
COALITION SCUD-HUNTING IN IRAQ, 1991

THE STRATEGIC ENVIRONMENT

In late January 1991, Gulf War coalition leaders faced a major challenge they had not anticipated at the beginning of the air campaign against Iraq. Saddam Hussein had succeeded in deploying Scud missiles aboard mobile launchers, and on January 18 he had initiated a series of attacks on Israel, Saudi Arabia, and Bahrain. In strictly military terms, these low-accuracy, low-reliability weapons had little utility as counterforce weapons. In a broader strategic sense, however, the Scuds posed a major threat. Through his missile attacks, the Iraqi leader hoped to shatter the fragile coalition created by the United States to roll back Saddam Hussein's August 1990 invasion. In attacking Israel, the Iraqi leader also was bolstering his credentials in the Arab world as the "Zionist entity's" most effective and dedicated adversary.¹

The Scud attacks on Israel, it was feared, would provoke an Israeli military response that would make it difficult for Arab states to remain a part of the anti-Iraq coalition. As a matter of national policy, Israel was committed to responding militarily to attacks on its territory. During the first week of the attacks, 26 missiles were launched against Israel, and although they caused relatively little destruction, they created a great deal of psychological unease among the popula-

¹Sean McKnight, "The Failure of the Iraqi Forces," in John Pimlott and Stephen Badsey (eds.), *The Gulf War Assessed*, Arms and Armour Press, London, 1992, p. 175-176.

tion and sparked widespread public demands for retaliation. An Israeli response, in all likelihood, would entail air strikes against Iraq, which would require overflying Jordan, Saudi Arabia, or Syria. Leaders of the coalition feared that the Arab members of the anti-Iraq force, including Saudi Arabia, Egypt, and Syria, would then withdraw, thereby undercutting a crucial political and diplomatic component of the war to drive Saddam Hussein's forces from Kuwait.² The Scud attacks on Saudi Arabia and Bahrain, while not as politically delicate as those on Israel, nonetheless caused serious concern among coalition leaders, who feared that they were intended to provoke the coalition into a premature offensive.³

The United States had taken a number of steps to persuade Israel not to enter the conflict and fracture the coalition. These measures included the transfer of two U.S. Army Patriot air defense batteries to Israel and a sustained air campaign to destroy the remaining Scuds before they could be launched. However, the Scuds proved to be extremely elusive targets; in the face of growing Israeli determination to conduct its own Scud-hunting operations in Iraq, the United States and its coalition partners considered new and more dramatic approaches to the strategic challenge posed by Saddam Hussein's ballistic missiles.

THE IRAQI SCUD THREAT

At the time of its invasion of Kuwait, Iraq had two versions of the Scud missile in its inventory, the *al-Hussein* (also known as the *al-Hosseih*), with a range of 600–650 kilometers, and the *al-Abbas* (also called the *al-Hijarah*), which had a 750–900 kilometer range. Both were Iraqi modifications of the Soviet R-17 ballistic missile known as the SS-IC Scud B in North Atlantic Treaty Organization (NATO) parlance.⁴ Iraqi modifications, such as the reduction of payload weight

²Bruce W. Watson, "Terrorism and Ecoterrorism Lessons," in Bruce W. Watson (ed.), *Military Lessons of the Gulf War*, Greenhill Books, London, 1991; Presidio Press, Novato, CA, 1991, p. 181.

³McKnight, "The Failure of the Iraqi Forces," p. 176. Targets in Saudi Arabia included the Dhahran air base, the Al Jubail port, and King Khalid Military City, where many coalition forces were deployed.

