

FALL 2024 - Volume 71, Number 3  
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# *Journal of the* Air Force Historical Foundation



know the past  
*.....Shape the Future*

# US Air Force Academy Department of History Alumni Association



A partner of the Air Force Historical Foundation, the History Department Alumni Association is an Academy Affinity Group under the sponsorship of the USAFA Association of Graduates. Its purpose is to support the USAFA History Department in its mission to “Teach History to the Profession of Arms.” This mission grows more vital every day as we move forward with technology that changes the nature of war and challenges our old assumptions. We welcome faculty alumni, former cadet history majors, academy alumni, and friends of our mission. We seek to serve as a force multiplier for the History Department in trying times. Most importantly we all share a common interest in history as a tool to contextualize thought, inform decisions, and serve as a platform for enjoying our discipline and each other. Please join us by clicking on the link below which will take you to our website where you can join us as an Alumni or as a Friend of the DFHAA. If you have questions, please email Larry Weaver, President of the Alumni association at [lweaverphd.ail.com](mailto:lweaverphd.ail.com) or call him at 703 969 1343). We look forward to hearing from you and sharing our common interest in our mission of “From Past to Future” shaping another generation of officers. <https://usafadhalumniassociation.com/>

## AFHF Moves Into the Modern Era

AFHF has moved into the modern era with its new Official Podcast: Know the Past...Shape the Future--The Official Podcast of the AFHF.

You may listen to the episodes by clicking at <https://www.afhistory.org/podcast/> or by searching any other Podcast provider. We have also taken all our Book Club episodes and War Stories interviews and are releasing them as part of our podcast series. You can find all the current episodes at the link above.

Join Know the Past...Shape the Future this fall with our guests Gen Ron Fogleman and Mrs. Natalie Crawford as they discuss the New World Vistas Scientific

Study created by the AF Scientific Advisory Board in 1994. Chief Fogleman was CSAF during the study and Mrs. Crawford Chaired the "Attack Panel." Three decades after the study, the successes and Failures are more apparent than ever.

Robert Arnold, Gen Hap Arnold's grandson (and AFHF Advisory Council Member), pays us a special visit and reveals the inside workings of "The Mind of an Air General."

Get ready to celebrate the 5th anniversary of the creation of the Space Force on 20 December. Our Winter Journals and Podcast episodes will focus on the actions and players who were a part of the creation of the new service.

## November 4-7 AFHF Symposium Postponed

The previously scheduled AFHF Symposium and Museums Conference has been postponed to a date to be determined in 2025. We regret any inconvenience this may cause members. As details for the new date and location are known, the Foundation will make every effort to notify our readers. Questions may be submitted to the Executive Director at [xd@afhistory.org](mailto:xd@afhistory.org).



# Journal of the Air Force Historical Foundation

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**Air Force Historical Foundation**

P.O. Box 405  
Mechanicsville, MD 20659  
(301) 736-1959

**E-mail: [angelabear@afhistory.org](mailto:angelabear@afhistory.org)**  
**On the Web at <http://www.afhistory.org>**

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**Editor**

Richard I. Wolf

**Book Review Editor**

Scott A. Willey

**Advertising**

Dik A. Daso

**Circulation**

Angela J. Bear

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Address **LETTERS** and **manuscripts** to:

Journal of the Air Force  
Historical Foundation  
70 Shannon Way  
Upton, MA 01568  
e-mail: [airpowerhistory@yahoo.com](mailto:airpowerhistory@yahoo.com)

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

Journal of the Air Force  
Historical Foundation  
P.O. Box 405  
Mechanicsville, MD 20659  
(301) 736-1959  
e-mail: [angelabear@afhistory.org](mailto:angelabear@afhistory.org)

**ADVERTISING**

Executive Director  
P.O. Box 405  
Mechanicsville, MD 20659  
(301) 736-1959  
e-mail: [xd@afhistory.org](mailto:xd@afhistory.org)

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## 2024 State of the Foundation

Dear Readers,

During the past year, the Foundation's growth and program development is soaring with help from our restructured Board of Directors and swelling membership.

Board Functions, while not the most glamorous part of Foundation leadership, have taken tremendous steps forward in both organization and governance. The Foundation bylaws committee, chaired by the Foundation Secretary, Frank Blazich, has updated and restructured the bylaws to comply with best practices for non-profit governance. You may review the final document on the members only webpage.

The Board of Directors has been restructured to support a more robust coverage of the history of the Space Force, to include a Foundation Vice Chair for Space, Stu Pettis. The Foundation is gearing up for the 5th anniversary celebration of the "Birth of the Space Force" on December 20, 2024. In recognition of this anniversary, the AFHF theme for 2025 will focus on the "Birth of the Space Force."

The Foundation's most impressive projects in the past year are research related.

AFHF has established a tremendous working relationship with the Air University Library Archives. As part of this relationship, AU Library Archives has created an AFHF research button on the Archives website. Included in that link are collections of images from a variety of sources (AF Magazine, individual collectors, the Super Sabre Society, and the Doolittle family).

For the first time since 2006, the AFHF is back in the publishing business. The Foundation has partnered with the Air University Press to create a new publishing imprint. Our goal is to publish one significant historical work each year. The first of these reprints is set to release in November 2024 during the AFHF Symposium and Museums Conference to be held in Tucson with Pima Air and Space Museum as co-sponsor. *A Few Great Captains*, by the late Pete Copp, is one of the most significant works covering the birth of American Airpower prior to World War II. The reprint will include a new Foreword, Afterword, a research guide, and updated images. It will be available digitally and, if we are lucky, in print as well.

The research page on our website has expanded tremendously and includes several new sections: Symposium panel videos, AFHF author/member lists, links to AU archives, New World Vistas Study video program from 1995, and much more.

AFHF has moved into the modern era with its new Official Podcast: Know the Past...Shape the Future. You may listen to the episodes by clicking here <https://www.afhistory.org/podcast/>, or by searching any other Podcast provider. We have also taken all our Book Club episodes and War Stories interviews and are releasing them as part of our podcast series. You can find all the current episodes at the link above.

With the dedication and skill of the Foundation Treasurer, Eileen Bjorkman, AFHF began publishing a Newsletter last February. "The Raider Chronicles" features short articles like, "Ask a Researcher," "When I Served," a quiz, a feature article, book reviews, and Foundation announcements. It is a quarterly feature, and we are seeking input from our membership for potential publication in the Newsletter. <https://www.afhistory.org/research/newsletter/>

The Foundation has been extremely fortunate to have the services of our Journal editor, Richard Wolf for more than two decades. He has announced his retirement by the end of 2025, and we will need a gifted replacement. Beginning in January 2024, the Journal became a full-color publication. The "Summer Special" edition for the past two years has been published as a 160-page softbound Journal. The 2024 edition featured a montage of aviation paintings by artist Rick Herter. Rick's work headlines what may be the finest edition of the Journal of the Air Force Historical foundation yet

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published. If you do not receive the Journal, you may order one on the Foundation Book Sale web page. <https://www.afhistory.org/programs/books/> .

This past year saw the return of the AFHF Symposium. We also included museums from across the country and the result was a wonderful mix of academic, exhibit, and discussion panels which we were able to record and distribute on our website. While attendance fell short of our goal, the content was terrific. Please join us in May 2025 for our next AFHF Symposium, details to follow at <https://www.afhistory.org/events/>

Our annual awards banquet at the Army/Navy Country Club was a wonderful event and featured the USAF Vice Chief of Staff, Jim Slife. His dinner address was one of the best in AFHF history. The event included the change of command for the Foundation, presentation of the Spaatz and Holley awards, and great fellowship among air and space power advocates. Foundation “Challenge Coins” (nice ones) were part of the evening, and each attendee took one home with them.

We would like to hear from you. Please share your ideas and consider getting involved. Opportunities exist by contributing to the Newsletter, authoring book reviews, attending AFHF events (particularly the membership meeting in the DC area in the spring each year). The continued success of many of our current and future endeavors depends on the support of our members. If you are not yet a member, we hope you will join the Air Force Historical Foundation.

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

Maj. Gen. John L. Barry, USAF (Ret.)  
Foundation Chair

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## From the Editor

This issue seems to defy all efforts to find a theme that runs between articles, except that they are all about air power. What a surprise.

Our opening article is by a return contributor, William P. Head, ably assisted by his co-author James Tindle. Bill has previously received our annual award for the best article. This one is about Operation Allied Force, and the aerial bombardment of the Balkan conflict in 1999.

Our next article is by return contributor Daniel L. Haulman, who provides a challenging and informative True/False test about the Tuskegee Airmen of World War II.

Our third article is by Richard R. Johnson, and ANG veteran and doctoral candidate at Kansas State University. He talks about Col. Robin Olds, and his leadership in the Vietnam Conflict.

Our final article is by a veteran author on technological matters, Thomas Wildenberg. He has been published in this magazine a number of times. This article is about how the USAF went about countering the SAM threats in Vietnam and the development of the Wild Weasels and their many integrated electronic systems.

We have lengthened this issue in order to publish a large number of reviews, 49 in all, to try and publish a backlog of this year’s reviews. The Winter issue will probably contain just as many.

This publication is also continuing the process of replacing our magazine editor, and the job announcement can be found on page 47. Submissions to the Foundation should be submitted by Halloween. The details are in the announcement.

The Leadership’s Message can be found on page 4. It’s worth the read. Don’t miss Upcoming Events on page 78. And the issue closes with the Mystery. Enjoy!

Richard I. Wolf, Editor

## 2023 AFHF Best Article Award

*The SA-2 and U-2: The Rest of the Story* by **John A. Schell** (Summer 2023)

The May 1st, 1960, shootdown of Gary Powers in a U-2C over the Soviet Union is an important milestone in Cold War history. Incomplete and often misleading public information masks the reality of “the U-2 incident” to this day. The timeline of events and summary offers new insights as to how the shootdown occurred and why it was truly an air battle in the skies over Sverdlovsk. It follows his earlier article in the Summer 2021 issue *The SA-2 and U-2: Secrets Revealed*.

John Schell graduated with a BSEE and MSEE in April 1970 from Penn State University and a reserve commission in the USAF. He initially worked as a radar research engineer at the Air Force Avionics Lab, at WPAFB, Oh. Assigned to the SR-71/U-2 Project Office in 1976, he led the development of ASARS-1 and ASARS-2 imaging radar prototypes for the SR-71 and U-2R. He was on the original team for the RQ-4 Global Hawk. After retirement in 2016, he volunteers at the National Museum USAF where he is a docent.

## 2024 AFHF Special Medal for “Old School” Technical Research (two articles)

*Operation Button Up: Security at Minuteman Launch Facilities* by **David K. Stumpf** (Fall 2023)

*Ballistic Missile Shock Isolation Systems* by **David K. Stumpf** (Winter 2022)

At first glance the original Minuteman launch facility and anti-penetration security design seems woefully insufficient and was readily proven so well after construction had begun on the first two Minuteman wings. Installation of the new system was part of the original construction for Wings III-VI and Squadron 20 at Malmstrom. \$70 million Operation Button Up retrofit program solved the problem and has had several updates made over the 60 years of Minuteman deployment.

In the late 1950s, designers of intercontinental ballistic missile launch facilities had to juggle hardening the facilities against nuclear weapon blast effects while maximizing reaction time and rapid force expenditure without excessive exposure time. First and foremost, however, was the need for the earliest operational capability.

David K. Stumpf, Ph.D., is a retired plant biochemist. He has written three nuclear weapon histories, *Regulus the Forgotten Weapon*, a history of the Navy’s Regulus I and II cruise missiles; *Titan II: A History of a Cold War Missile System* and *Minuteman: a technical history—The Missile that defined American Nuclear Warfare*, published February 2021. Dr. Stumpf volunteered at the Titan Missile Museum, Sahuarita, Arizona, as an historian and as a tour guide for 15 years.

## 2024 General Bryce Poe, II Award

1st Lt Erica C. Higginbotham was selected as the 2024 winner of the General Bryce Poe, II Award for her thesis “3- and 6-Degree-of-Freedom Investigation of Aerobraking to Support Cislunar and Planetary Operations.”

The technological foundations of the USAF began more than a century ago and are strengthened by the work of AFIT students like Lt. Higginbotham. We at the Foundation are exceptionally proud of her accomplishments and hope that her service career is filled with success and excitement.



## AFHF Two Air Forces Award for 2023

Wing Commander B Durham MBE, RAF, was selected as the winner of the Air Force Historical Foundation’s Two Air Forces Award for the year 2023. His winning paper: *And if Deterrence fails? The Case for Qualitative Edge and Combat Mass in a 21st Century Air Force*, was selected for this award by the Royal Air Force Historical Society. It symbolizes the rigorous review of academic effort that is essential for our two air forces’ continuing success.

Since 1996, the two organizations have combined to recognize excellence in the academic arena. As Wing Commander Durham continues to excel in future assignments, we have no doubt that he will help shape our combined air power heritage and will embody the highest standards of the Royal Air Force and the U.S. Air Force.





# Operation Allied Force and the Role of Air Power

William P. Head & James Tindle

A formation of A-10s as seen from the refueling tanker.

**A**rguably, one of the most successful campaigns in Air Power history was Operation Allied Force (OAF). In its immediate aftermath, on June 6, 1999, the preeminent military historian, John Keegan, in a *Daily Telegraph* editorial, wrote:<sup>1</sup>

*There are certain dates in the history of warfare that mark real turning points. November 20, 1917, is one, when at Cambrai the tank showed that the traditional dominance of infantry, cavalry, and artillery on the battlefield had been overthrown. November 11, 1940, is another, when the sinking of the Italian fleet at Toranto demonstrated that the aircraft carrier and its aircraft had abolished the age-old supremacy of the battleship. Now there is a new turning point to fix on the calendar: June 3, 1999, when the capitulation of President Milošević proved that war can be won by air power alone.*

How accurate is this claim? Was the Allied victory in Kosovo a victory for air power alone? Was it a victory at all? The only North Atlantic Treaty Organization (NATO)/United Nations (U.N.) forces used over the nearly four months of OAF were military aircraft. Not until after Serbian ground forces had withdrawn were NATO peace keeping ground troops introduced.

In many ways, OAF was the culmination of the aerospace technological revolution that began during the Persian Gulf War, which was culminated by a brief and, some have argued, unnecessary ground conflict. The possibility of such a victory had been strongly suggested in Bosnia when NATO air power had forced a peace settlement among the warring parties, but it had been such a small display few felt it significant. The air campaign was also complemented by a Croatian ground offensive which was not entirely tied to OAF.<sup>2</sup>

Slightly more than 100 years ago, British Air Marshall Hugh Trenchard formed the first independent air force and, as Keegan reminds us, this was done “on the expectations that aircraft had ceased to be mere auxiliaries to armies and navies and could achieve, henceforth, decisive results on their own.” Certainly, Giulio Douhet and Billy Mitchell advocated such concepts. According to Keegan, “That became the creed of the new Royal Air Force [in 1918], as it was to become that of the eventually much more powerful United States Army Air Forces.” Thus, “The idea of ‘victory through air power’ was to be held by both as an article of faith, a true doctrine in that believers clung to it in the face of all contrary material evidence.”<sup>3</sup>

Even though the post-World War II U.S. Strategic Bombing Survey cast doubt on the “decisive” role of air power in Europe and the Pacific, those who helped form the U.S. Air Force held to the theories of their founding fathers, albeit with modifications and often in moderation. The frustrations of Korea and Vietnam only made air power proponents work



Southeastern Europe in the 1990s

harder to upgrade their weapons and reform their forces and policies. The Gulf victory gave them reason to believe they were on the right track. For many, Kosovo meant a realization of the dream. Perhaps the goal was not victory alone, for that is not really what most of the air power proponents meant but, rather that someday, air power, “alone,” would form the tip of the spear.

## Background of the Conflict

It is impossible to evaluate OAF without first recalling

*Dr. William P. Head is Chief, 78th ABW History Office, Robins AFB, Georgia. He received his Ph.D. in U.S. diplomatic history from Florida State University in 1980. He has fourteen book-length publications to his credit. His most recent book is Storms over the Mekong: Major Battles of the Vietnam War (Texas A&M, 2020). For his work Shadow and Stinger: The History and Deployment of the AC-119G/K Gunships (Texas A&M, 2007), he received the AFMC Book Award and won the Frank Futrell Air Force-level prize. He also wrote Night Hunters: A History of the AC-130s and their Role in U.S. Air Power (Texas A&M Press). Dr. Head has authored forty articles and a like number of book reviews in such journals as Air Power History, Virginia Review of Asian Studies, Journal of Third World Studies, Journal of Military History, and the Journal of American History. He has made presentations on Modern Military, air power, Asian and American history to 106 scholarly meetings over the past thirty years.*

the history of the region and the conflict that left it a devastated relic of this post-Cold War struggle. Most of the people living in modern Kosovo are ethnic Albanians. Problems in the late 1990s harken back to the Battle of Kosovo Polje (Field), in 1389, when a Christian army of Serbs, Hungarians, Bosnians, Poles, Albanians, and Vlachs was defeated by Ottoman Turkish forces led by Sultan Murad I. This battle has since become a patriotic event in Serbian history because, as one Serbian proverb declared, “Wherever Serbian blood has been shed there lies Serbia.”<sup>4</sup>

After the Turkish occupation, the only remnant of Serbian culture in the Kosovo region was the Orthodox Church and her monasteries, many of which still exist today. Between 1804 and 1878, Serbian forces, often supported by Russia, finally regained their independence. In 1913, after the Balkan Wars, Kosovo once again became part of Serbia even though 90 % of Kosovars were, and are, ethnic Albanians, speak Albanian, and are Muslim. The majority of the remaining Kosovars are Orthodox Christians, ethnic Serbs, and speak Serbo-Croatian.

After World War I, Kosovo and Serbia became part of Yugoslavia. This consolidation continued after World War II following the creation of the communist regime of Joseph Broz Tito in 1948. Until the late 1960s, Albanian Kosovars suffered from repressive government policies. Tito moderated these policies in 1968 and, again, in 1974, when the new Yugoslav constitution made Kosovo an autonomous province within Serbia. In the 1980s, the death of Tito, the dissolution of Yugoslavia, and the growth of Serbian nationalism altered this bond.<sup>5</sup>

## Slobodan Milošević and the Kosovar Liberation Army

In the spring of 1987, Slobodan Milošević, a lesser known protégé of Marxist Serbian President Isan Stambolic, was swept to the forefront of Serbian politics on an enormous wave of often violent, pro-nationalist Serbian anti-government protests. By the fall, Milošević had led the overthrow of Stambolic and, by 1989, he had become President of Serbia. Soon after his ascension to power, he revoked Kosovo’s autonomy. Milošević’s apparent goal was the resurrection of a Yugoslavian state dominated by Serbia. This goal soon began to crumble as communism waned in Eastern Europe. Despite his support of violent excesses in Bosnia and Croatia, the dream of a unified Yugoslavia ended with the creation of new states like Croatia. Instead, all Milošević gained was the nickname, “The Butcher of the Balkans.” In 1995, he was forced to accept a NATO settlement to the ethnic conflicts in Bosnia. In 1996, despite this concession, Milošević was so powerful he set aside elections which his political opponents won.<sup>6</sup>

In the meantime, Kosovo erupted in protest. In 1989, following the initial revocation of autonomy, violent protests were put down. The following year, Milošević sent Yugoslav troops to formally dissolve the Kosovar’s government. By 1992, Kosovar separatists had proclaimed a republic and elected Ibrahim Rugova president. Rugova, an advocate of gaining independence peacefully, soon received recognition from Albania. However, continued repression



Serbian dictator Slobodan Milošević

by Serbian forces led other Kosovar Albanians to form the Kosovar Liberation Army (KLA) in 1996. KLA bombings and the death of two Serbian policemen on February 28, 1998, led to severe retaliation by Serbian authorities in which dozens of ethnic Albanians were killed. The Serbian dominated Federal Yugoslav Republic (FRY), the post-1980 remnant of Tito's Yugoslavia, and its neighbors were perched on the edge of yet another ethnic war. This conflict, like the one in Bosnia, led to Serbian sponsored "ethnic cleansing," or the murder of thousands of civilians, and the displacement of hundreds of thousands more.<sup>7</sup>

Tension continued to grow throughout 1998. On March 5, KLA and Yugoslav forces clashed during a battle for the village of Prekaz, where two Serb police and 20 ethnic Albanians died. Other reports indicated more than 50 other Albanian Kosovars were massacred by Serb police. Two weeks later, Kosovo voted for a new president and parliament. Serbian authorities denounced the elections calling them illegal.<sup>8</sup>

During April, both the Serbian Parliament and people (in a referendum) voted against outside mediation. In response, NATO and the U.S. imposed severe economic sanctions on Serbia. In July, following failed talks between Milošević and Rugova, the reelected Kosovar president administered the oath of office to the new Kosovo

parliament. This led to a major crackdown by Serbian police and armed forces. By August 16, they had captured the last major Kosovar rebel stronghold in the mountain town of Junik.

In September, the discovery of more mass graves of ethnic Albanians and continued fighting, led the U.N. to call for an immediate cease-fire. On the 24th, NATO representatives issued an ultimatum for Milošević to end the conflict or face air strikes against military targets. The previous October, following the withdrawal of U.S. and British nationals, a cease-fire was agreed upon so that more than 300,000 displaced Kosovars could find shelter and receive aid to avert an impending winter disaster. While this seemed to take care of the immediate problem, by January, it became clear little had changed. The discovery of more massacres and the KLA capture of Yugoslav police marked further increases in violence.<sup>9</sup>

On January 29, 1999, the six-nation Contact Group (major NATO/U.N. powers) called for a peace conference between the parties in Rambouillet, near Paris. Despite constant threats of air attacks against Serbia and an apparent tentative settlement, on February 23, peace talks remained deadlocked over Milošević's refusal to allow international peacekeepers into Kosovo and the KLA's understandable reluctance to disarm. As talks resumed on March 15, Serbian forces moved into Kosovo for a final assault which would reclaim the entire province.<sup>10</sup>

Three days later, Kosovar Albanian representatives signed the international peace agreement in Paris. Yugoslav representatives boycotted the meeting as did the Russians. The next day, the Contact Group adjourned the talks. On the 22nd, U.S. envoy, Richard Holbrooke, traveled to Belgrade in one last effort to convince Milošević to moderate his position. The next day, with international monitors leaving Kosovo, the Serbian Parliament refused to recognize Kosovo's autonomy as agreed to in the peace accords. With no apparent alternative, at 7:00 p.m., GMT, on March 24, 1999, NATO forces began air attacks.<sup>11</sup>

Over the next three and one-half months, these operations gradually escalated, witnessing the introduction of new weapons never used in combat. The operations were denounced as dangerous and inhumane toward civilians, a risky U.S. policy, dangerous to the survival of NATO, foolhardy without ground support, and/or simply not what the crisis required. Despite the criticism, by June, Slobodan Milošević had capitulated and withdrawn all Serbian forces, Kosovo was occupied by NATO/U.N. peacekeeping forces, and the process of rebuilding the broken land began. By most interpretations, air power was a decisive factor, the sole decisive factor according to some. Critics pointed to Russian diplomacy, the apparent solidarity of NATO, and even the growing threat of a ground invasion as factors in the outcome.<sup>12</sup>

### Background of the Air War

Original plans, drawn up by U.S. planners and agreed to by their NATO allies, called for a three-phased attack, without support of ground forces. Phase I was aimed at

enemy air defenses with initial suppression of enemy air defenses (SEAD) sorties against enemy command centers in Kosovo. The second phase was aimed military targets below the 44th parallel south of Belgrade. The final phase committed NATO aircraft to attack military targets in and around Belgrade. They hoped this would stop Serbian abuses of civilians and lead to the withdrawal of FRY forces. The goal was to restore peace and guarantee Kosovan autonomy.<sup>13</sup>

Even as more than 200 U.S. and 200 additional NATO aircraft prepared to strike Yugoslav military targets, including the 40,000 army and police personnel in and around Kosovo, U.S. President William Jefferson Clinton declared, “In dealing with aggressors in the Balkans hesitation is a license to kill. But action and resolve can stop armies and save lives.” The President also warned that Serb air defenses were formidable and would put U.S. and NATO pilots “in harm’s way.” He believed if NATO did not act, the conflict could spread, and thousands would die.<sup>14</sup>

The Serbian Integrated Air Defense System (IADS) was formidable. Their surface-to-air missiles (SAMS) and interconnected radar-directing systems were placed in a mountainous area full of hidden and connected valleys with low-lying clouds and constant fog. Unlike the vast, open expanses of the Persian Gulf Theater, Serbia and Kosovo were replete with mountains. The FRY’s “substantial and redundant” IADS included 50-60 SAM batteries each with dozens of Russian-made, radar-guided SA-2s, SA-3s, and mobile SA-6s. They also sported about 2,000, mostly-mobile anti-aircraft artillery +(AAA) guns and “a range of shoulder-fired missiles for lower altitude planes.” They had 240 combat aircraft, but only about 80 were of much operational consequence. These included 15 MiG-29s and 60 MiG-21s. Most of these IADSs were, at least, 15 years old; however, the FRY operators had trained to combat U.S. tactics for more than 40 years. They were better trained and had more equipment than NATO enemies had, had during the 1995 bombings in Bosnia and had better defenses than the Iraqis in 1991.<sup>15</sup>

Pentagon spokesman Kenneth Bacon warned that Yugoslav terrain presented new challenges since it was easier to hide air defenses. He noted it was harder to redeploy such assets. He concluded, “Yugoslav air defense forces are well trained, and well equipped, but if any NATO pilots were downed, special rescue teams would save the pilots like they had Capt. Scott O’Grady during the Bosnian air campaign.<sup>16</sup>

Allied planners respected the potential lethality of FRY IADS enough to predict the loss of ten aircraft during initial strikes. Of equal concern was how much the entire plan’s goal was reminiscent of Vietnam. Instead of the all-out series of well-coordinated attacks aimed at key military and infrastructure targets like in Iraq, the implied goal was to cause enough “suffering” to convince Milošević to withdraw his forces and return to negotiations—almost the same kind of strategy as LBJ’s increasing the “quotient of pain” on North Vietnam. Most western leaders believed it would be a quick victory. Some believed the mere show of



F-15s, like these, flew significant missions during OAF.

force would compel Milošević to acquiesce. They openly announced the attacks hours before the first strikes, since NATO planners reasoned it would take at least 24 hours to prepare the Tomahawk Land-Attack Missiles (TLAMs) to strike the 60 designated targets.<sup>17</sup>

### Combat Commences

At about 2:00 p.m., EST, NATO area commander U.S. Army General Wesley Clark informed NATO Secretary-General Javier Solana that OAF had begun. Soon, reports came in, from various news sources in the region, of massive explosions and blinding flames of light.<sup>18</sup> Concurrently, President Clinton announced the campaign had three goals: “to demonstrate NATO’s opposition to aggression and its support for peace; to impose a price on Milošević if he continues or escalates attacks on helpless civilians; and to diminish his military ability to wage war in Kosovo in the future.”<sup>19</sup>

With 11 NATO members participating, the first strikes came from 4 U.S. ships, 2 U.S. submarines, 1 British submarine, and 6 B-52 bombers. Ships fired TLAMs, while bombers launched AN/AGM-86C conventional air-launched cruise missiles at military, utility, and communication grids. These were followed by continuous night attacks, by NATO fighter-bombers, against FRY air-defenses, specifically SAM sites, radar and military network targets in Kosovo and southern Serbia, near Podgorica, the capital of Montenegro. To avoid enemy IADS, pilots flew above 15,000 feet even though this reduced bombing accuracy in some cases.<sup>20</sup>

Shockingly, FRY gunners did not fire a single SAM on the first night. Instead, a dozen FRY fighters launched to intercept the NATO combat aircraft making strike sorties during the first night. The Yugoslav pilots proved to be no



President Clinton and Defense Secretary William Cohen at the Pentagon.

match for NATO airmen with two MiG-29s being shot down by USAF F-15Cs and one by a Dutch F-16.<sup>21</sup>

Following the attacks, Clark told reporters, “We’re going to systematically and progressively attack, disrupt, degrade, devastate, and ultimately, unless President Milošević complies with demands . . ., we’re going to destroy these forces and their facilities and support.”<sup>22</sup> This meant air strikes had to continue. At first, leadership seemed reluctant to continue the raids because during the first week, the sorties had only a minimal effect. Milošević clearly was not moved and continued to kill or expel as many Kosovar Albanians as possible.

From the outset, the Allies employed a wide range of air assets, with the U.S. contributing F-15s, F-16s, and B-52s to the initial attacks. In addition, KC-135R air refueling aircraft proved essential for the attack aircraft to reach targets and return from sorties. One of the most amazing attacks was by two B-2 Stealth bombers of the 509th Bomb Wing flying out of Whiteman AFB, Missouri, launching two satellite-guided 2,000-pound bombs obliterating targets inside Yugoslavia. As one report read, “Flying 30-hour-long, non-stop missions from Whiteman to Yugoslavia and back, 2 USAF B-2s attacked heavily defended targets in all weather conditions and all returned without a scratch.” The success of the \$2.1 billion aircraft, while spectacular, had greater ramifications for the future of air power than for the outcome in Kosovo. As one analyst declared, “In its first combat test, the B-2 bomber defeated not only the Serbian air defenses but also the critics who

for years had insisted it would not work as advertised or would never be risked in real war.”<sup>23</sup>

On March 27, another kind of American aircraft made headlines when a USAF F-117A was shot down by ground fire near Belgrade. It was the kind of news every NATO leader feared. After several hours of gripping television coverage, the pilot was rescued, unharmed. With the potential of casualties now thrust before the public, the tepid support for Clinton’s policy in Washington and the nation, came bubbling to the surface. While Congress “officially” supported the President many, like Arizona Senator John M. McCain, a former Vietnam era Navy pilot and one of America’s most famous POWs, led some respected critics who wondered how the current trickle of bombs would ever get the Serb leadership to curb its inhumanity. Referring to the policies of Vietnam, where constant pauses and targeting restrictions thwarted an effective air war, McCain called for NATO to “crank it up or get out.” There were even private and guarded criticisms of the operations within the Air Force.<sup>24</sup>

This criticism, the increased suffering of the Kosovars, and the clear need for more action led Gen. Clark to ask for and receive North Atlantic Council permission to intensify the offensive. Thus, the ops tempo increased. On March 29, Defense Secretary William S. Cohen announced the U.S. was sending five B-1B “Lancer” bombers, five EA-6B “Prowler” long-range, all-weather aircraft equipped with electronic countermeasure, and ground-attack aircraft designed to degrade enemy air defenses. In addition, ten refueling aircraft and “several Predator and Hunter unmanned aerial reconnaissance aircraft were sent to Europe.” This brought to more than 250, the number of aircraft and 7,300, the number of U.S. personnel committed to OAF. Cohen also suggested the Army’s highly publicized AH-64 “Apache” attack helicopters might also soon be deployed. This remained a controversial subject since many in NATO, Washington, and the administration feared the Apache would signal, to a squeamish public, that a potentially bloody ground war was in the offing. Equally important, even though Clark wanted a ground option as well as the Apaches, many military experts worried privately if they could survive in such a missile and AAA laden environment.<sup>25</sup>

Even with this increase, Phase II of the campaign dragged along with only a “50-70 average daily sortie rate, a far cry from the 800-1,200 during the Gulf War air campaign.” Worse, bad weather and orders not to risk bombing nonmilitary targets meant dozens of sorties returned without having dropped their ordnance. Thus, Milošević, like North Vietnamese leaders of the 1960s/1970s, had hunkered down in safety, unconcerned with the suffering of his army or people and stubbornly continuing the cruel mass expatriation of Albanian Kosovars.<sup>26</sup>

Despite massive U.N. relief efforts which created sprawling border tent towns mostly on the Albanian border, it soon became clear the neighboring countries and provinces of Albania, Macedonia, and Montenegro could not accommodate the hundreds of thousands of displaced people. The U.N. and dozens of international aid agencies

began discussing airlifting thousands to other countries to avert a humanitarian catastrophe. Concurrently, leaders began to focus on aerial interdiction to cut off the Serb and FRY military forces and threaten both Milošević's base of power and his means to displace Albanian Kosovars.<sup>27</sup>

## The Conflict Drags On

On March 29, the first chink in Milošević's intransigence began to appear. After meeting with Russian Premier Yevgeny Primakov, Milošević said he would withdraw some forces if NATO would cease bombing. The NATO leadership, including President Clinton, Prime Minister Tony Blair, German Chancellor Gerhard Schroeder, and French President Jacques Chirac roundly rejected the proposal calling it "unacceptable."<sup>28</sup>

Milošević's attitude grew even more defiant, two days later, when the U.S. suffered the humiliation of having three noncombatant soldiers abducted and beaten while patrolling on the border of the Former Yugoslav Republic of Macedonia. NATO leaders put on a brave face, but they all realized the danger. Clark declared, "We've all seen their pictures . . . We don't like the way they were treated." British Foreign Minister Robin Cook condemned the affair saying, "There is no justification for using soldiers who have been captured for propaganda purposes."<sup>29</sup>

However, this was exactly what Milošević did. In the U.S. the media played up the story wondering if any Americans lives were worth involvement in a strictly European affair. With domestic support for Clinton already shaken by earlier impeachment proceedings at home, the general isolationist sentiment of U.S. citizens, the downing of the F-117A, and Milošević's defiance, the entire incident placed not only OAF but, also, the future of NATO, as a viable institution, in jeopardy. While the three soldiers were released through the efforts of Reverend Jesse Jackson, the weeks of captivity undermined what was already an unenthusiastic effort. Soon, NATO leaders realized unless they acted decisively, the entire operation might backfire. On April 2, Secretary Cohen directed the deployment of 12 more F-117A Stealth fighters from Holloman AFB, New Mexico to join NATO forces conducting OAF. This addition brought to 24, the number of F-117As in the theater, and to 210, the number of strike aircraft present. Still, this increase seemed to be a trickle compared to the torrent of refugees fleeing Kosovo. By April 2, NATO authorities estimated that 634,000 people had been displaced by the fighting.<sup>30</sup>

To deal with this problem, during early April, the Department of Defense (DOD) airlifted 500,000 humanitarian ration-units including food, large tents, cots, clothes, and blankets on C-17 "Cargo Master II's," C-5 "Galaxies" and, even, civilian contract Boeing 747s. Officials also dispatched forklifts, trucks, pallets, and a 60,000-pound loader to facilitate the aid effort.<sup>31</sup>

As the Allied air campaign entered its third week, the overall focus shifted from attacks on IADS to destroying FRY/Serb supply lines and lines of communications. Using classic aerial interdiction tactics, NATO targeted not only



An F-15 dropping a bunker buster.

logistics and communication but sought to create choke points to force vehicle concentrations which its aircraft could attack. In addition, they targeted storage and marshaling areas. The entire process proved to be very difficult but not unusual. Throughout air power history, aerial interdiction has always been the hardest mission for air assets. Notwithstanding the successful isolation of the battlefields in North Africa and Normandy, Allied air operations in World War II, Korea, Vietnam, and the Gulf War proved just how dangerous and difficult such attacks were. They continued to be difficult to execute, hard to accurately assess, and almost impossible to sustain pursuant to either the attacks or the interruption of the flow of men and/or supplies.<sup>32</sup>

Aerial interdiction is often complicated by bad weather, dense foliage, mountainous terrain, and a dedicated and determined enemy. In Kosovo, NATO pilots and planners soon discovered all these factors were in play. Enemy dispersion tactics were extremely effective as were their theater air defenses. Further, successful aerial interdiction requires a robust ground presence and an intense and redundant air campaign. It is the essence of joint operations and at the core of Air Land Battle Doctrine. A ground engagement, or at least, the threat of one draws the enemy ground forces into the open, exposes their logistics lines, and forces concentration of assets, particularly vehicles, armor, and artillery. The validity of this fact has been confirmed in every major air/ground conflict since World War II. The lack of a ground element and/or the decisive, round-the-clock air assaults, as happened in Vietnam, endangered the operation.<sup>33</sup>

By the second week of April, it seemed all the elements of defeat were in place in Kosovo. The air campaign muddled on in less than a decisive fashion. The weather was horrible, the terrain often impossible, and the Serbs seemed as determined as ever. Worst of all, there was no threat of NATO ground action. The NATO leaders had emphasized this omission, from the outset, fearing a lack of public acceptance of even minimal battlefield casualties. This was a concern enhanced by the initial response to the

above-mentioned F-117 downing and the seizure and mistreatment of three American soldiers. The torrent of criticism continued ranging from open questions about the success of bombing by such reputable sources as the *New York Times* to scathing new attacks by McCain.<sup>34</sup> In one *New York Times* article he stated:<sup>35</sup>

*These bombs are not going to do the job. It's almost pathetic. You're just going to solidify the determination of the Serbs to resist a peace agreement. You'd have to drag the bridges and turn off the lights in Belgrade to have even a remote chance of changing Milošević's mind. What you'll get is all the old Vietnam stuff—bombing pauses, escalations, negotiations, trouble.*

One Pentagon spokesman exclaimed, “We miscalculated. We thought when the bombing started Milošević would play the victim, not turn into Adolf Hitler, Jr.” Even Ken Bacon, in a DOD briefing, admitted, “I think right now it is difficult to say that we have prevented one act of brutality at this stage.”<sup>36</sup> With the memories of Vietnam burned in their minds, there is little wonder that senior U.S. military, especially Air Force, leaders became utterly frustrated. Publicly, they saluted smartly, but privately (sometimes not so privately) they expressed fears that, as currently arranged, the air campaign would fail. They also suggested means and methods to repair the process. One general compared OAF to Operation Instant Thunder and characterized it as operation “constant drizzle.” Most airmen agreed, air power was fine, it was the constant changes in plans “that screwed things up.” NATO civilian leaders came to realize nothing short of an intensive campaign and some threat of ground operations would work.<sup>37</sup>

The buildup process continued on April 3 when Cohen announced the U.S.S. “Theodore Roosevelt” Carrier Battle Group would stay in the Mediterranean and redeploy to a position capable of launching attack aircraft strikes against targets inside Kosovo. Two days later, President Clinton approved an increase in air operations tempo. Thus, despite increased SAM firings, NATO aircraft upped the ante. Of equal importance was the proposed dispatch of 24 Army Apache attack helicopters, Multiple Launch Rocket System artillery, 2,000 U.S. ground troops, and 14 Bradley fighting vehicles to Albania. They believed the vehicle-killing helicopters and the buildup of ground forces would, at least, plant the possibility of ground operation in the minds of FRY leaders. While, at first, officials turned down the dispatch of the Apaches, the President and Secretary of Defense eventually approved their deployment to display their resolve. In addition, brief weather improvements meant NATO planes were able to get at the well-hidden and disguised Serbian forces. As April progressed, the death and expulsion of thousands more Albanian Kosovars made it more essential than ever for NATO efforts to begin having effect.<sup>38</sup>

With criticism of real-time targeting capability, target acquisition, and target selection cascading over NATO from such respected sources as *Jane's Defense Weekly*, as well as numerous attacks on the aimless NATO policy and

their apparently dysfunctional leaders, NATO leaders had to reexamine their policy and take more decisive action.<sup>39</sup> On April 10, Pentagon officials announced the dispatch of an additional 82 U.S. aircraft including 24 F-16CJ “Falcons,” 4 A-10 “Thunderbolt IIs” for close air support, 6 EA-6B “Prowlers” reconnaissance aircraft, 39 KC-135R aerial refueling aircraft, 2 KC-10 aerial refuelers, and 7 C-130 tactical cargo/transport. Six other F-15C aircraft had just deployed from Elmendorf AFB, Alaska, bringing to nearly 500 the number of U.S. aircraft committed to the NATO campaign. Air Force leaders publicly blamed the weather for the poor showing until then and stated the new additions would increase their “deep-strike capability and help increase the intensity of round-the-clock air strikes in Yugoslavia.”<sup>40</sup>

By the third week of April, Clark, thwarted by the concealed Serbian forces in Kosovo, requested 300 more U.S. planes and an increase of the total number of NATO aircraft to 988, more than doubling the number with which the Allies started. At first, many DOD military officials complained such a commitment would take vital assets, especially high-demand E-3 AWACs and EA-6Cs, away from more important theaters such as Iraq/Kuwait and Korea. They also worried the “Apaches” might not survive in such a high threat environment laced with SAMs and AAA. Besides, many officials believed Clark's requests were nothing short of overkill and, if he used his assets better, they would be adequate.<sup>41</sup>

Week three witnessed one dramatic success when a cruise missile destroyed the enemy's primary communications facilities in Pristina, Kosovo's capital. Even with this success, the air campaign had not, yet, taken on any real strategic character since only 28 of the 439 targets attacked during this time were in Yugoslavia. U.S. and NATO officials could not seem to bring themselves to the harsh reality they were during a war and not a one-time response to some terrorist attack. The lack of sustained success eventually drew increased finger pointing from American domestic leaders. It left senior U.S. executive leaders groping for a policy direction. Cohen declared before Congress “We're certainly engaged in hostilities. We're engaged in combat.” In the next breath he equivocated, “Whether that measures up to a classic definition of war I am not prepared to say.” At least part of this unwillingness to publicly acknowledge a state of war was Clinton's fear he might be confronted by an already hostile Republican Congress over the War Powers Act.<sup>42</sup>

It appeared to those in Congress and the public that America's policy in southeastern Europe was, at best, without direction and, at worst, nonexistent. By the end of week three, public pronouncements out of the Pentagon declared the main purpose of the NATO operation was the expulsion of Serbian forces. Clearly, this was a shift from the original declaration focused on “diminishing” Milošević's military ability to expel Albanian Kosovars and conduct ethnic cleansing. It was a shift brought about since, with hundreds of thousands of refugees either in neighboring states or airlifted to other nations, the Serbian leader had all but accomplished his initial goal.<sup>43</sup>



USAF F-16 fighter aircraft line up for take-off at Aviano AB, Italy during Operation Allied Force.

