourteen Air Force special operations airmen were killed. The gunship's loss cast a cloud over a significant Coalition victory.

¹⁰⁶ Gordon and Trainor, 281-82.

¹⁰⁷ Khalid, 379; Atkinson, 209.

¹⁰⁸ Maj Jim Braden, USMC, ANGLICO attached to 2nd SANG, interviewed by Maj Daniel R. Clevenger, AFSAA,

¹⁰⁹ Gordon and Trainor, 284.

¹¹⁰ Khalid, 387.

By the afternoon of 31 January, organized Iraqi resistance in Khafji ended, and their remaining forces fled north to escape the continuous pounding from the air. Coalition pilots observed the disorganized Iraqi armor columns retreating north—virtually defenseless against the relentless air strikes. Two A-10 pilots recalled engaging a column of twenty to thirty vehicles, resulting in “a couple of miles of road on fire with vehicle hulks.”¹¹¹ Iraqi soldiers stranded in Khafji surrendered en masse, sometimes overwhelming Coalition soldiers. “We got at least five hundred prisoners and probably close to nine hundred prisoners..., observed Marine Major Jim Braden, a 2d SANG liaison officer. “And initially some of them were surrendering to some of our four-man ANGLICO teams”.¹¹²

Back in Riyadh, Schwarzkopf monitored intelligence reports that Coalition forces were progressively destroying the Iraqi 5th Mechanized Division. A final intelligence summary concluded that only twenty percent of the division, one of Iraq’s best armored units, escaped intact.¹¹³ While destruction of Iraqi armor continued for the next two days, some of the operational effects of the victory at Khafji were immediately recognized.

The Operational Effects at Khafji

The course of the Gulf War was permanently altered by the events at Khafji. Iraq never attempted a subsequent ground offensive, nor did it try to move armored units in large groups—even at night. However, the effects of Khafji on the direction of the Gulf War lay more in the *psyche* of the two sides than in any physical alteration of the battlefield. Each discovered the true extent of its enemy’s capabilities, both in skill and fighting spirit¹¹⁴. The Saudis discovered that they could fight and win; the Iraqis shattered that same myth about their own military force. Finally, the Coalition passed its first ground operation test, and received some indications about how its forces would work together. By comparing these outcomes with the original Iraqi intentions developed

¹¹¹ Givens interview.

¹¹² Braden interview.

¹¹³ Schwarzkopf, 426.

¹¹⁴ Following Khafji, the Marine leadership clearly questioned the Iraqi army’s capabilities. The CENTCOM staff, however, apparently failed to grasp how Khafji invalidated a basic assumption of the Coalition’s “left hook” strategy—that the Iraqis were sufficiently capable to avoid being routed by the Coalition supporting effort in the KTO. Again, see Gordon and Trainor, 276.

in the preceding chapter, one can make some conclusions about the Coalitions effectiveness.

Saddam Hussein failed to accomplish what was probably his primary objective at Khafji: precipitate the ground war. Iraqi defensive preparations in central Kuwait suggested that Saddam was convinced that his Khafji attack would spark a significant Coalition counteroffensive. However, no Coalition leader advocated such an operation. Some recognized Saddam's intentions immediately, and urged a cautious response. Lt Col Dave Deptula, Director of the Planning Cell in the TACC, listened as Horner and Glosson discussed possible Coalition responses to the Khafji attack. Sensing a chance to influence the debate, Deptula slipped Glosson a note that read, "They're trying to suck us into a ground war...Let's not fall for it."¹¹⁵ Schwarzkopf too was determined to not let the incursion drag him prematurely into a ground war. Intent on retaining the initiative, the CINC continued with his plan to move the 3rd Army westward, and directed that Marines and airpower alone halt the attack.¹¹⁶ By not allowing Khafji to begin the ground war, Schwarzkopf frustrated Saddam's strategic gamble to precipitate Coalition casualties.

Khafji also shattered the myth that American resolve would crumble in the face of casualties. Prior to Khafji, two weeks of intense air warfare had not produced the predicted losses of men and aircraft. Schwarzkopf undoubtedly anticipated the day when the shock of American deaths would test the public's support for the war. Khafji was that test. Not only were twenty-five marines and airmen killed in three days of fighting, but eleven marines fell victim to friendly fire—a serious problem magnified by the increased lethality and standoff ranges of the modern weapons. Nevertheless, U.S. soldiers continued to fight bravely, and the American public accepted the deaths as a consequence of their commitment to force Saddam from Kuwait.¹¹⁷

¹¹⁵ Deptula interview.

¹¹⁶ Maj Gen Thomas Olsen, USAF (Ret), Deputy CENTAF Commander during Desert Storm, interviewed by Maj Daniel R. Clevenger, AFSAA, 13 May 1996.; Grant, 31.

¹¹⁷ Despite claims that Americans are extremely averse to military casualties, evidence suggests that American's acceptance of casualties varies greatly with the perceived importance of the political objectives being pursued. See Eric V. Larson, *Casualties and Consensus: The Historic Role of Casualties in Domestic Support for U.S. Military Operations* (Santa Monica, Calif.: RAND, 1996); Americans were strongly committed to the Bush Administration's policy of expelling Iraq from Kuwait. In January 1991, Bush's approval rating stood at 84% (comparable to Franklin Roosevelt after Pearl Harbor), while half of

Apparently Saddam also desired to undermine U.S. resolve by taking American prisoners to demonstrate Iraq's military might. The Iraqis were much closer to realizing this goal than they may have known. While TF Shepherd and the 2d LAI screening forces competently met the western attacks and allowed the reconnaissance platoons along the border to retreat, the ANGLICOs at OP-8 received no such timely orders. The two reconnaissance teams trapped in the town of Khafji were dangerously close to being captured.¹¹⁸ Aside from these close calls, no Americans participating in the ground action seriously risked capture. The LAI battalion screening forces covered the withdrawal of the outposts, and then maneuvered to avoid being cut off. While Saddam failed capture U.S. prisoners at Khafji, the Iraqis suffered some unintended consequences.

First, Khafji provided the Saudis a much-needed boost in confidence and morale. This benefit was not missed on Schwarzkopf, who observed: "Khalid's soldiers had gone into the battle with little confidence in their ability to fight, and Saddam had turned them into victors."¹¹⁹ Khalid noticed the change as well. "Had the battle gone badly," observed the Saudi Prince, "the blow to our morale would have been severe. But victory changed the mood of our soldiers to an amazing degree: they had been given a chance to prove themselves and had done so splendidly."¹²⁰ While Khafji failed to persuade the Marines of the Saudis' fighting prowess, the battle revealed critical information about their foe.

Not entirely convinced that the Iraqis were deserving of their reputation as a skilled fighting force, the Marines nevertheless prudently assumed the worst about their enemy—until Khafji. "I guess it all boils down to the fact that the individual soldier did not measure up..." Lt. Gen William Keys, 2nd Marine Division Commander, observed after the war. "The Iraqis were not ready to die for what they believed in—whatever that was."¹²¹ Boomer later commented that the most important lesson of Khafji was that, "...in a fight with the Iraqis, if you bloody their nose in round one, they do not want to

Americans polled believed that over five thousand American soldiers would die in combat. See Atkinson, 159.

¹¹⁸ Gordon and Trainor, 280.

¹¹⁹ Schwarzkopf, 427.

¹²⁰ Khalid, 390.

come out for round two... It demonstrated some things that we were beginning to feel... I began to feel more and more confident about accomplishing my mission without getting a lot of marines killed.”¹²²

Besides boosting morale and confidence, the outcome at Khafji did not shift the initiative to the Coalition, in any real sense. It simply offered of a glimpse into the future. The Iraqi military was out-gunned, out-trained, and out-classed. Twenty days later, the Coalition forces would liberate Kuwait and seize Iraqi territory as quickly as M-1 Abrams tanks could move. At Khafji, a combined-arms team of marines and airpower defeated a substantial Iraqi attack. Marine ground forces stopped the Iraqi advance long enough for air strikes to apply overwhelmingly destructive firepower. Undoubtedly, the Coalition military force was very effective at Khafji. In the next chapter, the air portion of the battle will be examined in more detail, to determine its contribution to the Coalition victory.

¹²¹ “Rolling with the 2d Marine Division.” Interview with Lt Gen William M. Keys, USMC, Commanding General, 2d Marine Division. *U.S. Naval Institute Proceedings* 117 no. 11/1,065 (November 1991): 77-80.

¹²² “Special Trust and Confidence Among the Trail-Breakers.” Interview with Lt Gen Walter E. Boomer, USMC, Commanding General, I Marine Expeditionary Force. *U.S. Naval Institute Proceedings* 117 no. 11/1,065 (November 1991): 47-50.

Chapter 4

Airpower's Contribution at Khafji

The Coalition achieved a decisive victory at Khafji against a vastly inferior Iraqi force. From a tactical perspective, the engagements at Khafji were relatively small and brief. As discussed in the previous chapter, however, the strategic implications of Khafji were significant. Having concluded that the Coalition forces were very effective, the next step in assessing airpower's contribution requires delineating between air and ground forces, and their respective roles in the battle. Undoubtedly, a solid argument can be made that the effectiveness of one component is enhanced by the contribution of the other. But in the case of Khafji, the synergy between air and ground does not obscure some basic lessons about airpower and its contribution to the battle's outcome.

Intelligence, Reconnaissance and Surveillance

The Marines relied heavily on air assets to gather intelligence, and quickly lost track of the Iraqis without them. On 24 January, a I MEF intelligence officer anticipated delivery of new battlefield imagery after several days of overcast skies. "It will take a few days to get the film exploited," he briefed Boomer, "but that was the mission we needed to get good ground order of battle coverage to identify where units have been moving over the last four or five days under the cover of weather." The Marines gathered useful data from ground sources such as reconnaissance teams along the border and EPW reports, but air-gathered intelligence provided Boomer his most complete picture of the battlefield.

Air Force U-2 and TR-1 reconnaissance aircraft flew daily flights in the Marines' area of responsibility (AOR), providing useful data to the I MEF intelligence staff. During twice-daily briefings to Boomer, the I MEF intelligence collection manager

outlined the U-2 flight schedule and collection priorities, but the intelligence officer rarely offered his assessments based on the U-2's data alone. In other words, if the U-2s were providing Marine intelligence personnel with useful data, the marines were not apprising Boomer of it.¹²³ Optical photography appeared to be the least useful U-2 data. While the U-2 cameras produced high-quality pictures, the turnaround time from mission tasking to "photo-in-hand" was too slow to influence the daily decisions facing I MEF.¹²⁴ Two U-2 mission packages (ASARS and SYERS) flew daily, long duration orbits over the KTO, downlinking radar and electro-optical imagery to Riyadh.¹²⁵ The process for transmitting ASARS data to the I MEF was extremely crude, limiting its contribution to the Marines' effort.¹²⁶ Despite three decades of service as Air Force's primary intelligence-gathering aircraft, the U-2 was overshadowed in the Gulf war by a revolutionary new collection platform.

