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Journal of the Air Force Historical Foundation

know the past
.....Shape the Future

AFHF Symposium & Museums Conference

Steven F. Udvar-Hazy Center Executive Board Room, 21 May 2025

8 AM to 5 PM
REGISTRATION FEE
AFHF MEMBER: $140
NON-MEMBER: $195
Limited to 140 Participants
Includes parking, light lunch options,
and Symposium attendance for the day.

0810-0820	Welcome
0820-0855	Kickoff Address (Roger Launius, PhD, I.B. Holley Award recipient) *The Frontier Military Experience as a Model for the Military in Space* *Learning from History to Shape the Future*
0900-0955	Columbia Accident (Maj Gen John Barry, Executive Director/ Space Shuttle Columbia Accident Investigation)
1000-1130	AFHF Literary Awardees Panel All Article Winners and Book Prize recipients talk about their challenges and triumphs in documenting Air and Space history
1145-1215	LUNCH TALK: Back to the Books: The rebirth of *A Few Great Captains* AFHF/AU Press Imprint) (Phil Meilinger (Contributor), Abbie Hoffman (Editor), Dik Daso (Contributor)
1225-1400	Behind the Scenes: The Birth of Space Force with Those Who Were There (General David D. Thompson, Maj. Gen. Clinton E. Crosier, Col Stu Pettis, Chair)
1410-1500	Origins of the Space Force Through Artifacts (David Arnold)
1510-1645	The Military-Academic Zone: Teaching Spacepower in PME and at USAFA Chair, DFHAA-L Weaver, ACSC-P.J. Springer, DFH-T. Givler, Johns Hopkins-M. Pavelec, AU-J Terino
1650-1700	Conference Summary and Farewell

AFHF Annual Awards Banquet

Steven F. Udvar-Hazy Center Space Hangar, Chantilly, VA, 22 May 2025

6 PM to 10 PM
REGISTRATION FEE
AFHF MEMBER: $250
NON-MEMBERS: $300
Includes: Parking, Seated Dinner, Social Hour, USAF Quintet, USSF Honor Guard,
Special Guest Speaker, two beer/wine tickets, silent auction, and more
Dress: Formal/Mess Dress

For event sponsorship or to purchase tables of 10 contact, xd@afhistory.org
Awardees can be found at this link: https://afhistory.org/awards/
NOTE: Individuals attending both events will receive a $25 discount on the total registration fee.
To sign up for either or both events head to https://afhistory.org/events/

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Features

Book Reviews

List of reviews continues on page 3

Departments

FRONT COVER: This A–1H was part of OPERATION FARM GATE and flown by the SNVF from 1965 to 1975. It was initially assigned to the 514th Fight Squadron at Bien Hoa AB and later transferred to the 520th Fight Squadron, Binh Thuy AB, South Vietnam. *Photo by Ken LaRock*
BACK COVER: B–26K (Invader) of the 609th Special Operations Squadron over South Vietnam.

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Upcoming 2025 Special Edition Space Force 5th Anniversary Issue

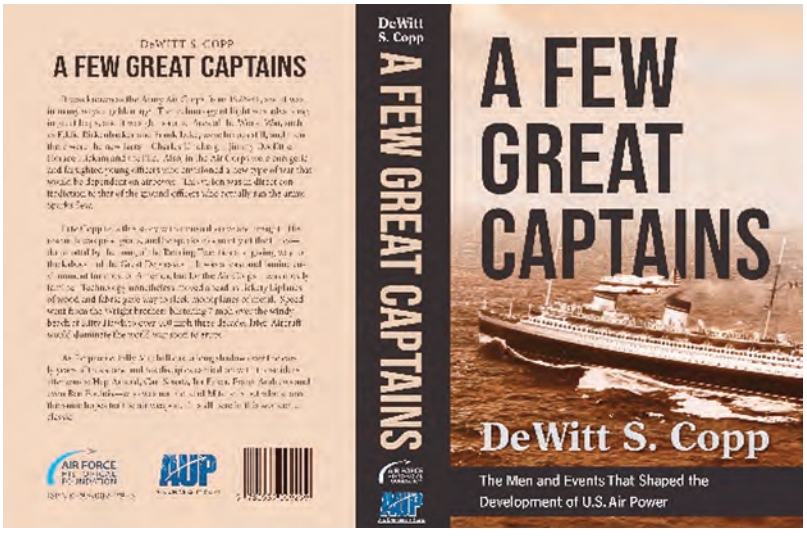
Dear Air and Space History Enthusiasts,

Since December, your Air Force Historical Foundation has enjoyed celebrating the establishment of the U.S. Space Force, now 5 years old. We have emphasized and expanded coverage of space-related history in our "This Day in Air and Space History" morning media releases. The Winter edition of the *Journal of the Air Force Historical Foundation* celebrated the fifth anniversary of the founding of the nation's newest military branch. The cover of that journal is the first commissioned Space Force painting and completed by the Foundation's favorite aviation artist, Rick Herter. You might remember Rick's stunning work in last year's "Special Summer Edition" tracing the evolution of USAF and AAF aircraft.

The upcoming "Space Force Special Edition," expands the anniversary Journal to include extra book reviews and several legacy space-related articles from the 1950s and 60s. The quality, scope, and the authors who wrote them are legendary in historical writing. The most important part of THAT story is that AFHF has been covering and documenting space-related history since the very earliest years of its establishment in 1953. The history of the Space Force begins with the Army Air Corps in the 1930s and grows rich and broad for the next 75 years.

The release of the special issue coincides with the Foundation's annual award banquet. This year we are celebrating an amazing slate of unit, individual, and literary recipients and have expanded our program to include a Lifetime Achievement Award for Space (Gen Kevin "Chili" Chilton) and have presented the Doolittle Award to a Space Force unit (Mission Delta 4) for the very first time. Also new, AFHF presented the Inaugural Hub Zemke "THUNDERBOLT" Trophy for the most Outstanding Unit for Training to the 56 FW, Luke, AFB, in February. Congratulations to all our extremely deserving award recipients.

In a joint program with the Air University Press, AFHF is immensely proud to announce the publication of Pete Copp's airpower classic (now expanded), ***A Few Great Captains: The Men and the Events that Shaped the Development of U.S. Air Power***. The free digital version will be available soon from the Air University bookstore. This reprint includes a retrospective introduction written by Board Member and Publisher, Phil Meilinger. The photo essays have been reworked to provide better quality images and a cohesive story line that follows the narrative. A new Afterword is included (written by me) that emphasizes the importance of knowledge of the past and how it continually shapes the future of our services—both USAF and USSF. The digital edition will also include Copp's reference material, eliminating critiques that bemoaned a lack of footnotes in the



original work. This publication marks the Foundation's return to publishing and disseminating important, relevant, and readable history to all. ENJOY!

Pete Copp's recounting of the events that shaped the development of the Army Air Forces is not just an epic narrative of technological change, struggles at the highest levels of military and political leadership, people, personalities, and sacrifices made by the earliest aviation pioneers. It is a cautionary tale—for Airmen and for Guardians. (from the Afterword)

AFHF is letting out all the stops for this year's Symposium and Banquet events on May 21-22, at the National Air and Space Museum, Hazy Center. Details can be found on the Foundation website at the "events" tab and within the pages of this Journal. The banquet is a formal affair and begins at 6 PM at the Hazy Center with a reception before the main event. Please consider sponsoring part of the banquet or purchasing a table for your organization (xd@afhistory.org). We hope to see you there to celebrate Air and Space history in a fabulous venue. REGISTER TODAY: https://afhistory.org/events/

"Lucky" Luckadoo, B–17 pilot, 100th BG, WW II *(USAF photo.)*

One closing note…I had the opportunity to attend the National Warbird Operators Conference in Dallas. The Friday lunch speaker was none other than John "Lucky" Luckadoo, now 103-years old, and survivor of the 100th Bomb Group during WW II. HE WAS AMAZING. Our Podcast producer, Matt Jolley, did an interview with him after his talk and I am posting the link to that Warbird Radio interview here.

https://www.warbirdradio.com/featured-shows-1/episode/d00ff1a4/warbird-radio-wwii-b-17-pilot-lucky-luckadoo-and-warbird-historian-brad-pilgrim-ep-675

Always Looking Up,

Lt Col Dik Daso, USAF (Ret.), PhD
Executive Director, AFHF

Don't miss our Podcast and Newsletter

The Air Force Historical Foundation sponsors additional streams of historical information. We have a podcast that you don't want to miss and a newsletter full of items of interest. The podcast is at www.afhistory.org/podcast/. The next series will focus on the birth of the Space Force. Lots of behind-the-scenes actors and info.

We have also launched a newsletter, called *Raider Chronicles*, which can be found at www.afhistory.org/research/newsletter/ and appears quarterly. The upcoming Winter issue will have a focus on women, with the feature article being about the history of the Women Military Aviators organization, which was established in 1982, and our "Member Spotlight" and "When I Served" columns both featuring women.

From the Editor

Our theme for the year is obviously the 5th Anniversary of the creation of the U.S. Space Force, officially on December 20, 2024.

Our opening article is by William Head, long-time USAF historian for the Air Logistics Complex at Robins AFB, Georgia. He has previously been awarded our Best Article prize, and once again he has given us an interesting and informative article, this time on Operation Farm Gate.

Our second article is by return contributor William Cahill, with a long article devoted to the Canal Zone, and American aircraft operations there.

This issue only has two articles in it because both were longer than our average article, but the editor did not want to split them up into multiple parts.

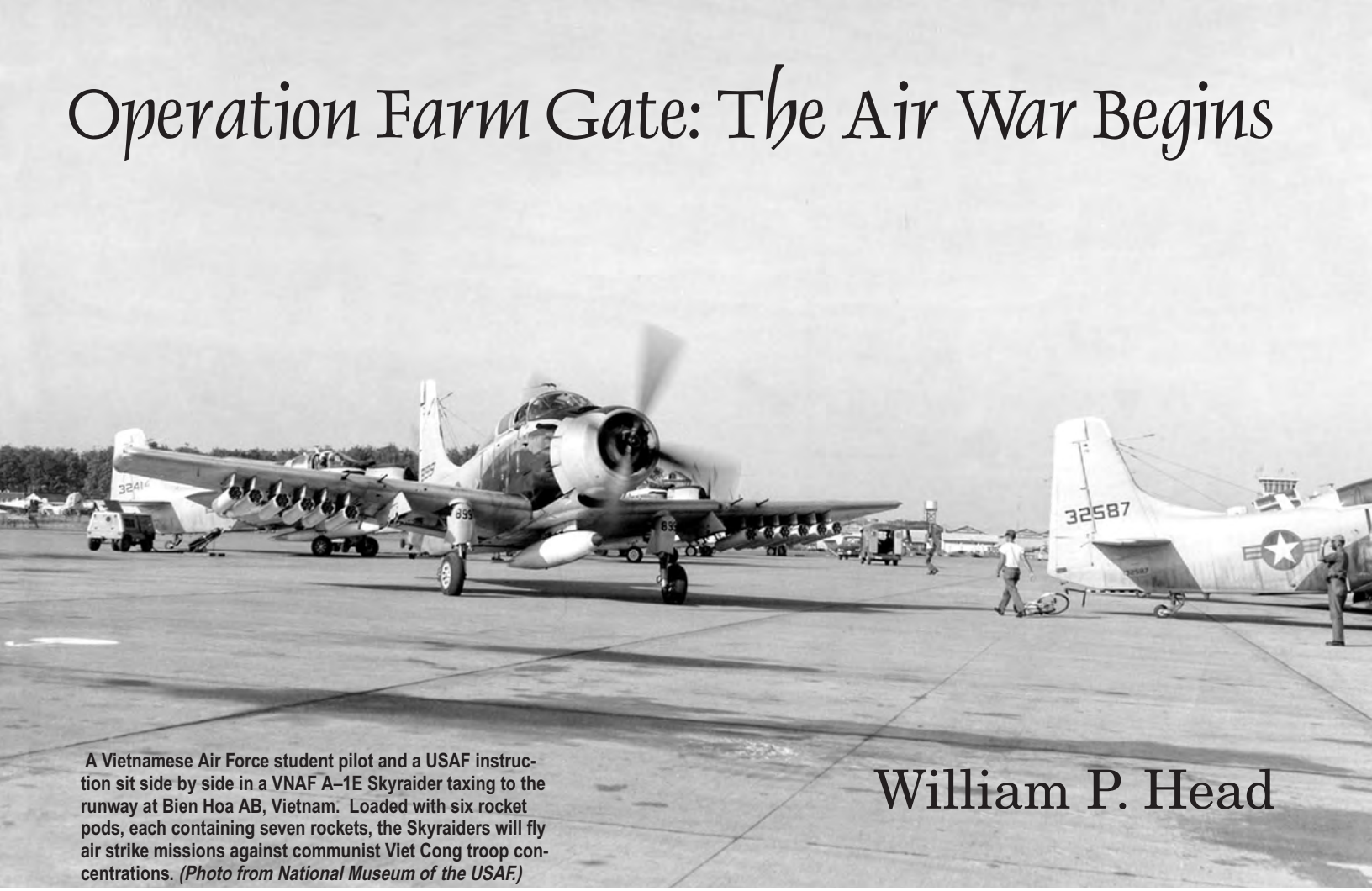
We have lengthened this issue in order to publish a large number of reviews, 39 this time, to try and publish enough of them to prevent a backlog of reviews and keep them as timely as we can. The Special Issue will probably contain just as many.

This publication is also continuing the process of replacing our magazine editor. Submissions to the Foundation are in and deliberations are underway. When there is further news on that, we will announce it.

The Leadership's Message can be found on page 4. It's worth the read. Don't miss Upcoming Events on page 76. And the issue closes with the Mystery on page 78. Enjoy!

Richard I. Wolf, Editor

Operation Farm Gate: The Air War Begins



A Vietnamese Air Force student pilot and a USAF instruction sit side by side in a VNAF A–1E Skyraider taxing to the runway at Bien Hoa AB, Vietnam. Loaded with six rocket pods, each containing seven rockets, the Skyraiders will fly air strike missions against communist Viet Cong troop concentrations. *(Photo from National Museum of the USAF.)*

William P. Head

As anyone who has studied the Vietnam War realizes, the origins of America's involvement in that protracted conflict came from the Cold War conflict between east and west after World War II. The conflict in Southeast Asia heated up, in early 1961, when Soviet leader Nikita Khrushchev made an inflammatory speech declaring that his government would actively support communist movements who were pursuing "wars of national liberation" and seeking to topple pro-Western governments in what became known as guerrilla or brushfire wars.

Soon after John F. Kennedy became president, he ordered a review of existing U.S. foreign policy to create a shift away from nuclear-dependent "Mutual Assured Destruction" and toward counterinsurgency (COIN) in conflicts in the "developing world. One result was a report by Air Force Brig. Gen. (later Maj. Gen.) Edward G. Landsdale

Landsdale, who, at the time, was widely recognized as an expert on counterinsurgency. In his compelling reports, the General warned that the Army of the Republic of Vietnam (ARVN) (South Vietnam), despite support from the west, was losing a "guerilla" war to 15,000-25,000 poorly armed anti-government irregular forces commonly called Viet Cong or VC. They were the military arm of the National Liberation Front (NLF). The VC were beginning to receive military resources from their communist allies in the Soviet Union and People's Republic of China through North Vietnam. At first it was a trickle. However, it would eventually become a torrent.[1]

Influenced by Landsdale's theories, President Kennedy signed a National Security Action Memorandum (NSAM) which instructed counterinsurgency units within the U.S. military to develop tactical and operational plans to counteract all "Soviet-supported" forces. Based on this directive, the Vice Chief of Staff of the Air Force (VCSAF), General Curtis E. LeMay directed appropriate personnel within the Tactical Air Command (TAC) to create a specialized and elite unit adept at executing anti-guerilla operations capable of defeating the VC and securing the existing pro-western regime.[2]

On April 14, 1961, at Gen. LeMay's direction, Air Force officials stood up the 4400th Combat Crew Training Squadron (later Group or 4400 CCTG) and stationed them at Hurlburt Field, Florida. At the time, Hurlburt was designated as Auxiliary Field Number 9 at Eglin AFB on the panhandle of Florida. The unit was comprised of 124 officers and 228 enlisted personnel. Their code name was "Jungle Jim." Its aircraft were composed of World War II/Korean War aircraft that included C–47 cargo/transport variants, B–26B bombers, and T–28D Nomad fighter-bombers (modified T–28 Trojan fighters/trainers). Ostensibly, their "official" mission was to train Republic of Vietnam Air Force (RVNAF) personnel to execute COIN-style air operations. General LeMay personally selected the commander, Col. Benjamin H. King, a veteran of World War II/Korean War, and a respected combat leader. The development of, and deployment of the Jungle Jims began during

Vietnam in the 1960s.

Major General Edward G. Landsdale

a time when President Kennedy had already determined to increase the number of "advisers" in Southeast Asia from 700 to 16,000.[3]

King, later Brig. Gen. was born on December 9, 1919, in Add, Oklahoma. He enlisted in the Army Air Force's Aviation Cadet Program on February 28, 1942 and graduated on November 10, at Foster Field, Texas, where he was commissioned a second lieutenant and received his wings. While stationed at Guadalcanal from February 1943 to August 1944 with the 339th Fighter Squadron, 347th Fighter Group, he flew P-38s and shot down three enemy aircraft.

During this assignment he too was shot down, but evaded capture returning to U.S. lines. After his recouperation he became a P-51 pilot and operations officer with the 368 FS, 359 FG, from August to December 1944.

After the war, Major King completed Command and General Staff School and learned to fly F-80 Shooting Star jet fighters. He was commander of the 65 FS, Elmendorf Field, Alaska from December 1946 to May 1948. In June 1950, King transferred to Johnson AB, Japan to command the 41 FIS. From October 1950 to April 1951, he became executive officer and, later, commander of the 8 FBS, Taegu AFB, South Korea.

Of significance to this study, in July 1960, he became commander of the 4400 4400 CGTG, stationed at Hurlburt Field, Florida. It was this group that, later, covertly deployed to Vietnam to support the ARVN and RVNAF during the early years of American involvement in the Vietnam War. He returned home from Southeast Asia in 1965 and spent his last years in the Air Force as a brigadier general at Norton AFB. California, retiring on February 1, 1971. He passed away on October 5, 2004 at age 84.[4]

Were We Training the RVNAF?

In the last years of the 1950s, the non-Communist forces in South Vietnam were caught in conundrum. Countries like America, Australia, and Great Britain wanted to provide the ARVN with better military equipment, especially aircraft. However, to provide the best they could, jets, they would violate the Geneva Accords. The United States

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.*

General Curtis Lemay.

Col. Benjamin King in front of his unmarked T–28.

ultimately decided to send the RVNAF T–28s. The first to deploy arrived in late 1960. Still, the South only had one squadron—the 2nd fighter squadron. Worse, they simply did not have many trained pilots.

The high point for the U.S. Air Force presence in Southeast Asia reached more than 95,000 service personnel and 1,800 aircraft. This buildup began in late 1961 with the deployment of, the previously mentioned, 151 Airman and 16 propeller aircraft to an old French airfield at Bien Hoa. The facility was just north of Saigon and had a 5,300-foot airstrip made of steel planking (in WW II known as Marston Mating) which needed significant repair. The first American personnel to arrive—the Jungle Jims, were initially billeted in field tents.

When the news media asked about the U.S. dispatch, one "informed source" in Washington, D.C. told a reporter from the *New York Times* that the reason for the deployment was mostly "on-the-spot" training of RVNAF pilots and crew members. In fact, this statement was an attempt at deception. To amplify this ruse the members of the air crews wore plain flight suits without insignias of any kind while their aircraft were at first without any markings and, later, with RVNAF motifs. The planes and personnel were in secluded areas away from the press and other outside observers. Years later, Col. King confessed, "We never trained a single Vietnamese pilot."[5]

King further admitted while the Jungle Jims were stationed at Hurlburt Field, they served mainly as combat pilots and crews not instructors nor advisers. The prominent Air Force historian Robert Frank Futrell stated in his book *The Advisory Years to 1965*, "Those completing the program were certified to be emotionally mature, highly motivated, and stable. Unfortunately, not all were mentally attuned to teaching members of other cultures or, in fact, to perform a training mission—they were combat-oriented."[6]

As it turned out, the need for more and better air crews and aircraft to support ARVN ground operations, became the origins of Operation Farm Gate and the deployment of the 4400 CCTG Air Commandos. As noted, they were formed at the behest of General LeMay in response to President Kennedy's presidential directive for a more vigorous American COIN capability.[7]

As noted earlier, the need for COIN had grown out of the Geneva Accords of July 1954 that had "temporarily" split Vietnam into North and South at the 17th parallel. This was scheduled to end in 1956 with reunification elections. However, at the behest of the Eisenhower Administration, especially Secretary of State, John Foster Dulles, neither the U.S. nor South Vietnam signed the Accords and thus, did not participate in the election. Instead, Eisenhower determined to support the South to prevent its collapse and, the subsequent fall of all other nations in the area. This "Domino Theory" soon became the core of American foreign policy in Southeast Asia prior to, and after Kennedy's election, even if veiled in different terminology.

