

THE DRAGON LADY
MEETS THE CHALLENGE:
THE U-2 IN DESERT STORM

by

Coy F. Cross II
9th Reconnaissance Wing Historian

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Chronology

- 19 June 1961 Kuwait declared free and independent.
- March 1973 Iraqi troops occupied As Samitah, a border town in northeast Kuwait.
- February 1979 Ayatollah Sayyid Ruhollah Musavi Khomeini overthrows the shah and takes control of Iran.
- 16 July 1979 Saddam Hussein becomes president of Iraq and commander of the military.
- 22 Sept 1980 Without warning, Iraqi jet fighters strike Iranian airfields near Teheran and other bases throughout the country. This begins the Iraq-Iran war.
- August 1988 End of Iraq-Iran war.
- 1990**
- July Saddam accuses Kuwait of ruining Iraq's economy demands Kuwait lease Bubiyan and Warbah to Iraq and forgive the billions in war loans. To emphasize his demands, Saddam moved about 100,000 troops to the Kuwaiti border.
- 2 August Iraqi Republican Guard divisions cross the border and captures Kuwait. JCS alerts CENTCOM, TAC, MAC, and SAC to prepare to deploy forces.
- 4 August President Bush meets with General H. Norman Schwarzkopf and Lieutenant General Charles A. Horner to discuss the Iraqi invasion.

Chronology (continued)

- 6 August UN Resolution 661 calls for restoration of Kuwaiti sovereignty, independence, and territorial integrity, and for an embargo on Iraq. Secretary of Defense Cheney, General Schwarzkopf, and General Horner arrive in Saudi Arabia to talk with King Fahd.
- 6 August King Fahd asks the United States to send forces to Saudi Arabia to help defend his nation from possible attack.
- 6 August The 9th Strategic Reconnaissance Wing at Beale AFB, California has been alerted for possible deployment to the Middle East.
- 7 August President Bush orders U.S. forces to deploy to Saudi Arabia. The Chairman of the Joint Chiefs of Staff orders two U-2s deploy ASAP.
- 8 August An eight-person advance U-2 site survey team, led by Lieutenant Colonel Bruce L. Liebman, departed for Saudi Arabia.
- 11 August Advance U-2 element arrives at Jeddah.
- 11 August MAC C-5s, supplemented by SAC KC-10s, arrived at Beale to carry U-2s and related people and equipment to Saudi Arabia.
- 13 August The site survey team arrives at Taif, in time to meet the first KC-10 carrying a load of people and equipment from Beale.

Chronology (continued)

- 13 August The SENIOR BLADE van arrives at Riyadh, Saudi Arabia.
- 17 August First two U-2s arrive at Taif.
- 19 August Lieutenant Colonel Lafferty arrived at CENTAF Headquarters at Riyadh.
- 19 August OL-CH launched its first two OLYMPIC FLARE sorties.
- 22 August 48th Tactical Fighter Wing's F-111s arrived at Taif.
- 23 August First two TR-1s arrive at Taif.
- 29 August First operation ASARS mission in theater.
- September The Defense Intelligence Agency and the Air Force Intelligence Directorate asked if the MIPE could deploy to Southwest Asia.
- 14 September The first incident of Iraqi fighters harassing U-2.
- October 17th SRW at RAF Alconbury begins phase inspections for 1704RS aircraft.
- 18 October UN announces that military action to free Kuwait would be legitimate if sanctions fail.
- 1 November The buildup of coalition forces reached 243,000.
- 8 November President Bush orders another 200,000 troops to the Persian Gulf.

Chronology (continued)

- 29 November UN votes to use force against Iraq unless that country complies with all previous UN resolutions by 15 January 1991.
- 19 December The mobile intelligence processing element (MIPE) moved to Riyadh.
- 31 December The first U-2 IRIS-III mission. MIPE personnel processed the film on 1 January 1991.
- 1991**
- 2 January Lieutenant Colonel Spencer deployed from the Pentagon's Joint Reconnaissance Center to the CENTCOM/J-2 in Riyadh.
- 9 January Talks between Secretary of State Baker and Iraqi Foreign Minister Aziz fail to reach a peace solution to Persian Gulf crisis.
- 15 January Deadline for Iraqi compliance with all UN resolutions.
- 15 January 1704RS personnel moved into tents on base to prevent possible terrorist attacks.
- 15 January President Bush authorizes military action against Iraq.
- 16 January Military action begins at 2339Z.

Chronology (continued)

- 17 January Flying aircraft 1076 with a SYERS sensor on-board, Major B. L. Bachus flies the first U-2 "border-crossing" mission into Iraq.
- 18 January The "Great Scud Hunt" begins.
- 19 January General Horner makes finding and destroying Scuds his primary target.
- 22 January Iraqi forces set fires at Kuwaiti refineries and at the al-Wafra oilfields.
- 25 January Iraq releases millions of gallons of crude oil into the Persian Gulf.
- February A second Senior Blade van (dubbed son-of-Blade) deploys to King Khalid Military City.
- 24 February The coalition invasion of Kuwait and Iraq begins at 0100Z.
- 27 February President Bush declares "Kuwait is liberated" and "Iraq's Army is defeated."
- 28 February The cease-fire goes into effect at 0500Z.
- October 1991 The TR-1 was redesignated U-2R.

Dedication

This monograph is dedicated to the men and women of the 9th Reconnaissance Wing, those who participated in Desert Shield/Storm and those who continue to be the "eyes of America" around the world.

Coy F. Cross II, PhD
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Chapter 1

Behind the Invasion

At 0100* on 2 August 1990, Saddam Hussein's Iraqi army swarmed across the common border with Kuwait. Caught unaware and vastly outnumbered, Kuwaiti forces were not on alert and offered little resistance. By 0700 Iraq had captured Kuwait City and driven the Kuwaiti emir and his government into exile. By nightfall, most of Kuwait's air force had fled to Saudi Arabia, those military members who remained were either dead or prisoners of war, and Iraq occupied the entire country. Saddam's army then massed 100,000 troops at the Kuwaiti-Saudi Arabian border, poised for a strike against the poorly defended Saudi oil fields. Within two days Iraq had 200,000 men in Kuwait and more than 1,000,000 reserves and reservists at home ready to mobilize.

The invasion not only caught the Kuwaitis off-guard, it surprised world leaders from Riyadh to Washington. Saudi Arabia's King Fahd Bin Abdel Aziz told his people, "They took the whole world by surprise when the Iraqi forces stormed the brotherly state of Kuwait in the most sinister aggression witnessed by the Arab nation in its history."¹ Given the history of Iraqi-Kuwaiti relations and Saddam Hussein's ruthlessness and unpredictability, the surprise is that the invasion was unexpected.

For six centuries, until World War I, both Iraq and Kuwait were part of the Ottoman Empire. The Empire was already crumbling when the Ottoman Turks joined the Germans against the Allies in World War I. The victorious Allies lost little time partitioning

*All times are local times, which are Zulu + 3.

the Empire after the war. Kuwait became a British protectorate. In 1922, trying to end bickering between the Middle Eastern states, British High Commissioner Sir Percy Cox redrew the map of the area. To satisfy Iraqi demands for territory Cox gave Iraq lands that had traditionally belonged to Kuwait and Saudi Arabia. To compensate Saudi Arabia for its loss, Cox carved off another piece of Kuwait for its western neighbor. The arrangement left Iraq unsatisfied, Saudi Arabia furious, and tiny Kuwait licking its wounds.²

A few years later, in 1938, drillers discovered oil in the Kuwaiti desert, but exploitation did not begin until 1946, following World War II. Oil production quickly transformed Kuwait from a poverty-ridden, backward state into a modern nation. By 1961, Great Britain believed the tiny country could survive on its own and declared Kuwait free and independent on 19 June 1961.³

Six days later Iraq, covetous of Kuwait's oil and deep water port, claimed the newly independent country as part of Iraq and amassed troops along the common border to enforce the claim. Kuwait's emir asked Great Britain for help and the British returned to protect Kuwait. Kuwait then joined the Arab League, which denied Iraq's claim. Iraq withdrew its army, but did not withdraw its claim for another two years.⁴

Under the protective wing of the Arab League and the watchful eye of Great Britain, Kuwait prospered during the 1960s and 70s. Oil-generated wealth provided jobs, homes, education, and medical care for all Kuwaitis. Kuwaitis became so wealthy they shunned menial labor and hired "third country nationals," including other Arabic peoples, to do most of the unpleasant work. Kuwait became the envy of the Arab world.

Iraq, meanwhile, had also developed its huge oil reserves. Instead of using its new-found wealth to build houses, roads,

schools, and hospitals, however, Iraq bought guns, planes, and tanks. From 1961 to 1968, internal dissension, including coups, counter-coups, and war against the dissident Kurds, occupied Iraq. In 1968 the Baath Party seized control of the government. Family and tribal ties molded the party's leadership into a close-knit unit. The party's top leaders, including Saddam Hussein, were almost all military men.⁵

A failed coup attempt shortly after the Baath Party came to power gave Saddam an opportunity to display his "talents." He directed a series of purges from 1968 to 1973 resulting in mock trials and executions. Other opponents of the party were assassinated without benefit of even a mock trial. Intimidated survivors quickly acquiesced to the Baath Party's demands. In 1970 the party issued a provisional constitution that consolidated extensive governmental powers into the hands of party leaders.⁶

As governmental power concentrated into the hands of the Baath Party, the party's hands most often belonged to two men: Ahmad Hasan al Bakr and Saddam Hussein. Bakr, the leader, had worked for more than ten years to gain the army's support and to bring the party legitimacy. Hussein, by 1969 the power behind the Baath Party, was more adept at clandestine activities, often outmaneuvering or simply assassinating the opposition. As Bakr became increasingly ill during the 1970s, he relied more frequently on Hussein. On 16 July 1979, Bakr resigned and Saddam Hussein replaced him as president of Iraq, commander of the military, Secretary General of the Baath Party Regional Command, and chairman of the party's Revolutionary Command Council.⁷

Relations between Iraq and neighboring Iran, meanwhile, deteriorated. In 1969 the shah abrogated the 1937 treaty that set the border between the two countries. The Iraqis retaliated by sending aid to anti-shah rebels. The shah then resumed aid to the

Kurdish rebels in Iraq. After Iran occupied islands in the Persian Gulf that had been under the sovereignty of the United Arab Emirates, Saddam and the Iraqis turned their attention to Bubiyan and Warbah, two Kuwaiti islands guarding Iraq's 26-mile coastline and only port. Saddam demanded that Kuwait either sell or lease the islands to Iraq. When Kuwait refused, Iraqi troops occupied As Samitah, a border town in northeast Kuwait in March 1973. When Saudi Arabia and the Arab League came to Kuwait's aid, Saddam's forces withdrew. In 1975 Saddam and the shah signed a treaty that settled their border dispute and Iraq relinquished all claims to Bubiyan and Warbah.⁸

Following the truce with Iran, Saddam initiated economic reforms to strengthen Iraq and solidify his hold on the country. A state sponsored industrial modernization plan increased Iraq's manufacturing output and tied the industrial sector to Saddam's central government. Other programs gave the average Iraqi greater access to education and land, improved his social mobility, and increased his income by redistributing part of the nation's wealth. The changes also converted many former enemies of Saddam and his party to loyal supporters. A quadrupling of oil prices in 1973 helped finance the reforms. For the first time in modern history, Iraqi factions had united in a national community. Saddam Hussein believed Iraq was ready to become a leader in the Arab world.⁹

Unfortunately for Saddam, as he prepared to assume his new position in the Arab community, the community drastically changed. In February 1979, a radical Shiah Islamic cleric, Ayatollah Sayyid Ruhollah Musavi Khomeini, whom Saddam had expelled from Iraq a few months earlier, overthrew the shah and took control of Iran. Khomeini immediately began converting the country into a fundamentalist Muslim nation. Shiite Muslims in Iraq, who included more than half the country's people but with little political power, cheered Khomeini's success and the purges that followed.

The Iranian revolution offered the impoverished sharecropping peasants and slum-dwelling Iraqi Shiites hope, but posed both internal and external threats to Saddam.¹⁰

The internal threat appeared quickly. In July 1979, after bloody riots in two Iraqi cities, Saddam discovered Ad Dawah, a secret Shiite group with ties to Iran, had incited the rioters. A few months later, in April 1980, Ad Dawah attempted to assassinate Tariq Aziz, the Iraqi foreign minister. The group then apparently tried to kill the Iraqi Minister of Culture and Information. Saddam arrested Ad Dawah members or supporters and deported thousands of Iranian-born Shiites. When Iraqi troops captured the presumed leader of Ad Dawah and his sister, Saddam executed them both. The threat to his own government and the apparent weakness of Iran following Khomeini's government and military purges convinced Saddam the time was right to reassert his claim to the Shatt al Arab waterway that divided the two countries and other areas along the border.¹¹

On 22 September 1980, without warning, Iraqi jet fighters struck Iranian airfields near Teheran and other bases throughout the country. Protected by reinforced hangars, the Iranian aircraft survived the attack and immediately retaliated against Iraqi cities. But Iraqi ground forces met little resistance as they drove nearly fifty miles into Iran. Besides conventional weapons, Iraq used mustard gas and nerve gas on the Iranians, inflicting about 10,000 casualties.** Slowly Iran regrouped and repelled the invaders. By 1984 the two sides were essentially at a stalemate, but the fighting continued until August 1988.¹²

Despite suffering several hundred thousand casualties, the Iraqi Army grew larger and stronger during the war. Kuwait,

**Saddam also used chemical weapons to help subdue the Kurds in 1988.

fearing a Khomeini-led fundamentalist Islamic revolution throughout the Middle East if Iran won, had lent Saddam between twelve and fifteen billion dollars to modernize his military and fight Iran. By August 1990 Iraq's army, with 900 thousand troops in uniform and another million in civilian reserves, was the fourth largest in the world. It was well-equipped with 5,700 tanks, including Soviet-made T-55s and T-62s, and 3,700 artillery pieces. The Iraqi Air Force, the sixth largest in the world, possessed 950 combat aircraft, including MIG-21s and MIG-23s.¹³

In 1990 Iraq had a formidable fighting force; but the war had left a forty billion-dollar debt. Unable to defeat Iran, Saddam again turned covetous eyes toward Kuwait. In July 1990 he accused Kuwait of ruining Iraq's economy by overproducing oil and demanded the Kuwaitis decrease production. He also claimed the Kuwaitis were "slant" drilling in the Rumaila oilfield near the Iraq-Kuwait border and stealing Iraqi oil. Saddam also insisted that Kuwait lease Bubiyan and Warbah to Iraq and forgive the billions in war loans. To emphasize his demands, Saddam moved about 100,000 troops to the Kuwaiti border.¹⁴

Intense negotiations sought to avoid armed conflict. Saudi, Jordanian, and Egyptian leaders flew to Baghdad to reason with Saddam. He reassured them that he would not invade Kuwait. Saudi Arabia's King Fahd arranged a meeting at Jeddah with Saddam and other Arab heads of state. The Iraqi delegation left in anger when Kuwait did not meet Iraq's unreasonable demands. Still, King Fahd, the Kuwaitis, and much of the world were surprised a few days later, on 2 August 1990, when Saddam Hussein ordered his army across the border into Kuwait.¹⁵

Notes Chapter 1

1. Speech, King Fahd to Saudi Arabia, 9 Aug 90.
2. Jean P. Sasson, *The Rape of Kuwait* (New York: Knightsbridge Publishing Co., 1991), 1-8.
3. Ibid, 9.
4. Ibid.
5. Helen C. Metz, ed., *Iraq: a country study* (Washington DC: Library of Congress, 1990), 57-58.
6. Ibid.
7. Ibid, 58-59.
8. Ibid, 60-61.
9. Ibid, 62.
10. Ibid 63.
11. Ibid, 232.
12. Ibid, 232-238.
13. Richard P. Hallion, *Storm Over Iraq: Air Power and the Gulf War* (Washington: Smithsonian Institution Press, 1992), 128; *Iraq*, 233-235; *The Rape of Kuwait*, 12-13.
14. *Rape of Kuwait*, 12-13.
15. Ibid, 13-14.

Chapter 2

The Wing Responds

American President George Bush reacted quickly to Iraq's invasion of Kuwait. On 4 August he met with General H. Norman Schwarzkopf, Central Command (CENTCOM) Commander, and Lieutenant General Charles A. Horner, Central Air Command (CENTAF) Commander to discuss the situation. The generals explained to the president the only Air Force assets in the area were two KC-135s operating in the United Arab Emirates since 24 July and fourteen F-111Es and four F-16s in Turkey. No one knew if Turkey would allow air attacks on Iraq from Turkish soil. There were no other American forces in the area and the nearest two aircraft carriers were days away. There was little the United States could do, unless Saudi Arabia or another nation in the area allowed America to base troops there. The president dispatched Secretary of Defense Richard B. Cheney, Schwarzkopf, and Horner to Saudi Arabia to talk with King Fahd. Armed with satellite photos showing the Iraqi deployment along the Saudi border, the three persuaded King Fahd of the imminent danger to his country. On 6 August the king asked the United States to send forces to Saudi Arabia to help defend his nation from possible attack.¹

By 6 August the 9th Strategic Reconnaissance Wing at Beale AFB, California had already been alerted for possible deployment to the Middle East. Colonel Randall A. Juracek, Deputy Commander Maintenance (DCM), and his staff started gathering the necessary assets. Unfortunately, world events had overtaken Air Force reconnaissance plans, which had been directed toward a major war in Europe against the Soviet Union. There were no Middle Eastern contingency plans and no unit type codes (UTC) for such a

deployment. Wing planners also knew very little about possible operating locations in Saudi Arabia and the surrounding countries. Colonel William P. Morton, Jr., Colonel Juracek's assistant, recalled sitting around the battle staff table studying old Central Intelligence Agency guides and aeronautical maps of the Middle East to learn which runways would support the U-2.²

Coincidentally, just before the Iraqi invasion, the wing had prepared to open Detachment 4 at Howard AFB, Panama. The plan for Detachment 4 became the starting point for the Middle Eastern deployment support package. Chief Master Sergeant Robert E. Hickey, Jr. and other senior maintenance noncommissioned officers (NCO) took the list for Detachment 4 and went through it "line-by-line" asking, "Do we need this item? If so, are the quantities okay?"³ They covered all the parts, spares, and equipment needed to sustain the U-2. Hickey and his team received conflicting information on how many aircraft would deploy and how long they would stay. First, there would be two aircraft for sixty days, then four aircraft, then two. Hickey finally decided to assemble a kit to support four aircraft for six months. When the DCM's deployment planners met at 1000 hours on 6 August, the equipment and spares list was ready.⁴

Although the list was complete, many items on it were not readily available. The deployment to Panama had taken spares that the supply system had not had time to replace. Hickey checked the war reserve spares kit (WRSK) and found 30-40 items missing, including several high-value ones. He located several items he needed in the Phase Inspection bench stock. Detachment 8, 2762 Logistics Squadron (Special), Robins AFB, Georgia, which manages the U-2 program, supplied other parts. Lockheed Corporation at Palmdale, California, furnished some items. Hickey cannibalized parts not readily available anywhere else from aircraft in maintenance for repair or undergoing phase inspection. He then

turned the parts into supply and had them reissued to fill the WRSK kits. Within 48 hours of initial notification, the WRSK kits were 99% complete, with no critical items missing. As additional items came in, crews loaded them on pallets ready for airlift. Detachment 8 and other sources shipped some parts directly to Saudi Arabia.⁵