No single aircraft contributed more to the battle of Khafji than the prototype E-8A JSTARS. Although it had been in the theater for only two weeks and was six years away from operational status, both the TACC battle staff and the I MEF soon depended upon it for timely and reliable information on Iraqi army movements. Pushed into service without even a written concept of operations, JSTARS made three significant contributions at Khafji.¹²⁷ First, with its high-resolution radar and moving target indicator display, JSTARS located and tracked armor columns moving within the KTO and immediately passed that information to awaiting strike aircraft.¹²⁸ This ability to locate and immediately assign targets to strike aircraft gave Coalition airpower a

¹²³ This apparent lack of interest in U-2 imagery contrasts with data retrieved by the Marines' RPVs. Marine briefers repeatedly credited Iraqi vehicle movement and BDA intelligence to direct observation by RPVs. See I MEF Briefings, 22 January through 5 February 1991.

¹²⁴ Marine intelligence briefers remarked that it would take "a few days" to process the photo imagery. See I MEF Briefing, 29 January 1991, P.M.

¹²⁵ ASARS: Advanced Synthetic Aperture Radar System; SYERS: 'Senior Year' Electro-optic Relay System.

¹²⁶ The TR-1 ASARS downlinked its imagery to a mobile site in Riyadh. The Marines simply stationed an officer in this vehicle during the TR-1 ASARS missions. If the officer noted anything of interest to the Marines, he called the I MEF intelligence officer to report it. See I MEF Briefing, 26 January 1991, P.M.

¹²⁷ Bingham, 17.

¹²⁸ Hosterman notes, entry for 30/2053L January 1991. (Secret) Information extracted is unclassified.

significant new advantage over enemy armor. JSTARS became to the ground campaign what AWACs was to the air battle.¹²⁹

Second, JSTARS gave the TACC staff a significantly enhanced awareness of the ground battle. In an amazing role-reversal, Horner, the air commander, may have had a better understanding of the Iraqi attack into Kuwait than Boomer, the tactical commander. By simply asking JSTARS to “look that way,” Horner quickly grasped the size and scope of the attack, which led to his decision to divert numerous sorties to counter the Iraqi incursion.¹³⁰

Third, JSTARS provided Boomer extensive information about the Iraqi forces well beyond the forward line of troops. During initial attack, JSTARS collected radar imagery deep in Kuwait to assess the extent of the Iraqi effort. JSTARS radar detected individual vehicles moving south, but no convoys from known the Republican Guard positions, convincing Boomer that the attack was not a major offensive. As a result, I MEF did not reinforce the LAI battalions with heavier forces.¹³¹ With only two JSTARS in the theater, the Marines received far less coverage than they desired. To augment the imagery collected by JSTARS, the Marines soon came to rely on a new “workhorse” of tactical intelligence collection.

The Marines regularly employed their Pioneer remotely piloted vehicles (RPV) during the Khafji battle to provide real-time tactical intelligence and bomb damage assessment (BDA). These small drones, tasked directly by the I MEF operations staff, flew deep into Iraq to detect vehicle movement or conduct post-strike assessments.¹³² On the first night of the Khafji attack, a RPV discovered an unusually large group of eighty

¹²⁹ Clearly JSTARS data offered Boomer more information about the enemy ground forces than in previous wars. Twice daily, Boomer listened to detailed briefings based on JSTARS data, and the I MEF constantly asked for more JSTARS coverage in their area of responsibility. But not all Marine commanders saw the value of this new technology. For example, Lt Gen Royal Moore, Commanding General, 3d Marine Air Wing, offered a different assessment in an interview shortly after the war. Asked about the value of JSTARS, Moore made a curious statement that revealed his unique perspective. He answered: “We also had elaborate prototype systems like JSTARS. The idea offers potential, *but we could not make any tactical decisions on its output.* [emphasis added]. It was in early development during the Gulf War and had enormous slewing problems.” The contrasting views of two generals within the same service with almost unlimited access to information is striking. For a complete account of the Boomer’s and Moore’s views on JSTARS, see Minutes of I MEF Daily Command Briefings, 22 January through 5 February 1991, and Lt Gen Royal N. Moore, Jr., USMC “Marine Air: There When Needed” *U.S. Naval Institute Proceedings*, November 1991.

¹³⁰ Hosterman Notes, 29/1931Z January 1991. (Secret) Information extracted is unclassified.

¹³¹ Jamieson, 165. (Secret) Information extracted is unclassified.

to one hundred BTRs massed near the Saudi border.¹³³ In another instance, RPVs discovered Frog missiles enroute to Khafji and passed the information to nearby FACs. Marine intelligence relied extensively on the RPVs' quick reaction time to assess the current battle situation. "The only report I have right now is hot off the RPV," an intelligence officer briefed to Boomer. "Down in the vicinity south, going toward Khafji, is a small column of 20 vehicles. We have RPV up right now trying to confirm the composition of said vehicles, sir."¹³⁴ When the Marines needed an answer quickly, they tasked a remotely piloted vehicle to provide it.

Despite this increased awareness, the Iraqis were still able to mass several brigades of armor from second-echelon divisions on the Saudi border undetected. Boomer apparently understood the limitations of intelligence-gatherers to provide every answer—even with 1990's surveillance technology. As such, he rarely expressed dissatisfaction with the amount or quality of his intelligence.¹³⁵ Boomer's information gaps were often associated with knowledge about his own forces. For example, as the Saudis attempted to recaptured Khafji on 31 January, the intelligence briefer concluded with: "It is our understanding that action continues in Khafji at this time, although we are not clear on exactly what is going on down there, sir." A frustrated Boomer asked: "Does anybody know?"¹³⁶ In sum, airborne intelligence assets failed to supply convincing proof of the impending Iraqi attack at Khafji, but did provide Boomer and Horner an excellent picture of the battlefield once the attack began.

¹³² Akst and Becker, 8.

¹³³ I MEF Briefing, 29 January 1991, P.M.

¹³⁴ I MEF Briefing, 31 January 1991, P.M.

¹³⁵ I MEF Briefings, 22 January through 5 February 1991; While Boomer generally expressed satisfaction with his intelligence, he questioned how the I MEF staff was tasking ISR resources. On his 28 January 1991 morning briefing, Boomer asked why his staff was not making better use of organic intelligence assets. "We [have] got all the RPV assets that are in the Marine Corps right here," Boomer observed, "and when I was being briefed this morning, I was told that one was going to be up today this morning. And my question was, one, we are always crying for BDA, why not all of them?" See I MEF Briefing, 28 January 1991, A.M.

¹³⁶ A staff member provided details on the fighting at Khafji. Apprised that two recon teams were surrounded inside Khafji, Boomer asked about the composition of the teams. Surprisingly, no one attending that briefing could provide that information. See I MEF Briefing, 31 January 1991, A.M.

Factors Influencing the Employment of Airpower at Khafji

The TACC staff was surprised by the Iraqi attack at Khafji and reacted to events as they perceived them from Riyadh. Unlike the Marine LAI battalions which executed their one assigned task, aircraft that responded to Khafji were diverted from other missions already underway. Because the air missions were centrally controlled but *de*-centrally executed, retasking missions already in progress strained the JFACC's command and control system. This section examines the TACC's response to the initial attacks of 29 January, as well as other factors that influenced CENTAF's response to the Iraqi incursion.

The weather during the Khafji battle was excellent and did not degrade airpower's effectiveness. CENTAF's shift to medium-altitude bombing on 20 January increased the possibility that weather would seriously degrade airpower's effectiveness, but the Iraqis failed time the Khafji attack to exploit this opportunity. Observations during 29-31 January indicated a regular pattern of low morning clouds that dissipated by late morning, raising ceilings above 10,000 feet—a significant improvement from the previous week. In the four days prior to Khafji, the Marines cancelled 129 sorties due to weather, and aborted 42 additional sorties after takeoff. In the four days of the Khafji battle, weather improved dramatically allowing the Marines to fly all but one sortie, and abort none.¹³⁷ The Iraqis also attacked during the full moon (29 January), which may have offered them some advantages for ground maneuver, but certainly did not offset the advantage it provided Coalition airpower in locating and attacking Iraqi armor at night. Finally, numerous pilot accounts of the Khafji battle omit any mention of weather, suggesting that ceilings did not degrade their effectiveness.¹³⁸ With good weather over Khafji, the most significant limit to the employment of airpower was CENTAF's ability to assess the Iraqi threat at Khafji and respond appropriately.

¹³⁷ Marine Corps sortie rates provide the best indicator of the effects of weather in the KTO because the vast majority of Marine sorties were flown in this small section of the entire theater. Also, the "air aborts" included any cancellation after takeoff, with weather being only one possible reason for the abort. See *GWAPS*, Vol. V, Pt. 1, 391.

¹³⁸ See Jay A. Stout, *Hornets Over Kuwait* (Annapolis Md.: Naval Institute Press, 1997), 119-29; Capt Michael Edwards, USAF, A-10 pilot during Desert Storm, interviewed by Major Daniel R. Clevenger, AFSAA; Givens interview; Havel interview.

From the perspective of the TACC battle staff, the air assets devoted to the Khafji battle were only a small portion of the larger air war. Less than nine hundred strike sorties flew in the KTO on the three-day period from 29-31 January.¹³⁹ In those same three days, the total Coalition air effort exceeded eight thousand total sorties. Of the nine hundred KTO sorties, Marine air units flew over five hundred, which were already tasked for battlefield preparation in the KTO. As a result, CENTAF sorties *diverted* to Khafji consisted of two types: (1) sorties already scheduled or flying, but retasked to the KTO; and (2) sorties not originally planned, but generated to fly as a result of the Khafji attack. Air Force aircraft generally constituted the former group, while Marine units made up the latter. Despite their abundance, Air Force aircraft flew only 119 sorties into the KTO during 29-31 January—averaging less than two sorties per hour during the height of the Iraqi attack.¹⁴⁰

The Marines employed a number of techniques to remain semi-autonomous from the JFACC's control, believing that ATO process was not sufficiently flexible to respond to changing battlefield conditions. The Marines acknowledged scheduling sorties that they did not intend to fly, learning from experience that it was easier to cancel sorties than to add them.¹⁴¹ Because the ATO did not reflect the Marines' actual plans, it is difficult to determine precisely how many sorties the Marines actually added in response to Khafji. Clearly, the Marines generated a significant number of additional sorties to counter the Iraqi attack. For example, on 29 January, Marine air flew 63 Harrier sorties; two days later, it nearly doubled the count to 104 sorties.¹⁴² OV-10s also responded, flying seven sorties on 29 January, and twenty-one the following day.¹⁴³ In sum, the Air Force did not divert a significant number of sorties in response to the Iraqi attack. The

¹³⁹ GWAPS Missions Database. This database, compiled by the GWAPS research team, is a selected database file of air-to-ground missions compiled from a large collection of paper archives and electronic databases. The following analysis, cited hereafter as "GWAPS Missions Database", examined only those air-to-ground and FAC sorties in the KTO during the Khafji battle.

¹⁴⁰ GWAPS Mission Database. This statistic shows the limited amount of Air Force sorties supporting the Khafji defense. These sorties include seven B-52 sorties and nine AC-130 gunship sorties, which do not numerically equate to other sorties in the above statistics.

¹⁴¹ For a complete account of how the Marine leadership circumvented the ATO process, see Moore interview.

¹⁴² John D. Parsons, Benjamin T. Regala, and Orman H. Paananen, *Marine Corps Desert Storm Reconstruction Report, Vol. IV: Third Marine Aircraft Wing Operations, CRM 91-229 (U)* (Alexandria, VA: Center for Naval Analysis, 1992), 14.

