

AIR POWER

History

SUMMER 2019 - Volume 66, Number 2
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.....Shape the Future





The Air Force *Historical* Foundation

Founded on May 27, 1953 by Gen Carl A. "Tooey" Spaatz and other air power pioneers, the Air Force Historical Foundation (AFHF) is a nonprofit tax exempt organization. It is dedicated to the preservation, perpetuation and appropriate publication of the history and traditions of American aviation, with emphasis on the U.S. Air Force, its predecessor organizations, and the men and women whose lives and dreams were devoted to flight. The Foundation serves all components of the United States Air Force—Active, Reserve and Air National Guard.

AFHF strives to make available to the public and today's government planners and decision makers information that is relevant and informative about all aspects of air and space power. By doing so, the Foundation hopes to assure the nation profits from past experiences as it helps keep the U.S. Air Force the most modern and effective military force in the world.

The Foundation's four primary activities include a quarterly journal Air Power History, a book program, a biennial symposium, and an awards program.

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AIR POWER History

The Journal of the
Air Force Historical Foundation
Summer 2019 Volume 66 Number 2

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Air Power History (ISSN 1044-016X) is produced for Spring, Summer, Fall, and Winter by the Air Force Historical Foundation.

Prospective contributors should consult the **GUIDELINES FOR CONTRIBUTORS** at the back of this journal. Unsolicited manuscripts will be returned only on specific request. The Editor cannot accept responsibility for any damage to or loss of the manuscript. The Editor reserves the right to edit manuscripts and letters.

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Correspondence regarding missed issues or changes of address should be addressed to the **CIRCULATION OFFICE**.

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Periodicals postage paid at Clinton, MD 20735 and additional mailing offices.

Postmaster: Please send change of address to the Circulation Office.

Once again, we are very much concentrated on the conflict in Southeast Asia. Three of our offerings deal with that conflict, and our fourth has a twenty-first century focus.

First up is part 3 of Theo van Geffen's series on the many attempts to destroy the Thanh Hoa Bridge. This time he covers the latter half of the 1960s into the next decade, and talks about the bombing halt, technological developments, and U.S. Navy efforts during the time period. He also offers a lovely collection of photos.

Our second article is by a repeat contributor also, Forrest Marion, who offers comparisons and contrasts between the air advising missions in Iraq and in Afghanistan. It's a much more current subject, and quite interesting.

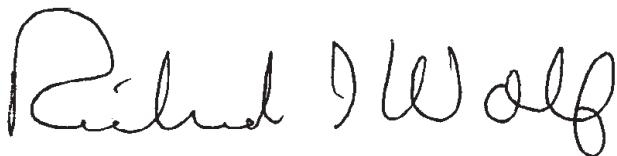
Our third article is another offering by Theo van Geffen, as he discusses the protective reaction strikes of the early 1970s that culminated in the dismissal of Gen. John Lavelle, a seeming injustice that is still controversial and also under review.

Our final article is by a first time contributor, Kenneth Katta, a crew member on a B-52 that flew in Operation Linebacker. He offers the first-person account of a true participant, and Distinguished Flying Cross recipient.

As usual, we have a great crop of seventeen book reviews, including a review of a very recent autobiography by retired USAF Chief of Staff General Norton Schwartz. At the back of the reviews, we offer an In Memoriam to a former editor of *Air Power History*, Henry Bausum, who passed away in January at the age of nearly 94. His stewardship bridged the gap between Robin Higham and the beginning of the current editors in 1993. He was a fine man of an older generation.

Don't miss the President's Message on page 4 and General Miller's discussion of the state of the Air Force Historical Foundation. This is an outgrowth of the most recent Annual Meeting of the Board of Trustees in May 2019.

A more detailed statement can be found at the Foundation web site at www.afhistory.org.

A handwritten signature in black ink, appearing to read "Richard I. Wolf". The signature is fluid and cursive, with a large, stylized 'R' at the beginning.

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From the President

May 2019 State of the Foundation

Dear Members,

Our tagline is "**Know the Past...Shape the Future.**" This past year we celebrated and documented airpower's past with energy and acumen. We honored an Air Force wing and two individuals for making or recording Air Force history; and we also conducted with our sister services a symposium titled "In Country: The War in Vietnam-1968" which received great reviews. Your foundation was also represented at the Air Force Association's 2018 Air, Space, and Cyber Conference, which broke attendance records for active Airmen. This was great exposure for the Foundation, something we will likely do again.

At our annual meeting the membership elected, or re-elected, the following individuals to the Board: General Ralph E. Eberhart, USAF (Ret); Lt Gen Robert J. Elder, USAF (Ret) (re-election); Lt Gen Nicholas B. Kehoe, USAF (Ret) (re-election); Maj Gen Charles W. Lyon, USAF (Ret) and Col Stephen E. Newbold, USAF (Ret). We look forward to the enthusiasm and leadership these leaders will bring, or continue to bring, to the Foundation.

The Foundation hosted a well-attended awards presentation in DC in November. The Doolittle Award was presented in two different venues to the 1st Fighter Wing, this year's recipient: The first was at our Annual Awards Banquet, and the second at their home station, Joint Base Langley-Eustis, VA. Those in attendance at the DC banquet were thoroughly entertained by our Spaatz award recipient Mr. Sherman N. Mullin, an engineer and executive who led Lockheed's Skunk Works before his retirement. We also honored Lt Gen (ret) Jack Hudson, recently retired Executive Director of the National Museum of the Air Force, with the Holley award for his lengthy and successful leadership of the Museum's airpower outreach.

Building on our recent website upgrade, we made a strong effort to expand our presence, and achieved over 40 percent total growth in all the different channels of e-mail, newsletter, Twitter, and Facebook. This seems to be paying off with increased membership in the Associate (online) category. Our membership now stands at 1130, a 13 percent gain over the past three years.

Financially, the Foundation had a nominal year, drawing slightly on our investments for operating funds but remaining essentially flat in our resource base. That said, increasing our membership, personal donations, and corporate support remain essential to offer enhanced services to you, our members; to the Air Force we support; and to all who value airpower. The Board elected to form membership and development committees to put focus and energy on these critical areas.

We have a number of specific initiatives in various stages of consideration or implementation, from seeking grants, to enhancing our electronic impact, to refreshing our book publishing efforts. I will provide updates as this work continues.

I leave you with a most serious challenge: as a Foundation, we need to be honest in asking how we will achieve the second half of our tagline, to "...**shape the future.**" In today's frenetic society, knowing the past is important but it's not enough to stop there. Certainly, our traditional emphasis on solid history cannot wane. Yet without more effective connection to serving Airmen and Air Force leadership, we are unlikely to have the growth, reach, or impact we need to have to meet the high bar established by our founders. Whether you respond to this challenge by writing on airpower history, sharing ideas with Foundation leadership, inviting active Airmen to join, or simply passing on "This Day in Air Force History" – this is a time to push up the throttle.

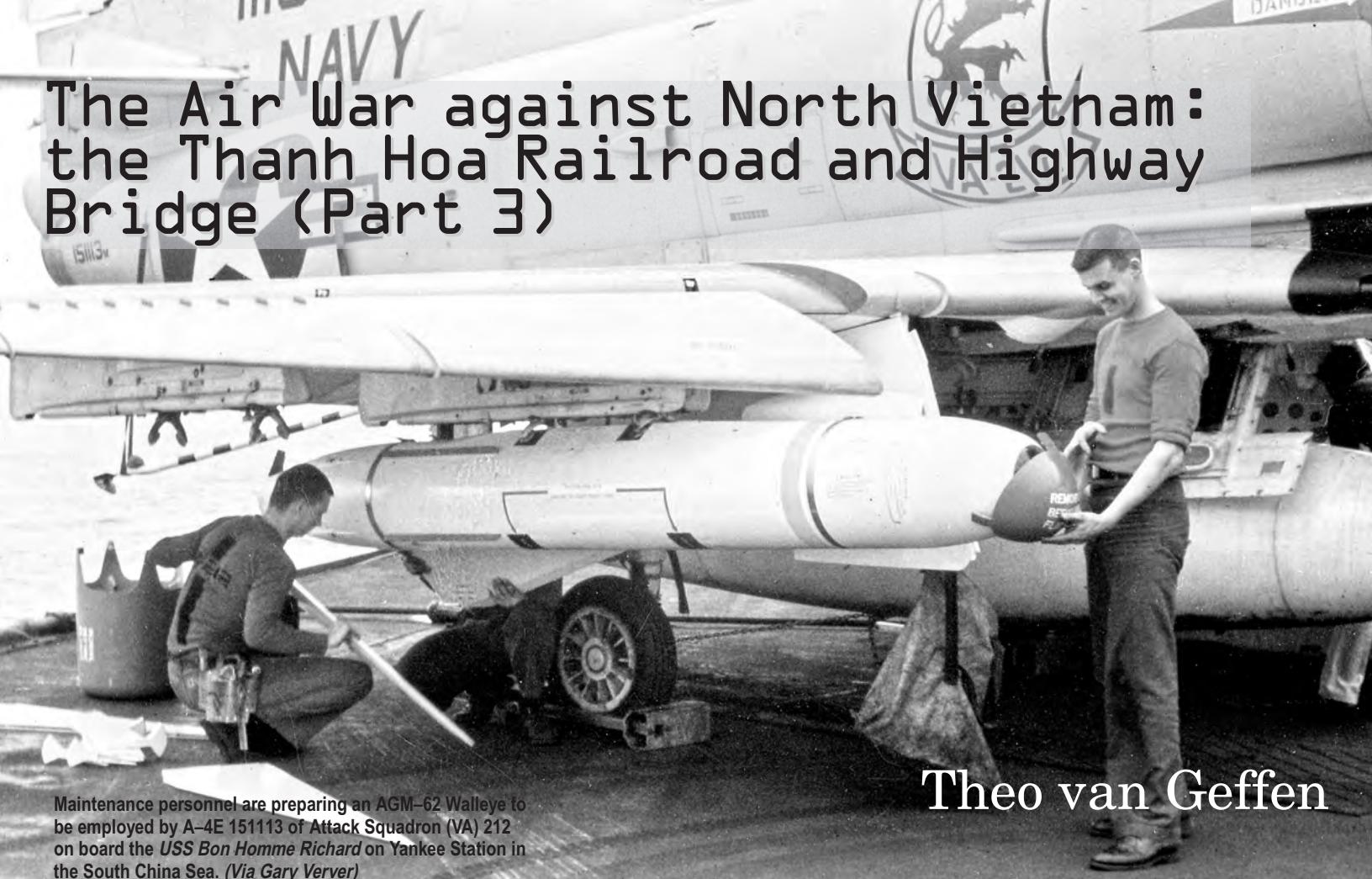
Sincerely,



Christopher D. Miller, Lt. Gen., USAF (Ret.)
President and Chairman of the Board



The Air War against North Vietnam: the Thanh Hoa Railroad and Highway Bridge (Part 3)



Maintenance personnel are preparing an AGM-62 Walleye to be employed by A-4E 151113 of Attack Squadron (VA) 212 on board the *USS Bon Homme Richard* on Yankee Station in the South China Sea. (Via Gary Verver)

Theo van Geffen

Air Force efforts to drop the Thanh Hoa Railroad and Highway Bridge took a twenty-month respite in 1966 and 1967. The two Carolina Moon missions with C-130E Hercules aircraft on May 30 and 31, 1966, were the only Air Force strikes against the Thanh Hoa Railroad and Highway Bridge in 1966 and 1967. This was not really surprising as the JCS target was situated in Route Package (RP) IV, which had earlier been assigned primarily to the U.S. Navy. Meanwhile, the Air Force and Navy were undertaking efforts to develop weapons of the second, 'smarter', generation for use in Southeast Asia.

Inventors

The efforts were undertaken by engineers of the Aviation Ordnance Department at Naval Air Station China Lake in California, who had been working for several years on the design and development of the AGM-62 Walleye. Jack Crawford and Bill Woodworth of the department are regarded as the inventors of the Walleye. Both had sought their boss's support in 1957 to begin exploratory-development work on an automatic television tracking system that was to guide an air-to-surface weapon. Initially known as *Fetch* and *Snoopy*, the Free-Fall Weapons Program named the concept *Walleye* after it had given Crawford and Woodworth 95,000 dollars in 1959 for further development. The weapon was not a guided weapon, nor a rocket, and nor a true bomb, but a TV-guided glide weapon. It could be regarded as the first precision-guided munition or 'smart' bomb.

It was primarily designed as an anti-materiel weapon to be used against hard and semi-hard targets like bridges and thermal power plants. The AGM-62 differed from the AGM-12 Bullpup in that the former was a fire-and-forget weapon, while in the case of the latter, the pilot had to manually guide the weapon to the target. The Walleye's TV guidance system, including a gyro-stabilized TV camera behind a clear lens in its nose, was integral to the weapon and optically tracked the target by referencing contrasting light shades. Maneuverability was provided by four wings with control tabs on the trailing edge. Prior to the weapon's launch, the pilot of the launching aircraft would be presented with a picture of the target on his TV monitor screen. He then selected the aiming point, which had to contrast with the background. Once that had been done and the information transmitted to the weapon, it was dropped. After release, the missile would independently track the target and the aircraft could leave the area.

Editors Note: This is part 3 of the author's series on U.S. efforts to destroy the Thanh Hoa Railroad and Highway Bridge, over many years. Part 1 ran in the Summer 2018 issue of *Air Power History* and Part 2 ran in the Winter 2018 issue.



Just prior to getting into the cockpits of their A-4E Skyhawks for the very first strike in South East Asia with Walleyes, on March 12, 1967, are Cdr Homer Smith, (left) VA-212's skipper, and Lt Tom Taylor, who was TDY from VX-5 for the combat operational evaluation of the Walleye. Both Skyhawks were configured with two Walleyes each. Cdr Smith was lost on May 20, 1967 on his 197th combat sortie, a Walleye mission against the Bac Giang Thermal Power Plant, JCS 82.26. He was taken POW, but died in captivity. (Via Gary Verver)

Development

Wind tunnel and sled testing of the aerodynamic configurations followed with the first tactical airframe configuration of the Walleye drop-tested in 1961. Batteries and a hot-gas generator to run the onboard electronics and the actuators to move the weapon's control surfaces were rejected due to weight and flight length restrictions respectively. Instead, a Ram-Air-Turbine generator was selected. The RAT would use an airstream-driven propeller to provide hydraulic and electrical power. After the first air drop had been a failure, the second, on November 27, 1962, was successful. Two months later, on January 29, 1963, the first

demonstration of the glide bomb's automatic homing feature took place when an YA-4B Skyhawk, flown by Cdr J.A. Sickel, released it against its target with a direct hit. The following April, the Naval Ordnance Test Station (NOTS) submitted a Technical Development Plan (TDP) for the Walleye to the Bureau of Naval Weapons (BuWeps), which approved the weapon. With a sixteen-mile range when launched at 30,000 feet, it would be a standoff TV-guided precision munitions with a 750-pound warhead.

The NOTS engineers continued to develop refinements and upgrades for the Walleye. 1965 saw the beginning of pilot production of the weapon. Also in 1965, and in anticipation of the Walleye operational evaluation, new targets were developed and added to China Lake's Coso Military Target Range, including a 250-foot-long highway bridge and a railroad tunnel built into a mountain side.

Testing, including launches by Air Development Squadron (VX) 5, the Naval Missile Center and the Air Force, did not take place without accidents. On June 11, 1965, the wing of the A-4C photo chase was ripped off after the Walleye, employed by a second A-4, had hit the target, knocking the wheel and axle assembly into the air. The chase pilot, Lt Douglas Mayfield was killed. The first live-warhead Walleye round was expended in April 1966, followed the following month by the start of the Operational Evaluation by VX-5. The Orlando Aerospace Division of Martin Marietta received a 24-million dollar production contract.

Theo van Geffen has been an aviation journalist and historian since 1977. He is from Utrecht, The Netherlands. His focus is the history of the F-105 Thunderchief and the units it was assigned to, and of the Air War in Southeast Asia. Mr. van Geffen has flown in USAF aircraft like the B-1B Lancer, EC-130E ABCCC, Century fighters F-101B Voodoo, F-105F, and F-106B Delta Dart, F-15B/D Eagle and the F-16B Fighting Falcon. He was the first program speaker at the THUD-OUT at Hill AFB on February 25, 1984 and one week later he became the last F-105 back seater ever while flying the next to last flyable F-105F to Little Rock AFB. He is the responsible editor for the Foreign News Department of Onze Luchtmacht, the official magazine of the Royal Netherlands Air Force Association.



Three pilots of VA-212 'Rampart Raiders' in the cockpits of their A-4E Skyhawks, awaiting their next combat mission. The aircraft are configured with one Walleye under the right wing and a Mk-82 under the left wing. The aircraft on the left, NP-233, was the A-4E in which Cdr Homer Smith was lost on May 20, 1967. (Via Gary Verver)

1966

Navy aircraft like A-4C/E Skyhawks and A-6A Intruders flew a total of eighty-one sorties against the Bridge in 1966, of which fifty-eight were armed reconnaissance and twenty-three were strike sorties. In addition, aircraft like the RA-5C Vigilante, escorted by F-4B Phantoms for cover, flew recce sorties, while other F-4Bs flew flak suppression sorties. Most 'visits' to the Bridge in 1966 were made in September (forty-two) and specifically on the 23rd. On that day, twenty-two strike/armed recce sorties were flown by A-6As and A-4Cs, while four F-4Bs carried out flak suppression. Four of the A-4Cs expended two AGM-12C Bullpups each. The aircraft were launched from the carriers *USS Constellation* (CVA 64) and *Coral Sea* (CVA 43) which were on Yankee Station in the South China Sea.

The sorties against the Bridge were part of a concentrated effort against Thanh Hoa's major logistic center in the September 21-25 period. A similar effort with ninety strikes had taken place on September 14-19 against the Ninh Binh logistic center which was situated some forty miles northeast of Thanh Hoa. On September 19, photo recce had revealed eighty-nine rail cars at the Thanh Hoa railroad ferry terminal and about sixty in the Thanh Hoa railroad yards. The rail cars were effectively trapped due to the fact the bridges over the Song Len (north of the city) and the railroad at Tien Linh Dong (south of the city) had been rendered unserviceable. Some 107 sorties were flown against targets in the Thanh Hoa area. Photo recce was flown daily in order to assess damage and determine areas for restrike. Final photo battle damage assessment (BDA) showed among others that (1) the Bridge had been rendered unserviceable to such an extent that a shuttle operation to cross the Song Ma was required, (2) 59 rail cars at the railroad ferry terminal and 21 at the railroad yard were destroyed and the railroad tracks interdicted, (3) two

POL tanks with a combined capacity of 1,678 metric tons were damaged, (4) the thermal power plant's transformer yard was severely damaged, and (5) of the 25 AAA and 3 SA-2 sites, five were damaged, four destroyed and seven silenced.

In spite of these efforts, although the Thanh Hoa Railroad and Highway Bridge had suffered once more in 1966, it was still standing at the end of the year.

VA-212

After returning home in August 1966, Attack Squadron (VA) 212 was informed it was to introduce the Walleye into combat in Southeast Asia. During its training cycle, the squadron's Skyhawks were modified in October/November 1966, to incorporate the Walleye weapon system. The *Rampant Raiders* of VA-212 thus became the first fleet unit to be equipped with the new weapon. On April 25, 1959 the unit had also been the first operational squadron to deploy with the GAM-83 (later re-designated as AGM-12) Bullpup when it sailed with its FJ-4B Furies on board the *USS Lexington* to join the Seventh Fleet in the western Pacific.

Six of the squadron's most experienced pilots were selected to go through Walleye training and they named themselves the *Succulent Six*. One of them was Lt Cdr Mike Cater, the unit's Safety and later Admin Officer. He states,

*As no live weapons were available, training and tactics development were accomplished with two dummy weapons. When we deployed with *USS Bon Homme Richard*, on January 26, 1967, no training had been done with live weapons. Live training was initiated on our first line period in the Gulf of Tonkin, which started on February 26. We worked Dixie station for a few days prior to any Walleye strikes in*



Carrier Air Wing (CVW) 21 on board the *USS Bon Homme Richard* had two squadrons of F-8 Crusaders assigned, Fighter Squadron (VF) 24 with F-8Cs and VF-211 with F-8Es. On the photo, four Crusaders are awaiting their turn to be launched from *Bonnie Dick*. The month of May was a bad month for CVW 21 as in the last thirteen days it lost one A-1H of VA-215, one A-4C of VA-72, three VA-212 A-4Es, one F-8C and two F-8Es. Two crewmembers were recovered, three taken POW and three were listed as MIA. (US Navy via author)

North Vietnam. Initially, only by the six original Walleye-trained pilots. Later on in the cruise we trained other pilots on the weapon after which they were involved in live drops. All of our Skyhawks were Walleye-capable and we were the only unit on that cruise to employ the weapon.

1967

The Walleye had been declared ready for fleet use on January 12, 1967 and deployed on January 26, 1967, with VA-212, part of Carrier Air Wing (CVW) 21 on board the *USS Bon Homme Richard*, CVA-31. As it had not been possible to complete the operational evaluation at China Lake, it was decided to do so at *Bonnie Dick* as a 'combat operational evaluation'. For this reason, Lt Tom Taylor of China Lake's VX-5 was on temporary assignment to VA-212. He was one of the pilots who had tested the Walleye during developmental testing. Resulting data, through among others gun and video cameras were used to further refine the launch and delivery techniques, and the weapon itself.

The U.S. Navy returned to the Thanh Hoa Bridge in force in 1967. A total of 126 sorties were flown, of which twenty-five were armed recce and 101 strike sorties. As before, the Bridge was not the only target in the city's area of interest to Navy's Task Force (TF) 77. For example, on February 4, aircraft not only struck the Bridge, but also the railroad yard complex. The extent of the damage to the complex was such that a major reconstruction effort would be required to open a through line. In addition, of the 309

rail cars present in the complex, 143 were destroyed and sixty-two damaged.

In March, mining operations were conducted in the Song Ma River. The Bridge was attacked only once that month, on the 12th. It was a special mission as for the first time in the war in South East Asia the Walleye glide bomb was employed against it. In a timeframe of twenty minutes, three VA-212 A-4E Skyhawks expended one Walleye each. The pilots reported all three weapons to be hits, but post-mission photo BDA did not show any apparent damage.

However, this was not the first use of the Walleye in Southeast Asia. Two days earlier, the Walleye had been employed against a military barracks which was located on North Vietnam's coast, just south of the Song Ma River near the village of Sam Son. Lt Steve Gray, one of the Rampant Raiders:

Pilots of the two A-4Es were the skipper of VA-212, Cdr Homer Smith and Lt Tom Taylor of VX-5. The target was chosen because the run could be made from seaward and would allow time for inflight adjustments in the delivery, without subjecting the aircraft to anti-aircraft fire. Back at the Bon Homme Richard, the video recording of the strike showed that one of the Walleyes flew right through a window of the barracks, resulting in collapsing most of the building (the Walleyes in the initial combat evaluation had been configured with data link transmitters. They transmitted what the TV camera in the nose of the weapon recorded all the way to impact. The tape recorders, put in a hollowed out drop tank, were carried by a chase A-4E).



In the January 24-28, 1968 period, RF-8G Crusaders of Light Photographic Squadron (VFP) 63, Detachment 43 on board the USS Coral Sea (CVA-43), flew four pre- and post-strike sorties to photograph the Thanh Hoa Bridge. The aircraft were unarmed, but in general the recce bird was escorted by an F-4B Phantom, as was the case on January 28. (*US Navy via author*)

The first line period was completed on March 21 with *Bon Homme Richard* returning to Cubi Point Naval Station in Subic Bay in the Philippines for replenishment which included maintenance of the catapults and corrosion control of the aircraft.

Recommendation

In May, the Navy flew fifty-five sorties against the Bridge, including fifty-one strike, one armed recce and three flak support sorties. Of those fifty-five sorties, forty were flown on a single day, the 14th. Ordnance expended by A-4C Skyhawks and A-6A Intruders included Mk-82s and Mk-84s, and 1,000-lb and 2,000-lb general purpose bombs, while the three A-4C flak support aircraft expended one AGM-12C Bullpup each.

In a May 19 message 'Air Strikes Against the Than Hoa Bridge' to CINCPACAF Gen John Ryan, Maj Gen Woodrow Swancutt, HQ USAF Director of Operations (DO), stated that recent Navy attacks had again failed to render the Bridge unserviceable. A review of the strike effort of May 14, indicated that over 200 attack sorties, in which 700 tons of ordnance were expended, had proven to have been in vain to destroy the Bridge. Also, that Defense Intelligence Agency/Bomb Damage Assessment records indicated that 2,000-lb bombs were the largest used. (This was not correct as the USAF had used 3,000-lb bombs against the Bridge for the first time in Rolling Thunder mission 24C6 on July 28, 1965). CINCPACAF was recommended, in view of DoD's delay in deciding to procure BLU-34s to satisfy the USAF's and Navy's heavy bomb requirements, to consider having Seventh Air Force re-

quest authority to strike the Bridge with a small force, armed with M-118 3,000-lb bombs, and select crews. USAF's DO further stated that while the destruction of the Bridge alone would warrant such a request, a successful strike, with such a force, would also vividly demonstrate Seventh AF's capability to destroy hard targets with pinpoint accuracy. According to Gen Swancutt, this would in turn enhance the USAF's ability to obtain approval for Air Force strikes against targets which required extreme bombing precision such as the Hanoi Thermal Power Plant, JCS 81.00. To understand the DO's recommendation to CINCPACAF better, the following. The Hanoi TPP, in Air Force assigned RP VIA, was authorized to be struck only with Walleyes to keep the collateral damage to the surrounding non-military area at a minimum. At that time, the Navy had the Walleye in its inventory and was using it in North Vietnam, while the Air Force was still struggling to deploy it to Ubon Royal Thai Air Base. Yet, two A-4Es of VA-212 expended two Walleyes on the Hanoi TPP on May 19, followed by four more on the 21st.

A background paper on Air Strikes Against the Thanh Hoa Bridge for the April 3, 1965-May 19, 1967 period stated that the Bridge had been struck by 247 aircraft, of which 110 were Air Force and 137 Navy. Seven aircraft had been lost, all Air Force*: five F-105Ds, one F-100D and one RF-101C. Ordnance expended included 686 tons of bombs, 1,064 rockets, 53 AGM-12B/Cs and three Walleyes.

The Navy expended a total of eighty-eight Walleyes in

* Surprisingly, there is no mentioning of the loss on May 31, 1966, of the Carolina Moon C-130E Hercules.



A total of seventeen Coral Sea A-4E Skyhawks participated in the January 28 strike against the Than Hoa Bridge. The photo shows an A-4E of VA-155 with two M-117s under the wing and three Mk-82s on a TER under the fuselage. (US Navy via author)

1967 (all in North Vietnam). The strikes against the Bridge on March 12 proved to be the only ones in 1967 with Walleyes.

As had been the case in the previous two years, the Thanh Hoa Railroad and Highway Bridge had been hammered in 1967, but was still standing.

1968

The Bridge was struck just once in 1968, on January 28. It would prove to be the only coordinated Air Force/Navy mission against it in the Air War against North Vietnam. Four days earlier, a Coral Sea RF-8G Crusader had flown a recce sortie. Navy aircraft initiated the attacks on the 28th at 05:00Z. They flew a total of twenty-one sorties, all launched from the USS Coral Sea: fifteen by A-4E Skyhawks (strike), two by A-4Es (Iron Hand), one by an RF-8G (recce) escorted by an F-4B Phantom, and two by F-4Bs (handheld photo recce).

The Air Force followed suit at 08:15Z with 27 Korat/Takhli F-105D Thunderchiefs which dropped a total of 48 M-118 3,000-lb bombs and 12 M-117 750-lb general purpose bombs. It was 08:35Z when the final flight (Zebra) of F-105Ds left the target area. Two pre-mission and two post-mission recce sorties were flown by RF-4C Phantoms of the 432nd Tactical Reconnaissance Wing out of Udorn RTAB. One day after the strikes, four recce sorties were flown, two by RF-4Cs (Udorn) and two by RF-8Gs (USS Coral Sea).

Twelve of the twenty-eight strike F-105Ds were launched from Korat in three flights, which included Scuba

and Gator of the 34th TFS. Of the twenty-four M-118s, twenty-two were dropped, all on target. Smoke and dust prevented BDA. In addition, the 388th TFW fragged two F-105F Iron Hand flights, which expended nine CBU-24s, three CBU-29s and six 500-lb bombs against firing 37/57-mm AAA sites on the east and west approaches of the Bridge. They reported the fire diminished after their attack and the suppression of four sites.

Initially, the strike against the Bridge was fragged for the morning with the 469th TFS furnishing the Mission Commander (MC) for the Korat force, Capt Steven Long (Takhli would have its own MC). Because of the weather forecast, Seventh Air Force (Seventh AF) made the decision to move the mission to the late afternoon. This also meant that the 34th TFS would supply the MC. The Squadron commander, LC Bob Smith, picked Maj Ken Mays, B Flight Commander, to be the afternoon's Mission Commander as Scuba 01. Maj James Daniel Jr, the squadron Operations Officer, would act as Deputy MC as Scuba 03. Another change was the configuration. Although the frag order called for the strike aircraft to be configured with six M-117s and two ECM pods each, the 388th TFW commander managed to convince Seventh AF to change the bomb load to two M-118s each, although two Takhli Ds were supposedly still configured with six M-117s each. Maj Mays:

I planned the mission with the help of Capt Long, a dear friend and class mate at Texas A&M. He still gives me a hard time for having 'stolen' his mission. I had a short conversation with the Navy in which the interaction was coordinated as to what direction to come in from and also called



Originally, the frag order had dictated that the F-105D strike aircraft be configured with six M-117s for the January 28 strike against the Thanh Hoa Bridge. However, the commander of the 388th TFW at Korat was able to convince Seventh Air Force to drop the six M-117s per aircraft in favor of two 3,000-lb M-118s. On the photo, F-105D 81172/JV of the 469th TFS being configured with an M-118. The aircraft was one of the twenty-eight fraged strike aircraft and also carried two ECM pods. (Except where noted, all photos USAF via author)

the Takhli Mission Commander on a secure phone to discuss the mission in detail. Attack would be made from the west (Laos) to let the North Vietnamese believe we would be flying towards Hanoi, then right down the Song Ma to Thanh Hoa. KC-135A Stratotankers would refuel us over Laos inbound and over the Gulf of Tonkin outbound. The strike flights would use the pod formation.

According to Mays, the weather that afternoon was clear with a light haze. Scuba would be the only flight to release its bombs against the primary target, the Thanh Hoa Bridge. Ken Mays:

Just before releasing my bombs, I noticed quite a few rail cars that were marshaled in a rail yard waiting their turn to cross on a pontoon bridge. As I had the authority to change the target from primary to secondary, I made the decision to do so and called the new target out to the flights behind me. Takhli F-105s also hit the secondary target. We put some good bombs on it. Thanks to our alternative flight plan, we did not see any MiGs.

Maj Mays also explained why the twelve F-105Ds in his Korat strike force dropped only twenty-two M-118s and not twenty-four:

Maj Jim Daniel was my Deputy on the mission. About the time we hit the Fish's Mouth in Laos, I called the force 'to go hot'. Jim then accidentally hit the jettison button and dropped his M-118s. I gave him the option to return to

Korat, but he chose to continue, albeit in a clean configuration.

Takhli

The remaining sixteen strike Thunderchiefs were launched from Takhli RTAB in four flights, which included Wolf and Bear (354th TFS), Bison (333rd TFS) and Zebra (357th TFS). Wildcat flight was not used, with Wildcat 01 becoming Bear 04 and Wildcat 02, Bison 03. Wolf 02 air aborted after the pilot was unable to obtain pre-strike refueling and returned to Takhli with its two M-118s. The fifteen Ds dropped twenty-six M-118 and twelve M-117 bombs. The 355th TFW also supplied a flight of four F-105D/Fs for flak suppression and eight EB-66 Destroyers (2/B, 2/C and 4/E) for offensive ECM support for the thirty-nine participating F-105D/Fs. Four of the Destroyers established an orbit over the North Vietnamese/Laos border (sixty-five miles from the target) and the other four aircraft over the Gulf of Tonkin (fifty miles from the target). The number of EB-66s and their close proximity to the target, resulting in intensive electronic jamming, severely limited or prevented the North Vietnamese air defense system from maintaining tracking continuity on the strike force and thus denying it the vital information to direct AAA batteries, to launch SA-2s (potentially, there were 14 sites in the target area) and to position MiG-17/21 interceptors. To shield the Destroyers effectively from the North Vietnamese radars, deviating flight routes had been established, and pre-orbital jamming and chaff drops



The Iron Hand/flak support mission on January 28 was carried out by three flights of four F-105Fs, two from Korat and one from Takhli. They tried to suppress the many AAA and SA-2 sites and their supporting radars in the Thanh Hoa area. As the AGM-78 Standard ARM had not yet been introduced in Southeast Asia, the Thunderchiefs were configured with AGM-45 Shrikes only, like the F-105F on the photo.

accomplished. In addition twenty F-4D Phantoms played a part in the strike with sixteen as MIGCAP and four as CAP for the EB-66s.