But, the U-2s could not deploy without airlift for their support staff and equipment. Reconnaissance airlift priority was 1-B-1, the same as every other important CENTCOM component. This meant that there was essentially no priority. So after the deployment package, people, and aircraft were ready to depart, they sat, waiting for airlift. On 11 August, MAC C-5s, supplemented by SAC KC-10s, arrived.⁶

Meanwhile, an eight-person advance site survey team, led by Lieutenant Colonel Bruce L. Liebman, departed for Saudi Arabia on 8 August, arriving 11 August. The team first considered Jeddah on Saudi Arabia's Red Sea coast, but the base's proximity to Islam's Holy City of Mecca apparently caused the Saudis to suggest King Fahad Royal Saudi Air Base, at Taif, instead. Located in the plateau region approximately 400 miles southwest of Riyadh, Taif's climate is more moderate than most of Saudi Arabia. The site survey team flew to Taif on 13 August, in time to meet the first KC-10 carrying Lieutenant Colonel James H. Lloyd III, the commander of the unit designated OL-CH, and a load of people and equipment from Beale. A stream of C-5s and KC-10s followed over the next two days, containing the remainder of the cargo and the rest of the 21 officers, 120 enlisted, and 25 civilians that would make up the initial detachment. The civilians, from Lockheed and other contractors, were a critical part of the U-2 support team.⁷

The U-2 operation would share a maintenance hangar with Royal Saudi Air Force (RSAF) F-5s. Office space was in an education

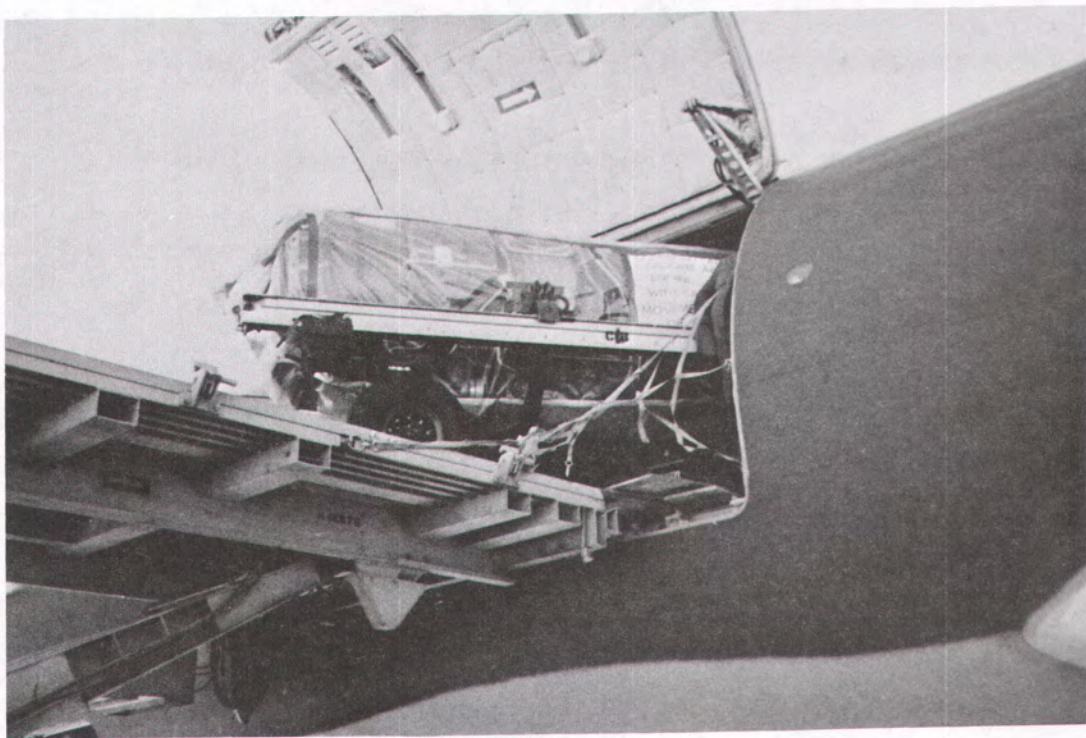
building a short distance away. Everyone, including civilians, initially billeted in Al Gaim, the McDonald-Douglas compound about 20 miles from the base. When the 48th Tactical Fighter Wing arrived at Taif two weeks later, however, the commander forced Lieutenant Colonel Lloyd to move the enlisted people from Al Gaim to make room for the F-111 personnel.⁸

Colonel Juracek and his staff, meanwhile, considered a fuel supply for the U-2. Unlike most Air Force aircraft, the U-2 uses jet propellant thermally stable (JPTS) fuel and there was none available in Saudi Arabia. The nearest JPTS was at RAF Akrotiri, Cyprus, and Torrejon AB, Spain. Air Force officials flew in 50,000-gallon storage bladders and KC-10s and C-141s carried 55-gallon drums from Torrejon and Barksdale AFB, Louisiana, while C-141s with area bulk fuel delivery systems and KC-135Qs moved bulk fuel from RAF Akrotiri. By the time the U-2s arrived on 17 August, there was a three-week supply of JPTS stored in bladders at Taif. Later, after airlift had built up a 60-day supply, ships carried JPTS from Spain to Jeddah, and trucks hauled it on to Taif.⁹

Lieutenant Colonel Lloyd recalled that when he arrived on 13 August, the site survey team had already begun receiving fuel and cargo. Since there were no Air Force aerial port or transportation people at Taif, everyone had to pitch in and unload the aircraft. The volume of cargo and only two supply people on hand made it virtually impossible to adequately document and maintain records of the incoming supplies. It would be several months before there would be enough trained supply technicians to properly sort, catalogue, and warehouse spare parts and supplies. But initially people worked around the clock to make sure they were ready to receive the first two U-2s on 17 August.¹⁰



Equipment and supplies in hangar at Taif



Unloading U-2 engine from KC-135Q at Taif

Notes for Chapter 2

1. (S/NF) *Gulf War Air Power Survey*, vol ii, "Operations and Effects and Effectiveness," 12-14, info used (U) per SAF/PAS security review, 95-1070.
2. Ibid., intvw (S/NF), Dr C. F. Cross II, 9RW/HO, with Col W. P. Morton, Jr., Det 1, 12th AOG/LG, 7 Sep 94, info used (U) per SAF/PAS security review 95-1070.
3. Intvw (S/NF), Dr. C. F. Cross II, 9RW/HO, with CMSgt R. E. Hickey, Jr., 9MS/MA, 30 Sep 94, info used (U), per SAF/PAS security review 95-1070.
4. Ibid.
5. Ibid.
6. Intvw (S/NF), Cross with Col Morton; intvw (S/NF), Cross with CMSgt Hickey; hist (S/NF/SAR/SY/WNINTEL), SAC, "9th Strategic Reconnaissance Wing, Jan-Jun 1991 (U)," vol i, 33-34, info used (S/NF/LD), info used (U), per SAF/PAS security review 95-1070.
7. Ibid.; hist (S/SY/SAR/NF/LD), CENTCOM, "Review of 1990 with the 1704th Reconnaissance Squadron Provisional (U)," 3 Feb 91, 1, info used (S/OADR); intvw (S/NF), Dr C. F. Cross II, 9RW/HO, with Lt Col J. H. Lloyd III, 26 Jan 94, info used (U), per SAF/PAS security review 95-1070.
8. Intvw (S/NF), Cross with Col Morton; intvw (S/NF), Cross with Lt Col Lloyd, info used (U), per SAF/PAS security review 95-1070.
9. Theodore R. Jamison, (S) *SAC Logistics Support of Operation Desert Storm: The First Thirty Days (U)*, (SAC: Offutt AFB, NE, 1 Apr 91), 23; intvw (S/NF), Cross with Col Morton, info used (U), per SAF/PAS security review 95-1070.
10. Hist (S/SY/SAR/NF/LD), CENTCOM, "1704th RSP (U)," 3 Feb 91, 1, info used (S/OADR); intvw (S/NF), Cross with Lt Col Lloyd, info used (U), per SAF/PAS security review 95-1070.

Chapter 3

The U-2 and its Sensors

The U-2R is a single-place, high-altitude reconnaissance aircraft that flies above 65,000 feet. Although it is not air-refuelable, the U-2R can remain airborne for more than twelve hours. Missions normally do not exceed nine hours, however. As a Strategic Air Command (SAC) asset, the U-2 flew "strategic" reconnaissance missions to detect a military build-up or other unusual activity. The TR-1, which made its first appearance in 1981, was essentially the same aircraft as the U-2R. Designated tactical reconnaissance to differentiate it from the U-2 "spy plane" associated with Gary Powers, the TR-1 was assigned to the 17th Reconnaissance Wing at RAF Alconbury, United Kingdom. During Operation Desert Shield/Storm, 1704RS(P) personnel considered both aircraft as U-2s. Parts and pilots were interchangeable between the two. With the 17RW's impending closure and the TR-1's transfer to the 9th Wing, the TR-1 was redesignated U-2R in October 1991.¹

Originally built in the 1950s "to be used for surveillance over 'denied areas' in Europe, Russia, and elsewhere," the U-2 endured because of its versatility and economy of operation. Although the U-2 inventory is small, sensors, not airframes, are often the limiting factor. In some cases only one or two items are available. For example, when Desert Shield began SENIOR SPAN, a one-of-a-kind prototype, deployed and flew operational missions. The limited number of most sensors makes it more economical to hire

¹In this monograph, I will use TR-1 to indicate aircraft stationed at Alconbury, but, in the narrative on Desert Shield/Storm, I will use U-2R for all aircraft.

contract maintainers. Also, Lockheed technical representatives have continued to work closely with the Air Force as U-2 advisers and maintainers. With the limited sensor inventory, not all airframes have been modified to carry all sensors. One of the Lockheed contractors' greatest contributions was their knowledge of which airframe could carry which sensor. So when the U-2 deployed to Saudi Arabia for Desert Shield/Storm, civilian contractors naturally deployed with them.²

One of the first aircraft deployed to Taif carried the SENIOR YEAR Electro-optical Reconnaissance System (SYERS). The SYERS is a dual-band system that includes a near-real-time electro-optical imagery sensor and an infrared sensor, although the infrared sensor was not operational during Desert Storm. The SENIOR BLADE van on the ground controls the electro-optical sensor and receives, processes, exploits, and reports digital imagery collected to theater commanders and national authorities. SYERS "projects" a digital "picture," onto a computer screen in the ground station. If the sensor is in "line-of-sight" (about 220 miles) of the ground station, the aircraft is "on-tether" and relays the imagery continuously, near-real-time. If the aircraft is beyond the range of the ground station, the SYERS stores the information then relays it when the U-2 is again within range. Intelligence personnel in the SENIOR BLADE van identify objects from the imagery and pass on the coordinates and other data to theater commanders. SYERS near-real-time imagery allowed Desert Storm commanders dynamically to retask attack aircraft already in flight and then retask the U-2 to assess the battle damage. The system can produce a "hard-copy" image, but the process is slow and inefficient.³

The SENIOR BLADE van arrived in Saudi Arabia on 13 August 1990. Because of Taif's distance from Iraq, the BLADE van deployed to Riyadh to give the SYERS maximum time "on-tether" while patrolling along the Saudi-Iraqi border. After Desert Storm began

and the U-2s crossed the border into Iraq, a second SENIOR BLADE van (dubbed Son-of-Blade) deployed to King Khalid Military City, Saudi Arabia nearer the border. This allowed the SYERS to cover nearly all of southern Iraq while remaining on-tether.⁴

The other electronic imagery system, the advanced synthetic aperture radar system II (ASARS-II), came to the desert with the TR-1s from Alconbury. Like the SYERS, the ASARS can relay imagery near-real-time to a ground station while on-tether. Tether range for the ASARS is approximately the same as the SYERS. Unlike the SYERS and the cameras, the ASARS can "see through" clouds, smoke, or darkness. The ASARS, therefore, is especially effective at night or during inclement weather. Since the system provided tactical reconnaissance for the Army in Europe, the Army's tactical radar correlator (TRAC) van deployed with the TR-1s. The TRAC van set up in the same compound in Riyadh as the SENIOR BLADE van. Neither the TRAC nor SENIOR BLADE vans had completed operational evaluation and testing when it deployed to Saudi Arabia.⁵

Although the U-2 primarily used SYERS and ASARS sensors during Desert Shield/Storm, the aircraft also flew several camera missions with the HR-329 (H-cam) and the intelligence reconnaissance imagery system III (IRIS-III). The H-cam uses a high resolution, gyro-stabilized framing system with a 66-inch focal length and folded optical path. Traditionally, the H-cam operates at an angle to provide greater coverage. During Desert Storm, planners experimented with the camera aimed straight down. The detail and clarity impressed planners and amazed theater commanders. Commanders were disappointed, however, that the system could not cover a greater range and still maintain the same detail and clarity. Although the H-cam imagery is especially useful for targeting, battle damage and order-of-battle assessment, targets must be preselected and the technicians must process the film after the aircraft lands.⁶

The IRIS-III is an optical imagery system that uses a high resolution, panoramic camera with a 24-inch focal length. Employing a folded optical path system mounted on a rotating optical bar assembly, the IRIS-III laterally scans through 140 degrees of the total viewing area. This camera covers a 32-nautical-mile swath on both sides of the aircraft. The IRIS-III provides wider "synoptic" coverage than the H-cam, but it does not have the resolution or NIIRS quality. Like the H-cam, the IRIS-III imagery gives the theater commanders excellent targeting, battle damage and order-of-battle assessment.⁷

In December the 9th Wing moved the mobile intelligence processing element (MIPE), a deployable ground station with 15 environmentally controlled vans and organic transportation and support equipment, to Riyadh. Originally designed for the SR-71 program, the MIPE lost its funding when the SR-71 retired. When Desert Shield began, the MIPE was in storage at Beale AFB. The 9th Reconnaissance Technical Squadron (9RTS) kept the system from falling into disrepair, but lacked the funds to properly maintain it. In September and October 1990, the Defense Intelligence Agency and the Air Force Intelligence Directorate asked if the MIPE could deploy to Southwest Asia. After assessing the MIPE, squadron officials explained that the system would need at least 14 days of contract maintenance before it could be operational. Eventually the Air Force Logistics Command authorized Houston Fearless Corporation to complete the needed maintenance, but only allowed six days before deployment on 19 December 1990. Working around the clock, 9RTS and contractor personnel completed the work and loaded the MIPE aboard C-5s on 19 December. The MIPE deployed to the Joint Imagery Processing Complex in Riyadh. The first U-2 IRIS-III mission was on 31 December and MIPE personnel processed the film on 1 January 1991.⁸

Notes Chapter 3

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2. Intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Mr F.M. Carmody, ADP Tech Rep, 11 Mar 94, info used (U), per SAF/PAS security review 95-1070; Jay Miller, *Lockheed's Skunk Works: The First Fifty Years* (Arlington TX: Aerofax, Inc, 1993), 77.

3. Draft reg (S), ACC, "U-2 and RC-135 Global Reconnaissance Operations (U)," 15 Mar 93; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Col G.A. Lafferty, 9OG/CC, 25 Oct 94, info used (U), per SAF/PAS security review 95-1070.

4. Intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Lt Col D. Wright, 1RS/CC, 7 Nov 94; draft reg (S), ACC, "U-2 and RC-135 Global Reconnaissance Operations (U)," 15 Mar 93; intvw (S/NF), Cross with Col Lafferty, info used (U), per SAF/PAS security review 95-1070.

5. Intvw (S/NF), Cross with Lt Col Wright; draft reg (S), ACC, "U-2 and RC-135 Global Reconnaissance Operations (U)," 15 Mar 93; intvw (S/NF), Cross with Col Lafferty, info used (U) per SAF/PAS security review 95-1070.

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Chapter 4

Command and Control

Unlike other major air commands, Strategic Air Command (SAC) had never automatically changed operational control (CHOPed) of deployed assets to the theater commander. Because of his responsibility for the nuclear response or single integrated operational plan (SIOP), the Commander in Chief SAC (CINCSAC) retained operational control (OPCON) over his forces so he could readily recall them to respond to any perceived nuclear threat. In an attempt to expand SAC's conventional warfare role and allay theater CINCs' fears that they could not rely on SAC assets during a contingency, in 1989 CINCSAC General John T. Chain, Jr. signed agreements with the CINCs of U.S. Atlantic Command, U.S. Pacific Command, and U.S. Central Command agreeing to CHOP 47 conventionally-dedicated B-52s to the theater commanders during regional crises.¹

For the first time, CINCSAC CHOPed assets to a theater commander during Desert Shield/Storm. Operational control for both B-52s and tankers changed to the U.S. Central Command commander. To help CENTCOM use the SAC assets most effectively, General Chain sent Brigadier General Patrick P. Caruana and a Strategic Forces advisory team to serve on the U. S. Central Air Force staff.* Brigadier General Caruana would be "dual-hatted" and act as Commander, 1700 Strategic Wing (Provisional), which included the 1704th Reconnaissance Squadron (Provisional), the U-2 unit at

*General Schwarzkopf and the USCENTCOM staff did not deploy until December. Meanwhile, Lieutenant General Horner served as Commander USCENTCOM (Forward).

Taif". He would exercise tactical control (TACON) for reconnaissance aircraft within the CENTCOM area of responsibility (AOR).^{***} General Chain, however, retained OPCON of his strategic reconnaissance forces, including the U-2/TR-1. His staff convinced him that for maximum utility, he should retain operational control over these "small-fleet, high-value" assets. Reconnaissance mission tasking would be "accomplished through established procedures with the Strategic Reconnaissance Center (SRC) at Headquarters SAC as the SAC focal point."² This decision would complicate command and control of the U-2 during Desert Shield.

Considered a "national asset" and designed for strategic reconnaissance, the U-2 required national command authority approval of peacetime tasking. To avoid repetition of the embarrassing Gary Powers shutdown in 1960, "established procedures" for U-2 peacetime tasking became involved and complicated. A theater CINC directed his request for U-2 coverage to Pentagon's Joint Reconnaissance Center. There the "book officer" analyzed the request to find out if Air Force assets were already covering the target and if the request was appropriate for the U-2. If satisfied, he then coordinated with the Defense Intelligence Agency to ensure there was no redundant coverage by sources outside the Air Force. If the agency "passed" on the request, then the book officer briefed the request through the chain of command to representatives from the Joint Chiefs of Staff, the Secretary of Defense, and the president's national security advisor, who could approve the request in the name of the president. This process normally took about two weeks.³

^{**}On 21 September 90, OL-CH was redesignated as 1704 RS(P).

^{***}Operational control [OPCON] provided "full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned tasks." Tactical control [TACON] provided authority to schedule, task, and execute missions locally.