¹⁴³ *Ibid.*, 17.

Marines, however, greatly increased their sortie rate to respond to Khafji—probably because they had the excess sortie capability available, and their ground forces were directly affected by the Iraqi incursion. This significant increase in sorties over the previous day suggests that the 3d Marine Air Wing (3d MAW) responded to the Iraqi threat by generating sorties on its own initiative. CENTAF’s other air assets generated and diverted sorties based on direction from Horner and the TACC battle staff.

Table 1: Strike Sorties Employed at Khafji

Service	ACFT	29 Jan	30 Jan	31 Jan	1 Feb
Air Force	A-10	20	10	4	24
	AC-130	2	3	4	3
	B-52		4	3	8
	F-111		23	4	1
	F-117	1	4		
	F-15E	4		4	2
	F-16	3	16	9	74
	F-4G		1		5
	Total	30	61	28	82
Navy	A-6	2	17	18	27
	A-7				19
	F/A-18	4	11	4	72
	Total	6	28	22	118
Marines	A-6E	17	12	27	38
	AV-8B	71	114	124	114
	F/A-18	22	80	40	134
	OV-10	5	20	17	14
	Total	115	226	208	300
All Services	Total	151	315	258	500

Source: GWAPS Database

By most accounts, the TACC initially failed to grasp the size and scope of the Khafji attack and consequently did not divert a significant amount of airpower to the KTO. Clearly, there was confusion in the TACC about what was happening at Khafji, as a dubious Horner predicted the reported tank columns would be “mythical.”¹⁴⁴ Although initial contact between Iraqi ground forces and the marines at OP-4 occurred at 2030L, the first of several TACC-directed aircraft arrived after 2300L. These included two F-

¹⁴⁴ Hosterman Notes, 29/2231L January 1991 (Secret) Information extracted is unclassified. In fairness to Horner, this confusion may not have been due to inattention within the TACC. Inaccurate or nonexistent reporting, as well as poor communications may have been at fault.

15Es, two F-16s, and four A-10s and an AC-130 gunship.¹⁴⁵ The Marines were alarmed by the TACC's apparent unresponsiveness. Monitoring the battle from the TACC, Lt Col Woods, a Marine liaison to the TACC, complained that "he wasn't happy about how much or what we [the JFACC] wanted to lend to the effort."¹⁴⁶ Glosson later described the TACC's performance on 29 January as "not the Air Force's best day." Continuing, he explained that "JSTARS clearly showed advancement of armor moving south but, for whatever reason, decisions were being made in the Ops Center that did not, or were not, consistent with the gravity of the situation from a time standpoint nor a momentum standpoint."¹⁴⁷ As a result, the Air Force's initial contribution to repulsing the Iraqi attack would be limited, especially on 29 January.

The Marines, having held back sorties for just such an eventuality, responded in force.¹⁴⁸ AV-8s flew 108 sorties on 31 January, a three-fold increase over sorties flown just four days earlier. OV-10s tripled their sortie rate overnight, from seven sorties on 29 January to twenty-one sorties the next day.¹⁴⁹ The close proximity of the Marines' forward air staging base at Tanajib (a five minute flight to Kuwait) and the rapid "turn-around" rate of the Harrier aircraft allowed AV-8Bs to fly up to three sorties in a day.¹⁵⁰ Not only were the Marine air units perfectly positioned to respond to the Khafji attack, but their exclusive focus on the KTO ensured that no competing priorities would dilute their effort.

The rapid response of Marine aircraft to the Khafji incursion highlights the difference in perspective between Boomer and Horner. For the Marines, the Khafji incursion superceded all other tasks and objectives. Boomer, as the I MEF commander, correctly perceived the Iraqi attack as a major threat to his subsequent operations, and responded with a significant increase in Marine airpower. Horner undoubtedly assessed

¹⁴⁵ Jamieson, 163. (Secret) Information extracted is unclassified.

¹⁴⁶ Hosterman Notes, 30/1203L January 1991 (Secret) Information extracted is unclassified.

¹⁴⁷ Brig Gen Buster Glosson, USAF, 14th Air Division Commander, interviewed by PBS Frontline; on-line, Internet, available from <http://www2.pbs.org/wgbh/pages/frontlin/gulf/oral/Glosson.html>.

¹⁴⁸ The 3d MAW staff perceived the ATO as rigid and unresponsive. In order to ensure the flexibility of Marine air, they admitted "gaming" the process by scheduling significantly more sorties than they intended to fly. This allowed them to "reserve" slots on the ATO to add sorties as necessary to respond to changing battlefield conditions. See Moore interview.

¹⁴⁹ Parsons, 20, 26.

¹⁵⁰ Peter E. Davies and Anthony M. Thornborough, *The Harrier Story*. (Annapolis, Md.: Naval Institute Press, 1996), 140.

the events at Khafji from a theater-wide perspective. Initially, he very likely perceived Khafji as potential distraction from accomplishing larger Coalition objectives. Faced with a rapidly changing intelligence picture, Horner surely guarded against changing course too rapidly, which would have caused responsiveness to the as yet not fully confirmed incursion to degenerate into indecisiveness. The Marines' rapid response to Khafji, in contrast to the TACC's slower reaction, must be view in this context.

Close Air Support and Interdiction

Airpower perhaps made its greatest contribution at Khafji by destroying Iraqi armored vehicles, either in contact with friendly ground forces (CAS), or enroute to the battle (interdiction). Nevertheless, the evidence to support an unequivocal assertion in this regard is entirely inconclusive. The records of Air Force and Marine air missions fail to present a complete picture of the battle. The Center for Naval Analysis attempted to reconstruct the 3d MAW's CAS and interdiction missions in the Gulf War. Finally abandoning the effort, the authors expressed their frustration:

The analysts attempted to reconstruct the Third MAW's battlefield-preparation period in sufficient detail to develop valid summaries of the number of sorties against various types of targets. Unfortunately, they considered the resulting reconstruction inadequate for that purpose and decided not to include the results in this paper.¹⁵¹

Air Force records provide little more insight into the effects of CAS and interdiction sorties. Nevertheless, within the limits of the available evidence, one may reach certain conclusions and judgements about airpower's role in the battle.

To understand how individual aircraft found targets in the KTO, it is useful to delineate between three categories of strike sorties: (1) Interdiction sorties with pre-selected (stationary) targets, (2) CAS sorties directed by air or ground FACs, and (3) battlefield air interdiction (BAI) sorties assigned to a "kill box."¹⁵² Because the Iraqi attack involved large numbers of maneuvering

¹⁵¹ Parsons, 55.

¹⁵² TACC planners created a simple grid of thirty mile by thirty mile "kill boxes" across Kuwait and Southern Iraq. For a complete explanation of the kill box system, as well as how aircraft were assigned to targets, see James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Air Power in the Gulf War*. (Santa Monica, Calif.: RAND, 1994).

armored vehicles, Coalition aircraft primarily used the latter two methods.¹⁵³ Inside the fire support coordination line (FSCL), ground or airborne FACs controlled all strike aircraft. To engage a target inside the FSCL, a pilot first contacted the Marine Direct Air Support Center (DASC) which served as the overall CAS manager. DASC controllers assigned the aircraft to a holding point and instructed the pilot to contact the appropriate FAC. The FAC's role was to identify enemy targets and assign them to the strike aircraft, while ensuring that pilots did not misidentify friend and foe. Airborne FACs generally fired white phosphorous flares toward the intended target. Ground FACs used a variety of means to identify a target, including directing LAV tracer fire toward the target.¹⁵⁴ While FACs and CAS aircraft were well trained, the high risk of fratricide required slow and deliberate coordination to ensure that strike aircraft positively located the correct mark. Pilots preferred to deliver munitions away from friendly ground forces, where every vehicle was an enemy—and a lucrative target.

To create these conditions, CENTAF planners devised a “kill box” system that allowed pilots to roam freely in Kuwaiti territory and strike targets of opportunity. Dividing Kuwait and Iraq into a system of grids, a C-130 Airborne Command and Control Center (ABCCC) assigned strike aircraft to “work” a kill box—a thirty mile by thirty mile square. Airborne FACs orbited over the kill boxes, advising arriving strike aircraft of the locations of Iraqi vehicles. Once assigned to a particular kill box, pilots were cleared to engage any target within the box. This “killer-scout” concept allowed a faster flow of strike aircraft into the fight. Confident that no friendly forces were near, A-10 pilots operating at night located targets directly through their Maverick seeker heads. The kill box system significantly increased the efficiency of strike aircraft. Because aircraft directed to kill boxes did not require close coordination with a FAC, pilots quickly delivered their ordnance and exited, freeing airspace for the next flight of

¹⁵³ A thorough explanation of the tactical command and control in MARCENT's AOR is beyond the scope of this paper. In spite of attempts to establish procedures for the integration of Air Force and Marine assets into MARCENT airspace, the interface between the FACs, ABCCC, DASC, and JSTARS was sometimes confused. Also, the system was prone to becoming overloaded. See Stout, 186.

¹⁵⁴ Pollard, 50.

aircraft.¹⁵⁵ While both Air Force and Marine aircraft participated in the kill box system, air-to-ground controllers distinguished between them when assigning targets.

Marine and JFACC strike sorties differed in the number and location of Iraqi targets. (See Appendix C)¹⁵⁶. First, Marines struck significantly more targets, which was no surprise considering their high sortie count. Second, the DASC generally assigned marines to CAS missions while directing JFACC sorties to kill boxes. This was likely due to the service identity of the two controlling agencies. The Marines manned the DASC which directed CAS, while airmen controlled the ABCCC which managed kill boxes. Although assigning aircraft of a given service to a particular area at times generated inefficiencies of distribution, this phenomenon was at least partially mitigated by the effectiveness that is derived from the close working relationships established between air and ground units within the Marine Corps. Also, the Marines maintained AV-8s on strip-alert at Tanajib airfield, only a five-minute flight from the Kuwait border. Once launched, these Harriers could expend their munitions (usually Mk 20 Rockeye) and return to Tanajib for a quick rearming. As a result, CAS requests were likely passed from the DASC to Tanajib, where the Marines counted on a steady supply of aircraft.¹⁵⁷ The mix of Marine and Air Force aircraft not only highlighted the differences between services, but ensured that a large variety of aircraft participated in the fight.

Virtually every type of strike aircraft participated in the Khafji battle (See Table 1). Marine AV-8Bs consistently flew the most sorties due to their close proximity to the battlefield and exclusive focus on the KTO. Air Force A-10s were particularly suited to the low SAM threat and the exposed armor of the Khafji battle, and AC-130 gunships maintained a nearly constant presence along the coast road during periods of darkness.¹⁵⁸

¹⁵⁵ Deep philosophical differences existed between the JFACC and the Marines concerning who should control Marine aircraft. While the issue was never settled entirely, a compromised was reached, whereby the Marines made available all Marine A-6 and one-half of their F/A-18 aircraft for tasking by the JFACC. The Marines retained tasking authority for the remaining F/A-18s and all AV-8Bs. This latter group of aircraft were scheduled, tasked, and flown independently of the JFACC to support 1 MEF objectives in the KTO. Considering that the Marines controlled these assets directly, it is useful to make a distinction between “Marine air sorties” and “JFACC sorties.” For a detailed account of JFACC and Marine air command and control, see James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991* (Santa Monica, Ca.: RAND, 1993), 119-20. For a detailed account of how the DASC became overloaded at Khafji, see Stout, 126.