⁴Centre for Defence and International Security Studies (CDISS), Lancaster University, "1990: The Iraqi Scud Threat," n.d., accessed at <http://www.cdiss.org/scudnt3.htm>.

and a faster burn-rate for the missile's fuel, which reduced its in-flight weight, were ingenious but resulted in a weapon that was less accurate and less reliable than the original Soviet model.⁵ As a result, the Iraqi Scuds were useful only as a terror weapon, as demonstrated during the 1980–1988 Iran-Iraq War, when Baghdad launched a total of 203 Scuds against targets in Iran. The attacks generated extensive panic in Iran—largely out of fear that the missiles were loaded with chemical weapons—but they caused relatively little destruction.⁶ While militarily ineffective, the Scud launches created an important legacy. The Iran-Iraq war developed within Saddam Hussein's military a dedicated cadre of experienced missile crews who had a demonstrated ability to fire missiles against civilian targets.⁷

At the time of the Persian Gulf War, the Iraqis had two means of launching the Scuds: fixed launchers and mobile transporter-erector-launchers (TELs). According to intelligence estimates used by U.S. military planners at the beginning of the air war against Iraq, Saddam Hussein's forces had 28 fixed launchers at five missile complexes in western Iraq, as well as a number of training launchers in other parts of the country.⁸ More important from the point of view of the subsequent Scud hunt were the mobile TELs employed by the Iraqis. These vehicles came in two forms: the Soviet-made, eight-wheeled MAZ-543, and the *Al Waleed*, a modified civilian Saab-Scania tractor-trailer.⁹ In addition, a large number of vehicles, in-

⁵McKnight, "The Failure of the Iraqi Forces," p. 175. According to one estimate, the modified Scuds had a circular error of probability (CEP) of more than 2000 meters (2188 yards) and a payload of a mere 180 kilograms (396 lb). Williamson Murray, with Wayne W. Thompson, *Air War in the Persian Gulf*, The Nautical & Aviation Company of America, Baltimore, MD, 1995, p. 165.

⁶McKnight, p. 175.

⁷Richard P. Hallion, *Storm Over Iraq: Air Power and the Gulf War*, Smithsonian Institution Press, Washington and London, 1992, p. 178.

⁸U.S. Department of Defense, *Conduct of the Persian Gulf War Final Report to Congress*, U.S. Government Printing Office, Washington, D.C., April 1992, p. 97.

⁹Garry R. Mace, *Dynamic Targeting and the Mobile Missile Threat*, Department of Joint Military Operations, U.S. Naval War College, Newport, RI, May 17, 1999, p. 4 (DTIC ADA370754). See the appendix for an illustration of the Iraqi mobile TELs.

cluding fuel trucks and missile supply vehicles disguised as civilian buses, supported the mobile launchers.¹⁰

The Iraqi military went to great lengths to ensure that their country's adversaries were unable to determine the precise number or location of the mobile TELs. High-fidelity decoys, some of East German origin, were widely employed. Iraqi missile crew tactics and procedures, such as the extensive use of gullies, wadis, culverts, and highway underpasses, were designed to thwart aerial reconnaissance.¹¹ Iraqi crews were able to operate from positions that coalition military leaders had not expected, such as hardened shelters at air bases and built-up areas. In addition, the Iraqis prepared protective, hidden holding pens for the TELs along highways in western Iraq.¹² Unknown to coalition planners, the Iraqis, drawing on their experience in the war against Iran, had shortened the Scud launch process in an effort to prevent post-launch detection. Soviet R-17 crews typically took as long as 90 minutes to set up and fire their missiles, but the Iraqis had managed to reduce the preparation and launch time to under half an hour.¹³ The Iraqis were also careful to avoid emitting telltale telemetry that could help an adversary locate the missile before it was launched.

As a result of these deceptions, the United States and its coalition partners were never able to get a complete picture of the missile and TEL inventory or its location. By the time the war began, U.S. intelligence analysts had a good understanding of the fixed Scud sites and their supporting infrastructure, such as missile manufacturing plants and storage facilities. But U.S. analysts remained uncertain about the locations of the mobile launchers, which the Iraqis had dispersed before the start of the air campaign. The exact number of TELs was also unclear. Estimates at the beginning of the war placed the figure at 36, although a post-war Pentagon study concluded that this number was probably too low.¹⁴ In the words of one senior Defense Intelligence Agency (DIA) official, there was "no accurate accounting

¹⁰"1990: The Iraqi Scud Threat."

¹¹Mace, "Dynamic Targeting," p. 4.

¹²Murray, *Air War*, p. 168.

¹³"1990: The Iraqi Scud Threat."

