THE DRAGON LADY MEETS THE CHALLENGE:

THE U-2 IN DESERT STORM

by

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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

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*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]

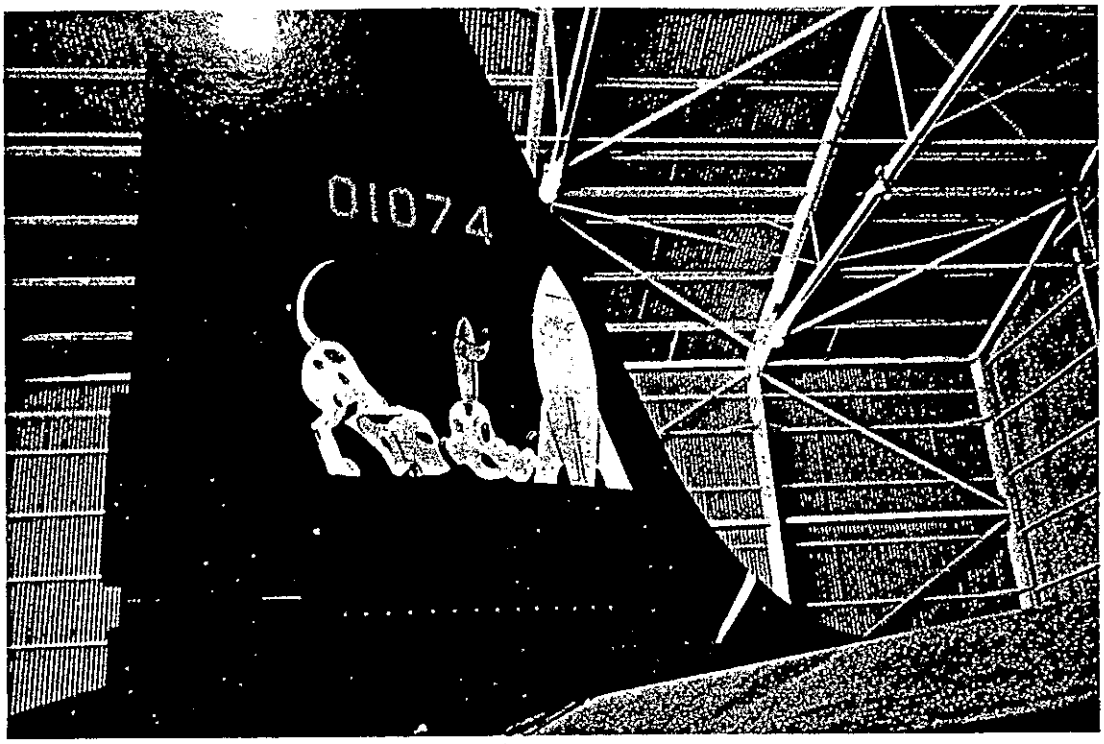
The 17th Reconnaissance Wing at RAF Alconbury also contributed immeasurably to maintaining the U-2s in Desert Shield/Storm.

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]

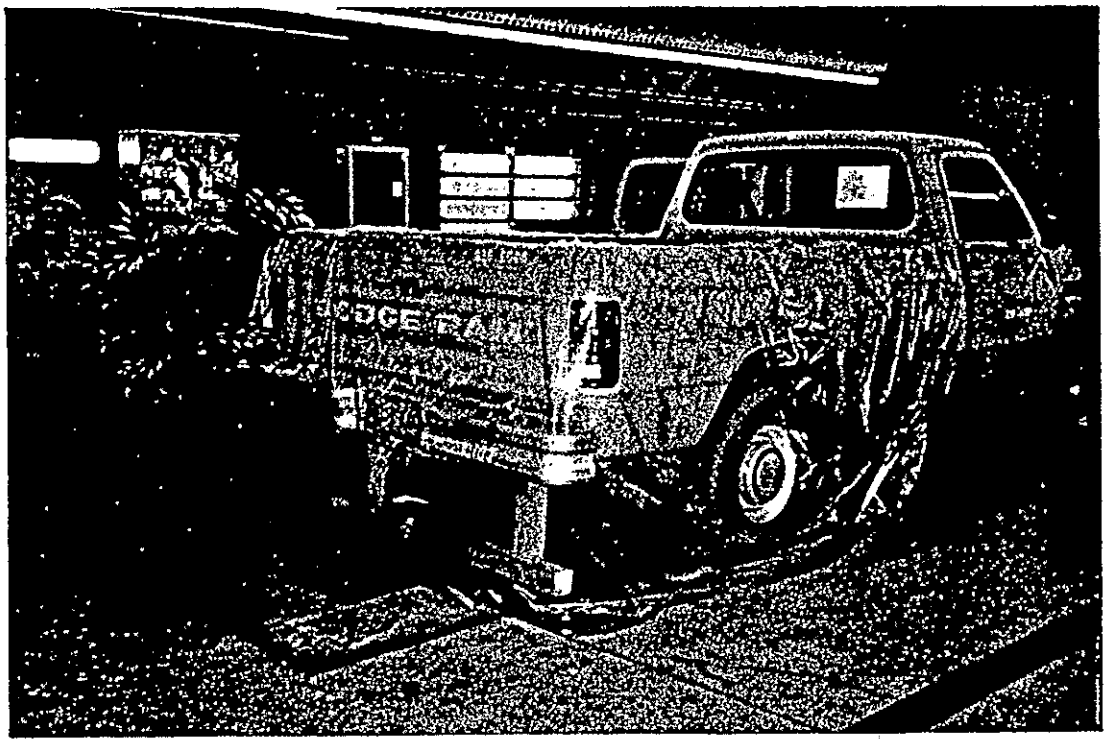
Ninth Strategic Reconnaissance Wing KC-135Qs were also critical to the U-2s success during the Gulf War. Although General H. T. Johnson, Military Airlift Command Commander, activated the civil reserve air fleet for the first time in history to provide additional airlift, airlift was still very limited. 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