¹⁵⁶ GWAPS database.

¹⁵⁷ Davies and Thornborough, 136.

¹⁵⁸ GWAPS database.

Horner reluctantly agreed to Boomer's request for B-52 strikes against the advancing Iraqi forces, in spite of his belief that their unguided "dumb" bombs were less effective against armor than precision-guided munitions (PGM). Reflecting on the request when better platforms were available for the task, Horner noted with humor that "Ground guys always ask for B-52s first."¹⁵⁹

Munitions varied as widely as the types of weapons systems employing them. The AV-8Bs, which flew the greatest number of sorties, primarily carried a combat load of six Mk-20 Rockeye cluster bomb units (CBU), dispensing 247 dart-shaped, armor-penetrating bomblets.¹⁶⁰ A-10s relied primarily on the IR Maverick Missile and developed new tactics to employ the weapon at night.¹⁶¹

Air-Ground Cooperation at Khafji

The aircraft, munitions and tactics employed by Coalition forces at Khafji were for the most part effective. Both Air Force and Marine aircraft were able to maneuver freely within the KTO, acquire targets, and then deliver munitions suited for the target. One exception deserves special attention. Marine AV-8Bs flew more sorties than any other aircraft during the Khafji battle, employing Mk 20 Rockeyes as its primary anti-armor munition. Despite being designed for low altitude delivery, Rockeyes were routinely released from 10,000 ft, seriously degrading its lethality. The Rockeye's time-delayed fuse was preset on the ground, requiring pilots to release the munition from precise parameters. Outside this narrow range, the Rockeye was largely ineffective.¹⁶² Using the AV-8Bs to deliver Rockeyes ensured that the most plentiful and responsive aircraft in the KTO dropped one of the most ineffective munitions of the Khafji battle. In spite of the Rockeye's poor performance, evidence suggests that airpower had a lethal effect on Iraqi armor.

The Gulf War Airpower Survey (GWAPS) team compiled total Iraqi armor losses throughout the entire theater over the five day period of 29 January through 3 February.

¹⁵⁹ Jamieson, 168-69. (Secret) Information extracted in unclassified.

¹⁶⁰ Davies and Thornborough, 140-42.

¹⁶¹ William L. Smallwood, *Warthog: Flying the A-10 in the Gulf War* (McClean, Va.: Brassey's, 1993), 43-49.

¹⁶² GWAPS, Vol. IV, Pt. 2, 88-89.

Based on CENTCOM BDA estimates, GWAPS reported a marked increase in armor attrition in the five days of the Khafji battle. While CENTCOM’s shift to Republican Guard units accounts for some of the increase in armor kills, the rise in non-Republican Guard attrition is primarily attributed to the Khafji strikes. Finally, these numbers are not influenced by the invention of “tank plinking,” which was not employed until later in February.¹⁶³

Table 2. CENTCOM BDA Estimates

	17 - 29 Jan (All Iraqi Forces)	30 Jan – 3 Feb (Republican Guard)	30 Jan - 3 Feb (non-Rep Guard)
Tanks	80	177	297
APCs	86	78	150
Artillery	308	23	94

Source: GWAPS Vol II part 2¹⁶⁴

In April 1991, a U.S.-Canadian Joint Intelligence Survey Team (JIST) conducted the most thorough battle damage assessment of the KTO. The team examined 163 Iraqi tanks throughout Kuwait and southern Iraq, and concluded that 85 had been destroyed by Coalition weapons. Of those destroyed, only twenty percent had been struck by air-delivered munitions.¹⁶⁵ The JIST team examined only a small percentage of the several thousand tanks destroyed by Coalition forces, so generalizations should be made cautiously. The data may also have been invalidated by Coalition ground forces during the ground war. Coalition armor undoubtedly fired upon any Iraqi tank not burning or otherwise obviously destroyed, so tanks abandoned due to the threat of air attack may have been counted as ground battle kills in the post-war analysis.¹⁶⁶

What does the JIST survey reveal about airpower at Khafji? Unfortunately, the data offers support for various positions. Ground advocates argue that pilot BDA estimates are not persuasive when compared to first-hand physical evidence suggesting that tank kills were primarily ground-inflicted. The JIST survey provides that evidence. Air proponents argue that the small sample size invalidates the study, and the Coalition ground forces likely “contaminated” the meager sample by firing on abandoned tanks.

¹⁶³ GWAPS, Vol. II, Pt. 2, 239.

¹⁶⁴ Statistics derived from CENTCOM J-2 Reports.

¹⁶⁵ Hosmer, 35-36. (Secret) Information extracted is unclassified.

¹⁶⁶ Ibid., 36.

Airmen point to the high number of tanks found without damage, arguing that the Iraqis abandoned them to avoid certain destruction by Coalition airpower.

[Despite these claims and counterclaims, some closure is possible.](#) By 31 January, JSTARS data revealed significant vehicle movement throughout Kuwait, in both east-west and north-south directions (See Figure B-5). This apparently random movement indicates a significant disruption of Iraqi second echelon forces, as they attempted to evade the constant air attacks. JSTARS imagery also revealed substantial northward movement along the coastal road, as forces retreating from Khafji suffered repeated strikes from Coalition aircraft.¹⁶⁷ In addition to the JSTARS view of the battle, some ground forces also witnessed the effects of airpower during the three-day battle.

[Marines engaged at OP-4 and Khafji described the punishment that airpower inflicted on the Iraqis.](#) Capt Roger Pollard, commander of a LAV company at OP-4, described how his forces illuminated targets for attacking aircraft. “Once the vehicle [LAV-AT] was on target,” observed Pollard, “a section or the entire platoon of LAV-25s would be ordered to fire on the designated target. This resulted in hundreds of little explosions showing up on a group of vehicles, which the aircraft could then find and target.” Pollard reported that by using these cooperative tactics, “the enemy began to disperse, attempting to flee the battleground. The air missions were breaking their attack.”¹⁶⁸ The marines at Khafji arrived at similar conclusions. Major Jim Braden, a Marine ANGLICO assigned to the 2nd SANG, observed aircraft engage Iraqi armor as the Saudis reclaimed Khafji on 31 January. “The effects of airpower were certainly, I think, what turned the tide initially”, explained Braden. “The Iraqis had the upper hand without it...and as soon as we did, it was an overwhelming force. We couldn’t have retaken the city without ground forces...but what gave those ground forces the absolute confidence to go in and do their job was the air.”¹⁶⁹

[Iraqi soldiers captured in Khafji expressed their fear of the incessant pounding from the air.](#) “They kept repeating a phrase which the Saudis roughly translated as, ‘No more air, no more air,’” recounted Braden. “When they saw the air they would hunker

¹⁶⁷ *JSTARS Final Report*, 56.

¹⁶⁸ Pollard, 50.

¹⁶⁹ Braden Interview.

down by the vehicle, they would try to get under something. Even though they were our prisoners, they were still frightened by the sound of tac air coming by them.”

[Pilot reports offer more convincing proof of airpower’s devastating effects at Khafji.](#) Though over-reliance on pilots’ accounts of the battle may be misleading, a number of convincing pilot reports offer ample evidence of airpower’s effect.¹⁷⁰

Describing a mission flown on 31 January, an A-10 pilot related the devastation he inflicted on a retreating Iraqi column:

...we came across an armored column that stretched a good couple miles long, probably, we could count between 20 and 30 armored vehicles on the road... [We] worked that target for about 45 minutes... I can say, that night when we left, and it’s a sight I will remember forever, there was at least a couple miles of road on fire with vehicle hulks... And you could see the entire road outlined for 50 or 60 miles away as we were going back home to Saudi Arabia.¹⁷¹

[The I MEF staff employed RPVs to collect BDA, concluding that airpower was effectively destroying Iraqi armor.](#) On 29 January, the I MEF air operations officer combined pilot reports and RPVs observations to determine BDA. During a briefing to Boomer, he stated:

What did come up from a flight of two AV-8s was a score of some BTR-60’s located in this general vicinity right here, and with...22 destroyed reported...Twenty sorties engaged those BTR[s]. The RPV reported 13 burning or smoldering and since then the BDA amounts to 34. So it looks like they are doing some good work in there.¹⁷²

During the same briefing, the air operations officer recounted the following: “I called the ATOC on how that engagement is going. One F-16 reported four tanks destroyed...They blew a bridge in front of the tank column and he reported back that it was like clubbing baby seals.”¹⁷³

¹⁷⁰ Any dispassionate observer will view pilot reports with skepticism for several reasons. First, pilots operated at altitudes above 5,000 feet, often making battle-damage assessment difficult. Second, pilots have a vested interest in the results of their sorties. Third, the existing interviews offer only the most spectacular accounts of successful interdiction missions. In other words, those pilots who did not report impressive bomb damage are typically not interviewed.

¹⁷¹ Givens interview.

¹⁷² I MEF Briefing, 29 January 1991, P.M.

¹⁷³ Ibid.; Air Force pilots sometimes convey mission reports using terminology unique to their service.

No single piece evidence proves airpower's effectiveness at Khafji. However, the preponderance of data suggests that airpower played a significant role in the defeat of Iraqi forces. Intelligence gathered by aircraft provided some warning of the attack and furnished Boomer with a detailed picture of the battlefield once the engagement was underway. In particular, JSTARS data provided both Horner and Boomer an awareness of the enemy's movements to a degree never before experienced in warfare. Airpower responded quickly to the attack, primarily due to the proximity and focus of the 3d MAW. Once air strikes began, the kill box system allowed a continuous flow of sorties into the Iraqi rear areas, ensuring that follow-on forces were destroyed or disrupted before entering the ground battle. JSTARS imagery and pilot reports offer the best evidence of the second echelon's disruption. CAS sorties were less effective, working through an inefficient command and control system. The threat of fratricide also reduced the lethality of CAS. Finally, capable aircraft employing generally effective munitions scored numerous armor kills throughout Kuwait. Despite the JIST study, the repeated pilot reports of burning vehicles along major lines of communication indicate that airpower destroyed large numbers of Iraqi armor and vehicles. In sum, airpower was very effective at Khafji.

Chapter 5

Conclusion

As Saddam Hussein began to feel defenseless against the incessant pounding from Coalition airpower, he embarked upon a strategic gamble by attacking U.S. and Saudi forces near Khafji. Hoping that a small tactical engagement would achieve a strategic victory, the Iraqis instead achieved none of their objectives and lost a significant number of soldiers and armor. Ironically, the results of their Khafji gambit did little more than hint at the rout that was soon to follow. In rendering this judgement, however, one must remember that Saddam Hussein was running out of options. Like Hitler before the Bulge, even a ten percent chance of victory was better than certain defeat. In Clausewitzian terms, the Iraqis had reached their point of defensive culmination: all of the advantages of waiting had entirely disappeared.