Takhli's OPREP-4 stated that all flights expended their ordnance in the target area with extensive impacts on the road immediately to the east of the Bridge. An unknown number of rolling stock was destroyed or damaged. Both sides of the Bridge showed some sixty-three additional rolling stock. Light automatic weapons to 37/57-mm non-tracking AAA and light 85-mm fire were observed. Tracking 37-mm fire was encountered to the east of the target.

Post-strike BDA recce revealed the Bridge had received structural damage to the truss on the eastern end. Photo interpreters estimated that the eastern approach was interdicted, rendering Rail Line #4 unserviceable to rolling stock. In addition, rolling stock was destroyed or damaged.

The fact that the Thanh Hoa Bridge was only struck once in 1968, on January 28, was the result of the northeast monsoon up to April 1, and a partly bombing halt thereafter. As a substantial concession and serious offer for peace through negotiations, President Lyndon Johnson had announced the restriction per April 1, 1968: all bomb-

ing north of the 20th parallel was halted. This was followed three days later by a further restriction to north of the 19th parallel, which included the Thanh Hoa area.

Reconnaissance north of the 19th parallel, which resumed on April 11, showed that the North Vietnamese were already busy repairing damage to, for example, bridges and military installations such as SA-2 installations and MiG bases. The infiltration of manpower and supplies into South Vietnam was also stepped up. This alarmed the JCS and CINCPAC was commissioned to make plans to resume the bombing past the demarcation line. Nevertheless, on October 31, 1968, Johnson ordered the immediate stop of all strikes against North Vietnam, beginning the next day.

Although having been battered heavily at the time of the bombing halt (for example, the railroad was not usable and both approaches were heavily cratered, preventing vehicular traffic), the Bridge was still standing.

When Air Force aircraft returned to the Thanh Hoa Bridge in April 1972, their pilots found a 'new' and heavily utilized Dragon's Jaw across the Song Ma River. However, this time they did return less 'empty handed': their F-4D Phantoms had been configured with laser-guided and electro-optical guided bombs.



All three versions of the EB-66 of the 42nd Tactical Electronic Warfare Squadron at Takhli RTAB participated in the January 28 strike against the Thanh Hoa Bridge. Their mission was offensive ECM support. On the photo, two of the Destroyer versions. The upper one (40435/RH) is an EB-66E and the other one (40468/RH) an EB-66C.



The Takhli strike force numbered four flights of F-105D Thunderchiefs: Wolf and Bear of the 354th Tactical Fighter Squadron, Bison of the 333rd and Zebra of the 357th TFS. The photo shows F-105D 24372 of the 357th TFS configured with two M-118s and two ECM pods. As a side note, on July 18, 1979 '372' became the very first Thunderchief to complete 6,000 flying hours. (*Cal Tax via author*)



The Thanh Hoa Railroad and Highway Bridge being hit by the M-118s off Maj Ken Mays' Thud of Korat's 34th Tactical Fighter Squadron. The major became Korat's Mission Commander because the mission was flown in the afternoon, while it had originally been fraggered for the morning with a 469th TFS Mission Commander.

Postscript

PACAF's Summary Air Operations Southeast Asia for March 1967, and information from JCS Southeast Asia files about all flown sorties in the 1966-1972 period against the three major North Vietnamese railroad and highway bridges in Thanh Hoa and Hanoi (Paul Doumer and Canal des Rapides) give as the date for the first employment of the Walleye March 11, and similarly on March 12, against the Thanh Hoa Railroad and Highway Bridge. In this respect I have corresponded with Mike Cater and Steve Gray, who were both assigned to VA-212 and participated in the Thanh Hoa Bridge strike. Mike as a pilot of a Walleye-configured A-4E and Steve of an A-4E as a flak suppressor. Both stated the March 12 date was incorrect. Mike stated,

The strike was in mid-April. Bon Homme Richard left Cubi Point in the Philippines on April 12. This means we were back on line around the 16th and the strike should have been shortly thereafter. The combat operational evaluation continued into this second line. We certainly did not go to the Bridge the day after the first drop. I was one of the four pilots of Walleye-configured A-4Es to strike the Bridge. Three of the four aircraft expended one weapon as my Walleye would not drop, relegating me to providing photo cover-

age for the other three Skyhawks as they made their runs. All attacks were made by individual aircraft in sequence which is why I had so many passes on the Bridge.

Steve stated the following in this respect,

My information is correct. The Thanh Hoa Bridge strike occurred sometime after mid-April and before mid-May after the Combat OPEVAL had been completed. ■

Thanks to:

Mike Cater, George Cully, Steve Gray, Ken Mays, Howard Plunkett, Barrett Tillman, Gary Verver, and the Skyhawk Association.

Sources:

Histories of the 355th (Takhli RTAB) and 388th Tactical Fighter Wings (Korat RTAB) for the Jan-Mar 1968 period. PACAF's Summary Air Operations Southeast Asia 1966-1968.

JCS Southeast Asia files about sorties flown in the 1966-1972 period against the three major North Vietnamese railroad and highway bridges.

The Station Comes of Age, History of the Navy at China Lake, Vol 4.

Comparing and Contrasting USAFCENT's Air Advising Mission in Iraq and Afghanistan, 2005-2015



TSgt Jacob Ness, standing, teaches a class to Afghan students on marshalling aircraft techniques, July 17, 2012 at Kandahar Airfield, Afghanistan. (U.S. Air Force photo/SSgt Quinton Russ)

Forrest L. Marion

The training and advising of foreign air forces is not a new mission for the U.S. Air Force (USAF)*, but it probably deserves greater attention than it has received.¹ Especially since the early 1990s, given a reduced force structure required by the smaller defense budgets that followed the end of the Cold War, as well as improved military-to-military links with some nations aligned with the Soviet Union until its dissolution, the USAF has worked with partner nations' air forces. The basic approach has been to provide some measure of training and advising, usually in conjunction with U.S. or allies' donations or purchases of aircraft along with logistics, maintenance, and other support packages for the partner air force, in order to facilitate its development as a capable, sustainable, and professional air service. Until 2007, the 6th Special Operations Squadron (6 SOS), in the Air Force Special Operations Command (AFSOC), was the sole USAF unit whose primary mission encompassed the training-advising of host nation air forces.² Often times this effort merged with the U.S. Government's counterinsurgency (COIN) / foreign internal defense (FID) initiatives in the host country.³

Informally since 2005, but formally since 2007-2008, USAF elements and, specifically, U.S. Air Forces Central Command (USAFCENT) air expeditionary units have engaged in air advising missions in Iraq and Afghanistan.⁴ This paper seeks to overview the advising mission in both countries, pointing out parallels as well as differences between the two. While some attention has been devoted to each effort individually, there has been little attention devoted to both of these ongoing air advising campaigns. In the case of Iraq, however, the 'ongoing' nature of air advising contained a caveat. At the end of 2011, the USAF withdrew its air advisors as part of the overall U.S. military withdrawal from Iraq, turning over air advising duties to the State Department. In mid-2015, 'blue-suit' air advisors returned to Iraq as the Obama administration attempted to counter the Islamic State of Iraq and ash Sham (ISIS) there.⁵

From British to Soviet Influence

In a broad sense, Iraq and Afghanistan shared a number of characteristics that influenced the air advising mission.

*The author gratefully acknowledges the assistance of the USAFCENT History Office, Shaw AFB, S.C., in the preparation of this manuscript, particularly Mr. Mike Gartland who provided edits, photographic selection and captions, and the overall formatting. Any errors, of course, are mine alone.



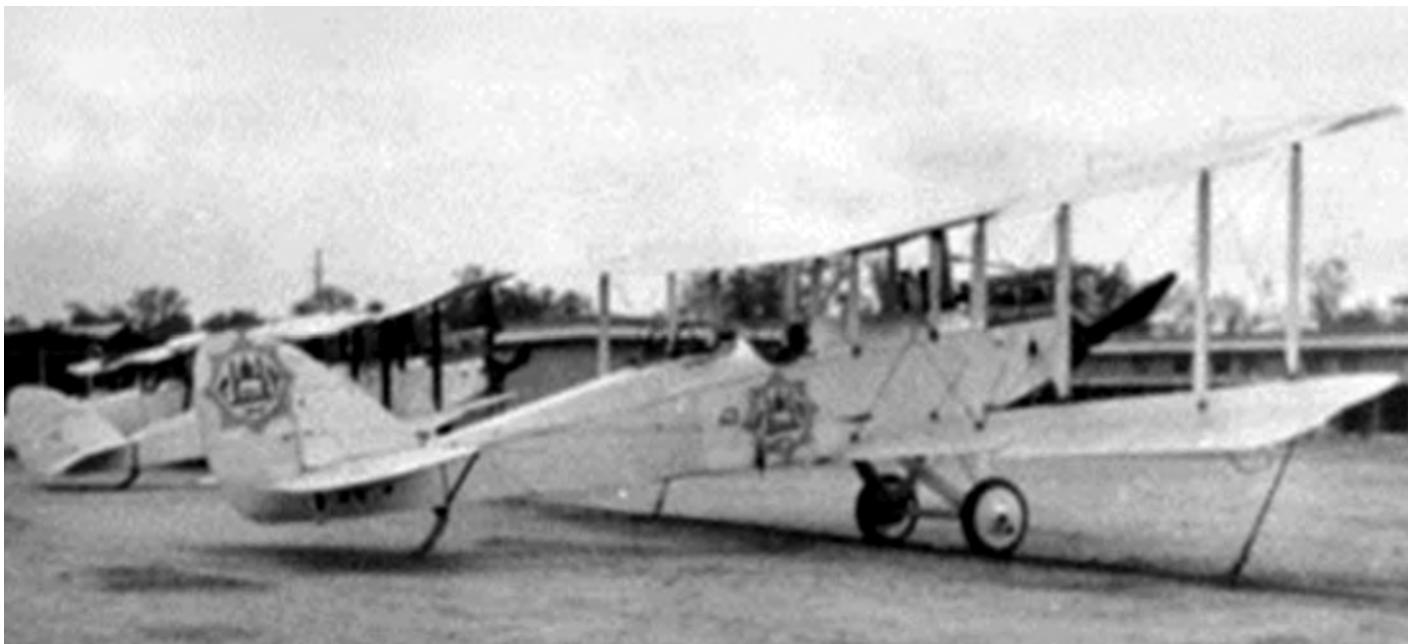
The British Hawker Audax "Nisr" reconnaissance aircraft was among the first aircraft in the Iraqi Air Force inventory.

Geopolitically, the two countries gained independence, more or less, over their foreign affairs in the first half of the twentieth century. In both cases, their independence was from British influence if not outright control. Indeed, British forces engaged in combat operations in both countries not long before their de facto independence: Iraq (then called Mesopotamia) in 1915 as part of the Great War; Afghanistan in 1919 in the short-lived Third Anglo-Afghan War. Aviation was still in toddlerhood, but an indigenous air arm began in both countries within a few years: by 1924⁶ in Afghanistan, and in 1931 in Iraq. As British power diminished after the Second World War, the Soviet Union eventually filled the vacuum in South Asia as it sought to align countries situated on or near its periphery with its bloc during the Cold War.⁷

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In Iraq, the British retained influence economically and politically for several decades. Established in the 1920s and under British control, the Kirkuk-oil-field based Iraq Petroleum Company became the country's most important economic enterprise, but it was the 1950s before significant revenues accrued to the Iraqi government. Also, in the 1920s the RAF played a major role in pacifying "tribal insubordination...before it could grow dangerous" in Iraq, often by its aircraft appearing overhead and deterring would-be insurgents. British military forces occupied Iraq early in the Second World War and maintained access to bases after the war, including RAF Habbaniya west of Baghdad which did not pass to Iraqi control until 1959. Air Force historian George Cully wrote that Great Britain remained Iraq's leading "source of military aviation training and combat aircraft procurement until the late 1950s."⁸

But the 1958 revolution that overthrew the Hashemite monarchy in Iraq led to a reorienting of Iraqi foreign policy. Iraq withdrew from the Baghdad Pact, a south-southwest Asian version of NATO intended to deter Soviet aggression in the region. The new Iraqi government pursued closer relations with the U.S.S.R., forging economic, military, and cultural agreements with the Soviets. By the mid-1960s the Iraqi Air Force (IqAF) boasted Soviet MiG-21 fighters and Tu-16 bombers. At the same time, however, the IqAF continued taking delivery of British-built Hawker Hunter fighters until 1967. By the late 1960s, the Indian Air Force – British-trained, of course – also assisted the IqAF (as it did the Afghan Air Force, or AAF).⁹ Indian flight instructors



Afghanistan operated the British de Havilland DH9 in the 1920s.

served in Iraq, and Iraqi pilot candidates trained in India. Taken together, the British and Indian air force support for Iraq countered to no small degree the Soviet role, strongly suggesting that Soviet influence in Iraq was not quite what it became in Afghanistan. Another contributing factor was that Iraq had been a member of the Baghdad Pact, but Afghanistan had not been invited to join.¹⁰

During the next three decades from the end of the 1960s, the increasingly strong hand of Saddam Hussein in Iraq, in contrast with a succession of relatively weak Afghan rulers several of whom were controlled (or toppled) largely by Moscow (including during the 1980s' Soviet-Afghan War), suggested relatively greater Soviet influence in Afghanistan than in Iraq. The Soviet influence at the expense of the West's – especially Britain's – in Afghanistan, most likely played a part after 2005 in the overarching cultural challenges experienced by air advisors in the shadow of the Hindu Kush.¹¹

In contrast with its continuing role in Iraq, after the 1919 conflict that gave Afghanistan control over its foreign affairs, the British withdrew – the new Afghan king initially was anti-British – and attempted to retain a degree of indirect influence as best it could.¹² Anglo-Afghan relations were always dependent to considerable degree on Soviet-Afghan relations because the two powers traditionally viewed Afghanistan as a buffer, seeking to use their relations with Kabul to advantage against their more powerful adversary. A career foreign service officer and a leading mid-late-twentieth-century U.S. scholar on Afghanistan, Leon B. Poullada wrote of the 1920s, "As Anglo-Soviet relations blew hot and cold, Soviet-Afghan relations tended to become closer or more distant."¹³

The brief, modernizing reign of King Amanullah (1919–1929) marked a low point in Anglo-Afghan relations, exacerbated by Amanullah's taunting of the British over their colonial policies in India, and, equally distressing, British

diplomats' expressions of contempt for the young and inexperienced Afghan king. When in the winter of 1928–1929 a tribal rebellion led Amanullah to abdicate the throne, many Afghans blamed the British. In fact, they had not instigated the rebellion, but the presence of Col T. E. Lawrence ('Lawrence of Arabia') in the Indian tribal area at that very time added to the aura of foreign intrigue. In essence, the British Raj – encompassing the future nations of India and Pakistan (created in 1947) – represented the nearest significant British military presence and influence. The kind of British economic and political role seen in Iraq from the 1920s into the 1950s was largely absent in Afghanistan.¹⁴

The more-or-less British withdrawal coupled with tense relations with Amanullah facilitated the rise of Soviet influence in Afghanistan. In aviation terms, that was clear enough. Poullada¹⁵ wrote the British were "aghast" at the king's willingness to field a Soviet-trained air force. One British intelligence report in the 1920s referred to the Afghan air force as essentially "a Russian service," and it regarded the aerodrome at Kabul "as a Russian advanced base" in view of the preponderance of Soviet aircraft, pilots, and advisors at the time. In late 1927, Amanullah's government signed the Soviet-Afghan Air Agreement, which might have had long-term significance had the king not abdicated barely a year later. As British and Soviet influence ebbed and flowed, beginning in the late 1930s the British supplied Hawker Hind aircraft to Afghanistan, plus associated technical assistance and training to Afghan pilot candidates in India, tangible examples of somewhat better relations by that time. The Hawker Hind light bombers remained the mainstay of the Afghan inventory into the 1950s. But the AAF remained very small, never exceeding about fifty aircraft.¹⁶

In Afghanistan by 1955 (and in Iraq by 1959), substantial agreements by the government with the U.S.S.R.

brought Soviet economic and military aid as well as the sovietization of Afghanistan's military (and probably to a lesser degree, Iraq's). Soviet military assistance included aircraft, infrastructure, training, and technicians (or, advisors). The Soviet system included such elements as the withholding of information from one's comrades, layered bureaucracy, discouragement of initiative by lower-ranking personnel, and the making of decisions only at the highest levels. This system and the culture it fostered – blended with traditional cultural elements in the host nations – challenged U.S. and other Western air advisors in the years to come.¹⁷

Time, Planning, and Activity, or the “Advisor Frustration Zone”

Perhaps the most challenging of all matters for the air advisors of both partners' air forces were those related to culture. One important topic concerned the view of time and its relationship to planning and activity. While the U.S.-Western way was to do the heavy planning very early in the process of implementing some change, thereby leaving relatively little planning to do when the time of execution approached, the Iraqi approach was different. Air advisors in Iraq had a name for this: the “advisor frustration zone.” Col Robert J. Rowell, who during 2011 advised in Tikrit, Iraq, recalled that if there had been one thing he wished he had known to expect before deploying, this was it. While the ‘advisor frustration zone’ moniker may have been unknown in Afghanistan, the phenomenon it identified was known there, too.¹⁸

As the 321st Air Expeditionary Wing (AEW) commander in 2011, Maj Gen Anthony J. Rock, explained, the Iraqis were “born negotiators,” which most U.S. personnel were not. Culturally, they did not believe that ‘no’ was the final answer even when it was repeated to them several times or documents had been signed to that effect. Typically, the Iraqis failed to plan until nearly the proverbial last-minute required them to do so, whether it was for the opening of a new dining facility or drawing up the itinerary for a distinguished visitor. Particularly, that approach was employed for any *undesired* development for which waiting until the last minute might possibly convince the Americans to purchase whatever it was the Iraqi government was obligated to buy for themselves. When finally forced to accept the impending reality, the Iraqis engaged in a flurry of planning and activity. It was quite opposite to the U.S.-Western model in which the planning was heavily front-loaded so the finalizing of details and the plan's execution were not hectic and error-prone. General Rock and other air advisors especially experienced the phenomenon when the Iraqis simply refused to believe that U.S. forces were “going to zero” at the end of 2011.¹⁹

In Afghanistan, air advisors experienced something similar. Afghanistan-Pakistan (AFPAK) Hand and air advisor Frank D. Bryant, who worked on AAF command and control throughout his deployment, remarked in early 2011, “The way you know when the Afghans are going to do something, is *when* they do it.”²⁰

Ethnic, Religious, and Linguistic Divisions

Ethnically and religiously, both Iraq and Afghanistan have been divided, but the divisions – at times, the enmities – in Afghan society arguably have been deeper and more complex, again indirectly creating special challenges for air advisors striving to build a national air force. In Afghanistan, Pashtuns, Tajiks, Hazaras, and Uzbeks, comprising the four largest ethnic-sectarian groups, accounted for about 86 percent of all Afghans, with smaller groups comprising the remainder of the population. Of the four largest, only the Shi'i Hazaras (about 9 percent) were non-Sunni Muslims, but old rivalries existed among those groups. An Afghanistan country study noted that ethnic groups perceived themselves in terms of rank status, with the Pashtuns considered “the most prestigious ethnic group, both in their own eyes and usually also in the eyes of others.” The Hazaras, however, often were despised, considered just above the status of gypsies.²¹

In Iraq, however, the basic social structure included only three relatively large groups: Sunni Arabs, Shi'i Arabs, and the Kurds, the last of which practiced, generally since the 1990s, a kind of self-imposed segregation in the northern mountains. Until 1951 Iraqi society included ancient Jewish and Christian communities that together comprised perhaps 5 percent of the populace (several hundred thousand), thereby enriching the country's economic and intellectual life out of proportion to their numbers. At the same time, their presence manifested a degree of toleration for non-Islamic religious practices. Afghanistan, however, never had more than about five thousand Jews, residing mostly in Herat in the west, and so had fewer such moderating, and perhaps modernizing, influences on the culture.²²

Closely related to ethnicity and religion, language is another factor that, generally, has favored Iraq over Afghanistan. Orit Bashkin of the University of Chicago's Department of Near Eastern Languages and Civilizations pointed to the importance of the Iraqi press in the first one-half of the twentieth century – and which published in Arabic – in helping to create a shared culture among Iraq's diverse groups in the decades prior to the 1958 revolution. Significantly, that community and culture shared Arabic as its language and permitted, for a time, a “universe of discourse shared by all Arab intellectuals” concerning the nature of democracy in Iraq. At least until recently, virtually all Iraqis were capable of communicating in Arabic.²³

But at least by the opening decade of the twenty-first century, some observed that the use of Arabic was becoming less common in Kurdistan, a process facilitated by Iraq's 2005 constitutional guarantee of an autonomous Kurdistan in the north. Whereas Arabic once had been spoken there just as in the rest of the country, in 2010 a former translator-turned-journalist from Baghdad, Yasmine Mousa, experienced “the language barrier that is slowly emerging here, dividing the country not only linguistically, but also generationally,” as many younger Kurds did not know Arabic. Such a trend could create additional challenges for an Iraqi Air Force that included Kurdish and

Arabic speakers, at least depending on the degree to which the airmen shared the ability to speak English. Particularly that may be the case because, according to a country study of Iraq, the Kurdish language is the Kurds' "most distinguishing characteristic, and the one that binds them to one another."²⁴

In Afghanistan, however, the language barrier was more pronounced. The mainly southern-dwelling Pashtuns (42 percent of the population) often did not share the ability to communicate easily with other Afghans. Commenting on the Afghan government's practice since 2001 of deploying non-Pashtun, northern Afghan soldiers to the south (especially Helmand Province) to fight the Taliban, a former United Kingdom ambassador to Afghanistan, Sir Sherard Cowper-Coles, stated, "The Afghan Army is almost as alien to the farmers of the Helmand valley as the 3rd (United Kingdom) Division...or the 82d Airborne Division." The main reason was that few Pashtun residents of Helmand spoke Dari, the language of most northern Afghans.²⁵ The language division was one of several factors that added to air advisors' difficulties as they sought to nurture a national perspective and a single air force for Afghanistan.²⁶

Learning English, and Older and Younger Airmen

Broadly, one of the most relevant distinctions between Iraq and Afghanistan with respect to the air advisor experience may have been captured by one USAF officer, with experience in both countries, who opined that while the Iraqis he knew in 2009 had seen better days – both as a country and as an air force – the Afghans had suffered so much and for so long that there seemed to him no remembrance of better things for which to hope, on the part of the Afghans he worked with some four years later. Indeed, the Iraqi Air Force had been *almost-first-world* when Saddam invaded Kuwait in 1990. In 2017, Col Matthew T. Fritz, a career tanker pilot with acquisitions experience as well, recalled a *drive* to learn English by a number of the Iraqis he met during his deployment to Combined Air Force Transition Team (CAFTT) / 321 AEW eight years earlier. Fritz had seen many Iraqis, some of them recruited straight off the street, "working very hard, on their own, to gain English language skills because it was the ticket to something [their parents or grandparents remembered as] better." But in Afghanistan during 2013-2014, Fritz did not sense the same drive. Another Kabul-based 438 AEW advisor, a USAF lieutenant colonel, observed during the same period that it was "often the children of the less powerful or rich AAF members who would apply themselves and honestly try to learn the language, while often the children of those in power in the AAF would not apply themselves and squeak by." At least once in 2014, AAF leadership actually blocked an air advisor attempt to administer an English test since the Afghans were not the ones to administer it.²⁷

Air advisors had diverse experiences with airmen learning English, however. In 2018, Lt Col Sabine U. Peters, an assistant professor of German at the U.S. Air Force Academy, recalled her experience in Iraq as an English in-

structor in 2008-2009 and again in 2010-2011. She wrote that "cheating on the dreaded 'ALCPT' (American Language Course Proficiency Test) was a huge problem," with some Iraqi airmen demonstrating great creativity as they tried to maneuver around the test. If they failed the test, they could not continue to pilot training. In at least one case, students took a #2 pencil and meticulously pierced its sides to correspond with the answers of a particular version of the ALCPT. At such times individuals were at fault but on other occasions the problems were of misunderstanding, or were institutional. At Kirkuk in 2010, Peters had six older (termed 'legacy') pilots in her class who were expected to cross-train into the T-6 aircraft. Initially, the Iraqi defense ministry only allotted them one month to acquire the minimum ALCPT score (80/100), but that was too short a timeline, and only one of the six initially passed the test. He had spent some time in England years earlier and so enjoyed considerably more experience with the language. In the end, two more of the remaining five legacy pilots succeeded (or so they thought). Somehow, the Ministry of Defense decided the legacy pilots did not require a minimum score of 80, so when the two pilots scored in the high-70s, they were pulled from the class. When the Ministry of Defense was made aware of its misunderstanding, the air advisors perceived undue delay on its part in providing orders for the pilots to return to the course. Such frustrations were everyday issues for the air advisors in both countries.²⁸

Colonel Peters and others pointed to another aspect, one highly relevant to advising in both Iraq and Afghanistan: *older* versus *younger* host nation airmen. Concerning the Iraqi pilots she had worked with, Colonel Peters wrote,

The 'old' guys are referred to by the younger guys as 'alligators.' A big gripe the young guys have is that the old guys still have the 'Saddam Hussein' mentality. And [they] will not listen to the younger (typically US trained) guys for anything. The young guys feel powerless to change anything for the better. Many who have come to the US for training (not only pilot training) and returned felt disillusioned because they are not able to implement anything they learned [in the United States]²⁹

That very perspective was shared by other air advisors to both the IqAF and AAF, and it may also have played into the (above) observations of Colonel Fritz and the other 438 AEW advisor to the Afghans. In Afghanistan, the Czech Republic Air Force furnished Mi-17 and Mi-35 instructor pilots and maintainers for years. One of the Czechs' greatest concerns related to the older and younger Afghan airmen, both aviators and maintainers; and in some cases the problem was the reverse of that noted by Colonel Peters in Iraq. The more capable of the older AAF pilots and maintainers possessed a body of knowledge that their younger counterparts could well use, even those who were U.S.-coalition trained and spoke English well. Colonel Petr Ceplka, a highly experienced Mi-35 instructor pilot, found the older Afghan pilots were "not willing to share their knowledge," an observation shared by other air advisors in various training contexts. But – as was the case at least in



The Iraqi air force Commander, Lt Gen Anwar, and Brig Gen Robert Kane talk during the joint commanders' conference at Camp Victory, Iraq on 20 May 2009. (U.S. Air Force photo/SrA Jacqueline Romero)

Afghanistan – caught in a military personnel system that lacked a paid retirement feature, who could blame the older airmen? If they assisted the young ‘eagles’ to replace them, they soon could be out of a job and without an income. Simply put, there were no easy or quick solutions.³⁰

Another generational issue was that of influence and command. In a 2015 *Small Wars Journal* essay, Nick Barley wrote of the challenge to advisors produced by “a layer of ex-Soviet trained or former Mujahedeen senior officers sitting above newly trained professional young officers who were being taught to use their initiative.” A number of air advisors in Afghanistan agreed, one of whom commented that “on a regular basis, those people that were trying to have trust in their senior leaders had that trust violated... . They wanted to do right...and then that trust gets violated.” Those experiences exasperated advisors and young professional Afghan aviators alike, the latter even more so when some of them were not allowed to fly for months at a time upon their return home from overseas training. It was almost as though their seniors wanted to wait for the young pilots’ newly-honed skills to deteriorate before they returned to flying.³¹

In another context, the critical importance of English language capabilities was undeniable. Of the original group of about ten Iraqi pilots sent to the United States for F-16 training, in 2011 four of them were brought home for failing to make sufficient progress at the Defense Language Institute. Anticipated as the premier aircraft in the IqAF, the first batch of eighteen F-16s were expected in Iraq by 2015, and the initial cadre of Iraqi F-16 pilots were the

most carefully screened airmen in the country. They had to be strong English speakers.³²

One of those who met that requirement had been Colonel Peters’ student at Taji in 2008. The young lieutenant was selected as the first IqAF T-6 instructor pilot and later went on to fly the F-16. There was nothing more rewarding to a dedicated air advisor than that. Another supremely rewarding experience for Colonel Peters occurred during her second deployment to Iraq, when one of her students from two years earlier was one of the pilots to fly her in a C-208 Caravan from Tikrit to Kirkuk.³³

In one of the few glimpses of the Iraqi Air Force between the U.S. withdrawal in December 2011 and mid-2015 when air advisors returned, Colonel Peters recalled she had known twelve IqAF aviators who perished after 2011. Ten of those died in helicopters while performing operational missions, and all were lost after 2013 when ISIS began its ruthless attempt to establish a caliphate in Iraq-Syria. One of Colonel Peters’ friends that died was Thulfiqar Sattar, “a wonderful young man” shot down by ISIS. He was the first of the ‘new’ Iraqi pilots to be killed, she remembered. It was one of the inevitable heartaches of advising future aviators in a country at war.³⁴

In Afghanistan, some air advisors also enjoyed close relationships with their partners, though certainly not as frequently after the Guardian Angel protocol was implemented than before. While it was probably the case in both countries that the enthusiastic, younger host nation airmen most often were the ones with whom the air advisors developed the best rapport, in one case an older Afghan

Mi-17 pilot, Maj Abdul Wodoud, became a favorite among the Americans. In 2011, Wodoud became the first Afghan Mi-17 instructor pilot at Kandahar. He worked hard to learn English and by the end of air advisor Col Fred C. Koegler's deployment that year, the two of them held conversations in English. Major Wodoud was such a good pilot that in the typical American way, he was known as The Dude. But, sadly, he died in 2014 when an Afghan fuel truck inadvertently backed over him. It was a serious blow to morale at the Kandahar Air Wing.³⁵

Air Force Leadership

Among the differences between the Iraqi and Afghan air advising experiences was the advisors' impression of host nation air force leadership. Whereas in Iraq, U.S. air advisors praised the Iraqi Air Force commander's grasp of many of his service's problems and his willingness to pursue their resolution, such favorable assessment was not found in Afghanistan. In 2009 in Iraq, the British Army's senior advisor to the U.S.-led CAFTT, Gp Capt Philip Storey, considered General Anwar³⁶ "a very effective leader" whose priorities aligned closely with those of his mentors. Air advisor Col Matthew Fritz, who in 2009 ran the CAFTT A-Staff training function, later recalled Anwar's leadership as "phenomenal...he seemed to get it." On the other hand, in Afghanistan in 2010 the outgoing 438 AEW commander remarked on the problem of senior Afghan military leadership. "Even if not malign actors, current senior Afghan leadership is entrenched in the ways of old and simply has been unable to make the leap of faith needed to forge a new path with their air forces," wrote Brig Gen Michael R. Boera. Similarly, several 438 AEW air advisors were convinced that the AAF commander during the early advisory years hindered the development of his air force and, in particular, that he "did not want anything changed" in terms of AAF command and control (C2) arrangements. But the commander was so well connected to the political leaders in Kabul that his elevation to a newly-created general staff position was, in the view of at least two field grade air advisors, the only way to get him out of the way.³⁷

The host nations' air force commanders may also have differed in their willingness to pursue something considered a standard feature in professional air forces: the commander's conference, in which subordinate unit commanders and key staff came together to learn their boss's leadership philosophy, guidelines, and priorities. In October 2009, General Anwar held a base commanders/staff meeting that demonstrated a professional, disciplined approach. The U.S. air advisors present at the meeting considered it similar to a USAF staff meeting, with the staff speaking only when it was their turn to brief or during times of open discussion. Maj Gen Robert C. Kane, the 321 AEW commander and CAFTT director in 2009, viewed it "very professionally done." Anwar's remarks were "very straightforward [and] no nonsense" and focused on capabilities, successes, and challenges facing the Iraqi Air Force.³⁸

Although any larger significance, if any, attached to his ethnicity was difficult to pin down, it was interesting to

note that General Anwar was a Kurd. Whereas 'ethnic balancing' – a stated objective in Afghanistan – appeared to be somewhat less of an issue in Iraq, since the early 1990s the Kurdish minority had worked hard to establish a self-governing, autonomous enclave in the northern part of the country.³⁹ Their favorable contacts with the West, including cable television and political offices situated in Europe and the United States, may well have been reflected in higher English literacy and the adoption of Western ways than for the majority of Iraqis who had lacked safe access to the West under Saddam's despotic regime.⁴⁰

There were some examples of concern for ethnic balance in the IqAF. Colonel Peters recalled that pilot training honor graduates were recognized in three categories: Sunni, Shi'i, and Kurd, one each per class. Also, Colonel Peters recalled that during her time in Iraq, there were "rumblings that too many [Shi'i] were being selected for out-of-country pilot training."⁴¹

In any case, General Anwar's solid performance contrasted with what appeared to some air advisors in Afghanistan to be reluctance on the part of the AAF commander to engage in similar professional practices. One 438 AEW commander, Brig Gen Michael D. Rothstein, encouraged his counterpart to hold a commander's conference. General Rothstein later acknowledged that ongoing combat operations in the field during the winter of 2014-2015 had presented some concern in bringing Afghan commanders from distant locations to Kabul for the gathering. Further, the drawing down of U.S.-coalition air assets in Afghanistan at that very time was weighing heavily upon AAF and Afghan defense ministry leaders, the general recollects. But some air advisors felt the greater issue may have been the reliability of AAF subordinate commanders who were to be left in charge while their bosses attended the two-day conference.⁴² Both views probably held merit. In any case, in December, following extensive planning and preparation by dozens of U.S. personnel, and a postponement earlier that month, the AAF commander's cancellation of the conference the day prior to its re-scheduled start date was "a letdown" to air advisors. But it was only one of many delays or cancellations experienced in Afghanistan.⁴³

