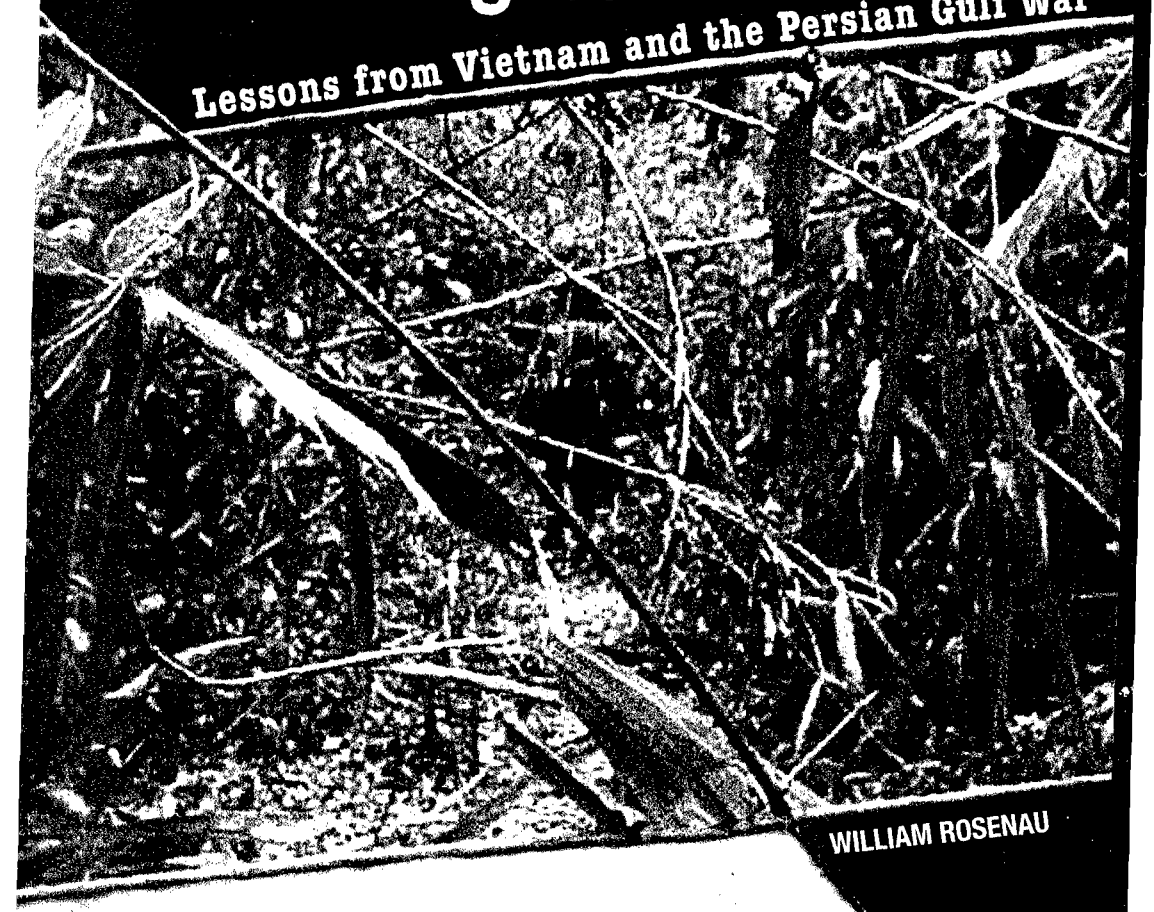
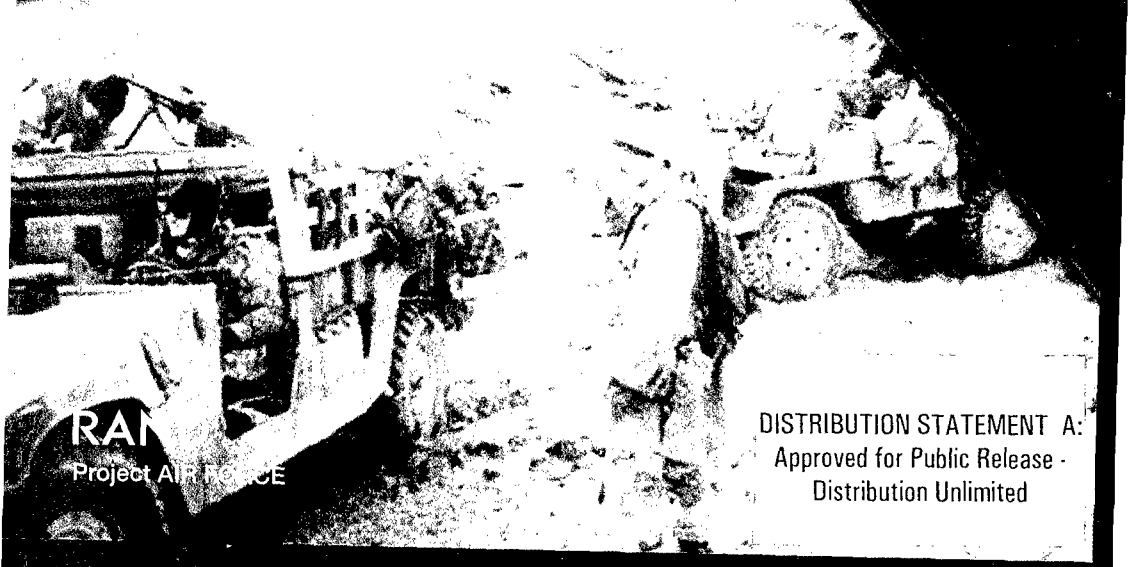
Special Operations Forces and Elusive Enemy Ground Targets

Lessons from Vietnam and the Persian Gulf War



WILLIAM ROSENAU



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Special Operations Forces and Elusive Enemy Ground Targets

Lessons from Vietnam and the Persian Gulf War

WILLIAM ROSENAU

Prepared for the

United States Air Force

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PREFACE

This report was written as part of a Project AIR FORCE FY 2000 study on elusive ground targets. The larger effort, sponsored by the Director of Strategic Planning, Headquarters, USAF, explored the possibility that warfare is evolving in reaction to the dominance of standoff sensors and weapons. The study looked in particular at how elusive forces (ranging from light forces in a peace operation to mobile ballistic missiles in a larger conflict) operate, why the United States has a limited capability against them today, and how we might do better in the future. Findings from the broader effort, part of the Project AIR FORCE Strategy and Doctrine program, are documented in MR-1398-AF, *Aerospace Operations Against Elusive Ground Targets*, by Alan Vick, Richard M. Moore, Bruce R. Pirnie, and John Stillion.

This report explores the role of ground observers in efforts to detect and defeat such forces. Drawing on U.S. experiences during the Vietnam and Persian Gulf wars, the study examines the challenges associated with employing ground observers to search large areas for elusive targets. The report also suggests ways in which ground observers might be usefully employed during future conflicts. It should be of interest to both aviators and land warriors in U.S. and allied militaries as well as the broader defense community.

Research for this report was completed in November 2000.

PROJECT AIR FORCE

Project AIR FORCE, a division of RAND, is the Air Force's federally funded research and development center (FFRDC) for studies and analysis. It provides the USAF with independent analysis of policy alternatives affecting the deployment, employment, combat readiness, and support of current and future air and space forces. Research is performed in four programs: Aerospace Force Development; Manpower, Personnel, and Training; Resource Management; and Strategy and Doctrine.

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SUMMARY

During the Vietnam War and the Persian Gulf conflict, U.S. forces confronted sets of strategically important but elusive adversary ground targets. Political and other considerations prevented the deployment of conventional ground units, and air power alone proved unable to eliminate the targets. In both cases, policymakers turned to special operations forces (SOF) to conduct reconnaissance operations to locate the hidden targets. During the Vietnam conflict, SOF teams crossed the border into Laos to search for truck parks, storage depots, and other critical targets along the Ho Chi Minh Trail that were obscured by triple-canopy jungle and camouflage. During the Gulf War, British and American SOF patrolled vast areas of western Iraq searching for mobile Scud launchers that had escaped coalition strike aircraft.

In both cases, the nature and size of the terrain, combined with adversary countermeasures, made it extremely difficult for the ground teams to achieve their tactical and operational objectives. The operations along the Ho Chi Minh Trail did not succeed in reducing Hanoi's ability to move materiel along North Vietnam's strategic lifeline to the south. However, these campaigns were not failures. The SOF operations succeeded in harassing the communist forces, and they compelled Hanoi to divert resources to the trail's defense that would have otherwise been committed to the war against South Vietnam. In the case of the Scud-hunting campaign in western Iraq, coalition forces failed to locate and destroy Saddam Hussein's mobile missile launchers. However, the SOF teams were successful at the strategic level, in that they helped persuade Israel not to enter the war and fracture the fragile anti-Iraq coalition.

The campaigns against the Ho Chi Minh Trail and the mobile Scud launchers have a number of implications for future operations. They highlight the difficulty of employing ground SOF to search vast areas of difficult terrain behind enemy lines. Although new technology, such as mini– and micro–unmanned aerial vehicles (UAVs), may make it easier for teams to conduct wide-area reconnaissance, it is unlikely that using SOF in this fashion will achieve U.S. objectives. In addition, popular and official concerns about casualties and prisoners of war are likely to limit the use of U.S. SOF to those situations in which only the most vital national interests are at stake. That said, however, there are a number of possible ways in which SOF could be employed to improve the U.S. military's ability to find and destroy elusive adversary ground targets. Unattended ground sensors (UGS) could play an increasingly important role in future operations. Although most will be delivered by air, some UGS will require hand emplacement in difficult enemy terrain, a mission well suited to SOF. In addition, SOF can be used in a battle damage assessment (BDA) role to help ensure that critical targets have been destroyed. Finally, SOF could be employed to disable, destroy, or recover nuclear, biological, or chemical weapons, tasks that may be difficult or impossible to achieve with air power alone.

ACKNOWLEDGMENTS

The author would like to thank Colonel Robert Stephan, USAF, of the National Defense University, for his many insights into coalition Scud-hunting in western Iraq. The author would also like to acknowledge Mr. John L. Plaster, author and U.S. Military Assistance Command Vietnam Studies and Observation Group (MACVSOG) veteran, and Professor Richard H. Shultz, Jr., director of the International Security Studies Program, Fletcher School of Law and Diplomacy, Tufts University, for generously supplying key information on unconventional operations against the Ho Chi Minh Trail. Brigadier General Harry "Heinie" Aderholt, USAF (ret.), provided the author with a very useful overview of Air Force special operations during the Vietnam era. Finally, the author would like to thank Technical Sergeant Andrew I. Martin, of the 24th Special Tactics Squadron, Pope Air Force Base, for his ideas on how new technology could improve the U.S. military's ability to find and destroy elusive adversary ground targets. Professor Shultz and Dr. James Mulvenon of RAND served as reviewers of the manuscript and their comments added greatly to the final report. The author is also indebted to Dr. Edward (Ted) Harshberger, director of Project AIR FORCE's Strategy and Doctrine Program, for his support. Finally, the author would like to acknowledge Dr. Alan Vick of RAND for laying the conceptual foundation for this study and for his continuing advice and assistance throughout this project. Any errors are, of course, the author's own.

