WINTER 2023 - Volume 70, Number 4
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Journal of the Air Force Historical Foundation

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Love Pilot Stories?

Head to the Super Sabre Society website and click Member Bios. Pick a name and you'll find a pilot's profile page. We have a comprehensive roster of F-100 pilots and some of the best pilot stories you'll find anywhere.

You can find more intriguing stories, tall tales, and a scoreboard of feats of "the greatest fighter pilots of all time" in our Intake journal. The AFHF and the Air University/exlibris group have collaborated to provide all issues of the Intake in pdf form on their website.

The Super Sabre Society is also proud to announce their final Reunion being held April 16-19, 2024, at the Gold Coast Hotel and Casino in Las Vegas. F-100 pilots and their families will gather to meet as a group for the last time and will enjoy the traditional "Flight Suit" party, shows, entertainment, shopping, a trip to Hoover Dam, and visits to Creech and Nellis Air Force Bases.

Members of the Super Sabre Society wish to thank the AFHF for their collaboration in making our pilot stories and Intake journal available to the general public.

LINKS:

SSS Member Bios: **https://supersabresociety.com/**

All Issues of the Intake Journal:
https://aul.primo.exlibrisgroup.com/discovery/collectionDiscovery?vid=01AUL_INST:AUL&collectionId=8198385010006836&lang=en

SSS 2024 Reunion Registration and Hotel Reservations:

To attend the Reunion, click here: **https://supersabresociety.com/upcoming_events/2022-las-vegas-reunion-registration-form-ready-to-download/**

Link to Hotel Reservations. Note: Hotel reservations are made separately from Reunion Registration.
https://book.passkey.com/event/50457840/owner/32020/home

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FRONT COVER: Front view of an F–4G Wild Weasel Phantom II from the 37th TFW. *(USAF Photo)*
REAR COVER: Two F–4G Wild Weasel Phantom II from the 37th TFW prepare for takeoff. *(USAF Photo)*

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Journal of the Air Force Historical Foundation

The Journal of the
Air Force Historical Foundation
Winter 2023 Volume 70 Number 4

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Journal of the Air Force Historical Foundation ISSN 2992-9326 (Online) is produced for Spring, Summer, Fall, and Winter by the Air Force Historical Foundation. ISSN 2992-9318 (Print) is produced for Summer.

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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Journal of the Air Force
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Periodicals postage paid at Mechanicsville, MD 20659 and additional mailing offices.

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

Jacob "Jack" Neufeld
December 1940 - August 2023

Jacob "Jack" Neufeld, Editor Emeritus of *Air Power History*, passed away in August 2023. His passing marks the end of an era in U.S. Air Force history. Over the course of his long and distinguished career, Jack left his mark on three decades of Air Force historical research, writing, and publishing, from as early as 1970 through his two retirements, first from the Air Force history program in 2006 and second from editorship of this magazine in 2014. He will be sorely missed by the historical community and by all who knew him.

Jack was born in December 1940, in Buczacz, Poland, one of just three children from his town who survived World War II. Jack and his mother (Nettie) survived by hiding in the forest, people's homes, and anywhere they could find shelter, while his father (Nadje Dunajer) was a partisan who was killed a few days before the end of the war. Jack and his mother were rescued and spent time in displaced persons camps. They arrived in New York City in 1950.

Jack earned B.A. and M.A. degrees in Russian history at New York University. After his Masters degree, he was commissioned in the U.S. Army and served with the Corps of Engineers at Ft. Campbell, Kentucky, and Ft. Belvoir, Virginia, from 1964 to 1966. After his Army service, he joined the Air Force History program in 1967, serving initially at HQ Eighth Air Force (SAC), then located at Westover AFB, Massachusetts. While there, he completed all of the course work for a doctoral degree at the University of Massachusetts, Amherst in American studies.

In 1970, when the Eighth Air Force was reassigned to another location, Jack chose to transfer to the newly constituted Office of Air Force History, in Washington, D.C. He remained assigned to that office in its many iterations until retiring in 2006. After this retirement, he continued to edit *Air Power History* until 2014, completing twenty-one years of leadership.

A unifying force at the Office of Air Force History, Jack held many positions, including staff writer, branch chief, division chief, senior historian, and director. A gifted researcher, writer, and editor, Jack wrote or edited numerous scholarly works in military history and the history of technology, including *The Development of Ballistic Missiles in the United States Air Force, 1945–1960*. In all, he had more than a dozen works to his name and oversaw as Director more than one hundred publications. He was an adjunct professor of history at American Military University, Montgomery College, and the University of Maryland.

In addition to his expertise as a writer and historian, Jack proved to be an excellent manager, especially as Chief of the Center for Air Force History and as Director of the Air Force Historical Studies Office. When office manning diminished after the end of the Cold War, he was instrumental in preserving the Air Force History book publishing program. A consummate professional, Jack was a hard worker and was keenly aware of the individual needs of those working for him. Moreover, he protected and fought for his people. People trusted Jack and knew they could count on him to listen and to help resolve many issues.

Jack was an esteemed colleague to dozens of Air Force historians, mentoring and encouraging many people throughout their careers. He was renowned for his caring, his quick wit, and his humanity, while still holding the highest standards. He might be sympathetic to a deadline being missed, but he never accepted less than the best.

Jack and his beloved wife, Shari, celebrated their 58th wedding anniversary in April 2023. Survivors also include daughters Michelle (Jonathan) Goldberg and Jessica Goldstein, and son Neil; and grandchildren Jordan Goldberg, Andie and Logan Neufeld, and Jeremy, Kyra, and Ethan Goldstein.

Leadership's Message

The AFHF Symposium is back!

To our members,

From September 15-18, the AFHF held a symposium that focused on the American exit from Vietnam in 1973. Presentations were delivered by museum professionals, Vietnam veterans, expert historians, and Air Force historical Foundation members. It was, perhaps, the most eclectic gathering of presenters and attendees for such an event. Topics ranged from Vietnam era helicopter history and restoration, to teaching lessons about the War in Southeast Asia to Cadets and college students, to personal storytelling by a panel of combat veterans of the war.

The Kickoff speech was delivered by renowned Vietnam War expert, Larry Berman (PhD, Princeton University), Professor Emeritus at the University of California, Davis. His work has been featured on C-Span's Book TV and After Words, the History Channel's Secrets of War, Bill Moyers's The Public Mind, David McCullough's American Experience and Vietnam: A Television History. He served on the Vietnam Veterans Memorial Fund Content Advisory Committee for the Education Center at the Wall project. He is a frequent speaker at Vietnam Veterans events and reunions. Berman has been an invited speaker at the Air Force Academy, the Air War College, West Point, The Naval Academy and the National War College. His presentation set the perfect tone for the conference.

To summarize each of the terrific panel and individual presentations would take many pages. Thankfully, we do not have to. The entire conference was recorded by a wonderful videographer, Ramón Purcell (Boneyard Safari), and each session—including a wonderful dinner address by the I.B. Holley Award recipient Col. Phillip Meilinger and the full awards presentation on September18—can be accessed by visiting the AFHF website at **afhistory.org** or directly on Youtube at:
https://www.youtube.com/playlist?list=PLtKKBQ39u880pykaWKeL2HPPvAqSHHybV

We have many to thank for their contributions and assistance in the sympoium effort. Jelly Belly sponsored our videographer and kickoff speacker. The Super Sabre Society made the symposium possible on many levels. With their generous support, the event was elevated in content and outcome. Wings Over the Rockies Air & Space Museum hosted the awards event. This included an aerial demonstration, a terrific live band, great food, and a spectacular program that included the presentation of AFHF awards, a commemoration of Vietnam Veterans, and the capstone speech by AFHF member and former CSAF, Gen. Ron Fogleman.

If you have the opportunity to review the symposium panel presentations, speeches, or awards presentation, please consider a donation to the Foundation to help with next year's sympoium. Every donation to that end will go 100 percent to the 2024 symposium currently in the planning phase.

In January, AFHF will publish its inaugural Newsletter. What better way to end the year than with a naming contest. Please email your Newsletter Name offerings to **xd@afhistory.org** by January 5, 2024. The winner will receive two seats at the AFHF annual award banquet in DC in the spring.

In early 2024, the Foundation will launch a new evening series—"Space Stories that are Out of this World." Much like War Stories, this format will highlight space history in a focused and unexpected way. It is our plan to launch a Podcast that highlights our unique content at some point during the year. If your company or organization would like to sponsor the AFHF Podcast Series, we would like to hear from you!

Next year, our overarching theme is "Air and Space Technology—1920-2020." It is a broad topic and will culminate in December 2024 as the US Space Force reaches its 5th birthday.

Gen. James "Mike" Holmes
Foundation Chairman

Jonna Doolittle Hoppes
Foundation President

Air Force Historical Foundation teams up with Wings Over the Rockies for Annual Symposium/Award Spectacular!

On September 18, 2023, at the Centennial Airfield Annex (Exploration of Flight) of the Wings Over the Rockies Museum in Denver, the Air Force Historical Foundation and the Museum held a joint event honoring Vietnam Veterans from all the military services and to present the AFHF annual literary and academic awards for 2022. It was the culminating event for the AFHF Symposium held the previous weekend at the Denver Hyatt Tech Center Hotel.

The collection of awardees and participants that gathered at the event highlights the remarkable legacy of our service and how these individuals have shaped and preserved USAF history. Connections between awardees and attendees are many. Many were USAF Academy graduates. Several of those were members of the USAF Academy Department of History (DFH). At the root of this gathering stands the Air Force Historical Foundation (AFHF) whose purpose is to demonstrate the significance of preserving and disseminating Airpower and Space history as a tool to "Shape the Future." Have a look at this list of awardees and attendees at the Wings of Valor celebration.

The guest speaker for the event, former USAF Chief of Staff, Gen. Ronald Fogleman (USAFA '63), holds a degree in history from Duke University and was a member of the USAF Academy Department of History (DFH) faculty from 70-73. He received the AFHF Spaatz Award for lifetime achievement in 2015 and was the recipient of the inaugural AFHF President's Integrity Medal at this event. (**left**, Gen. Ron Fogleman with AFHF President, Jonna Doolittle Hoppes). He is an AFHF life member and a former member of the AFHF Board.

General "Speedy" Martin (USAFA '70) flew 161 combat missions in Southeast Asia, he commanded the 67th Tactical Fighter Squadron, the 479th Tactical Training Wing, and the 33rd and 1st fighter wings. He also served as Vice Director of the Joint Staff's Force Structure and Resources Directorate, Director of Operational Requirements for the U.S. Air Force, and Principal Deputy to the Assistant Secretary of the Air Force for Acquisition and served as the Commander of U.S. Air Forces in Europe and Allied Air Forces Northern Europe. He is the 2022 recipient of the AFHF Spaatz Award for Lifetime Achievement and an AFHF Benefactor. (**Right**,on the right with Gen. "Mobile" Holmes, Chair, AFHF, and former ACC Commander)

The recipient of the I.B. Holley Award for Lifetime Achievement in the documentation and teaching of USAF history is Col. Phillip Meilinger (USAFA '70), PhD. Col. Meilinger is a prolific author and airpower strategist, taught history at USAFA, and was the 3rd Dean of the School for Advanced Airpower Studies at Air University. His impact upon not only the USAF but all those airpower strategists in every service is incalculable. Several members of the Class of 1970 attended the celebration to support their classmate. (**Left**)The current Chair of the AFHF, Gen Mike "Mobile" Holmes (right), former ACC Commander, was a student at SAAS while Col Meilinger was the Dean (left).

The recipient of the Foundation's inaugural AFHF Book Prize for USAF History is Major Daniel Jackson (USAFA '09). Maj. Jackson (**right**, at left), author of *Fallen Tigers*, is currently completing his graduate studies program at the University of Wisconsin-Madison and will return to the USAFA History Department faculty in 2025. Dan also won the 2009 AFHF Student Award as a cadet.

The recipient of the AFHF Best Article Award for 2022, Ted Young (**right**, at right) holds degrees from Harvard, University of Washington, and King's College, London. His remarkable career and his skilled writing set the highest of standards for those future article ward recipients.

Maj. Gen. John Barry (USAFA '73), CEO of Wings Over the Rockies Air and Space Museum, the host for the AFHF Awards event which included an aerial demonstration, a live band, terrific food, and a USAF Birthday celebration to end the evening. John is also the 1st Vice Chair of the AFHF.

Lt. Col. Dik Daso (USAFA '81), is the Executive Director of the AFHF, the author of books on General Hap Arnold, Gen Jimmy Doolittle, and the *USAF: A Complete Chronology*. He was the Modern Military Aircraft Curator at the National Air and Space Museum from 2001-2012. He was a member of DFH during the 1992-93 school year and is a Life Member of AFHF.

A group of CS-28 cadets attended as guests of Wings Over the Rockies and were able to enjoy the event with a group of ROTC cadets from the greater Denver area. Involving future air and space power advocates and leaders is part of the AFHF charter. The youngest member from the USAFA Class of 2027 cut the cake with the most senior USAF Official, former Chief of Staff, Gen. Mike Dugan.

Representing the AFHF at the event were the grandchildren of three famous WW II generals—Robert Arnold, Paul Tibbets IV, and Jonna Doolittle Hoppes. They are life members of the AFHF and represent our lineage and rich history of our parent service—the U.S. Army Air Forces (USAAF). Our USAF Academy Alumni building bears the name of Jonna's grandfather, Gen. Jimmy Doolittle.

Is it just coincidence that AFHF members have made such a dramatic impact upon both the documentation of USAF history and in the actual making of USAF history? Those honored and in attendance on the 18 September are linked together by the Air Force Historical Foundation (AFHF) whose motto is simple:

Know the Past…Shape the Future!

https://www.afhistory.org/support/become-a-member/

From the Editor

This issue honors the life and passage of our former Editor (1993-2014), Jack Neufeld. He was an honorable and remarkable man. His "*In Memoriam*" is on page 3.

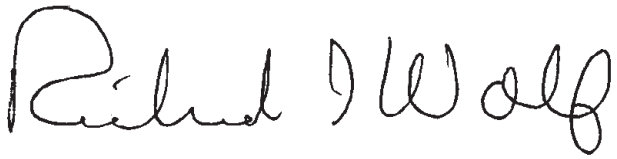
We start with an article by one of our Board members, and faculty member at the USAFA, John Farquhar, who writes about the USAF role in shaping the second Taiwan Strait crisis in 1958.

Our second article is also by a returning contributor, Theo van Geffen, returns with Part 5 of his series on Proven Force and the first Gulf War..

Our third article is by our 2023 I.B. Holley Award for Lifetime Achievement winner, Phillip Meilinger who writes about the evolving role that escort fighters had during the early years of Strategic Air Command.

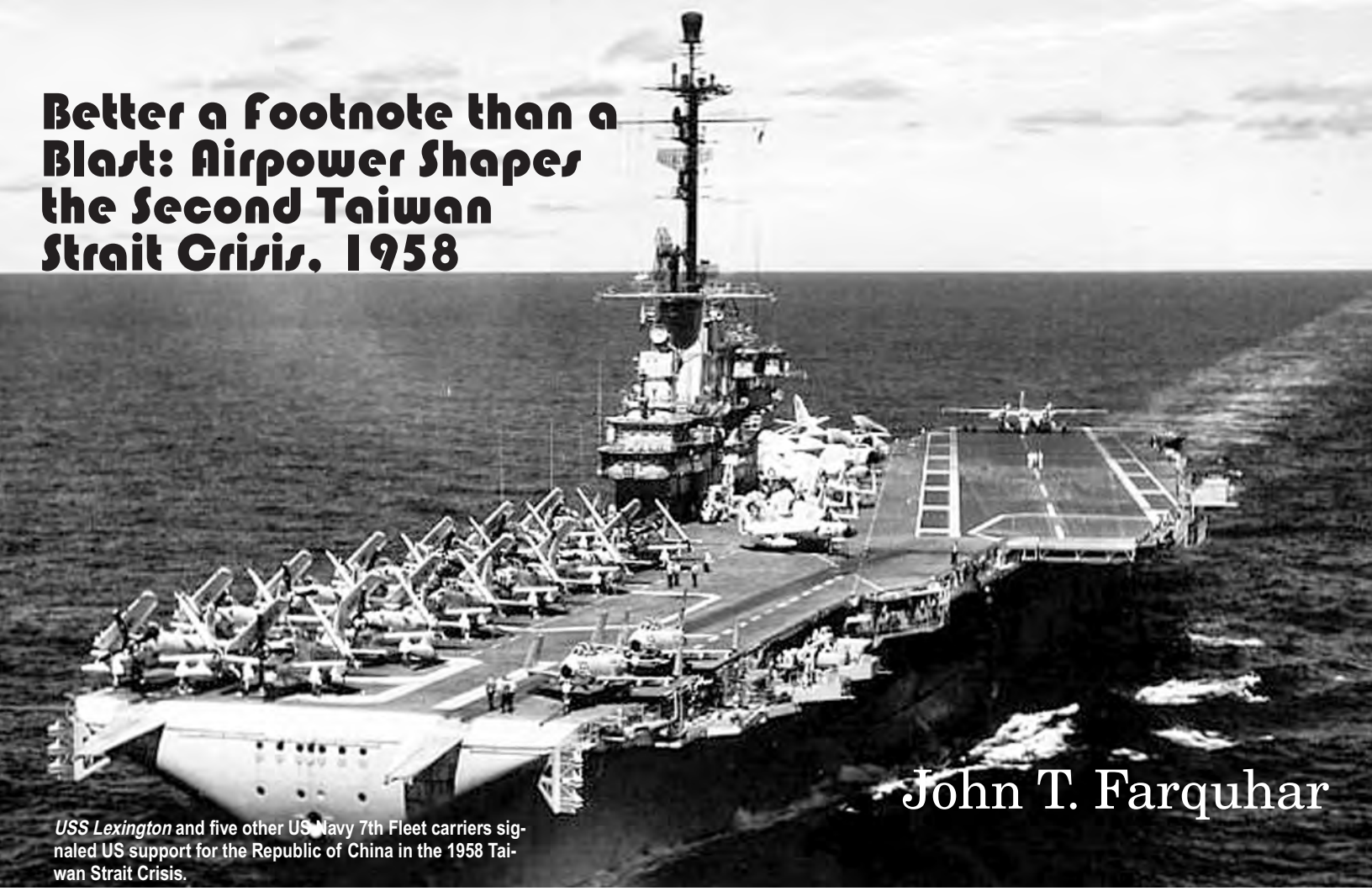
Our fourth article is by one of our regular book reviewers, John Cirafici, who tells the story of his work flying in and out of Russia and the Soviet Union between 1987 and 1993.

The Leadership's Message can be found on page 4. It's worth the read to keep you abreast of our changes. We also have coverage of the revived Academy Symposium from this past September. Don't miss Upcoming Events on page 68. And the issue closes with the Mystery. Enjoy!



Better a Footnote than a Blast: Airpower Shapes the Second Taiwan Strait Crisis, 1958

John T. Farquhar

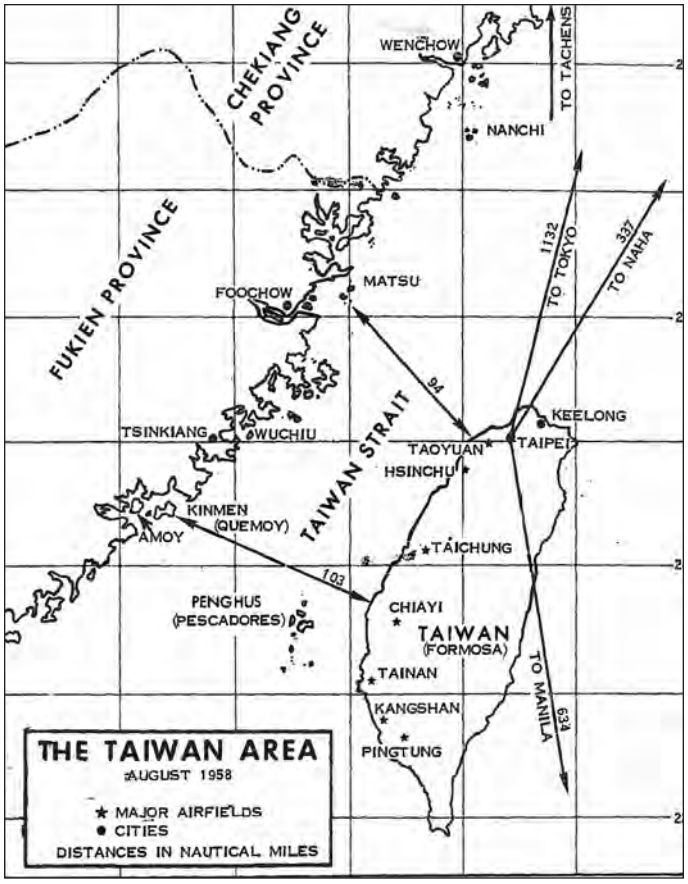


USS Lexington and five other US Navy 7th Fleet carriers signaled US support for the Republic of China in the 1958 Taiwan Strait Crisis.

On August 23, 1958, three hundred Chinese Communist field guns fired over 40,000 rounds against the Nationalist-held offshore islands of Quemoy and Matsu.[1] For the next five days, firing continued at a similar rate accompanied by Chinese Communist statements calling for the liberation of Taiwan from Nationalist occupation.[2] This resumption of shelling after a three-year hiatus from what specialists call the First Taiwan Strait (or Formosa Strait) Crisis of 1954-55 worried American policy makers and led to a potential nuclear flashpoint only exceeded by the famed 1962 Cuban Missile Crisis. Although many contemporary accounts of US-China or China-Taiwan affairs mention the 1958 crisis only in footnotes, the Second Taiwan Strait Crisis and especially airpower's influence as an instrument of policy deserves attention. During the summer of 1958, Chinese Communist and Nationalist air and naval forces engaged in significant clashes and the United States deployed impressive air, land, and naval forces to the region as a sign of resolve and a test of nuclear doctrine. Both the United States and Soviet Union worried about nuclear escalation, although Mao's Peoples Republic of China (PRC) claimed not to be concerned.[3]

When studied today, the 1958 Second Taiwan Crisis receives attention in three primary areas: 1.) an episode depicting Cold War tensions; 2.) Mao Zedong's skillful political manipulation of both the United States and the Soviet Union to boost the PRC's independence and sovereignty; and 3.) a case study of the Eisenhower's administration's successful crisis response. The Republic of China's (ROC or Nationalist China) successful rebuff of Communist political and military pressure fails to receive attention. These areas of study rightfully reinforce famed military theorist Carl von Clausewitz's adages that war is an instrument of politics by other means and military operations must be subordinate to political objectives.[4] Nevertheless, the military dimension of the crisis significantly influences the geopolitical aspect and arguably, the air domain emerges as the center of gravity for the Second Taiwan Strait Crisis. Exploring the influence of airpower upon the political dynamic raises a series of questions that help explore these assertions: To what extent did air capabilities impact American nuclear policy, then known as air-atomic strategy? To what level did American and Soviet sponsors prepare and sustain the air combat during the crisis? Did the air clashes represent tests of state-of-the-art, advanced air and radar systems, or merely battles featuring surplus, obsolescent systems? What did each air force and their sponsors learn from the aerial engagements? How serious was the threat of political and military escalation; in other words, was this another round of nuclear brinksmanship?

These questions focus this study and do not imply that the naval and ground dimensions were not significant. However, an air-centric approach narrows the topic and explores four areas:



The Second Taiwan Crisis, August 1958

1.) applicable U.S. air-atomic operational plans,
2.) the deployment of U.S. Air Force, Navy, and Marine aviation assets to reinforce Taiwan,
3.) strategic aerial reconnaissance flown by the Republic of China Air Force (ROCAF) and U.S. CIA U–2 spy planes, and
4.) the air battles between the People's Liberation Army Air Force (PLAAF) and the (ROCAF).

Evidence from this inquiry supports a general hypothesis: More than a mere political instrument, ROCAF air dominance over the PLAAF in the 1958 Taiwan Strait Crisis shaped the policies of the belligerents both limiting the PRC's opportunity to seize the offshore islands and defusing a genuine nuclear crisis.

Dr. John T. Farquhar graduated from the Air Force Academy and flew as a navigator in the RC–135 reconnaissance aircraft with the Strategic Air Command and Air Combat Command. With a Master's Degree in U.S. Diplomatic History from Creighton University and a Ph.D. in American Military History from Ohio State, Dr. Farquhar has taught courses in military history, air power, strategy, and military innovation at the United States Air Force Academy where he serves as an associate professor of Military and Strategic Studies. He has published articles in Air Power History *and* Air & Space Power Journal.

PACAF Briefing Slide of the Taiwan Strait and Offshore Islands (Quemoy labeled as Kinmen)

In 1958, the Nationalist-held offshore islands assumed a far greater geopolitical importance than their military-strategic value. Located two miles off the Chinese coast and visible from the city of Xiamen, Quemoy was the largest of four offshore islands, while a hundred miles to the northeast, Matsu lay ten miles from the city of Fuzhou.[5] The U.S. Joint Chiefs of Staff considered the islands vulnerable, a reckless waste of resources, and impossible to defend. To the Chinese Communist Party (CCP), Quemoy and Matsu represented important political principles: 1.) China's sovereignty and territorial integrity; 2.) the PRC's legitimacy as the sole government of China; and perhaps most important, 3.) an opportunity to eliminate a dangerous ideological threat—the Nationalist Kuomintang (KMT) as an alternative to the CCP.[6] Similarly, to the Republic of China, the offshore islands represented a symbol of its claim as the rightful Chinese government and a valuable springboard for returning to the mainland. Consequently, ROC leader Generalissimo Chiang Kai-shek stationed roughly 100,000 of his 450,000 troops on the offshore islands.[7] Both claimants agreed on one China and one Chinese government; the question was which one would rule?[8]

Adding an additional Cold War dimension, in a 1955 letter to British Prime Minister Winston Churchill, President Dwight D. Eisenhower rejected pulling out of the offshore islands as advocated by many American military and diplomatic officials. He pointed to the Korean War, suspended in an armistice five years earlier (with the north and south still officially at war), and the Vietnamese Communist success in Indochina the previous year. Eisenhower recognized the importance of the offshore islands to "Chi-Nat" morale. Abandoning the islands would be a disaster: "With hope gone [of return to their homes], Chiang's units might desert wholesale."[9] Moreover, a ROC presence on the PRC flank would tie down "ChiCom" forces that otherwise might be available against either South Korea or South Vietnam.[10] He concluded, "The French are gone—making it clearer than ever that we cannot afford the loss of Chiang unless all of us are to get completely out of the corner of the globe. This is unthinkable to us—I feel it must be to you."[11]

Table 1. Comparison of US v. USSR Strategic Forces

Type	Designation	Number	Type	Designation	Number
Long-range Strategic Bomber (US)	Convair B-36	45	Long-range Strategic Bomber (USSR)	Tu-95 Bear	68
Long-range Strategic Bomber (US)	Boeing B-52	294	Long-range Strategic Bomber (USSR)	Myasishchev M-4 Bison	85
Medium-range strategic bomber	Boeing B-47	1,052	Medium-range strategic bomber	Tu-16 Badger	920
Total Strategic bomber		1,391	Total Strategic bomber		1,073
Tactical Bomber	Martin B-57	78	Tactical bomber	Tu-4 Bull (B-29 copy)	445
Tactical Bomber	B-66	44			
Air Refueling Tankers	KC-97	646	Air Refueling Tankers	Unknown but some bombers above assumed to be converted to tankers.	
Air Refueling tanker	Boeing KC-135	107			
Total tankers		753			

Source: For US, "Fiscal Year 1959, 14th edition, prepared by Directorate of Statistical Services, cited in Halperin, *Taiwan Straits Crisis*, p. 18. For USSR, AFCIN estimates, cited in Halperin, *Taiwan Straits Crisis*, p. 19.

Contrasting Cold War political concerns, American military power, expressed in terms of nuclear superiority, reached its apex in relation to Soviet forces in the summer of 1958. Despite the shock of *Sputnik*'s launch in October 1957, the U.S. National Intelligence Estimate did not believe prototype Soviet Intercontinental Ballistic Missiles (ICBMs) would be ready until 1960.[12] Meanwhile, the U.S. fielded an impressive force of both intercontinental (B–36 and B–52) and medium-range (B–47) bombers manned by well-trained, experienced crews. On August 7, 1958, Secretary of State John Foster Dulles assessed:

The fact of the matter is the military estimate of the situation is that we are relatively stronger today than the Soviet Union than we have been perhaps in recent years and that we may be in the future (sic). Because they have apparently tried to jump the gap between the heavy bomber period and the missile period, they do not have many heavy bombers and they do not have missiles in actual production and in place. So that actually I think the military situation is quite favorable in that respect at the moment.[13]

Based upon the Eisenhower administration's New Look strategic vision, U.S. war plans relied on what was known as "air-atomic strategy."[14] As the 1958 Taiwan Strait Crisis unfolded, the JCS consistently warned that effective U.S. military intervention would necessitate atomic bombing of PRC air bases and ports.[15] Operational planning for the defense of Taiwan fell under the authority of U.S. Pacific Command (PACOM), headed by Admiral Felix B. Stump (July 1953 to July 31, 1958) and later Admiral Harry D. Felt (after July 31, 1958). On May 16, 1958, Admiral Stump released Ops Plan 25-58 reflecting air-atomic strategy and directed component (air-land-sea) commanders to prepare further details. Under the command of General Laurence S. Kuter, the Pacific Air Forces (PACAF) envisioned a three-phase air operation: Phase I consisted of patrol and reconnaissance activities; Phase II called for the defeat of a communist attack; and Phase III directed a limited nuclear strike against PRC ports and airfields conducted primarily by Strategic Air Command B–47 bombers, supplemented by PACAF F–100 fighter-bombers. The initial attack would hit five PLAAF airfields with 16-kiloton airbursts (to reduce ground fallout) with each bomb creating a 3-4 mile lethal area. Later bomber waves targeted 62 sites with PACAF responsible for 32 strikes from Clark Air Base, Philippines and Kadena Air Base, Okinawa.[16]

To the dismay of the PACOM field commanders, President Eisenhower rejected the JCS position paper advocating a nuclear attack. In the opening days of the crisis, he charged a State Department-Defense-CIA joint committee to provide non-nuclear options. Despite Chairman of the JCS General Nathan S. Twining's objections, the White

PACOM Commander Admiral Harry D. Felt and PACAF Commander General Laurence S. Kuter.

PACAF Briefing Slide of non-nuclear revision of Ops Plan 25-58.

House ordered a special non-nuclear revision to Ops Plan 25-58 on August 25, 1958. In his compliance, PACAF commander General Kuter observed that according to USAF war planning factors, PACAF would require four squadrons of F–100s (or B–57s) or 20 squadrons of F–101s to neutralize just one communist airfield with follow-on bombings every four days to sustain neutralization. Assuming the PLAAF would have more than 200 jet fighters on its coastal airfields plus a variety of antiaircraft guns, American air forces would sustain significant casualties.[17]

Improving White House planning for the Taiwan crisis, the July 14, 1958 Iraqi Revolution served as a prelude and conditioned Washington policymakers for deliberation and action. After the rapid deployment of naval and air units to the Middle East and later the landing of U.S. Army troops in Lebanon on July 21st, PACAF intelligence personnel informed General Kuter of the strong possibility of a communist move on Taiwan.[18] This coincided with ROCAF visual and photographic reconnaissance overflights of the PRC coast. From July 16-22, ten ROCAF RF–84 missions revealed no significant military activity; however, by August 2nd, recon flights showed two PLAAF airfields opposite Taiwan ready for operations and two others near completion. Consequently, General Wang Shuming, ROC Chief of the General Staff, informed American officials on Taiwan who in turn, relayed the news to PACAF and PACOM. On August 18, five nuclear-armed B–47s were placed on alert on Guam and three days later, twelve PACAF B–57 bombers assumed atomic alert as well. By August 23, photographs of the four PLAAF airfields revealed 173 communist aircraft, including new MiG-17 fighters.[19]

On July 31, 1958, Soviet Premier Nikita S. Khrushchev surprised western analysts by an unannounced visit to Beijing where met with Mao Zedong for four days. Although they did not know the exact topics of discussion, PACOM commanders assumed that PRC-ROC hostilities were imminent. American analysts paired the visit with the PLAAF aerial buildup as an indicator of invasion, although whether it would be limited to the offshore islands or Taiwan itself was unknown.[20] As a result, on August 6, PACAF commander General Kuter distributed Ops Plan 23-58 to his units, and both the U.S. Air Force and Navy prepared to deploy reinforcements. Additionally, in accordance with the existing mutual defense treaty, the ROC government asked the U.S. for advanced permission to bomb PRC installations in the event of fighting. Not wanting his hands tied, and desiring to wait until events played their course, President Eisenhower refused the request.[21]

Within two weeks of the PRC's initial shelling of Quemoy on August 23, the Eisenhower national security team decided upon a middle-ground approach to the Second Taiwan Crisis that focused on deterrence (preventing an action from occurring) by demonstrating both the will and the capability for escalatory action. The prompt deployment of nuclear-capable, top-line aircraft demonstrated capability and the highly publicized move of the Seventh Fleet (now augmented to six aircraft carriers) signaled Eisenhower's will.[22] Additionally, on September 4, the President authorized Secretary of State John Foster Dulles to issue a statement confirming the U.S. decision to defend the offshore islands. The White House left questions of America's possible use of nuclear weapons ambiguous. A week later, Eisenhower delivered a "No Far East Munich" speech emphasizing, "There is not going to be any appeasement."[23] To recap, Eisenhower rejected JCS position papers to execute air-atomic plans, but he also rebuffed State Department guidance calling for withdrawing ROC troops and "demilitarizing" the offshore islands.[24] The White House decision on August 29 to escort ROC supply ships to the three-mile limit for territorial waters represented a compromise move.[25] In the diplomatic realm, the U.S. sought to find balance between a show of force and potential nuclear escalation.

In the military sphere, prompt, purposeful, opera-

A USAF Lockheed F–104 deployed to Taoyuan Air Base, Taiwan on Sep 15, 1958.

ROCAF F–86s formed Taiwan's first-line of defense in the 1958 Second Taiwan Strait Crisis.

tional-level decisions by PACOM and PACAF resulted in a significant enhancement of Ops Plan 23-58 Phase II (defend Taiwan from invasion) and Phase III (offensive nuclear operations). By September 20, General Kuter reported that the USAF had reached 183 atomic-capable aircraft while the Navy's 7th Fleet aircraft carriers contributed 96 more. Defensively, 121 USAF F–104, F–100, F–86 and U.S. Marine Corps (USMC) FJ4 and F4Ds were in place at Taiwanese air bases to augment 400 ROCAF F–86 and F–84 fighters. They established a round-the-clock air defense alert force with 8 USAF, 2 USMC, and 8 ROCAF aircraft on 5- and 15-minute day alerts and 8 USAF and 2 USMC aircraft on night, all-weather alerts.[26] Although White House policy emphasized conventional-only options, General Kuter and Admiral Felt were still convinced of the eventual need for atomic weapons.