The Joint Reconnaissance Center then notified the Strategic Reconnaissance Center (SRC) at Offutt AFB, Nebraska of the requirement. The SRC evaluated possible threats to the aircraft, coordinated the movement of aircraft, sensors, and support staff and equipment, and scheduled the sortie. Wing mission planners prepared the flight track, planned the mission, and briefed the pilot. The pilot then flew the sortie under peacetime applications of reconnaissance programs (PARPRO) rules. Such flights were in international or friendly airspace. The pilot flew only under VFR (visual flight rules) conditions, gave regular radio checks, and avoided threats or denied territory. If, for any reason, the pilot could not maintain the PARPRO restrictions, he/she aborted the mission and returned to base. If there was no photography processing element in theater, photographs might reach the commander, who had requested the mission, from seven-ten days after the sortie. This long processing and dissemination time caused most commanders to opt for electro-optical or radar imagery, which the SENIOR YEAR Electro-Optical Reconnaissance System (SYERS) and Advanced Synthetic Aperture Radar System (ASARS) could provide near-real-time.⁴

To make the system more responsive to General Schwarzkopf's needs, the Strategic Reconnaissance Center requested the 17th Reconnaissance Wing at RAF Alconbury, Great Britain to deploy Lieutenant Colonel G. Ashton Lafferty to Brigadier Caruana's staff as the U-2 advisor. Lieutenant Colonel Lafferty arrived at CENTAF Headquarters at Riyadh, Saudi Arabia on 19 August 1990. Initially, he aided the "bed-down" of the U-2 detachment at Taif. For example, he helped the unit get a new refueler truck to replace the dilapidated model they had been using. His primary responsibility, however, was simplifying the U-2 requesting and scheduling process.⁵

Since the U-2 began flying operational sorties the day Lieutenant Colonel Lafferty arrived, he immediately began

coordinating the flying schedule between CENTAF, SRC, and the 1704th. Throughout Desert Shield, the U-2 flew under PARPRO restrictions. Flight tracks were in approved "boxes," normally along the Saudi-Iraqi border or along the Saudi-Kuwaiti border. These tracks had already been through the "book process." Lieutenant Colonel Lafferty worked with CENTAF planners and relayed their requirements to SRC to ensure theater commanders were getting the reconnaissance coverage they needed. The Strategic Reconnaissance Center then issued the tasking and execution orders directly to the 1704th. When the air war began and the operational control for reconnaissance changed to the theater on 16 January 1991, Lieutenant Colonel Lafferty's responsibilities increased dramatically.⁶

Notes for Chapter 4

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5. Ibid.

6. Ibid.

Chapter 5

Desert Shield

The first two U-2s landed at King Fahad Air Base, Taif, on 17 August 1990, only two days after Lieutenant Colonel Lloyd and the first contingent of OL-CH arrived. Two days after receiving the aircraft, OL-CH launched its first two OLYMPIC FLARE sorties on 19 August 1990. Captain Lamb flew the first successful operational U-2 sortie, a SENIOR SPAN mission in aircraft 1070. The SYERS mission, however, was unable to establish a data link with SENIOR BLADE. Lieutenant Colonel Lloyd's flight on 21 August in aircraft 1076 was the first successful SYERS mission. All missions during Desert Shield followed basic PARPRO rules. The initial tracks were in the neutral zone between Iraq, Saudi Arabia, and Kuwait, 15-20 miles south of the Iraqi border. From there SYERS could survey most of southern Iraq and SENIOR SPEAR/RUBY sensors covered most of Iraq, including Baghdad. A few days later the tracks expanded along the Saudi-Iraqi border, the Saudi-Kuwaiti border, and the Saudi-Yemeni border.¹

On 23 August the first two TR-1s from the 17th Reconnaissance Wing, RAF Alconbury, Great Britain, arrived at Taif.* The TR-1s carried Advanced Synthetic Aperture Radar System-II (ASARS-II) sensors. ASARS gathered imagery data and relayed it directly to the Army's Tactical Radar Correlator (TRAC) van that deployed to Riyadh in the same compound as the SENIOR BLADE. Intelligence officers in the van could use this information to direct airborne strike aircraft to targets. Captain Sanders completed the first operational ASARS sortie on 29 August. By the end of that month

*This gave the unit 4 aircraft and 10 pilots.

OL-CH had flown eleven SYERS, seven Span, and three ASARS missions for a total of 168.9 hours.**2

Amid the confusion of the OL-CH bed-down and the first operational sorties, the 48th Tactical Fighter Wing's F-111s arrived at Taif on 22 August. As the ranking American officer, Colonel Thomas J. Lennon, 48TFW Commander, became host unit commander and OL-CH became the tenant. Members of OL-CH perceived that the F-111 community considered the U-2 organization as "second-class citizens," since the U-2 did not carry bombs. Relations between the two units quickly deteriorated. Colonel Lennon ordered OL-CH enlisted people out of the Al Gaim compound to make room for 48FTW people. OL-CH enlisted people reluctantly moved to the King Fahad Sports Complex. Then, after Lieutenant Colonel Lafferty had found two refueling trucks to replace the "safety nightmares" the OL-CH was using, Colonel Lennon insisted the trucks should go to the 48FTW. Only General Caruana's intervention prevented OL-CH from losing the trucks. This characterized relations between the two units until family health problems forced the OL-CH commander, Lieutenant Colonel Lloyd, to return to the United States. Lieutenant Colonel Steve Peterson, his replacement, came to Taif with orders to "fix" the relations between the two units. Relations between the commanders gradually improved, but animosity between the "troops" continued to create irritations until the "air war" began on 16 January 1991.³

The operations tempo for OL-CH, meanwhile, increased to 51

**The limiting factor in the U-2/TR-1 inventory was and is the sensors. As the aircraft inventory increased at Taif, maintainers often switched sensors between U-2s and TR-1s. The aircraft were not limited to carrying only one sensor. The SENIOR SPAN system, however, is not interchangeable, so aircraft 1070 flew all the SENIOR SPAN missions until Lockheed finished converting another airframe to accommodate the SENIOR SPAN configuration. For a complete breakdown of all Desert Shield sorties, see Appendix 1.

sorties and 432.4 hours in September 1990. By 30 September, the unit, now designated the 1704th Reconnaissance Squadron (Provisional), scheduled a SYERS sortie every day, an ASARS mission every night, and a SENIOR SPAN flight every other day. In October a SYERS-equipped U-2, aircraft 1098, deployed from Detachment 2 at Osan AB, Korea, to Taif. With the additional aircraft the squadron flew 62 sorties, including 29 SYERS, 27 ASARS, and 6 SPAN in that month. The operations tempo increased to 78 sorties in both November and December. By 16 January 1991, the 1704RS(P) had flown 284 sorties and 2726.2 hours in support of Desert Shield.⁴

As stated previously, pilots flew Desert Shield missions under PARPRO rules. The rules, however, gradually changed to meet theater conditions. Since USAF E-3 airborne warning and control system (AWACS) aircraft were aloft and in contact with the U-2 during flights, VFR conditions and periodic radio checks were eliminated. Another PARPRO rule, "assume all aircraft in the area are friendly and do not deviate from flight track," caused some anxious moments. The first incident occurred on 14 September. Lieutenant Colonel Lloyd was flying parallel to the Saudi-Iraqi border, 15 miles from the border. Two Iraqi fighters flew along the border, 5,000 lower than the U-2. The AWACS warned Lieutenant Colonel Lloyd of the approaching fighters, but PARPRO rules dictated that he continue along his scheduled flight path. Eventually, the fighters veered north and the U-2 completed its mission. Later, CENTAF provided an airborne MIGCAP to protect the U-2 from possible attack. More than 20 other incidents, ranging from fighters to radio contact to radar indications, kept the U-2 pilots from becoming lackadaisical during Desert Shield.⁵

The heavy flying schedule affected everyone in the 1704RS(P), especially the mission planners. They kept a hectic pace drawing tracks, coordinating routes with both the Strategic Reconnaissance Center at Offutt AFB and the Pentagon's Joint Reconnaissance

Center, and planning missions. During Desert Shield, JRC would notify SRC of the requirement. SRC then called the planners at Taif, gave them the coordinates that formed a box within which the mission was to fly, and ask the planners to devise the best track. Working with an intelligence planner, the mission planner created a flight track within the box that allowed the sensors to operate at optimum angles. He then relayed the proposed track to SRC, who coordinated the track with JRC. After both JRC and SRC approved the track, SRC would notify the 1704RS(P) to fly the mission. Lieutenant Colonel Lafferty at Riyadh worked with SRC, the 1704RS(P), and CENTAF to speed up the process and make it flow smoothly.⁶

Major Les Mathews, a 1704RS(P) mission planner during Desert Shield, recounted that tracks for the electronic sensors were not as critical as with camera missions.^{***} Another planner checked the track for accuracy before releasing it to SRC. Initially tracks changed often, and each change meant redoing the track. Later the tracks became more standard and required fewer changes. As time drew near for the air war, however, the number of track and schedule changes greatly increased. In December, for example, CENTCOM added an extra sortie, with only four hours notice. Also, on 20 December CENTCOM identified a need for U-2 optical imagery and the 1704RS(P) started flying Intelligence Reconnaissance Imagery System III (IRIS III) camera missions and the 9th Reconnaissance Technical Squadron deployed to set up the mobile intelligence processing element (MIPE) at Riyadh^{****}. Soon, planners and pilots would have to learn new procedures to accommodate the many changes and dynamic taskings coming from CENTCOM.⁷

^{***}For maximum clarity, camera missions required optimum lighting, contrast, and camera angles.

^{****}See Chapter 3 for details on the MIPE and imagery processing.

Meanwhile, military maintainers and civilian contractor advisors worked around the clock to provide the mission-ready aircraft and the sensors to meet the demanding flying schedule. For the first 100 sorties of Desert Shield U-2/TR-1's mission capable rate was 98.7 percent. The Air Force-wide average was 83.2 percent for U-2s and 66 percent for TR-1s. Only one aircraft returned early because of airframe problems. In the warlike environment of Desert Shield, the civilians work the same 12-hour shifts, lived in the similar facilities, and faced the same hardships as their military counterparts. Both Lieutenant Colonels Lloyd and Peterson praised the contributions of the civilians as vital to the operation's success.⁸

A problem with tail-wheel tires illustrated the close relationship between the civilian contractors and the U-2 military maintainers. In the 1970s more durable polyurethane tires replaced the original rubber tires on the U-2. The polyurethane worked well until 1990 when the tread started separating from the tire carcass. At Taif, where the aircraft sometimes had to taxi for a long distance, the U-2 would arrive at the end of the runway, ready for takeoff with a separated rear-wheel tire. Working together, the civilian and military maintainers developed a technique for changing the tire with the aircraft engines running. This prevented any late takeoffs for tire problems. Although the tire manufacturer denied any change in the manufacturing process, he eventually discovered the problem. Environmental concerns had caused his workers to replace the aerosol cans of 5% silicon, used as a separating agent in the tire molds, with a 100% silicon solution applied with a cloth. The higher concentration of silicon prevented the polyurethane from adhering properly. Switching from silicon to teflon as a parting agent solved the problem.⁹

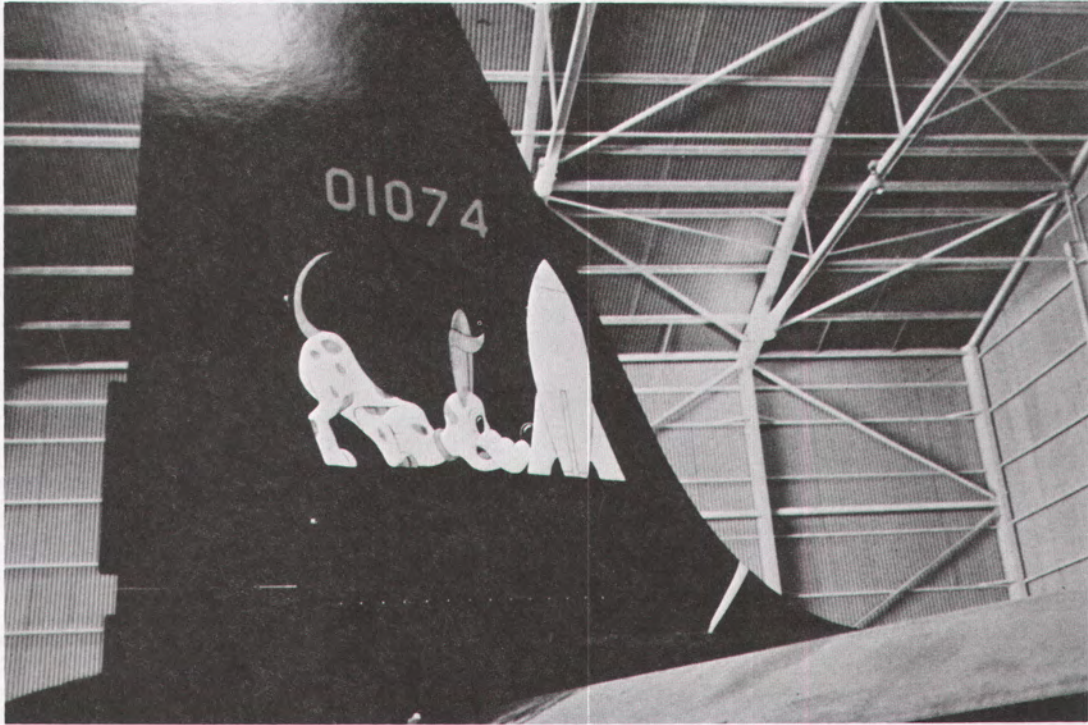
The 17th Reconnaissance Wing at RAF Alconbury also contributed immeasurably to maintaining the U-2s in Desert Shield/Storm.

First, since the U-2 and TR-1 were virtually the same aircraft and parts were interchangeable, the wing served as a parts' depot for operations at Taif. With a unique aircraft and such a limited inventory, parts were not available through normal supply channels. Without the 17RW, either the 9SRW or Detachment 8 at Robins AFB, Georgia would have had to ship U-2 parts to Taif, a much slower process. Also, 9th Wing leaders quickly realized that lack of space, limited personnel, and an exceptionally high ops tempo would preclude the 1704RS(P) from doing phase inspections at Taif. The U-2 requires a phase inspection every 200 hours under training conditions with short flights and many "touch-and-go" landings, such as operations at Beale. During contingencies, however, with long flight times and only one takeoff and landing per flight, the phase inspection interval can increase to 400 hours. The 17RW agreed to do the phase inspections for 1704RS(P) aircraft at RAF Alconbury. Rotating U-2s back to Beale for phase inspections would have taken longer, leaving fewer aircraft available for operational sorties, and used up about 50 hours in flight time, reducing operational hours available between phase inspections. Doing phase inspections at Alconbury was the best solution available and began in October 1990.¹⁰

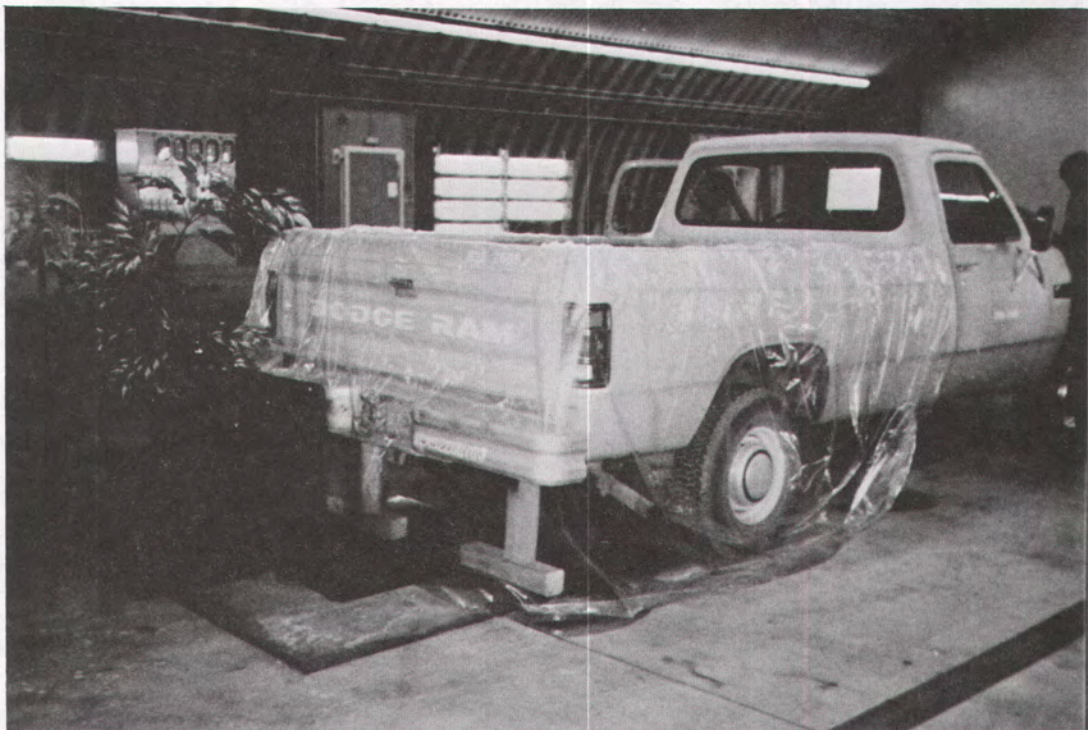
Ninth Strategic Reconnaissance Wing KC-135Qs were also critical to the U-2s success during the Gulf War. Although General H. T. Johnson, Military Airlift Command Commander, activated the civil reserve air fleet for the first time in history to provide additional airlift, airlift was still very limited. The 9th Wing deployed 20 tankers to Jeddah, Saudi Arabia and several others to supplement the tanker task force in Europe and the Pacific. Wing maintainers continued to do KC-135 phase inspections at Beale. In August 1990, shortly after Desert Shield began, Detachment 8 suggested using SAC organic airlift to support the U-2 operations because the "spares and support equipment for both ground and airborne systems [were] largely prototype and one-of-a-kind with

very few or no spares."¹¹ Headquarters SAC agreed and scheduled weekly tanker flights from RAF Mildenhall, Great Britain to Taif. USCENTCOM also initiated "Desert Express," a nonstop C-141 flight from Charleston AFB, South Carolina to Saudi Arabia to carry high priority cargo. The 9SRW used these alternate carriers when feasible, but the KC-135Q tankers rotating between Beale and Saudi Arabia, through RAF Mildenhall, carried almost all parts, equipment, and people between Beale, Alconbury, and Taif. A KC-135Q even carried a spare U-2 engine to Taif, a feat few people believed possible. Tankers also shifted sensors from Korea, Panama, England, Cyprus, and the United States to Saudi Arabia. Colonel Morton acknowledged the operation at Taif greatly benefitted from having the tankers. "I am sure the airlift community still doesn't appreciate how we solved many of our own problems by using the tankers."¹²

Although the 1704RS(P) had more aircraft than normal for a detachment and the operations tempo was higher, in many ways it was "business as usual" during Desert Shield. But a significant change was beginning. Pilots were learning to coordinate with AWACS. PARPRO rules were adapting to new conditions. Mission planners and maintainers were responding faster than ever before to dynamic taskings from theater commanders. But the changes were only just beginning. Desert Storm would dramatically change the way theater commanders viewed the U-2 and the way the U-2 community viewed itself.