When the North Vietnamese supported the December 1960, creation of the National Liberation Front (NLF) and their military arm dubbed the Viet Cong by President Ngo Dien Diem, the struggle in South Vietnam was underway in earnest. Kennedy, who had long opposed the posturing of U.S. defense policy based only on nuclear deterrents subscribed to the concept of countering "limited brush-fire wars" to prevent the Domino Theory from coming to fruition. He was determined to demonstrate American credibility and commitment to preventing the spread of communism in Asia.[8]

The Events and Actions that Shaped Farm Gate

The tactical plans established for what became Operation Farm Gate called for the 4400th to operate anywhere

President John F. Kennedy, briefing on issues in Southeast Asia.

in the world out of primitive airfields and with sparse logistical support. The T–28s were already available since they were operating as "trainers," and additional ones were easy to deploy. However, more aircraft were needed and the most obvious were B–26B Invaders. Between March and September 1961, 27 were either removed from storage at Davis-Monthan AFB, Arizona, and reconstituted at Hill AFB, Utah or brought from maintenance in Taiwan after use by the Central Intelligence Agency (CIA). Plans called for 15 to be blended in with the T–28s and SC–47Js and sent to Hurlburt Field to train crews prior to their dispatch overseas. Hurlburt was a particularly good location since it was remotely located at Eglin AFB and was designated as the location for special project development. Somewhat appropriately, it had been the location where Jimmy Doolittle and his medium B–25 bomber crews had trained for their carrier attack on Japan in April 1942. Now the volunteers of this new unit and their B–26s would train at this historic location.[9]

T–28s like this one flew during Farm gate without USAF markings.

A Farm Gate B–26 in Vietnam without USAF markings.

President Kennedy "officially sanctioned" sending U.S. forces to Vietnam on November 22, 1961. In fact, by this time the first Farm Gate aircraft had already arrived in-country. The President had authorized their deployment on October 11. On November 5, about half the squadron—some 150 men, together with four SC–47s and eight T–28s—left Florida for Southeast Asia. This was Detachment 2A of the 4400 CCTG, the first part of project Farm Gate. It reached Initial Operating Capability (IOC) in Vietnam when their last T–28s arrived on November 16. At the request of Frederick E. Nolting, the U.S. Ambassador to South Vietnam, all Farm Gate aircraft carried Vietnamese insignia, to keep a low profile.

Meantime, while Col. King and his men were in Vietnam, they also flew the renovated World War II/Korean War B–26B Invaders which were twin-engine light bombers used, among other things, for Close Air Support (CAS). By April 1961, the Central Intelligence Agency had employed, less sturdy versions, in various missions in places like Cuba, to support the Bay of Pigs invasion.[10]

Other aircraft used during Farm Gate were SC–47Js which were modified C–47 Skytrain cargo/transports aircraft. They had been reconfigured to dispense flares that illuminated enemy positions and drop supplies to allied ground forces. In addition, they performed psychological operation (Psy Ops) missions by dropping leaflets and making propaganda broadcasts over loudspeakers.

The T–28 Trojan was built by North American Aviation, Los Angeles, California. It merged with Rockwell to become Rockwell International in 1973. Today it is part of Boeing. The modified T–28 known as the "Nomad," carried rockets, bombs, and machine guns. It was a tandem-seat radial-engine military training aircraft for the U.S. Air Force and Navy, first flown in the early 1950s. The Air Force version evolved from primary pilot training to limited training of Special Operations Forces (SOF) aircrews and for primary training for select foreign military crews. While some converted to Special Operation combat missions, improved B and C models continued to be trainers for the Navy, Marines, and Coast Guard until 1984.[11]

As General LeMay and others made plans to send the Farm Gate detachment to Vietnam, they had to determine what kind of personnel would become part of this unique unit. To this end, the General ordered that the entire unit be comprised only of volunteers. Indeed, he sent out a directive to all unit commanders stating, "You will request volunteers from the list of active-duty officers, . . . for assignment to Project Jungle Jim, temporary duty (TDY), which may include combat." Thus, all operational members were covertly recruited into the unit. Moreover, the American personnel did not wear USAF uniforms and understood, they did not formally fight or act on behalf of the U.S. government.[12]

According to then Lieutenant Colonel (later Colonel) Robert L. Gleason, Operations Officer and later Commander of the Jungle Jims, Air Force leadership and personnel experts screened thousands of personnel records to find "candidates whose records indicated they should be 'invited' to join this select group." Membership in Farm Gate was not an open proposition open to just anyone. Volunteers, yes, but by invitation only. The basic guidelines required pilots to have at least 5,000 hours of flying time and enlisted personnel to be rated among the top two percent in their specialties. As alluded to, all those screened were asked, "Would you volunteer to serve in a foreign country under extreme hardship conditions for extended periods?" Further, "Would you perform in an overt or covert status? Would you serve out of the U.S. uniform?[13]

Much like the iconic TV show "Mission Impossible," they knew their nation's military and civilian leaders might even deny knowledge of their activities and not provide normal protection provided to American citizens or military prisoners. Before they left to join the unit, they underwent psychological evaluations to determine if any of them demonstrated unstable tendencies and could handle the stress of the job. One pilot, named Capt. Richard V. Secord, (later major general and advisor to President Ronald Ragan) recalled that it appeared the Air Force was looking for "crazy guys."[14]

The Air Force modified C–47s like this one into SC–47Js for Farm Gate.

When they gathered prior to deployment, they trained with Army Special Forces members to perfect methods of airlift, CAS, and reconnaissance. Some training included flights to Ft. Bragg, North Carolina. These exercises built a strong bond between the air and ground forces. The B–26s and T–28s training, especially strafing and low-level bombing attacks honed their skills for day and nighttime operations against enemy targets. Even as they prepared for their assignment, no one really knew where they were going. Indeed, most believed they were headed for the jungles of Cuba. While it was to jungles, it was not to the Caribbean, instead it was to Southeast Asia.[15]

In retrospect, perhaps the thing that really convinced the Kennedy Administration and the U.S. military to go ahead with Farm Gate in October 1961, was when the President sent former General Maxwell Taylor and key White House staffer Walt Whitman Rostow to Vietnam to investigate, firsthand, how U.S. support was affecting the struggle between the NLF/VC and the South Vietnamese. One vital aspect proved to be the concern over the efficacy of deploying the Jungle Jim detachment. According to a report from the *New York Times*, one unnamed official, stated that when the two presidential advisers arrived back in Washington, Taylor had expressed doubt as to how effective any number U.S. military personnel would be. Taylor and Rostow, also supposedly stated that even the President "strongly opposed" sending ground troops. Later reports suggested Taylor had recommended sending 6,000-8,000 ground troops.[16]

According to Futrell, in December, at a foreign policy conference in Hawaii, Secretary of Defense (SECDEF) Robert S. McNamara, during his opening remarks, emphasized "that the President did not desire to introduce American combat troops openly into Vietnam at that time." Thus, the idea of dispatching Farm Gate Airman appeared to be a much better solution.[17]

The main point being that while the U.S. was determined to save the Republic of Vietnam, they did not wish to advertise that they had deployed Airman to Vietnam to participate in combat operations. Only three months later, Roger Hilsman wrote a clandestine "memo for the record" stating that while keeping U.S. presence quiet, especially Farm Gate, exploiting this airpower resource needed to be used to its maximum affect. In short, he asked, why should we have air assets present if we didn't plan to use them properly?[18]

Deployment

Thus, with the dispatch of the Jungle Jims, the United States air war in Vietnam began. Later, the 4400th's designation changed to the 1st Air Command Wing (1 ACW) to honor the 1 ACG which had fought in the China, Burma, India Theater during World War II. Even so, as the Air Commandos moved on to Bien Hoa Air Base, their official assignment continued to be "training" RVNAF pilots to fly the old T–28 Nomads, B–26 Invader, and SC–47J Skytrain. As noted, the B–26Bs had been acquired from CIA facilities in Taiwan and many were veterans of the Korean War.

Jungle Jims and their required RVNAF "trainee" in front of their B–26.

While some had been originally scheduled for use in Indonesia, the vast majority were ultimately aimed at the communist guerillas in South Vietnam.[19]

With the conflict in Vietnam intensifying, both Secretary of Defense Robert McNamara and Gen. LeMay believed since the Jungle Jim's initial force of 155 Airman, eight T–28s, and four modified SC–47Js was already operational, they were the best unit to fit into this specific COIN operation. Of course, these first arrivals were soon joined by eight enhanced B–26s Invaders. By the time the unit was complete and in place at Bien Hoa it had been redesignated "Farm Gate."[20]

Early Farm Gate Sorties

On November 5, 1961, the men of Det. 2 departed Hulburt Field. The SC–47Js flew first to Clark AB, The Philippines and then to Vietnam. The T–28s were dismantled in California and packed in crates and placed on C–124s for shipment to Clark AB. Late in the month, all these components were sent to Saigon and then to Bien Hoa AB, only 22 miles north of the capital city. After, final modifications were made on the B–26s, they joined the others in late December. At this point, each aircraft was reassembled and prepared for flying duties.

Most of the Jungle Jim members were not impressed by their new base facilities. Most of them described Bien Hoa AB as "a dump" and many crew members simply "detested it." Part of the reason was that the old French-built airfield had fallen into disrepair and its 5,800-foot-long runway, with its steel-planks, shaped like Swiss Cheese, was rusting away and in constant need of repair.

Command and Control was confused from the outset. In the early days, Farm Gate personnel were part of the Air Force section of the Military Assistance Advisory Group (MAAG)Vietnam (later Military Assistance Command, Vietnam, MACV). However, as Col. King recalled, few leaders in the Pacific Theater had been informed of the Farm Gate operation/project. As a result, neither he, nor any of his charges knew who to report to. The explained the odd setup saying, "A lot of people had questions about that, including me. I took my orders from two lieutenant colonels in the bottom of the Pentagon building." As alluded to, MAAG could not direct combat operations, so an "advanced echelon," the 2nd Advanced Operational Node or ADVON, was created by the 13th Air Force in Saigon and "given charge of Farm Gate."[21]

In February 1962, 2nd ADVON which was an Army designation, was over Farm Gate, which also placed it under MACV. While this sort of clarified the chain of command, it created another problem since almost all the "commanding" individuals were Army officers who had little notion of how to use these Farm Gate assets which had just arrived apparently popping out of nowhere. Finally, in October 1962, the Department of Defense (DoD) established the 2nd Air Division, the predecessor of the 7th Air Force (7 AF). As Frank Futrell explained, "This regularization of this Air Force unit organization indicated a movement away from counterinsurgency concepts and toward the conventional."[22]

Other important military leadership organizations, like the Joint Chiefs of Staff (JCS), paid very little attention to what was happening in Southeast Asia, especially regarding Farm Gate. When they did notice this odd group appearing on their charts and in their briefings, they supported the notion of having Vietnamese Airman flying with Farm Gate crews in Vietnam. As for the Americans in the unit, B–26 pilot Jack Williams later said, "On every mission, we carried a RVNAF who sat on a pull-down seat behind the navigator and the hydraulic fluid reservoir." Supposedly, "We were ostensibly there to advise the RVNAF, but our advice was simple: 'Don't touch anything.' We did not carry the aircraft forms with us and in the event of a crash, the RVNAF was flying, and we were along to give him advice."[23]

A Jungle Jim pilot, named Roy Dalton, recalled, "We'd carry anybody that was available. We'd go over to the Vietnamese base commander, and he would give us the guy who was sitting around either typing or sweeping the floors—and he would fly with us." While most of the Vietnamese Airman knew little about flying, in fact, some were very qualified. For example, Col. King's co-pilot on one specific SC–47J mission happened to be Col. Nguyen Cao Ky, who later became chief of staff of the RVNAF and Vice President of the Republic of Vietnam. Throughout these early years Air Force leaders tried to get the Vietnamese crew member "ruse" stopped since most of them spoke no English and were more of an encumbrance than an asset. Despite their efforts both the State Department and SECDEF "refused to give in just yet."[24]

Perhaps senior leaders should have paid more attention to these Airman in the field. Indeed, several Farm Gate crew members later rose to hold significant positions in the Air Force and government. For example, John L. Piotrowski, who served as the first Farm Gate armament officer, became Commander-in-Chief of Air Force Space Command. Richard Secord eventually became, Deputy Assistant Secretary of Defense during President Ronald Reagan's time in office.

In the end, all this alteration eventually caused Farm Gate to be noticed by the media, despite the supposedly se-

"Bush Hat" worn by Jungle Jims.

cret nature of its mission. During a March 1962 news conference Secretary McNamara revealed, "There has been sporadic fire aimed at United States personnel and in some minor instances they've had to return fire. Americans are under instruction not to fire unless fired upon." This seemed to indicate America was drawing closer to open war. However, in May Undersecretary of State George W. Ball sought to reclaim the original cover story when he declared that there were "no American combat forces in Vietnam and that the United States was neither fighting nor running the war."[25]

Their Special Look

Certainly, one of the most identifiable features of the "Jungle Jims" was their attire, especially their headgear. In many respects they looked like actors from central casting preparing to shoot a jungle combat scene in Asia. As time passed, and the Airman of Farm Gate became the foundation of a growing U.S. and Air Force presence in Vietnam, nearly all of them began to wear singular jump suits and "bush hats." In fact, this feature soon identified with their presence in theater and defined the group. The "bush hats" had long been head cover traditionally worn by Australian troops. They had numerous advantages such as protection from heat and rain. Besides, they were cool looking, and their Aussie allies appreciated the gesture. As a result, nearly every Jungle Jim soon swapped their baseball-style hats and took to wearing the distinctive jungle-fighter look. Even Col. King had one.[26]

Getting Up To Speed

Not surprisingly, as soon as the Americans made their arrivals and began to settle in, their first job was to get airborne. To this end, T–28 pilots quickly underwent their orientation flights almost as soon as they unpacked their duffle bags. As part of their deception of training Vietnamese pilots and to acclimate everyone involved, during these initial sorties, American aircraft, as often as possible, took off escorted by RVNAF aircraft. In these first missions, if they were assigned potential enemy targets, they "dropped their load", observed and recorded the damage inflicted, and then returned to base. In most cases they were able to report successful operations. This where the lack of knowledge on the part of their Army chain of command came in. Instead of praise, they were frequently admonished for not maintaining the training ruse and then, instructed not to "conduct any more independent combat sorties." This was when, on December 26, 1961, leadership, in Washington, issued the curious regulations directing American pilots to have at least one RVNAF crew member onboard for each mission. Secretary McNamara went one step further and instructed the Farm Gate T–28 pilots to have the South Vietnamese "fly in the backseat position."

Gradually, the incredulity of this directive became clear due to the sparsity of RVNAF Airman. This meant that without back seaters either missions were not flown, or pilots misrepresented after-action reports by admitting to flying without RVNAF personnel. Still, not everything was a problem. Vietnamese pilots did gain some experience, and many returned to their own units as capable Airman. However, as their replacements arrived, the Americans quickly discovered these rookies had no background in flying and almost no noticeable skills in dealing with anything resembling modern technology. To add to this conundrum RVNAF red tape meant that even promising cadets were stuck waiting for orders to go to flight school so they could eventually work with the Americans.[27]

Despite all the issues facing them, their indefatigable determination soon led to joint American and RVNAF manned aircraft flying sorties against VC supply lines and troops. They were launched from Bien Hoa or newer bases at DaNang and Pleiku. These missions focused on CAS, interdiction, and Intelligence, Surveillance, and Reconnaissance (ISR). The specialized Skytrains were flying airdrops, "psyop" leaflet sorties, and loudspeaker broadcasts near forward operating bases (FOB) manned by Army Special Forces units supported by South Vietnamese

Bien Hoa AB in late 1964. Note the new runway.

Civilian Irregular Defense forces. The reality was that there was hope that the South might gain stability if their forces, with U.S. support, might continue to gain the skills and technology necessary to go into the field root out and eliminate the VC.[28]

Unfortunately, this momentum never could gain enough drive to finish the assigned goals. Instead, as Farm Gate's role in the "civil war" grew, the confused state within the Command and Control (C^2) of Air Force units in Vietnam not only failed to improve, but it also got worse. By 1962, in an effort to sort things out, senior leadership moved all Air Force units in Southeast Asia under the 2nd Advance Echelon, 13th Air Force. In fact, this moved the decisionmakers further away from the men operating in the rice paddies and jungles whose actual mission should have been to create a "sustained offensive, defensive, and reconnaissance air operation aimed at the destruction or neutralization of Viet Cong forces, resources, and communications within the borders of South Vietnam."[29]

With this muddle facing Air Force leaders at Bien Hoa AB, they sought to exercise de-facto operational command over Farm Gate personnel and resources whenever practical. King undertook to follow the basic premises of Air Force doctrine which argued that all air assets should be managed by Airman and should operate independently under Air Force leadership structure. This had been the essence of the original guidance he received from Gen. LeMay, who had made it clear that King's unit should "function separately and independently."

This was not going to be easy since at one point, the 2 ADVON commander had warned Col. King he would probably not be allowed to fly daytime combat missions. This exasperated King since it essentially meant a non-Air Force officer was telling him the Jungle Jims would not be able to take part in all combat operations. It seemed they would be allowed to fly only secondary night sorties. In reality this was misguided and illogical since the RVNAF had only one squadron which was capable of flying daytime operations and no night ones since they did not have low-level light television (LLLTV) equipment. Fortunately, King soon devised several means to circumvent these restrictions so he and his Airman could fly all their intended sorties. For example, at night they used flares "obtained" by their operations officer, Capt. John L. Piotrowski so that the SC–47Js could jettison the flares and illuminate the jungle floor allowing their T–28s aircraft to attack enemy targets, thus, breaking up VC incursions Ultimately, this became the standard tactic during nighttime engagements. For daylight raids King and others came up with other clever plans.[30]

Still, they had to be careful about unexpected, but thankfully infrequent, visits by the "Brass." For example, not long after King returned to the U.S. and Col. Gleason took over command, the unit was visited by Adm. Harold D. Felt, Commander of the Pacific Command (CINCPAC). Even though their success rates were excellent, the spit and polish Admiral found something to be upset about. Indeed, he ordered the pilots and crews to stop wearing their "bush hats." Gleason agreed to follow orders but, immediately, contacted Air Force officials at Hurlburt through back channels. Within 24-hours he received orders from Air Force headquarters, that Gen. LeMay had designated the bush hats as official headgear for the unit.[31]

Admiral Harold D. Felt, CINCPAC, 1958-1964.