Perhaps of equal embarrassment, and certainly of equal tragedy, was the fact interdiction campaigns often lead to attacks against friendly forces or innocent noncombatants. On April 15, Secretary Cohen acknowledged NATO responsibility for an accidental bombing of a refugee convoy in which 64 Albanian Kosovars died. One of the biggest problems facing Allied pilots throughout April and May was the difficulty in identifying enemy and refugee convoys. On occasion, the Serbs interspersed their vehicles with lines of refugees to confuse or divert NATO attackers. While U.S. leaders officially apologized, the damage had been done. Unfortunately, it would not be the last accidental bombing in Kosovo or Yugoslavia.<sup>44</sup>

While the Pentagon wrestled with this public relations disaster, they were also forced to confront growing calls for some sort of plans for the introduction of ground forces. While Secretary Cohen publicly reiterated the Administration's resolve not to introduce ground forces in combat areas, Secretary of State Madeleine Albright wondered out loud to the media if, from a strategic point of view, ground forces might be necessary at some later date. Even General Michael J. Ryan, Chief of Staff, U.S. Air Force, declared in the *New York Times*, "I don't know if we can do it without ground troops."<sup>45</sup>

Behind the scenes, Clark pushed relentlessly for at least preparations and plans for ground actions. Officials around the President, as well as those in the Air Force, held out hope the air campaign might yet succeed. Air Force leaders were convinced a focused and dedicated series of attacks against meaningful Yugoslav targets would prove decisive. By mid-April, Clark's insistence had forced a consensus among NATO leaders, led by Prime Minister Blair that the ground option should, at least, remain a possibility.<sup>46</sup>

To solidify the buildup process and demonstrate his resolve, Clinton asked Congress for nearly \$6 billion to help finance Allied Force and humanitarian aid missions in the Balkans. Of the monies requested, about \$5.5 billion was allocated to the DOD for air operations, replenishment of cruise missile stocks, precision-guided munitions (PGMs),

refugee relief, and Operation Desert Fox in Iraq. More than \$4 billion was for air operations. Air Force leaders were now hopeful that "real" operations could begin against targets in and around Belgrade.<sup>47</sup>

With the bombing campaign about to become a month old and a NATO summit soon to convene, planners began to expand the scope of the campaign to include not only FRY forces in Kosovo but, also, key industrial and infrastructure targets deep within Yugoslavia.

These "four pillars," as they became known, were Milošević's political power centers: the tightly controlled Serbian digital and print news media, his security forces and their facilities, and Serbia's economy, especially its oil refineries, electric grids, and lines of communication. Among the sites added to the target list were roads and bridges over the Danube River, petroleum depots and oil refineries, railroad lines and military rolling stock, military facilities and buildings, com lines and installations, and factories producing weapons, munitions, and spare parts.<sup>48</sup>

Early on April 21, the new strikes began when NATO issued communiques warning employees of Belgrade radio and television stations to evacuate all facilities. A few hours later, three cruise missiles slammed into the central Belgrade radio/television complex, temporarily shutting down all service. Not only did the attack bring the war home to the Serbian people, but it proved NATO was ready to go for the throat after a month of tiptoeing. In addition, the strike introduced the threat of further attacks against the industry and finances of Serbian elites and nearly all of Slobodan Milošević's personal and business associates. To compound the shock value, no sooner had the first wave of missiles struck than another wave struck the headquarters buildings of Milošević's Serbian Nationalist Party.<sup>49</sup>

These attacks preceded a rapid succession of raids on Milošević's family dwellings. The highlight of these was the use of a GBU-37 4,700 pound "bunker-busting" weapon dropped on the FRY national command center comprised of a multi-story underground facility located 100 feet below ground. Planned as a haven for Milošević and his family, the structure hosted extensive communications nets, food, and supplies for more than a month, as well as living space and medical supplies/facilities for the main FRY civilian and military defense leadership.<sup>50</sup>

### NATO Takes the Gloves Off!

As the air campaign intensified, NATO leaders, many uncertain of the organization's future, held a summit meeting in Washington. The meeting, which lasted from April 23 to 25, not only paid homage, albeit briefly, to the 50th anniversary of NATO, but also focused on solidifying the alliance's resolve to bring Milošević to heel. The Serbian leaders had consistently sought to pry the partnership apart, often using Russia and other U.N. nations as a wedge. Russia, a historic Serbian ally, had often opposed NATO's actions throughout the affair but had also roundly condemned Milošević's methods of handling Kosovo. The Russian military was a mere shell of the once powerful Soviet Red Army, and the Russian government was desperate





President Bill Clinton congratulates Gen. Wesley Clark.



The B-2 Spirit, the ultimate JSOW, was deployed during OAF.

for U.S. and Western monetary and economic aid. Thus, she was able to do little more than irritate the NATO partners. On April 25, following a reassuring three days of talks, NATO leaders restated their original demands: “a verifiable stop to Serbian military action in Kosovo; withdrawal of all Serbian forces; an international military force in Kosovo; refugee return; and acceptance of a political framework based on Rambouillet.”<sup>51</sup>

As if to demonstrate American sincerity, President Clinton signed a selected reserve call-up on April 27, directing 33,102 reservists to enter active duty. It involved a 270-day period, initially focusing on 2,046 airmen and 47 aircraft in eight Air National Guard (ANG) and Air Force Reserve Command (AFRC) units. While the order potentially affected every branch of the U.S. military, Air Force reservists bore the brunt of the call-up. The Air Force ceiling was set at 25,000, the Army at 6,100, the Navy at 892, the Marine Corps at 1,100, and the Coast Guard at 10. The first activation involved only aerial refueling units. The ANG units included: the 161st Air Refueling Wing (ARW), Phoenix, Arizona; 171 ARW, Pittsburgh, Pennsylvania; 117 ARW, Birmingham, Alabama; and 128 ARW, Milwaukee, Wisconsin. The AFRC units were 927 ARW, Detroit, Michigan; 940 ARW, Marysville, California; 434 ARW, Kokomo, Indiana; and 931 Aerial Refueling Group, Wichita, Kansas. They were stationed in Budapest, Hungary.<sup>52</sup>

Two days later, during a Pentagon news brief, U.S. Army General Henry Shelton, Chair, Joint Chiefs of Staff (JCS), announced the deployment of 13 more U.S. aircraft including ten B-52Hs. Shelton emphasized the air campaign was finally having an effect, reminding reporters “we faced three formidable challenges in the area. First was the integrated air defense system; second was the terrain; third was the weather.” He assured the gathering that, despite the problems, NATO aircraft would soon move into the “‘domination phase’ where NATO aircraft will aim at decimating Yugoslav field forces.” He and Cohen reiterated NATO’s resolve and openly denounced what they called Milošević’s “underestimation of the will of the alliance.”<sup>53</sup>

By early May, the Allies had over 700 aircraft on station, of which 400 were strike airplanes. This number was

continually growing toward the commitment of 988 aircraft, previously made to Clark. NATO aircraft had flown 15,000 sorties by May 5, 5,000 of which had been bombing sorties. The magnitude of the attacks would soon grow dramatically.<sup>54</sup>

On the night of May 3, Air Force F-117As, employing CBU-94s, attacked five major electrical transformer facilities in and around Belgrade. The significance of this attack cannot be overstated since 70% of the electricity in Yugoslavia was cut off for several hours. The CBU-94s proved to be a diabolically effective weapon. As the canisters descended, they released numerous BLU-114B sub-munitions which unwound as treated wires. They covered the high-tension power lines like massive amounts of silly string at Halloween or silver tinsel on a Christmas tree. Once affixed, they shorted out the power. Most of the targets were focused on electric service to the Yugoslav 3rd Army. The attack also affected the morale of Milošević’s political allies, bringing the war even closer to home.<sup>55</sup>

On May 6, the Group of Eight Nations (G8) Foreign Ministers met in Bonn, Germany and resolved to expel FRY forces from Kosovo. This meeting became the initial forum where the framework for the eventual settlement was formulated. It was at Bonn that the NATO foreign ministers agreed on the basic principles for resolving the crisis. Using the good offices of Finnish President Marti Ahtisaari and Russian Premier and envoy Viktor Chornomyrdin as go-betweens, it was through these initiatives that Milošević eventually agreed to terms on June 3. On June 7-8, in Bonn and Cologne, the G8 Foreign Ministers signed this draft agreement which became U.N. Security Council Resolution 1244 on June 10.<sup>56</sup>

By mid-May, some Yugoslav officials openly admitted Serbia’s economy was suffering from the upgraded assaults. This meant widespread hardship for the Serbian people, especially those in and around Belgrade. Unemployment was a particular hardship with over 100,000 civilians inside Yugoslavia, losing their jobs due to bomb damage. After one attack on Krujevac, a large munition plant and vehicle plant were totally destroyed. Between 9,000-12,000 plant employees were left without work.

Without orders for tires, plastics, windshields, etc., collateral industries were forced to shut down or cut back 30,000-45,000 jobs. Many other factories suffered the same fate. Add to this the effects of over 90 months of sanctions brought on by the conflict in Bosnia, and pecuniary hardship became something nearly all citizens experienced. Some Yugoslav economists called it worse than the deprivation during World War II.<sup>57</sup>

One target still not fully exploited was the FRY's electric power generating systems. What had been an initial target during Desert Storm had only seen an early May "love tap," which temporarily shorted power for some hours and destroyed nothing. On May 24, NATO planes attacked, with devastating accuracy obliterating the entire FRY electrical grid. Yugoslav air defenses, banking and defense computers, and numerous other key national and military institutions completely lost power, Belgrade was BLACK! But why had it taken so long to achieve this level of success? Two months into the war, decisive action had finally received approval. As an apparently vindicated General Clark said later, "this was the only air campaign in history in which lovers strolled down riverbanks in the gathering twilight and ate at outdoor cafes and watched the fireworks." That is, until May 24!<sup>58</sup>

Even with these successes, NATO leadership was not going to wind down operations until Milošević capitulated. Throughout May, the buildup continued. On May 7, the SECDEF signed an order deploying 176 more fighters and refueling aircraft to Europe. Of these, there was one squadron of 18 A-10s and F-16CJs and two squadrons of 36 F-15E "Strike Eagles" and 24 F/A-18D "Hornets." In addition, 80 KC-135s were deployed which meant 2,789 more ANG and AFRC airmen would be called up, raising the total to 5,035. They included: the 104th Fighter Wing (FW), Barnes Field, Westfield, Massachusetts; the 110 FW, Kellogg Airport, Battle Creek, Michigan; and the 124 FW, Boise, Idaho. All were A-10 units. Active-duty units affected included the 20 FW, Shaw AFB, South Carolina and its F-16CJs; the 4th FW, Seymour Johnson AFB, North Carolina and its F-15Es; and the Marine Aircraft Group (MAG) 31, Marine Corps Air Station, Beaufort, South Carolina and its F/A-18s. In addition, 524 Air Force Red Horse engineer reservists from Kelly AFB, Texas and Great Falls, Montana were deployed to Albania to support overflow refugee operations. Lastly, 70 Air Force weather and intelligence personnel deployed as the culmination of Gen. Clark's April request for about 1,000 aircraft.<sup>59</sup>

## Beginning of the End

On the battlefield, operations shifted to Kosovo. On May 26, 4,000 Kosovo Liberation Army (KLA) irregulars advanced into Kosovo, at two points, along the southwestern border. Their goal was to form a secure corridor to resupply their beleaguered comrades. The offense quickly bogged down, and FRY forces, using artillery attacks, soon pushed the KLA into a defensive position on 6,523-foot Mount Pastrik, just inside Albania. While this seemed a terrible turn of events since it proved that, even after 2 ½

months of air attacks, the FRY troops in Kosovo were viable. Conversely, it drew into the open 700-800 FRY troops and dozens of vehicles and artillery. According to initial reports, when KLA forces counterattacked, FRY forces had to concentrate to defend themselves. Employing E-8C Joint Surveillance Target Attack Radar system (JSTARS) aircraft deployed from Robins AFB, Georgia, Allied forces soon detected groups of FRY troops trying to maneuver for safety. As they did, NATO fighters assaulted these columns. Although the damage did not equal the level of destruction done along the "Highway of Death" during the Gulf War, much of the Serbian mechanized hardware became smoldering wrecks.<sup>60</sup>

Soon thereafter, many skeptical reports, helped by Serbian propaganda, appeared in the media, downplaying Serbian losses. This prompted a major NATO effort to research the battlefield and discern the true outcome of the engagement. It was clear enough the skeptics (and Serbia) had underplayed the defeat, and the actual destruction was not far short of the original NATO estimates. Still, the Serbian ground forces seemed to have left Kosovo, in good order, and more intact than the Iraqi Army in the Gulf War. In any case, it appears likely the damage to Milošević's fielded forces was not the decisive factor in his decision to quit.<sup>61</sup>

## Chinese Embassy Bombing

In spite of the apparent progress on the battlefield on May 6, a terrible public relations catastrophe occurred when NATO aircraft accidentally bombed the Chinese Embassy in Belgrade killing three persons described as "journalists" and injuring 20 others, six critically. The magnitude of protest and outcry from China was considerable. Even U.S. films, such as "Saving Private Ryan," were removed from Chinese movie theaters and America-based fast-food restaurants were forced to close, partly in protest and partly out of fear of violence.

On May 8, Clinton apologized for the accidental bombing and expressed profound condolences to Chinese President Jiang Zemin. Despite these generous U.S. and NATO apologies, the Chinese seemed inconsolable. Thousands of demonstrators hurled rocks and debris at the U.S. and British Embassies in Beijing during several days of riotous protests. Even so, China could do very little to change the progress of the conflict, and her diplomatic protests fell short of any real threats. After a time, the furor died down, and the bombing continued.<sup>62</sup>

By early June, the Serbs were near the end. The NATO buildup had finally proved effective enough for diplomatic efforts to begin bearing fruit. On June 1, *Jane's Defence Weekly* reported NATO had 59 airbases, in 12 countries, supporting OAF. At these bases they had 941 fixed-wing aircraft, 279 helicopters, and dozens of unmanned aerial vehicles (UAVs). The next day, *Jane's* reported the Serbs were running out of SAMs since they had wasted many of them firing blind shotgun-pattern salvos at NATO attack aircraft. In addition, many of the missiles had been lost to NATO SEAD operations spearheaded by USAF F-16CJs carrying AN/AGM-88 High-speed Anti-Radiation Missiles



B-52 carpet bombing raid.

or HARMs. *Jane's* believed the SEAD attacks had been so effective that most subsequent attack sorties were unopposed. One unnamed F-16 squadron commander told a *Jane's* reporter, "We have attrited 80% their SAMs—they have fired off 90% of their SAMs. They can't have an endless supply."<sup>63</sup>

However, later analysis suggested the IADS had not been destroyed. Rather, they had been forced out the air for the most part. This meant the SEAD attacks had, at least, been partially successful, even if not at the level first claimed. Still, the enemy IADS remained as a kind of fleet-in-being that continued to threaten the Allied air campaign, forcing NATO sorties to remain at medium altitudes where their target acquisition and bombing accuracy, with some weapons, were not as effective as they might have been at lower altitudes.<sup>64</sup>

With potential disaster staring him in the face, Milošević blinked. On June 2, former Russian Prime Minister Viktor Chernomyrdin, and Finnish President Martti Ahtisaari, representing the European Union, traveled to Belgrade. There they offered Milošević a peace plan to end the war, with Ahtisaari present to guarantee that Milošević clearly understood NATO intentions. The next day, President Clinton announced that both sides had agreed to a draft proposal whereby: all Serbian and FRY forces would withdraw promptly, all refugees would be allowed to return, self-rule of Albanian Kosovo under Yugoslav sovereignty would be restored, a few hundred Serbian liaison personnel would assist in removing mines, Allied peacekeeping forces would occupy key positions in Kosovo to assure a peaceful transition and, once all FRY forces withdrew, the bombing would end. Later, the President and Secretary Cohen agreed NATO would provide about 50,000 peacekeepers and America 7,000. NATO troops and U.N. forces from several nations, including Russia, were scheduled to participate as part of the peacekeeping force. It should be noted that Russia was not a welcome partner.<sup>65</sup>

Soon after the two sides reached an agreement in principle, a continuing squabble developed over how and when Serbian forces should withdraw and when NATO air strikes would end. The delay, apparently staged by the

Serbs, clearly provided them time to continue attacks against KLA forces. In response, NATO re-intensified air strikes in Kosovo. On June 7, two B-52s and two B-1Bs dropped 86 MK82 unitary bombs and dozens of CBU-97 cluster weapons on Serb forces in an open plain near Albania. Of the nearly 1,000 FRY forces, initial assessments estimated half of these forces, their artillery, and vehicles were attrited. While subsequent appraisals suggested that the numbers were slightly smaller, the FRY attack came to an abrupt halt and, for one of the few times in the war, a ground engagement between FRY and Allied forces—KLA in this case, had exposed the enemy to the full fury of NATO air power.<sup>66</sup>

The next day, negotiations began again in earnest and, by the 9th, a final agreement was reached and signed in Macedonia. Following the agreement, NATO Secretary-General Javier Solana officially suspended the NATO air attacks. However, he warned Yugoslav leaders that NATO would resume bombing if they did not follow every provision of the peace agreement. Plans called for all Serb forces to be out of Kosovo in 11 days. The province was divided into three zones of occupation to be run by the U.S., Great Britain, and France. The advance guard of the 7,000-man, U.S. contingent was comprised of the 26th Expeditionary Force and army units of Task Force Hawk. Together, this force was designated Task Force Falcon and commanded by Brig. Gen. John Craddock, Assistant Division Commander, 1st Infantry Division.<sup>67</sup>

The air campaign had ended, and it was up to the diplomats to finalize the peace. On the 10th, the U.N. Security Council voted 14-0, China abstaining, to approve Resolution 1244. Not only did it put Kosovo under U.N. international civilian control, but it reconfirmed previous U.N. and NATO resolutions calling for Serbian troop withdrawals, Kosovo's autonomy, and an international peacekeeping and monitoring forced under U.N. authority.<sup>68</sup>

## The Aftermath

On June 11, 1999, President Clinton declared "victory" in a nationwide speech. The next day, with FRY forces already pulling back, the first peacekeeping forces entered Kosovo preceded by a Russian advance party which, without prior agreement, took up positions around Pristina Airport. Although an annoyance, the Russian move hardly stopped the U.N. force's deployment. Eventually, they were integrated into the overall occupation forces. By June 20, Serbian forces had completely withdrawn, and U.N. forces had taken their places on schedule. Concurrently, overall commander British Army Lt. Gen. Sir Michael Jackson, began the difficult task of disarming the KLA within 90 days. With the occupation in place, Secretary General Solana officially terminated the air campaign on June 20. Plans called for about 50,000 forces to remain. British, U.S., and French forces slowly shrank to about 5,000, while other countries augmented the U.N. military presence. By September 21, officials announced the successful demilitarization of the KLA. The winter months heightened the need for shelter, food, clothes, and medical supplies while

the occupation continued in Bosnia to enforce the Dayton Accords.<sup>69</sup>

## Examining the Statistics

The NATO air campaign lasted from March 24 to June 20, or 89 days. Actual air attacks spanned 78 days, with no actual attacks taking place during the last 11 days. All totaled, 22,200 Air Force, Army, Navy, and Marine personnel were assigned to United States European Command (USEUCOM), although not all directly participated in the conflict. The Allies flew 38,004 sorties, 10,484 of which were strike missions. Overall, 829 aircraft, from 14 countries, took part in the air campaign. Target reports indicated NATO had destroyed 11 railroad bridges, 34 highway bridges, 29% of all stored ammunition, 57% of stored petroleum supplies, all Yugoslav oil reserves, 268 non-track military vehicles, 1,220 trucks, 203 armored personnel carriers, 314 artillery pieces, 100 aircraft of all kinds, and 10 military capable airfields.<sup>70</sup>

CNN, citing official NATO sources, estimated FRY and Serb forces suffered nearly 10,000 killed and wounded, while the U.S. lost two soldiers killed in a helicopter accident, and three Chinese diplomats died in the accidental NATO bombing of the People's Republic of China's Belgrade Embassy. Citing numbers from the U.N. High Commission for Refugees and

Yugoslav government figures, CNN reported 1,500 civilians had died, and 5,000 had been wounded during the air raids. The U.N. reported that, by the end of OAF, half of all Albanian Kosovars were displaced persons. All totaled, 200,000-300,000 ethnic Albanians had fled Kosovo prior to the air attacks with 68,000 traveling west to Montenegro, 440,000 southwest to Albania, and 240,000 southeast to Macedonia after the war officially began. In total, 850,000-900,000 of the 1.8 million Albanian Kosovars left the province after the air campaign began.<sup>71</sup>

In NATO's summation of the conflict on June 21, they recorded attacks had begun at 2:00 p.m. EST on March 24, had been suspended at 10:00 a.m. EST on June 10, and halted at 10:50 a.m. EST on June 20. At the start, enemy forces had 114,000 active-duty service personnel and 1,400 artillery pieces. They had 100 SAMs including SA-2, SA-3, SA-6, SA-7, SA-9, SA-13, SA-14, and SA-16 missiles. The FRY had 1,850 air defense artillery weapons, 240 aircraft, 48 attack helicopters, 1,270 tanks, and 824 armored fighting vehicles. The Serbs had 40,000 troops and 126 tanks in Kosovo or on the border and, more than 10,000 troops and several dozen tanks near their border with the Former Yugoslav Republic of Macedonia.

According to NATO sources, 19 member nations contributed to OAF, including 31,600 U.S. service personnel, 18,400 ashore and 13,200 at sea, with over two-thirds of that number belonging to USEUCOM. NATO Naval forces included the carrier U.S.S. "*Theodore Roosevelt*," one British and one French carrier; two U.S. cruisers; three U.S. and six British, French, Italian, and Greek destroyers; two U.S. and one British submarine; and 10 frigates from Britain, Spain, Turkey, Italy, the Netherlands, Germany,



The U.S. bombing targets in Belgrade.

and Greece. The U.S. also committed the *Kearsarge* Amphibious Ready Group consisting of three specialized vessels.

By June 21, the U.S. had committed over 650 aircraft. These included: the Navy F-14 "Tomcat" and F/A-18 "Hornet" fighters, the Air Force F-15E "Strike Eagle," F-16CJ "Fighting Falcon" multi-role F-117A "Nighthawk," AV-8B "Harrier," and A-10 "Thunderbolt" fighter and attack aircraft. Bombers included: the Air Force B-1B "Lancer," B-2 "Spirit," and B-52H "Stratofortress." Cargo aircraft included: the Air Force C-5B "Galaxy," C-17 "Cargo Master II," C-130 "Hercules," and C-141 "Starlifter." The Air Force also sent KC-10A "Extenders" and KC-135R "Stratotankers" for aerial refueling as well as AC-130H "Spectre" Gunships and E-8C JSTARS ground surveillance aircraft. The Navy contributed EA-6B "Prowlers" for Electronic Warfare duties, while the Army sent AH-64A "Apache" attack helicopters.

Last, but not least, the U.S. had provided dozens of RQ-1A "Predator" and "Hunter" UAVs. The remaining NATO members contributed 277 total aircraft of which 192 were fighters, fighter/bombers, and bombers; 63 support aircraft; 19 reconnaissance; and 3 helicopters.

The operations ultimately cost billions of dollars, ensuring that yet another corner of the world had been occupied by U.S., U.N., NATO, and Allied forces to assure peace.<sup>72</sup>

## The End of Milošević

Following the war, Milošević temporarily remained in power. Even as he continued to act as the head of state, officials from the International Criminal Tribunal for the Former Yugoslavia (ICTY) indicted him on May 24, 1999, for war crimes and crimes against humanity in Kosovo. At first it appeared he would survive, since he argued any trial was illegal under the policies and stipulations of the U.N. charter. Concurrently, Milošević called for new elections which he seemed to lose. Ironically, it was an election he did not need to call to retain authority. He and his associates already controlled power. The five-person presidential race took place on September 24, 2000. Milošević lost, in the first round, to opposition leader Vojislav Kostunica,

who initially appeared to win over 50% of the vote. However, Milošević refused to concede, claiming no one had won a majority. If this could be proven, the Yugoslav constitution required a runoff. “Government” vote-counters had Kostunica with barely less than 50%. The internationally funded Center for Free Elections and Democracy challenged this outcome, and during the next two weeks, thousands of citizens took to the streets of Belgrade in protest, the largest being on October 5. Fearing for his life from this so called “Bulldozer Revolution,” on the 6th, Milošević met with Kostunica and publicly conceded defeat. Kostunica became the Yugoslav president the next day.<sup>73</sup>

On April 1, 2002, following a 36-hour armed standoff between police and the dictator’s bodyguards at his villa, Milošević was arrested by Yugoslav authorities. Although no official charges were made, following his arrest, the United States pressured the Yugoslav government to extradite him to the ICTY or lose financial aid from the International Monetary Fund and the World Bank. President Kostunica opposed extradition of Milošević on the grounds it violated the Yugoslav constitution. Concurrently, Prime Minister Zoran Dindic convened the parliament to issue a decree for extradition.<sup>74</sup>

To prevent this, Milošević’s attorneys, led by Toma Fila, appealed the extradition to the Yugoslav constitutional court. The judges asked for two weeks to consider the appeal. Ignoring objections from the president and the court, the Prime Minister ordered that Milošević be extradited to the ICTY. On June 28, the former President was airlifted, by helicopter, from Belgrade to the American airbase in Tuzla-Bosnia-Herzegovina and then, on to The Hague in the Netherlands. The deportation caused political turmoil in Yugoslavia. President Kostunica denounced the expulsion as illegal and unconstitutional. Fila said this act violated the Yugoslav constitutional ban on extradition. Dindic warned if they did not deport him, NATO and the U.N. would impose severe penalties. He said that sending Milošević to the ICTY was not extradition since it was a U.N. body and not a foreign country. As proof of these points, no sooner had the dispatch of the former dictator taken place than Yugoslavia received \$1 billion in financial aid.<sup>75</sup>

From the beginning of the ICTY proceedings, Milošević denounced the Tribunal as illegal because it had not been established with the consent of the U.N. General Assembly. To demonstrate his disdain, he refused to appoint a defense counsel, instead, conducting his own defense during the five-year trial, which ended, without a verdict, when he died in his prison cell, in The Hague, on March 11, 2006. Much of his adult life, the former president, had endured heart issues and high blood pressure. Despite insinuations by his supporters that he was murdered, most experts believe he died of a heart attack. Members of the Tribunal vehemently denied any responsibility for Milošević’s death and stated he had refused to take his prescribed medicines, deciding to medicate himself.

Milošević had been found dead in his prison cell in the U.N. war crimes Tribunal’s Detention Center, located in the Scheveningen sector of The Hague. Officials had au-

topsies conducted which confirmed he had a “myocardial infarction” or heart attack. Medical examiners reported his heart showed signs of severe and prolonged damage. Even after confirmation of this diagnosis some of his inner circle openly expressed suspicions that the heart attack had been caused or made possible at the behest of the ICTY. Others believed he purposely caused his own death since Milošević’s death took place shortly after the Tribunal denied his request to seek specialized medical treatment at a cardiology clinic in Russia.

The return of Milošević’s body and his widow’s reappearance in Serbia created a major controversy. Supporters of the ICTY bemoaned the fact he went unpunished and denied him a state funeral. His family and associates held a private funeral in his hometown of Pozarevac, while tens of thousands of his supporters attended a memorial ceremony in Belgrade. Adding fuel to the fire, former U.S. Attorney General Ramsey Clark and Austrian Nobel Laureate Peter Handke were among the attendees at the funeral.<sup>76</sup>

After Milošević’s death, the ICTY and the International Residual Mechanism for Criminal Tribunals determined to resolve the legal issues left undecided. Eventually, they declared the former dictator was part of a cooperative criminal enterprise to remove Croats and Bosnians from large parts of Croatia and Bosnia/Herzegovina. Separately, the International Court of Justice determined that in the Bosnian Genocide case there was no evidence linking him to massacres committed by Bosnian Serbs during that War. The Court did find he and other Serbs had, by failing to stop the genocide and not helping the ICTY prosecute perpetrators like Gen. Ratko Mladic, violated the Genocide Convention.<sup>77</sup>

## Some Final Points

This article is not designed to provide some searing analysis or definitive lessons learned. Still, I feel compelled to make some observations and, at least, attempt to lift some facts, if not eternal truths, from OAF. One way to begin is to see what others have said. Nick Cook, in a special feature in *Jane’s Defence Weekly* wondered, as many senior NATO officials had, if the harsh military lessons would be lost in the euphoria and relief of cessation of the conflict and the minimal loss of lives on the NATO side. According to Cook, one U.S. official declared, “We pulled off the Kosovo caper through fortuitous circumstances, bombing the Serbs back to their country for just two aircraft lost.” This same source wondered, however, “What if the Serbs had deployed their air defense system and inflicted major losses? How long would the U.S. have stuck it out? The answer is not very long. Then what would Europe have done?”<sup>78</sup>

Cook’s piece could have been titled, “I have some good news and bad news.” For example, the aerospace technological revolution, which brought us PGMs, JSTARS, UAVs, JDAMs, etc. during and after the Gulf War, has continued. The upgrades demonstrated on aircraft, radar, missiles, navigation, SEAD, etc. seemed nothing short of

science fiction. On the other hand, such systems are very expensive, and fewer were available than during the Gulf conflict. Perhaps equally troubling is that 90% of this sophisticated equipment is U.S. built, owned, and deployed. Undoubtedly, NATO, whose fragile existence was tested greatly during OAF, cannot be comforted by the reality that it was, again, utterly dependent, “on U.S. air power and technology to fight and win a war that took place in the heart of Europe.”<sup>79</sup>

Another issue with mixed results was the way in which the air war was conducted. Clearly, the conflict involved not one, but two, air campaigns. The first was, as it turned out, hampered by political conditions and highly restrictive rules of engagement which reminded many of the catastrophic policies of Vietnam, policies airmen had hoped were discarded. In an October 21 Senate Armed Services Committee hearing, Air Force Lt. Gen. Michael Short, Gen. Clark’s air chief and a former combat aviator, declared, “I’d have turned the lights out, . . . I’d have dropped the bridges across the Danube, I’d have hit five or six political-military headquarters in downtown Belgrade. Milošević and his cronies would have woken up the first morning asking what the hell was going on.”<sup>80</sup>

Admiral James Ellis, NATO Naval Commander Southern Europe and Gen. Clark mostly agreed. Clark said, “Once the threshold is crossed and you are going to use force that force has to be as decisive as possible in attaining your military objectives.” However, Clark also pointed out that much of the early timidity came from the need to obtain, “the consensus of 19 nations . . . to approve action, and many countries had preconceptions about how to apply force.” In the end, Clark chose to focus his remarks on the positive aspects of the operation, such as the fact that 19 countries, with varying backgrounds, some even former enemies, hung together to put a stop to “inter-territorial barbarism.”<sup>81</sup>

Naturally, there were those who despite kind words about the military effort and courage of NATO forces, could not refrain from “bashing” the overall policy. Of note was the criticism that Milošević had initially achieved his goal of expelling or killing most Albanian Kosovars despite the air war. Many in Congress criticized Clinton, blaming the human disaster in Kosovo on slow and flawed diplomacy and indecisive military action. Echoing these sentiments, Delaware Senator William V. Roth, Jr., went so far as to make lengthy (later published) remarks on the Senate floor on September 16 claiming, “While Operation Allied Force did attain victory, the realization of its goal did not yield a shared sense of triumph and finality.” He believed NATO’s poor use of its power had helped Milošević because “during Operation Allied Force, Milošević accelerated and expanded his campaign of terror. Before the war was over, nearly 90% of Kosovar Albanians were driven from their homes. Nearly one half were expelled from Kosovo.” In addition, Roth claimed 10,000 Kosovars were “executed by Milošević’s henchmen.”<sup>82</sup> While some of Roth’s numbers may have been high and his attacks politically motivated, the lack of initial resolve did worsen the situation.