1.Intvw (S/NF), Cross with Lt Col Lloyd; William T. Y'Blood, *(S/NF/WIN/OADR) The Eagle and the Scorpion: The USAF and the Desert Shield First-Phase Deployment, 7 August-8 November 1990 (U)* (Washington: Center for Air Force History, 1992), 38; rpt (S/NF/LD/OADR), USCENTCOM, "Review of 1990 with the 1704th Reconnaissance Squadron Provisional," 2-3, info used (U), per SAF/PAS security review 95-1070.

2.Intvw (S/NF), Cross with Lt Col Lloyd; msg (S/OADR), CJCS to CSA, et al, "Airborne Reconnaissance Support (U)," 161955Z Aug 90; rpt (S/NF/LD/OADR), "Review of 1990 with the 1704th Reconnaissance Squadron Provisional," 1-4, info used (U), per SAF/PAS security review 95-1070.

3.Intvw (S/NF), Cross with Col Lafferty; intvw (S/NF), Cross with Lt Col Lloyd; intvw (S/NF), Dr C. F. Cross, 9RW/HO, with Lt Col S. M. Peterson, 27 Jan 94, info used (U), per SAF/PAS security review 95-1070.

4.Hist (S/NF/LD/OADR), USCENTCOM, "History of the 1704th Reconnaissance Squadron Provisional, 27 January-28 February 1991 (U)," 7; msg (S/OADR), CJCS to CSAF, "Deployment Order (U)," 211930Z Sep 90; msg (S/OADR), HQ SAC/DOR to 15AF/DO, et al, "Request for U-2 SYERS Support (U)," 231400Z Sep 90; msg (S/OADR), Det 2, 9SRW/CC to 9SRW/CC, et al, "Deployment Issues (U)," 270715Z Sep 90; msg (S/OADR), HQ SAC/DOR to 9SRW OL-CH Deployed/CC/DO, "Daily U-2R SYERS Missions in SWA (S)," 272030Z Sep 90, info used (U), per SAF/PAS security review 95-1070 .

5.Intvw (S/NF), Cross with Lt Col Lloyd; msg (S/OADR), SAC/INC to 9SRW/CC, et al, "U-2/TR-1 Threat Assessment (U)," 111500Z Oct 90; msg (S/LD/OADR), HQ SAC/DOR to 1704RS(P)/CC, et al, "Alternate Entry/Exit Procedures for OLYMPIC FLARE (U)," 262130Z Oct 90; msg (S/OADR), 1704PRS/IN to USCENTAF/SCOF, et al, "MIJI Report 900-007 (U)," 011440Z Nov 90; msg (S/OADR), 1704PRS/IN to USCENTAF/IN, et al, "Possible Fighter Reaction to Mission Aircraft (U)," 012045Z Nov 90; msg (S/OADR), 9SRW/INZ to 544CAS/CAOS, "U-2 Mission Debriefs (U)," 052210Z Nov 90; msg (S/NF/LD/OADR), HQ SAC/DOR to JRC, et al, "Track Report (U)," 081600Z Nov 90; msg (S/NF/LD/OADR), HQ SAC/DOR to JRC, et al, "Track Report (U)," 142100Z Nov 90; msg (S/NF/LD/OADR), 1704PRS/IN to HQ SAC/SRC, et al, "Fighter Activations (S)," 140730Z Dec 90, info used (U), per SAF/PAS security review 95-1070.