Chapter One

INTRODUCTION

During two of the largest U.S. military conflicts of the past 50 years, U.S. leaders faced the difficult challenge of finding and destroying well-hidden adversary ground targets. During the Vietnam War, Hanoi moved men and materiel along a logistical pipeline in Laos that was heavily camouflaged. The 12,000 miles of trails, footpaths, and roads that made up the Ho Chi Minh Trail played a critical role in supplying communist forces operating in South Vietnam. For President Lyndon Johnson and his senior advisors, interdicting the logistical flow down the trail became a goal of paramount importance. However, using air power alone to find and destroy targets hidden under the trail's jungle canopy was less effective than administration officials had hoped. Given the ostensible neutrality of Laos and U.S. reluctance to further widen the conflict in Southeast Asia, the Johnson administration ruled out the use of conventional ground forces to cut the trail. Instead, policymakers turned to unconventional means. Using special operations forces (SOF), strike aircraft, and a network of ground sensors, the United States military embarked on a six-year effort to cripple Hanoi's jungle supply system.

Thirty-five years later, during the Persian Gulf War, U.S. officials were again confronted with a strategically important but equally elusive set of ground targets. Saddam Hussein was employing Scud missiles to attack targets in Israel, Saudi Arabia, and Bahrain in an attempt to force Israel into the war and rupture the fragile coalition established to drive Iraqi forces from Kuwait. As in the Vietnam War, the U.S. adversary used deception techniques to prevent coalition forces from finding and destroying the mobile launchers that fired the Scud missiles. And as in the case of the Ho Chi Minh Trail, air power alone

was not enough to locate and destroy strategically important ground targets. Once again, American policymakers embraced the notion of using SOF behind enemy lines to hunt for critical ground targets and call in air strikes.

In both instances, however, the operations proved less successful than U.S. officials had hoped. During the war in Southeast Asia, and later, in the Persian Gulf conflict, countermeasures by a determined adversary proved highly effective. In both cases, shortfalls in sensor capabilities and other technical problems made it difficult to identify and destroy targets from the air. Perhaps even more significant, however, was the nature of the environment in which SOF and the strike aircraft that supported them conducted their operations. In both conflicts, enemy forces operated in vast areas of difficult and unforgiving terrain. Lacking a thorough awareness of where the targets were likely to be, U.S. (and in the case of western Iraq, British) ground reconnaissance teams were forced to patrol huge amounts of territory searching for well-hidden targets. Adding to the challenge was the fact that the adversary had to ensure the survival of only a small number of its key assets to achieve success. For the United States to succeed, however, its military forces had to be able to destroy most if not all of these key targets.

This is not to suggest, however, that these operations were without merit. In Laos, the U.S. campaign succeeded in harassing the North Vietnamese army and in forcing Hanoi to divert resources to defend the trail—resources that otherwise would have gone to waging war against South Vietnam and the American forces deployed there. Although these operations entailed political risks, they were financially inexpensive when compared with conventional U.S. operations in the region, and they offered the promise of a high strategic payoff. Given the critical nature of the trail, the protracted nature of the conflict, and America's high stakes in Southeast Asia, it was understandable that American policymakers would embark on a bold campaign to choke off Hanoi's logistical lifeline to the south. In the case of western Iraq, the air-ground Scud-hunting campaign was equally unsuccessful at the tactical and operational level. At the strategic level, however, this campaign could claim a measure of success. In committing its best military forces to the Scud hunt, the coalition appears to have convinced Israel not to enter the war against Iraq. In helping to preserve the coalition, and consequently

the eventual liberation of Kuwait, the SOF–air power campaign against Iraq's mobile missiles could be considered a strategic success.

The operations against the Ho Chi Minh Trail and the mobile Scud launchers suggest a number of possible lessons for the future. Although advances in communications, sensors, and unmanned aerial vehicles (UAVs) could make such operations more effective, the use of ground observers to search for elusive targets in hostile or denied areas will remain problematical.[1] Even when equipped with new technology, SOF will confront the daunting challenge of searching vast expanses of difficult terrain for targets that the adversary will take vigorous steps to hide or otherwise defend, such as nuclear, biological, or chemical weapons and their delivery vehicles. There are, however, a number of possible roles that SOF could play in enhancing the U.S. ability to find and destroy elusive targets on the ground, such as planting sensors and conducting bomb damage assessment (BDA).

ORGANIZATION OF THE REPORT

Detailed case studies of U.S. operations against the Ho Chi Minh Trail and Iraq's mobile Scud launchers form the centerpiece of this report. These cases were selected for three reasons. First, in examining campaigns in two very different environments, the cases present an analytically useful range of operations. Second, they are near enough in time to be useful for drawing implications for the future. Finally, a wide variety of accessible primary and secondary source material exists for both campaigns. In both cases, the strategic environment, air operations, SOF missions, and the question of effectiveness are considered in depth. The information used in this report is from open primary and secondary sources, including official military histories, government-sponsored studies, interviews with service personnel, and memoirs by participants.

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[1]Because such operations will be conducted covertly and clandestinely, they will most likely need to be carried out by SOF. Thus, throughout this report, the terms "ground observers," "ground reconnaissance teams," and SOF will be used interchangeably.

This report consists of four chapters. Following this Introduction, the report presents the case studies. Chapter Two focuses on the U.S. campaign against the Ho Chi Minh Trail. Chapter Three examines coalition Scud-hunting operations in western Iraq. Finally, in Chapter Four, possible future roles for ground SOF in finding and destroying elusive adversary ground targets are explored.

Chapter Two

U.S. AIR GROUND OPERATIONS AGAINST THE HO CHI MINH TRAIL, 1966–1972

THE STRATEGIC SETTING

During the mid-1960s, as the United States embarked on a major ground war in Southeast Asia, President Lyndon Johnson and his senior national security advisors confronted a major challenge. Since 1959, the military forces of the Democratic Republic of Vietnam (DRV) had been employing the Truong Son Route—better known as the Ho Chi Minh Trail—to infiltrate men and materiel through Laos and into the U.S.-backed Republic of Vietnam (RVN). For the communist leadership in Hanoi, the trail was a lifeline that was essential to its military operations in South Vietnam. However, the network of paths, trails, and roads that made up the trail served as more than just a supply line for communist forces. The trail also functioned as a basing area and as a sanctuary in Laos from which communist forces could attack South Vietnamese targets.

Indeed, the trail, with its ability to function both as a logistical pipeline and as a staging area, played a crucial role in enabling Hanoi to escalate the war below the 17th parallel dividing North and South Vietnam. By 1965, the trail's importance had grown even more, after the South Vietnamese navy succeeded in closing off the sea route from Haiphong that had supplied some 70 percent of the materiel to the communist forces operating in the south.[1] As the United States

[1]BDM Corporation: *A Study of Strategic Lessons Learned in Vietnam*, Volume 1, *The Enemy*, McLean, VA, November 30, 1979, p. 5-14.

escalated its commitment to the defense of South Vietnam, interdicting the flow of men and materiel along the trail became a paramount mission. During the first three months of 1965, some 5000 People's Army of Vietnam (PAVN) troops had moved through the trail, a 50 percent increase over the 1964 levels.[2] In the words of William Colby, the former director of central intelligence who had served as chief of the CIA's Saigon station, "it was important to our strategy . . . that the North Vietnamese not be allowed to work their will in Laos the way they wanted to."[3]

The 1962 Geneva Accords, however, had ostensibly neutralized Laos. Under the terms of that agreement, neither the United States nor North Vietnam, nor their allies, were permitted to conduct ground operations within Laos. Although Hanoi ignored this provision, the United States ruled out the commitment of ground troops, and as a result, Washington would over a six-year period employ air power, advanced new technology, and small teams of special operations forces to staunch the movement of PAVN men and materiel along North Vietnam's Ho Chi Minh Trail lifeline.

HO CHI MINH TRAIL CHARACTERISTICS

The Ho Chi Minh Trail grew out of a network of footpaths, trails, and secondary roads that had been employed by Viet Minh guerrillas during their 1946–1954 struggle against French colonial rule.[4] As early as 1958, the DRV, anticipating the resumption of overt armed conflict in South Vietnam, began laying the foundations for a logistical pipeline by training personnel to establish way stations and guide systems in Laos.[5] During the 1959–1964 period, Hanoi created the trail's key logistical infrastructure, including truck parks, repair depots, vehicle shelters, and food storage and distribution facilities.[6]

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[2]Kenneth Conboy, with James Morrison, *Shadow War: The CIA's Secret War in Laos*, Paladin Press, Boulder, CO, 1995, p. 142.

[3]William E. Colby, interview by Ted Gittinger, Interview I, June 2, 1981, transcript, Lyndon Banes Johnson Library, Austin, TX.

[4] William J. Duiker, *Ho Chi Minh*, Hyperion, New York, 2000, p. 517.

[5] BDM Corporation, *Strategic Lessons Learned*, pp. 5-14, 5-16.

[6]M. G. Weiner, J. R. Brom, and R. E. Koon, *Infiltration of Personnel from North Vietnam: 1959–1967*, RAND, Santa Monica, CA, RM-5760-PR, October 1968, p. 37.

Initially a crude series of jungle tracks, the trail was by the mid-1960s a sophisticated network of truck and foot routes stretching from mountain passes along the North Vietnam-Laos border down the eastern "panhandle" of Laos to communist sanctuaries in southeastern Laos near the border of South Vietnam. As noted by a former Laotian military commander, the trail passed through some of Southeast Asia's most inhospitable terrain:

> The trail runs through tropical, dense forests .... The jungles along these trails are almost impenetrable primeval forests; the mountains are steep and rocky. During the French colonial regime, as well as after Laos independence, this part of the country was so remote, isolated and undeveloped that no effort was made to control it.[7]

The triple-canopy jungle enveloping the trail made the route extremely difficult to follow from the air. In a first-hand account written in 1965, William Sullivan, then U.S. Ambassador to Laos, observed

> impenetrable tree canopy which high-speed, high-flying jets literally can not see through.... [N]owhere on this road, except for two limited areas, was it open to the sky. Even flying over it slowly with a helicopter, road was not discernible from above. It seems clear to me ... that significant quantities of logistics can still be moving over routes which ... our strike aircraft are unable to discern.[8]

Expert deception techniques employed by the 559th Transportation Group—the PAVN unit responsible for trail construction, maintenance, and security—further reduced the trail's visibility from the air. Where the trail was exposed, the North Vietnamese wove together treetops to create obscuring trellises. Great care was taken not to disturb foliage, and if trees or other plants were cut down during

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[7]Brigadier General Soutchay Vongsavanh, *RLG* [Royal Laotian Government] *Military Operations and Activities in the Laotian Panhandle*, Indochina Monographs, U.S. Army Center of Military History, Washington, DC, 1981, p. 4.