¹⁴DoD, *Conduct of the Persian Gulf War*, p. 97.

of numbers of mobile launchers or where they were based [or] hiding.”¹⁵

AIR OPERATIONS AGAINST SCUDS

Coalition military planners had been well aware of the potential threat posed by Iraq’s ballistic missiles. In mid-January 1990, during the opening days of the Gulf War, a large number of sorties were directed at the fixed Scud launch sites and at the manufacturing facilities that supported the missiles. But contrary to coalition expectations, the Iraqis chose to rely exclusively on mobile launchers. Further, the fixed sites hit on the night of January 16–17 were in fact decoys intended to divert coalition attention away from the Scud TELs that had already been dispersed to hidden locations.¹⁶

Poor weather conditions and Iraqi deception techniques made it extremely difficult for coalition forces to detect and attack the dispersed TELs before they launched their missiles. Instead, air commanders focused on destroying the vehicles after they had launched their Scuds. Toward this end, the coalition mounted combat air controls over so-called “kill boxes” where TELs were suspected.¹⁷ The kill boxes were located in two areas—western Iraq near the Jordanian border, where the Scuds were fired at Israel, and southern Iraq, where they were aimed at Saudi Arabia.¹⁸ Air commanders hoped that keeping aircraft on station over the kill boxes would allow F-15E and F-16L strike aircraft to hit the TELs after they had launched their weapons but before they had time to flee to safety.¹⁹ However, sensors aboard orbiting coalition aircraft, including LANTIRN (Low-

¹⁵Rear Admiral J. “Mike” McConnell, interview by Diane T. Putney, Center for Air Force History, and Ronald H. Cole, JCS Historical Division, February 14, 1992, as quoted in Murray, *Air War*, p. 166.

¹⁶Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report*, USGPO, Washington, D.C., 1993, p. 86 (abbreviated hereafter as *GWAPS*).

¹⁷Mace, “Dynamic Targeting,” pp. 4–5. These kill boxes were defined by satellites, TR-1 aircraft, E-8 JSTARS (Joint Surveillance [and] Target Attack Radar System) radar ground surveillance aircraft, and Royal Air Force Tornado GR-1a reconnaissance aircraft also participated in the Scud hunt. Mark Urban, *UK Eyes Alpha: Inside British Intelligence*, Faber and Faber, London and Boston, 1996, p. 173.

¹⁸Urban, p. 173.

¹⁹Keaney and Cohen, *GWAPS*, p. 86.

Altitude Navigation and Targeting Infrared System for Night) and a synthetic aperture radar, were unable to identify and acquire the TELs, whose infrared and radar signatures were virtually indistinguishable from trucks and other electromagnetic “clutter” in the Iraqi desert and were relatively easy to mask.²⁰ The maddeningly elusive nature of the Iraqi targets is illustrated dramatically by the fact that on the 42 occasions during the war when orbiting strikers visually sighted mobile TELs, in only eight instances were they able to acquire the targets sufficiently well to release ordnance.²¹

MISSIONS OF SPECIAL OPERATIONS FORCES

It became increasingly apparent to the coalition’s senior military commanders that finding and destroying the elusive mobile TELs demanded a new approach. The use of conventional ground troops to hunt for Scuds had been rejected by JCS Chairman General Colin Powell and General Norman Schwarzkopf, the commander of U.S. Central Command. More recently, however, Israel had threatened to take matters into its own hands and mount its own air and ground operations in western Iraq. Washington refused to approve such operations, but the Israeli proposal prompted U.S. Secretary of Defense Dick Cheney to consider employing special operations forces (SOF) to hunt for Scuds.²² British Special Forces, he discovered, had been operating in western Iraq since January 20. Some of the coalition’s senior military commanders, including Schwarzkopf, had long been skeptical about the value of special operations, and was unenthusiastic about using SOF for cross-border operations in Iraq. In Schwarzkopf’s judgment, western Iraq, an area of roughly 29,000 square miles, was simply too large for a ground force to search. As he explained at a January 20 press conference, “there’s not much point putting people on the ground to try and find nine, maybe ten

²⁰Keaney and Cohen, pp. 86–87. According to a post-war DIA assessment, inadequate cueing of strike aircraft by satellites also contributed to the inability of coalition aircraft to hit the mobile TELs. Mace, “Dynamic Targeting,” p. 5.