In terms of air force leadership, however, there was at least one important commonality: the host nation's army or the army-dominated defense ministry often limited the air force commander's authority. Combat aviation advisors in the 6 SOS noted that army control of partner air forces was common in many of the countries they worked with, including the army's sway over the air force's budget. Iraq and Afghanistan were no exception for the conventional air advisors. A former 321 AEW squadron commander, Col Jonathan R. VanNoord, recalled his experience at Taji AB in 2008-2009: "The relationship between the Iraqi Army base commander and the IqAF base commander was not great. The IqAF commander was lower ranking and a tenant on the Iraqi Army base so usually got the short end of the stick." At the Iraqi defense ministry, the situation probably was exacerbated at times by General Anwar's minority status (Kurdish). Whether that was part of the equation or not, General Kane felt that much of General Anwar's au-

thority had essentially been “eviscerated” by the army-controlled defense ministry in terms of his ability to execute his decisions.⁴⁴

A perfect example was the defense ministry’s refusal to allow General Anwar to travel to neighboring Jordan – potentially Iraq’s closest ally in the region – a trip General Kane very much wanted him to make in order to “see what’s happening to his helicopters [and] how stuff is progressing,” in addition to engaging with a regional partner. Another advantage of close military relations with Jordan was that among Iraq’s neighbors, the Jordanians were the most pro-Western in terms of military leadership philosophy, discipline, and culture, and in 2004 and 2005 they were the primary trainers for IqAF UH-1 helicopter and C-130 transport personnel.⁴⁵

Similarly, in Afghanistan, air force senior leader Lt Gen Mohammad Dawran’s ethnicity as a Tajik probably contributed to his generally cool relations with the Afghan general staff of almost exclusively Pashtun generals. Colonel Rhude Cherry III, a USAF officer in the AFPAK Hands program who worked with AAF Maj Gen Abdul Raziq Sherzai at Kandahar, witnessed Pashtun-Tajik tensions in such mundane incidents as the Kabul C2 entity’s refusal to respond to (verified) email requests from General Sherzai’s Kandahar Air Wing. Perhaps partly for that reason, General Sherzai – the highest-ranking AAF general at Kandahar – had no relationship with his (Tajik) three-star senior at Kabul, choosing instead to go through his own politically well-connected older brother in Kabul to get whatever he required to run the air wing. Colonel Cherry, who spent considerable time with General Sherzai, recalled he “never saw any” interaction between him and General Dawran.⁴⁶

Moreover, when in 2011 General Dawran joined the general staff he was the only air force general among the ‘inner circle’; all the others were army. Much to the dismay of U.S. air advisor leadership, if not also the AAF, in 2013 the Afghan defense ministry shifted operational control of the AAF’s helicopters from its own level (the general staff) to Afghan army corps commanders, most of whom had little understanding of air power. Although the point might be debatable in the context of Afghan air requirements, most of which supported ground operations, U.S. air leaders viewed the decision as offering further evidence of the lack of air-mindedness on the part of Afghan army leaders.⁴⁷

Women’s Roles and Female Airmen

Although both Iraq and Afghanistan shared, to a degree, traditional Islamic views regarding the roles of women in society, air advising priorities reflected a difference between the two countries. No IqAF air advisors contacted for this study recalled any effort to recruit female pilot candidates or female airmen in general. Several did not recall ever seeing a female Iraqi airman. It was simply not an issue. Most likely, U.S. leadership was not concerned with the issue in Iraq because, as Middle Eastern scholar William R. Polk wrote, “Iraqi women [were] the most liberated in the Islamic East – well educated, engaged in all

the professions, occupying senior government positions, and even serving in the armed forces during the twentieth century.”⁴⁸

But in Afghanistan the situation was different, where the U.S.-coalition made the recruiting of Afghan women into the AAF and, in particular, finding suitable female pilot candidates a stated objective of the air advisor effort, including a support structure for them. Noted *Taliban* author Ahmed Rashid wrote that in the late 1990s the American “rejection of the Taliban was largely because of the pressure exerted by the feminist movement at home.” The growing awareness in the West of the Taliban’s repression of Afghan women fueled a strong Western desire after 2001 to improve opportunities for females in Afghanistan, including the armed forces. The U.S.-coalition air advising campaign plan included measures for recruiting females into the AAF and carefully preparing the most promising ones for pilot training. By 2010-2011, there were at least a half-dozen Afghan females preparing for, or undergoing, pilot training. In 2013, the most highly-publicized female pilot, Capt Nilofar Rahmani, became the AAF’s “first female fixed-wing pilot.” She flew the Cessna C-208 Caravan. Unfortunately (but not unpredictably), Captain Rahmani later received death threats from ultraconservative Afghans. Eventually, she and at least two other female officers requested asylum in the United States (Rahmani did so in 2016).⁴⁹

One might ask whether the U.S.-coalition ought to have allowed more time before pursuing such a non-traditional initiative in Afghanistan, or at least attempted to do so more-or-less ‘under the radar’? In one possible historical parallel, Leon Poullada pointed toward Afghanistan Prime Minister Daud’s no-publicity, no-official-announcement approach to allowing the unveiling of women around 1960 as having been successful, in contrast with King Amanullah’s “full glare of publicity for his campaign” over the same issue a generation earlier. Further, some U.S. planners seemed to forget that one of the chief catalysts for the Afghan insurgency against the pro-Soviet regime in 1978-1979, especially in rural areas, was the communists’ advocacy of various women’s rights and programs including schooling and literacy. There was traditional opposition to such measures from the ultraconservative Pashtun tribesmen, historically the power brokers in Afghanistan.⁵⁰

Moreover, at times American culture was unhelpful in the air advising context, as when pornographic calendars were displayed with insufficient discretion in offices frequented by Afghan interpreters, if not AAF airmen. If, as *Joint Publication 3-22 (Foreign Internal Defense)* stated, “the moral high ground may be just as important as the tactical high ground,” such incidents hindered U.S. efforts. The practice also meshed poorly with promoting opportunities for Afghan females in their air force, not to mention encouraging Afghan respect for U.S.-coalition females.⁵¹

Force Protection and the Insider Threat

One of the most tangible differences between the two advising programs involved the critically important matter



Maj Carl Miller, advisor pilot and guardian angel A1C Anthony Brown, after a training flight on a Cessna C-208 with an Afghan Air Force pilot at Hamid Karzai International Airport, Kabul, Afghanistan, 21 September 2015. (U.S. Air Force photo by Staff Sgt. Sandra Welch)

of force protection given the potential for *insider* or *green-on-blue* attacks. In Iraq, the insider threat was rarely, if ever, even mentioned, although air advisors regularly dealt with the threat of enemy rockets or other indirect fire from outside their heavily-fortified compounds.⁵² At U.S.-controlled bases, Iraqi airmen were not permitted to carry weapons, and they appeared to comply with the directive whenever engaging in train-advise sessions with U.S.-coalition personnel.⁵³ But at Iraqi-controlled bases, Iraqi airmen were armed. At Taji Air Base (AB), where the U.S. and Iraqis each controlled a section, the Iraqis were expected to be armed on the Iraqi side but not on the U.S. side. Colonel Fritz never felt threatened in the presence of Iraqi airmen in 2009 but, in 2013 – two years after the devastating insider attack in April 2011 that killed nine air advisors at Kabul International Airport – he was always concerned for his safety when advising in Afghanistan. For one thing, the several official explanations of how a single, unassisted Afghan colonel managed to kill nine Americans in a conference room, most of whom were armed, were not consistent and lacked credibility. To many it was an unconvincing theory, and important questions remained unanswered.⁵⁴

The attack of 27 April 2011 altered forever the degree of concern for force protection on the part of advisors to the Afghan Air Force, as well the U.S. leadership in Afghanistan. A protocol called Guardian Angel (GA)⁵⁵ went into effect immediately at all 438 AEW units and elements that advised AAF personnel. Under GA requirements, whenever any advisor-AAF meeting took place, at least one U.S. military member was expected to be present to provide security. The GA member did not participate in the meet-

ing or advising but was there solely to watch the proceedings and to be prepared to respond, with force if necessary, in the event of any attempted attack against air advisor personnel. The GA donned the individual body armor and helmet that all U.S.-coalition personnel brought with them to Afghanistan and was armed, usually at least with an M-4 carbine (officers also carried a sidearm, the M9 Beretta). All other advisor personnel (except contractors)⁵⁶ carried their personal weapons as well.⁵⁷

While GA rules became the new norm for air advising in Afghanistan, nothing of the sort was implemented by the air advisors in Iraq. And by the spring of 2011 the air advisors' time was winding down in Iraq. All U.S. military personnel serving in Iraq as part of Operation New Dawn (which began 1 September 2010) departed Iraq by 15 December 2011. It was mid-2015 before U.S. Air Force air advisors returned to Iraq.⁵⁸

In Afghanistan, the Guardian Angel protocol ran counter to the climate of rapport and trust that U.S. advisors traditionally sought to nurture with their host nation partners. Several AFSOC combat aviation and USAF conventional air advisors viewed GA as going against the basic principles of how to work with host nation airmen. Colonel Cherry was one, who arrived in Kabul just after the April 2011 attack. Assigned to the International Security Assistance Force (ISAF) rather than to the U.S.-coalition train-advise command, Colonel Cherry nonetheless advised Afghan airmen regularly on such subjects as nutrition and the basics of flight. He typically wore his gear, including body armor and helmet, while traveling between installations, but because he did not fall under GA rules, once he



Lt. Col. David Hauk, Afghan Air Force Academy senior mentor, with the Train, Advise, Assist Command – Air, walks to the parade pad to see candidates from the Afghan Air Academy perform pass in review for Lt. Col. Mattiullah Shinwari, Afghan Air Academy chief of staff, Nov. 22, 2014, in Kabul, Afghanistan. The candidates execute pass in review weekly in an effort to refine their drill and ceremonies skills. (U.S. Air Force photo by Staff Sgt. Perry Aston)

arrived at Kabul International Airport, he left the gear in his vehicle. But on occasion, he found himself in settings with a Guardian Angel when working with Brig Gen Mohammad Shoaib at the AAF's command and control center. Previously he had enjoyed good rapport with General Shoaib – later, the AAF commander – but Colonel Cherry recalled that with a GA in the room, “we went from talking to staring.” In his assessment of advising at Kabul International, particularly on the maintenance side, “progress was basically in reverse” later in 2011.⁵⁹

A straight-talking South Carolinian and graduate of The Citadel who in 2017 served as the Ninth Air Force vice commander, Colonel Cherry summarized his view that Guardian Angel was “necessary, but it killed advising.” Another former advisor, Col Fred Koegler, who commanded the rotary-wing advisory squadron at Kandahar for a year starting in late 2010, recalled that especially at Kabul after the attack, the climate was one of “cold war, no trust.” Retired LTG Daniel Bolger, who commanded the NATO Training Mission-Afghanistan (NTM-A) beginning in fall 2011, wrote bluntly concerning the GA protocol (later extended to the ground trainer-advisors in Afghanistan): “It wasn’t an overreaction.” He also recalled the treachery that was “a part of the Afghan culture” experienced by the retreating British army and camp followers in January 1842 at the hands of fierce Ghilzai (Pashtun) tribesmen, rivals of the Durrani and among the most warlike of all Afghans. When the hapless British commander agreed to place the women, children, and wounded under Ghilzai “protection”

– a fraudulent offer made several times by tribal leader Akbar Khan in the course of the debacle – the tribesmen killed most of them, sparing the British soldiers as hostages. Of a total of some twelve thousand troops and camp followers, less than two thousand survived.⁶⁰

Indeed, GA was not an overreaction, as insider attacks continued, with subsequent killings occurring at air advisors’ flight line areas in July 2013 at Kandahar and in January 2015 at Kabul. In the 2013 attack, Slovakia suffered its first loss in Afghanistan (one killed, several wounded). In the 2015 incident, three U.S. contractors were gunned down. In another 2013 attack, at Shindand AB an air advisor was shot in the head, but his helmet deflected the round and he survived. In August 2014 MG Harold J. Greene, USA, the Combined Security Transition Command-Afghanistan (CSTC-A) deputy commander, was killed by an Afghan soldier. Greene was the highest-ranking U.S. general officer to die in combat since Southeast Asia. At least fifteen others were wounded. There also were instances in which Afghans working with U.S.-coalition advisors were removed from their positions when U.S. authorities discovered they had been in contact with antigovernment elements and might be planning an attack. While the insider threat remained, 2012 was the worst year in terms of the number of U.S.-coalition losses. About one in six U.S.-coalition fatalities that year were at the hands of insiders. Meanwhile, the Obama administration’s withdrawal of U.S.-coalition forces continued through the end of 2014.⁶¹

Command and Control

Host nation air force C2 issues also shed light on the contrast between advising in Iraq and Afghanistan. The enabling of a host nation professional C2 system was a critical component of the advising efforts with both air forces.⁶² In Iraq, by 2010 U.S. senior leaders there pointed to encouraging results in terms of IqAF command and control. The deputy commanding general for advising and training, U.S. Forces-Iraq, wrote of significant achievements in terms of IqAF sortie production, including connectivity with C2 entities. Summing up the IqAF's support for the national election earlier that year, in August 2010 LTG Michael D. Barbero, USA, 'dual-hatted' as the NATO Training Mission-Iraq commander, stated, "On election day, the [Iraqi] Air Force flew more than 120 sorties, providing intelligence, surveillance, and reconnaissance with real time downlinks to national command centers. They also provided essential airlift and battlefield mobility." By that time, the Iraqi air operations center typically exerted C2 over some 350 sorties a week.⁶³

At the end of August, however, Operation Iraqi Freedom transitioned into Operation New Dawn, officially a non-combat mission. By the end of August, the number of U.S. military personnel in Iraq dropped to near 50,000, down from 180,000 at its peak. As events unfolded, the U.S. military's train, advise, and assist mission continued in Iraq only until December 2011, despite the fact that at least another four years, perhaps longer, had been projected to achieve the air advisory campaign's objectives. As one U.S. official put it, "The U.S. has a long-term strategic interest there. If the whole program unravels after 2011, Iraq degenerates into sectarian conflict and the neighbors get involved, it means the whole project was flawed."⁶⁴

But in Afghanistan, the glowing reports on the partner air force's command and control were almost unknown. By 2010, as the number of Mi-17 helicopters in the AAF inventory increased, C2 became a growing concern for the advisors. The 438 AEW historian recorded "many examples of [Afghan army] Corps commanders skipping the AAF chain of command and several instances of tasking coming directly from the [Ministry of Defense]." The Afghan senior leaders seemed to consider the Mi-17s as their personal assets, in the process ignoring flight planning, aircraft scheduling, and flight regulations. After one incident in August in which Kabul Air Wing Mi-17 aircraft departed on an undetermined mission without any flight planning and in poor weather, air advisor Lt Col Gregory A. Roberts identified the source of the problem in the Kabul wing, AAF, and Ministry of Defense leadership, who "see the aircraft as cars in the garage rather than assets which require careful planning for effective utilization." Colonel Roberts – a squadron commander and the mission commander for a record-setting helicopter rescue mission just days earlier⁶⁵ – noted that in his view, the AAF squadrons "will not tell the chain of command 'no,' for fear of repercussions." At about the same time and in a similar light, a U.S. Navy air

advisor at Kandahar, CDR Bruce J. Webb, expressed his view that in terms of the prioritization of missions, some of which could be accomplished by ground convoy, the AAF leadership "still think of a helicopter as a truck." Those concerns continued.⁶⁶

One major contributor to the AAF's C2 problems – or at least to the U.S.-coalition advisors' problems with the Afghans' system – was the practice of what some air advisors called "cell phone" C2. In 2010, the outgoing 438 AEW commander, General Boera, wrote, "Unfortunately, a key strategic area in which there was little improvement this past year was in the area of command and control.... We must be careful not to try and make the [Air Command and Control Center] a western air and space operations center (AOC), but they need to have something more effective than the current 'cell phone' C2." In his end-of-tour report in August 2011, 438 AEW commander Brig Gen David W. Allvin referred to the practice and pointed to "the government leadership and external actors with influence" as the chief perpetrators. The lion's share of the incidents involved the AAF's wing at Kabul, not Kandahar, and especially not Shindand where dedicated flying training remained the clear priority. In another paper, General Allvin noted that the AAF's command and control relied on "a combination of 'day-prior' scheduling and 'morning of' cell-phone tasking." A year later, in August 2012, General Allvin's successor, Brig Gen Timothy M. Ray, discussed the Afghans' "desire for short-notice or 'cell phone' taskings; many of which were direct phone calls from Afghan senior leaders *to the actual aircrew within the aircraft.*" Understating the case, General Ray offered that such taskings "do not account for campaign requirements and usually adhered to an underlying patronage system."⁶⁷

The 438 AEW commanders between 2013 and 2015, Brig Gen John E. Michel and Brig Gen Michael D. Rothstein, acknowledged the widespread continuation of cell-phone C2. Early in 2018, General Rothstein (by then a major general) recalled it was not necessarily the practice of using cell phones that was the real issue – it was that such a system had potential for poor operational decisions to be made in order "to preserve [the] relationship," which was always the priority in Afghan culture. In short, relationships trumped tactics, with which General Ray's assessment agreed in different words. Relationships also trumped Western-defined effectiveness, a cultural reality perhaps forgotten for the moment when General Boera wrote that the Afghans needed "something more effective than the current 'cell phone' C2." *Effectiveness* itself was culturally-defined.⁶⁸

But rather than trying to dissuade the AAF from relying on cell phones, General Rothstein had preferred to look for ways to help them do it well. Retired General Michel opined that it was probably unrealistic for the Americans to expect the Afghans to relinquish the traditional C2 system, adding that another aspect of anonymous cell-phone C2 was that "those [AAF] assets are great for doing a lot of illicit⁶⁹ things." And most sorties remained opaque to the air advisors.⁷⁰

Conclusions

While this essay merely scratches the surface of the U.S.-coalition air advising experience in Iraq and Afghanistan during the decade from 2005 to 2015, a few tentative conclusions are warranted, despite the ongoing nature of the efforts in both countries. First and foremost, the final chapters remain to be written. Nonetheless, it seems worth pointing out a few challenges faced by the host nations as well as by the United States. Regarding the U.S. partners, on the macro-level the Iraqi and Afghan air forces shared a number of challenges, from their (twentieth-century) Soviet- and (many-centuries') tribal/ethnic/sectarian-influenced cultures to the linguistic barriers and dearth of human capital within their countries. As suggested herein, the challenges appeared to be generally greater in *less-accessible-and-less-literate Afghanistan* than in *nearer-to-the-West-and-more-literate Iraq*. Moreover, those issues were inseparable from the fact that Iraq – although, like Afghanistan, only about a century old as a nation-state – has developed a degree of national consciousness (Kurdistan arguably excepted) that remains mostly unknown in Afghanistan.⁷¹

In 2000, war correspondent Jon Lee Anderson offered his perspective to *The New Yorker's* readers after he asked an Afghan friend about the easy changing of allegiances among Afghans: "In America and other places," Shahmurat said, "people have the idea that their countries are important to them. But in Afghanistan the fighters don't have this notion, and the poverty here leads them to join whoever is powerful." Moreover, the well-known perspective that to be an Afghan is to be Pashtun, obviously denied the majority of those residing within the country's porous boundaries the privilege of considering themselves the equal of their countrymen. And to risk stating the obvious, that attitude was not likely to change soon.⁷²

On the micro-level, both host nations' air forces struggled with the tensions between older and younger airmen who often viewed one another as vying for the same jobs, rightly so to some degree. Leadership issues may also involve the matter of older versus younger airmen and their relative willingness to try new and, to them, untested ap-

proaches. But in at least three areas, 1), women's roles in the air force; 2), the insider threat; and, 3), command and control, the Iraqi Air Force held a clear advantage. In Iraq, the question of female airmen and their roles were not the issues they were in Afghanistan – at least not for the air advising campaign there. Contrast that with Afghanistan, where, unwisely it seems, U.S.-coalition leadership made the integration of females into the AAF a highly publicized matter, with potentially serious consequences for those Afghan women in the limelight. In Iraq, no insider attacks took place in the decade through 2015, although USAF air advisors were not present there from the end of 2011 until mid-2015. But in Afghanistan, after April 2011 the insider threat was never forgotten by the air advisors, who implemented the Guardian Angel protocol immediately thereafter. Certainly, some evidence pointed toward a GA-produced loss of the rapport and trust viewed as critical to successful air advising. And in the critical arena of the C2 necessary for a professional air force, as of 2015 the AAF remained committed to a cell-phone system that perhaps had the potential to work well for them, but all too often appeared to be employed for the personal benefit of Afghan senior leaders. The preserving and nurturing of relationships was always the uppermost priority; operational requirements were, at best, of secondary importance.

For the United States and coalition partners, perhaps one of the most basic questions that must be asked as the air advising campaigns continue, is this: is the real air advisory mission to *set the table* for host nation success on their own, which may or may not happen (even assuming a long-term, but more likely an unending logistics-maintenance support package for Afghanistan), after we go home? Or is the real mission to *prevent the failure* of the IqAF and AAF? As General Rock expressed at the end of 2011 in Iraq, "Some flying squadrons have already shown more discipline than others, but it remains to be seen what senior officials will emphasize in the future. We have provided them with examples and programs to emulate, but establishing and enforcing discipline remains in their own power." And that is the very kind of discipline in a military context that noted classicist and military historian Victor Davis Hanson makes clear, is a Western trait.⁷³ ■

NOTES

1. A relative lack of official documentation, and limited time, necessitated cutting off the study with the year 2015. Since 2009, the official designation is HQ United States Air Forces Central Command (USAFCENT).

2. The other unit was the 370th Air Expeditionary Advisory Squadron at New Al Muthana AB, Iraq, activated in 2007; see Jennifer D. P. Moroney, Kim Cragin, Eric Gons, et al, *International Cooperation with Partner Air Forces* (RAND: Santa Monica, CA, 2009), p. 73. https://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG790.pdf

3. Maj William Brian Downs, "Unconventional Airpower," *Air & Space Power Journal* 19, no. 1 (2005): 20-25. http://www.airuniversity.af.mil/Portals/10/ASPJ/journals/Volume-19_Issue-1-4/spr05.pdf. Sadly, Major Downs was killed in the crash of an Iraqi Comp Air 7 aircraft on May 30, 2005, the event that served as catalyst for a more focused, robust air advising campaign in Iraq;

see George W. Cully, *Adapt or Fail: The USAF's Role in Reconstituting the Iraqi Air Force, 2004-2007* (Air University Press: Maxwell AFB, Ala., 2017), pp. vi-viii, xi, 127-28. https://media.defense.gov/2017/Jun/14/2001763019/-1/-1/B_0147_CULLY_ADAPTER_FAIL.PDF.

4. In January 2007, Lt Gen Gary L. North, the USCENTAF (AFCENT from Feb 08 and USAFCENT from Aug 09) commander, held a teleconference that, for the first time, highlighted the advisory plans for both Iraq and Afghanistan. The Iraqi and Afghan air forces were expected to become capable of conducting effective COIN air operations "in the near term;" see Lt Gen North, "Building Airpower Capacity in Iraq and Afghanistan," briefing slides, Jan 07 (copy at AFHRA, Maxwell AFB, AL).

5. On the air advising mission in Iraq, see Cully, *Adapt or Fail*; on Afghanistan, see Forrest L. Marion, "The Destruction and Rebuilding of the Afghan Air Force, 1989-2009," *Air Power History*

57, no. 2 (2010); and Marion, "Training Afghan Air Force Pilots, 2006-2011," *Air Power History* 63, no. 1 (2016). On the air advisor mission and the USAF's establishment of an academy for the training of air advisors, see Maj Gen Timothy M. Zadalis, "The Air Advisor: The Face of US Air Force Engagement," *Air & Space Power Journal* 27, no. 4 (2013). http://www.airuniversity.af.mil/Portals/10/ASPJ/journals/Volume-27_Issue-4/SLP-Zadalis.pdf. For a focus on aircrew and maintenance training and on rotary- and fixed-wing train-advice programs in both countries, see Maj Gen Michael A. Keltz, "Getting Our Partners Airborne," *Air & Space Power Journal* 28, no. 3 (2014). http://www.airuniversity.af.mil/Portals/10/ASPJ/journals/Volume-28_Issue-3/SLP-Keltz.pdf. A recent work that includes Iraq and Afghanistan (mainly the advising of ground forces) is Antonio Giustozzi, and Artemy M. Kalinovsky, *Missionaries of Modernity: Advisory Missions and the Struggle for Hegemony in Afghanistan and Beyond* (Hurst and Co.: London, 2016). For coverage of ISIS in Iraq, see "Syria Iraq: The Islamic State militant group," *BBC News*, Aug. 2, 2014, accessed January 27, 2018, <http://www.bbc.com/news/world-middle-east-24179084>.

6. The de facto date was a judgment call. Some sources use 1921, but it was arguably a Russian-air-force-at-Kabul at that early point.

7. William R. Polk, *Understanding Iraq: The Whole Sweep of Iraqi History, from Genghis Khan's Mongols to the Ottoman Turks to the British Mandate to the American Occupation* (Harper-Collins Publishers: New York, 2005), pp. 69-70; Brian Robson, *Crisis On The Frontier: The Third Afghan War and the Campaign in Waziristan 1919-1920* (Spellmount Limited: Brimscombe Port, Stroud, Gloucestershire, Great Britain, 2007 [2004]), pp. xi-xiv; Lennart Andersson, "The First 30 Years of Aviation in Afghanistan," (2 parts), part 1, 2, accessed November 24, 2015, <http://www.artiklar.z-bok.se/Afghanistan-1.html>; Cully, *Adapt or Fail*, p. 3; TSgt Jason Lake, "Iraqi air force leaders thank U.S. advisors, celebrate 80th anniversary," *U.S. Air Forces Central Command News*, Apr. 22, 2011, accessed January 9, 2018, <http://www.afcent.af.mil/News/Article/219484/iraqi-air-force-leaders-thank-us-advisors-celebrate-80th-anniversary/>.

8. Polk, *Understanding Iraq*, pp. 83-84, 99-100, 125-27, including quote 1 (pg. 83, Polk quote of High Commissioner to League of Nations, 1923); Cully, *Adapt or Fail*, p. 3, including quote 2; Phebe Marr, *The Modern History of Iraq* (Westview Press: Boulder, CO, 2012, 3rd ed.), pp. 8, 28-29, 33, 38, 55-56, 65, 82. An interesting video depicting the transfer of authority at RAF Habbaniya from United Kingdom to Iraq is available at <https://www.youtube.com/watch?v=psXIPO-TWME> (Jan. 9, 2018) [Although the video is entitled, "RAF Bases in Iraq (1955), the actual transfer of the base occurred in 1959]. In 2010, U.S. and Iraqi airmen briefly considered relocating Iraqi Air Force flying training from Kirkuk to the old Habbaniya air base but instead decided on Tikrit; see Paul G. Cepeda, *History of the 321st Air Expeditionary Wing* (321 AEW: Baghdad, Iraq), Apr 10, Narrative [all 321 AEW histories cited herein are held at AFHRA].

9. Note the official designation of the Afghan air service has changed several times over the decades. For simplicity, I have elected to use "Afghan Air Force (AAF)" throughout this essay. In 2010, the Afghan National Army Air Corps was redesignated by President Karzai the Afghan National Army Air Force. Since 2010, typically, it has been referred to by the U.S.-coalition air advisors as the Afghan Air Force or AAF.

10. Marr, *Modern History of Iraq*, pp. 93, 106-107, 112, 124, 146, 185; Cully, *Adapt or Fail*, pp. 3-5.

11. Marr, *Modern History of Iraq*, pp. 144, 149-50, 175, 210-11, 217. Note Marr's assessment that the "high tide of Soviet-Iraqi cooperation came with the conclusion of the Iraqi-Soviet Friendship Treaty of 1972," which called for cooperation in military, political, and economic matters. "But the relationship soon cooled," wrote Marr (146). By the late 1970s, Iraqi trade with the West increased while the Soviet bloc's share dropped to 5 percent of Iraq's total trade (165).

12. From 1879 to 1919, Afghan foreign affairs were directed by the British viceroy of India; see Sara Koplik, *A Political and Economic History of the Jews of Afghanistan* (Brill: Leiden and Boston, 2015) [vol. 54 of Brill's Series in Jewish Studies], 53. The new Afghan king, Amanullah, was "strongly anti-imperialist and therefore anti-British"; see Leon B. Poullada, *Reform and Rebellion in Afghanistan, 1919-1929: King Amanullah's Failure to Modernize a Tribal Society* (Cornell University Press: Ithaca and London, 1973), p. 234.

13. Poullada, *Reform and Rebellion in Afghanistan*, p. 230, including quote (chapter 10 covers relations with Russia, chapter 11 with the United Kingdom).

14. Poullada, *Reform and Rebellion in Afghanistan*, chapter 11.

15. Poullada also served as Ambassador to Togo under the Kennedy administration; see "Leon B. Poullada, Ex-Envoy and Afghan Expert, is Dead," *New York Times*, Jul. 23, 1987, accessed January 16, 2018, <http://www.nytimes.com/1987/07/23/obituaries/leon-b-poullada-ex-envoy-and-afghan-expert-is-dead.html>.

16. Poullada, *Reform and Rebellion in Afghanistan*, pp. 230, 237, including quote 1; Andersson, "First 30 Years of Aviation," part 1, 3, including quotes 2-3 (British report quoted by Andersson), and part 2, 1-3. The Shuttleworth Collection's Hawker Hind was acquired in 1970; as of 2009, it still flew. The RAF Museum's Hind was donated in 1967. Two other Hinds went to Canada in 1975. See the Historic Aircraft Collection, Hawker Hind, accessed Nov. 30, 2015, <http://www.historicaircraftcollection.ltd.uk/restorations/hind/>.

17. Marr, *Modern History of Iraq*, pp. 93, 106-107, 112, 124, 146 (1970s), 185 (1980s); Polk, *Understanding Iraq*, p. 101; Cully, *Adapt or Fail*, pp. 52, 121, 123; Marion, "Destruction and Rebuilding of the Afghan Air Force," 24; Discussion (Disc) with Brig Gen Mohammad M. Zahir (Afghan Air Force, Ret.), with Col Forrest L. Marion, USAFR, May 26, 09, Kabul, Afghanistan; Nick Barley, "The NATO Training Mission-Afghanistan: A Game-Changer; Lest We Forget," *Small Wars Journal*, Dec 5, 2015, accessed January 4, 2018, <http://smallwarsjournal.com/jrnal/art/the-nato-training-mission-afghanistan-a-game-changer-lest-we-forget>. By the 1960s, both countries' air forces flew Soviet fighters, helicopters, and transport aircraft. Note also Britain completed its withdrawal from the Arabian Gulf between 1969 and 1971, resulting in the independence of Bahrain, Qatar, and the federated United Arab Emirates.

18. Oral History Interview (OHI), Col Robert J. Rowell (USAF), by author, Dec 14, 2017 (audio-only, AFHRA, Maxwell AFB, AL, call no. K239.0512-2769), including quote. Col Rowell attributed the phrase to Maj Gen Rock, the 321 AEW commander.

19. OHI, Maj Gen Anthony J. Rock (USAF), Oct 17, 2011, including quotes, labeled as "Gen Rock Brief-17 Oct 2011," contained in Robert J. Brown, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Sep 2011; Robert J. Brown, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), 1 Oct-10 Dec 11, CF06, Maj Gen Anthony Rock's end-of-tour report, pp. 10-12, labelled as "111121-321 AEW CC." General Rock also referred to an insightful essay that explained the differing perspectives of Americans and Iraqis; see LTC Brian L. Steed, "Bees and Spiders: Seeing the World from Different Perspectives," *ARMY*, December 2009, pp. 24-25, accessed June 6, 2018, http://www1.usa.org/publications/army-magazine/archive/2009/12/Documents/FC_Steed_1209.pdf.

20. Discussion, Lt Col Frank D. Bryant (USAF), with author, ca. Feb 2011, Kabul, Afghanistan, including quote. AFPAK Hands was the designation of a JCS-managed program beginning in 2009-2010 that sought to deploy Dari-speaking, culturally-at-tuned U.S. personnel to Afghanistan to promote various governmental and military improvements especially through rapport-building and long-term relationships.

21. Richard F. Nyrop and Donald M. Seekins, eds., *Afghanistan, a country study* (The American University: Washington, 1986), p. 113, including quote.

22. Marr, *The Modern History of Iraq*, pp. 18-19; Koplik, *Political and Economic History of the Jews of Afghanistan*, pp. 1, 3, 21. Ko-

plik writes, “The demise of the Afghani Jewish community is a case study of the failure of Afghanistan to embrace the talents of its non-Islamic minorities” (pg. 240).

23. Orit Bashkin, *The Other Iraq: Pluralism and Culture in Hashemite Iraq* (Stanford University Press: Stanford, CA, 2009), 8-9, 265, 269, including quote (pg. 269).