Airpower's Effectiveness at Khafji

Measuring airpower's effectiveness at Khafji requires an understanding of Iraqi intentions. Unfortunately, they remain speculative. It will likely be years before Western researchers are granted access to Iraqi documents and leaders to provide these answers. The few senior leaders who have spoken about Khafji, such as Foreign Minister Tariq Aziz, appear more interested in convincing the West of Saddam's military prowess than accurately assessing the events of the war. While the U.S. possessed unparalleled intelligence collection assets during the Gulf War, observations of enemy activity alone do not reveal actual intent. Perhaps the Iraqi leadership had many objectives, or various leaders differed over intent. Failure to determine Iraqi intent conclusively imposes some limitations on the study's validity.

In spite of these difficulties, some preliminary conclusions can be drawn about the Iraqi leaderships' intent at Khafji. First, although the Iraqis appear to have had limited geographic objectives, the attack itself was apparently intended to have at least operational consequences. Second, the limited depth of the Iraqi attack suggests that the Iraqis intended to make contact with Coalition forces and then retreat back to Kuwait. More confident in their ability to fight a defensive war, Saddam probably intended to provoke the Coalition into a premature ground attack. Finally, the probable goal of this Iraqi-initiated ground war was to inflict U.S. casualties, in hopes that American public support for the Gulf War would rapidly erode.

The total Coalition force fought the Iraqis effectively at Khafji, preventing them from achieving any of their potential goals. The Marines successfully delayed the Iraqi attack in major engagements at OP-4 and Al Wafra, and called upon airpower to halt the offensive. The combined effects of Coalition air and ground forces turned back a surprise attack of three brigade-sized Iraqi ground forces, requiring only a fraction of the I MEF's ground combat power. The Iraqis were unable to initiate the ground war, or lure the Coalition ground forces into their well-prepared defensive positions across the border. They did not capture a prisoner; in fact, over four hundred Iraqi soldiers became prisoners themselves. The Iraqis did not escape the punishment of Coalition air attacks, they encouraged them by moving in columns under the presumed safety of darkness. Finally, the Iraqis failed in their attempt to inflict casualties on U.S. troops, hoping that the sight of young Americans coming home in body bags would erode U.S. will.

Although the available evidence is inconclusive, airpower appears to have contributed significantly to the Coalition victory at Khafji. Airborne intelligence collection assets provided senior commanders a view of the overall battle never before achieved in warfare. JSTARS, though years away from its initial operational date, supplied that picture. While BDA is inconclusive, the overwhelming number of pilot reports, RPV imagery, and JSTARS returns indicate that airpower had a devastating effect on the attacking Iraqi force. Numerous reports of burning tank columns cannot be discounted, especially when confirmed by Marine RPVs. The actual size of Iraqi second-echelon forces remains speculative, but JSTARS confirmed that Iraqi vehicles deep in Kuwait moved in all directions, presumably to avoid certain destruction from the air.

Finally, airpower assured that once Iraqi forces broke contact with Coalition ground forces, they were relentlessly pursued. Unlike Coalition ground forces, which were threatened only when engaged at the border, Iraqi forces found no such sanctuary. The retreating armor columns were pursued by Coalition airpower until the Iraqis concluded that they were safest away from their tanks. The combination of Air Force and Marine airpower was very effective at Khafji.

Implications

The results of this study have several implications for the future of joint warfare. They are:

Airpower theorists will correctly continue to point to Khafji as the best example of airpower's new ability to halt enemy armor forces. As the single Iraqi offensive of the Gulf War, Khafji was the one and only opportunity for airmen to demonstrate that a technological revolution had given airpower a significantly increased role in surface warfare. Most central to this revolution were PGMs, which enabled aircraft to target individual armored vehicles achieving nearly one kill per weapon employed. Khafji demonstrated that air-delivered munitions could be employed effectively against moving vehicles at night, as well as during the day. Finally, JSTARS provided the air commander a unprecedented ability to locate enemy vehicles and pass that information directly to waiting strike aircraft.

Absent more reliable data, the Khafji battle is insufficient evidence to suggest that airpower alone can "halt" a significant armor offensive. Khafji falls short of a convincing "strategic halt" argument for several reasons. First, for Khafji to be acceptable proof, it must be demonstrated that the Iraqi attacking force was: (a) significant in size and capability, and (b) attempting to move from Point A to Point B, whereby they could be "halted" enroute. The available evidence supports neither assertion. Second, airpower advocates argue that a significant second-echelon force was soundly defeated before reaching the Saudi border, and that the Marines never made contact with this force is proof of airpower's effectiveness at halting enemy armor. This circular argument attempts to avoid real question—what was the size, capability, and intent of the Iraqi second echelon? The available information is insufficient to determine an answer. Third, the Iraqis were so outmatched that even a moderately capable response

would have soundly defeated the Khafji offensive. The Coalition had complete air superiority created by the flight of the Iraqi Air Force to Iran and the Iraqi army's rudimentary organic air defenses. This allowed otherwise vulnerable A-10s and AV-8Bs to roam the KTO in search of targets with minimum risk, a scenario unlikely to be relevant to future wars. Finally, airpower derived benefits from the Marine presence.

Evidence suggests that at least some modicum of ground forces is required to stabilize a situation and direct air strikes. The marines at OP-4 and Al Wafra provided two key functions: delaying the attacking ground forces, and alerting air units to the threat. Without Coalition ground forces present to detect and delay their attack, the Iraqis moved into Khafji untouched. While airmen may prefer to have friendly ground forces well away from the enemy (preferring interdiction to CAS), FACs often provide a certainty to targeting that, in its absence, would prevent any employment of airpower. Also, ground forces supported by airpower applied the force necessary to remove the Iraqis from Khafji. While airpower destroyed much of the retreating Iraqi force, it was the synergy of ground and air forces that recaptured Khafji.

The USAF must improve mission debriefing and record keeping to ensure that data is available for exploitation during combat and post-hostilities operations analysis. Air advocates often cite Khafji as a case study in how airpower will be employed against ground forces in the future. But the lack of careful record keeping prevents the Air Force from making a definitive case. This example highlights the importance of history to constructing future doctrine. Are there lessons relevant to the next air war that elude airmen because of inadequate record keeping at Khafji? It is a distinct possibility. Without the data that the Air Force could have collected, future Khafji analyses may be printed on glossier paper, but they won't provide a deeper understanding of the impact of airpower.

The JFACC concept of organizing air forces offers some dividends. The 3d MAW, which never completely subscribed to the Desert Storm command relationships, operated as a semi-autonomous force. It pursued objectives that supported the overall Marine campaign, and only reluctantly participated the JFACC's air war. As a result, the 3d MAW quickly responded to the Khafji attack by concentrating its airpower to meet the threat. Regardless of the JFACC's priorities, the 3d MAW responded to Khafji. The

TACC, in contrast, focused on larger theater objectives, and initially saw Khafji as a distraction. As a result, Horner maintained his focus on the larger war and the current task at hand—defeating the Republican Guard. Horner was reluctant to divert sorties to Khafji until he was absolutely sure that the attack was genuine, and significant. While roundly criticized for this perceived failure to act, Horner’s cautious response to Khafji was appropriate. Senior commanders must not react too quickly to kaleidoscopically changing events. There is a balance between responsiveness on one hand and indecisiveness on the other.

This study has attempted to “set the record straight” on Khafji. To that end, it has surveyed a very wide array of primary data and secondary analyses, including a number of recently declassified U.S. Air Force documents. Although it cannot claim to be definitive, it attempts to provide the most in-depth unclassified study conducted on Khafji to date. The results of the study indicate that Khafji demonstrates the potential of airpower to play a more significant role than it did prior to the Gulf War to impede the progress of armored formations. The extent of that potential, however, is circumscribed by the inconclusiveness of much of the data as well as by the particular circumstances of Desert Storm in general and the battle of Khafji in particular. Airmen would therefore be well advised to be slightly cautious about using the datum point of Khafji as the single case for advocating an entirely new operational concept.

Appendix A

Order of Battle: Major U.S. Marine Units

1st Marine Division

Div HQ

TF Ripper
HQ Co, 7th Marines
1/5 Bn
1/7 Bn
3rd Tank Bn

TF Papa Bear
HQ Co, 1st Marines
1/1 Bn
3/9 Bn
1st Tank Bn

TF Shepherd
LAI Bn

TF Taro
HQ Co, 3rd Marines
1/3 Bn
2/3 Bn
3/3 Bn

TF Grizzly
HQ Co, 4th Marines
2/7 Bn
3/7 Bn

TF King
HQ Btry, 11th Marines
1/11 Bn
3/11 Bn
5/11 Bn
1/12 Bn
3/12 Bn

TF Troy

TF Xray

2nd Marine Division

Div HQ

6th Marines
HQ Co, 6th Marines
1/6 Bn
2/6 Bn
2/2 Bn
8th Tank Bn

8th Marines
HQ Co, 8th Marines
1/8 Bn
2/4 Bn
3/23 Bn

1st Bde, USA 2nd AD (Tiger Bde)
H&HQ, 1st Bde, 2nd AD
3-41 Inf (Mech)
1-67 Armor
3-67 Armor

10th Marines
HQ Btry, 10th Marines
2/10 Bn
3/10 Bn
5/10 Bn
2/12 Bn
1-3 Field Atry