[8]U.S. Department of State [DOS], telegram from Sullivan to DOS, 21 June 1965, *Foreign Relations of the United States* [*FRUS*], *1964–1968*, Volume 27, *Laos*, accessed at www.state.gov/www/about_state/history/vol_xxviii.

construction or operations, PAVN personnel would often transplant flora to maintain coverage of the trail. By the end of the war, according to the North Vietnamese, the 559th Group had camouflaged nearly 2000 miles[9] of the 12,000-mile trail.[10] The PAVN's use of underwater bridges not detectable from the air, and the employment of deception tactics such as strewing gasoline-soaked rags along the trail, to trick pilots into believing they had struck real targets, served to make the trail even more elusive to U.S. air power.[11]

Given its importance, it is not surprising that Hanoi would commit tremendous resources to constructing, maintaining, and defending the trail. At any given time, approximately 100,000 people were employed along the trail as drivers, mechanics, engineers, and porters and in ground security and anti-aircraft units.[12] Anti-aircraft artillery appeared in 1965,[13] and by 1970, the entire trail was protected by anti-aircraft guns, some equipped with radar.[14] The PAVN's employment of "hunter-killer" teams and tribal scouts also protected the trail against enemy incursions.

EARLY OPERATIONS AGAINST THE TRAIL

American operations against the trail began as early as 1961. The CIA, in an effort to develop a more complete understanding of Hanoi's use of the trail, trained Lao tribesman in road-watching techniques. Using nothing more sophisticated than cameras, the tribal detachments gathered information on the flow of PAVN men and materiel. Although the CIA case officers responsible for overseeing the program were skeptical about its effectiveness—

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[9]Edgar C. Doleman et al., *The Vietnam Experience: Tools of War,* Boston Publishing Company, Boston, MA, 1985, p. 151.

[10]Estimates of the trail's length vary. The one used here is from John Prados, *The Blood Road: The Ho Chi Minh Trail and the Vietnam War,* John Wiley & Sons, Inc., New York, 1999, p. 374. The trail and its immediate surroundings covered an area of some 1700 square miles.

[11]Michael E. Haas, *Apollo's Warriors: U.S. Air Force Special Operations During the Cold War,* Air University Press, Maxwell Air Force Base, AL, 1997, p. 193.

[12]Gregory T. Banner, "The War for the Ho Chi Minh Trail," Master's thesis, U.S. Army Command and General Staff College, 1993, p. 12 (DTIC, AD-A272 827).

[13]BDM Corporation, *Strategic Lessons Learned*, p. 5-19.

[14]Soutchay Vongsavanh, *RLG Military Operations*, p. 17.

noting, for example, that the trail watchers often lost their cameras—U.S. Secretary of Defense Robert S. McNamara believed that the reconnaissance teams were beneficial and urged their greater use.[15] By 1964, as Hanoi's reliance on the trail expanded, senior Johnson administration officials approved more aggressive covert operations in Laos. In May 1964, the U.S. Military Assistance Command Vietnam (MACV) began training five eight-man teams of South Vietnamese Montagnard tribesmen led by South Vietnamese Special Forces personnel. Known as LEAPING LENA, this project involved the creation of forces that would conduct reconnaissance operations across the border in Laos. U.S. personnel, while helping to organize, train, and equip the South Vietnamese force, would have no direct role in the operations of the units. During late June and early July, the teams parachuted into Laos. They were poorly motivated and poorly led—"you had to damn near force them on the plane at the point of a gun," recalled one U.S. special forces advisor—and nearly all of the LEAPING LENA personnel were located by the enemy and captured or killed.[16] The few survivors who managed to straggle back across the border to South Vietnam brought low-level intelligence of little military utility. However, while LEAPING LENA clearly failed to achieve its objectives, it did have two noteworthy consequences for unconventional American military operations in Southeast Asia.

First, LEAPING LENA served as the nucleus for a far more successful successor effort, known as Project DELTA, which fielded combined American and South Vietnamese special forces units for long-range reconnaissance missions inside South Vietnam.[17] These units located enemy forces, collected intelligence, called in air strikes, and conducted BDA. One of the most innovative aspects of Project DELTA was its use of U.S. Air Force (USAF) forward air controllers (FACs). First assigned to Special Forces units in December 1965,

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[15]Conboy, *Shadow War*, p. 119.

[16]As quoted in Terrence Maitland and the editors of the Boston Publishing Company, *The Vietnam Experience: Raising the Stakes*, Boston Publishing Company, Boston, MA, 1982, p. 142.

[17]Francis J. Kelly, *U.S. Army Special Forces, 1961–1971*, Vietnam Studies, Department of the Army, Washington, DC, 1973, pp. 53–54; Shelby L. Stanton, *Green Berets at War: U.S. Army Special Forces in Southeast Asia, 1956–1975*, Presidio Press, Novato, CA, 1985, pp. 194–203.

overhead FACs directed air strikes, helped exfiltrate teams in trouble, and provided radio relay. The new tactics and procedures developed by USAF and Special Forces personnel resulted in "one of the most significant and more productive applications of airpower in Vietnam" and represented "a high payoff for a small investment of resources," according to a 1969 Air Force study.[18]

Second, LEAPING LENA's failure provided a negative example for U.S. military officials, who were now convinced that successful covert, cross-border operations required direct U.S. military participation. The LEAPING LENA debacle was to lead directly to the U.S. decision to send U.S.-led teams into Laos to help disrupt Hanoi's use of the Ho Chi Minh Trail.

During the mid-1960s, the United States began air interdiction operations against the Ho Chi Minh Trail. Operation BARREL ROLL in northern Laos and Operation STEEL TIGER in the southern part of the country were designed to reduce the ability of the DRV to move men and materiel down the trail. The intention of these and subsequent interdiction campaigns, according to General William W. Momyer, the 7th Air Force commander during this period, was not to halt the flow of traffic along the trail. Rather, the U.S. objective was to reduce the traffic "to such an extent that the enemy couldn't get enough supplies for sustained operations."[19] U.S. aircraft struck truck convoys as well as trail infrastructure such as bridges. Attack aircraft also cut roads in the hope of creating chokepoints that would create traffic jams of trucks that could be attacked readily from the air. Yet the combination of dense jungle, poor weather, and PAVN deception techniques made it extremely difficult for strike pilots to find targets along the trail. The nature of the military technology employed in aerial interdiction missions also made it difficult to attack and destroy trail targets. U.S. pilots in fast-moving aircraft, such as the F-105 Thunderchief, had only a few seconds to acquire their targets and unload their ordnance.[20]

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[18]U.S. Air Force, "USAF Support of Special Forces in SEA," HQ PACAF, Directorate, Tactical Evaluation, CHECO Division, 10 March 1969, p. 75.

[19]General William M. Momyer, *Airpower in Three Wars,* U.S. Government Printing Office, Washington, D.C, 1978, pp. 188–189.

[20]Haas, *Apollo's Warriors*, p. 215.

IGLOO WHITE AND THE "ELECTRONIC BATTLEFIELD"

The critical but elusive nature of targets along the Ho Chi Minh Trail prompted U.S. Department of Defense (DoD) officials to explore the application of new technology to the interdiction problem. The IGLOO WHITE program, a network of sensors and remote surveillance systems, emerged from an earlier DoD effort to create an electronic anti-infiltration system across the width of the demilitarized zone in South Vietnam and into Laos.[21] During the lifetime of the program, which ran from 1966 to 1971, the United States spent approximately $1.7 billion to create a network of 20,000 battery-powered sensors along the trail in Laos.[22] The IGLOO WHITE system was vast. In the words of one Air Force officer, "[w]e wire[d] the Ho Chi Minh trail like a drugstore pinball machine and we plug[ged] it in every night."[23] The most commonly employed sensors included

- *Acoubuoy,* a sonar-like acoustic sensor dropped by parachute into the jungle canopy, had a transmission range of up to 30 miles and could detect vehicles at distances of more than 1000 yards and personnel as far away as 438 yards.[24] Its camouflage was intended to give it the appearance of vegetation.
- *Air-Delivered Seismic Intrusion Detector (ADSID)* resembled a lawn dart. It was reportedly the most durable and reliable of the IGLOO WHITE sensors. It was equipped with a self-destruct mechanism to prevent tampering or spoofing by the enemy.

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[21]Popularly known as the "McNamara Line," the proposed anti-infiltration system consisted of a manned fence, minefields, and thousands of acoustic and other sensors. Johnson administration officials hoped that the system would allow the United States to de-escalate the politically costly air war against North Vietnam. Christopher P. Twomey, "The Vietnam War and the End to Civilian-Scientist Advisors in Defense Policy," *Breakthrough,* MIT Security Studies Program, Spring 2000, accessed at http://ebird.dtic.mil/May2000/s20000502end.htm.

[22]Banner, "The War for the Ho Chi Minh Trail," p. 58. Estimates of the cost of the program vary. According to another study, IGLOO WHITE cost roughly $1 billion per year during the 1969–1972 period. Paul Dickson, *The Electronic Battlefield,* Indiana University Press, Bloomington, Indiana and London, 1976, p. 83.

[23]George Weiss, "Battle for Control of Ho Chi Minh Trail," *Armed Forces Journal,* 15 February 1971, p. 17.

[24]Eric D. Haider, "Unattended Ground Sensors and Precision Engagement," Master's thesis, Naval Postgraduate School, Monterey, CA, December 1998, pp. 44–45 (DTIC ADA359912).

While the ADSID had a much shorter range than the Acoubuoy (109 yards for vehicles, 33 yards for personnel), improvements in its lithium battery gave it a longer useful life. Although usually delivered by air, the 25-lb sensor could also be hand emplaced.[25] As with the other sensors placed along the trail, great care was given to the device's camouflage. For example, its antenna, the only part of the device that was visible after it drilled into the ground, was made to resemble the stalks of weeds.