The Delusion & Reality of Combat

The problem with all this commotion was that it interfered with their flying job. The fact is that, from the outset, the Jungle Jims discovered that, as they no doubt had supposed, flying combat missions was no boy scout jamboree. Theirs was a serious business and this meant at least some of them would die. This fact soon hit home. On one occasion in February 1962, during a leaflet drop, a Farm Gate SC–47J was shot down in the Central Highlands near Bao Loc. All six members of the aircrew, two soldiers, and the obligatory Vietnamese crew member on board were killed. This became the first Farm Gate aircraft lost. It would not be the last since this was the reality of this conflict. The delusion of secrecy was the way they operated. Secretary McNamara's directives temporarily maintained the delusion that the Americans were just training the South Vietnamese since he still wanted to be sure that if any USAF aircraft crashed, they could deny that they had violated the Geneva Accords of 1954.[32]

By end of January of 1962, Farm Gate aircraft had flown 229 sorties out of Bien Hoa AB. To facilitate future missions, airfields near Da Nang and Pleiku were upgraded to expand their capabilities to fly ISR, interdiction,

South Vietnamese President, Ngo Dien Diem.

and CAS sorties. Despite the previously mentioned crash of the SC–47J, their roles also increased specifically their crews flying more "psyop" missions not just dropping leaflets but employing loudspeakers to broadcast anti-communist polemics which sometimes had the desired affects. They especially operated out of U.S. Special Forces forward bases supporting ARVN and Civilian Irregular Defense Group forces and even though they were all shaken by the loss of one of their own crews they hung on with stubborn determination. In these early days the fact that there were so few Americans the death of any of their number often shook the members of Farm Gate even though combat losses were always going to be a predictable, and sobering reality.[33]

Meantime on the ground, Vietcong combat activities spread across South Vietnam, undermining the pro-American government Ngo Dien Diem. To shore up ARVN ground forces in their COIN efforts it was necessary to employ an increasing number of CAS sorties. To this end, forward operating locations (FOL) were established in Qui Nhon and Soc Trang augmented by new airfields. The forces operating these outposts included Farm Gate personnel as well as RVNAF military members. Soon it became obvious that the air resources on hand were not sufficient to carry out the "real" job they had to do. Thus, Brigadier General Rollen Henry Anthis, the Commander of the 2nd Air Division, requested more men and material to maintain pressure on the enemy. He asked for ten more B–26s, five more T–28s, and two more SC–47s. McNamara

U–10 Helio Courier in flight. Others like this one flew with Farm Gate.

was reluctant to commit more Americans since their supposed goal was to "train and deploy RVNAF forces to fight their own fight." Ultimately, the SECDEF, due to the obvious reality facing Allied forces, approved the request, even adding two U–10s Helio Courier cantilever high-wing light Short Take Off and Landing (STOL) utility aircraft.[34]

Despite this major increase in material and manpower support, the year 1963 began badly when, in January, a sizable ARVN force suffered an unexpectedly devastating setback to a rag tag group of Viet Cong at Ap Bac. This tactical defeat came about despite having more men, better equipment and intelligence, and even excellent U.S. advisory support, by such famous and controversial American officers as Lieutenant Colonel John Paul Vann.[35]

Farm Gate aircraft flew many important missions. One specific example was a SC–47-night mission executed on July 20, 1963. They flew to Loc Ninh dodging enemy fire, fighting strong winds, and black-out conditions, the entire way. Eventually, the crew landed and rescued six severely wounded ARVN soldiers. Even as they performed such heroic actions, on June 17, 1963, the Air Force had already begun to dissolve Farm Gate units as detachments of Special Air Warfare Center and combine them with remnants of the 1st Air Commando Squadron (Composite) at Bien Hoa AB.[36]

Part II: Recalling Some "Combat" Missions

The story of Farm Gate would not be complete without examining combat sorties its aircraft and crews flew. This section will examine at least some of these. Of course, the two most notable combat aircraft were the B–26s bombers and the T–28s fighters. At the very beginning of the operation only four B–26s were available in Southeast Asia and had been previously part of Project Mill Pond. As mentioned earlier, they had been in Taiwan and were sent to Bien Hoa in late 1961. To avoid seeming to violate the Geneva Accords these aircraft, as well as those that came later, were referred to as RB–26s implying they were reconnaissance planes and not bombers. Once on station, however, they were mostly employed in combat sorties. To further expand the illusion of being non-combat aircraft

they were equipped with K-17C cameras that were used to confirm bomb damage. Sometimes, they had an external camera pod attached under the left wing for the same purpose.[37]

Early in 1962, as the Air Commandos slowly, but surely, began to intensify their combat activities, soon, discovering that they had much to learn when it came to the tactics they employed. In March, they flew occasional night sorties in response to "unidentified aircraft" and on at least two occasions when the B–26s were scrambled they made no contact with any intruders. Later in the month, due to these episodes, officials deployed Navy and Air Force fighter aircraft to South Vietnam since none of the Farm Gate aircraft were suited for such air defense engagements.[38]

As noted throughout, the U.S. tried to cover up the real role of its crew members. However, numerous media reports in the U.S. announced that American pilots had been flying combat missions in Vietnam. Indeed, the unit's training cover was beginning to wear thin. To this end, after much debate between various high-ranking officers and political leaders, they formed a new classified Concept of Operations (CONOPS) which publicly stated that the purpose of having American pilots and crews present was: "To develop and improve tactics and techniques for COIN operations and to train the RVNAF in such operations." Moreover, it said, "Fulfillment of this task will greatly enhance the RVN [Republic of Vietnam] in country capability to eliminate the communist threat. Operational tasks in RVN include combat and combat support flights as an extension of the training mission."[39]

To this end, all Farm Gate operations were limited to those within the borders of South Vietnam and combat sorties were flown only when the RVNAF lacked the capability to conduct the mission (because of scarcity of aircraft, pilots, training, equipment, etc.) "and then only with a combined USAF/RVNAF crew aboard the aircraft." Thus, these kinds of sorties were to be for "the purpose of providing training for RVN personnel so that the RVNAF can perform the missions required at the earliest possible time." In fact, as Col. King later mentioned, "No training of RVNAF personnel was ever carried out using the B–26s." So, "to satisfy the call for a 'combined USAF/RVNAF crew,' any member of the RVNAF with or without flight training, and regardless of whether he understood English or not would be put into the cramped jump seat behind the American pilots." Not surprisingly many of the Vietnamese expressed a definite lack of enthusiasm for the proceedings since they filled no function during flight. This was not the case during missions that were flown in conjunction with strike aircraft of the RVNAF.[40]

In mid-1962, the number of sorties tripled, even though all Farm Gate sorties were subordinate to specific "Rules of Engagement" (ROE) such as "all daytime strikes were carried out under the control of a Forward Air Controller, except when returning enemy ground fire." Of note was the fact that, "FACs could be either airborne or on the ground. During the Farm Gate period, most airborne FACs belonged to the RVNAF, which, not surprisingly, lead to awkward situations. "Not only were there relatively few RVNAF FACs available, but many of them had rather poor knowledge of English." One report recalled, "The almost standard phraseology of the FAC was, 'I drop smoke, you hit smoke.'" To be sure, "any smoke grenade canister released from as high as 1,000 to 1,500 feet likely would cause it to detonate before it hit the ground and the smoke would dissipate. Moreover, it was not unusual for a ten to twenty-minute discussion to take place to determine exactly where the target was in relation to the smoke. This report sarcastically concluded, "It is at this point in the COIN environment that favorable endurance becomes a desirable factor."[41]

Personal Accounts

As the assignment unfolded, so did the efficacy of the multi-various Farm Gate sorties. As it was, most of their missions involved air strikes, against VC targets located in South Vietnam. The following entries are extracts from the personal diary of B–26 pilot Captain, later Colonel Roy Dalton. They should provide the reader with an indication of what the air war in Vietnam was like during these early years.

On Friday, September 21, 1962, Dalton's B–26 crew arose at 0345 in support of a C–123 "defoliation escort mission in the Delta." The formation flew at 200 to 800 feet, it was dark, raining, and there were low clouds. After C–123s departed the combat zone, the FAC announced he had targets for us. These were, "Huts and boats hidden under trees in a VC training area." The Invaders "destroyed seven boats and two huts." As they returned, they experienced very bad weather over the Mekong River. They then, "Flew up the river toward BH [Bien Hoa] at 100 ft and could just barely see the ground." Fortunately, "Near BH weather cleared to about 500 ft." Even so, the "Runway was slick."[42]

On Monday, October 8, 1962, his crew flew a morning strike sortie. To quote, "Terrain very difficult. A valley about one- and one-half miles long by one-half mile wide, with one end closed by mountains and the other open. Stream in the middle with rice paddies and 'houches.' The steep sides of the mountains are covered with jungle." In addition, "The FAC marked at each end and stated that all in between was target area plus one village on the rim. This was 'a reported VC Battalion training area.' We destroyed the village and set lots of fires up and down the valley." The main problem facing the U.S. aircraft was that it was, "Very difficult to get in close and pull up. We saw 'zip', but the FAC reported ground fire. *The valley was very pretty. I sometimes wonder if we aren't making more enemies for the local government than we are doing good. Sure, hope their intelligence was right.* On the way back we lost one engine. Feathered and returned home."[43]

On Monday, October 25, 1962, they flew another morning strike mission and caught several VC in open ground. He knew they had killed several. Only later was it confirmed that the number had been 31. Dalton went on to state that, the "Mission was in support of a helicopter as-

An American AD–6 Skyraider in flight later in the war.

sault operation. We flew cover, T–28s flew prestrike sorties. We observed choppers coming and 'Butterfly,' our FAC, called and put smoke in and directed us to an area about one-fourth of a mile from a bridge." Further, "We put in napalm on visible VC. A guess would be 15 to 30. Second pass we strafed. We hit around bridge with napalm and guns as FAC called 'many VC in area.'" Next, they, "Went back up and orbited for another hour and tacked onto a flight of three RVNAF AD–6s. Put rest of our ordnance on their target." Finally, they, "Headed for home and got call from L-28 [reconnaissance aircraft]. Said I was right above him and he had VC on ground. Picked up four VC running and put in short burst, two fell and two made it to a ditch. A chopper hit the two in the ditch."[44]

As November began, their operational tempo increased as did the variation of targets. On Friday, November 16, 1962, Dalton's crew flew a strike mission along the Mekong Delta. As he wrote in his after-action report, "Was giving close air support to ground operation when five hidden boats were found. Got three. 'Couldn't hit my butt.' Everyone else busy so even though I have duty officer, Charlie and I pull alert. Got scrambled at 2300. Fort under attack at Can Tho. Covered it for two hours. Appeared to be good mission. Fort called flare ship and told them to thank us. Had been up since 0600 Friday morning. Finally got to bed at 0330 Saturday morning."[45]

Between November 17 and 19, Dalton recorded that he had slept most of the 17th and was the duty officer on the 18th. He played poker that night and lost $12.00. On the 19th, he flew his 100th mission, making 25 passes against "a large target area." His flight "hit boats, houches, and personnel. Word came in on Friday night's fort defense mission—18 VC confirmed KIA."[46]

His November 20 report stated, "Yesterday's mission. 6 structures, 14 boats, and 25 VC confirmed KIA. They certainly were everywhere." He went on to say, "Dave...told me about one of their missions. The FAC directed them at VCs under trees. Just before they dropped Dave saw women under a tree. They didn't drop and pulled off. We agreed that it sometimes gets to be a gut call." Indeed, "The FAC, who is [often] Vietnamese, can see and he directs the fire, still it's bad sometimes. *Some time I'm going to add up the total KIAs and destruction and then again it would probably be better if I didn't*."[47]

Losses

Not all operations went smoothly. During late 1962, Farm Gate lost two B–26Bs. On October 10, 1962, an RB–26C, T/N 44-35813, was badly damaged while preparing for a night mission at Bien Hoa AB. As Captain (later Colonel) James Ifland recalled, "My camera crew was uploading photo flash cartridges for this night photo mission. Although properly grounded, all the cartridges ejected from their dispenser during camera preflight and exploded four seconds later on the ramp beneath the aircraft." He further recalled, "As you can imagine, there was quite an explosion." Afterwards, "eyewitnesses claimed that the aircraft was lifted off the ground four to six feet (I find that hard to believe). Fortunately, there was no fire, although the aircraft had just been fully fueled." As it turned out, "My two Camera Airman, who were both in the cockpit running the preflight, frantically climbed out of the aircraft and ran to the tip of the wings and then leaped to the ground - both suffering broken ankles, wrists, etc., and having the s—- scared out of them."[48]

In looking back, the cause of "the accident was never fully established but was thought to be stray voltage across the flare firing pins due to a nearby thunderstorm. The Invader was eventually patched up sufficiently for a one-time, gear-down flight to the depot at Tan Son Nhut, where it was given further work and then flown to Clark Field,

Philippines for refurbishing. It was subsequently returned to service, but only after very extensive repairs."

As Dalton recorded, "The other loss was a B–26B shot down in the Mekong Delta on an outpost air support mission during the night of November 4-5. The night sorties formed an important part of the Farm Gate mission in South Vietnam since the RVNAF had no nighttime strike capability at this point, and consequently the Farm Gate B–26s and T–28s were the only aircraft available for air support between sunset and dawn."[49]

Other Kinds of Sorties

In recalling other Farm Gate actions, Dalton asserted, "Most of the night sorties flown were in support of outposts, and this was a very demanding type of mission. Flares were dropped over the target by Farm Gate SC–47Js, or by RVNAF C–47s with American copilots (a total of thirty USAF C–47 pilots, known as the 'Dirty Thirty,' were on loan to the RVNAF), and the B–26s worked under the flares, placing ordnance under the direction of a ground controller inside the outpost." In fact, "Sometimes the B–26s had direct radio contact with the ground forces, and sometimes the instructions had to be relayed by the C–47. In some cases, there was no radio contact at all, and the drops were made by observing the flashes from the ground fire, or in the direction the outpost's 'flaming arrow' was pointing. Most outposts were equipped with one of these arrows, consisting of flare pots or electric lights on a large platform which could be rotated to show the direction of the enemy." On the other hand, "A simpler alternative consisted of straw or reeds laid out in an arrow shape and set on fire. In most cases, however, the Viet Cong broke off the attack as soon as the air support arrived."[50]

Dalton further explained, "Invariably the tactic was to drop some napalm first. This gave the pilot a better ground reference and rockets, bombs and guns could then be used as required. Working at night, under flares and using suction gyros, with poorly lit cockpits and either bad weather or light reflecting off water filled rice paddies, was guaranteed to give the pilot a severe case of vertigo, and only extensive training made such missions possible." However, as he pointed out, "they were still seen as the most rewarding missions since they challenged the skill of the crews and because the results were immediately obvious. The provision for a navigator in the B–26 was a decided advantage at night. The antiquated cockpit lighting system of the Invader often made it necessary for the navigator to use a flashlight, however, to find the armament switches." As he concluded, "The obsolete instrumentation also provided some additional hazards, as a report observed: 'The navigator assists at night by giving the pilot a friendly tap on the shoulder when approaching minimum altitudes.'"[51]

On the night of November 5, Dalton, that evening's "Ops Duty officer," wrote, "Things quiet until about 2015. One C–47 and B–26 were scrambled to the Delta... Got them off OK. Then at 2300 scrambled another 26. Bennett and Tully took this one. First 26 got back about 2400. At 0130 got word that the flare ship had lost contact with the 26 and saw fire on the ground." He stated further, "Called Lt. Col. Doyle [the Farm Gate commander] and scrambled another 47 and 26. At sunup JOC [Joint Operations Center] sent two RVNAF AD–6s and we sent another 47 to act as radio relay. Had been up for 24 hours so went to tent to sleep. Doyle went to area in L-28."

The Captain awakened "about 0900 and heard that one of the ADs was also down and that the 26 had been located. Went to the line about noon. The AD pilot had been killed as was Bennett, Tully and the RVNAF on board [the B–26]." On a personal note, he wrote, "Bennett was my roommate. In a four-man hut Charlie and I have lost two roommates. Doyle had a meeting about 2000. They, of course, will never know exactly what happened. Shot down or just flat flew into the ground. That's easy at night on napalm runs. The VC had gotten to the A/C and taken everything available. The bodies were recovered."[52]

In fact, this event became "the third USAF strike aircraft lost in Vietnam, the previous ones being two T–28s shot down in August and October." Around the same time, one B–26 was wrecked "when the undercarriage collapsed during a landing in July 1962, and another Invader lost an engine to ground fire on November 13. Several other aircraft also received superficial damage from small arms fire." Indeed, "The serviceability of the B–26 initially left a few things to be desired. During the second half of 1962, only an average of 54.5% of the Invaders were serviceable at any given time. This was by far the lowest figure for any contemporary USAF aircraft in Vietnam. In comparison, the T–28s managed an average of 80.3% serviceability."

Dalton commented, "I was surprised when I reread the diary to note the difficulties we had with the aircraft and armament systems. Keep in mind that these were aircraft that had probably been used in WW II and certainly in Korea. They were old and had had little modification. However, every man associated with the operation was dedicated to make it work. Therefore, we had few qualms about flying aircraft that might not be 100%." He went on to note, "Had we not done so, operating under the conditions with which we were faced, we would not have been effective."[53]

To be sure, most of the mechanical problems faced by Farm Gate were due to the age of the aircraft and the limited restoration provided each aircraft prior to them being transferred to Vietnam. One report dated April 12, 1963 stated, "The Invaders had between 1,800 and 4,000 flying hours each and had been through varied degrees of modification." At this point, there were 14 aircraft stationed in Ben Hoa and the report observed that, "none of the B–26s at Farm Gate were configured alike." To be sure, "each Inspect & Repair as Needed (IRAN) depot and each work package change within each depot resulted in some variation in electrical wiring, communications equipment, location of cockpit controls, etc." The results were that "valid wiring diagrams do not exist for many of the aircraft and armament switches for the various stores and stations were stored in five separate locations in each of the four different armament switch configurations within the B–26 fleet."[54]

This kind of ad hoc "variations in aircraft configuration had caused the same problems for the USAF squadrons using the B–26 in Korea." Indeed, "They, too, had received aircraft which had been in storage for several years, and only given a minimum of rehabilitation before being sent to the combat units." Thus, "these lessons had been forgotten by the time the Invaders were wheeled out of storage for the second time."

Still, as Dalton and others noted "all in all, the B–26s were still effective aircraft, and were considered superior to the T–28s. Despite the slow start, Farm Gate had flown a total of 1,135 B–26 combat sorties by the end of 1962, and some crews had completed over 100 missions in less than four months." Ultimately, in the summer of 1962, four more B–26Bs arrived at Bien Hoa, with the first two ferried in from Kadena AB, Okinawa in June. These aircraft were not in good shape with both having struggled into Clark AB, on one engine to make emergency repairs, prior to finally making it to Bien Hoa. Not long after, the Jungle Jims received four Helio U–10A (modified L-28A) Super Couriers. This meant by January of 1963 the total unit strength stood at 24 aircraft. This represented roughly 40% of all the USAF aircraft in South Vietnam. Importantly, this meant the Jungle Jims could reach any target in South Vietnam from Bien Hoa. Nonetheless, officials sent three B–26s north to be stationed at Pleiku hoping this would decrease their response time. In February 1963, the unit numbers increased again with the arrival of more B–26s and T–28s. Briefly, some B–26s were based at Da Nang.[55]

On April 1, 1963, leadership at Bien Hoa reported "the number of personnel had more than doubled, to around 350, but there was still only one air crew available for each aircraft." In addition, there were two RVNAF squadrons, which had AD–6s and T–28s. Even so, the USAF aircraft made up "the only dedicated air strike capability in South Vietnam." Planners determined they needed additional aircraft to strengthen Farm Gate's number of Invaders on hand. Ultimately, this included RB–26Ls. Three other reserve B–26s were being kept in other parts of the Pacific Air Forces (PACAF) area of responsibility (AOR). Despite the apparent urgency, they did not reach their target number until the middle of 1963, and then only briefly. As Farm Gate neared the end of its official tenure, their numbers shrank "due to the increasing aircraft losses during the year and the need to rotate aircraft to Taiwan for maintenance."

The previously cited 1963 report entitled "'Tactical Analysis of B/RB–26 Aircraft in Republic of Vietnam," had one section that "listed the various types of COIN missions undertaken in Vietnam and analyzed the strength and weakness of the B–26 in each one." Both Whitcomb and later, Rossel, summarized the frequency of each kind of mission flown. The percentage of uses for the B–26s in the first quarter of 1963, came to 40% interdiction; 18% Close Air Support; 15% Air Cover; 13% Photo Reconnaissance, with about 3/4th of these not completed due to low cloud ceilings; 9% Escort; and 5% was Armed Reconnaissance.[56]

Carrying a Heavy Load

It should also be noted, "The B–26 could theoretically carry a total of 7,500 pounds of disposable armament. But in Vietnam they seldom carried more than 6,000 pounds, and usually even less." As the tactical analysis report stated, "One reason was the condition of the runway at Bien Hoa. Up to April 1963, when a 10,000-foot concrete runway was built, their flightline was only 5,300 feet long and consisted mainly of deteriorating pierced steel planking. Since many of the strike missions were carried out in mountain terrain, it was also important to have the extra climb performance given by a lighter load." In fact, "A typical ramp alert ordnance load consisted of two 500-pound napalm bombs and two LAU 3A 2.75-inch rocket launchers under the wings, plus six 100-pound General Purpose [GP] bombs and six 120-pound frag clusters in the bomb bay." In addition, the bomber's defensive ordnance consisted of 350 rounds of .50 ammunition in each nose gun. The total ordnance load was, thus, about 4,000 pounds. Alternative loads might include "six napalm bombs under the wings and twelve frag clusters in the bomb bay or two rocket pods and four 500-pound GP bombs under the wings, and six more in the bomb bay."[57]

Significantly, "the minimum release altitude for bombs was usually 1,600 feet, with a pull-out altitude of 1,000 feet to avoid bomb blast damage. Bombs were normally delivered in steep dives, and conventional straight and level bombing missions were rarely, if ever, flown." In addition, "rockets and guns were fired at considerably lower altitudes, while napalm was dropped as low as 50-200 feet. A major problem was the two G [gravity] load limitation imposed on seven of the Farm Gate B 26s after it had been discovered that the original waist gun optic sight mount, replaced by a plywood floor during previous IRANs, had been part of the load bearing structure of the fuselage. Most of the ordnance delivered by these aircraft, therefore, had to be released at a high altitude, to permit a 'gentle' recovery."[58]

Leaving or Not?

With the official decision by senior U.S. civilian and military leadership to begin the withdrawal of their military aircraft in the late summer of 1963, it appeared the U.S. had had enough. However, the total collapse of the Diem regime which culminated in his assassination on November 2, 1963 as well as VC successes on the battlefield, and the murder of President Kennedy on November 22, 1963, caused America's new leaders to postpone departure plans. As Vice President Johnson eased into his new role as President, the U.S. became convinced "the Viet Cong were wholly dependent on aid and control from Hanoi, despite intelligence analyses to the contrary." As a result, "a program of covert operations against North Vietnam was put into action in February 1964, to put pressure on Northern leaders. As it turned out, these activities failed to have any real effect."[59]

On March 17, 1964, President Johnson ordered the development of new plans that, "included bombing raids against military and possibly also industrial targets in

Dropping Napalm Cannisters on an enemy target in late 1964.

North Vietnam, to be carried out by the RVNAF and by Farm Gate, the latter reinforced for this purpose by three squadrons of B–57s to be flown in from Japan." These proposals "were never carried out and it was not until a year later that the first USAF bombing," designated "Rolling Thunder," began.