Many military and civilian leaders of NATO and non-NATO countries questioned not only NATO’s policy but, also, what ended the conflict. General Jackson, the U.N. occupation commander, openly scorned the notion that air power won the conflict, claiming he had never favored such a policy. In his opinion, Russian, and, later, Finnish diplomacy, had convinced Milošević to pull back in order to save his forces for later mischief.<sup>83</sup>

Criticisms like that from Roth and Jackson, while certainly stating facts, seemed motivated by resentment or politics. As John Keegan, a one-time critic, admitted later, All this [positive remarks] can be said without reservation, and should be conceded by the doubters, of whom I was one, with generosity. Already some of the critics of the war are indulging in ungracious revisionism, suggesting that we have not witnessed a strategic revolution and that Milošević was humbled by the threat to deploy ground troops or by the processes of traditional diplomacy, in this case exercised—we should be grateful for their skills—by the Russians and the Finns. All to be said to that is that diplomacy had not worked before March 24, when bombing started, while the deployment of a large ground force, though clearly a growing threat, would still have taken weeks to accomplish at the moment Milošević caved in. The revisionists are wrong. This was a victory through air power.<sup>84</sup>

Keegan also expressed frustration. He, like many, was appalled by the initially sluggish ops tempo, NATO’s fragile state of unity and resolve, the mishandling of diplomacy prior to the conflict, and the apparent failure to heed past lessons. Ultimately, while pleased, he urged Tony Blair and, by implication, all NATO leaders, to reexamine OAF to learn its lessons and never enter a similar situation without clearer military goals and policies.<sup>85</sup>

One encouraging note was earnest official efforts by NATO, especially the U.S. and the United Kingdom (UK), to formulate, and learn, lessons from this, often difficult conflict. During the fall of 1999, the UK Ministry of Defense published a report on “Initial Lessons Learned” suggesting such things as the value of NATO having better unity of purpose, clearer objectives, and mutual determination to achieve these goals. Concurrently, both the DOD and JCS not only made similar reports, but Secretary Cohen and Gen. Shelton presented a lengthy prepared statement to the Senate Armed Services Committee. It asserted “For 50 years NATO has given caution to our foes and comfort to our friends.” However, it also pointed to a need to learn from this “victory” in order to prevent such human tragedy in the future.<sup>86</sup>

Perhaps as telling as anything for the leaders of the 19 NATO nations were Gen. Short’s comments to the *Washington Post* on June 20, following a final Allied Force joint NATO briefing. Short, a firm believer in the lessons of the Gulf air war and utterly frustrated by the NATO political conundrum that slowed necessary air action by a month declared, “I hope those [NATO] nations that could not participate in the way they would have liked will take the necessary investments to catch up. Otherwise, we run the risk of creating second or third teams within the Alliance.”<sup>87</sup>



The main bridge over the Danube in the city of Novi Sad, in what is now Serbia, lies broken after NATO bombardment in April 1999. (TASS)

Certainly, it is hard to disagree with an expert like Keegan that, despite all the other factors, OAF was a NATO victory, an air power victory. As Gen. Clark said, “This really wasn’t a war [like the Gulf War]. It was diplomacy backed by force.”<sup>88</sup> If we accept von Clausewitz’s notion that war is an extension of diplomacy, then, as Clark suggests, NATO used its considerable power to enforce its diplomatic will in Southeastern Europe. Clearly, OAF was also one of those times when diplomacy or political fears and gamesmanship left the component military members without viable options and unable to fulfill their mission. Vietnam, from 1965 to 1971, was certainly one such case and few can deny that the first month of Allied Force degenerated into a similar state. Perhaps John T. Correll, Editor-in-Chief of *Air Force Magazine*, said it best,<sup>89</sup>

*Diplomacy and war are related, but they are not the same. Diplomatic objectives are ambiguous by design, leaving room not only for negotiation but also for varying interpretation, which is often beneficial for political purposes. This was seen, for example, in Allied peace proposals of May 6. Military objectives are, or should be, as unambiguous as possible. They are about employing lethal force and putting ordnance on targets. The difference goes a long way toward explaining why so many assumptions went awry in Kosovo.*

Another point best stated by a UK MOD report asked, “Why did Milošević concede?” As noted, some suggested the

threat of ground action or Russian/ Finnish diplomacy convinced the dictator to quit. The report suggested four reasons: 1) NATO and international (Russian too) unity and resolve, “strengthened as the crisis and air campaign continued;” 2) the increase “in the tempo of the air operations, and the huge damage and disruption they caused to his [Milošević’s] forces’ operations, was a highly significant factor;” 3) Milošević’s indictment by the “Criminal Tribunal for the Federal Republic of Yugoslavia” added pressure; and 4) “Finally, the increasing pace of the buildup of ground troops in neighboring countries.”<sup>90</sup>

Most analysts would agree with all or part of these reasons, however, it is worth examining each point. As Keegan says, the buildup of ground forces, while a threat was, in fact, only a threat. It was one which most NATO leaders, no matter how seriously they thought they discussed this option, were reluctant to execute. The nightmare for Clinton and Blair was of U.S. and British men, and women, coming home in body bags or television clips, as in Somalia, of their dead soldiers dragged through the streets. It was not something NATO nations would have stomached for long. This risk was particularly great for the President, who had to face major Congressional opposition to any U.S. involvement. Many Americans wondered why U.S. servicemen had to suffer the inconvenience of going to Southeastern Europe to defend Albanian Muslims. Many Americans wondered why their allies needed the U.S. to bail them out of a situation which was at Europe’s back door. Had not



Belgrade's Usce Tower, home of the Communist headquarters, ablaze after it was hit with multiple missiles on April 21. The building was later rebuilt with a 36-meter extension. (TASS)

enough Americans died to guarantee a free and democratic Europe in World War II? The thought of a bloody ground conflict was a last option, and this is something Milošević had to know.

As for Milošević's indictments and world condemnation, if he was concerned, he would not have helped slaughter so many in Bosnia. If one accepts this, it follows that Hitler worried about world opinion over the final solution, or Stalin over his treatment of Kulaks, Saddam Hussein the murder of Kurds or Vladimir Putin the invasion of the Ukraine. The prospect of foreign outrage obviously had little effect on Milošević.

While Russian and Finnish diplomacy played a role in attaining peace, as Keegan says, there had been intensive negotiations by many parties long before March 24. Earlier demands on Milošević from the Rambouillet Accords, were less strict and less stringent than the ones he ultimately accepted. When the bombing first began, Milošević was defiant and had carried out ethnic cleansing against the Albanian Kosovars. It is not a coincidence this began to change when air ops intensified in late April.

NATO unity may well have had an affect however, this factor was uncertain, at first, and played a major role in political restrictions on air ops during the first month, thereby hampering the air campaign. Once political leaders provided Clark and Short with the means, material, and policy freedom to "turn out the lights in Belgrade," everything changed and NATO showed real unity, and Milošević showed real fear. Thus, air power was the major factor of the conflict's resolution, political blunders notwithstanding. It might be imprudent to assert that air power was decisive, alone. Still, Milošević's friends were hurting in late May. Those who kept him in power were inconvenienced, frightened, hurt financially, or even killed. This, direct results of the Allied air campaign, proved too much for the Serbian leader. As Clark remarked when asked if the operation was a success, "The final standard is: Did it work? Did it provide crucial leverage to diplomacy? I think, yes it did!"<sup>91</sup> ■

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# TUSKEGEE AIRMEN TRUE FALSE TEST



Members of the first pilot class at the advanced flying school at Tuskegee, Alabama, listening to their instructor, 1942.

Daniel L. Haulman

The Tuskegee Airmen were the first black pilots in United States military service. They should be remembered for their heroism against great odds during World War II, overcoming obstacles not only from the enemy but also from racists in their own country and service. They got their name from the place they received their flight training. The ones who deployed to North Africa and Italy during World War II, and entered combat, served the Twelfth Air Force and then the Fifteenth Air Force. During World War II, they shot down a total of 112 enemy airplanes. Between the beginning of June 1944 and the end of April 1945, they flew missions for the Fifteenth Air Force, most of them to escort B-17 and B-24 heavy four-engine bombers to enemy targets in central Europe. Countless white bomber crews, with an average of ten personnel per bomber, owed their lives to the Tuskegee Airmen and the other fighter groups that escorted them. The Tuskegee Airmen proved that black pilots could fly as well in combat as the white pilots, and they continued to campaign for equal rights both in the military and outside of it, after the war was over. Many of them continued to serve their country by flying in the Korean and Vietnam wars. They are true heroes, and we should honor them. At the same time, we need to be careful when we hear claims about the legendary Tuskegee Airmen, since many of those claims are false. Their exemplary story needs to be told accurately, without any false embellishment.

Here is a fourteen-question true false test, with the correct answer then given and an explanation, with endnotes, to show my sources:

## Tuskegee Airmen True False Test:

True or false?: On their bomber escort missions, the Tuskegee Airmen fighter pilots never lost a bomber to enemy aircraft fire. FALSE. On seven of their 179 bomber escort missions for the Fifteenth Air Force, between the beginning of June 1944 and the end of April 1945, Tuskegee Airmen-escorted bombers were shot down by enemy aircraft. A total of at least 27 bombers were shot down while being escorted by the Tuskegee Airmen's 332d Fighter Group.<sup>1</sup>

True or false?: The Tuskegee Airmen lost significantly fewer escorted bombers to enemy aircraft than the other P-51 Mustang fighter groups of the Fifteenth Air Force. TRUE. Between the beginning of June 1944 and the end of April 1945, the Tuskegee Airmen's 332d Fighter Group lost at least 27 escorted bombers to enemy aircraft, but the 31st Fighter Group lost 49, the 325th Fighter Group lost 68, and the 52d Fighter Group lost 88. The average number of escorted bombers lost to enemy aircraft by each of the white fighter groups was 68.<sup>2</sup>

True or false?: Of the four P-51 Mustang fighter groups of the Fifteenth Air Force, the Tuskegee Airmen's 332d Fighter

Group shot down far fewer enemy aircraft in the same time period, from the beginning of June 1944 through the end of April 1945. TRUE. During that period, the 332d Fighter Group shot down 94 enemy airplanes. Each of the other Mustang groups shot down more than 200. The 31st Fighter Group shot down 278, the 52d Fighter Group shot down 224.5, and the 325th Fighter Group shot down 252. Each of the white Mustang groups, in the same time period, had at least ten aces, or pilots who shot down at least five enemy airplanes. The 31st Fighter Group had 10 aces, the 52d Fighter Group had 10 aces, and the 325th Fighter Group had 11 aces, in the same period. The 332d Fighter Group had no aces during World War II.<sup>3</sup>

True or false?: Tuskegee Airman Lee Archer was the first and only black ace, but one of his five aerial victory credits was reduced or taken away from him by racists. FALSE. During World War II, Lee Archer claimed to have shot down one enemy aircraft on July 18, 1944, and three on October 12, 1944, and he received credit for all four claims. There is no evidence he ever claimed or received credit for shooting down any more than four enemy aircraft. Claims that Archer had more than four credits did not emerge until after the war, and there is no evidence to support them.<sup>4</sup>

True or false?: Tuskegee Airman Roscoe Brown was the first American pilot to shoot down a German jet aircraft. FALSE. Before Roscoe Brown shot down an enemy jet aircraft on the Berlin mission of March 24, 1945, American pilots had already shot down sixty German jets. Roscoe Brown claimed to have been the



Tuskegee Airman Lee Archer.

first black pilot to shoot down a German jet, but two other Tuskegee Airmen also shot down German jets the same day he did, and records do not show he shot down his before they shot down theirs.<sup>5</sup>

True or false?: The Tuskegee Airmen sank a German warship. FALSE. Tuskegee Airmen claimed to have sunk a German warship by machine gun fire alone on June 25, 1944, in the upper Adriatic Sea (Gulf of Venice) near Trieste. The only German warship attacked by American aircraft at that time and place was the TA-22, the former Giuseppe Missori, which had been an Italian destroyer in World War I. The TA-22 did not sink that day, but was scuttled on May 3, 1945, near Trieste.<sup>6</sup>

True or false?: The first three black generals in the United States Air Force were all Tuskegee Airmen. TRUE. The first three black generals in the United States Air Force were Benjamin O. Davis Jr., Daniel "Chappie" James, and Lucius Theus. All three of them were Tuskegee Airmen.<sup>7</sup>

True or false?: Most of the flight instructors of the Tuskegee Airmen, at Tuskegee Army Air Field, were white. TRUE. Although most of the flight instructors in the primary phase of flight training at Moton Field, using mostly biplanes on grass, were black, at first all of the flight instructors in the basic and advanced phases of flight training at Tuskegee Army Air Field were white, and the majority of them were white throughout World War II.<sup>8</sup>

True or false?: Tuskegee Airman Brigadier General Charles McGee flew more combat missions than any other Air Force pilot. FALSE. Brigadier General McGee flew a total of 409 combat missions in three wars. Colonel Ralph S. Parr, another Air Force pilot, flew a total of 641 combat missions in the same three wars (World War II, Korea, and Vietnam), and Colonel

*Daniel L. Haulman recently retired as Chief, Organizational Histories, at the Air Force Historical Research Agency, Maxwell AFB, Alabama. After earning a BA from the University of Southwestern Louisiana and an ME (Master of Education) from the University of New Orleans, he earned a Ph.D. in history from Auburn University. Dr. Haulman has authored several books, including Air Force Aerial Victory Credits, The USAF and Humanitarian Airlift Operations, and One Hundred Years of Flight: USAF Chronology of Significant Air and Space Events, 1903-2002. He has written several pamphlets, composed sections of several other USAF publications, and compiled the list of official USAF aerial victories appearing on the AFHRA's web page. He wrote the Air Force chapter in supplement IV of A Guide to the Sources of United States Military History and completed six studies on aspects of recent USAF operations that have been used by the Air Staff and Air University. He has also authored The Tuskegee Airmen Chronology. The author of forty-seven published articles in various journals, Dr. Haulman has presented more than twenty historical papers at historical conferences and taught history courses at Huntingdon College, Auburn University at Montgomery, and Faulkner University. He co-authored, with Joseph Caver and Jerome Ennels, the book The Tuskegee Airmen: An Illustrated History, published by New South Books in 2011.*



Gen. Daniel "Chappie" James Jr., one of the original Tuskegee Airmen, went on to become the first African-American to attain the rank of four-star general in the U.S. Air Force.

Harold S. Snow, still another Air Force pilot, flew a total of 666 combat missions in the same three wars.<sup>9</sup>

True or false?: The Tuskegee Airmen's 332d Fighter Group won the first USAF aircraft gunnery meet, but its achievement was covered up and the trophy was hidden for decades by racists in the Air Force. FALSE. The first USAF gunnery meet, held in Las Vegas, Nevada, in 1949, had two winners in two categories. The 332d Fighter Group won the propeller aircraft category, and the 4th Fighter Group won the jet aircraft category. There was no overall category, and the propeller and jet groups did not compete against each other, because there was a different number of events in each category, and a different possible maximum number of points. The trophy contained the names of both the 332d Fighter Group and the 4th Fighter Group. Two other groups won the 1950 USAF gunnery meet, and the names of those groups were also engraved on the trophy. The trophy was not hidden for decades to obscure the victory of the black group any more than it was hidden for decades to obscure the victory of the other three groups. In fact, the Air Force Museum had not even opened yet. The Air Force did not attempt to cover up the achievement of the 332d Fighter Group or any of the other three groups that won in the meets of 1949 and 1950.<sup>10</sup>

True or false?: The Tuskegee Airmen's 332d Fighter Group, unlike the other fighter escort groups in the Fifteenth

Air Force, had four squadrons instead of three, and therefore more airplanes and pilots than the other groups. TRUE. All of the fighter groups of the Army Air Forces in World War II had three squadrons except the 332d Fighter Group, which between July 1944 and early March 1945, had four fighter squadrons, the 99th, 100th, 301st, and 302d. The average number of fighters per squadron, during World War II, was 25. Except for the 332d Fighter Group, each fighter group, with three squadrons, had an average number of 75 aircraft. The Tuskegee Airmen's 332d Fighter Group had four squadrons. If each of its squadrons also averaged 25 fighters, it had an average of 100 aircraft assigned. In early March, 1945, the 302d Fighter Group of the 332d Fighter Group was inactivated, and from then to the end of April 1945, the 332d Fighter Group had the same number of fighter squadrons as the other fighter groups.<sup>11</sup>

True or false?: Tuskegee Airman Daniel "Chappie" James was one of the leaders of the "Freeman Field Mutiny" that resisted segregation at Freeman Field, Indiana in April 1945. FALSE. Tuskegee Airman Daniel "Chappie" James was stationed at Freeman Field in April 1945, and was assigned to the Tuskegee Airmen's 477th Bombardment Group that was stationed there. At first sixty-one black officers were arrested for attempting to enter the "white only" officer's club. All but three were soon released, but the base commander issued a segregation regulation and demanded that all the officers sign acknowledgement of it. 101 of the black officers, many of whom had been arrested among the 61 originally arrested, refused to sign, and were arrested. A total of 120 black officers were arrested, accounting for those who were arrested twice. Daniel "Chappie" James was not arrested in either round. While he might have sympathized with the desegregation cause of his fellow black officers, he did not resist enough to be listed among those arrested either for attempting to enter the white officer's club or for refusing to sign the base segregation regulation.<sup>12</sup>

True or false?: The Tuskegee Airmen flew four different kinds of fighters in combat during World War II. TRUE. The 99th Fighter Squadron, the first of the Tuskegee Airmen units to deploy overseas and enter combat, at first flew P-40s. The 332d Fighter Group and its three squadrons, the 100th, 301st, and 302d Fighter Squadrons, all flew P-39s in combat after those units reached Italy in 1944. Eventually, the 332d Fighter Group converted to P-47 and then P-51 aircraft, and the 99th Fighter Squadron was assigned to that group. Thus the four different kinds of aircraft the Tuskegee Airmen flew in combat were P-40s, P-39s, P-47s, and P-51s. The Tuskegee Airmen, however, did not fly more different types of aircraft than any other fighter group. There were some other fighter groups that flew even more than 4 types of aircraft.<sup>13</sup>

True or false?: Some of the Tuskegee Airmen flew not only fighters but also bombers during World War II. TRUE. Some of the Tuskegee Airmen, during their advanced

training at Tuskegee Army Air Field, trained in twin-engined aircraft, and were eventually assigned to the 477th Bombardment Group, which flew B-25 twin-engine bombers. However, the 477th Bombardment Group did not deploy overseas or take part in combat during World War II. By the time the 477th Bombardment Group was activated in early 1944, and black pilots were assigned to it, the war was already far along, and by the time the 477th Bombardment Group, including not only its pilots but also its navigators and bombardiers and other personnel, were fully trained, the war ended. Racism at some of its bases also delayed the training.<sup>14</sup>



(Right) A pair of Tuskegee Airmen scan the skies.

## NOTES

- 1 Monthly histories of the 332d Fighter Group for the period June 1944 through April 1945; Daily narrative mission reports of the 332d Fighter Group for the same months; Fifteenth Air Force mission reports for the same period; reports on missing aircrews (Missing Air Crew Reports, or MACRs) for each bomber reported having been lost on each mission by date and place, particular attention to MACRs 6317, 6179, 6097, 6894, 6895, 7034, 6856, 6953, 6954, 6975, 6976, 6977, 6978, 6979, 6980, 6981, 7097, 7098, 7099, 7153, 7310, 6914, 6919, 7971, 13278, 13274, 133750.
- 2 Monthly histories of the 31st, 52d, and 325th Fighter Groups for the period June 1944 through April 1945; daily narrative mission reports of those groups for the same months, and reports on missing air crews for each of the bombers lost by the escorted groups, for the period they were escorted by the respective groups. All these documents available from the Air Force Historical Research Agency.
- 3 USAF Historical Study 85, recording aerial victory credits for each of the squadrons and groups of the Army Air Force during World War II, on file at the Air Force Historical Research Agency, and orders awarding aerial victory credits to individual pilots belonging to those squadrons and groups.
- 4 Histories of the 332d Fighter Group, by month, June 1944 through April 1945; USAF Historical Study 85 regarding Army Air Forces aerial victory credits during World War II; Fifteenth Air Force general orders 2350 (dated Aug. 6, 1944) and 4287 (dated Nov. 1, 1944).
- 5 Robert F. Dorr, *Fighting Hitler's Jets* (Minneapolis, MN: Zenith Press, 2013), Appendix B (USAAF Aerial Victory Credits Over Me 262 Jets), compiled by Patsy Robertson of the Air Force Historical Research Agency), pp. 281-89.
- 6 332d Fighter Group history for June 1944; David Brown, *Warship Losses of World War II* (Annapolis, MD: Naval Institute Press, 1990), pp. 114, 149, 168; M. J. Whitley, *Destroyers of World War Two* (Annapolis, MD: Naval Institute Press, 1988), p. 78.
- 7 Biography files on USAF generals on file in the second

floor research room of the Air Force Historical Research Agency.

8 Histories of Tuskegee Army Air Field, 1941-1945, on file at the Air Force Historical Research Agency. The histories contain numbers of black and white personnel.

9 John L. Frisbee, "The Pinnacle of Professionalism," *Air Force Magazine* (February 1987), p. 109; "Ralph S. Parr, Fighter Pilot," *Daedalus Flyer*, vol. XXXVI, no. 2 (Summer 1996), pp. 15-21; e-mail, Barrett Tillman to Daniel Haulman, July 22, 2013; John Mollison, *666 The Devil's Number: The Amazing Service of Hank Snow* (2013), from website: John Mollison.com.

10 Zellie Orr, *Heroes in War-Heroes at Home: First Top Guns* (Marietta, GA: Communication Unlimited, 2008), p. 49; History of Nellis AFB, NV for 1949, at Air Force Historical Research Agency; History of 332d Fighter Group for 1949, also at Air Force Historical Research Agency; author's own visit to the National Museum of the United States Air Force, where he saw the trophy with the names of the four 1949 and 1950 winning organizations listed at the base of the trophy.

11 Mauer Maurer, *Air Force Combat Units of World War II* (Washington, DC: Office of Air Force History, 1983), pp. 83-85, 113-115, 206-208; 212-213; *The Official World War II Guide to the Army Air Forces* (New York: Bonanza Books, 1954), p. 21.

12 Lt Col James C. Warren, *The Tuskegee Airmen Mutiny at Freeman Field* (Vacaville, CA: The Conyers Publishing Company, 2001), Appendix D (Arrestees), pp. 98-200; LeRoy Gillead, *The Tuskegee Aviation Experiment and Tuskegee Airmen, 1939-1949* (San Francisco, CA: Balm-Bomb in Gillead, 1994), pp. 132-33.

13 Mauer Maurer, *Air Force Combat Units of World War II* (Washington, DC: Office of Air Force History, 1983), pp. 83-85, 113-115, 206-208; 212-213

14 Lineage and honors history of the 477th Bombardment Group and monthly histories of the group from January 1944 through May 1945, on file at the Air Force Historical Research Agency, Maxwell Air Force Base, Alabama.

# The Mask of Robin Olds: Theatrical Heroic Leadership in Air Combat



Colonel Robin Olds flew this McDonnell F-4C-24-MC Phantom II, 64-0829, SCAT XXVII, when he and 1st Lieutenant Stephen B. Croker shot down two VPAF MiG-17s near Haiphong, North Vietnam, May 20, 1967. (U.S. Air Force)

Richard R. Johnson

United States Air Force Colonel Robin Olds took command of the 8th Tactical Fighter Wing (8th TFW) at Ubon Royal Thai Air Base during the first week of October 1966.<sup>1</sup> At that time, the morale and performance of the 8th TFW was very low for many reasons.<sup>2</sup> The wing had deployed to Thailand in early 1965 to participate in the broader air war in Southeast Asia, flying combat missions over Laos and North Vietnam.<sup>3</sup> Twenty of the wing's seventy-two F-4 *Phantom* fighters had been lost in combat, and one more crashed in an accident.<sup>4</sup> In exchange for these high losses, the members of the wing had shot down only five enemy MiGs. Even the un-maneuverable F-105 fighter-bombers the wing had been sent to protect had shot down four MiGs on their own.<sup>5</sup>

The rules of engagement imposed by President Johnson and the Joint Chiefs of Staff did not permit attacking enemy airfields, for fear of sparking a wider war by killing Soviet or Chinese advisors on the ground. The American pilots could not take out enemy anti-aircraft weapons until after the North Vietnamese fired at them.<sup>6</sup> The air-to-air missiles the Americans were using proved unreliable in dogfights, with many weapons malfunctioning.<sup>7</sup> The Air Force's 100-mission rotation policy resulted in a steady stream of inexperienced aircrews entering the wing, and the loss of experienced pilots who were returning home. The policy also damaged unit cohesion as pilots arrived and left in a piecemeal fashion.<sup>8</sup> Finally, many of the pilots felt the air war was being micromanaged by politicians in Washington, D.C., and planners in Hawaii, with little input from the people flying the missions.<sup>9</sup>

Ralph Wetterhahn and John Stone, both young captains in the wing, recalled the bitterness pilots had for their commanders. They recalled that their wing commander rarely flew missions, and never over the most dangerous parts of North Vietnam.<sup>10</sup> Stone recalled, "I wouldn't have wanted to address that crowd. We had no respect for leaders because they weren't flying and couldn't talk to us about flying."<sup>11</sup> Yet Colonel Olds took command of the wing, and twelve months later morale was extremely high. In a year under Olds' command, the wing accumulated sixteen more aerial victories, and F-4 and F-105 aircraft losses declined. The members of the 8th TFW developed pride, fellowship, and loyalty; now proudly referring to themselves as the "Wolf Pack." When Colonel Olds completed his last combat mission at the end of his tour of duty, the cheering aircrews of the wing carried their commander to the officers' club on their shoulders as a sign of respect, endearment, and camaraderie.<sup>12</sup> Olds became one of the most famous pilots of the Vietnam War, and revered within the fighter pilot community.<sup>13</sup> What was it about Robin Olds' leadership that transformed the morale and performance of the 8th TFW?

The scholarly military history literature contains many examinations of the leadership of important military commanders, from generals and admirals down to field grade officers. These works overwhelmingly focus on army and naval



Colonel Robin Olds being carried off the flight line by his men after completing his last combat mission in Southeast Asia. These expressions on the faces of the pilots convey respect, appreciation, and affinity for their wing commander. (Source: NMUSAF)

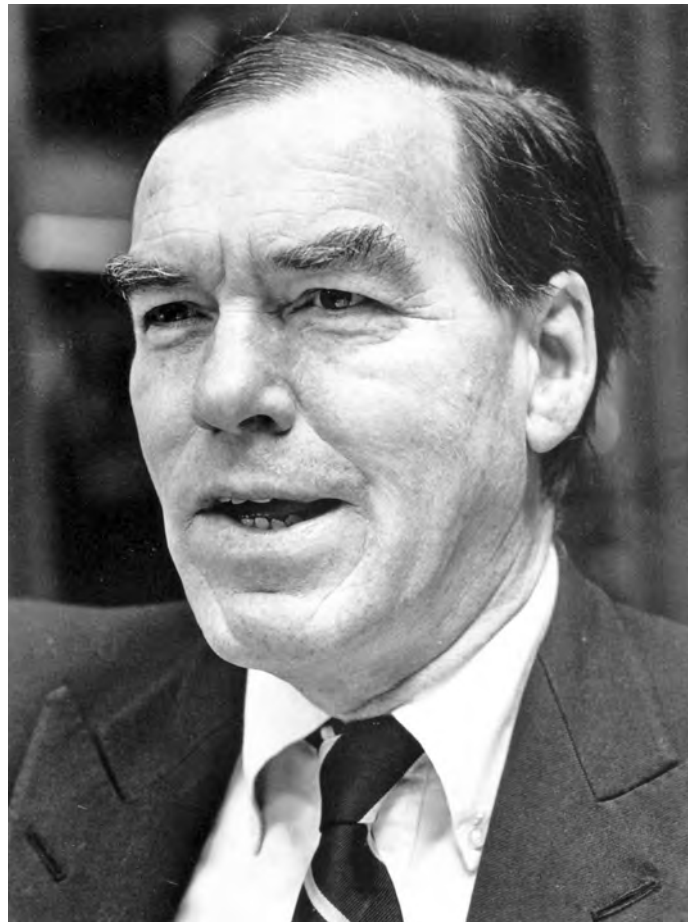
commanders, with comparatively few works about air force leaders. Of the existing works addressing the leadership of air force officers, the literature has almost exclusively focused on commanders at the theater level or higher, such as Henry “Hap” Arnold or Curtis LeMay. While many works deal with individual pilots or flying units, most are memoirs or popular battle histories, rather than scholarly analyses of leadership. This article is a first step in trying to fill the void in the historical literature regarding the leadership actions of field-grade air power leaders.

This article uses John Keegan’s model of theatrical heroic leadership to examine Robin Olds’ leadership style during his command of the 8th TFW in Southeast Asia. It will provide an overview of Keegan’s model as he applied it to famous leaders of ground combat throughout history. Keegan claimed the effective combat leader displays five important qualities: kinship, prescription, sanction, action, and personal example.<sup>14</sup> These five qualities will serve as a framework for the rest of the article, relying on Old’s memoir, the memoirs of other pilots, official government documents, and some secondary historical sources to examine the extent to which Robin Olds’ behaviors fit Keegan’s model.

## The Mask of Command

Noted military historian John Keegan offered a useful framework for examining the leadership style of combat

*Richard R. Johnson is a doctoral candidate in the security studies program at Kansas State University. He holds a master’s degree in military history, and a bachelor’s degree in public policy analysis, and is a veteran of the Air National Guard.*



Sir John Keegan, the author of *Mask of Command*, was a military historian, author of thirty books on military history, and a lecturer at the Royal Military Academy Sandhurst. (Source: Royal Military Academy Sandhurst)

commanders. In his classic *Mask of Command*, Keegan studied Alexander the Great, the Duke of Wellington, Ulysses S. Grant, and Adolph Hitler to determine what factors did, and did not, make a great military leader in war. The ‘mask’ in the title refers to the outward persona displayed by the commander, consciously or unconsciously, that made the commander an effective wartime leader. The effective combat leader must display certain important qualities before one’s subordinates, while concealing other qualities. From his analysis of these four military leaders, and tertiary analyses of other leaders such as Julius Caesar and Napoleon Bonaparte, Keegan developed a model for effective combat leadership based on five primary qualities: kinship, prescription, sanction, action, and personal example.<sup>15</sup> The present article will use these five qualities as a framework for examining Robin Olds’ behaviors while commanding the 8th TFW during the American wars in Southeast Asia.

## Kinship

The first characteristic Keegan addressed he called ‘kinship.’ Kinship is generally described as a feeling of commonality with other people, but Keegan used kinship to refer to the “aura of mystery with which the successful commander surrounds himself” to balance the leader’s re-





Colonel Olds with his deputy commander of operations, Colonel Daniel “Chappie” James. The affable Colonel was the “people person” Olds relied upon for handling daily conflicts and morale issues within the wing. (Source: National Museum of the US Air Force)



Colonel Vernon “Pappy” Garrison was the meticulous, detail-oriented, wing vice-commander Olds relied upon to handle the daily operational and logistical issues for the wing. (Source: National Museum of the US Air Force)

lational intimacy with his followers.<sup>16</sup> The leader must juggle both having a personal connection with one’s followers, while simultaneously creating an impression of being special and important. Keegan noted that the Duke of Wellington maintained this aura through his official status as a gentleman, and the associated accoutrements of servants, meals on dinnerware, fine horses, and hunting dogs, even while operating in the field. Ulysses Grant shared a commoner background with his troops, yet maintained relational distance by surrounding himself with close staff officers who served as both his promoters among the troops, and as a protective barrier from the troops.<sup>17</sup>

Robin Olds also had an aura of being special. He was the son of General Robert Olds, who had been a fighter pilot in World War I, and later served on the staffs of air power giants Billy Mitchell, Hap Arnold, and Carl Spaatz.<sup>18</sup> Robin Olds was tall (6 foot, 3 inches), muscular, and athletic, winning honors as a football player in high school and at the United States Military Academy at West Point.<sup>19</sup> After graduating from West Point, he became a fighter pilot in Europe during World War II. Flying P-38 *Lightning* and P-51 *Mustang* fighters, he accumulated thirteen confirmed air-to-air kills, and three probable kills, becoming a double ace.<sup>20</sup> After the war, Olds served in fighter squadrons at bases in the United States, Europe, and North Africa, continuing to boost his reputation as a top fighter pilot and leader.<sup>21</sup> As if that was not enough to create a special mystique, Olds was married to a “pin-up girl” movie star, actress Ella Raines.<sup>22</sup>

Like Ulysses Grant, Olds maintained some relational distance by surrounding himself with close staff officers who supported his decisions and relieved him of many of the daily administrative tasks required when running a fighter wing. Upon taking command of the 8th TFW, Olds replaced the deputy commander for operations with his friend Colonel Daniel “Chappie” James. Olds met James while attending the U.S. Army War College, and they later worked together at the Pentagon and in a fighter wing in Europe. Like Olds, James was an imposingly large former

football player and a veteran fighter pilot who had flown more than a hundred combat missions during the Korean War.<sup>23</sup> James had a great sense of humor, a talent for persuasive public speaking, and excellent conflict-resolution skills. Colonel James helped Olds handle morale and discipline issues within the wing. As an African-American, James represented legitimate leadership to black airmen during a period of strained racial tensions in America society.<sup>24</sup>

While Colonel James was the “people person” Olds needed to handle personnel issues and impose discipline, Olds kept Colonel Vermont “Pappy” Garrison as the vice-commander of the wing. Garrison was also an old friend to Olds who had become a fighter ace during World War II, and a double ace during the Korean War.<sup>25</sup> Garrison was meticulous, detail-oriented, and an excellent administrator. Garrison handled the daily operational and logistical issues for the wing, including planning the flight schedules.<sup>26</sup> As Colonel James addressed conflicts and personnel issues, Olds was insulated from having to deal directly with his personnel on these issues.

Yet, Olds fraternized with his subordinates far more than Keegan’s model recommends. Captain Dick Stultz remembered, “Almost overnight, it seemed, he knew all our names.”<sup>27</sup> At times, Olds violated the relational distance Keegan suggested was important to maintain the mystique of being set apart from the rest.<sup>28</sup> Olds actively participated in the hazing and party games so common among fighter squadrons around the world.<sup>29</sup> Such practices as let-

ting junior officers physically wrestle with him at the officers' club, and participating in after-hours festivities with his men, carried the risk of allowing his followers to become too familiar with him. One should recall the old axiom "familiarity breeds contempt." However, engaging in these antics proved successful for Olds in increasing follower devotion.

While eating his first meal at Ubon, for example, the 44-year-old Olds got into a wrestling match at the officers' dining facility with two first lieutenants. Not realizing Olds was their new commander, the two young pilots made snide remarks about Olds' flight suit (the type worn by stateside units), and his unit patches from a stateside squadron. Rather than formally addressing this insubordination and lack of professional decorum, Olds challenged the young pilots to tear off his patches. In the wrestling match that ensued, the large and muscular Olds held his own against the younger officers until the military police arrived to break up the melee.<sup>30</sup>

At a fighter tactics conference at Korat Royal Thai Air Force Base, Olds introduced the "MiG Sweep" party trick at the officers' club. The "MiG Sweep" involved six pilots, with arms linked together, running in a line from one end of the bar to the other, knocking down anyone they encountered. One witness reported, "Robin and his band of brigands maneuvered their way to the far end of the very long bar. Then, without warning, rushed pell-mell down its business side laying waste to everyone in their path."<sup>31</sup> The F-105 and F-4 pilots from other squadrons tried to use bar stools to block and trip Olds' crew, with all the pilots ending up in a wrestling pile on the beer-soaked floor. Olds and another colonel ended up on the bottom of the pile. Colonel Howard Johnson recalled, "I managed to get ahold of the scruff of [Olds'] neck and found myself trying to pound his head into the sticky terrazzo floor...It was one unforgettable night."<sup>32</sup> While such behaviors violate Keegan's model for effective combat leaders, these incidents appear to have worked for Olds.

## Prescription

What Keegan called 'prescription' might be better described as inspiration. Keegan explained prescription was the quality of knowing how to make one's soldiers feel appreciated and understood, while also inspiring them to persevere and succeed when faced with adversity.<sup>33</sup> Included within prescription is ensuring that the basic needs of one's followers are addressed. All great military leaders, no matter how heroic or inspirational, must also ensure administrative and logistic functions are fulfilled. Ulysses Grant won the loyalty of his troops, in part, because he shared the same sparse living conditions and meager rations as his troops.<sup>34</sup> Referring to Alexander the Great, Keegan remarked, "The marching of large contingents...was a major administrative feat, but one far less testing than his need to keep his men and animals supplied with provender on a daily basis."<sup>35</sup> Personnel need to be fed, paid, and housed.

Olds intentionally arrived at Ubon unannounced so that he could observe how the base operations and check-



Colonel Robin Olds, 8th Tactical Fighter Wing, with SCAT XXVII, his McDonnell F-4C-24-MC Phantom II, 64-0829, at Ubon Rachitani RTAFB, 1967. (U.S. Air Force)

in procedures were operating. Arriving in the back of a cargo plane with the enlisted replacements for the wing, he quickly discovered that the base operations were inefficient and organized for the convenience of support services office personnel, rather than combat operations. While the aircrews, mechanics, and intelligence staff were working around-the-clock on combat missions, they could only take care of administrative issues (such as pay, billeting, medical appointments, clothing requisitions, etc.) during banker's hours. These services were only open Monday through Friday from 8 o'clock in the morning to 4 o'clock in the afternoon, and were closed during the lunch hour. Olds quickly ordered that officers commanding supporting units switch to a wartime mindset and put the needs of operational personnel first.<sup>36</sup>

Keegan explained inspirational leadership as the ability to motivate followers through camaraderie, putting others before self, and through delivering inspiring, well-crafted orations. Keegan noted that Alexander the Great and Napoleon were recognized for giving motivational speeches to their troops and convincing them to fight for principles more than spoils.<sup>37</sup> In order to inspire his aircrews, Olds gave many motivational speeches, praised signs of initiative, and challenged his personnel to out-perform him. He engaged in camaraderie-inducing activities, and tried to protect his personnel from unnecessarily bureaucratic rules.