²¹Keaney and Cohen, *GWAPS*, p. 87.

²²Michael R. Gordon and General Bernard E. Trainor, *The Generals’ War: The Inside Story of the Conflict in the Gulf*, Little, Brown and Company, Boston, 1995, p. 244.

trucks.”²³ Nevertheless, Cheney approved a plan to send U.S. SOF personnel across the Saudi Arabian border to hunt for Scud launchers.²⁴

On February 7, the first U.S. SOF teams began searching for mobile TELs in western Iraq.²⁵ American and British Special Forces—the Special Air Service (SAS)—divided the responsibility for searching the region. U.S. personnel operated in a several thousand square-mile area northwest of the main Baghdad to Amman route up to the Syrian border. Known as “Scud Boulevard,” the area included Al Qaim, where it was suspected that the Iraqis were using phosphate mines as hiding places for mobile TELs. The SAS squadrons were also assigned a several thousand square-mile hunting ground, nicknamed “Scud Alley,” that stretched from an area around the H-2 airfield south of Highway 10 to the Saudi border.²⁶ American and British areas of operation are depicted in Figure 3.1.

Open sources contain relatively little operational information about U.S. SOF activities in western Iraq. Some basic elements have emerged, however. Operating at night, Air Force MH-53J Pave Low and Army MH-47E helicopters would ferry SOF ground teams and their specially equipped four-wheel-drive vehicles from bases in Saudi Arabia to Iraq.²⁷ The SOF personnel would patrol during the night and hide during the day. When targets were discovered, Air Force Combat Control teams accompanying the ground forces would communicate over secure radios to Airborne Warning and Control

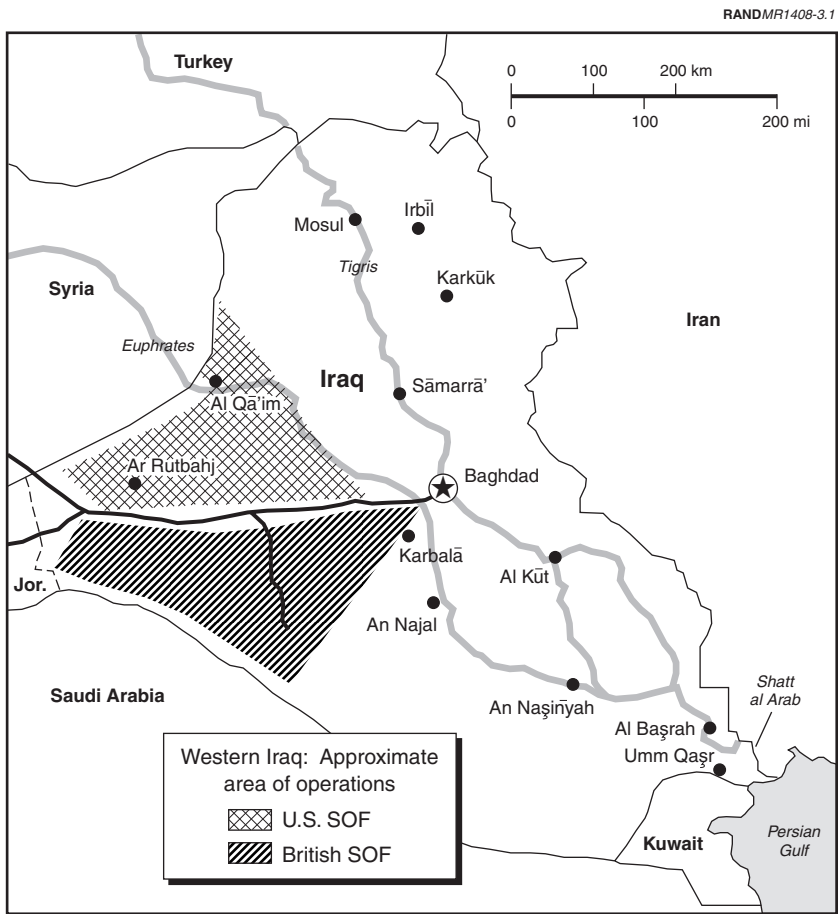
²³As quoted in Urban, *UK Eyes Alpha*, p. 173.