In fact, "even if the plans had been implemented immediately, it would have made little difference to Farm Gate." Their time had run out, especially for the B–26s. "The heavy underwing loads used by Farm Gate imposed high negative G forces on the wings when taxiing the aircraft on the bumpy airfields in Vietnam, and the structures were becoming increasingly fatigued." As the Tactical Analysis Report, mentioned, "The fact that the aircraft were used as dive bombers did not help either, especially as the aircraft initially had no G meter to tell the crew how many Gs they were pulling. After a B–26 had lost a wing during a mission on August 16, 1963, strict limitations were placed on just how hard aerial maneuvers could be allowed during combat sorties." This became even more obvious during a February 11, 1964 fire power demonstration at Eglin AFB's range 52 "when Captains Herman S. Moore and Lawrence L. Lively were killed in B–26B T/N 44-35665." Tragically, the "left wing of their aircraft separated during pull out from a strafing run." With this object lesson facing them leadership made the decision withdraw these B–26s from combat.[60]

This event having occurred in the United States almost immediately made it big news. Indeed, "when news of this second accident reached Vietnam, one B–26 was airborne on a strike mission. The crew was given orders by radio to return immediately to Bien Hoa, making sure not to put any undue stress on the aircraft on their way back. From that day on, the Farm Gate B–26s were, for all practical purposes, grounded."[61]

As early as November 1963, plans had been developed to convert B–26Bs into B–26Ks, "with the intention of replacing the Farm Gate B–26s during the second half of 1964, but there was no way the old, unconverted B–26s could be kept in service until then. To this end, the remaining aircraft were flown to Clark Field during the first week of April, where they officially" became part of the "Super Sabre-equipped [F-100Ds] 405th Tactical Fighter Wing." In the end, four of the Invaders became part of Congo operations, and two RB–26s were returned to the U.S. and reassigned to Hill AFB, Utah. Ultimately, most of these bombers were scrapped in the Philippines in late 1964 or early 1965.[62]

Some Concluding Thoughts

By the time Farm Gate personnel and aircraft left Vietnam, U.S. involvement had taken on an increasingly full-scale commitment. First, Air Force and Navy attacks on

North Vietnam known as Rolling Thunder had replaced Farm Gate changing American Air Power presence from a covert operation to a conventional airpower campaign. During their time in Vietnam, 16 members of their group died in action while the older aircraft had increasing numbers of structural failures. As events proved, Allied forces in Vietnam needed more modern aircraft to join the U.S. presence while these older weapons systems were withdrawn.

Still, it is worth recalling the role the Jungle Jims played in the early days of America's involvement, since they became the first component in U.S. Air Power's intervention into the war in Southeast Asia. In fact, the official records state that B–26s in 1962 flew 1,140 sorties and 3,674 in 1963. In turn, T–28s flew 1,853 in 1962 and 4,848 in 1963. They killed 3,200 enemy troops in 1962 and 3,256 in 1963. They destroyed 4,000 structures in 1962 and 5,750 in 1963. Lastly, they had sunk 275 boats in 1962 and 2,643 in 1963.[63] All things considered a remarkable record.

In looking back, Farm Gate began as "combat training" unit flying with RVNAF to "legitimize the mission." Of course, Farm Gate was combat in every sense of the word. Officially, it lasted from October 1, 1961 to July 28, 1963. In fact, Jungle Jims remained in Vietnam well into 1964. By the time all its planes and personnel had returned home, America had a new President, Lyndon B. Johnson and she had fully committed to fighting the war in Vietnam with its front-line "uniformed" forces.[64]

Even so, more than 60 years later, the traditions and essence of Farm Gate have evolved into to today's Air Force Special Operations Command, headquartered at Hurlbert Field, where the 4400 CCTS Jungle Jims trained in the early 1960s. Indeed, from World War II to Korea and Vietnam, Air Commandos have fought in all of America's wars—often in very different ways.[65]

The Farm Gate Logo on the back of a Kennedy Half Dollar

As the renowned author and decorated Air Force Vietnam veteran Darrel Whitcomb wrote: "Farm Gate can now be seen for what it really was, the first step in a very long war. One can fix the exact date of its start. In a real sense, however, it had no precise end date. Farm Gate simply was absorbed into the larger U.S. war effort. … During its official life, however, the outfit spawned 11 different squadrons, several wings and groups, and the Special Air Warfare Center, which inherited the original Jungle Jim mission."[66] ■

NOTES

1. Landsdale was a career Air Force officer who retired in 1963 as a major general and then, worked for the CIA. In the early 1950s he had played a key role in suppressing the Philippine Huk Rebellion. In 1954, he went to Saigon to establish the U.S. Military Mission. He was a firm believer that America could defeat insurgents by use of "psychological tactics" or "winning the hearts and minds of the people." This COIN theory was embraced by both Presidents Kennedy and Johnson. His most famous book was *In the Midst of Wars* (New York: Harper & Row, 1972).

2. One truly excellent article on this topic is by Darrel Whitcomb, "Farm Gate," *Air & Space Forces Magazine*, Dec. 1, 2005, http://www.airandspacefores.com/article/1205farmgate/, [hereafter Farm Gate]. A particularly significant report on Farm Gate is a synopsis also by Darrel Whitcomb on the Special Operations web page. It includes an official 1963 report entitled, "Tactical Analysis of B/RB-26 Aircraft of Vietnam," https://napoleon130.tripod.com, [hereafter *Whitcomb Synopsis*].

3. Another well written piece on Farm Gate is by John T. Correll, "The Air Force Enters the Vietnam War," *Air & Space Forces Magazine*, May 5, 2022, [hereafter USAF in Vietnam]; The official account of the early days of the Air Force in Vietnam was written by Jacob Van Staaveren, *USAF Plans and Policies in South Vietnam, 1961*, (Washington, D.C.: USAF Historical Division, Liaison Office, June 1965), [hereafter *USAF Plans and Policies*]. A contemporaneous article is by Col. Robert D. Johnston, "The Invader Returns," *Air University Review*, Vol. XV, No. 1 (November-December 1963), pp. 9-22.

4. Air Force Historical Support Division, "Col. Benjamin H. King in Vietnam, 1961," Official USAF Website, no date; Article by Veteran Tributes, "Brig. Gen. Benjamin H. King," no date, https://www.veterantributes.org/TributeDetail.php?recordID=1704.

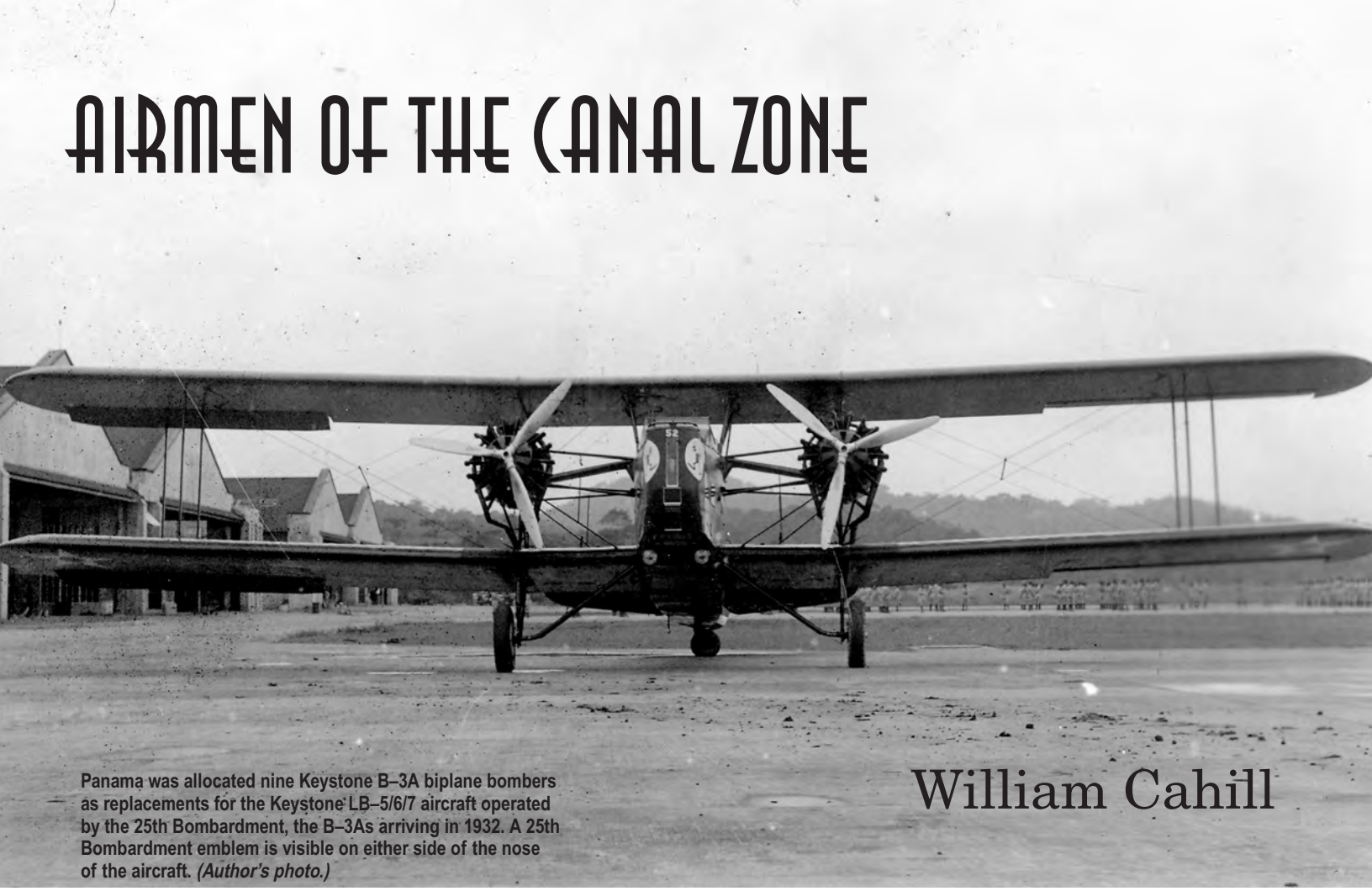
5. *Whitcomb Synopsis*; King Bio; John T. Correll, "The Air Force Enters the Vietnam War," *Air & Space Forces Magazine*, May 5, 2022, [hereafter USAF in Vietnam].

6. Robert Frank Futrell, with Martin Blumenson, *The United States Air Force in Southeast Asia: The Advisory Years to 1965*, (Washington, D.C.: Office of Air Force History, USAF, 1981), [hereafter Advisory Years].

7. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic thinking in the United States Air Force, 1961-1984*, (Maxwell AFB, Alabama: Air University Press, December 1989), pp. 207-208, [hereafter Ideas, Concepts, Decisions]. A study worth looking at is a graduate thesis from the School for Advanced Airpower Studies (SAAS), by Major John W. Doucette, "United States Air Force Lessons in Counterinsurgency: Exposing Voids in Doctrinal Guidance," (Maxwell AFB, Alabama: SAAS, 1999). The part

most relevant to Farm Gate are pages, 16-38, [hereafter Lessons in Counterinsurgency].
8. Futrell, *Ideas, Concepts, Doctrine*; Correll, *USAF in Vietnam*.
9. Correll, *USAF in Vietnam*; Van Staaveren, *USAF Plans and Policies.*
10. Correll, *USAF in Vietnam*; Van Staaveren, *USAF Plans and Policies*; *Whitcomb Synopsis*.
11. Correll, *USAF in Vietnam*; Van Staaveren, *USAF Plans and Policies*; Reference, by American Airpower Museum, "North American AT-28D-5 'Nomad' MK 1," https://www. americanairpowermuseum.com/.
12. Darrell Whitcomb, "Farm Gate," *Air & Space Forces Magazine*, Dec. 1, 2005; Correll, *USAF in Vietnam*.
13. Col. Robert L. Gleason, *Air Commando Chronicles*: *Untold Tales from Vietnam, Latin America, and Back Again*, (Lawrence, Kansas: Sunflower University Press, 2000), [hereafter *Commando Chronicles*]. Chapters 1 through 8, pp. 15-140, covers Farm Gate, the key individuals, and events the Jungle Jims faced.
14. Gleason, *Commando Chronicles*.
15. Whitcomb, "Farm Gate;" Article, na, "This Day In History: The First Sorties in Operation Farm Gate Are Flown," https://historycollection.com/day-history-first-sorties-operation-farm-gate-flown-1962/; Van Staaveren, *USAF Plans and Policies*.
16. Correll, *USAF in Vietnam*.
17. Futrell, *The Advisory Years*.
18. Memo for record, by Roger Hilsman, Director of the Bureau of Intelligence and Research, [is farm gate being used correctly?], March 19, 1962, Office of the Historian, Foreign Relations of the United States, 1961-1963, Volume II, Vietnam, 1962.
19. For more on FAC operations, see Jan Churchill, *Hit My Smoke! Forward Air Controllers in Southeast Asia*," (Lawrence: Kansas: Sunflower Press, 1997), [hereafter *FACs in SEA*]; Van Staaveren, *USAF Plans and Policies*; Correll, *USAF in Vietnam*.
20. Whitcomb, "Farm Gate;" Van Staaveren, *USAF Plans and Policies*.
21. Futrell, *Advisory Years*; Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*; Gleason, *Commando Chronicles*.
22. Futrell, *Advisory Years*; Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*.
23. Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*.
24. Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*.
25. Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*.
26. Correll, *USAF in Vietnam*.
27. Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*.
28. Correll, USAF in Vietnam; Gleason, *Commando Chronicles*.
29. Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*; Gleason, *Commando Chronicles*.
30. Futrell, *Advisory Years*; Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*; Gleason, *Commando Chronicles*.
31. Futrell, *Advisory Years*; Correll, *USAF in Vietnam*; Van Staavern, *USAF Plans and Policies*; Gleason, *Commando Chronicles*.
32. Gleason, *Commando Chronicles*; Van Staaveren, *USAF Plans and Policies*.
33. Van Staaveren, *USAF Plans and Policies*; Futrell, *Advisory Years*; Correll, *USAF in Vietnam*.
34. Van Staaveren, *USAF Plans and Policies*; Doucette, *Lessons in Counterinsurgency*; Gleason, *Commando Chronicles*.
35. For a detailed study of the battle of Ap Bac, see William P. Head, "The March to Oblivion: The Defeat at Ap Bac Hamlet and the Americanization of the Vietnam War," *Journal of Third World Studies* (now *Journal of Global South Studies*, (Fall 2014), Vol. 31, No. 2, pp. 57-81.
36. Van Staaveren, *USAF Plans and Policies*; Doucette, *Lessons in Counterinsurgency*; Gleason, *Commando Chronicles*.
37. Whitcomb, "Farm Gate;" Van Staaveren, *USAF Plans and Policies*; Futrell, *The Advisory Years*; Correll, *USAF in Vietnam*. A truly excellent source for Farm Gate in 1960-1961 can be found in Kenneth H. Williams, *The U.S. Air Force in Southeast Asia, and the Vietnam War: A Narrative Chronology*, Vols. I, *The Early Years through 1959*, (Washington, D.C.: Air Force History & Museum Program, 2019) and Vol. II, *1960-1961*, (Washington, D.C.: Air Force History & Museum Program, 2020).
38. Futrell, *Advisory Years*; Correll, *USAF in Vietnam*; Whitcomb, "Farm Gate;" Van Staaveren, *USAF Plans and Policies*.
39. Van Staaveren, *USAF Plans and Policies*; Gleason, *Commando Chronicles*.
40. Van Staaveren, *USAF Plans and Policies*; Churchill, *FACs in SEA*; Gleason, *Commando Chronicles*; Doucette, *Lessons in Counterinsurgency*. Also see, Anthony B. Carr, "America's Conditional Advantage: Air Power, Counter Insurgency, and the Theory of John Warden," Thesis for the School of Advanced Air and Space Studies, Air University, Maxwell AFB, AL, June 2009, pp. 71-94.
41. Whitcomb, "Farm Gate;" Van Staaveren, *USAF Plans and Policies*; *Whitcomb Synopsis*.
42. Eugene Rossel, "*Project Farm Gate*, Vietnam 1961-1964," *Air Commando Association*, no date, aircommando1@eathlink.net. Original from Col. (then Capt.) Roy Dalton, personal unpublished diary, no date, [hereafter *Project Farm Gate*]. This truly a valuable resource.
43. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
44. Van Staaveren, *USAF Plans and Policies*; Doucette, *Lessons in Counterinsurgency*; Gleason, *Commando Chronicles*; Rossel, *Project Farm Gate*; *Whitcomb Synopsis*. The L–28 was designated the "Courier" and was a product of Helio Aircraft Company, Pittsburg, Kansas. Roughly 500 were produced between 1954 and 1974. It was used mostly as an observation/spotter plane in Vietnam. The AD–6 Skyraider was a single propeller-driven fighter and attack aircraft. It was built by Douglas Aircraft Company.
45. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
46. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
47. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
48. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
49. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*; Gleason, *Commando Chronicles*.
50. *Whitcomb Synopsis*; Gleason, *Commando Chronicles*.
51. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
52. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
53. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*.
54. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*; Van Staaveren, *USAF Plans and Policies*.
55. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*; Van Staaveren, *USAF Plans and Policies*; Mark Clodfelter, *Vietnam in Military Statistics: A History of the Indochina Wars, 1772-1991*, (Jefferson, North Carolina: McFarland & Company, 1995), [hereafter *Vietnam in Military Statistics*].
56. Rossel, *Project Farm Gate*; *Whitcomb Synopsis*; Van Staaveren, *USAF Plans and Policies*.
57. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*.
58. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*.
59. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*. Gleason's book *Commando Chronicles* also mentions many of these same facts.
60. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*. For details of the end of Farm Gate, see Van Staaveren, *USAF Plans and Policies*.
61. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*.
62. *Whitcomb Synopsis*; Rossel, *Project Farm Gate*.
63. Van Staaveren, *USAF Plans and Policies*; Clodfelter, *Vietnam in Military Statistics*.
64. Futrell, *Advisory Years*; Corell, *USAF in Vietnam*; Rossel, *Project Farm Gate*.
65. Correll, *USAF in Vietnam*.
66. Whitcomb, "Farm Gate."

AIRMEN OF THE CANAL ZONE

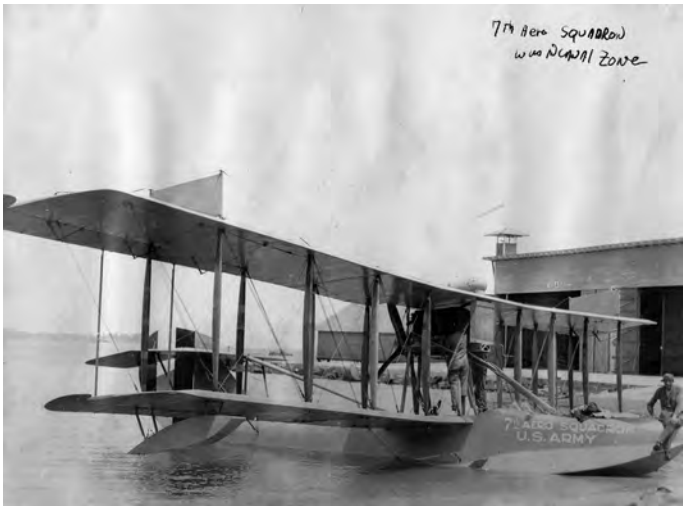


Panama was allocated nine Keystone B–3A biplane bombers as replacements for the Keystone LB–5/6/7 aircraft operated by the 25th Bombardment, the B–3As arriving in 1932. A 25th Bombardment emblem is visible on either side of the nose of the aircraft. *(Author's photo.)*

William Cahill

The Isthmus of Panama, lying nearly east-west, is split by a range of mountains that influence weather patterns and contribute to frequent low ceilings. There are few level areas except to the far west along the southern coast, with the majority of the terrain between the mountain range and the coast cut up by rocky gullies and ravines. The dry season runs from December 15 to April 15 and has good flying conditions, with little rain. The rest of the year has scattered rain showers, many severe, and averages 100 inches per year.[1] After a French company failed in its attempt to build a canal across Panama, a province of Columbia, the United States took charge of the effort. In 1903 the United States, having failed to obtain from Colombia the right to build a canal across the Isthmus of Panama, sent warships in support of Panamanian independence from Colombia. This being achieved, the new nation of Panama ceded to the Americans the rights they wanted in the Hay–Bunau-Varilla Treaty, which allowed for the construction of the Panama Canal by the United States. The Panama Canal Zone was located within the nation of Panama, consisting of the Panama Canal and an area generally extending 5 miles on each side of the centerline and including artificial lakes but excluding the cities of Panama City and Colón.