His first motivational speech occurred during his initial week commanding the 8th TFW. Olds called a meeting to be attended by all aircrews within the wing. Amazingly, this was the first time all aircrews had been briefed together as a group since their deployment to Thailand the year before. The wing had not been meeting as a unit.<sup>38</sup> Olds introduced himself and, rather than touting his own record, deferred to the expertise of his aircrews. "You guys

know a lot that I don't know and I'm here to learn from you," some recall him saying. "I'll be flying as your wingman for a couple of weeks. You are going to teach me, but you better teach me good and you better teach me fast."<sup>39</sup> Olds explained that as he became familiar with the combat environment, he would progressively take over more and more of a leadership role in the air. He would start as the lowest-seniority wingman, then work up to lead a section, then a flight, and finally serve as mission commander. One pilot recalled Olds repeatedly challenging his pilots by saying, "Stay ahead of me because as long as you know more than I do, we are going to get along just fine. I will listen to you and learn from you, but soon I'm gonna be better than all of you."<sup>40</sup> Captain Dick Stultz recalled, "He continued giving the speech every now and then, always ending it with the challenge 'I'm gonna be better than you.'"<sup>41</sup>

After gaining experience, Olds made it his practice to assign the newest and least experienced pilots to fly with him in the back seat of the F-4. At this time, it was U.S. Air Force policy that the F-4 was crewed by two rated pilots. It was not until 1968 that the Air Force began replacing the back-seat pilot with a non-flying rated Weapons System Officer (WSO).<sup>42</sup> Olds flew with the least experienced pilots in order that he could help shape the new arrivals, and so that fewer of his existing pilots would have to be at risk working with an inexperienced copilot.<sup>43</sup> Olds discovered a group of his pilots had been studying intelligence information to analyze the tactics of the North Vietnamese pilots with the intention of creating an unofficial tactics manual for their squadron. Olds endorsed the effort and made contact with higher levels of command to get their manual approved as an official document for the whole theater.<sup>44</sup>

Another example of Olds' support for the innovative thinking of his personnel resulted in Operation Bolo. Captain John "JB" Stone approached Olds with a plan to lure North Vietnamese MiGs into an ambush by using F-4 fighters to simulate formations of unescorted F-105 bombers. The expectation was that the North Vietnamese MiGs would go after what they thought were sluggish, bomb-laden F-105 fighter-bombers, only to discover the formation was composed of F-4 fighters prepared for air-to-air combat. Olds gave Stone his full backing and personally flew to Hawaii to meet with General William Momyer, Deputy Commander for Air Operations, Military Assistance Command, Vietnam (MACV) to get his support. Olds' efforts convinced General Momyer to permit the operation.<sup>45</sup> Returning to Ubon, Olds assembled a team to plan the mission and used his influence to help the team acquire the intelligence and equipment they needed.<sup>46</sup> They carried out the mission on January 2, 1967, which resulted in no American aircraft losses and seven North Vietnamese MiG-21 fighters destroyed – half of the new MiG-21 aircraft the Soviet Union had provided North Vietnam.<sup>47</sup>

## Sanction

The quality Keegan called 'sanction' refers to the degree the leader may act autonomously to issue orders and



Colonel Robin Olds with Captain John ("J.B.") Stone, 433rd Tactical Fighter Squadron, one of the planners of OPERATION BOLO. (U. S. Air Force)

discipline followers.<sup>48</sup> Despite Olds' involvement in high-spirited mischief with his aircrews at the officers' club during downtime, Captain Dick Stultz recalled that Olds "was pure business in the cockpit."<sup>49</sup> Olds delegated most of his day-to-day discipline responsibilities to Colonel James, his deputy commander, yet Olds also contributed to maintaining discipline, especially with regard to flying. Olds led post-mission briefings by being brutally candid about any mistakes made, and demanding that the other aircrews did the same. This critical examination helped identify and eliminate practices that had been contributing to accidents and combat losses.<sup>50</sup>

Olds demonstrated his authority regarding the authority over sanctioning when an incident occurred within another fighter wing involving a group of pilots who had violated the rules of engagement by strafing a Soviet freighter ship, and then engaged in a cover-up of the incident. Olds called together all his personnel and warned them never to cover up mistakes that they made. He told them, "My loyalty is to you as your commander. I will fight for you, I will protect you, and I will do everything I can." He assured them, "If you screw up like that, come and tell me. You are in my outfit. It is my responsibility and I will make the decision and take the brunt of the reaction."<sup>51</sup>

In another example, Olds pushed back hard against the Rapid Roger maintenance program ordered by Secretary of Defense McNamara. This ill-advised program sought to increase the number of aircraft sorties flown in a day by having the same aircraft flown for both day and night missions within the same 24-hour period. The program resulted in increased wear and tear on the aircraft, and increased aircraft maintenance hours. The program ended up having the opposite effect of its intention, reducing the number of aircraft available for flight operations, and overburdening the maintenance personnel who had to

work around the clock. Maintenance crews were not able to keep up with the demands of Rapid Rodger and the aircraft that were breaking down at a high rate. Olds personally lobbied generals throughout the Air Force, pleading with them to end the program. He coordinated his complaints with those of the other wing commanders in Southeast Asia. When the Rapid Roger program was finally rescinded, Olds placed the directive for Rapid Roger in a small wooden casket he had ordered the base carpentry shop to build. He then led a formal procession and ceremony attended by his aircraft maintenance personnel. They buried the casket with the Rapid Roger order inside, and then all took turns urinating on the grave.<sup>52</sup> This not only illustrated unity with his maintenance airmen, but his power to get the order rescinded and authority to permit such unprofessional and possibly insubordinate behavior.

Another rule Olds flouted was the Air Force facial hair regulations against mustaches. Olds noted that many of the pilots flying in Southeast Asia were growing mustaches. For some it was superstition, claiming their 'bulletproof mustaches' would bring them good luck and keep them from getting shot down. To others, it was an act of protestation against the U.S. Air Force higher command for what the pilots perceived as ridiculous rules of engagement and mission orders.<sup>53</sup> In an act of solidarity, Olds grew a large, waxed, handlebar mustache more flamboyant than those of his subordinates. When news stories covering the air war in Southeast Asia featured photos of Olds' prominent mustache, it drew the ire of the U.S. Air Force Chief of Staff. Yet Olds demonstrated his autonomy to sanction by permitting his personnel to wear their mustaches, and retaining his own mustache until his return from Southeast Asia.<sup>54</sup>

### Action

'Action,' in Keegan's model, refers to issuing commands that prove successful, but he pairs action with the gathering of knowledge. Keegan wrote, "Action without forethought or foreknowledge is foolhardy. Commanders must know a great deal before they act and see what they are about when they do."<sup>55</sup> It appears Olds was constantly gathering knowledge, trying to understand how and why things operated as they did, before he implemented any changes. In his memoir, Olds described his first few days on base at Ubon, roving through as many base offices as he could. He described getting familiar with the layout of the base facilities and each work center. At each base facility, he introduced himself, peppered people with questions, and answered questions from his subordinates.<sup>56</sup> Olds later said these activities were crucial to taking over a new command and learning the state of the unit one had inherited. "I planned to check out all the shops, check out equipment used by the men, look at their supplies, learn how things were put together and taken apart."<sup>57</sup>

Olds studied everything he could about the missions, the targets, and the air war. He seemed to strive to know as much, if not more, than his crews. "I kept running into Robin in [the] Intelligence [office]," Captain Stultz recalled.



Colonel Olds sporting his "bulletproof mustache." This was simultaneously a sign of camaraderie with his aircrews, and a sign of the latitude he had to flout certain rules. (Source: National Museum of the US Air Force)

"Robin would be in there in the late hours...asking the same kind of questions we were asking."<sup>58</sup> Through studying the air missions his wing was flying, Old realized a significant lack of communication and cooperation between the F-105 units conducting the bombing missions, the F-4 units providing fighter cover, the aerial refueling units providing tanker support, the electronic and photo reconnaissance units, and the command-and-control aircraft.<sup>59</sup> In response, Olds organized and hosted a "tactics conference" at Ubon, to which he invited representatives of these various units. The purpose of the conference was to build camaraderie, but also share information. The conference took place in January 1967, and four more such conferences were held from 1967 through 1968. The formal and informal information shared at these conferences resulted in much-improved operations for all.<sup>60</sup>

### Personal Example

Of all the characteristics in Keegan's model of combat leadership, conspicuous leadership by example in the face of danger was regarded as the most important. Keegan wrote that the "greatest imperative of command is to be present in person. Those who impose risk [on others] must be seen to share it...hence the collapse of so many armies whose commanders neglected to show themselves to their soldiers at the moment of danger."<sup>61</sup> Keegan provided examples of this conspicuous leadership under fire, such as Alexander the Great taking positions at the head of his cavalry, or in the front row of an infantry phalanx. Several times in Gaul, Julius Caesar personally turned the tide of

a battle while wearing a conspicuous red cape so that his men could easily spot his brave actions on the battlefield. Ulysses Grant had multiple horses shot out from under him.<sup>62</sup> Keegan saw this heroic leadership as the most important of the five qualities, and described heroic leadership as aggressive risk-taking.<sup>63</sup> He emphasized that having a reputation for risk-taking in years past, such as Adolph Hitler's earning the Iron Cross for bravery in World War I, was no substitute for the influence of heroic leadership in the present.<sup>64</sup>

Keegan argued that a leader's conspicuous acts of heroism inspired one's troops to follow their commander's lead and be equally courageous. It strengthened their commitment to the leader who openly risked his life alongside them.<sup>65</sup> Nevertheless, Keegan suggested that since the beginning of the twentieth century, the size of armies, the large geographic dimensions of battlefields, and the ability to communicate across long distances, have all made it impractical for commanders above the company level (or squadron level here) to be at the front of the battle.<sup>66</sup> How much more would this be the case for an air wing commander who was responsible for leading seventy-two aircraft, and a thousand personnel? How much more would this be the case for a leader of a force that engaged in battles hundreds of miles from their home base, and in a three-dimensional battlespace a hundred miles across and 40,000 feet in height? One would expect that such a wing commander would have to depend on his past reputation for air combat exploits as a squadron member earlier in his career to earn the respect of his troops.

In fact, it was normal for that rank and responsibility to concentrate on administrative tasks and rarely fly in combat. The wing commander who had preceded Olds in commanding the 8th TFW flew only twelve combat missions during the year he commanded the wing. These missions were flown mostly within the lowest-risk regions over Laos and southernmost portions of North Vietnam.<sup>67</sup> It would not have been out of the ordinary if Olds had done the same. Furthermore, Olds was already a double ace during World War II, with all his aerial victories involving German fighter aircraft shot down in dogfights.<sup>68</sup> Not one American fighter pilot had yet achieved ace status in Southeast Asia. It could easily be argued that Olds had nothing more to prove regarding his bravery in combat.

Olds, however, *did* engage in conspicuous heroics in combat alongside his pilots. As he had promised in his first briefing to the wing, Olds placed himself on the flying schedule, initially flying combat missions in a junior member role, and gradually working his way up to lead missions. After being ordered to stop leading missions by the Chief of Staff of the Air Force, Olds returned to flying combat missions in a junior role.<sup>69</sup> Olds engaged in combat missions, even within Route Package VI, the most northern and dangerous part of North Vietnam. He dodged anti-aircraft fire and surface-to-air missiles. He engaged in air-to-air combat, successfully shooting down four North Vietnamese MiG fighters in intense dogfights, while most members of his wing were lucky to shoot down just one MiG during their 100-mission tours.<sup>70</sup> As for the 100-mis-

sion tour requirement imposed by the Air Force, in his memoir Olds stated he avoided being sent home before his full-year tour of duty was up by sneaking into the wing's operations room at night and erasing his name from prior flight schedules. This ensured that his flight tally remained in the mid-eighties for months, despite his flying missions every week.<sup>71</sup> The actual number of combat missions Olds flew is unknown, but clearly more than the required one-hundred.

In addition to sharing the same risks as the other pilots in the wing, Olds demonstrated heroics by engaging in unnecessarily risky behavior in combat. Many might label these actions reckless. While leading a four-aircraft formation on a mission on May 4, 1967, for example, Olds exposed himself (and his copilot, First Lieutenant William LaFever) to unnecessary risks while unarmed. Over the capital of North Vietnam, his flight engaged in twisting, turning dogfights with multiple North Vietnamese MiG-21 fighters. The enemy fighters were attacking formations of F-105 aircraft bombing targets around Hanoi. One of Olds' missiles failed to fire, and several of his missiles failed to track. Olds was finally able to shoot down one MiG-21 with a heat-seeking missile (his second aerial victory of the war), but was now out of missiles. The F-4C model aircraft he was flying lacked a gun, so Olds was now weaponless.<sup>72</sup>

Nevertheless, Olds refused to leave the battle while he still had fuel and the other F-4s of his flight had missiles. After the last of the F-105s safely departed the area, Olds led his flight of F-4s to the nearby enemy Hoa Loc airfield where several enemy MiG-17 fighters were in the traffic pattern, circling and waiting to land.<sup>73</sup> According to the rules of engagement at that time, once the MiGs landed the Americans could not attack them. Despite being unarmed himself, Olds encouraged the rest of his flight to engage the enemy fighters while he disrupted the landing pattern so the enemy aircraft would remain aloft.<sup>74</sup> In an interview years later, Olds recalled, "We got right into the traffic pattern, 200 feet to a couple of thousand feet, right over their airfield, in a hell of a go-around with the MiGs. It kind of amused me."<sup>75</sup> Despite anti-aircraft gunfire coming from the airfield and being unarmed, Olds flew at the enemy fighters head-on, forcing them to turn away from the airfield. He then chased MiGs, getting as close as possible to the rear of some enemy fighters so that they thought they were about to be shot down. Once the F-4s were low on fuel, Olds ordered his flight to head for home. All successfully fled the area having sustained no losses.<sup>76</sup>

In another example of recklessness, Olds was leading one of two flights of four F-4s providing air cover for an F-105 bombing mission near Hanoi on May 20, 1967. The American fighters were suddenly attacked from behind by a group of twelve to sixteen MiG-17s, and Old's wingman (pilot Major Jack Van Loan and copilot Joseph Milligan) was shot down on the first pass. The remaining seven F-4s spent ten minutes in intense dogfights with multiple MiGs.<sup>77</sup> During the battle with the silver MiGs, Olds noticed a single, uniquely camouflage-painted MiG-17 flying a lazy figure-eight pattern down at treetop level. Olds surmised that the pilot of that MiG was the leader, coordinat-



Colonel Robin Olds, USAF, in the cockpit of McDonnell F-4C-21-MC Phantom II, 63-7668, on his last flight out of Ubon-Rachitani RTAFB as Wing Commander, 8th Tactical Fighter Wing, 23 September 1967. This was his 152nd combat mission of the Vietnam War. (U.S. Air Force)

ing the actions of the rest of the MiGs. Olds, however, was too busy protecting his fellow flight members to do anything about that lone MiG. In the chaotic aerial melee, four enemy MiG-17s were shot down by the seven remaining American fighters, with no further American losses.<sup>78</sup>

Once the F-4s were low on fuel, they fled the area and the remaining MiG-17s also turned for home base. While flying towards the Laotian border, Olds kept thinking about that one low-altitude MiG he had witnessed. Despite barely having enough fuel left to make it back to base in Thailand, and over the objections of his back seat co-pilot First Lieutenant Steve Croker, Olds turned back to engage the lone, low-level MiG leader. Diving to treetop level to avoid detection by enemy radar, Olds returned to the area of the earlier dogfight and found the leader MiG-17 just starting to turn toward its home base. The enemy pilot spotted Olds approaching and started jinking hard right and left, still flying at low altitude above the palm trees and rice paddies.<sup>79</sup> "I stayed below him at 30 to 50 feet [above ground level] as we tore across the deck," Olds wrote in his memoir.<sup>80</sup>

At this time Olds was too close to the MiG to use a radar-guided missile, and because there was too much reflected heat energy from the rice fields below, he could not obtain a heat-seeking missile lock. As Olds pursued the MiG across the rice paddy plain at high speed, less than a hundred feet above the ground, they approached a wall of karst ridges. As the MiG-17 pilot pulled up hard to avoid the ridges, he pulled away from the heat interference from the ground. This gave Olds the opportunity for a heat-seeking missile lock and he fired a *Sidewinder* missile that destroyed the MiG. As the MiG exploded, Olds narrowly missed hitting its debris.<sup>81</sup> Turning for home, Olds frantically called for a tanker to refuel him, with only minutes of fuel left and more than a hundred miles to the Laotian border. He and Lieutenant Crocker narrowly avoided having to eject over enemy territory and only returned to base safely because a tanker aircraft was willing to travel farther north than was authorized to save Olds from running out of fuel.<sup>82</sup>

Olds engaged in conspicuous risk-taking simply by routinely flying combat missions with his men. This alone

was uncommon for a wing commander in the post-World War II era. Olds took this element of Keegan's model to the extreme, however, by exceeding the number of combat missions flown by his subordinates and taking truly unnecessary risks – engaging enemy fighters while unarmed and pursuing an enemy fighter at treetop level while alone and almost out of fuel. Olds' behaviors also placed his youngest subordinates at unnecessary risk as his copilots in each of these events were along for the ride whether they liked it or not. Olds acknowledged that Lieutenant Croker was very upset after almost running out of fuel over North Vietnam, yet Croker later remembered Olds fondly.<sup>83</sup>

## Conclusion

Keegan described the outward characteristics of great military leaders as their mask – the outward persona adopted to lead effectively in the combat environment. Keegan described the qualities of this mask as consisting of the five primary qualities of kinship, prescription, sanction, action, and personal example.<sup>84</sup> Robin Olds displayed these characteristics and has been acknowledged by many as a good leader of fighter pilots. Olds managed the 8th TFW well, appointing people to the right leadership positions and fighting the military bureaucracy to improve efficiency. He was an inspirational leader, inspiring his followers through motivational speeches, personal encouragement, sticking his neck out to protect his people from undue interference, and building camaraderie. Olds engaged in the-

atrical displays of risk-taking by exposing himself to direct enemy fire – something air commanders in the nuclear age no longer did. Olds' behaviors won him the respect of his subordinates, demonstrated his continued competence as a fighter pilot, and improved the morale and operational effectiveness of the 8th TFW over the course of the one year he commanded the unit.

Olds' behavior, however, deviated from Keegan's model at times. While the leaders Keegan studied all kept a clear social distance from their lower subordinates, for example, Olds physically wrestled with his younger pilots. Olds mocked some of those in command above him, potentially setting a poor example for his subordinates in this regard. He flouted some rules, while strictly obeying others. One may also question whether Olds' behavior was really a 'mask,' or Olds' natural personality. As Olds displayed similar traits in peacetime units and even administrative assignments, it is likely his leadership behavior was natural rather than contrived.<sup>85</sup> It is also questionable whether the U.S. Air Force leadership wanted wing commanders who exhibited such behaviors. The fact that Olds had an exceptional Air Force pedigree through his father, yet many of his peers were promoted ahead of him, suggests many top Air Force leaders did not appreciate Olds' style of leadership. Nevertheless, Keegan's model of combat leadership did not require the approval of those who oversaw the leader. What mattered most was how the leader's subordinates perceived and responded to the leader. In this regard, Robin Olds was a hero to his followers. ■

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# *Black Boxes and Wild Weasels: Suppressing SAMs in Vietnam*



Thomas Wildenberg

One of the F-100Fs converted to a Wild Weasel aircraft, Eglin AFB, Florida, 1965. (USAF photo.)

In late March and early April 1965, as the North Vietnamese air defenses were attempting to blunt the impact of the Rolling Thunder bombing missions, they began to deploy a new weapon: the SA-2 surface-to-air guided missile. On April 5, photos taken by a Strategic Air Command U-2 high-altitude reconnaissance aircraft and a Navy RF-8 Crusader reconnaissance plane flying from the Coral Sea (CV 43) both revealed the construction of a SAM site fifteen miles south of Hanoi. The introduction of the SA-2s was a watershed event that changed the nature of the air war over Vietnam. Unless an effective counter was found, high ranking officers in both services believed it could inflict unacceptable losses.<sup>1</sup>

The first aircraft loss attributed to the SA-2 occurred on July 24 when the North Vietnamese 236th Air Defense Regiment downed an Air Force F-4C flown by Capt. Richard P. Keirn. Keirn parachuted safely, but he spent almost eight years as a prisoner of war in North Vietnam. The Navy lost its first aircraft in the early hours of August 12, when a North Vietnamese SAM site engaged two A-4Es from *Midway* (CV 41) flying an armed reconnaissance mission sixty miles south of Hanoi. The missiles destroyed the A-4E piloted by Lt. (jg) Donald H Brown, Jr. and severely damaged the A-4E piloted by Lt. Cdr. Francis D. Roberge who managed to make it back to the *Midway*.<sup>2</sup>

The downing of a second U.S. aircraft by an SA-2 missile along with five Navy planes lost to AAA the next day as they searched in vain for the SAM sites, “sent shock waves throughout the JCS and the services” forcing Air Force leadership to take action. General John P. McConnell, Air Force chief of staff, directed Brig. General Kenneth Dempster, deputy director of Operational Requirements and Development, to convene a high-powered Air Staff Task Force to answer one question: “What is the most effective means of neutralizing the threat posed by SAM missiles and the heavy anti-aircraft in the Southeast Asia conflict.” Dempster’s task force, which included representatives of the Air Staff, the major air commands, industry and the scientific community, met between August 13 and August 18. One of the members described it as “ten or twelve guys who sat in smoke filled rooms and brought contractors in to figure out what to do.” The committee recommended a list of requirements that was needed to combat the SA-2. The list included the following: a warning system to alert air crews when they were under enemy radar surveillance, better pinpointing of enemy radar locations, timely processing of intelligence data, prompt air strike decisions, adequate ECM for all fighter aircraft, precise navigation for aircraft flying at high speed and low altitude into a target area, and suitable tactics for strikes in areas defended by

**Editor’s Note:** This article was taken from a chapter in a new book on electronic warfare in the skies over Vietnam titled *Spy Planes, Intruders, and Wild Weasels* that will be published by the Naval Institute Press sometime in 2025.



Brig. General Kenneth Dempster (later major general as shown here) was instrumental in establishing the first Wild Weasel unit and seeing that they had the radar homing and warning gear needed to locate SAM sites. (USAF photo.)

anti-aircraft weapons. One of the most significant recommendations made by the task force was for the development of a fighter designed specially to locate SA-2 sites and mark them for immediate attacks by accompanying strike aircraft. To expedite the availability of such an aircraft it was to be achieved using existing off-the-shelf equipment installed in an existing aircraft.<sup>3</sup>

Because Dempster's office oversaw the Quick Reaction Capability program, with authority to procure new equipment on an accelerated basis, they were undoubtedly aware of the AN/QRC-153-2 radar homing equipment that

*Thomas Wildenberg is an award-winning author with a special interest in aviators, military aviation, and technological innovation in the military and a frequent contributor to the Journal of the Air Force Historical Foundation. He is a former Smithsonian Fellow having served successive terms as a Ramsey Fellow at the National Air and Space Museum in 1998 and 1999. Mr. Wildenberg is the recipient of a number of awards recognizing his scholarship. These include the Surface Navy Association Literary Award, an award from the Air Force Historical Foundation for the best article in Air Power History in 2009, and the John Laymen Award. He recently published Fighting in the Electromagnetic Spectrum: U.S. Navy and Marine Corps Warfare Aircraft, Operations, and Equipment (2023) from the Naval Institute Press.*

had been installed in the F-100Fs that participated in the Gold Fire I Exercise conducted between the end of October and the beginning of November 1964. The series of maneuvers conducted during this time period were designed to evaluate the Air Force's ability to enhance the mobility of the Army. The Air Force was to test and practice concepts and doctrine related to command and control, reconnaissance, close air support, and assault airlift.<sup>4</sup>

The exercise, which was conducted over more than two million acres of wooded rolling terrain and farmland in the northern Ozark region south of Fort Leonard Wood, pitted the units of Task Force Ozark, the friendly side, against Task Force Sioux, the opposition representing the aggressor. Prior to the exercise several F-100Fs were equipped with AN/QRC-253-2 radar homing receivers. The F-100Fs, which were assigned to Task Force Ozark, penetrated deep into enemy territory to seek out and destroy the enemy's Hawk missile sites. "One Super Sabre," according to an article that appeared in the March-April 1965 issue of the *Air University Review*, "destroyed [as evaluated by the umpires] six missile launchers and several missiles."<sup>5</sup>

Based on the recommendations made by Air Staff Task Force charged with solving the SAM problem, the staff in Dempster's office began to formulate a plan that would provide tactical aircraft with a means of hunting down SAM sites by homing in on their radar emissions. Although Bendix had propose installing such a system in F-100 Super Sabres in the Spring, "The Air Force," according to Larry Davis, "rejected the device stating that *there is no requirement for such a system.*" The new look into the hunter-killer idea, was encouraged by the demonstration given to Dempster's task force by the Applied Technology company's Vector radar receiver.<sup>6</sup>

Applied Technology, Inc. (ATI) was started in April 1959 by William E. Ayer, formally a senior researcher at Stanford University's Systems Engineering Laboratory. ATI quickly established itself as a producer of specialized jammers and radar warning receivers. In the early part of 1965, Edward Chapman, a recent hire who had serviced in Air Force B-52 Stratofortress bombers as an electronic warfare officer and was familiar with the B-52's APR-54 tail warning radar, came up with the idea for a new type of radar warning receiver having a CRT display to show the relative bearing of the threat with the intent of selling the device to SAC.<sup>7</sup>

Building on Chapman's idea, one of ATI's engineers redesigned the System XII (developed for the U-2) to cover three radar bands in the 2-12 GHz range and added a 3-inch CRT to show the direction and strength of the intercepted signal as a strobe originating from its center. The type of strobe — solid, dashed or dotted line — indicated which radar band was being received. An audio output allowed the operator listen to the radar's scan pattern, which aided in identifying it. The company named the new device the Vector receiver.<sup>8</sup>

The Vector was considerably smaller and more effective than the B-52's APS-54 tail warning radar that Chapman was familiar with. Recognizing that the Air Force would likely buy it once they saw how well it worked,

Chapman, using one of his Air Force contacts in the Pentagon assigned to the B-52 Project Office, arranged for a company presentation. By the time he received authorization to the visit on August 5, 1965, Dempster's Air Staff Task Force, heavily involved in investigating various radar homing and warning systems, were anxious to see what ATI had come up with. When Chapman and his presentation team showed up at the B-52 Project Office with suitcases full of electronic equipment they found a note on the door directing them to go to a conference room on the third floor where they found General Dempster and twenty-five officers eagerly awaiting the Vector presentation. Chapman later described what transpired next to Alfred Price during an interview conducted years later as part of Price's research for his *History of U.S Electronic Warfare*:<sup>9</sup>

*We set up a signal generator and antenna system on a pedestal in the middle of the conference table. I gave an introduction saying what we were going to do. Then Bob [Johnson the engineer who designed the Vector] proceeded to tell them how the Vector receiver worked. The we walked around the room with the prototype, to demonstrate the equipment's direction-finding capabilities.*

The presentation went well and after a few questions they picked up their equipment and left. Based on the Air Force's interest, ATI's management decided to build five Vector systems using company money. The company, according to John Grisby, then VP of Engineering, "figured that if the Task Force didn't come up with anything better than what we had that we might be the likely candidates to supply Radar Warning Systems. If we started early on our own risk, we could be 'Johnny at the rat hole' when a decision was taken by the Air Staff."<sup>10</sup>

In addition to their interest into the Vector IV, Dempster's team had begun to focus on the merits of ATI's IR-133 panoramic radar receiver. On August 27, Maj. Irwin Joel "Pierre" Levy, an electronic warfare expert who worked for Dempster, called Grisby at his office as Grisby was preparing to leave for home. Levy wanted to buy a couple of IR-133 receivers that one of ATI's salesmen had been pushing. The units were priced at \$40,000 each, but he only had enough money for one. After consulting with ATI President Bill Ayers, Grisby told Levy they had a deal. ATI would provide two units for \$40,000. The IR-133, as they discussed, had the following specifications: it covered the Fan Song's S-band, have a sensitivity of -70 dbm to -80 dbm, handled 0.3-microsecond-wide pulsed, and have automatic and manual scanning. It had a 1-inch by 3-inch panoramic CRT display, the main box could be a B-1D case, and the indicator needed to be small as it had to fit on a fighter's instrument panel. The IR-133 received radar pulses through a set of antennas located symmetrically around the nose of the aircraft. The signals were analyzed for frequency (which told the crew whether the signal was from a SAM, anti-aircraft gun emplacement, or some other type of radar) and the repetition rate, which indicated whether the radar was in a search, tracking, launch, or guidance mode. By comparing the signal strengths on each

side of the aircraft's nose, the EWO instructed the pilot to turn right or left to home on the signal. At first it was thought that range could be determined through triangulation as the aircraft turned slightly away from the radar signal using the CRT display to indicate the offset, but translating the minute changes in the CRT into range proved to be unworkable and the technique was abandoned. Henceforth range calculations would have to be made based on operator judgment, which in reality could only be determined if a Weasel crew actually saw a missile launched from a camouflaged site. The range problem would plague the F-100F Wild Weasels throughout their deployment.<sup>11</sup>

Grisby, considered ATI's proposal to be quite reasonable until Levy told him that the first one had to be delivered in thirty days and the second one fifteen days later. "Pierre," said Grisby, "these things don't exist; they are paper-ware, advertising flyers used to try to stir up some interest in the reconnaissance and surveillance community." If Grisby agreed, the Air Force contract would be ready the following Monday. Grisby, said OK, and instead of going home, went up to the engineering floor to get the ball rolling on the detailed design work that would be necessary to meet the thirty-day delivery date.

On Monday, August 30, 1965, Grisby, was in Washington to sign the IR-133 contract and attend to other business. In the morning Ed Chapman took him to Andrews Air Force Base where the Air Force Systems Command contract office was located. Grisby tells us what happened next:<sup>12</sup>

*There we were met by a little old lady who said, "I've never seen anything happen so fast in all of my life." She had typed up the contract and the technical specifications for the IR-133, with multiple carbon copies, on Monday so that they were ready for signing on Tuesday morning. Remember that this is in the days of carbon copies, and Ditto- and Mimeograph-machines, not xerographic copiers. The specifications took a grand total of one and one-third pages and essentially said build us a couple of S-band radios to the numbers Pierre and I had discussed on the telephone the previous Friday evening. So [,] contract AF18(600)-2879 was issued for two VECTOR-IV and two IR-133 Systems at an "order of magnitude" Firm Fixed Price of \$80,000 with delivery dates of 9/28/65 for the first system and 10/13/65 for the second system plus some undefined field/installation support. The in-house project number assigned was 10105. Thusly, we had a "home" for the first two VECTOR systems that we were building for inventory.*

A few days later, Chapman was summoned to a meeting in the Pentagon with Major Levy and his boss, Colonel William B. "Willie" Williamson. It was then that he first learned of the Air Force's plan to equip two-seat F-100Fs with radar homing equipment to seek out and destroy SAM sites using both the Vector warning receiver and the IR-133 homing receiver. The top-secret project was given the name Wild Weasel. The first portion of the name, "Wild," reflected the nature of the mission — it also described the personalities and attitudes of the crew mem-



The F-100F's air to air refueling system was different than that used by other USAF aircraft flying into North Vietnam, complicating aerial tanker scheduling. (U.SAF photo.)

bers who volunteered to fly such missions. The second portion, "Weasel," was selected because the aircraft "were supposed to 'weasel' their way into enemy territory at low altitude, to sniff out electronically the position of SAM sites, and effectively mark those sites so that accompanying bomb-laden fighter-bombers could visually acquire and destroy them." Most sources claim that the name Project Ferret had been considered at first, but Harold Johnson, who was a crew member of the F-105F Wild Weasel III group sent to Southeast Asia in 1966, claims the program name was changed from "Mongoose," when it was also discovered to have been a clandestine World War II project. Both claims were partially true as Dan Hampton explained in his book *The Hunker Killers*. Air Force officers in the Pentagon, according to Hampton's account, initially named the project "Ferret" after a World War II radar killing program. He goes on to explain that they thought a new, fresh name was needed. "Mongoose" was chosen after the ferocious little animal that killed deadly snakes. It seemed appropriate, but has also been previously used by the CIA, so . . . it became the 'Wild Weasel' program."<sup>13</sup>

The two-seat F-100F, it turns out, was the ideal candidate for the Wild Weasel role. In addition to the second seat, which was needed for the engineering duty officer assigned to operate the radar warning and homing gear, the F-100F had similar flying characteristics to the F-100D that was optimized for ground attack. It was also fast, and had space to accommodate the system's electronics. The F-100F was a relatively inexpensive aircraft too, and was readily available. To meet Dempster's requirement, four low-flying-time F-100Fs were selected from the 27 TFW located at the Cannon Air Force Base in New Mexico and flown to the North American Aviation facility in Long Beach, California, where they were to be modified under an Air Force contract issued to the company's Space and Information Division. Upon arrival, the F-100F bearing the tail number 58-1231 was taken into a closed hanger, gutted of its wiring, and had all of the nonessential instruments in the backseat panel removed to fit the new equipment.<sup>14</sup>

The R&D model of the Vector prototype was delivered to Long Beach so that North American's engineers and technicians, aided by two Air Force EWOs assigned to the

project, could determine what modifications were needed to be made in order to install the new system. This required the addition of new wiring and cables, as well as the specialized antennas and "black boxes" that contained the electronics. The Vector IV system<sup>15</sup>, as it was dubbed, had a single box for the 3-inch CRT that presented a strobe indicating the direction of the threat, a panel of small lights, called the Threat Panel that indicated the different types of radar threats present. Four antennas (two mounted under the nose intake facing forward on each side of the aircraft centerline and two facing rearwards on the trailing edge of the vertical fin) were connected to an electronic receiver mounted in the nose. Although the IR-133 was still in development, ATI knew the size of the receiver and the panoramic display. This information, along with the types of cables used and the location of antennas was provided to North American personnel so they could prepare the F-100F for installation of the IR-133 receiver.<sup>16</sup>

The first Vector IV was delivered on September 12, 1965, and installed in the first F-100F selected for modification. This aircraft, with a North American Aviation crew, was flown for the first time on September 16. Ed Chapman later disclosed that the Vector warning system didn't work at all during the initial test. "It wasn't picking up signals and it wasn't giving the proper indications. The problem, which was diagnosed by Bob Robinson, was the type of cable used by North American for the installation. The Vector system depended on balancing the output from the antennas on the front and the cable runs, versus the antennas on the back and the cable runs. The cable used by North American was not the type specified by ATI. The Vector system depended on balancing the output from the antennas and cables on the front and back of the aircraft. To verify the cable installed by North American was the problem, ATI hooked some of their own cables to the box in the cockpit, and ran them out the open canopy. "When we switched [it] on," recalls Chapman, "we showed the guys there wasn't any problem with our system. It's your cables. . . . Rip it apart, put the right cables in and everything will be fine."<sup>17</sup>

Back at ATI, development of the IR-133 proceeded rapidly and the company was able to deliver the first unit on September 28, twenty-nine days after starting the design. The third Vector-IV and the second IR-133 were delivered to North American Aviation on October 12. In the meantime, William C. Doyle, ATI's director of systems engineering, had come up with the design for a new warning receiver "which, if it worked the way he hoped, would give the air crews a few seconds warning prior to a SA-2 'Guideline' missile coming off the rails of the launcher-transporter vehicle." Doyle got the idea while he came across a piece of data on the SA-2's L-Band guidance signal while visiting a potential military client. On the flight home he sketched out the block diagram showing how it would work. Doyle discussed the idea, for what became the WR-300, the next day. It looked promising enough for them to give General Dempster a briefing over the telephone as to what they had in mind and what it might do for aircrew survivability. Dempster said to "get started on your own nickel and if it's



Wild Weasel commander Maj. Gary Willard at Korat, Thailand. He later returned to the U.S. to head the Wild Weasel school at Nellis AFB. Willard later retired from the USAF as a brigadier general. USAF

worth really pursuing we will cover you.” And that is what ATI did. They began design work on September 23 with the expectation of receiving two Detection Warning Systems in two weeks at an anticipated value of \$18,000 (equivalent to over \$180,000 today). The WR-300 detected the launch of an SA-2 by monitoring the SAM’s guidance and control frequency. The launch of a missile was indicated by a characteristic shift in the power of the guidance signal when the missile was fired that caused the WR-300 to activate a red warning light on the aircraft’s instrument panel. “This light,” stated Grisby, “got the infamous name of the ‘Oh, Shit’ light, meaning that a Guideline Missile was on the way.” ATI delivered the first unit on November 8, 1965.<sup>18</sup>

After the modifications to the four F-100Fs borrowed from the 27 TFW were finished—a process that took ten days—they were flown to the Tactical Warfare Center at Eglin, where they were united with the flight crews that had been “volunteered” to fly them in combat. The pilots were drawn from other F-100 units; the EWOs from SAC B-52 or EB-66 squadrons. “The crews were to be mated and trained together. But a couple of small problems arose,” as aviation author Larry Davis wrote in his often-quoted work the *Wild Weasel*. “First, some of the pilots had almost never herd of an EWO . . . and second.[sic] All of the EWOs came from SAC bombers — big, multi-jet beasts that rode the skies like airliners. None of the EWOs had much, if any, single engine fighter time. And most ‘were reluctant to bounce all over North Vietnam in a single engine fighter with a wild-eyed, hot dog pilot at the controls.” Capt. John E. “Jack” Donovan’s reaction to the job was typical of the EWOs once they found out what they had volunteered for. “You want me to ride in the back seat of a two-seat fighter with a teenage killer in the front seat? You gotta be shittin me,” which when converted to “YGBSM” became the tradi-

tional motto of the Wild Weasels that often appeared on their insignia.<sup>19</sup>

When training began in October, there was no program, no classrooms, or intelligence briefs that were normally used in an Air Force program. As Dan Hampton put it, “The pilots and the EWOs were the experts; they were supposed to sort it out somehow.” Maj. Gen. Benjamin B. Putnam, commander of the Tactical Warfare Center told them to just make it work. Training flights began on the 11th of October and continued through November 18. After a few familiarization flights, the four Wild Weasel prototypes began flying test missions against the Soviet Air Defense Simulator #1 (SADS-1) that had been fabricated and delivered to Eglin by the Army’s Harry Diamand Laboratory. It was a working surrogate of the Fan Song Model B radar, built to conform to the best available intelligence on the system. Unlike the mobile Soviet model however, it was housed in a building, not in a van. The system was continually upgraded as new information on Soviet radars was obtained from the CIA’s program of precision measurement carried out by aircraft and crews operated by the U.S. Air Force that began collecting highly specialized radar data during the summer of 1963. When training operations began for the F-100 Wild Weasel crews at Eglin, the CIA had conducted numerous ELINT missions acquiring signal intelligence on Fan Son, Spoon Rest, Knife Edge, Flat Face, Back Net, and Bar Lock, radars.<sup>20</sup>

During these training exercises, which took place over Eglin’s test ranges, the EWO’s detected the SADS-1 radar using the IR-133 panoramic scanning receiver, using the manual tuning mode to identify and analyze the signal. The IR-133 provided an initial azimuth which the aircraft followed until the signal was strong enough for the shorter-range Vector IV set. The F-100F crews found that the IR-133 worked best when flying at a medium altitude, following the beam directly toward the transmitter. On one such occasion the panoramic scan receiver picked up the tracking signal 107 nautical miles away. As they closed with the transmitter, the EWO in the back set had to rely on the three-inch Vector CRT display mounted in the center of the rear cockpit to locate the SAM site. A strobe in the CRT indicated the direction of the signal and was divided into three concentric rings that could be used to approximate the distance to the radar based on the length of the strobe. Once they came within SAM range, they had to search visually for the site before it could be attacked.<sup>21</sup>

Although the practice sorties allowed the Wild Weasel crews to figure out how to use and gain experience with their electronic equipment, they were all conducted against the SADS simulator, which looked nothing like the real Fan Song. The SADS, housed in a big white building topped by a distinctive radome could be easily seen from miles and never moved. This provided a false sense of accomplishment for the Wild Weasel crews that would be quickly shattered when they tried to locate the well camouflaged, heavily defended SAM sites in Vietnam.<sup>22</sup>

Having completed their specialized training, the four F-100Fs under the command of Maj. Gary A. Willard Jr., took off from Eglin’s runway at 1000 hours on November



Wild Weasel Detachment, 6234th Tactical Fighter Wing, Korat, Thailand. The first Wild Weasel aircrews are (front, l to r): Capt. Walt Lifsey, Capt. Sandy Sandelius, Capt. Ed White, Maj. Garry Willard, Capt. Jack Donovan, Capt. Allen Lamb, Capt. John Pitchford, Capt. Maury Fricke, unknown and Maj. Bob Swartz (not pictured are Capt. Les Lindenmuth, Capt. Donald Madden and Capt. Robert Trier). (USAF photo.)