U-2 tail art during Operation Desert Shield



Chaplain's make-shift baptistery

Notes for Chapter 5

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Chapter 6

Desert Storm

The buildup of coalition forces reached 243,000 by 1 November 1990. This was enough to safeguard Saudi Arabia from attack, but not to oust Iraq from Kuwait. On 8 November President Bush ordered another 200,000 U.S. troops to the region. When the U.N. Security Council met on 29 November it passed resolution 678 giving Iraq until 15 January 1991 to comply with all previous resolutions, including resolution 660 passed on 3 August 1990 demanding an immediate and unconditional withdrawal from Kuwait. If Iraq did not conform, coalition forces could use "all necessary means" to force compliance.¹

Because of other worldwide commitments, the 1704RS(P) did not begin building-up immediately. Most additional people arrived on 15 and 16 January. At the end of December the unit still had only five aircraft (two SYERS U-2s, one SPAN U-2, and two ASARS TR-1s) and 153 people (13 fewer than on 31 August). By 16 January 1991, however, the squadron had nine aircraft and 231 people, including 24 pilots. Eventually the 1704RS would amass six U-2s, six TR-1s, 253 people, including 30 pilots, making Desert Storm the largest U-2 operation in history. The buildup also included the MIPE, additional reconnaissance staff to CENTCOM at Riyadh, and another SENIOR BLADE van with a U-2 pilot assigned to monitor missions.²

Although the additional aircraft and people had not yet arrived, during the last week of December the 1704th stepped up preparation for the air war. Exercises gave a preview of the U-2's changing role. An ASARS-equipped aircraft relayed near-real-time target-of-opportunity information to the theater air control

center, which passed it on to an airborne battlefield command, control, and communication aircraft, which, in turn, fed that data to airborne F-111s from the 48FTW. The F-111s then struck the simulated target. The ASARS performed so well the squadron flew a similar test with SYERS a few days later. Within ten minutes of target acquisition by the SYERS, the theater air control center had approximate coordinates ready for the strike aircraft. This was a harbinger of tactical-oriented commanders' expectations for the U-2's role when the air war began.³

Meanwhile, on 15 January, Lieutenant Colonel Peterson moved squadron personnel on base to protect them from possible terrorist attacks. Pilots had rooms in hardened aircraft shelters. This provided them a dark, quiet place to sleep. Unfortunately, shelter space was so limited four people had to share a room. Major David Wright, the squadron operations officer, tried to schedule everyone in a room to fly either day sorties or night sorties, but this was not always possible. Pilots often had to rely on Restoril, a prescribed sleeping medication, for crew rest. The only available accommodations for everyone else, including civilian contractors, were tents next to the flight line. Although spacious and air conditioned, the tents had no sound protection from nearby jets. Since most F-111 sorties were at night, day shift workers seldom got more than one or two hours of uninterrupted sleep.⁴

Also, as the 15 January deadline approached, General Schwarzkopf and most of the USCENTCOM headquarters staff moved from MacDill AFB, Florida to Riyadh. Since General Schwarzkopf took no one with airborne reconnaissance experience with him, Lieutenant Colonel Mark S. Spencer deployed from the Pentagon's Joint Reconnaissance Center to the CENTCOM/J-2 (Director of Intelligence) on 2 January. Lieutenant Colonel Spencer became part of a five-person Joint Reconnaissance Cell, which included overhead reconnaissance. He spent the first two weeks educating operations'

taskers on the U-2's capabilities and limitations. Unfortunately, Lieutenant Colonel Spencer had no access to the "Black Hole," which planned the initial phase of the air war. When General Schwarzkopf released the plan about 12 hours before the allied attack began, there were no provisions for airborne reconnaissance. U.S. Navy Captain Agnew, who headed the Joint Reconnaissance Cell, alerted the Director of Intelligence and airborne reconnaissance was added at the last minute.⁵

On 16 January 1991*, President Bush announced the beginning of the allied air offensive against Iraq two hours earlier. Cable News Network (CNN) reporters in Baghdad, against a backdrop of antiaircraft artillery and exploding bombs, had already alerted the world that Desert Storm had begun. The screen went blank moments later as an F-117 struck Iraq's communications center. CNN inadvertently proved to the world the effectiveness of stealth technology.

With the start of the air war, rules governing U-2 operations switched from PARPRO to emergency reconnaissance operations (ERO). Operational control switched from SAC to CENTAF. Lieutenant Colonel Lafferty had already talked with the Strategic Reconnaissance Center and had confirmed that he, as the theater commander's representative, had the authority to approve missions. He kept SRC informed of the reconnaissance operations, but approval authority rested in the theater. Lieutenant Colonel Spencer, working closely with Lafferty, made sure the U-2 taskings were in the air tasking order (ATO). Lafferty alerted the 1704RS of impending taskings to allow the mission planners enough time to prepare routes and flight plans. In anticipation of the coming war, mission planners had already drawn tracks for most target areas in Iraq.⁶

*It was the morning of 17 January in the Middle East.

Switching from PARPRO to emergency reconnaissance operations with the onset of the air war also gave the U-2 authority to cross the border into Iraq. Coalition fighters flew MIGCAPs nearby to protect against Iraqi fighters. Also, the ATO alerted coalition pilots that the U-2 would be in the area and U-2 pilots stayed in contact with the airborne AWACS to avoid a "friendly fire" incident.⁷

Captain Mark C. McDonald was flying an ASARS mission when the Desert Storm began. He was scheduled for a 0140L** hours takeoff on 17 January. But when the squadron received notice that the air war would begin at 0300 hours*** on 17 January, his takeoff was delayed to 0245 hours. His track, still south of the Iraqi border, included airfields in western Iraq. McDonald recalled seeing fighter activity and bombs exploding.**** His defensive systems showed two SA-2 activations and one detonated slightly above his altitude, approximately ten miles away. The mission planner had designed the track well keeping the aircraft ten miles outside the SA-2 range. Flying aircraft 1076 with a SYERS sensor onboard, Major B. L. Bachus took off at 0519 hours on 17 January. His was the first U-2 "border-crossing" mission into Iraq. Bachus described the experience as feeling "like a burglar who broke into a policeman's house without a gun and the policeman is expected home at any minute."⁸

When the war began the operations tempo immediately jumped to five sorties a day. Although additional pilots had arrived, there was insufficient time to train them on local procedures, so the pilots who had been at Taif longest flew the initial missions.

**All times are local.

***Official start time is listed as 0239L.

****Coalition weapons hit the first Iraqi targets at 170239L Jan 91.

Lieutenant Colonel Peterson, himself, flew on 18 January. On the third day the newer pilots began flying operational sorties.⁹

During Desert Shield the U-2 looked for indications the Iraqi troops were moving, especially toward Saudi Arabia, and sought likely targets for future bombing operations. When the air war began the U-2 initially flew bomb damage assessment sorties, but almost immediately switched to searching for SCUD missile launching sites. Using primarily the ASARS on-tether, the U-2 patrolled suspected launch areas in Iraq passing near-real-time data to the TRAC van in Riyadh. When the interpreter in the TRAC van spotted a likely SCUD missile launcher, he called in an air strike on the position. Major Bachus, for example, while enroute to his planned target area, received a new tasking to examine a suspected fixed SCUD site in Qasr Amij E area of western Iraq. He found the launch site and fighters destroyed it later that day. Observers credited this technique with destroying 15 or 16 missile launchers during the first week of the war.***** A B-52 bombardier joined the crew in the TRAC van and helped assess targets. On one mission he used the ASARS information to redirect a flight of B-52s, within two-and-a-half hours of the original target, to a suspected ammunition storage area. Bomber crews reported seeing secondary explosions up to six thousand feet after the strike.¹⁰

In February when a second Senior Blade van (dubbed son-of-Blade) became available, it deployed to King Khalid Military City about 40 miles south of the Saudi-Iraqi border. Although the 1704RS had flown a few SCUD-hunting missions with the SYERS on-tether before, the deployment of son-of-Blade allowed the SYERS to cover all of southern Iraq while remaining on-tether. Major Wright, scheduled to return home, deployed to King Khalid Military City with the son-of-Blade instead. By this time U-2 tasking

*****Many SCUD and launcher "kills" were revised downward after the war.

procedures allowed the airplane to be dynamically retasked during flight. Wright, as an experienced U-2 pilot, evaluated the danger to the aircraft to prevent unnecessary risks during these dynamic retaskings. If attacking aircraft spotted a suspicious target, the U-2 could leave its planned track, examine the target, relaying the data via the tether back to the son-of-Blade. Photo interpreters and an Army intelligence officer in the van would decide if the target warranted an immediate attack. If so, strike aircraft would hit the target. Later the U-2 would assess the damage. Major Wright related that a U-2, using this technique, detected a suspected chemical weapons' storage site. General Schwarzkopf, himself, received the information and ordered an air strike against the target. The U-2 returned the next day to confirm the target had been destroyed. Also, when General Schwarzkopf wanted the Persian Gulf surveyed to assess damage from the Iraqis dumping oil into the Gulf, a SYERS-equipped U-2 diverted from its scheduled track to overfly the damaged area.¹¹

On 27 February, during the ground war, Captain Dan Sanders flew a mission to pinpoint Iraqi troop movements west of Basra, Iraq. Informed that coalition and Iraqi forces were waging a fierce tank battle, Sanders deviated from his preplanned track, visually located the battle site, and positioned his airplane so the sensors could acquire the targets. Data from the sensors allowed friendly forces to withdraw and Apache and Cobra helicopters to strike the Iraqi tanks. Captain Sanders then noticed Iraqi reinforcements moving toward the area. He relayed that information to coalition forces and repositioned his aircraft so the sensors could acquire the new targets. With Sanders help, the coalition forces destroyed 350 Iraqi vehicles, including 23 T-72 tanks.¹²

Despite the invaluable near-real-time information ASARS and SYERS were providing, in-theater commanders, especially Army

commanders, wanted hard copy products. Although the systems could provide hard copy, the process required about 20 minutes and interfered with near-real-time collection. The U-2 began flying camera sorties to satisfy this need, but until the MIPE arrived in theater film processing took several days. Before the aircraft had border-crossing authority, U-2s carried the H-camera and furnished spot imagery of targets inside Iraq. With border-crossing authority, the U-2 flew IRIS-III missions that covered half the AOR in one sortie, but with less clarity. Field commanders appreciated the additional coverage, but wanted greater resolution. Lieutenant Colonels Lafferty and Spencer, working with the 1704RS, decided to revise the H-camera's procedures. Instead of shooting photographs at an angle, as it was designed to do, the camera would shoot straight down from nadir. Technicians at Taif had to remount and adjust the cameras. Mission planners had to develop tracks, similar to the IRIS-III tracks, but with the lines less than three miles apart since the H-camera at nadir only covers a two-mile swath on each pass. The result was pictures beyond expectations. Again field commanders loved it, but wanted it to cover a larger area. Lieutenant Colonel Spencer recalled, "We turned around a system and made it do something it wasn't designed to do. In reality, because of the professionalism of our people, we were giving far more than what we should have been able to, but we were criticized for not living up to the expectations of people who knew little about the system."¹³

The daily taskings also reflected the dynamic nature of tactical reconnaissance. Targets changed constantly, Lieutenant Colonel Lafferty recounted that although he worked 16 hours a day, sometimes CENTAF or CENTCOM taskers would change the planned route after he had gone to bed. They would call Taif directly, perhaps at 2200 hours, and change a route that Lafferty had coordinated earlier. The mission planner would have to construct a new track to replace the one he had drawn earlier. Pilots could no longer do

conventional mission planning a day in advance, since they often did not know where they were going until just before takeoff. Lieutenant Colonel Spencer, from the perspective of CENTCOM headquarters, explained that conditions and circumstances changed so quickly that what was true at 1000 hours might not be true at 2200 hours. Ground unit commanders, in planning for the ground war that began on 24 February, needed to know the exact position of the enemy before planning an attack. Major James C. Hundley, a U-2 mission planner, noted that despite the short notices and the frustration of redoing just-completed tracks, the mission planners completed the tracks for every tasking enabling the pilots to meet the mission requirements.¹⁴

The increased demand for U-2 imagery caused the operations tempo to nearly double over night. From 1 through 16 January 1991, the 1704RS scheduled 44 sorties and flew 38. In the last 15 days of January, the squadron scheduled 85 sorties and flew 73. Total flying hours for January was 872.6. February's flying schedule set all-time records for deployed U-2 operations: 182 sorties flown, with 1386.7 total flying hours.¹⁵

The recording breaking operations tempo put considerable pressure on the maintenance people, both military and civilian, to furnish mission-ready aircraft for so many flights. Fortunately, the U-2 flies better at higher ops tempos. Still, the environment with the dust and heat, the lack of hangar space that forced maintainers to leave airplanes on the ramp exposed to the elements, and round-the-clock operations in a wartime setting made the work especially difficult. Dust accumulated inside the fuselages and engines, but caused no problems. Except the tire problems, mentioned previously, and inertial navigational system overheating, the temperatures had little affect on the airplane. Occasionally, if a fully-fueled aircraft sat on the ramp in the sun too long, the fuel expanded and ran out through the overflow port. This was more

a bother than a problem, a bucket to catch the overflow prevented fuel from running onto the ramp. On the other hand, heat could cause problems for pilots in their pressure suits. But physiological support division technicians developed procedures to provide extra cooling into the cockpit until the pilot was ready for takeoff. So the people and equipment performed well, despite the extreme conditions.¹⁶

But, like other squadron members, the last minute changes and additions to the flying schedule affected the maintenance people. Since not all U-2s could carry all sensors, the aircraft were not completely interchangeable. Lockheed technical representatives were especially helpful in keeping the maintainers aware of which sensors each aircraft could carry. If a late night change in the ATO called for a change in sensors, maintainers often had to scramble to prepare another airplane or spend hours moving a sensor from one airplane to another. Despite the heat, dust, lack of hangar space, and last minute changes, the 1704RS(P) maintainers had a fully-mission-capable rate of 92 percent for February 1991. This compared with a 72.5 percent rate at Beale for the same month.¹⁷

Another constant concern for Major Steve Lundell, the squadron's logistics officer, was JPTS. When Desert Storm began, the squadron had almost 450 thousand gallons of JPTS on hand, an estimated four-week supply, based on a sortie rate of five per day. When the operations tempo increased to seven sorties per day, the monthly JPTS requirement grew to approximately 600 thousand gallons. Although ships and C-130 "bladder birds" kept bringing in more fuel, by the middle of February the squadron had approximately a two-week supply. Major Lundell acknowledged that between resupply ships the total once dropped to less than 100 thousand gallons. Logistic staffs at Headquarters SAC and at the San Antonio Logistics Center worked to increase the supply. Extra fuel

and decreased flying activity after the end of the war eased the shortage.¹⁸

Squadron activity peaked in the week before 24 February 1991, the scheduled onset of the ground war. The 1704RS(P) had 12 airframes and regularly flew seven sorties a day. Dynamic battlefield conditions made short-notice track and schedule changes almost routine. The 100-hour ground war, beginning at 240400L and ending at 280800L February, was quick and decisive. The U.S. Air Force and the 1704RS(P) had done their job well.¹⁹

The U-2's performance and contributions during Desert Shield and Desert Storm were impressive. During the five months of Desert Shield, the U-2 flew 284 sorties and 2726.2 hours, averaging nearly 57 sorties and over 545 hours per month: an impressive performance. In the six weeks of Desert Storm, the U-2 flew 260 sorties and 2022.5 hours, averaging over 43 sorties and 337 hours per week: a phenomenal achievement. Authorities estimated that the U-2 provided approximately 50 percent of all imagery intelligence and 30 percent of the total intelligence for the war: quite an accomplishment for the platform's first venture into tactical reconnaissance.²⁰

Chapter 6 Notes

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Chapter 7

Assessing the U-2's Performance

No combat commander has ever had as full and complete a view of his adversary as did our field commander. Intelligence support to Operations Desert Shield and Desert Storm was a success story.¹

General Colin Powell

The great military victory we achieved in Desert Storm and the minimal losses sustained by US and Coalition forces can be directly attributed to the excellent intelligence picture we had on the Iraqis.²

General H. Norman Schwarzkopf

At the strategic level, [intelligence] was fine. But we did not get enough tactical intelligence---front-line battle intelligence.

Lieutenant General William M. Keys, USMC

In assessing the U-2s performance in Desert Shield/Storm, one should ask three questions: was the system responsive to the theater commander's desires? did it gather the information he wanted? and, did the system furnish the information quickly enough to be of value? General Schwarzkopf and his unit commanders gave the intelligence function mixed reviews. The House Armed Services Oversight and Investigations Subcommittee studying intelligence successes and failures in Desert Shield/Storm concluded intelligence collection was "generally very good and deserving of praise, although there were some major problems." They considered CENTCOM's failure to "mature an intelligence capability" and tactical imagery systems' inability to provide field commanders the quantity and type of products they needed two major problems. The committee, however, cited three outstanding collection platforms, including the ASARS-equipped U-2.³

CENTCOM's failure to "mature an intelligence capability" affected the U-2's ability to respond. When Desert Shield began CENTCOM had one person on the J-2 staff with U-2 experience. CENTAF had no one. Without knowledgeable staff people, there was little likelihood of making the U-2 respond quickly or cover the desired targets. Lieutenant Colonel "Ash" Lafferty, with experience in strategic reconnaissance operations, deployed to CENTAF as a U-2 operations officer. Lafferty and Lieutenant Colonels Spencer and Bonsi used their "connections" at the SRC, the Joint Reconnaissance Center in Washington, and at the 1704RS at Taif to overcome the hurdles and make the system work. They simplified the tasking and approval procedures and made the U-2 responsive to General Schwarzkopf's desires. Lieutenant Colonel Spencer recalled, "We worked hard . . . so Schwarzkopf could maneuver airplanes to meet his needs and still keep the command authority aware of how many airplanes there were, what they were doing, and what their ops tempo was."⁴

Despite these efforts some in-theater commanders grumbled the U-2 was not responsive to their needs. Lacking experience in high altitude flying, few commanders appreciated the difference between the U-2 and fighter aircraft. First, because the U-2 lacked armament to defend itself, mission planners had to develop flight plans that avoided known threats. The Defense Intelligence Agency, SAC, and CENTCOM each had a threat database, and the three seldom agreed. Conflicting opinions over where the U-2 could safely fly caused frustration. Second, since ground stations controlled the sensors, intelligence personnel and mission planners had to coordinate closely to ensure optimum data gathering. Third, physiological restrictions required pilots to "prebreathe" 100% oxygen before flying and to have longer crew rest between flights. Fourth, the small number of platforms and sensors limited system availability. Fifth, other theaters continued to have reconnaissance needs that prevented the national command

authorities from sending all the reconnaissance assets to the Persian Gulf.⁵

Even with these limitations, the U-2 responded well to taskings. Lieutenant Colonels Bonsi, Lafferty, and Spencer ensured that all approved CENTCOM taskings were in the ATO. The 1704RS at Taif mission planners often worked through the night to plan add-on taskings, and the pilots sometimes flew missions without knowing where they were going until just before flight time. The pilots even responded to dynamic retaskings while in flight, something U-2 pilots had never done before the Gulf War. The criticism of the U-2 for lack of responsiveness seems unjustified.⁶