Overseeing the construction of the Canal since 1907, in 1910 the US Army conducted an on-site survey of necessary fortifications to defend the Canal Zone from external threats. Defense construction started in 1911 and that October the 10th Infantry Regiment arrived to form the nucleus of a mobile defense force. Initially known as the Panama Canal Guard, on June 26, 1917 Army forces were aligned under the newly created Panama Canal Department and charged with the defense of the Canal Zone including land areas, coastal defenses, air defenses, and sea defenses within medium bomber range. On April 9, 1915 the Signal Corps decided to organize three companies for service overseas, one each for the Philippine Department, the Hawaiian Department, and the Canal Zone. By June estimates were in hand for construction costs to build out the overseas bases, with Panama projected to cost $175,000 for barracks, quarters, a machine shop, and storehouse. Initial fielding of overseas aircraft was planned by the end of 1915, with Panama projected to get its garrison by mid-1916.[2] This timeline did not sit well with Brig Gen Clarence Edwards, commander Panama Canal Department. On August 12, 1915 he appealed to have the Panama Aero Company at the earliest practicable moment, stating aircraft were essential to the defense of the Panama Canal Zone. Maj Gen Leonard Wood, Commanding General of the Eastern Department, favorably endorsed the project and increased the unit to a squadron.[3] Initial construction took place in 1916 at Fort Sherman, located on Toro Point at the Caribbean (northern) end of the Panama Canal, and was composed of five temporary wood structures including one hangar and a machine shop.[4]



A 7th Aero Squadron Curtiss HS–2L boat undergoing engine maintenance at France Field circa 1920-1922. The HS–2L served briefly after the Great War until the 7th Aero commander decided that flying boats were "not being needed at this station." *(Photo courtesy of Eric Willhite.)*

By December 1916 seven squadrons either had been established or were to be organized, with the 7th Aero Squadron planned for Panama. On January 9, 1917, Capt H. H. "Hap" Arnold was relieved from duty at the Signal Corps Aviation School in San Diego and ordered to Panama to organize and command the 7th Aero Squadron. On February 25, 1917 51 airmen at the Signal Corps Aviation School in San Diego were assigned to the nascent 7th Aero, arriving at the Isthmus on March 28, 1917. There was no preparation for the arrival of the troops and no quarters available, with the troops initially living in old and condemned buildings.[5] Joining the 7th Aero in Panama was Maj C. W. Russell, who replaced Arnold who departed Panama in April for assignment in the Office, Chief Signal Officer. The command moved to Fort Sherman in August 1917 and two Curtiss R–4 land planes were assigned to the squadron, using an enlarged parade ground as a landing field and a small canvas hangar to house the aircraft. In October the squadron flew fifteen flights with its two aircraft and received its third squadron commander in seven months, Maj Walter Wynne.[6]

Aviation requirements for defense of the Panama Canal had evolved since the arrival of the 7th Aero Squadron in Panama. After the declaration of war against Germany on April 6, 1917 a study of aircraft requirements for coastal defense noted it was unnecessary to supply new aircraft to the Philippines until after the current hostilities. Hawaiian requirements increased from one to three squadrons of aircraft and one balloon squadron, while Panama grew to four squadrons of aircraft and one of balloons.[7] The Panama force requirement was informed by a memo from the 7th Aero Squadron commander Captain Arnold, who recommended two seaplane ("hydroplane") squadrons, one pursuit squadron, one reconnaissance squadron, and six captive balloons to fulfill three missions: over water reconnaissance in conjunction with coast defenses; aerial defense of the Canal; and land reconnaissance for mobile forces.[8] Original plans called for the 7th Aero to operate seaplanes from Miraflores Lake but Panama Canal officials vetoed it out of concern for Canal traffic. In February 1918 construction started on an airfield for the 7th Aero Squadron at the Atlantic entrance to the Panama Canal along the eastern banks of Mansanillo Bay, directly across the bay from Colon. Originally part of Coco Solo Naval Station, the base consisted of two segments of filled swamp divided by a deep bay used for seaplanes with hydraulic fill from the dredging of the seaplane harbor creating a surface for a landing field. While under construction the new field was named "Coco Walk."

In March 1918 the 7th Aero moved to Coco Walk, though the squadron continued to conduct flight operations with the two R–4s from the parade grounds at Fort Sherman.[9] In late 1917 two Curtiss R–6s, a US Navy two-seat floatplane, were shipped to Panama.[10] In January 1918 ten Curtiss R–9s were transferred from the Navy to the Army and shipped to the 7th Aero, though the squadron never listed more than seven R–9s in inventory. The R–9 was a dedicated two seat floatplane bomber version of the R series, similar to R–6 but with crew positions reversed so pilot sat in front cockpit and observer in rear. The Navy R–9s arrived March 20, 1918 and 7th Aero pilots were building experience on their new charges as maintenance personnel assembled and repaired the aircraft. Soon the squadron was ready to join the war effort and on May 15, 1918 commenced tri-daily patrols of the Atlantic coastal waters adjacent to the entrance of the Canal searching for German submarines.[11]

In June the US Navy began anti-submarine patrols and at a joint conference it was decided to coordinate flight operations. This was in accordance with a March 12, 1918 Joint Army-Navy Board decision that the Army Air Service would cooperate with Navy over the ocean for fire control, scouting, and for offensive measures when the enemy was in the vicinity of the coast.[12] By mid-June 1918 the 7th Aero had eleven aircraft, with five R–9s, one R–6 and one R–4 in commission and one R–4, one R–6 and two R–9s out of commission or unassembled. None of these aircraft were equipped with machine guns, driving a request to Washington for machine gun-armed JN–4HG's and shipment of plans and machine gun mounts to change the rear cockpit of R–6 from pilot to gunner (effectively making the aircraft an armed R–9).[13] Two JN–4HGs had arrived in Panama in late June, with one in commission by the end of the month.[14]

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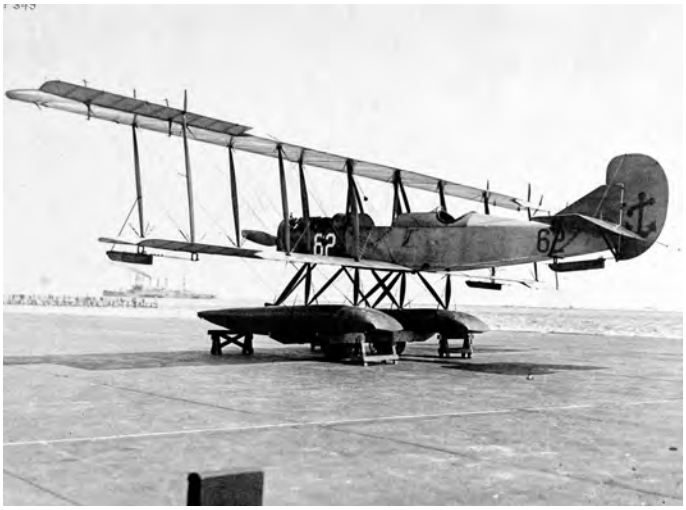


A Curtiss R–6 seaplane poses on the ramp at Pensacola, FL on June 29, 1917. In late 1917 four Curtiss R-6s were delivered to the Signal Corps Aviation School at Chandler Field, PA. Two were subsequently shipped to 7th Aero Squadron and served with similar R–9 aircraft for the first few years of the squadron's existence. *(USN Naval History & Heritage Command.)*

Flying in Panama had its challenges, among them unforgiving weather and few places to crash land an aircraft. DH-4B AS s/n 24-85 is recovered after crashing into Gatun Lake on October 7, 1927. *(AFHRA via George Cully.)*

7th Aero patrols were flown in conjunction with coast defense forces, with either an Army or Navy aircraft in the air during daylight hours until November 11, 1918.[15] Flights were split into five 1.5 hour patrols alternating between Army and Navy flight coverage. These patrols were flown with two aircraft and formed a triangle covering 100 square miles in the main shipping channel. Once a week exercises were held with US Navy submarines. By August 1918 a portion of the fill at Coco Walk had dried sufficiently to permit occasional flights, the landing field featuring turf atop a coral base to provide drainage. The field was proving to be ill-suited for flight operations as the prevailing winds forced pilots to use the narrowest portion of the landing ground that was bounded by water, swamp and structures.[16] Three Curtis HS–1L flying boats were received in late August 1918 with one in commission by mid-September, just in time as the R–9s were getting worn out and engine spares were lacking.[17]

Post-Armistice and Peacetime Drawn Down

Post-Armistice, daily patrols ceased and flying was reduced to routine training combined with aerial surveys and photographic missions in support of Canal Zone engineers.[18] By December 20, 1918 France Field had eight permanent structures including a machine shop and a technical storehouse, three temporary hangars for seaplanes, and fifteen buildings, mainly quarters and barracks, under construction. The number of aircraft in commission was reduced to two Curtiss R–9s, four JN–4H and two HS-1Ls. Two R–9s and one HS–1L were in reserve and three R–9s were stored.[19]

As Air Service staff in Washington cast about for focus and direction post-hostilities, 7th Aero commander Maj Loring Pickering offered his views on the topic of Panamanian aviation in January 1919. He believed one observation squadron equipped with six N9H for controlling coast artillery, four HS–2L for coastal reconnaissance, and six DH–4s and two JN–4Hs along with a photographic section would meet the aviation needs of the Canal Zone; Washington countered with four R–9s, four JN–4Hs, nine DH–4s, and nine HS–2L, with one third of the fleet being kept in reserve.[20] By October 1919 the post-war reality of an Air Service of 12,000 men had dashed prior plans, with the Canal Zone air organization settled as the 7th Observation Squadron under a "to be organized" 3rd Observation Group and a future 12th Photo Section.[21] The 7th Aero Squadron was formally redesignated the 7th Squadron (Observation) in April 1921.[22] In 1921 Balloon Companies 4 and 5 were organized at Brooks Field, Texas for service in the Canal Zone, but the balloon companies became victim of post-war downsizing and were dis-established on June 12, 1922 before leaving the States.[23]

On June 4, 1919 Brig Gen William Mitchell, as Chief of Training & Operations Group, penned a note to the Department Air Service Officer in Panama requesting he "study and develop locally methods for observations in connection with coast defense artillery" because "no serious effort" had been made in the past on this topic. Mitchell broke the problem into two phases – the location and tracking of the target and the observation of fire on the target.[24] By 1920, the War Department outlined the threat to the Panama Canal as enemy "airplane carriers" housing "30 to 50" airplanes capable of striking the Canal Zone with little warning. [25] A "Plan of Operations for the Aerial Defense of the Canal Zone" was published which outlined the need for air power to be able to operate over both the interior of Panama as well as the sea approaches. This operational need drove the requirement to locate emergency landing fields for future operations as well as equip a force capable of performing these missions.[26]

While Washington dabbled with future plans, the airmen in Panama moved on with normalizing flight operations in the Canal Zone. Coco Walk was officially designated

France Field on July 15, 1919, named for 1Lt Howard France, the first pilot to lose his life in the Canal Zone.[27] In July 1920 the Philadelphia Navy Yard was directed to ship five Curtiss HS–2L flying boats to France Field.[28] While the HS–2Ls eventually shipped in late 1920, De Havilland DH–4 aircraft arrived in a flood in the spring and summer 1919, replacing the now obsolete Curtiss landplanes.[29] At least 139 DH–4s were received, with the vast majority going into storage. Overseas Air Service bases in Panama, Hawaii and the Philippines received a "lifetime" supply of airframes to make up for the vagaries of ocean transport and to allow for a wartime reserve; as an example, on June 14, 1921 France Field had six DH–4s in commission and 133 in reserve. The concept of "war reserve" airframes was quickly dispelled; the tropical climate wreaked havoc on the wood frame and fabric covering and put to death the myth that these aircraft could be rapidly restored to flight.[30]

In 1919, work started to make France Field a permanent installation. Three steel hangars were constructed for seaplane use and money allocated to improve the landing field and adjacent areas with additional fill and top soil seeded for sod.[31] France Field's landing field would be a constant source of problems for the Canal Zone aviators, with leveling work and draining continuing for the field's first decade of existence. In mid-1924 work started on extending France Field with hydraulic fill, the field extending southward into the bay and covering 86 acres.[32] With the problems of France Field in mind Panama airmen had cast about for another operational base and settled on a swampy tidal basin near Balboa, the Canal Zone capital, that had received dredged fill since 1915. When the area was selected as a landing field in 1922 it was covered with top soil, though drainage problems persisted with heavy downpours leaving the field under 2-3 feet of water.[33]

As the post-war reorganization fights wound down, a force structure was finalized for Panama. Two squadrons were identified to move to the Canal Zone to grow the 3rd Observation Group, organized on September 30, 1919 and re-designated the 6th Observation Group in 1921 and the 6th Composite Group the following year. The 24th and 25th Aero Squadrons were reconstituted at Mitchell Field, NY on October 1, 1921 as the 24th Squadron (Pursuit) and 25th Squadron (Bombardment). There were no regularly assigned aircraft at Mitchel Field, the time there spent organizing and training. Both squadrons departed for France Field the afternoon of April 22, 1922 aboard the US Army Transport (USAT) *Somme*. A week later, the transport docked and the airmen moved into France Field. Construction of facilities for the new squadrons had started six months prior, with additional officers' quarters, barracks, and steel hangars nearly complete by mid-May. The runway, a perennial source of trouble, had witnessed extensive work over the past year with a red clay surface being added over the coral base by a fleet of steam shovels.[34]

As new units arrived, command was shuffled at France Field. In March 1921 Maj Millard Harmon was reassigned to Washington, replaced by Maj Raycroft Walsh. After arrival, the airmen of the new squadrons had their abilities

Loening COA–1 undergoing maintenance inside a hangar at France Field, circa 1928. In February 1926 two Loening COA–1 amphibians were shipped from the factory to France Field. Though originally allocated against a requirement for rescue work, the 7th Observation also used them for coastal trips and flights to islands. ***(AFHRA via George Cully)***

assessed – with Maj Walsh unimpressed with what he saw. The airmen with the greatest aptitude were put into training with classes in machine shop, engine overhaul, and aircraft maintenance to get the recruits ready to support flight operations. Also bothersome to Walsh was the lack of equipment for the two squadrons, he being under the impression that existing policy required the units to transfer with equipment. Walsh convened a local board that recommended MB–3A aircraft for the 24th and Martin bombers for the 25th and in the interim he issued the squadrons DH–4Bs.[35] After becoming settled in Panama, the squadron designations changed on January 25, 1923, the 7th Squadron (Observation) being redesignated the 7th Observation Squadron, the 24th Squadron (Pursuit) the 24th Pursuit Squadron, and the 25th Squadron (Bombardment) the 25th Bombardment Squadron. Maj Walsh moved to Quarry Heights, Canal Zone in August 1923 to become the Department Air Officer, replaced at France Field by Maj Follett Bradley.[36]

Flight Operations through 1925

The airmen in Panama disregarded the machinations in Washington concerning their force structure and set about learning how to integrate air power into Army operations in the Canal Zone. As would be the task of an observation squadron, the 7th Observation focused on working with department engineers in performing photo surveys of the Canal Zone for use in map making. In a typical week of survey support, a DH–4 could photograph approximately thirty square miles and during the "dry season" could aid in the making of six photographic maps. HS-1L and HS–2L flying boats performed similar missions along the coast of Panama, with flying boats venturing to the Perlas Islands situated about 30 miles off the Pacific Coast of the Canal Zone and down the coast to Colombia.[37]

In November 1918 the Panama Canal Department convened a board to recommend landing fields between France Field and Balboa with the intent to have landing fields

Flight line at France Field, circa 1927. Two DH –4Bs and white painted Cox-Klemin XA –1 ambulance in foreground facing two DH –4Bs and a probable Eberhart S.E.5e. In the mid-1920s aircraft types rapidly rotated through Panama, though the DH –4B was a constant for close to a decade. ***(AFHRA via George Cully)***

Loening OA–1A "ST. LOUIS" from the 1926-1927 Pan-American Good Will Flight taxiing past a DH–4 at France Field. The Pan American Good Will Flight used five OA–1As to promote American diplomatic and commercial ties with Central and South America as well as forge aerial navigation routes. ***(AFHRA via George Cully)***

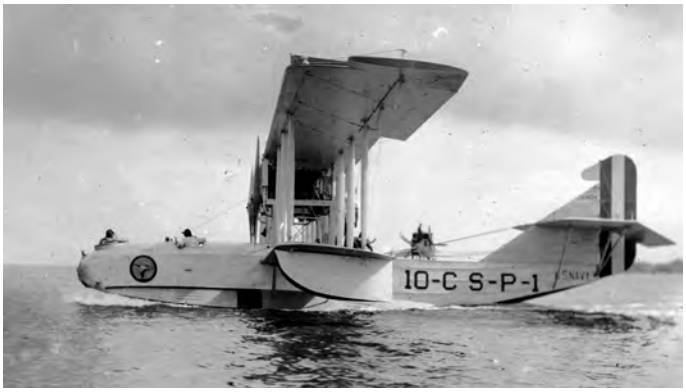
every 12 miles across the Canal Zone. Reconnaissance flights with DH–4s and JN–4s aided in locating landing fields for maneuvers and emergency, locating eleven fields considered relatively easy to put into use with an additional two requiring more effort.[38] Once the fields were constructed, they were flown to on a regular basis both to familiarize pilots with their location as well as to check on their status. By early 1921 the first emergency landing field was completed, located near Camp Clayton, and was put to use within one week of completion! By the start of the wet season in April 1921 there were at least six operational landing fields, though Panama's heavy precipitation caused some fields to be under water! The development of emergency landing fields continued throughout the 1920s, and by December 1927 emergency landing fields were in regular use at Pennonome, Chame, David, and Calobre.[39]

The 7th Observation also trained for infantry contact missions in the dense jungle. In February 1920 initial work was done with the First Battalion, 33rd Infantry Regiment and in April liaison was maintained with two companies of the 33rd Infantry during a 10 day reconnaissance hike through the jungle west of Gatun Lake and along the Chagres River. Messages were sent to aircraft via artillery panels and supplies dropped to support the troops. Interesting as missions supporting soldiers in jungles may be, the real reason airmen existed in Panama was to defend the Canal from enemy naval forces. Coast artillery fire adjustment commenced in 1920 and soon followed a seasonal cycle. Support to the coastal defenses started towards the end of wet season, usually in September or October, and lasted for approximately four months. Airmen of the 7th Observation assisted in spotting shots for forts on both the Atlantic and the Pacific side of the Canal Zone. Pilots and observers would also aid firing missions by patrolling the firing zone, looking to alert unknowing boats of the danger they were approaching. Assistance was also given to anti-aircraft batteries with altitude measurement missions. Though radio sets were available they were in poor condition due to age and environment, causing the crews to switch to dropping messages and reading ground panels for communication. The coast defense training period would usually culminate in a week long exercise against an adversary fleet where the 7th Observation spotted for coast artillery and flew coast reconnaissance missions.[40]

The wet season, starting at the end of April, precluded work with infantry and artillery and made most cross-country flying difficult due to rain. Since the rain was generally in the afternoon, short morning flights could still be flown either for pilot proficiency, maintenance, or searching for new landing fields. Maintenance personnel also took advantage of reduced flight hours to assemble stored aircraft or new aircraft and there was also time to experiment – with the poor performance of radios, when the wet season started in 1920 the squadron conducted tests on releasing carrier pigeons from a DH–4 in flight. This testing and training continued for at least seven months and had limited success; searchlight flashes were also tried to communicate messages to aircraft.[41] Communications would slowly improve, and by 1924 25th Bombardment NBS-1 bombers and 7th Observation DH–4s were fitted with SCR 68 radio sets.[42]

The 24th Pursuit worked to refine operations in the air to air arena, including squadron gunnery practice against meteorological balloons filled with hydrogen. The 24th Pursuit also worked with anti-aircraft units to provide aircraft as targets for tracking exercises. Similarly, the 25th Bombardment slowly trained its personnel in the intricacies of bombing and flight operations in the tropical environment. As the squadrons mastered their individual roles, the group started to exercise their combined airpower functions. All squadrons of the 6th Composite Group participated in an aerial maneuver on September 7, 1923. The 24th Pursuit provided reconnaissance, the 7th Observation provided communications with France Field and the 25th Bombardment made a simulated attack on coastal defenses of the Canal. This expanded to weekly combined maneuvers held during the month of December 1923. The 25th Bombardment dispatched its aircraft seaward for 60 miles before they turned back and came in as "enemy" aircraft to attack the Canal and France Field. 7th Observation aircraft were aloft as an aerial picket, sending a radio message to France Field to launch 24th Pursuit aircraft as soon as the bombers were sighted.[43]

Working with individual components of the Panama Canal Department trained the Panamanian airmen on



A Naval Air Factory H–16 (modified) flying boat preparing to take off from the waters off Panama in the late 1920s. Joint exercises between the Army and Navy of this time period witnessed Navy patrol aircraft such as this joining Air Corps reconnaissance flights in search of "enemy" fleets. ***(AFHRA via George Cully)***

Six P–12B's escort a Ford tri-motor carrying French Field Marshal d'Esperey to France Field in November 1931. The P–12B had arrived a year prior, replacing the Boeing PW–9 in pursuit service in Panama. ***(US National Archives)***

their tactical job while department-level exercises trained the staff on proper employment of assigned squadrons and provided a venue to showcase air power. The first department-level maneuvers involving air power were conducted likely conducted in 1924. A good example of this type of activity was the Annual Pacific Sub-sector Maneuvers for the Panama Division that ran from April 1-10, 1924. The exercise centered on defending the Canal Zone against an enemy landing force. The 6th Composite Group played a major role, starting with 2-3 days of air-ground communications training before the exercise kicked off with the 7th Observation locating, tracking, and attacking "enemy" boats. Three 25th Bombardment Martin bombers accompanied by 7th Observation DH–4s played "red" forces and attacked the canal, driven off by a 24th Pursuit defending force of three MB–3As and three S.E.5s.[44]

Joint Maneuvers involved the Panama Canal Department working with local US Navy units as well as additional deployed Naval forces to protect the Panama Canal against a maritime threat. The adversary, played by the US Navy as well, could be equipped with carriers as well as amphibious forces. The first Joint Maneuver was likely held in February 1923, followed by a Joint Army and Navy Exercise held January 16-17, 1924. The 6th Composite Group partnered with deployed Navy aircraft to protect the Canal from a marauding "hostile" fleet. 24th Pursuit and B Flight, 7th Observation provided the defensive pursuit forces, working with US Navy Vought VE–7s of VF-2 to provide protection for the Canal from 6 AM to 6 PM, with the 7th Observation's longer-range DH–4Bs covering the Pacific side due to Atlantic-side basing of short-range MB–3As. A Flight, 7th Observation was assigned to Panama Air Commander, supporting ground forces and performing reconnaissance missions. The 25th Bombardment was also under the Panama Air Commander and provided long range reconnaissance and strike force against enemy vessels, aided by Navy DH–4Bs of observation squadrons VO–1 and VO–2 and Douglas DT–2s of torpedo squadron VT-2. US Marines in the adversary role landed at Coco Solo the morning of January 17, with delayed reporting coming from a 7th Observation patrol. Soon the Marines were under attack by Air Service NBS–1s, DH–4Bs, S.E.5s, and MB–3As along with USN VO–1 and VO–2 DH–4Bs and VF-2 VE–7s. Air power notwithstanding the Marines captured Fort Randolph and Coco Solo, threatening France Field. The exercise concluded and lessons were cataloged.[45] Exercises like this highlighted the need for the air force in Panama to be equipped with modern and capable aircraft; this would prove to be a challenge through the 1920s and 1930s.