- *Mini-Seismic Intrusion Detector (MINISID)*, unlike other sensors employed along the trail, was specifically designed to be delivered and implanted by hand. The MINISID, as well as its smaller version, the MICROSID, was a personnel detection device that was often used in combination with the magnetic intrusion detector (MAGID). Combining sensors in this way improved the ability of individual sensors to detect different types of targets in a variety of ways, and reduced the number of false alarms.[26]

Tactical aircraft and Navy OP-2E antisubmarine aircraft dropped strings of sensors along roads and trails. As vehicles or soldiers moved past the sensors, the devices would record "hits." The data would then be transmitted to EC-121R aircraft, and, later in the life of the program, to unmanned QU-22B Pave Eagle planes continuously circling overhead. These aircraft, in turn, relayed the data to the Infiltration Surveillance Center (ISC) at the U.S. Air Force Base at Nakhon Phanom, Thailand. Inside the 200,000-sq-ft ISC building, IBM 360-65 computers—at the time, the world's most powerful—recorded, stored and processed the information received from the

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[25]The batteries initially lasted two weeks. Since it was impossible to replace the batteries by hand, new sensors had to be delivered when the batteries wore down. Given that the sensors initially cost $2145 each, it became critical to develop a longer-lasting battery. Three years later, in 1970, the ADSID had a better battery, its unit cost had dropped to $975, and the U.S. military had become more efficient in placing them. As a result, the cost-per-sensor-per-day had dropped from $100 to less than $15. Dickson, *Electronic Battlefield*, p. 84.

[26]Haider, "Unattended Ground Sensors," pp. 51–52. Another device, nicknamed TURDSID, was made to resemble dog excrement. However, after it was discovered that there were no dogs along the Ho Chi Minh Trail, the sensor was refashioned to resemble a piece of wood. Haider, p. 50. A variety of other sensors detected such characteristics as body heat and the scent of human urine.

sensors.[27] Intelligence analysts searched for patterns in the processed data, and sought to determine the speed, location, and direction in which the trucks or enemy personnel were moving.[28] Once this was achieved, FACs in Laos conveyed the target information they received to attack aircraft pilots. According to one estimate, the time between target acquisition and the delivery of ordnance was on average a mere five minutes, and in some cases, as short as two minutes.[29] This targeting information, however, was not precise. As General William G. Evans, an Air Force officer with responsibility for the so-called "electronic battlefield" in Southeast Asia, explained in 1971.

> We are not bombing a precise point on the ground with a point target bomb—we can't determine each truck's location that accurately with ground sensors, which are listening—not viewing—devices. Since we never actually "see" the trucks as point targets, we use area-type ordnance to cover the zone we know the trucks to be in.[30]

The Air Force claimed that IGLOO WHITE had achieved great success in helping to interdict North Vietnamese truck convoys, the primary focus of the program. According to the Air Force, U.S. aircraft during the 1966–1967 period—before IGLOO WHITE became fully operational—found 49,371 trucks along the Ho Chi Minh Trail and damaged or destroyed 10,472 of them. As the IGLOO WHITE system matured, the rate of destruction increased dramatically, according to the USAF. For the October 1970–May 1971 period, the service was claiming to have destroyed 25,000 trucks and damaged many more.[31] These estimates, however, were highly controversial,

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[27]At the time, the ISC was reportedly the largest building in Southeast Asia. The massive size was a function of the relatively bulky nature of the computers and the need to house vast amounts of data collected on the trail. Edgar C. Doleman, Jr., *The Vietnam Experience: Tools of War,* Boston Publishing Company, Boston, MA, 1985, p. 144.

[28]Editors of Boston Publishing Company, *The Vietnam Experience: War in the Shadows,* Boston Publishing Company, Boston, MA, 1988, p. 133.

[29]Dickson, *Electronic Battlefield,* p. 86.

[30]As quoted in Dickson, p. 87.

[31]James William Gibson, *The Perfect War: Technowar in Vietnam,* The Atlantic Monthly Press, Boston and New York, 1986, p. 398. According to General Momyer, the

even within the Air Force. For example, according to a 1971 congressional study, service personnel in Laos believed that the truck kill figures should have been discounted by a factor of 30 percent.[32] Regardless of the sophistication and speed of the IGLOO WHITE system, poor weather and rugged terrain made it difficult for pilots to hit the targets the sensors and computers had identified.[33] Finally, despite DoD's attempts to create tamper- and spoof-resistant sensors, it appears that the North Vietnamese were frequently able to destroy the devices (e.g., by shooting them out of trees), deactivate them by removing their batteries, or deceive them with tape-recorded truck noises and bags of urine.[34]

THE CREATION OF MACV SPECIAL OPERATIONS GROUP (MACVSOG)

In January 1964, Lyndon Johnson approved a plan to employ covert means to put pressure on Hanoi and reduce the North's ability to prosecute the war in South Vietnam. Known as OPLAN 34A, the program included unconventional warfare operations such as the creation of indigenous resistance forces north of the 17th parallel; psychological operations designed to foment division within the DRV leadership and population; and direct-action missions involving raids on economic targets throughout the North. To create the clandestine military architecture for carrying out OPLAN 34A, Johnson signed General Order 6, which created a new classified organization within MACV.[35] Given the deliberately bland and deceptive name of

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rate of destruction for the AC-130 gunship, an advanced system equipped with infrared sensors, low-light television, and radar, was 9.72 trucks per sortie. Momyer, *Airpower*, p. 212.

[32]U.S. Congress, Senate, Committee on Foreign Relations, Subcommittee on United States Security and Commitments Abroad, *Laos: April 1971*, U.S. Government Printing Office, Washington, DC, 1971, as cited in Gibson, p. 39.

[33]Banner, "The War for the Ho Chi Minh Trail," p. 61.

[34]John M. Van Dyke, *North Vietnam's Strategy for Survival*, Pacific Books, Palo Alto, CA, 1972, p. 40; Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, MIT Press, Cambridge, MA and London, 1996, p. 4, accessed at www.si.umich.edu/~pne.

[35]Richard H. Shultz, Jr., *The Secret War Against Hanoi: Kennedy's and Johnson's Use of Spies, Saboteurs, and Covert Warriors in North Vietnam*, HarperCollins Publishers, Inc., New York, 1999, pp. 37–40.

"Studies and Observation Group" (SOG), the organization was a joint service, unconventional warfare task force composed of five sections:

- Covert naval operations (OP 37);
- Air support (OP 32 and OP 35, the "Air Studies Branch" and the "Air Studies Group");
- Psychological operations (OP 39);
- Airborne operations (OP 34, responsible for inserting agent teams into North Vietnam); and
- "Ground Studies Group" (OP 35, responsible for reconnaissance missions in Laos and eventually Cambodia).

OP 35 was created to deal with a variety of strategic and operational problems associated with interdicting the Ho Chi Minh Trail. U.S. military commanders had concluded that ground observers were necessary to improve the ability of American aircraft to hit targets along the trail's difficult terrain. One possible option was to rely more heavily on the CIA's tribal road-watch teams, which continued to gather intelligence and targeting information along the trail. Their performance, however, was judged to be poor, and the reliability of their intelligence information questionable. In addition, poor communications between the road watchers and U.S. military personnel prevented real-time target acquisition, a requirement that senior U.S. officials had identified as critical.[36] Although new equipment, such as the Hark ground-to-air communications sets, allowed the tribal teams to communicate directly with U.S. FACs, bilingual personnel were required onboard the aircraft to translate the reports from the ground.[37] These communications difficulties, combined with the LEAPING LENA disaster, convinced senior military commanders that any cross-border operations had to be led by U.S. military personnel. Cloaked in secrecy, OP 35 would also meet another critical U.S. need. Given the *de jure* neutrality of Laos and the refusal

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[36]Telegram from Commander in Chief, Pacific (McCain) to Chairman of the Joint Chiefs of Staff (Wheeler), December 11, 1968, *FRUS, 1964–1968*, Vol. 27, *Laos*.

[37]Jacob Van Staaveren, *Interdiction in Southern Laos, 1960–1968*, The United States Air Force in Southeast Asia, Center for Air Force History, Washington, DC, 1993, pp. 110–111.

of the Royal Laotian government to approve U.S. ground operations inside the country, any reconnaissance operations would have to be carried out covertly.[38] In sum, OP 35, like all strategic special operations units, offered policymakers the prospect of a high political return with relatively low cost, operational flexibility, and plausible deniability.[39]

Although established in 1964, OP 35 did not conduct its first missions until 1966. Two factors explain the delay. First, Johnson had been reluctant to widen the war into Laos. However, the continued infiltration of communist manpower and other resources convinced him that the trail could no longer be kept off limits. Second, senior military leaders, while eager to take the war into Laos, were acutely aware of the recent LEAPING LENA disaster and had to be convinced that MACVSOG would not produce similar results.[40] By 1966 this official reluctance had been overcome. As the strategic importance of the trail grew, and U.S. policymakers demanded more operations to interdict the flow of men and materiel, OP 35 expanded dramatically to become MACVSOG's largest operational section.[41]

During the next six years, small teams of OP 35 personnel would conduct hundreds of classified missions along the Ho Chi Minh Trail in Laos. OP 35's primary mission was identifying targets and calling in air strikes. Targets included truck park areas, portering points, troop concentrations, and road bypasses. U.S. military leaders in Saigon and Washington also discovered that the highly trained and motivated OP 35 personnel could carry out a variety of other activities while they were on missions in Laos. These included direct-action missions (such as attacking PAVN storage facilities and other

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[38]Memorandum from the Deputy Assistant Secretary of State for Far Eastern Affairs (Unger) to the Assistant Secretary of State for Public Affairs (Donnely), October 3, 1966, *FRUS, 1964–1968*, Vol. 27, *Laos*. Despite its shortfalls, the CIA's tribal road-watch program would continue into 1968 as a parallel effort to MACVSOG's cross-border operations. Conboy, *Shadow War*, p. 148.

[39]Colin S. Gray, "Handfuls of Heroes on Desperate Ventures: When Do Special Operations Succeed?" *Parameters*, Spring 1999, accessed at http://carlisle www.army.mil/usawc/Parameters/99spring/gray.htm.

[40]Maitland et al., *Raising the Stakes*, p. 145.