6.Intvw (S/NF), Cross with Col Lafferty; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Maj Les Mathews, 9OSS/OSTC, 29 Sep 94, info used (U), per SAF/PAS security review 95-1070.

7.Intvw (S/NF), Cross with Maj Mathews; msgs (S/OADR), 1704PRS/CC to HQ SAC/LGX, et al, "SITREP 90-06 through 90-18 (U)," 22 Dec 90-13 Jan 91; rpt (S/NF/WIN/OADR), 9RTS, "1700th Reconnaissance Technical Squadron Provisional After Action Report (U)," 25 Mar 91, info used (U), per SAF/PAS security review 95-1070.

8.Intvw (S/NF), Cross with Lt Col Lloyd; intvw (S/NF), Cross with Lt Col Peterson; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Mr Andy Stumpp, ADP, 13 Sep 94; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Mr Bud Fortner, ADP, 13 Sep 94; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Mr John Casuba, ADP, 13 Sep 94; intvw (S/NF), Dr C.F. Cross, 9RW/HO, with Mr Tom Hutty, ADP, 14 Sep 94; msg (S/OADR), 9SRW OL-CH Deployed/CC to HQ SAC/SBS, et al, "SITREP 90-03 (U)," 300836Z Sep 90; msg (S/OADR), 1704PRS/CC to HQ SAC/LGX, et al, "SITREP 90-05 (U)," 161716Z Oct 90, info used (U), per SAF/PAS security review 95-1070.

9.Interview (S/NF), Cross with Carmody; intvw (S/NF), Cross with Maj Lundell, info used (U), per SAF/PAS security review 95-1070.

10.Intvw (S/NF), Cross with Col Morton; intvw (S/NF), Cross with Maj Lundell; intvw (S/NF), Cross with Stumpp; intvw (S/NF), Cross with Fortner; intvw (S/NF), Cross with Casuba; intvw (S/NF), Cross with Hutty; msg (S/OADR), 9SRW OL-CH Deployed/CC to SRC/DORSU, et al, "BUSY RELAY-U2R/801092 (S)," 021140Z Oct 90; msg (S/OADR), HQ SAC/SBS to 9SRW OL-CH Deployed/CC, et al, "Aircraft Swapout (U)," 131953Z Sep 90; msg (S/OADR), 17RW/LG to 9SRW/CC, et al, "Aircraft Phases (S)," 281000Z Sep 90; msg (S/OADR), HQ SAC/DOR/LGX to 9SRW/CC, et al, "Aircraft Phases (U)," 281300Z Sep 90; msg (S/LD/OADR), HQ SAC/LGX/DOR to 17RW/CC, et al, "U-2, TR-1 Aircraft Management in Support of Desert Shield (S)," 041602Z Oct 90; msg (S/OADR), 9SRW OL-CH Deployed/CC to SRC/DORSU, et al, "BUSY RELAY-TR1/801086 (S)," 081531Z Oct 90; msg (S/OADR), 1704PRS/CC to SRC/DORSU, et al, "BUSY RELAY-TR/1801076 (S)," 141505Z Oct 90; msg (S/OADR), 1704PRS/CC to SRC/DORSU, et al, "BUSY RELAY-TR1/801070 (S)," 251116Z Oct 90; msg (S/OADR), 1704PRS/CC/LG to HQ SAC/DOR/LGXR, "U-2 Phase Time (U)," 011700Z Jan 91; msg (U), CINCSAC/CS to AIG 667/CC, et al, "Desert Shield Impact on Phase I/Phase II Inspections," 071700Z Jan 91, info used (U), per SAF/PAS security review 95-1070.

11.Msg (S/OADR), Det 8 2762LS/CC to HQ SAC/LRC, et al, "Logistics Support for SENIOR YEAR Operations (U)," 172203Z Aug 90, info used (U), per SAF/PAS security review 95-1070.