In deliberations with his national security advisors, President Eisenhower proved adept in utilizing strategic aerial reconnaissance, both traditional provided by the ROCAF and highly classified CIA U–2 sorties that reported directly to the White House. From his experience as commander of World War II's Normandy invasion, Eisenhower appreciated aerial photography providing factual evidence to refine otherwise subjective intelligence analysis. Additionally, Eisenhower learned to trust the data revealed by U–2 flights that helped defuse the 1956 Suez Crisis.[27] By 1958, ROCAF reconnaissance aircraft routinely patrolled the PRC coast adjacent the offshore islands. U.S. military assistance had built a ROCAF recon force of seven RF–86Fs, 25 RF–84Fs, and one long-range, high-altitude RB–57A.[28] Both ROCAF and U.S. aircraft used oblique photography (specialized cameras designed to produce a panoramic view of terrain to the side of an aircraft's flight path) to surveil ports and PLAAF airfields. On June 18, 1958, a CIA U–2 examined the central China coast observing Shanghai, Hangzhou, and Fuzhou, but not the coastline across from Quemoy or Matsu.[29]

As the crisis intensified, the U–2 flights provided Ike "an ace-in-the-hole." Although not real time by contemporary standards, CIA analysts rapidly processed U–2 film and by passed bureaucratic channels, including PACAF and PACOM, to provide the president with up-to-date, accurate information. In late August and early September, CIA U–2s flew four missions over the mainland searching for evidence of invasion preparations.[30] Hence, Secretary of State Dulles informed the National Security Council (NSC) at meetings on August 7 and 21 that there were no indicators of invasion and that the recently occupied PLAAF airfields only based short-ranged MiG-17 fighters and not bombers. Two later U–2 missions on September 9 and October 22 gave Eisenhower confidence that PRC actions and rhetoric were extemporaneous or opportunistic political posturing rather than deliberate military moves.[31]

If CIA U–2 strategic aerial reconnaissance shaped Eisenhower's NSC policies, ROCAF aerial reconnaissance initiated a series of PRC-ROC air battles that profoundly influenced the Second Taiwan Strait Crisis. On July 29, two ROCAF RF–84 photo-reconnaissance aircraft with two F–84 fighter escorts battled PLAAF MiG-17s near Swatow with the loss of both unarmed RF–84s.[32] A week later, a second clash featured ROCAF reconnaissance aircraft and MiGs from the new PLAAF airfields near the offshore islands with no loss for either side. At this point, U.S. intelligence believed that the Chinese Communists had an edge over the Nationalists based on front-line fighters and overall numbers. In accordance with Eisenhower's worries over crisis escalation, U.S. officials drove rules of engagement whereby the ROCAF could engage only in self-defense.[33]

Between September 7 and October 6, the ROCAF established air superiority over the Taiwan Strait and the offshore islands. Over the course of a month, the two non-Western air forces fought 25 separate air engagements with the ROCAF destroying 32 PLAAF aircraft, damaging ten, and listing three as probably destroyed against the loss of 2 F–86s and 2 F–84s.[34] On September 24, the most notable clash occurred where 100 MiG-17s fought 32 ROCAF F–86s in three separate engagements resulting in ten MiGs shot down with no Nationalist casualties. This battle marked the first time US-made Sidewinder air-to-air missiles were used in combat. Of six Sidewinders launched, four resulted in kills.[35]

In assessing the air combat, the ROCAF impressed General Kuter and PACAF intelligence analysts. On paper,

Table 2: Taiwan Strait Air Battles, September 7 – October 6, 1958

Date	Combatants (ROCAF v. PLAAF)	Results
8 Sep	12 F-86 v. 15 MiGs	4 MiGs destroyed, 1 F-86 damaged
18 Sep (1)	4 F-86 v. 20 MiGs	2 MiGs destroyed, 1 MiG damaged
18 Sep (2)	4 F-86 v. 25 MiGs	No casualties
18 Sep (3)	4 F-86 v. 8 MiGs	3 MiGs destroyed
20 Sep	4 engagements each with 4 F-86 v. larger number of MiGs	No casualties
24 Sep	3 engagements; 20 F-86 with Sidewinder Air-to-air missiles v. 100 MiGs	10 MiGs destroyed (total); 4 by Sidewinder missiles
29 Sep	20 C-46 transports	1 C-46 destroyed by Flak
3 Oct	C-46 transports in resupply v. unknown number of MiGs	1 C-46 downed by MiGs

Source: Halperin, *Taiwan Strait Crisis*, p. 307. This publication was a 1966 classified analysis written by RAND for Project Air Force.

the newer Soviet-built MiG-17 held an edge over the American-made F–86 of Korean War fame: the MiG could fly higher (60,000 feet) and faster (635 knots) compared to the F–86's 48,000-foot ceiling and 600-knot top speed. Still, the ROCAF's superior training, tactics, and aggressiveness outmatched the PLAAF. Post-flight debriefings showed the Communist pilots deficient in teamwork and basic air-to-air maneuvers. General Kuter's post-crisis briefing lauded the quality of ROCAF fighter pilots noting that many were "among the most experienced in the world" with over 1,400 hours in the F–86. He noted that only 20 ROCAF fighters had been equipped with Sidewinders and that superior old-fashioned aerial gunnery accounted for most victories. He concluded his assessment succinctly: "They are eager, skillful, and their tactics are good."[36] At an Air Force Association conference on September 5, 1959, Kuter linked the ROCAF's success to American training efforts following the First Taiwan Crisis: "The Chinese Nationalist Air Force is the show-piece of the Military Assistance Program in the Far East/Pacific. Quantitatively, they believe they are the masters and proved it in battle less than a year ago. . . . the overwhelming superiority of the squadrons of the Chinese Nationalists in F–86F's over very large formations of the Chinese Communists in MIG-17's is eloquent proof of greatly superior quality."[37]

The ROCAF's dominance in the skies over the Taiwan Strait solved many political challenges for President Eisenhower. Even though strategic aerial reconnaissance suggested no imminent invasion, the CIA did not rule out the potential of an opportunistic, no-notice landing. The Peoples Liberation Army (PLA) based three 46,000-man armies in the province opposite Taiwan and 80,000 troops were stationed within fifty miles of Quemoy.[38] On the other hand, Eisenhower knew from experience that a cross-channel amphibious assault required air superiority for success. ROCAF air superiority over the Taiwan Strait significantly reduced the prospect of an unanticipated Chinese Communist invasion of either the offshore islands or Taiwan itself; in turn, this reduced the risk of nuclear escalation.

On October 6, 1958, the PRC announced a humanitarian pause to the shelling of Quemoy that signaled an end to the immediate crisis.[39] Gradually, the hostilities entered an almost ceremonial state where the PRC would fire rounds on one day and the ROC would respond the next, alternating at various intervals until the U.S. recognized the PRC as the government of China on January 1, 1979. Considering the intensity of U.S. deliberations and the argument over the proper response which included serious consideration of atomic bombs, the dénouement of the 1958 Second Taiwan Crisis seems anticlimactic, a fizzle of Cold War drama.

At the strategic level, Eisenhower's crisis management stands strong and Stephen Ambrose's description of the event as Ike's diplomatic *tour de force* seems apt.[40] Likewise, Henry Kissinger's portrayal of Mao as a sophisticated chess master using the offshore islands as pawns to manipulate both the United States and the Soviet Union rings true. Mao's PLA appears not to have had serious invasion plans. Nevertheless, the Second Taiwan Crisis reached the brink of nuclear war. In particular, General Kuter's PACAF prepared to execute Ops Plan 23-58. Mark 6 atomic bombs were loaded on SAC B–47s and PACAF B–57s on alert posture, ready to launch.[41]

At the operational level, the Second Taiwan Crisis taught four lessons:

The air-atomic strategy was necessary, but insufficient. The genuine will and capability to launch nuclear war served as a powerful deterrent to general nuclear war, but the "all or nothing" approach failed to provide Eisenhower with the flexibility and maneuver room he sought.[42]

U.S. military units and command organizations effectively deployed significant combat-ready forces swiftly within theater and from the continental US. The Second Taiwan Crisis validated the 1954-1958 efforts to establish war readiness stocks of fuel, ammunition, spare parts, and other materiel in Taiwan and to bring ROCAF air-

USAF analysts assumed new Soviet-built MiG–17 fighters would give the PLAAF an edge over the ROCAF. In this author's photo, a MiG–17 on display at the Pueblo Weisbrod Air Museum, Pueblo, Colorado.

fields up to U.S. standards for interoperability. General Kuter's after-action report identified shortfalls and occasional lapses, but overall, the Cold War U.S. military performed well.

Only two years after its initial overflights of the Soviet Union, the CIA's U–2 program provided the president with rapid, accurate, and valuable information. U–2 aerial photography tamed extreme interpretations of Chinese Communist intentions.

ROCAF planes and pilots performed admirably against larger numbers of more advanced PLAAF aircraft. ROCAF air dominance over the Second Taiwan Crisis eliminated any opportunity for Mao to try a spontaneous, opportunistic attempt to seize Quemoy or other offshore islands. The crisis fizzled because of ROCAF skill and proficiency.

A ROCAF F–86 with Sidewinder air-to-air missile.

In sum, this article's initial hypothesis holds true, but needs amending. In the 1958 Second Taiwan Crisis, ROCAF air combat proficiency proved more than a political instrument, it shaped U.S. and Chinese policy, both in defusing nuclear tensions and in limiting Mao's temptation for an opportunistic gamble. Additionally, both ROCAF and the secret CIA U–2 strategic aerial reconnaissance provided President Eisenhower with the factual evidence to justify his reluctance to execute existing air-atomic war plans. This reinforces air power as more than a mere instrument of policy. Shifting to the present, given today's vast changes in the PRC's economic, military, and technological capabilities, it is perhaps not a surprise that the 1958 crisis is a mere footnote. But, maybe being a footnote is not a bad thing . . . better a footnote to ponder than an examination of the unintended consequences of America's second atomic war.[43] ■

NOTES

1. The English language documents of the time used the Wade-Giles transliteration system vs. today's accepted *pin yin* transliteration. Thus, this paper will use Quemoy instead of Jinmen (or Kinmen or Chien-men as found in some accounts) and Matsu instead of today's Mazu. For this paper, Quemoy will be used for two islands—Big Quemoy and Little Quemoy—while Matsu refers to a five island group—Kaoteng, Pei-Kan-F'ang, Ma-tsu Shan, His-ch'uan Tao, and Tung-ch'uan Tao. *Foreign Relations of the United States* (*FRUS*), 1958-1960, *China,* Vol. 19. Document 43, Memorandum of Meeting, 25 August 1958, p. 73, https://history.state.gov/historicaldocuments/frus1958-60v19/d43. Differing slightly in rationale, since documents use both Taiwan and Formosa commonly, I will use Taiwan exclusively for consistency. Also, I owe credit and thanks to US Air Force Academy Command Historian Brian Laslie, whose footnotes in his excellent biography of Laurence Kuter led me to the primary documents that made this paper possible.

2. H. M. Halperin, *The 1958 Taiwan Straits Crisis: A Documented History* (Santa Monica, CA: RAND Corporation, 1966, viii, https://nsarchive.gwu.edu.

3. Kissinger, *On China* (New York: Penguin Press, 2011), p. 167.

4. Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N. J.: Princeton University Press, 1984), p. 87, 605-607.

5. Kissinger, *On China,* 153; US Department of State, "The Taiwan Strait Crises: 1954-55 and 1958," United States Department of State Archive 2001-2009, https://2001-2009.state.gov/r/pa/ho/time/lw/88751.htm, p. 1.

6. Kerry K. Gershaneck, *Political Warfare: Strategies for Combating China's Plan to "Win without Fighting"* (Quantico, VA: Marine Corps University Press, 2020), p. 49.

7. Jacob Van Staaveren, ""Air Operations in the Taiwan Crisis of 1958," USAF Historical Division Liaison Office, November 1962," p. 12, https://nsarchive.gwu.edu; Halperin, *Taiwan Straits Crisis*, p. 32.

8. Kissinger, *On China*, p. 151.

9. Stephen E. Ambrose, *Eisenhower*, vol. 2: *The President* (New York: Simon and Schuster, 1984), p. 236.

10. US government documents of the period frequently used ChiNat and ChiCom as abbreviations for Chinese Nationalists and Chinese Communists respectively. Although tempted to continue the practice, I will refrain. Likewise, I will use ROC instead of GNC (Government of Nationalist China) or GRC (Government of Republic of China) found in some sources and ROCAF (Republic of China Air Force) for ChiNatAF (Chinese Nationalist Air Force), GRCAF (Government of China Air Force) or CAF (Chinese Air Force).

11. Ambrose, *Eisenhower*, p. 236.

12. NIE [National Intelligence Estimate] 11-5-57, *Soviet Capabilities and Probable Programs in the Guided Missile Field,* in *Intentions and Capabilities: Estimates on Soviet Strategic Forces, 1950-1983*, ed. Donald P. Steury (Washington, DC: History Staff, Center for the Study of Intelligence, Central Intelligence Agency, 1996), p. 59.

13. Halperin, *Taiwan Straits Crisis*, p. 16.

14. For expanded explanation of air-atomic strategy see John T. Farquhar, "Arctic Linchpin: The Polar Concept in American Air Atomic Strategy, 1946-1948," *Air Power History* vol. 61, no.4 (Winter 2014): 34-45 and Edward Kaplan, *To Kill Nations: American Strategy in the Air Atomic Age and the Rise of Mutually Assured Destruction* (Ithaca, NY: Cornell University, 2015), pp. 3-5, 15-46.

15. Halperin, *Taiwan Straits Crisis*, pp. vi-vii.

16. Van Staaveren, "Air Operations," pp. 15-16; Kaplan, *To Kill Nations*, p. 129; Robert S. Hopkins, III, *Spyflights and Overflights: US Strategic Aerial Reconnaissance,* vol. 1: *1945-1960* (Manchester, UK: Hikoki Publications, 2016), p. 132; and Brian D. Laslie, *Architect of Air Power: General Laurence S. Kuter and the Birth of the US Air Force* (Lexington: University Press of Kentucky, 2017), p. 157.

17. Van Staaveren, "Air Operations," p. 52.

18. Laurence S. Kuter, "Report on Taiwan Straits Situation," p. 3, Presentation by CINCPAC, ZI Commanders' Conference, Patrick AFB, November 20-21, 1958, Papers of Laurence S. Kuter, MS 18, Series 3, Box 31, Folder 4, McDermott Cadet Library, Clark Special Collections, US Air Force Academy, CO. [All Kuter papers are located in the Clark Special Collections of the McDermott Cadet Library and will be abbreviated as collection MS 18]; Kuter, "A Chronology of Major Events Pertinent to Taiwan," Unpublished memorandum, n. d. MS 18, p. 1; Van Staaveren, "Air Operations," p. 54

19. Kuter, "Taiwan Straits Crisis," 3, MS 18, Addendum 1, Series 2, Box 11, Folder 5; Halperin, *Taiwan Straits Crisis*, pp. 29, 33.

20. There is a discrepancy between sources regarding the exact dates of Khrushchev's visit. Halperin cites 31-3 Aug and Kuter 5-9 Aug. Halperin, *Taiwan Straits Crisis*, pp. 24-26; Kuter, "Chronology," p. 2; Kuter, "Report on the Taiwan Straits," p. 2.

21. Halperin, *Taiwan Straits Crisis*, p. 41.

22. Much to Kuter's chagrin, the Air Force deployment was not widely known; he viewed it as a missed opportunity for further deterrence and for public recognition of the Air Force's role in the crisis. Halperin, *Taiwan Straits Crisis*, ix; Kuter, "Taiwan Straits Crisis," p. 8.

23. Kuter, "Taiwan Straits Crisis," pp. 8-9; Dwight D. Eisenhower, "Radio and Television Report to the American People Regarding the Situation in the Formosa Straits," September 11, 1958, https://www.eisenhowerlibrary.gov/eisenhowers/speeches.

24. Halperin, *Taiwan Straits Crisis*, p. xv.

25. The first US Navy escorted convoy occurred on September 7. Halperin, *Taiwan Straits Crisis*, p. ix.

26. Kuter, "Report on Taiwan Straits," 8; Van Staaveren, "Air Operations," p. 33.

27. Hopkins, *Spyflights and Overflights*, p. 130.

28. Hopkins, *Spyflights and Overflights*, p. 132; Van Staaveren, "Air Operations," p. 39.

29. Hopkins, *Spyflights and Overflights*, pp. 131, 139; Gregory W. Pedlow and Donald E. Welzenbach, *The CIA and the U–2 Program,* History Staff Center for the Study of Intelligence (Washington: Central Intelligence Agency, 1998), p. 215.

30. Pedlow, *CIA and the U–2*, p. 215.

31. *Ibid*.; Hopkins, *Spyflights and Overflights*, pp. 130-31, 133.

32. Halperin, *Taiwan Straits Crisis*, p. 24; *Foreign Relations of the United States* (*FRUS*), Doc. 27, p. 44.

33. Halperin, *Taiwan Straits Crisis*, pp. 29-30.

34. Van Staaveren, "Air Operations," pp. 37-38.

35. Kuter, "Taiwan Straits Crisis," p. 12; Van Staaveren, "Air Operations," p. 38.

36. Kuter, "Taiwan Straits Crisis," p. 13; *FRUS*, Doc. 26.

37. Laurence S. Kuter, "Relationship Between USAF Units and Foreign Air Forces in the Far East," 4, Speech, Air Force Association Convention, September 5, 1959, Miami Beach, FL, MS 18, Box 31, Folder 4.

38. Halperin, *Taiwan Straits Crisis*, pp. 2-3.

39. Halperin, *Taiwan Straits Crisis*, p. xvi.

40. Ambrose, *Eisenhower*, p. 245.

41. Kuter, "Report on Taiwan Straits," p. 3.

42. Kaplan, *To Kill Nations*, pp. 126, 129.

43. This observation was based on a hallway conversation in late February 2023 with an old friend, Dave Stilwell who might claim the final line as his own, but even though he did say it first, I was thinking it. Thanks to him and to Mark Groteluesch en for being good sounding boards as I explored paths with this paper.

Joint Task Force Proven Force and the Gulf War (Part 5)

Theo van Geffen

Shaikh Isa's living areas. (Victor Ballanco)

After Iraq occupied Kuwait on August 2, 1990, Saddam Hussein exclaimed it as his country's 19th province. The United States and their allies responded quickly and in force, by, among others, deploying a score of aircraft types to the Gulf Region. In mid-January, a second front was opened from Incirlik Air Base (Turkey). Earlier we looked at Joint Task Force (JTF) PROVEN FORCE, B–52G, EC–130E, and EF–111A combat operations, and the development of EC–130E, EF–111A and F–4G Advanced Wild Weasel aircraft. In this part 5, the focus is F–4G (combat) operations in DESERT SHIELD/STORM and PROVEN FORCE. Part 6 will deal with F–4G post-war combat operations.

After President Bush's meeting with the National Security Council on August 4 and an August 6 Saudi request for military assistance, it was decided to deploy U.S. forces. Prior to this, on August 2, CJCS (Chief, Joint Chiefs of Staff) had issued a warning order, alerting CENTCOM (Central Command), MAC (Military Airlift Command), SAC (Strategic Air Command) and TAC (Tactical Air Command) to prepare to deploy, and a partial deployment order to the U.S. Navy. In anticipation of air deployments, SAC tankers were operating from seven locations in Europe and Asia, while at 2130Z on the 6th, the NGB (National Guard Bureau), in response to a request, reported the ANG (Air National Guard) could provide 30 KC-135s for 30 days on a volunteer basis and began polling units for exact information.

Phase I Deployments

It is interesting to notice the Force Requirements and Deployment Schedule/U.S. Central Command Preliminary Planning for USAF for Week 1, mentioned no F–4Gs, but one squadron of F–4Es on C+3.

On 07/0050Z August 7 ('C–Day'), CJCS issued initial deployment orders, including two F–15C squadrons and 'sufficient' E–3A/B Airborne Warning and Control System (AWACS) aircraft to maintain one 24-hour CAP (Combat Air Patrol), plus air refueling assets as required. Later that day, CJCS issued additional orders for deployments 'as soon as possible' (two U–2Rs and three RC–135s) and 'over the next nine days' (including four C–130, one F–15E and six F–16 squadrons). At 1400Z, the USS Independence with its Carrier Battle Group arrived on station in the Gulf of Oman.

In a 08/0330Z August message, CINCCENT (Commander, Central Command) informed JCS the number of requested F–16 squadrons was decreased to four, while a large number of other types of aircraft was added, including four C–130 and four A–10 squadrons. Also added was an F–4G Wild Weasel squadron. At 1733Z, CJCS amended his requirements, decreasing the number of F–16 squadrons to two, deleting three E–3A/Bs, but adding an F–4G squadron.

Five E–3A/Bs from Tinker's 552nd Airborne Warning and Control Wing (AWCW) arrived at Riyadh (Saudi Arabia)

on the 8th, preceding 23 fully armed F–15Cs of the 71st TFS/1st TFW which arrived that afternoon from Langley (VA) at Dhahran, also in Saudi Arabia. One Eagle had to divert. In his 09/0355Z August message, CINCCENT designated Dubai (United Arab Emirates, UAE) as bed-down base for the F–4Gs. The Pentagon announced on the 10th the operation was called DESERT SHIELD.

With the September 12 arrival of the last of five AC–130s at King Fahd Airport, all Phase I aircraft had closed in-theater for a total of 962 fixed-wing (of which 600 combat) and approximately 1,100 rotary wing aircraft. Thirty-six F–4Gs were at Shaikh Isa, Bahrain. It was mandatory for all U.S. personnel arriving in theater at all bases, camps, etc. to read General Order #1, which was rather lengthy and covered pretty much all aspects of day-to-day life to include such as rules of conduct, prohibitions, host countries customs and sensibilities, and things not to do.

Phase II Deployments

After SECDEF (Secretary of Defense) Richard Cheney directed the deployment of additional forces to the Gulf Region, CJCS, in his 16/1540Z November message 'Follow-on Air Forces for Operation Desert Shield', to CINCCENT issued the deployment order of 283 aircraft, to arrive in the AOR (Area of Responsibility) not later than January 15, 1991. Included were 12 F–4Gs. Forty-two A–10As were to arrive not later than January 30. One-hundred-and-one aircraft were to be on-call for deployment within 120 hours after the beginning of hostilities.

To provide forces to support USCINCCENT, USCINCEUR (Commander, European Command) in a 19/1313Z November message 'Follow-on Air Forces' ordered Hq USAFE (United States Air Forces in Europe) to deploy 86 aircraft, including 12 F–4Gs. In addition, 24 aircraft were placed on-call.

To prevent too many units from reporting directly to CENTAF (Air Forces Central Command) after deployment of Phase II of the buildup, two Air Divisions Provisional, ADP 14 and 15, were activated on December 5 at Riyadh and Doha (Qatar) respectively and assigned to 9th Air Force (9AF). ADP 14 exercised operational control of CENTAF–assigned TFWs (Tactical Fighter Wing) and ADP 15, of CENTAF–assigned combat support aircraft like EW (Electronic Warfare), reconnaissance, and AWACS.

On January 1, 1991, the CENTAF AOB (Air Order of Battle) numbered 1,368 aircraft, 819 combat and 549 combat support aircraft. USAFE deployed 182 aircraft, 68 in Phase I and 114 in Phase II. On January 15, CENTAF assessed that 'we have essentially completed deployment of CENTAF forces for DESERT SHIELD. We have planned, trained and are ready to conduct air operations'. The U.S. AOB numbered 1,847 aircraft, including 1,098 combat and 749 support aircraft, including 48 F–4G Wild Weasels. Air-to-air and air-to-ground forces units remained loaded out and all airfields were operational.

(Re)deployment, 35th TFW

The primary mission of the 35th TFW at George (CA) in early August 1990 was the destruction and suppression of SAM (Surface-to-Air) systems. For this purpose the Wing had two F–4G squadrons assigned, the 561st Tactical Fighter Squadron (TFS), the Black Knights, and the 562nd Tactical Fighter Training Squadron (TFTS), which was responsible to train PACAF, TAC and USAFE F–4G aircrews.

The Wing commander, Col Merrill Karp, was advised by 12AF on August 2 to prepare the 561st for deployment to the Middle East. TAC later established C–Day and L-Hour as 07/1700Z August.

As scheduled, Lt Col George Walton took command of the 561st TFS on August 7, five days after Iraq occupied Kuwait. The next day, the Wing received the deployment order from TAC's Command Post, stating that a package of 24 F–4Gs should be prepared to deploy to the staging base Seymour Johnson (NC) and to start conducting operations by August 16. Seymour's 4th TFW flew F–4Es and could help the 561st when necessary. After Col Karp was

Emblem of the 561st Tactical Fighter Squadron. (Via Eric Bosch)

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Emblem of the 81st Tactical Fighter Squadron. (Via Eric Bosch)

notified to send ten spare F–4Gs to Seymour, aircrews of the 562nd TFTS were tasked and launched on August 10. As no tanker support was available six aircraft staged through Holloman (NM) and four through England (LA). The ATO (Air Tasking Order) was received on August 9 and included configuration information: 12 of the aircraft had three external fuel tanks, three AIM-7s, two AGM-88 HARMS (High-speed Anti-Radiation Missile), a full load of chaff and flares in the ALE-40 dispensers, and an ALQ-184 ECM (Electronic Counter Measure) pod, while the other 12 aircraft were configured with one HARM and a travel pod versus two HARMs. The ALQ-184 would be reprogrammed locally with the most current program, allowing aircrews to counter the Kuwaiti I-Hawk surface-to-air missiles and Cyrano radar systems confiscated by the Iraqis. Also on the 9th, Col Karp was notified by TAC's Battle Staff that due to lack of airlift, the deployment might be delayed four days. The Wing was directed on the night of August 10 to deploy 24 F–4Gs to Seymour, without having a real prospect for transportation. The next day, the Wing was informed deployment would be to Shaikh Isa, that it would be the host wing and that deployment from Seymour would be August 14. Said Col Walton in this respect,

Our destination changed four or five times in as many days while we awaited our turn to depart. When I was told we were going to Shaikh Isa in Bahrain, none of us had ever heard of it. I was certain we could find our way to Bahrain, but there was absolutely no information available about Shaikh Isa. All I had was a satellite photo of a newly finished airfield at the southern tip of this 25-mile island. That had to be enough.

Twenty-four F–4Gs, in six-ship flights, departed George, were aerial refueled four times and arrived on the 12th, joining the ten 562nd aircraft. Each six-ship was escorted by two F–4Es of the 21st TFTS. In case of an emergency with one of the Gs, an F–4E would join up and escort it to an alternate base. This was not necessary and all F–4Es landed at Seymour as well.

After several delays, mainly due to the unavailability of airlift, the F–4Gs finally departed for Shaikh Isa at 16/1600Z August. Departure was in four eight-ships, including two spares, with a 30-minute separation between each cell. Each flight joined up with three KC–135s east of New Jersey over the Atlantic. Col Walton stated,

As planned, all eight aircraft would refuel to assure everyone could in fact take on JP-4. Once this was completed, the two spares were cleared off to recover at McGuire (NJ) and then return to George. Trust me, the spares were hoping someone would break down and they could replace them and continue on with us.

When the offload of two of the three tankers was complete, they left the flight and returned to Pease AFB (NH). Tanker #3 remained and was joined by two Mildenhall KC–135s mid-Atlantic, continuing the cycle. After splitting into one-mile trail spacing for straight-in approaches, twenty aircraft landed at Shaikh Isa, with Col Walton's crew as the very first one. Two F–4Gs diverted into Lajes (Azores) when an aircrew was faced with a generator problem and two into Sigonella (Sicily), when one crew was unable to aerial refuel.

As to urination and defecation on the 15.5-hour flight, Col Walton stated,

The latter was taken care of by pre-planned high-protein, low residue meals before we left, but of course, there were no guarantees. Frankly, when you sit on something as hard as an ejection seat, the sphincter muscles have a tendency to take care of that problem. As to the former, well…let's just say, the little plastic bag with the sponge in it, took some effort to use effectively. As Forrest Gump would stay, 'and that's all I have to say about that'.

Fourteen C–141s, seven C–5s, one McDonnell Douglas DC–10 and one Lockheed L–1011 were loaded by George personnel between August 16 and November 16. The latter two (commercial) aircraft arrived on August 20 with almost no prior notification. The first maintenance and support personnel arrived on the 18th, five days later followed by HARVEST BARE equipment, including tents, showers and latrines.

JCS was informed by CINCCENT in his 18/0613Z August Sitrep (Situation Report) of the arrival of the first F–4G squadron at Shaikh Isa, with 1,062 personnel and 24 F–4Gs. After the arrival, it was soon realized that much work had to be done to prepare for war. Before tents arrived and were assembled, maintenance personnel also slept in the halls of maintenance hangars and claimed any available floor space there. Maintenance personnel labored under severe working conditions for most of their stay, working at least 12 hours per day. They and their equipment were packed into just a few buildings. In addition,

F–4G hardstands at Shaikh Isa. (Victor Ballanco)

temperatures as high as 130°F and a high humidity (70-100 percent) were not uncommon. Ultimately, tents, air-conditioners and building materials began to arrive. Portable toilets, shower and movie tents, etc. were built, resulting in 'Tent City'. Initially, the Weasels were parked wing tip to wing tip. Result was the development of the base's South Loop area, starting in October, which was solid rock, covered by a few inches of powdery sand. By January 16, 1991 all four F–4G/RF–4C units and nearly every shop in the Wing's maintenance complex operated out of the new facilities. Jim Uken, the 480th TFS Assistant Ops Officer (as the 81st did not have an ADO, Jim was selected to fit that need), in this respect,

All the squadrons had their own Ops hut and briefing rooms, but we shared the larger tents that housed big briefing areas, mission planning, intel, etc. While we never trained with the RF–4C crews, they were fond of trailing our elements in and out of Iraq, using 'unauthorized' beer call signs to make the Iraqis think they were Weasels, etc.

Initially, the 35th in Bahrain was referred to by CENTAF, USAF and TAC as 35th TFW (Forward), and its remaining portion at George as 35th TFW (Rear). On September 13, CENTAF designated all units under its command as 'Deployed', the 35th becoming 35th TFW (Deployed). Finally, on December 20, re-designation followed to Tactical Fighter Wing Provisional, 35 (TFWP 35) and assignment to ADP 15. At the same time, the 561st TFS was attached and Combat Support Group, 35 (CSG 35) activated and assigned to the Wing. All F–4Gs (and later the RF–4Cs) were OPCON (Operational Control) to the Wing. Attachment of the 561st ended when the Squadron redeployed to George.

On October 10, TAC, in conjunction with CENTAF, laid the final framework for a rotation policy for the Wing, calling for each of the three F–4G wings to maintain twelve aircraft and their assorted equipment at Shaikh Isa, while the troops rotated on 179-day intervals. However, on December 6, the Office of the Secretary of the Air Force issued a statement which also included that a specific rotation policy had not been announced and was not planned to be announced in the near future.

The response posture for the entire U.S. Middle Eastern military community was increased by the Chief of CENTCOM intelligence from Threatcon BRAVO to CHARLIE (when intelligence indicated some form of terrorism action was imminent) on December 21. It lasted until January 2, 1991 when the threat level was lowered to BRAVO and in that period, all TFWP 35 personnel were restricted to base.

By the time DESERT STORM was initiated, USAF population at Shaikh Isa was 2,532, representing 86 different bases around the globe. In the first night of the war, the Iraqis launched Scud missiles at targets in the south and this resulted at 0400L in sounds of 'Scud alarm, Scud alarm, Scud alarm. Don your masks, gloves and take cover'.

Personnel began returning to George on March 22, 1991 with the first passengers boarding a KC–10A, which arrived on 23/0600L March, and 12 F–4Gs departing for George via Zaragoza (Spain) and Hulman Field (IN). The remaining 13 F–4Gs left on March 23. All Weasels were back on the 26th. In the meantime, attachment of the 561st was ended on March 25. Personnel received a red carpet reception. On April 20, the Wing was reassigned to CENTAF Forward (Fwd) and on August 2, both Wing and Group were inactivated.

(Re)deployment, 52nd TFW

The 52nd TFW at Spangdahlem (Germany) had three operational squadrons assigned, the 23rd, 81st and 480th TFS, to perform the SEAD (Suppression of Enemy Air De-

fenses) mission, destruction, neutralization and degradation of enemy radar-directed surface-to-air threats. Unlike the squadrons of the 35th, those of the 52nd TFW each had 12 F–4Gs and 12 Block 30 F–16C Fighting Falcons integrated to form hunter-killer teams. To realize this, the 37th TFW at George (all Wild Weasel aircraft were assigned to the 37th then) transferred 13 of its F–4Gs to Spang, with the final one arriving on September 26, 1986. Jim Uken about the 'Wild Weasel' F–16Cs,

In early 1987, USAF 'realized' that because of the earlier sale of F–4Es to Turkey and their due departure, a decision had to be made about their replacement. The answer was to divert the F–16s that were initially scheduled for Ramstein. I was at the F–4G test outfit at George, working primarily on tactics development when that news hit, to include an F–16C as a wingman in all future development. Originally F–16s weren't even capable of AGM-45 Shrike employment since the type was never intended to carry them and as a result was not included in their computer weapons list. We got around that by 'lying' to the computer, telling it an AGM-65 Maverick was loaded, thus able to send a direct fire pulse. It was not until later in 1989 they got their first ability to carry a HARM with the ALIC, Avionics / Launcher Interface Computer, where a single HARM could be programmed for a specific threat before takeoff. Once the programming was set, it could not be changed. A WW F–16C could be configured with two AGM-88s. The F–4G's EWO provided targeting information to get the best results, but the F–16 pilot could employ the missile without it, but in that case the probability of a kill was considerably lower. The HARM and the Shrike were employed by the 23rd TFS in Operation PROVEN FORCE. The HTS, HARM Targeting System, which the Block 50 / 52 F–16CJs use today was still six years in coming.

After Iraq invaded Kuwait and before the first units of the 52nd TFW at Spangdahlem were tasked, scenarios were planned as early as the spring of 1990 for possible contingency operations that included, among others, pulling back mobility plans off the shelves and updating them, the fighter squadrons flying more long-range attack profiles, the maintainers hammering away at their periodic maintenance requirements, and the supply folks updating their WRSKs (War Readiness Spares Kit).