²⁴It is possible that the earlier campaign against the Ho Chi Minh Trail informed DoD’s decision to employ SOF in the Scud hunt. In the judgment of one former OP 35 member, operations in Laos “proved to the military . . . that we had that capability whereas before it didn’t They knew we could do it and therefore they were able to call on special forces to do that particular role [in the Gulf].” LTC Raymond Call, “MACVSOG Oral History Interviews,” p. 34.

²⁵CDISS, “The Great Scud Hunt: An Assessment,” n.d., accessed at <http://www.cdiss.org/scudnt6.htm>.

²⁶CDISS.

²⁷Douglas C. Waller, *The Commandos: The Inside Story of America’s Secret Soldiers*, Dell Publishing, New York, 1994, pp. 407–408.



SOURCES: de la Billière, *Storm Command*; p. 225; Centre for Defence and International Security Studies, "The Great Scud Hunt: An Assessment"; author's interviews. Basic map accessed at http://www.Lib.utexas.edu/Libs/PCL/Map_collection/cia99/Iraq_sm99.jpg.

Figure 3.1—Coalition SOF Areas of Operation

System (AWACS) aircraft, which would in turn communicate with orbiting F-15E and A-10 aircraft loaded with cluster munitions and 1000-lb bombs.²⁸

Given Britain's traditional penchant for official secrecy, it is ironic that far more information is available about SAS activities in western Iraq. Since the end of the Persian Gulf War, memoirs by former members of the SAS, as well as senior military commanders, have revealed many of the details surrounding Special Forces missions against Iraq's mobile TELs. Because British and American special operations forces were striving to achieve similar objectives in similar terrain, it is probably safe to use British sources for insights into coalition special operations in general. Having said that, however, it is important for us to recognize that significant differences existed. American units generally had superior equipment and better intelligence about their targets. In addition, U.S. SOF were much more numerous, which allowed their commanders to rotate them out after their missions, which typically lasted a week or ten days. Relatively fewer British forces, combined with an organizational ethos that stressed long-term insertions, meant that SAS missions tended to be far longer.²⁹

Like their American counterparts, eight-man SAS teams were flown in Chinook helicopters into Iraq under the cover of darkness from forward operating bases in Saudi Arabia. Most patrols went in with modified Land Rovers known as "pinkies." However, as noted by Lt. General Sir Peter de la Billière, the senior British commander, SAS patrol members have a tradition of great operational autonomy, and at least two teams chose to patrol on foot. Upon landing at the target area, one of those teams, after quickly surveying the flat terrain, concluded that it would be impossible to hide adequately, and insisted on being helicoptered out. Most of the second team, which patrolled on foot for several days, was ultimately captured by the Iraqis.³⁰

²⁸Waller, p. 408.

²⁹Author's interview with Colonel Robert Stephan, USAF, October 3, 2000, Washington, D.C.; author's interview with former SAS officer, London, January 28, 2001.

³⁰General Sir Peter de la Billière, *Storm Command: A Personal Account of the Gulf War*, HarperCollins Publishers, London, 1992, p. 222.

During the day, SAS personnel would hide in carefully camouflaged “lying up positions” in wadis, gullies, or other spots where detection by Iraqi troops would be difficult. The desert, ostensibly empty, was in fact populated with Bedouin goat herders and their families, who were scattered throughout the Scud alley operational area. The risk of compromise by the tribesmen was a major concern for the SAS before and during their missions. Although some troopers favored killing any Bedouins they encountered, a “hearts and minds” approach prevailed.³¹ At night, aboard the pinkies, patrol members would search the desert for mobile TELs. Whereas American teams on the ground were given daily intelligence updates about potential targets,³² SAS teams had only the most general indication of where a Scud launcher might be found. Their primary source of intelligence was their own eyesight. In the words of one SAS staff sergeant,

Scuds were usually launched at night and gave a huge signature, a great big ball of light. You could see the fireball at the base of the motor from thirty miles away across flat open desert, and that gave us an indication of where to look. The launcher would be moved immediately after firing, but if you looked at the layout of the roads and interpreted it intelligently you could generally pick up where the launcher was going to be.³³