Ninth Reconnaissance Wing leaders determined the U-2 provided 30% of *total* intelligence, over 50% of *imagery* intelligence and 90% of all Army targeting intelligence for the entire theater. Still, some commanders complained they did not get the type or the quantity of imagery they wanted. The House Armed Services Committee acknowledged the U-2's "continuous coverage all-weather, day and night for targeting during the ground war." But the committee criticized national authorities because the investment in tactical collection assets had not kept pace with national assets. Specifically, there was no system to provide wide-area imagery with sufficient resolution: to make maps and provide terrain data for the F-117, the Tomahawk land attack missile, and the F-15E; to locate and count enemy weapons systems and provide adequate BDA; or to locate and target key enemy forces, including mobile missile launchers. The committee found that the retirement of both the SR-71 and a wide-area satellite imagery system simultaneously without follow-on systems was short-sighted.⁷

Although the committee's assessment that the U-2 could not provide broad-area coverage with high NIIRS (national imagery interpretation rating scale) resolution was valid, there was no

operational system available with that capability. The U-2 staff who deployed to Saudi Arabia, however, worked hard to provide the best imagery possible to the field commanders. The Strategic Air Command always considered the U-2 as a "strategic" asset for gathering intelligence data against the Soviet Union. Designers never intended the sensors as battlefield assets for gathering "tactical" intelligence. Before the Gulf War the intelligence community preferred the near-real-time electronic and radar imagery generated by the SYERS and ASARS and neglected photo imagery. Specialists in the ground stations analyzed the images and within a very short time issued an IPIR (initial photographic interpretation report) pinpointing suspected targets by coordinates. Reliance on SYERS and ASARS became almost exclusive after the SR-71 retired and funding was eliminated for the MIPE.⁸

Pilots and commanders, however, did not like the IPIRs. They wanted photographic quality imagery. After the war, General Schwarzkopf told the House Armed Services Committee, "General Chuck Horner said to me . . . in every other war when our pilots were to go out and hit a target, they generally have an aerial photograph in their laps that was no more than 24 hours old of exactly what it was they were going to hit. . . . We didn't have that capability."⁹

While both the Blade and TRAC vans could produce hard copy images, the process took about twenty minutes for one hard-copy print and interfered with the near-real-time collection. To compensate for the slow hard-copy processing, during the Gulf War Air Force bombardiers and Army staff officers joined the ground stations and reported what they saw directly to their commanders or to flight crews. This allowed dynamic retasking, even while the attacking aircraft was in-flight. In one instance, the bombardier in the TRAC van saw a likely target and redirected a B-52 in-flight. The B-52 struck the new target and reported secondary explosions up to six thousand feet, indicating an apparent bomb

dump. When the ground war started the Army representative relayed battlefield conditions and enemy positions and movement to his commander. This gave the ground commanders near-real-time information from one of their own observers. The TRAC (which supports the ASARS) and Blade (which supports the SYERS) vans performed extremely well, especially for unproven systems. Neither the TRAC nor the Blade van had completed operational testing and evaluation before they deployed to the theater.¹⁰

To satisfy the demand for "hard-copy" imagery before the war began, the 1704RS flew IRIS-III and H-camera missions that provided broad-area coverage of Iraqi positions within 50 miles of the Saudi Arabia-Iraq and Saudi Arabia-Kuwait borders. The "customers" liked the broad-area coverage, but wanted higher resolution. After the air war started and coalition forces established air supremacy over Iraq, the squadron flew sorties with the H-camera taking bomb damage photos from the nadir position. This never-before-tried technique produced results that exceeded the camera's advertised capability. The customers liked the resolution, but wanted broader coverage. There was no sensor available to provide both high NIIRS and broad area coverage, so increasing customers' expectations surpassed the U-2's capability.¹¹

To provide more photographs in less time, the 9th SRW brought a refurbished MIPE to Riyadh in late December 1990. Before that, film had to be flown to Germany for processing. Processing film in the MIPE is a time-consuming, labor-intensive operation, requiring about 12 hours for one roll of film. Equipment limitations and chemical processing dictate the time needed. Also, field commanders wanted many targets covered on each roll. Pinpointing each target and making individual prints slowed the process even more. In response to the ever-increasing demand for photographs, the U-2 flew more camera missions. The U-2 output quickly overwhelmed the MIPE's processing capability. The bottleneck was

in dissemination of the intelligence products, not in the gathering.¹² General Horner's criterion of pilots having "an aerial photograph in their laps that was no more than 24 hours old of exactly what it was they were going to hit" was beyond the capability of the available systems. With a larger and more U-2 educated staff, General Horner and the field commanders could have realized they had unrealistic expectations for the sensors and the processing element.

Targeting, or taking pictures of the sites commanders wanted covered, also got mixed reactions in the Gulf War. Order of battle reconnaissance covering the Iraqi Army served the coalition forces well and got good reviews.¹³ The House committee, however, considered battle damage assessment, the ability to determine if the air campaign had made Iraqi heavy equipment inoperative, the "greatest challenge and greatest failure of the intelligence community in Operation Desert Storm."¹⁴ The committee also labeled the "Great Scud Chase" a "double loser." Hunting the mobile launchers diverted resources needed elsewhere and "there is no hard evidence that the Great Scud Chase destroyed even a single Scud missile or mobile launcher."¹⁵

The Gulf War Air Power Survey (GWAPS) stated, "Coalition intelligence provided remarkably complete tactical intelligence on the locations and dispositions" of Iraqi ground forces in Kuwait. The Coalition ground forces "encountered no major surprises" during the one-hundred-hour campaign. U.S. Army Brigadier General John F. Stewart, Jr., noted, "The enemy was exactly where intelligence said he was, disposed as intelligence described." The Coalition forces' rout of a large, well-equipped, dug-in Iraqi Army in one hundred hours with few allied casualties proves the quality of the intelligence. As mentioned earlier, the U-2 provided 90% of the U.S. Army's target intelligence.¹⁶

Although almost everybody agreed that bomb damage assessment (BDA) was inadequate in the Gulf War, causes for the problem were nearly as many as the people giving opinions. General Schwarzkopf told Congress, BDA "led to some disagreements. As a matter of fact, it led to some distancing on the part of some agencies from the position of CENTCOM at the time, as to what the bomb damage assessment really was."¹⁷ When Colonel John Warner presented the basic concept that became the Desert Storm strategic air campaign, he envisioned "centers of gravity" that were necessary for Iraq to continue functioning and supporting the Iraqi Army. His plan's objective was to stop these centers' functioning long enough to cause war support to collapse and the Army to surrender. Measuring a system's ability to function is far different from evaluating physical damage to a structure.¹⁸

Even assessing physical damage was difficult because Desert Storm, unlike previous air campaigns, relied heavily on "smart bombs" to destroy important functions with minimum collateral damage or injury. These weapons could destroy a building's interior while leaving the exterior intact. The only visible sign might be a six-inch diameter hole. Gathering BDA on heavy equipment was also confusing as the Iraqis placed burning oil cans on tanks and artillery pieces to simulate bomb damage. Only the U-2's H-camera, flown at the nadir position, could differentiate between a real tank fire and a simulation. The H-camera at nadir, however, covers very little area. Unfortunately, the Air Force only had two H-cameras in its entire inventory, which were not enough to cover the entire area of battle with this pinpoint photography.¹⁹

Battle damage assessment suffered, too, especially after the Great Scud Chase began, because it lacked the priority of other missions. With only twelve U-2s available, authorities had to choose which requests to support. According to the GWAPS, "once

the war began . . . Horner and Glosson made a conscious decision 'not to waste aircraft to shoot pictures of targets we knew had already been struck.'²⁰ Iraqis Scuds presented little military threat. But their psychological effect on Israel and the diplomatic implications of possible Israeli retaliation made the Scuds an important political target. Scud hunting became more important than BDA.²¹

The short-range Scuds posed little danger to Coalition forces. Saddam knew, however, how to use them for maximum effect. By aiming Scuds at Israeli cities and leaving open to speculation whether they carried poisonous gases or deadly viruses, Saddam hoped to draw a retaliation from Israel and split the Western-Arab coalition. Locating and destroying Scuds and their transporter erector launchers (TEL), therefore, gained high priority for the national command authorities in Washington. The U-2 had little trouble finding fixed launchers and coalition aircraft destroyed several.²²

The TELs, however, proved much more difficult. There were several reasons for this. First, intelligence analysts believed the Iraqis would employ the Scuds the same way the Soviets had during Warsaw Pact exercises. The Soviets took hours to carefully erect, calibrate and aim the missiles before firing. The Iraqis arrived at a launch site, erected the missile, fired, and moved on within ten minutes. Also, the Iraqis almost exclusively launched the Scuds at night. This procedure made the Scuds ineffective militarily, but effective psychologically. It also made them very hard to locate. To further complicate the task, the Iraqis created decoys that were difficult to distinguish from the TELs.²³

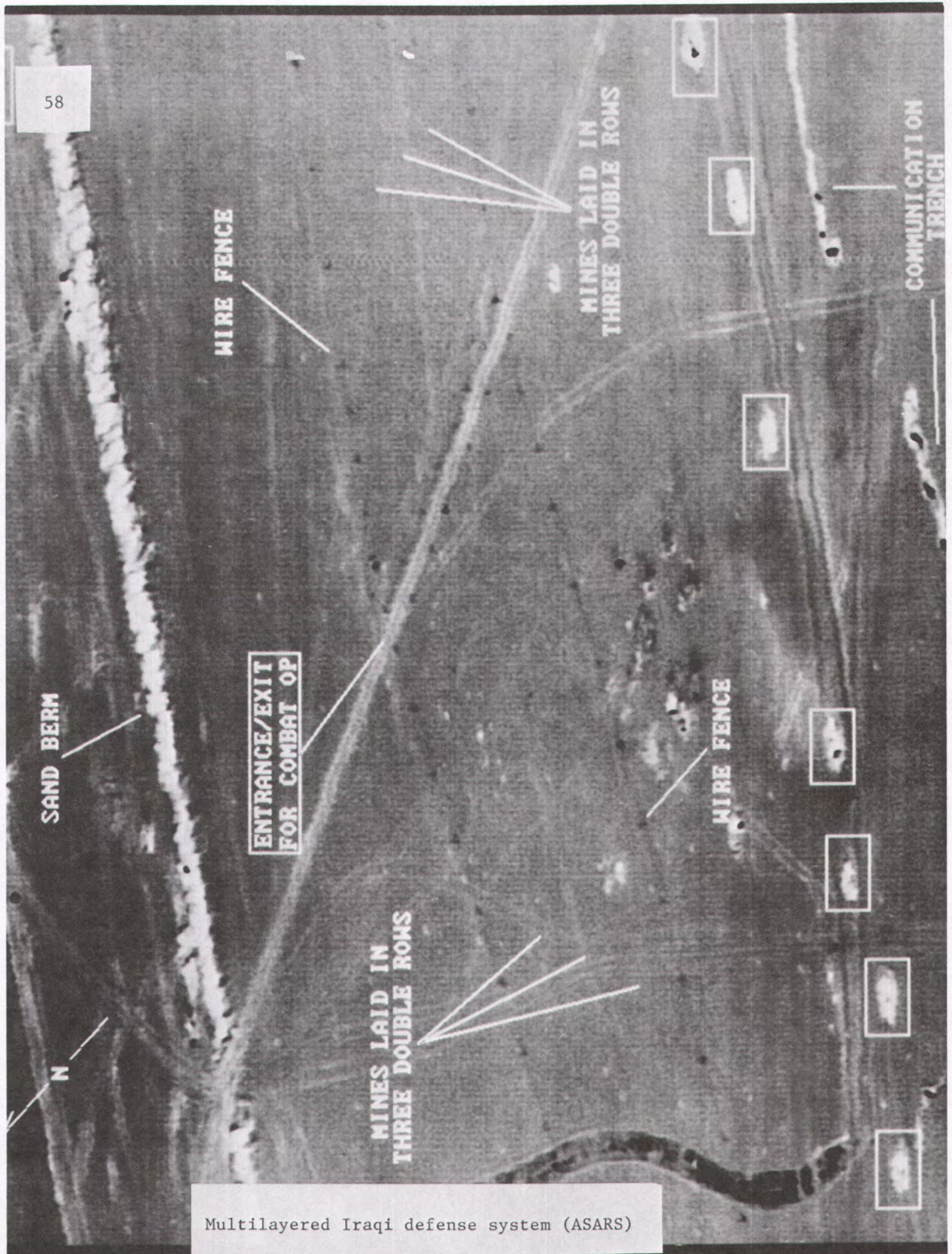
Since American forces had never hunted mobile missiles before, planners had to create new tactics. They devised the continuous combat air patrol, primarily with an ASARS-equipped U-2 and an F-

15E. When the ASARS located a suspected TEL, the F-15E destroyed it. In the air campaign's first ten days, aircrews claimed several mobile launcher "kills" using this technique. A slowdown in Scud launches seemed to confirm the claims. Subsequent investigation revealed, however, that the kills were of decoys, other short range missiles, or trucks. As previously stated, the House committee found there was no "hard evidence" of any Scud or TEL kills. The committee also admitted that even when the fighters knew the exact location of a Scud launcher, pilots had trouble finding and destroying them. The committee concluded, however, that the allied effort probably "retarded the Iraqi Scud effort" and made the firings much more inaccurate by forcing the Iraqis to act so quickly. If the Scud hunt's purpose was to prevent Israel from retaliating and entering the war, which it apparently was, then the hunt succeeded even though it was ineffective militarily.²⁴

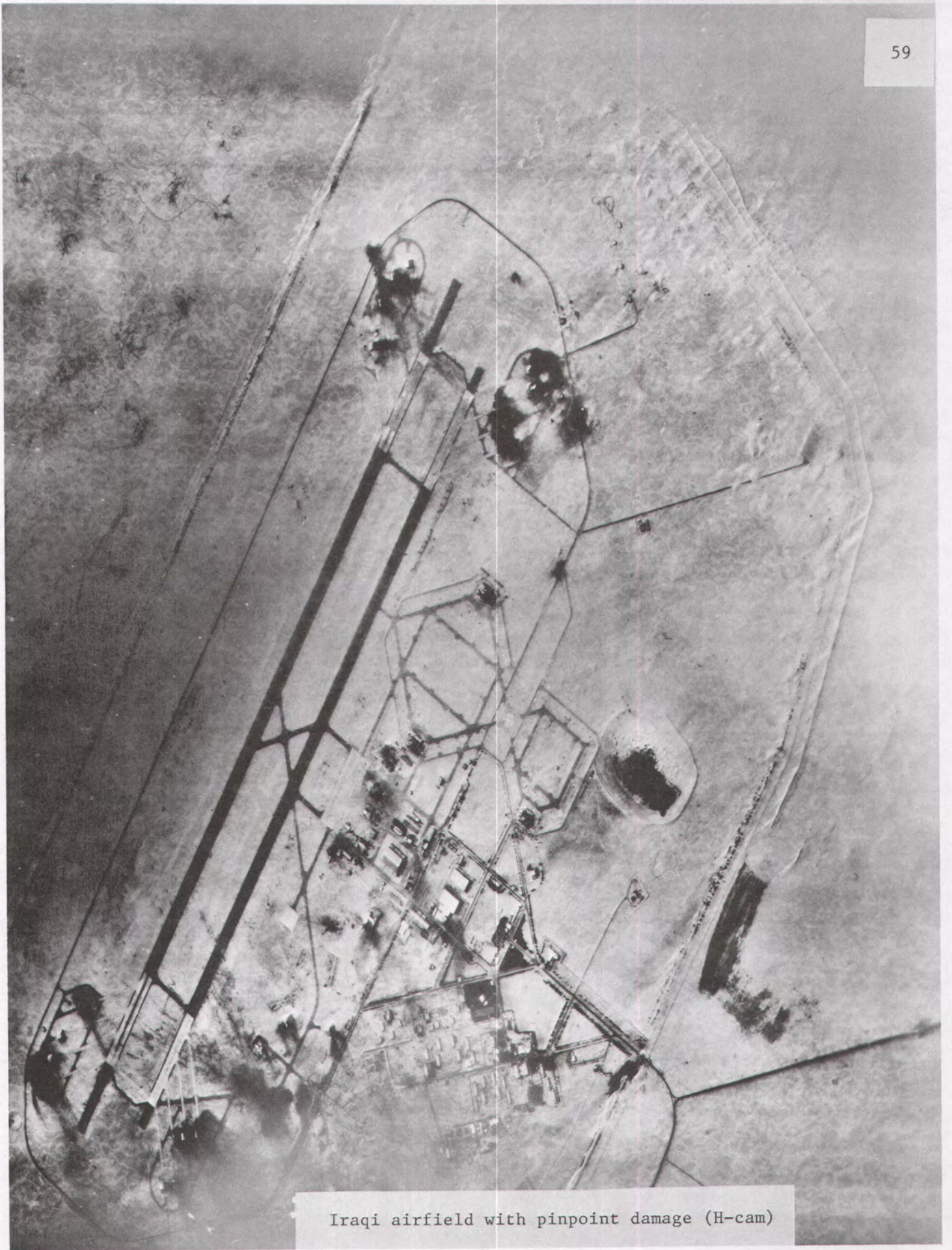
Returning to the three original questions to assess the U-2s performance in Desert Shield/Storm: was the system responsive to the theater commander's needs? "Yes," despite the lack of U-2 educated people on the CENTCOM staff. Knowledgeable people in key positions used their contacts to make the system respond, even to dynamic, in-flight retaskings, something the U-2 had never done before. Did it gather the information he wanted? "Yes and no." The U-2 provided a clear picture of Iraqi Army field positions and insured there "were no surprises" during the ground war. Imagery for battle damage assessment and finding Scuds was much less successful. Did the system furnish the information quickly enough to be of value? Electro-optical and radar imagery was near-real-time. With Air Force and Army observers in the ground stations, aircrews and ground commanders received near-real-time intelligence. Many commanders, however, wanted photographs. The U-2 had no camera that could provide broad-area, high resolution photographs. Also, the demand for photographic imagery overwhelmed the processing and dissemination system. So it was virtually

impossible to provide the quantity of photographs within time to be useful.

Some criticisms of the U-2, therefore, were valid and others were not. Even the valid ones, however, should not reflect negatively upon the men and women of the 9th Reconnaissance Wing. They showed great flexibility, ingenuity, and dedication in adapting the U-2 to its new "tactical" wartime role. Any shortcomings reflected policy and planning failures "at a much higher pay grade."