24 Yasmine Mousa, “It’s Iraq but It’s Not, Part 1,” *New York Times*, Jan 6, 2011, including quote 1, accessed January 9, 2018, <https://atwar.blogs.nytimes.com/2011/01/06/its-iraq-but-its-not-part-1/>; Helen Chapin Metz, ed., *Iraq, a country study* (Federal Research Division, Library of Congress: Washington, 1990), p. 84, including quote 2; “Iraqi Kurdistan profile,” *BBC News*, Oct 31, 2017, accessed January 9, 2018, <http://www.bbc.com/news/world-middle-east-28147263>. For another insightful piece by Mousa, see “Unfamiliar Feelings in a Familiar Land,” *New York Times*, Apr 2, 2013, accessed January 9, 2018, <https://atwar.blogs.nytimes.com/2013/04/02/unfamiliar-feelings-in-a-familiar-land/>.

25. Most northern Afghans in the Afghan military were Tajiks, which were over-represented in the armed forces; Tajiks comprised some 27 percent of the population but nearly 41 percent of the army, including 70 percent of the infantry kandak commanders and the bulk of the officer and NCO corps; see Nick Barley, “The NATO Training Mission-Afghanistan: A Game-Changer; Lest We Forget,” *Small Wars Journal*, Dec 5, 2015, accessed June 6, 2018, <http://smallwarsjournal.com/jrnl/art/the-nato-training-mission-afghanistan-a-game-changer-lest-we-forget>.

26. Frank Ledwidge, *Losing Small Wars: British Military Failure in Iraq and Afghanistan* (Yale University Press: New Haven and London, 2011), pp. 99-100, including quote (Sir Sherard Cowper-Coles quoted by Ledwidge).

27. OHI, Col Matthew T. Fritz (USAF), by author, Scott AFB, Ill., Dec 19, 2017, including quote 1 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2770); Curtis L. Swift, *History of the 438th Air Expeditionary Wing* (438 AEW: Kabul, Afghanistan), Oct 2014, Chronology/Narrative, including quote 2 (paraphrase of comment by an anonymous lieutenant colonel to 438 AEW/HO), [all 438 AEW histories cited herein are held at AFHRA].

28. Email, Lt Col Sabine U. Peters, USAF, to author, “RE: IqAF air advisor experiences,” Jan 3, 2018, including quote (copy at AFHRA); Email, Lt Col Sabine U. Peters, USAF, to author, “RE: Document1,” Jan 23, 2018 (copy at AFHRA); Telephone discussion, Lt Col Peters with author, Jan 26, 2018; Email, Lt Col Sabine U. Peters, USAF, to author, “RE: revised para..” Jan 29, 2018 (copy at AFHRA); Email, Lt Col Sabine U. Peters, USAF, to author, “RE: revised para..” Feb 15, 2018 (copy at AFHRA). In August-September 2010, Colonel Peters and one other Iraq Training and Advising Mission-Air Force (ITAM-AF) instructor, and one Defense Language Institute instructor, provided the only English Language Training (ELT) for the IqAF. There were far too few qualified instructors, and the 321 AEW/HO wrote that ELT “... persisted as a significant obstacle to the continued development of the Iraqi Air Force”; see Andrew Billman, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Sep 10, Narrative.

29. Email, Lt Col Sabine U. Peters, USAF, to author, “RE: IqAF air advisor experiences,” Jan 3, 2018, including quote.

30. OHI, Col Petr Cepelka (Czech Republic Air Force), by author, Maxwell AFB, Ala., Feb 23, 2016, including quote (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2746).

31. Nick Barley, “The NATO Training Mission-Afghanistan: A Game-Changer; Lest We Forget,” *Small Wars Journal*, Dec 5, 2015, accessed January 4, 2018, <http://smallwarsjournal.com/jrnl/art/the-nato-training-mission-afghanistan-a-game-changer-lest-we-forget>, including quote 1; OHI, Lt Col John P. Conmy (USAF), by author, Fort Belvoir, Va., Sep 22, 2014, including quote 2 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2726); OHI, Col Jaroslav Falta (Czech Republic Air Force), by author, Maxwell AFB, Ala., Feb 1, 2017 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2758); OHI, Col Fred C. Koegler (USAF), by author, Maxwell AFB, Ala., Apr 16, 2015 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2734).

32. Robert J. Brown, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), 1 Oct-10 Dec 11, CF06, Maj Gen Anthony Rock’s end-of-tour report, pp. 9-10.

33. Telephone discussion, Lt Col Peters with author, Jan 26, 2018. Peters’ student who went on to fly the F-16 had instructed in the T-6 at Tikrit.

34. Emails, Lt Col Sabine U. Peters, USAF, to author, “RE: revised para..” Jan. 29, 1-2 Feb 18, including quote (copy at AFHRA).

35. Telephone discussion, Col Mark W. Haberichter (USAF), with author, Aug 26, 2016; OHI, Col Fred C. Koegler (USAF), Apr 16, 2015; Curtis L. Swift, *History of the 438 AEW* (438 AEW:Kabul, Afghanistan) Nov 14, Chronology.

36. His full rank and name were Staff Lt Gen Anwar Hamad Amen Ahmed. The advisors generally referred to him as “General Anwar.”

37. Thomas L. Raab, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), May-Jun 09, Narrative, including quote 1 (Storey paraphrased by 321 AEW/HO); OHI, Col Matthew T. Fritz (USAF), 19 Dec 17, including quote 2; Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 13, CF15, Memo, Brig Gen Boera, “End of Tour Report,” para. 6, including quote 3 (AFHRA, Maxwell AFB, AL, 533.82, Jun 2013-Nov 2013); OHI, CAPT George H. Slook (USN, Ret.), by author, Leesburg, VA, Apr 26, 2016, including quote 4 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2749); OHI, CAPT Christopher M. Mills (USN), by author, Joint Base McGuire-Dix-Lakehurst, NJ, Apr 27, 2016 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2751).

38. Silvano A. Wueschner Ph.D., *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Dec 09, CF20, Maj Gen Robert C. Kane interview, Oct 7, 2009 (contained in Dec 2009 history), by Dr. Silvano Wueschner, 321 AEW/HO, including quote 1, and Narrative, including quote 2.

39. There were rival factions among the Kurds, which Saddam Hussein used to his advantage on at least one occasion, in 1996; see Polk, *Understanding Iraq*, pp. 165-66. The Iraqi Air Force was heavily Sunni in terms of ethnicity. Even though the U.S.-coalition did not pursue ethnic balancing in Iraq as they did in Afghanistan, they tracked ‘who-was-who’ in terms of ethnicity at least among the more senior or influential Iraqis; Telephone discussion, Col Christian G. Watt (USAF), with author, Jan 16, 2018. In 2009-2010, Watt served as the Expeditionary Mission Support Advisory Group (EMSAG) commander in Iraq. At least on occasion, air advisors observed what they considered evidence of Iraqi partiality based on ethnicity, as in a decision that hindered Gen Anwar’s leading of the IqAF; see OHI, Col Clayton B. Bartels (USAF), by author, Maxwell AFB, AL, Feb 1, 2018 (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2772).

40. Marr, *The Modern History of Iraq*, 233-34, 248, 254, 281, 293, 311-12; OHI, Col Matthew T. Fritz (USAF), Dec 19, 2017; OHI, Col Robert J. Rowell (USAF), Dec 14, 2017.

41. Email, Lt Col Sabine U. Peters, USAF, to author, “RE: revised para..” Feb 15, 2018, including quote.

42. In fairness, note that the insurgency in Afghanistan in 2014 when the conference was being planned was relatively stronger than the Iraqi insurgency had been at the time of Anwar’s conference in 2009. The insurgency in Iraq had dropped off to a relatively manageable level well prior, by mid-2008; see Thomas L. Raab, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), May-Jun 2009, Narrative.

43. Curtis L. Swift, *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Dec 2014, Narrative, including quote; OHI, Maj Gen Michael D. Rothstein (USAF), by author, Jan 18, 2018 (audio-only, AFHRA, Maxwell AFB, AL, call no. K239.0512-2771). The AAF commander at that time was Maj Gen Abdul Wahab Wardak. The advisors generally referred to him as “General Wahab.”

44. Email, Col Jonathan R. VanNoord, USAF, to author, “RE: IqAF advisory duty,” Jan 16, 2018, including quote 1 (copy at AFHRA); Silvano A. Wueschner Ph.D., *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Dec 2009, CF20, Kane interview, Dec

8, 2009, by Dr. Silvano Wueschner, 321 AEW/HO, including quote 2; Thomas L. Raab, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), May-Jun 09, Narrative; OHI, Col Clayton B. Bartels (USAF), Feb 1, 2018. Another example of Iraq's army-centric defense ministry was its decision to halt IqAF recruiting in late 2008.

45. Silvano A. Wueschner Ph.D., *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Dec 2009, CF20, Kane interview, Dec 8, 2009, by S. Wueschner, including quote; Cully, *Adapt or Fail*, pp. 9-10, 12, 25, 27, 33.

46. OHI, Col Rhude Cherry III (USAF), by author, Shaw AFB, SC, Jun 8, 2017, including quote (audio-only, AFHRA, Maxwell AFB, Ala., call no. K239.0512-2762); OHI, CAPT George H. Slook (USN, Ret.), Apr 26, 2016.

47. OHI, CAPT George H. Slook (USN, Ret.), Apr 26, 2016; OHI, Brig Gen John E. Michel (USAF, Ret.), by author, Maxwell AFB, Ala., Apr 14, 2016 (audio-only, AFHRA, Maxwell AFB, AL, call no. K239.0512-2748); Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, Chronology; Catherine Dale, *Operation Iraqi Freedom: Strategies, Approaches, Results, and Issues for Congress* (Congressional Research Service: Washington: [updated] 28 Oct 08), CRS-111. In Michel's words, many Afghan defense ministry army generals viewed the AAF as basically another army corps, or even a "little start-up" operation.

48. Polk, *Understanding Iraq*, pp. 50-51, including quote; OHI, Col Robert J. Rowell (USAF), Dec 14, 2017; OHI, Col Matthew T. Fritz (USAF), Dec 19, 2017; OHI, Col Clayton B. Bartels (USAF), Feb 1, 2018. Air advisors who shared the above observation included Rowell, Fritz, Bartels, and Watt. Further, referring to the effects on Iraqi women from the war with Iran in the 1980s, Marr wrote, "The Ba'th position on women was relatively progressive to start with, encouraging their education, literacy, and professional advancement" (*The Modern History of Iraq*, 206).

49. Ahmed Rashid, *Taliban: Militant Islam, Oil and Fundamentalism in Central Asia* (Yale University Press: New Haven and London, 2000), p. 182, including quote 1; Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, Chronology, including quote 2; OHI, Col Matthew T. Fritz (USAF), Dec 19, 2017; Email, Maj Melissa Moon-Brown (USAF, Ret.), to author, "RE: Requested Information," Jun 14, 2016. Rahmani's given name was also rendered "Niloofar." For more on Rahmani, see also Danielle Moylan, "Meet Afghanistan's first female fixed-wing pilot," *Al Jazeera*, Nov 9, 2015, accessed December 28, 2017, <http://www.aljazeera.com/programmes/women-make-change/2015/11/meet-afghanistan-female-fixed-wing-pilot-151106124527043.html>; Jawad Sukhanyar, "Afghan Response to Female Pilot's U.S. Asylum Case: 'I Am Sure She Lied,'" *New York Times*, 25 Dec 16, accessed 28 December 2017, http://www.nytimes.com/2016/12/25/world/asia/afghanistan-niloofar-rahmani-asylum-air-force-pilot.html?_r=0.

50. Poullada, *Reform and Rebellion in Afghanistan*, pp. 84-86, 108, 273-74, including quote (pg. 84); Daniel P. Bolger, *Why We Lost: A General's Inside Account of the Iraq and Afghanistan Wars* (Houghton Mifflin Harcourt: Boston, New York, 2014), p. 399; Koplik, *Political and Economic History of the Jews of Afghanistan*, p. 241.

51. *Joint Publication 3-22, Foreign Internal Defense* (Washington: Joint Chiefs of Staff, 12 Jul 2010), VI-38, including quote [the identical quote was in the preceding *Joint Publication 3-07.1, Joint Tactics, Techniques, and Procedures for Foreign Internal Defense (FID)* (Washington: Joint Chiefs of Staff, Apr 30, 2004), V-30]; Author's observation, 438 AEW/HO, Feb-May 2011. Another culturally problematic arena on the U.S. side concerned contract requirements. In September 2014, Afghan maintainers had to wait until the following day to change a blown tire on a Cessna C-208 Caravan because the contract required program management office approval before allowing the Afghans to perform the work. In a similar scenario one month earlier, Afghan maintainers had changed a tire in under an hour, but it was unknown whether the requisite approval had been secured in that instance;

see Robert A. Michel, *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Sep 2014, Chronology, including quote 2; Robert A. Michel, *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Aug 2014, Chronology.

52. While the search was not exhaustive, I found no mention of "force protection" in the context of potential insider or green-on-blue attacks in the 321 AEW official documentation I reviewed. The Joint Staff revised Joint Publication 3-10, *Joint Security Operations in Theater*, in 2006 (first update in a decade) and 2010 before addressing the insider threat in the 2014 edition. Although the terms "green-on-blue" and "insider" are interchangeable in the context of attacks by partner forces on US military members, "insider" sees broader usage in describing the threat of US members accessing defense information systems to conduct espionage, sabotage, or fraudulent activities or for commercial gain.

53. One advisor recalled that, at the U.S.-controlled bases, IqAF airmen received personal weapons just prior to flying a mission; Telephone discussion, Col Christian G. Watt (USAF), with author, Jan 16, 2018.

54. OHI, Col Matthew T. Fritz (USAF), Dec 19, 2017; OHI, Col Robert J. Rowell (USAF), Dec 14, 2017. Ali and Tikrit were U.S.-controlled bases; Rustamiyah and New al Muthana were Iraqi-controlled bases; Telephone discussion, Col Christian G. Watt (USAF), with author, Jan 16, 2018. This topic is covered at length in Forrest L. Marion, *FLIGHT RISK: The Coalition's Air Advisory Mission in Afghanistan, 2005-2015* (Naval Institute Press: Annapolis, Md., 2018), chapter 4. The Afghan officer wore the honorary rank of colonel or lieutenant colonel (depending on the source), but was paid as a captain.

55. The Guardian Angel force protection protocol implemented in Afghanistan was different from the USAF's Guardian Angel weapon system that encompassed the traditional enlisted Pararescueman (PJ); since 2000, an officer specialty known as Combat Rescue Officer (CRO); and the Survival-Evasion-Rescue-Escape (SERE) specialist. This community focused on the rescue/recovery of personnel from 'outside the wire.' In May-June 2003, the CSAF, Gen John P. Jumper, designated PJ/CRO/SERE as the Guardian Angel weapon system.

56. Immediately following the insider attack at Kabul on Jan 29, 2015, then-Brig Gen Rothstein pursued permission for the arming of those contractors who, in most cases as former military members, previously had completed qualifications for arming; see OHI, Maj Gen Michael D. Rothstein (USAF), Jan 18, 2018.

57. Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, CF15, Memo, Brig Gen Alvin, "End of Tour Report," Aug 26, 2011; Author's firsthand discussions / observations including those as 438 AEW/HO, Feb-May 2011. Even prior to Apr 27, 2011, air advisors at Kandahar typically carried their weapons with a round in the chamber when working on the AAF compound; see OHI, Col Fred C. Koegler (USAF), Apr 16, 2015. In some cases, insider attacks may have had strategic ramifications; see Deb Riechmann and Slobodan Lekic, "Can NATO force weather France's faster exit?," *Associated Press Writers*, Jan 29, 2012, accessed January 4, 2018, <http://www.thereporteronline.com/article/RO/20120129/NEWS05/301299998>. France suffered the loss of two French Foreign Legion members to an insider attack on Dec 29, 2011, and the loss of four soldiers, also at the hands of an Afghan soldier, on Jan 20, 2012.

58. Barbara Salazar Torreon, *U.S. Periods of War and Dates of Recent Conflicts* (Congressional Research Service: Washington, DC, 11 Oct 2017), pp. 7-9.

59. OHI, Col Rhude Cherry III (USAF), Jun 8, 2017, including quotes. Similar comments were made by two Combat Aviation Advisors, see OHI, Lt Col Bryan F. Raridon (USAF), by author, Duke Field, FL, Jul 27, 2017 (audio-only, AFHRA, Maxwell AFB, AL, call no. K239.0512-2763); official biography, Lt Col Bryan F. Raridon (USAF) (copy at AFHRA); OHI, Lt Col John J. Contreras (USAF), by author, Duke Field, FL, Jul 27, 2017 (audio-only, AFHRA, Maxwell AFB, AL, call no. K239.0512-2764); official biography, Lt Col John J. Contreras (USAF) (copy at AFHRA).

- 60.** OHI, Col Rhude Cherry III (USAF), Jun 8, 2017, including quote 1; OHI, Col Fred C. Koegler (USAF), Apr 16, 2015, including quote 2; Bolger, *Why We Lost: A General's Inside Account of the Iraq and Afghanistan Wars*, pp. 399, 410, including quotes 3-4; Diana Preston, *The Dark Defile: Britain's Catastrophic Invasion of Afghanistan, 1838-1842* (Walker & Co.: New York, 2012), pp. 191, 199, 205, 208, 215, including quote 5; Poullada, *Reform and Rebellion in Afghanistan*, pp. 1-2, 4, 25; Abubakr Asadulla, "Ghilzai Afghans," *Khyber.ORG*, Aug 13, 2009, accessed January 27, 2018, http://www.khyber.org/tribes/info/Ghilzai_Afghans.shtml. The author of the above piece states, "The Ghilzai Pashtuns were the most dominant Pashtun tribe from 1000 AD until 1747 AD when power shifted to the Durranis."
- 61.** Lisa Lundquist, "Afghan soldier attacks Slovak troops at Kandahar airfield," *Long War Journal*, Jul 9, 2013, accessed January 25, 2018, https://www.longwarjournal.org/archives/2013/07/afghan_soldier_wound.php; Meer Agha samimi, "Slovakian killed in insider assault," *Pajhwok Afghan News*, Jul 10, 2013, accessed July 25, 2018, <https://www.pajhwok.com/en/2013/07/10/slovakian-killed-insider-assault>; Sudarsan Raghavan and Missy Ryan, "3 Americans killed in shooting at Kabul military hub," *Washington Post*, Jan 29, 2015, accessed January 25, 2018, https://www.washingtonpost.com/world/3-foreign-contractors-afghan-national-killed-in-shooting-at-kabul-airport/2015/01/29/4976758a-a7e9-11e4-a06b-9df2002b86a0_story.html; Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, Chronology; Dan Lamothe, "Maj Gen Harold Greene isn't the first fatality: A history of U.S. generals killed in combat," *Washington Post*, Aug 5, 2014, accessed January 8, 2018, https://www.washingtonpost.com/news/checkpoint/wp/2014/08/05/maj-gen-harold-greene-isnt-the-first-fatality-a-history-of-u-s-generals-killed-in-combat/?hpid=z2&tid=a_inl; Dan Lamothe, "New details emerge about death of Maj Gen Harold Greene, killed in Afghanistan," *Washington Post*, Aug 6, 2014, accessed January 8, 2018, <https://www.washingtonpost.com/news/checkpoint/wp/2014/08/06/new-details-emerge-about-death-of-maj-gen-harold-greene-killed-in-afghanistan/>; Bill Roggio and Lisa Lundquist, "Green-on-blue attacks in Afghanistan: the data," *Long War Journal*, 23 Aug 12 [data last updated 7 May 16], accessed December 5, 2017, [http://www.longwarjournal.org/archives/2012/08/green-on-blue_attack.php#timeline](https://www.longwarjournal.org/archives/2012/08/green-on-blue_attack.php#timeline).
- 62.** Lt Gen North's briefing in January 2007 listed C2 as the number 4 priority for the IqAF (slides 5, 7, 12) and included airborne command and control as the fifth "capability" expected of the AAF (slide 13). The coalition advisory effort in Iraq predicated that in Afghanistan by 18 months and was considerably more robust. Inexplicably, C2 development was not identified as a priority for the AAF in North's briefing, although it became so in later years; see David W. Allvin, "Afghan Air Force Professionalization Program," Jun 17, 2011, pp. 1-5 [unpublished paper for use by NTM-A, CSTC-A, and NATC-A] (copy at AFHRA); [John E. Michel], *Afghan Airpower for Today... & Tomorrow: The Afghan Air Force Master Plan – Our Story 2013-2017* (NATO Air Training Command-Afghanistan, 13 May 14), pp. 23, 25, 48-50 (copy at AFHRA).
- 63.** Michael D. Barbero, "Deputy Commander's Corner," *The Advisor* [U.S. Forces-Iraq], vol. 7, no. 8 (Aug 2010), including quote; Thomas L. Raab, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), May-Jun 09, Narrative; Daniel A. DeForest, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), Jul 10, CF13 (IAOC Morning Briefs).
- 64.** Liz Sly, "Iraq Borders at Risk in Pullout," *Los Angeles Times*, 1, Aug 12, 2010, including quote; Jim Garamone, "U.S. mission in Iraq officially changes Sept. 1," *Air Force Print News*, Aug 19, 2010.
- 65.** Forrest L. Marion with Gregory A. Roberts, "The Other Face of Air Power: 'Afghan Rescue 705 Flight,' July 28-29, 2010," *Air Power History*, vol. 59, no. 1 (Spr 2012), 20-33.
- 66.** Robert A. Michel, *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Aug 10, Chronology/Narrative, including quotes 1-3, and CF04, "738 AEAG Daily Summary, including quote 4. Col Cherry affirmed Roberts' "cars in the garage" assessment.
- 67.** Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, CF15, Memo, Brig Gen Michael R. Boera, "End of Tour Report," Sep 1, 2010, para. 6, including quotes 1-2 (quote 1, quoted by Boera); Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 13, CF15, Memo, Brig Gen Allvin, "End of Tour Report," Aug 26, 2011, including quote 3; Allvin, "Afghan Air Force Professionalization Program," Jun 17, 2011, p. 5, including quote 4; Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, CF15, Memo, Brig Gen Ray, "End of Tour Report," Aug 15, 2012, including quotes 5-6 [emphasis added]. In Iraq, one air advisor recalled that IqAF personnel below the grade of general were not allowed cell phones at his base, which was Combined Operating Base Speicher at Tikrit; see OHI, Col Robert J. Rowell (USAF), Dec 14, 2017. Two other air advisors recalled the Iraqis generally carried cell phones, at least at their bases; Email, Col Jonathan R. VanNoord, USAF, to author, "RE: IqAF advisory duty," Jan 16, 2018; OHI, Col Clayton B. Bartels (USAF), Feb 1, 2018. In Iraq, the cell-phone question may have varied over time and location. That patronage systems or networks were very much a part of Iraqi culture was acknowledged in a study of the Iraqi national elections of 2005 and 2010. The author of the study concluded that in Iraq's recent experience with elections, "the dynamics of the political process...have evolved since 2003 in such a way as to put a very low premium on the idea of government service as a career or profession based on a disinterested view of the public good...in the new Iraq...the state and its institutions are increasingly run as fiefdoms to serve private interests and a local clientele of beneficiaries. ...The danger in the long term is...that state institutions are being emptied of any real authority, in favor of the connections and patronage networks that underlie them and that run them behind the scenes"; see Kanan Makiya, "The Iraqi Elections of 2010 – and 2005," Middle East Brief, Brandeis University, Crown Center for Middle East Studies, Jun 2010, no. 42, 6, accessed June 6, 2018, <https://brandeis.edu/crown/publications/meb/MEB42.pdf>.
- 68.** OHI, Maj Gen Michael D. Rothstein (USAF), Jan 18, 2018, including quote 1; Paul J. Hibbeln Ph.D., *History of the 438 AEW* (438 AEW:Kabul, Afghanistan), Jun 2013, CF15, Memo, Brig Gen Michael R. Boera, "End of Tour Report," Sep 1, 2010, para. 6, including quote 2.
- 69.** 'Illicit' was a culturally dependent term. In traditional Afghan culture, preserving and nurturing influence with one's tribal connections was the right thing to do, and the Mi-17 helicopter was a perfect vehicle for doing so. It had a large hauling capacity and could land almost anywhere, especially just outside a remote village where it was heard and seen by all. The villagers also were well aware that it had arrived at the command of a tribal senior leader, who in many cases happened also to wear an Afghan army uniform or to serve in the defense ministry/general staff. Such Mi-17 sorties were examples of "wasta," an Arabic term encompassing power, influence, nepotism, clout, and, as one advisor expressed, "street cred" (OHI, Col Clayton B. Bartels (USAF), Feb 1, 2018). See also Rena [or Rana] Feghali, "Wasta: Connections or Corruption in the Arab World?," *Nardello and Co.*, April 2014, accessed September 27, 2017, <http://www.nardelloandco.com/insights/item/142-wasta-connections-or-corruption-in-the-arab-world>.
- 70.** OHI, Brig Gen John E. Michel (USAF, Ret.), Apr 14, 2016, including quote; OHI, Maj Gen Michael D. Rothstein (USAF), Jan 18, 2018.
- 71.** Bashkin, *The Other Iraq*, pp. 268-69.
- 72.** Jon Lee Anderson, "The Surrender," *New Yorker*, Dec 10, 2001, accessed January 4, 2016, <http://www.newyorker.com/magazine/2001/12/10/the-surrender>, including quotes.
- 73.** Robert J. Brown, *History of the 321 AEW* (321 AEW:Baghdad, Iraq), 1 Oct-10 Dec 11, CF06, Maj Gen Anthony Rock's end-of-tour report, 15, including quote. For Hanson's argument, see his *Carnage and Culture: Landmark Battles in the Rise of Western Power* (Anchor Books: New York, 2001).

U.S. Mini-air War Against North Vietnam: Protective Reaction Strikes, 1968-1972



An F-105F Wild Weasel of the 17th Wild Weasel Squadron at Korat Royal Thai Air Base. Of the aircraft that accomplished the Iron Hand mission during PDA, F-105F/G, A-7E and A-6A aircraft, only the Thunderchief expended the AGM-78 Standard Arm. F-105F 38301/ZP has an AGM-45A Shrike under both wings and an AGM-78 under the right. (via Leo Callahan)

Theo van Geffen

After President Lyndon Johnson had restricted the bombing of North Vietnam to south of 20°N on April 1, 1968, it was further restricted to south of 19°N three days later. Johnson further announced on October 31 that all combat operations over North Vietnam (NVN) would be stopped effective 9 p.m., November 1 (H, Hawaii time; in South Vietnam it was 18 hours later). It was no surprise that North Vietnam would make grateful use of it. Neither, that the US would respond as it was a threat to a further American withdrawal from South Vietnam. This cat-and-mouse game would continue into April 1972, when, after the North Vietnamese had invaded the South again, large scale US attacks on North Vietnam were initiated. In the end, it cost 7th Air Force Commander, Gen John Lavelle, his job.

Moving cautiously, the Joint Chiefs of Staff (JCS) initiated a new manned aerial reconnaissance program, TESTER, for intelligence purposes and to determine North Vietnam's intentions and reactions with regard to the program. Its objective was to remain somewhat aware of North Vietnam's resupply activities, troop build-up and threat development towards US and allied forces south of the Demilitarized Zone (DMZ, between North and South Vietnam).

Escort

TESTER I missions began on November 4 with single RF-4Cs of the 432nd Tactical Reconnaissance Wing at Udorn Royal Thai Air Base (RTAB), flying high-speed, shallow penetrations of North Vietnam's southern panhandle. Although the Phantoms flew unescorted, Electronic Warfare (EW), Search and Rescue (SAR), flak suppression and Iron Hand aircraft orbited over Laos to support each TESTER mission when necessary. If North Vietnam reacted to their presence, the Phantom crew had to withdraw at once. Fourteen TESTER sorties had been ignored by the North Vietnamese before an RF-4C was fired upon by Anti-Aircraft Artillery (AAA) near Dong Hoi on November 8. The first such reaction had occurred the previous day when a Navy RA-3B Skywarrior was fired upon during a night sortie in Route Package (RP) III.

It was then decided to escort each RF-4C by one to two F-4Ds. Their crews were under orders to expend their ordnance only in support of RESCAP operations in case one of the aircraft was shot down. On November 10, the first of the TESTER II missions were flown.

On November 23, while on a recce mission of Route 1036 and a Surface-to-Air Missile (SAM) site in Route Package I, a Udorn 14th Tactical Reconnaissance Squadron (TRS) RF-4C (Triton 01, 60445) was downed by heavy 37/57mm AAA. Launched SAR forces were unable to recover the crew. As a result of the loss, Pacific Command increased the fighter escort to at least two fighter aircraft configured with, among others, CBUs and air-to-air missiles. The weapons were to be expended against AAA or SA-2 sites only whenever the flight received enemy reactions of a sufficient intensity that



F-105Fs were configured with a KA-71 panoramic camera under the nose. This photo, made by such a camera, shows on the right just a little part of the nose of the 650-gallon fuel tank under the fuselage of the Wild Weasel. Just moments prior to this, the pilot had fired, via the so-called loft launch method, an AGM-45 against a SA-2 Fan Song radar. Just prior to the 90 seconds, normally the flight time for the Shrike for that method, the radar went 'off the air'. The condensation line of the Shrike can be seen in the right and left upper corner. The crew of the aircraft consisted of Maj Norm Powell (pilot) and Capt John Gibbons (EWO). (USAF, via Major Norm Powell)

would hinder the recce mission. These missions became known as Protective Reaction Strikes (PRS). Initially they were few in number and small in size. There were three categories, (1) those in response to enemy attacks against US recce missions over NVN; (2) those reacting to cross-border AAA and SAM attacks against US aircraft operating in Laos (cross-border firings already took place in November and December 1968); and (3) those directed against active NVN radars which threatened US aircraft. Two days later, on November 25, the Air Force lost another Phantom, this time an F-4D escort of Udorn's 555th Tactical Fighter Squadron (Grommet 02, 67523) which was hit by 37mm AAA. The US lost a second aircraft that day when a Navy RA-5C Vigilante, Old Kentucky 113, of *USS Constellation*'s Reconnaissance Heavy Attack Squadron (RVAH) 5 was hit by 37/57mm AAA northwest of Vinh. In both cases SAR forces were unable to recover the four crewmembers. In November, the USAF flew 83 TESTER RF-101C/RF-4C photo recce sorties over North Vietnam. Photo coverage indicated, among others, heavy (rail)road reconstruction, transportation of massive amounts of supplies and equipment even during daylight without any attempt of camouflage or concealment and transshipment activity.

The Air Force, Navy and Marines flew 220 photo recce sorties in North Vietnam in December with North Viet-

namese reactions to twenty-nine sorties. It looks like the first Protective Reaction Strikes were flown in December. For instance, four F-4Ds struck overly aggressive AAA sites just north of the DMZ, while two F-4Ds dropped ordnance in a SAR effort. A total of forty-eight 750-lb bombs, twelve CBU pods and four napalm bombs were expended.

1969

The number of F-4D escorts was reduced from two to one on April 17. In less than a month, the number was increased again to two for recce sorties north of 17°15'N (May 10). The Air Force lost another aircraft in North Vietnam, when on June 5, an RF-4C (Taksan 01/60388) from Udorn was downed by 57mm AAA near Dong Hoi. The crew was able to maneuver the aircraft over the Gulf of Tonkin where they ejected and were recovered. The Marine Corps lost an F-4B (149416) of Marine Air Group (MAG) 11 to unknown causes. The Phantom was escorting a Marine RF-4B in lower RP I. The crew was listed as missing.

In June, 205 photo recce sorties were flown over the North, of which 121 were by USAF aircraft. Analysis of the results revealed that the North Vietnamese continued to move supplies south toward South Vietnam. Quang Khe maintained a major transshipment point and received supplies moved by coastal shipping (large ships and POL ships were observed) and land traffic.

Recce sorties were not only flown by AF RF-101C/RF-4C, Navy RA-5C/RF-8G/J and Marine RF-4B aircraft, but also by Strategic Air Command's GIANT SCALE SR-71As and BUMPY ACTION drones. However, SAC recce covered all of North Vietnam. For instance, in September, the SR-71 flew nine sorties; the drones twenty-six, of which sixteen over RP V and VI. Six drones were lost of which five while performing low altitude recce and one during recovery.

October had seen thirty-one reactions against US aircraft of which three over North Vietnam against two RF-4Cs and one RF-8J. The other twenty-eight were against aircraft operating in Laos by AAA sites within North Vietnam, the highest number recorded in one month. As a result, on November 4, eighteen F-105s from Korat and Takhli and thirteen F-4s from Ubon and Udorn struck AAA sites near the Mu Gia Pass in North Vietnam. Their mission was to discourage cross border firing against US

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To have at least some idea what the North Vietnamese were doing after the bombing halt of November 1, 1968, the US primarily used tactical photo reconnaissance to accomplish this. The majority of the USAF recce sorties were flown by RF-4C Phantoms of Udorn's 14th Tactical Reconnaissance Squadron. The photo shows RF-4C 80609/OZ which is being refueled by KC-135A 71463, probably prior to flying a recce sortie over North Vietnam with the South China Sea below the aircraft.

aircraft operating in Laos. Ordnance expended included 136/500-lb bombs, 4/AGM-12Cs, and 8/2,000-lb bombs. Bomb Damage Assessment (BDA) included five 37mm guns silenced and two damaged, four 23mm guns silenced, 13 trucks destroyed and 12 roads cut.