12.Intvw (S/NF), Cross with Col Morton; intvw (S/NF), Cross with Maj Lundell; msg (S/OADR), 15AF/CAT/LRC to HQ SAC/SBS, et al, "Consolidated U-2 Requirements at OL-CH (U)," 181430Z Aug 90; msg (U), SECDEF/ASD:PA to AIG 671, "Desert Shield 13," 192157Z Aug 90; msg (S/NF/OADR), HQ SAC/LRC, et al, to 17RW/CC, et al, "Reconnaissance Aircraft Logistics Support in Saudi Arabia (S/NF)," 220800Z Aug 90; msg (S/OADR), HQ SAC/SBS to 8AF/DO, et

al, "In-theater Resupply (U)," 251100Z Aug 90; msg (U), HQ AAVS/LGS to AIG 8513/CC, et al, "High Priority Shipments to Desert Shield," 142300Z Nov 90, info used (U), per SAF/PAS security review 95-1070.

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]

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*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 planners, 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 that 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

1.Article (U), *Washington Post*, "Resolution Sets Jan. 15 Deadline For Withdrawal," 30 Nov 90; msg (U), AFNEWS/IIB to AIG 9333/PA, *et al*, "United Nations Resolutions," 152215Z Feb 91.

2.Hist (S/NF/LD/WIN/SAR/SY/OADR), SAC, "History of 9th Strategic Reconnaissance Wing, Jan-Jun 91 (U)," vol 5, 1 Nov 91, Exhibits II-65 & II-66, info used (S/NF/LD/OADR); intvw (S/NF), Cross with Lt Col Peterson; intvw (S/NF), Cross with Lt Col Spencer; intvw (S/NF), Cross with Lt Col Wright, info used (U), per SAF/PAS security review 95-1070.

3.Intvw (S/NF), Cross with Lt Col Peterson; msg (S/NF/OADR), USCINCCENT/CCJ2 to HQ SAC/DOR, et al, "U-2/TR-1 Wartime Requirements for SWA (U)," 200900Z Dec 90; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "Manning and Equipment Issues (U)," 260000Z Dec 90; msg (S/NF/LD/OADR), 1704PRS/CC to 9SRW/CC, et al, "Manning and Equipment Issues (U)," 281100Z Dec 90; msg (S/NF/LD/OADR), 1704PRS/DO to 99SRS/CC, et al, "Pilot Rotations (U)," 310000Z Dec 90; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 90-16 (U)," 011145Z Jan 91; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 90-17 (U)," 062215Z Jan 91, info used (U), per SAF/PAS security review 95-1070.

4.Intvw (S/NF), Cross with Lt Col Peterson; intvw (S/NF), Cross with Maj Lundell, info used (U), per SAF/PAS security review 95-1070.

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

6.Intvw (S/NF), Cross with Col Lafferty; intvw (S/NF), Cross with Lt Col Spencer; intvw (S/NF), Cross with Maj Mathews; msg (S/OADR), HQ SAC/DOR to USCINCCENT/CCJ2, et al, "SAC SWA Reconnaissance Tasking and Execution Procedures (U)," 142225Z Jan 91; msg (S/NF/OADR), 17ADP/DOR to 9SRW/CC, "Trip Report (U)," 141200Z Feb 91, info used (U), per SAF/PAS security review 95-1070.

7.Intvw (S/NF), Cross with Lt Col Peterson; intvw (S/NF), Cross with Lt Col Wright, info used (U), per SAF/PAS security review 95-1070.

8.Intvw (S/OADR), SSg E.D. Wallwork, 1704RS/HO, with Maj B.L. Bachus, 1704RS, ca 19 Jan 91; intvw (S/OADR), SSg E.D. Wallwork, 1704RS/HO, with Capt M.C. McDonald, 1704RS, ca 19 Jan 91, info used (U), per SAF/PAS security review 95-1070.

9.Intvw (S/NF/OADR), SSg E.D. Wallwork, 1704RS/HO, with Lt Col S.M. Peterson, 1704RS/CC, ca 19 Jan 91, info used (U), per SAF/PAS security review 95-1070.

10.Intvw (S/OADR), SSg Wallwork with Lt Col Peterson; intvw (S/NF), Cross with Col Lafferty; msg (S/NF/LD/OADR), 1704PRS/CC to 9SRW/CC, "Commander's Mission Summary Olympic Flare (U)," 191645Z Jan 91; memo (S), Col C.W. Hinkle, "Recommendation for the Award of the Distinguished Flying Cross," info used (U), per SAF/PAS security review 95-1070.

11.Intvw (S/NF), Cross with Lt Col Wright; intvw (S/NF), Cross with Col Lafferty; msg (S/OADR), Det 8, 2762LS/ME to USCINCENT/CCJ2, et al, "Airlift Support for Additional U-2 SYERS/SENIOR BLADE (U)," 241900Z Jan 91, info used (U), per SAF/PAS security review 95-1070.