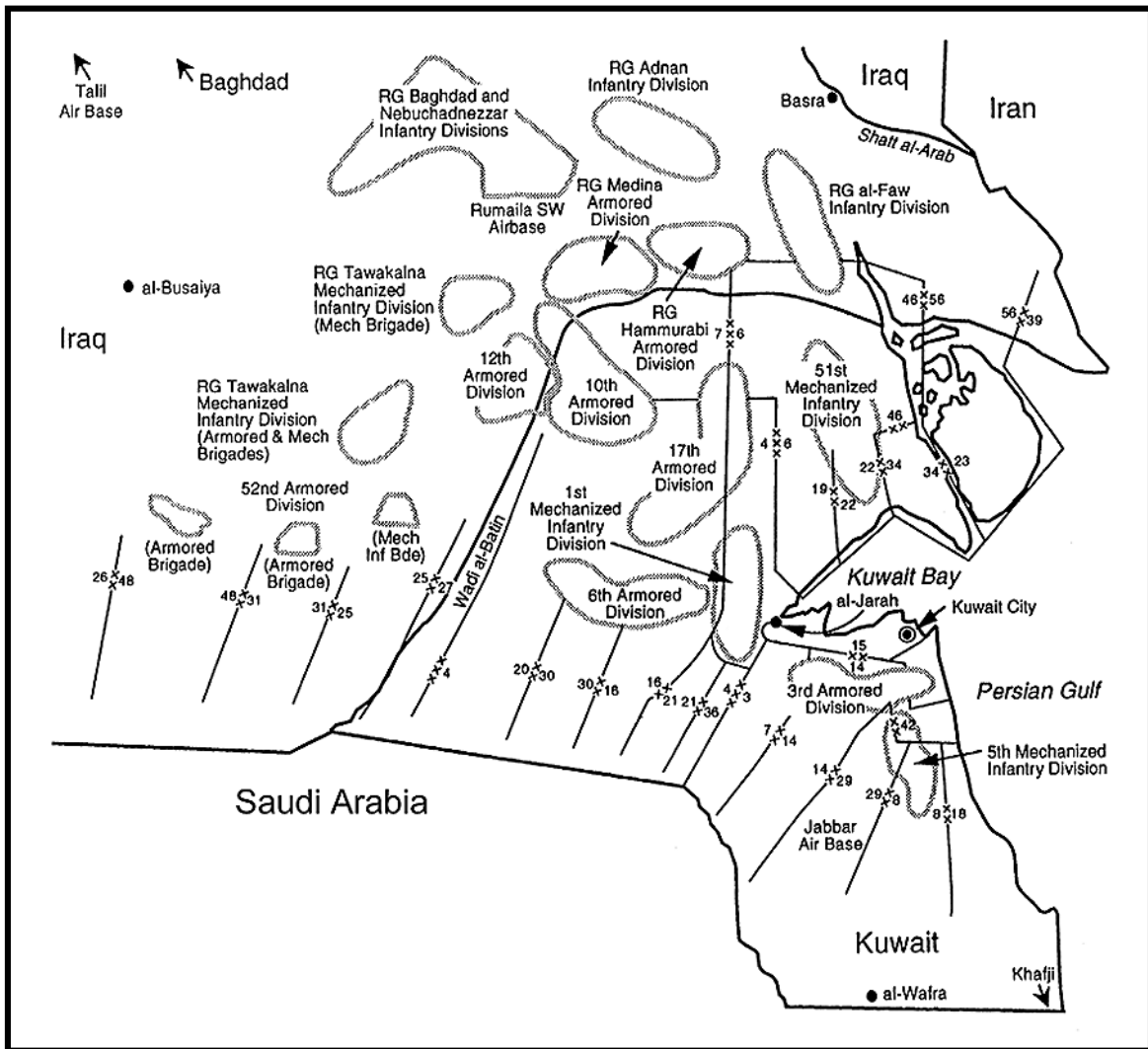
2nd LAI Bn

2nd Tank Bn

3rd MAW

MAG-11 (Fixed Wing)
MAG-13 (Fixed Wing)
MAG-16 (Rotary Wing)
MAG-26 (Rotary Wing)
MWSG-37
MAGC-38

Source: George Akst and Lt Cdr Kevin J. Becker, *Marine Corps Desert Storm Reconstruction Report (U)*
Vol II: Ground Force Operations. (Center for Naval Analyses, October 1991)



Iraqi Order of Battle

Source: Stephen T. Hosmer, *Effects of the Coalition Air Campaign Against Iraqi Ground Forces in the Gulf War*, MR-305-AF, (S), (Santa Monica, CA: RAND, 1994)

Iraqi Ground Units in the KTO

Echelon	Unit	Function
1 st	27 Infantry Divisions	Front Line Force
2 nd	52 nd Armor Div (VII Corps) 1 st Mech Infantry Div (IV Corps) 6 th Armor Div (IV Corps) 3 rd Armor Div (III Corps) 5 th Mech Infantry Div (III Corps)	Corps Reserves
3 rd	51 st Mech Infantry Div (II Corps) 17 Armor Div (II Corps) 10 th Armor Div (“Operation Jihad” Corps) 12 th Armor Div (“Operation Jihad” Corps)	Theater Reserves
4 th	7 Republican Guard Divisions	Strategic Reserves

Source: Stephen T. Hosmer, *Effects of the Coalition Air Campaign Against Iraqi Ground Forces in the Gulf War (S)*, (Santa Monica, CA: RAND, 1994),

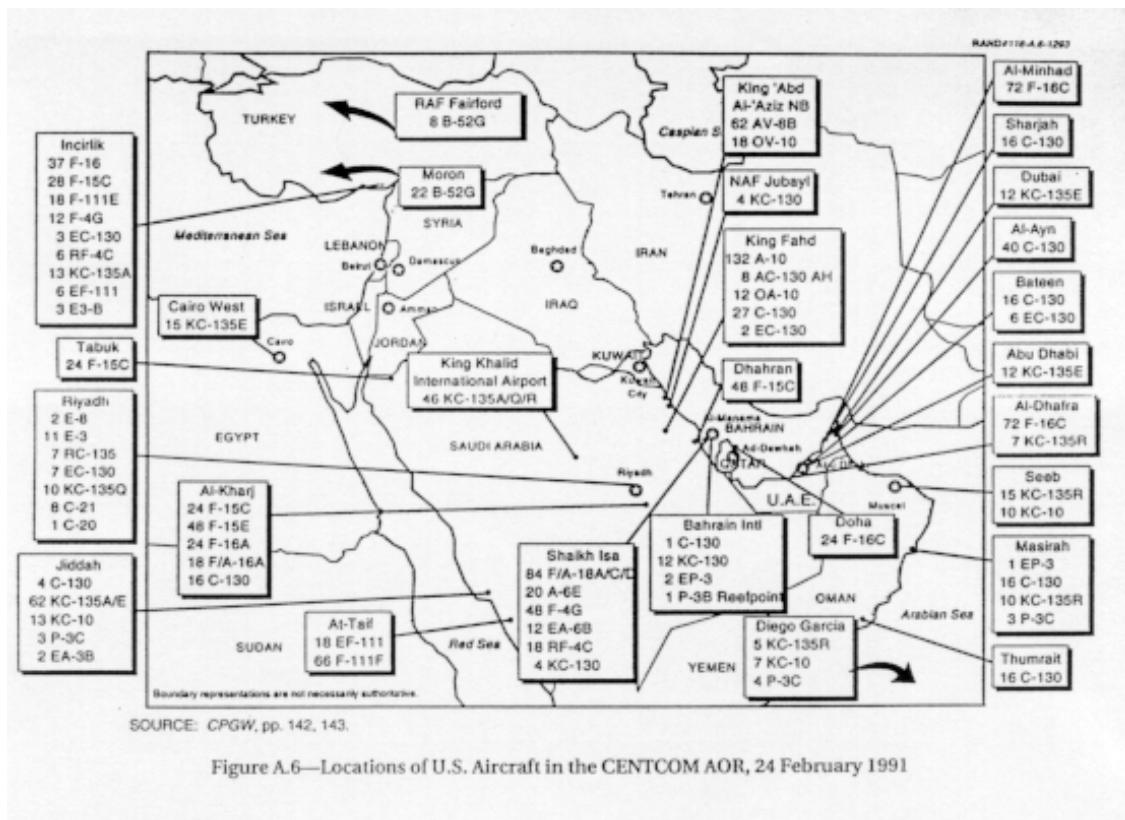
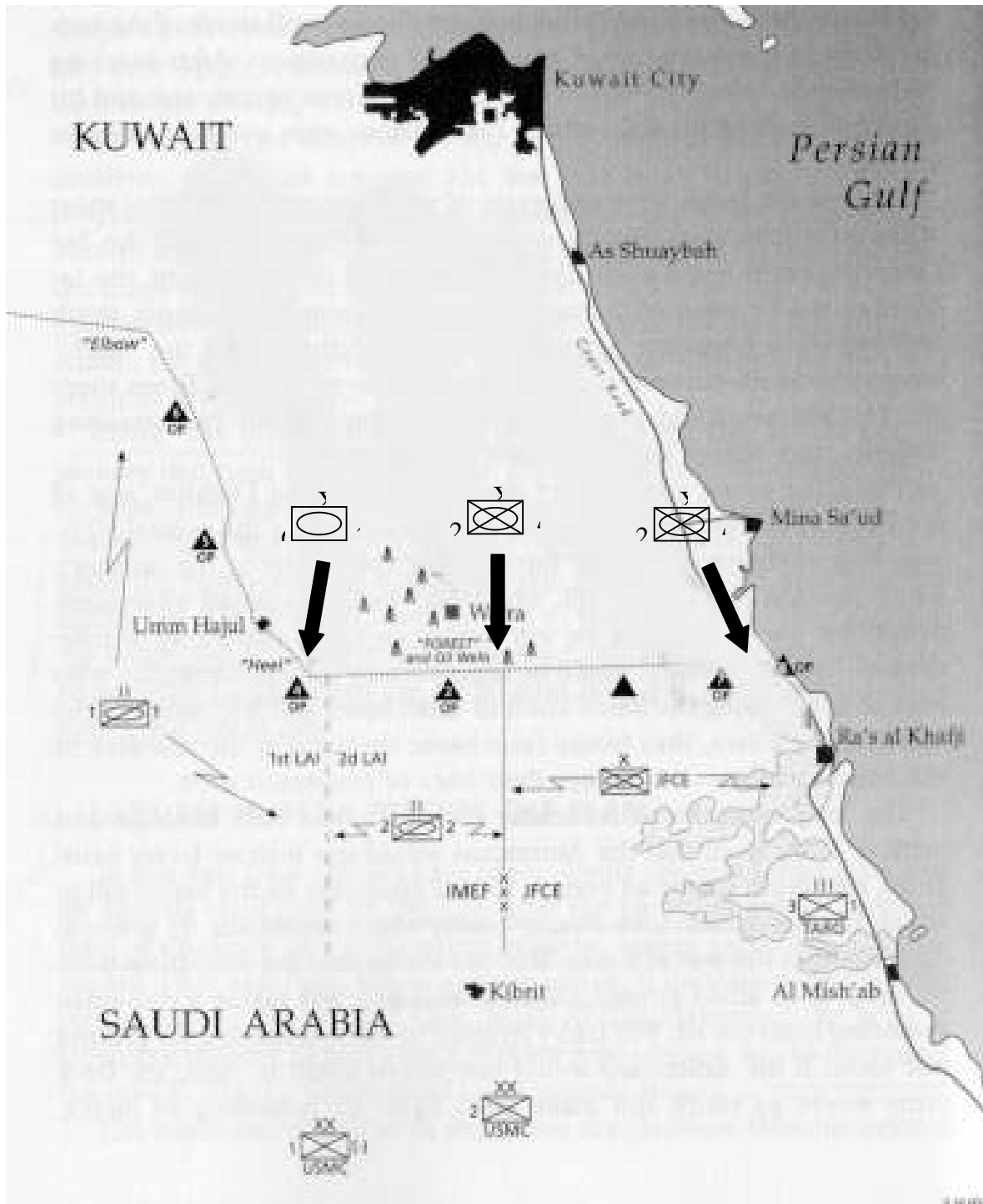


Figure A.6—Locations of U.S. Aircraft in the CENTCOM AOR, 24 February 1991

Coalition Air Order Units

Source: 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, 1994)