The Air Force flew a total of 211 strike sorties in the North in 1969. One hundred-and-seventy-four were flown in the first six months, of which ninety came in May and sixty-six in June. Thirty-seven were flown in the July-December period with thirty-one in November.

1970

Ordnance expending strike sorties in North Vietnam numbered forty, of which thirty-four took place in the first half of the year. F-4Ds flew thirty sorties and F-105s ten. In addition, Phantoms and Thunderchiefs expended ordnance while escorting RF-4Cs on recce sorties over North Vietnam.

On January 28, an RF-4C with the call sign Tendon was accompanied by two four-ship flights of F-4Ds and a two-ship flight of F-105F Wild Weasels. All aircraft received RHAW indications and observed two to five SA-2s, although some of the SA-2 sightings might have been duplicative. The missiles climbed through the flight and detonated at about 25,000 feet. The eight F-4Ds expended ordnance on the firing site with numerous secondary fires and explosions reported. The two Thunderchiefs, Seabird 01 and 02, also struck the SA-2 site. While recovering from his ordnance delivery, Seabird 02 (38329/44th TFS) observed a second SA-2 site. The pilot rolled in and strafed it. The aircraft was hit by AAA fire. One minute later the

crew was forced to eject due to extreme vibrations. Two good chutes were observed and beepers heard, but the crew could not be recovered. While in a holding pattern in Laos west of the SAR area, HH-53B (614434, 40th Air Recovery and Rescue Squadron), call sign Jolly Green 71, was struck and downed by an Atoll missile fired from a North Vietnamese MiG-21, which had taken off from Vinh. The helicopter disintegrated on missile impact with no chutes seen or beepers heard. Final BDA was two SA-2s and one SA-2 site destroyed, and numerous secondary fires and explosions. This was the first North Vietnamese attack directed at aircraft operating outside its airspace.

January also saw additional authority for air operations in Laos below 19°N. F-105F Iron Hand aircraft were authorized to overfly the North Vietnamese border to the extent necessary to position themselves between AAA/SA-2 sites and ARC LIGHT B-52s operating in Laos. Also, laser illuminator aircraft were authorized to overfly the North Vietnamese border, not to exceed three miles, to guide ordnance onto selected targets in Laos close to the border. Aircraft expending LGBs were authorized to egress over the border after delivery of their ordnance in Laos.

Earlier, a SAM contingency force had been established which, in accordance with the Rules of Engagement, was authorized to strike AAA positions in North Vietnam which fired into Laos. On March 1, USAF F-4s operating in Laos received 37mm fire from North Vietnam. When the site was attacked by the first force of eight of Phantoms, a second site opened fire, while an SA-2 was observed launched. The BDA after the strike by the contingency force of fifteen Phantoms included five 37mm sites silenced/destroyed/



During PROUD DEEP ALPHA, EB-66C/Es of Korat's 42nd Tactical Electronic Warfare Squadron flew a total of 33 sorties. While flying their missions, EB-66s did so over areas that were normally inaccessible due to the threat level like over North Vietnam and well-known missile launch installations. A total of six SA-2s were launched against EB-66s without success. The mission of the Es was to jam all enemy frequency bands to neutralize the defensive networks. The photo pictures EB-66E 40469/JW of the 42nd TEWS.

damaged, one SA-2 site damaged, two SA-2s destroyed and fifteen large secondary explosions. All flights received AAA fire. This also occurred when two RF-4Cs flew strike and post-strike recce. In response, the eight escorting Phantoms expended ordnance on 23 and 37mm gun sites, resulting in ten explosions.

On March 30, an escorting F-4D with call sign Vespa 01 (68707/13th TFS) was hit by AAA north of the Mu Gia Pass in North Vietnam. The crew was able to fly the aircraft to about six nautical miles of Nakhon Phanom RTAB, when they were forced to eject. Both crewmembers were recovered.

A Navy F-4J of Constellation's Fighter Squadron (VF) 142 had been luckier two days earlier while escorting an RA-5C near Thanh Hoa when the North Vietnamese pilot of an MiG-21 tried to attack the Vigilante. The MiG-21 was downed by an AIM-9 Sidewinder.

Tactical recce sorties increased in May to 167 sorties, including 102 AF sorties. Analysis of the results and sensor activations showed that the road network west of the DMZ had become the primary logistic entry into Laos from North Vietnam. There were two North Vietnamese defensive actions. On the 2nd, 23/37mm AAA twelve miles north of the DMZ damaged the RF-4C (Falcon 02) and downed the escorting F-4D with the call sign Falcon 93 (68721/13th TFS). The RF-4C, hit in the left wing, made a safe landing at Da Nang. The crew of the F-4D ejected and was recovered by a Jolly Green after an hour and a half on the ground.

On May 22, Seventh AF established a Quick Reaction Force (QRF) at the 8th TFW at Ubon, followed five days later by one at the 432nd TRW at Udorn. The Command regarded the QRF concept as a management tool to promote the effective allocation of air resources to initially Laos and North Vietnam under circumstances of limited targets and variable weather conditions. The QRF program

had evolved from proposals formulated by 7AF/DO, MG Joseph Wilson. On-target time of 45-60 minutes were established in the program. Initially, the QRF at each of the two bases consisted of six F-4Ds. They were to take off within 30 minutes after being notified by BLUE CHIP, the Seventh AF Command Center. The number of aircraft was quickly increased to twelve at each base but decreased to eight due to requirements in South Vietnam. In 1971, QRF was also established at Da Nang. Ordnance generally included Mk-82s and various types of CBUs, while later, four of the Ubon F-4Ds were configured with Laser Guided Bombs for use against especially lucrative targets. During the high period of 1970, 25 QRF sorties were flown daily. This decreased to an average of thirteen in 1971. Later QRF were expanded to include South Vietnam and Cambodia. On November 22, 1971, the Seventh AF commander, Gen John Lavelle directed establishment of a Quick Strike Reconnaissance (QSR) program with two RF-4Cs in alert status at Udorn each day.

There were three North Vietnamese reactions in November, all in the same location, to RF-4C photo recce missions, resulting in one RF-4C loss. The aircraft involved was Falcon 14 (60420/14th TRS) which was hit by AAA on a low level recce sortie (500 feet) of four SA-2 sites. An explosion in the aft section was immediately followed by the breaking up of the Phantom. The crew was listed as KIA. No ordnance was expended after either of the three reactions as the firing gun positions could be pinpointed. On the 30th, an F-105F of the 6010th Wild Weasel Squadron (Korat), supporting a B-52 ARC LIGHT bombing mission in Laos, fired an AGM-45 Shrike on a Fan Song signal just north of the DMZ.

Increased SA-2 deployments to North Vietnam's lower panhandle during the last two months of 1970 became a significant threat to air operations in the Steel Tiger region of Laos. For instance, on December 12, three SA-2s were



During PDA, F-4Ds equipped with AN/ARN-92 LORAN-D made it possible as 'pathfinders' to achieve reasonable results under Instrument Meteorological Conditions. The photo shows F-4D 68756/OY of Udorn's 555th Tactical Fighter Squadron. On May 11, 1972 the crew of '756' claimed a North Vietnamese MiG-19.

fired at U.S. aircraft near the Ban Karai and Mu Gia Passes, a Navy A-7E and two F-105Fs. The most troublesome threat, however, was to ARC LIGHT B-52D Stratofortress aircraft striking the entry interdiction boxes near those two Passes.

1971

However, after three SA-2s had been fired on January 1, at a flight of B-52Ds that struck interdiction Box Bravo, Seventh Air Force started planning Operation LOUISVILLE SLUGGER, which was initiated on the tenth. Initially, the concept entailed an RF-4C flying a recce mission along segments of three Routes (15, 101 and 137) in North Vietnam, being accompanied by an F-4 fast FAC and two escorts. Later, the number of Routes was expanded to seven, including 101, 103B, 1036 and 1039 just north of the DMZ due to the increased Fan Song radar activity in that area. In case an AAA and/or SA-2 site would be sighted, pre-strike photography was to be accomplished by the RF-4C aircrew which would then return to Udorn. The FAC would then identify the location, leave the area with the two escorts to be refueled by an KC-135A Stratotanker. While being refueled, the FAC requested the launch of the pre-arranged strike package and provided the necessary information. After leaving the tanker, the three aircraft would proceed to the target with the escorts expanding their ordnance under the control of the FAC. A similar process would take place after the strike package had reached the target to complete the mission. Poor weather allowed strikes to be conducted on only three days of the Operation, February 20, 21 and 28. Sixty-seven strike sorties were flown. Bomb damage assessment included the destruction/damage of five SA-2s and fifteen SA-2 transporters.

Notwithstanding, the first six months of the year were relatively quiet as compared to the final six months of the previous year. Thirty-seven strike sorties were flown by Air Force aircraft during 'regular' Protective Reaction Strikes, compared to 897 sorties in the second half.

On March 2, an F-105G, Bear 01, of the 6010th WWS

successfully expended the first Air Force AGM-78B Standard Arm. Target was a Fan Song radar at about 20NM south of Dong Hoi. After being launched, the missile made one left turn and dove for the target. At the same time the AGM-78B impacted (thirty seconds after launch), the Fan Song signal went off the air. No BDA was reported. Wild Weasel aircraft were being modified at McClellan AFB under program SEED HAWK X-RAY, which would give them an advanced armament system, including employment of the AGM-78B/C. With the introduction of the AGM-78B with its improved seeker head, the F-105 received a true standoff capability. In addition, the missile had a BDA system, allowing the Electronic Warfare Officer (EWO) to correlate between the missile detonation and the loss of signal, giving in-flight BDA evaluation. The first four modified Thunderchiefs deployed to Korat in mid-January with the first combat sortie flown on the 21st.

Fracture Cross Alpha

Despite the LOUISVILLE SLUGGER strikes, the North Vietnamese continued to aggressively employ SA-2s against aircraft operating in Steel Tiger. This cost the Royal Australian Air Force (RAAF) one of their Canberra Mk20s on March 14th, when the aircraft, A84-228 of 2 Squadron, which was attached to the 35th TFW at Phan Rang in South Vietnam, was downed by an SA-2 six nautical miles east-southeast of the western end of the DMZ. The crew was recovered. Five days later, an F-4 was heavily damaged by an SA-2 fourteen nautical miles from Tchepone in Laos. In addition, two SA-2s were fired from the vicinity of the Ban Raving Pass in North Vietnam at a flight of three B-52Ds which were supporting Operation Lam Son 719 in Laos. In a response to prevent the North Vietnamese from disrupting air support for Lam Son 719, the US executed Operation FRACTURE CROSS ALPHA on March 21 and 22. Air Force and Navy aircraft flew 234 strike and thirty armed reconnaissance sorties. BDA included eight SA-2s, one Fan Song radar, sixty-four structures and forty-five trucks destroyed/damaged. The Operation cost the USAF an F-4D on the 22nd, when Falcon 84 (67655/13th TFS)



At the end of December 1971, the USAF still had 21 A-1 Skyraiders in Southeast Asia, of which nineteen were stationed at Nakhon Phanom RTAB (NKP). Their mission was to guide and protect HH-53B/Cs during Search and Rescue missions, also during PROUD DEEP ALPHA. On the photo an HH-53B of NKP's 40th Air Rescue and Recovery Squadron is accompanied by two Skyraiders of the 1st Special Operations Squadron, also from NKP.

was downed by an SA-2. The crew had evaded the first missile, but was hit by the second. The F-4D was the first US aircraft to be downed by an SA-2 since October 1968. The crew was recovered by Air Force SAR.

Tactical recce efforts by RF-4Cs in April documented a continued high level of logistics activity along the three major supply corridors into Laos, the Ban Raving, Ban Karai and Mu Gia Passes. In addition, photos showed that the North Vietnamese were engaged in additional construction of their POL pipeline system. By April 6, all three major North Vietnamese airfields south of 20 degrees had MiG aircraft assigned: Vinh had one MiG-21, Quan Lang had two and Bai Thuong had three MiG-21s.

In response to AAA cross-border firings, F-4Ds struck AAA sites near the Ban Karai Pass in North Vietnam on April 9 and 22. A total of seven 2,000-lb LGBs and one 3,000-lb LGB were expended destroying four and damaging two guns. On the 22nd, A Navy RA-5C Vigilante was fired on by AAA in the vicinity of Quan Lang Airfield. In response, three A-7 Corsair II, eight A-4 Skyhawk and one A-6 Intruder aircraft struck the 37/57mm sites at the west end of the airfield. BDA included the destruction of two MiG-21s that were parked close to the AAA sites. During the strike, SA-2 warnings were detected, which were reacted to by two AGM-45s and two AGM-78s.

On July 11, an F-4E on a Wolf FAC sortie near the Mu Gia Pass in Laos was fired upon by AAA in North Vietnam. Two Quick Reaction F-4Ds executed a PRS and expended three 2,000-lb and one 3,000-lb LGBs, destroying four and damaging three AAA sites with thirty-five North Vietnamese personnel KBA.

The increase in AAA reactions in the Ban Karai Pass and just west of the DMZ areas in August coupled with the continued road maintenance indicated that the North Vietnamese wanted to keep the logistic corridors open. After

F-4s had been fired upon on August 28 and 29 by 37mm AAA two miles inside North Vietnam, Quick Reaction F-4Ds expended M-118 and Mk-84 LGBs, destroying the sites.

On September 10, tactical photo recce revealed a large concentration of AAA weapons and related fire control radars in new locations just north of the DMZ in Route Package 1. The concentration consisted of seven firing sites falling within a two-mile radius of a point immediately south of Bat Lake. Photography revealed one occupied 100mm site; five occupied 57mm sites and one occupied 37mm site.

September proved to be a busy month for the USAF in North Vietnam. In addition to sixty-one RF-4C photo recce sorties and eleven Protective Reaction Strikes against AAA sites, including seven as reaction to cross-border firings, aircraft flew a total of strike 204 sorties in Operation PRIZE BULL. The Operation was executed on the 21st by F-4D/Es, including Phantoms from Da Nang's 366th TFW, against POL storage facilities at Thu Thu, Xuan Duc and An Bo and supported by four Navy A-7 Corsair IIs. A total of 2,016 Mk-82 bombs, 254 CBU-24s, ten CBU-49s and seventy-eight CBU-52s were expended. Thirty-one POL tanks containing 167,000 gallons were destroyed and nineteen POL tanks with 107,000 gallons were damaged.

Threat

In November, the number of Protective Reaction Strikes against AAA/SAM sites increased to thirteen from five in October. The sites, located in North Vietnam, reacted to US recce aircraft operating in North Vietnam and the Steel Tiger area in Laos. A total of twenty-one USAF (nineteen/F-4 and two/F-105) and twelve Navy (two/A-6, six/A-7 and four/F-4) aircraft expended ordnance.

For instance, on November 8, four Navy F-4Js con-



Two of the participating Korat units were the 34th and 469th Tactical Fighter Squadrons which flew both F-4E Phantoms. Because of weather conditions, the F-4Es carried out their bombing missions led by LORAN-equipped F-4Ds. Ninety-nine out of their 120 planned sorties were executed. Of the remaining 21, several were diverted to support SAR or aborted due to technical problems. The largest number of sorties took place on the last day when 32 F-4Es attacked eight different targets. (Lee Griffin)

ducted a PRS at Vinh Airfield, expending ordnance against two AW/23mm AAA sites. The Phantoms were escorting an RA-5C Vigilante on a recce mission. On the same day, two USAF F-4Ds, while escorting an RF-4C mission over Quan Lang Airfield, expended on a 23/37mm AAA site after it had fired on the aircraft. At the same time, RHAW indications were received, although SA-2 launches were not observed. Two other USAF Phantoms, F-4Es, also flying in the Quang Lang area, received Fan Song RHAW indications. While maneuvering, a missile detonation was observed 3,000-4,000 feet away from the flight. Photography indicated that SA-2 sites VN423 and VN-438 were operational.

North Vietnam's actions had by that time become a serious threat to the US presence over Laos, the remaining troops in South Vietnam and RF-4C and RA-5C recce flights over the panhandle of North Vietnam. For example, MiG-21s breached Laotian airspace seven times that month. During such an incident, a MiG-21 pushed some fifty kilometers into Laos, fired an air-to-air missile that barely missed a cell of B-52Ds on an ARC LIGHT bombing mission, after which the Fishbed returned to its base in North Vietnam. Several cross-border SA-2 launches and the possibility of the existence of such missile installations in Laos began to have a negative impact on the number of B-52, AC-130 and Forward Air Control (FAC) missions against the infiltration routes west of the Mu Gia, Ban Karai and Ban Raving Passes. The (temporary) stationing of four to six MiG-21s at the airports of Bai Thuong and Quan Lang only increased the threat. Finally, a large buildup of North Vietnamese military logistics had taken place north of the DMZ.

Combination

All this led the highest American governmental and military planners to conclude that a coordinated attack op-

eration should be planned and launched to protect the interests of the US and its allies in Southeast Asia. Due to, among other things, the many changes and the extraordinarily tight security regime under which the planning took place, it would take about a month before the implementation phase would be reached. The reason for the changes was the expansion of the area of operations, the priority and the weather.

In essence, the final plan came down to the combination of two existing operations that were never executed, FRACTURE DEEP and PROUD BUNCH. The former had been an in-being contingency plan formulated in July 1971 with the objective for Air Force and Navy aircraft to strike the four North Vietnamese airfields south of 20°N. In the latter, U.S. aircraft were to have struck selected hard logistics targets within thirty-five nautical miles north of the DMZ. The nickname was combined as well, PROUD DEEP. The merger came about during a planning conference on November 25 and 26, 1971 at Hq MACV at Tan Son Nhut. Three days later, CINCPAC, Commander in Chief Pacific Command (Adm. John McCain), published the new plan including targets, operations area and Rules of Engagement. The next day it was already adjusted, accepted and published. Specific objects included the destruction of MiGs on the ground and of logistical and other military targets in North Vietnam south of 18°N.

It was emphasized that in order to achieve the greatest possible effectiveness, it had to be executed under Visual Meteorological Conditions (VMC), although options under Instrument Meteorological Conditions (IMC) were included as well.

Christmas truce

On December 1, CINCPAC proposed to the JCS to carry out the operation between December 2 and 10, given the expected favorable weather forecasts. JCS stated one day later that the operation and other options were still being reviewed and that execution would not be feasible in the proposed period. CINCPAC would be kept informed. In the December 10-19 period, the USAF lost seven fighter aircraft in Southeast Asia, one F-105F, one F-4E and five F-4Ds. Of the fourteen crew members, three were killed, seven recovered and four taken prisoner. For instance, on December 10, an SA-2 shot down F-105G 38326 (Ashcan 01) of Korat's 17th Wild Weasel Squadron (WWS). The aircraft supported a B-52 ARC LIGHT cell near the Mu Gia Pass in the Steel Tiger area in Laos. Eight days later, F-4D 60241 (Falcon 66) of the 555th TFS was shot down by a North Vietnamese MiG-21 while on a MIGCAP (MiG Combat Air Patrol) at about 115 kilometers west/northwest of Bai Thuong. During the rescue operation of Falcon 66's crew, the 13th TFS (Udorn) lost two F-4Ds: 50799 was knocked down by a MiG-21 while 40954 was unable to reach a KC-135A Stratotanker due to fuel starvation after the Phantom had been attacked by a MiG-21.

The loss of Falcon 66 by a MiG-21 prompted Gen Creighton Abrams, COMUSMACV (Commander, US Military Assistance Command, Vietnam), to forward another plea for execution authority of PROUD DEEP. In his mes-



Map showing the SA-2 location, the number of SA-2 fired and the SA-2 periphery on the last day of PROUD DEEP ALPHA, December 30, 1971. (Except where noted, all photos USAF via the author.)

sage to CINCPAC he stated,

In view of recent hostile MiG activity culminating in the loss of F-4 aircraft this date, strongly recommend execution Proud Deep. Weather forecast indicates most favorable conditions for execution on December 19 and 20; however, request authority to execute be granted for a period of at least five days beginning December 19.

Following CINCPAC's strong support, the JCS had a willing ear this time. Approval was given for a period of seventy-two hours for strikes against air defense, logistical and other military targets. The operation had to be completed before the Christmas truce. Because the JCS extended the operating area to south of 20°N, the name of the operation was changed to PROUD DEEP ALPHA (PDA). The extension increased the number of lucrative targets and the possibilities for armed reconnaissance.

USAF strike aircraft committed to PDA included 212 F-4D/Es. They were to be supported by fourteen F-105F/Gs, seventeen EB-66C/Es, twenty-two Udorn RF-4Cs, and thirty-six U-Tapao KC-135As. Additional F-4Ds

acted as MIGCAP aircraft and Search and Rescue (SAR) forces included A-1s and HH-53s. The USN had two aircraft carriers off the coast of Vietnam, CVA-43 *Coral Sea* with Carrier Air Wing (CVW) 15 and CVA-64 *USS Constellation* with CVW 9 on board. The ships had 126 strike aircraft assigned such as the A-6A, A-7E, and F-4B/J with 25 RA-5C, EKA-3B and RF-8G aircraft in a support role. In the last two weeks of December, the total number of sorties in the Steel Tiger area of Laos decreased with about 400 due to the PDA requirement.

From the time of approval, the weather was followed with more than the normal interest. Weather reconnaissance and satellite photos were assessed twice a day. The proposed data did not turn out to be a workable option after all. It also became clear that PDA would most probably not take place before Christmas and that the imposed seventy-two hour implementation period would be too short. The JCS concurred with the requested postponement.

Execution order

On December 25, the weather service anticipated good conditions for the next day and a provisional Go was decided upon. Target lists and special instructions were sent to the participating units. The provisional Go was followed by the Frag Order, in which, among others, the number of participating Air Force and Navy aircraft with their tasks were given. At the same time it was stipulated that it was not yet an execution order. The weather forecast remained favorable and at 0330H the decision was taken to implement VMC day 1 with a Time over Target (TOT) of 1000H. In the meantime, Gen Abrams had indicated on December 24 that when the weather would permit a quick strike with Laser-Guided Bombs (LGBs) with a good probability of success, LGB strikes would be added against the Thanh Hoa Railroad and Highway Bridge and the Thanh Hoa Lock. At 0405H, MG Alton Slay, Deputy Chief of Operations of 7th Air Force at Tan Son Nhut Air Base, issued the execution order on behalf of 7AF/CC. It read,

1. This is an execution message for Proud Deep Alpha; D-Day is 26 Dec 71, H-Hour is 0200Z; Repeat D-day is 26 Dec 71, H-Hour is 0200Z.
2. Execute Proud Deep Alpha VMC Day One...Repeat Execute Proud Deep Alpha VMC Day One. [Acknowledge receipt, etc.].

A pilot on an early weather recce sortie reported he could see the North Vietnamese coast while flying over Laos and a 0805H satellite photo showed the area was still clear, although a forecaster indicated some change in the clouds over Bai Thuong. The weather however, did not abide at all to the expectations! Twenty minutes before TOT, heavy (thunder)storms developed over the target area. For the Navy planes which had been launched and on their way to the Bai Thuong Airfield, the mission became impractical. The pilots were forced to drop most of their ordnance over the sea before returning to their carriers. The USAF was able to attack four targets under mar-



The KC-135A Stratotankers were important assets in the skies over South East Asia as they refueled aircraft like the F-105, F-4, and RF-4 pre- and post-strike. Crews even risked their lives and repercussions by higher ups by flying into North Vietnam to save aircraft from fuel starvation. To support Proud Deep Alpha, thirty-six U-Tapao-based KC-135As flew a total of 102 sorties. The photo shows a KC-135A Stratotanker in the skies of Southeast Asia awaiting its next receiver. (USAF, SSgt John Evans)

ginal conditions including the Xuan Son Transshipment Point and the Thanh Hoa Barracks and Vehicle Repair area. In the latter case, an F-4D, Coach 03 (68818/433rd TFS), was downed by AAA with both crewmembers being listed as MIA. The USAF also managed to fly fourteen armed recce sorties against six targets. Of the 136 participating aircraft only thirty-four were able to reach their target and expend ordnance. The other aircraft returned home with their ordnance. Two MiG-21s were seen by MIGCAP F-4Ds after RED CROWN had vectored them to two unidentified tracks. In addition, several SA-2s were launched. All further sorties for that day were canceled.

Later that day, JCS informed CINCPAC that the operation had been extended from seventy-two hours to five days with the restriction that it had to be completed before the New Year's truce.

Warning order

Planning started immediately, but given the expected weather conditions, now based on the IMC option. The Air Force would use F-4D pathfinders equipped with AN/ARN-92 LORAN-D (Long Range Navigation), each of which would lead three non-LORAN-equipped F-4D/Es. The trailing aircraft dropped by watching Lead's bombs and his voice command. Such operations had not been flown on a large scale until then. The Navy used the radar of A-6A Intruders to locate the target. A-7E Corsair IIs or F-4B/Js would then drop their bombs on command of the A-6 crew. Seventh AF also offered the Navy the use of LORAN-configured F-4Ds to lead A-7/F-4 strikes, but none were flown.

At 20:00H on December 26, General Slay issued the warning order for morning and afternoon missions on the next day, which were executed. Of the 176 AF strike sorties fragged, 160 aircraft expended their ordnance. Although the Navy was fragged for seventy-two sorties, seventy-

eight aircraft were launched which all expended their ordnance. BUFFALO HUNTER drone photography showed that the strikes had been profitable.

After this first IMC day, three more followed, on December 28, 29 and 30. The operation was to be terminated on the 30th, not later than 1800H.

Sentinel Lock

One of the targets on December 29 was Quan Lang Airfield, about sixty-five kilometers north of Vinh. It was the second most active airport south of 20°N and had a pierced steel plank runway which was 1,800 meters long and forty meters wide. Four to six MiG-21s were stationed there off and on. The mission was flown by two attack waves consisting of F-4D/Es guided by LORAN-equipped F-4Ds using extrapolated SENTINEL LOCK/LORAN coordinates from known data. SENTINEL LOCK consisted of raster-annotated photography developed and produced by the Aeronautical Chart and Information Center in St. Louis. Photos of a certain area were compensated for the height of the terrain, roll, yaw and the altitude of an airplane at the time of the photography. It was the most precise system to map terrain. The disadvantage was that it took sixty days to complete the process. SENTINEL LOCK coordinates were only available for part of Barrel Roll in northern Laos and Route Pack I in North Vietnam.

As SAM launches were expected and MiG intercepts possible, the strike aircraft were supported by Destroyers, Wild Weasel Thunderchiefs and F-4D/Es for MIGCAP. MiGs were not seen, however, six SA-2s were launched but did not hit any target.

Two hundred and six Mk-82 bombs were dropped in thirty-three strike sorties. Photographs taken after the strike showed that 168 of them (eighty-one percent) fell within the target area. The runway was interdicted in fourteen places (already repaired within a few days) while fifteen buildings were destroyed and another five damaged. Furthermore, an East German television program later showed that two MiG-21s had flipped over.

Dong Hoi Airfield was struck the same day by three Navy A-7E Corsair IIs. They expended twelve Mk-82s and three Mk-20 Rockeyes.

Surface-to-Air missiles

SA-2s were the most successful on December 30. Of a total of forty-five missiles launched in the whole operation, twenty-two were launched that day against attacking US aircraft. While supporting aircraft striking the Ben Thuy Coastal Transshipment Point, a Navy MIGCAP F-4B Phantom (150418, Old Nick 203) of VF-111 (*USS Coral Sea*) was downed by a SAM. Later, an A-6A (155677, Boomer 506) of Attack Squadron (VA) 165 (*USS Constellation*) which functioned as a pathfinder for A-7s and F-4s was also downed by an SA-2. Only one of the four crewmembers was recovered.

At 1536H on December 30, the final three attack aircraft left North Vietnam to finish PROUD DEEP ALPHA. A little less than one hour later, COMUSMACV officially terminated the operation. Strong suggestion was given



Four US Navy F-4B/J Phantom units participated in PDA: VF-92/96 from the *USS Constellation* and VF-51/111 from the *USS Coral Sea*. The photo shows an F-4B of Fighter Squadron (VF)-111 'Sundowners', a few moments before being launched for a combat sortie. While supporting aircraft striking the Ben Thuy Coastal Transshipment Point, the unit lost one of their MIGCAP Phantoms when it was downed by a SAM. (Alamy via Theo van Gefen)

that further strikes would continue unless North Vietnam stopped supply buildup and the increase of AAA challenge to US aircraft over the Ho Chi Minh Trail.

Korat

Four squadrons of the 388th Tactical Fighter Wing (TFW) at Korat participated in PDA, the 34th and 469th TFS (F-4E), 17th WWS (F-105F/G) and 42nd TEWS, Tactical Electronic Warfare Squadron (EB-66C/E). Because of the weather conditions, the F-4Es carried out their bombing missions led by LORAN-equipped F-4Ds. Ninety-nine out of their 120 planned sorties were executed. Of the remaining twenty-one, several were diverted to support SAR or aborted due to technical problems. The largest number of sorties took place on the last day when thirty-two F-4Es attacked eight different targets.

While flying thirty-three sorties, the mission of the 42nd TEWS was twofold. The task of the EB-66Cs was, among others to serve as a warning platform to detect the launch of SA-2s and to provide standoff jamming of selected missile control and guidance emissions. The EB-66Es were to jam all enemy frequency bands to neutralize the defensive networks. While flying their missions, EB-66s did so over areas that were normally inaccessible due to the threat level like over North Vietnam and well-known missile launch installations. In their protective role it was sometimes necessary to position themselves bore-sight between the SA-2 installation and the attacking aircraft. A total of six SA-2s were launched against EB-66s without success. Three of them were launched on December 29 against Lt Col Frank Wink's EB-66E Basco 21, which sup-

ported a strike against a target in an extremely hostile area. The three SA-2s were launched in succession by three different installations. Before each launch, Wink was informed by his Electronic Warfare Officer (EWO) that he had received launch indications, after which the crew was instructed to perform evasive maneuvers, including high speed descent combined with a rapid turn away from the site involved. After the third launch, all three of the SA-2's condensation stripes were visible to the crew.

Iron Hand

An integral part of the success achieved could be attributed to the Wild Weasel aircraft. Due to their complex Radar Homing and Warning (RHAWS) system, the many radar emissions could be identified from the integrated Ground-Controlled Intercept, GCI (Bar Lock and Big Bear), Anti-Aircraft Artillery gun-laying (Fire Can and Whiff) and SA-2 (Fan Song) acquisition and tracking radars. Among other things, RHAWS was able to determine the signal type, its strength and often its range. The mission was carried out by USAF F-105F/Gs and Navy A-6As and A-7Es. They fired fifty-one AGM-45 Shrike and ten AGM-78 Standard Arm missiles. Thunderchiefs were configured with a combination of AGM-45s and AGM-78s, Navy aircraft with AGM-45s and strike ordnance like CBUs. Iron Hand aircraft flew 102 sorties against eighteen targets, divided fairly between the Air Force and Navy. The fifty-one Air Force sorties were flown by the 17th WWS. Of the other nine of the sixty planned sorties, four were diverted to support SAR, two were canceled by Seventh AF and two were air aborts due to mechanical problems.



Both carriers also had four A-7E Corsair II squadrons assigned: VA-22/94 on the Coral Sea and VA-146/147 on the Connie. During their bombing missions, A-6 Intruders functioned as Pathfinders. On the photo, an A-7E of Attack Squadron (VA)-146 about to land on the Connie after completing a combat mission. (USN, via Theo van Geffen)

A-6A and A-7E aircraft expended thirty-five Shrikes and AF F-105F/Gs sixteen. Of that number, thirty-one were fired against SA-2 Fan Song and twenty against AAA Fire Can and Whiff radars. Of the ten expended AGM-78s, five were against Fan Song and five against Bar Lock and Big Bear sites. The result was the probable or possible destruction of two Bar Lock, five Fan Songs, four Whiff/Fire Can, and one Big Bar radars. The five SA-2s launched against the Wild Weasels were no-hitters.

A more accurate estimate of Iron Hand Bomb Damage Assessment (BDA) was difficult for various reasons. Firstly, weather conditions made visual observation of the impacts impossible. Secondly, the North Vietnamese, who had earlier taught themselves an excellent control over the radar emission the hard way, frequently switched one radar off and at the same time switched on a neighboring radar to deceive the AGM-45/78. In many cases they switched off the radar just before the programmed impact time of the missile. Although the radar installation was normally not hit, the effectiveness of the radar network with its radars at SA-2 and AAA sites was reduced in totality.

Recommendations

BDA showed, among others, that the airfields (Bai Thuong was not struck at all) had not suffered permanent damage, that only six percent of the POL was destroyed and that thirty-eight buildings had been destroyed. Extensive study of photographs taken by RF-4Cs after attacking thirty-eight targets showed that of the 10,029 bombs dropped, 2,754 craters were found, or twenty-seven and a half percent.