[41]Shultz, *Secret War*, p. 68. At its height, according to one estimate, MACVSOG totaled roughly 2500 Americans and 7000 Vietnamese personnel. Maitland et al., *Raising the Stakes*, p. 145.

targets), capturing prisoners, emplanting mines, and conducting BDA. Reconnaissance teams also emplanted IGLOO WHITE sensors.[42] Although most of these sensors were delivered by air, particularly sensitive devices, such as the MINISID, had to be placed near the trail by hand. Given the devices' weight and bulk, it is hardly surprising that reconnaissance team members did not relish the task. As one former SOG member recalled, the 25-lb sensors his team was sometimes compelled to carry were considered "bulky 'albatross[es].'"[43]

"OVER THE FENCE" IN LAOS

MACVSOG's cross-border operations typically were carried out by reconnaissance teams made up of U.S. noncommissioned officers (NCOs)—usually recruited from U.S. Army Special Forces—and nine indigenous personnel. Special Forces, with their history of conducting high-risk, unconventional operations against high-value targets behind enemy lines, were a natural reservoir of military talent from which to draw. The indigenous members of the reconnaissance teams, who typically were Nung, a Sino-Vietnamese ethnic group who had often served as mercenaries in previous conflicts,[44] provided a set of primitive but often effective jungle warfare skills that complemented American technological sophistication. In addition to their operational utility, the tribesman served another purpose, albeit an unstated one. According to John Plaster, a former MACVSOG member, "[s]ince most members of SOG recon teams were indigenous, U.S. casualties, proportionally, would be reduced."[45]

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[42]Charles F. Reske, *MAC-V-SOG Command History Annex B, 1971–1972*, Vol. 1, Alpha Publications, Sharon Center, Ohio, 1990, p. 43. This volume is a reprint of the SOG annex of MACV's command history.

[43]Harve Saal, *SOG: MACV Studies and Observations Group*, Vol. 3, *Legends*, Jones Techno-Comm., Milwaukee, WI, 1990, p. 294. Team members also collected twigs, seed pods, and vegetation to serve as models for IGLOO WHITE sensor camouflage. John K. Singlaub, with Malcolm McConnell, *Hazardous Duty: An American Soldier in the Twentieth Century*, Summit Books, New York, 1991, p. 312.

[44]Jeffrey J. Clarke, *Advice and Support: The Final Years, 1965–1973*, United States Army in Vietnam, U.S. Army Center of Military History, Washington, DC, 1988, p. 205.

[45]John L. Plaster, *SOG: The Secret Wars of America's Commandos in Vietnam*, Onyx, New York, 1998, p. 31.

To maintain plausible deniability in the event they were captured, OP 35 team members operating "over the fence" in Laos wore Asian-made uniforms with no insignia or other identifying marks, and carried so-called "sterile" weapons and other equipment that could not be traced back to the United States.[46] OP 35 missions (initially labeled SHINING BRASS) were launched from forward operating bases in South Vietnam close to the Laotian border.[47] OP 35 areas of operation are depicted in Figure 2.1.

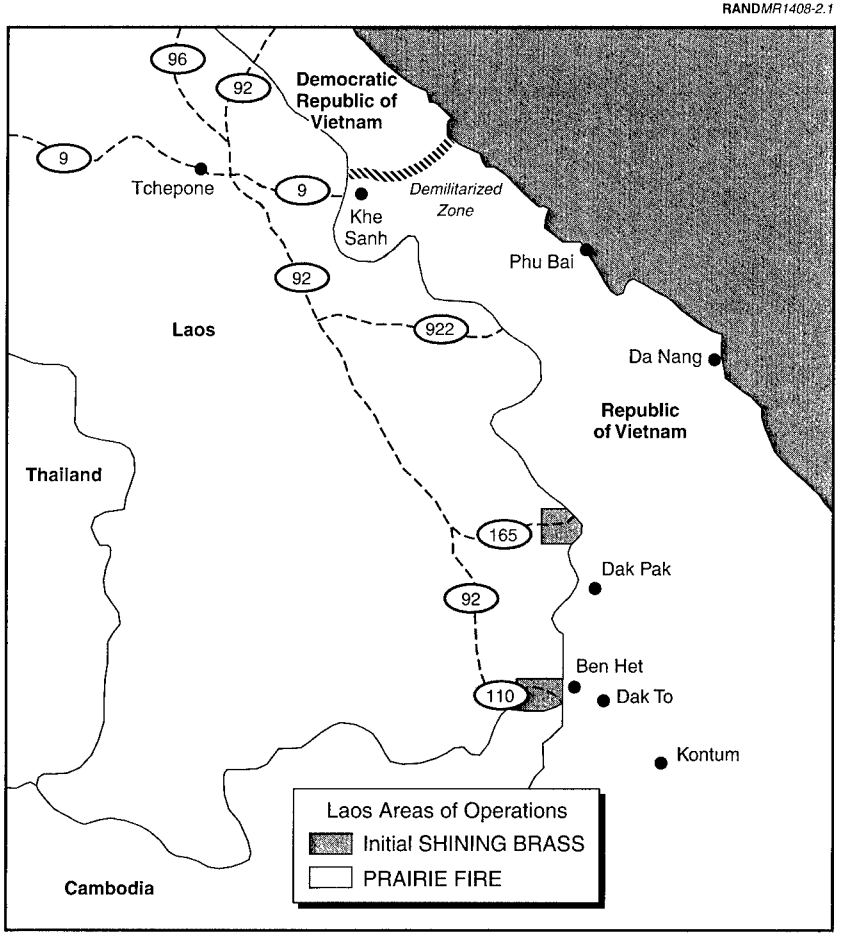
To reduce the chance of alerting PAVN trackers and other reaction forces, unmarked USAF helicopters inserted the teams at dusk.[48] U.S. Army helicopters (e.g., the UH-1 or Huey), armed with miniguns and rockets, served as escorts. Major General John K. Singlaub, USA (ret.), a former MACVSOG commander, has described the typical pattern insertion and extraction process. After a dusk landing at an isolated clearing,

> the men quickly dispersed from the LZ [landing zone] and set up a night ambush position to hit any [PAVN] that might have been attracted by the chopper. It was impossible to move silently in the jungle at night, so the teams could hear any approaching enemy patrols. Missions could last between one and two days all the way up to several weeks, depending on the assignment and the team's success in evading enemy patrols. When it was time to extract the

[46]Plaster, pp. 33–34.

[47]Initially, a command and control cell in Danang oversaw SHINING BRASS operations. As these operations expanded, MACVSOG established Command and Control South (CCS) and Command and Control Central (CCC) to supplement the work of the Danang cell, which was rechristened Command and Control North (CCN).

[48]Infiltration and exfiltration of ground teams was carried out using "Pony Express" CH-3 helicopters from the 20th (and later, the 21st) Special Operations Squadron. Air Force special operators also delivered sensors along the trail and infiltrated and extracted tribal road-watch teams. Philip D. Chinnery, *Air Commando: Fifty Years of the USAF Air Commando and Special Operations Forces, 1944–1994*, St. Martin's Paperbacks, New York, 1997, pp. 128–129.



SOURCE: Shultz, *The Secret War Against Hanoi*, p. 211. Map reproduced by John Plaster.

Figure 2.1—Ho Chi Minh Trail and SHINING BRASS/PRAIRIE FIRE Areas of Operations

team, we often used so-called McGuire rigs, slings attached to a long line dangled through the rain forest canopy from the hovering chopper. After some trial and error, this system was modified to include the STABO harness, which was easier to use and allowed

team members to fire their weapons as they were lifted from the forest floor.[49]

Moving through and searching the jungle surrounding the trail, teams would conduct area reconnaissance in the hopes of discovering lucrative targets such as truck parks, weapons depots, and storage facilities. Teams would also select observation points from which they could conduct point surveillance of a stretch of the trail, taking care to ensure that they neither got too close nor stayed too long.[50] Using PRC-77 and KY-38 radios, the SHINING BRASS forces, unlike the tribal road watchers, could communicate directly with the FACs in English.[51] FACs, who typically flew slow-moving, propeller-driven OH-1 Bird Dog observation aircraft, circled above the teams, ready to communicate targeting information to USAF F-4 Phantoms and other strike aircraft.[52] The average time lapse between a SHINING BRASS request and an air strike was 30–40 minutes, according to one Air Force estimate.[53]

To improve the ability of the FACs to communicate this targeting information, MACVSOG came to an agreement with the 7th Air Force to allow former reconnaissance team leaders to fly on the observation aircraft. Known as "Covey Riders," these MACVSOG personnel helped find targets, choose landing zones, plan insertions and extractions, and stay in radio communication with the ground teams.[54] In addition to improving the ability of aircraft to hit ground targets, the Covey Riders also provided a psychological boost to the

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[49]Singlaub, *Hazardous Duty*, p. 298.

[50]LTC Charles W. Churchill, "Interview with Lieutenant Colonel Kenneth R. Bowra," Senior Officer Oral History Program, U.S. Army War College, Carlisle Barracks, PA, March 31, 1989, p. 13. Bowra was an OP 35 team leader assigned to CCN.

[51]McCain to Wheeler, *FRUS, 1964–1968*, Vol. 27, *Laos*.

[52]MACVSOG teams and IGLOO WHITE, according to one estimate, were capable of providing six-digit grid coordinates for targets such as truck stops. Six-digit coordinates provide a target location within a 100-square-meter area. Banner, "The War for the Ho Chi Minh Trail," p. 60.

[53]Van Staaveren, *Interdiction in Southern Laos*, p. 121. Beginning in 1967, AC-130 Spectre gunships were also employed along the trail. Equipped with electronic sensors, a night observation device, a forward-looking infrared radar, and a devastating arsenal of miniguns and 20-millimeter canon, the Spectre proved to be the Air Force's most effective truck killer. Hass, *Apollo's Warriors*, pp. 276–280.

[54]Plaster, *SOG*, p. 41.

frequently beleaguered friendly forces on the ground. In the words of one former reconnaissance team leader, "I know that when I was down there, just to hear a voice gave me such a degree of comfort that I don't even have the words to explain it."[55]

The nature of the Ho Chi Minh Trail environment, and the North Vietnamese efforts to defend their logistical lifeline, combined with the need to maintain strict secrecy, helped to make OP 35's cross-border operations among the most demanding, stressful, and dangerous of the Vietnam War. The jungle that shrouded the trail was a formidable obstacle for the SHINING BRASS teams. Forward movement was often extremely difficult and sometimes impossible. Knives and machetes became useless against the thick vegetation, and teams often were forced to crawl on their hands and knees to get through the tangled vines that choked much of the trail's environs.[56] Adding to the challenge was the need to maintain absolute silence, since PAVN "Route Protection Battalions" and "Rear Security Units" constantly patrolled the trail looking for American and South Vietnamese interlopers.[57] As a result, the reconnaissance teams could cover relatively small amounts of ground. According to one estimate, the MACVSOG personnel during a typical mission could move a maximum of only two kilometers from the point of insertion; more typically, they were able to go only 1500 meters.[58]

The number of SHINING BRASS operations (renamed PRAIRIE FIRE for operational security reasons in March 1967) increased steadily between 1966 and 1970. In 1966, OP 35 averaged 11 patrols per month.[59] By 1968, the monthly average had reached 25, and by 1969, MACVSOG's peak year for reconnaissance missions in Laos, the monthly average was more than 37.[60] The 7th Air Force's inter-

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[55]Plaster, p. 41.

[56]Saal, *SOG*, pp. 256–259.

[57]Plaster, *SOG*, p. 86.