12.Memo (S), Col C.W. Hinkle, "Recommendation for the Award of the Distinguished Flying Cross," info used (U), per SAF/PAS security review 95-1070

13.Intvw (S/NF), Cross with Lt Col Spencer; intvw (S/NF), Cross with Col Lafferty; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-19 (sic) (U)," 102145Z Feb 91, info used (U), per SAF/PAS security review 95-1070.

14.Intvw (S/NF), Cross with Col Lafferty; intvw (S/NF), Cross with Lt Col Spencer; (S/OADR), SSg E.L. Wallwork, 1704RS/HO, with Maj J.C. Hundley, 1704RS, ca 19 Jan 91; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-19 (U)," 272345Z Jan 91; msg (S/NF/OADR), 17ADP/DOR to 9SRW/CC, "Update (U)," 191100Z Feb 91, info used (U), per SAF/PAS security review 95-1070.

15.Hist (S/LD/WIN/SAR/OADR), CENTCOM, "History of the 1704 Reconnaissance Squadron, Provisional, 27 January-28 February 1991 (U)," info used (U), per SAF/PAS security review 95-1070.

16.Intvw (S/NF), Cross with Carmody; intvw (S/NF), Cross with Lt Col Peterson; intvw (S/NF), Cross with Lt Col Wright; intvw (S/NF), Cross with Maj Lundell; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-20 (U)," 031731Z Feb 91; msg (S/OADR), 1704PRS/LG to 17RW/CC, et al, "Material Deficiency Report (U)," 030935Z Feb 91, info used (U), per SAF/PAS security review 95-1070.

17.Hist (S/NF/WIN/LD/SAR), "History of 1704RS(P), 27 Jan-28 Feb 91 (U)," vol 1, 5, info used (S); hist (S/NF/WIN/LD/SAR/SY), SAC, "History of 9th Strategic Reconnaissance Wing, January-June 1991 (U)," vol 1, 158, info used (U); msg (S/OADR), HQ SAC/DOR to 17RW/CC, et al, "U-2 Aircraft Swapout (U)," 042110Z Jan 91; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "Aircraft Configuration Changes (U)," 050055Z Feb 91; msg (S/OADR), HQ SAC/DOR/LGX to USCINCCENT/CCJ2, et al, "Aircraft Configuration Changes (U),"

122200Z Feb 91; msg (S/OADR), JCS/J36/JRC to USCINCEUR/ECJ3, et al, "Additional Akrotiri Aircraft (U)," 142015Z Feb 91; msg (S/OADR), USCINCCENT/CCJ2/JRC to HQ SAC/DOR, et al, "Additional Aircraft for Desert Storm (U)," 152201Z Feb 91; msg (S/OADR), HQ SAC/DOR/LGX to 8AF/DO, et al, "Busy Relay (U)," 161600Z Feb 91; msg (S/OADR), CJCS to CINCSAC, et al, "Deployment Order for Additional U-2/TR-1 Aircraft (U)," 161718Z Feb 91, info used (U), per SAF/PAS security review 95-1070.

18.Hist (S/NF/WIN/LD/SAR), "History of 1704RS(P), 19-21 Jan 91 (U)," vol 1, 4, info used (S); intvw (S/NF), Cross with Maj Lundell; msg (S/OADR), 48FTW/RM to SA-ALC/SF, "Additional Requirement for JPTS (U)," 130500Z Feb 91; msg (S/OADR), HQ SAC/LGSF to SA ALC/SF, et al, "Additional JPTS Requirement (U)," 151503Z Feb 91; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-22 (U)," 172100Z Feb 91; msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-23 (U)," 241723Z Feb 94; msg (S/OADR), USCENTAF/LG to USTRANSCOM/CAT, et al, "Airlift of JPTS (U)," 020517Z Mar 91, info used (U), per SAF/PAS security review 95-1070.

19.Msg (S/OADR), 1704PRS/CC to 9SRW/CC, et al, "SITREP 91-23 (U)," 241723Z Feb 91; hist (S/NF/LD/WIN/SAR/OADR), CENTCOM, "History of the 1704 Reconnaissance Squadron, Provisional, 27 January-28 February 1991 (U)," 1; (U) *Gulf War Air Power Survey*, vol v, "A Statistical Compendium and Chronology," 231, 240, info used (U), per SAF/PAS security review 95-1070.

20.Hist (S/NF/LD/WIN/SAR/OADR), CENTCOM, "History of the 1704 Reconnaissance Squadron, Provisional, 27 January-28 February 1991 (U)," 1-2, info used (U), per SAF/PAS security review 95-1070.