21, 1965, headed for Korat Air Base, Thailand. Delayed by bad weather and a layover in Hawaii, the flight did not arrive in Korat until late in the day on November 25. Upon arrival, Willard's detachment was assigned to the 2nd Air Division's 6234th Tactical Fighter Squadron and began a sixty-day operational trial that ran from November 28, 1965 to January 1966. The trial period was established to evaluate equipment and tactics used by the Wild Weasels based on the following objectives:<sup>23</sup>

- To determine the warning capability of the radar homing and warning equipment installed in the Wild Weasels.
- To investigate the effect of jamming by friendly aircraft on the Vector IV and the IR-133 equipment.
- To determine the homing accuracy of the radar homing and warning equipment and the capability of the crew to place the aircraft within visual range of the target.
- To determine tactics for employing the Wild Weasel aircraft against SAM defense systems.
- To determine maintenance requirements and reliability of the radar homing and warning equipment.
- To determine the organization and manning requirements for Wild Weasel operations.
- To determine the training requirements for flight crews and maintenance personnel.
- To test any additional equipment which made available.

During the first three days of the operation, from November 28 to November 30, the F-100F Wild Weasels flew orientation missions with the F-105s of the 388th Tactical Fighter Wing. The purpose of these missions was to provide the crews area orientation in a high threat environment, verify the capabilities of their radar homing and warning gear (RHAW), and to observe the effects of jamming on the Vector and IR-133 equipment. The F-100Fs "would troll along the border, monitoring their scopes and listening to the various radar tones emanating from North Vietnam."<sup>24</sup>

Bad weather delayed the first Wild Weasel mission until December 19, when a flight of two F-100Fs led by

Major Willard took off in an attempted to locate SAM sites in North Vietnam, but were unable to pick up any Fan Song signals. The F-100F Wild Weasels in Willard's flight were armed with two LAU-3 canisters of twenty-four 2.75-inch rockets, and 200 rounds of ammunition for each of its two M-39 20-mm cannons. A pair of 355-gallon drop tanks provided enough fuel to complete their mission. Their mission was to locate the Fan Song radar and mark its location with the white phosphorous (Willy Pete) rockets, or combination of high explosive and phosphorous rounds, to identify the site for the accompanying F-105s. This, as Peter Davies and David Menard observed, meant that the SAM-hunting F-100Fs "were going to have to fly ahead of the strike formations over some of the most heavily defended targets in military history." Once they marked the target, the F-105Ds accompanying Willard's flight, which were armed with four LAU-3 canisters loaded with six to eight CBU-24 cluster bombs and an internal M-61 20-mm cannon that spit out 6,000 rounds per minute, would attempt to knock out the site. Neither of Willard's Wild Weasels were able to detect any Fan Song signals, however, and the flight returned to Korat without engaging the enemy. On the following day, the Wild Weasels suffered their first combat loss when an F-100F piloted by Capt. John J. Pitchford was downed by anti-aircraft fire while leading an unsuccessful attack on a SAM battery near Kep airfield. Both Pitchford and his EWO Capt. Robert D. Trier bailed out of the stricken aircraft. Pitchford was captured and remained a prisoner of the North Vietnamese, Trier was shot and killed while trying to resist capture.<sup>25</sup>

The Wild Weasels were hampered by an excessive list of restrictions contained in the rules of engagement established by the Department of Defense in Washington, D.C. in accordance with President Johnson's wishes that controlled all aspects of the air campaign. In addition to avoiding attacks on SAM sites within 30-nautical mile circle from the center of Hanoi and a 10-nautical mile circle around Haiphong, attacks within 30 nautical miles from the Chinese border were prohibited. The most restrictive rule confronting those trying to hit the SAM sites, however, was that prohibiting the suppression of SAMs and gun-laying radar systems in populated areas and areas were attacks on North Vietnamese air bases from which attacking aircraft might be operating.<sup>26</sup>

Despite these restrictions, Wild Weasel piloted by Capt. Allen T. Lamb with Capt. Jack Donovan, his EWO, conducted the first successful SAM strike led by a Wild Weasel on December 22 after detecting a Fan Song radar 100 miles from the target. Captain Lamb described how he closed the target and marked it for the accompanying F-105Ds:<sup>27</sup>

*I kept the SAM site at around "ten o'clock so he wouldn't get the idea I was going after him. When I could, I dropped into shallow valleys to mask our approach. Now and again, I'd pop up for Jack to get a "cut." After breaking out of the Red River Valley I followed the strobe on the Vector IV and turned, keeping the river alongside us. At this point the IR-*



Captains Allen Lamb and Jack Donoval of the Wild Weasel crew that made the first SAM kill on December 22, 1966. (NMUSAF photo.)

*133 strobes started "curling off" at "12 o'clock," both to the right and left of the CRT, and I knew we were right on top of the site. I started climbing for altitude and Jack kept calling out our SAM positions literally left and right. My rockets hit short, but as I pulled off the target there was a bright flash.*

The F-100Fs rockets had hit one of the SA-2's fuel tankers, which clearly marked the target. Having successfully identified the SAM site, the two airmen watched as the F-1005Ds Thunderchiefs engulfed the target area with seventy-six 2.75-inch rockets sending smoke and dust 300 to 400 feet in the air. The flight expended its remaining ordnance on the AAA defenses guarding the site.<sup>28</sup>

From December, when the first Wild Weasel/Iron Hand mission was flown through February 5, 1966, six SA-2 installations were overflowed by the hunter-killer teams of Wild Weasels and F-100Ds. The aircrews learned that in heavily defined sectors of North Vietnam, the best tactic to use during SAM search and destroy missions was for one F-100F to lead three F-105Ds into a suspected SAM target area at 8,000 feet with five miles of visibility. This was above small caliber anti-aircraft and small arms fire, but left enough maneuvering to dive should a SA-2 launch appear imminent. When a Fan Song signal was picked up the Wild Weasel would either home in directly, at altitudes between 4,500 and 8,000 feet, or drop down for terrain masking. Instead of flying directly over the emitting radar, the Wild Weasels tried for an offset of 100 to 500 feet so that it would be easier to acquire the target visually. Once the installation was found, the F-100F would try to mark it with rockets for the F-100D strike aircraft. When the terrain contained numerous ridges and valleys, and interfered with radar reception, the aircrews developed a low altitude tactic using the terrain to shield them from SAMs or anti-aircraft until they were directly over the site. When using this tactic, the flight flew at normal search altitudes until



F-100F with tail number 58-1213 on the air field at Phu Cat air base, South Vietnam (date unknown). (USAF photo.)

a signal was located and a bearing determined. Then the flight would descend below the line-of-sight altitude, flying up valleys and over ridges, pooping up to obtain another bearing, and then descending again. The greatest advantage of this tactic was the element of surprise.<sup>29</sup>

A number of shortcomings in the Wild Weasels equipment were revealed during these initial operations. While the Vector IV was capable of detecting the emissions of the Fan Song radars, it was unable to determine whether or not a particular radar was tracking the Wild Weasel. It also had a high false alarm rate. The crews also found that the IR-133 could not be used for homing during the frequent maneuvers to avoid anti-aircraft fire or when the receiver was saturated with numerous signals. Although the SA-2 presented the most apparent threat to the Wild Weasel flights, the difference in the speed of the F-105 and the F-100F was a key detriment that affected some missions.<sup>30</sup>

Because the F-100 was originally designed as a supersonic, high-altitude fighter-interceptor, it suffered from both poor maneuverability and poor performance at low altitudes, making it vulnerable to anti-aircraft fire. Another factor was its radar cross section, which, according to one former F-100F pilot, was larger than the accompanying F-105s alerting the North Vietnam defenders of the Wild Weasel's presence and making it easier for the crews of the radar controlled anti-aircraft guns defending the SAM sites to focus on the F-100Fs. Although this fact has never been revealed before, it only added to the hazards faced by the F-100F pilots and may have contributed to their high loss rate. In any case, the loss of a second F-100F Wild Weasel to anti-aircraft fire convinced the 2nd Air Division that the F-100F Super Sabres were too slow when fitted to carry external stores to survive in the most heavily defended areas in the north and they ceased flying above the Red River delta at the end of March. By then three of the first nine F-100Fs had been lost to ground fire and one overstressed its airframe beyond repair. The remainder were so damaged that to ensure enough Wild Weasels were available to support operations in Route Package V and VI the next batch of Wild Weasels based on the F-105F's airframe were rushed to the theater. Once these arrived,

many of the initial Wild Weasel pilots were sent back to the training program established at Nellis Air Force Base as instructors. The arrival of the F-105Fs, which had the

same performance of the D models, marked the end of those Iron Hand formations designed to compensate for the difference in the speed of the F-105 and the F-100F.<sup>31</sup> ■

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## **Job Announcement**

### **Editor of the Journal of the Air Force Historical Foundation**

The Journal of the Air Force Historical Foundation is the pinnacle media product for the AFHF. Published under several different titles since 1957, the Journal is held in high esteem internationally for the publication of Air and Space history scholarship. The Journal also keeps membership informed of Foundation events, programs, awards, and acts as a focal point for announcements.

**POSITION:** Editor of the *Journal of the Air Force Historical Foundation*. This is a contract position, with no benefits attached. This position is compensated on a quarterly basis, as each issue is submitted for publication. The Editor reports to the Executive Director of the Foundation for direction, and works with the Office Manager/Administrative Assistant for all administrative matters. The contract is reviewed and renewed annually, in consultation with the Executive Director and approved by the Executive Committee. Salary is negotiable and is approved by the Foundation Executive Committee.

**DUTIES:** The Editor is responsible to produce the *Journal of the Air Force Historical Foundation* for publication. This entails preparing 4 issues per year, Spring (64 pages, electronic only), Summer (160 pages, printed and electronic), Fall (64 pages, electronic), and Winter (64 pages, electronic). While a quarterly publication, AFHF occasionally publishes special compiled digital versions—like a Book Review edition. Submissions are in PDF format, high resolution submitted electronically to the printer, and low resolution for the web site. The Editor selects the articles from the submissions presented by subject matter expert authors. The Editor may request articles from subject experts, notable historians, or individual participants in events whenever possible. The articles should be referred to referees for suitability review and substantive suggestions. The Editor is the final judge of what is to be printed, in consultation with the Executive Director or designated representative. The magazine illustrations are often provided with the submitted manuscripts, but at times, the Editor will perform photo searches to illustrate articles, or to enhance the illustrations submitted. The Editor will coordinate with regular outside contributors, like the Book Review Editor (who provides 20-30 reviews per issue), the History Mystery editor (who provides text and photos for the final two pages), and the Upcoming Events editor (who provides meeting notices.) The Editor is responsible for locating photographs for the journal covers. The Editor will import the articles into a page layout program, import image files to illustrate the text, and produce final production pages in PDF format. For the Summer (160-page) printed issue, the Editor will submit the high-resolution PDF files to the printer for production and review the page proofs before final printing is approved. For each issue, low-resolution PDF files will be provided to the Office Manager for posting on the Foundation Web site. Published Journals may be viewed at the following web link: <https://www.afhistory.org/research/the-journal-of-the-afhf/>

**KNOWLEDGE, SKILLS AND ABILITIES:** The successful candidate will have:

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**SUBMISSION GUIDELINES:** Applications will be accepted either by email or US Postal Service. Materials submitted should include a cover letter, resume or CV, and any relevant samples of applicant's work (no more than 3) which can be in the form of links to electronic products where applicable. The candidate shall provide contact information for three individuals who have direct knowledge of the applicant's work ethic, skill level, and potential. Applications should be submitted no later than October 31, and the intention is to identify the successful candidate by the end of December. Interviews are at the Foundation's discretion and will be telephonic or possibly via electronic means such as Zoom. A background check will be completed prior to the candidate becoming the selectee. Hard-copy submissions should be directed to the Foundation's mail location, Air Force Historical Foundation, P.O. Box 405, Mechanicsville, MD 20659 and phone inquiries submitted to (301) 736-1959. Electronic submissions should go to [airpowerhistory@yahoo.com](mailto:airpowerhistory@yahoo.com) and [angelabear@afhistory.org](mailto:angelabear@afhistory.org).

**Su-57 Felon.** By Piotr Butowski. Stamford UK: Key Books, 2022. Photographs. Tables. Diagrams. Pp. 96. \$24.95 paperback. ISBN: 978-1-913870-44-7

Butowski is an aviation journalist, writer, and photographer specializing in the Russian aerospace industry and technology. In addition to aircraft and systems descriptions, he provides historical background and accurate data relating to program development and production. Since 1978, he has published books and articles in aviation magazines all over the world.

The Sukhoi Su-57 (NATO code *Felon*, originally called the T-50) is a fifth-generation, multirole, stealth fighter. The program originated as a project in the early 2000s to create an advanced combat aircraft to succeed the older Su-27 (*Flanker*) family. *Felon* features advanced avionics, sensor systems, and stealth capabilities designed to compete with other fifth-generation fighters such as the F-22 Raptor and F-35 Lightning II. Its design emphasizes extreme maneuverability, supersonic cruising speed, and operational autonomy via advanced sensor-fusion capabilities.

The program has faced several challenges and delays, including funding issues, technical setbacks, and changes in requirements. Despite these challenges, Russia has continued its development and production. Limited numbers are entering service, albeit with some uncertainties regarding its future production and deployment.

Butowski begins with the description of conceptual work on fifth-generation Russian fighters, beginning in 1983 with the introduction of the fourth-generation MiG-29 *Fulcrum* and Su-27 *Flanker* fighters. Advanced multirole fighters are subject to three primary requirements: 1) supersonic cruising speed and, more importantly, the ability to conduct air combat at supersonic speed; 2) extreme maneuverability, which places great demands on the aircraft's aerodynamic configuration and control system; and 3) reduced visibility (stealth). Other Soviet Air Force requirements included automation of the aircraft's fire-control and defense systems, highly autonomous operation, and short takeoff and landing capability.

Butowski briefly describes other competing projects including the MiG 1.44 and Sukhoi's own forward-swept-wing Su-47. He then explains the Su-57's development, overviews early flights, and provides many color photographs of the first pre-production aircraft executing ground and flight tests. He talks about military aircraft test procedures in Russia, which consist of preliminary trials by the aircraft manufacturer to check basic performance, flight handling, and compliance with Russian Aerospace Force requirements. The test article is then handed over for joint state trials which conclude with its acceptance as a flying vehicle. The next stage tests mission systems and armaments. Butowski relates how, from the very beginning of the program, the Russians were actually considering a partnership with India. It has been buying and producing Russian military aircraft under a license for decades.

The book ends with Su-57 acquisition plans; an excellent chapter on details such as aerodynamic configuration, stealth features, powerplant, sensor fusion, radar and electro-optical suites, armament, and missiles; potential upgrades and modernization; an Su-57K shipborne version; the Sukhoi S-70 unmanned combat aircraft; and the MiG light multirole fighter (LMF) canard.

This is a short but excellent book that provides a good systems-engineering view. An index would substantially aid the reader, but it is a quick read that leaves the reader with a good overview of the Russian systems-acquisition process. It is definitely worth a look.

*Frank Willingham, docent, National Air and Space Museum*



**Solomons Air War: Volume 2, Guadalcanal and Santa Cruz, October 1942.** By Michael John Claringbould and Peter Ingman. Kent Town, Australia: Avonmore Books, 2023. Maps. Tables. Illustrations. Photographs. Appendices. Bibliography. Index. Pp. 192. \$48.95 paperback. ISBN: 978-0-645-70045-9

Starting with *South Pacific Air War Volume 1* in 2017, Claringbould has authored, either alone or with other writers, more than 20 books on aerial combat and aircraft in the southwest Pacific during World War II. This book continues his day-by-day chronicle of the air war. Ingman, an aviation enthusiast, owns Avonmore Books.

Whenever possible, Claringbould correlates both sides' claims against actual results derived from Japanese and American documents. He has become well known in recent years for this research capability. Many pilots received credit for downing enemy aircraft when no corresponding loss is recorded in the enemy's accounts.

The authors first define the strategic situation facing each side at the beginning of October 1942. As the battle progresses, the respective air-orders-of-battle are updated, reflecting losses and replacements.

While proceeding day-by-day, the authors allocate various time periods to specific themes. While the ground battle for control of the American-held airfields grinds away in the background, the individual chapters usually are associated with prominent naval actions.

The chronology begins with the American carrier USS *Hornet's* hit-and-run raids at the beginning of the month. Land-based American airpower, relying primarily on Douglas SBD Dauntless dive bombers and Grumman F4F Wildcat fighters, attempts to disrupt supply efforts by the Japanese Navy. To succeed, the Japanese depended on darkness and fighter cover.

The middle chapters focus on the Japanese efforts to neutralize the American airfields with both relentless bombing and long-distance bombardment from battleships

and cruisers operating at night. The Japanese almost succeeded, as they damaged or destroyed significant numbers of American aircraft. These attacks preceded a major Japanese ground offensive that failed to dislodge American Marines. Aside from land-based twin-engine bombers, dive bombers, and fighters, the Japanese also made excellent use of float planes operating from protected waters with the aid of tenders. Long-range, four-engine patrol planes also played a role.

The final three chapters deal with a series of naval battles near the Santa Cruz Islands that ultimately resulted in the loss of the *Hornet*.

Like the Japanese, American airpower also utilized long-range aircraft—for instance, the Consolidated PBV Catalina and Boeing B-17 Flying Fortress. While it was desirable to base the B-17s on Guadalcanal, that option proved unrealistic, given the persistent Japanese attacks. With storage facilities severely damaged, the Navy's Douglas R4D transports played a critical role in ferrying essential supplies and fuel to the island. They also evacuated wounded personnel, thus boosting morale.

This book is highly recommended for anyone interested in the Guadalcanal campaign. It's an easy read despite considerable detail. Modelers should find the color illustrations useful.

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



**Pacific Profiles, Volume 12, Allied Fighters: P-51 and F-6 Mustang Series New Guinea and the Philippines 1944-1945.** By Michael Claringbould. Kent Town, Australia: Avonmore Books, 2023. Glossary. Illustrations. Maps. Photographs. Index. Pp. 108. \$42.95 paperback. ISBN 978-0-6457004-4-2

Michael Claringbould is an aviation artist and globally recognized expert in Japanese aviation and the Pacific air war. While growing up in Papua New Guinea, he became fascinated by the many World War II aircraft wrecks which lay around that country and throughout the Solomon Islands. He has authored and illustrated many books on Pacific war aviation and has assisted with the recovery and identification of aircraft wrecks. In addition, he has helped both the US and Japanese governments to identify missing aircraft crews.

The P-47 Thunderbolt, with its rugged design and powerful radial engine, initially served as a high-altitude interceptor and a versatile fighter-bomber in the World War II New Guinea and Philippines campaigns. It played a crucial role in escorting bombers and engaging in ground-attack missions and air-to-air combat. The P-51D was developed later and gained prominence in Europe as a long-range escort fighter with the ability to accompany

bombers deep into enemy territory. It did not replace the P-47 in the Southwest Pacific but, rather, supplemented its role, particularly in long-range escort missions. Late in the war, Mustangs widened their air campaign over the Japanese Home Islands. Their long-range capability allowed for extended patrols and escort missions, protected bombers during strategic raids, and contributed to overall Allied air superiority.

The F-6 Mustang was a reconnaissance variant of the P-51 designed for tactical reconnaissance missions. It featured cameras instead of heavy armament and was used for intelligence gathering and mapping. The F-6 played a significant role in providing vital information for strategic and tactical planning.

The Pacific Profiles series presents artistic profiles of aircraft which served in the South- and Southwest Pacific theaters during the Second World War. This volume covers ten USAAF Fifth Air Force fighter and reconnaissance squadrons. Claringbould begins with an introductory chapter describing markings and technical notes. He covers operations in the Combat Replacement Training Center that had been established at Nadzab, New Guinea, to give incoming crews training and experience before they were assigned to frontline units. He also briefly covers how, by 1944, the P-51 was introduced into a changed war. A short chapter covers the first Mustangs brought into New Guinea. This is followed by the ten short chapters covering each of the air commando, fighter, and reconnaissance squadrons. Each chapter includes an overview of the squadron's service. Excellent graphic profiles showing markings, serial numbers, insignia, and nose art, along with supporting photographs of selected aircraft are included. A brief note on pilot losses, as applicable to each profile, is included, accompanied by the status of each aircraft. Claringbould ends with a discussion of post-war Mustangs.

Claringbould's book provides, for the first time, brief profiles supported by photos and documentation of the Fifth Air Force Mustangs. The book is a quick read and will provide a good reference for modelers and for those interested in more details of the air war in this combat theater.

*Frank Willingham, docent, National Air and Space Museum*



**Dirty Eddie's War: Based on the World War II Diary of Harry "Dirty Eddie" March, Jr.** By Lee Cook. Denton TX: University of North Texas Press, 2021. Maps. Photographs. Notes. Glossary. Appendices. Bibliography. Index. Pp. 320. \$29.95. ISBN: 978-1-57441841-5

Cook has made something of a cottage industry authoring books about the "illustrious US Navy F4U Corsair fighter unit, VF-17." He has clearly become a trusted agent

to the surviving members of the unit and their families and friends. In turn, they have given him access to materials documenting the wartime exploits of the “Jolly Rogers.” In this book, Cook focuses on the career of Harry March, whose skills, perseverance, and sheer guts carried him through the hostile skies of the Solomon Islands from 1942 to 1944. A nationally ranked track-and-field star, March put aside his Olympic dreams to become a naval aviator, flying the F4F Wildcat and F4U Corsair against Japan’s fearsome Zero-sen.

To March’s diary and flight logs, Cook has added comments, explanations, photographs, and maps to put March’s words into context. He points out that the diary was against naval regulations, so March formatted it as a series of “letters” to his wife just in case the non-diary was discovered. March’s journal does not contain any military secrets. Rather, it is the comments of a young man under enormous stress who is watching his comrades die while gathering the nerve to fly one more mission on one more day. The journal entries describe, in painful detail, his physical and emotional decline and his relief at being pulled from the frontline of Guadalcanal for rest and recuperation. Cook warns us that many of the entries are not politically correct for the 21st century but do represent the thoughts and emotions of the time in which they were written.

One interesting thread which weaves through March’s assignment with VF-17 was his work building and testing bomb racks for the Corsair. March worked with the Vought field-service representative on the bomb rack project. Evidently unknown to March then, or to Cook now, Charles Lindbergh was working on the same project in the same theater. In *The Wartime Journals of Charles A. Lindbergh*, Lindbergh writes of his work designing and building bomb racks for the Corsair and even testing the racks with 1000- and 2000-pound bombs against Japanese targets. I think March would have documented even a peripheral connection to Lindbergh in his own diaries. Given Lindbergh’s narcissistic self-absorption, I am not surprised he would ignore the efforts of a mere mortal like March. But the anecdote points out the limitations of Cook’s focus. While his personal connection to VF-17 is laudatory, it seems to have caused him to overlook information from other sources. Call it literary target fixation.

That said, I was hooked after the book’s first sentence. The insight Cook offers into the heart and mind of Harry March will resonate with anyone who has served in a combat zone a world away from loved ones and where surviving another day is a victory in itself.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**The June 1967 Arab-Israeli Six-Day War Volume 1: Prequel and Opening Moves of the Air War.** By Tom

Cooper. Warwick UK: Helion, 2023. Maps. Tables. Illustrations. Photographs. Notes. Bibliography. Index. Pp. x, 80. \$29.95 paperback. ISBN: 978-1-915070-77-7

For many years, Cooper has focused his research efforts on “small-country” air forces. As a result, he has compiled extensive archives. Along the way, he has developed useful contacts for exploring the history of 20th century Middle Eastern air forces. Besides serving as Helion’s co-editor for its @War book series, he has written numerous books and countless articles.

As with Osprey Publishing, Helion has devised a winning formula for succinctly detailing various conflicts. While the Osprey publications take a stand-alone approach, Helion prefers to discuss a topic in multiple volumes. Each Helion volume includes considerable background material usually followed by the combination of a chronological approach with a topical one. Photographs and tables are interspersed. Each volume typically includes color side-views for modelers.

This volume follows Helion’s tried-and-true format. It begins with a summary of conflicts and politics involving the surrounding Arab states and Israel, from that nation’s birth into the early 1960s. Besides the Suez Crisis of 1956, another significant dispute revolved around water rights—a factor that would contribute to increased tensions in the early 1960s.

Most accounts of the Six-Day War available in English are written from the Israeli perspective. Cooper’s work emphasizes developments that affected Arab thinking, including internal politics and foreign influence. Throughout the book, he contrasts Israel’s approach with that of its neighbors. He repeatedly points out how certain events could be misinterpreted.

Besides creating a timeline leading to the outbreak of the war, Cooper summarizes the capabilities and doctrinal choices of each of the belligerents: Egypt, Jordan, Iraq, Israel, and Syria. He points out misconceptions, frequently repeated in the west, regarding the capabilities and orders of battle for the various air forces.

Following his analysis of the various air forces, he examines in detail the events in May 1967 that eventually led to the Israelis’ decision to launch a pre-emptive attack—one of the most successful in military history. It equals Nazi Germany’s destruction of the Soviet Air Force in June 1941 or the Japanese success attacking Hawaii and the Philippines in December 1941. Cooper argues that Egyptian incompetence considerably helped Israel. Of course, the same could be said for Stalin in Russia and MacArthur in the Philippines.

At one time, Air University required professional-military-education students to analyze a campaign. One of the choices was the June 1967 war, which I selected. One take-away from my research was how the Israelis conducted a series of feints prior to the actual attack. They hoped to create a sense of complacency among the Egyptians. Cooper makes no reference to this tactic.

This book is highly recommended to anyone with an interest in the Israeli-Arab conflict and, particularly, the initial use of air power in the June 1967 war.

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



**Air Battle for Leningrad 1941-1944.** By: Dmitry Degtev and Dmitry Zubov. Barnsley UK: Pen and Sword Books, 2023. Photographs. Bibliography. Index. Maps. Pp. 320. \$42.95. ISBN: 978-1-39906-123-0

It has been over fifty years since I read *The 900 Days*,<sup>7</sup> Harrison Salisbury's seminal work on the siege of Leningrad during World War II. But I still remember thinking, "How is it I have never heard of this before?" And half a century later, the siege of Leningrad still has to be one of the most under-reported major battles of the Eastern Front, if not the entire war. Degtev and Zubov are prolific Russian writers on the war; and, in this book, they provide the reader with a very detailed, if quirky, account of the air war over the city. I say "quirky" not because of the information, but because of the uniquely Russian style of the book's narrative.

The book is a translation to English of an original Russian work. As translations go, it is very readable with clear, simple syntax and little strange-word choice. Line notes are on the bottom of the page; so, when the message is unclear, the additional notes are nearby. But Degtev and Zubov embraced the construct of ending seemingly every other sentence of the book with an exclamation point. This results in a feeling that the authors are shouting at the reader! If everything is emphasized, then nothing is important.

Throughout the book, Degtev and Zubov place the entire blame for the horror of Leningrad at Stalin's feet. But, at the end of the nine hundred days—marked by the collapse of the German Army and the tidal wave of Russian forces that would inundate Eastern Europe—Stalin is hardly mentioned, much less credited for the victory. In the book's conclusion, Degtev and Zubov suggest the reader do further reading on Hitler and Stalin's psychological profiles, offering their own Pen and Sword-published books on Russian and German aviation subjects as a good place to start.

This leads me to a brief discussion of the source reference materials for their work. The book is sourced primarily from ex-Soviet and German archives. The authors describe these as "incomplete" and containing "direct distortions." They mitigate this flawed source material with eyewitness accounts from undocumented sources. Most citations for Russian facts are the Central Archives of the Russian Ministry of Defense. German "facts" are not cited from official archives or unit histories, but from commercially published books. So, the reader would be advised to

bring a generous portion of skepticism to this material. The book itself is a comfortable read. It uses a larger font, which I appreciated. All illustrations are in a section in the center of the book. The maps would have been more useful placed closer to their appropriate narrative. I want to reiterate that the translation is very readable, exclamation points aside.

In the end, *Air Battle For Leningrad* is readable as recreation but somewhat unsuitable as a source for serious research. Fifty years on I still remember Salisbury's work. I doubt if I will remember Degtev and Zubov's effort next week.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**Heinkel 162 from Drawing Board to Destruction: The Volksjäger.** By Robert Forsyth and Eddie J. Creek. Sussex UK: Chevron Publishing, 2009/2023. Photographs. Appendices. Index. Maps. Bibliography. Drawings. Pp. 208. \$57.95. ISBN: 978-1-80035299-5

At first look, Forsyth and Creek give the reader a comprehensive look at one of the Luftwaffe's "too little-too late" wonder weapons. There are many photographs and technical drawings, a plethora of performance charts and specifications, and myriad stories about the deployment and short, ineffectual operational career of the fighter. But the book offers so much more than that. Forsyth and Creek gained access to a trove of documents from the Heinkel production facility and the archives of the *Reich Luft Ministerium* (RLM) which they use to document the bureaucratic processes that consumed four of the five months of the He 162's short life—a life that started well before the Heinkel engineers began their work. The first half of the book focuses on the He 162's bureaucratic gestation. The last half describes operational deployment, proposed special weapons to improve its efficiency, and post-war service in the hands of its captors.

The concept of fielding hundreds of small, fast interceptors flown by young pilots with minimal training was seen as a way to halt the tidal wave of Allied aircraft roaming German airspace at will and striking targets with impunity. The fighter would be built of wood and employ one jet engine. Its components could be assembled using POWs and concentration camp inmates supervised by skilled Reich technicians. Production and assembly would be decentralized in underground plants to avoid destruction. Component movement to the final assembly location would be orchestrated to minimize exposure to Allied weapons. All this while the Red Army was advancing on Berlin, and American and British troops were capturing Luftwaffe airfields and personnel.

For a high-tech weapon to go from approval to first

flight in only 70 days must have required broad approval from political and military leaders. Nothing could be further from the truth. The RLM had terminated “all” aircraft programs to focus on the “proven” Me 262 and Ar 234—the He 162 would only divert resources from these programs. But Göring had already felt the Führer’s wrath over the Luftwaffe’s failures, and he was not about to risk open opposition to the Führer-approved Volksjäger, so the program survived despite its many flaws.

Interestingly, it was glue that almost brought the program to a full stop. Many combatants experimented with using wood to build combat aircraft because of a shortage of aluminum. So, German aircraft companies developed techniques to build wonder weapons using wood and glue with minimal metal. An excellent glue was made in Berlin, but the production facility was destroyed in RAF raids of early 1943. Alternative glues were of inferior quality, and these were applied by forced labor in non-optimum conditions. There were constant complaints about glue quality throughout the program. An early test flight ended in a fatal crash when the glue holding the wing leading edge failed.

Post war, the USAAF, RAF, and French and Soviet air forces all received He 162s and conducted independent flight test programs. Even legendary Bob Hoover put one through its paces. Several of these aviators spoke highly of the aircraft and what might have been had the war gone on for a few more months. But some of these skilled and experienced test pilots died testing the He 162. The chapter on the Volksjäger’s combat deployment reads like one long accident report: quality control issues, sensitive controls, unreliable powerplants, and inadequate training contributed.

*He 162* is an excellent book. The large segment devoted to the bureaucratic fight to establish the program was professionally written and made the Machiavellian process as clear as it could be. Including large numbers of extracts from Luftwaffe sources was interesting in establishing the *bona fides* of the authors’ research. The color profiles are well executed and placed in context. The book is strongly bound, and the high-quality paper shows images in detail. The book is a glimpse behind the curtain of Hitler’s *Götterdämmerung* and is a case study in a dysfunctional political-military-industrial complex run amok.

Gary Connor, docent, National Packard Museum, Cortland OH



**Focke-Wulf Fw 190: The Latter Years—Prototypes To The Fall of Germany.** By Chris Goss. Barnsley UK: Frontline Books, 2023. Photographs. Glossary. Pp. 180. \$28.95 paperback. ISBN: 978-1-47389940-7

This is an annotated photo album dedicated to the Fw

190. While the photos have some expanded captions, Goss’s considerable writing talents are not on display. He does acknowledge a debt of gratitude to the late Dr Alfred Price for his mentorship and for the photographs contained in the book. During the late 1960s and early 1970s, Price was one of the few writers authoring books about aviation in World War II. His care in collecting photographs from the period serve today’s authors and aficionados well. If it is Goss’s intent to step into Price’s shoes, he does, indeed, have some big shoes to fill.

*Focke-Wulf Fw 190* is very straightforward in offering images of the “Butcher Bird” in various settings from production through testing and deployment. Of special interest are the various weapon configurations intended to improve the Fw 190’s ability to engage ever-increasing numbers of Allied aircraft and Soviet tanks.

For a book of this type, choosing the appropriate paper to display the photographs with clarity is obviously important. The images are, for the most part, clear. Close-ups show much detail that modelers and diorama-makers will find useful. A number of the photos are displayed over two pages, and I question whether the paperback spine will stand up over time. The captions are detailed. I fact-checked a few of the captions with the JG26 War Diaries, and the information matched. So, as expected, Price and Goss did their homework.

This book is a solid product. It is nicely curated, and Goss’s acknowledgement of Price’s foundational work is classy. But I look forward to seeing Goss’s writing skill on display in a more conventional manner.

Gary Connor, docent, National Packard Museum, Cortland OH



**The Boeing KC-135 Stratotanker, Third Edition: More Than a Tanker.** By Robert S. Hopkins III. Manchester UK: Crécy Publishing, 2022. Maps. Glossary. Tables. Diagrams. Photographs. Appendices. Bibliography. Index. Pp. 448. \$46.95. ISBN: 978-1-80035-264-3

Every so often, a book comes along that can be described only with superlatives. This is one of those books. An absolutely outstanding volume that lays out about everything anyone could ever want to know about one of the most adaptable and long-lasting airframes in the history of aviation.

This is the third edition of the book. I didn’t even know there had been a first (1997) and second (2017) edition. So, this monumental work has been around for over a quarter century and, I assume, has gotten only better with each new edition. Hopkins flew the KC-135 and many of its variants for a number of years. In addition to his own experiences, he has drawn on the expertise of many others who have served with this venerable aircraft in a host of different roles.

So, why all the excitement? Because just the original Foreword by test pilot Tex Johnston (why this aircraft) and Preface by former CINCSAC Gen Jack Chain (why aerial refueling) are worth the book's price themselves. And they are just two pages. The other 446 pages are divided into eleven chapters, six appendices, the absolutely required glossary, and the multiple indexes.

The first chapter looks at how refueling affects strategy. The next chapter is a wonderful dissertation on how we got the refueling capability we have today—a history of how the US and UK developed this marvelous military tool. Chapters three and four look at the development of the aircraft and the hardware and systems that make it tick. The next chapter, “Without Us, the War Stops,” couldn't be truer and covers the refueling job that these aircraft have been doing since 1957. But the US isn't the only country to use KC-135s, and Chapter Six covers these other air forces and their operations.

Starting with Chapter Seven, the reader is immersed in the “More Than a Tanker” part of the story. That chapter covers the C-135 transport and its less-than-stellar history. But Chapters Eight through Ten are where most readers will wonder what hit them. These chapters cover the myriad uses of the -135 airframe: test and evaluation, many forms of reconnaissance, command-and-control at both the conventional and nuclear levels, communications relays, intelligence gathering, weather, etc. The list of acronyms and projects is seemingly endless: HAVE THIS, PEACE THAT, RIVET WHATEVER, COBRAs, ARIA, RAMP, and on and on. Sub-variants of sub-variants. This is where the glossary and indexes are invaluable. The final chapter is “Beginning of the End.” I don't know. For my money, the -135 appears to be going the way of the DC-3: it will never die!

In short, this is a fabulous book. The hundreds of pictures are clear and crisp. Any tail number a reader can come up with is in the book somewhere. There are dozens of excellent tables. The ONLY caution I can give is that older readers might want to have a magnifying glass handy. The text has a font size of 9, and the tables and photo captions are in 7! Even with pictures, there is more text on one page than most books have on two or three pages. My suggestion is to clear any other KC-135 material from your bookshelf. This is all the reference you will ever need on this icon of the air.

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



**Sanctuary Lost: Portugal's Air War for Guinea 1961-1974: Volume 2 - Debacle to Deadlock, 1966-1972.** By Matthew M. Hurley and José Augusto Matos. Warwick UK: Helion, 2022. Photographs. Illustrations. Maps. Diagrams, Tables. Appendices. Bibliography.

Notes. Pp. viii, 104. \$29.95 paperback. ISBN: 978-1-804512-05-0

This is the highly detailed and compelling follow-on to the excellent initial volume of this series on one of the sparsely covered African colonial war campaigns of the mid-Cold War.

Beginning in 1963, a fierce war for independence was fought over Portugal's colony of Guinea, now Guinea-Bissau. The rise of nationalist thinking began in the 1950s and, by the 1960s, had grown to such a distressing level that Portugal sent its military throughout their colony in an effort to stop African Party for the Independence of Guinea and Cape Verde (PAIGC) activities. The Portuguese Air Force (FAP) was relied on heavily and showed itself to be a responsive and adaptable organization against the pro-independence forces. However, by the time the conflict ended in 1974, the FAP was essentially rendered irrelevant, degrading the operational ability of the ground and naval forces. The war against the insurgents was lost, and the independence of Guinea was at hand.

Colonel Hurley (USAF, Ret) is a former intelligence officer who published numerous articles on airpower history and campaign analysis. Augusto-Matos is a Portuguese military historian who has focused on the FAP during the African colonial wars.