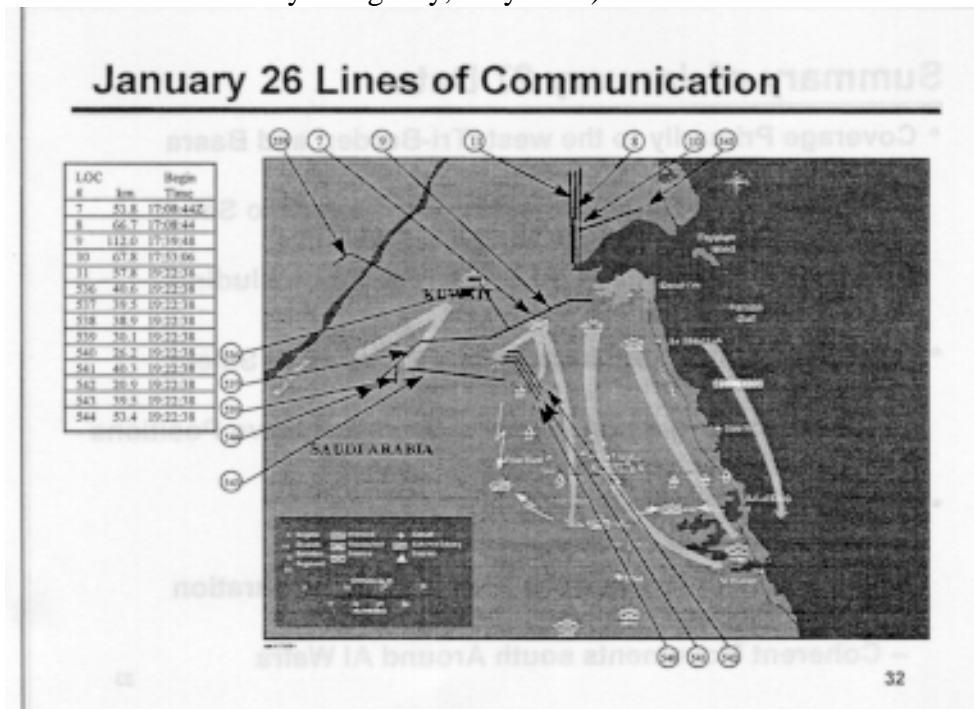
Iraqi Attacks on 29 January 1991

Adapted from Michael R. Gordon and Gen Bernard E. Trainor in *The General's War: The Inside Story of the Conflict in the Gulf* (Boston, Mass.: Little, Brown, and Co., 1995)

Appendix B

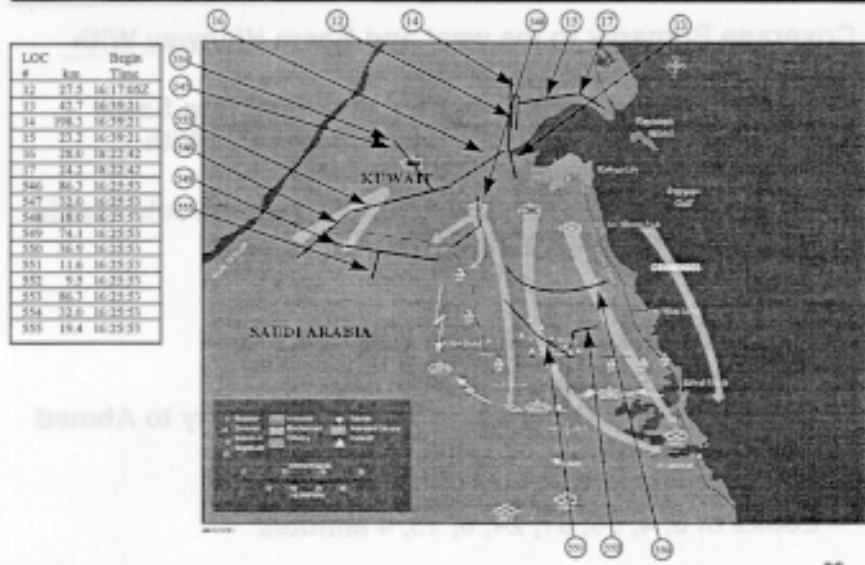
JSTARS Imagery of KTO

Joint Stars Data Analysis of "The Battle of Khafji", Final Report
(Air Force Studies and Analysis Agency, May 1997)



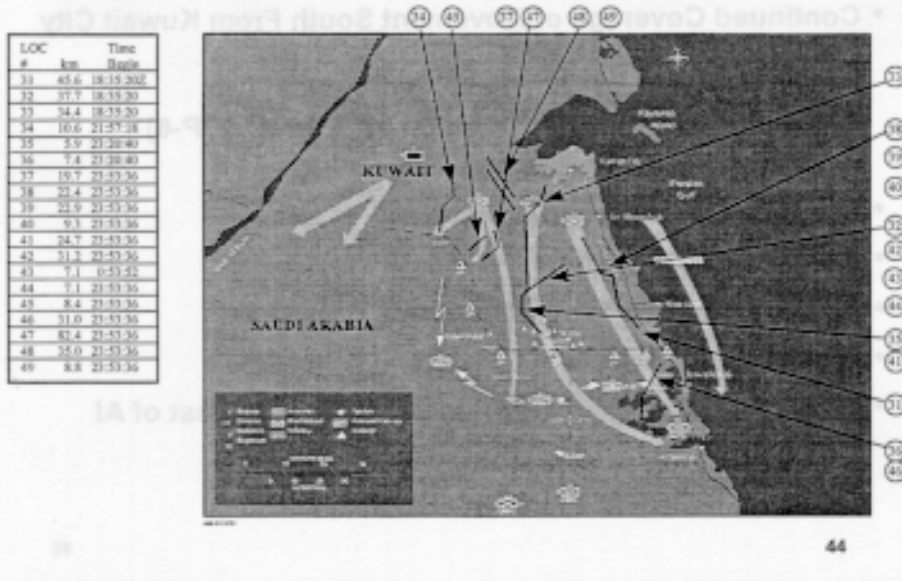
26 January 1998

January 27 Lines of Communication



27 January 1998

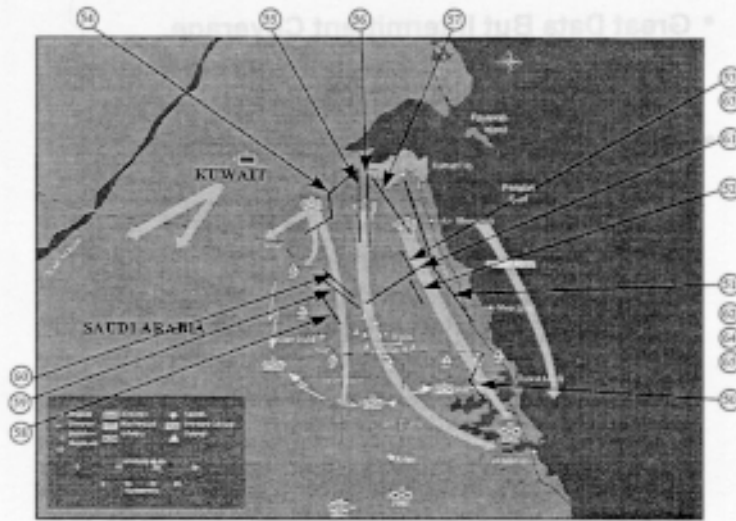
January 29 Lines of Communication



29 January 1998

January 30 Lines of Communication

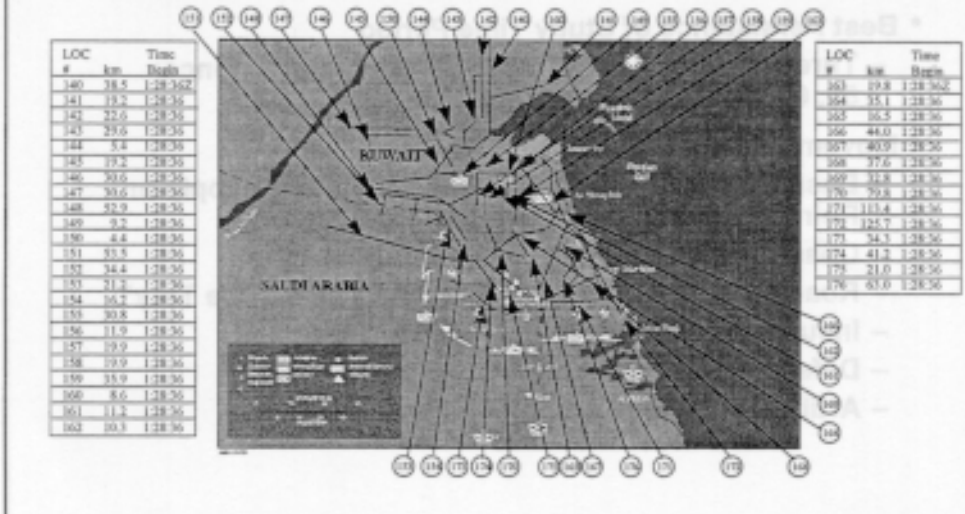
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31	60.0	15:03:18
32	26.5	15:03:18
33	41.3	15:03:18
34	45.0	16:37:35
35	35.3	16:37:35
36	18.4	16:37:35
37	33.0	16:37:35
38	29.0	16:37:35
39	22.7	18:33:29
40	21.0	18:33:29
41	42.0	21:17:01
42	31.1	21:17:01
43	42.4	00:12:41
44	37.0	00:12:41
45	37.0	00:12:41