At the beginning of Labor Day weekend, September 1-3, 1990, the Wing was requested to determine the requirements to deploy 12 F–4Gs to a classified location. As the three squadrons at Spang were mixed squadrons and the aircrews trained accordingly, the Wing prepared to deploy such a mixed force. However, the alerting message stated later very clearly that CENTCOM was looking forward to welcoming F–4Gs only and at Shaikh Isa in two days: CENTCOM already had enough AGM-88 HARM shooters, but wanted aircraft that could employ the missile to engage the most threatening system to strike packages, the radars necessary to support SAM and AAA sites. As Lt Col Randle Gelwix was the only squadron commander who was F–4G qualified, the 81st TFS was selected to deploy.

The result was that one-half of the Squadron was packed up and deployed overnight, something Col Gelwix had found difficult to tell his F–16C pilots. To do so, [81st TFS aircraft and aircrews were recalled from Karup (Denmark), where they participated in NATO exercise Oxboel, while those of the 23rd TFS were recalled from Zaragoza (Spain) while on a month-long semi-annual Weapons Training Detachment (WTD)], maintenance feverishly generated the F–4Gs for immediate combat operations (Intel had indications Saddam Hussein was about to launch his forces further south into Saudi Arabia), i.e., they were configured with three fuel tanks, two AIM-7 Sparrows, two HARMS, chaff and flares, and an ALQ-131 ECM pod. In the meantime, for instance, flight plans, dubbed DUE REGARD, were prepared, divert data arranged and was determined which people would be deployed. When USAFE finally announced that KC–10A Extenders were sent to Spang for the airlift of personnel and equipment, the load had to be re-planned, as the Wing's Resource Plans had prepared plans for airlift by C–130s, C–141s and C–5s, but not by KC–10s.

Twenty aircraft were prepared, 18 started and 16 were launched. When any F–4G would have an issue after launch, its aircrew and his lead/wingman would peel off as a two-ship, their place being taken by a spare element. At 0230L on September 5, led by Gelwix and Uken, 12 F–4Gs were launched, eight of the 81st and four of the 480th TFS, plus four spares. The best aircraft were picked, which would not need phase inspections for a while. The four aircraft, aircrews and maintenance/support personnel of the 480th flew under the flag of the 81st. Once into France by some 50 miles it was go-no go decision time. No spares were used. The flight went down the center of France, exiting into Mediterranean airspace, and turning east once in the middle. Once Cairo was off the right shoulder, a turn was made south, flying down the Nile, turning left at Luxor, flying east across the Red Sea to Jeddah. In Saudi airspace it

During DESERT STORM aircrews of the 561st and 81st TFS flew their missions separately. During DESERT SHIELD at least one exception was made, when aircrews of two 561st TFS F–4Gs (WW) and two of the 81st (SP) posed while on a training mission over Bahrain's coast line for MSgt Bill Thompson's camera. The F–4Gs are configured with four AGM-88 HARMs, High-speed Anti-Radiation Missiles, each.

F–4G 69-7202 of the 81st TFS in its hard stand at Shaikh Isa. The Weasel is configured with two AGM-88s. The 52nd TFW patch was removed. (Victor Ballanco)

was Wedj, Riyadh, Dhahran, basically flying about 100 miles south of the Iraqi border. Then into the Persian Gulf just north of Bahrain, down its east shore until landing at Shaikh Isa on the very southern tip, after eight hours and in 114-degree weather. All aircraft were 'Code One', bringing the number of F–4Gs to 36. The 35th TFW was supposedly surprised USAF had tapped the 81st to add WW forces. They had expected the Wing's second squadron, the 562nd TFTS, would be deployed for the augmentation, but the 562nd had a dedicated training mission and was not mission ready. The 81st was sensitive to this and tried not to act as invaders. After a few days, it was no problem.

The aircraft were parked on the taxiway south of the main ramp, approximately one mile from all support facilities. The aircrews spent their first couple of nights in tents on cots with sleeping bags. The support team arrived early next morning, while three KC–10s transported some 180 personnel and equipment. Within 24 hours after arrival, personnel and aircraft were integrated in 35th TFW Fwd. The 81st kept its unit identity as much as possible, but this was exclusively for internal operations. In this respect, Jim Uken stated,

The squadrons stayed pretty much separate. I never sensed any competition of any sort the entire time we were there. In general and being in a fairly small community, many of the guys knew guys in the other squadron from previous assignments. We deployed and flew in the same four-ships at Shaikh Isa from Day One all the way until the squadron realignment on January 1, 1991. My pilot was Capt Kirk Kingsley, who was also flight lead. Since I knew aircrews of both squadrons, I was tasked by Col Gelwix to build eight 'go-to-war four-ships'. As I was seeking an equal distribution in the new squadron 'blend', I paired myself with Col Gelwix. I don't remember a single exception where the 81st and the 561st flew a DESERT STORM mission together. As the 561st TFS was the first to deploy, the structure was built around the 35th TFW.

It was the beginning of a very successful cooperation, living, working and flying side by side with the Wing. As of the third day of arriving, 81st crews went through a local area familiarization phase with both day and night sorties. Although at Spang it was not unusual to fly with just about everyone, at Shaikh Isa ultimately eight 'hard' four-ships were formed, which included the Clark aircrews: for the duration of the war, the pilot and EWO would fly together and in the same flight. By the end of the first week, the Squadron assumed one-third of the Wing's alert commitment with four aircraft pre-positioned and ready for 24 hours every third day.

In about week three, the 81st moved into its own facilities, having a separate, secure planning area. It was called the 'Secret Squirrel Cage' and discussion and details at Shaikh Isa were kept to only the Wing (CC and DO), Squadron commanders and MPC (Mission Planning Cell) members.

Maintenance made sure their Phantoms were ready to launch, while supply personnel jumped on the job to build the vital logistic train. Others were tasked to 'build an air base', like an immense hydrant system from scratch, fed by 50,000-gallon bladders, which they connected with more than 300 miles of portable pipe and to erect the tents that would prove to serve as home for the next seven months. When Shaikh Isa was constructed, it was planned for only 800 people. Eventually, the base would house 6,000, assigned to four AF units, eleven Marine Corps (MC) squadrons, plus two squadrons of the Bahrain Amiri AF. Over 200 aircraft were operating from a single runway. In the November 10-16 period, two replacement F–4Gs arrived from Spangdahlem as part of a scheduled F–4G rotation. By November 30, the 52nd had 219 personnel at Shaikh Isa.

After this initial deployment, the Wing was regularly tasked to perform studies to deploy either to one location or another, or reacting to alerting messages, resulting in the 52nd maintaining a constant readiness to deploy, anytime and anywhere. The week before Christmas brought clarity as the deployment order directed the Wing to deploy an additional twelve F–4Gs to Shaik Isa, the remaining aircraft and aircrews of the 81st and 480th TFS. This time personnel had to be recalled from leave. When all preparations had been made, the weather showed its unpredictable side and waiting started on a day-by-day basis for it to clear. Finally, on December 26, weather allowed the twelve Phantoms to launch. In his 27/0800Z December Sitrep, CENTAF Fwd informed CINCCENT of the arrival of 11 F–4Gs at Shaikh Isa, followed by a latecomer, increasing the number to 48. A total of 596 Wing personnel accompanied the F–4Gs, including some 240 in the 81st AMU (Aircraft Maintenance Unit). When the second increment arrived, officers went back to eight officers to a room, while other personnel crammed even tighter into their tents. But yet, the new arrivals were welcomed warmly. To generate the high number of sorties in DESERT STORM, 'dining in' at the flight line and 'combat napping' became the rule for the personnel.

After departure of the remaining F–4Gs of the 81st and 480th TFS, the 52nd TFW was realigned, one squadron with 24 F–4Gs, the 81st, and one with 24 F–16C/Ds, the 480th TFS. The third squadron, the 23rd, remained unchanged, 12 F–4Gs and 12 F–16C/Ds.

Redeployment was initiated on April 5, 1991 when eight aircraft returned to Spang, followed on May 10 by another eight Phantoms. Of the remaining eight F–4Gs, four returned on June 27, with the final four still at Dhahran as of December. Left behind at Shaikh Isa were the aircraft, aircrews and support personnel that had deployed there in late December 1990.

Sgt. Todd Nelson of the 52nd TFW is checking the Mode 4 on an F–4G on the parking ramp area. Mode 4 is a military discrete variant of ATC's Identification Friend or Foe (IFF) used throughout the world. Mode 4 is an encrypted IFF, changed daily, and thus the reason for being checked before takeoff, especially when used in combat operations. (USAF, MSgt Bill Thompson)

The 52nd also supported Operation PROVEN FORCE at Incirlik, Turkey with personnel and aircraft. The combined (Incirlik/Shaikh Isa) 36 F–4Gs and 12 F–16Cs were supported by 1,300 personnel and 6,000 tons of equipment. More than 3,900 sorties were flown with 7,200 flying hours. Radars were hit 142 times. The deployment of the 23rd and 81st TFS meant only one of the fighter squadrons, the 480th, remained at Spang, not as a mixed squadron of F–4Gs/WW F–16Cs, but of 24 WW F–16Cs. Yet, they, commanded by Lt Col Jim Allgood, played an important role. For instance, they provided the senior supervision and instructors to bring the newly arriving aircrews to mission ready status and possible deployment and supplied 'spare' bodies for every other tasked deployment. As the 52nd TFW background document stated, 'The 480th TFS stayed at Spangdahlem in body, but not in spirit'.

In August 1990, Lt Col Edward 'Victor' Ballanco was the Chief of Weapons and Tactics Division of the 52nd TFW. He was attached to the 23rd TFS for flying. Wing Weapons had two F–4G and F–16C pilots and two F–4G EWOs. As he was assigned to the Wing, he did not expect to deploy. However, after receipt of the Execution Order, Col Rudi Peksens, the Wing commander, pointed at him and said, 'Victor, you're going, I want you to make a SEAD campaign happen' (based on the 1982 Israeli Bekaa Valley experience and the confidence in the HARM capability, Wing Weapons developed a SEAD Campaign concept for Wild Weasel employment in NATO. Analysis indicated it could be very effective even against the full-up Soviet IADS NATO faced across the Iron Curtain. The Wing wanted NATO to employ the Weasels using a campaign approach, not in a piecemeal fashion. Also, medium/high altitude airspace was required so that the F–4Gs could be loaded with four HARMs and one external fuel tank, rather than the usual two and three respectively. A timeframe in which 'low' was the standard, this was 'swearing in church'. This caused very heated briefings. During a Green Flag exercise in July 1990, the USAFE planning staff, with much resistance from the Green Flag Staff, tasked the missions at medium to high altitude and demonstrated a SEAD campaign. This concept was not well received by all the participants, but the two USAFE DOs were strongly behind the concept and training program. It would not be long, before the lessons learned in the training program and in Green Flag could be put into practice). Victor arrived at Shaikh Isa per KC–10 late in the evening of September 5. The Extender, which escorted and refueled the F–4Gs, also transported maintenance personnel. Victor said,

My primary job was mission planning, as a minimum for the 81st, and eventually for the 35th TFW, but also flew quite a few sorties, normally with different EWOs. Fortunately, after reading into the top secret Desert Storm plan, I quickly saw there was no need to convince anyone in CENTAF of the need for a SEAD campaign: it was already

There were 28 hot pit refueling stations at Shaikh Isa, ten of which, just north of the F–4G parking area, were solely dedicated to Phantom operations. After each mission, the F–4G/RF–4C would be taxied to the hot pits, stop, and be pushed back into a refueling position. Once gassed up, the aircraft was taxied to the parking area. It looks like the HARMs were expended. The ECM pod is an AN/ALQ-184. The refueling port behind the cockpit is open. (USAF)

planned. A few days after arriving I went to CENTAF in Riyadh to meet the planners in the "Black Hole", where BG Buster Glosson was in charge of overall planning and BG Larry Henry of SEAD planning. After this trip I made several trips to meet the units and plan the missions face to face. Since the C2 aspect of the air campaign were well in-hand, we had to apply the proper SEAD to maximize our effort. The Israeli Bekaa Valley operation had also been studied by the CENTAF planners, and we more or less modeled the SEAD campaign on that. Gen Henry decided we needed drones to help stimulate the SAM radar environment. He was successful in finding and obtaining the drones, so this helped with part of the problem regarding how to stimulate the SAMs to turn on their radars for anti-radiation missiles to home on and destroy. Our preferred method was drones if available, and then EF–111A and EC–130H standoff jamming. We hoped to engage and kill the SAMs before the attackers entered the threat rings. If the threats did not cooperate, we would ensure we were positioned to protect them. This was the classic Weasel 'First In-Last Out' approach.

As the forces were plussed up beginning in November, most of the coordination was done, using ATO updates (ATOs specified the targets, TOTs, dedicated aircraft and air refueling information). SPINS, Special Instructions, also spelled out further coordination use, such as the WW SAM priorities, and communications through STUs, Secure Telephone Units. Many of the missions expanded after that time, but the basic plan remained essentially the same. F–4G flight leads were brought in on the plan about ten days before execution. This allowed them to continue the final coordination while the planners tried to look at the bigger picture.

Because of the threat environment (approximately 300 radar-guided SAMs, over 3,000 IR-guided SAMs and over 6,000 AAA pieces), the long distances that had to be traveled, the fact that the first missions were at night, and the possibility the Iraqis could use chemical weapons, it was determined that medium to high altitude employ would be best. It would give the APR-47 optimum detection and ranging capabilities and the HARM had a longer employment range. It came with a disadvantage though, as the minimum range of the missile increased.

According to Victor he did not lead any of the flights, although he planned the missions. This enabled him to concentrate on the big picture and leave flying ops to the flight commanders, 'who were damn good', as he stated.

(Re)deployment, 3rd TFW

The 3rd TFW at Clark AB (Philippines) had two squadrons assigned, the 3rd and 90th TFS with the latter performing the defense suppression mission. The 90th had integrated its F–4Gs with the E model of the Phantom to form hunter-killer teams. Six complete F–4G aircrews, who were on volunteer standby status, arrived TDY at Shaikh Isa on January 30, 1991. The crews, attached to the 81st TFS, formed 'hard' crews and flew either as a hard four-ship, or two-ship, although crews were swapping positions. Uke in this respect,

When the 'new' 81st TFS was formed after arrival of the 480th TFS crews in late December 1990, Col Gelwix was tasked to put eight 'hard' four-ships together, comprised of a mix of aircrews that were already at Shaikh Isa with the newly arrived 480th aircrews, plus the 81st guys who had not deployed in early September. Every sortie the 81st four-ships flew until January 1, 1991, had the same lineup. As the 561st TFS had the 'luxury' of deploying many of the 35th TFW staff officers, they actually had about six more crews available for flying than we did. However, our tasking was the same as theirs and if one of the crewmembers got sick, that sortie did not go, as we had no spare aircrews. We finally got some relief when the Clark F–4G aircrews

A pair of F–4Gs of the 81st TFS being refueled by a KC–135 Stratotanker. The aircraft closest to Victor Ballanco's camera, 69-7571, was lost on Day Three of DESERT STORM, January 19, on a night Wild Weasel mission. The aircraft ran out of fuel after it was hit by AAA. The crew, Capts Tim Burke and Juan Galindez (EWO) ejected safely and were back to business two days later.

The crew of this 561st TFS F–4G is banking away from the KC–135 they refueled from. The refueling port, located behind the cockpit, is still open. The aircraft is configured with at least two fuel tanks on the outboards and two HARMs on the inboards. (USAF)

showed up, allowing a four-ship to get a break every 8-9 days.

PACAF also planned for F–4Gs assigned to the 90th to go to George to back-fill any shortages. The aircrews returned to Clark on March 13.

Training

After arriving at Shaikh Isa, the 35th TFW maintained F–4G alert to accomplish the SEAD mission. However, in the light of the anticipated Iraqi threat into Saudi Arabia, aircrews expressed the need for air-to-air training. This necessitated live ordnance to be downloaded and external fuel tanks to be changed, obviously compromising mission preparedness. The solution was found in keeping the majority of the F–4Gs on alert and reconfigure six aircraft for air-to-air combat training. To meet both the USAF and Marine Corps fuel requirements, hot pit refueling quickly became the preferred method, establishing four hot pit areas. Each pumping unit contained four refueling points. During DESERT SHIELD, the hot pits dispensed an average of 280,000 gallons of fuel per day to USAF, MC and BAAF aircraft.

Two areas were noticed by Col Karp that needed attention after the arrival of the Spangdahlem aircrews, (1) inter-operability (to fly similarly and have similar procedures) and (2) night flying (the 81st flew night sorties, but the 561st did not). As to (1) Col Karp brought in the DO (Deputy for Operations), Col Gene Patton, who fixed it; as to (2) Col Karp decided to fly at least 50 percent of the sorties at night. In addition, both weapons and tactics officers, Lt Cols Victor Ballanco and Bradley Ellico, suggested training should also include more medium altitudes (10,000-20,000 feet) for both the direct support roles and CAS (Combat Air Support), as it would enhance the survivability of the F–4G and permit the aircrews to use the HARM to its fullest potential, as AAA was considered their primary surface-to-air threat.

Training accomplished in DESERT SHIELD knew three categories, (1) desert acclimatization, (2) local-area orientation, and (3) mission preparation.

Until January 9, 1991, more than 160 ATOs were produced with an average of some 750 daily training/operational sorties. The next day, CENTAF units began a gradual aircraft load-out and increased their alert posture. By the 13th, 60-70 percent of the air-to-ground units and all air-to-air units were combat-configured and loaded.

On September 8, CENTAF initiated a weekly integrated-package flying training program. Initial packages were single-service. But after the 12th, emphasis was placed on the creation and operation of large force packages by including other services and Coalition forces with, for example opposition air, escort fighters and Wild Weasel support. The purpose was to promote interoperability of friendly forces, conduct integrated training with allies, and exercise package operations. As planners assembled packages, they coordinated their support to make scarce resources, such as F–4Gs and EF–111As, available to support as many of them as possible. For instance, targets and missions of B–52Gs were to be supported by as many F–4Gs as possible. The bulk of coordination with the external units was done by the Mission Planning Cell, most of it during DESERT SHIELD. Once DESERT STORM started, the MPC did the initial coordination and left the

561st TFS F–4G Wild Weasel pilot Capt Clyde Bellinger and EWO Capt Randy Thompson inspect an AGM-88 HARM prior to flying a nighttime combat mission during DESERT STORM. (USAF, TSgt Fernando Serna)

Air refueling was a mere necessity for F–4G aircrews due to the distances from Shaikh Isa to targets in Iraq. That's also why aircraft were configured with only two AGM-88s and not four as was in general the case on missions to Kuwait. F–4G 69-0286 of the 81st TFS is being refueled by a KC–135 of the 380th Bomb Wing (Plattsburgh, NY). (Victor Ballanco)

contact information for the Mission Commander to do any final coordination over the phone.

Packages increased in size and complexity as DESERT SHIELD progressed. For instance, on October 7, 12 F–4Gs participated in three packages, (1) with 40 F–16s and four F–15Cs; (2) six F–16Cs and four RAF Tornados; and (3) 16 F–16Cs and six RSAF Tornados. Jim Uken in this respect,

Coordination was a never ending process, largely as additive forces kept arriving in the theater all the way into early January 1991. From a macro level, targets were selected, assets to attack those targets, and then timing and target de-confliction had to be considered and finally all the support assets added, such as Weasels, jammers, tankers and CAPs. One change in the Master Attack Plan (MAP) could have a ripple effect. To this day, I can't believe we never had a mid-air collision given 2,000 aircraft in the same airspace at the outset, many with no air-to-air radar.

Other training missions included practicing threat suppression profiles and communications by electronic combat assets (F–4G, EF–111A, EC–130 and EA–6Bs), the first of which was flown on September 9. F–4Gs also flew training missions with B–52Gs. For instance, on September 23, five B–52Gs on a low-level strike mission were supported by F–4Gs, which provided defense suppression.

Examples of training exercises were, (1) INITIAL HACK, October 24-26, included practicing pre- and post-strike air refueling, airfield attacks, CAS, and Command and Control (C2) procedures against a simulated D-Day ATO; aircraft in eighteen packages, involving some 40 Coalition air units, flew more than 300 simulated combat and 200 other sorties; (2) IMMINENT THUNDER, November 15-21, to closely simulate D-Day ATOs and practice CAS and CSAR (Combat Search and Rescue). Combined strike packages, CAS and CSAR were flown by U.S., Saudi, British, Kuwaiti, French and Canadian forces. One thousand aircraft participated with 4,000 sorties flown; and (3) DESERT FORCE, December 5-7, by 317 aircraft in 12 packages, plus 114 aircraft exercising CAS.

Desert Storm

Gaining and maintaining air superiority was the prime concern during the first days of combat operations and in this respect Electronic Warfare was to play a central role in the neutralization of Iraqi's air defense system (air superiority was declared on January 27). It was planned as the second Phase of the campaign and took place in conjunction with Phase I, the physical attack of KARI, Iraq's automated Command and Control system, which was built by French contractors. Assets included airborne and space systems. EW's mission included collection of electronic intelligence and suppression of Iraqi electronic capabilities. To keep Coalition losses as low as possible, EW assets were of greater importance to overall air operations than ever before. As to airborne assets, an array of specialized aircraft was employed, like F–4Gs and EF–111As. In addition, two types of radar-decoy drones stimulated Iraqi radar activity, (1) Navy A–6E Intruders launched ADM-141 Tactical Air-Launched Decoys (TALD) and (2) Grumman (Navy) BQM-74C Chukars were launched from Saudi Arabia by personnel of USAF's 4468th Tactical Reconnaissance Group, SCATHE MEAN. The Group arrived on November 7, 1990 at King Khalid Military City, Saudi Arabia.

To destroy Iraq's air defense radars, USAF had 61 F–4G Wild Weasels stationed at Shaikh Isa and Incirlik, 63 percent of its F–4Gs. Like all EW assets, Weasels were in limited supply, resulting in a concerted effort to maximize their use by piggybacking as many attack packages as possible into a given area at a specific time. Jim Uken stated,

The demand for electronic warfare assets far exceeded the availability. There was a famous message that came from Gen Chuck Horner, CENTAF's Commander at Riyadh, stating that CENTCOM was doing their best to allocate available EW assets against the highest priority, best defended targets and commanders at the bases should stop complaining if they didn't get Weasel support. If we had followed standard USAF tasking rules, we would have generated 64 WW sorties a day between the two squadrons. Reality was we far exceeded this the first week, but it was beginning to become a safety factor as average missions exceeded five hours airborne and crew rest requirements were being waived between missions. Given the amount of adrenaline created by the many missions, many of the guys were having trouble trying to get what little sleep they should have been getting.

SEAD tactics changed when threat activity diminished toward the middle of the war, especially in the KTO (Kuwait Theater of Operation). For instance, by not accompanying all strike packages, each F–4G element was enabled to cover 30-40 strike formations there, resulting in an EW umbrella. EWOs conserved HARMs by using the F–4G's AN/APR-47 Radar Attack and Warning System (RAWS) to see and attack threats as they came on the air.

Wild Weasels then became more available to support packages as they struck 'kill boxes' in the KTO. Kill box designators were used by most everyone as a convenient and simple way to direct aircraft on missions. They were based on the Saudi Air Defense Map grid. There were 22 named kill boxes, like AE 5 through 8. A total of 732 strikes were flown by F–4G crews, of which 295 in named and 437 in unnamed boxes. For example, crews located and attacked mobile SA–6s deployed with the Republican Guard. As Jim Uken explained,

Our mission gravitated from almost 100 percent direct support to strike packages to a combination that included kill boxes, primarily for A–10s and F–16s striking targets of opportunity. This became known later as what we called the Weasel Police mission, or in other words, a Weasel Combat Air Patrol. The mechanics were simple. Take three 2-ships and stagger their takeoff times by 40 minutes. Hit a preflight tanker and then fly into southern Iraq, which was divided into 30-mile square kill boxes, each having an active time. Forty minutes on station time and the two-ship behind you arrived and you headed back to the tanker to get another load of fuel. Second two-ship was replaced by the third one and then you replaced them. And then do it all over again for what we called a 'triple pump'. In this way we had continuous presence in the region for six hours and with subsequent six-ships, were able to cover 24 hours with 24 sorties. They were long missions though, average was 5.5 hours.

Victor added,

We encouraged CENTAF to develop an airspace de-confliction plan for the KTO, as aircraft were all over the sky, which at night was both dangerous and nerve wracking, negatively impacting mission success. Towards the end of the war, the Weasel Police missions were pretty boring, as SAMs were not turning on their radars or shooting at anyone. We had achieved air supremacy from surface threats through our SEAD campaign. Many of the Weasels sat over the KTO at night and counted the oil well fires. One night 200 were counted, which was quite a sight.

When dominance became so complete that tanker aircraft could accompany F–4Gs further north, their aircrews were able to remain on-station even longer.

In addition, USAF had 12 'Wild Weasel' F–16Cs available at Incirlik with AGM-88 capability, while the Navy/Marine Corps deployed A–6Es, A–7Es, F/A–18A/Cs and (27) EA–6Bs from six carriers (Navy) and Shaikh Isa (Marines) with HARM capability.

F–4G aircrews flew three mission types, (1) autonomous, (2) direct support, and (3) area SEAD. During (1), targets were attacked in a particular geographic area to reduce Iraqi air defense threats or roll back the air defenses for upcoming Coalition air operations; during (2) F–4G aircrews joined aircraft flying attack missions and carried out SEAD that could pose a threat. Most of the missions were direct support ones; and on (3) F–4Gs were not tied to a particular strike force, but provided SEAD support for numerous strikes against various targets. In-flight refueling was required for all missions. While over the target area, the crews planned on about ten minutes of serious 'hunt and kill' work. As the standard Weasel configuration used for long station times was two AGM-88s (and three fuel tanks), aircrews believed they would probably be out of the target area in quick order. As to the configuration Jim stated,

The first days, the 81st TFS had 16 F–4Gs that carried four HARMs each. On about the third day we reconfigured as there were not as many SAMs operating in the KTO. The difference was the depth of penetration into Iraq. Anything going into Kuwait or southeastern Iraq, carried four and all else had two. Since we trained as set four-ships and 'Weaseling' was such a fluid mission, I am sure all the four-ships set up their own HARM shot de-confliction plan. Something as basic as lead has SA-2 B/F, #2 has SA-2 C/E, #3 has SA-3 and #4, SA–6. Most four-ships reserved the option for lead to be directive, e.g., '#3, target the SA–6 at your 3 o'clock'. Since we literally had months to train together, we had every possible "if what" covered. A great example, our first mission quickly degenerated into four "singles", as we had all "gone defensive" from being targeted multiple times. First rule is to defeat the threat, then worry about where the other guys are. We all came out single ship, which was just fine with all of us. The other de-confliction rule, "If someone is launching on you, shoot back as your HARM is faster as long as you react quickly". Since only one jet could be targeted at a time, you know the other guys are clear from this one. Three of our shots the first night were reactions to SA–6s being fired at us. See also later.

The afternoon prior to the beginning of DESERT STORM, a general officer of the CENTCOM Staff arrived

F–16As of the Air National Guard also participated in (daylight) combat missions on the opening day of DESERT STORM. Included were 16 aircraft of the 138th TFS (New York ANG). Their target, SA-2 sites near Ahmed Al Jaber Airfield in Kuwait, was to be struck by the 32 Mk 84 2,000-pound bombs the F–16As were configured with. In addition, the aircraft carried two AIM-9s and an AN/ALQ-131 ECM pod. The photo shows F–16A 79-0352 of the 138th TFS on 'last chance' at Al Kharj, prior to its very first combat sortie on January 17. (USAF, MSgt John Luszcz)

at Shaikh Isa from Riyadh and told the assembled aircrews, 'Gentlemen, tonight we ride'.

The Beginning

The Coalition's first weapons struck Iraqi targets on 16/2339Z January (17/0239L), D-Day (Army AH-64A Apaches, firing 27 AGM-114 Hellfire missiles, 100 2.75-inch Hydra rockets and 4,000 30-mm rounds. This was the only time Army assets were part of the [MAP or ATO, Air Tasking Order]). This MAP, called 'First 24 Hours', provided for 25 large-scale SEAD attacks. Sixteen F–4Gs of the 561st TFS and 12 of the 81st launched, starting at 0150L. Takeoff was in flights of four, with an interval of 20 seconds between each Phantom. Call signs used were brand name beer logos, like Miller, Strohs and Falstaff.

One of the SEAD strikes was directed at H+40 (0340L) on the first night, against the area south and west of Baghdad. USAF struck the former and the Navy the latter area. A total of 48 aircraft were involved, including 12 561st TFS F–4Gs, led by Col Walton. The 20-minute basic brief started a little before midnight. Split was then made to four-ship briefings with call signs Coors 31-34, Lonestar 41-44 and Michelob 51-54. As to the call signs, Col Walton explained,

They came up a few days prior to the beginning of DESERT STORM. I received a phone call from one of the planners in Riyadh, who asked me what call signs we would like to use. My first preference had already been taken by another fighter squadron, so I thought for a few seconds, remembered we had been without beer or alcohol of any sort for months, and proposed to use beers as our call signs. He responded, why not? Our call signs were distinctive, recognizable, unforgettable, and as the Campaign progressed, folks knew who the Weasels were.

The aircrews stepped at 0025L for a 0055L engine start and it was planned to have all aircraft armed and on the runway for a 0125L takeoff.

Other participants were three EF–111A Ravens (USAF), and three EA–6Bs, which carried no HARMs (Prowlers were primarily used as jammers, as carrying AGM-88s meant giving up room for jammers), with their three F–14 Tomcat escorts, two A–6E Intruders, ten F/A–18 Hornet and eight A–7E Corsair II HARM shooters, and three KA–6D tankers, all from carriers in the Red Sea. The effort was covered by four additional A–6Es with TALDs, to further confuse Iraqi defenders. In addition, slightly behind the western package, four A–6Es and four RAF Tornado GR.Mk1s struck Al Taqaddum Airfield. It was planned to approach from numerous directions, force a reaction and destroy the radars. Each of the three EF–111As (and EA–6Bs) established an orbit, while BQM-74Cs were launched to stimulate the IADS, Iraqi Air Defense System. When the Iraqis activated their target acquisition radars, they were jammed by Raven and Prowler crews, forcing the radars to increase their vulnerability to AGM-88s. A–7E and F/A–18 crews fired 51 HARMs, 45 in their prebriefed mode, at targets already designated as known SAM

RF–4Cs were relative latecomers to Shaikh Isa. By December 25, the 192nd TRS (152nd TRG, Nevada ANG) had moved there from Al Dhafra (Saudi Arabia), bringing along two of its own Phantoms and taking over four RF–4Cs of the 117th TRW (Alabama ANG). On the photo, two RF–4Cs at Shaikh Isa after returning from a combat photo recce mission. RF–4C 64-1047 shows Alabama ANG markings, but is flown by 192nd TRS aircrews. Note '047' completed its 14th combat sortie. The ECM pod under the left wing is an AN/ALQ-131. (USAF, MSgt Bill Thompson)

sites, and six more at targets of opportunity. In addition, Intruder crews dropped 25 TALDs within 20 minutes spacing. One F/A–18C of Saratoga's Strike Fighter Squadron (VFA) 81 was supposedly shot down by a MiG–25 Foxbat. Its pilot, LCDR Michael Speicher, was killed.

After takeoff, the three F–4G flights joined in route formation and passed the lights of Dhahran. Over the Saudi desert join-up was made with the tankers, Tuna flight. Refueling took place at FL 210 and everyone topped off. Each F–4G crew was tasked to destroy high-threat mobile SAMs within their assigned area of responsibility. As F–4Gs possessed the capability to identify active SAM sites from the air, an EWO (Electronic Warfare Officer) could mark active sites from his equipment and then fire at the site by programming the HARM on board the aircraft. The F–4G SEAD package headed straight for Baghdad and then swung northeast, just short of the city. Crews picked up SAM activity 100 NM from the capital. At 0037Z, SA-8s, AAA radar, and I-Hawk came up, while 11 minutes later, activity became very heavy. While swinging northeast, EWOs picked sites that Intel had identified. When any proved to be inactive, the crew went after targets of opportunity. Col Walton and his EWO, Budman Redmond, fired two HARMs, one at a SA-2 and the second at a SA-3 radar site. With their missiles gone, Col Walton made a hard turn to the right to the egress point. All three flights post-refueled and returned to Shaikh Isa. After landing, the aircraft went through hot pit refueling. In all, 22 HARMs were expended, with ten shots being assessed as successful (46 percent), causing the targeted emitters to go off the air. Although BDA (Bomb Damage Assessment) could not be fully obtained, a significant reduction in electronic activity was noted by ELINT operators. Approximately one hour later, a flight of four F–4Gs followed on a direct support mission to the Salman Pak area, south of Baghdad. As Col Walton remarked,

None of us got a lot of sleep for the next three days. Nobody complained. Nobody second-guessed anything. Not sure how many folks needed to wind their clock, but I didn't worry about it after that night.

In the 0357-0420L timeframe, SEAD and strike packages struck two Kuwaiti air bases and Shaibah Airfield, south of Basra in Iraq. The three bases were probably no more than 30 miles equidistant. At Shaibah, the combined package was composed of three VMAQ-2 (Marine Tactical Electronic Warfare Squadron Two) and two USN EA–6Bs, ten HARM-configured Marine Corps and seven Navy F/A–18s, four Navy A–6Es, four RAF Tornado GR.Mk 1s, carrying bombs, and BQM-74 drones. The package was supported by four 81st TFS F–4Gs, Pearl 51-54, led in 97232 by Gelwix and Uken, who crossed the Kuwaiti border at H-2. CAP was flown by four USN F/A–18s. To coordinate F–4G support to Navy Alpha strikes, Jim made at least four trips to two different carriers. The Weasels carried four AGM-88s each, plus a centerline fuel tank. Jim Uken said,

It's almost like the Iraqis knew when H-hour was, as at that moment an SA-2 came up directly under our 4-ship and, since we were flying a loose route formation, we all got the same "you're being launched on" indications. As we all went defensive at the same time, that's pretty much the last we saw of each other that night. But we'd briefed every possible situation and just flexed to that plan.