PROUD DEEP ALPHA provided lessons in tactics, planning, and targeting that were to improve similar future operations, including all-weather LORAN bombing. Because PDA was primarily executed under IMC versus VMC conditions, ordnance like the PAVEWAY Laser Guided Bombs could not be employed. As Maj Gen Alton Slay later stated,

It could take 800 Mk-82s, under IMC, to get a 70 per cent probability of a kill against a 130mm gun; under VMC, it would take one PAVE WAY.

Gen John Lavelle, Seventh AF commander, asked his wing commanders for comments and recommendations about how future and similar operations could be improved. Many recommendations proved to be useful and would be included in future contingency plans. One of the recommendations was the need for accurate SENTINEL LOCK or LT GAP (LORAN Targeting, Grid Annotated Photography) coordinates of high priority targets north of the currently annotated areas. In a Talking Paper 'Proud Deep Alpha', Gen Lavelle stated among others,

As long as the possibility remains that we may be directed to go North again and forced to strike IFR, we must develop and maintain the best possible capability to perform the task. In order to obtain more accurate LORAN time delays, I have directed that Combat Thunder RF-4 photography be obtained on key targets in the North. This program is presently being conducted.

Already in April 1972, the wing commanders were able to put their recommendations into practice in renewed large-scale attack of targets in North Vietnam, this time also with large numbers of B-52s.

Number of planned/ flown strike sorties

Date	Type	USAF	USN
Dec	Planned/Flown Sorties		
26	VMC-1	124/34	84/0
27	IMC-1	176/163	72/78
28	IMC-2	152/150	72/60
29	IMC-3	136/124	96/96
30	IMC-4	164/157	95/48
Total		752/628	420/282

Combined, planned 1,172 sorties and flown 910. With exception of a limited number of targets struck visually on the first and final day of PDA, F-4D LORAN-equipped and Navy A-6A aircraft were used in directing F-4D/Es and A-7/F-4 aircraft respectively to their targets. A total of 10,222 bombs were expended in 910 US sorties by 628 AF F-4D/Es and 72/A-6A, 156/A-7E and 54/F-4B/J aircraft (all Navy) against the 41 primary targets. Twenty-nine armed reconnaissance sorties were flown against twelve targets, fourteen by the USAF and fifteen by the Navy. Support sorties totaled 452, of which 256 by Navy (including KA-6A refueling, EKA-3B ECM and E-2B early warning sorties) and 196 by AF aircraft (28/MIGCAP and 33/escort sorties, plus 102/KC-135A Stratotanker and 33/EB-66C/E Destroyer sorties while flying over Steel Tiger East in Laos).

After the completion of PROUD DEEP ALPHA, CINC-PAC Adm John McCain stated the following,

I commend all participants for their valor and dedication. The professional ability that was demonstrated in sustaining these operations in well-defended areas under markedly adverse weather conditions was of the highest order.



A-7E Corsair IIs flew strike and Iron Hand missions. The photos show six A-7Es of VA-146 and 147, awaiting their turn to be launched from the *USS Constellation*, while an F-4J Phantom has just cleared the flight deck. All Corsair II's are configured with MK-20 Rockeyes, while aircraft 404 also carries an AGM-45 under the right wing. Typical ordnance for an Iron Hand mission. (*USN, via Theo van Geffen*)

Other December sorties

Protective reactions increased three-fold compared to November with the majority of the eighteen PRSs involving attacks in response to SAM/Bar Lock signals. In twenty Wild Weasel sorties eleven AGM-45s and thirteen AGM-78s were expended. The strikes were centered around the Barthelemy and Mu Gia Passes. AF and Navy aircraft carried out two PRSs each in response to AAA and SA-2 fire directed at the recce aircraft and its escorts. Four AF and nine Navy aircraft expended ordnance.

1972

There were three major trends in North Vietnamese defensive activity apparent in Laos in January: (1) a continuing high MiG incursion rate, (2) AAA, and (3) SA-2 battalions becoming operational. North Vietnamese MiG-21s made thirty-five penetrations into Laotian airspace, two in the Steel Tiger and thirty-three in the Barrel Roll area north of the Barthelemy Pass. Most of these incursions originated from Phuc Yen Airfield. F-4 Phantoms continually responded, however, with very few actually obtaining visual contact. On January 16, for the first time since March 1971, the presence of SA-2s in Laos was confirmed when two missiles were fired at two F-105 Wild Weasels from the Laotian side of the Ban Karai Pass.

US aircraft executed eight PRSs as a result of nine defensive reactions towards AF and Navy recce aircraft and their escorts. Air Force F-4s expended ordnance in reaction to four of the five AAA reactions. On January 31, for instance, four USAF F-4Ds expended twenty-four CBU-52s on a 23/37mm AAA site fourteen nautical miles northeast of the Ban Karai Pass, which had fired on RF-4C Falcon 03. F-105F/G Thunderchiefs expended AGM-45/78s in re-

sponse to SAM-related incidents. The eighth PRS was executed on the 19th by Navy aircraft when an RA-5C Vigilante was fired upon by an SA-2. During the PRS, a Navy F-4J Phantom of VF-96 (*USS Constellation*) downed a MiG-21 near Quang Lang Airfield. It was the first of five MiG-21 kills by the Randy Cunningham/William Driscoll team. In addition, F-4Ds expended eight Mk-84 LGBs in response to two cross-border firings.

The Air force flew a total of forty-seven attack/flak support sorties (twenty-five by F-4s and twenty-two by F-105s) and the Navy fourteen (two by A-6, seven by A-7, and five by F-4 aircraft). A total of sixteen AGM-45 and twelve AGM-78 missiles were expended by F-105F/G Wild Weasels.

SA-2 activity resulted in fifteen protective reaction sorties flown in North Vietnam from Laos by in general F-105F/G Wild Weasel aircraft. One such sortie was flown by Basket 02, an F-105F/G of Korat's 17th WWS. The crew consisted of pilot Capt Jimmy Boyd and EWO 1Lt Al Spiers. The aircraft was performing an IRON HAND patrol southwest of Ban Karai Pass in Steel Tiger in Laos. During the flight, a Whiff AAA fire control radar was detected which tracked Basket 02 from the right. When Boyd started a right turn, the Whiff locked on. Lt Spiers stated,

The APR-36 vector was 2½ rings. We lined up the vector at our 12 o'clock and made a dip check. We pulled up to 15,000 feet MSL and fired the AGM-45 on the left outboard. Then we pulled up to five degrees pitch and fired the Shrike on the right outboard. Both missiles went straight ahead, pitched over and entered the undercast. They appeared to guide on target. Immediately after the second firing we observed 57mm bursting at 6 o'clock and 2-3000 feet low. Flak



The North American RA-5C Vigilante was the Navy's reconnaissance counterpart of the Air Force's RF-4C Phantom, flying tactical photo recce missions over North Vietnam. During the bombing halt of North Vietnam, the Vigilantes flew recce missions, usually accompanied by F-4 Phantoms and A-7 Corsair IIs. Like in the case of the RF-4C, the North Vietnamese also tried to down an RA-5C with AAA and SA-2s, which, in many cases, triggered a protective reaction strike. The photo shows an RA-5C off the *USS Constellation* while on a recce mission. (USN, via Theo van Geffen)

continued until the Whiff signal went down 70 seconds after the first expenditure.

As a result of the crew's observations and the fact the Whiff signal went down within impact parameters, a suspected kill was recorded.

February

MiG-21s out of Phuc Yen made eight incursions into the Barrel Roll area of Laos. On the 21st, a COMBAT TREE-configured F-4D of Udorn's 555th TFS (Falcon 62), crewed by Maj Robert Lodge/1Lt Roger Locher, engaged one of them, expended three AIM-7Es and shot it down. Increased North Vietnamese reactions against AF aircraft, resulted in thirty-three PRSs in which ordnance was expended in 110 sorties. Eighty-three of them were flown by F-4s which were escorting RF-4C photo recce aircraft, eleven by F-105F/Gs against emitting radar threats and finally sixteen in reaction to cross-border firings. In addition, ordnance was expended in thirty F-4 strike sorties against the buildup of heavy artillery and AAA defenses north of the DMZ. Ordnance expended included thirty-one Mk-84 LGBs and sixty-nine CBUs.

On February 16-17, a total of thirty-nine SA-2s were fired at U.S. aircraft from operational sites in the Bat Lake and Dong Hoi area, claiming three USAF aircraft. On the 16th, F-4D Muskat 01 (67601, 25th TFS) on a FAC mission near the DMZ, was downed by an SA-2. The next day, two aircraft were lost. An F-105G, Junior 02 (38333/17th WWS), which was on a RF-4C photo recce escort mission in RP I was also shot down by an SA-2. An F-4D of Udorn's 13th TFS, Falcon 74, was hit by a SAM while on a flak support mission and lost. Five of the crewmembers ended up in Hanoi and one was listed as MIA. A total of fifty-two sur-

face-to-air missiles were fired at U.S. aircraft, of which forty-two were on the 16th and 17th.

To counter the increased SA-2 threat, ECM pods were carried on all combat missions executed by the 388th TFW. In contrast to other SEA units, the 388th adopted the procedure of turning on the pods prior to entering a high threat area. On February 29, the first planning session for the Korat SAM Strike Team (SST) took place. The concept married the F-105G capabilities with the ordnance delivery capabilities of the F-4E. The concept employed one F-105G with AGM-45/78s and three F-4Es with CBUs that penetrated as a flight toward a pre-selected SA-2 site target. The distance of twelve NM from the pre-selected site was important as when any site emitted or fired before reaching that point, it would be engaged by the SST. When no sites would have become active, the F-105G was to expend its AGM-45/78s at the pre-planned target. The SST was not implemented until late March.

March

U.S. aircraft engaged MiG-21s on four occasions and shot down three. Two were downed by AIM-7s of Udorn F-4Ds, one on the 1st (555th TFS, LC Joseph Kittinger/1Lt Leigh Hodgdon) and one on the 30th (13th TFS, Capt Frederick Olmsted/Capt Gerald Volloy). F-4B crew Lt G. Wiegand/Lt(jg) W. Freckleton of VF-111 shot down the third with an AIM-9D. A total of twenty-five SA-2s were fired at U.S. aircraft, bringing the total for 1972 to 108.

Fourteen of the thirty RF-4C missions were reacted to by the North Vietnamese. In response, escorting F-4s carried out fourteen PRSs with fifty-three aircraft expending ordnance. Emitting radar threats kept the attention of the Wild Weasels. In twelve PRSs, eleven aircraft fired AGM-45/78s. One AAA cross border firing resulted in one PRS



On July 29, 1971, Gen John Lavelle assumed command of 7th Air Force at Tan Son Nhut Air Base, South Vietnam. After having been accused of having ordered unauthorized bombing missions into North Vietnam and authorized reports to be falsified in order to conceal those missions, the general was removed from his command in April 1972 by the CSAF Gen John Ryan. As a result, Gen Lavelle was retired as major general, two grades lower than the grade he served in at 7th Air Force.

with one sortie expending. The Navy flew 68 strike/flak support sorties. In the March 10-19 period, seven Navy A-6B Intruders expended eight AGM-78 Standard Arms against emitting Fan Song radars. BDA was estimated to be one possible kill.

In 1970, 1971 and the first three months of 1972, a total of 176 Protective Reaction Strikes (in response to North Vietnamese reactions to RF-4C photo recce missions, cross-border firings and radar emissions) were flown by the Air Force with respectively twelve, seventy-five and eighty-nine strikes. F-4D/Es and F-105F/Gs flew eighty-nine against AAA and SAM sites and F-105F/Gs eighty-seven against emissions associated with AAA, SAM and GCI radars. Ordnance was expended in 373 sorties. F-4Ds expended 1,082 500-lb bombs, seventy-three 2,000-lb and six 3,000-lb LGBs (none in 1970), forty-two M-36s, and CBUs. Wild Weasel expenditures included seventy-four AGM-45s, forty-nine AGM-78s and CBUs.

Seven strike aircraft were lost, five F-4Ds and two F-105Gs. In addition, one RF-4C was lost. The high number of PRSSs in the latter part of 1971 and the first three months of 1972 was partially attributed to a significant increase in AAA and SAM defenses in RP I.

As result of the North Vietnamese invasion of South Vietnam on March 29, 'incidental' Protective Reaction Strikes were terminated and continuing attacks on targets south of 20°N re-instated on April 6 by executing Operation FREEDOM TRAIN. In addition, missions were flown against key targets north of 20°N.

Protective Reaction Strikes, aftermath

On July 29, 1971, Gen John Lavelle transferred from HQ Pacific Air Forces at Hickam AFB, where he was Vice Commander in Chief, to Tan Son Nhut in South Vietnam where he assumed command of Seventh Air Force.

In less than a year, after being accused of having ordered unauthorized bombing missions into North Vietnam and authorizing reports to be falsified in order to conceal those missions, the general was removed from command in April 1972 by the USAF Chief of Staff Gen John Ryan. As a result, Gen Lavelle was retired as a major general, two grades lower than the grade he served in at 7th Air Force.

Thirty-five years later, in 2007, newly released and declassified information proved that Lavelle had been authorized by U.S. President Richard Nixon to execute the bombing missions. In addition, the Air Force Board for Correction of Military Records had found no evidence that the general had caused the falsification of records, directly or indirectly, or that he had even been aware of their existence. Action had been taken by Lavelle to ensure that the practice was discontinued after he had learned of the reports. As a result of the new information, the Board decided to reinstate Lavelle's four-star grade, the one he had while serving as 7AF/CC.

Both the Secretary of Defense, Robert Gates, and Secretary of the Air Force (SECAF), Michael Donley, supported the Board's decision and recommended President Barack Obama nominate Lavelle posthumously for advancement on the retired rolls to the rank of general. The President did so in August 2010. However, the necessary support by the Senate Armed Services Committee (SASC) was not obtained as it declined to vote on the nomination proposal.

Efforts are still being made to restore Lavelle's rank to general. According to Military.com, the Air Force began a review process that might lead to a posthumous restoration of Lavelle's rank to full general. The Air Force has studied the issue, and convened a study group to make a new recommendation. As of this writing, no public announcement of the study results or a recommendation has taken place. ■

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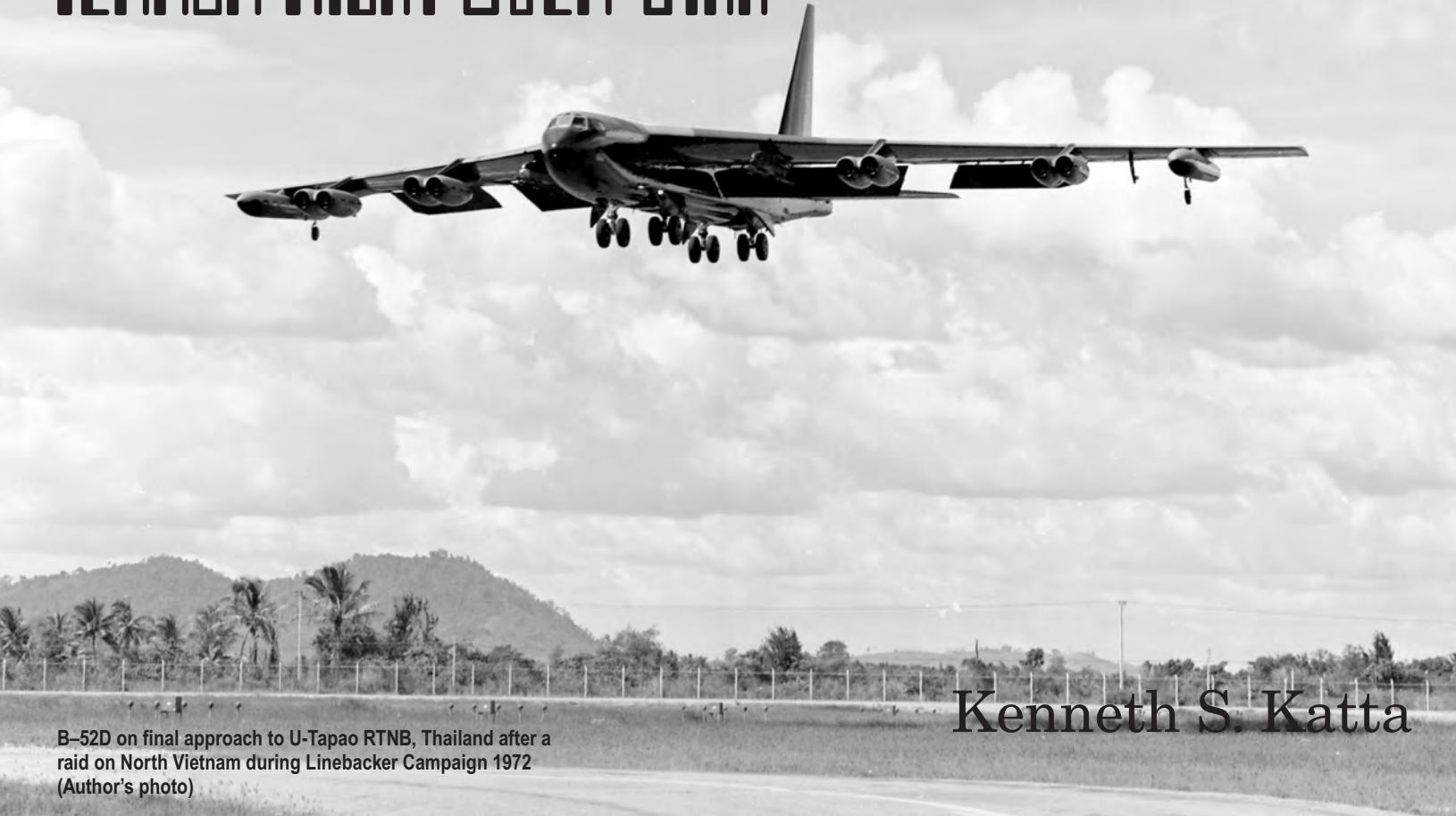
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TERROR NIGHT OVER VINH



B-52D on final approach to U-Tapao RTNB, Thailand after a raid on North Vietnam during Linebacker Campaign 1972
(Author's photo)

Kenneth S. Katta

*This paper is dedicated to all the B-52 crew members who participated in the ARC LIGHT and LINEBACKER campaigns of 1972, especially those who did not return.
“We in it shall be remembered—we few, we happy few, we band of brothers. For he today that sheds his blood with me shall be my brother.” (Henry V-St. Crispin’s Day Speech)*

This is the story of the first B-52 lost due to enemy action in the Vietnam War and the rescue of the downed crew as told by a participant.

In early 1972, in anticipation of a major North Vietnamese conventional invasion of South Vietnam, later termed *The Easter Offensive*, the Strategic Air Command deployed B-52Ds from stateside bases under five numbered “Bullet Shot” deployments. These deployments were to reinforce the units at Andersen AFB, Guam and U-Tapao RTNB, Thailand. This began with “Bullet Shot I” on February 7, 1972, which included the 306 Bomb Wing at McCoy AFB, Fla. I was deployed with McCoy crew E-07 at that time. The author’s crew consisted of Aircraft Commander pilot Major Kenneth G. Taylor, co-pilot Captain Randolph Wright, Radar Navigator Lt. Colonel Norman Labrie, Navigator Captain Kenneth S. Katta, Electronic Warfare Officer (EWO) Captain Thomas Kruse, and Gunner SSgt James E. Howell.

The North Vietnamese 1972 offensive was possible due to large scale military aid deliveries extending back into 1971. These included 700 AAA weapons and equipment to support deployment of some twenty AAA regiments out of country. These units were also supplied with SA-7 missiles responsible for downing fifty-four known aircraft. Imports of equipment for at least ten SA-2 battalions were also estimated to have arrived in North Vietnam in 1972 from the USSR. These imports were not only to replace losses but to also to support deployment of several SAM regiments out of country, notably in the DMZ and along the Ho Chi Minh Trail. This increased the threat to B-52 raids even over South Vietnam. Hanoi maintained its missile strength at about forty-five to fifty battalions throughout 1972. Moscow remained the sole supplier of replacement SAMs in 1972. These shipments from the USSR permitted the North Vietnamese to fire an estimated 4000 missiles at U.S. aircraft in 1972. Finally, SA-3 equipment from the USSR was observed in North Vietnam during January 1973. The SA-3 complemented SA-2 batteries and significantly increased their effectiveness in attacking even low flying aircraft.

Previous B-52 raids were relegated to ground support missions below the Demilitarized Zone (DMZ), but it now became necessary to strategically blunt the logistical supply routes in North Vietnam. When Linebacker I began on April 9, 1972, B-52 raids began to progressively raid supply routes north of the DMZ up to the 19th parallel, especially the railroad



(Left) North Vietnamese SA-2 Surface-to-Air Missile Threat Areas Nov 1972 -Jan 1973.(Author's map)

transportation hub at Vinh which was attacked for the first time by fifteen B-52Ds on April 9. Subsequent raids included POL (Petroleum, oil, lubricants) targets above the 20th parallel near Hanoi and Haiphong, and an eighteen sortie (bomber) raid on rail facilities near Than Hoa near the 20th parallel on April 21 & 23. In response to the Than Hoa raid, fifty SA-2 SAMS were launched. While several B-52Ds suffered significant battle damage, all were able to land safely.

Even though raids above the 20th parallel were suspended on October 22, 1972, B-52 raids continued over North Vietnam below the 20th. These missions still ran the gauntlet of North Vietnamese SA-2 surface to air missiles and AAA (85mm and 100mm antiaircraft artillery) fire, especially over Vinh and Than Hoa, in addition to the threat of MiG-17, MiG-19 and MiG-21 interception. It was considered a propaganda victory for the North Vietnamese to claim a B-52 shoot-down. Whenever the B-52s ventured far north, the SAMs went after them with a vengeance.

This is the backdrop for what began in November 1972, right after the October Kissenger "Peace is at Hand" speech. With the cessation of all air operations above the 20th parallel, the North Vietnamese were given invaluable time to strengthen their air defenses. Without bombing raids above the 20th parallel, the enemy was able to concentrate their defenses over Vinh and Than Hoa.

On November 22, 1972, the inevitable happened with the first combat loss of a B-52. On that day, it was the first B-52 in 180,990 Southeast Asia combat sorties covering seven years of operation to be downed by hostile fire. Previously B-52 cells had come under attack on eighty-one separate occasions with a total of 286 missiles fired at them.

The mission designator was DP-37R with the target being a rail transportation storage area at Vinh (18.52N/105.19E) twenty-four miles northwest on a "press on" mission. This meant the mission would proceed regardless of the enemy defensive response. The target was located in a SAM Confirmed Operating Area with Confirmed Operating Sites. This mission employed MSQ-directed sorties or RBS/Sky Spot which meant our cell would be directed by a ground site. This site would direct the lead bomber and the remainder of the cell would employ DASK-drift angle station keeping to time when to drop their bombs off the lead bomber. The call sign for the bomber formation was OLIVE. Olive 1 in aircraft 6621 was Westover AFB crew S-07, Olive 2 in aircraft 5110 was Dyess AFB crew E-05 and Olive 3 in aircraft 6693 was McCoy AFB crew E-07. Olive 2 was crewed by Captain Norbert J. Ostrozny, aircraft commander; Captain P.A. Foley, co-pilot; Major Bud Rech, radar navigator; Captain Robert Estes, navigator; Captain Larry Stephens, electronic warfare officer; and SSgt Ronald W. Sellers, gunner.

The formation also included a B-52D three-ship cell call sign COPPER preceding Olive cell; and another B-52D cell following Olive cell with the call sign SNOW. Thus there were a total of nine B-52Ds fragged for that target.

Lt. Col. Katta is a Distinguished ROTC graduate from Manhattan College earning a B.S. in Physics in 1968. He graduated from Undergraduate Navigator Training in June 1969. He was assigned to a B-52 squadron later that year. He was sent to his first Southeast Asia Tour at U-Tapao RTNB, Thailand in February 1971 supporting Operation Lam Son 719. In February 1972, then Lt. Katta was deployed to Andersen AFB, Guam and subsequently to U-Tapao, RTNB, Thailand as part of the Bullet Shot deployments in anticipation of the major North Vietnamese Easter offensive. These missions included both ARC Light and Linebacker missions over North Vietnam. Katta accomplished nearly 200 combat missions. He separated from the Air Force in August 1973 and entered graduate school at the University of Florida receiving a Master of Science degree in Nuclear Engineering in June of 1975. In September, he entered the Doctor of Optometry program at the State University of New York graduating with the degree in June 1979. He reentered the Air Force in 1990 at the time of Desert Shield. He graduated from Air War College in the first class to receive the Master of Strategic Studies degree in June 1999. At the same time, he received the Master of International Relations degree from Auburn University. He subsequently was assigned to the 105th Medical Group, Stewart ANGB, Newburgh, NY from which he retired in December 2004.



North Vietnamese SA-2 Surface-to-Air missile on its launcher.

The launch time from U-Tapao (U-T) RTNB, Thailand for OLIVE was 1310Z with a time on target of 1457Z. Ironically, crew E-05 was originally crewed on aircraft 6608, but that aircraft experienced a ground abort and the crew was transferred to 5110.

After the mission briefing at the command headquarters shack, the crews proceeded by bus to the armaments shack to receive their flak vests with the .38 cal. revolver. The bus proceeded to the flight line to the respective bomber assigned to that crew. The Navigator was to remove all the safety pins from the bomb racks in the bomb bay including the external wing racks, without which there could be no bomb release. After the pilots did their external pre-flight checks, all crewmen proceeded into the aircraft to our respective positions. The radar-navigator and navigator were positioned in the lower deck. We then completed the Interior Inspection checklist.

Four of the six crewmen, pilot, copilot, EWO and gunner, on a B-52D had access to windows and portholes. However, toward the rear of the upper deck, behind the pilots, there was a square shaped hole in the deck that opened into a shadowy interior void leading to the lower deck. It was down in this void, known as the "Black Hole of Calcutta", that the B-52 navigator-bombardiers were seated side by side. They were seated at a desk which had radar scopes and instrument panels in front of them. There were no windows or portholes so it was not for the claustrophobic. The only reference to the battle taking place outside the aircraft was the radio transmissions heard through the headsets.

Pre-takeoff checklists were completed while taxiing to the end of the runway. The pilot, co-pilot and navigator reviewed the take-off data which included acceleration timing or 70-knot call by the pilot, and after takeoff heading. It was critical that takeoff was on time if Olive cell was to be in proper position for the support aircraft which included three EB-66 aircraft providing stand-off electronic counter-measures support, F-4 MiG CAP sorties, and two F-105 IRON HAND SAM suppression sorties. Four F-4 aircraft laid a chaff corridor over the target ten minutes prior to first TOT (time on target).

Once airborne the formation proceeded to the timing box located over Laos. This enabled navigators to adjust their course to arrive at the target on time. Prior to arriving at the timing box, the cell contacted the command post call

sign "LID". This site was manned by the 1st Combat Evaluation Group (CEG) which directed aerial bombing raids. The code name for Ground Directed Bombing (GDB) was COMBAT SKYSPOT. These ground radar sites were manned by the CEG in South Vietnam, Thailand and Laos 24/7 from 1966-1973. These sites were so formidable, the enemy conducted daring raids to eliminate them or force relocation.

Olive 1 then advised the cell to go to secure radio. This meant all transmissions on that radio frequency went through the cipher machine so the enemy would only hear garbled transmissions. Olive 1 navigator was responsible to contact LID. The Olive 1 navigator made the call: "LID, LID, Olive 1". LID responded - "Olive 1, we have mission number DP-37R. Olive Cell beacon check". The MSQ site would then determine if each bomber in the cell had an operable beacon that the MSQ site could direct on the bomb run. We then knew we were going to "Cross the Fence" into North Vietnam. The navigators in the "Black Hole" would then complete the "Before IP" checklist.

Olive 1 then advised the MSQ site that the cell had arrived at the IP (Initial Point - start of the bomb run) and the site would then direct the bomber cell on the bomb run. At 120 seconds to bomb release a little after the IP (initial point at which the cell would turn toward the target on the bomb run, usually about 60nm), Olive 1 directed the cell to heading 047. The navigators would then complete the "Bomb Run" checklist. Bomb doors would only be opened at "ten seconds to go" to minimize radar reflection to the North Vietnamese FANSONG radar. This radar would feed target information to the SAM site target tracking radar. At that point, the cell came under intense SAM missile fire; the EWO on Olive 1 reported "SAM Uplink". This indicated that a North Vietnamese S-75 Dvina surface-to-air missile target tracking radar was locked on to the Olive cell. The S-75 (NATO designation SA-2) was a Soviet two-stage command-guided surface-to-air anti-aircraft missile. It is 34 feet, 9 inches long and two feet, 3.6 inches in diameter. It is liquid-fueled and has a maximum speed of Mach 4 with a range of 15 miles. The missile has a 441 pound fragmentation warhead.

Copper cell had previously reported multiple SAM launches during their bomb run with some AAA fire without any battle damage. Olive cell came under intense surface-to-air missile fire from the IP into post bomb release.



Industrial complexes in North Vietnam targeted during LINEBACKER in 1972 (Author's map)

During the post release turn in a 50 degree bank to 205 heading, Olive 2 gunner and the copilot reported two visual SAMs at the 1 o'clock position which missed and detonated above the aircraft at 7 o'clock. The pilot in Olive 3 reported he lost sight of Olive 2. A SAM was then reported at three o'clock by the Olive 2 copilot. This missile disappeared under the aircraft and detonated. All aircraft in Olive cell were doing evasive maneuvers to avoid the SAMs. The air battle continued.

Olive 3 was within sixty seconds of bomb release when the EWO reported "SAM TTR (Target Tracking Radar)". This was followed very shortly by "SAM Uplink, 3 rings" which meant the missile had our name on it. Olive 3 gunner then reported "SAM 3 o'clock High!". The pilot then made a hard evasive maneuver at about a 90 degree bank and the missile just missed us and detonated above us. The gunner later reported he could read the Russian writing on the missile. This was one of many times where the professionalism and courage of the E-07 pilots, EWO, and gunner saved us. Olive 3 completed its bomb release successfully and made the post target turn to heading 205. This heading did not lead us "feet wet" into the Gulf of Tonkin where a bailout would be recovered by Navy vessels in the area. Instead the heading kept our cell within the SAM threat area until we "crossed the fence" into Laos. Both the pilot and radar navigator tried to keep Olive 2 within visual and radar contact to maintain the best position for mutual ECM support. We

were still within the SAM operating area and the EWO was still reporting North Vietnamese radar tracking signals. We were still under intense SAM and AAA fire.

Meanwhile Olive 2 pilot, Capt Ostrozny, reported the SAM detonation as "something like a static discharge". Major Adam Rech, the Radar Navigator (bombardier), reported, "We rolled out and there was a detonation in the lower deck that appeared to be somewhat like a firecracker going off. At this time Capt Robert L. Estes, Navigator was motioning to me. I didn't understand what his signals were, but he was pointing down and we shined our lights down and found he had been hit. There was blood all over the deck below his seat and below his desk where he had been hit in the leg. Captain Estes deserves special credit because he maintained his cool and continued to do all the navigation."

After the SAM hit, communications with the gunner was lost, the pilots instrument system had either ceased to function or was inaccurate, and overall communications were bad or non-existent even with the parachute survival radios. This meant that there was no communication outside the aircraft. This is an important fact to remember since it will factor into the how the eventual recovery of the crew was accomplished.

Meanwhile, Olive 3, McCoy E-07, was trying to keep both visual and radar contact to provide ECM support as the cell had not "crossed the fence" out of North Vietnam. We were still under intense multiple SAM launches. In addition, Olive 3's pilots made numerous attempts to establish radio contact with Olive 2 to no avail. The navigator of Olive 3 maintained an accurate position to possibly report the position of any bail out or ejection out of the aircraft of the crew of Olive 2 for Search & Rescue. Olive 3 reported the situation to the command post at U-T which had not heard from Olive 2. Olive 3 had no knowledge of the situation of Olive 2. It was later determined the navigation instruments of Olive 2 were inoperable from battle damage.

Olive 2's alternators and engines began failing and fire was consuming the right wing. Not having any navigation aids, the navigator expertly used basic Dead Reckoning (DR) utilizing a stop watch, air speed and the whiskey compass to navigate from the last known position. Olive 3 had no communication with Olive 2 to aid in the navigation. The pilot of Olive 2 was determined to make it to friendly territory to prevent the crew from being "guests" at the "Hanoi Hilton". He also did not want to risk a bailout even over Laos, since capture by the Pathet Lao (the Laotian version of the Viet Cong) might mean never getting repatriated. Olive 2's crew valiantly attempted to recover the aircraft as near to Nakhom Phanom (NKP) Air Base, in northern Thailand, as possible. Copilot, Capt. Tony Foley, relates: "We knew damn well that we wouldn't be able to recover the jet. All the engines had flamed out. Our principle concern was getting back to friendly territory. We knew we were on fire but not exactly where and how serious until Ron (gunner) told us it was burning into the right wing which subsequently departed the airplane." The pilots of Olive 2 fortunately were able to visually determine they had crossed the Mekong River into Thailand. Capt. Os-

Ostrozny continued to fly the bomber in an effort to get as close to NKP as possible.