48

30 January 1998

January 31 Lines of Communication - Look 4

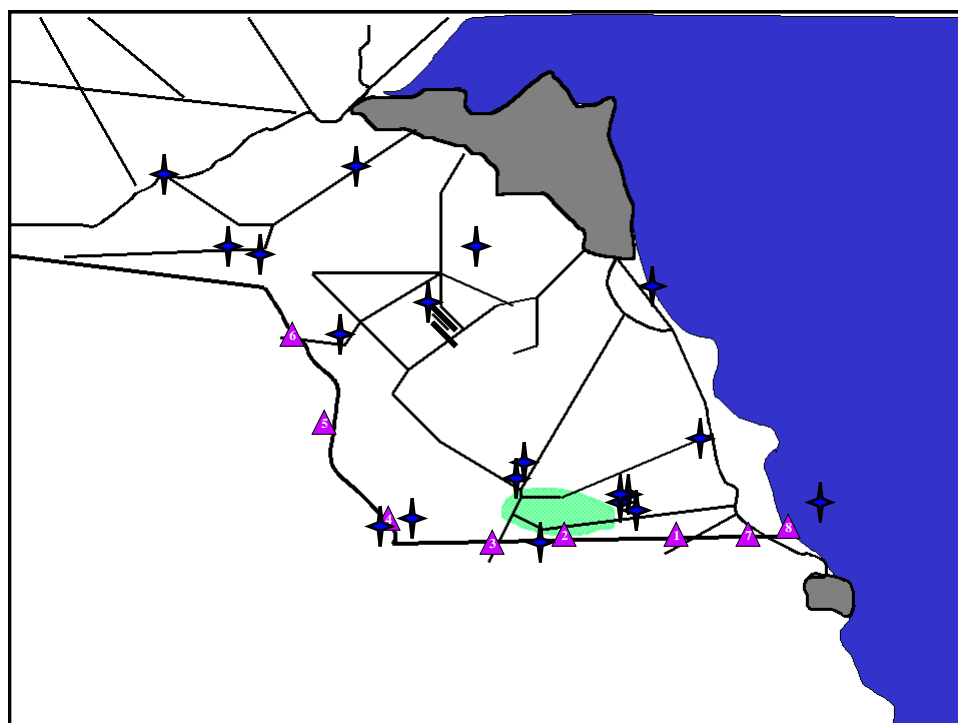


31 January 1998

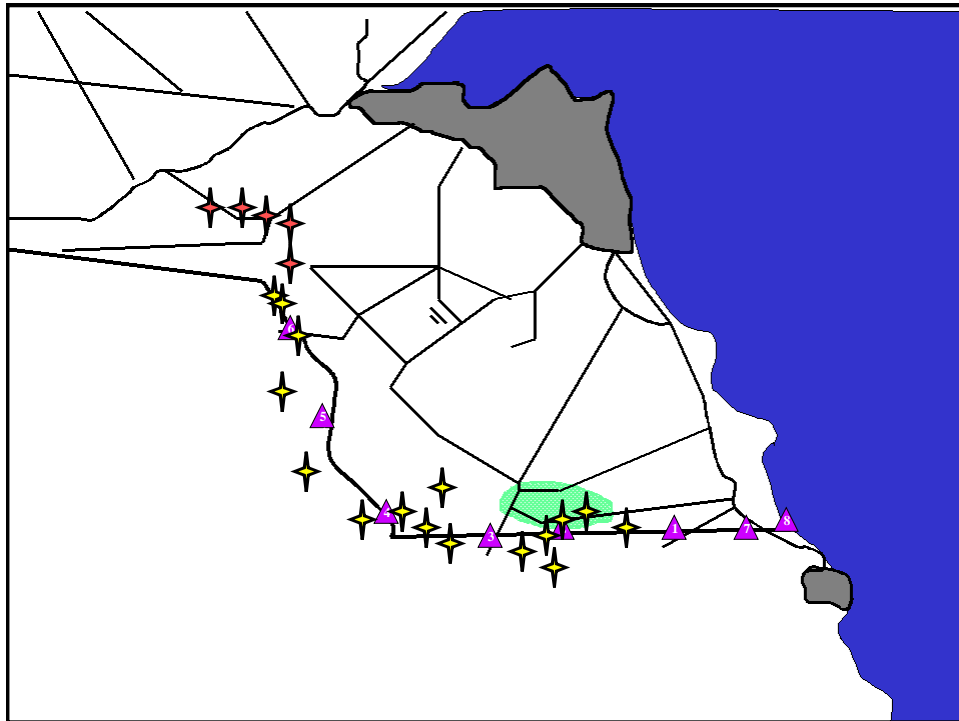
Appendix C

Strike Sorties in the KTO (29-31 January 1991)

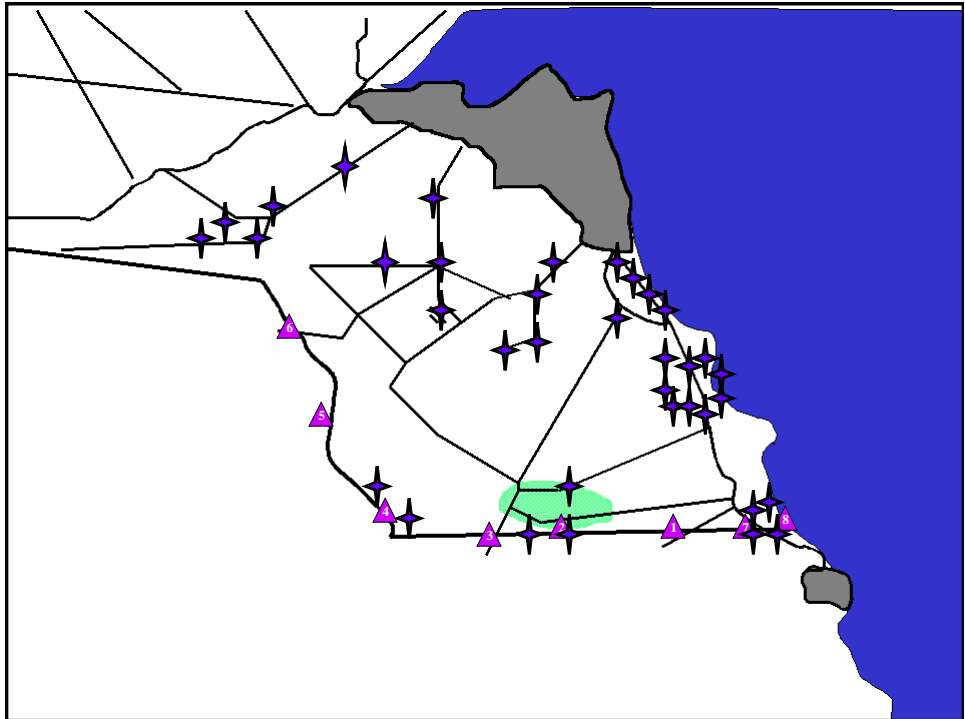
Source: Lt Col David J. Scott, Lt Col Peter J. Palmer, and Lt Col John L. Toolan, "The Battle of Khafji: An Assessment of Airpower" (Air War College report, April 1998)



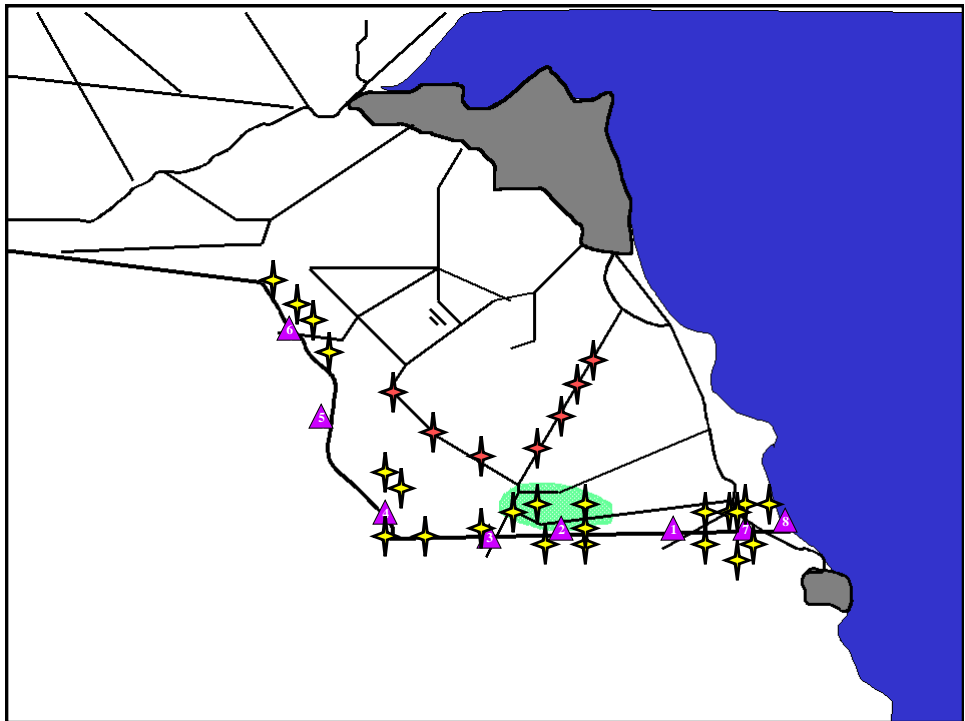
29 Jan 91—JFACC Sorties (Diverted After 1500L)



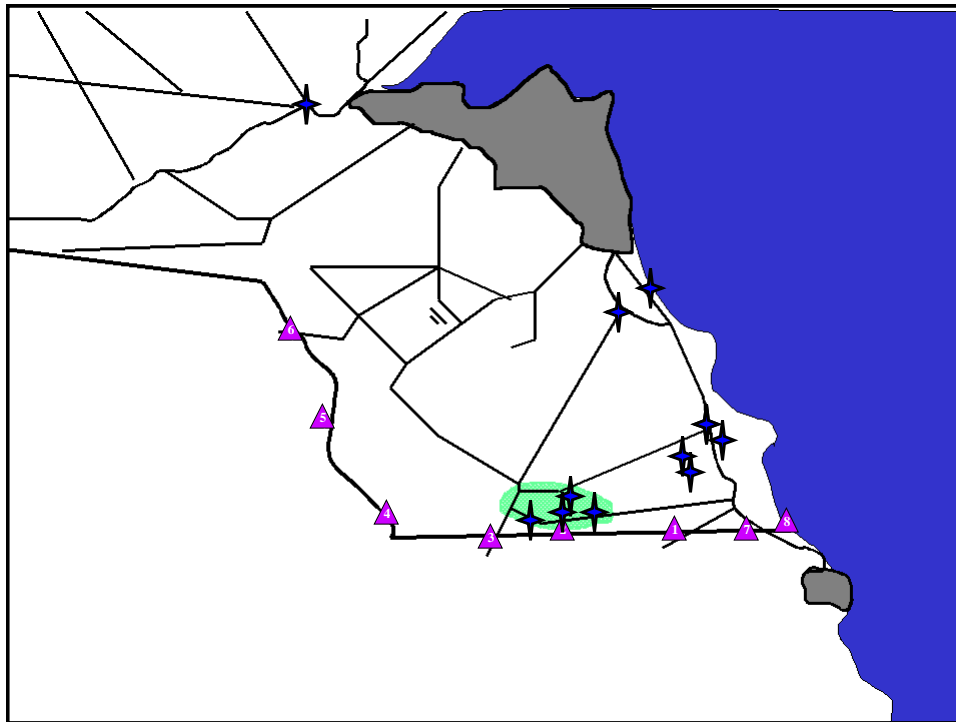
29 Jan 91—3rd MAW Sorties



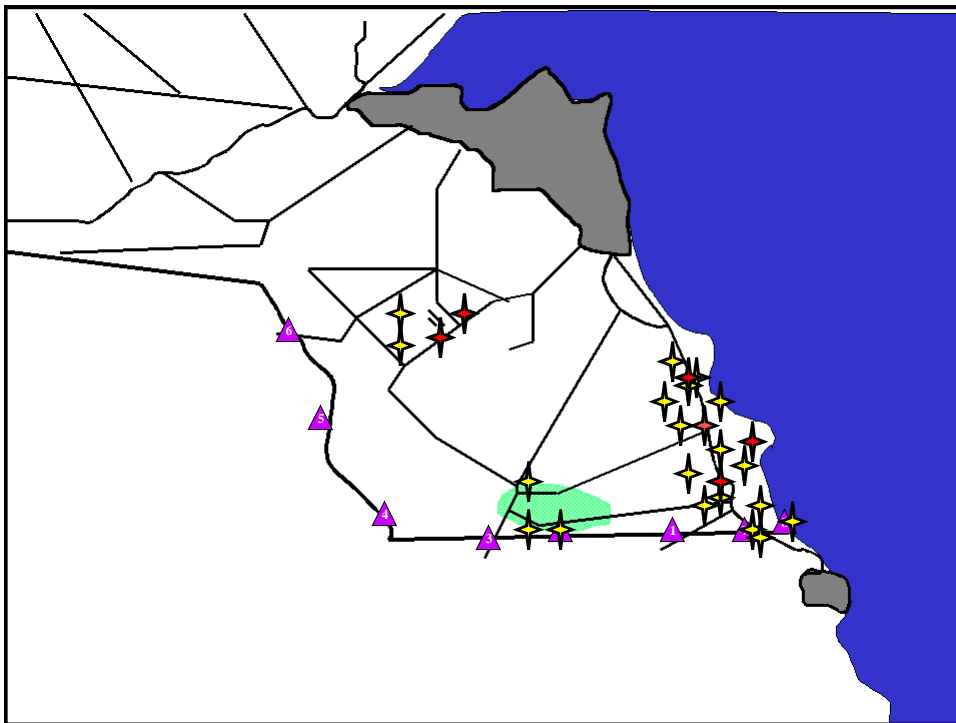
30 Jan 91—JFACC Sorties



30 Jan 91—3rd MAW Sorties



31 Jan 98—JFACC Sorties



31 Jan 91—3rd Maw Sorties

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