As in Volume 1, each of the five chapters discusses a phase of the counter-insurgency campaign from 1966 to 1972. Things appeared to be improving for Portugal. The FAP began employing Fiat G-91 ground-attack fighters (use of their F-86s was prohibited by the US), Alouette III helicopters, Noratlas transports, Reims 337s, and even B-26 Invaders. Increased numbers of aircraft and ground forces were able to push back PAIGC forces.

However, the PAIGC was evolving its armed units into a traditional military structure and began acquiring military equipment suited for maneuver warfare. PAIGC's acquisition of more-capable air-defense guns and, later, missiles further complicated FAP operations and support of ground forces. They also gained support from Senegal, the Republic of Guinea, Algeria, Cuba, et al. Further, MiG-17s arrived in the Republic of Guinea from the USSR and were available to support PAIGC operations.

Volume 2 wraps up with in-country Portuguese forces pleased with their progress against PAIGC but pessimistic in the face of increased enemy activity and external support to the PAIGC. Portugal faced worsening relations with the international community and NATO allies, often manifesting in arms embargoes and/or restrictions on use of materiel (e.g., the F-86). The country had concurrent conflicts in Guinea, Angola, and Mozambique that were becoming very unpopular due to length and cost. The PAIGC acknowledged the defeats and losses inflicted on them by Portuguese forces but realized the FAP was the main reason for these results. Plans were afoot to deal with that. Portuguese leaders were concerned that their forces might

not prevail if the war continued much longer.

The maps, graphics, and tables make it easy to follow the combat situation. The excellently curated and captioned images show actual conditions experienced during the conflict. This deeply researched book cogently tells the story of Portugal's operations during this colonial war. This second book in a three-book series is well worth the read. I eagerly look forward to the concluding volume.

*Tim Hosek, USG (Ret) and former National Air and Space Museum docent*



**Operation Pedestal 1942: The Battle for Malta's Life-line.** By Angus Konstam. Oxford UK: Osprey Publishing, 2023. Photographs. Index. Maps. Bibliography. Drawings. Illustrations. Pp. 96. \$25.00 paperback. ISBN: 978-1-47285567-1

This is an offering in Osprey's "Campaign" series. Konstam offers a detailed chronology of an attempt to get much needed supplies to the British Empire's outpost on the island of Malta. With the fall of France and the rise of Vichy, Malta was isolated and exposed and in a perfect position to interdict the supply lines supporting Axis efforts in North Africa. The island's government made no secret of the fact the population would run out of food, fuel, medical supplies, and the ability to defend itself by September 1942. The British decided to send supplies through a large, fast, and heavily defended convoy whose commercial vessels were the survivors of a failed Russian convoy. Its military escorts—aircraft carriers, battleships, cruisers, destroyers and submarines—were supplied by the Home Fleet and numerous other task groups.

Konstam is an obviously talented researcher and a competent writer. His narration is clear, and the editing is precise. Curation of the imagery is a bit uneven, but there were probably few photographs taken during actual combat engagements. The various charts and diagrams were helpful. Aside from brief biographical segments on the Allied and Axis commanders, there are no firsthand accounts by participants. Therefore, given that we know the outcome, the reading can get a bit dry at times.

That said, the book does offer some unique tidbits, such as an Italian air-delivered weapon called the *motobomba*. These were 360-kg aerial mines dropped by parachute into the path of a ship. On impact with the water, the parachute detached, and a compressed-air motor drove the mine in an ever-expanding spiral until it impacted a ship or the motor quit and the mine self-destructed. There were no reports that this device enjoyed any success.

A second issue that attracted my attention was the 3-inch steel armored flight decks on the British carriers. The Admiralty felt its carriers would be subjected to both aerial attack and shellfire during the war and believed the

armor's protection was worth the adverse effect on ship-handling and performance. American fleet carriers had wood decks, believing that combat in the vast expanses of the Pacific would reward speed and agility. The Kamikazes, the crudest form of precision weapon, showed vessels the size of carriers could never be fast or agile enough to avoid damage. And in Operation *Pedestal*, Ju 87 Stukas dropping 250-kg "dumb bombs" that readily penetrated British flight decks.

The nature of the Campaign series is to let the reader decide who won. In the case of Operation *Pedestal*, remnants of the convoy got through. Pedestal forces suffered huge losses in men, material, and ships. Axis losses of men, aircraft and some ships were significantly less in number and scale. I was left with the impression that it would have been extraordinarily difficult, if not impossible, for the British to mount a *Pedestal 2.0*. But the success of Operation *Torch* and the victory at El Alamein meant there was no need for a *Pedestal 2.0*.

I visited Malta in the early 2000s and was impressed at the intimacy created by the size of the island. Residential areas directly faced onto the Grand Harbor, and it was easy to picture the seawalls lined with people who knew their lives depended on those *Pedestal* ships limping into port. And no less emotional were the British and Allied war planners who knew that, with the fuel, parts, and supplies the ships carried, soon it would be the Afrika Korps with hunger pangs.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**Tokyo 1944-45: The Destruction of Imperial Japan's Capital.** By Mark Lardas. Oxford UK: Osprey, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. 96. \$25.00 paperback. ISBN: 978-1-4728-6035-4

With over 50 books on military, naval, and maritime history to his credit, Mark Lardas has hit a solid triple with this latest effort. If it weren't for the large number of errors in the text, this would be an easy home run.

Lardas has broken down a complex World War II campaign to destroy the center of Japanese power into an easy-to-follow chronological narrative. Following Osprey's proven formula, he presents the background of the campaign and an analysis of the capabilities of both the Japanese and the Americans. The usual ribbon-diagrams, tables, photos, and illustrations help to bring the narrative to life and are done with Osprey's usual high quality.

There were four primary players involved in taking Tokyo out of the war. The first was the Doolittle Raid—not much tactically, but a strategic shot in the arm for the Allies. Two-and-a-half years later, the B-29s started coming. They didn't do much at first, but they kept coming and get-



ting more deadly. Many readers probably aren't as familiar with the naval raids by Task Forces 38 and 58—the fast carriers. These, and attacks by Seventh Air Force's P-51s from Iwo Jima also added to the overall elimination of the capital as a viable military target.

The narrative well describes the changes in tactics and weapons that made the B-29 the formidable weapon it became. If one is interested in aircrew perspectives of what these raids were like, there are many other books that provide that. Lardas has given us the who, what, why, and when of the campaign and has provided solid analysis of why it ultimately succeeded.

But that brings us to the errors. I was surprised that an author who spent decades as an engineer could be so sloppy with details—and that Osprey didn't catch them. And Lardas does provide tons of detail—times, speeds, payloads, altitudes, and the like. These are needed but should be correct. One egregious error is calling the USAAF the Army Air Force, not the Army Air Forces. In his chronology, the date for Doolittle's Raid is 16 April 1942. It was 18 April. His descriptions of the B-29 airfields, gunnery system, and placement of the radar countermeasures equipment are partially or totally wrong. Lardas says that 580 million tons of shipping were handled in Tokyo ports every month! *Bockscar* dropped a *Fat Man* on Nagasaki, not a *Little Boy*. I was often unsure of whether he was addressing Tokyo proper or the greater urban area that includes Yokohama and other cities. There are more, but I found these without any need to check other resources. How many other errors are there?

I don't normally like to dwell on errors. However, they are important in a book that is as detail oriented as this one. The overall assessment of this book is that it is a must read for anyone interested in the strategic air war in the Pacific. The tale is well told, but it should be read for the overarching evolution of tactics, equipment, and strategic decision making. Don't get overly hung up on, or enamored with, the myriad details.

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



**Juliet Tango November: A Cold War Crime: The Shootdown of an Argentine CL-44 over Soviet Armenia, July 1981.** By Gustavo Marón. Warwick UK: Helion, 2023. Photographs. Maps. Notes. Bibliography. Pp. 70. \$29.95 paperback. ISBN: 978-1-80451371-2

I thought this would be a straightforward account of the Soviet shoot-down of an innocent commercial airliner that found itself flying over Mother Russia. I could not have been more wrong. Marón weaves a tale so convoluted, Byzantine, and Kafkaesque as to strain credulity. The story stretches from the corruption of the Argentine commercial

aviation sector to the Biafran Civil War. From Soviet command-and-control centers to the Iran-Iraq War. And it all leads to a summer day in 1981, when the Soviets intentionally lured the Argentine airliner into Soviet airspace and into the waiting trap sprung by an incompetent Russian pilot who collided with the commercial transport.

I congratulate Marón and Helion for being able to package this story in a readable and coherent fashion. The narrative is so complicated, that poorly chosen pronouns or awkwardly constructed complex sentences could have been disastrous. Despite the complexity of the story and the multitude of characters, the book reads very well.

The first and last thirds of the book concentrate on things Argentinian: detailed explanations of corporate business dealings, corrupt politicians enabled by banks, and a corrupt military junta. Much of this story takes place against the backdrop of the Falkland Islands War as well as the endemic political corruption rife in Argentina. Marón shows how the bureaucratic buffoonery of the Argentine government facilitated creation of “ghost” airline companies fabricated to facilitate smuggling and circumvent arms embargos. The circumventions allowed Israel to sell arms and spare parts to Iran to use in its war with Iraq. Both Israel and Iran used American military equipment; so, Israel could provide everything from F/RF-4 parts to armored vehicle parts and weapons and use Argentine aircraft flying dummy routes through Cyprus to make their way to Teheran. Marón implies the US knew what was happening and allowed Israel to support the transaction with 1000% mark-ups, knowing the profits would be used to buy newer and better American weapons. The backdoor route to Teheran took advantage of the regional geography and borders, using NATO-member Turkey's airspace while skirting Soviet Armenia. Eventually, the Soviets recognized what was happening and used meaconing (false signals) to lure aircraft into Soviet airspace to be intercepted and forced to land. Unfortunately, a Soviet pilot ended up ramming LV-JTN, causing it to crash with the loss of the crew. He survived to receive the Order of the Red Banner. Marón points out that both NATO and Iran ran frequent intentional—and occasional accidental—inursions into Soviet airspace in this region. These provoked the Russian Bear into a disproportional response. That said, Russian paranoia has led to shoot-downs of military and commercial aircraft from the immediate post-World War II period (e.g., Berlin Airlift shootdowns) to more-recent history (KAL 007).

Marón did an amazing job researching the subjects and shining a bright light into the actions of his own country. Photos are well curated with explanatory captions that add to the narrative. The bibliography is a bit light, but the end notes are extraordinarily strong. Half a century ago, my basic navigator training included significant information on meaconing and the evil of becoming overly reliant on external radio nav aids. Each class session included cautionary tales of unwary aircrews lured to their doom by the

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siren song of a strong signal. The story of Juliet Tango November would have fit right into the curriculum.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**The First Hellcat Ace.** By CDR (Ret) Hamilton McWhorter III and LtCol (Ret) Jay Stout. Havertown PA: Casemate, 2024. Photographs. Pp. 225. \$34.95. ISBN: 978-1-63624409-9

This book is a revised reprint of a 2001 autobiography. McWhorter “went West” in 2008, so this version reflects his original work and subsequent revision by Stout. The writing is clear, concise, direct, and very human. McWhorter’s style handles technical, historical, and personal matters with equal style and grace. His extraordinary career covered US Navy carrier aviation from the early dark days of the Pacific war to the Allies’ final victory.

While its readability is noteworthy, the book is a wealth of historical facts. And McWhorter does not pull punches. Whether talking about people, command decisions, or his own successes and failures, he is direct and clear. In most cases, it is this detail that brings out his humanity. He acknowledges his early infatuation with aviation and the lengths he went through to become not just an aviator, but a Navy fighter pilot.

When he talks about flying the F4F Wildcat, the reader is in the cockpit with him. When he talks about the 27 revolutions of the hand-crank to retract the landing gear and the possibility of ending up with a broken wrist in the process, the reader winces in sympathy. He comfortably talks about the strength and durability of Grumman products and the tendency of Japanese aircraft to burn when on the receiving end of a burst of .50-caliber slugs. This is not a secret in the aviation-history world; but, when McWhorter talks about a target bursting into flames, the statement carries a bit more weight. He tells another story of a Hellcat pilot who was lost during a failed take-off when his open canopy slammed shut, and he was trapped in the cockpit. But then he follows with a description of a field modification made by the plane captains (crew chiefs) to install a small, hinged blocking bar the pilots could use to prevent the canopy from slamming shut. These historical stories are too numerous to list. They may come across as minutia to some readers, but they could be the difference between life and death to the pilots.

The home front and his personal life receive equal attention. He meets his future wife, they marry, and she accompanies him on numerous cross-country moves, staying in hotels, Quonset Huts and, occasionally, their car. He talks about having a tire blow out and being forced to go before a small-town ration board to plead for a rare replacement tire so he can continue to his duty station. And

he talks about the effect of increasing casualties on his wife and other squadron wives and girlfriends. In the early phases of the war, a Navy fighter squadron might have 10-12 pilots, and everyone intimately knew everyone else. In the later stages of the war, a fighter squadron might have over 100 pilots and 200 ground personnel, and the personal relationships suffered.

McWhorter’s original book was a cathartic exercise. He clearly realized how lucky he was and the overwhelming importance of luck. When I was an Air Force aviator, we had a saying, “I would rather be lucky than good.” Whether he was acknowledging the role luck played in surviving a botched carrier landing or finding a Zero in his gunsight, McWhorter was lucky. But it was also clear he carried a significant load of survivor’s guilt. When he talks about losing 20 or more comrades, you know that he could still see their faces and speak their names.

This is one of the best aviation autobiographies I have read. It has something for every reader, and every reader will be better for having read about the life of this extraordinarily lucky man.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**Defending Putin’s Empire: Russia’s Air Defense System.** By Mihajlo S. Mihajlović. Barnsley UK: Frontline Books, 2023. Abbreviations. Notes. Bibliography. Index. Photographs. Tables. Illustrations. Appendix. Pp. 244. \$42.95. ISBN: 978-1-39904-307-6

Mihajlović is a professional engineer, physicist, and historian with more than 25 years of experience. He is an expert in military technology, weapons systems, missiles, and radars who specializes in radar countermeasures and decoy design. He has written several books and articles related to stealth technology and radar and missile engineering.

The National Air Defense System of Russia is assigned a wide spectrum of missions. Its improvement is a major Russian objective. The main purpose is to create an operationally effective and economical air defense system employing the characteristics of all modern weapons to their maximum effect to reliably defend all vital military installations and civilian facilities. Russian experience shows that the best way to defend the state and its armed forces is an integrated system made up of subsystems operating under the overall direction and synchronization of a common command-and-control authority.

This book covers the origins and evolution of Russian air defense since the early 1950s. As Russia is hardly an open book on defense-related subjects, the study of air defense systems is subject to some degree of speculation. However, Mihajlović provides a wealth of technical, visual,

and historical information which provides the reader with a good understanding of the overall system and its five major components:

**Air Space Control and Surveillance:** intelligence gathering assets of all armed services including sea, land, air, and space radar, radio, electronic and optoelectronic equipment. It is a multilayered component. The highest authority is space-based. Land and sea electronic intelligence subsystems include air-based radar, ground-based air defense, and air traffic control, also included, is ground-based information for fighter and missile defense.

**Fighter-Interceptor Forces:** providing air cover by interceptor aircraft, airborne and early-warning-and-control aircraft, regional fighter command, and vectoring stations.

**Missile Defense System:** the main source of firepower for air defense and countermeasures. Includes surface-to-air missiles and mobile automatic anti-aircraft units and supply services. Ensures the defense of military and civilian infrastructure against high-density air attacks.

**Electronic Warfare and Countermeasures:** includes electronic countermeasures and reconnaissance which enable defense systems to disorganize and jam hostile multifunctional attack weapons.

**Automated Command and Control:** concentrates on real time control of assets operating at different organizational levels to ensure maximum effectiveness.

The S-300 was the first unified Russian air defense system for naval and ground forces and is the base for evolution of all subsequent systems. It evolved into the S-400 mobile, multi-channel, air-defense missile system that engages air-attack weapons and interacts with other defense and missile systems. The latest evolution is the S-500 Prometheus, which includes surface-to-air missile systems capable of intercepting intercontinental ballistic and hypersonic missiles and aircraft. It also provides defense against AWACS and jamming aircraft.

When I first picked up this book, I had some trepidation as to how I could get through all the detail. Mihajlović has included not only overview diagrams of the various major systems, but also many photographs and detailed drawings of individual mobile and electronic system components. He even includes radar-cross-section data on “enemy” aircraft such as the F-18, F-35, F-22, and B-2. Surprisingly, I found the book eminently readable. Mihajlović describes not only the technologies, but also the rationale behind systems development and evolution. He describes the political environment in which it all happened and where it intends to go. The book is a great reference for defense-technology enthusiasts.

*Frank Willingham, NASM docent*



## **Damned Hunchbacks: Italy's Forgotten Torpedo Bomber Units of the Second World War (1940-1943).**

By Paolo Morisi. Warwick UK: Helion, 2023. Photographs. Appendix. Bibliography. Pp. 312. \$49.95. ISBN: 978-1-804512-37-1

Paolo Morisi is a military historian who has written extensively on the Italian Army during both World Wars. He has published several books and articles.

Italy's torpedo bomber units played a significant role in the Mediterranean between 1940 and 1943. The primary aircraft was the Savoia-Marchetti S.79 *Sparviero*, a trimotor initially designed for passenger service. Adapted for military use, it carried a single torpedo. These aircraft often operated in groups, using a coordinated approach to overwhelm enemy defenses. They often flew at low altitudes to evade enemy radar and anti-aircraft fire, making surprise attacks more effective. But, after 1940, Italian units began to face the challenges of an aging bomber fleet and increasing dominance of allied forces.

Morisi begins by describing the origins of the Regia Aeronautica (RA), its political infighting with Italian army and navy organizations, and its poor state of readiness at the onset of the war. The Italian aviation industry was badly organized and inefficient. Its cottage-industry and artisan production methods resulted in long production times and a variety of aircraft types produced in only small numbers. As the war began, Italian industry had grown; but its size and might paled in comparison to that of France, Britain, and the US. The industrial base was fragmented, and its labor-intensive shops did not follow accepted industrial processes. This was all exacerbated by an economy several times smaller than Britain's.

Morisi describes how the RA's bomber fleet was not large enough to sustain multiple operations. It could conduct only a limited campaign in the central Mediterranean. However, torpedo-bomber successes caused the RA to change tactics and transform standard bomber units into new torpedo-bomber squadrons. But the marginally successful torpedo-bomber campaign of 1941 was stymied by slow production of aerial warheads, untrained crews, and few serviceable aircraft. By late 1942, the RA had shifted its attack focus from lone-wolf to simultaneous and synchronized mass attacks. This led to large losses of aircraft. The RA was overstretched and quickly running out of resources: bombers, experienced crews, torpedoes, and fighter escorts.

In his assessment of the RA and S.79 roles in the war, Morisi states that the 1942 siege of Malta was the best example of Axis air force efficacy in the Mediterranean. Torpedo bombers also influenced the convoy war. The constant threat of torpedo attacks against British shipping tied up a large British force. But Italian aerial-torpedo and torpedo-aircraft technology stagnated, while measures instituted by the Royal Navy and the RAF to preempt torpedo attacks improved as the war evolved. General unprepared-

ness and lack of cooperation with the navy led to their inability to fight together as a cohesive force in the war's early stages. Proper group-attack tactics with adequate fighter escort, coupled with attacks by dive bombers and fighters improved overall RA effectiveness. The lack of national intervention in developing aeronautical technology ultimately led to a situation where innovation in Italy lagged that of other nations.

Morisi packed a lot of information into this book. His chapters end with summaries and results which are quite useful in reviewing information presented. The extensive bibliography will help the researcher. The photographs are varied, but many are of poor quality. All-in-all, however, this book is a worthwhile read on a generally under-reported subject.

*Frank Willingham, docent, National Air and Space Museum*



**Afghan Air Wars: Soviet, US and NATO Operations, 1979-2021.** By Michael Napier. Oxford UK: Osprey, 2023. Maps. Photographs. Illustrations. Notes. Appendices. Bibliography. Index. Pp. 320. \$40.00. ISBN: 978-1-4728-5901-3

Napier, a former Royal Air Force Panavia Tornado pilot who flew combat sorties in Iraq, has written mostly about post-World War II aviation. He has authored more than a dozen titles.

In this most recent book, he provides a detailed accounting of air operations, proceeding in chronological order. Before discussing the Soviet Union's use of airpower in Afghanistan in the 1980s, he wisely uses a few pages to review the nation's geography. All of the following chapters start with a brief mention of air power's influence on military operations. Aviation assets historically have helped "shrink" Afghanistan's size and allowed access to remote areas.

For ten years, the Soviet Union and its partner, the Afghan government, faced resistance from the Mujahidin. The opposition relied on classic guerrilla tactics, hiding in the mountains and among sympathetic villagers. Like the Western forces that followed them, the Soviets lacked sufficient ground forces and turned to airpower. The Soviet Air Force used a variety of fixed-wing aircraft including the MiG-21, MiG-23, and Su-17; but the most effective was the Su-25, a purpose-built, ground-attack airplane. Likewise, helicopters were essential. The Mi-24 gunship proved extremely useful, as did the Mi-8 and Mi-17 by providing logistical support. The situation changed after the Mujahidin received the man-portable Stinger surface-to-air missile.

About two-thirds of the book covers the nearly two decades of US and NATO air operations. Napier divides

the period into four chapters influenced by ground operations and the changing political situation. He describes specific missions whenever possible while recognizing the multinational effort. Coalition warfare is always a tricky proposition, and that certainly seems to have been the case in Afghanistan. For example, rules of engagement varied from nation to nation. This occasionally limited controllers' options in targeting. On the other hand, aircrews repeatedly handed off responsibilities for supporting friendly forces when fuel shortages forced departures.

As was the case with the Russians, western air forces employed a wide array of aircraft including the F/A-18, AV-8, F-15, F-16, A-10, Mirage 2000, AC-130, and Tornado. Using increasingly lethal guided munitions, the B-1B proved to be an extremely effective tactical platform. Napier mentions electronic-warfare aircraft and unmanned aerial vehicles; but, aside from the chaotic evacuation in August 2021, both airlift and aerial refueling receive only limited attention.

Napier relies almost exclusively on secondary sources, many of them found on the internet. He lists numerous Russian sources. Given the recent nature of the conflict, it is understandable that much operational information remains to be released. This book is best suited for those readers unfamiliar with Soviet operations or who may be interested in learning more about the West's most recent use of air power.

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



**Korea 1950-53: B-29s, Thunderjets and Skyraiders Fight the Strategic Bombing Campaign.** By Michael Napier. Oxford UK: Osprey Publishing, 2023. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Index. Pp. 96. \$25.00. ISBN: 978-1-4728-5555-8

"Another Osprey book" could be an easy remark for *Korea 1950-53*, but the informality of this quip leaves out the fact that it's a compliment. The publisher of Napier's latest book routinely has the ability to delve into the smallest niche of aviation knowledge, all-the-while maintaining a high degree of entertainment value.

When one thinks of strategic bombing, 1000-plane raids of B-17s, Lancasters, and their escorts fending off the Luftwaffe over occupied Europe usually come to mind. Though the Superfortress debuted in the Pacific by 1944 and officially closed the war, the lack of resistance from Imperial Japan's decimated air force contextualizes the aerial combat in a much different way. However, B-29 crews would again find themselves embroiled in vicious air warfare only five years after World War II, but now over the skies of the Korean peninsula, with deadly MiG-15 jets slicing through their formations.

For anyone interested in airpower epoch shifts, the Korean War serves as a textbook case study; and Napier's book does an excellent job of highlighting this point. War-winning stalwarts of the Second World War were now going toe-to-toe with borderline sci-fi ideas that only a few years prior were mere sketches on a drawing board. Since technology was advancing more quickly than production would allow, several aircraft were essentially obsolete as soon as they rolled off the assembly line. For example, on Republic's Thunderjet, Napier states, "the straight-wing F-84 was no match for the swept-wing MiG-15 in air-to-air combat and it was soon switched to the ground-attack role." Luckily, as Napier shows, there was no shortage of targets for the aircraft of this book to hit.

*Korea 1950* has a healthy mix of period photographs, maps, as well as modern, digital aviation art by Mads Bangso, which is top notch. The maps and diagrams are particularly helpful, for they illustrate strategic bombing and attack tactics that would read like stereo instructions if exclusively described via the written word. There's also a chart for an allied order-of-battle, an easy-to-use index, and a chronology of Korean War milestones that pertain to the air campaign, of which many dates and events would be unknown to the average military-aviation enthusiast. Though the book doesn't examine this notion, it's worth situating the Korean police action in the wider context of the Cold War. For example, more modern B-36 Peacemakers and early versions of the B-47 Stratojet were in operation during the Korean conflict, but none saw action there. Though there are several reasons for this, Washington still had the concern of deterring Soviet aggression in Europe and elsewhere throughout the globe.

Napier concludes his work with five lessons learned from the Korean War air campaign—which I'll leave in suspense for the reader. However, it's worth noting that these lessons exemplify the fact that this conflict was a proving ground for a new type of aerial war—one much different than the previous conflict that inspired most of the aircraft designs. Sadly, Napier points out the truth that many of the lessons would need to be relearned a decade later in another North vs. South conflict, this time over the skies of Vietnam.

*LCDR Alexander "Roadtrip" Buschor, USN*



**On Warriors' Wings: Army Vietnam War Helicopters and the Native Americans They Were Named to Honor.** By David Napoliello. Bryn Mawr PA: Global Collective Publishers, 2023. Maps. Tables. Photographs. Tables. Notes. Appendices. Bibliography. Index. Pp. xxiv, 446. \$34.95. ISBN: 978-1-957831-08-4

Napoliello, a retired Army colonel, spent much of his career in artillery-related assignments. However, as an

Army "brat" following his father to various posts, he was fascinated by the early helicopters he observed. In Vietnam, he spent many hours in helicopters and the Cessna O-1 Birdog helping direct artillery fire. Frequently working at isolated fire-support bases, he appreciated how helicopters maintained a link to the outside world.

Before writing this book, Napoliello wrote several other books and many book reviews and articles for military journals. He became involved in the fund-raising effort to create The Education Center at the Wall. There, part of his responsibilities included communicating with Native Americans who served in Vietnam. That experience sharpened his awareness of their role in American military history, whether as foe or friend, enemy or patriot. Almost from the beginning of military helicopter operations, the Army has named its rotary-wing aircraft after Native American tribes. For this book, Napoliello chose to tell two stories in parallel: one profiling each of the Army helicopter types, and the other about the tribe or individual for which it was named.

The colonel begins by providing an overview of the Army's use of rotary-wing aircraft. He follows that chapter with one about the Native American warfighting experience from the first contact with European settlers through the Korean War. From there, he profiles eleven different types of helicopters, all of which served in Vietnam. He begins with the Bell OH-13 Sioux and concludes with the Bell OH-58 Kiowa. However, this is only half the book. The remainder focuses mostly on the contributions of Native Americans, including six introduced in individual essays. He adds 19 others who lost their lives while involved in helicopter-related operations.

Of the more than 50,000 service members who perished in Vietnam, 237 were Native Americans. He includes basic information on each.

In the epilogue, Napoliello reviews each of the post-Vietnam Army helicopter types. Some proved successful; others were disappointments. The appendices include topics such as Native American Medal of Honor recipients and characteristics of Vietnam-era helicopters.

Napoliello's unconventional approach works surprisingly well. The reader essentially receives two independent, but related, stories under one cover. I highly recommend this outstanding book to anyone wishing to learn more about Army aviation. It also is appropriate for those interested in an overview of Native-American military history.

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



**Harpoon Missile vs. Surface Ships: US Navy, Libya and Iran 1986-88.** By Lon Nordeen. Oxford. UK: Osprey Publishing, 2024. Index. Photographs. Illustrations. Dia-

grams. Maps. Index. Pp. 80. \$23.00 paperback. ISBN: 978-1-472859-20-4

Nordeen worked for more than 40 years at the American Institute of Aeronautics and Astronautics. He was also an executive for McDonnell Douglas/Boeing products (including Harpoon). He is a technical writer in defense, aviation, and military technology and has written several books on these subjects.

The Harpoon missile is a long-range, all-weather, anti-ship missile system originally developed by McDonnell Douglas (now Boeing). It is designed to strike enemy ships with precision, serving primarily as an anti-ship missile but also capable of hitting land-based targets. The missile can be launched from various platforms including surface ships, submarines, and aircraft. Harpoon is the most widely used anti-ship missile in the West.

The first US combat use of a Harpoon took place in 1986. Operation *Prairie Fire* was conducted by the Navy in March in response to Libya's aggressive actions in the Gulf of Sidra. The operation was prompted by Libya's claim of territorial waters extending far beyond the internationally recognized twelve-nautical-mile limit. During this operation, aircraft carriers USS *Coral Sea*, USS *Saratoga*, and USS *America*, along with their accompanying naval task forces, launched a coordinated attack on missile sites located along the coast of Libya. The primary objective of the operation was to neutralize Libyan military capabilities and send a strong message of deterrence to the Libyan government. Harpoons sank two Libyan patrol boats.

Operation *Praying Mantis* was a US military response to Iranian naval attacks during the Iran-Iraq War in the Persian Gulf. The operation took place on April 18, 1988 after the US guided missile frigate USS *Samuel B. Roberts* struck an Iranian mine. In retaliation, the US launched a series of coordinated strikes against Iranian naval targets. This operation marked the largest surface engagement involving the US Navy since World War II. US forces targeted Iranian ships, oil platforms, and naval facilities and sank the frigate *Sabalan* with a Harpoon.

Nordeen begins with a brief chronology of events over a 20-year period beginning with the Naval Air Systems Command requirements for an air-launched missile to hit surface submarines and ending with the sinking of the *Sabalan*, which itself ended the day-long war at sea against Iran. He goes on to describe the initiation of the Harpoon program and describes the missile in detail. He emphasizes that anti-ship-missile development was accomplished in response to the Soviet Navy's tasking to defend the USSR from strikes by US Navy carriers. It did so by replacing obsolete warships with new missile boats armed with powerful anti-ship missiles.

The book has brief histories and technical specifications for the various surface ships and aircraft involved in the Harpoon missile actions of 1986 and 1988. Nordeen provides photographs or illustrations of each and reviews

the strategic precursors to the actions in both Libya and Iran. The main section of the book is most interesting, in that Nordeen provides first-hand accounts of the actions of US personnel directly involved in the employment of Harpoon missiles and other ordinance throughout the engagements of the two operations.

Nordeen's book is a worthwhile read. It is well written and gives the reader a good understanding of the technology and operations involved in not-well-known, but historical, combat, when Harpoon missiles were first fired in anger.

*Frank Willingham, docent, National Air and Space Museum*



**Cold War Boys: Previously Unpublished Tales of Derring-Do from Pilots and Crew of the Lightning, Phantom, Hunter, Tornado and other Aircraft.** Richard Pike. London: Grub Street, 2022. Photographs. Index. Pp. 192. \$39.95. ISBN: 978-1-911667-37-7

In his latest *Cold War Boys* book, Pike once again returns to his proven method of weaving a collection of seemingly disparate stories to create a picture of what it was like for British aviators during the Cold War. When referring to the Cold War, Pike focuses on the time period from the end of World War II to the fall of the Soviet Union, rather than just activities involving the Soviet Union, its client states, and allies. By taking this approach, he opens up a larger aperture for potential stories.

Pike's earlier works focused on specific aircraft types. *Cold War Boys* is divided into twenty chapters, with each presenting a different and unique story. Pike includes stories involving nine different aircraft: fighters, helicopters, trainers, and the Red Arrows. In addition to the flying chapters, Pike includes chapters telling the stories from outside the cockpit. These stories fit well into the book's overall theme.

Combined, the mixture of varied stories builds a comprehensive picture of British military flying during the Cold War. Each chapter is short and easily read. The chapters include more than just stick-and-rudder stories. They tell what it was like to sit alert waiting for the scramble alarm, or to fly the corridors from West Germany to Berlin. The stories help show the underlying stresses of maintaining a constant vigilance against the Soviet Union and its allies. The varying nature of each chapter lends itself to reading the book over time without the reader losing continuity.

At the editor's request, Pike included an afterward that is the story of Marshal of the Royal Air Force Sir Thomas Geoffrey Pike's (the author's father) first night-fighter combat sortie as a Bristol Beaufighter pilot during World War II. While a departure from the Cold War theme of the book,

including this story adds to the enjoyable nature of the book. Sir Thomas would become a senior RAF leader during the heart of the Cold War. Including his father's story provides a bit of depth to the experiences that shaped the RAF's senior leadership during the Cold War.

As in his earlier *Boys* books, Pike includes a section of photographs. These include both stock RAF and personal photos and give the reader a sense of the aircraft included in the book. This is especially true for aircraft that American readers may not be familiar with.

*Cold War Boys* is not a history of the RAF during the Cold War. That never was Pike's intent. It is a "there I was" book focused on Cold War flying. The selection of stories is well curated to tell the story of flying during that period. As a personal preference, I would have liked to have seen a story or two about scrambling and escorting Soviet bombers as they attempted to penetrate NATO airspace. However, putting that personal preference aside, *Cold War Boys* is a thoroughly enjoyable and engaging read for both aviation fans and students of the Cold War looking to personalize the time period.

*Lt Col Daniel J. Simonsen, USAF (Ret), Alexandria VA*



**Modern South Korean Air Power: The Republic of Korea Air Force Today.** By Robin Polderman. Vienna, Austria: Harpia Publishing, 2021. Maps. Tables. Illustrations. Photographs. Appendices. Glossary. Bibliography. Index. Pp. 253. \$59.95 paperback. ISBN: 978-1-950394-07-4

Robin Polderman is a Dutch aviation author, photographer, and researcher who has been studying certain air forces in the East Asian region for many years. In addition to the rich narrative, many of the excellent photographs in this book were taken by him.

Given Korea's history of being controlled by Japan until the end of World War II and then separated into North and South, it should come as no surprise that an air force didn't exist until after the war. The Republic of Korea (ROK) officially formed the ROKAF on October 1, 1949—a force with a handful of L-4 liaison aircraft and AT-6 trainers. With the Korean War, a force of 130 F-51s ultimately came in. These were the teeth of the ROKAF until 1955.

The association with the USAF was close during the war and continued afterwards. F-86 jets joined the ROKAF in 1955. As the Cold War pressed on, the Koreans received F-5, F-4, F-15, F-16, and F-35 fighters; C-123 and C-130 transports; and numerous other types. They built themselves into a first-class fighting force. With the founding of Korean Aerospace Industries in 1999, the ROK began to develop and field a number of excellent fighter, trainer, helicopter, and unmanned aircraft to its growing force structure and to the air arms of other foreign countries.

Polderman tells the story of the development, fielding, modernization, and operations of the formidable ROKAF in 8 chapters. The first covers the force's history. Next is a solid description of the markings, serial number system, and unit designations used by the ROKAF. This chapter also describes the organization of, and bases within, the air force. Chapter 3 is a long one and covers each of the 30 aircraft types in ROKAF service. The fourth chapter gives the same treatment to air-to-air and air-to-ground weapons, reconnaissance systems, and other armaments. The fifth chapter covers the ROKAF training syllabus and discusses the phases of flight training, training in specific weapon systems, Red Flag, and other operational exercises. They also have their own Fighter Weapons School and employ their own test pilots.

Chapter 6 looks to the future, as the ROKAF continues to modernize through 2035 with both new and upgraded systems. In Chapter 7, Polderman expands on his coverage of the indigenous industry that supports much of the ROKAF's operations and modernization. The final chapter is very important: a look at a troubled peninsula in a volatile region. This is an excellent review of the role the ROKAF plays. It compares the force with its counterparts in the region, and also looks at how it and the USAF interact.

With Polderman as writer and Harpia as publisher, this book is the definitive source on today's ROKAF. It is typical Harpia fare: superb hi-res photos, gloss paper, and excellent layout. The book should be mandatory reading for anyone interested in this nearly unstable part of the world and what the South Koreans will bring into any future conflict.

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



**Ejército del Aire y del Espacio: The Spanish Air Force from 1939 to the Present Day.** By Pere Redón-Trabal. Warwick UK: Helion, 2023. Maps. Tables. Illustrations. Photographs. Glossary. Bibliography. Pp. 74. \$29.95 paperback. ISBN: 978-1-915070-67-8

Redón-Trabal is a Spanish writer and journalist who specializes in military subjects, particularly ones that are aviation-related. Most of his published articles and books have appeared in Spanish. In this work on the history and status of the Ejército del Aire (EdA, or Spanish Air Force), he and the editors have done an excellent job of making a very-readable narrative in English.

The saga begins with a brief history of the air force. As in the US, military aviation grew slowly under several different names and organizations. Military air activity began in 1911. Spain maintained military aircraft throughout the First World War (the country was a neutral, so it had a very

small air force) and into the 1920s and 1930s. During the three-year civil war, 1936-1939, many foreign aircraft (and German, Russian, and other aircrew) came into the country. In the Fall of 1939, the EdA was formally established. Except for a volunteer squadron that fought with Germany on the Eastern Front, Spain was again neutral. It had a large (if largely obsolete) air force by the end of the war. By 1951, the first tentative contacts with the US began. These eventually led to purchases of F-86, C-130, F-5, and F-104 types of aircraft. While both indigenously designed and other foreign aircraft have been flown by the EdA, the US types have generally been the point of the Spanish spear. F-4s and F-18s were added later.

The majority of this book covers the EdA of today. Redón thoroughly covers the bases, aircraft and other systems, training facilities, ranges, schools, base defense, and organization of the country's air arm. As a member of NATO since 1982, Spain—with its bases on the Iberian Peninsula, Canary Islands, and Balearic Islands—plays a major role in defending the southwest corner of the alliance and the entrance to the Mediterranean.