New Aircraft for Panama

Initially the airmen in Panama fared well in the allocation of new equipment and the first generation of aircraft were rapidly replaced at the end of the Great War as the "lifetime supply" of DH–4s in 1919 allowed the 7th Observation to retire its older Curtiss land planes. Similarly, the late 1920 transfer of five HS–2L flying boats from the US Navy allowed the aging HS–1L aircraft to be set aside. Like the DH–4, the HS–2L were assembled as needed, with the aircraft being used for coastal flights and trips out to islands.[46] Almost immediately after receipt of the HS–2L, flying boats appeared to fall out of favor with the 7th Observation. In February 1922 squadron commander Maj Walsh wrote the Chief of Air Service requesting to transfer the HS–2Ls back to the Navy as the "boats [are] not being needed at this station" and the four seaplane hangars were already being converted to engineering shops and barracks. Walsh went on to state "we will not use flying boats at this station under any circumstances at present conceivable to the undersigned (due in great measure to the fact that Naval Air Station is immediately adjoining and specializes on seaplane and flying boat work)."[47] Only one HS–2L was in commission in February 1922; by June all five had joined 130 DH–4 in storage at the local 8th Air Park.

Though the DH–4 was a robust aircraft compared to the frail Curtiss landplanes that had served in Panama, its actual combat capabilities were seen as doubtful. Between 1919 and 1923 the Air Service contracted to have

1,538 DH–4s remanufactured into DH–4Bs by moving the pilot's seat back and the gas tank forward, correcting the most serious problems in the DH–4 design. Of these, 75 were allotted to Panama but the first group of seven DH–4Bs did not arrive until January 1921, with the next allotment of 10 not following until June 1922. Thirty DH–4Bs modified by the Witteman-Lewis Aircraft Co. arrived on October 17, 1923, unfortunately in poor condition due to improper packing and shoddy construction. Two DH–4BP photographic planes were shipped to Panama at the same time as the batch of 10 aircraft in June 1922 and were used for photographic mosaic mapping. The DH–4s would primarily equip the 7th Observation, but would also be used to bulk out other squadron's inventories. The 7th Observation would operate a mix of aircraft until all DH–4Bs were received, with four DH–4, three DH–4B, two JN–4H assigned in May 1922. An inventory of DH–4s in Panama on July 31, 1925 revealed 57 DH–4Bs with 20 awaiting survey and two DH–4BPs. The Air Service was finding deterioration to wooden fuselages in the tropics was very rapid, especially down in the tail section where mud and water collected. Even metal fuselages were apt to rust rapidly in this climate, the only solution being constant care and attention. In October 1922 only 2 of 30 stored DH–4 airframes were worthy of rebuild.[48]

Curtiss JN–4H, either new aircraft acquired for Panama or un-armed JN–4HGs, were used for "stunt flying" (aerobatics) and along with DH–4Bs were issued to the 24th Squadron until their replacement as a pursuit trainer, the S.E.5e, arrived. In 1922 the Eberhart Steel Products Co. received a contract to rebuild 50 of the Air Service's S.E.5a aircraft into S.E.5e pursuit trainers by equipping them with 180-hp Wright-Hispano "E" engines and plywood skin on the fuselage. Six S.E.5e's were shipped to Panama, the first two in late 1922, the remaining four later in 1923. The S.E.5's were followed by the first true pursuit aircraft issued to the 24th Pursuit – the MB–3A. Boeing delivered 200 MB–3A aircraft to the Air Service as an improvement over the flawed Thomas-Morse MB–3. The Air Service distributed the MB–3As to the 1st Pursuit Group at Selfridge Field and the overseas pursuit squadrons in the Philippines, Hawaii and the Canal Zone. Based on the recommendation of Commanding Officer of France Field, two MB–3A were shipped to Panama in February 1923 to determine whether it was feasible to use these aircraft in the Canal Zone. By mid-May 1923 the aircraft had performed favorably in testing and the additional 22 allotted airframes arrived by Naval transport USS *Sirius* in August 1923. By late 1923 the 24th Pursuit was assigned twelve MB–3A, six S.E.5e, and two DH–4B. That October, orders came down from Washington to retire the S.E.5e's assigned to the 24th Pursuit Squadron, though they remained in service at least through the end of 1926.[49]

While the 24th Pursuit was struggling with its aircraft, the 25th Bombardment was swapping out its DH–4B's for Martin NBS-1's. The Martin NBS-1 was an improved version of the Martin MB–1, a scout-bomber built during the final months of the Great War. Also built under contract by Curtiss, LWF and Aeromarine Plane and

Loening OA-1A flying over France Field in August 1927. OA-1s lasted for four years in the rough Panamanian environment before being replaced by Sikorsky C-6A amphibians. ***(US National Archives)***

Motor Company, the Martins were procured for service with the 2nd Bombardment Group and overseas units in Hawaii, the Philippines and Panama. Four Martin bombers built under a contract with Curtiss arrived in Panama in October 1922, part of a larger group of fourteen purchased by the Air Service for use in Panama with the balance delivering in May-June 1923.[50] Within a year, five NBS-1 fuselages in storage were condemned and shipped to the States for repair due to failing glue joints, rusty steel fittings, and damaged aluminum instruments and fittings. Two replacement NBS-1s were received on July 20, 1924 to replace two crashed aircraft.[51] By October 1925 the 25th Bombardment had eight NBS-1s in service and five in storage and characterized the aircraft as "in fair condition and will satisfy our requirements." [52] Even with the Martin bombers in Panama, the 25th would continue to operate DH–4 variants through the end of the decade for training and cross-country flights.

The perpetual task at France Field, maintenance of the landing field, continued into 1924 as dredging from Limon Bay was used to raise and increase the size of the airfield area, but engineers were fighting nature as the landing field slowly continued to settle. Two hangars for the 25th Bombardment were built to house the new Martin bombers.[53] Similar to France Field, the Balboa fill landing field had a troubled youth; in June 1923 it was seen as barely adequate for DH–4Bs and not capable of operating loaded bombers or MB–3A fighters. The 8th Air Park was established in 1922 and unofficially (in the eyes of the Air Service staff in Washington) designated the Panama Air Depot. By 1924 the 8th Air Park was overhauling engines and assembling, overhauling and repairing aircraft. In September 1924 the Air Service recommended all overseas air depots be abandoned; after a visceral response from the overseas departments, the Panama Air Depot was allowed to stay open in an inactive status.[54] The 63rd Service Squadron replaced the 8th Air Park by January 1925, the unit tasked with the assembly, inspection, and overhaul of aircraft as well as test flights before delivery to tactical

squadrons. By 1925, the Air Depot on average was performing three aircraft and ten engine overhauls per month in addition to assembling or repairing five to seven aircraft. On November 11, 1924 the Balboa fill field was designated Albrook Field after Lt Frank Albrook, who had been the Engineering Officer at the field and died within six months of his departure from Panama in an accident at Chanute Field, IL. [55]

1926-1930

Operations

The Air Corps Act became law on July 2, 1926, but other than changing out letterhead flight operations carried on as usual in Panama. Coast artillery support continued to be the center focus of the 7th Observation for four months of every year, with training starting in October. On October 28, 1926 the squadron flew its first night observation mission in support of Fort Sherman, using a radio set to spot fire on a surface target illuminated by a coast artillery searchlight. Six weeks later, the squadron dropped flares to illuminate night targets. Overall, the 7th Observation flew about 10 missions per month supporting coast artillery firing, employing two-way radio communication to talk with artillery troops.

Working with the anti-aircraft forces for the common defense of the Canal Zone was one of the primary missions of the 6th Composite Group in the 1920s. Anti-aircraft tracking exercises centered on Panama airmen providing a straight and level target for anti-aircraft personnel to train on tracking and computing a firing solution. All three squadrons contributed to this exercise, seen as little training value by the airmen. The 7th Observation and 25th Bombardment also did this exercise at night for the benefit of training sound locator and searchlight crews. Target towing involved working with anti-aircraft gun batteries, with the aircraft towing a cloth gunnery sleeve at the end of a long steel cable. While initially done by all squadrons in 1925, the task transitioned to the 25th Bombardment in 1926 and to the 7th Observation starting in 1928. Target towing was conducted off the coast of Forts Sherman and Randolph, with the aircraft pulling gunnery sleeves about five miles off shore. Though the tasking could rotate through different units, there was likely only one or two aircraft fitted with the equipment to tow targets; in 1927 this target tow aircraft was a DH–4B. [56] The culmination of this training was a combined anti-aircraft exercise.

Combined night operations between the 6th Composite Group and the Panama Anti-Aircraft Command were held March 16 – 31, 1927. 25th Bombardment NBS-1s and DH–4Bs planned night attacks on the Atlantic and Pacific locks of the Canal, defended by searchlight batteries and sound locating devices supporting pursuit aircraft and simulated anti-aircraft batteries. Once a bomber was located with the sound locating device, searchlights would be trained on the aircraft and 24th Pursuit PW-9s would dive upon it simulating an attack.[57] A similar follow-on exercise was held April 2-6, 1928, with the exercises merely highlighted the difficulty in night air defense.[58]

Secretary of War Dwight Davis flies in DH–4B #33 over Gatun Lake when crossing the Isthmus of Panama, March 30, 1927. The ubiquitous DH–4B served in all squadrons in Panama in the 1920s and provided loyal service to Canal Zone airmen. ***(US National Archives)***

The 7th Observation, working with the 12th Photo Section, flew mapping flights for the Corps of Engineers at Corozal to complete a mosaic of the entire Canal Zone in 1927. The 7th Observation also flew field artillery, infantry liaison, and Infantry contact missions, in addition to aerial gunnery, low altitude bombing and regular garrison training. Aerial gunnery was done in concert with the "official" start of dry season in January. In addition to supporting defense by simulating attacks or towing targets, the 25th Bombardment continued to expand on training for its primary mission and in January 1927 was authorized to bomb two sunken wrecks in Limon Bay near the entrance to the Canal, the *President Marroquin* and the *Cartagena*. Like the 25th Bombardment, the dry season gave the 24th Pursuit the ability to refine the tactical skills of its pilots through gunnery and bombing practice. Pursuit pilots practiced aerial and ground attack gunnery as well as dropping small bombs from their PW-9s. The squadron also practiced its wartime role of deploying to a forward air base. In the 1927 dry season, the 24th Pursuit flew ten PW-9s and a Douglas C–1C transport to Anton and established a "model camp." A few weeks later this same squadron left on an extended trip to David, near the Costa Rican border. All airplanes encountered enroute were treated as enemy planes and a detailed report was made to Post Operations as to the time, place and outcome of hostile engagements.[59]

Supplementing tactical training were cross-country training missions, with at least one flight carried out every week. One of the additional duties levied upon the airmen was air ambulance, using the recently-delivered Cox-Klemin XA–1 to ferry sick people to the hospital in Panama City. During this time period allocated flying time depended on many variables to include weather, available aircraft, and gas shortages but averaged 40-60 missions totaling 150-250 flight hours per squadron per month. The 6th Composite Group also continued to participate in annual departmental exercises. The 1926 exercise held in January and February was broken into three parts, the first covering airborne forces flying daylight patrols within

The Boeing MB–3A was the first true pursuit aircraft assigned to the 24th Pursuit Squadron. As seen here, the aircraft could be fitted with a bomb rack and used in the ground attack role. ***(US National Archives.)***

10 miles of the coast of Panama, the second phase focusing on defending the Atlantic Sector against the carrier USS Langley and the Scouting Fleet of the US Navy, and the final phase protecting the Pacific Sector from the 'enemy' main fleet and an amphibious assault. The following year the 6th Composite Group earned the praise of Panama Canal Department commander Gen Martin for the unit's day and night long distance reconnaissance and simulated attack upon the naval air force. 1928 departmental exercises featured group aircraft locating the "enemy" and dropping messages to the defending forces.[60]

Joint exercises between the Army and Navy endured as well. The 1927 Joint Exercise ran from March 1 through 4, with Navy patrol aircraft joining Air Corps reconnaissance flights from Albrook Field and David looking for the enemy "Orange" fleet. The "Orange" fleet was spotted the morning of March 2 and re-acquired the morning of March 3. An attack was mounted on March 3, with pursuit aircraft attacking enemy aircraft and the carrier USS Langley while bombers escorted by pursuit planes concentrated on the main enemy fleet. March 4 was devoted to the land portion of the exercise, supported by Air Corps observation aircraft. The exercise highlighted the lack of communications between Air Corps and friendly naval air forces as well as the inadequacy in 6th Composite Group assets against a concentrated attack.[61] Minor joint exercises usually lasting a day and only covering one sector were also planned. In late 1926 an exercise was held between the Harbor Defense of Cristobal, the 7th Observation and the Navy, the mission of the airmen to locate and report by radio enemy submarines which were simulating an attack on the Atlantic entrance to the Canal.[62]

Aircraft

In February 1926 the first six Boeing PW-9s for the 24th Pursuit arrived in Panama by ship, with an additional five PW-9As reaching the Canal Zone on July 12. The PW-9 was powered by the Curtiss D-12, with the PW-9A featuring the D-12C and the PW-9C the D-12D. Virtually all of the 114 PW-9 variants produced served overseas. The PW-9 replaced the unloved MB–3A, with deliveries to Panama continuing into 1927 when the final six PW-9C were delivered. The squadron operated a mixture of PW-9 variants, with inventory in September 1929 revealing two PW-9s, four PW-9As, and six PW-9Cs. Attrition whittled down the numbers and by January 1930 only two PW-9 and six PW-9C remained in inventory. Replacements in the form of six P–12B arrived in Panama aboard USAT *Chateau Thierry* on May 26, 1930 with a further dozen showing up with the USAT *Somme* on June 3. Once the P–12Bs were assembled and ready for operations, the five remaining PW-9C were transferred by air to San Antonio Depot in mid-1930.[63]

Tropical weather continued to wreak havoc with Panama airmen and their operations. The latest casualties were the wooden propellors for the 25th Bombardment's NBS-1 bombers. During a three month period in 1928 twenty were condemned due to delamination and warping, the solution being to either ship new metal propellors or replace the worn out and tired airframes. Relief came in the form of Keystone LB–5A aircraft, the first group of five arriving on July 10, 1928 with the bombers quickly uncrated and assembled for flight. The LB–5A were originally supposed to be part of a delivery of fifteen of the type, but only four more – LB–6s with a lengthened fuselage and a modified tail unit – delivered in 1929. In April 1930 the three LB–6 aircraft remaining in Panama were re-engined with Pratt & Whitney R–1690-3 Hornet engines to become LB–7s.[64] Due to low numbers of available Keystone aircraft the 25th Bombardment was forced to rely upon whatever was available to meet training needs. DH–4s were used through 1927 for cross-country training and NBS-1s were still being flown in October 1928, though propellor shortages continued to impact availability. One Martin bomber survived until September 1929, with the Keystone LB–7s lasting through 1932.[65]

The DH–4B itself was considered obsolete soon after delivery, and in 1923 the Army placed an order for a new DH–4 variant from Boeing with a new fabric-covered steel tube fuselage in place of the original plywood structure. These aircraft were designated DH–4M-1 and ordered into production with the generally similar DH–4M-2 developed by Atlantic Aircraft. The Panama Canal Department originally did not want DH–4M aircraft, characterizing them in 1925 as having limited fuel capacity and a steel tube structure that would "probably deteriorate very rapidly in this climate." The Department accepted six for Service Test, likely knowing there were few options for the replacement of the DH–4B.[66] On April 13, 1926 one DH–4M-2P was received in Panama and prepared for service, followed by five DH–4M-1 delivered by the USAT *Chateau-Thierry* on September 12 and assigned to the 7th Observation.[67] The DH–4M-2P was a photographic variant of the DH–4M, similar to the DH–4BP. The DH–4B continued to soldier on, with 16 at France Field on December 31, 1926 and two DH–4B and five serviceable DH–4M-1/2 aircraft assigned to

Five Martin NBS–1's of the 25th Bombardment Squadron lead six De Havilland DH–4B aircraft in a flight across Colon, Republic of Panama in March 1927. The NBS–1 supplanted the DH–4B in the 25th in 1923-24, though the De Havillands continued in squadron service for another four years. ***(US National Archives.)***

Panama in January 1928. A second DH–4M-2P was assigned to Panama on July 1, 1927 and a third DH–4M-2P was received soon after. The 7th Observation continued to fly the DH–4 but by August 1928 was restricted to flying only amphibians as all other types had been salvaged. [68]

In February 1926 two Loening COA–1 amphibians were shipped from the factory to France Field, arriving on April 3. These aircraft were originally allocated against a requirement for rescue work at France Field. Over the next two years, the COA–1s were joined by five Loening OA–1As, one OA–1B and two OA–1Cs. The 7th Observation was happy with their Loening Amphibians, using them for coastal trips and flights to islands. Operational losses rapidly cut down the numbers of amphibians, with the last Loening OA–1C in Panama being surveyed in February 1931. By mid-1928 the 7th Observation was greatly handicapped by a lack of airplanes to maintain its training schedule and perform all missions assigned to it. Four Amphibians and one DH–4M constituted the effective strength of the organization in January 1928; the remaining DH–4s - three DH–4Bs, four DH–4Ms, and three DH–4M-2P – were assigned to other units within the group. Help was on the way as fifteen Douglas O–2Hs arrived on January 10, 1929. The depot immediately started assembling these planes due to the need to get the 7th Observation fully equipped before the beginning of the combined Army and Navy Maneuvers.[69] By September 1929 two DH–4Ms and one DH–4M-2P were on the group inventory, dwindling down to one DH–4M in February 1930. The DH–4M-2P was replaced in May 1929 by an O–2H modified at the Panama Air Depot for photographic work.

Seventeen Douglas C–1C single engine transports were delivered to the Air Corps starting in 1926, with two assigned to Panama. The first was shipped on the USAT *Chateau Thierry*, arriving May 4, 1927, with the second arriving in March 1928 – unfortunately one of the C–1s was completely wrecked shortly thereafter. One Cox-Klemin XA–1 ambulance plane, designed as an ambulance aircraft to replace modified DH–4s serving in that role, was assigned to Panama in 1927. Both the C–1C and XA–1 proved useful in the Canal Zone and requirements for a larger transport aircraft were transmitted to Washington. Initially, one of three Atlantic-Fokker C–2 tri-motor transport aircraft developed for the Air Corps from the civilian Fokker F.VIIa/3m airliner design was assigned to Panama. The transport was ferried from Wright Field, Ohio to France Field via Miami, Florida, Havana, Cuba and Managua, Nicaragua before arriving in Panama on January 16, 1929. Though the US Navy had first flown F5L flying boats to the Canal Zone in 1921, this was the first time an Air Corps plane has been delivered to a foreign station by ferry. A second C–2 soon followed, with the 6th Composite Group carrying two C–2A on the books by January 1930. A C–9 Ford Tri-motor delivered to France Field from Wright Field in February 1930 with the C–2s retiring shortly thereafter.[70]

The Air Corps continued to fight against nature in the Canal Zone, waging a never-ending battle against corrosion and sinking runways. Progress was made in the late 1920s to drain standing water during the wet season as well as develop drainage to handle heavy rains.[71] Other improvements to the landing fields included the installation of night landing equipment at France and Albrook Fields during November and December 1926.[72] Panama Air Depot and its organizational component, the 63rd Service Squadron, continued to grow in capacity and capability. Through the latter half of the 1920s, the depot averaged four aircraft repairs and two overhauls per month, with assembly work and surveys adding in additional work. On average, nine engines were overhauled per month in addition to engine repairs and modifications.