[58]Author's telephone interview with John L. Plaster, June 19, 2000.

[59]Prados, *Blood Road*, p. 153.

[60]These figures do not include missions conducted by OP 35's Hatchet forces. These far-larger platoon- and company-size "exploitation forces" were a separate component of PRAIRIE FIRE responsible for harassing the PAVN along the trail and, in Singlaub's words, depriving the adversary of "a sense of sanctuary." Singlaub, *Hazardous Duty*, p. 299.

diction campaign in Laos was a major impetus for this increase in missions during the 1967–1969 period. As the PAVN deployed increasingly sophisticated and robust countermeasures designed to frustrate air attacks, General Momyer demanded more and more OP 35 missions to help the Air Force hit elusive trail targets.[61]

When compared with the tens of billions of dollars per year the United States was spending to wage war in Southeast Asia, the direct financial costs of these missions was relatively modest—$15.6 million for the 1967–1969 period, according to one estimate.[62] The human cost, however, was more substantial. As the tempo of operations increased, the PAVN threw more resources into increasingly effective countermeasures. Both sides recognized the Ho Chi Minh Trail's strategic importance, and both sides were engaged in a protracted and bloody conflict in defense of vital national interests. North Vietnamese forces, like their American adversaries, were compelled to innovate. The PAVN, for example, employed local tribesman to serve as an early warning and signaling system. When the tribesmen detected Americans or South Vietnamese along the trail, they would strike pots, gongs, and drums like a tocsin to warn the North Vietnamese.[63] The PAVN also offered substantial rewards for anyone who killed or captured an American, and they deployed mobile tracker teams to patrol aggressively near suspected insertion areas. On occasion, the PAVN used Radio Direction Finding (RDF) equipment, which allowed them to locate OP 35 teams within 200 yards.[64] Finally, Hanoi devoted tremendous human intelligence resources to penetrating MACVSOG operations. Communist agents served as drivers at MACVSOG headquarters, and as bartenders and waitresses at MACVSOG compounds, where they

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[61]Prados, *Blood Road*, p. 274. Yearly totals for SHINING BRASS/PRAIRIE FIRE missions are illustrated in the appendix.

[62]Prados, p. 273.

[63]Major Charles Norton, interview by Richard H. Shultz, Jr., "MACVSOG Oral History Interviews with Officers Who Served in MACVSOG OP 35 (Clandestine Operations in Laos and Cambodia against the Ho Chi Minh Trail)," International Security Studies Program, Fletcher School of Law and Diplomacy, Tufts University, January 1997, p. 50, abbreviated hereafter as "MACVSOG Oral History Interviews."

[64]Plaster, *SOG*, p. 85.

were able to gather useful and highly sensitive information about personnel, operations, and tactics.[65]

As Hanoi increased its counter-infiltration measures, PRAIRIE FIRE teams lost the element of surprise and were forced to cut back the amount of time they could spend on the ground. In the early days of the MACVSOG missions, teams typically could expect to spend up to six days deployed on a reconnaissance mission. But the PAVN quickly learned OP 35's methods of operation. As a former OP 35 commander recalled,

> [the North Vietnamese] knew the helicopter routine. They knew the air support that was provided to it. They figured out what the FAC did when he over flew the operational area .... Then it became much more difficult for us. As time went on ... the losses mounted or us, because we really only had so many options to go into Laos and the NVA [North Vietnamese Army] knew that.[66]

By 1969, PRAIRIE FIRE teams were spending on average two days on the ground, and in some cases, as little as six hours. While their time along the trail was shorter, their casualty rate was increasing, from 39 percent per mission in 1967 to 44 percent in 1968 to a staggering 50 percent in 1969, the peak year of OP 35 activity.[67] By 1972, PAVN countermeasures had become devastatingly effective. In the words of Richard Shultz, reconnaissance teams "found themselves fighting for their lives. They felt like hunted animals."[68] On April 30, 1972, MACVSOG, as part of the Nixon administration's "Vietnamization" policy, was closed down and its personnel transferred to a short-lived South Vietnamese covert warfare task force.[69]

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[65]Shultz, *Secret War*, pp. 244–246.

[66]Norton interview, "MACVSOG Oral History Interviews," p. 40.

[67]Shultz, *Secret War*, p. 250. However, by 1970, improved extraction techniques led to a drop in friendly casualties, despite the high tempo of OP 35 operations.

[68]Shultz, p. 262.

[69]Editors of the Boston Publishing Company, *War in the Shadows*, pp. 88–92.

ASSESSING OP 35's EFFECTIVENESS

During the late 1960s, MACVSOG's operations against the Ho Chi Minh Trail enjoyed sustained support among the senior U.S. military leadership. In the judgment of a July 1970 MACV report, for example, PRAIRIE FIRE, in successfully harassing the PAVN, had compelled the North Vietnamese to shift infiltration routes, thereby increasing transit time and offering more opportunity for tactical air exploitation.[70] In 1969, the peak year of OP 35 activity, MACVSOG reconnaissance teams called in 1016 air strikes and, through direct action, destroyed 161 structures and killed an estimated 718 PAVN troops.[71] OP 35 had also forced the enemy to expend significant resources to defend the trail, including the deployment of 25,000 men to provide security along key segments.

There were opportunity costs associated with North Vietnam's expenditure of resources to protect its strategic lifeline in Laos. According to MACV, the cross-border operations forced the PAVN to divert resources that could have otherwise been used in offensive operations against South Vietnam.[72] A number of North Vietnamese shared the U.S. military's view of OP 35's effectiveness. In the view of Nguyen Tuong Lai, a former PAVN officer who had operated along the trail, the MACVSOG teams "effectively attacked and captured our soldiers and disrupted our supply lines. This weakened our forces and hurt our morale."[73] MACVSOG's effectiveness may have reached its apogee during a weeklong mission in 1971, when OP 35 teams, working with AC-130 gunships, destroyed hundreds of trucks and temporarily halted all traffic along the Ho Chi Minh Trail. In the judgment of the Joint Chiefs of Staff (JCS), the MACVSOG–Air Force personnel who participated in this mission were as effective as two battalions of regular U.S. infantry.[74]

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[70]Joint Chiefs of Staff, MACVSOG Documentation Study, July 1970, Appendix D, "Cross-Border Operations in Laos," p. 39, as quoted in Shultz, *Secret War*, p. 238.

[71]*MACVSOG Command History, 1969*, Annex F, p. F-111-4-A-1, Tab A, as quoted in Saal, *SOG*, p. 428.

[72]Charles F. Reske, *MAC-V-SOG Command History, Annex B, 1971–1972*, Vol. 2 Alpha Publications, Sharon Center, Ohio, 1990, p. 368.

[73]As quoted in Singlaub, *Hazardous Duty*, p. 299.

[74]Editors of the Boston Publishing Company, *War in the Shadows*, p. 88.

MACVSOG operations succeeded in harassing the PAVN and in forcing Hanoi to divert resources to defend the Ho Chi Minh Trail. It seems clear, however, that the cross-border operations never achieved the strategic effect of seriously impeding the movement of North Vietnamese men and materiel. Official U.S. concerns about the utility of the cross-border missions emerged as early as December 1966, when U.S. State Department officials concluded that these operations had failed to produce "any significant interruption of the [North Vietnamese] infiltration efforts."[75] Interestingly, this skepticism about the U.S. operations in Laos was shared by several former OP 35 personnel who have argued that MACVSOG never achieved strategic results against Hanoi's war-waging capabilities. According to Major John Crerar, who served as executive officer to OP 35 commanders during 1966 and 1967, the Ho Chi Minh Trail was a formidable and ultimately indestructible target:

> You could pinprick it. You could cause the kind of damage that required them to put out people with security roles and things like that. You could put a security requirement on the enemy by having him worry that there are people who are going to tear things up, take prisoners, direct air strikes, and so on but that's the most you could do with what you had then .... I don't think SOG ever had the ability of stopping the trail flow.[76]

A number of factors beyond the control of MACVSOG or the 7th Air Force impinged on the U.S. operations in Laos. Operations against the Ho Chi Minh Trail were severely limited by U.S. officials who were eager to preserve the covert nature of the campaign and thus the perception that the United States was adhering to the Geneva Accords. All operations had to be authorized in advance, a complex bureaucratic process that involved approval by the secretary of state, the secretary of defense, and senior White House officials.[77] MACVSOG missions deemed particularly sensitive were approved by

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[75]Memorandum from the Deputy Assistant Secretary of State for Far Eastern Affairs (Unger) to the Under Secretary of State (Katzenbach), December 2, 1966, *FRUS, 1964–1968*, Vol. 27, *Laos*.

[76]Major John Crerar, interview, "MACVSOG Oral History Interviews," p. 74.

[77]General William C. Westmoreland, *A Soldier Reports*, Doubleday & Company, Garden City, NY, 1976, p. 107.

the President himself.[78] In Vientiane, the U.S. ambassador, William Sullivan, exercised in a vigorous fashion what he termed "policy supervision and control" over all significant American military activities in Laos, including those involving the Ho Chi Minh Trail.[79] Sullivan, in effect, held veto power over any proposed operations. Indeed, Sullivan's forceful and imperious style and his eagerness to exercise control over military operations earned him the sobriquet "field marshal."[80] Although Sullivan did not select targets for attack, his prior authorization was required for every preplanned air strike against Laotian targets. In his memoirs, Sullivan describes the intensity of his involvement in all aspects of the war in Laos

> Many a night I was wakened from a sound sleep by a telephone call, and sitting on the edge of the bed, had to decide whether to order the evacuation of an outpost under attack, to hold on, to reinforce, to call for air support, or to mount a diversionary action to relieve pressure on the front.[81]

Another factor that limited American effectiveness was the way North Vietnam waged war. With few economic resources relative to those of the United States, the DRV was compelled to wage a protracted, low-technology conflict that used Hanoi's comparative advantages in manpower and time to offset its relative disadvantages. Vast numbers of people could be mobilized to repair or bypass damaged roads, construct elaborate camouflage, and conduct security

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[78]Kenneth Conboy and Dale Andradé, *Spies and Commandos: How America Lost the Secret War in North Vietnam,* University Press of Kansas, Lawrence, 2000, p. 95.

[79]U.S. Senate, Committee on Foreign Relations, *United States Security Agreements and Commitments Abroad: Kingdom of Laos,* hearings before the Subcommittee on United States Security Agreements and Commitments Abroad, 91st Congress, 1st Session, Pt. 2, 1969, p. 487.