At the same time, a package with one Navy EA–6B, CAP-ed by two F–14s, BQM-74 drones, eight F–16Cs with LANTIRN (Low-Altitude Navigation Targeting Infrared for Night) pods, eight F–111Fs, and two A–6Es struck the Ali Al Salem SOC (Sector Operations Center) and the Scud shelters at Ahmad al-Jaber and Ali al Salem Airfields in Kuwait. The Shaibah F–4G flight also supported the Kuwait package. Fifteen AGM-88s were expended, with one hang fire. Mission duration was 2.5 hours and Gelwix/Uken were credited with destroying two SA–6 radars and an unknown, probable SA–6 radar. The aircraft of Pearl flight were the first ones to return to Shaikh Isa. After the end of runway post-flight check, the parallel taxiway was lined with Airmen and Marines. The CONRAC recorder, which copies everything the RWR sees, HARM shots taken, emitter parameter data, etc. was given to Intel. After a quick verbal debrief, the aircrews were strongly advised to try to get some rest. Another 81st F–4G 4-ship came in 15 minutes after Pearl flight. The first night, a total of 200 AGM-88 HARMs was expended.

Victor Ballanco flew his first combat mission on the first day of Desert Storm. As he described,

On this early daylight mission (takeoff at 0722L), my EWO, Lt Col Don Whitler, and I were number six of a six-ship, Coors 36, to fly on the wing of Maj Mark Turberville / 1Lt Steve Garland, Coors 35. Mark was the 81st SEFE, Stan Eval Flight Examiner. A total of ten 81st aircrews were involved as Coors 31-36 (Mission #1231W) and Blatz 41-44 (Mission #1241W). The F–4Gs were each configured with four HARMs and a centerline fuel tank. To reach the targets in the KTO, pre-strike refueling was necessary. Yet, due to the configuration we could not go very far or stay on station very long. We briefed with the aircrews of Blatz flight, as we had a wide time window to cover across the full KTO. We hoped to provide overlapping coverage in the event anything went wrong. There might also be a possibility a flight might have excess missiles after covering the strike missions we were directly supporting, which would be a transition from a direct support to an area support mission. The mission briefing, which took place while aircraft of the initial F–4G flights were returning, was relatively uneventful, except that the weather was not as good as we had become accustomed to: a strong north wind and cumulus clouds throughout the area.

Emblem of the 23rd Tactical Fighter Squadron. (Via Eric Bosch)

As Victor continued,

After arriving at the Squadron duty desk for our aircraft assignments, things started to go downhill. Only two of the six Coors aircraft were ready, Coors 35 and 36. Ultimately, eight F–4Gs got airborne with 26 HARMs expended, of which all eight by the crews of Coors 35 and 36, seven out of eight by the crews of Coors 33 and 34, for a total of 15 out of 16 HARMs. Blatz 41-44 all got airborne and their crews expended 11 out of 16 AGM-88s. Coors flight was scheduled on different tankers, but all were supposed to enter the KTO at about the same time with Coors 31-34 (Coors 31 and 32 did not get airborne) supporting F–16As of the 157th TFS (South Carolina ANG) in the north and west, and Coors 35-36 supporting F–16Cs of the 614th TFS in the southeast, striking Ali Al Salem and Al Jaber airfields. Since we would be the only ones going into the target area, focus would be covering the full area to the best of our ability, con-

centrating on direct support for the attack missions. Our target priorities based on SAM type was SA-3, SA-2, SA–6 for us and SA-2, SA–6 and SA-3 for Coors 35.
After takeoff, we joined on our tanker, Walleye 62, and took a full load of fuel. As we turned to the north, I got sight of the 614th F–16Cs, which were about ten miles in front of us, while it should have been the other way around. On radar we could see the F–16As of the 157th, which were even further ahead. Our flight plan called for us to take on more fuel as we flew north to the drop-off point, but, as we were further south than planned, we decided to depart the tanker and push it up to go as fast as possible to the target area. When we climbed away, the Swamp Foxes of the 157th asked about the status of the Weasels. I told them we were only a flight of two and several miles behind them. The impact of only two Weasels airborne early on was that the 157th pilots did a lot of defensive maneuvers. They were not happy and rightfully so. When I recommended them to make a 360 turn so that we could close the gap, they answered negative and continued on to their targets, most likely due to fuel. After the 157th pilots stirred up the SAMs, Don and I had several SAMs displayed on our nose, with good ranging on our APR-47s. After selecting the closest SA–6 to the F–16As, we fired a HARM, a long-range shot, about 40 miles with a 2½-minute missile time of flight. This was immediately followed by a second HARM, at 35 miles and two-minute time respectively. While in the firing process, we lost sight of our element lead. Continuing veering to the right, we fired our third HARM at an SA-2 to the east, the vicinity of the F–16C target area. Expending the three missiles took place within one minute. We then rolled out on a northerly heading while trying to find Mark and Steve, and the 614th F–16Cs. A few seconds later, we had a popup launching SA-2 in their area, at about ten miles and 20 degrees to the right of our nose. I turned to put the missile on the nose to reduce its time of flight and Don did the handoff. As soon as we rolled out, we took the shot and the HARM went like a spear directly towards the SAM location.

Coors 36 was out of HARMs, but still had plenty of gas remaining to make it back to Shaikh Isa, even without the scheduled post-strike refueling. Coors 35's crew was not seen until after arrival. A quick intel and maintenance brief were made, followed by a review of the tapes. As for analysis Victor stated,

Had we been on time and ahead of the attack force, we would not have been in a position to make as rapid a shot as we made. If we were past the target area, rather than pointing at it, it would have been a longer turn to point to the target, which result in a longer missile time of flight. On future missions, we made it a point to keep nose on to the target area whenever possible. To fly a four-HARM, single tank F–4G into combat with a target-rich environment proved to be the only one and highlight of my career.

Victor flew 18 combat sorties for 65 hours.

According to the Gulf War Air Power Survey (GWAPS), the first night of DESERT STORM was 'an elaborately choreographed combination of stealth aircraft, specialized electronic warfare aircraft, decoys, cruise missiles, and attack aircraft, delivering a sudden, paralyzing blow to the integrated air defense system from which the Iraqis never recovered'.

By 17/0800Z (17/1100L), CENTAF reported that 30 air-to-ground, eight air-to-air, and two reconnaissance packages were flown against a variety of strategic targets, which included air defense, telecommunications and command facilities, and airfields. The Coalition supplied 669 aircraft, of which 530 were U.S. aircraft. One Navy F/A–18C Hornet was reportedly lost to a MiG–25, resulting in the pilot's death, plus an A–6E with both crewmembers taken POW and later released. The RAF lost an Tornado GR.Mk 1, with both crewmembers also taken POW and later released. Pilots of F–15Cs claimed six and of Navy F/A–18Cs two Iraqi fighters.

Throughout the first day, Air Force and Navy SEAD packages went after Iraqi air defenses, both control centers and SAM sites. For instance, 40 F–16Cs, supported by four BQM-74 drones, eight F–4Gs, four EF–111As, plus 16 CAP F–15Cs, struck the Tallil IOC/SOC (Integrated/Sector Operations Center). The F–4G aircrews expended all 16 HARMs. Also, F/A–18s, supported by EA–6Bs, attacked the Al Amarah IOC. Later in the day, 32 F–16s struck Al Taqaddum Airfield, which was one of the largest and best-equipped in Iraq, and the Habbaniya Petroleum Storage Facility. They were supported by eight F–4Gs, four EF–111As and 16 CAP F–15Cs. Two Eagle pilots shot down two MiG–29s.

At 2100L, high flying B–52Gs, supported by four F–4Gs, two EF–111As, and four CAP F–15Cs, flew the first bombing mission against the Republican Guard's Tawalkalna Mechanized Division.

Combat sorties on Day One were not only flown by Air Force pilots, but also by their ANG colleagues. CENTAF Rear on December 3, 1990 released information on the first call-up of ANG (F–16A) and AFRes (A–10A) fighter and support units. Included were two ANG fighter units, the 138th TFS/174th TFW (New York, flying F/A-16As) and the

Sixteen of the 72 Package Q F–16Cs on January 19 were flown by pilots of the 614th TFS, Doha (Qatar). Two aircraft were lost with their pilots taken prisoner, but later released. The photo shows F–16C 86-0288 of the 614th being configured with Mk-20 Rockeye anti-armor bombs. (USAF)

The crew of 561st TFS F–4G 69-0265 is about to strap in for the redeployment flight to George. The first 12 aircraft departed Shaikh Isa on March 22. The Weasel's configuration included an AN/ALQ-184 ECM and luggage pods. (USAF, Sgt Jeff Wright)

157th TFS/169th TFG (SC, with F–16As). The 4th TFW held a planning conference at Seymour Johnson on the 6th with both units on their upcoming deployment to Al Kharj. Eight days later, the National Guard Bureau (NGB) instructed the two units not to repaint their aircraft in desert colors, but to leave them in their ghost grey mode. A call-up message was issued by CENTAF Rear for the 169th (December 25) and 174th (December 29). On the 23rd, CENTAF Rear issued ATO 91-27 for the deployment of three 174th TFW F–16 cells, each containing six aircraft plus two air spares and to deploy with three external tanks, one travel pod, one ECM pod, full chaff and flare dispensers if available, two AIM-9s, and guns loaded and armed. Departure from Syracuse was scheduled at 02/1900Z Jan 91. Arrival was on the 3rd. Twenty-two F–16As of the 169th TFG arrived at Al Kharj on December 30. The other two aircraft were broken down at Cairo West. A team was sent to repair them and the aircraft arrived on January 3. The ANG F–16As were part of a force of 248 USAF F–16A/Cs, more than any other U.S. fighter aircraft. On the 7th, the ANG contingent included 100 officers and 804 enlisted personnel. One day later, CENTAF Rear tasked the 187th TFG at Donnelly Field (Alabama ANG) to be prepared to provide ten Block 10 F–16As and aircrews as replacement fillers for both deployed ANG units, while the 152nd Tactical Reconnaissance Group (TRG, Nevada ANG) was to be prepared to provide two additional RF–4Cs. On December 9, TFWP 4 reported that of the ALQ-119 pods possessed by the 138th and 157th TFS, 13 were NMC, Not Mission Capable. The Wing also stated that under the then current conditions, F–16s would not be launched without operational ECM pods. On January 13, the 138th TFS lost an F–16, when its pilot experienced an engine failure. The aircraft crashed in central Saudi Arabia after the pilot had ejected safely.

The ANG Fighting Falcons lacked the equipment needed for night and weather operations. For this reason their pilots staged a variety of daylight attacks on targets in Kuwait and southern Iraq, including SA-3 missile sites, bridges, airfield and the Republican Guard. During their missions no F–4G Wild Weasel or ECM support were generally not directly attached to ANG F–16A packages, but would be in the area of their targets.

On the first day of Desert Storm, the two ANG F–16A units flew 68 sorties with 113.6 flying hours, 32/47.6 and 36/66.0 for the 138th (18 F/A-16A) and 157th TFS (24 F–16A) respectively. The first mission flown by pilots of the 157th TFS involved SEAD in support of a strike package that was tasked to strike Kuwaiti Ahmed Al Jaber and Ali Salem Airfields. During the 10-15 minutes in the target area, pilots struck ten Iraqi SAM sites in marginal weather conditions. The Squadron's second mission was planned late in the afternoon and involved re-striking Ahmed Al Jaber Airfield. However, near the end of the pre-briefing the pilots were informed their target had been switched to strike several SA-2 sites near the Airfield. In addition, takeoff time was delayed by two hours while the pilots were strapping in. Sixteen F–16As each of the 157th and 138th TFS took off, with the 138th taking off first. Each F–16 was configured with two Mk 84s, meaning standard 20-second single-ship takeoffs. On this mission the strike package included four F–4Gs and two EF–111As. The F–4Gs had arrived over the target area before the arrival of the F–16s. Pilots of the Weasels informed their F–16A colleagues that the lower cloud deck had lots of holes over the target area. One of the 157th TFS pilots was Capt Wayne Phillips. His flight lead was Maj John Bellinger. Capt Phillips,

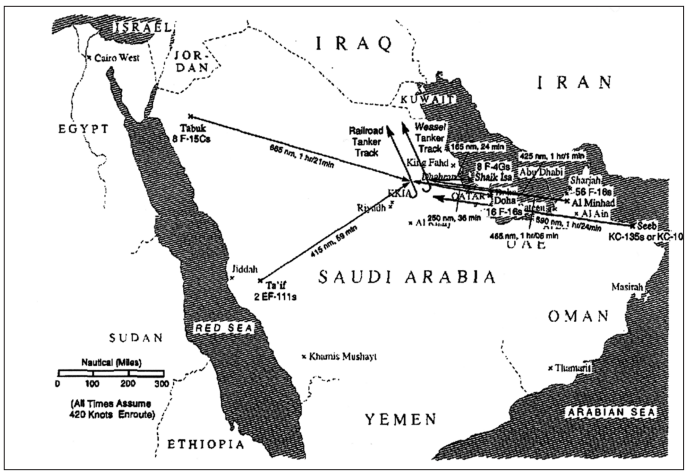
Because of clouds and the twilight, we soon lost sight of the other two flight members. Because our target was obscured by clouds, it was decided that Bellinger would do his best CCRP (Continuously Computed Release Point) delivery and I would release manually when I saw his bombs would come off. But due to the weather I could not see his bombs and with 15 other pilots on the radio, I did not hear his 'pickle' call either. When I heard him say 'off left', I pickled and felt the bombs leaving my wings.

Although the main concern of Phillips was to avoid colliding with another F–16, all 32 pilots made it back safely to Al Kharj, although nobody had landed there before after dark. Pilots of the 138th and 157th TFS flew 3,645 combat sorties, dropping 3,500 tons of ordnance without losing a single aircraft to Iraqi fire.

According to GWAPS, 79 F–4G sorties were flown from Shaikh Isa on D-Day, the most in DESERT STORM, with aircrews expending 123 AGM-88s. The 79 sorties resulted in 118 strikes, including 15 OCA (Offensive Counter-Air, against radar installations and radars collocated with SAM sites) and 103 SAM (like SAM sites/complexes) strikes.

Day Three, Package Q

To exploit the principle of mass and economy of force, large force employment packages, typical of DESERT



Package Q Air Elements, Day Three, January 19. (GWAPS)

STORM, consisted of up to 90 aircraft. They were preceded by a dedicated SEAD package of F–4Gs and EF–111As, plus dedicated CAP for protection from Iraqi fighters. However, a great deal of coordination was required, increasing dramatically with the size of the package.

The MAP for Day Three, January 19, called for three packages to strike targets against Baghdad, Package F, G and Q. 'F' (TOT, Time Over Target, 0700L) was composed of 70 aircraft, including four F–4Gs, while 'G' (TOT 0715L) numbered 60 aircraft, including eight F–4Gs. None of these sorties were flown due to weather, tanker, or scheduling problems, or a combination of these factors. In the meantime, however, in the KTO (Kuwait Theater of Operations), Package E of four F–4Gs and two CAP F–15Cs, supporting four B–52Gs struck the Madinah Division with an 0600L TOT, while two hours later, four F–4Gs supported a Marine Corps package with two EA–6Bs, four F/A–18s with HARMs, 12 strike F/A–18s and four CAP Hornets to strike the Madinah and Hammurabi Divisions. F–4Gs supported several other Packages with B–52Gs, like 'T', with eleven Stratofortresses and two EF–111As, striking Tikrit targets. The third package, 'Q', with an 1630L TOT, was the biggest package in DESERT STORM. As the ATO for this day was not in the GWAPS files, the movement up to the Iraqi border was described in general terms, such as probable take-off times and tanker rendezvous times on the basis of known distances and flying times. Participating aircraft were eight F–4Gs, two EF–111As, 72 (56 and 16) F–16Cs, and 12 F–15Cs, which meant that aircraft from five different bases had to proceed to the tanker tracks. Pilots of F–15Cs at Tabuk needed 2+ hours (620 NM, taking off at 1307L), those of the EF–111As at Taif 1.6 hours (485 NM, taking off at 1330L) and F–4G crews, only 30 minutes (105 NM, taking off at 1437L). Like a finely tuned watch, mission commanders adjusted their speeds so that their aircraft arrived at the tanker tracks on the mark.

Aircraft supporting the Package were KC–135 tankers (tracks used were Railroad and Weasel, each with up to eight tankers), E–3 AWACS, EC–130E ABCCC (Airborne Battlefield Command and Control Center), EC–130H COMPASS CALL, and RC–135V/W RIVET JOINT aircraft.

Depending on their tanker track, F–4G aircrews at Shaikh Isa in general had flights of 250-300 nautical miles (NM) before reaching Iraqi air space. In reality, they often faced longer distances, as missions formed up on tanker tracks and then crossed the border as integrated packages. To execute their missions, allied aircraft required extensive mid-air refueling and by January 1991, CENTAF had established a series of refueling tracks, which stretched from the Persian Gulf all the way across northern Saudi Arabia to the Red Sea. Each track was aligned north-south with anchors separated by 50 NM. Refueling altitudes were between FL 180-280. Most of the tracks had 2-5 tankers, which operated at different altitudes within their track. It required careful coordination as often tankers came from different airfields.

Due to distance and fuel consumption, Package Q F–4Gs were configured with only two HARMs. Yet, not much time could be spent in the target area and it also limited flexible maneuvering. Tanker drop off was at 1547L, some 175 NM and 40 minutes after reaching the tanker rendezvous point. It took another 50 NM and eight minutes before reaching the Saudi-Iraqi border. After crossing it, Baghdad was reached after some 265 NM at around 1630L. From the moment 'Q' approached Baghdad's air defenses, Weasel crews engaged SAM sites. The first F–16Cs to strike were the 56 of TFWP 388 (Al Minhad, UAE), hitting the nuclear research facility near Baghdad. A TFWP 401 (Doha, Qatar) report stated, among others, 'unfortunately, for the following F–16s, the F–4G SEAD package had fired all its HARMS and left the area, as did the covering F–15s'. However, according to MG Buster Glosson, in an April 1992 interview with GWAPS personnel, there was a problem with the Weasels allocated to the mission. Either because of fuel, timing, or the decision of the package commander, not all appeared to have made it to the Baghdad area. Moreover, some of the aircrews did not fire all their HARMs, which suggested they had to leave because of fuel problems. The GWAPS Database showed that only six HARMs were expended. Maj John Nichols of the 614th TFS stated in his July 1992 interview that up to the Weasel call they were leaving, SAMs had been fired by the Iraqis the ballistic way. Following this, many SAMs were guided, forcing his flight members to take evasive action and jettison ordnance and fuel tanks. Two F–16Cs of the 614th were hit by SAMs and crashed. Their pilots, Maj Jeffrey Tice and Capt Harry Roberts, ejected successfully, taken POW, and released on March 6, 1991. A number of lessons were learned from Package Q: Baghdad's defenses remained lethal and, consequently, it was not worth the risk to send conventional packages to strike targets there. Therefore, Package Q was not repeated, with F–16 packages becoming smaller, more manageable and easier to coordinate and fly.

Day Four

On D+4, January 20, F–4G aircrews flew a combined 61 combat sorties, totaling 69 strikes, 22 OCA and 47 against SAMs. B–52Gs flew 27 combat sorties, all air in-

After the Turkish Parliament gave its blessing, the U.S. was authorized to increase its forces at Incirlik. One of the units involved was the 23rd TFS, which, on January 17, 1991, deployed from Spangdahlem with initially seven F–4Gs and 12 F–16Cs. The photo shows an F–4G and F–16C of the 23rd on a wet 'last chance' before takeoff to the Turkish base. (USAF, TSgt Fernando Serna)

terdiction. As usual, the Stratofortresses were supported by F–4Gs. Four of those 61 sorties were flown by Michelob 61-64 flight, led by Col Gelwix and Uke, who made his most satisfying HARM shot ever. As he described,

It was a night sortie and we were supporting a three-ship B–52Gs with the call sign Boston 30-32. Their mission was striking the Headquarters of the Medinah Republican Guard Division, which was located just outside the northwest border of Kuwait. We had talked with Boston 30 on the STU III, so we knew their TOT and the attack axis was 150 with an egress to the south. We had already stepped and were checking the flight in at engine start time, when we received a call from Squadron Ops, informing us our tanker for the night had aborted and that according to Riyadh there were no spares. Knowing the BUFFs had already taken off and were already flying over the barrens of western Iraq, we were betting they were unaware of our dilemma. As we would already be going to be well beyond the planned Joker/Bingo fuel with no chance of a post-attack refueling, it would mean landing short at one of the Coalition bases just south of the Kuwait border. While still on the ground, we decided on breaking the flight into four singles with 20-mile in-trail spacing to extend our collective on-station time, allowing us to cover the B–52G's vulnerability period. Once airborne, it all went pretty much as planned. As we approached the target, we were able to find Boston 30 on the radar, still being 15 miles from the threat ring. Less than a minute later, an SA–6 target tracking radar was up and we started working it. As the bombers were still outside the target threat and betting the SA–6 was focused on the B–52s, we delayed the HARM shot for a few seconds. We fired, made the perfunctory Magnum call and verified the time to impact cue looked good. Just as the SA–6 guidance radar came up, we got an excited call from Boston 30's EWO, informing us he thought they were going to shoot. I was able to tell him OK, HARM time to impact is x seconds as they were launched on. He did not need to tell me, we were also seeing it, as the fly-out cue soon went :00 and four seconds later, the SA–6 'went dotted'. Boston 30 was one happy aircraft commander, who promised us a case of Scotch…still waiting. We then 'zoomed for the moon' for fuel, did our best imitation of a space shuttle descent and were able to make it back to Shaikh Isa, logging a single bag 1.9.

The 61 sorties flown from Shaikh Isa and Incirlik increased the combined total for the first four days to 286, 76 OCA and 243 strikes against SAMs (319).

Decrease

F–4G aircrews also participated in the Scud campaign. After rescheduling two packages of F–111Fs from air defense and SRBM (Short-Range Ballistic Missiles) targets in Kuwait and Tallil, 26 F–111Fs were sent on 21/0530L to Scud sites near H-2 and H-3. They were supported by eight F–4Gs, six EF–111As and 16 CAP F–15Cs. At 23/2015L January, four F–4Gs, two EF–111As and eight CAP F–15Cs supported 20 Taif F–111Fs which struck suspected Scud sites and shelters at Qalat Salih Airfield. The next morning, at 0400L, a similar package hit the H-2 airfield shelters.

On January 28, F–4Gs and A–10A Warthogs struck an SA-3 site northwest of Ali Al Salem AB, signaling "the birth of the 'Wart Weasel'." A package of three B–52Gs and four Saudi Tornado IDS aircraft were supported on a February 2 strike against the Republican Guard by F–4Gs of Coors flight. One of the F–4Gs were flown by a 90th TFS crew, Capt Vince Farrell and EWO, Capt Ed Fisher. He picked up several radar signals on his electronic gear, but not enough information to expend an AGM-88.

On February 4, CENTAF reported that the size of the average strike package was beginning to decrease. However, as the number of sorties remained essentially constant, this meant that the actual number of packages flown increased. Sixty-three packages were flown, including three by JTF–PF, Joint Task Force Proven Force. Thirty-nine CENTAF packages were flown against Republican Guard-related targets. In general, JTF–PF continued to fly three packages daily.

By Day 28 of the Air Campaign, February 13, it had become obvious the Coalition had established almost complete dominance in the skies over Iraq. This meant, for instance, that SEAD sorties no longer directly supported most KTO strike packages: F–4Gs flew orbits to seek out and strike SAM sites that came up. However, F–4Gs and EF–111As still accompanied packages, striking deeper in Iraq. That day, 14 large force packages were flown. For instance, a massive package of 12 B–52Gs were supported by eight F–4Gs, three EF–111As and four CAP F–15Cs. Struck was the Taji Missile Repair Facility. Fifty-seven combined F–4G sorties were flown.

In an 21/0300Z February Sitrep, ARCENT (U.S. Army Forces, Central Command) stated its aviation battalions continued their attacks on Iraqi forces. Elements of the 24th Attack Helicopter Battalion struck an early warning radar site near As Saman AB, 62 NM inside Iraq and in the 45th Infantry Division rear area, destroying a van, two

'McDonalds' at the Lik. It was next to the 23rd TFS Ops shelter for crews to have meals. L-R, Capts Cal Tinkey, Keith Snyder, Dave Lujan, Billy Harvey, Eric Larson, and 1/Lts Sid Mayeux, and Mark Devane. (Karl Dittmer)

AA guns and several vehicles. On their way in, the AH-64A Apache helicopters were supported by F–4Gs, EF–111As and EC–130Hs, providing SEAD.

Liberated

CINCCENT reported on D+38, February 24, the beginning of the Offensive Ground Campaign, that Coalition aircraft flew the highest number of sorties to date (3,062, of which 1,648 by CENTAF. Its overall aircraft mission-capable rate was 94.3) with the majority in direct support of allied ground forces. RAF Tornado GR.Mk 1s and Buccaneer S.Mk 2Bs, escorted by F–4Gs, struck Hardened Aircraft Shelters (HAS) at Tallil and Jalibah Airfields. That number was surpassed two days later when 3,200 sorties were scheduled in 52 packages (JTF–PF flew 116 sorties). On February 27, Coalition forces flew 2,940 sorties (1,651 by CENTAF with an 93.1 percent overall mission-capable rate) and JTF–PF, 119 against the Tajo steel fabrication plant.

Also on the 27th, President Bush declared Kuwait as liberated and Iraq as defeated and ordered suspension of offensive air operations at 28/0500Z February. To celebrate, Col Karp hosted a TFWP 35 end-of-war party at the 'Weasel Dome', which was opened for business on December 15 and was located just off-base. It included a bar, a Pizza Hut, a Baskin-Robbins and a stage area. In his assessment, Col Karp stated, for instance, that overall he was absolutely thrilled with the results: the aircrews performed brilliantly, the support forces did a tremendous job and the aircraft did extremely well.

The 23rd TFS 'gang' at Incirlik. (Karl Dittmer)

In a 01/2115Z March message, CINCCENT informed the JCS that in 43 days of the air war, Coalition forces flew over 110,000 sorties.

The redeployment of US forces was called DESERT FAREWELL, popularly called DESERT CALM. Yet, defensive CAPs, reconnaissance, AWACS and Scud response sorties continued to be flown.

AGM-88

In a 06/0800Z October message, CENTAF Fwd requested CINCCENT, in addition to previously stated logistics priorities, to move, among others, all available AGM-88 HARMs. CENTAF Fwd, in a 13/0800Z November Sitrep to CINCCENT, placed munitions back on his logistics priority list by requesting immediate shipment of 1,000 AGM-88s.

Due to the relatively short distance from Shaikh Isa, F–4Gs of the 81st TFS were configured with four HARMs and a centerline fuel tank during two-thirds of the missions flown in the KTO. Weasels, scheduled for missions into the Baghdad area carried two -88s and three fuel tanks.

The AGM-88 proved to be the chief lethal component of effort to suppress enemy air defenses. It homed in on radar emissions and destroyed the emitter. Of the 1,961 HARMs expended by U.S. aircraft, F–4G and F–16C aircrews fired some 1,067. Aircrews of TFWP 35 fired 905 (13 were jettisoned), with 254 radars recorded as destroyed, for a 28 percent success rate. Navy and Marine Corps aircrews fired 894 HARMs. During the first week, some 1,000 HARMs were expended. Also, seven AGM-45A/B, eight AGM-65D and four AIM-7 missiles were fired. One of the eight Mavericks was expended from Jim Uken's F–4G against a Thin Skin height finding radar. He stated,

There was a big difference between firing an AGM-65 and a HARM, as the Maverick requires much closer in, lower altitude employment. Due to the requirement to place the target in the missile's narrow Field of View (FOV), located on your radar scope and which can be converted to a TV picture, is a rectangular depiction of the FOV. Once the target is placed within the FOV, you can track the threat, physically identify and lock onto the target, in this case the Maverick's infrared picture, and then make sure the missile 'sees' and is locked onto the target before firing. I estimate our shot was probably 2-2.5 miles out. On this mission we also carried a Shrike, but it was not frequency-capable against the Thin Skin radar.

Both -45s and -88s home in on the radar energy being emitted, but the big difference and advantage of the HARM is it memorized its position and killed the radar, even when it would be shut down quickly. On January 1, 1991, there were 2,579 HARMs on hand, with a requirement for 2,500.

USAF Air Order of Battle/Shaikh Isa

Type	1 Sep	1 Oct	31 Dec	1 Feb+
F–4G	24#	36*	48**	49**
RF–4C	0	0	5++	18++
Total	24	36	53	67

all 561st TFS
* 12 F–4Gs of the 81st TFS/52nd TFW arrived on September 5.
** 12 F–4Gs of the 52nd TFW arrived on December 26. A 13th aircraft arrived on January 1, 1991 from Moron.
+ Shaikh Isa also hosted 125 Marine Corps aircraft: 12 EA–6Bs, 20 A–6Es, 78 F/A–18A/C/Ds, and 15 KC–130s.
++ The 152nd TRG was activated on December 3, scheduled to deploy to Al Dhafra, Saudi Arabia and then redeploy to Shaikh Isa. Initially to Al Dhafra, to enable the 117th Tactical Reconnaissance Wing (TRW, Alabama ANG) there to acquaintance their Nevada colleagues with the mission and desert flying ops and to transfer three of its aircraft. The first 152nd TRG C–141 departed on December 6. One day later, CENTAF Rear tasked 152nd to deploy three RF–4Cs to Shaikh Isa, beginning on December 10 via Seymour and Moron (Spain). The first 192nd TRS/152nd TRG personnel arrived December 7-9. On the 11th, a change to ATO 91-12 stated one of the three RF–4Cs to be deployed was to be from the 117th TRW. The three aircrews would meet at Seymour by December 14 and then deploy to Shaikh Isa. Change 2 to ATO 91-12 of the 12th changed the destination to Al Dhafra. The three aircraft arrived at Moron on December 16. Two aircraft arrived on the 19th from Moron, while the third one, an 152nd TRG aircraft, which required an engine change at Moron, arrived on January 1 at Shaikh Isa, in company of an F–4G. As the 152nd TRG aircraft apparently were not equipped with AIM-9 modifications, the unit was tasked to send mod kits so that the aircraft could be retrofitted. The five 152nd TRG RF–4Cs had relocated to Shaikh Isa by December 25, as on that date, the unit flew its first four of six scheduled recce sorties.
On November 18, 1990 CENTAF (Rear) notified TAC's 67th TRW at Bergstrom (TX) the 12th TRS was tasked to deploy aircrews, supporting personnel and 12 RF–4Cs to Shaikh Isa. Eleven C–141s, 358 personnel and the 12 RF–4Cs were deployed January 5-14, 1991. This meant all CENTAF F–4s were stationed at one location, Shaikh Isa. Radar-guided shots were fired at 12th TRS aircrews in only one encounter. Their final two recce Phantoms arrived at Bergstrom on May 18.

Aircraft Activity, Shaik Isa, according to TFWP 35

Unit	Desert Shield Sorties/Flying hours	Desert Storm Sorties°/Flying hours°°	Total
561TFS*	1,793/3,435	1,182/4,393**	2,975/7,828**+
81TFS+	1,006/2,007	1,149/4,194++	2,155/6,201+*
Total	2,799/5,442	2,331/8,587	5,130/14,029
12/192TRS	157/320	741/1,731	898/2,051+++
Grand Total	2,956/5,762	3,072/10,318	6,028/16,080

° 3,000th on February 27; °° 10,000th on the 26th.
* Twenty-six different F–4Gs were employed, including two that arrived on January 20 as attrition aircraft, 97254 and 97256. Averaged 28.1 sorties/104.6 flying hours per day.
** 3.7 sortie duration average.
**+ also flew 138 sorties/380 flying hours during March in DESERT CALM.
+ Twenty-five different F–4Gs were employed, including 97254 which was transferred from the 561st after the loss of 97571 on January 18. Averaged 27.3 sorties/99.8 flying hours per day.
++ 3.6 sortie duration average.
+* also flew 166 sorties/252 flying hours during March in DESERT CALM.
+++ also flew 221 sorties/425 flying hours during March in DESERT CALM.

Air-to-Ground Expenditures

Service	Type AGM-45	AGM-88	Total	%
USAF	53	1,067	1,120	55
USMC	7	233	240	12
USN	18	661	679	33
Total	78	1,961	2,039	100

One month later, the numbers were 1,786 and 2,500 respectively. To replenish the HARM's inventory, the Texas Instruments FY91 production contract was increased from 1,400 to 3,841. Only five Coalition aircraft were lost to Iraqi radar-guided SAMs, four of those not having F–4G support. During the latter stages, with the remaining radars rarely emitting, F–4G aircrews used AGM-65Ds against non-emitting radar targets.

The Wing's highest one-day sortie total was flown on February 3 with 86 sorties by all four squadrons. The highest one-day flying hour mark, 308.3, occurred on the 10th. On the 21st, both F–4G squadrons flew their 1,000th combat sortie, respectively by Lt Col Rodney Miller and Capt James Carnahan (561st) and Capt Gary Gray and Maj Victor Lin (81st). The 4,000 combat hour point was passed by the 561st on February 23 and by the 81st on the 25th. Three-hundred-and-forty-thousand feet of film, 'shot' by RF–4C crews, were processed, more than 65 miles, with 19,000 photos developed.

The GWAPS Composite Sorties Database for January 16-February 28, 1991 showed F–4Gs flew a combined 2,683 sorties from Shaikh Isa and Incirlik, 2,676 OCA, five training and two other. The average daily number for the period was 63.3 sorties.

At the peak of DESERT STORM, 308 KC–10A and KC–135A/E/Q/R tankers were either deployed in the AOR (222) or supporting from outside the AOR (86). They accomplished 60,184 DESERT SHIELD/STORM refueling events/sorties, of which 3,331 to TAC F–4G aircraft, while USAFE F–4Gs were involved in 1,730 in-flight refueling events/sorties.

Only one F–4G (81st TFS) was lost in combat, on 19/0255Z January on a night Wild Weasel mission. The aircraft, 97571, ran out of fuel after it was hit by AAA. The crew, Capts Tim Burke and Juan Galindez (EWO) ejected safely and were back to business two days later. With 2,676 combat sorties flown, the loss rate per 1,000 sorties was 0.4.

Block 30 F–16C 86-0232 of the 23rd TFS leads a gaggle of F–4Gs and F–16Cs, all configured with AGM-88s, for takeoff in a daylight combat mission from Incirlik. The aircraft that just took off must have been a KC–135A tanker. (Karl Dittmer)

JTF Proven Force

On August 2, 1990, EUCOM (European Command) had fourteen RAF Upper Heyford (UK) F–111Es on WTD (Weapons Training Detachment) and four Torrejon (Spain) F–16Cs on a NATO (SIOP, Single Integrated Operational Plan) commitment at Incirlik, Turkey. However, it was not known if the Turkish government would allow strikes against Iraq.