Another important aspect of the story is the military aviation industry in Spain. CASA, through its legacy components, is one of the oldest aircraft companies in the world. It built up an indigenous capability to manufacture engines because of the difficulty in obtaining powerplants during World War II. During the Civil War, it had become dependent on German aircraft types. CASA manufactured large numbers of modified Bf 109, He 111, and Ju 52 types under Spanish designations, since the country could no longer obtain these from Germany. They developed their own jet attack aircraft in the 1950s; have made a number of small transports, attack, and training aircraft; and continue as an overseas depot under US military contracts. Operationally, the EdA has been an integral part of many peacekeeping and humanitarian aid missions since joining NATO and the EU. It also participated in the evacuation of Kabul.

Redón has written a fine overview of one of NATO's component air forces. I don't believe there is a comparable summary extant. His writing, combined with Helion's usual publication excellence, has produced a book well worth reading by those interested in the details of one of Europe's fine air forces.

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



**Operation Oyster: World War II's Forgotten Raid: The Daring Low Level Attack on the Philips Radio Works.** By Kees Rijken, Paul Schepers, and Arthur Thorning. South Yorkshire UK: Pen and Sword, 2022. Photographs. Maps. Diagrams. Pp. 227. \$34.95. ISBN: 978-1-39901-976-7

The Royal Air Force of World War II is best known for its night area-bombing strategy, but it also had an ambitious program of precision daylight attacks with both long range four-engine heavy bombers and mid-range, twin-engine medium bombers. This book is about the December 6, 1942, low-level daylight raid by No. 2 Group RAF with Mosquitoes, A-20 Bostons, and B-34 Venturas on the Philips Radio Works, a producer of radio components in Eindhoven, the Netherlands, whose output was critical to the Nazi war machine.

The trio of authors has unusual ties to the raid. Eindhoven native Kees Rijken witnessed the raid as a child. He piqued the interest of his son-in-law, Philips employee Paul Schepers, on the history of his workplace; and the two set about learning more about the mission. Finding only cursory references in published sources, they instead researched it on their own—digging documents out of military and civil archives, interviewing participants and witnesses, and even visiting the site. Their curiosity satisfied, Rijken and Schepers donated their findings to the RAF Museum at Hendon. The third author, Arthur Thorning, is an aeronautical engineer who acquired an interest in the raid from a neighbor whose brother flew on it. Finding the research file at Hendon, he corroborated with Rijken and Schepers to produce this unique work.

The book recounts the raid from the perspective of aircrews, the factory owner, the enemy, and unfortunate civilians caught under the bombs. Official documents are reproduced and never-before-seen photos supplied by Philips and military and private sources show the factory target from the air, the city of Eindhoven, military participants, and civilian victims. Aircrew training—complete with rehearsals over England—is described in detail. There are nail-biting descriptions, enhanced by riveting in-action photos, of the precise navigation and low-level flying needed to penetrate enemy air space in the teeth of Nazi resistance. Students of the Allied bombing campaigns over Europe will be especially interested in accounts of the factory owner's evaluation of damage to his production facilities, and his strategy of surviving under Nazi rule by managing expectations with falsified records.

The aftermath includes eyewitness accounts (including Rijken's) of the raid's effect on civilians, and photos of graves of those killed on both sides. All military and civilian casualties are listed. Numerous well-placed maps aid reader comprehension. This book reminds me of such detailed mission accounts as Münster (Hawkins, 1984) and the Dambuster raid (Holland, 2012, and Hastings, 2020). Numerous histories (Richards, 1994, and Terraine, 1985), document this operation as one of the more effective RAF precision daylight raids.

Some attempt at a narrative flow has been made; but, in many places, this book is simply a recitation of evidence. Discontinuities of style from author to author sometimes distract. Sharp-eyed readers may find the occasional technical detail amiss. Nonetheless, this book tells a riveting



tale and is recommended for this overlooked portion of the RAF's air war over Europe in World War II.

*Steve Agoratus, Hamilton NJ*



**The Scrapyards: Aircraft Salvage Around Davis-Monthan AFB Volume 1—1980s.** By Graham Robson. Horncastle UK: Tempest Books, 2023. Photographs. Pp 195 . \$ 55

The subjects of this pictorial, illustrated with nearly 200 photographs of decommissioned aircraft, are the scrapyards engaged in the metals and parts recovery businesses and aircraft refurbishing. They conduct their operations immediately adjacent to Davis-Monthan AFB's facility for retired and scrapped aircraft. Aside from museums and aircraft on display, Davis-Monthan is, for the most part, the final destination for military aviation's discards.

Once known as the Military Aircraft Storage and Disposition Center (MASDC), it is now known properly as the Aerospace Maintenance and Regeneration Group (AMARG), although many aviation buffs have for decades referred to it simply as the "boneyard." As one turns this book's pages, looks at the photos of aircraft acquired by the scrapyards, and reads the supporting narrative, a sense of bittersweetness hits. On the one hand, the decommissioned aircraft are there because the military has moved on to a newer generation or because of treaty obligations. But, on the other hand, they invoke a feeling of nostalgic sentiment and, at the same time, a sense of loss. They bring back memories of aircraft ranging from the supersonic B-58 Hustler, to C-124 Globemasters, KC-97Ls, B-52s, and many others. The aircraft sent there are from not just the Air Force. One will discover Navy F-8s, P-3s, and the E-1B Tracer, among others. The Army's H-34s and the H-37 Mojave, as well, experienced their ends in the scrapyards. Even the iconic Air Force F-105D, famous for its combat operations taking it to Hanoi's doorstep, found its way here for an unceremonious end.

During my first visit to the "boneyard" in the 1970s, I realized that there were aircraft of historical significance under threat of being reduced to piles of aluminum ingots. I saw so many that had a role to play in history and that, on a personal level, had been a part of my military experiences. What especially caught my eye, however, was something I had seen in a book when I was a child in the mid-1950s. There in front of me was perhaps the only existing example of a Bell Helicopter XV-3. Why was it of historical importance? It represented this country's first attempt to produce a tiltrotor aircraft (think of it as the forebearer of the V-22 Osprey), and what I was seeing was a forgotten wreck. The Army, thankfully, later rescued it and years later, after extensive restoration by the original builders, it went on display at the National Museum of the Air Force.

When I returned to Davis-Monthan in the late 1980s, it was to deliver BGM-109G Ground Launched Cruise Missiles for destruction under the terms of the 1987 Intermediate-Range Nuclear Forces Treaty. Again, I walked through the boneyard and recognized many of the aircraft awaiting their fate and recalled the role they played defending America during the Cold War. There ahead of me were B-52s, decommissioned per treaty requirements, all awaiting a huge chopping device.

This volume's photographs were assembled from Robson's collection taken four decades ago in the 1980s. As I looked at the aircraft, I sensed that, like me, many readers perusing them will travel down memory lane and, hopefully, have fond memories of a time now long gone. For younger readers, the aircraft seen here should prove equally interesting and informative. This book will probably be the catalyst for many conversations about the aircraft. Enjoy reading it.

*John Cirafici, Milford DE*



**Red Dragon 'Flankers': China's Prolific 'Flanker' Family.** By Andreas Rupprecht. Wein, Austria: Harpia Publishing, 2022. Glossary. Appendix. Bibliography. Index. Photographs. Illustrations. Map. Diagrams. Pp. 256 paperback. \$44.40. ISBN: 9-78-1-95039-410-4

Andreas Rupprecht is an aviation journalist who has authored several books on China's military aviation, including *Modern Chinese Warplanes* (a directory of Chinese Air Force combat aircraft) and *Flashpoint China* (Chinese air power and regional security). He works as a Chinese military aviation researcher and China news reporter for international magazines.

During the 1990s, China contracted with the Soviet Union/Russia for advanced technology aircraft, such as the Su-27 *Flanker*, for several reasons. First, China sought to modernize its military capabilities rapidly and acquire advanced fighter technology, to include long-range interception and combat capabilities. Second, at that time, Russia (the successor state to the Soviet Union) was facing economic challenges and saw arms sales as a way to generate revenue. The deal was mutually beneficial, providing China with advanced aircraft, and Russia with an economic opportunity. Additionally, the Su-27 purchase facilitated the development of indigenous fighter aircraft, contributing to China's goal of strengthening its defense capabilities and reducing its dependence on foreign military technology. China continued to enhance its indigenous spinoff, the J-11, capabilities, evolving it into various variants such as the J-11B and J-11D. These highlighted advancements in indigenous engines, avionics, and weaponry. This in-house development process resulted in disputes over technology transfer and Russia's concerns about in-

tellectual property. Russia regarded these aircraft as illegal copies and a breach of their formal agreement.

Rupprecht provides excellent overviews of *Flanker* variants produced in both Russia and China. His first chapter covers single-seat-fighter variants and related two-seaters, describing the genesis of this family (the Su-27SK and UBK). These evolved in China to the J-11B, C, and D. He also covers AL-31F and WS-10 turbojet engine development and aircraft history in both Russia and China. He describes technical proposals, contract negotiations, licensing-and-manufacturing agreements, along with the many problems they entailed. Rupprecht also describes design updates, flight testing, operational use, performance assessments, colorings, and markings.

Rupprecht provides additional similar chapters on two-seat, multirole-strike variants and carrier-borne fighter variants. Another chapter describes Chinese and Russian air-to-air, air-to-ground, air-to-surface, and anti-ship weapons; guided bombs; rockets; mines; and targeting, navigation, and electronic warfare pods. His final chapter discusses operational service, including Russian and Chinese *Flanker* assignments to air divisions, regiments, and brigades. Photographs of *Flanker* variants are included with their assignments. Rupprecht concludes with an appendix which is a recognition guide with color side-views of the many variants. Included is an interesting family tree that shows ten original Su-27 models and 25 Chinese modifications and indigenous production models.

Rupprecht provides an excellent reference for those who are interested in Chinese military air power. His many quality photographs and discussions on contract negotiations and technical problems are of particular interest. The book provides an excellent political and operational history of Chinese *Flanker* evolution. There is a wealth of information—something to be kept on the shelf and continually revisited.

*Frank Willingham, NASM docent*



**Battle for Grozny Volume 1: Prelude and the Way to the City, 1994.** By Efim Sandler. Helion, 2023. Notes. Illustrations. Photographs. Maps. \$29.95. Pp. 78 paperback. ISBN: 978-1-804512-14-2

Following the dissolution of the Soviet Union in 1991, the Russian military had reached the nadir of its powers. This coincided with a bold strike for independence by Chechnya, a small autonomous area in the Caucasus. Thus began, in late 1994, the First Chechen War. What followed was the worst post-World War II reversal for the Russian Army until three decades later in Ukraine.

Before describing the immediate events leading up to the conflict, Sandler devoted the monograph's first section to a summary of the region's tragic history of conquest by

Russia, and its continual resistance to occupation. Paralleling the external struggle has been a never-ending internal struggle between indigenous factions that would either seek Moscow's favor or change sides and oppose the Russians. That situation continues to the present, with Moscow's chosen faction in power.

When the Soviet Union collapsed in 1991, the various "republics" within the Union elected for independence, including those immediately to Chechnya's south. Chechnya, likewise, sought its independence. Russia, under President Yeltsin's direction, responded by declaring a state of emergency in November 1991, denied independence, and began the process of reining in the local Chechen leadership. Chechnya forced his hand when Russian forces within the region came under attack. On 31 December 1993, Chechnya formally declared its independence.

The monograph addresses the creation of combat units within Chechnya, who led them, their efforts to acquire weaponry from surrounded Russian units based within the region, and how equipment was sabotaged before Chechens took possession. Russia, initially attempting to avoid direct use of its military, first recruited Chechens to form opposition militias for an assault on Grozny (Chechnya's capital) against those supporting independence. That assault took place on October 15, 1994 and resulted in a complete rout of pro-Russian Chechens. What followed in November is the key focus of this monograph—preparation for a Russian Army advance on Grozny.

What took place in preparation for the assault is striking in what was not accomplished. There was a systemic failure to properly mission plan, rehearse, brief, establish effective lines of communications, or allow for battlefield flexibility. Mission planning intelligence was practically nonexistent. In other words, there was total incompetence in planning and execution. This is similar to what would happen 28 years later in Ukraine. Equally telling was the dismal state that the Russian military had fallen to on the eve of major operations against Chechnya: poor or unserviceable equipment, inexperienced officers and men, unfunded requirements for supplies, and critical under-manning. I personally recall the day-to-day difficulties of the Russian military when I worked with elements of the Russian Air Force in the very same period, during a time when the US military sought a positive relationship with its opposite numbers in Russia.

This volume closes in December 1994, when Russian forces commenced their advance on Grozny. Although it is laden with tactical-level detail, the monograph, more importantly, provides a picture of a military totally unprepared to go to war. With the current Ukrainian war in mind, one should read it as a lesson tragically not learned.

*John Cirafici, Milford DE*



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**Earthquake: Brigadier General Robert F. Titus: Fighter Pilot, Test Pilot, Leader.** By William B. Scott. US: North Slope Publications, 2024. Photographs. Pp. 170. \$14.99 paperback. ISBN: 979-8-9886315-1-4

The title of this excellent biography pretty much says it all. This is the story of a great fighter pilot, test pilot, and leader of airmen. William Scott is a former bureau chief for Aviation Week, and a graduate of the USAF Test Pilot School who accumulated over 2000 hours in dozens of different aircraft. His experiences, combined with an excellent writing style, resulted in a very readable and meaningful book.

Titus certainly had an interesting career. Yes, there is a lot of the “there-I-was-at-30,000-feet” genre in this book. There has to be if one is to follow and understand a unique career. However, there is a much more about the man, how to effectively lead others, and the attributes that make both a great man and a great leader.

Young Robert was a bright student but didn’t really enjoy school. On his 18th birthday in December 1944, he enlisted in the Army and became a paratrooper in the 82nd Airborne. The division commander, MG James Gavin, became one of Titus’ early leadership icons.

Discharged in 1946, he started college but was lured into the Air Force by a campus recruiter. Sent to pilot training, he got his wings and was thrilled to be assigned to F-51 Mustangs. From late-1951 to August 1952, he logged 101 combat missions in Korea in both the F-51 and F-86. Returning to CONUS, he thought about getting out of the Air Force, but stayed and flew F-84s and F-86s on ferry missions to Europe. He then applied for Test Pilot School, graduated, and ended up flying many of the latest aircraft and doing voluntary parachute testing. He particularly enjoyed flying the F-104, F-105, and the really hairy F-100D Zero Length Launch program.

Titus earned an MBA and then got back into fighters, sitting F-105 nuclear alert in Europe. Assigned to Tactical Air Command headquarters, he was working on deployment of F-5s to Vietnam and then went with the aircraft to command a Skoshi Tiger unit.

After a short return to the US, he was once again in Vietnam, this time commanding a squadron of F-4Cs. During this tour, Titus bagged three MiG-21s (one a gun kill). The experience served him well at his next tour in the Pentagon where he was instrumental in getting the F-X (F-15) program off the ground—with a gun included.

From there, it was on to wing command in Okinawa with F-4s again. But his career started to close at Air Force Systems Command headquarters where he led a losing battle to retain the gun on F-4Es and made some powerful new enemies. After a tour at European headquarters (where he saw more of the politics he hated), and a final tour working for Gen Chappie James (another of his icons) in Colorado Springs, he decided he had seen enough and retired. The book ends with his work in civilian life.

While all of the “wild blue” stuff is important, what really comes out is one man’s perspective on the value of both real-world experience and reading. He was a voracious reader and spent a lot of time learning languages in places he was assigned. Titus was (still is at 97) an observer of the traits that make a good leader. He doesn’t pull many punches in pointing out good and bad traits in individuals that many AFHF Journal readers will know or have heard of.

The book is a quick read and a well told story that should be read by all USAF officers and enlisted personnel alike.

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



**F-16 Fighting Falcon: American All-Purpose Combat Machine.** By Bertie Simmonds. Horncastle UK: Tempest Books, 2022. Tables. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. 200. \$36.99. ISBN: 978-1-911658-56-6

The F-16 Fighting Falcon, originally manufactured by General Dynamics and developed for the US Air Force, is easily one of the most successful (and recognizable) lightweight, single-engine, supersonic, multi-role fighter aircraft in modern times. With over 4500 produced and employed by more than 25 nations, the Fighting Falcon has been operational since 1974 and is, astonishingly, still being produced today. Don’t recognize it? Attend any Air Force Thunderbirds air show. It has been their steed since 1982. Like the aircraft, this book is a winner.

Almost 50 years of production is a vast timeframe to chronicle and analyze well, but Simmonds reviews and evaluates the F-16’s manufacturing and military history with a comprehensive, yet accessible and readable, style. With over 225 action-packed photos, the book discusses the F-16’s genesis as a “lightweight fighter concept . . . born from the crucible of the air war over Vietnam and the need for cheaper, simpler, and more manoeuvrable [UK] fighter aircraft . . .”

At the time, the political turbulence generated for a smaller aircraft was not particularly palatable to those arguing for a larger competitor to the MiG-25 Foxbat: the “F-15 Eagle programme was sacrosanct in the USAF and the Pentagon” and it had a head start. But to some, the Eagle’s cost and attendant budget pressures argued for an entirely different aircraft. Enter a group of powerful and persuasive advocates, known as the Lightweight Fighter Mafia, who argued for a smaller and cheaper fighter. After much analysis and political wrangling, the F-16 was conceived.

So how does one cover the extensive history of this remarkable aircraft? Simmonds does it with skill and deft-

ness. Even the aviation neophyte will find this book approachable and informative.

In a previous life as a commercial banker, I was a participant in a consortium invited to General Dynamics headquarters in St. Louis in the mid-1970s to review and analyze the financial condition of the company and to entertain their request for a substantial bank line of credit. These events are normally tedious and dull occasions, but this program was different. We knew, of course, that the company was developing a new fighter aircraft, but we lacked visual details. “Would anyone like to see a special video?” came a voice from the dais. “Welcome, bankers, to our newest fighter aircraft.” The screen exploded with an extraordinary promotional video of the Fighting Falcon. Collectively, we were all speechless. As this was still the Vietnam era, we were all familiar with F-4C Phantoms, F-105 Thunderchiefs, and F-111 Aardvarks. Wow! This exciting new aircraft was a sports car: futuristic and huggable. The rest is history.

In eleven chapters Simmonds takes the reader through the birth of the aircraft, its progenitors, competitors, production history, combat experience in Israel and the Gulf War, “cousins,” avionics, weaponry, and status today. The book is well-designed and an attractive addition to modern aviation history. It’s as slick as its subject matter. Unfortunately, although Simmonds lists and acknowledges his sources at the outset, his book, like many today, lacks notes.

Simmonds, an aviation and motorcycle writer, has written a paean to an exceptional aircraft; and, if predictions are accurate regarding the Fighting Falcon’s future production schedule, there could be a second edition in another 25 years.

*David S. Brown, Jr., volunteer, Museum of Flight, Seattle*



**100 Years of Civil Aviation: A History from the 1919 Paris Convention to Retiring the Jumbo Jet.** By Ben Skipper. Barnsley UK: Pen and Sword, 2023. Photographs. Bibliography. Index. Pp. 278. \$42.95. ISBN: 978-1-9906596-2

Skipper, a former member of the Royal Air Force, writes as a freelancer on a wide variety of topics, including military affairs. He is an associate member of Pen and Sword Club, a writers’ society supporting the media goals of the British military. Aside from a book on the Boeing B-17, his previous military titles focused on fighting vehicles and armored conflict.

Publisher Pen & Sword claims this work is the first “to include women in civil aviation’s 100-year-old history and to include all aspects of civil [sic] aviation in a single volume.” To cover such a broad expanse in fewer than 300 pages, Skipper chose a topical approach.

His opening chapter offers a brief look at companies

producing purpose-built commercial airliners in the United States and Europe in the 1920s and 1930s. Significant aircraft are covered in a couple of sentences each. He follows this section by remembering the bold aviators of the 1920s and 1930s who captured the headlines and the public’s fancy on both sides of the Atlantic. He includes the impact of events such as the Schneider Cup and the public’s fascination with racing.

References to airlines appear in most chapters, but several are almost exclusively devoted to them. In the third chapter, he tackles the emergence of the airlines between World War I and World War II. His coverage of European airlines equals that of those operating in the Western Hemisphere.

For the 100 years under discussion, the single greatest change in aviation occurred in the 1950s, when the jet engine arrived as the preferred powerplant for all large civil aircraft, a topic covered in Chapter 4, “The Arrival of the Jet.” He mentions the post-World War II piston-powered aircraft before transitioning to jetliners entering service at the end of the 1950s. Skipper follows that chapter with how the airlines vied for customers with better planes, better service, and better branding. From there, he moves on to women in aviation and infrastructure—international agreements, air traffic control, training, and financing. In Chapter 8, “Civil Aviation beyond the Holiday,” Skipper emphasizes the diversity of civil aviation with brief passages on topics such as crop dusting and hang gliding.

Prior to the brief conclusion that mentions cutting-edge technologies, Skipper remembers some of the tragedies—horrific accidents, bombings, and hijackings.

Perhaps this book would be of use to an educator searching for an introduction to share with students studying the history of technology. But aviation enthusiasts would be far better served examining specialized works such as R.E.G. Davies’ books on commercial aviation and the airlines.

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



**MiG-21 “FISHBED”: Opposing Rolling Thunder 1966-68.** By István Toperczer. Oxford UK: Osprey Publishing, 2023. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp: 80. \$23.00 paperback. ISBN: 978-1-4728-5756-9

István Toperczer is a flight surgeon in the Hungarian Air Force. His brief biography notes that he has traveled to Viet Nam on numerous occasions to conduct research and interview Vietnamese veterans. The book is full of photographs from his personal collection and anecdotes collected from his research. While the book follows the Osprey recipe meticulously, I found it much more personal than is

typical. It quickly became obvious that Toperczer was highly committed to the subject matter on a personal level. The book opens with a developmental history of the MiG-21, leading to the unique fact that the Soviet aircraft industry developed a “tropicalized” variant of the MiG-21, designed to be easier to maintain and operate in Viet Nam’s climate. Toperczer goes into detail to discuss the training of Vietnamese pilots and maintenance personnel. I was surprised at the number of flight hours logged by Vietnamese pilots checking out in the MiG-21.

Also surprising was the segment Toperczer dedicated to describing how North Korea sent a group of pilots to not only supplement Vietnamese aviators, but also to gain valuable combat experience. The Koreans used both Vietnamese aircraft and tactics while flying their missions.

The MiG-21 was a short-range, point-defense weapon system. It was not designed to be a dogfighter. It carried a minimal weapons load and used radar and GCI to attain the optimal position to attack American formations. The tactic was perfectly suited to their platforms, and they practiced it and used it to great effect against the F-105 Wild Weasels and bombers as well as their F-4 escorts. Toperczer literally uses the last sentence in the book to credit the MiG-21s with a 1.7:1 victory ratio over American Rolling Thunder formations. Throughout the narrative, his anecdotes cite North Vietnamese claims first, occasionally noting when American records disagree.

I found this book interesting. While most of the story is generally familiar to modern aviation historians, there are new tidbits included. The narrative is very smooth with none of the clunky syntax problems that machine translations frequently offer. It is well worth reading.

*Gary Connor, Cortland, Ohio*



**Uniting Against the Reich: The American Air War in Europe.** By Luke W. Truxal. Lexington, KY: University Press of Kentucky, 2023. Photographs. Diagrams. Bibliography. Notes. Index. Appendix. Pp. 254. ISBN: 978-0-8131-9828-6

This Mitchell Institute-series book is about the significance of the changes in command made in the Allied air forces in the European Theater of Operations (ETO) and Mediterranean Theater of Operations (MTO) in preparation for Operation *Overlord* at the Allied conferences at Tehran and Cairo in December 1943. Truxal’s thesis is that divisions in US airpower command in 1943 between Ira Eaker in the Eighth Air Force in the ETO and Carl Spaatz in the MTO hamstrung the effort to gain air superiority over the Luftwaffe until remedied by decisions made at the summits.

Truxal, who has published in the *Journal of Military Aviation History* and on the *From Balloons to Drones* web-

site, exploits archival resources, unit histories, and campaign accounts to produce a very readable, well-argued history of the command structure in the ETO and MTO strategic aerial campaigns of World War II. The Combined Bomber Offensive agreement at Casablanca is characterized as a decision to split command, with the US Eighth and Twelfth (and later Fifteenth) Air Forces each going their own way. Conflicts over resource allocation, heavy losses of bombers, and a corresponding failure to subdue the Luftwaffe by the fall of 1943 resulted in a decision at the Tehran and Cairo Conferences to unify all heavy bomber commands under General Spaatz in a newly established organization, the United States Strategic Air Forces in Europe (USSTAF). Thus unified, the strategic air forces wrested air superiority from the Luftwaffe in time for D-Day.

Many books cover the changes in command of the American air forces in the two theaters at the end of 1943. Some works (Perret, 1993; Daso, 2000; Sherry, 1987; Keeney, 2012) state that General Arnold sent Eaker (who had failed to achieve air superiority with the Eighth) to command the Mediterranean Allied Air Forces (MAAF) and sent Doolittle (who had commanded first the Twelfth and then the Fifteenth Air Forces in the Mediterranean) to the Eighth. According to these accounts, this move was the key to victory over the Luftwaffe. Others ascribe the changes to Eisenhower (Hansell, 1972; Smith, 2012; Coffey, 1977; Zaloga, 2011). Truxal contends that unity of command was the key factor underlying them all.

These are minor quibbles, however. The book might have taken more notice of the air war’s global nature. As General Arnold reminded both Spaatz and Eaker, the Eighth and Twelfth were among many air forces around the world demanding resources. Similarly, recognition of General Arnold’s establishment of USSTAF as part of his (unspoken) campaign to establish strategic airpower as an independent, decisive capability (Huston, 2002; Hansell, 1972) would have fit nicely with the unity of command thesis. The strong partnership between Spaatz, Eaker and Arnold, a major factor in ETO/MTO airpower throughout the war, is only hinted at here. Also, Maj Gen Hugh J. Knerr was not “a friend of Arnold’s,” as Knerr’s memoirs (2021) make clear.

Despite these, this must-read book is an important addition to air war historiography that should be on everyone’s shelf.

*Steve Agoratus, Hamilton NJ*



**“To Force the Enemy Off the Sea”: The Story of the RAF’s North Coates Strike Wing.** By John Vimpany and David Boyd. Warwick UK: Helion and Company, 2022. Photographs. Maps, Appendices. Bibliography. Index. Pp. 140. \$39.95 paperback. ISBN: 978-1-80451085-8.

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John Vimpany's father, Dick, was a navigator in the North Coates Wing of Coastal Command, the subject of this book. Vimpany and Boyd drew heavily on friends and on family archives in putting together this record of the unit. This results in a very personal book.

The first 30 pages briefly outline the mission of Coastal Command and the path it took to establish the strike wings and develop successful operating procedures. The remainder of the book looks at operations and life at North Coates, followed by a brief assessment of the strategic worth of their operations. As such, the book is a closely-focused, personal look at one squadron's role, from one officer's perspective, during a portion (1943-45) of the war. For a broader look at RAF anti-shipping operations, readers would be well advised to look somewhere else.

The North Coates Wing story, for the purposes of the book, begins when they were first equipped with the Bristol Beaufighter and the torpedo-carrying "TorBeau" variant. As an operational record, the book is heavily weighted toward missions Dick Vimpany participated in. During this period, the three squadrons of the wing typically worked together: the TorBeaus followed a unit of flak-suppression Beaufighters while, at the same time, a bombing unit attacked the enemy's flak batteries to dilute the defensive fire against the attackers. These operations constituted a large part of the wing's activities until the end of the war.

The book also contains a brief general look at wartime life on the station and the history of the North Coates location, along with profiles of some of the commanding officers. In the end, the authors offer an assessment of the contributions of Coastal Command and, in particular, the North Coates Wing. Brief appendices cover Beaufighter specs, where the North Coates Wing fit into the overall Coastal Command structure, and a tally of Coastal Command and North Coates Wing shipping claims.

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



**Fighting in the Electromagnetic Spectrum: U.S. Navy and Marine Corps Electronic Warfare Aircraft, Operations, and Equipment.** By Thomas Wildenberg. Annapolis MD: Naval Institute Press, 2023. Glossary. Tables. Appendices. Notes. Bibliography. Index. Photographs. Diagrams. Pp. 270. \$39.95. ISBN: 978-1-68247-849-3

Wildenberg is an award-winning scholar with special interests in aviators, naval aviation, and military technological innovation. He is the author of a number of books on a variety of naval topics as well as biographies of Joseph Mason Reeves, Billy Mitchell, and Charles Stark Draper.

Electronic warfare (EW) refers to the use of the electro-

magnetic spectrum to detect, disrupt, or deceive enemy systems and communication networks, thereby gaining advantage in military operations. It involves tactics such as jamming, spoofing, and signal interception to deny or degrade the opponent's ability to communicate and coordinate effectively. The Department of Defense divides EW into three main categories in order to effectively organize and prioritize electronic warfare activities: support, protection, and attack. EW support involves actions taken to enhance the effectiveness of friendly forces through the control and exploitation of the electromagnetic spectrum. EW protection focuses on measures taken to defend friendly forces and assets from the harmful effects of enemy electromagnetic threats. EW attack involves actions taken to directly target and disable or degrade enemy electronic systems and capabilities.

Wildenberg begins with the premise that, although EW has grown in importance over the years, few naval historians have attempted to document the growth and development of the equipment, techniques, or operational use. He feels that there are several reasons for this: a high level of secrecy surrounding EW, the difficulty in acquiring information about it, and the fact that it is highly technical in nature. In addition, he feels there is no single source on US Navy and Marine Corps EW aircraft and equipment that provides a comprehensive picture of the use of EW since its inception in 1942. Therefore, he intended to fill this gap in the history of these services.

To provide a comprehensive history, Wildenberg covers a large number of topics: radio intelligence in World War I, the earliest form of EW; descriptions of operational missions in the Second World War using rudimentary jammers and chaff; Cold War electronic intelligence and EW during the Korean War; descriptions of losses, including EC-121M *Deep Sea 129* off Korea; evolving EW platforms, to include the EA-6A Intruder and RA-5C Vigilante; operations in the Vietnam War countering the SA-2 Guideline surface-to-air missile; the EA-6B Prowler development—"an EW platform from the ground up"; and the birth of the EA-18G Growler and next generation jammers.

Wildenberg's progression of EW equipment and aircraft throughout the book is especially informative. He starts with the basic EW elements (receiver, pulse analyzer, direction finder, jammer), their evolution, and how they were integrated with progressive aircraft designs, including the PBY-5, AD-2Q, EA-3B, EC-121, EA-6A, EA-6B, ES-3A, and EA-18G. The book closes with a historical perspective that discusses how innovations presented in this work may help prevent future military leaders and planners from repeating mistakes of the past.

This is an excellent reference book! In addition to the well-written text (with its many adequate photographs and diagrams), the notes and selected bibliography provide an exceptional reference source for further reading. The book provides an outstanding foundation for the study of EW. It

certainly meets Wildenberg's objective. Very much worth the read!

*Frank Willingham, docent, National Air and Space Museum*



**Eagles of the Luftwaffe: Focke-Wulf Fw 200.** By Matthew Willis. Horncastle UK: Tempest Books, 2023. Photographs. Appendix. Index. Maps. Bibliography. Drawings. Illustrations. Pp. 146. \$22.50 paperback. ISBN: 978-1-91165865-8

The Treaty of Versailles placed extraordinarily harsh sanctions on Germany designed to prevent it from ever having a thriving aviation industry or fielding commercial or military air formations. But the country was later able to create a national commercial airline, *Deutsch Luft Hansa* (DLH). By the mid-1930s, DLH was a leading European carrier, serving over 200 European cities as well as a number of international destinations, usually close to German ex-patriot colonies in the Americas and Africa. However, its Junkers transports and Dornier flying boats were becoming antiquated; so DLH began to explore the international air transport market, buying engines from the US and UK and two Boeing 247s. After examining these articles, DLH released a commercial request for a modern, multi-engine airliner capable of serving domestic and international routes. Kurt Tank and Focke-Wulf responded by offering the Fw 200 Condor.

Willis well describes this aircraft, its commercial and military history, and its strengths and flaws. He is an excellent writer. With clear and concise narratives, he covers technical and human subjects with equal ease.

Armchair aviation historians know that many Luftwaffe aircraft in 1939 had their genesis in commercial aircraft requirements. The Do 17, He 111, and Do 24 all began as nominally commercial designs, although their configurations would indicate most were too small for passenger service or as cargo carriers. So, F-W's work on a large aircraft that was passenger and cargo capable should have come as no surprise.

The Condor's use of Boeing 247 design elements created an aircraft of revolutionary design. Both the Boeing and F-W aircraft employed cantilever wings with similar sweep angles and aspect ratios derived from NACA airfoil and engine-nacelle data. The general layout of both low-wing monoplanes with retractable landing gear and a cantilever tailplane was unique for its time but became common by the 1940s. However, the Fw 200 was much larger, with significant range, speed, and payload advantages. The Condor's "stepped" fuselage created a less-streamlined profile and made manufacture more expensive and time-consuming. It also caused the tail boom to be attached at a single point. While not a problem in a passen-

ger aircraft, in a heavier combat aircraft subject to higher stress and rough handling, it did become a problem.

The Fw 200's commercial debut fulfilled much of its promise. A highly modified Condor fitted with extra fuel and stripped of excess weight flew from Berlin to New York—not forgotten when the Luftwaffe began to explore options for a "New York Bomber." Willis offers several interesting anecdotes including the fitting of cameras by DHL to obtain pre-war photography.

Willis addresses Condor's conversion to a warplane in detail. Fw 200A and B models were commercial variants, while the C was a bomber/maritime-strike platform, and the D was a military transport. Conversion to the C and D models added over 7000kg to the Condor's weight, mostly aft of the wing. This added stress to the aft fuselage. At least eight Condors suffered "broken backs" on heavy landings. While the elegant thin wings offered range and fuel efficiency, they were susceptible to bending and flutter at high speeds and heavy loads. The Fowler flap system added manufacturing complexity and additional weight to the fragile wing. Willis implies that the Condor was too fragile for combat. Lacking self-sealing fuel tanks and armor for the crew, they were vulnerable to even rifle-caliber RAF weapons early in the war.

But even flawed, its endurance allowed it to range over most North Atlantic and Russian convoy routes. It tracked convoys and dropped radio beacons for U-boats to home in on, bringing convoys under constant attack. Not until the British fitted catapults and flight decks to merchant marine hulls to extend fighter protection was this partnership put in abeyance.

The D-model transport, fitted with additional fuel tanks, became the sole source of fuel for German troops trapped in Stalingrad and the Kuban Pocket. These flights, in an already fragile fuselage, would not have been for the faint of heart.

I strongly recommend this book. It is well written, and its photographs are nicely curated and clearly presented. Willis and Tempest Books show that a book small in size is not necessarily small in content or impact.

*Gary Connor, docent, National Packard Museum, Cortland OH*



**Royal Navy Torpedo-Bombers vs. Axis Warships, 1939-1945.** By Matthew Willis. Oxford, UK: Osprey, 2022. Photographs. Bibliography. Index. Maps. Pp. 80. \$22.00. ISBN: 978-1-47285248-9

Willis has authored over 15 aviation-related history books, primarily focused on British units during World War II, as well as numerous aviation-related articles. He is well versed on the subject, and this work includes many historical photographs (most from his personal collection) as well

as several maps and illustrations.

The title is misleading. “Warships” refers solely to capital ships (battleships and cruisers). If the reader is looking for information related to Fleet Air Arm (FAA) use of torpedo bombers in an anti-submarine role during the Battle of the Atlantic, they will be disappointed. Also, Willis has confined the discussion to Europe and the Mediterranean against Germany’s *Kriegsmarine* and Italy’s *Regia Marina*—only minor mention is made of their employment in the Indian Ocean and the Pacific against the Japanese.

Willis begins in July 1914 when Squadron Leader A.M. Longmore first deployed an aerial torpedo from a Short S.64 seaplane. Two years later, the Royal Naval Air Service (RNAS) conducted two successful attacks on ships in the Aegean. At about the same time, flight decks were introduced to several seaplane carriers, eventually evolving into the aircraft carrier in 1918. That same year, the RNAS fielded the Sopwith Cuckoo, a specially designed aircraft capable of deploying from an aircraft carrier while carrying a torpedo on its undercarriage. However, the Armistice was signed before it could be employed against Germany’s High Seas Fleet.

Throughout the inter-war years, the Royal Navy (RN) developed tactics for employing torpedo bombers as long-range reconnaissance and targeting platforms for the fleet and, once having found the enemy, reducing its speed by torpedo attack prior to attack by capital ships.

It wasn’t until the collapse of the naval treaties in the 1930s that the *Kriegsmarine* and *Regia Marina* were able to begin developing and fielding large capital ships. Willis provides detailed descriptions of the various ship classes and anti-aircraft defense systems fielded by both navies. Meanwhile, the RN pursued development and acquisition of four torpedo-bomber variants. The Fairey Swordfish and Fairey Albacore (both biplanes) and the Fairey Barracuda (monoplane) were of British design. Only the Swordfish and Albacore saw extensive action with the FAA, while the Barracuda never attacked anything more substantial than a flak ship with torpedoes. While the Grumman Tarpon (the Avenger in the FAA) was procured, it never conducted a torpedo strike while in British service.

The first successful attacks by British torpedo bombers took place in July 1940 against Vichy French units in North African ports when their crews refused RN demands for disarmament. That same month, attacks were made against *Regia Marina* units throughout the Mediterranean. Attacks against ships in port culminated with the successful attack on the Italian fleet at Taranto in November 1940. The greatest triumph, however, was the successful attack on the German battleship *Bismarck* by HMS *Ark Royal* torpedo bombers in May 1941.

Torpedo bombers continued to be employed against Axis surface units in Europe until 9 May 1944, when HMS *Furious* Barracudas struck a convoy and its escort with a mix of torpedoes and bombs off Kristiansund, Norway—the last FAA torpedo attack against surface ships in Europe.

This is a wonderful quick-reference guide for anyone interested in British torpedo bombers and their employment by the RN in the European and Mediterranean during World War II.