[80]Timothy N. Castle, *At War in the Shadow of Vietnam: U.S. Military Aid to the Royal Lao Government, 1955–1975,* Columbia University Press, New York, 1993, p. 79. Sullivan derived his authority from two sources. The first was a May 1961 letter from President Kennedy that gave U.S. ambassadors presidential authority to direct the activities of all U.S. government agencies present in any given mission. The second was Sullivan's successful argument that since there was no "organic" U.S. military command on Laotian soil, the ambassador had the authority to direct the activity of the American armed forces operating there. U.S. Congress, *Laos Hearings,* pp. 517–518.

[81]William H. Sullivan, *Obbligato: 1939–1979, Notes on a Foreign Service Career,* W.W. Norton & Company, New York and London, 1984, p. 213.

patrols. The low-tech nature of Hanoi's strategy and operations also meant that the PAVN's logistical requirements were relatively limited.

Those limited requirements proved to be a significant advantage that had major consequences for U.S. military operations in the region. In 1968, at the height of the U.S. military commitment in Vietnam, an estimated 13,700 tons of supplies per day were needed to keep Army troops in the field.[82] The PAVN, in contrast, required only a small fraction of what U.S. forces needed. Estimates of North Vietnamese requirements range widely, from a low of 15 tons per day[83] to a high of 60 tons.[84] As few as 15 trucks per day, according to one estimate, were all that was required to supply Hanoi's forces in South Vietnam.[85] No matter how many ground reconnaissance teams were sent into Laos, and no matter how intensive the air interdiction along the Ho Chi Minh Trail—which after October 1968 reached 450 sorties per day[86]—it was almost certain that at least 15 trucks would escape the air strikes.

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[82]Prados *Blood Road*, p. 374.

[83]Van Dyke, *North Vietnam's Strategy*, p. 36. This figure, which is taken from an estimate made by Defense Secretary Robert S. McNamara in August 1967, is for nonfood supplies only. Other estimates cited in the literature are less specific in terms of dates and the nature of the requirements. For example, requirements were likely to be far higher for the PAVN in its final, more conventional military phase during the 1973–1975 period.

[84]Walter J. Boyne, "The Plain of Jars," *Air Force Magazine*, Vol. 82, No. 6, June 1999, accessed at http://afa.org/magazine/0699plain.html.

[85]Herman L. Gilster, review of *The Blood Road: The Ho Chi Minh Trail and the Vietnam War*, by John Prados, in *Armed Forces & Society*, Vol. 26, No. 2, Winter 2000, pp. 351–352.

[86]Van Dyke, *North Vietnam's Strategy*, p. 40. Before the bombing halt, the sortie rate was 150 per day.

Chapter Three

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-

[1]Sean 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

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[2]Bruce 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.

[3]McKnight, "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.

[4]Centre 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-

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[5]McKnight, "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.

[6]McKnight, p. 175.

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

[8]U.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.

[9]Garry 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."

[11]Mace, "Dynamic Targeting," p. 4.

[12]Murray, *Air War*, p. 168.

[13]"1990: The Iraqi Scud Threat."

[14]DoD, *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-

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[15]Rear 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.

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

[17]Mace, "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.

[18]Urban, p. 173.

[19]Keaney 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

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[20]Keaney 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.

[21]Keaney and Cohen, *GWAPS*, p. 87.

[22]Michael 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

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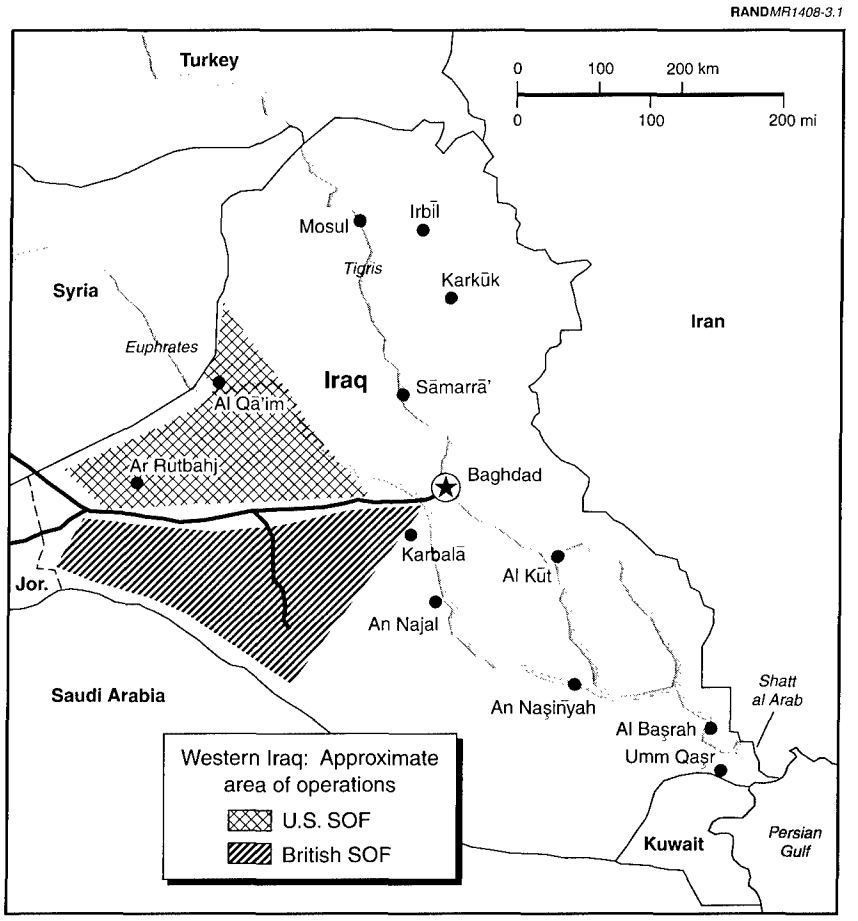
[23]As quoted in Urban, *UK Eyes Alpha*, p. 173.

[24]It 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.

[25]CDISS, "The Great Scud Hunt: An Assessment," n.d., accessed at http://www.cdiss.org/scudnt6.htm.

[26]CDISS.

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



SOURCES: de la Billiére, *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]

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[28]Waller, p. 408.

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

[30]General 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-

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[31]When 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.

[32]Author's interview with Stephan.

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

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

[35]Andy 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 bugger 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

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

[37]Curtis, p. 352.

[38]CDISS, "Special Forces Operations in Desert Storm," n.d., accessed at http://www.cdiss.org/scudnt5.htm.

[39]CDISS.

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

[41]de 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

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[42]Curtis, *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.

[43]Connor, 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.

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

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

[46]Connor, *Ghost Force*, p. 316.

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

[48]As 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]

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[49]Keaney and Cohen, *GWAPS*, p. 91.

[50]Urban, *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.

[51]As 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 retarget . . . 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-

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[52]Gordon 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.

[53]Gordon 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.

[54]Murray, *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

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[55]Keaney and Cohen, *GWAPS*, p. 84.

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

[57]James 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.

Chapter Four

CONCLUSIONS AND IMPLICATIONS FOR FUTURE OPERATIONS

During two of the most significant U.S. military conflicts of the late twentieth century, American political and military leaders were confronted with elusive ground targets that posed strategic challenges. In Southeast Asia, the United States faced an adversary whose jungle-covered logistical pipeline was essential to the communist military campaign against a U.S.-backed regime. In western Iraq, Saddam Hussein's mobile Scud missiles threatened to draw Israel into the Persian Gulf War and undermine the fragile coalition created to roll back aggression against Kuwait. In both cases, U.S. air power alone was not sufficient to destroy the targets deemed essential by American policymakers. In both cases, U.S. leaders turned to special operations forces in an effort to improve the ability to find and eliminate strategically important targets. However, in neither instance did the use of ground reconnaissance forces prove decisive.

In Laos, small MACVSOG teams were overwhelmed by the difficult terrain surrounding the Ho Chi Minh Trail and by the counter-infiltration operations mounted by the North Vietnamese to defend a supply route that was essential to their war effort. Covering roughly 1700 square miles, the trail and its environs was a vast area, and it proved extremely difficult for the small number of reconnaissance personnel operating there at any given time to search a significantly large piece. Special operations forces, then as now, were an extremely limited resource relative to conventional military units, so it was impossible to send many more MACVSOG personnel to conduct reconnaissance missions. But the large Ho Chi Minh Trail area, combined with the counter-infiltration and security operations con-

ducted by the 25,000 North Vietnamese troops deployed along the trail, created insurmountable tactical and operational hurdles for MACVSOG.

To be sure, the ground reconnaissance teams could point to a number of successes. They gathered intelligence on the enemy, captured prisoners, and conducted bomb damage assessments of critical targets. More important, they succeeded in taking the war to the adversary. MACVSOG operations reduced the trail's role as a sanctuary and safe haven for PAVN forces and compelled Hanoi to expend resources to defend the strategic lifeline. However, with respect to OP 35's primary mission—finding targets and calling in air strikes—success proved much more elusive. This is not to say that the SHINING BRASS/PRAIRIE FIRE teams failed to locate key targets. However, the strike aircraft called in to destroy trucks, vehicle shelters, and roads had great difficulty in hitting enough targets to affect North Vietnam's ability to wage war. The logistical requirements for communist forces operating in South Vietnam were tiny compared to those of the United States. To keep Hanoi's forces supplied, only a handful of North Vietnamese trucks needed to escape the American ground-sensor network, reconnaissance teams, and strike aircraft on any given day.

The challenges posed by the mobile TELs in western Iraq were in some respects even more daunting. The area in which they operated—29,000 square miles of desert—was significantly larger than the Ho Chi Minh Trail and its environs. Satellite and other overhead reconnaissance was unable to locate the mobile launchers with any precision, so the U.S. and British ground SOF were forced to conduct wide-area surveillance for the TELs. As in Southeast Asia, camouflage and other deception techniques were a major part of the adversary's tactics and procedures. Iraqi deception, combined with shortfalls in coalition aircraft sensors and other technical problems, made it extremely difficult for strike aircraft to destroy the targets identified by the SOF personnel on the ground. The combined air-ground operations may have resulted in the destruction of some mobile TELs, but it seems likely that the number was small and well below what DoD officials had originally claimed.

Thus, as in the case of the campaign against the Ho Chi Minh Trail, the air-ground operations in the Persian Gulf failed to achieve their

tactical and operational objectives. However, there was one important difference with respect to their relative effectiveness. As noted by Colin Gray, "the definition of success for special operations is not straightforward. Tactical failure at the right time, in the right way, and for the right reasons can amount to strategic success."[1] At the tactical and operational level, the American and British forces succeeded in little more than harassing Iraqi mobile TEL crews. At the strategic level, however, SOF, in helping to persuade the Israelis not to enter the war and rupture the coalition, achieved their primary objective.