While CENTCOM planners were wrestling with the details of the deployment and defense of Saudi Arabia, Pentagon air planners were requested to begin planning for offensive operations. In the meantime, a small cadre of 52nd TFW pilots at Spangdahlem were conceptualizing opening a second front in northern Iraq by conducting Electric Warfare from Incirlik. This would force Iraq to divert air defense resources from the south, thus helping CENTCOM's air component in case of a war against Iraq. However, while passing through Wing, 65AD, USAFE and EUCOM channels, the concept grew into a full-scale operation, which ultimately reached CJCS, Gen Colin Powell. He supported the concept, which was continually being reviewed and refined.

As a result, USCINCEUR, on December 23, issued an OPORD (Operations Order), establishing Joint Task Force Proven Force (JTF–PF). Four days later, MG James Jamerson, USAFE's Deputy Chief of Staff of Operations (DCO), was appointed as its commander. It was formally activated at Ramstein (Germany) effective 7/0800Z January 1991. Concurrently, the Turkish General Staff approved the deployment of a small ADVON to Incirlik.

Incirlik, nicknamed 'the Lik', on January 1, 1991 hosted 48 USAFE aircraft, ten F–15Cs (had arrived on December 16 for a WTD), 24 F–16Cs (on September 18, Torrejon deployed 20 additional F–16Cs and maintenance personnel for NATO exercise DISPLAY DETERMINATION 90), and the 14 WTD F–111Es, which had not redeployed. Also, SAC had deployed four KC–135As.

On the 13th, the Turkish government approved the construction of 30 12-person tents to house projected JTF personnel at Incirlik and Batman. Two days later, the U.S. Ambassador in Turkey was formally informed by the Turkish Foreign Ministry that the 'temporary' deployment of 48 additional aircraft was approved, which would bring the total of combat aircraft at Incirlik to 96. To house all incoming personnel, a PRIME BEEF Civil Engineering team constructed a tent city, dubbed 'Tornado Town'.

On January 16, USAFE activated Composite Wing Provisional, 7440 (CWP 7440) at Incirlik as the JTF–PF's air component, with BG Lee Downer as commander. It was attached to USAFE. The Wing assumed control there of the 39th Tactical Group. Also, the first JTF ELUSIVE CONCEPT Special Operations Forces and the first echelon of JTF's Headquarters arrived, deployment of the augmentation package was initiated with the arrival of four F–111Es from Sigonella (Sicily), the first two C–5 Galaxy aircraft arrived in support of PROVEN FORCE, and the Turkish Parliament approved the deployment of the 48 additional aircraft. Within hours, 30 arrived and by next morning, all 48 were in place. As of January 18, the JTF had 120 aircraft on station, including 12 SAC KC–135As, 12 SOF aircraft and two TAC E–3B AWACS aircraft, with 104 being mission capable by 1200Z. Units and aircraft were attached to CWP 7440. In an 02/0703 February Sitrep, CINCEUR stated SECDEF had directed the deployment of six RF–4Cs, CREEK STORM, which arrived on the 3rd. Support personnel and equipment for the requested Pennsylvania ANG EC–130E VOLANT SOLO propaganda broadcast aircraft arrived on February 25. The Hercules arrived the next day with its first sortie scheduled for the 28th.

(Re)deployment of the 23rd TFS

While DESERT SHIELD was in full swing, USAFE efforts were initiated to develop a concept to further the war effort, if one was to start. This would ultimately be Operation PROVEN FORCE. 52nd TFW personnel for this operation were identified early in the fall and trained nearly exclusively for this contingency. However, they had to wait

until January 16, 1991 before the Turkish Parliament authorized the use of Incirlik for strikes against Iraq. As a result, the only mixed fighter squadron still in USAF, the 23rd TFS, commanded by Lt Col Dave Moody, launched its initial elements of seven F–4Gs and 12 WW F–16Cs to Incirlik, arriving very late in the evening on January 17. Their ADVON team had arrived earlier with enough time to procure a few cots, some rooms, and most importantly, to lay the ground work for the first strikes. By 18/1200Z, all F–16s and five of the seven F–4Gs were mission capable. Another five F–4Gs arrived later that day, bringing the number to 12, which also meant that the Wing deployed 100 percent of its F–4G PAA, Primary Authorized Aircraft. As not all F–4Gs were MC and maintenance had not enough spare parts to get them ready for the first strikes, they had to cannibalize F–4Gs that were too broken to fly. A second problem was the fact that before all maintenance personnel could be deployed, weather closed Spang for three straight days. Spang personnel was then supported by F–16C personnel of the 612th TFS, which had deployed to Incirlik in September 1990. Some of them had an F–4 maintenance background. The opposite was also the case. For instance, Spang maintenance personnel launched RF–4Cs and when Clark's F–4Es arrived with insufficient maintenance personnel, they were reconfigured to a combat configuration by Spang personnel. After the weather broke, more personnel trickled in. It also enabled the Wing to fly 168 HARMs to Incirlik, just in time to not be forced to upload the aircraft with AGM-45 Shrikes as the AGM-88 inventory had been expended to about zero.

As of January 17, the Squadron was attached to the 7440th, which ended on March 15, 1992. In general, the Squadron participated in packages with three mixed fourships in the afternoon and two at night. The Wild Weasel Air Order of Battle on February 1 was 13 F–4Gs and 12 F–16Cs. The GWAPS Composite Sortie Database showed F–4Gs flew 389 sorties from Incirlik.

Combat Operations

On the first day of DESERT STORM Turkey approved operations against Iraq from its territory, Incirlik (combat) and Batman, which became a Forward Operating Location (FOL) for CSAR MH-53Js. EUCOM maintained operational control over the JTF, but CENTCOM exercised tactical control. While sorties were in CENTAF's daily MAP, JTF–PF built its own strike packages without formal coordination, while issuing its own ATO. At least, as long as JTF stayed north of the 35th parallel.

The Wing's focus was on targets in northern Iraq, flying two daylight packages and one at night against, for example, nuclear, chemical, command and control facilities and airfields. A package was as big as 71 aircraft (January 22, cancelled due to weather), while 147 aircraft participated in the three packages on January 24). Compared to the Coalition air forces in the Gulf Region, the 7440th lacked aircraft capable of designating targets for PGMs, Precision-Guided Munitions, (F–111Fs) and stealth aircraft (F–117As). As to the former, by request of Gen Jamerson, four aircrews and F–4Es of the 3rd TFW at Clark, modified to carry the Westinghouse AN/AVQ-26 PAVE TACK pod, arrived on February 21. However, the C–5 Galaxy with the pods ran into maintenance problems en route and arrived after combat operations had ended. As to the latter, no F–117A sorties were flown from Incirlik.

In general one nighttime and two daylight packages were flown from the Lik each day. The photo shows a 23rd TFS pilot standing in front of his Block 30 F–16C, 86-0260, prior to a nighttime combat sortie. The aircraft is configured with CBU-87s and a centerline ECM pod. (Karl Dittmer)

Combat sorties from Incirlik were initiated in the evening of January 17, when F–111Es struck radar targets in northern Iraq. This proved to be the only mission package flown without F–4G and/or EF–111A support. The planners played on that by changing the initial targets to a lower threat area. The first 'real' mission was flown at 18/0410L January, by a package of ten CBU-58 carrying F–111Es, which were supported by four F–4Gs, an EC–130H and eight CAP F–15Cs. Targets were in the Mosul, Tikrit, Kirkuk, Quayyarah and Erbil areas.

On January 20, JTF forces flew three packages, striking targets at Kirkuk and Quayyarah. One F–111A sustained minor battle damage. When Iraqi Mirage F1s tried to interfere, two were shot down by CAP F–15C Eagles of Capt David Prather and 1Lt David Sveden, both of the 525th TFS (Bitburg). In a 25/0703Z January Sitrep, CINCEUR stated JTF PROVEN FORCE had noticed reduced Iraqi air defense radar activity on all missions. The first air-to ground combat credits were accomplished on the 28th by pilots of F–111Es and F–16Cs, when they struck four B–767s at Mosul Airfield and eight SU–20/22 Fitters at Kirkuk.

On February 2, 109 sorties were flown by three packages against targets in northern Iraq. At Tuz Khurmatu, an F–4G crew scored a direct Imaging Infra-Red (IIR) AGM-65D Maverick hit on a parked IL-76 Candid, while F–16C pilots reported direct hits on dispersed fighter aircraft. On the 13th, three packages were launched, involving a total of 125 aircraft, including supporting aircraft. In the first, with a TOT of 0920L, four F–4Gs and four F–16Cs (SEAD), plus two EF–111As and six CAP F–15Cs supported 20 F–16Cs, striking the Kirkuk SOC. In the second, TOT 1545L, a similar number of F–4G/F–16C and EF–111A aircraft, plus eight CAP F–15Cs, supported 12 F–

Wild Weasel sorties according to USAFE Command Management Review

Type	Sched	Flown	Hours	Av MC	Av poss
F–4G	429	414	1,247	69.6*	13
F–16C	580	577	1,760	85.6	13
Total	1,009	991	3,007		

* versus USAFE 78.9 FY91 standard.
156 AGM-88s, 48 AGM-45s and 52 AGM-65D/Gs were expended.

16Cs, which struck targets in Qayyarnh West. The third package struck the Kirkuk SOC again at 2310L with 12 F–111Es, which were supported by three F–4G and three F–16C SEAD aircraft, two EF–111As and six CAP F–16Cs. The next day, 87 sorties were flown against targets in northern Iraq. Participating F–4G aircrews engaged Tall King, Flat Face and SA-3 sites at Erbil and Mosul.

In the final two weeks of the Air Campaign, JTF–PF F–16Cs and F–111Es came south, almost reaching Baghdad, for the first time on February 15. Four days later, for instance, F–4Gs supported F–16Cs on a daylight strike. Thirteen strike packages with some 140 F–16Cs and F–111Es, supported by CENTAF SEAD/EW aircraft, attacked the Taji military complex, which surrounded an airfield on the northern outskirts of Baghdad, and included, for example, air and ammunition depots, a steel fabrication plant and aircraft engine repair facilities. In addition, about 70 B–52G sorties struck Taji. The next day, a large package of F–16Cs and newly arrived F–4Es were supported by F–4Gs, EF–111As and CAP F–15Cs when they struck the Al Mawsil military research and production facility and the Al Shahiyat liquid fuel Research and Development facility. Eventually, after the SAM threat decreased, a few WW F–4G and F–16C aircraft were used for missions other than SEAD. For example, F–4Gs started to employ AGM-65 Mavericks, providing pin-point accuracy on any target selected, while F–16Cs were used to protect HVA (High Value Assets) such as the E–3A/B and RC–135V/W when F–15Cs were tasked for other missions.

Aircraft in 100 attack packages flew 4,936 sorties and 15,313 hours, striking 108 targets and expending 3,500 tons of ordnance. There were no combat losses, although an F–16C was lost due to engine problems. Its pilot, Capt Strom, ejected safely and was recovered. Five Iraqi aircraft were downed by pilots of F–15Cs. The number of USAFE personnel deployed was 2,630.

The 52nd Chronology stated its deployed 36 F–4Gs and 12 F–16Cs flew 2,061 sorties with 7,200 flying hours, 1,000 support personnel were deployed, 142 separate radar sites were destroyed. According to the 52nd TFW background information publication the conclusion was, 'The F–4G/F–16C WILD WEASEL Team worked!'. Also, that SEAD worked and that the single organization structure of the 7440th was certainly a factor why no combat losses were suffered.

Overall, during the combat phase of both deployments, flying hours more than tripled and their average sortie duration doubled. Sorties and flying hours during DESERT STORM were equivalent to four months of peacetime flying. ■

The first 23rd TFS F–4Gs and F–16Cs redeployed to Spangdahlem on March 15, 1991. The crew deplaning is Capt Keith Snyder and Randy Comer (EWO). The intake of their F–4G shows at least 15 silhouettes of killed Iraqi radars. It is supposedly also the aircraft of which the crew, on February 2, expended an IIR (Imaging Infra-Red) AGM-65D against an IL–76 Candid, which was parked at Tuz Khurmatu, for a direct hit. (Karl Dittmer)

For further JTF–PF information, see *Air Power History*, Winter 2021, Volume 69, Number 4.

Thanks to Sandor Kocsis, Jim Uken, Victor Ballanco, George Walton, Karl Dittmer, Kurt Dittmer, Budman Redmond, Bart Quinn, Jim Musser (AFHRA), Michael Dugre (ACC), Tina Luers (ACC), Peter Lay, USAFE acting historian and Blair Haworth (ANG).

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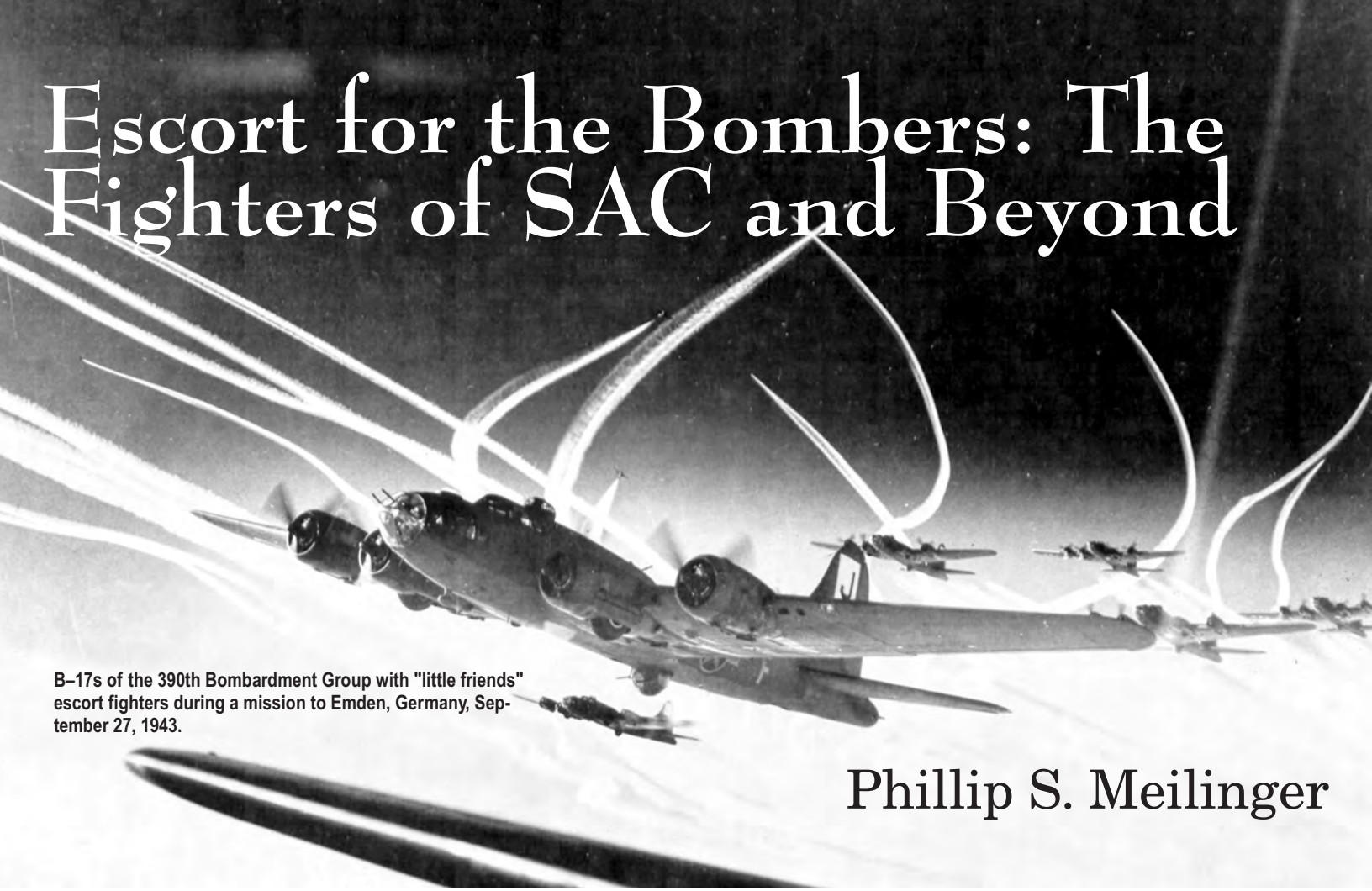
Escort for the Bombers: The Fighters of SAC and Beyond



B–17s of the 390th Bombardment Group with "little friends" escort fighters during a mission to Emden, Germany, September 27, 1943.

Phillip S. Meilinger

World War II had demonstrated that fighter escort was necessary for bomber operations against Germany. Although prewar doctrine had recognized that escort was desirable, it was believed that such an aircraft was both technologically impractical and also doctrinally inappropriate. Escort would presumably require long range in order to accompany the bombers deep into enemy territory, and this implied a large aircraft that was probably multi-engined. That would in turn require a lot of fuel. Such a large fighter would be ungainly and lack the agility to compete effectively with the smaller and more nimble interceptors it would encounter. (The Seversky P–35 would illustrate the range problem for a good fighter was not insurmountable.)

In addition, fighter pilots scoffed at the "passive" mission of defensive escort. It was figured (hoped?) that the bomber formations, ablister with machine guns, would be self-defending and not need fighter protection.[1] The *Flying Fortresses* and *Liberators* that launched against Germany from their bases in England during 1942 and 1943 therefore went alone on deep strikes into enemy territory. Prewar doctrine was proven wrong: the bombers could not defend themselves. Losses were heavy, and by the fall of 1943, missions like those at Schweinfurt—which suffered 20 percent loss rates—ratified that fighter escort was essential. The solution was a change in thinking and the unglamorous drop tank mated to traditional fighters like the P–38, P–47 and P–51. By the end of the war escort for the bomber formations was present on virtually all daylight missions over enemy territory, regardless of how deep were the targets. Indeed, by war's end the P–51 had a longer range than the bombers it was guarding.[2]

Distances in the Pacific theater were far greater than in Europe. The bombers themselves could not reach the Japanese Home Islands effectively until bases in the Marianas were built, and it was not until the capture of Iwo Jima in June 1945 that fighters could escort those B–29s. After the war, the issue of fighter escort reemerged.

When Strategic Air Command (SAC) was formed in March 1946, it was assumed escort would be necessary for the B–29s going against the Soviet Union, which in the postwar period was identified as the main threat to the U.S. and Europe. Initial plans therefore posited that SAC would include escort groups in its numbered air forces. Originally, SAC was to have twelve fighter groups, which had the mission of protecting the twenty-one very heavy bomb groups that would conduct the bombing operations.[3] Those numbers dropped quickly. In mid-1946 there was only one fighter group operational (two others on paper); by late 1947 there were five; a year later it was down to two; and in 1951 back up to seven.[4] In truth, the entire issue of fighter planes in SAC was marked by a lack of clarity regarding mission, performance and even desirability.

Initially, however, escort fighters in the bomber command seemed appropriate. The war experience was pretty obvious, and airmen did not want to make the same mistake twice about thinking escort unnecessary. Surprisingly, although thou-

SAC Commander, General Curtis E. LeMay.

sands of fighters existed at the end of the war, they were almost immediately scrapped, and it proved difficult to equip SAC with serviceable P–47s and P–51s. Even so, these proved inadequate—they had neither the range nor performance to escort the B–29s that far east—even with bases in newly liberated Germany. The F–82 *Twin Mustang*, an unusual design, was tried but found wanting. The introduction of jet-propelled F–80s was an advance, but these first-generation jet fighters were obsolescing quickly, and the Korean War soon demonstrated their inadequacy against the Soviet jet fighter the MiG–15. In April 1950, SAC's commander, Lieutenant General Curtis E. LeMay, admitted that his bomber command had no long-range escort capability.[5]

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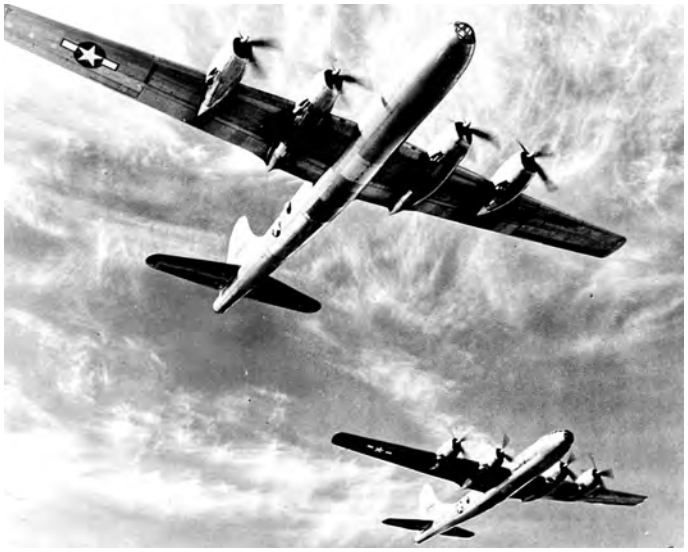


In the immediate postwar period, B–29s like these were expected to supply SAC with its punch, but had been proven to need fighter escort.

The successor to the F–80, the Republic F–84, was to be the best-available answer for this problematic mission for several years, and SAC was equipped with these jets by 1952. In truth, the *Thunderjets* were not up to the task either. The bomber command sent several F–84 units to Japan to be used in combat and to give the units and personnel some experience in the escort role, but for various reasons they were not often used in the escort mission during the Korean War. Instead, the leaders at Far East Air Forces used the SAC fighters that deployed into the theater as fighter-bombers in a close air support role in Korea. LeMay, objected, but was rebuffed.[6] The whole point of the deployments was thus mooted. In truth however, it would have made little difference: the various F–84 models were not in the same class as the MiG 15.

Of interest, the doctrinal issue of what precisely was the mission of the escorts arose in Korea as it had over Germany. SAC was adamant: the mission of the escorts was not to shoot down enemy fighters, but to ensure the bombers made it to their targets and back. Decorations were to be based solely on the fighters' ability to bring the bombers home safely. Indeed, SAC advised its fighter pilots they should "regard their aircraft as additional guns or defensive artillery to prevent attacks upon the bomber."[7] As

The Republic F–84 *Thunderjet* was the best available answer in the early 1950s, but was not able to compete on equal terms the MiG–15

Atlantic C–2A (aka Fokker F.VII) *Question Mark* refueled by a Douglas C–1, in an early test of aerial refueling.

An early refueling operation, with a KB–29 supplying the fuel.

in 1944, this passive mindset must have troubled the fighter pilots.

Meanwhile, the problem of escort for the top-priority nuclear bomber offensive against the Soviet Union remained. Because targets in the Soviet Union were even farther off from existing bases than had been German factories from bases in England during the war, the issue of sufficient range for escort reappeared. SAC began to experiment. First, air refueling was used to extend the range of the F–84s and this helped somewhat but not enough to allow escort of the bomber force into and out of Russia.

Air refueling had been used in the Air Service as early as the 1920s—recall the famous six-day flight of the *Question Mark* commanded by then-Major Carl Spaatz in 1929. But the mechanism for transferring fuel from one aircraft to another in flight was cumbersome, expensive and somewhat dangerous.[8] Air refueling was not employed during World War II, even for bombers, and using the existing technology to refuel escort fighters was not seriously considered. That changed in the early 1950s when new methods—specifically the probe and drogue and the flying boom techniques—came into use.[9] In September 1950 an F–84E flew non-stop from England to Maine—a flight of ten hours that was a transatlantic first for a jet fighter.[10]

During the Korean War a squadron of KB–29s—bombers modified for the tanker role—deployed to Japan to test the probe and drogue system in combat with jet fighters. The world's first combat air refueling took place on July 6, 1951. The Air Force chief of staff, General Hoyt S. Vandenberg, had expressed concern to his commander in the Far East, Lieutenant General Otto P. Weyland, that increased enemy air activity (specifically, he was worried about Chinese and Soviet bombers) might threaten South Korean airfields, so combat air refueling for jet fighters was tested in the event the F–84s had to redeploy to Japan. If that occurred, air refueling would be essential to permit the fighters to conduct combat operations over Korea.[11] Far East Air Forces and Tactical Air Command were pleased with the realization of how air refueling could impact fighter operations. Eventually, TAC would acquire its own tanker force—KC–97s that the USAF sloughed off as new KC–135s entered the inventory to handle SAC's bombers.[12]

In 1952 tankers began escorting and refueling fighter squadrons that were deploying across both the Atlantic and the Pacific. Previously, fighter units had to be flown to bases near the coast where aircraft were specially prepared and disassembled, loaded onto ships, moved across the ocean, and then unloaded and rebuilt upon docking overseas. This process generally took several weeks to complete before combat flight operations were possible. In July 1952, operation FOX PETER I deployed the 31st Fighter Wing to Japan: 58 F–84Gs, led and periodically refueled by KB–29s, flew from Turner AFB in Georgia to Japan. The aircraft were available for combat within hours of arrival.[13] This would be the first of many such air-refueled deployments that dramatically enhanced the responsiveness and flexibility of air units.

The arrival of high flying and faster jet bombers added another layer of complexity to an already thorny problem. Although the F–84 had the speed to keep up with the B–50 (essentially a modified B–29 with more powerful engines) and B–36, it lacked the range and altitude capability to accompany the new all-jet B–47s. Moreover, the appearance of Soviet fighters like the MiG–15 revealed in Korea that the F–84s were outmatched. A study conducted by SAC in February 1951 stated that "neither current escort fighters nor programmed escort fighters have a capability of adequately defending bombers" and as a result, the bomber force would "suffer an unacceptable loss rate during daylight conditions over enemy territory defended by interceptors."[14]

SAC needed a high-performance escort fighter with a 3,000-mile range. McDonnell rolled out the XF–88 in mid-1950, which LeMay liked but the Air Force did not. Eventually, McDonnell would add new engines, and the resulting F–101 was a success. Ten wings of *Voodoo* fighters were programmed for the escort role, but by 1956 and the imminent arrival of the B–52, SAC changed its mind.

The XF–85 *Goblin* hangs under a B–36 in its trapeze.

An F–84F hangs under a B–36 in its trapeze.

Money would be better spent on more bombers. After only a few weeks in SAC, the F–101s were transferred to Air Defense Command.[15]

Providing adequate range for the existing escort fighters remained an obstacle and unusual—if not bizarre—solutions were offered to overcome it. In 1948 a parasite fighter, the McDonnell XF–85 *Goblin*, was built to be carried inside the bomb bay of a B–36. The intent was for F–85-carrying *Peacemakers* to accompany the nuclear-toting bombers into enemy territory. If enemy interceptors appeared, the *Goblins* would be dropped out of the bombers (a B–36 could carry two) via a trapeze mechanism, ignite their engines, and maneuver to take on the attackers. At the conclusion of the dogfight, the F–85s would return to the B–36, reattach to the trapeze, and be lifted back into the bomb bay, where they could await further use. The XF–85 flew four times, but re-engaging the trapeze proved so difficult the project was dropped.[16]

At the same time, SAC experimented with other ideas for its fighter force besides escort. Initial atomic bombs were ten feet long, five feet in diameter and weighed 10,000 lbs., which meant that only very large aircraft could deliver them. This situation changed in 1950 when revolutionary advances in weapons design meant that nuclear weapons could be built that were a third the size and weight—but more powerful—than the original atomic bombs. This in turn permitted fighter aircraft to deliver the new weapons. In January 1953, SAC converted its F–84s so they could carry the new tactical nuclear bombs; SAC's fighters thus became part of the nuclear strike force.[17]

The range problem remained, so one scheme included mounting a trapeze bracket on the underside of a B–36. A swept-wing F–84F would be attached to the trapeze (which was external and not in the bomb bay as with the XF–85) and would carry a nuclear weapon. Upon entering Soviet airspace the fighter would fire up its engine, drop free, and zoom off to drop its bomb. It would then return to its mother ship, reattach itself to the trapeze, and both would return home. In a related concept, straight-wing F–84Es would attach themselves to the wing tips of a modified B–36. The fighters would then shut down their engines and be "towed" by the bomber to enemy airspace where the faster and more maneuverable fighters would restart their engines, detach, and fly on to drop their nuclear weapon. They would then reattach to the bomber for the ride home.[18] Another version of this concept was for the F–84 to be a reconnaissance version: it would fly on ahead of the bomber once inside Soviet airspace and locate suitable targets.[19]

These ideas went nowhere, but the fact they were even attempted illustrates the seriousness of the problem. SAC needed to solve the range problem for its fighter aircraft. The Korean War indicated once again that unescorted bombers would have difficulty penetrating air defenses—unescorted B–29s had been easy prey for the MiGs. It was obvious that the bomber force attempting to penetrate Soviet airspace in daylight—and during the summer months northern Russia was always in daylight—would be suicidal. Yet, repeated attempts to build a suitable escort fighter were unsuccessful. Eventually, SAC gave up on the escort idea, but was reluctant to let go of its fighters. As a result, new missions were devised: perhaps the jets could become part of the nuclear strike force and either attack targets near the enemy border or be "carried" into enemy airspace for that mission. This proved infeasible, and the nuclear-capable fighters were eventually transferred to the theater commanders as "tactical" assets.

Reconnaissance was also a requirement, so attempts were made to convert the fighters for this mission. These ideas also foundered due to problems with range and survivability in the face of superior Soviet interceptors. SAC finally gave up: the fighter force, which had never been a high priority within the command, was surrendered and its assets given to other units that could make better use of them. The constant changes in aircraft type, mission, movement to different airbases and shortages of special-

SAC Fighter Combat Readiness

	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Assigned Units	3	5	2	2	3	3	4	6	6	7	6	0
Combat Ready	0	0	2	2	2	0	1	4	0	2	3	0

An F–86 *Sabre* which SAC used mainly as air defense interceptors.

ized jet mechanics and other maintenance personnel were revealed in the dismal combat-ready statistics of the jets throughout this period:[20]

Only twice during this twelve-year period were all of SAC's fighter wings combat ready, and in five other years, *none* of the wings achieved this status. (Note, the Air Force had changed the designation from group to wing in 1948.) To further illustrate what seemed to be indifference on the part of SAC, only one fighter competition was ever held in the command (1956), even though bomber competitions had occurred annually since 1946 and were considered an integral part of the command's culture. Apart from neglect, the original problem remained: how would SAC's bombers penetrate enemy airspace to complete their mission and what role would fighters play in that dilemma? In truth, LeMay and his successors eventually decided that a combination of speed, low altitude terrain-following tactics, decoys, and electronic countermeasures would substitute for the fighter escort that seemed impossible to develop.

It could be argued that SAC did not take the fighter escort problem seriously—as the poor combat-ready status of the fighter wings throughout their decade of existence would seem to indicate—but LeMay bridled at charges of neglect. When one interviewer asked him why he seemed uninterested in securing fighter escort, the general responded: "Let me ask you why you have a lack of interest in buying your wife a new mink coat every year?"[21] To LeMay the issue was one of money and priorities. Yes, he thought it nice to have escort—as it would be nice for your wife to have a fur coat—but the command's priority was the bomber fleet and that's where the finite amount of money needed to go.

In 1950 SAC acquired a wing of F–86 *Sabre* jets. These were of commendably high performance, but they were hardly long-range escorts. Instead, the jets were used as interceptors to defend SAC airbases. The demands of the Korean War ended this experiment quickly: the jets were in high demand to counter the Soviet MiGs and they could not be spared for airbase defense. By 1958 the *Sabre* jets were being supplanted by newer designs, so again SAC received a wing of the now-obsolescing F–86s, which were moved to Spain to be used as interceptors to defend SAC staging bases. When SAC decided these forward staging bases were too vulnerable, the fighter interceptor idea fizzled out along with the bases. By 1959 the last fighters were transferred out of SAC and moved to Tactical Air Command and Air Defense Command where they could be more gainfully employed.

The concept of escort for the heavy bombers died—as did the entire notion of including fighter aircraft within SAC. To cope with the challenges of penetrating enemy airspace, SAC eventually decided the bombers would go in alone. Speed and altitude adjustments would be important and tactical experimentation would tinker endlessly with the best method and formation for surviving in enemy airspace—bad weather, night operations, decoys and evasive tactics would all be used to enhance the chances of success. At one point it was believed the bombers would go in high and fast. The epitome of this concept was to be the XB–70 that would penetrate at Mach 3 and 70,000 feet. The development of the Soviet SA-2 surface-to-air missile—one of which downed the U–2 spy plane of Francis Gary Powers in June 1960—put an end to that idea. Instead, SAC bombers would go in low—beneath enemy radar coverage. Sometimes, bombers like the B–58 *Hustler* planned to go in fast; other aircraft like the B–52 would penetrate low and slow. In addition, the bombers would rely extensively on the use of electronic jamming and countermeasures installed on designated bombers to penetrate Soviet airspace.[22]

The Korean War had demonstrated that electronic countermeasures (ECM) would be essential equipment for the bombers. In fact, LeMay believed ECM was as important as armament to the survivability of the SAC bomber force. During that period SAC's ECM budget quintupled.[23] Given the intractable problems of providing escort to the bombers, ECM would be a main weapon of defense. By the end of 1954 the B–36—but especially the RB–36—was fitted out with increasingly advanced ECM gear. The plane's size made the incorporation of extra equipment, antennae and an additional ECM crewmember a simple task.[24] One SAC wing commander later stated the bomber's ECM was excellent: "with our broad jamming I don't think the Russian gun laying equipment could lay a glove on the B–36."[25] The B–47, on the other hand, was virtually defenseless when first built—it was thought the bomber's high speed and altitude capability would keep it safe. The emergence of the MiG-19 quickly put an end to such thoughts. Eventually, the *Stratojet* was equipped with an automatic jamming pod installed in the bomb bay: the EB–47s would then accompany the bombers to clear a path in to the target and back out. In later models two ECM operators would occupy the pod during flight.[26] The B–52 would be the first jet bomber designed and built with ECM in mind from the outset—the crew position of electronic warfare officer, or EWO, was included from the beginning.[27]

Fortunately, it was never necessary to find out if the lack of fighter escort would result in prohibitive losses for the nuclear strike force—as had been the case during World War II.

Yet, the requirement to protect strike aircraft while they are penetrating enemy airspace did not disappear with the demise of the SAC requirement. Simply, a bomb-

laden aircraft intent on finding and destroying a target is generally too busy to worry about enemy interceptors or surface to air missiles. Moreover, because it is usually heavily laden with bombs, it is poorly equipped to maneuver as necessary to defend itself. As a result, throughout the Vietnam War bombing aircraft heading north, usually F–105s, were escorted by F–4s in the event North Vietnamese MiGs showed up, but also by specialized aircraft—initially modified F–105s and then F–4s—carrying radar-homing missiles to take out enemy ground defenses—they were termed "wild weasels."[28] Similarly, during Desert Storm in 1991, a typical strike mission contained bomb-carrying F–16s that were usually escorted by F–15Cs to fend off Iraqi fighters, F–4G "wild weasels" with anti-radiation missiles to thwart enemy surface-to-air missiles, and EF–111s to jam enemy radars.[29]

In sum, the problem identified in World War II by Allied bombers over Germany and Japan has not gone away. Protection for the bombers is always necessary, sometimes it will take the form of escort fighters, at other times, it will require electronic jammers or other such chicanery such as terrain following, decoys, or weather to mask or confuse enemy defenses. In the near future, it is hoped that "magic" technology like stealthy construction and skin coatings will thwart defenders—although even then it is likely that stealthy B–2s and B–21s will be accompanied by F–22s and F–35s as far as possible into enemy airspace.