1931-1935

Organization

Coming out of the Air Corps Act of 1926 was a five year program of expansion which, delayed by financial woes, did not occur in Panama until April 1, 1931 with the activation of the 78th Pursuit and 44th Observation squadrons at France Field. A lack of fighter aircraft in Panama meant the 24th and 78th Pursuit operated a pool of 15 aircraft through August 1932. Initially the 44th Observation was attached to the 7th Observation for barracks, rations and aircraft operation and the only tactical work it did was tow targets for the coast artillery and ground organizations with its three assigned O–19s. In March 1932 the Provisional Observation Group, under Capt Robert D. Knapp, was organized to split tasking with the 7th Observation only assigned tactical missions relating to training, such as formation flying, gunnery, photography, and reconnaissance, while the 44th Observation performed all cooperative missions with the Coast Artillery, Anti-Aircraft Artillery, Field Artillery, and Infantry. In addition to other missions, the 44th ran the "Fresh Air Taxi Service" from one side of the Isthmus to the other. This distribution of duties was to permit each organization to perfect its assigned duties, with an exchange of pilots at the end of six

months.[73] During this time period, the 7th Observation was assigned 14 aircraft and the 44th Observation six.

As the last part of the expansion program, the 16th Pursuit Group was activated at Albrook Field on December 1, 1932, with the 24th and 78th Pursuit Squadrons and the 80th Service Squadron, transferred from Mather Field, CA. In December 1932 the 15th Air Base Squadron and the 44th Observation Squadron, which had moved to Albrook on May 13, 1932, were attached to the 16th Pursuit Group. The 29th and 74th Pursuit Squadrons were activated October 1, 1933 at France Field, moving to Albrook Field to give the 16th Pursuit four assigned tactical squadrons.[74] The next major act in the reorganization of air forces in Panama took place on January 25, 1933. The 19th Composite Wing was activated at Mitchell Field, NY on April 1, 1931 and the first tranche of personnel moved to Albrook Field on that date. Commanded by Lt Col William McChord, the wing was composed of the 16th Pursuit Group under Maj Robert Walsh and the 6th Composite Group commanded by Maj Louis Brereton. Brereton had previously commanded the Panama Air Depot in early 1932, seen as a stepping stone to group command at France Field.[75] Brereton stayed in command of France Field and the 6th Composite Group for three and a half years, relinquishing command to Lt Col Junius Houghton on June 20, 1935.

Operations

By 1931 the Canal Zone airmen had an annual training schedule based on weather. Though some training flight activity could start in October, the focus was on the "dry season" of January through March. January was devoted to wing training, February to sector maneuvers, and March to department training and maneuvers. Tactical training followed annual maneuvers in March or April and started with an annual camp for two weeks of gunnery and bombing practice. Initially squadrons used three ranges set up on Galeta Island, located four miles from France Field. This was not convenient for forces based at Albrook Field who were forced to use overwater gunnery ranges. In 1934 a gunnery camp suitable for all Panama-based airmen was added to Rio Hato, located 65 miles southeast of Albrook Field along the coastline of the Bay of Panama.

Panama airmen continued the cross-country flights started by the 7th Aero Squadron. Expanding on programs from prior years, the groups started to fly with larger formations and greater distances. As an example, the 6th Composite Group flew an extended cross-country flight in May 1935 involving seven O–19C and two B–3A bombers led by group commander Lt Col Brereton. Over a two day period the group flew from France Field to San Salvador, El Salvador via San Jose, Costa Rica and Managua, Nicaragua. The group remained for three days in El Salvador before starting back. Squadron tactical training filled in the remainder of the time of the annual training schedule. While pursuit squadrons focused on aerobatics and aerial gunnery, the 25th Bombardment continued to bomb target ships in Limon Bay, both sunken wrecks and a purpose built target ship that was repaired after each annual training. The 44th Observation performed all target tow missions for anti-aircraft units using two O–19C fitted with appropriate equipment as well as radios. Though the 44th Observation focused on cooperative missions with other branches of the Army the other squadrons still contributed to training ground forces. The 25th Bombardment in particular contributed night missions to support searchlight practice for the Coast Artillery. The standard routine of training was broken up with diverse tasking every now and then. On July 30, 1932, the 12th Photo Section received War Department orders to make an aerial survey of the Guatemala-Honduran Border to help resolve a border dispute. 1Lt H. K. Baisley, pilot, and SSgt B.C. Powers, photographer, left France Field for Puerto Barrios, Guatemala, to spend six weeks completing the task. The 6th Composite Group also performed a series of tests with the Health Department of the Canal Zone in combating mosquitoes using a B–3A fitted with a "dusting" funnel connected to vats of a solution of pulverized dried clay and Paris Green. The dusting proved to be successful, with the group supporting anti-mosquito campaigns in future years.[76]

Albrook Field provided continual challenges to operations in the rainy season. Two O–19C of the 44th Observation Squadron wait out a rain storm circa 1933-34. ***(US National Archives.)***

Exercises

To address the challenge of early warning of an air attack without having to rely on a continuous observation aircraft presence, the 6th Composite Group set out to establish ground observation posts to enable the tracking of enemy bomber forces. On March 1, 1932, 1Lts Overacker and Forrest were sent for three days' instruction in Anti-aircraft Intelligence at Fort Amador. Following training, each was given a detail of forty men, reels of telephone wire and a 2Lt and sent off to establish observation posts on many of the high hills on the Pacific Coast for the purpose of locating enemy aircraft approaching the Isthmus. While the response to a surprise attack would have entailed the use of locally-assigned forces, if there was time it was planned to fly air forces south to support in the defense of the Canal. In 1929, the Air Corps had planned to conduct

a "minor joint exercise" in early 1930 in which 170 aircraft would deploy down to Panama via flight through Central America. Logistical considerations – the lack of adequate basing in the Canal Zone – likely coupled with financial concerns eventually killed the project, but it does provide insight into reinforcements that could have flowed south in times of hostilities. Included were 100 pursuit aircraft from the 1st Pursuit Group and the 96th Pursuit Squadron, 15 bombers from the 2nd and 7th Bombardment Groups, 30 attack aircraft from the 3rd Attack Group, and 26 transports grouped into two provisional transport squadrons.[77]

Wing and group level exercises gave airmen the opportunity to practice larger tactical problems. At the end of the 1932 'wet season' in September 1932, a series of 'tactical problems' involving all tactical squadrons of the 6th Composite Group were carried out each Saturday morning. The majority of the problems centered on pursuit squadrons defending a vital point of the Canal against attack by 'enemy' bombers operating from aircraft carriers at sea. In order to limit the action of the problem, it was assumed that the bombers were reported on the way and must cross a given line about 120 miles from the Zone in a certain interval of time. Pursuit squadrons were moved to an advanced field and remained on alert, awaiting word from observation aircraft flying search missions. Since pursuit aircraft assigned to Panama were not equipped with radios, messages from the observation aircraft had to be picked up on the pursuit squadron's field set. In good weather pursuit ships did not have much difficulty completing their interception, the problem developing into a race of who would arrive first - the bombers over their target or the pursuit on the bombers. When the sky was heavily clouded, the pursuit airmen were under a severe handicap, as once they took off they could hear no further information from observation and had a blind chase. This training continued in January 1933 as the two squadrons of the 16th Pursuit Group worked squadron, group and composite group problems. One pursuit group 'tactical problem' was worked each week and involved the pursuit group defending the Pedro Miguel Locks against attackers from the 6th Composite Group. Due to the shortage of planes in the Canal Zone, it was not an uncommon sight to see a "bomber" formation composed of a Douglas Amphibian and two O–19Cs 'bombing' the target. A similar wing exercise in January 1935 featured a four day operation in which the 25th Bombardment and the Observation squadrons occupied an airdrome at Rio Hato and simulated attacks against the Canal Zone. The 16th Pursuit Group was in defense, trying to defend a line 45 miles long with 33 pursuit aircraft.[78]

The 1932 Annual Panama Canal Department Maneuvers started with the 6th Composite Group being designated the Panama Canal Department Air Force on January 20. The group was ordered to readiness for missions and 7th Observation's A Flight was ordered to deploy five aircraft to an advance landing field at Fort Clayton and function as Divisional Observation. On January 28 the "enemy" was reported as landing at Chepo, about 40 miles

Panama's sole Cox-Klemin XA–1 wings over the Naval Station at Coco Solo in April 1927. The XA–1 replaced DH–4s that had been modified locally for the air evacuation role. ***(US National Archives.)***

northeast of Panama City, and the war was on in earnest. The Panama Canal Department Air Force immediately moved to Miller Field at Fort Clayton. The "enemy" air force was represented by the 24th Pursuit simulating attack aircraft along with two observation planes and three bombers. From January 28 to February 5 the "war" was fought in earnest, airmen performing independent attacks against the enemy units as well as supporting friendly forces. Emergency landing fields in the interior were utilized by command and observation missions, with pilots detailed with the Infantry for periods varying from two to five days. The exercise ended on February 8 with a review by the Department Commander and a critique of the annual maneuvers. Following the maneuvers the entire 6th Composite Group moved by air to La Venta, Rio Hato, where two more days were spent under canvas before returning to France Field.[79]

Annual Maneuvers participation for 1933 was not as extensive as in the prior few years. The maneuvers were divided into three periods: the first being anti-aircraft defense, the second individual maneuvers by Atlantic and Pacific sectors, and the third period combined maneuvers of both sectors in the Chame area. During the first period 15 anti-aircraft intelligence stations were established on each side of the mountain range and all were in telephone or radio contact with anti-aircraft Headquarters. In order to test the efficiency of the system, the 25th Bombardment simulated a hostile attacking force and launched an attack on the Canal from David. The Canal was defended by two Pursuit Squadrons and a screen of aircraft from the 44th and 7th Observation squadrons working with the anti-aircraft intelligence stations. The bombers were sighted by the observation screen near Penonome and Albrook Field ground station was immediately radioed, giving the place, altitude, course and time the attackers were sighted. The 16th Pursuit Group took off and interception was made about 15 miles from Gatun – the bombers' objective. Night attacks on the Canal by bombers were also simulated during this period. Approximately ten US Navy bomber and torpedo planes also launched two attacks against the

Canal. During the second period, Atlantic sector troops proceeded through the jungles toward Porto Bello and the air units were only called upon for a few liaison missions. The last period saw the combined forces of the Atlantic and Pacific Sectors in a stand against an imaginary enemy which was advancing toward the Canal from the west along the National Highway. All troops went into action near Chame, supported by the 44th Observation from an advanced field at La Chorrera. The entire Panama Air Force was moved to the field on February 22. During the withdrawal from this area a situation was assumed in which the enemy was attempting an amphibious assault to establish a beach head near La Chorrera and the air force was called upon to transport a battery of 3 inch mountain artillery from Chame to a La Chorrera where it could harass the enemy. In two trips, the 25th Bombardment transported 80 men and all the equipment for the battery with the 7th Observation transporting an additional 18 men. For this movement protection was given by two pursuit squadrons.[80]

The department Annual Maneuvers for 1935 began on March 6, and during the first part of the exercise the Wing operated from Albrook Field and France Field. As the enemy "Brown" fleet in the South Pacific moved eastward, the 19th Composite Wing readied to move at short notice from permanent basing to auxiliary fields. On order, all personnel and equipment were ferried to advanced fields by air transportation with the 6th Composite Group camp at LaJoya near the Pacora River. The 6th Composite Group then switched sides and Lt Col Brereton, normally the Commanding Officer of the 6th Composite Group, was Commanding Officer of the mobile air force of the "Brown Force," commanded by Maj Gen Lytle Brown. The 6th Composite Group attacked the Zone while the 16th Pursuit Group (44th Observation Squadron attached) was attached to the defending Provisional Coast Artillery Brigade. The five squadrons of the 16th Pursuit Group operated from a field at La Chorrera, deployed via motor convoy and living under canvas for nine days. The maneuvers ended on March 30 with a review at Albrook Field.[81]

New Aircraft Arrive

Captain Ira C. Eaker, who recently won distinction as Chief Pilot of the Air Corps endurance plane "QUESTION MARK," flew a Boeing P–12 from Brownsville, Texas southward to Panama, arriving at France Field on March 17, 1929. The P–12 was fitted with a larger fuel tank under the engine and a hand fuel pump at Kelly Field for refueling stops before Eaker set out to prove a route for future express, mail, and cargo service between the US and Central and South America. Subsequent ferry flights for new aircraft bound for Panama essentially followed his path, departing Brownsville, Texas with fuel stops in Tampico, Tejeria/Vera Cruz, Minatitlan and Tapachula, Mexico; Guatemala City, Guatemala; San Salvador, El Salvador; Managua, Nicaragua; San Jose, Costa Rica; and David, Panama. The flights would take a few days and, if more than a few aircraft, would usually be led by a field grade officer. Delivery could be done by Canal Zone pilots, though

The Thomas-Morse O–19C replaced the Douglas O–2H in the observation role in Panama. Though the 7th Observation did not operate the O–19B shown in this photograph, the O–19C differed from the similar O-19B in having a tail wheel and cowling around the engine. ***(Photo courtesy of George Cully.)***

at times pilots from Air Corps stations across the US would be recruited for the delivery. The first major flight of aircraft to Panama was likely in August 1932, with additional ferry flights occurring in December 1932 and February 1933. The reason for the large ferry flights was funding under the five year plan coming from the Air Corps Act was finally resulting in aircraft deliveries to Panama. For Fiscal Year 1932, running from July 1, 1931 to June 30, 1932, it was planned to ship 28 pursuit, nine bombardment, two amphibian and two cargo aircraft to Panama.[82]

Panama was allocated nine Keystone B–3A biplane bombers as replacements for the Keystone LB–5/6/7 aircraft operated by the 25th Bombardment. The B–3A was a follow-on to the LB–6 family and originally ordered by the Air Corps as the LB–10A. An initial group of nine B–3As were delivered sometime in early to mid-1932. Two additional B–3A arrived at France Field on December 31, 1932 and three more on February 10, 1933 as part of the large ferry flights to Panama.[83] The tropic environment continued to not be kind to aircraft based in the Canal Zone. In June 1934 the Panama Air Depot noted that a large percentage of the B–3A would be surveyed within a year as the replacement of longerons on the bombers would not warrant economic overhaul.[84] As of January 1, 1935, the 25th Bombardment had five B–3A airplanes and ten pilots. By the time the Air Corps maneuvers ended in February, three were recommended for survey leaving the Canal Zone with two bombers in commission.[85]

The first eighteen P–12B's arrived in May-June 1930. An additional twelve P–12B arrived in Panama by August 1932, but these did little to stem the ongoing loss through crashes. By November 30, 1932 there were only twelve operational P–12Bs, split evenly between the 24th and 78th Pursuit Squadrons, impacting the training of 27 pilots by only having an average of nine planes available to fly. For Fiscal Year (FY) 1933, 24 P–12Es were allocated to Panama with delivery via the air ferry route. The first twelve P–12Es were delivered in December 1932, with the remaining twelve P–12Es landing on February 10, 1933. Unfortunately, the spares allocation for the P–12Es was

Albrook Field was constituted as an active airfield on April 25, 1932, with the 44th Observation and 24th and 78th Pursuit Squadrons moving in later that year. The 16th Pursuit Group was activated at Albrook Field on December 1, 1932 and expanded to four tactical squadrons with the activation of the 29th and 74th Pursuit Squadrons on October 1, 1933. *(US National Archives.)*

less than desired with broken tail skids sidelining aircraft due to a lack of replacements. Taking into account overhauls and repairs, by July 1933 there was on average only 20 P–12s available for flight on any given day. [86] The FY 1934 allotted pursuit aircraft strength for Panama was eight P–12B and 37 P–12E included nine P–12Es delivered in early 1934, the airframes coming from units in the US converting to the P–26. In April 1935 there were four P–12B in commission, two awaiting survey, and 25 P–12E in commission including eight in overhaul at the depot – much less that the allotted strength of 45 aircraft.[87]

The replacement for the Douglas O–2H arrived surprisingly fast, with Thomas-Morse O–19Cs starting to arrive by February 1931 with Panama receiving twenty by 1932. While the majority were split between the two observation squadrons, in August 1932 the 24th Pursuit and 25th Bombardment each had one assigned O–19C for aerial gunnery, instrument flying, and other training purposes.[88] Two additional O–19C's arrived on the February 10, 1933 ferry flight, but Panama was rough on its aircraft. In June 1934 the Panama Air Depot stated that a large percentage of the O–19C aircraft in Panama would be surveyed within a year as the replacement formers and skins would not warrant economic overhaul.[89] By April 1935 there were only fourteen O–19 in service in the Canal Zone, with the O–19s not projected to pass their next overhaul date due to enlargement of rivet holes and other defects. [90] As of May 1, 1935, the 7th Observation has eight O–19Cs in operation, with two planes surveyed in the past month.[91]

Two Sikorsky C–6A amphibians were assigned to the Canal Zone in late 1931. Initially allocated to the 7th Observation, the two aircraft were transferred to the 24th Pursuit in August 1932. In March 1932 airmen from Panama arrived at the Douglas Aircraft plant in Santa Monica, California to pick up two new Y1C–21 amphibians for delivery to France Field, with one aircraft transferring to Albrook Field in late 1932. A Y1C–26A was also ferried south later in the year, arriving at France Field on December 31, 1932. In February 1933 cargo planes were shifted, giving the 80th Service Squadron at Albrook Field the only Ford C–9 Transport, one Douglas Y1C–21, and a C–6A Sikorsky. The Albrook Field commander noted in July 1933 that the C–6A and C–9 "have passed the period of economic overhaul." The next cargo aircraft for the Canal Zone came in the form of a Bellanca C–27A that delivered on October 14, 1933.[92] By April 1935 the C–6As had been retired, but the C–9 was still in service along with one C–27A, an OA–4A (a redesignation of the Y1C–26A), and one OA–3 (redesignation of Y1C–21).[93]

France Field was bulging at the seams and expansion room was required to handle the increasing number and size of aircraft assigned to the Canal Zone. Albrook Field was constituted as an active airfield on April 25, 1932.[94] That year, work was done to expand Albrook Field and three double hangars, an Engineering hangar and a Supply hangar were completed along with leveling and landscaping around buildings and seeding the runway with Bermuda grass. In 1933 work started on concrete hangar apron as well as Headquarters and Operations Building, but the runway was still not in good shape. Even in the dry season, unloaded bombers would sink to their hubs and P–12s of the assigned pursuit squadrons continually broke their tailskids and damaged their rudders on the French drains located on the field. The runway was marginally usable during the rainy season, even though different construction techniques and types of grasses were tried to improve the landing field surface. By the end of 1933, three fairly good runways were in use for landings and a concrete ramp used for all take-offs.[95] Work continued on emergency landing fields, a continual drain on resources as the jungle was doing its best to reclaim any clearings and return them to forest.[96] By 1932 the Panama Air Depot was considered a permanent unit with fifteen assigned enlisted airmen and four civilians. In addition, Service Squadrons also existed at France and Albrook Fields to support maintenance work. During this time period an average month would see four to six aircraft overhauled, with additional minor work done on a similar number of aircraft. Five to ten engines would also be overhauled and 90-100 parachutes folded and 120-130 inspected. Though there was a desire to convert to an all-civilian work force the Air Corps had insufficient funds to hire additional civilians.[97]

1936-1939 – The Road to War

Organization

On August 20, 1936 Lt Col (Brevet Brig Gen) George Brett arrived in Panama and assumed command of the 19th Composite Wing, staying for two years before being replaced by Lt Col (Brevet Brig Gen) Herbert Dargue. During those two years, Brett oversaw a dramatic reorganization of airpower in Panama. One year later, on September 1, 1937, a wholesale renaming took place with the 19th Composite Wing becoming the 19th Wing, the 6th Composite Group the 6th Bombardment Group, the 74th Pursuit Squadron the 74th Attack Squadron, and both the 7th and

A 7th Observation Squadron Martin B–10B wings over the jungles of Panama in June 1936. Though they only served in the Canal Zone for three years, the B–10 was a key step in transitioning Panama airmen from fabric biplane Keystone B-6 bombers to contemporary all-metal bombers with retractable landing gear. *(US National Archives.)*

44th Observation Squadrons becoming Reconnaissance Squadrons.[98] The 78th Pursuit Squadron was inactivated on that date.[99]

Brett's view of the wing in 1936 was not pleasant – an air unit in "deplorable condition" that was "obsolete, antiquated and of practically no value in the defense of the Canal Zone" against a well-equipped adversary. Brett put the wing's airmen through a regimen of weekly exercises to increase their tactical acumen. Constricted budgets hampered Brett's ability to modernize his force and when Chief of the Air Corps Maj Gen Oscar Westover visited Panama in May 1938 the two discussed a way forward. Modern aircraft aside, four conclusions were drawn regarding the problems confronting the 19th Wing's infrastructure: move the Panama Air Depot to Albrook Field, move forward with building a new air base at Bruja Point for bombardment aircraft, expand Albrook Field housing to accommodate new air depot as well as tactical units at full strength, and retain France Field for use by the 7th Reconnaissance with a mission focused on support to coast artillery and other branches. The activation of the 14th Reconnaissance Group in Panama was not recommended due to a shortage in personnel and higher priorities for the 19th Wing.[100]

In March 1938 Secretary of War Woodring implemented a plan based on the War Department's "Balanced Air Corps Program" that called for an additional 1,094 aircraft. In April 1938 Congress authorized the first phase of expansion. One year later, the plan was expanded with another bill signed by Congress in April 1939 that looked to grow to 24 tactical groups.[101] The Air Corps had started on a dramatic journey of expansion, with new programs rolling out before the prior one was completed.[102] The 1939 expansion program was superseded by the 54 Group Program in July 1940, essentially a doubling of the prior program. Squadrons were to furnish cadres for the formation of new combat squadrons, with new units activating at the parent base and sharing equipment until additional aircraft arrived. A massive influx of new recruits were assigned to the parent unit to backfill the cadres assigned to the new units.