Multilayered Iraqi defense system (ASARS)



Iraqi airfield with pinpoint damage (H-cam)

60



Burning oilfield in Kuwait (SYERS)

Notes for Chapter 7

1. Rpt (U), DOD, "Conduct of the Persian Gulf War: Final Report to Congress," Apr 92, C-1.
2. Ibid.
3. Rpt (U), HR, "Intelligence Successes and Failures in Operations Desert Shield/Storm," 16 Aug 93, 1-7.
4. Intvw (S/NF), Cross with Lt Col Spencer; intvw (S/NF), Cross with Col Lafferty; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Lt Col D. Bonsi, 10 Feb 95; msg (S/OADR), HQ SAC/DOR to USCINCCENT/CCJ2, et al, "SAC SWA Reconnaissance Tasking and Execution Procedures (U)," 142225Z Jan 91, info used (U), per SAF/PAS security review 95-1070.
5. Ibid.
6. Intvws (S/NF), Cross with Lt Col Bonsi, Col Lafferty, and Lt Col Spencer; citations (S), 9RW, "Citations to accompany the award of DFCs," **Appendix 2**, info used (U), per SAF/PAS security review 95-1070.
7. Rpt (U), HR, "Intel Successes and Failures," 7-10; memo (S/NF/LD), 9RW, "Justification for Outstanding Unit Award," ca Jul 91, info used (U), per SAF/PAS security review 95-1070.
8. Intvws (S/NF), Cross with Lt Col Bonsi, Col Lafferty, and Lt Col Spencer, info used (U), per SAF/PAS security review 95-1070.
9. Rpt (U), HR, "Intel Successes and Failures," 30.
10. Intvws (S/NF), Cross with Lt Col Bonsi, Col Lafferty, and Lt Col Spencer, info used (U), per SAF/PAS security review 95-1070.
11. Ibid.
12. Ibid.
13. Rpt (U), HR, "Intel Successes and Failures," 13.
14. Ibid., 18.
15. Ibid., 11-12.
16. Rpt (U), "Gulf War Air Power Survey Summary Report," 1993, 138.
17. GWAPS, 139.

18. See Richard T. Reynolds, *The Heart of the Storm: Genesis of the Air Campaign Against Iraq* (Maxwell AFB: Air University Press, 1995) for a discussion of Colonel Warden's role and the planning of the air campaign.

19. Intvw (S/NF), Cross with Lt Col Spencer and Lt Col Bonsi, info used (U), per SAF/PAS security review 95-1070.

20. GWAPS, 131.

21. Intvw (S/NF), Cross with Col Lafferty, info used (U), per SAF/PAS security review 95-1070.

22. GWAPS, 123-24; rpt (U), HR, "Intel Successes and Failures," 11-12; intvws (S/NF), Cross with Lt Col Spencer and Col Lafferty, info used (U), per SAF/PAS security review 95-1070.

23. GWAPS, 123-24; intvws (S/NF), Cross with Lt Col Spencer, Col Lafferty, and Lt Col Bonsi, info used (U), per SAF/PAS security review 95-1070.

24. GWAPS, 123-24; rpt (U), HR, "Intel Successes and Failures," 11-12; intvws (S/NF), Cross with Lt Col Spencer, Col Lafferty, and Lt Col Bonsi, info used (U), per SAF/PAS security review 95-1070.

Appendix 1

OLYMPIC FLARE MISSIONS

Appendix 1

Chart 1

OLYMPIC FLARE MISSIONS

MONTH	SCHEDULED	FLOWN	HOURS FLOWN
August	22	20	187.2
September	52	52	433.8
October	63	62	523.3
November	74	70	557.9
December	77	77	630.4
January	130	111	872.6
February	183	172	1356.4
TOTALS	601	564	4,561.6

SOURCE: Rpt (S/DECL OADR), 9SRW/IN, "Olympic Flare Mission Summary, Jan-Jun 91 (U)," info used (U), per SAF/PAS security review 95-1070.

**Appendix 1
Chart 2**

OLYMPIC FLARE MISSIONS

AUGUST 1990

DATE	MSN NUMBER	FLY HOURS	SENSOR
19 Aug	001	7.0	SPAN
19 Aug	002	5.0	SYERS
21 Aug	003	9.0	SPAN
21 Aug	002	11.1	SYERS
22 Aug	004	11.0	SYERS
23 Aug	005	11.2	SYERS
23 Aug	006	8.8	SPAN
24 Aug	007	10.6	SYERS
25 Aug	008	8.8	SPAN
25 Aug	009	11.1	SYERS
27 Aug	010	10.9	SYERS
27 Aug	011	7.9	SPAN
28 Aug	012	11.0	SYERS
29 Aug	013	2.0	SPAN
29 Aug	014	8.4	ASARS
29 Aug	015	11.5	SYERS
30 Aug	016	10.9	SYERS
30 Aug	017	8.5	ASARS
31 Aug	018	11.5	SYERS
31 Aug	013	3.0	SPAN
31 Aug	019	1.2	ASARS
31 Aug	020	6.8	ASARS
TOTALS	22/20	187.2	

SOURCE: Rpt (S/OADR), 9SRW/IN, "Olympic Flare Mission Summary," August 1990, info used (U), per SAF/PAS security review 95-1070.

Appendix 1
Chart 3

OLYMPIC FLARE MISSIONS

SEPTEMBER 1990

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Sep	21	8.0	SPAN
01 Sep	22	7.7	ASARS
02 Sep	23	11.0	SYERS
02 Sep	24	9.0	ASARS
03 Sep	25	9.3	SPAN
03 Sep	26	8.9	ASARS
04 Sep	27	9.0	SYERS
05 Sep	28	8.9	SPAN
05 Sep	29	8.9	ASARS
06 Sep	30	7.1	SYERS
06 Sep	31	5.1	ASARS
07 Sep	32	8.0	SPAN
07 Sep	33	7.7	ASARS
08 Sep	34	10.0	SYERS
08 Sep	35	8.6	ASARS
09 Sep	36	7.9	SPAN
09 Sep	37	9.2	ASARS
10 Sep	38	10.4	SYERS
10 Sep	39	8.9	ASARS
11 Sep	40	8.9	SPAN
11 Sep	41	9.0	ASARS
12 Sep	42	11.3	SYERS
12 Sep	43	9.0	ASARS
13 Sep	44	8.1	SPAN
13 Sep	45	4.7	ASARS
14 Sep	46	10.7	SYERS

Chart 3 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
14 Sep	47	9.1	ASARS
15 Sep	48	8.9	SPAN
15 Sep	49	8.0	ASARS
16 Sep	50	10.1	SYERS
17 Sep	52	7.0	SPAN
17 Sep	53	7.6	ASARS
18 Sep	54	10.8	SYERS
18 Sep	55	8.7	ASARS
19 Sep	56	4.2	SPAN
19 Sep	57	9.1	ASARS
20 Sep	58	9.1	SYERS
21 Sep	59	9.1	ASARS
21 Sep	60	1.7	SPAN
21 Sep	61	9.0	ASARS
22 Sep	62	11.2	SYERS
22 Sep	63	8.8	ASARS
23 Sep	64	8.8	ASARS
23 Sep	65	10.5	SYERS
24 Sep	66	7.9	ASARS
25 Sep	67	8.8	ASARS
26 Sep	68	2.4	SYERS
26 Sep	69	3.7	ASARS
27 Sep	51	10.9	SYERS
28 Sep	72	10.8	SYERS
29 Sep	73	5.8	SYERS
30 Sep	76	6.5	ASARS
TOTALS	52/52	433.8	

SOURCE: Rpt (S/OADR), 9SRW/IN, "Olympic Flare Mission Summary,"
September 1990, info used (U), per SAF/PAS security review 95-1070.

Appendix 1

Chart 4

OLYMPIC FLARE MISSIONS

OCTOBER 1990

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Oct	81	11.2	SYERS
01 Oct	82	7.6	ASARS
02 Oct	83	11.0	SYERS
02 Oct	84	7.3	ASARS
03 Oct	85	11.0	SYERS
03 Oct	86	6.6	ASARS
04 Oct	87	9.0	SYERS
04 Oct	88	8.8	ASARS
05 Oct	89	10.1	SYERS
05 Oct	90	8.7	ASARS
06 Oct	91	6.3	SYERS
06 Oct	92	6.7	ASARS
07 Oct	93	6.1	SYERS
07 Oct	94	8.8	ASARS
08 Oct	96	8.7	ASARS
09 Oct	97	9.7	SYERS
09 Oct	98	9.8	ASARS
10 Oct	99	10.3	SYERS
10 Oct	100	8.6	ASARS
11 Oct	101	10.0	SYERS
11 Oct	102	8.7	ASARS
12 Oct	103	4.2	SYERS
12 Oct	104	8.6	ASARS
13 Oct	105	9.9	SYERS
14 Oct	106	3.2	SYERS
14 Oct	107	8.9	ASARS

Chart 4 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
15 Oct	108	9.2	SYERS
15 Oct	110	8.7	ASARS
16 Oct	111	10.1	SYERS
16 Oct	112	8.8	ASARS
17 Oct	113	9.8	SYERS
17 Oct	114	8.9	SPAN
18 Oct	116	4.7	SYERS
18 Oct	117	8.7	ASARS
19 Oct	118	9.0	SYERS
19 Oct	119	8.2	SPAN
20 Oct	121	9.9	SYERS
21 Oct	123	6.5	SYERS
21 Oct	125	6.2	SPAN
22 Oct	126	9.5	SYERS
23 Oct	128	9.9	SYERS
23 Oct	129	7.4	ASARS
23 Oct	130	9.0	SPAN
24 Oct	120	5.5	ASARS
24 Oct	131	9.6	SYERS
24 Oct	132	2.8	ASARS
25 Oct	133	9.9	SYERS
25 Oct	134	8.2	ASARS
26 Oct	136	9.8	SYERS
26 Oct	137	8.2	ASARS
27 Oct	138	9.0	SYERS
27 Oct	140	8.1	ASARS
28 Oct	141	9.9	SYERS
28 Oct	142	7.9	ASARS
29 Oct	143	9.9	SYERS
29 Oct	144	8.8	SPAN
29 Oct	145	8.5	ASARS

Chart 4 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
30 Oct	146	9.4	SYERS
30 Oct	147	7.5	ASARS
31 Oct	148	8.9	SYERS
31 Oct	149	8.5	SPAN
31 Oct	150	8.6	ASARS
TOTAL	62	523.3	

SOURCE: Rpt (S/OADR), 9SRW/IN, "Olympic Flare Mission Summary,"
October 1990, info used (U), per SAF/PAS security review 95-1070.

Appendix 1

Chart 5

OLYMPIC FLARE MISSIONS

NOVEMBER 1990

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Nov	156	10.0	SYERS
01 Nov	157	1.5	SPAN
01 Nov	158	7.4	ASARS
02 Nov	159	9.7	SYERS
02 Nov	160	8.9	ASARS
03 Nov	161	10.1	SYERS
03 Nov	162	9.1	SPAN
03 Nov	163	7.4	ASARS
04 Nov	164	9.7	SYERS
04 Nov	165	7.2	ASARS
05 Nov	166	5.3	SYERS
05 Nov	167	8.8	SPAN
05 Nov	168	8.6	ASARS
06 Nov	169	10.0	SYERS
07 Nov	171	9.7	SYERS
07 Nov	172	8.9	SPAN
07 Nov	173	4.6	ASARS
08 Nov	174	9.9	SYERS
08 Nov	175	7.4	ASARS
09 Nov	176	9.9	SYERS
09 Nov	177	8.7	SPAN
09 Nov	178	3.3	ASARS
10 Nov	179	10.0	SYERS
10 Nov	181	9.7	SYERS
11 Nov	182	8.7	SPAN
11 Nov	183	8.3	ASARS

Chart 5 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
12 Nov	170	5.3	ASARS
12 Nov	184	9.9	SYERS
12 Nov	185	3.5	ASARS
13 Nov	186	9.9	SYERS
13 Nov	187	8.7	SPAN
13 Nov	188	3.6	ASARS
13 Nov	192	5.5	ASARS
14 Nov	189	10.0	SYERS
14 Nov	190	7.4	ASARS
15 Nov	191	5.7	ASARS
15 Nov	193	3.5	ASARS
16 Nov	194	8.9	SYERS
16 Nov	195	7.3	ASARS
17 Nov	196	10.0	SYERS
17 Nov	197	8.7	SPAN
17 Nov	198	6.8	ASARS
18 Nov	199	9.2	SYERS
18 Nov	200	7.4	ASARS
19 Nov	201	10.1	SYERS
19 Nov	202	8.0	SPAN
19 Nov	203	8.1	ASARS
20 Nov	204	10.0	SYERS
20 Nov	205	8.6	ASARS
21 Nov	206	9.8	SYERS
21 Nov	207	8.9	SPAN
21 Nov	208	9.5	ASARS
22 Nov	210	7.9	ASARS
23 Nov	211	9.6	SYERS
23 Nov	212	8.4	SPAN
23 Nov	213	6.7	ASARS
24 Nov	214	4.9	SYERS

Chart 5 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
25 Nov	217	8.9	SPAN
26 Nov	219	8.3	ASARS
27 Nov	220	2.3	SYERS
27 Nov	221	8.7	SPAN
27 Nov	222	8.5	ASARS
28 Nov	223	4.8	SYERS
28 Nov	224	11.0	ASARS
29 Nov	209	9.3	SYERS
29 Nov	225	3.0	SYERS
29 Nov	226	9.1	SPAN
29 Nov	227	10.7	ASARS
30 Nov	228	10.2	SYERS
30 Nov	229	8.5	ASARS
TOTALS	70	557.9	

SOURCE: Rpt (S/OADR), 9SRW/IN, "Olympic Flare Mission Summary,"
November 1990, info used (U), per SAF/PAS security review 95-1070.

Appendix 1
Chart 6

OLYMPIC FLARE MISSIONS

DECEMBER 1990

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Dec	231	9.4	SYERS
01 Dec	232	9.0	SPAN
01 Dec	233	8.6	ASARS
02 Dec	234	10.0	SYERS
02 Dec	235	8.8	ASARS
02 Dec	249	9.7	ASARS
03 Dec	236	9.8	SYERS
03 Dec	237	9.0	SPAN
03 Dec	238	8.4	ASARS
04 Dec	239	6.4	SYERS
04 Dec	240	8.5	ASARS
05 Dec	241	9.7	SYERS
05 Dec	242	8.9	SPAN
05 Dec	243	8.6	ASARS
06 Dec	244	8.9	SYERS
06 Dec	245	8.8	ASARS
07 Dec	246	9.7	SYERS
07 Dec	247	8.8	SPAN
07 Dec	248	9.0	ASARS
08 Dec	250	9.0	SYERS
08 Dec	251	9.0	ASARS
09 Dec	252	5.7	SYERS
09 Dec	253	9.2	SPAN
09 Dec	254	9.2	ASARS
10 Dec	255	9.2	SYERS
11 Dec	257	8.8	SYERS

Chart 6 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
11 Dec	258	9.0	SPAN
11 Dec	259	8.0	ASARS
12 Dec	260	10.0	SYERS
12 Dec	261	4.6	ASARS
12 Dec	256	4.4	ASARS
13 Dec	262	9.5	SYERS
13 Dec	264	8.7	ASARS
14 Dec	263	8.8	SPAN
14 Dec	265	2.8	SYERS
14 Dec	266	2.6	ASARS
14 Dec	285	5.5	ASARS
15 Dec	268	8.9	SYERS
15 Dec	269	9.5	ASARS
16 Dec	267	8.4	SPAN
16 Dec	270	9.4	SYERS
16 Dec	271	3.3	ASARS
16 Dec	350	6.9	ASARS
17 Dec	273	8.9	SYERS
18 Dec	272	9.0	SPAN
18 Dec	275	9.3	SYERS
19 Dec	278	9.6	SYERS
19 Dec	279	9.1	ASARS
20 Dec	277	8.0	SPAN
20 Dec	280	8.4	SYERS
20 Dec	281	9.7	ASARS
21 Dec	283	10.2	SYERS
21 Dec	284	10.2	ASARS
22 Dec	282	8.9	SPAN
22 Dec	286	9.2	ASARS
22 Dec	302	8.7	SYERS
23 Dec	287	3.5	SYERS

Chart 6 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
23 Dec	288	7.7	ASARS
23 Dec	X06	7.8	SYERS
24 Dec	290	7.2	SYERS
24 Dec	291	8.8	ASARS
25 Dec	292	5.8	SYERS
25 Dec	293	3.7	ASARS
26 Dec	296	4.9	ASARS
26 Dec	X08	5.2	ASARS
27 Dec	298	8.7	ASARS
27 Dec	X07	4.7	ASARS
28 Dec	299	9.0	SPAN
28 Dec	300	10.1	SYERS
28 Dec	301	1.7	ASARS
29 Dec	X02	9.6	SYERS
29 Dec	303	8.4	ASARS
30 Dec	304	10.0	SYERS
30 Dec	305	7.9	SPAN
30 Dec	X03	9.2	ASARS
31 Dec	X04	9.2	IRIS-II
31 Dec	X05	9.0	ASARS
TOTALS	78	630.4	

SOURCE: Rpt (S/OADR), 9SRW/IN, "Olympic Flare Mission Summary,"
December 1990, info used (U), per SAF/PAS security review 95-1070.