The decade-long period of SAC fighter planes was an interesting chapter in the complex SAC history and indicates how seriously the problem enemy defenses posed to penetrating aircraft, both then and now. ■

NOTES

1. This "passive" argument was advanced by two of the most noted pursuit instructors at the Air Corps Tactical School during the 1930s, Claire Chennault and Hoyt Vandenberg.

2. For the best account of the Eighth Air Force, see Donald L. Miller, *Masters of the Air* (NY: Simon & Schuster, 2006), and for the air superiority battle, see Stephen L. McFarland and Wesley P. Newton, *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944* (Washington, DC: Smithsonian, 1991).

3. "Strategic Air Command—1946: Organization, Mission, Training and Personnel," *Official History*, Vol. I, pp. 34, 46. (The SAC histories were multi-volume studies done each year. The histories began with an overall narrative, and then the documents upon which that narrative was based were included as well and referred to as "exhibits." Originally, these volumes were classified at the secret level or above.) All are located at Maxwell AFB in the Air Force Historical Research Agency (AFHRA).

4. "Development of Fighter-Escort in Strategic Air Command through 1951," SAC Historical Study, June 1, 1952, AFHRA, file K416.01-29, 261. Over the years the number of fighter aircraft assigned to SAC fluctuated between 0 (1957 and 1960) and 568 (all F–84s in1955).

5. "Notes from Commanders Conference, Exercise DUALISM," April 25-27, 1950, AFHRA, File, 168.15-10, p. 219.

6. LeMay to Stratemeyer (Commander, FEAF), letter, 30 March 1951 and Stratemeyer to LeMay, letter, April 14, 1951, both in "Development of Fighter Escort," exhibits 33 and 38.

7. "Development of Fighter Escort," p. 312.

8. Richard K. Smith, *Seventy-Five Years of Inflight Refueling* (Washington, DC: Air Force History and Museums Program, 1998), pp. 1-3; James Parton, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air* (NY: Adler & Adler, 1986), pp. 70-76.

9. The flying boom method pioneered by Boeing proved superior to the probe and drogue method, especially regarding the speed of fuel download. "SAC History—1949," vol. II, p. 10. Nonetheless, although it was standard practice thereafter that all USAF aircraft employed the boom method, all Navy and Marine aircraft used the probe and drogue. Problems and arguments over this dilemma raged for decades. Today, USAF tankers are able to utilize both systems to refuel all the services as well as numerous allied aircraft.

10. "SAC History, 1952," Vol. 1, pp. 225-30.

11. Vandenberg to Weyland, letter, January 17, 1952, in "SAC History—1952," vol. 4, exhibit 28.

12. The B–29 and C–97 were essentially the same airframe. Initially, SAC converted bombers into tankers, but soon discovered it was easier to modify the cargo versions for that mission. The KC–97 were not nearly as fast as the jet fighters they were refueling and this caused problems. Eventually, SAC took on the task of refueling TAC fighters.

13. Smith, pp. 34-38.

14. Robert J. Boyd, "SAC Fighter Planes and Their Operations," SAC Historical Study, 1988, p. 5.

15. "Development of Fighter Escort," pp. 284-86.

16. Don Pyeatt and Dennis R. Jenkins, *Cold War Peacemaker: The Story of Cowtown and the Convair B–36* (North Branch, MN: Specialty Press, 2010), pp. 221-22; Frank Gudaitis, "It Seemed Like a Good Idea at the Time," *Aviation History*, March 2011, p. 68.

17. Pyeatt and Jenkins, pp. 222-24.

18. *Ibid.*, pp. 224-26; C.E. Anderson, "Dangerous Experiments: Wingtip Coupling at 15,000 Feet," *Flight Journal*, December 2000, pp. 64-72. See also, Mark Wolverton, "Project Tip-Tow," *Aviation History*, January 2012, pp. 14-15. Initial tests were conducted using a modified B–29. After several dozen successful flights, the idea was abandoned when a coupled F–84 rolled over onto the bomber—both planes went down and all crew members were killed.

19. Power to LeMay, letter, October 19, 1949, in "SAC History—1949," vol. 3, exhibit 111.

20. Boyd, p. 22.

21. Interview with Gen Curtis LeMay, by Robert M. Kipp and John T. Bohn, November 16, 1972, AFHRA.

22. For an excellent overview, see Daniel T. Kuehl, "The Radar Eye Blinded: The USAF and electronic Warfare, 1945-1955," PhD dissertation, Duke University, 1992.

23. "SAC History—1951," I, p. 213.

24. Pyeatt and Jenkins, pp. 125-26.

25. Interview with Lt Gen Clarence S. Irvine, by Robert M. Kipp, Dec 17, 1970, AFHRA, p. 31.

26. Alwyn T. Lloyd, *Boeing's B–47 Stratojet* (North Branch, MN: Specialty Press, 2005), p. 111.

27. Kuehl, pp. 207-19.

28. Note that the Navy generally used A–4s and F–4s as bomb droppers and F–8s or F–4s as escorts. For an excellent discussion, see Craig Hannah, *Striving for Air Superiority* (College Station: Texas A&M University Press, 2002), especially chapters 3 and 4.

29. Given the plethora of allies and aircraft employed during the war, many different bomb droppers, escorts and jammers were employed. For the authoritative discussion, see Eliot Cohen (ed.) *Gulf War Air Power Survey*, 5 vols. (Washington, D.C.: Government Printing Office, 1993), see Vol. II, "Operations."

Recalling a Time of Cooperation with the Russians

John L. Cirafici

Tiksi Mi 8 flying out to the frozen Lena Delta on March 20, 1993.

In 1991 the world celebrated with a shared sigh of relief when the Cold War, after forty-five years of existence, had finally ended not in a radioactive cloud but peacefully. Those four and a half decades had been a time of often daunting uncertainty punctuated too often by threats of mutual annihilation. For those who had grown up in the shadow of the Cold War and then served in it, it seemed that when one crisis ended another began. The Berlin Airlift, the Berlin Wall, Matsu and Quemoy; the Laotian Crisis, the Cuban Missile Crisis, the Vietnam War, the Pueblo Incident, crisis in the Congo, the 1983 "Able Archer" war scare, deployment of the Soviet SS-20—a concealable intermediate-range ballistic missile with a multiple independently targetable reentry vehicle, and on and on. For those of us who were in the military during that era there was almost always the possibility that whenever heightened tensions arose, it could go from "cold" to "hot." We all had a role to play and mine was simply a supporting one, flying airlift missions with the C–5 *Galaxy* to every corner of the globe. In an entirely different capacity, I also had served on the ground in Europe as a Combat Control Team member. Our special operations team mission included one in which we would operate behind the Red Army if it overran the narrow waist of West Germany. However, it was as an airlifter and as an expert on airfield operations that I had an opportunity to participate in missions that finally led to the Cold war's demise. Consequently, this is one person's experiences in those events, traveling to far flung places in the Soviet Union, later Russia, from Siberia's Arctic coast to Central Asia, to Moscow and to Kyiv. Perhaps the best place to begin on this journey is an unprecedented mission flown deep into the Soviet heartland.

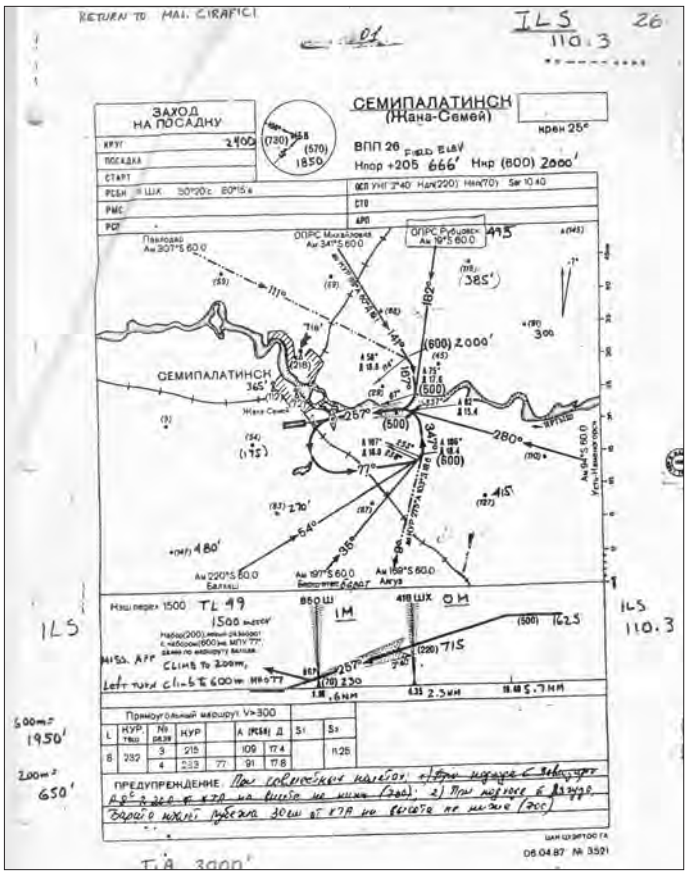
Into the Soviet Heartland

In December 1987, the leader of the Soviet Union, General Secretary Mikhail Gorbachev, met with President Reagan at the Washington Summit. As Gorbachev was having a final conversation with the president, they reached agreement to conduct mutual test monitoring experiments at their respective nuclear test facilities. The decision was based on the 1974 Threshold Test Ban Treaty and the 1976 Treaty on Underground Nuclear Explosions for Peaceful Purposes. In their joint statement they expressed the hope that the verification experiments would lead eventually to the complete cessation of nuclear testing. Once the two leaders had reached agreement it set in motion the US Department of Energy's (DOE) Joint Verification Experiment (JVE) "Kearsarge." DOE quickly assembled its CORRTEX (Continuous Reflectometry for Radius versus Time Experiment) instrumentation system and a fifty-five ton Cardwell KB-500 drill at the Nevada test site. This system would be employed at the test facility in Soviet Central Asia to compare results with test monitoring lo-

cations outside the Soviet Union. This would verify compliance accuracy. The drill was necessary for proper placement of the system in the ground.

In early April 1988, our crew was directed to fly the unprecedented mission to Semipalatinsk (now known as Semey), in the Kazakh region of the Soviet Union. This was the gateway to the site for the Soviet Union's nuclear weapons testing. A C–5 *Galaxy* had already flown to Indian Springs, Nevada where it was uploaded with ninety tons of equipment. Now it was our turn to take it from Dover Air Force Base, Delaware and continue on to Rhein Main Air Base, just south of Frankfurt/Main, Germany, before proceeding into the Soviet Union.

The final leg of the mission within Soviet airspace presented many challenges. We could not access any data at all about the airfield. No dimensions for the runway, nothing about the taxiways, obstacles, or ramp space, no load bearing (ACN-PCN) information, nothing at all about procedures for the approach. The PCN number was important because our weight when we landed would be approximately 580,000 pounds. On a positive note, a C–5 actually has a lighter footprint than many large aircraft because of its load distributing landing gear. We were similar in footprint to the smaller Illyushin–76 *Candid*, a commonly used aircraft in the Soviet Union and one that had likely landed on Semipalatinsk's runway many times. The greater question was, why was data unavailable? To answer that question we had to see our mission in its proper context. Strategic Air Command, of course, had the facility on its SIOP (Single Integrated Operational Plan); they intended to nuke it in the event of war. Consequently, they had excellent imagery of the airfield, but they weren't going to share it with us. Instead, they provided a nearly useless postage stamp sized image of the runway on a large scale satellite photo of the general area. We were flying the very first American aircraft to what was for security reasons designated by the Russians a "closed city"— a highly restricted area where nobody ever went, including Russians, unless given official authorization, and certainly not open to Americans. The Soviet airline, Aeroflot did service the city, and two of its navigators would fortuitously join with us in Europe. We were to learn from them that the airfield actually had an unlisted ICAO identifier, UASS, however, used only within the Soviet Union. Hence, the lack of information. Until the Russian navigators showed up in Germany we appeared to be on our own. The only thing we knew was that the flight



Semipalatinsk approach plate.

plan sent to us by higher headquarters reflected the Soviet requirement that we fly around politically and militarily sensitive areas. The extended round trip lengthened our crew duty day to twenty-eight hours. That, by regulation, exceeded the normal limit of twenty-four hours for an augmented crew. As to be expected, the additional hours were quickly waived.

When we were joined by the two Aeroflot navigators at Rhein Main a very positive relationship was immediately established. They spoke very understandable English and provided a wealth of useful information on the idiosyncrasies of flying within the Soviet Union. They also had with them the Semipalatinsk airfield approach plate, however, in Russian. I learned from the two Russians that neither had ever been to Semipalatinsk, so this flight was for them unique as well. Once on the way at least one of them would be in the cockpit at all times monitoring radio traffic and they would clarify for us procedures to follow within Soviet airspace. On a personal level I quickly found common ground with them. Yuri, one of the navigators revealed his taste for American popular music. We quickly realized we had a shared appreciation for the very popular group, *Manhattan Transfer*. The next time I went to Russia I would bring along an album for him. Our Air Attaché in Moscow also wanted to be a part of this unprecedented mission. To the Russians, however, it apparently was like letting the fox into the chicken coop, and he was denied permission.

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Semipalatinsk April 18, 1988 in front of Gorbachev portrait.

Semipalatinsk May 1988 with Aerflot navigators.

On our way to Semipalatinsk

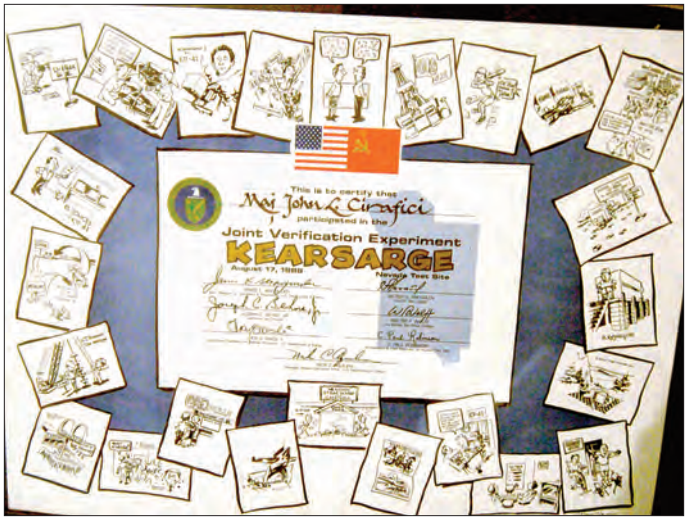
At 22:10 on the 17th of April we lifted off from Rhein Main on a most unusual journey during which there were some unanticipated but interesting and entertaining moments en route to the nuclear weapons testing facility.

The Soviet mandated routing took us up to the Swedish FIR (Flight Information Region), across the Baltic, past Moscow, and on to Novosibirsk, Siberia before heading south to Kazakh SSR. As we entered Swedish airspace we experienced our first surprise. Suddenly, off the left wing, a Swedish *Draken* fighter-interceptor appeared close enough so that we could wave to each other. He then moved off our right wing before departing. Were the Swedes curious why in the midst of the Cold War an American military aircraft was heading straight into the Soviet Union? There was no explanation given or requested. After turning east and entering Soviet airspace over the Gulf of Riga we followed the prescribed route that eventually took us just south of a brilliantly lit Moscow. I had tuned in Radio Moscow just as they began the hour with their signature tune by Kenny Ball and his Jazzmen, performing the fantastic jazz number, *Midnight in Moscow*. Although based on a well liked Russian song—*Moscow Nights*—first performed in 1955, the upbeat jazz version was not at first appreciated by the ossified Soviet leadership. Times change and now it served as the theme music for Radio Moscow's international broadcasts. For us it was a perfect backdrop as we watched brightly lit Moscow pass off the left wing. From 33,000 feet above the Earth, we could easily look east just as Dawn's fingers pressed up against and over the slopes of the Ural Mountains. The inspiring visuals while listening to upbeat music made for an incredible moment. If one believes in omens then our mission was clearly bound for success, and lasting peace would prevail between our two nations. Continuing on, we overflew Novosibirsk and then headed south to Semipalatinsk. At ten a.m. on the 18th of April 1988, we made a little bit of Cold War history when our C–5 *Galaxy*, tail number 00464, touched down in the Soviet heartland.

I would fly a total of four times into Semipalatinsk and each time enjoy the hospitality and warmth of our hosts. Practically every Russian I met clearly wanted the Cold War to go away and we talked like old friends who regretted not seeing each other more often.

Now, about flying in Russian airspace. With the assistance of the Russian navigators I figured out the approach procedures. There were several idiosyncrasies on their mimeographed approach plate that caught my attention. On approach to an airfield our normal procedure is to set into the altimeter the local air pressure at that moment, given to us by the approach controller (properly known as "QNH"). The altimeter will then indicate the actual field elevation in the touchdown zone upon landing. The Soviets did it somewhat differently, in a way that was critically important for us to be aware of. Their setting was based on QFE; therefore, when we touched down the altimeter would not be reading field elevation; instead, it would be zero. That could be a measurable and important difference. Also, when the ground controllers reported the air pressure for the altimeter setting they used millimeters as opposed to inches of mercury as done in the States and millibars in most other places. Winds were reported in meters per second and not knots. The quick conversion was to double the speed to get knots. Finally, the approach plate was in Russian. We were on a learning curve as we continued on to the airfield. Once we sorted out the procedures we were able to understand the directions transmitted to us by the controllers and the approach and landing went very smoothly. The taxi to parking had its moments because of airfield fencing around the parking area. Our wingtips were way out there and we did not, thousands of miles from our maintenance support, need to ding them. We deplaned wing walkers and continued on to parking where we knelt the aircraft. All went well and our loadmasters and equipment operators offloaded the aircraft. I believe the Russians were impressed that even our youngest airmen were so competent and professional. While the cargo was being downloaded I carried on a conversation with an officer of

5 May 1988 Semipalatinsk the kind Babuska in front of her church.



1988 Joint Verification Experiment Kearsarge certificate.

the border guards. This was with the realization that they and especially the KGB were there to keep a keen eye on us; after all we were in a place where foreigners never entered. What we did not talk about, and I learned about only later was something that should have concerned us all, both Russians and Americans. The nuclear weapons testing area near Semipalatinsk is the most contaminated place in the world as a consequence of it having been used extensively for open air testing. Then again, perhaps it has competition for its dubious distinction from the nuclear disaster site at Chernobyl. While we were standing around the official told me several Russian jokes. The jokes were revealing in that the guys who were the butt of the jokes are always the people of the other nationalities in the Soviet Union. One joke was about a Korean. It goes this way,

The good people of a small town began noticing the disappearance of their dogs and they demanded that the militia (police) do something about it. After an intense search, the militia discovered the culprit and brought him in. Because Russia had now entered the time of Perestroika (enlightened government) the police did not beat the Korean senseless; instead, they took him to a psychologist. The doctor got out his gold watch and swinging in front of the Korean, hypnotized him. The doctor said over and over again, "You are a Russian. You are a Russian." The Korean said he was a Russian, so they released him. Things were fine for several months and then dogs again began to disappear. The militia was called out, and this time they knew exactly where to look. Deep in the forest they found the Korean sitting on a log. In a semi-circle around him were the dogs. He was swinging a gold watch and repeating, "You are a pig; you are a pig."

I wanted to ask about jokes where Americans were the fall guys but kept it to myself.

While standing on the ramp I saw something rarely observed by outsiders. An Mi–24 *Hind* attack helicopter arrived and hovered nearby. The legendary helicopter has a well earned reputation for its capabilities and survivability in combat. In fact, it is often referred to as a "flying tank." As I watched it maneuver over the field I could only speculate that it was flying to or had returned from the war in Afghanistan, several hundred miles to the south. I also noticed abandoned aircraft placed in a line in the grassy area along side and parallel to the runway. They seemed to be decoys for an enemy aircraft making a strafing run.

The following month we flew some six or seven more missions to Semipalatinsk to complete the delivery of equipment. This time the aircraft were flown to Helsinki, Finland en route where crews were changed out. I stayed in Helsinki and met aircraft as they came through and continued on into the Soviet Union. I had one more interesting experience there. I had done my research on Semipalatinsk and discovered that the Russians conquered the area in the eighteenth century. At that time, they built a church that was still standing today. So, after arriving there and sitting on a Russian bus I proposed to our KGB minders that we visit the church. These guys were unimaginative. They got off the bus to hold a conference. I could guess what they were saying. How could this American, who had never been in town know about the church. He claims that he saw it on the approach; is that possible? Does he have a covert agent waiting there to pass information? The only way we can find out was to go there and watch him carefully. While we waited on the bus for their answer one of our guys looked into a toiletries bag conveniently left near us. The owner of the kit looked just like Peter Lorre, Hollywood's archetypical foreign spy. Inside was a small reel to reel tape recorder. Welcome to amateur spying. "Peter Lorre" came back onto the bus with his plan. First, we have lunch, and then we go to church. While we were at the church a *Babushka* [older traditional women in Russia who are the caretakers of the church] came up to me. Babushka refers to the kerchief that these simply dressed women always wore over their hair. She pressed into my hands a small church icon that Russians would hang up in their homes. I was sincerely touched by her gesture. I was

During President George HW Bush's visit to Kyiv on July 30, 1991.

also imagining that Peter Lorre said to his fellow agents, "so there is his point of contact." He probably wanted to pull out her fingernails until she confessed.

I returned to the Soviet Union on an INF (Intermediate-Range Nuclear Forces Treaty) support mission and later twice in support of President George H.W. Bush's 1991 visit to Kyiv. It was in November 1988, the day before Thanksgiving, that I went on an INF mission to Moscow. We were transporting sixty-eight tons of monitoring equipment for American observers posted to an OSIA (On-site Inspection Agency) monitoring site at Votkinsk, in the Soviet Union. What proved to be interesting on this visit was the candid conversation I had with a Russian colonel at the airport. Our Soviets hosts had invited us over to a small office with cafeteria near the terminal. They provided excellent pastries, cheese and salami on bread, coffee, tea, and Pepsi Cola in large quantities. That was when I had a very interesting conversation with Colonel Pavlov about his viewpoints and observations of the changes in Russia. He began by saying,

"These are most unusual times. Here we have the US

At Anadyr with the base commander, March 18, 1993.

and Soviet militaries working together so well. If the militaries show the way by their friendly cooperation, then it will be possible for everyone to follow." Pavlov seemed as pleased as I was with this development. He went on to say that he was happy to learn that President Bush had promised to continue President Reagan's efforts to work with the Soviet Union.

He then elaborated on the costly errors made by Josef Stalin and the price paid by the Russian people.

"We now see that Stalin was excessive in his rule and his policies caused great suffering. Today we are discussing with intensity the terrible things which Stalin did to the Soviet Union. Where he could have made the same gains with moderate means, he chose to use excessive methods."

After a long conversation and as we were about to return to our aircraft, Pavlov said, "As a historian you can appreciate that our history examinations in school are being revised to de-emphasize the distortions which previously have been taught."

The colonel then firmly shook my hand and warmly thanked me for the opportunity to express his thoughts. I felt that it was me who most benefitted from Colonel Pavlov's candid discussion. I pray he is right about the future, especially when our two countries can join together in a spirit of cooperation.

Another and unique opportunity arose when in 1993 I was sent to Russia to assist in arranging a joint Russian-American military exercise in Siberia.

Sojourn in Siberia: One more time in Russia: A journey to the Arctic

In March 1993 I was told on short notice to make my way to Anchorage, Alaska. There, I would join a team and travel onboard an Alaska Air National Guard C–130 *Hercules* aircraft bound for Russia on a very special mission. I was expected to use my expertise on airfield operations and professional manner to conduct a survey of a Russian military facility. In fact, I was going to an unusual base. Tiksi, where I was bound, would be used, in the event a war broke out, to forward position Russian strategic bombers with nuclear warheads. Their target: the American heartland.

The next morning, we were on our way. We made two fuel stops en route, first in Nome, on the Alaskan coast and then directly west of it, Anadyr on the Russian Far East coast. We arrived in Nome just as sled dog teams were completing the grueling Iditarod Trail Race from Anchorage. The world famous race crossed over 1,000 miles of Alaskan wilderness and terminated right there on main street. I couldn't believe it. I always considered the Iditarod something I would perhaps read about in a National Geographic article but never see firsthand. As I was standing there in a light snow shower, Martin Buser—the 1992 winner—had just arrived, in sixth place. Very pleased with the unanticipated treat we went back to our aircraft and took off at 10:50 heading for the Asian continent. We soon crossed the International Date Line and suddenly today became tomorrow. Now, because of a line drawn on a map, it was the 18th of March. The Russian coast appeared ahead, and we dropped down for an approach into Anadyr's Ugolny airfield, located just two degrees of latitude below the Arctic Circle. It was still morning when we landed, arriving just ten minutes to ten, local time. As I looked around it appeared that Ugolny was used as a fighter interceptor base. I quickly counted what appeared to me to be eleven Sukhoi Su–11 Fishpot-Cs parked with several Antonov An–12 Cub transports along the snow covered ramp. It was a clear day, with the temperature hovering around -20 degrees Celsius and a brisk wind blowing. The fighter interceptors seemed to be positioned there to attack B–52s flying to their targets in the Russian heartland. The local commander informed

At Tiksi with Russian colonels holding the Yukut Region flag with An–12 in the background, March 22, 1993.

us that the winds at our final destination—Tiksi—were far too high for us to continue that day. The crosswinds at Tiksi were blowing across the runway at fifteen meters/second (thirty knots), and therefore far too hazardous for us to attempt a landing there. The Russian fighter base turned out to be an interesting interlude when we paused there for two days while waiting for the excessive winds at Tiksi to diminish.

The base commander graciously invited us to lunch with him and his staff and we were treated as honored guests. We had plates of food piled high with caviar, smoked salmon, chopped potatoes, beets with onions, fried smelts which had been caught through an ice hole just that morning, freshly baked army bread, cheese, and sliced meats. A sweet apple extract served as my drink (what I had thought was bottled water was actually vodka). The next course was one of three soups. I chose pea and potato. The last course was an excellent preparation of potato and reindeer. The conversation was then joined by two ladies who were leaders of the "snowflake" organization. These were Russian women who traveled throughout arctic regions and had recently completed an "expedition" to Antarctica, that they called "Operation Metelitza {Blizzard)." At the conclusion of the meal and conversation we were presented with small gifts. We then joined with the district commanding general at his family's apartment. His son, aged 15, had the television on with a video player connected (this was the first one I had seen in Russia). He then left us for his room where he had a TV on repeat from the VCR. As I looked around the apartment I noticed that the furniture reminded me of German homes. Just as I had lived in Germany for a number of years, so too had the general and his wife spent years posted to Germany. Of course, they were in East Germany, near Berlin. She had acquired that Central European manner about her that I was so accustomed to.

After our conversation with the general and his wife we retired to our quarters for rest. My sleep cycle was being thrown off by the many time zone changes I was experiencing. Oddly enough while I was off just six hours from Delaware on the East Coast the Russians who joined us from Moscow were off an incredible nine hours from their time zone. The next day we had a joint meeting to discuss the purpose of our visit. Russia and the United States were to jointly conduct in Siberia a rescue exercise built around the possibility of an airliner flying over the North Pole route being forced by some disaster to make an emergency landing on the tundra. We reviewed the entire concept of operations that would employ three Russian Mi–8 *Hip* helicopters, two An–12 *Cub* cargo aircraft, an American HC–130 *Hercules* configured for rescue operations, and two HH–60 helicopters. As we concluded the meeting we learned that winds had finally subsided at Tiksi. Our journey now continued.

As our aircraft approached Tiksi from the northeast I looked out at the frozen Lena River delta and the gently rolling, almost featureless terrain ahead. Suddenly it occurred to me that I had seen something very similar before. And then I realized what I was seeing in my mind's eye. It was the final scene in the early 1960s film, *Doctor Strangelove, or how I learned to stop worrying and love the bomb*. The lone surviving B–52 crew was about to penetrate the Siberian coast and soon drop its hydrogen bomb, thus inadvertently becoming the initiator of World War III and the end of civilization. Our approach unnervingly looked identical to that scene in the movie. This was a reminder that where I would be staying for the week was also on the Strategic Air Command's integrated targeting list. In other words, I was once again, just as during my time on Semipalatinsk's air base, at Ground Zero for one of our own hydrogen bombs. What a strange twist to my Russian visits.

We were greeted upon arrival by two generals: General Boris Amelkin from the general staff in Moscow, and Gen-

In Algiers with Russian Col Prochine, May 9, 1999.

eral Peter Ivanovich Sharikov, commanding officer of Tiksi. The reception and supper were outstanding. We feasted on fish—baked, smoked, fried—and reindeer—flesh, heart, and tongue—with beets and potatoes. The fish soup, according to the Russians, should never be eaten without adding a tablespoon of vodka (which we immediately added). In fact, the Russians consumed vodka with breakfast, lunch, supper, in-between meals and afterwards.

Following supper, we established the agenda for the next morning, and then returned to our rooms. The quarters we were staying in presented an irresistible opportunity for me to determine what the layout and dimensions were of a typical Russian apartment. This had been of some interest to me ever since I was in high school. At that time the topic of quality of life in Russia had been mentioned in the news. In the early 1960s the Soviet leader, Nikita Khrushchev, made it a priority to give the Russian people decent housing. Now I had a chance to see what a typical Russian family's apartment might look like.

The following day would, after a few hours of work, turn into a National Geographic experience. We first observed a demonstration by an An–12 cargo aircraft airdropping a series of 55-gallon drums filled with fuel. The drums were to be the source of fuel for Mi–8 helicopters when we conducted our joint long range rescue exercise in the arctic. Next, we climbed aboard two Mi–8 helicopters for a one hour flight along the Lena to the heart of its delta. We arrived on an island where American Arctic explorer, George Washington De Long, spent in 1881 his last days as he died of hunger and exposure. An interesting book, *In the Lena Delta. The Search for Lieut. Commander De Long and his Companions*, published by George W. Melville, leader of a rescue attempt, tells much of the story. On a rise, in the center of the barren island, a large cross memorial and monument had been erected in 1976 and maintained by Tiksi air base personnel. The weather that morning was clear but the -30 degrees Celsius temperature seemed even colder because of the winds. It was easy to remember that we were only some 1,100 intensely cold miles south of the North Pole.

We continued flying along the ice covered Lena looking for stands of frozen fish which had been left where fishermen bored holes and lowered their nets. The fisherman would bore two holes and, after passing the net down one, snag it with a gaff through the other, and anchor it until retrieved. General Sharikov said that on a good day the net would fill with fish within hours. After the nets were extracted, the fish were dumped in a pile and allowed to freeze. The pilots landed our Mi–8s on the frozen river and we went over to one such pile to fill our sacks. The Russians felt totally at ease despite our remoteness and the bitter cold. Just as they did at De Long's memorial, the pilots shut down the engines (our military would likely never take that chance, especially with generals onboard), and joined us for a picnic back in the passenger compartment. Some of the frozen fish were scraped clean of their skin and then sliced into slivers. We dipped the strips into a dip made of tomato paste, paprika, red pepper, and sweet pepper. We also had the remainder of the reindeer, and a bit of soldier's bread. The Russians, including the pilots, warmed themselves with a nip of vodka. After this excursion, we flew south to Tiksi. The day was not over so we went to the officer's hide-a-way after we landed, to continue socializing.

Renewal in a Russian Banya

The next morning began with a wonderful breakfast followed by our planning conference at the headquarters building. I finally had a chance to get down to my purpose for being on this visit. The others in my party had straightforward, uncontroversial business with our Russian hosts. They did not need to press them on questions which the Russians were not accustomed to answering. I specifically needed to inspect the air base for capability, conditions, and construction. I was going to get from them information that under different circumstances people had been shot for, as spies. This took a firm sense of direction, on my part. General Amelkin tried to catch me off guard one time when he said, "I know who you really are." I suspect he was alluding to the world of special operations, or as he would call it, Spetsnaz. I just smiled politely, said that should make things easier, and continued on with my questions. My business with them was legitimate and above board. From that time on I really felt closer to the generals. We understood each other and mutually enjoyed the relationship. At one point there was mutual recognition that all three of us had entered the military in the early 1960s and consequently had been Cold War warriors all our adult lives.

General Amelkin had served in North Viet Nam during the war, probably as some sort of advisor. I was in ground combat in the South. Later he took part in the Soviet effort in Ethiopia after it became their client state instead of ours and fought a war with Somalia. I had been responsible for Somali airfields during Operation Restore Hope. Back in the Soviet Union he flew the tanker version of the Ilyushin IL–76 *Candid* of the Soviet Air Force's Long-Range Aviation, their equivalent to the U.S. Air Force's Strategic Air Command. Peter Ivanovich also served in Long-Range Aviation, as a bomber pilot. He had flown the Tupolev Tu–26 *Backfire-B*, a supersonic variable swept wing bomber. I enjoyed sharing our experiences, but I had to get on with my work.

First, I requested the official plans to the airfield. The colonels assisting me were helpful, but another colonel outside the planning staff appeared displeased. He must have been the security officer, who probably possessed a lot of authority. I got my hands on the official plans of the entire base and extracted data from it. After we took a short break the security colonel "recaptured" the plans. Then we did a visual inspection of the actual runway and ramps. I measured all the hard surfaces, examined fuel pumps, and ground support equipment. I was impressed with the construction of the airfield and especially the condition of the concrete. After all, this airfield was built atop permafrost in a hostile climate, with construction materials hauled a long distance.

When I was finished, we all rejoined and headed for the *banya*—the communal sauna and bath. It had been built by the officers in an old building, which when viewed from the outside, belied its club-like interior. It was a labor of love whose interior was finished with wood paneling and done up with the amenities one expected to find only in a place where people really enjoyed gathering together.

The banya was an old tradition in Russia. A poster on a wall explained, in Russian, the origins of the banya and its benefits. The first room was for hanging up clothes and the room off to the left for sitting down (on stools) at a table and feasting. Once through the dining area one entered the sauna. Beyond that was a square pool five feet deep, continually flushed with cold water. The ritual was as follows: Three times alternately in the sauna and in the pool with a break in the dining area for food and vodka. The series repeated itself three times. General Amelkin hosted us and Colonel Nikolai Kotev conducted the rituals. The general had a wonderful time with us.