Olive 2 continued to descend due to the damaged engines and at 1520Z at approximately 19,000 feet the pilot ordered the bailout and the aircraft began an uncontrollable right roll. Olive 3 realized the crew of Olive 2 had bailed out when the parachute transponders were heard. The aircraft was seen exploding in the air by Capt. Ostrozny into three sections and was found scattered over a two mile area in the same forest about 12nm west-southwest of NKP.

The position of Olive 2's bailout was reported to Search and Rescue by Olive 3's navigator (Capt. Katta) and the crew was rescued within minutes by helicopters from NKP. Olive 2's crew was taken to NKP where they remained overnight. They received a thorough medical exam by the Flight Surgeon who found that the Co-Pilot suffered a hairline fracture of the left ankle and was hospitalized; the Gunner received minor burns on both forearms and the navigator received a minor shrapnel wound in the left leg and was hospitalized. The remainder of the crew sustained only minor bruises and abrasions.

While at NKP, Capt. Ostrozny received a telephone call from Brig. Gen. Glenn R. Sullivan, 17th Air Division Commander at U-T. Gen. Sullivan first inquired about the condition of the crew and was concerned that the family members be notified ASAP. He then recommended that the crew be debriefed ASAP to learn what transpired so that recommendations could be made to Strategic Air Command (SAC) for future missions. Gen. Sullivan was amazed that the crew was rescued so quickly. He was unaware that Olive 3, McCoy E-07, had radioed the position of Olive 2 to Search and Rescue. Gen. Sullivan did mention that another B-52, possibly Snow 2, received minor battle damage from an SA-2 SAM. The recovered crew, except for the co-pilot and navigator, were returned to U-T the following day.

Lessons learned included the fact that Olive 2 was struck while in the post target turn (PTT), which was not considered by the bomber wing planners when they were planning the initial December Linebacker II raids on Hanoi and Haiphong. Many of the bombers shot down then were hit while in that turn which increased their radar return, slowed their airspeed and downgraded their ECM countermeasures. Furious over SAC's flawed Linebacker II plan, 17th Air Division Commander at U-T, Brig. Gen. Glenn R. Sullivan, contacted CINCSAC(Commander-in-Chief SAC) directly to modify the tactics to eliminate the PTT and other tactical changes which were eventually incorporated into the tactics. The losses were reduced significantly. B-52s hit by SAMs would then continue on a straight course to the Gulf of Tonkin for rescue by the US Navy. Unfortunately, this action by Brig. Gen. Sullivan ruined his further career but gained the undying gratitude of the B-52 crews. He finally retired in 1974, as a Brigadier General and passed away in 1998, a true hero and forever in the hearts of the B-52 crews.

The significance of the elimination of the PTT was demonstrated during a post-Linebacker II raid over Vinh on Jan 4, 1973, when Ruby 2, a Dyess AFB B-52D crew commanded by Lt.Col. Gerald Wickline became the last

B-52 lost in the Vietnam War. Even though Ruby 2 received a SAM hit over Vinh, the straight line course to the Gulf of Tonkin allowed it to go down "feet wet" rather than over land. This prevented North Vietnamese capture of another B-52 crew. The crew bailed out feet wet and were quickly recovered by US Navy ships in the area. The last bomber to sustain battle damage was 0058 on January 14, 1973, from two SA-2 SAMS probably over Vinh. McCoy E-07 was also on that mission. The total B-52 losses in the Vietnam War was 31. 33 crewmen were killed in action, and 33 were captured and held as prisoners of war.

This last B-52 shoot-down, Ruby 2, happened in the bomber cell just behind the formation which included McCoy E-07. So McCoy E-07 was part of the beginning and end of the B-52 shoot-downs which were the bookends for Linebacker II for the 3 month period. The missions over Vinh were no "milk runs".

In recognition of his determination and courage that night, Capt. Ostrozny received the Silver Star, the third highest decoration for valor in combat. The remainder of the crew received the Distinguished Flying Cross, the fourth highest decoration for valor and the Purple Heart in recognition for their valor and injuries suffered due to enemy action during that mission. For his action on that mission, Capt. Katta, navigator on Olive 3, was also awarded the Distinguished Flying Cross. ■

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Book Reviews

Airlines at War: British Civil Aviation 1939-1944. An Official History. By British Air Ministry. Yorkshire, England: Air World Books, 2018 (first published as *Merchant Airmen: The Air Ministry Account of British Civil Aviation 1939-1944*, by Her Majesty's Stationery Office, London, 1946). Maps. Photographs. Illustrations. Pp. 208. \$34.95 ISBN 978-1-47389-409-9

This book was written before the end of the Second World War with the support and assistance of those involved in the planning and operations of the United Kingdom's civilian aviation organizations.

Much has been written about the brave exploits of the pilots and crews of the Royal Air Force (RAF) during the Second World War; however, the men and women of the civilian airlines also played a significant role in that conflict. The British Overseas Airways Corporation (BOAC) was formed in November 1939 as a transport service for the RAF—having no requirement to provide commercial service—by merging two existing commercial services: Imperial Airways and British Airways. The inaugural BOAC had 82 aircraft, a large proportion of which were seaplanes and flying boats. Service began with existing air routes over land and water, covering many parts of the world. As the Axis onslaught expanded during the early war years, many of these routes became unavailable. New, lengthier routes skirting, for example, the North Atlantic, Mediterranean Sea, Gulf of Bothnia, southern Indian Ocean, and the South China Sea had to be developed to keep wartime Britain connected with its colonies and the free world—often under enemy fire. Mail, cargo, and personnel were carried over 54,000 miles of air routes at a rate of 19,000,000 miles per year. This book explores much of the merchant air service's war history and something of the lives, risks taken, and operational achievements of its personnel.

Two important elements of the book are geography and navigation. It has ample charts showing the routes flown. Examples of these are the Trans-African route from Foynes to Lisbon, Dakar, Lagos, Khartoum, and Cairo; and the India Route from Cairo to Basra, Karachi, Calcutta, Rangoon, Bangkok, Singapore, Batavia, and Darwin. Atlantic routes included west from Foynes to Montreal and New York; east from Montreal to Goose Bay, Reykjavik, and Prestwick; and south from Baltimore to Bermuda and Lisbon, or to Trinidad, Natal, and Lagos. There was also a risky Swedish route from Prestwick direct to Stockholm flown by the fast flying de Havilland Mosquito. Finally, there were the Russian routes north from Prestwick, to the Arctic Circle, then Finland, Riga and Moscow; and south via Cairo, Tehran, Kuibyshev, to Moscow. Stations along these routes were carefully chosen, established, manned, supplied, and often relocated as the tides of battle shifted. There were over two dozen sea- and land-plane types involved (have Wikipedia open as you read)! Many had to be adapted to routes based on availability and capability.

The book has many action-packed accounts of opera-

tions along the routes: aircraft strafed at moorings; crews getting frostbite or running out of oxygen on trans-Atlantic ferry flights; flying Churchill across the Atlantic to Washington DC in secrecy, twice; Malta being supplied by air while under siege; and flying boats landing on the fast-running Congo River are but a few examples.

This narrative is an eye-opener and is very much worth the read.

Frank Willingham, NASM Docent



The Secret History of RDX: The Super-Explosive that Helped Win World War II. By Colin F. Baxter. Lexington KY: University Press of Kentucky (2018). Photographs. Notes. Bibliography. Index. Pp x, 204. ISBN: 9780813175287 (book); 9780813175300 (pdf); 9780813175317 (epub). \$45 (all formats)

Colin Baxter is a professor emeritus of history and former chair of the department at East Tennessee State University. He has published several selected bibliographies on World War II. In this concise, informative, and readable account, he tackles a topic basically neglected by historians to this point—advances in munitions that gave the Allies an edge in their struggle with the Axis powers.

The introduction provides a solid synopsis of how the Allies overcame production challenges as well as bureaucratic inertia. RDX, initially developed by Britain's Woolrich Arsenal in the early days of World War II, proved to be about thirty percent more powerful than the standard explosive of the day, TNT.

Recognizing that Woolrich would never have the capacity meet the production needs of the Royal Air Force, particularly Bomber Command, British leaders lobbied Washington. American and Canadian scientists helped refine the manufacturing process. The British meanwhile discovered that by adding TNT to a mixture with RDX, the resulting product was more stable during shipping. They called this derivative Composition B.

Initially, U.S. Army Ordnance leaders declined to embrace the new technology, as they thought it was somewhat exorbitant. Eventually, however, they recognized Composition B's superior qualities. The Army hired the Eastman Kodak Company of Rochester, New York, to manage production. Kodak, established a subsidiary, the Tennessee Eastman Company, to operate what would become the Holston Ordnance Works in Kingsport, Tennessee. Manufacturing the explosive required enormous amounts of water, which was, thankfully, available from the nearby Holston River. On April 25, 1942, the plant shipped its first load.

Besides writing a very understandable account of Composition B's development, Baxter also examines its use in combat. He cites three solid examples: the Allies' combined bombing offensive against Germany; the develop-

ment of a superior aerial depth charge that severely hampered German submarine operations during the Battle of the Atlantic, and improved warheads in U.S. Navy torpedoes.

With so much written about World War II over the years, Baxter points out that historians need to refine their perspectives if they are to pursue new insights into the war. He mentions historian Paul Kennedy's observation that the "middle" deserves more attention than the "top" (strategic decision-making) or the "bottom" (personal reminiscence). This work hits the "middle" dead on. It also serves as a reminder, once again, how the urgency of winning the war resulted in a "can-do" attitude that substantially improved weaponry available to the Allied side.

Steven D. Ellis, Lt Col, USAFR (Ret), docent, Museum of Flight, Seattle



A Tale of Ten Spitfires: The Combat Histories of Spitfire VCs AR501 to AR510. By Andrew Critchell. Barnsley UK: Pen and Sword Aviation, 2018. Photographs. Glossary. Bibliography. Appendices. Notes. Pp. 180. \$49.95 ISBN: 978-152672809-8

Critchell starts with a very simple premise: he selects ten Supermarine Spitfire Mk VCs with sequential tail numbers and follows their operational careers in the RAF. The first of the ten is AR501, an airframe still flying as part of the Shuttleworth collection. But his underlying theme is more subtle. The Mk VCs were the RAF's frontline fighter when the *Luftwaffe* introduced the Fw 190A into the western theater. On paper, the Fw 190A was significantly more capable than its RAF counterpart. The Fw was faster and more maneuverable at some altitudes. So the story within the story is how Spitfire pilots coped with their disadvantages.

Critchell uses a significant body of research to make his case. He presents amazing details not only on the life of each airframe, but also its pilots. Several of the planes found homes with Czech, Polish, and Norwegian ex-patriot units flying beside their British brothers in arms on a wide variety of missions. Critchell describes the boredom of shipping-reconnaissance patrols and the anxiety of escort missions: protecting Eighth AF heavies, Ninth AF medium bombers, and a wide variety of RAF attack aircraft.

The mission descriptions were most interesting. For example, the Boulton-Paul Defiant was still flying two years after its abject failure in the Battle of France. But, in 1942, some surviving Defiants were fitted with the MOONSHINE electronic countermeasures system, designed to counter the German *Freya* radar. Flying in fixed formations of nine aircraft, these early "Ravens" were escorted by Spitfires in an effort to protect RAF bomber formations.

Critchell competently describes the backgrounds and experiences of the people who climbed into the Spitfires' cockpits. The pilots' successes and struggles mirrored the ultimate fate of each aircraft. Only four of the ten airframes survived wartime operations: three were lost to accidents, and the others to mechanical failures and enemy action. Collectively they accounted for two enemy aircraft destroyed and partial credit for six others. This record shows that in well-trained hands using effective tactics, even a less-capable airframe can be a formidable opponent.

Critchell did not address a significant operational limitation that was, perhaps, as important to his story as was the performance characteristics of the Spitfire and Focke Wulf. During the Battle of Britain two years before, *Luftwaffe* fighters were significantly limited by a lack of range and endurance. By the time of Critchell's story, the situation had been reversed. The Spitfire's short legs significantly limited its effectiveness in offensive operations. When combined with the Focke Wulf's ability to use its speed advantage to pick and choose engagements, limited endurance placed the Spitfire and its pilots at a significant disadvantage.

A Tale of Ten Spitfires is meticulously researched. Critchell's style is a bit dry, and his narrative can be repetitive. The sixth time he used the same words to describe the engine starting sequence for the Merlin was five times too many. And the editors failed to recognize several homophones which can't be blamed on Critchell but did distract from the narrative. But most distracting was his approach to notes. He includes "Author Notes" in the body and "Notes" at the end. This disrupted the narrative flow of the text. That said, the book will be interesting to any World War II or British aviation buff.

Gary Connor, Docent, Smithsonian Air and Space Museum



Junkers Ju 87 STUKA. By Martin Derry and Neil Robinson. Barnsley UK: Pen and Sword Aviation, 2018. Photographs. Illustrations. Pp. 96. \$29.95 ISBN 978-152670-262-3

This Flight Craft publication is written primarily for modelers. However, Derry and Robinson have also provided an excellent story of the Ju 87 Stuka and provide detailed descriptions of the aircraft and its modifications as it fought to stay relevant to the war and was assigned new roles. Oftentimes, these modeler-oriented books provide some of the best information available about an aircraft's design and operational use. This is one such book.

The initial chapter covers the origins of the dive bomber and how First World War German Ace Ernst Udet influenced the design after flying an exported American Curtiss Hawk in demonstrations of dive bombing. There were opponents for the idea of dive bombing, such as *Luftwaffe* Field Marshall von Greim, who believed it would be

difficult to train pilots to perform the diving maneuver. The Junkers firm took an interest, though, and began working with designs. They grappled with different engines before settling on the Jumo 210. The aircraft would have a fixed landing gear with an inverted gull wing design with dive brakes located under each wing. The first model's performance was lacking but improved with subsequent modifications and models. The authors provide detailed info about each version's design. One interesting thing to note about the Stuka was that the German designers conceived of the Automatic Dive Recovery system, which helped pilots to pull out of their frightening dives at an eighty-degree angle. This system is described in detail in the book. Some of the significant changes included more-streamlined wheel pants; a better engine (Jumo 211) that provided enough power to reinstate a rear gunner; a swinging bomb cradle; and eliminating one of the iconic Stuka features, the screaming siren attached to the front of one of the wheel pants. Most pilots found this device affected dive speed and had already removed them.

We all know how robust *Luftwaffe* aircraft were at the beginning of the Second World War. The early Stuka was a mediocre success as a dive bomber in the Spanish Civil War in 1937. But in the beginning battles of World War II (Poland, Scandinavia, France, Belgium, and Holland), it performed very well. All that came to an abrupt end in the Battle of Britain where it was slaughtered by the Hurricanes and Spitfires. The *Luftwaffe* ceased flying it against Britain. It went on to serve in North Africa with moderate success as a dive bomber, and actually was successful as a naval attack aircraft, sinking British destroyers and a cruiser in the Balkans campaign. With its relatively slow speed and single rear gunner, its reputation sank as Allied aircraft and tactics became more sophisticated. Operation Barbarossa called it back for extensive use, but the tide began to turn on the Stuka as a dive bomber, and it was modified to be a ground attack aircraft—notably a tank killer. As the Axis went on the defensive, the Stuka stuck to the role of tank killer on the Eastern Front. The authors also discuss the export Stukas that flew with Italy, Hungary, Croatia, Romania, Slovakia, and Bulgaria.

The remainder of the book is primarily aimed at modelers. One chapter covers markings and camouflage and the *Luftwaffe* coding system used for the Stuka groups used throughout their operational history. Not many photographs are included, but there are 16 pages of wonderful color plates, all done in fine detail and with extensive notations. The authors certainly seem to have done their homework here. The final chapter deals exclusively with modeling the Stuka. For anyone wanting to replicate this famous aircraft, this is an invaluable resource.

While this book is primarily written for modelers, it is also a tremendous source of information for those interested in better understanding one of the iconic *Luftwaffe* aircraft of the Second World War.

Tony Kambic, retired database administrator; restoration volunteer, National Air & Space Museum



Eagles Over Husky: The Allied Air Forces in the Sicilian Campaign, 14 May to 17 August 1943. By Alexander Fitzgerald-Black. Solihull UK: Helion and Company, 2018. Photographs. Maps. Tables. Glossary. Appendices. Bibliography. Indexes. Pp. 192. \$39.95 ISBN: 978-1-912174-94-2

Alexander Fitzgerald-Black has a Master of Arts in Military History from the University of New Brunswick and is currently a Master of Arts in Public History candidate at the University of Western Ontario. His research interests include air power in World War II, with a particular focus on the Mediterranean, and on Canadian military history. This is his first book, being a representation of his master's thesis.

The Allied invasion of Sicily, codenamed Operation Husky, was a major campaign of the Second World War. It was the largest amphibious assault in the war to its date, and was one of the greatest air battles of the war. The campaign began with Allied strategic bombing of principal airfields; industrial targets; and ports in Sardinia, Sicily and southern Italy. This was followed by airborne and seaborne landings on July 9, 1943. By August 17, 1943, the Allies had won a substantial victory. However, the German and Italian armies had successfully evacuated over 100,000 active and wounded troops and more than 25,000 tons of vehicles, ordinance, and stores across the Strait of Messina to the Italian mainland.

One of the Fitzgerald-Black's major objectives is to counter arguments of historians that this operation was merely a Pyrrhic victory. That both ground and air operations were characterized by national and inter-army squabbles that allowed the enemy to mount a skillful withdrawal against essentially complete Allied naval and air superiority. All this, while being outnumbered 6:1 on the ground and 4:1 in the air. He points out that the strategic implications of Husky—opening the Mediterranean to shipping, diverting German military strength from western Europe and the Eastern Front to southern Europe, and pressuring Italy to capitulate and withdraw from the Axis alliance—were all accomplished. In addition, he provides support for the fact that, in a similar fashion, the combined Allied air forces met their established objectives: attain and maintain air superiority; provide continuous strategic bombing of the theater to interdict transportation and communications, deny reinforcement and supply, limit enemy bomber operations, and keep sea lanes open; and provide tactical support to battlefield operations where practicable.

Fitzgerald-Black provides a well-researched story. His organization of the book with its maps and tables plus six

helpful indexes (People, Places, Allied Units and Formations, Axis Units and Formations, Aircraft and Naval Vessels, and General Terms), makes it easy to follow and to go back to find pertinent related sections. It provides an excellent reference. A criticism is that his presentation is a bit one-sided. He gives only limited information on the objectives, strategy, and planning of the Axis side of the equation. In addition, while providing ample references throughout the book, he relies repeatedly on the reports of S. Zuckerman, scientific advisor to Air Chief Marshal Sir Arthur Tedder, and his British Bombing Survey Unit.

That being said, this book is a good read. It presents a somewhat different and clear view of the Sicily invasion and its importance to the Allied European war strategy.

Frank Willingham, NASM Docent



Knights of the Battle of Britain: Luftwaffe Aircrrew Awarded the Knight's Cross in 1940. By Chris Goss. Barnsley UK: Frontline Books (imprint of Pen and Sword Books), 2018. Photographs. Tables. Glossary and Abbreviations. Bibliography. Pp. 212. \$34.95 ISBN: 978-1-52672-651-3

Chris Goss is a prolific and effective writer of World War II aviation books and articles, specializing in *Luftwaffe* topics. His works are noted for attention to detail; the ability to find information (written as well as photographic and graphics); and their presentation in a clear, if sometimes formal, fashion. He has developed working relationships with other specialists in the field resulting in very tight and detailed products. *Knights of the Battle of Britain* continues in that vein.

Instituted on September 1, 1939 and first awarded on September 30, 1939, the *Ritterkreuz des Eisernen Kreuzes* (Knight's Cross of the Iron Cross) was the highest military decoration of the German military. As the war continued and the accomplishments of German soldiers continued to grow, higher variants were created. In 1940, the Knight's Cross with Oak Leaves was authorized, followed in 1941 by the Knight's Cross with Oak Leaves and Swords and the Knight's Cross with Oak Leaves, Swords, and Diamonds. The ultimate Knight's Cross, the Knight's Cross with Golden Oak Leaves, Swords, and Diamonds followed in 1944. The Knight's Cross could be earned by members of the Heer, Kriegsmarine, and *Luftwaffe*, as well as the Waffen-SS, the *Reichsarbeitsdienst* (RAD—Reich Labor Service), and the *Volkssturm* (national militia), along with personnel from other Axis powers. The award was authorized for all ranks, from senior leaders to the rank and file, and could recognize a long period of accomplishment or a single act of gallantry. The unique Grand Cross of the Iron Cross was awarded only once, in July 1940, to Generalfeldmarschall Hermann Göring. By the end of hostilities, over

7,000 Knights Crosses in the six categories were awarded to personnel serving the Reich.

Knights of the Battle of Britain is a collection of brief (one-two page) mini-biographies listing the 121 *Luftwaffe* members who received the Knight's Cross by the end of 1940. As a reader would expect, it recognizes the accomplishment of bomber and fighter aircrew and staff but also includes maritime, reconnaissance, and transport personnel as well. A number of recipients were awarded the decoration for service beyond the Battle of Britain. This structure is very clear and places appropriate emphasis on the actions of the individual but it makes for a difficult read. Mr. Goss's stilted style only exacerbates the problem. There is little narrative flow to the overall work. Some of the more extensive biographies (e.g., Mölders and Mayer) show Goss's demonstrated skill as a writer, but most of the biographies are little more than expanded paragraphs.

This book is an unique research tool for the serious historian doing targeted work on specific *Luftwaffe* personnel or unit histories within the early war years. But, for most readers, it would not be a recreational read. *Knights of the Battle of Britain* offers more personal information than the numerous web-based pages offering lists of Knight's Cross recipients. And the book, somewhat obviously, lays the groundwork for sequels.

Gary Connor, docent, National Air and Space Museum; Udvar Hazy Center



One Nation, Under Drones: Legality, Morality, and Utility of Unmanned Combat Systems. By Capt. John E. Jackson, USN (Ret), ed. Annapolis MD: Naval Institute Press, 2018. Photographs. Notes. Index. Pp. x, 229. \$29.95 ISBN: 978-168247238-5

Much like the ubiquitous cell phones most of us can't seem to live without, drones are rapidly becoming part of our everyday lives. From science fiction (where they are sometimes helpful but more often seem to threaten our imminent destruction) to the possibility our online purchases will arrive in hours courtesy of an aerial delivery system, there is no escaping them. While many people think of the small four-bladed aerial hobby drones or perhaps the large military drones used to seek out and attack terrorist targets in remote corners of the world, these vehicles actually span the land, sea, and air spectrum. They perform tasks deemed too dangerous, unfit, or inconvenient for humans ranging from undersea exploration and defense to aerial surveying; crop dusting; and, perhaps soon, daily package delivery. *One Nation, Under Drones* explores the development and use of these devices from multiple perspectives including the legal, ethical/moral, technical, and operational. This collection of essays seeks to answer some of

these questions while posing others for further discussion. The authors range from academics (military and civilian) to scientists to practitioners. The title sets the tone for the whole book. Because of the variety of systems, how they are controlled (direct human interaction or autonomous), and the tasks they perform, there is little agreement on what to call them. Jackson chose the term drone. While not technically accurate, it is commonly understood. Understanding and relating the subject matter to the layman is a consistent theme. The discussions are not dumbed down, but neither are they full of legalese. There are a few obscure examples of philosophical constructs (the Arkin test being one example); but, on the whole, terms, theories, and explanations are straightforward and clear.

The focus is on systems adapted for maritime use, including surface, subsurface, and airborne systems used by both the Navy and Marine Corps. Discussions include technical issues such as launching and recovering aerial drones off smaller vessels, defeating swarms of micro drones, the legal issues of armed autonomous systems patrolling territorial waters and economic exclusion zones, and dealing with neutral vessels and airspace penetration.

The book has many strengths, the greatest being the contributors themselves. As a group they seem to represent some of the most engaged and knowledgeable people in the field. There are short biographies of each which are helpful in assessing their qualifications. The breadth of discussions and the format encourage readers to explore further and continue conversations on this important topic. The legal and ethical articles especially give current and future commanders in any arena food for thought as the services work to incorporate these systems into everyday operations. A couple of things would have made an already useful book even more so. Some of the articles are more dated than others; in such a fast-moving field, notes indicating changes or updates since the article was written would be useful. With the plethora of systems discussed an appendix including tables or charts identifying systems, uses, capabilities, strengths, weaknesses, manufacturers, users, etc. would be very helpful. There is almost no mention of land-based systems. Since this book focuses on maritime applications, suggestions for further readings would be useful.

This is a useful and interesting primer on the current state of affairs and future directions for this technology. It is easily accessible in multiple electronic formats, and the hardcover price is quite reasonable as well. Well written and edited, it is worth reading.

Golda Eldridge / Lt Col, USAF (ret) / EdD



Aerial Warfare: The Battle for the Skies. By Frank Ledwidge, Ph.D. Oxford UK: Oxford University Press, 2018. Maps. Illustrations. Photographs. Sources. Bibliography. Index. Pp. 184. \$18.95 ISBN: 978-0-19-881813-7

In this compact and concise volume, Ledwidge, a Senior Fellow in Law and Strategy at the RAF College at Cranwell, offers less a history than a template for thinking about the framing and evolution of aerial warfare.

One might view this slender, small-format work as a sort of "Cliff's Notes" for the history of aerial warfare. It can serve that purpose, providing the naive reader with an easily digested overview of the evolution of war in the air. To comprehend the scale, understand that Ledwidge covers "The Second World War—Air Operations in the West" crisply in twenty-two pages. A few hours of reading takes you from the first scouting flights over the Great War trenches in France to the missile-armed, remotely-piloted aircraft over 21st-century Afghanistan.

But there is a bit more going on here. Early in the book, Ledwidge suggests that there are, and always have been, four roles of air power:

Control of the Air. Ensuring that it is you, not your enemy, that has freedom of the air.

Intelligence, Surveillance and Reconnaissance. Finding the enemy and learning as much as you can about him.

Attack. Attack, or bombing, is enabled by control of the air and good intelligence.

Mobility: The ability to use aircraft to transport equipment or people.

Ledwidge's thesis is that these roles have remained constant from the origins of aerial warfare in the 1914-18 Great War, through the interwar years and World War II, then into the Cold War and on into the post-Cold War conflicts in the Middle East and the Balkans. The roles for air power are unchanging; the technology evolves.

So the book reviews, concisely but cogently, a century of aerial warfare taking note of evolving doctrine and technology. The contributions to air power of the Italian theorist Giulio Douhet, the American promoter William Mitchell, and the British organizer Hugh Trenchard are briefly discussed. The development of aircraft that would apply the theories of those thinkers and their disciples to the four roles of air power in the run-up to, and in the battles of, World War II are also covered.

The half-century after the end of World War II is viewed in the context of the Cold War. The Berlin Airlift, the Korean War, the Vietnam War, and the various Arab-Israeli conflicts are mined for examples of how advancing systems and technologies do change the way in which the four roles get implemented but do not change the underlying roles themselves.

On the doctrinal front, Ledwidge acknowledges the contributions of Cols. John Boyd and John Warden to air superiority and to aerial attack, and he describes these briefly.

Toward the end of the book, Ledwidge notes the rise of precision and the arrival of stealth technology, drone technology, and cyber-warfare—all capabilities that would have

astonished the aerial warriors of the Great War but whose utility they'd have understood immediately.

Ledwidge establishes his thesis—that the four roles of air power are constants—early in the work; by the end he has made his case efficiently and effectively. If one is even a casual student of the history of air power, this work is unlikely to provide new facts; but it offers the reader an interesting perspective from which to assess other works. For areas where further detail is desired, a substantial “Further Reading” list is included.

Frank Van Haaste, Alexandria VA



Open Cockpit. By Arthur Gould Lee. London: Grub Street Publishing, 2018 (first published 1969). Photographs. Notes. Index. Pp. vi, 218. \$17.95 ISBN: 978-1916210-4

With the recent 100th anniversary of the end of World War I, *Open Cockpit* seems a timely choice for anyone interested in early air combat. The book is well worth your while. Lee joined the Royal Flying Corps in 1915 and flew as a combat pilot in World War I. He went on to retire from the RAF as an air vice-marshal in 1946. *Open Cockpit* is a follow-on to his earlier *No Parachute*. He describes his experience as a student and operational pilot during the war. Unlike many fighter pilot memoirs, this is not a “there I was . . .” loose collection of war stories.

Lee was an insightful student of air warfare and a talented writer. His intent is to describe through his own experience the birthing pains of a whole new form of warfare, air combat. He provides an excellent feel for just how primitive air warfare was in 1915. He describes his own training and combat experience with a compelling structure. Rather than the usual chronological description of his Great War experiences, each chapter is devoted to a particular air warfare topic and his experience with it (e.g., training, dawn patrols, high altitude patrols, heroes, ground strafing). Furthermore, he offers insight on why things turned out as they did.

Lee paints a vivid picture of just how primitive air warfare was in 1915, when air forces were making it up as they went. Lee attributes his own survival to the fact that he was injured in a crash during training and was not deployed to France as scheduled just before “Bloody April” took place and the RFC took monstrous casualties. During his recovery, he accumulated fifty flying hours and went into his first combat with far more flying experience than his squadron mates who had merely fifteen hours. That realization was not wasted on him.

He was also able to realize just how primitive his flight training was. Instructors were often rejects from the front with limited skills rather than the more talented pilots who would be better suited to instructing. No effort was

made to teach the teachers how to teach. In 1915, no one really knew why or how airplanes stalled or spun or what to do about it. Lee, as a 21-year old, seemed to realize this and decided to teach himself how to fly while convalescing.

His descriptions of missions are also remarkable. He paints a vivid picture of the brutal, bitter cold of high-altitude flight. And while putting the reader in the freezing open cockpit, he points out the tactical rationale of those missions. Likewise, he describes the terror and foolishness of using fighters for ground strafing of the trenches—needless risk of expensive aircraft and experienced pilots to shoot 700 bullets at an enemy hiding in trenches. His insight on dog fighting is also compelling. Because of lack of radios, communication was non-existent when two large formations tangled. Most times, after a whirlwind of dodging and trying not to get shot, both sides broke off with little damage done to either. He gives a delightful description of “cloud chasing,” but also ties it to the significance and use of clouds in air combat. Lee also offers fascinating insights into training-airfield requirements, the then-new RAF uniforms, and ranks (based on navy rather than army traditions), and parachutes.

The only aspect of this book that gives one pause is Lee’s somewhat unrealistic philosophical musing at the end. He laments the futility of war, the shameful loss of so many young lives, and loss of respect for British ideals. True enough, but he suggests that “bold diplomacy” could have prevented the war and even communism. Maybe so, but there is that pesky human nature and historical precedent to contend with.

Open Cockpit is a well-crafted work that captures the environment from which a new type of warfare emerged through the eyes of a young, enthusiastic, naive, but smart pilot.

Lt Col Paul Jacobs, USAF (Ret), NASM Docent



Forging a Total Force: The Evolution of the Guard and Reserve. By Col. Forrest L. Marion, USAFR (Ret) and Col Jon T. Hoffman, USMCR (Ret). Washington DC: Historical Office, Office of the Secretary of Defense, 2018. Photographs. Notes. Appendices. Pp. 311. \$34.00 ISBN: 978-0-16-094388-1

This ground-breaking book explores the costs and benefits of Total Force policy on citizen-soldiers, their families and employers, and the armed forces. The emphasis is on the extensive National Guard and Reserve deployments for the global expeditionary taskings of the last 25 years. It describes the considerable progress made in improving support of citizen-soldiers and discusses the issues with which policy makers must grapple to sustain the current model.

Marion is a staff historian at the AF Historical Re-

search Agency. His previous publications include *Flight Risk: The Coalition's Air Advisory Mission in Afghanistan, 2005–2015* (2018). Hoffman is Chief Historian at the US Army Center of Military History. His previous publications include *Once a Legend: Red Mike Edson of the Marine Raiders* (2001).

This well-researched book puts Total Force policy into context with a brief history of the citizen-soldier reaching back to pre-Revolutionary times, when local militias supported the British Army in various campaigns. After the Revolution, the new nation relied on the citizen-soldier rather than a large standing army. Militia contributed substantially to holding the line early in the Civil War, until the volunteer army could take the field. In the postwar years, the term National Guard came into use. The role of the unit, drills, and support of the regular army were emphasized. Success in such professionalization enabled eighteen mobilized National Guard divisions to deploy overseas in World War I. The Reserves were created early in the twentieth century as a reservoir of specialized skills. Despite the impact of tight funding on readiness between the wars, activated Guard divisions enabled the Army to grow quickly for World War II. The armed forces relied extensively on Reserve and Guard units early in the Korean War.

During the 1950s, USAF started incorporating the ANG and Air Force Reserve into day-to-day operations. Total Force integration became official policy in 1970, essentially changing the Guard and Reserves from a rarely-called-up strategic reserve to a frequently activated operational reserve. Despite the impact of limited post-Vietnam budgets, the ANG dominated William Tell air-to-air competition during the 1970s, and the first Air Force Reserve fighter NATO deployment occurred in 1977. Reagan-era defense budgets improved Guard and Reserve readiness in time for acceleration of total force integration caused by post-Cold War regular force drawdowns. The wars in the Persian Gulf, Afghanistan, and Iraq exposed problems in heavy Guard and Reserve reliance. Successive initiatives in family support, health care and call-up scheduling helped mitigate these adverse effects.