John F. “Jack” Keane, LCDR, USN (Ret)



**Marshall’s Great Captain: Lieutenant General Frank M. Andrews and Air Power in the World Wars.**

By Kathy Wilson. Lexington, KY: University Press of Kentucky, 2024. Appendix. Notes. Bibliography. Index. Photographs. Pp. 273. \$40.00. ISBN 978-0-8131-9918-4

This is the first full-length biography of Lieutenant General Frank M. Andrews. The book describes Andrews’ life from childhood, through West Point, early cavalry assignments, his switch to flying in 1918, and subsequent posts of increasing responsibility in the pre-war Air Corps. Even-tempered and articulate, Andrews became well-versed in command, planning, and operations with attendance at the Air Corps Tactical School, Command and General Staff School, and the Army War College. Kathy Wilson is a Writing Fellow at Norwich University with multiple airpower history publications. Aside from Copp’s *Marshall’s Airman* (2003) and passages in his *A Few Great Captains* (1980) and *Forged in Fire* (1982), to date there have been only profiles of Andrews in reference books and journals.

Selected in March 1935 as Commanding General, General Headquarters (GHQ) Air Force, Andrews built a credible air striking force. However, his advocacy for B-17 bombers caused the Army General Staff to banish him to Fort Sam Houston in March 1939 as Air Officer of the Eighth Corps area. A new wind was blowing, however; and Army Chief of Staff George C. Mashall selected him as Assistant Chief of Staff for Operations and Training (G-3) that August. Here Andrews built Army air and land combat capabilities, even endorsing tanks as a mobile fighting force.

Recognizing the Panama Canal Zone’s emerging criticality, Marshall appointed Andrews as Commander, Panama Canal Air Forces, in November 1940. Andrews organized aerial defenses there despite limited resources. His insistence on coordination of air, sea, and land forces met local resistance but was noticed in Washington. As the world situation deteriorated, Marshall promoted Andrews to lieutenant general—the first three-star air officer—and selected him in August 1941 as Commander, Caribbean Defense Command and Panama Canal Department. As the first air officer to command a theater in a combat zone, Andrews organized air, ground, and naval defenses against an enemy attack that, until the Battle of Midway, was imminently expected.

Marshall appointed Andrews as Commander, US



Forces, Middle East, in Cairo, Egypt, in October 1942 to forge US air and land units into a fighting force. Just three months later, Marshall selected him as Commander, US Forces, European Theater of Operations (ETO). Here Andrews drove cross-Channel invasion preparations and Eighth Air Force expansion.

Andrews' promising career was cut short on 3-May 1943, when a B-24 Liberator in which he was flying crashed in a fog-shrouded landing attempt in Keflavik, Iceland. Some sources state he was traveling to meet with Marshall in Washington, others to inspect US troops in Iceland. The true reason remains unclear, but what seems certain is that Andrews would have considerably influenced the course of the war had he not perished.

Wilson's style is erudite but approachable. The book is heavily based on primary resources. The endnotes are copious and detailed. The bibliography is thorough, although I missed Cassius Mullen's *Before the Belle* (2015), an account of the 3 May crash. Maps of theaters where Andrews commanded would have been helpful. The book is illustrated with photographs of key players and points in Andrews' career. This unique book is highly recommended.

*Steven Agoratus, Hamilton, NJ*



**The Ones Who Got Away, Mighty Eighth Airmen on the Run in Occupied Europe.** By Bill Yenne. Oxford UK: Osprey, 2023. Maps. Photographs. Bibliography. Index. 327 pp. Ill. \$35.00. ISBN: 978-1-47285871-9

This is a rather unusual subject except for the 1956 book with nearly the same title, *The One That Got Away*, about Luftwaffe ace Hauptmann Franz Freiherr von Werra, who was shot down during the Battle of Britain. He escaped imprisonment *four* times but eventually returned to Germany and the Luftwaffe, where he was again shot down and never found. His story was made into a 1957 feature film under the previous book's title. With all this drama behind the title of his new book, Bill Yenne had a lot to write about.

Eighth Air Force aircraft and crews waged the air war over Europe from many bases in the UK. This is the story of pilots and crews who bailed out and spent days or even months evading the Germans, including the dreaded SS and other Nazi groups bent on finding and capturing them. It includes the courageous and dedicated civilian organizations who collected the "evaders" and got them to safety in Spain or England. The story has seldom been told by an American author in a book-length publication.

Most of the names will not be familiar, but there were a few who were definitely known to the public. One is Beirne Lay, Jr. He had been writing long before the war and later co-wrote the iconic novel *12 O'Clock High*, which describes the experiences of a B-17 group and its leader,

BG Frank Savage, and his personal involvement with his men. The book was eventually made into an equally-classic movie starring Gregory Peck as Savage. Most people don't know Lay washed out of Navy flight training when he failed to pass final checks in primary seaplanes, because his instructors "did not believe the student can develop proper feel of plane to pass a final check with extra time"! Undeterred, Lay tried the Army, got his wings, and rose to command a B-24 group, only to be shot down on May 11, 1944. His evasion and eventual returning to England in August are covered in this book.

Other personalities include fighter pilots such as then-Major Walker Mahurin, shot down in March 1944, having been credited with 19.75 kills (with 3.5 more in Korea). There is occasional humor such as the story of top-turret T/Sgt Otto Bruzewski of the B-17F *Chug-A-Lug Lulu* as he starts an odyssey that involved several families in Belgium. Then there is the appearance on the TV show *This Is Your Life*, in November 1957, when USAF Major Hank Sarnow had a happy reunion with one of his Belgian benefactors, who had opened her house to the then-2nd Lt at considerable personal risk.

The descriptions of each man's experiences as he desperately sought either rescue or sustenance while on the run (not always successful) are one of the book's main themes of how each person survived his often-lengthy period of evasion. There is the labyrinthine tangle of people and groups dedicated to gathering the American evaders and safely seeing them repatriated, while avoiding Nazis equally dedicated to capturing, and often executing, those who aided the evaders. The details include considerable research, often available in the Escape & Evasion reports each person filled out after he was repatriated.

The single folio of photos in this lengthy book is disappointing. Searching for photographs is part of creating the book and part of a dedicated author's overall task. But Yenne's latest book still shows more of a different aspect of the air war in Europe than most of us normally see.

*CDR Peter B. Mersky, USNR (Ret), retired editor of Approach magazine; book review editor for Naval Aviation News*



**Me 262: Hitler's Jet Plane.** By Mano Ziegler. London UK: Grub Street, 2023 (translation of 1978 German book). Photographs. Notes. Bibliography. Pp. 206. \$39.95. ISBN3:978-1-911667-82-7

Mano Ziegler (1908-1991) wrote several books on the Messerschmitt Me 163 and Me 262 aircraft. A glider pilot prior to the outbreak of World War II, he became a Luftwaffe pilot once war broke out. From 1943-45, he was a flying instructor and flew the Me 163 with an operational test squadron and then with a fighter Group. Even though he

never flew the Me 262, his knowledge of non-propeller-driven aircraft, and close contact with Me 262 pilots, qualify him to write this book. Interestingly, he was also an accomplished diver and a member of Germany's Olympic high-diving team.

This descriptive book presents the origin, development, and implementation of the Me 262 jet fighter. Ziegler's history of the development of the jet engine and, ultimately, the jet aircraft is excellent. Designer Willy Messerschmitt was an avid believer in the development of the German jet engine and was far ahead of the US, UK, France, and Italy regarding a functional jet engine.

Once a design for a jet fighter was achieved, the finished product was presented to Goering and the Luftwaffe. Well noted and stressed throughout the book was that the Me 262 was designed as a fighter and was never intended to be a bomber. Ziegler interjects politics into the book here. Hitler, point blank, asked Messerschmitt if this aircraft could be used as a bomber. Being a typical sycophant, as were most who were close to Hitler, he acquiesced and said, "Yes mein Führer." Ziegler stressed that this was a major mistake regarding the operational mission of the Me 262. Hitler insisted that it would be used as a "blitz bomber" that would be fast enough to easily repulse the impending Allied invasion of the continent. The political debate delayed the intended use of the Me 262 and severely hindered its potential. A bomber variant was eventually hastily developed. This variant proved to be operationally ineffective. The aircraft's design prohibited proper bombing technique, the bomb load was very light, and the pilot had no viable bombsight.

The way Ziegler weaves politics into this book is excellent. The Me 262 had the potential to be a game changer that could alter the air war over Germany. Its effectiveness was evident once Hitler finally allowed the Me 262 to be used as a fighter. Ziegler describes operational missions and the success of the jet fighter against Allied bombers and fighters. It is important to note that fielding finished aircraft was difficult; pilots had to ferry them to operational units. At one point, completed aircraft had to be transported by rail and reassembled upon arrival.

The weaknesses of the Me 262 were its relatively short range and its vulnerability to Allied fighter attacks during take-offs and landings. Much of the book includes interviews with actual line pilots. Ziegler extensively used primary information from accomplished Luftwaffe pilot General der Jagdflieger Adolph Galland.

The reader must understand the context in which this book is written: both the development of an advanced aircraft and politics hindered the Me 262's implementation. Even though this book is not written in a typical scholarly fashion, it is still highly recommended. If the Me 262 had been used as intended earlier in the war, it may have seriously changed the outcome of the air war over Germany.

*John Hladik, Columbus IN*



**Target Hong Kong: A True Story of U.S. Navy Pilots at War.** By Steven K. Bailey. Oxford UK: Osprey, 2024. Maps. Photographs. Notes. Bibliography. Index. Pp. 368. \$35.00. ISBN: 978-1-4728-6010-1

Bailey, a professor of English at Central Michigan University, first visited Hong Kong in 1986. Over the years, he researched life in the former British colony during World War II. In a previous book, *Bold Venture*, he detailed the bombing of Japanese-occupied Hong Kong by US Army Air Forces crews. This effort introduced him to a fellow enthusiast; and, together, they investigated crash sites, including some involving US Navy aircraft. Curiosity about the events behind the losses of these aircraft led to this book.

He focuses on Operation *Gratitude*, a January 1945 US Navy plan to minimize Hong Kong as a base from which the Japanese could threaten the western flank of America's Pacific operations. While the most of the detail surrounds carrier operations, Bailey introduces several complementary elements. Among them is a British civilian internee, Ray Jones. Interned in 1941, Jones would have a front-row seat for the bombing in 1945.

By early 1945, the American anti-shipping effort increasingly hampered Japan's ability to transport essential goods from southeast Asia to the home islands. The same crews who would attack Hong Kong harassed a Japanese convoy. That convoy would find itself in Hong Kong during the two-day attack.

Aside from the damage done to Hong Kong's military infrastructure and the convoy, Bailey details several "friendly fire" incidents and how, in most cases, the Navy exonerated the crews. In one instance, 14 internees died when a bomb hit a bungalow in the facility in which Jones was held. In another accident, Navy pilots bombed the Portuguese colony of Macao, a neutral territory. Later, a British official in the colony aided Navy personnel escaping to Nationalist Chinese territory. One particularly tragic incident occurred when carrier fighters shot down a Fourteenth Air Force Consolidated B-24 on a reconnaissance mission.

Besides putting the reader in the cockpit of a Curtiss SB2C Helldiver, Bailey looks at what happened to crew members who survived the losses of their aircraft. Some evaded, while others were captured and sent to prisoner-of-war camps in Japan.

Bailey concludes his narrative by relating how American personnel worked diligently in the years immediately after the war to identify the remains of crewmembers initially listed as missing in action.

This book is exceptionally well written. Bailey has excelled in his research efforts and has also steered clear of the tendency of some writers to attribute comments directly to primary personalities without foundation. The resulting book reads like a novel. It is probably best suited for readers curious about the challenges of acquiring targets in an intensely hostile environment or perhaps for

those who had parents or grandparents who flew in harm's way with the Navy in the Pacific.

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



**Hawker Hunter.** Tony Buttler. Stamford UK: Key Publishing, 2022. Photographs. Illustrations. Pp. 95. \$24.95 paperback. ISBN: 978-1-80282-315-8

As the 16th volume in Pen and Sword's "Historic Military Aircraft Series," this book tells the story of an important British early-Cold War jet fighter. To tell the story of this stalwart, Buttler breaks the book down into seven chapters. Each tells a different part of the Hawker Hunter's story and range from its development, to variants, operational use, combat history, international users and, finally, aerobatic teams.

With design work beginning in 1946, the Hawker Hunter was intended to be a day interceptor intended to engage high-speed, high-altitude, Soviet bombers. The swept wing aircraft was intended as a replacement for the straight-winged Gloster Meteor. To show the various design changes from concept to first flight, Buttler includes a series of line drawings to help the reader understand these changes. The Hunter first flew in 1951 and reached operational status in 1954. Despite various design changes (Buttler does a sound job of describing these), the short development period was possible, because the Royal Air Force had placed a production order even before the fighter's first flight.

Despite having first flown in in the early 1950s, the Hunter enjoyed great longevity, with several operators still flying these fighters into the 1990s. There were eleven major Hunter variants: nine operational and two trainer models. The Hunter would serve as a fighter, ground attack, and reconnaissance aircraft. Each of these is well described. This discussion is backed up by a chart listing which units flew each variant. Having discussed the Hunter variants, Buttler briefly provides the details of the Hunter's 20 international operators. These and the RAF employed the Hunter in eight conflicts, and Buttler briefly discusses these combat operations. Finally, he concludes his work with a chapter about the eight nations who used the Hunter in their aerobatic team.

Buttler's book is a general history focusing on the technical side of the aircraft. As is often the case with books of this nature, Buttler includes extensive coverage of details, such as the tail numbers of the Hunter test and prototype aircraft. While the book includes the detail that fans of the Hunter will crave, the level of detail is certainly not overwhelming to the casual reader. In addition, with 110 images, the book averages over one image per page. All of the

pictures are sharp, well captioned, and add to the overall quality of this book.

This work will certainly appeal to readers wanting to know more about post-World War II British fighter jets. For readers looking for a book of "there I was" stories, this is not it, nor was it intended to be such. Tony Buttler's *Hawker Hunter* provides a solid, yet brief, history of the iconic aircraft. His book is a quick read with just the right amount of detail.

*Lt Col Daniel J. Simonsen, USAF (Ret), Alexandria VA*



**U-2 'Dragon Lady' Units 1955-90.** By Peter E. Davies. Oxford UK: Osprey Publishing, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Bibliography. Index. Pp. 96. ISBN: 978-1-47286168-9

Peter Davies has written more than 50 books specializing in aircraft of the Cold War and Vietnam periods. In his works, Davies analyzes tactics, techniques, and procedures along with the politics behind the use of the military aircraft involved. This book is no exception to his usual methodology.

This book is part of the excellent Osprey Combat Aircraft series. It focuses on the history, development, and operational use of the U-2 spy plane from its inception in 1955 through 1990 and, in particular, on its use during the Cold War. Davies explores the geopolitical backdrop against which the U-2 was developed and operated, particularly during the tense Cold War era. As is found in most of Osprey's books, this one includes detailed insights into the design, evolution, and technical specifications of the U-2 aircraft, including its capabilities and limitations.

Davies does an excellent job of covering the various operational deployments of the U-2, including its use by the CIA, the United States Air Force, and other international operators. He delves into the reconnaissance missions undertaken by the U-2, highlighting its crucial role in gathering intelligence during critical moments such as the Cuban Missile Crisis and other significant events.

Specific units and squadrons that operated the U-2 are detailed. Davies further profiles many key personnel and their contributions to reconnaissance missions, and also analyzes the U-2's impact on aerial reconnaissance, its enduring legacy in military aviation, and its adaptation over the decades.

The book includes numerous photographs, illustrations, and detailed color profiles of U-2 aircraft in different operational configurations and markings.

Overall, *U-2 Dragon Lady Units 1955-90* is a comprehensive resource for enthusiasts of military aviation history. It offers both technical detail and historical narrative

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about one of the most iconic and enduring spy planes of the 20th century and beyond.

*Col Charles P “Chuck” Wilson, USAF (Ret); Past Chairman of the Board, The Cold War Museum®; U-2 Pilot & Commander; NASM docent*



**Fighting the Night: Iwo Jima, World War II, and a Flyer’s Life.** By Paul Hendrickson. NYC NY: Alfred A. Knopf, 2024. Index. Photographs. Illustrations. Pp. 394. \$32.00. ISBN 978-0-59332-113-3

Paul Hendrickson is a three-time finalist for the National Book Critics Circle Award and a winner in 2003 for his book *Sons of Mississippi*. He has been the recipient of writing fellowships from the Guggenheim Foundation, National Endowment for the Arts, Lyndhurst Foundation, and Alicia Patterson Foundation. Since 1998, he has been on the faculty of the Creative Writing Program at the University of Pennsylvania. He was a staff writer at *The Washington Post*.

This book is a nonfiction narrative of an American family beginning in World War II. It focuses both on the wartime service of the author’s father as pilot of a P-61 Black Widow night fighter and on his post-war service as an Eastern Airlines pilot. It is really a narrative of Hendrickson’s archival research and exhaustive interviews into his father’s life and military career. It is also Hendrickson’s story of family life in America during that period. It is an analysis of his search for the factors underlying his father’s pursuit of flying and his sometimes-tough personality.

Hendrickson focuses only tangentially on combat missions, and his narrative provides only scant detail on aircraft operational capabilities. The 549th Night Fighter Squadron was one of the units equipped with the Northrop P-61 Black Widow during World War II. It was deployed to the Pacific Theater later in the war. Joe Paul (his father) arrived in the Pacific in early 1945 and began operations from Saipan and Iwo Jima in March. He participated in night interception missions and night patrols to protect Allied forces and installations. After the war ended, Joe Paul left Iwo for the States in September 1945.

Hendrickson’s book is well written. It departs somewhat from an average autobiography in that the son has more or less constructed a view of his father’s exploits both from research and from personal knowledge. I found of particular interest his last chapter, “Essay on Sources,” which describes how he researched and wrote the book, chapter by chapter. Hendrickson spent half a century deliberating on whether to write this volume. As he says, “significant parts of this book rely on note taking he did decades ago.” Thus, it turns out to be a book more about remembering,

supported by reporting and research. It is a hybrid work and a worthwhile read.

*Frank Willingham, docent, National Air and Space Museum*



**Days of Delta Thunder.** By Dan Kovalchik. Independently published, 2024. Abbreviations and Acronyms. Notes. Bibliography. Notes. Pp. vii, 422. \$19.67. ISBN: 979-8-32069686-7

For those looking for an insider’s warts-and-all account of Delta space launches during 1995–2018, this book fits the bill. For more than two decades, working first for McDonnell Douglas Aerospace on the Delta II system and later for United Launch Alliance (ULA) on Delta IV, Kovalchik served as the launch system administrator on military, civil, and commercial missions. Whether from the Delta Mission Checkout facility or the blockhouse, his hands-on involvement with the details of preparations for virtually every Delta space launch from Cape Canaveral AFS FL and some from Vandenberg AFB CA gave him an intimate perspective that he now shares with his readers.

Kovalchik became the first system administrator for the Delta II team’s new launch control center, with its Command and Data Processing System, and he oversaw implementation of the Advanced Launch Control System that significantly improved ground support equipment. With occasionally salty language, he recalls the trials and tribulations of installing new computer hardware, software, and firmware amidst ongoing operations at Cape Canaveral’s two-pad Space Launch Complex (SLC) 17. He consistently peppers his first-person narrative with other team members’ shared recollections, which gives the final product an extra-spicy richness.

The otherwise chronological telling of this managerial tale begins with several chapters on Delta mission 241, the disastrous loss of the GPS IIR-1 satellite on January 17, 1997, when the launch vehicle failed 13 seconds into the flight. Readers learn in meticulous detail about the excruciating sense of failure that haunted him and his crew at Cape Canaveral’s SLC-17. We also vicariously share the successes of sending NASA’s X-ray Timing Explorer (XTE) and Korea’s Koreasat-2 into orbit. Meanwhile, the frustrations of activating new Delta II launch systems and dealing with the software provider’s faulty product come to the fore. Nonetheless, by the time of the XTE mission in December 1995, at least 80 new ground and flight system changes had been completed at SLC-17, which prompted Kovalchik to remark “that the XTE rocket should have been recorded as the first launch of a Delta III—or at least of a Delta IIA.”

As the years passed, he endured the engineering challenges associated with the actual Delta III, and he worried

about the need for a “drastically revised database” to monitor and control its hydrogen-fueled second stage and its new ground support equipment. By the time Delta IV (“an all-new vehicle to be built and tested with new launch control software in new facilities and launching from a new pad”) came along, Kovalchik was feeling nostalgic about having conducted the final Delta II launch from SLC–17. He also agonized over ULA managers making “egregious software choices” for Delta IV missions. His frustration reminded him of Sisyphus from Greek mythology, but he kept working because “some people will do anything to keep launching rockets.” His last Delta IV launch before retirement was a pair of Geosynchronous Space Situational Awareness Program (GSSAP) satellites—on July 28, 2014.

But that is not the end of Kovalchik’s story as a launch system administrator. He came back in 2018 as a short-term contractor to lead the team using the last flightworthy Delta II to launch NASA’s ICESat-2 Earth observing satellite from pad SLC–2W at Vandenberg AFB. In a way, *Days of Delta Thunder* reads like a novel, with dozens of subplots and anecdotal morsels in both narrative and endnotes. While some might fault him for not including an index or illustrations, his storytelling skills more than make up for any such trimmings.

*Dr. Rick W. Sturdevant, Director of History, HQ Space Training and Readiness Command*



**Operation Sheepskin: British Military Intervention in Anguilla, 1969.** By Matthew J. Lord. Warwick UK: Helion & Company, 2023. Bibliography. Illustrations. Maps. Notes. Photographs. Pp. 82. \$29.95 paperback. ISBN: 978-1-804513-72-9

This monograph covers a little-known 1969 Caribbean military intervention. What may seem unusual is that the British are the interventionists. I participated in American military operations in the Dominican Republic, Haiti, and Panama—just a few on a long list of America’s use of military force in the Caribbean. But the British had a post-Second World War history of doing the same, worldwide, as their empire went into its death throes.

In 1956, with the French and Israelis, the British invaded Egypt. In 1958, they intervened in Kuwait. They also fought in Malaya, Kenya, Tanganyika, and Aden. However, when confronted with a 1965 rebellion in Southern Rhodesia, they chose not to react militarily. In contrast, two years later, they intervened in tiny, benign Anguilla, a narrow island less than ten miles long with a population of perhaps 6500, living in poverty and lacking basic necessities.

The operation was inconsistent with Britain’s refocusing of priorities. It took place as Britain curtailed its military involvement “east of Suez” and focused on its NATO

commitments. Castroite Cuba was then in its ascendancy. Every crisis seemed to invite Cuba’s involvement—even when there was no evidence to support that fear. That, coupled with Britain’s effort to painlessly shed its colonies, led to a mini-crisis.

The UK had created a neat little entity of several of its island possessions in the Caribbean, grouping Anguilla with neighboring Saint Kitts and Nevis. Anguilla, opposed to the federation and wanting out, declared itself an independent republic. London then sent a Foreign and Commonwealth Office (FCO) official to put things back in order. His indiscretions only angered the Anguillans, especially when he falsely claimed that mafia elements were behind Anguilla’s defiance. He was forced to leave immediately, leading to the decision to send in troops.

The British military had been reduced in size and lacked the resources to deploy a large force. Consequently, as interventions go, this was on a rather small scale. The miniscule strategic reserve, meant for rapid deployment, was the under-strength parachute regiment. Hence, some 300 parachute regiment soldiers augmented by 22 London Metropolitan police were sent. Poor intelligence indicated the possibility of armed resistance from an opposition force that did not exist. Ridiculed by some as Prime Minister Harold Wilson’s “Bay of Piglets,” this response undermined his hold on government. He lost the 1970 election.

Operation *Sheepskin* commenced on March 18, 1969 with the airlift of soldiers from England to Antigua, incurring controversy on that island and in Canada where they stopped enroute. From Antigua, they boarded frigates to Anguilla and landed in the early hours of March 19th without incident. International condemnation reached the United Nations. On a positive note, the “paras” conducted a “Hearts and Minds” campaign to win over the island’s inhabitants and minimize friction. Royal Engineers, likewise, improved the island’s infrastructure. When the military departed in 1971, London promised that Anguilla would not be forced to rejoin St. Kitts; and, by the 1980s, the island was happily once again a British Overseas Territory.

This monograph is filled with details of the operation, its backdrop, and the outcome. However, a reader must have an interest in a rather insignificant episode in Britain’s effort to unburden itself from its colonial past.

*John Cirafici, Milford DE*



**Ultimate Allied Fighters of the Second World War.** By Justo Miranda. Stroud UK: Fonthill Media, 2024. Illustrations. Tables. Bibliography. Pp. 384. \$60.00. ISBN: 978-1-78155-888-1

Justo Miranda is a Spanish Air Force Museum advisor and technical drawer who uses advanced drawing methods to reconstruct historical aircraft, starting from original

parts. He is an historian who specializes in German secret weapons and has published eleven books and thirty monographs on aeronautical subjects. His wife, Paula, is a journalist at Reuters and co-author of his works.

During World War II, Allied engineers faced significant challenges in improving fighter aircraft performance amidst various constraints, including compressibility effects and limitations of both piston and early jet engines. As aircraft approached the speed of sound, they encountered compressibility, causing loss of control and stability. To counter this, various aerodynamic solutions were introduced to delay the onset of compressibility effects and enhance aircraft performance at high speeds. Piston engines had limitations in terms of power output and altitude performance. Improved supercharging systems, optimized fuel injection, and alternative fuels were also evaluated. Early jet engines offered superior performance at high altitudes and speeds. However, they were subject to limited range, high fuel consumption, and reliability issues. Allied efforts to improve fighter design also involved the integration of advanced technologies such as radar systems, improved cockpit instrumentation, and electronic countermeasures.

Miranda examines these technical challenges and reviews the requirements leading to the modification, design, and development of individual advanced aircraft projects by the United States, Great Britain, France, and the Soviet Union. He provides an introductory section for each country including an overview of the operational performance situation and objectives, with brief summaries of individual aircraft-performance improvement programs. He follows with discussion and excellent three-view diagrams of each aircraft design improvement. His narrative provides technical data including dimensions, weight, performance, airframe material, and armament.

This is an interesting and enlightening book. There are many lesser known, but important, facts regarding aircraft design requirements and operational outcomes. Miranda presents design information and operational test and evaluation data that not often discussed elsewhere. The three-view drawings are detailed and of excellent quality. However, there are several factors that negatively influence its value as a research volume. There is no index or acronym list. It would have been particularly helpful to include a list of all aircraft covered. There are also some inappropriate translations of terms. Overall, however, these shortfalls do not detract significantly from the book's value. I think it is worth the read.

*Frank Willingham, docent, National Air and Space Museum*



**V-Bombers: Britain's Nuclear Frontline in the Cold War.** By Dr Tony Redding. London UK: Grub Street, 2024.

Index. Notes. Bibliography. Photographs. Pp. 352. \$39.95. ISBN: 978-1-911667-87-2

Dr. Redding takes the reader on a deep dive into the story of the Cold War-era V-Bomber force: Avro Vulcan, Handly Page Victor, and Vickers Valiant. All three airframes were strikingly beautiful and never failed to attract attention whenever and wherever they appeared. The V-Bombers were also combat veterans, seeing action in the Suez Crisis, Falklands/Malvinas Liberation, and *Desert Storm*. Redding focuses on the V-Bomber force as a Cold War weapon—Britain's attempt to field a manned bomber force capable of influencing the nuclear balance between the USSR and the US. Unfortunately, he leaves a lot unsaid, which ultimately proved disappointing.

Following World War II, Britain attempted to use its nuclear credentials to hold on as a major world power. Its rapidly disappearing empire was eroding its stature, but having even a first-generation nuclear weapon in its possession was a golden ticket of sorts. The RAF first borrowed modified B-29s (Washingtons) to use as a stop gap until the English Electric Canberra became operational. This, in turn, served as a stop gap nuclear-delivery platform until the V-Bombers came on line. But they were produced in such small numbers (as were their nuclear weapons), that the procurement seemed as much a method of keeping the British aircraft industry alive as providing a real military capability. The V-Bomber force was always extremely vulnerable to Soviet pre-emptive attack. Surviving bombers, carrying a single weapon, had to penetrate a formidable and prepared defense to attack significant urban/industrial areas. It was not until over a decade of service that these lone penetrators were nominally deconflicted within the American Single Integrated Operations Plan (SIOP). So tenuous was the capability of the V-Bomber force that Britain jumped at the American offer of Polaris SLBMs to give Britain a truly survivable and meaningful nuclear deterrent.

That is not to say the V-Bombers were not capable. Crews practiced delivering lay-down gravity weapons from 50-foot altitude to within 200 yards of the target using low-level tactics that had not changed since the days of Operation *Carthage* in World War II. Redding spends a few pages talking about the V-Bombers' navigation, bombing, and primitive electronic countermeasures systems, but he spends little time talking about the aircraft themselves. Were the manufacturers cooperating or competing? Were they offered equal shares of the procurement or were the aircraft so "equal" in capability that the cost of establishing three entirely unique logistics networks was thought to be worthwhile? Since low-level penetration became the delivery tactic of choice, was some sort of terrain avoidance system developed? Redding's people stories and anecdotes are interesting and personable, but the lack of any meaningful discussion of the V-Bombers themselves was a grave omission.

A detailed discussion of the development of their own nuclear weapons was interesting and uniquely “British.” The early realization that stand-off weapons simplified the defense penetration problem was critical, but the inability to produce their own version of the Subsonic Cruise Armed Decoy (SCAD) or Short-Range Attack Missile (SRAM) meant they were saddled with antiquated and marginally effective deterrent tools.

The book feels like a body of academic research repackaged into a commercial product. It benefits from meticulous editing, high production values, and wonderfully curated photographs, many in color. But it tells only part of the V-Bomber story, omitting the true stars of the show, the aircraft themselves.

*Gary Connor, docent, National Packard Museum, Cortland OH, who had seat time in the Victor and Vulcan during an RAF Exchange Tour*



**Operation Eldorado Canyon: The 1986 US Bombing on Libya.** By Jim Rotramel. Vienna, Austria: Harpia Publishing, 2024. Maps. Tables. Illustrations. Photographs. Notes. Appendix. Bibliography. Index. Pp. 253. \$64.95 paperback. ISBN: 978-1-95039-412-8

After graduating from Wichita State University with a degree in aeronautical engineering, Rotramel served in the Air Force 20 years, with ten of those in the General Dynamics F-111D and F-111F, where he accumulated more than 1,000 hours. Following active duty, he worked for the Navy, specializing in mission planning and ordnance issues.

Rotramel crewed one of the F-111s that attacked Libya in the joint Air Force-Navy operation in April 1986. In this very detailed account, he reminds readers of the world situation in the early 1980s when terrorists around the world frequently attacked Americans. As tensions with Libya’s Muammar al-Qaddafi increased, the administration of President Ronald Reagan chose to strike a government believed to be the instigator of many such attacks.

Planning began in late 1985. Because France and Spain denied the Air Force overflight rights, the F-111 crews flew south to the Strait of Gibraltar before turning east to Sicily and south to Libya. Such a lengthy mission required extensive tanker support. Additional KC-10s and KC-135s were deployed from the United States to augment in-theater assets. The large number of tankers aroused the interest of Britain’s “plane-spotter” community. Despite this, the strike force achieved tactical surprise.

More than 25 percent of the narrative covers the actual attack in extreme detail. The Air Force lost an F-111 and two crewmembers. For various reasons, some of the 15 aircraft failed to deliver their ordnance while those that did had mixed results in terms of accuracy. Nevertheless, those

aircraft, with assistance from electronic-warfare and suppression-of-enemy-air-defense assets successfully penetrated a very intense antiaircraft environment. The Navy’s aging 12 Grumman A-6Es had similar results as described in a chapter about their strikes.

Unexpected headwinds and delays in taking on fuel on the inbound portion of the mission resulted in some stressful moments for some F-111 crews before they successfully rendezvoused with the tankers after departing their targets. Of the 15 F-111s launched, 14 recovered safely.

The Air Force claimed security concerns required anonymity for the crews who returned to Britain. The Navy imposed no such restriction. Rotramel, almost 40 years later, comes across as highly disappointed in the Air Force’s failure to adequately express its appreciation for what he and all the others achieved. Furthermore, he once again reminds the reader how micromanaging by the National Command Authority once it has directed a mission can affect the outcome. He argues, very convincingly, that those at the point of attack are best qualified to make the proper tactical decisions. This book is an excellent case study and should be required reading for all Air Force leaders.

*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:

Col. Scott A. Willey, USAF (Ret.)  
46994 Eaker St  
Potomac Falls VA 20165  
Tel. (703) 409-3381  
e-mail: [scottlin.willey@gmail.com](mailto:scottlin.willey@gmail.com)

# Coming Up



Compiled by  
George W. Cully

#### September 18-19, 2024

The **NASA History Office** will coordinate a symposium entitled “NASA and Archaeology From Space” to honor the pioneering work of former NASA archaeologist Dr. Thomas L. Sever in the field of archaeology and remote sensing over his many decades of service. The symposium seeks to highlight past archaeology projects at NASA, the current state of the field, and promising new opportunities in multiple sectors. The symposium will be held in Washington, D.C. For more details, see the Office’s newsletter at NASA History - NASA.

#### October 28-30, 2024

The **American Astronautical Society** will present its annual Werner von Braun Space Exploration Symposium at the University of Alabama in Huntsville, Huntsville, Alabama. For registration and more details, see the Society’s website at von Braun Space Exploration Symposium | American Astronautical Society.

#### November 7-10, 2024

The **History of Science Society** will hold its annual meeting in Mérida, Yucatán, Mexico. This is the Society’s centennial, and the theme of this year’s gathering is “**Imperfect Pasts, Uncertain Futures.**” For more details, see the Society’s website at HSS 2023 Call for Proposals - History of Science Society (hssonline.org).

#### November 21-23, 2024

The **National World War II Museum** will host its 17th annual conference at the Museum in New Orleans, Louisiana. The program for this year’s gathering will begin with a symposium on “The Battle of the Bulge, 80 years on.” For details and registration, see the Museum’s website at 17th International Conference on World War II | The National WWII Museum | New Orleans (nationalww2museum.org)

#### January 3-6, 2025

The **American Historical Society** will hold its annual meeting in New York City, New York. For more details as they become available, see the Society’s website at Annual Meeting - AHA (historians.org)

#### March 26-29, 2025

The **National Council on Public History** will deliver its annual gathering bilingually at Le Centre Sheraton Montreal in Montreal, Canada. This year’s theme will focus on “Solidarity” and its meaning in the field of public history. For registration and other details, see the Council’s website at 2025 Annual Meeting | National Council on Public History (ncph.org).

#### March 27,30, 2025

The **Society for Military History** will offer its 91st Annual Meeting at the Battle House Renaissance Mobile Hotel and the Renaissance Mobile Riverview Plaza Hotel in Mobile, Alabama. Look to the Society’s website at <https://www.smh-hq.org/annual-meeting/info/cfp.html> for further details.

#### April 3, 2025

The **Organization of American Historians** will offer its annual conference in Chicago, Illinois. For more information as it becomes available, see the Organization’s website.

#### April 7-10, 2025

The **Space Foundation** will open its 40th annual Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. Get details in due course via the Foundation’s website at Space Foundation | Advocating Space Education & Exploration.

#### April 10-12, 2025

The **Vietnam Center & Sam Johnson Vietnam Archive** will present its latest biennial conference on the Vietnam War at Texas Tech University in Lubbock, Texas. This year’s theme will be “1975: The End Of The Vietnam War.” For further information, see the Center’s website at The Vietnam Center and Sam Johnson Vietnam Archive: Events (ttu.edu).

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:

George W. Cully  
3300 Evergreen Hill  
Montgomery, AL 36106  
(334) 277-2165  
E-mail: warty0001@gmail.com

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Answer: Operation Linebacker II began on December 18, 1972. At least by its name it was the “sequel” to Linebacker I, which focused on the air interdiction of North Vietnam’s flow of supplies. President Nixon authorized the Operation as a means to reinvigorate the Peace talks with the North Vietnamese. Linebacker II was the heavy bombing of North Vietnam including Hanoi and Haiphong. Linebacker II included over 200 B-52s that flew out of Guam and U-Tapao Thailand. A complex air operation, Linebacker II also included many other types of aircraft including the F-111, KC-135, and F-4. The American forces faced stiff opposition from North Vietnamese air defense forces including the MiG-21 Fishbed and SA-2 Surface-to-Air missile. Often called the Christmas Bombing, the U.S. did not actually bomb on Christmas Day. Linebacker II. After eleven days (December 18-29, 1972) of heavy bombing, the North Vietnamese agreed to return to the negotiating table. Less than two months after Linebacker II began, the United States and North Vietnam signed a peace agreement on January 27th, 1973.

Use the following links to learn more about the following topics;

**Linebacker II:** *Linebacker II: A View from the Rock* by Brig Gen James R. McCarthy and Lt Col George B. Allison <https://media.defense.gov/2010/Oct/13/2001330010/-1/-1/0/linebacker2—2.pdf>

**B-52 during Linebacker II:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195837/b-52s-and-linebacker-ii/>

**Linebacker I & II:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195841/north-vietnam-linebacker-and-linebacker-ii/>

**B-52:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195842/b-52-stratofortress-in-southeast-asia/>

**F-111:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195844/f-111a-in-southeast-asia/>

**F-4:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196051/mcdonnell-douglas-f-4c-phantom-ii/>

**KC-135:** <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/1529736/kc-135-stratotanker/>

**MiG-21:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/195970/mikoyan-gurevich-mig-21pf-fishbed-d/>

**SA-2 Surface-to-Air Missile:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196037/sa-2-surface-to-air-missile/>

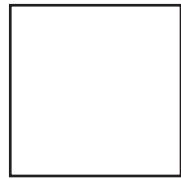


### This Issue's Quiz:

Question: The military operation has a name that implies it is a "sequel" to an operation earlier in the year. It is often referred to by the holiday that it surrounds, despite the fact that the U.S. did not conduct strikes on that day. It is also often credited with being the impetus to bring the U.S.'s adversary back to the negotiating table. Can you name the Operation? When was the Operation and what was the holiday it is often named after?



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 P.O. Box 405  
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