Appendix 1 (U)

Chart 7

OLYMPIC FLARE MISSIONS (U)

JANUARY 1991

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Jan	309	0	SYERS
01 Jan	310	8.1	ASARS
02 Jan	311	0	SYERS
02 Jan	312	0	SPAN
02 Jan	313	8.2	ASARS
03 Jan	314	10.0	SYERS
03 Jan	315	9.4	ASARS
04 Jan	316	9.2	SYERS
04 Jan	317	3.3	SPAN
04 Jan	318	7.6	ASARS
05 Jan	319	7.9	SYERS
05 Jan	320	9.2	ASARS
06 Jan	321	5.7	SYERS
06 Jan	322	3.4	SPAN
07 Jan	323	0	ASARS
07 Jan	324	10.2	SYERS
08 Jan	325	0	ASARS
08 Jan	326	9.6	ASARS
08 Jan	327	8.8	SPAN
09 Jan	328	9.4	ASARS
09 Jan	329	8.6	SYERS
09 Jan	330	8.3	ASARS
10 Jan	331	9.3	ASARS
10 Jan	332	9.1	SPAN
10 Jan	333	9.3	ASARS
11 Jan	334	9.7	SYERS

Chart 7 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
11 Jan	335	5.9	SYERS
12 Jan	336	5.6	H-CAM
12 Jan	337	6.7	SPAN
12 Jan	338	3.2	ASARS
13 Jan	339	8.5	ASARS
13 Jan	340	10.9	ASARS
14 Jan	341	9.4	ASARS
14 Jan	285	0	RESCHED
14 Jan	323	6.2	ASARS
15 Jan	311	5.7	H-CAM
15 Jan	344	4.9	ASARS
15 Jan	325	5.7	ASARS
15 Jan	345	4.8	ASARS
16 Jan	X09	6.0	ASARS
16 Jan	312	1.1	H-CAM
16 Jan	346	10.2	SYERS
16 Jan	347	7.0	SPAN
16 Jan	347	7.0	SPAN
16 Jan	348	8.1	ASARS
17 Jan	X10	6.0	H-CAM
17 Jan	X11	9.2	SPAN
17 Jan	349	7.1	SYERS
17 Jan	350	8.9	ASARS
17 Jan	X13	7.1	SYERS
17 Jan	X12	8.5	ASARS
18 Jan	X14	8.5	SPAN
18 Jan	X15	8.9	ASARS
18 Jan	X16	0	
18 Jan	353	9.6	ASARS
19 Jan	X17	8.1	SPAN
19 Jan	354	7.8	SYERS

Chart 7 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
19 Jan	355	8.9	ASARS
19 Jan	351	3.1	ASARS
19 Jan	X18	1.7	ASARS
19 Jan	X19	0	ASARS
20 Jan	357	9.2	SPAN
20 Jan	358	9.1	ASARS
20 Jan	356	0	SYERS
20 Jan	352	5.5	H-CAM
20 Jan	X16	9.5	ASARS
21 Jan	X19	8.9	SPAN
21 Jan	359	6.8	SYERS
21 Jan	X21	0	ASARS
21 Jan	360	8.8	ASARS
22 Jan	356		
22 Jan	361	8.2	SYERS
22 Jan	363	8.8	ASARS
22 Jan	362	9.5	SPAN
21 Jan	X20	9.7	ASARS
22 Jan	X21	8.9	ASARS
23 Jan	356	9.0	SPAN
23 Jan	364	7.1	SYERS
23 Jan	365	7.9	ASARS
23 Jan	X22		
24 Jan	X23		
23 Jan	X24	9.6	ASARS
24 Jan	366	10.3	SYERS
24 Jan	367	9.4	SPAN
24 Jan	X23	6.2	IRIS
24 Jan	X25	5.8	H-CAM
24 Jan	368	8.8	ASARS
24 Jan	X26	9.3	ASARS

Chart 7 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
25 Jan	369	0	
25 Jan	371	0	
25 Jan	373	9.2	SPAN
25 Jan	370	9.2	ASARS
25 Jan	374	9.3	ASARS
26 Jan	369	2.7	SYERS
26 Jan	371	7.2	IRIS
26 Jan	372	9.2	SPAN
26 Jan	X27	6.0	SYERS
26 Jan	375	8.3	ASARS
26 Jan	376	8.2	ASARS
27 Jan	377	5.8	SYERS
27 Jan	378		
27 Jan	379	5.2	H-CAM
27 Jan	380	9.2	SPAN
27 Jan	X28	9.7	ASARS
27 Jan	X29	9.8	ASARS
28 Jan	378	10.5	SYERS
28 Jan	X30		
28 Jan	X31	9.2	SPAN
28 Jan	X32	9.3	ASARS
28 Jan	X33	4.1	ASARS
28 Jan	X34	6.0	H-CAM
29 Jan	X40	6.7	ASARS
29 Jan	X30	10.2	SYERS
29 Jan	X35	6.1	IRIS
29 Jan	X36	5.8	H-CAM
29 Jan	X37	9.2	SPAN
29 Jan	X38	9.4	ASARS
29 Jan	X39	9.0	ASARS
30 Jan	X46	10.5	SYERS

Chart 7 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
30 Jan	X41	8.3	SYERS
30 Jan	X42	9.0	ASARS
30 Jan	X43	11.1	SPAN
30 Jan	X44	8.8	ASARS
30 Jan	X45	8.9	ASARS
31 Jan	X47	9.7	SYERS
31 Jan	X48	4.6	IRIS
31 Jan	X49		H-CAM
31 Jan	X50	6.1	SPAN
31 Jan	X51	8.8	ASARS
31 Jan	X52	8.4	ASARS
TOTALS	130/111	872.6	

SOURCE: Rpt (S/DECL OADR), 9SRW/IN, "Olympic Flare Mission Summary (U)," info used (U), per SAF/PAS security review 95-1070.

Appendix 1
Chart 8

OLYMPIC FLARE MISSIONS

FEBRUARY 1991

DATE	MSN NUMBER	FLY HOURS	SENSOR
01 Feb	381	10.9	SYERS
01 Feb	383	4.6	SYERS
01 Feb	384	8.2	SPAN
01 Feb	385		ASARS
01 Feb	386		ASARS
02 Feb	387	10.2	SYERS
02 Feb	388	9.3	OCF FLT
02 Feb	389	8.7	ASARS
02 Feb	390	9.0	SPAN
02 Feb	391	9.2	ASARS
02 Feb	392	8.6	ASARS
03 Feb	394	8.7	ASARS
03 Feb	395	9.0	SPAN
03 Feb	396	9.0	ASARS
03 Feb	397	9.5	ASARS
04 Feb	393	10.0	SYERS
04 Feb	398	8.7	SYERS
04 Feb	399	9.1	IRIS
04 Feb	400	5.4	H-CAM
04 Feb	401	9.2	SPAN
04 Feb	402	3.2	ASARS
04 Feb	406	7.3	ASARS
04 Feb	403	8.5	ASARS
05 Feb	405	10.4	SYERS
05 Feb	407	8.3	SPAN
05 Feb	408	7.6	ASARS

Chart 8 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
05 Feb	409	9.0	ASARS
05 Feb	410	5.3	Blade Van Test w/SYERS
06 Feb	411	9.3	SYERS
06 Feb	412	7.6	ASARS
06 Feb	413	9.0	SPAN
06 Feb	414	8.7	ASARS
06 Feb	415	8.8	ASARS
07 Feb	416	10.2	SYERS
07 Feb	420	4.7	SPAN
07 Feb	421	9.3	ASARS
07 Feb	422	8.8	ASARS
08 Feb	423	8.0	SYERS
08 Feb	424	6.6	IRIS
08 Feb	425	5.7	H-CAM
08 Feb	426	7.1	SPAN
08 Feb	427	8.8	ASARS
08 Feb	428	10.1	ASARS
09 Feb	429	6.8	SYERS
09 Feb	430	4.5	SYERS
09 Feb	431	6.9	IRIS
09 Feb	432	6.9	H-CAM
09 Feb	433	9.2	SPAN
09 Feb	434	8.5	ASARS
09 Feb	435	2.5	ASARS
09 Feb	436	4.5	SYERS
10 Feb	437	10.2	SYERS
10 Feb	438	8.1	IRIS
10 Feb	439	6.3	H-CAM
10 Feb	440	8.8	SPAN
10 Feb	441	9.0	ASARS
10 Feb	442	9.9	ASARS

Chart 8 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
10 Feb	444	7.0	ASARS
11 Feb	445	11.1	SYERS
11 Feb	446	9.3	SYERS
11 Feb	447	6.1	H-CAM
11 Feb	448	7.6	SPAN
11 Feb	449	8.6	ASARS
11 Feb	450	5.9	ASARS
12 Feb	451	10.6	SYERS
12 Feb	452	8.9	SYERS
12 Feb	453	7.2	H-CAM
12 Feb	454	9.5	SPAN
12 Feb	455	8.3	ASARS
12 Feb	456	9.2	ASARS
12 Feb	458	6.6	ASARS
13 Feb	459	6.9	H-CAM
13 Feb	460	8.3	ASARS
13 Feb	461	9.4	SPAN
13 Feb	462	8.7	ASARS
13 Feb	463	9.5	ASARS
13 Feb	464	9.0	SYERS
14 Feb	466	9.2	SYERS
14 Feb	467	8.1	H-CAM
14 Feb	468	3.1	SYERS
14 Feb	469	8.6	SPAN
14 Feb	470	9.3	ASARS
14 Feb	471	9.3	ASARS
14 Feb	472	11.1	SYERS
15 Feb	473	9.1	SYERS
15 Feb	474	7.9	IRIS
15 Feb	475	7.9	H-CAM
15 Feb	476	3.4	SYERS

Chart 8 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
15 Feb	480	7.3	SYERS
15 Feb	477	8.4	SPAN
15 Feb	478	9.3	ASARS
15 Feb	479	9.2	ASARS
16 Feb	481	8.9	SYERS
16 Feb	482	1.8	SYERS
16 Feb	483	7.7	IRIS
16 Feb	484	8.8	H-CAM
16 Feb	488	3.7	ASARS
16 Feb	486	9.0	ASARS
16 Feb	487	9.2	ASARS
17 Feb	485	9.0	ASARS
17 Feb	490	9.4	SPAN
17 Feb	491	8.8	ASARS
17 Feb	492	7.5	ASARS
18 Feb	489	10.0	SYERS
18 Feb	493	8.0	SPAN
18 Feb	494	7.5	ASARS
18 Feb	495	8.6	ASARS
19 Feb	496	4.0	SYERS
19 Feb	497	1.3	IRIS
19 Feb	499	8.7	H-CAM
19 Feb	500	10.1	SYERS
19 Feb	497	4.9	SYERS
19 Feb	501	9.3	SPAN
19 Feb	502	9.1	ASARS
19 Feb	503	9.3	ASARS
20 Feb	504	5.9	SYERS
20 Feb	505		
20 Feb	507	7.1	ASARS
20 Feb	508	9.0	SPAN

Chart 8 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
20 Feb	509	8.6	ASARS
20 Feb	510	8.9	ASARS
21 Feb	514	6.0	SYERS
21 Feb	513	7.4	H-CAM
21 Feb	511	9.2	SYERS
21 Feb	512	6.1	IRIS
21 Feb	515	9.1	SPAN
21 Feb	516	8.6	ASARS
21 Feb	517	8.0	ASARS
22 Feb	518	9.5	SYERS
22 Feb	519	5.5	IRIS
22 Feb	520	7.7	H-CAM
22 Feb	521	10.0	SYERS
22 Feb	522	5.6	SPAN
22 Feb	523	9.2	ASARS
22 Feb	524	9.7	ASARS
22 Feb	525	8.9	SYERS
23 Feb	526	3.9	IRIS
23 Feb	527	8.5	H-CAM
23 Feb	528	5.7	SYERS
23 Feb	529	1.7	SPAN
23 Feb	530	9.2	ASARS
23 Feb	531	9.9	ASARS
24 Feb	532	9.7	SYERS
24 Feb	533	4.4	IRIS
24 Feb	534	4.3	SYERS
24 Feb	535		
24 Feb	536	8.7	ASARS
24 Feb	537	9.3	SPAN
24 Feb	538	9.1	ASARS
24 Feb	540	5.0	SPAN

Chart 8 (Continued)

DATE	MSN NUMBER	FLY HOURS	SENSOR
24 Feb	539	1.4	ASARS
25 Feb	539	7.2	ASARS
25 Feb	541	9.5	SYERS
25 Feb	542	3.8	IRIS
25 Feb	543	4.1	H-CAM
25 Feb	544	1.1	ASARS
25 Feb	545	0	SPAN
25 Feb	546	8.5	ASARS
25 Feb	547	8.9	ASARS
25 Feb	544	6.8	ASARS
26 Feb	549		SYERS
26 Feb	550		
26 Feb	551		
26 Feb	552		SYERS
26 Feb	554	8.3	SPAN
26 Feb	555	9.0	ASARS
26 Feb	556	8.0	ASARS
27 Feb	549	10.2	SYERS
27 Feb	550	9.5	SYERS
27 Feb	551	7.5	IRIS
27 Feb	553	9.6	ASARS
27 Feb	557	9.1	SPAN
27 Feb	558	9.2	ASARS
27 Feb	559	9.2	ASARS
28 Feb	560	10.3	SYERS
28 Feb	561		SYERS
28 Feb	562	7.5	IRIS
28 Feb	563	6.7	H-CAM
28 Feb	564	8.9	SPAN
28 Feb	565	9.1	ASARS
28 Feb	566	9.8	ASARS
TOTALS	183/172	1356.4	

SOURCE: Rpt (S/DECL OADR), 9SRW/IN, "Olympic Flare Mission Summary (U)," info used (U), per SAF/PAS security review 95-1070

Appendix 2

Distinguished Flying Crosses

Appendix 2**Document 1****Distinguished Flying Cross**

I recommend Captain Bryan K. Anderson for the award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as a U-2 Aircraft Commander in western Iraq on 22 January 1991. On this date, Captain Anderson was tasked by Special Operations Command Central (SOCCENT) to precisely locate suspected Surface-to-Air (SAM) sites in a large area of western Iraq. Although Captain Anderson had preplanned and studied this mission, the sheer tasking of the mission necessitated almost continuous dynamic retasking once airborne in the operating area. Continual replanning of mission tracks for over nine hours in a single-seat aircraft was significantly complicated due to the vast area requiring imaging. Combat Air Patrol (CAP) was not available for the entire region. Captain Anderson received his initial targets from the United States Central Command (USCENTCOM) ground site enroute to the operating area. Several hours later, after imaging the area, Captain Anderson flew the aircraft so as to reestablish link with the USCENTCOM ground site. Additional tasking was given to pinpoint the exact locations of several targets. Again, Captain Anderson flew back into the hostile area. While enroute to the new track, Captain Anderson received a Mayday call from a downed F-15E aircrew. Captain Anderson immediately turned toward the approximate location given by the aircrew and loitered in the area until he passed on the coordinates to the Airborne Warning And Control System (AWACS) aircraft and Search-and-Rescue (SAR) forces were activated. Still Captain Anderson continued farther into Iraq to complete his mission. Totally due to his extraordinary persistence he did, in fact, image and provide the exact latitude and longitude of four SA-2 sites, several SA-3 batteries, and numerous Anti-Aircraft Artillery sites. All of the SA-2 sites were later confirmed as destroyed, one which

had not been indicated previously by any other intelligence source. The professional competence, aerial skill, and devotion to duty displayed by Captain Anderson during this extremely complex mission reflect great credit upon himself and the United States Air Force.

<signed>

THOMAS J. KECK, Colonel, USAF

Commander

Appendix 2**Document 2****Distinguished Flying Cross**

I recommend Captain Gregory D. Augst for the award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as U-2 Aircraft Commander near Khafji, Saudi Arabia, on 30 January 1991. On that date, Captain Augst flew a critical high altitude reconnaissance mission to pinpoint Iraqi troops attacking United Nations Coalition forces. Ground commanders, unsure of the precise scale of the attack, were dependent on Captain Augst's current intelligence to formulate Coalition strategy. Poor visibility and rapidly changing circumstances made ascertaining clear imagery extremely difficult. To accomplish the task, Captain Augst deviated from his preplanned track and developed his own strategy for collecting the critical data needed by Coalition ground forces. By using his high altitude vantage point, Captain Augst determined that obstructing weather would eventually move out of the area, leaving the target area clear. But to remain on-station meant a lengthy extension to an already extremely long flight. Despite this fact, Captain Augst volunteered to extend well past his original mission recall time. More importantly, instead of loitering over the cloud covered target area, he utilized his time by imaging other areas that later proved essential to the successful Marine campaign at Failaka Island. Finally, with weather no longer a factor, Captain Augst returned to Khafji and delivered clear photographic intelligence that confirmed the small probing nature of the Iraqi attack. Additionally, during this time Captain Augst played an active role in the Search-and Rescue of a downed A-10 pilot evading behind enemy lines. Placing himself at risk by maintaining radio contact with the pilot, Captain Augst maneuvered around Surface-to-Air Missile threats to obtain the exact location of the downed airman. The professional competence, aerial skill, and devotion to duty

displayed by Captain Augst during this highly successful mission reflect great credit upon himself and the United States Air Force.

<signed>

CHARLES W. HINKLE, Colonel, USAF

Commander

Appendix 2**Document 3****Distinguished Flying Cross**

I recommend Major Blaine L. Bachus be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as U-2 Aircraft Commander near western Iraq on 12 February 1991. On that date, Major Bachus flew a high altitude reconnaissance mission to locate and verify suspected fixed SCUD sites. The importance of this mission was accentuated in that intelligence had indicated previous SCUD missile launches from this area were bound for Israel. While enroute to the area Major Bachus received new tasking for a SCUD site in the Qasr Amij E area. He planned and verified the proposed track and indeed changed the track to avoid overflying Iraq Surface-to-Air Missile sites. For the next two hours Major Bachus searched for and subsequently found the Qasr Amij E SCUD fixed launchers. Shortly after his verification of the site, the precise coordinates were passed to United States Central Command's targeting cell for destruction by airborne bombing assets. Later, same day imagery confirmed the launchers were destroyed. With several hours remaining in his flight, Major Bachus flew east in Iraq at the request of Army Central Command to image three separate Iraqi artillery batteries. United Nations Coalition forces had no imagery of these sites and needed exact targeting data for strike force tasking. Bombing missions were planned for all three sites; however, Major Bachus discovered that only one of the batteries was operational and the other two were mere decoy locations. With this timely discovery, two elements of an airborne strike force were diverted to secondary targets. The remaining element continued to the artillery battery validated by Major Bachus and completely destroyed it. Major Bachus, because of his quick thinking and precise airborne flight planning during this one sortie, provided essential imagery leading to the destruction of significant Iraqi armament. The professional

competence, aerial skill, and devotion to duty displayed by Major Bachus reflect great credit upon himself and the United States Air Force.

<signed>

CHARLES W. HINKLE, Colonel, USAF
Commander

Appendix 2**Document 4****Distinguished Flying Cross**

I recommend Major Charles D. Braymer be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as U-2 Aircraft Commander near Khafji, Saudi Arabia, and the southern border of Kuwait on 31 January 1991. On this date, Major Braymer deviated from his preplanned mission track to provide vital damage assessment of fighting in the town of Khafji. United Nations (UN) Coalition ground commanders desperately needed real-time information that only Major Braymer could provide from his high altitude vantage point. During the following several hours Major Braymer was able to confirm the exact disposition of enemy forces in and just north of the town. He found over 50 percent of the Iraqi armor destroyed or disabled and pinpointed exact locations of the remaining operable units. This information allowed the on-scene UN Coalition commander to formulate overall strategies that culminated in the sound defeat of Iraqi forces. Although the desperate need for his unique imagery still existed, Major Braymer was again retasked for an even higher priority target area. Already several hours into his scheduled nine hour sortie, Major Braymer repositioned his aircraft to aid in the Search-and-Rescue of a downed United States Air Force C-130 aircraft. He knew the effort would extend him beyond his planned duration but calculated exactly how long he could loiter with his remaining fuel. For over an hour Major Braymer worked in concert with several other airborne assets to pinpoint the exact location of the crash site. Since only the general location of the C-130 was known Major Braymer steered his aircraft's sensors to search large areas of land. Despite deteriorating weather conditions caused by haze and smoke from oil fires, Major Braymer navigated to image these areas from virtually every possible direction. Major Braymer's efforts enabled other newly arrived airborne platforms to

concentrate their search on what proved to be the correct location. The professional competence, aerial skill, and devotion to duty displayed by Major Braymer reflect great credit upon himself and the United States Air Force.

<signed>

CHARLES W. HINKLE, Colonel, USAF
Commander

Appendix 2**Document 5****Distinguished Flying Cross**

I recommend Lieutenant Colonel James E. Burger be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as TR-1 Aircraft Commander over Iraq on 18 January 1991. On that date, Lt Colonel Burger was tasked to locate and verify Iraqi SCUD launchers being used against Israel. The international importance of this sortie, allowing Israel to remain out of the conflict, made substantial success an absolute. Israeli involvement could have shattered the somewhat tenuous cohesiveness of the United Nations (UN) Coalition forces assembled against Iraqi President Saddam Hussein's military forces. Although the mission was planned to search large areas of Iraq, Lt Colonel Burger was retasked in-flight to image a suspected concentration of SCUD missile launchers deep into northern Iraq. Unlike any normal mission, Lt Colonel Burger had to coordinate, plan, and certify the proposed changes to his mission. This task alone is not an easy one, especially in the single-seat, high altitude environment. Even so, Lt Colonel Burger deviated from the planned orbit and proceeded north, well into Iraq. Despite limited fuel reserves from the long drive north, Lt Colonel Burger managed to position his aircraft so that on-board sensors enabled ground site personnel to confirm the presence of ten SCUD missile launchers. The precise latitude and longitude of each launcher was passed to United States Central Command's targeting cell. Within one hour of Lt Colonel Burger's verification, all ten SCUD missile sites were destroyed by a strike package of F-111, F-15, and B-52 aircraft. Entirely due to Lt Colonel Burger's intelligence imagery gathering, Secretary of Defense Richard Cheney was able to brief the successful destruction of SCUDs the next day. The professional competence, aerial skill, and devotion to duty displayed by Lt Colonel Burger reflect great

credit upon himself and the United States Air Force.