Although heavy on legal and administrative details, the narrative is lively, with clear introductions and conclusions. Specific examples of Guard and Reserve experiences reinforce the authors' points. Policies of the different services are compared and contrasted. Endnotes are specific and detailed. The book was sourced from official documents and reports, interviews, and secondary sources.

I gained a much better understanding of Total Force policy and its effects on the National Guard and Reserves from *Forging a Total Force*. This book should be required reading for everyone affected by or interested in Total Force implementation and policies.

Steven Agoratus, Hamilton NJ



Focke Wulf Jet Fighters. By Justo Miranda: Stroud UK: Fonthill Media, 2018. Diagrams. Illustrations. Bibliography. Pp. 252. \$25.00 ISBN: 978-1-78155-664-1

This is a difficult book to categorize. It is not a narrative although it has some characteristics of a narrative. In many ways it is more like a text book for advanced scholars of late-Second World War German aviation. It clearly pre-supposes an extensive knowledge of German aircraft armaments and engines, both reciprocating and jet, on the part of the reader. There is a presumption that the reader knows what an Argus AS 413 engine is, or a BMW 803A, or a Jumo A213-A1 engine and their characteristics. There are many references for engines and armaments that require pre-existing knowledge.

Following an introduction, there are twenty-eight chapters, each dealing with a different Focke Wulf model project and related subjects, such as Russian Fakes, a transonic (author spelling) project, and a few other subjects related to interesting post-war projects with which Focke Wulf had some influence.

The narrative in each chapter seemed detailed, complete, and straightforward with a "bare-bones" writing style. The highlight of the book is the drawings, of which there are myriad. Generally these are line drawings of front, side, and top views of each model as well as related aircraft. Not surprisingly, there are no photographs.

While most of the chapters are dedicated to individual specific design models, it is, however, the introductory chapter that provides the best overall view of the Focke Wulf jet projects' seemingly second-rate status. The Messerschmitt Me 262, originally designed in 1940, actually became an operational jet aircraft, primarily as an air superiority fighter. Arado also developed an operational jet aircraft (the Ar 234). Originally conceived as a bomber, poor load capability led to its use as a very effective reconnaissance aircraft. However, none of the Focke Wulf jet aircraft designs actually made it to operational production. The reasons for this appear to have been related to the fact that the very limited number of first-line jet engines were assigned to other design bureaus. Focke Wulf had to make do with what they could get, which explains many of the design selections and why many of these engine models may be more obscure than others. This, combined with aerodynamic problems related to air compressibility, resulted in projected performance that never quite made the grade. This was reflected in their poor performance in the 1943 Jagdflugzeug and later trials.

There is a reasonably complete bibliography but no index. This would make finding specific information somewhat easier (e.g., for referencing engines), although the chapter headings are helpful in that the model information is clearly presented. The addition of some tables with projected performance data, where available, and equipment would also have been very helpful.

Overall, this is a book for scholars and historians. It is not “bed-time” reading in the same sense as many of the other historical books to come out of this era. For what it is, however, it is a very useful addition to a scholar’s library.

Arthur B. Chausmer, MD, docent, NASM’s Udvar-Hazy Center



Soviet Strategic Bombers: The Hammer in the Hammer and Sickle. By Jason Nicholas Moore. Stroud UK: Fonthill Media, 2018. Tables. Illustrations. Photographs. Appendices. Glossary. Bibliography. Index. Pp. 302. \$50.00 ISBN: 978-1-78155-597-2

This book is a comprehensive and well-illustrated study of the development, testing and operational history of Soviet strategic bombers from World War II through the end of the Cold War. Beginning with three United States Army Air Forces (USAAF) Boeing B-29 Superfortresses that were forced to land in the Soviet Union, the book chronicles the history of Soviet Long-Range Aviation (DA or Dal’nyaya Aviatsiya). From the Tu-4 “Bull,” the Soviet reverse-engineered copy of the B-29, to the modern swing-wing Tu-160 “Blackjack” now flying combat missions in Syria, Moore provides technical specifications, combat histories (including those of foreign users such as Iraq, Libya, and China), pilot interviews, and comparisons with non-Soviet bombers such as the Royal Air Force (RAF) Avro Vulcan and USAF Boeing B-52 Stratofortress.

Imperial Russia fielded the world’s first four-engine bomber, the Ilya Muromets, in 1913 and flew it on many tactical and strategic missions before Russia dropped out of World War I. Large, all-metal bombers were developed by the Soviet Union in the 1930s. However, strategic bomber development stagnated during World War II (or the Great Patriotic War) in favor of ground-attack aircraft such as the famous Ilyushin Il-2 Sturmovik. When the United States refused to provide lend-lease B-29s during World War II, Soviet Premier Joseph Stalin directed Andrei Tupolev and Vladimir Myasishchev to develop similar aircraft for the Soviet Air Force. The fortuitous internment of the three B-29s in 1944 allowed Tupolev to design the Tu-4 copy, which flew in 1947 and served as the Soviet Union’s first nuclear-capable strategic bomber.

During the Cold War, the Soviet Union developed a series of remarkable strategic bombers, including the Tu-95 “Bear,” Tu-16 “Badger,” and Tu-22M “Backfire.” The turboprop Tu-95, which first flew in 1952 (the same year as the B-52), is a direct descendant of the B-29/Tu-4 series of World War II-era bombers and remains in service today. Its rival for longevity is, of course, the USAF B-52. Both aircraft may well continue flying for another 20-plus years, a testament to their design, performance, and adaptability. A specially modified Tu-95 dropped the world’s most pow-

erful thermonuclear bomb, the Tsar Bomba (King Bomb), during a 1961 test over Novaya Zemlya in the Soviet Arctic. Weighing 55,000 lbs, the Tsar Bomba detonated with a force estimated at over fifty megatons!

Though focused on the Cold War, Moore brings the story of these Soviet-era aircraft to the present day. Current versions of several of these strategic bombers remain in service with the Russian Federation and other countries (including the Peoples Republic of China) and have seen combat during the past several years in Syria. This book will likely be a standard reference work on Soviet strategic bombers and is highly recommended for anyone fascinated with Soviet-era military aviation.

Jeffrey P. Joyce, Major, USAF (Ret)



The Chaco Air War 1932-35. By Antonio Sapienza. Solihull UK: Helion & Company, 2018. Maps. Tables. Illustrations. Photographs. Appendices. Sources. Pp. 64. \$29.95 paperback ISBN: 9-781911-51296-7

The Chaco War, “[t]he first modern air war in Latin America,” was fought by Paraguay and Bolivia over a disputed territory called the Chaco. It is about 385,000 square miles of flat, arid, thinly populated land that both nations claimed for historic reasons and coveted for economic reasons (there were hints of mineral and petroleum potential). Some incidents occurred starting late in 1928. Fighting began in earnest in June 1932 and lasted until June 1935.

This slender volume is not Sapienza’s first effort regarding the Chaco War. In 1996, with co-author Dan Hagedorn, he produced *Aircraft of the Chaco War 1928-1935*. The earlier volume focused on the aircraft employed by the belligerents, with less attention paid to operations. The present work takes a complementary approach, providing a detailed account of the operations conducted by both air arms.

On paper, this conflict looked to be an easy win for Bolivia. Its military was much larger and better equipped than the Paraguayan force, and this disparity extended to the two nations’ air arms. But, after three years of combat operations, it was Paraguay that prevailed, expelling Bolivia from the Chaco and acquiring, under the terms of the peace treaty, most of the disputed territory. The air arms of both sides were significant factors in determining the outcome.

Sapienza provides a couple of “stage-setting” sections broadly describing the background of the conflict and the histories and status of both Paraguayan and Bolivian military aviation as of the onset of hostilities. These absorb about twenty pages. He then follows with a highly detailed (and apparently thoroughly researched) forty-page chronological account of the three years of war from the perspective of the air arms. He details the circumstances of each

one of the 20 aerial combats that occurred (resulting in losses of two aircraft for each side), and similarly details many bombing attacks and reconnaissance missions. And in these accounts, an understanding emerges as to why the outcome was so unexpected.

Both air arms had brave pilots and effective aircraft (albeit more of each on the Bolivian side); but the Paraguayan higher command understood how to make effective use of air, while the Bolivian command did not. Pilots on both sides provided good intelligence on troop concentrations and movements. The Bolivian C-in-C, German Gen. Hans Kundt, consistently disregarded pilots' reports and was consistently defeated. In contrast, Paraguay's Gen. Jose Felix Estigarribia exploited his aviators' reports to enable dynamic campaigns that overwhelmed the numerically superior Bolivians. Estigarribia referred to his air arm as the "eyes" of his army.

This is a fine reference for anyone wanting to delve into details: names, dates, places, and aircraft serial numbers for every consequential action of the three years of combat are provided. It is thorough to a fault (e.g., we may not have needed the name and rank of every officer in each class at the Paraguayan Military Aviation School). It is less successful as a vehicle for giving an overview of the role of aviation in the war's larger context. Some prior study on the broader historical context and an ability to draw inferences would help the reader understand the significance of the actions that Sapienza chronicles in such detail.

The book is profusely illustrated with fascinating contemporary photographs and includes a half-dozen useful maps and 21 delightful full-color aircraft profiles to delight model builders.

Frank Van Haaste, Alexandria, VA



Reconnaissance Planes Since 1945. By Frank Schwede. Barnsley, South Yorkshire: Pen and Sword, 2018. Tables. Photographs. Pp. 127. \$17.95 paperback ISBN: 1473891337

This book is one of a series the publisher calls its "fact file." Its intent is to provide "fundamental knowledge for aviation enthusiasts, covering a vast number of brands and model history with technical data, facts and images." As a former reconnaissance pilot myself, I was looking forward to reading this book. According to the press release accompanying it, Schwede is a freelance journalist who collects police badges and model police vehicles. I'm not sure how this qualifies him to write this book, and the results are reflected here.

The book covers the USA, Europe, Asia, and Russia and describes very briefly (one-two pages) each aircraft's purpose, development, and facts about its use. Each entry includes a short table with specifications including

dimensions, engines, crew, range, and speed. The introduction outlines very briefly the development of airborne reconnaissance and defines some terms commonly known as the INTs (e.g., Signals Intelligence, SIGINT; Electronic Intelligence, ELINT; and so on). This is helpful, but not a comprehensive list, as some of the aircraft he discusses collect other types of information (e.g., measurement and signals intelligence, or MASINT, being a key item) and he includes Airborne Warning and Control or AWACS. This last one is obviously an electronic combat mission but is considered battlefield management and command and control—not reconnaissance. Schwede includes numerous other aircraft which stretch the definition of reconnaissance to include command and control or scientific research aircraft. These include the EC-135 Looking Glass and ARIA (Apollo Range Instrumentation Aircraft), E-3 Sentry, E-6 Mercury, and the Russian Beriyev A-50. Given the book's short length, space used for these non-reconnaissance aircraft could have been used expanding the sections on others. One plus of the book is that Schwede includes the RQ-4 Global Hawk unmanned reconnaissance aircraft. This and other UAVs have had a dramatic impact on intelligence collection; it would have been good to see one or two more examples included.

This book's strength is the photos. There are, on average, four photos per type. Most are in color, and they are very well reproduced on high-quality paper. They include looks into cockpit interiors and crew compartments. Unfortunately this is the book's only strength. The data are rife with inaccuracies and editing errors that even a cursory review by a qualified editor should have caught. Simple errors such as the discussion of the EC-135 Looking Glass firing cruise missiles are simply wrong. The Looking Glass could fire ground-based ICBMs, an important distinction. The Boeing P-8 program is listed as costing \$3.9 million, a figure that wouldn't pay for the engines of one aircraft. Almost half the specifications tables had errors ranging from number of crew to thrust output to the number of engines on the aircraft (the P-3 Orion is listed as having two engines when the picture right next to the table shows four)! Other issues include photo captions that merely repeat the text and no bibliography, index, or glossary. All of these things would be helpful to someone interested in further study: any reader could get just as much (or more) information using Wikipedia. What could have been a handy although limited reference is merely an overpriced picture book.

Golda Eldridge, Lt Col, USAF (Ret), EdD



Luftwaffe Eagle: A WWII German Airman's Story. By Erich Sommer; edited and expanded by J. Richard Smith. London UK: Grub street, 2018. Photographs. Footnotes. Index. Glossary. Pp. 214. \$35.00 ISBN: 978-1-910690-54-3

In the late 1940s and early 1950s, publishers began to offer biographies and autobiographies describing the experiences of combatants in World War II. Of special interest to many arm-chair historians were books that described the wartime contributions of members of the Axis forces: *Samurai*, *The Blond Knight of Germany*, *Stuka Pilot*, and *The Forgotten Soldier* attracted significant readership despite the fact that many of the stories were ghost written by authors using sometimes dubious sources. Many relied on oral histories and memoirs and memories that may have faded over time. The format of these works became formulaic: an introductory section describing the conventional youth and adolescence of the protagonist, then the transition to the military to include training and early relationships with comrades and superiors, and, finally, the actual wartime experiences. I expected *Luftwaffe Eagle* to follow this format and, to a large part, it did.

What sets Sommer's work apart is his penchant for detail. When he talks about the reorganization of a squadron, he provides the squadron markings of aircraft before and after the reorganization. When he talks about the *Luftwaffe*'s efforts to field a blind-bombing system, the X-Verfahren, he provides details on the location of ground radio transmitters, aircraft modifications, aircrew instruments and controls, operational procedures, and photographs of the same.

The same holds true of the people Sommer mentions. He talks in detail about working with Zirkus Rosarius, the commander of "Rosarius's Flying Circus," a unit dedicated to restoring and testing captured allied aircraft. Sommer recounts Circus pilots being unimpressed with the low-altitude flight characteristics of the P-51 Mustang because of its laminar wing design. The Circus eventually crashed both of its P-51s, killing the pilots, during low-level flight. He recounts his encounter with the French designer Coco Chanel and his efforts to specifically identify the previously unknown mystery woman.

Sommer's career is rather extraordinary, bringing an aspiring brewery chemist into many of the *Luftwaffe*'s cutting-edge technological programs. In addition to his work on blind-bombing systems, he was the navigator on numerous high-altitude reconnaissance/bombing sorties over England using the highly modified Ju 86R. He participated in night anti-shipping missions in the Black Sea using He 111s modified with forward and side-looking-radar systems. And the highlight was when Sommer, a newly minted pilot, became involved in the Ar 234 jet program, flying both prototypes and production variants, including reconnaissance sorties over the beaches of Normandy immediately following the allied landings. Again, the detail he provides recounting these events is extraordinary.

The book was printed on high-quality clay-based paper so that the many photographs provided, most from Sommer's own albums, are sharp and crystal clear. These make the book just as valuable to the serious modeler as the arm-chair historian.

Luftwaffe Eagle describes an unique military career. The detail of the stories and anecdotes sets it apart from the usual offerings in the genre. While a relatively short work, the detail of Sommer's story will have the serious reader stopping to cross check and research the information Sommer offers.

Gary Connor, National Air and Space Museum; Stephen Udvar Hazy Center



All the Factors of Victory: Adm. Joseph Mason Reeves and the Origins of Carrier Airpower. By Thomas Wildenberg. Annapolis MD: Naval Institute Press, 2019. Photographs. Figures. Tables. Notes. Abbreviations. Bibliography. Index. Pp. 336. \$29.95 (paperback) ISBN 978-1-68247-299-6

Wildenberg is an independent historian and scholar with special interests in aviators, naval aviation, and technological innovation in the military. He has written extensively about the US Navy during the interwar period, replenishment at sea, the development of dive bombing, and the history of US torpedoes. He served as a Ramsey fellow at the National Air and Space Museum and has received several literary awards for his work in naval history and biography.

Joseph Mason Reeves was born in November 1872. In 1890 he was appointed to the US Naval Academy at Annapolis. During his time there, the Navy was entering the early stages of a reformation that would transform it from a collection of older ships, second-rate cruisers, and coastal monitors, into a modern fleet built around formidable battleships. After graduation, Reeves was posted as an engineer officer on the protected cruisers *Cincinnati* (C-7) and *San Francisco* (C-5) and the pre-dreadnaught battleship *Oregon* (BB-3). While serving on the *Oregon* during the Spanish-American War, Reeves took part in the action against Admiral Pascual Cervera y Topete's fleet at Santiago in June and July of 1898. This was the only war action Reeves experienced at sea during his entire career.

In the early 1900s, Reeves served on the battleships *USS Wisconsin* (BB-9) and *USS Ohio* (BB-12), as a line officer, in addition to a shore tour at Annapolis, where he was an instructor in the Department of Physics and Chemistry. He also served as the Academy's head football coach in 1907. Following shore duties, he was posted as ordnance officer on board the battleship *USS New Hampshire* (BB-25.)

In 1913, then-Commander Reeves assumed command of the collier *USS Jupiter* (AC-3), the Navy's first electrically propelled vessel. In 1916, he commanded the battleship *USS Maine* (BB-10) during World War I, earning the Navy Cross for "exceptionally meritorious service" during that tour.

Reeves received his qualification as a Naval Aviation Observer and in 1925, was posted as Commander, Aircraft Squadron, Battle Fleet. His flagship was the experimental carrier *USS Langley* (CV-1), rebuilt and recommissioned from his old ship, *Jupiter*. This ship was the Navy's first aircraft carrier. While in this command, Reeves developed carrier aviation tactics, and the use of dive-bombing. He demonstrated these concepts repeatedly during the Navy's annual fleet exercises.

Reeves retired from the Navy in 1936, but was recalled to active duty in 1940. He retired a second time in 1946, and died in 1948. Wildenberg best describes Reeves as "an extremely talented officer, well versed in all aspects of naval science. Although he made his historical mark in fleet operations and carrier aviation, he also exhibited an exceptional understanding of engineering, gunnery, aeronautical developments, logistics, counterintelligence, administration, and organization. He was a teacher and a tactician who had a lifelong commitment to learning." He became known as the "Father of Carrier Aviation."

Wildenberg has written a very well researched and enjoyable biography. While having to deal with a scarcity of information from Reeves himself, Wildenberg made rational assumptions, where necessary, based on his extensive research. He provides many entertaining anecdotes about Reeves' life at sea and ashore. Of particular interest is the detail he offers on Reeves' interactions throughout his career with fellow officers, command-level naval officers, members of various boards and panels, and period politicians, including President Franklin Roosevelt. The book serves to enlighten the reader on the life, commitment and outcomes of a little-known, but highly influential, American patriot. It is a good read.

Frank Willingham, NASM docent



Journey: Memoirs of an Air Force Chief of Staff. By Gen Norty Schwartz. New York: Skyhorse Publishing, 2018. Photographs. Glossary. Index. Pp. xxii, 370. \$29.99. ISBN: 978-1-5107-1033-7

This book is one of the finest autobiographies, or biographies, ever written by or about an Air Force (or Air Service, Air Corps, or Army Air Forces) officer. While written about a different time, and approaching its subject from a different perspective, in content it ranks up there with Richard Davis' *Carl A. Spaatz and the Air War in Europe* and Hap Arnold's *Global Mission*.

Schwartz was the nineteenth Chief of Staff of the Air Force. His rise to that assignment was marked by the expected wide variety of command and staff jobs. However, what was unusual was his career path. Most of the twenty-one men who have served as Chief came from the fighter/attack and bomber communities (exceptions were Thomas

White, observation aircraft and many staff jobs; and Lew Allen, who started in bombers but spent much of his career in R&D and science). Schwartz's path was through the airlift and special operations fields. Without doing a detailed analysis, I think it is safe to say that he had by far the broadest joint background of any of the modern Chiefs—and he started that very early in his career and stayed in close contact with other Services and foreign militaries throughout his upper-level commands and staff positions.

There are a number of facets of Schwartz's career that stand out in *Journey*. First, this is not the autobiography of a combat ace, so the "Here I was at 30,000 feet" stuff does not fill ninety percent of the book. But Schwartz flew in Vietnam and later participated in some of the earliest operations in the special operations arena. He includes a lot of those tales in his story. What I found to be most fascinating, however, were the stories of the higher-level command and staff jobs—the behind-the-scenes views of events that many of us heard about or, perhaps, participated in tangentially or at lower-grade levels. There haven't been many books written about the jobs of Director of Operations (J-3) and Director of the Joint Staff, two of the most important—and toughest—staff jobs in the US military. Schwartz held these jobs and provides tremendous insight into the responsibilities inherent in both. The dealings with Congress, two Presidents, and several Chairmen of the Joint Chiefs and Secretaries of Defense are laid out with few punches pulled.

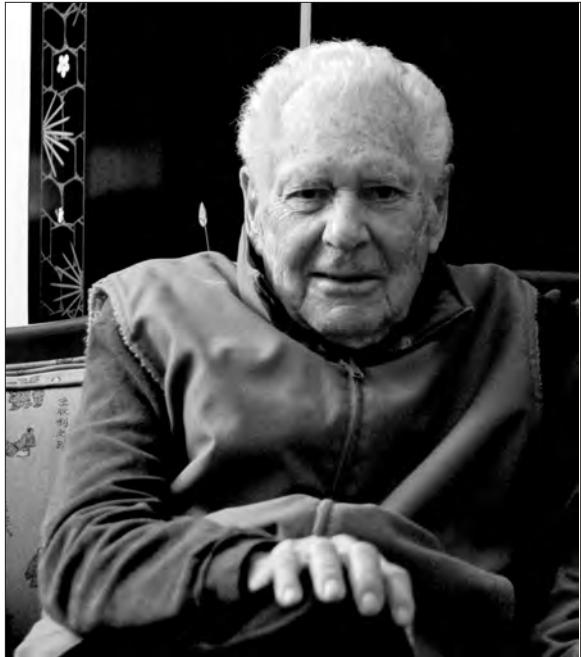
And now to the feature that really makes this book stand out. While Schwarz's early life and years at the Air Force Academy are well covered and show the building of the character and principles of the future Chief, certainly the most influential facet of his life has been his wife, Suzie. Unconventional may be an appropriate adjective to describe her—and nothing pejorative is meant or implied by that at all. She just had a style and approach to her husband's career that was different and very proactive. Schwartz chose to have her write a substantial part of the text—sections of her own or paragraphs interspersed with those of her husband. These parts make readers feel as if they are sitting in a living room with the couple listening to a conversation. It's all very effective and provides a look at the other side of what Schwartz consistently states was a close-knit partnership through his career and beyond.

Throughout the book, Schwartz and his wife are extraordinarily open and never fail to heap praise on those who helped and guided them along the way—and many of these were in other Services, officers and spouses alike. It is an honest look at the development of one Chief's career and what happens behind the scenes at the highest levels of our government. *Journey* is a keeper.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and Docent, NASM's Udvar-Hazy Center



Henry S. Bausum 1924-2019



Henry S. Bausum, historian, professor, and journal editor, died on January 5, 2019, at his home in Beloit, Wisconsin. He was 94 years old. His death occurred a few weeks shy of a much-anticipated 95th birthday.

Dr. Bausum's pathway to academe sprung from unlikely roots. His parents, Frederic William and Florence Burke Hillborn, had received only modest educations. His father's profitable business collapsed in the Great Depression, forcing the family to relocate in 1934 from a comfortable home in Winchester north of Annapolis to a rustic farm on the opposite side of the city. The youth nonetheless completed high school in Annapolis. He enlisted in the Army Air Corps on December 12, 1942. His ambition to become a pilot was derailed by his sensitivity to high-altitude flying, and he served with squadron operations until the end of the war. He was discharged with the rank of sergeant on December 22, 1945.

Dr. Bausum used the G.I. Bill to enroll in the University of Maryland two months after leaving military service, quickly changing his field of study from agriculture to history. Later that year he met Dolores Brister of Pineville, Louisiana, with whom he would share a seventy-one-year marriage. The two were married the following summer in Pineville on June 7, 1947.

The University of Maryland awarded his bachelor's degree in 1949. Fifteen years later, in 1964, he earned his doctorate in history from the University of Chicago. In between he studied for a year at Andover-Newton Theological School and gained a master's in history from Boston University.

The many years of schooling were interspersed with breaks for employment and the birth of two children, a son, David Rees, born in 1948, and a daughter, Ann Sharon, born nine years later. Having begun his academic teaching career in Tennessee at Carson-Newman College, Dr. Bausum joined the faculty of Virginia Military Institute (VMI) in Lexington in 1964 after receiving his Ph.D. He taught history there for the next twenty-five years, including five as chair of the History Department.

Dr. Bausum developed a program at VMI known as the John Biggs Cincinnati Lectures in Military Leadership and Command. This series brought prominent military historians to campus for cadets to meet and hear. His experience editing annual collections of the lectures prompted him to undertake further editorial work after he retired from teaching in 1989. For the next ten years he edited a scholarly quarterly, the *Journal of Military History*, from an editorial office based at the George C. Marshall Library on the VMI campus. In addition, from 1991 to 1993 he served as editor-in-chief of *Air Power History* magazine, the quarterly journal of the Air Force Historical Foundation.

In the span of forty-six years, Dr. Bausum and his wife traveled abroad twenty-five times, principally to Europe but also to China—shortly after the country reopened to Westerners—and to India. They remained active well into a period they perennially referred to as late middle age, taking their last international trip at ages eighty-six and eighty-two. The Bausums moved to Beloit, Wisconsin in 2000 to be nearer their daughter and her family. Until last summer, Dr. Bausum was still clearing his own snow, pulling weeds, and mowing his lawn. A series of strokes and failing memory forced the curtailment of his full independence, but even to his final days he was eager to spin a zinging pun, and unfailingly devoted to his wife.

He is survived by Dolores, their children David (Mary) and Ann, grandsons Sam and Jake, step-grandson Andrew (Suzanne), step-granddaughter Siona, and his younger sister Mary Catherine. Memorial gifts may be made in the name of Henry S. Bausum to the Development Office, American Historical Association, 400 A St. SE, Washington, DC 20003 or online at <https://www.historians.org/about-aha-and-membership/donate>.

Coming Up



Compiled by
George W. Cully

June 17-21, 2019

The **American Institute for Aeronautics and Astronautics** will host Aviation 2019, its annual premier aviation and aeronautes forum and exhibition, at the Hotel Anatole in Dallas, Texas. For registration and other information, see their website at <https://aviation.aiaa.org/>.

July 10-12, 2019

The **American Astronautical Society** will present its first annual John H. Glenn Jr. Memorial Symposium at the Huntington Convention Center in Cleveland, Ohio. Attendees will also have the opportunity to tour NASA's world-class test facility sited in Cleveland. For registration and other details, see the Society's website at <https://astronautical.org/events/john-glenn-memorial-symposium>.

July 16-21, 2019

The International Organization of Women Pilots, better known as **The Ninety-Nines**, will hold its annual convention on the grounds of the University of Dayton in Dayton, Ohio. For more details, see their website at www.ninety-nines.org/who-we-are.htm.

July 22-27, 2019

The **International Committee for the History of Technology** will hold its annual meeting in Katowice, Poland. This year's theme will be "Technology and Power." For registration and additional details, see the Committee's website at <http://www.icohtec.org/w-annual-meeting/katowice-2019/call-for-papers/>.

July 23-27, 2019

The **History of Science Society** will hold its annual meeting in Utrecht, the Netherlands. For details as they become available, see the Society's website at <https://hssonline.org/>.

September 5-8, 2019

The **Tailhook Association** will host its annual meeting at the Nugget Casino Resort in Reno, Nevada. For more information, see the Association's website at <https://www.tailhook.net/>.

September 10-12, 2019

The **American Astronautical Society** will hold its annual Wernher von Braun Symposium in Huntsville, Alabama. For registration and program details, see the Society's website at <https://astronautical.org/events/vonbraun/>.

September 16-19, 2019

The **Air Force Association** will hold its annual National Convention and Air, Space and Cyber Conference at the Gaylord National Hotel in National Harbor, Maryland. For details, see the Association's website at www.afa.org/events/calender.

September 25-28, 2019

The **Society of Experimental Test Pilots** will present its 63rd Annual Symposium and Banquet at the Grand Californian Hotel in Anaheim, California. For more particulars, see the Society's website at <http://www.setp.org/symposium/meetings/annual-symposium-banquet/>.

September 28, 2019

The **National Aviation Hall of Fame** will host its 57th Enshrinement Dinner and Ceremony at the Wings Over the Rockies Air & Space Museum in Denver, Colorado. For further information, see their website at <https://www.nationalaviation.org/>.

October 14-16, 2019

The **Association of the United States Army** will host its annual meeting and exhibition at the Walter E. Washington Convention Center in Washington, DC. For a program agenda and other details, see the Association's website at <http://ausameetings.org/2019annualmeeting/>.

October 16-19, 2019

The **Oral History Association** will hold its annual meeting at the Sheraton Salt Lake City HotelSalt Lake City, Utah. This year's theme will be "Pathways in the Field: Considerations for those Working In, On, and Around Oral History." For more details, see the Association's website at <http://www.oralhistory.org/2019-call-for-proposals/>.

October 17-20, 2019

The **Mars Society** will host its 22nd annual convention on the campus of the University of Southern California in Los Angeles, California. For program information and registration details, see the Society's website at <http://www.marsociety.org/conventions/2019/>.

October 24-27, 2019

The **Society for the History of Technology** will hold its annual meeting in Milan, Italy. For additional information, see the Society's website at <https://www.historyoftechnology.org/annual-meeting/2019-shot-annual-meeting-24-27-october-milan-italy/>.

October 28-30, 2019

The **Association of Old Crows** will hold its annual convention at the Renaissance Downtown Washington D.C. hotel and convention center in Washington, DC. For more details, ping a crow at www.crows.org/page/annualsymposium.

January 3-6, 2020

The **American Historical Association** will hold its 14th annual meeting at the New York Hilton Hotel in New York City, New York. For registration and program details, see the Association's website at <https://www.historians.org/annual-meeting>.

Readers are invited to submit listings of upcoming events. Please include the name of the organization, title of the event, dates and location of where it will be held, as well as contact information. Send listings to:

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History Mystery Answer



The twin engine transport planes that delivered the 82nd and 101st Airborne divisions during D-Day were the C-47 Skytrain and the C-53 Skytrooper. Both were militarized versions of the Douglas DC-3. The C-47 was the military version of the Douglas DC-3 commercial airliner. The Douglas DC-3 first flew in 1936 with the C-53 making its first flight in October of 1941, and the C-47 first flying in December 1941 (~two weeks after Pearl Harbor). The Skytrooper was equipped to primarily serve as a troop carrier with seating for twenty-four. The Skytrain differed from the DC-3 as the Skytrain was equipped with a cargo door, a hoist attachment, and strengthened floor. The C-47's tailcone was also shortened to accommodate glider towing. The cockpit was fitted with an astrodome for the navigator to use.

Less than 300 Skytroopers were produced because they proved to be less flexible than the versatile C-47. Over 10,000 C-47 Skytrains were produced. Equipped with a reinforced cargo floor and a door wide enough for a jeep to be loaded, the C-47 Skytrain served in all theaters during the war. The C-47 flew "The Hump" delivering personnel and supplies from India to China.

Also affectionally called a Gooney bird, and the Dakota by the British, the C-47 proved to be a durable and amazing versatile aircraft, seeing service in World War II, the

Berlin Airlift, Korea, Vietnam, and the Antarctic. In Vietnam, the C-47 was modified with mini-guns to become the AC-47 "Spooky" Gunship. The Gunship was also known as "Puff the Magic Dragon." While the C-47 remains in service around the world, the C-47 left the USAF inventory in the 1970s. The 6th Special Operations Squadron continued to operate a remanufactured updated and reengined version of the DC-3 known as the Basler BT-67 until 2008.

To learn more about:

U.S. Air Forces activities on D-Day: <https://www.nationalmuseum.af.mil/Upcoming/Events/D-Day-75th-Anniversary/igphoto/2002083656/>

<https://www.nationalmuseum.af.mil/Visit/MuseumExhibits/FactSheets/Display/tabid/509/Article/196162/d-day.aspx>

<https://media.defense.gov/2010/Sep/24/2001329767/-1-1/0/AFD-100924-019.pdf>

C-47: <https://www.nationalmuseum.af.mil/Visit/MuseumExhibits/Fact-Sheets/Display/Article/196271/douglas-c-47d-skytrain/>

New History Mystery

by Dan Simonsen

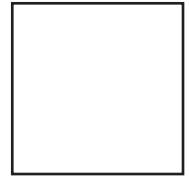


This June 6th marks the seventy-fifth anniversary of Operation Overlord, the allied invasion of Nazi-occupied France. On D-Day, June 6th, 1944, at 0630 in the morning, the allied armies came ashore across a fifty-mile-wide section of the beaches of Normandy France. The shoreline was divided into 5 beaches: Sword, Juno, Gold, Omaha and Utah for the 150,000 British, Canadian, and American troops. As part of the invasion, Allied fighters, bombers and transport aircraft swarmed the region, flying over 8,700 sorties. To prevent the Allied aircraft being mistaken for *Luftwaffe* aircraft, allied aircraft were painted with black and white stripes (as shown in this picture of an F-5 Recon version of the P-38 Lightning.)

Beginning under the cover of darkness, 1,400 American transport planes and CG-4 Gliders dropped over two airborne divisions (13,000 paratroopers) behind enemy lines. The 1,400 American transports were two versions of the same airplane. Name that transport plane.



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