Now, it was time to begin our return journey. Again, a wonderful breakfast which included fish, reindeer, hard boiled eggs, and salami. The very last entree was reindeer with either eggs or pelmeni (dumplings). We then had our final meeting with closing remarks by General Amelkin. General Peter Ivanovich Sharikov mentioned to me that I should plan to watch CNN after arriving in Alaska. I had noticed all that morning that the Russian officers were agitated over something. I suspected that it was related somehow to a confrontational situation then developing between President Boris Yeltsin and Russia's Congress of People's Deputies. Apparently, what they were reacting to was Yeltsin's impeachment and an attempt to overthrow his government. This was later followed by street fighting in downtown Moscow when the Congress was stormed by forces loyal to the president. Nearly two hundred Russians lost their lives, something not seen since the Bolshevik Revolution. In the end Yeltsin was able to consolidate his support by the Army which in turn attacked the "White House," the meeting place for the Congress, thus ending the crisis. We were at that moment isolated from those events as they unfolded and did not know the outcome. That explained the intense interest of the Russians in what was happening thousands of miles to the west.

We had a warm felt sendoff at the side of our C–130 and then departed Tiksi. Now that we were heading east the time zones made us progressively later in the day. Because we were close to the North Pole where all the longitude lines converged the time zones were very narrow. After a four-hour flight we arrived back in Anadyr at 20:00 local and landed in blowing snow and poor visibility. Again, the base commander greeted the aircraft and hosted us for a wonderful supper. Customs accompanied us to the club and processed our paperwork. One of the customs men was a young fellow who had only recently been discharged from the Russian Marines and was quite proud of having served in an elite unit. He was a pleasant person to talk with (through an interpreter) and sounded just like any other young person who has finished his service and felt good about the experience.

We returned to our refueled *Hercules*, took off at 23:10, and flew directly to Anchorage, Alaska. This time, because we had passed through the International Date Line at around midnight, the passage didn't have as much impact on the date. We had departed in the evening and arrived in the morning of the very same day.

Three days later I was heading south on an Alaska Airlines flight and going home. As I looked around the passenger cabin, I knew it was not possible at that moment to even attempt a conversation about the astonishing spirit of cooperation that I had just shared with the Russians. If I could explain what I had experienced, then people in our country should see how Russian aspirations for peaceful co-existence and friendship did not different from that of most Americans. What we and the Russians had just done together should give us all hope for our future. Optimistically, it would be in a world so much more benign than what we had experienced during the Cold War years.

Tragically, that opportunity has now slipped away. As recent events in Ukraine demonstrate, Russian leader Vladimir Putin has embraced an imperial mindset better suited to the nineteenth and not the twenty-first century. When I think about all those Russians with whom I have worked including Colonel Alexander Prochine, my defense attaché counterpart in Algeria, and friend, I can't help but wonder what their opinions are on this sad turn of events. Or is it possible that the optimism following the Cold War's end was just a pipe dream or a tenuous deviation from the norm? I can't help but wonder if the children of today will, like us who grew up during the Cold War, now face a very uncertain future. ■

Behold the Dark Gray Man. By Katharine Campbell. Hull UK: Biteback Publishing, 2021. Illustrations. Photographs. Appendices. Bibliography. Index. Pp. 512. $24.00. ISBN: 978-1-78590597-1

Katharine Campbell is a neuroscientist and Marshal of the RAF William Sholto Douglas' only child, born late in his life. Both of these contribute to her exploration of her father's life. This isn't, however, written as a doting daughter. Heavily footnoted (largely from primary sources), her book is a thorough exploration of the man and his life, including what her professional expertise allowed her to look back at and identify as post-traumatic stress disorder (PTSD). She has not only identified this, but also laid out the numerous events in his life that contributed to its development. Growing up in poverty after his father deserted the family, through multiple concussions suffered during World War I, to the signing of death warrants while Military Governor for the British Sector of occupied Germany post-World War II all contributed to his mental makeup.

Although it was her growing awareness that her father had suffered from PTSD that led her to write this book, her work is not a case study of a PTSD sufferer. Readers will find an in-depth, well-researched, and highly readable account of his life, drawn from the National Archives, other primary and contemporary documents, and memoirs by him and others.

Through her father's life. Campbell covers British (and world) history from the start of the 20th century through Douglas' service in World War I; civilian and military aviation in the inter-war period; service as one of the top RAF officers during World War II; commander of the British Air Forces of Occupation; and, reluctantly, Military Governor of the British Zone of Occupation. After his retirement in 1947, he served on the board of British Overseas Airways Corporation and, later, as chairman of the board of British European Airways (BEA) for 15 years. During that time, he led BEA in a financial turn-around to an eventual annual profit of £3 million by his retirement in 1964.

Campbell's last chapter discusses how Douglas' life experiences contributed to his PTSD, a broader look at factors leading to development of PTSD in individuals, and activities that may delay or defer its onset or mitigate the symptoms. The notes in this chapter are heavily weighted to studies of the subject, including case studies of combatants from World War I on.

Jon Barrett, volunteer photographer/researcher, National Air and Space Museum

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Pacific Profiles, Volume 9, Allied Fighters: P–38 Series, South & Southwest Pacific 1942-1944 & **Pacific Profiles, Volume 10, Allied Fighters: P–47D Series, South & Southwest Pacific 1943-1945.** By Michael Claringbould. Kent Town, Australia: Avonmore Books, 2022 and 2023. Glossary. Maps. Photographs. Illustrations. Index. Pp. 124 and 108. $26.09 paperback each. ISBN: 978-0-6452469-7-1 and 978-0-6457004-0-4

Michael Claringbould is a three-dimensional, digital aviation artist and globally recognized expert in Japanese aviation and the Pacific air war. He is a contributing editor for *Flight Path* magazine and is the author of many books on the Fifth Air Force and World War II Pacific history. While growing up in Papua New Guinea in the 1960s, he became fascinated by Pacific air war aircraft. His writings cover the many types of aircraft used by both sides, personnel involved, and aerial combat operations conducted in that vast theater of war.

The Pacific Profiles series presents artistic profiles of aircraft which served in the South Pacific and Southwest Pacific (Solomons and New Guinea) theaters during the Second World War. Volume 9 covers 20 USAAF Fifth and Thirteenth Air Force squadrons that operated the P–38 in day-fighter, night-fighter (field-modified P–38G), reconnaissance (the F–4 and F–5 models of the Lightning), and ground-attack roles. Volume 10 covers 12 USAAF P–47 squadrons that operated in fighter, escort, and ground attack roles.

The P–38 was a large, single seat fighter. Originally designed as an interceptor with high speed and good climb characteristics, it needed two engines based upon a large total power demand. Turbosuperchargers were also considered necessary to maintain power available for rapid high-altitude performance. Packaging of the required propulsion components made for longer nacelles; and, once a tricycle landing gear arrangement was chosen, twin booms naturally resulted. This configuration provided for concentrated , unsynchronized firepower in the central pod nose, a distinct positive characteristic. However, this twin configuration resulted in somewhat reduced maneuverability, particularly at low altitude. This shortcoming was easily overcome by proper energy and airspeed management.

Claringbould begins with an introductory chapter describing P–38 performance and operational shortfalls in an effort to dispel well-publicized myths about the aircraft's combat prowess, spread by "Lightning aficionados." He supports this argument by comparison of accurate and detailed Japanese unit logs to, in his view, less-reliable allied information. Here I should note that I have reviewed many of Claringbould's books and have always found it interesting that he displays a definite pro-Japanese slant. For an Australian, this perspective has always seemed unusual—especially since the Allies decisively won in the theater.

The P–47 Thunderbolt was one of the main USAAF fighters of World War II. Approximately 15,700 were manufactured from May 1941 through September 1944. By far the largest percentage were the "D" model, which were more or less evenly split between the "Razorback" (serving in the SWPA) and bubble-canopy versions. The Thunder-

bolt was a short-to-medium-range escort fighter. It was designed around the Pratt & Whitney R-2800 Double Wasp 18-cylinder radial engine and incorporated an advanced turbosupercharger which optimized its performance in high-altitude air-to-air combat. Application of its excellent roll rate and energy-saving dive and zoom climbs often allowed it to outmaneuver enemy fighters. Its ruggedness and radial piston engine had a high tolerance for damage. Ruggedness, eight 50-cal. machine guns, and its ability to handle 2500 lbs. of bombs made the P–47 a formidable ground attack aircraft. Claringbould again asserts that, while successful in the European theater, the P–47 was a poor performer in the SWP theater. He states it had a "despairing loss figure" and that a Thunderbolt pilot was five times more likely to lose his life to weather, or takeoff and landing incidents than directly to combat.

Both volumes describe aircraft models and squadron assignments to various bases in the Pacific theaters. Each chapter is dedicated to a specific squadron and include an overview of the squadron's service. Excellent graphic profiles showing markings, along with supporting photographs of selected aircraft, serial numbers, insignia, and nose art are provided. A brief note on pilot losses as applicable to each profile is included, accompanied by the status of each aircraft. An additional chapter in each book describes Lightnings that had unique theater roles (Vol 9) and P–47 operations in the Combat Replacement Training Center at Nadzab to give incoming crews training and experience before they were assigned to frontline units (Vol 10).

Both books provide a succinct overview of the aircraft's service in the southern Pacific. They serve to clarify the plethora of markings and rationale for their application. Both are quick reads and will provide a good reference for modelers while also providing a student of the combat theater with additional information on the air war there.

Frank Willingham, docent, National Air and Space Museum

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Lockheed Blackbird: Beyond the Secret Missions—The Missing Chapters. By Paul Crickmore. Oxford UK: Osprey Publishing, 2023. Maps. Tables. Diagrams. Illustrations. Notes. Photographs. Appendices. Bibliography. Index. Pp. 528. $80.00. ISBN: 978-1-47285138-3

Powerful! Informative! Rich in technical detail and illustrations! Crickmore's latest book is perhaps the finest and most comprehensive book on the Blackbird ever written.

Crickmore is a world-renowned aviation expert who has written over 22 books on legendary aircraft such as the A–12, SR–71, YF–12A, F–117, F–15, and many more. He spent over 13 years as a controller at the London Air Traffic Control Center and earned his license to pilot general aviation aircraft. His research allowed flights in various refueling, bomber, and fighter aircraft including the RAF Lightning, F–16, F–4, the British Red Arrows Team, and many more. In October 1981, he was granted special access to fly a KC–135Q Stratotanker on an operational air refueling mission of the SR–71 Blackbird from RAF Mildenhall UK. After that, he was hooked on writing about the Lockheed Blackbird.

In this book, Crickmore builds on his classic *Lockheed Blackbird: Beyond the Secret Missions* (2016) using 850 pages of recently declassified documentation and images that describe and illustrate the Central Intelligence Agency's (CIA) A–12 *Oxcart* program. This is a phenomenal work that takes the reader on a deep dive into high-flying aerial reconnaissance history (some not previously seen by the public) that led up through the *Archangel* "A-series" aircraft to the production of the A–12 (the 12th in a series of internal design efforts for *Archangel*, the aircraft's internal code name) by Kelly Johnson and Lockheed's Skunk Works.

This heavy "brute" of a volume describes the enormous political challenges that this high-flying, top-secret program experienced; the huge amount of engineering and technological innovation that took place at each stage; and the operational deployment of the A–12 for 29 overflight missions of Vietnam, before the SR–71 assumed that role.

And there is more. The story of the Blackbird is so much bigger than just the legendary SR–71 aircraft. It is the Blackbird family of aircraft and the thousands of people who were on the Blackbird team—Team Recce. Crickmore takes the reader on a journey through and beyond the comprehensive technical specifications and scientific data of the Blackbird and travels to the distant, often clandestine, operating locations. The reader learns of many tough, challenging, and sometimes hair-raising missions, accompanied by photos with breath-taking views. Along the way, readers will discover many of the experiences and first-hand accounts of not only the pilots and reconnaissance systems operators, but also of the mission planners who spent countless hours thinking through and preparing each mission, the Physiological Support Division (PSD) technicians who maintained the pressure suits, the aircraft maintenance wizards who made sure the Blackbird was ready, and of the little known but significant operations of the specialized KC–135Q Stratotanker and KC–10 Extender crews who were always on time for precision Blackbird refuelings. With over 26,000 air refueling contacts over three-plus decades, that is impressive! In addition, the related programs *Oxcart*, *Black Shield*, *Kedlock*, *Tagboard*, *Senior Bowl*, and NASA missions are all in this volume.

In all, Crickmore's book is a most comprehensive, illustrated, go-to reference on the Blackbird program and its "missing chapters." Highly recommended for your reference library.

Col Charles P "Chuck" Wilson, USAF (Ret); Chairman, The Cold War Museum®; U-2 pilot and IP; NASM docent

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Defending Rodinu: Volume 2 - Development and Operational History of the Soviet Air Defence Force, 1961-1991; By Krzysztof Dabrowski. Warwick UK: Helion and Company, 2023. Photographs. Drawings. Maps. Pp. 78. $29.95 paperback. ISBN 978-1-804510-27-8

About half-way through *Defending Rodinu*, I had a thought. If I could send this book back in time and put it in the hands of an ambitious 1970s-vintage SAC intelligence officer, they would be very happy indeed. The detail Dabrowski has assembled is exceptional, and the story he tells is enthralling. Vol 2 picks up the story of air defense of the Motherland in 1960 and follows the operations, doctrine, equipment, and personalities of the Soviet Air Defense forces, the PVO-Strany. Dabrowski's product is a detailed portrait of military organization that was institutionally paranoid and thinly stretched. Despite cutting-edge technology and thousands of aircraft and missiles, it was unable to defend Mother Russia from Cessnas and Aero Commanders. The PVO wouldn't hesitate to shoot down commercial airliners or order its pilots to ram intruders but found it difficult to defend its borders from balloons.

I found the chapter dedicated to detailed accounts of PVO intercepts of balloons the most engaging. Of course, recent events surrounding the American efforts to bring down a Chinese balloon added a current twist to Dabrowski's narrative. He explains that the PVO found it extraordinarily difficult to intercept and bring down balloons. The targets were frequently at the upper edge of interceptor performance envelopes, and air-to-air radars found it hard to discriminate between the fabric balloon and the denser instrument gondola the balloon carried. Special units were formed and equipped to counter the balloon menace, and a detailed chart of aerial victories shows a significant number of successes.

On the darker side, I think most readers will be troubled by the accounts of commercial aircraft shoot-downs by PVO aircraft and surface-to-air missiles (SAM). In most cases, PVO pilots visually identified the airlines and recognized commercial profiles and markings. In some cases, the airliners recognized the military interceptors and demonstrated their willingness to land. And in most cases, the interceptors shot them down with cannon or air-to-air missiles anyway. Interviews with PVO pilots cited various justifications. Following orders was popular. Commercial looking aircraft could be military aircraft in disguise was another. One pilot complained that the financial award he received was too small.

Joseph Heller is credited with the saying," Just because you are paranoid, doesn't mean they aren't out to get you." The forces arrayed against the Soviet Union were formidable, and the PVO had a lot to worry about. But the paranoid nature of Mother Russia is never more clearly on display than in Dabrowski's book. This work is much more than a modeler's information source. It is an excellent story of a Cold War that occasionally became very hot and lethal.

Gary Connor, Cortland OH

Eagles Overhead: The History of US Air Force Forward Air Controllers from the Meuse-Argonne to Mosul. By Matt Dietz. Denton TX: University of North Texas Press, 2023. Photographs. Notes. Bibliography. Index. Pp. vii, 335. $40.00. ISBN: 978-3-57441-890-3

Dietz, an Air Force colonel serving as the head of the history department at the Air Force Academy at the time of publication, is highly qualified to examine the historic role of forward air controllers (FAC). A former McDonnell Douglas F–15E pilot, he deployed to the Middle East for Operations *Iraqi Freedom* and *Enduring Freedom*. He helped plan North Atlantic Treaty Organization involvement in Operation *Unified Protector*. Prior to his academic post, he was director of operations at US Central Command.

Dietz examines the challenges of coordinating close air support (CAS) with ground operations while using aviation personnel. He proceeds in a chronological format. Despite primitive communications, he cites how the US Army Air Service in the latter days of World War I implemented airborne calvary reconnaissance patrols that helped ground forces—aided by attacking aircraft—locate and destroy German concentrations.

During the Italian campaign in the spring of 1944, he credits innovations in operational thought with creating *Horsefly*. This control system incorporated ground-based air liaison officers, a communications network, and Stinson L-5 observer aircraft to help facilitate timely and accurate CAS. This approach laid the foundation for CAS operations in Korea, Vietnam, and the Middle East.

In Korea, CAS played a critical role supporting United Nations ground forces that were frequently outnumbered by Communist attackers. Mosquitos (modified North American T-6 trainers with extra radios) improved the effectiveness of CAS missions. The L-5, frequently used by Army artillery units, played a part as well.

Vietnam presented other challenges, particularly because of the limited visibility associated with the frequently dense foliage. The Air Force initially used the Cessna O-1. FACs marked targets with white phosphorous rockets. As the war dragged on, the threat to the "slow movers" increased. Fast FACs such as the McDonnell Douglas F–4 Phantom II became the preferred platform. At the same time, the Air Force dedicated significant resources to proper training. In the years ahead, this would diminish.

FACs played a significant role in Operation *Desert Storm*. In the 30 years since that conflict, however, Dietz argues that the Air Force has neglected FAC operations. He

contends the reliance on advances in communications and sensors is leading to a highly centralized and physically separate approach. The absence of on-scene FACs and reduced local-area command responsibility may be detrimental to the United States achieving its future battlefield goals.

This book is highly recommended to anyone with an interest in CAS and Army-Air Force operations. It covers far more than FACs. An underlying theme tackles differences between the Army and Air Force. Well-informed readers will detect some unfortunate errors regarding the types of attack aircraft employed in different conflicts (e.g., confusion between the Martin B–26 and Douglas A/B–26), but these detract only minimally from the overall story.

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

Spitfire Photo-Recce Units of World War 2. By Andrew Fletcher. Oxford UK: Osprey Publishing. 2023. Photographs. Drawings. Index. Pp. 96. $25.00 paperback. ISBN: 978-1-47285461-2

Spitfire Photo-Recce Units of World War II is a comprehensive and well-written account of the use of Spitfire photo-reconnaissance (PR) aircraft by the Royal Air Force (RAF) during World War II. The book covers the development of the PR Spitfire, the different variants that were used, and the operations that they flew. It follows the Osprey formula for success to the letter.

Fletcher begins by discussing the early history of aerial reconnaissance and the development of the Spitfire. He then goes on to discuss the different PR Spitfire variants that were developed during the war, including the Mk I, Mk II, Mk IV, and Mk IX PR. Fletcher also discusses the specialized equipment that was used on PR Spitfires, items such as cameras, film magazines, radios, and navigation equipment. I believe Fletcher under-emphasizes a very important statistic. Only 249 Spitfire PR variants were manufactured during the war. These were literally spread across the globe to support Allied reconnaissance requirements. The PR variant performance envelope was so superior to all other Allied platforms and Axis opponents that they were responsible for many of the most critical discoveries benefiting the Allies. There were over 1800 of the USAAF's most effective recce platform, the F4 and F5 variants that were derived from the P–38 Lightning.

The second part of the book discusses the operations that were flown by PR Spitfires during the war. Fletcher covers the various theaters of operation where PR Spitfires were used, including North Africa, the Mediterranean, Italy, France, and the Far East. He also explains that PR Spitfires flew strategic, tactical, and weather reconnaissance missions as required by theater commanders.

Of course, the camera systems fitted to recce platforms go a long way toward determining their success. Fletcher briefly talks about the standard, pre-war, F8 cameras and the later F24 and F52 upgrades. But there was ample opportunity for more detailed discussions of exactly how the camera/aircraft interface worked and the role the pilot played in operating both.

As with all Osprey products, the book is well-illustrated with photographs of PR Spitfires, crews, and support staff. Fletcher also includes several first-hand accounts from PR Spitfire crews. These "war stories" add life to some occasionally dry reading.

Fletcher's writing is usually clear and direct. He does a good job of explaining complex technical concepts in a way that is easy to understand. Overall, this is a strong book that provides a comprehensive and well-written account of the use of Spitfire reconnaissance aircraft by the RAF during World War II.

Gary Connor, Cortland OH

Soviet Air Power of the Cold War. By Michael Green. Philadelphia: Pen & Sword Aviation, 2023. Illustrations. Photographs. Pp. 232. $46.95. ISBN: 978-1-39908-539-7

Michael Green is a freelance author, researcher, and photographer who has authored or co-authored over 100 books on various sea, air, and land military subjects. He is well qualified to write a book such as this.

In this book, Green freely admits that his intent is somewhat limited. Quite simply, this book is a survey of the topic. It is a good overview of the aircraft used by the Soviets from 1945 until the Cold War ended in 1991. As Green says, "For those wishing for more information on particular aircraft featured in the book, there are many well-researched references available on a significant number of them."

The book has five topical chapters: Fighters (other than those designed by Mikoyan and Gurevich), MiG Fighters, Bombers, Miscellaneous Aircraft, and Helicopters. Each starts with a brief overview of the topic along with sections on various related topics. For example, in the bomber chapter, Green writes a summary of bombers during the 45-year period, discusses four-engine bombers and American bomber influence, and then briefly discusses a number of different bomber designs. Throughout the chapter are sidebars on such topics as Tu-16 cruise missiles, bomber nomenclature, turbo-prop engines, and the like. The chapter then concludes with a section of excellent photographs of the various aircraft along with captions that provide a fair amount of information about the pictorial topic.

All five chapters follow the same pattern. While the fighter, bomber, and helicopter chapters cover just those types, the miscellaneous chapter is just that—everything

else: transports, airborne early warning, seaplanes, trainers, and even the Concordski (Concorde SST equivalent) are covered. Unfortunately, as he says, these are "far less interesting" to many readers than the armed aircraft, "but [they] are just as crucial" to any airpower application. There are no concluding chapters that do any analysis or summarization.

Overall, this book is an excellent survey of Soviet Air Force and Naval Aviation equipment during the Cold War. But, it is just that—a survey. The photo coverage is very good. Many of the types are shown at the great Air Force Museum at Monino, the home of the last types of many of these aircraft. There are no three-view drawings of the aircraft, or performance tables, or other sources of detailed information.

For someone not all that familiar with Soviet aviation during the Cold War, this is really a great place to start. A reader gets the overall picture and then can delve into the *Wikipedia* articles on the individual aircraft types or any of dozens of books that go into more detail about the overall Soviet Air Force or the specific planes.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and former National Air and Space Museum docent

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His Majesty's Airship: The Life and Tragic Death of the World's Largest Flying Machine. By S.C. Gwynne. New York: Scribner, 2023. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Bibliography. Index. Pp. x, 299. $32.00. ISBN: 978-1-9821-6827-8

In 1924 Britain elected its first Labour government. In a remarkable decision, it undertook construction of two massive lighter-than-air airships to be named the R100 and R101. They were distinctly different vehicles. R100 was to be built by a private contractor and was more conservative in design, based mainly on German Zeppelin structures used in World War I. R101, built by a government consortium, was to be the more advanced and was (or should have been) considered more of a research vehicle. The downfall of the R101 and the entire British airship program came when personal and political pressures overcame known engineering, materials, manufacturing, and performance limitations—and nobody dared to say "Stop."

A key factor was the personality of Lord Thomson, Secretary of State for Air and overseer of the airship program. An ambitious man and close friend of the prime minister, he saw the airship as the key to maintaining timely connections with Britain's vast empire—especially India. And Lord Thomson made little secret of his personal ambition to be the next Viceroy of India!

Both vehicles had known major handling problems. The tradeoffs to maximize available lift (i.e., payload) while achieving intercontinental range were certainly beyond the level of knowledge 100 years ago. The materials to create a strong, safe, yet light structure 755 feet long did not exist. The massive gas bags, holding five million cubic feet of explosive hydrogen, were made of animal intestines. (Helium, on which America had a monopoly, was not the cure-all, as was seen in the losses of US Navy airships *Shenandoah*, *Akron*, and *Macon*.)

Test flights of both vehicles were hurried, abbreviated, and not reported in detail. "Bad news" stopped well short of the Cabinet level. Massive repairs to the acres of external fabric were often carried out in flight. But the greatest shortfall of the R101 was its weight. It was 26% overweight when that figure was finally assessed. That extra weight came at the cost of payload. So, an extra 500,000-cu-ft gas bag was hurriedly inserted into the completed airframe.

The tragic end of the R101 took place in October 1930. Lord Thomson had advocated a high-visibility round trip to India and, despite clear advice to the contrary, insisted it take place. Bad weather dogged the flight from its beginning. R101, already 2-1/2 hours behind schedule, crashed into a hill 60 miles north of Paris. A massive hydrogen explosion occurred. Lord Thomson and 47 other men died at the scene. There were only six survivors.

Gwynne clearly states his case that the program was a massive mistake (Chapter 2 is entitled "Brief History of a Bad Idea)). He introduces some familiar personages of the era (Winston Churchill, R100 designer Barnes Wallace, Lord Trenchard of the RAF, and Air Vice-Marshal and future Battle of Britain hero Hugh Dowding). There is technical detail aplenty along with insightful looks at Britian's society as it settled into the Depression.

This book certainly holds the world's airship programs up to a glaring light and finds them all lacking. Even more important to current readers is that it points out the perils of an organization lead by a zealot, and the terrible costs of an acquisition program conducted without an honest evaluation process.

Ron Davis, Valiant Air Command, Inc. Warbird Museum, Titusville FL

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Cuban MiGs: The Defenders of Castro's Air Force. By Helio Higuchi and Paulo Roberto Bastos Junior. Vienna, Austria: Harpia Publishing, 2022. Photographs. Maps. Bibliography. Illustrations. Tables. Appendix. Index. Pp. 137. $41.95 paperback. ISBN: 978-1-950394-09-8

Higuchi has contributed numerous articles on Latin American military affairs to Brazilian publications. He translated this book's original Portuguese manuscript to English. Co-author Bastos also writes about military topics, particularly mechanized forces. He edits the Brazilian journal *Tecnologia e Defesa*,

This effort is essentially a history of the Cuban air

force. The writers proceed in chronological fashion. The first two chapters focus on Cuban military aviation during the Fulgencio Bautista regime and the early years of Fidel Castro's emergence as the nation's leader. Numerous incursions by counter-revolutionaries from the second half of 1959 into early 1961 prompted Castro to upgrade his air force, which then consisted primarily of aging American and British aircraft. The second chapter also summarizes Cuba's success in thwarting the April 1961 invasion at Playa Giron, known in English as the Bay of Pigs.

Facing diplomatic challenges in acquiring aircraft from the West, Castro turned to the Soviet Union, which began delivering MiG-15s just a month after the invasion attempt. In November, Cuba received MiG-19s; but Cuban pilots encountered difficulties adapting to the newer model. Of the 12 flown by the Cubans, four were lost in crashes through 1965.

After devoting a chapter to the October 1962 Cuban Missile Crisis, the authors move on to the MiG-21. In September 1963, the Cubans officially gained control of MiG-21s supplied by the Soviet Union. With the MiG-15s rapidly aging, the Soviets replaced them with MiG-17s. To enhance the MiG-17's capability against US aircraft, Cuban technicians—independent of the Soviets—armed it with air-to-air missiles. Over the coming years, Cuba would receive assorted MiG-21 models.

With the most potent air force in Latin America in the 1970s, the Cubans used the MiG-21 to intimidate neighboring island nations who, they believed, had acted improperly in seizing Cuban fishing boats.

In the 1980s, before the collapse of the Soviet Union, the Cubans also received MiG-23s and MiG-29s, but never in the quantities approaching that of the MiG-21.

Cuba's aircraft are best known for participating in the civil war in Angola (1975-1991) following that country's independence from Portugal. The authors also mention several other nations Cuba supported: North Vietnam (1967-1975), Guinea and Portuguese Guinea, Syria (1973-1974), South Yemen (1973-1976), Ethiopia (1977-78), and Nicaragua (1979).

Drawing on numerous Cuban sources, the authors offer an insight into what, in the second half the 20th century, was one of the most capable air forces in the Western Hemisphere. The appendix features color illustrations of the various MiGs that should be of interest to modelers. This book is highly recommended for anyone with an interest in Soviet-built aircraft, "small-country" air forces, or both.

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

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Bf 109 *Jabo* Units in The West. By Malcolm V. Lowe. Oxford UK: Osprey, 2023. Photographs. Drawings. Appendices. Bibliography. Pp. 96. $25.95 paperback. ISBN: 978-1-47285445-2

In the current age of multi-mission aircraft, we tend to forget that, not so long ago, fighters were fighters and bombers were bombers, and never the twain should meet. But in the earliest stages of the conflict that would become World War II, air forces came to realize that the fighter characteristics of speed and maneuverability would serve a bomber well. Lessons learned by the Luftwaffe's Condor Legion in Spain resulted in the creation of fighter-bomber, or *jagdbomber* (*jabo*), units in the earliest phases of the war in Europe.

Using the advanced Bf 109 E as a basis, modifications were made to permit carriage of bombs to augment the already improved weapons suite. My initial thought was the Bf 109 was a poor platform to turn into a bomber. It was a small airframe with a small fuel capacity (meaning either short range or reduced weapon load); the cockpit was equally small; and the pilot had poor ground visibility. There was no bombsight as such. Lines drawn on the cockpit window provided a ground reference, and the Revi gunsights served as a makeshift bombsight. Luftwaffe tacticians, led by Hauptman Franz Liesendahl, developed the unique *Liesendahl Verfahren* (Liesendahl Method) attack profile, "a very fast initial low-level approach at wave-top height at a speed of 450km/hr. When 1800m from the target, a rapid climb to 500m and level off. Dive to the target at 3 degrees with speed increasing to 550km/hr. Using the Revi gunsight, pull up and release the weapon, lobbing the 250kg bomb toward the target."

Keep in mind, one of the advantages the *jabo* offered was pinpoint surgical strikes on small, high-value targets. Lobbing a bomb doesn't seem very precise. The tactic sounds like the LABS maneuver used by SAC B–47 aircrews, but those crews used city-busting nuclear weapons targeting large urban areas. In the early stages of the Battle of France, Battle of Britain, and attacks on shipping in the Channel, the Liesendahl Method was surprisingly effective, and the RAF had a very difficult time defending against the *jabos*.

But, not for the first or last time, the Luftwaffe proved to be its own worst enemy. Many fighter units did not embrace the *jabo* mission and avoided assigning aircraft and pilots to it whenever possible. As German interests turned east, units were moved from the west to support Russian and Mediterranean operations, and the number of aircraft available in the west quickly shrank. But while the Luftwaffe seemed to lose interest, the RAF and USAAF embraced the fighter-bomber mission and fielded the Tempest, Typhoon, and P–47 (perhaps the ultimate World War II *jabo*).

Lowe finishes his book with a detailed description of Operation *Bodenplatte* in January 1945, perhaps the Luftwaffe's last gasp in the west and the ultimate *jabo* operation. While the Luftwaffe enjoyed some success, the cost in losses of planes and pilots was catastrophic.

As with most Osprey books, this is a quality product. The small font size annoys older readers, but the quality

image curation was very useful in advancing the narrative. It is an excellent read and contains information useful to armchair historians.

Gary Connor, Cortland OH

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Fighting from the Heavens: Tactics and Training of USAAF Bomber Crews, 1941-1945. By Chris McNab. Philadelphia: Casemate, 2023. Maps. Diagrams. Illustrations. Photographs. Bibliography. Pp. x, 214. $29.95. ISBN: 978-1-63624-382-5

With more than 100 titles to his credit, McNab has specialized in military history and military technology for many years. He has become an expert at mining military training manuals. Since these documents typically are free of copyright restrictions, he has unleashed a treasure-trove of information seldom seen or studied by the public.

Fighting from the Heavens neatly fits this model. In this volume, he copies the text, illustrations, diagrams, and maps from pertinent manuals. At the beginning of each chapter, he includes a few paragraphs providing context for the material that follows. Most chapters conclude with a passage from various wartime issues of *Air Force*. These stories typically involve a crew member reflecting on a particularly difficult mission.

He includes a chapter on recruitment and training and covers the various crew positions: Pilots and co-pilots, bombardiers, navigators, radio operators; gunners, and flight engineers. The final chapter summarizes the challenges of bombing missions in World War II.

The pilot and co-pilot chapter draws heavily on the manual for Consolidated B–24 crews in the spring of 1945. It emphasizes formation flying and supporting squadron and group operations. This chapter includes relatively brief excerpts from the North American B–25 manual for 1945 covering different types of missions. It also includes excerpts from the Boeing B–17F manual for 1944.

For the chapters concerning the bombardier, navigator, and radio operator positions, McNab once again turns to the B–24 pilot training manual for 1945. The sections included in the book feature bombing from different altitudes, troubleshooting, and crew coordination. The passages for a B–24 navigator and radio operator are limited to just a few pages. However, he does include a portion of the Combat Crew Manual for XX Bomber Command in 1944 that are similar in length to the B–24 excerpts. The XX Bomber Command introduced the Boeing B–29 to combat.

Rather than focus on a particular aircraft, *The Gunner's Information File – Flexible Gunnery* (1944) applied to all gunners. This is one of the book's longest chapters. It includes numerous diagrams showing how to shoot enemy fighters from various positions: powered turrets and side, nose, and tail positions.

The chapter covering the flight engineer's responsibilities concerns the B–29 in 1944. The final chapter covers coping with antiaircraft guns and dealing with inflight emergencies.

This book is a straightforward account of how American bomber crews were expected to perform while flying in combat. It is recommended to anyone with an interest in World War II multiengine bomber aircraft. However, it should be noted that the title is very misleading. The book covers manuals from 1944 and 1945 only. How the manuals changed between 1941 and 1945 deserves investigation.

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

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RAF and USAAF Airfields in the UK During the Second World War – A Complete Gazetteer. By Geoff Mills and Daniel Knowles. Stroud UK: Fonthill Media, 2022. Illustrations. Maps. Photographs. Glossary. Bibliography. Pp. 653. $70.00. ISBN: 978-1-78155-837-9

There are many books written of the brave pilots who defeated the Luftwaffe in the skies over England during the Battle of Britain and the pilots and aircrews who took the war to the European Continent to defeat the Nazi war machine. The stories of their heroics and sacrifice are as heart racing as they are inspirational. But from where did these heroes and their aircraft embark to wage war against tyranny? Geoff Mills and Daniel Knowles describe in meticulous detail the planning, design, material, and construction of the more than 500 airfields Britain prepared for their own and allied air forces. They describe in minute detail the design and functional aspects of the airfields and the nuances of their being suited for fighters or for bombers. For aviation enthusiasts with an eye for architecture and construction design stratagems, Mills and Knowles describe the evolutionary steps taken to design airfield geometry as it pertained to operations, administration, and logistics from munitions storage and transport, to personnel billeting, mobility, and sustainment.