Dramatic improvements in sensors, communications, and other technology since the time of the Ho Chi Minh Trail and Persian Gulf campaigns raise the question of whether these missions, if conducted using modern equipment, would be any more successful than they were in the past. Although the communications systems employed by MACVSOG personnel in Laos were state of the art in contemporaneous terms, advances in radios, satellite communications, burst-transmission devices, and electronic repeaters would make it much easier for ground teams to remain in continuous contact with forward air controllers.[2] Reconnaissance teams, whether hunting for targets in a jungle environment or in the desert, could also call upon new and improved imaging devices, such as third-generation night vision goggles (NVGs) and thermal-imaging systems. The latest NVGs permit military personnel to positively identify objects at twice the range that was possible during the Scud hunt.[3] In addition, crews aboard aircraft that could be used to interdict ground targets, such as A-10s, are now NVG-capable. Thermal-imaging systems have also improved dramatically, with an effective range of up to 5000 meters, roughly five times greater than those employed during Operation Desert Storm.[4]

That said, however, a number of major hurdles are likely to continue to hamper operations against elusive ground targets. In a hostile or

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[1]Gray, "Handfuls of Heroes."

[2]Churchill, "Interview with Bowra," p. 12.

[3]Author's interviews with service personnel at 24th Special Tactics Squadron, Pope AFB, May 31, 2000.

[4]Author's interview with Stephan.

denied country, finding and identifying mobile objects that have been obscured by foliage or by deception, or are simply dispersed in vast areas like western Iraq, remain beyond the capability of even the most sophisticated reconnaissance sensors.[5] Because of their relatively high cost, such sensors and their platforms are also likely to remain scarce, as JSTARS and the TR-1/U-2R were during the Persian Gulf War.[6] SOF personnel, almost by definition, also are likely to remain in short supply, which would pose a major obstacle if they were called upon to search large areas for mobile TELs or other high-value targets.

Nevertheless, it is possible to imagine a future role for SOF in finding elusive enemy ground targets. In cases where it is imperative that a strategically important target—such as a nuclear, biological, or chemical weapon or production facility in a hostile or denied area—be destroyed with absolute certainty, it may be worth considering deploying SOF to conduct the mission. Advances in technology could make it safer and easier for SOF to carry out such operations in the future. For example, mini– and micro–unmanned aerial vehicles could allow ground reconnaissance to search far larger areas than they could from vehicles or on foot, and with far less risk of discovery by adversary forces.[7]

Two other potential SOF roles could enhance the ability of the United States to find and destroy elusive targets on the ground. Although BDA was never more than a collateral mission for SOF during the Vietnam and Persian Gulf conflicts, it could play a larger role in the future in operations involving strategically important targets, such as ballistic missiles and their supporting infrastructure. After suspected sites have been subjected to air attack, ground teams could survey the damaged areas and provide visual confirmation that the target had been destroyed. Such "policing of the battlefield" by SOF might also include scouring the attacked site and securing any

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[5]CDISS, "Implications for the Future," n.d., accessed at http://www.cdiss.org/scudnt8.htm.

[6]CDISS, "The Great Scud Hunt: An Assessment."

[7]"Prospects for Unmanned Aerial Vehicles," *Strategic Comments,* International Institute for Strategic Studies, Vol. 6, No. 7, September 2000, p. 2.

operable missile warheads or components that could still be used by the adversary or make their way to sale on the black market.[8]

Finally, SOF ground personnel could play a role in what during the Vietnam era was termed the "electronic battlefield." As was the case with BDA, emplanting unattended ground sensors (UGS) was a secondary mission for SOF during operations on the Ho Chi Minh Trail. In the future, however, Air Force personnel may rely heavily on UGS to identify adversary ground targets in terrain that is difficult to survey using airborne reconnaissance sensors. As with IGLOO WHITE, most of the UGS currently under development are air-delivered. Some UGS, however, may have to be carried into the surveillance area and put into place by hand.[9] In built-up areas, for example, dropping even well-camouflaged UGS from the air would make little sense, since there would be a great likelihood that the local population or adversary forces would detect them. Imaging UGS in particular are likely to require emplacement by hand. If dropped from the air, these devices, which require a clear line of sight to their targets, could have their field of vision obscured by a rock, tree branch, or other obstruction. In addition, imaging UGS are likely to be fairly delicate instruments that would be damaged if delivered from jet aircraft moving over the ground at hundreds of miles per hour.

Even these more limited roles, however, will carry with them potentially high political costs. Given the obstacles associated with the earlier use of SOF, policymakers must bear in mind that even relatively small-scale missions to find elusive targets entail great risk of failure. Strategic special operations are by definition high risk, and SOF failures (as in the failed 1980 Iranian hostage rescue mission) tend to be both spectacular and politically costly.[10]

During the missions against the Ho Chi Minh Trail and the Iraqi mobile TELs, political and military leaders were rightly concerned about the damage caused if these covert and clandestine operations

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[8]Wirtz, "A Joint Idea," p. 92.

[9]This section relies heavily on information gathered during the author's conversations with RAND analysts Rich Moore and John Stillion.

[10]Lucien S. Vandenbroucke, *Perilous Options: Special Operations as an Instrument of U.S. Foreign Policy*, Oxford University Press, New York and Oxford, 1993, p. 4.

were exposed.[11] Such concerns will carry forth to any future operations involving the use of SOF to find elusive ground targets. In the future, however, political and military leaders will have to grapple with an additional burden. It is a truism that Western public opinion has become deeply averse to casualties—among their own forces, civilian populations in war zones, and even among adversary forces. Today, it is also true that the citizens of the Western democracies are deeply troubled by the capture of friendly military personnel. Prisoner-of-war aversion may now be as deeply ingrained as casualty aversion. Political and military leaders will have to bear this new domestic political factor in mind as they weigh the costs and benefits of deploying ground observers in hostile or denied areas.

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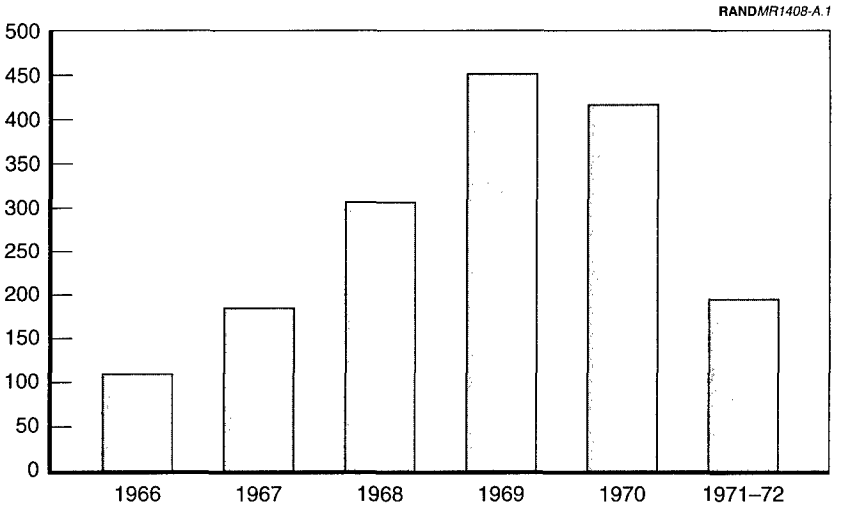
[11]See for example, memorandum from Unger to Katzenbach, December 2, 1966, *FRUS, 1964–1968*, Vol. 27, *Laos*; de la Billière, *Storm Command*, p. 223.

Appendix

SUPPLEMENTARY MATERIALS



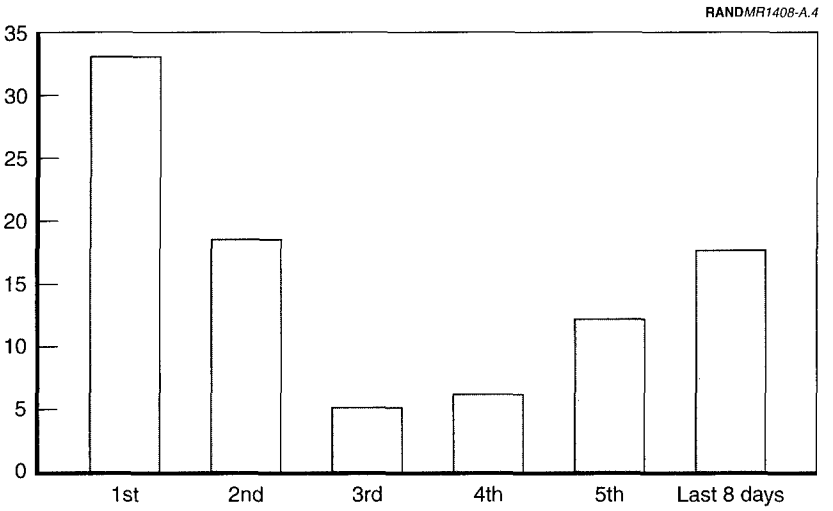
SOURCES: Shultz, *The Secret War Against Hanoi*, Chapter 6; Saal, *SOG: MACV Studies and Observations Group*, Vol. 3, *Legends*, p.186.

Figure A.1—SHINING BRASS/PRAIRIE FIRE Missions per Year, 1966–1972

RAND*MR1408-A.3*

SOURCE: UNSCOM photo, accessed at http://cns.miis.edu/research/iraq/_launchr.htm.

Figure A.2—Iraqi Mobile TELs



SOURCE: Keaney and Cohen, *Gulf War Air Power Survey Summary Report*, p. 88.

Figure A.3—By-Week Launch Totals for Iraqi Scuds, January–February 1991

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Special Operations Forces and Elusive Enemy Ground Targets

Lessons from Vietnam and the Persian Gulf War

In the Vietnam War and the Persian Gulf conflict, special operations forces (SOF) conducted reconnaissance operations to locate hidden targets when political and other considerations prevented the deployment of conventional ground units and air power alone was unable to locate and eliminate elusive objectives. In Vietnam, SOF teams crossed the border into Laos to search for truck parks, storage depots, and other assets along the Ho Chi Minh Trail that were obscured by jungle canopy and camouflage. In western Iraq, British and American SOF patrolled vast areas searching for mobile Scud launchers. In both cases, the nature of the terrain combined with adversary countermeasures made it extremely difficult for ground teams to achieve their objectives. There are a number of implications for future operations. Although new technology, such as mini- and micro-unmanned aerial vehicles, may make it easier for teams to reconnoiter wide areas, using SOF in this fashion is unlikely to achieve U.S. objectives. Concerns about casualties and prisoners of war are likely to limit the use of SOF to the most vital national interests. However, unattended ground sensors could play an enhanced role in future operations. Although most will be delivered by air, some will require hand emplacement in difficult enemy terrain, a mission well suited to SOF. SOF in a battle damage assessment role could help ensure that critical targets have been destroyed. Finally, SOF might disable, destroy, or recover nuclear, biological, or chemical weapons.

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