<signed>

THOMAS J. KECK, Colonel, USAF

Commander

Appendix 2**Document 6****Distinguished Flying Cross**

I recommend Captain Domenick M. Eanniello be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as U-2 Aircraft Commander near the western border of Iraq on 19 February 1991. On that date, Captain Eanniello heard radio transmissions indicating a United Nations (UN) Coalition fighter aircraft had crashed behind enemy lines. Despite having just completed an extremely long high altitude mission, Captain Eanniello deviated from his planned route back to base and established an orbit over enemy territory in the vicinity of crash site. Despite knowing that multiple radio transmissions could possibly give away his own position, Captain Eanniello initiated repeated calls to the downed airman. Working with a variety of airborne resources, he managed to establish radio contact with UN Coalition Search-and-Rescue (SAR) teams. Even so, the remote location of the suspected crash site necessitated Captain Eanniello's presence on-station while an organized search could be safely executed behind enemy lines. Realizing this, Captain Eanniello began a series of manual fuel computations to determine the exact amount of time he could remain on-scene. Although fatigued from the long mission and subsequent loiter over enemy territory, Captain Eanniello remained the focal point for all SAR operations. Finally, having reached his absolute minimum fuel to return to base, Captain Eanniello established contact with the downed pilot and conveyed his position to SAR personnel already enroute. Not long after his departure back to base, SAR personnel successfully recovered the pilot. The diligence, perseverance and courage displayed by Captain Eanniello exceeds that expected of any professional airmen. This unusual and identifiable act of selfless devotion to duty is deserving of the Distinguished Flying Cross.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2**Document 7****Distinguished Flying Cross**

I recommend Major Gary R. Edelblute be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as TR-1 Aircraft Commander in the Kuwait Theater of Operations on 24 February 1991. On that date, Major Edelblute was airborne as the only high altitude reconnaissance platform during the start of offensive ground operations into Iraq and Kuwait. Continually, Major Edelblute quickly responded to dynamic tasking from the United States Central Command TR-1 ground site. With substantial and exacting intelligence data compiled from previous U-2/TR-1 assets the ground commanders knew where to concentrate the offensive thrust. However, Major Edelblute was able to provide hour-by-hour imagery updates of precise enemy front-line armor and troop movements, exact assessment of inflicted damage, and Iraqi strategies for second echelon reinforcements. The initial ground campaign progressed faster than seemed possible. Due to this fact, Major Edelblute was again asked to deviate still farther north into Kuwait and eastern Iraq. Although this dictated a mission over nine hours in his single-seat aircraft, Major Edelblute quickly planned and verified the new mission track and provided an airborne map of enemy locations, movement, and capabilities for United States Marine forces as they continued to thrust north. On two more occasions Major Edelblute extended his mission due to collect absolutely essential imagery. Without hesitation, Major Edelblute went far beyond normal demands of an airman and obtained imagery of attacking ground forces that only he could provide. The professional competence, aerial skill, and devotion to duty displayed by Major Edelblute reflect great credit upon himself and the United States Air Force.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2**Document 8****Distinguished Flying Cross**

I recommend Captain Nathan E. Green for the award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as a U-2 Aircraft Commander, near Kuwait City on 29 January 1991. On that date, Captain Green was specifically tasked by United States Central Command (USCENTCOM) to obtain imagery intelligence of Iraqi troop concentrations and armor locations in the Kuwait Theater of Operations (KTO). As the only high altitude reconnaissance platform in the KTO, Captain Green was required to deviate off of his preplanned track as additional tasking was received from the USCENTCOM Senior Blade ground-site. After more than six hours in the KTO Captain Green obtained imagery of a group of Iraqi naval vessels moving south along the Kuwait coast toward Saudi Arabia. Immediately the ground site alerted USCENTCOM commanders via secure telephone. In the meantime, Captain Green deviated off his track and given new coordinates to establish an orbit off-shore from the position of the Iraqi vessels. From his real-time imagery, the ground site was able to pinpoint the present location of the vessels, establish the speed and direction of movement, and indicate extent and configuration of possible Iraqi armament. This precise data was continually up-channeled to USCENTCOM. With the information in-hand, they dispatched British Royal Navy helicopters with Sea Skewer missiles to intercept the vessels. For this entire time, Captain Green remained on the scene extended his sortie length beyond ten hours, and, in fact, confirming the actual destruction of several vessels. Captain Green's superb ability to quickly respond to dynamic tasking and willingness to exceed the demands of a normal mission enabled United Nations Coalition forces to negate any possible tactical or propaganda advantage Iraqi commanders might have hoped to gain. The professional competence, aerial skill, and devotion

to duty displayed by Captain Green during this highly successful mission reflect great credit upon himself and the United States Air Force.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2**Document 9****Distinguished Flying Cross**

I recommend Major David R. Hensley be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as TR-1 Aircraft Commander near, southeastern Iraq on 8 February 1991. On that date, Major Hensley flew a critical high altitude reconnaissance sortie to provide specific targeting data for United Nations (UN) Coalition forces. Enroute to his orbit Major Hensley encountered a pressurization problem in the aircraft's Q-Bay, the primary housing area for his inertial navigation unit. Using a variety of techniques, Major Hensley determined that by leaving the gear down, speed brakes out, and power setting higher than usual, sufficient pressurization existed to keep all systems on-line. Continuing on-track, Major Hensley observed the launch of a SCUD missile from southeastern Iraq. He maintained visual watch of the launch location and immediately steered his aircraft in that direction. Major Hensley deviated off-track into unknown or unconfirmed threat areas and passed the approximate latitude and longitude of the launch location to the sensor ground site. Unlike any normal mission, Major Hensley, while airborne, plotted and verified a ground track to relay to the ground site enabling them to develop a collection plan that would ensure identification of the SCUD's location. Time and accuracy were of the essence and Major Hensley provided both. In less than one hour after his visual sighting, the SCUD launch site was located, verified, and destroyed. With several additional hours remaining to fly, Major Hensley returned to his original preplanned track for more collection. Within a short time the ground site identified a suspected ammunition dump in southeastern Iraq. Once again Major Hensley deviated from course. With only a moment's notice, Major Hensley developed a plan to position his aircraft to enable the sensors to reacquire the suspected target. Despite

having to loiter over enemy territory for prolonged periods of time, Major Hensley relocated the ammunition dump and pinpointed its position for targeting. Later results showed the ammunition dump was a forward location and, therefore a vitally important target to prevent Iraqi resupplies going into the Area of Responsibility (AOR). Even after all of his accomplishments while responding to dynamic tasking, the ground site still had vital targets left to image on the original orbit. Major Hensley calculated his fuel reserves and extended his mission to enable all remaining targets in the AOR to be covered. The professional competence, aerial skill, and devotion to duty displayed by Major Hensley reflect great credit upon himself and the United States Air Force.

<signed>

CHARLES W. HINKLE, Colonel, USAF
Commander.

Appendix 2
Document 10

Distinguished Flying Cross

I recommend Captain Richard S. Jackson for the award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as a TR-1 Aircraft Commander over Kuwait and eastern Iraq on 25 February 1991. On that date, Captain Jackson flew a high altitude reconnaissance mission tasked by United States Central Command (USCENTCOM) to precisely locate Iraqi ground forces. The ground campaign continued at the initial blistering pace into the second day. USCENTCOM ground commanders desperately needed the current intelligence imagery and exacting locations that only Captain Jackson's airborne platform sensors could provide. He took off knowing that unlike any normally tasked mission, once in the Kuwait Theater of Operations almost minute by minute dynamic retasking and in-flight track planning and verifying would be required. Immediately upon contact with the USCENTCOM ground site, Captain Jackson was tasked to concentrate on Iraqi armored units in northern Kuwait. Even though his new flight path required Captain Jackson to fly over the confirmed Surface-to-Air site at Basara, Iraq, he remained in the area to provide the imagery. This imagery was continually passed through the USCENTCOM ground site to the ground forces commanders as the battle was waging. Strategic choke points were found as a direct result, allowing United Nations (UN) Coalition Forces to initiate and complete the planned flanking movement eastwardly to cut off the Iraqi retreat out of Kuwait. The bulk of Iraqi tanks, armor and artillery pieces and troops were captured. Due to Captain Jackson's continually changing airborne tracks, the Iraqi ground forces that were not captured were targeted and destroyed by UN Coalition forces. The professional competence, continual aerial skill, and devotion to duty displayed by Capt Jackson during this

highly successful mission reflect great credit upon himself and the United States Air Force.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2
Document 11

Distinguished Flying Cross

I recommend Major John J. Jacobson be awarded the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as TR-1 Aircraft Commander over southeastern Iraq on 28 January 1991. On that date, Major Jacobson was tasked to fly a high altitude reconnaissance mission to pinpoint exact locations of Republican Guard units in Iraq and the Kuwait Theater of Operations. Repeatedly during the sortie Major Jacobson was required to deviate from the mission track. He accomplished this even though it meant flying the aircraft closer to known Surface-to-Air Missile (SAM) sites than planned. In fact, he flew directly over an unconfirmed but operational SAM site in order to accomplish the newly tasked imaging. Previous to this mission other intelligence sources indicated that Iraqi forces would, as another terror tactic, utilize SCUD missiles to launch attacks on United Nations (UN) Coalition forces. Great concern existed that these SCUD missiles would contain chemical payloads. The implications of such an attack would be devastating and so the priority tasking from United States Central Command to find SCUD sites was obvious. While returning to his original orbit from an incursion farther north into Iraq, Major Jacobson did indeed find a battery of SCUD launchers. Again, he deviated from track and remained in the area to image the site from all angles. Major Jacobson verified a number of operational SCUD launchers. In fact, one SCUD was being readied for use at that moment. Airborne bomber assets were redirected to the precise location to attack each site. Subsequent intelligence imagery confirmed the complete destruction of the launchers and, as a result, no missiles were fired toward UN Coalition forces on that night. The professional competence, aerial skill, and devotion to duty displayed by Major Jacobson reflect great credit upon himself and the United States Air Force.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2
Document 12

Distinguished Flying Cross

I recommend Captain Michael J. Masucci for award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as U-2 Aircraft Commander over Iraq on 23 January 1991. On that date, Captain Masucci flew a critical high altitude reconnaissance mission to determine the disposition of enemy troops in Iraq. This sortie required Captain Masucci to penetrate deep into northern Iraq in his single-engine aircraft, outside the glide range of any suitable alternate. During the flight, Captain Masucci was instrumental in advising the ground site of breaks in cloud cover that allowed for maximum use of the optical sensor carried on-board. When imagery revealed troops, truck convoys, and artillery pieces, Captain Masucci established an orbit allowing long-term collection to determine the destinations of enemy movements and the rate of travel. On several occasions Captain Masucci was forced to maneuver extremely close to Surface-to-Air Missile (SAM) sites. Even so, he remained on-station in precisely the right location. The intelligence data derived from this imagery proved absolutely essential during the early planning stages of the war. After more than seven hours of collection, Captain Masucci was advised by an Airborne Warning and Control Systems (AWACS) aircraft that a United States Air Force F-15E had crashed behind enemy lines. AWACS controllers forwarded a general location to Captain Masucci and requested his assistance in searching for the downed crew. While continuing to avoid SAMs, Captain Masucci deviated from his preplanned route of flight and coordinated with ground site personnel to employ the sensor to aid in the search. During this process Captain Masucci was required to recalculate his fuel reserves so that a minimum fuel could be established for return to base. Having accomplished the computations, Captain Masucci volunteered to remain over enemy

territory well beyond his scheduled departure time. Although his search proved unsuccessful, the selfless efforts displayed by Captain Masucci at the completion of an already long sortie over enemy territory are deserving of the recognition associated with the Distinguished Flying Cross.

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THOMAS J. KECK, Colonel, USAF

Commander

Appendix 2
Document 13

Distinguished Flying Cross

I recommend Captain Mark C. McDonald for award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as TR-1 Aircraft Commander over Iraq on 22 February 1991. On that date, Captain McDonald flew a critical high altitude reconnaissance mission to provide specific targeting data for United Nations (UN) Coalition Forces. Once established on-track, Captain McDonald observed the launch of a SCUD missile from southeastern Iraq. As he watched the misdirected flight path of the missile move closer to his aircraft, Captain McDonald initiated an evasive maneuver to remain well clear. The missile detonated within three miles of the TR-1 he was flying. With the visual identification of an actual launch site, Captain McDonald proceeded immediately off his preplanned routing to image the SCUD location. Time and accuracy were of the essence and Captain McDonald provided both. Unlike any normal mission, Captain McDonald, while airborne, plotted and verified a ground track to relay to the ground site enabling them to develop a collection plan that would ensure identification of the SCUD missile site. Despite constant maneuvering to avoid Surface-to-Air Missile threats, he positioned the aircraft to facilitate a precise latitude and longitude of the site. These coordinates were quickly passed to the United States Central Command's targeting cell. In less than one hour after his visual sighting, the SCUD launch site was located, verified, and destroyed. The professional competence, aerial skill, and devotion to duty displayed by Captain McDonald reflect great credit upon himself and the United States Air Force.

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THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2
Document 14

Distinguished Flying Cross

I recommend Major James M. Milligan, Jr. be awarded the Distinguished Flying Cross for heroism while participating in aerial flight as U-2 Aircraft Commander over Kuwait and southeastern Iraq on 4 Feb 1991. On that date Major Milligan was tasked to fly the second high altitude reconnaissance mission for the war within lethal range of Iraqi SA-2s. [deletion] This critical mission was tasked to photographically verify the presence of SA-2 missiles at suspected SAM sites not visually verified previously due to haze and smoke. Within minutes of entering the lethal range of Iraqi high altitude air defenses, Major Milligan received indications on his radar warning gear that he had been acquired by an SA-2 target tracking radar. Major Milligan immediately executed evasive maneuvers which successfully placed him beyond the missile's range. Knowing the importance of imaging all suspected SAM sites, Major Milligan calculated the nearest point at which he could reestablish his route clear of the active site. After continuing his route within range of suspected SA-2 sites for another sixty minutes, Major Milligan again received indications on his radar warning gear that he had been acquired and fired upon. Being in the center of multiple suspected SA-2 sites, Major Milligan displayed uncommon situational awareness and airmanship by maneuvering his aircraft to safety. Once again Major Milligan reestablished his route and placed himself in grave danger in order to accomplish the mission. As a result of Major Milligan's persistence and disregard for personal safety, numerous missile sites were identified and subsequently destroyed. In addition, Major Milligan verified the absence of missiles at sites previously reported [deletion]. The success of this mission was directly responsible for opening previously denied airspace over Kuwait and southeastern Iraq to subsequent U-2 sorties. These

sorties provided invaluable tactical intelligence which substantially increased the quality of individual target development and bomb damage assessment. The amount of high resolution photography required for this intelligence increased dramatically after Major Milligan's mission. The heroism and devotion to duty displayed by Major Milligan during this extremely hazardous mission reflect great credit upon himself and the United States Air Force.

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RICHARD A. YOUNG, Colonel, USAF
Commander

Appendix 2
Document 15

Distinguished Flying Cross

I recommend Captain Joseph G. Pacheco for the award of the Distinguished Flying Cross for extraordinary achievement while participating in aerial flight as a TR-1 Aircraft Commander over Kuwait and eastern Iraq on 22 February 1991. On that date, Captain Pacheco flew a night high altitude reconnaissance mission to locate, confirm and verify the strength of Iraqi Republican Guard units. The general area of these forces were well known; however, their mobility made pinpoint targeting extremely difficult. Later events revealed precise targeting intelligence data was desperately needed to allow United Nations (UN) Coalition Commanders to significantly hamper the contribution of the Republican Guard in the impending ground phase of Operation Desert Storm. To achieve this goal, Captain Pacheco quickly responded to the dynamic tasking by the United States Central Command's (USCENTCOM) ground site. During this time, the ground site imaged a large concentration of Republican Guard. Captain Pacheco established an orbit over eastern Iraq, positioning the aircraft for optimum sensor collection. Through the next hour, Captain Pacheco imaged Iraqi tanks, armored personnel carriers and troops not sheltered in fortified locations. As a result, the exact latitude and longitude of the concentration were forwarded to the USCENTCOM targeting Cell. In turn, they redirected airborne bombing assets to attack these Iraqi assets. Subsequent intelligence confirmed the majority of this concentration was destroyed. In fact, due to Captain Pacheco's quick reaction to dynamic changes, more than 300 enemy tanks were destroyed that night. The professional competence, aerial skill, and devotion to duty during this extremely successful mission reflect great credit upon himself and the United States Air Force.

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<signed>

THOMAS J. KECK, Colonel, USAF
Commander

Appendix 2**Document 16****Distinguished Flying Cross**

I recommend Lieutenant Colonel Stephen M. Peterson be awarded the Distinguished Flying Cross for heroism while participating in aerial flight as U-2 Aircraft Commander over Kuwait and southeastern Iraq on 31 January 1991. On that date, Colonel Peterson flew the first sortie of the war in which a U-2 was tasked to fly into the lethal range of Iraqi SA-2s. [deletion] This critical mission was tasked to photographically verify the presence of SA-2 missiles at numerous suspected SAM sites. While flying greater than 70 minutes within lethal range of multiple suspected SA-2 sites, Colonel Peterson identified which sites actually contained missiles. These sites were subsequently destroyed. In addition, Colonel Peterson discovered the absence of missiles at sites previously reported [deletion]. The success of this mission was directly responsible for opening the airspace over Kuwait and southeastern Iraq to U-2 aircraft. As a result, subsequent sorties provided invaluable tactical intelligence which substantially increased the quality of individual target development and bomb damage assessment. This high resolution photography required for this intelligence was not being obtained prior to Colonel Peterson's mission. In addition, Colonel Peterson imaged numerous SA-3 and SA-6 sites which were subsequently destroyed. The destruction of these sites resulted in safer skies for all allied aircraft. The heroism, disregard for personal safety and devotion to duty displayed by Colonel Peterson during this extremely hazardous mission was an inspiration to his men and reflects great credit upon himself and the United States Air Force.

<signed>

RICHARD A. YOUNG, Colonel, USAF

Commander

Glossary (continued)

RTS	Reconnaissance Technical Squadron
SAC	Strategic Air Command
SAF	Secretary of the Air Force
SIOP	Single Integrated Operational Plan
S/NF	Secret/Not Releasable to Foreign Nationals
SRC	Strategic Reconnaissance Center
SRW	Strategic Reconnaissance Wing
SYERS	SENIOR YEAR Electro-optical Reconnaissance System
TACON	Tactical Control
TEL	Transporter Erector Launcher
TRAC	Tactical Radar Correlator
UTC	Unit Type Codes
VFR	Visual Flight Rules
WRSK	War Reserve Spares Kit