However, navigation across the desert proved to be a major challenge. Fog, sandstorms, and cold made it extremely difficult for even a force as well trained and experienced as the SAS to cover much ground.³⁴ The flat, featureless terrain, with no reference points, also created significant obstacles to the effective use of maps,³⁵ and be-

³¹When they encountered Bedouin, the SAS teams attempted to co-opt them. “Patrols neither abducted nor killed [them]. They were respectful to them, offered them food and drink, and if necessary bluffed them.” Ken Connor, *Ghost Force: The Secret History of the SAS*, Weidenfeld & Nicolson, London, 1998, p. 313.

³²Author’s interview with Stephan.

³³As quoted in Connor, *Ghost Force*, p. 315.

³⁴de la Billière, *Storm Command*, p. 225; author’s interview with former SAS officer.

³⁵Andy McNab, *Bravo Two Zero*, Island Books, New York, 1993, p. 98. As noted by McNab, the leader of the ill-fated SAS foot patrol, “In most countries there’s high ground that you can take reference points off, there are roads, or there are markers, and it’s all quite easy. But here in the desert there was buggar all, so it was all down to bearings and pacing again, backed up by [the] Magellan [global positioning system].”

cause of cloud cover, there was little or no ambient light in the desert at night, making night-vision devices relatively useless.³⁶ From open sources, it is difficult to determine precisely how much ground a vehicle could cover in any given evening. However, a former SAS member describes his horror one morning upon discovering how little his patrol had traveled during the previous night. One of his fellow SAS members urged the patrol to cover at least 80 kilometers the following evening, suggesting that the distance they had traveled the night before had been considerably less.³⁷

When targets were discovered, SAS team members would call in USAF strike aircraft using TACBE radio distress beacons. At first there were no established procedures for calling in air strikes, and the SAS teams had to use the emergency “guard” radio frequency to talk to the pilots.³⁸ In an effort to improve command and control, communications procedures were established, and SAS liaison officers eventually were assigned to the U.S./coalition Tactical Aircraft Control Center (TACC) in Riyadh, the nerve center of the air campaign.³⁹ After the SAS teams found a target, their messages were relayed to the TACC, which would transmit the information to orbiting AWACS aircraft. The AWACS, in turn, would communicate with strike aircraft on combat air control—typically, A-10s during the day and F-15Es at night.⁴⁰ Despite these improved command and control measures, however, the time between target identification by the ground teams and the delivery of ordnance by the strike aircraft was 50 minutes or more,⁴¹ roughly on par with the U.S. experience during operations along the Ho Chi Minh Trail.

Like their MACVSOG predecessors, SAS personnel did more than find targets and call in air strikes. They were multipurpose forces, capable of taking direct action, conducting BDA on targets previously hit

³⁶Mike Curtis, *Close Quarter Battle*, Corgi Books, London, 1997, p. 346.

³⁷Curtis, p. 352.

³⁸CDISS, “Special Forces Operations in Desert Storm,” n.d., accessed at <http://www.cdiss.org/scudnt5.htm>.

³⁹CDISS.

⁴⁰de la Billière, *Storm Command*, p. 224.

⁴¹de la Billière, p. 224.

by coalition aircraft, and capturing Iraqi prisoners.⁴² Teams destroyed fiber-optic links that carried targeting data for the Scud missile crews,⁴³ and used plastic explosives to blow up microwave relay towers and communications bunkers.⁴⁴ Frustrated with the relatively long delays involved in calling in air strikes, SAS troopers also attacked Iraqi vehicles and other targets directly, usually at night. Using thermal imagers, the teams employed shoulder-fired Milan missiles to engage Iraqi mobile TELs.⁴⁵ As the Iraqis began moving Scud-related equipment in 10- to 20-vehicle convoys as a defensive measure, SAS teams mounted ambushes using bar mines and bulk explosives.⁴⁶