Mills and Knowles' book is an exceptionally well-crafted gazetteer. Airfields such as Royal Air Force (RAF) Northolt, home of the famed Polish Number 303 Squadron RAF, and RAF Kenley, home of the renowned RAF Number 501 Squadron, were among the bases charged with the defense of London. Pilots from these fields tallied the greatest number of victories against the Luftwaffe. Also covered are RAF Scampton, the base of the *Dam Busters*; United States Army Air Force (USAAF) Thorpe Abbots, home of the 100th Bombardment Group (*The Bloody 100th*); and USAAF Bassingbourn, home of the *Memphis Belle* and the 324th Bomb Squadron, 1st Bomb Group. I was personally drawn to USAAF Grafton-Underwood in Northamptonshire. My

father-in-law, a 20-year-old B–17G pilot with the 545th Bomb Squadron, 384th Bomb Group, flew from there until being shot down over Poland in May 1944. He and his entire crew were made POWs and returned home after the war. Until well into their 80s, he and my mother-in-law returned to Grafton-Underwood for group reunions.

A World War II airfield enthusiast, Mills thoroughly researched the United Kingdom's Word War II airfields. His vision, records, and perspectives are the foundation of this gazetteer. Sadly, he passed away before its publication. Knowles is a military historian having published works on the RAF Bomber Command and the actions of the Royal Navy during World War II. As co-author, Knowles saw to the work's publication after Mills' passing to ensure that Mills' history of these airfields endured.

Among the stories of the airfields are brief highlights and photos of the pilots, crews, and support personnel who took the war to the European continent. The base illustrations and descriptions provide tremendous technical insight into the design and building of these bases. The only components of the descriptions missing are the Jeppesen charts.

Included in this work is an account of each airfield's post-war history. Whether retained in active military service, placed in government service, or returned to the neighboring community for farming, rearing of livestock, or general use, the authors provide a meticulously detailed record of these historic fields and their contribution to the Allied victory in Europe during World War II.

Col Anthony J. MacDonald, USA (Ret)

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The Women Who Flew for Hitler: A True Story of Soaring Ambition and Searing Rivalry. By Clare Mulley. New York: St Martin's Press, 2017. Photographs. Notes. Pp. 512. $17.00 paperback. ISBN: 978-1-25018390-3

Clare Mulley has created an outstanding book documenting the lives of two extraordinary aviators. Hannah Reitsch is well known to people interested in gliding and soaring, the Third Reich, the Luftwaffe "V" weapons programs, and her unwavering support for Hitler and the tenets of National Socialism. Melitta von Stauffenberg is perhaps less well known but possibly even more accomplished, serving as an aeronautical engineer and test pilot. But von Stauffenberg was also a woman of Jewish ancestry who married into the von Stauffenberg family—Prussian nobility best known for its support of the Valkyrie Project that attempted to assassinate Hitler.

A superb biographer, Mulley weaves meticulous and voluminous research into a story that captures the reader. After only a few pages, the reader forms an emotional bond with the women, both of whom were accomplished aviators. Reitsch displays unusual courage to survive and thrive as a test pilot, surpassing the accomplishments of competitors and colleagues. Von Stauffenberg is just as capable in the cockpit but also has the intellect, training, and discipline to determine why an aircraft performed in a given manner. She completed over 3,000 dives in the Ju 87 to perfect its fearsome dive-bombing tactic. While leading several academic research centers, she developed bombsights and night-landing and long-distance navigation equipment—while knowing that her Jewish ancestry meant she could be consigned to a concentration camp at any moment.

Both Reitsch and von Stauffenberg are shown to be ardent citizens of the Fatherland even though both knew personally of the extraordinary crimes the Nazis were perpetrating in its name. Von Stauffenberg did not survive the war, falling victim to a marauding P–51 in 1945. Reitsch did survive and spent the remainder of her life as an anti-Semitic-Holocaust-denier defending Hitler and National Socialism.

Mulley shows the strong animosity between these two women. Von Stauffenberg is portrayed as a cool, calm academic who simply ignores Reitsch at every opportunity. She is an elitist workaholic who sees her success as a way to protect her vulnerable family by showing her irreplaceable value to the war effort. All of this while simultaneously plotting the murder of Hitler and the overthrow of the government. Reitsch is a ball of energy who will do anything to demonstrate her fearlessness and her love of Hitler and the Fatherland—all while cultivating friendships with anyone and everyone who could help her personally succeed. Reitsch changed personal allegiances at a moment's notice if it was to her benefit. Mulley cites numerous instances when Reitsch brought von Stauffenberg's ancestry to the attention of their Luftwaffe superiors. Unremarkably, Reitsch continued to disparage von Stauffenberg for decades after the war, blaming her "numerous failures" on her Jewish ancestry.

Because Mulley's work is very well documented, the occasional technical misstatement is a bit jarring. She describes one of Reitsch's test missions as piloting a Me 321 glider while being towed to over 30,000 ft by a Ju 52—a highly unlikely, if not impossible, feat. But Mulley struck a balanced narrative, including enough technical information to satisfy the aviation aficionado, while doing the same for the historians, social scientists, and arm-chair psychologists. To her credit, she makes the reader care about the characters—one a bit more than the other.

Gary Connor, Cortland OH

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Boeing F–15E/K/SG Strike Eagle: Action, Cockpit, Fuselage, Weapons, Maintenance. By Robert Pied and Nicolas Deboeck. HMH Publications, 2023. Photographs. Pp. 194. $44.00 paperback. ISBN: 978-2-931083-19-2

This—and I have to assume the same applies to the rest of the *Aircraft in detail* series (F–15E is the 26th title)—is a strange book. It took me quite a bit of time to even figure out who the authors are. On the next-to-last page, in very small and subdued print, I found their names. I don't know who Duke Hawkins (the prominent name on the front cover) is, and my guess is that HMH is a self-publishing outfit, with Casemate being the North American distributor. I assume the authors get permission to go out and take photographs of the subject aircraft for publication. Text is pretty much limited to photo captions.

I recognize that's a strange introduction for a review. So, what does a reader get for a somewhat hefty price? Just the greatest collection of photos of the Strike Eagle variants ever assembled. This series of books covers a specific type of aircraft in great detail, and the photography is superb. The details are crisp; the lighting let's the reader see everything; and the photographers/authors certainly didn't miss much of the outside (and a lot of the inside) of the planes. In other words, these books are primarily focused on the modeler—the larger the scale being worked, the better. This is not the kind of book that most readers of *The Journal of the AFHF* will go for.

The book's arrangement is straightforward. It covers the aircraft by major assembly—forward fuselage, wings, center fuselage, nose and then main landing gear, cockpit, etc. There are sections on maintenance and ordnance as well. The final section is where the action shots are, including a lot of excellent air-to-air work.

History, development, and use are essentially non-existent. One paragraph on the back cover essentially covers it. The paragraph ends with, "In this book we bring you a complete portrait of this awesome aircraft, both in detail and in action in over 420 photos." Hawkins and the authors certainly don't disappoint in that regard.

In summary, if one is looking for a source of details in order to build a large-scale model of an F–15E, or if one really wants to see that a modern combat aircraft is not just a lot of aluminum with a pretty paint job, this is, hands down, the book to buy. However, if one wants to understand what went into the development of this amazing weapon, what it's like to fly it in combat, and how all of the systems work, there are a number of very good books and monographs out there to be purchased. The *Wikipedia* article on the F–15E is not a bad place to start. For its purpose, this is a really superb book. I just wouldn't recommend it for most AFHF readers.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and former National Air and Space Museum docent

Belgian Military Forces in the Congo Volume 2: Congolese Tactical Air Force Co-Operation with the CIA 1964-67. By Stephen Rookes and Polydore Stevens. Warwick UK: Helion, 2022. Notes. Maps. Glossary. Photographs. Illustrations. Bibliography. Pp. 86. $22.00 paperback. ISBN 978-1-804510-12-4

True to Helion's reputation for producing first rate monographs, this is another in the Africa@War series that is, at the same time, informative and, with its illustrations and photographs, pleasing to the eye.

From the moment the Democratic Republic of the Congo (Kinshasa) gained its independence from Belgium in June 1960, it became embroiled in rebellions, coups, secessions of regional states, mutinies, and mercenary groups fighting across the breath of this huge country. Adding to the intrigue were the Soviet Union and China providing aid to anti-government forces. The United Nations, financially strapped and having pulled out of the Congo, authorized technical assistance by Belgium to support the central government in its struggle to unify and stabilize the country. One form of assistance was creation of the Congolese Tactical Air Force (FATAC), manned by members of Belgium's Air Force.

This monograph is primarily about the aircraft and men of the FATAC and their critical role, However, it also covers the CIA's clandestine military operations from December 1962 onward, primarily with B–26s and T-28C/D Trojans. Those aircraft were provided by the US Military Mission, Congo (COMISH) and flown by Cuban-exile pilots to provide close air support for the Congolese National Army (ANC).

The FATAC was equipped with thirteen C–47s and its civilian version, the DC–3. The Portuguese provided two C–54 Skymasters, and the USAF supplied six Piasecki H-21 Shawnee helicopters. Their role in the Congo was to provide transport and reconnaissance, conduct airdrops, and execute search-and-rescue missions in support of the ANC. They also airlifted to safety hostages liberated from the rebels. The aircrew members did not all go willingly to the Congo to participate in highly risky missions. However, as members of the Belgian Air Force, they were subjected to strong pressure to accept deployment for three months. Others went because of the large supplements to their pay while serving in the Congo. On all of their minds were the incidents where aircrews and civilians had experienced horrific atrocities. In one instance, ANC troops took prisoner the crew of a FATAC H-21 and were planning to execute them as spies until the timely arrival of a senior FATAC officer. On another occasion, Swedish crewmembers flying a humanitarian mission were killed after they landed. One had only to recall how, during the previous UN phase in the Congo, an Italian C–119 crew flying for the United Nations had been seized while eating a meal, taken to a riverbank, and hacked to death.

The authors detail the operating characteristics of the aircraft, especially during missions flown from short and often unimproved runways and in high ambient temperatures. The losses of overloaded aircraft flown in hostile en-

vironments and adverse conditions illustrate the everyday challenges and dangers faced by the aircrews. The FATAC was, at times, tasked to support mercenary troops fighting under direction of the government. Unfortunately, mercenaries were just as often fighting the government and forcing FATAC crews to airlift them.

This monograph captures the day-to-day life of FATAC crews as they flew highly dangerous missions in a very confusing and brutal war. It is a very informative read and a fresh look at a phase of the Cold War as it was fought in Africa.

John Cirafici, Milford DE

R. J. Mitchell: To the Spitfire. By John Shelton. Stroud UK: Fonthill Media. 2022. Notes. Photographs. Drawings. Appendices. Bibliography. Index. Pp. 445. $60.00. ISBN: 978-1-78155885-0

A book reviewer walks a fine line, balancing an analysis of the writer with an analysis of the writer's subject. The reviewer must consider both, of course. And a skilled writer will weave the tapestry of their work to tell their story "their" way. Shelton is a skilled writer who tells the story of R. J. Mitchell in excruciating detail. Considering that this is his third book on the subject, he should have Mitchell's story down pat. While Mitchell enjoyed tremendous success as a float-plane designer and winner of multiple Schneider Trophies, he is best known as the designer of the iconic Spitfire. Tragically, he died before it was accepted into squadron service, hence he never saw the role his design played in securing the Allies' victory over the Axis.

Shelton builds on his previous research and the work of Mitchell's son to build an image of Mitchell as a designer, noting that he served his apprenticeship in a locomotive works and never received formal training in any of the disciplines critical to aircraft design (e.g., fluid dynamics, systems engineering, propulsion, electronics). Shelton makes the case that, while Mitchell was lacking in academics, he was not lacking in common sense. His rapid rise at Supermarine was recognition of his common-sense problem solving and willingness to explore all possible solutions. For example, many designers recognized the value of wind-tunnel experimentation; Mitchell used wind tunnels to improve the aerodynamic efficiency of his overall designs. His early experimentation with retractable landing gear on his amphibious designs was also noteworthy for its innovation.

Mitchell was a master of lightweight construction; he could squeeze added performance from the somewhat anemic engines of the 1920s and early 1930s. By using innovative materials and production techniques, he designed aircraft that were strong and durable, but also lightweight, fuel-efficient, and practical. When frequently queried about the Spitfire's elegant elliptical wing, his practical side formed his response: "I don't give a bugger whether [the wing shape] is elliptical or not, so long as it covers the guns!"

Mitchell died of cancer in 1937 at the age of 42. He did not live to see the durability of his Spitfire design. Shelton includes a detailed description of each of the 19 Spitfire marks and 52 sub-variants to assist the reader. But Mitchell also didn't live to see the number of lives saved by his amphibian Walrus air/sea rescue platform, either.

This is a heavy read. The narrative flows smoothly, and Shelton is adept at distilling technical subject matter into comfortable text. His book offers an exceptional array of superbly curated photographs and drawings. The book's content is heavily biased in favor of Mitchell's Schneider Cup efforts and offers the Spitfire almost as something of an afterthought. Shelton's appendices add depth to the stories of people and aircraft. His bibliography is balanced and clearly cited.

This is Shelton's third book about Mitchell; he has clearly found a subject he can exploit. I am somewhat skeptical of authors who become so fixated on one subject. While specialization offers some value, perhaps he could look to Mitchell for inspiration. Mitchell mastered the world of amphibians and seaplanes, but he reached his true pinnacle of professional achievement when he expanded his horizons, accepted the challenge of the RAF's request F10/35, and gave the world the Spitfire. Perhaps Shelton could consider expanding his view as well.

Gary Connor, Cortland OH

Air Battles Over the Baltic 1941: The Air War on 22 June 1941: The Battle for Stalin's Baltic Region. By Mikhail Timin. Warwick UK: Helion & Company. copyright 2018. English Translation 2022. Photographs. Drawings. Maps. Index. Pp. 400. $79.95 paperback. ISBN: 9781804512449

Timin's work is drawn almost exclusively from Soviet-era archives of the Great Patriotic War. As such, we must assume that the archive contents reflect the Communist Party's goals and agendas of the period and not necessarily "facts." Until the Soviet collapse, the contents of the archives were highly classified, with access limited to party-approved researchers. Since declassification, access has improved; it is possible for researchers to compare archive data to other sources (other national archives, private memoirs, etc.) to determine what information can be accepted at face value. An author who relies solely on the archives is asking the reader to either accept the information as presented or do additional independent research to verify and validate the data. For example, Timin talks about the difficulty training sufficient aviators to man

front-line units. Part of the manpower requirement was due to growing new units in preparation for war, but it was also due to the unmentioned Stalinist purges when 20-30% of Russian aviators were liquidated on the eve of the war. The Russian proverb "trust but verify" applies to any information derived from Soviet sources.

The USSR's "Day of Infamy" was 22 June 1941, when Nazi Germany launched Operation *Barbarossa*, sending 3.8 million troops and thousands of armored vehicles and aircraft eastward on a front that stretched from the Gulf of Finland to the Black Sea. Timin focuses on one small portion of that day: the air battles over the Baltic states (Latvia, Lithuania, and Estonia). Ironically, there were very few "air battles" as such; Russian fighter aircraft were destroyed on the ground, or Russian pilots were ordered to avoid provoking the attackers. Timin draws almost exclusively on the recently declassified archives to paint a detailed picture of that corner of a much larger conflict.

Timin begins his narrative in the early 1940s, describing aircrew training and aircraft design, production, and maintenance. He goes into some detail, even describing magneto problems with one engine and the effect that defect had on operational readiness. He offers an extraordinary number of photographs of both aircraft and people. The short biographies are very helpful for fleshing out the somewhat sterile, mind-numbing details of flight operations. To Timin's credit, he also provides information on the Luftwaffe order of battle arrayed against Soviet units.

From a volume perspective alone, the amount of detail Timin offers a reader is impressive. He has clearly broken the code in understanding how to mine data from the Russian National Archives. Unfortunately, that story is sometimes muddled by the translation. Russian and English have significant grammatical differences which make direct translation difficult, creating an English language product that is awkward and mechanical and which can be very challenging to read. A born-English speaker will find Russian text that is directly translated to be stilted and formal with pronoun use confusing and inconsistent. The bottom line: *Air Battles Over the Baltic 1941* is not a casual recreational read. A dedicated researcher will find the appendices and indexes helpful, only to be faced with the issue of the reliability of the data derived—fruit from a poisoned tree.

On one hand, I applaud Timin's work in finding and assembling the material he offers the reader. He depends heavily on soviet-era sources but does attempt to include German data to provide balance. On the other hand, the lack of corroboration and citation substantially limits the book's utility as a research tool.

Gary Connor, Cortland OH

James Stewart At War: His Career in the USAAF. By Pavel Turk. Barnsley UK: Pen and Sword Books. 2023. Photographs. Drawings. Pp. 112. $34.95. ISBN: 978-1-39906695-2

I think there is a general fascination with now-famous people who spent their formative years in military service. A significant subset of that group are then-famous people who stepped away from stellar careers to serve their country in time of war. The two names that must be at the top of that smaller list are the baseball player Ted Williams and the actor Jimmy Stewart. I won't argue with others who add Clark Gable to that short list. Of course, many other folks from the theatrical community wore the uniform in time of war, but these icons were warriors who placed their lives in jeopardy to join their countrymen. Turk offers the reader a very brief look at Jimmy Stewart's meritorious service as a bomber pilot and unit commander in the hostile skies over Europe during World War II.

Turk opens the book with an apology to the reader, noting that since he did not have access to Stewart's logbook, he had to rely on other historical sources. The result is little more than an annotated list of Stewart's training and combat missions. The list is very sterile and lifeless. We learn little about Stewart the man. Why did he feel driven to abandon his film career in favor of a B–24 cockpit? Did he fear German flak more than Luftwaffe fighters? Did he look forward to letters from home. When he screwed up, and he did screw up, did he feel he received special treatment because of his special status? What did he do during his periodic three-month breaks between operational missions and did he think these breaks affected his proficiency? Other than mentioning Stewart's feelings of responsibility for the men of his unit, Turk offers little insight into the man himself.

Stewart continued his Air Force career through the post war era. Turk offers interesting insight into his successful pursuit of the Bendix trophy. He mentions his periodic flights with active-duty Air Force crews. Some were meaningful, as with his various Strategic Air Command missions. Some were publicity-seeking, such as his pursuit of a Mach 2 pin in a TB–58. I found that anecdotal story more frightening than anything that happened over Europe.

There are several books about Jimmy Stewart's aviation career which offer greater depth and color. I highly recommend Starr Smith's *Jimmy Stewart: Bomber Pilot* (2006) for readers who are interested in the subject. I could not determine if Turk's book was translated into English, but it "feels" like a machine translation. Odd word choices and phrasing, forced informality, and a lack of narrative flow impacted the reading experience. The book is rich in photographs and even includes a large section of color profiles. But at the end of the read, the book was disappointing.

Gary Connor, Cortland OH

Danger Zone: US Clandestine Reconnaissance Operations Along the West Berlin Air Corridors, 1945-1990. By Kevin Wright. Warwick UK: Hellion, 2023. Maps. Diagrams. Illustrations. Photographs. Notes. Bibliography. Pp. 80. $29.95 paperback. ISBN: 978-1-804510-25-4

Wright is a PhD who specializes in the Cold War and international security and politics. This, combined with his interests in aviation history and intelligence, makes him an ideal author to tackle this intriguing subject.

Much of the information related to reconnaissance operations takes a long time to reach the general public. Indeed, decades later, some of it is still classified. Wright has done a great job of culling the published secondary sources, and he also includes information from archives sites as well as a number of airmen who participated in these missions.

None of what went on in the West Berlin Air Corridors and the Berlin Control Zone (BCZ) for those 45 years would make much sense without some background as to how this strange operating area came into being and how it was controlled. Wright's descriptions of these are outstanding. The Berlin Air Safety Center (BASC)—a group manned by Soviet, US, UK, and French officers—authorized all flights into and out of Berlin; but actual operational control was exercised by the Berlin Air Route Traffic Control Center (BARTCC). Thankfully, there is a list of abbreviations in the front that is easily accessible! Many other Allied groups had their fingers in the pie as well.

What was the purpose of all of this "clandestine" activity (the Soviets knew full well what was going on, but the general populace did not). There were numerous Warsaw Pact (WP) airfields, air defense sites, and military installations under and relatively near the three politically established corridors. A great deal of useful intelligence regarding new equipment (aircraft, tanks, missiles, et al.), maintenance routines, troop movements, operational exercises, possible preparations for movements against other countries, and the like was obtained. While there were instances of WP interference with flights in the corridors, no Allied aircraft was ever lost to such confrontations. It was a different "game" than that being played with flights around (or over) the borders of the Soviet Union.

The equipment involved makes up a large part of the story. Operations started with converted B–17, A-26, and C–54 aircraft. But these gave way to C–97s and C–130s that had all sorts of clandestine sensors and cameras aboard. These were all carefully engineered with covering doors that made them look just like any other "standard" aircraft. In the immediate BCZ, the Army had UH-1, O-2, and UV-20 aircraft flying around all the time—some of these just happened to have cameras aboard as well. All of these assets are depicted in excellent photos and sideview illustrations.

Helion has another winner in this volume. The quality of writing that they must demand of their authors is first rate. The maps, tables, and photo captions only add to the excellent text. For anyone interested in the cat-and-mouse game of aerial reconnaissance during the Cold War or for a different look at how the strange setup around Berlin and East Germany functioned for four and half decades, this is a good book to add to your collection.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and former National Air and Space Museum docent

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F4F Wildcat: South Pacific, 1942-43. By Edward M. Young. Oxford UK: Osprey, 2023. Photographs. Illustrations. Maps. Diagrams. Pp. 80. $23.00 paperback. ISBN: 978-1-47285486-5

Journal readers will likely readily recognize expert author Young, an accomplished writer of many books on military aviation, primarily focused on the air war in World War II's Pacific Theater. After reviewing this book, I re-read his *F4F Wildcat vs Zero-sen, Pacific 1942* (Osprey, 2013). These two books would have made an excellent single comprehensive volume about the F4F–4, Guadalcanal, and the *Zero-sen*.

This book is well written and follows the standard Osprey layout. There are plentiful maps, illustrations, and photographs; and the general flow is engaging. Young does not rigidly grind through the technical data about the aircraft and then try to place it into the context of the battlespace. Instead, he nicely moves through six chapters: In Battle, Setting the Scene, Path to Combat, Weapon of War, Art of War, and Combat.

Young starts with the Wildcat's birth as the XF4F–1 biplane to its main operational variant, the F4F–4. He clearly explains the drawbacks of the F4F faced by its Naval and Marine Corps pilots. The *Zero-sen* was superior in climb, maneuverability, and speed. American pilots had to develop tactics suited to the F4F. Here, Young excels with an in-depth explanation of how the naval aviators developed their offensive and defensive approaches to dealing with the enemy. The tactical contributions by Naval Aviators LCDRs James Flatley and John Thach are explained in detail. The "Thach Weave," later officially called the Beam Defense Position by the Navy, became the standard defensive approach when engaging the *Zero-sen*. This book provides an excellent diagram and explanation of the Thach Weave.

Young deftly transitions from technical data about the aircraft to tactical applications. This book easily could have been a dry read about a less-than-glamorous aircraft. Instead, it shines with an excellent combination of technical, tactical, and in-theater data with well-placed extensive primary source material.

This is not a book for the novice reader of military aviation history. The reader should have a thorough knowledge of the geopolitical situation before 1941 and what the

American situation was in the early, dark days of 1942. Readers also need to understand how the Battle of Midway relates to the landing on Guadalcanal and where the F4F fit into this complex battle space. Young does well to cover some of this, but it was not his objective to provide a comprehensive history of the Guadalcanal campaign.

Overall, this book is well done, highly recommended, and in line with Young's other fine books. The F4F is presented in a narrow context, which is essential for what this book was meant to do. It would have been easy to drift from what he set out to do. He does mention that the F4F had a lengthy career and served until the end of the war. Its use in hunter-killer, Wildcat-Avenger squadrons based on escort carriers is also mentioned. But Young stayed the course and presented the part of the Wildcat's career he promised, which is this book's strong suit.

John R. Hladik, MA, research / archives, National Museum of the USAF

American Interceptor: US Navy Convoy Fighter Projects. By Jared A. Zichek. Horncastle UK: Tempest Books, 2022. Tables. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. 350. $58.75. ISBN: 978-1-911658-94-8

In the opening years of World War II, the Battle of the Atlantic saw the sinkings of thousands of tons of Allied shipping—shipping that was vital to bring the supplies Britain and the USSR needed to prosecute the war against Germany. Outside the range of friendly air cover, these convoys were decimated by Nazi subs and aircraft. Some merchant ships were equipped with catapulted fighters (Hurricats), but this was hardly to answer to protecting convoys. When enough escort carriers were ready, friendly air protection became a reality. But these required expenditures of huge resources.

When the war was won, the US Navy had to turn its attention to protecting convoys that might have to be used in a potential conflict with the USSR. How would it keep nuclear-armed aircraft from getting within range of vital convoys? After many studies, the Navy decided that a turboprop-powered, vertical-takeoff-and-landing plane launched and recovered from merchant ships could be the answer. In November 1950, the Navy issued a solicitation to American manufacturers for proposals for such an aircraft.

Five contractors responded: Convair (Model 5), Martin (Model 262/262P), Goodyear (GA28A/B), Northrop ((N-63/63A), and Lockheed. This is story of how they developed their responses to the solicitation. Using primarily original sources (test reports, patents, and the proposals themselves), Zichek has put together a story never before told

and covers each of the five company's efforts in separate chapters. The book is lavishly illustrated with hundreds of photographs of models, mockups, wind-tunnel tests, and engineers at work; engineering drawings of both all-up aircraft and many of their included systems; and tables of projected performance and specifications. He also includes side-view illustrations of what production models of the aircraft would have looked like in Navy colors. The text well describes the decisions that had to be made and the tradeoffs involved in coming up with a proposal that would result in a contract from the Navy.

Two companies received contracts: Convair for the XFY–1, and Lockheed was assigned to develop the XFV–1. Both aircraft were built and flew, although the Convair bird is the only one to actually transition from vertical takeoff, to horizontal cruise, to vertical landing. But Zichek emphatically points out that this is not the story of those aircraft and why they failed to go into production. Other books ably do that.

The story ends with a number of other proposals for the USAF and Army that were related to the developments stemming from the 1950 solicitation. None of these went into development.

In the end, this book is certainly not a "Here I was at 30,000 feet" kind of story. It is an excellent study of the effort involved in deriving the basic idea of what a Service feels it needs to field in order to carry out a mission and then how industry attempts to translate those ideas into hardware that can perform in the real world. This story isn't often told. For anyone interested in this aspect of weapons systems development, this is certainly an excellent book to read.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and former National Air and Space Museum docent

The Arab-Israeli War of Attrition 1967-1973, Volume 1: Aftermath of the Six-Day War, Renewed Combat, West Bank Insurgency and Air Forces. By Bill Norton. Warwick UK: Helion, 2022. Maps. Tables. Illustrations. Photographs. Notes. Bibliography. Pp. viii, 80. $29.95 paperback. ISBN: 978-1-804512-25-8

Norton spent forty years in engineering flight test including twenty with the U.S. Air Force. In recent years, he has established himself as one of the most prolific authors of aviation history, especially books dealing with specific aircraft. In this volume, he examines various aspects of the Arab-Israel conflict in the immediate years after the June 1967 Six-Day War.

He begins by briefly summarizing the events leading up to the Six-Day War and the immediate consequences of the Israeli victory. Most significantly, Israel took control of the Sinai Peninsula (formerly Egypt), the West Bank (formerly Jordan) and the Golan Heights (formerly Syria).

The early chapters examine the political situation in the nearby Arab states as well their efforts to re-arm along with Israel. The emergence of the Palestinian Liberation Organization (PLO) in western Jordan would influence Israeli defense actions. Artillery barrages, air strikes, and commando raids all became tools for the belligerents' attempts to coerce their adversaries.

Following his review of the impact of land and naval forces, Norton devotes two chapters to air power. In Chapter Five, he details the value of air bases throughout the region and provides orders of battle for the nations involved.

Chapter Six analyzes what he considers the strengths and weaknesses of the various air forces. Aside from examining air-to-air and air-to-ground capabilities, this chapter also includes a look at aerial reconnaissance, aerial refueling, special operations, and antiaircraft defenses.

The book concludes with a chapter on the Israeli army's efforts to counter Palestinian raids launched from Jordan. Norton details the March 1968 Israeli assault on a Palestinian stronghold in the Jordanian town of Karameh and the aftermath.

Norton relies on a topical approach for the most part. Most chapters emphasize Egypt and Israel while including Syria, Jordan and, sometimes, Lebanon. Untangling the sequence of events poses a minor challenge, at least for this reviewer. Also, this volume appears to focus on the situation through 1968.

Despite these organizational shortcomings, this work is packed with information and should appeal to anyone with an interest in the history of conflict between Israel and its neighbors. Modelers will appreciate the color illustrations of armored fighting vehicles and aircraft.

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

PROSPECTIVE REVIEWERS

Anyone who believes he or she is qualified to substantively assess books for the journal should contact our Book Review Editor for a list of books available and instructions. The Editor can be contacted at:

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Compiled by
George W. Cully

December 7-9, 2023
The **National World War II Museum** will host its 16th annual International Conference at the Museum in New Orleans, Lousiana. For registration, see the Museum's website at 16th International Conference on World War II | The National WWII Museum | New Orleans (nationalww2museum.org).

December 11-13, 2023
The **Association of Old Crows** will hold its 60th Annual Symposium and Convention at the Gaylord National Resort & Convention Center in National Harbor, Maryland. For more information, ping a Crow at AOC 2023 (crows.org).

January 4-7, 2024
The **American Historical Society** will hold its annual gathering at the Hilton San Francisco Union Square Hotel in San Francisco, California. For further details, see the Society's website at Annual Meeting Program | AHA (historians.org).

January 18-19, 2024
The **NASA History Office** and the **National Air & Space Museum** will jointly sponsor "Discover@30 and New Frontiers@20: a Symposium on NASA's Discover and New Frontiers" space exploration programs. This event will be held at the National Academy of Sciences Building, 2101 Constitution Ave, Washington, D.C. For details visit the web site at www.nasa.gov.

February 2-3, 2024
The **Institute for Political History** and the **Arizona State University Center for American Institutions** will co-host a Policy History Conference at the Tempe Mission Palms Resort in Tempe, Arizona. The theme of this year's gathering is "Policy History Studies: The State and Future of the Field". For registration, see the Institute's website at Policy History Conferences | Journal of Policy History (asu.edu).

April 8-11, 2024
The **Space Foundation** will hold its 39th annual symposium at the Broadmoor Hotel in Colorado Springs, Colorado. For more information as it becomes available, see the Foundation's website at www.spacesymposium.org/, Industry Events> Space Symposium.

April 10-13, 2024
The **National Council on Public History** will offer its annual meeting in partnership with the Utah Historical Society at the Hilton Salt Lake City Hotel in Salt Lake, Utah. The theme of this year's gathering is "Historical Urgency." For registration and other information, see the Council's website at 2024 Annual Meeting | National Council on Public History (ncph.org).

April 11-14, 2024
The **Organization of American Historians** will offer its annual conference at the New Orleans Marriott Hotel in New Orleans, Louisiana. This year's theme will be "Public Dialogue, Relevance and Change: Being in Service to Communities and the Nation." For more information, see the Organization's website at oah.org/conferences/oah24/.

April 18-21, 2024
The **Society of Military History** will host its annual conference at the Crystal Gateway Marriott convention center in Arlington, Virginia. To register, visit the Society's website at 2024 Annual Meeting | The Society for Military History (smh-hq.org).

April 22-25, 2024
The **Association for Uncrewed Vehicle Systems International** will present Xponential 2024, its premier annual event, at the San Diego Convention Center in San Diego, California. More details can be had at the Association's website at XPONENTIAL 2024 | AUVSI.

April 24-26, 2024
The **Army Aviation Association of America** will offer its 2024 Mission Solutions Summit and symposium at the Gaylord Rockies Hotel and Convention Center in Denver, Colorado. For registration, see the Association's website at Home (goeshow.com).

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

Answer: The Korean War ushered in a new age of air-to-air combat. During World War II, the United States relied on propeller-driven fighter aircraft. It was the German *Luftwaffe* that introduced jet fighters into the arena of air-to-air combat. At the end of the war, the United States had ordered its first lot of jet fighters, but they would not see combat during World War II. Five years later the U.S. (now Air Force) would be involved in an air-to-air first: the first jet versus jet air-to-air engagement. On November 8, 1950, Lt Russell J. Brown, while flying a Lockheed F–80C assigned to the 16 Fighter Interceptor Squadron, 51 Fighter Interceptor Wing, engaged and shot down a communist MiG–15. It would be Brown's only air-to-air kill during the war. When Brown shot down the MiG–15, little was known about the MiG–15 in the West. The MiG–15 had appeared in the theater only the week prior.

To learn more about the Korean War and the aircraft involved in this question:

Description of the air-to-air engagement:
https://www.af.mil/News/Article-Display/Article/126178/korean-war-pilot-achieves-aviation-first/

The Korean War:
https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196090/korean-war-introduction/ .

The P-80:
https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196116/lockheed-f-80c-shooting-star/

A more detailed. history of the P–80 (pg 1-4) and other Korean War fighters:
https://media.defense.gov/2010/May/26/2001330287/-1/-1/0/AFD-100526-027.pdf

The MiG-15: https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196115/mikoyan-gurevich-mig-15bis/

Air Superiority in the Korean War:
https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196089/air-superiority-controlling-the-skies/

The USAF in Korea Campaigns, Units, and Stations 1950 –1953:
https://media.defense.gov/2010/May/26/2001330297/-1/-1/0/Korea_Campaigns.pdf

New History Mystery

by Dan Simonsen

This Issue's Quiz: Question: 2023 marks the fiftieth anniversary of the end of the Korean War. Yes, technically, the Korean War did not with a Peace Treaty, but rather a cease-fire; however, the United States did not declare war either. Getting past the formalities of calling the Korean conflict a war vice police action, let's dive into this quarter's question. The Korean War marked a first in air-to-air combat. Can you identify the event? Hint: it happened in 1950. Stepping things up a notch, can you identify the American and North Korean aircraft involved? Finally, who was the American pilot?

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