ASSESSING THE EFFECTIVENESS OF THE SCUD HUNT

In the immediate aftermath of the war, British and American political and military leaders announced that coalition operations had effectively neutralized the Scud threat. Senior U.S. SOF officers claimed that U.S. teams operating in western Iraq were responsible for the destruction of as many as a dozen mobile TELs.⁴⁷ A year after the war's end, however, Pentagon officials began expressing public doubt about the number of Scud TELs actually eliminated by coalition forces. In the words of Pete Williams, the assistant secretary of defense for public affairs, there was "no accurate count of how many mobile launchers had been destroyed."⁴⁸ The Pentagon's postwar study on Gulf air operations, the *Gulf War Air Power Survey*, concluded that sensor limitations on coalition aircraft, combined with

⁴²Curtis, *Close Quarter Battle*, p. 412. U.S. SOF, according to Stephan, did not conduct BDA, fearing that Iraqi troops were likely to be in the vicinity of the targets hit by coalition strike aircraft.

⁴³Connor, however, argues that these cables, which ran in communications trenches along the sides of roads, were not Scud communications links. "In fact the Russians, who manufactured the Scuds, normally provided survey vehicles to accompany mobile launchers and supply the targeting data." Connor, *Ghost Force*, p. 318.

⁴⁴de la Billière, *Storm Command*, p. 224.

⁴⁵Curtis, *Close Quarter Battle*, p. 326.

⁴⁶Connor, *Ghost Force*, p. 316.

⁴⁷Gordon and Trainor, *The Generals' War*, p. 245.

⁴⁸As quoted in CDISS, "The Great Scud Hunt: An Assessment."

highly effective Iraqi tactics, resulted in relatively few mobile launcher kills. According to the report,

a few [TELS] may have been destroyed, but nowhere near the numbers reported during the war [T]here is no indisputable proof that Scud mobile launchers—as opposed to high-fidelity decoys, trucks, or other objects with Scud-like signatures—were destroyed by fixed-wing aircraft.⁴⁹

The postwar UN Special Commission (UNSCOM) established to eliminate Saddam Hussein's weapons of mass destruction discovered substantial evidence that the coalition had destroyed far fewer missiles and mobile TELs than had originally been claimed. Despite the coalition's Scud-hunting campaign, Saddam Hussein, according to UNSCOM, retained a significant postwar capability of 62 complete *Al Hussein* missiles, 12 MAZ 543 TELs, and seven *Al-Nidal* and *Al-Waleed* mobile launchers.⁵⁰

In the face of such skepticism about earlier claims of effectiveness, defenders of the special operations against the Scud threat put forward a new argument. Instead of focusing on the question of how many Scuds or mobile TELs had been killed, supporters now stressed the deterrent effect of coalition operations. As de la Billière explained during a television interview after the war, the counter-Scud missions

really denied the Iraqi Scuds the capability of deploying sufficiently close to Israel to launch their weapons effectively I'm quite confident that [absent such operations] the Scuds would have gone on operating despite the massive air superiority that we possessed."⁵¹

⁴⁹Keaney and Cohen, *GWAPS*, p. 91.

⁵⁰Urban, *UK Eyes Alpha*, p. 174; CDISS, "The Great Scud Hunt: An Assessment." These sources differ on the number of mobile TELs in Iraq's postwar inventory. The former places the number at 19, the latter at ten. Urban's figure, however, appears to include not just complete TELs, but also TEL components discovered by the UNSCOM inspectors.

⁵¹As quoted in Urban, *UK Eyes Alpha*, pp. 174–175.

The combination of special operations and air strikes, according to this view, created pressure on mobile TEL crews, forcing them to continuously seek new launch sites and slowing their rate of fire.⁵²

To be sure, launch rates did decline over the life of the Scud-hunting campaign. During the course of the war, Iraq fired a total of 88 extended-range Scuds against targets in Israel, Saudi Arabia, and Bahrain. A total of 33 launches took place during the opening week of Desert Storm, a daily rate of 4.7 launches. During the remaining 36 days of the conflict, the Iraqis fired 55 missiles, bringing the daily launch rate down to 1.5. As impressive as this lower rate sounds, however, it must be considered in context. While it is true that Scud firings dropped during the third and fourth week, they began to increase during the final week of the conflict. Iraq, according to a March 1990 DIA assessment, had the ability even in the last days of the war to “initiate firings from new launch areas and to re-target . . . from urban to military and high-value targets.”⁵³

What this suggests is that after initially being hindered by coalition anti-Scud activities, the Iraqis managed to adapt to the pressure created by these operations.⁵⁴ (By the same token, however, it seems fair to conclude that had the war continued, allied SOF also might have learned to adapt to and overcome some of Iraqi’s countermeasures.) The pattern of Iraqi launches over time also calls into question the operational effectiveness of the Scud-hunting missions. Coalition SOF searched for mobile TELs in western Iraq, the region from which Scuds were fired at Israel. However, the presence of large numbers of Iraqi troops kept SOF teams out of the southernmost part of Iraq, the area from which Scuds were launched at Saudi Arabia. After the first week of the war, the Iraqi launch rate for mis-

⁵²Gordon and Trainor, *The Generals’ War*, p. 247. In the view of DIA, anti-Scud operations “most likely reduced Iraq’s opportunities to employ several mobile launchers for near simultaneous firing of multiple missiles, a method that could have increased damage and saturated Patriot defenses.” DIA, “Iraqi Short-Range Ballistic Missiles in the Persian Gulf War: Lessons and Prospects,” Defense Intelligence Memorandum, March 1990, as quoted in Gordon and Trainor, n. 19, p. 498.

⁵³Gordon and Trainor, p. 498. Weekly Scud launch rates are depicted in the Appendix. Although Baghdad’s command, control, communications and intelligence system (C3I) was effectively destroyed during the allied air campaign, Scud crews operated autonomously, and thus were able to continue firing their missiles.

⁵⁴Murray, *Air War*, p. 176.

siles directed at Israel was roughly the same as the rate for those fired at the Arab states.⁵⁵ In other words, the Iraqis fired their missiles at the same rate regardless of whether SOF were operating in the launch area.⁵⁶ Thus, on the tactical and operational level, it would appear that the special operations in western Iraq did not achieve their objective of eliminating, or seriously reducing, the Scud threat. The Iraqis' use of decoys and other deception techniques, the quick-fire "shoot and scoot" capabilities of the Scud crews,⁵⁷ and sensor and other technical shortfalls, plus the vast amount of terrain special operations personnel were expected to cover, combined to frustrate and undermine the coalition's Scud-hunting mission.

On the strategic level, however, the coalition SOF can claim much more success. The British and American teams were sent in response to a grave challenge to the continued Arab participation in the coalition formed to respond to Iraq's aggression against Kuwait. In the judgment of the Bush administration in Washington and the Conservative government in London, continued Scud attacks were likely to bring Israel into the war, which would cause the Arab members to defect from the coalition. Such an outcome, in the view of Washington and London, would cause major strategic and political problems for the coalition, and would seriously degrade its ability to prosecute the war against Saddam Hussein.

To assuage Israel, coalition leaders pledged to send its best trained, most experienced, and most elite ground forces to hunt for the Scuds in western Iraq. The fact that Washington and London made this SOF commitment, and employed the coalition's most advanced reconnaissance and strike aircraft, including the F-15E, appears to have convinced Tel Aviv that an Israeli military response against Saddam Hussein was unnecessary. The coalition held, and the way

⁵⁵Keaney and Cohen, *GWAPS*, p. 84.

⁵⁶Urban, *UK Eyes Alpha*, p. 175; Connor, *Ghost Force*, p. 330.

⁵⁷James J. Wirtz describes the "shoot and scoot" problem well: The "'flaming datum' used to target mobile missile launchers proved ineffective. Even though aircraft arrived in the general vicinity of a missile site only a few minutes after a missile launch, Scud crews had plenty of time to 'scoot' to predetermined hiding areas before US warplanes arrived overhead." James J. Wirtz, "A Joint Idea: An Antisubmarine Warfare Approach to Theater Missile Defense," *Airpower Journal*, Vol. 11, No. 1, Spring 1997, p. 87.

was paved for the liberation of Kuwait. Thus, while not reaching their tactical or operational objectives—beyond perhaps the goals of harassing Iraqi TEL crews—SOF were useful in achieving higher strategic objectives that ultimately served to drive Saddam Hussein from Kuwait.