By early 1939 the 19th Wing tactical units were desperately under-manned. On May 16, the wing commander noted "all squadrons are seriously short of personnel [and] even with those attached cannot man all airplanes."[103] Help was on the way - the initial stages of Air Corps expansion in August 1939 saw an influx of 2,697 enlisted personnel into the Panama Canal Department, increasing strength to 4,087. Of these men, 287 were experienced and the remainder new recruits.[104] On August 22, the War Department promised Panama Canal Department commander Maj Gen David Stone that if hostilities broke out, additional infantry regiments would flow to Panama and pursuit strength would double. On October 16, 1939 the Panama Provisional Coast Artillery Brigade was created to oversee all anti-aircraft units assigned to the Canal Zone, including additional coast artillery anti-aircraft forces that were enroute.[105] With the influx of new personnel, the 19th Wing entered a period of intense training that started in November 1939 and ran through January 31, 1940.[106]

In January 1940 the War Department instructed Maj Gen Daniel Van Voorhis, the new commander of Panama Canal Department, to submit to the newly created Air Defense Board in Washington a report on protecting the canal against air attack. The resulting study recommended further centralization of the air defense mission.[107] New units activated in Panama on February 1, 1940 as part of the expansion program included the 3rd Bombardment, 43rd Pursuit, and 39th Observation Squadrons. The 37th Pursuit Group, composed of the 28th, 30th, and 31st Pursuit Squadrons, was also activated. To accommodate this growth, a new basing plan for Panama was published on May 27, 1940. Panama's new planned base, Howard Field, would now house the 6th Bombardment Group, the 9th Bombardment Group (Medium), and the 44th Reconnaissance and 16th Air Base Squadrons. The 9th Bombardment Group would arrive from Mitchell Field, NY and be based at Rio Hato Field in temporary housing until Howard Field was ready for occupancy. France Field would house the 7th Reconnaissance (M) and 39th Observation Squadrons.[108] Finally, existing units were also re-named. On December 6, 1939 the 25th Bombardment was designated a medium bomb squadron (25th BS (M)). On November 1, 1939 the 74th Attack was re-designated the 74th Bombardment, becoming a medium bomb squadron on December 6 and assigned to the 6th Bombardment Group on February 1, 1940. Reflecting the urgency and lack of equipment of the era, on December 13, 1939 the 74th Bombardment operated a polyglot force of aircraft, including three B–18s, three amphibians and four A–17s.[109]

An expanding force necessitated increased servicing of aircraft. By the mid-1930s, the Panama Air Depot performed two functions for the Panama Department – storage and issue of Air Corps and Signal Corps supplies and third echelon maintenance and repair of Air Corps equipment. In addition, it acted as a supply warehouse and sec-

ond echelon maintenance and repair for France Field due to a lack of space at this station. In return, France Field provided medical, quartermaster and guard functions for the depot. In September 1936 the Air Depot was separated from France Field, with the depot an independent department unit and reporting to Commanding General of the Panama Canal Department.

Operations

The annual training schedule, with minor adjustments, continued to drive operations in Panama. In 1937 training for reconnaissance squadrons included radial search and parallel search from a single base while pursuit squadrons practiced interception by patrol and by direction from anti-aircraft intelligence stations or observing aircraft. By 1938 the annual gunnery camp at Rio Hato had changed from April/May to starting in September and running through the end of the year, likely to accommodate the large number of squadrons who needed to spend two weeks at the facility. The majority of flying, though, was to simply build flight hours for all the new pilots and undergo conversion training on new aircraft as obsolete airframes were finally replaced in Panama. The 24th Pursuit went through two type conversions in the space of a year, transitioning from the P–12 to the P–26 and then P–36 all in 1939![110]

Flights continued to support anti-aircraft training as the Air Corps was drawn tighter to Canal Zone air defense units. Coast Artillery Brigade Maneuvers conducted in March 1936 identified the need to co-locate the Anti-aircraft Defense Command Post close to the Command Post of the Air Forces of the Panama Canal Department to enable better integration between the two entities. The 19th Composite Wing responded with a new program of training with the Coast Artillery scheduled to last over a year and a half. The Air Corps alternated between being the attacker and the defender, with weekly missions such as pursuit attacking anti-aircraft sites while bombers went after targets or pursuit and observation defending against attacking bombers. The anti-aircraft intelligence stations were also upgraded from voice communications to teletype machines in late 1936. In between training missions, the Panama airmen supported humanitarian missions such as mosquito spraying or flying emergency supplies for earthquake relief to Santiago, Chile in 1939. This long distance 'mercy mission' highlighted the growing capacity of Panama airmen to fly great distances. Cross-country flights continued in the late 1930s, building flight hours for new pilots and familiarity with new aircraft as well as preparing airmen for emerging air warfare concepts that took place over hundreds of miles. In early 1937, a change in 19th Composite Wing policy encouraged international cross-country flights. Usually once a month 5-15 aircraft would depart Panama and remain overnight for a couple days, visiting airports in either Central or South America. An extreme example of this occurred in February 1938, where Brig Gen Brett led 150 airmen in P–12s, A–17s and B–10s to Guatemala City, Guatemala via Managua, Nicaragua. The trip ended up lasting five days, including a formal aerial review in Guatemala.[111]

The Boeing P–26A arrived in Panama aboard the US Army Transport *Ludington* in October 1938. The thirty P–26As were assembled at Panama Air Depot and once the pursuit squadrons had completed transition to the new airplane the remaining P–12s were allocated to a training role. *(George Cully.)*

Exercises

The March 1936 departmental maneuvers focused on air defense, a deviation from past exercises. The Air Force of the Canal was assumed to have been destroyed during the invasion, with only three O–19s assigned to the 44th Observation surviving at La Chorrera airdrome. All other forces were aligned to the opposing "Red Force" which was assumed to have effected a landing in the Foncesca Bay region and at Aguadulce and was advancing with the mission of capturing the Panama Canal. The 6th Composite and 16th Pursuit Groups operated for approximately two weeks from the temporary airfield of Aguadulce, Republic of Panama. The 1937 maneuvers followed a similar format, with the air forces assigned to the enemy "Black Force" and representing carrier attack aircraft that had secured a beach head operating against a small "Blue Force" contingent of observation aircraft. The two week maneuvers started on March 14 with the 19th Pursuit Group relocating to Rio Hato while the bombers of the 6th Composite Group moved to Aguadulce. The 1938 maneuvers were more traditional in format and centered on the joint defense of the Canal from a hostile fleet. The exercise kicked off on March 14 with "Blue" Air Corps and US Navy patrol aircraft searching for the "Black" fleet with the 6th Bombardment Group flying from Rio Hato. Once the enemy was located by the "Blue" Navy patrol aircraft, B–10s launched from Rio Hato and joined Navy bombers in attacking the enemy fleet. The second day focused on defending Albrook and France Fields from a "Black" carrier air strike. Switching sides, the 7th Reconnaissance and the 25th Bombardment bombed "Blue" fields against 19th Pursuit Group opposition while the 74th Attack hit anti-aircraft batteries with simulated gas bombs. The third morning saw similar play with the 7th Reconnaissance and the 25th Bombardment launching B–10s to attack Canal Zone defenses and airfields, dodging "Blue" pursuit forces while later in the day "Blue Forces" mounted a strike against the "Black" fleet, ending the exercise.[112] For the

The 30 Curtiss P–36As assigned to the Canal Zone in September 1939 were critical for the rapid expansion of the pursuit force in Panama, though many would be lost in training accidents as newly-minted pilots attempted to master a relatively complex and fast aircraft with few flight hours under their belt. ***(George Cully.)***

1939 annual maneuvers, the 6th Bombardment Group and the 74th Attack Squadron represented the carrier-based air arm of the opposing "Black Force" invaders bent upon the destruction of the Canal via land, sea and air. The 24th and 29th Pursuit Squadrons were assigned defensive missions with the "Blue Forces," flying from Albrook Field and aided by reconnaissance missions by the 44th and 7th Reconnaissance Squadrons.[113] These exercises highlighted the difficulty in defending the Canal Zone from aerial attack and noted the need for long range detection of aircraft intruders – a niche that radar posts would soon fill in a few years.

Going to war

With the outbreak of hostilities in Europe on September 1, 1939, war came to Panama. The following day the wing started to prepare a plan to search sea lanes approaching the Panama Canal as well as escort vessels within the current three mile limit of territorial waters. Submarines that attacked vessels within the three mile limit would also be attacked. By September 11 the role of the Air Corps in the defense of the Canal was solidified. Aircrew and ground personnel were to be on alert for aircraft flying over the Canal Zone. Unknown or belligerent aircraft would be directed to land; if unresponsive, details on the aircraft were to be reported. Aerial reconnaissance and bombing were to be used to repel hostile attacks on the Canal and two bombers were to be in readiness at all times for armed reconnaissance missions.[114]

The Panama Canal Department had been preparing for war since the mid-1930s. In November 1936 planners made the assumption that any attack on the Canal would not involve an organized landing but would be through either air attack or sabotage. Existing air bases such as France Field were open to aerial attack and auxiliary airfields had no security other than what squadrons could provide, so a concept was explored to build a base in an area northwest of Gamboa where surrounding hills could be tunneled into for bomb proof hangars, barracks and shops. Lack of resources kept this from reaching fruition, but the department did start to develop plans and organize forces to prepare for the defense of the Canal Zone. On August 13, 1938 department commander Maj Gen Stone appointed a board of officers to study the anti-aircraft defense of the Canal Zone. By the turn of the year a plan was in place and on April 24, 1939, Albrook Field assigned 18 four-man machine gun crews to defend the base against hostile low level air attack. On September 18, 1939 Maj Gen Stone selected the dark-of-the-moon periods for the next three months as the time for practicing black-outs of the entire Canal Zone as a major feature for training military and civilians in anti-aircraft defense. Exercises were held on October 10 and November 9, with 44th Reconnaissance B–18s flying to observe the effectiveness of the 15 minute period of darkness.[115]

Aircraft Technology Leaps Forward

The mid-1930s witnessed a dramatic jump in aircraft capability, with the Air Corps entering the decade flying fabric-covered biplane pursuit ships and leaving it with all-metal monoplanes. Bombers followed a similar transformational path and dedicated cargo aircraft also appeared on the scene. Unfortunately, a myriad of factors delayed the introduction of new technology to Panama. The Fiscal Year 1935 procurement was cut, aircraft priority being given to the newly-organized GHQ Air Force, and the policy of not sending new aircraft overseas without proper service testing all conspired to keep Canal Zone airmen operating a decreasing number of increasingly obsolete aircraft.[116]

In February 1936 Panama received eleven 'used' but refurbished Keystone B–6A bombers, Langley Field offering up the examples after converting to Martin B–10 bombers. The biplane bombers joined a flight of thirteen P–12Fs on the overland delivery route through Central America – these would be the last biplanes delivered to Panama. The following month nine B–10Bs departed Brownsville, Texas for France Field, flown by 2nd Bomb Group crews who had picked the aircraft up from the Martin factory. After arrival in Panama, eight of the B–10Bs were assigned to the 7th Reconnaissance who installed target tow reels in these aircraft to aid in work with anti-aircraft units, replacing O–19Cs in the task which were deemed unsuitable due to age and condition.[117] 1937 witnessed an additional 25 B–10Bs delivered in two flights in June and December, with a final installment of ten B–10Bs arriving in April 1938. These 35 B–10Bs were second-hand, sourced from March, Hamilton and Langley Fields. B–6As still found some use in Panama even after the arrival of B–10s, with some Keystone bombers surviving for another year of use at France Field. The B–10Bs were mere placeholders, allowing aircrew to transition to a more modern platform.

Once tactical units in the US had replaced the B–10 with the B–18, the transition process for the Canal Zone squadrons would take place with excess B–10s returning to the US for disposition. The first three B–18s arrived in

The Douglas B–18 was critical to the modernization of the Canal Zone's striking force. This 25th Bombardment Squadron B–18 is seen up on jacks in a hangar conducting landing gear maintenance. ***(AFHRA via George Cully.)***

July 1938, ferried direct from the factory via Randolph Field to Miami and via Cuba to Panama. Ferry crews returned three B–10s to the US, with both B–18 and B–10 flights escorted by an amphibian aircraft. The three B–18s were spread around, and at the end of September 1938 the 25th Bombardment had twelve B–10B, one B–18 and one P–12E assigned with the 7th Reconnaissance having a similar complement and the 44th Reconnaissance eight B–10B, one B–18 and one Y1OA–8. Once 6th Bombardment Group crews were trained on the B–18, they would fly B–10s up to the US and return with B–18s. Three flights of ten B–10s went north in 1939 with crews returning with a like number of B–18s. A final flight of five B–10Bs in August 1939 brought south four Grumman OA–9 amphibians.[118] The 33 bombers were split between units, with the 6th Bombardment Group receiving 19 and the 7th and 44th Reconnaissance receiving six each with Headquarters Squadrons taking the remainder. Fighters also witnessed a similar dramatic change in technology.

The last biplanes for Panama arrived in February 1936, thirteen P–12F ferried south by 16th Pursuit Group pilots from their prior home at Langley Field. P–12s would continue to serve the pursuit squadrons in Panama for another few years, with 16th Pursuit Group rolls noting the 24th and 29th Pursuit each equipped with fifteen P–12s in January 1939. The P–26A, delivered to the Air Corps in 1934, was held back from overseas deployment until unsatisfactory flying characteristics were worked out and landing fields in Panama lengthened. In March 1938, with GHQ AF units converting to more modern pursuit ships, P–26As became available for shipment to Panama after refurbishment at a Stateside Air Depots. In October 1938 the USAT *Ludington* docked in Panama with thirty P–26As to be split between the two pursuit squadrons. Assembly at Panama Air Depot took a few months, with conversion training at the squadrons not starting until February 1939. Once the P–26s were assembled and squadrons had completed transition to the new airplane, P–12s allocated to a training role in the Canal Zone. On November 21, 1936 16th Pursuit Group requested two BT–9 aircraft for each pursuit squadron for use in instrument flying and landing training, with a total requirement for Panama being six aircraft.[119] All BT–9s were scheduled for use at the Training Center at Randolph Field so none were available for shipment. A replacement airframe was identified in the North American BC–1, the first of 177 starting to deliver to the Air Corps in June 1937. The first two of six BC–1s allotted to Panama arrived aboard the USAT *Ludington* on October 28, 1938.[120]

With the start of hostilities in Europe, in September 1939 30 P–36As and one P–26A were ferried down from the US and used to equip the 24th Pursuit, with the 29th Pursuit enlarging to 25 P–26s. Unfortunately, three P–36s were lost enroute. Thirty additional pilots also joined the 16th Pursuit Group at that time, many Second Lieutenants straight out of training. The 24th Pursuit transitioned to the P–36A in October 1939, flying down to Rio Hato mid-month for annual gunnery camp. On the return flight to Albrook Field a formation of nine P–36s encountered bad weather and two aircraft crashed into Chame Bay with 1Lt Mell Stephenson dying. At the end of 1939 the squadron had twelve P–36A and twelve pilots. All of the long-serving P–12s in the Panama Canal Zone were dismantled and shipped by freighter to the US for the Advanced Flying School at Kelly Field, Texas, the P–26s being retained by the command. The 74th Pursuit had turned in its biplanes earlier, equipping with fifteen A–17s that were ferried to Panama in August 1937 – appropriate equipment for an attack squadron.[121]

By the mid-1930s, the Air Corps in the Panama Canal Department had two major requirements for air transportation: moving parts from the Panama Air Depot to other locations and assisting tactical units moving from permanent bases to emergency landing fields. Cargo movement was mainly handled by a Bellanca C–27A and two Keystone B–6s converted to the purpose, the Ford C–9 having retired in 1935 due to age and projected overhaul cost.[122] In December 1936 Brig Gen Brett led a ferry flight of a Bellanca C–27C and two Douglas Amphibians, an OA–4B and a C–29, arriving in Panama on December 20, 1936. Unfortunately, having two C–27s in Panama did not last long as the newly-delivered C–27C broke up in a storm and was lost on August 3, 1937. Brig Gen Brett wrote Washington within a month requesting a replacement; no response is on file, but in December 1937 a Sikorsky Y1OA–8 was assigned to Panama. In late 1938 Panama's OA–4B was upgraded to OA–4C status and in August 1939 one C–39 and four Grumman OA–9 amphibians arrived at France Field.[123] The C–39 was allocated as the personal transport for the Commander of the Panama Canal Department.

Reconnaissance squadrons started their transition away from fabric covered biplanes with the assignment of eight B–10Bs to the 7th Reconnaissance in March 1936 and soon four of the bombers were transferred to the 44th Reconnaissance in exchange for four O–19Cs so both squadrons were similarly equipped. By the end of 1938 the 44th Reconnaissance received a few B–18s from the initial delivery of the bombers to Panama. While the B–10/B–18 could perform admirably in the over-water reconnaissance

function, they were ill-suited to provide direct support to ground forces and the O–19s, growing old and not equipped with an updated radio, were fast becoming irrelevant. The Douglas O–46As planned for Panama were diverted to the Philippines in late May 1938 due to a shortage of observation aircraft within the Air Corps and Canal Zone airmen were forced to make do with what they had on hand.[124]

Bases

The runways at Albrook Field continued to be a perennial source of trouble. In 1938, Albrook Field commander Lt Col Hale considered it "foolhardy" to try and operate P–26s from Albrook. That September funds were approved to pave the runway at Albrook Field with construction starting on December 20, 1938. The completed runways were turned over for use on May 24, 1939 along with additional hangars. In early 1939 the War Department submitted a budget proposal that included $7.7M for construction at Albrook Field, with plans finalized by April for construction and land acquisition to support expansion of Air Corps bases in the Canal Zone. By the end of 1939 work was going forward with extending Albrook Field by clearing out the surrounding jungle.[125] Air Corps expansion in Panama was not limited to Albrook.

Flight operations in the Canal Zone and Republic of Panama centered on the two "airdromes" - France Field and Albrook Field – but other facilities existed. Most Army installations had landing fields, to include Fort Sherman and Fort Davis, though the field at Fort Clayton was discontinued on March 10, 1933. The 47 other landing fields that existed as of May 1, 1937 were mainly unmanned with 38 classed as "emergency." These fields were inspected monthly, with local citizens paid to maintain the landing area and keep the jungle from encroaching. Jaque, located at the extreme southeastern tip of Panama, had a 3000 ft runway and a supply building constructed of wood with corrugated iron roof. Though funding was allocated between 1937-40 to improve landing fields, as the Air Corps transitioned from fabric-covered biplanes that could land on a relatively smooth patch of grass to heavier bombers and fast all-metal pursuit aircraft the utility of maintaining a short, cleared patch of jungle was questioned and the Air Corps started to focus on a smaller number of fields with paved runways and more facilities, some of which were not in the Canal Zone.[126]

As Panama drifted towards war in October 1939, the extension of Canal Zone defenses into Panamanian territory seemed the only route open for terrain suitable for additional airfields. Rio Hato, located in the Republic of Panama, was initially leased in 1932 as an auxiliary training base. Throughout the mid-1930s further land was leased and additional facilities built to include barracks, sheds, and added gunnery ranges. Additional funds in 1938 to transform Rio Hato into a permanent auxiliary base resulted in construction of barracks, a mess hall, concrete walks and a sewer system to replace the tents previously used. Five additional fields were identified as "auxiliary bases for operation:" San Miguel Bay, Aguadulce, David,

Work on the Panama Air Depot started in April 1940, with some buildings completed by March 1941. This June 1941 aerial photo of Albrook Field shows major construction work under way. ***(US National Archives.)***

Almirante and Anachuna Bay. These fields were planned to have surfaced runways at least a mile long and storage for 25,000 gallons of gasoline and oil. Two dispersion fields – Chame and La Jolla – and five emergency landing fields – Jaque, La Chorrera, Aguadulce, La Mesa and Las Lajas – rounded out the list of flight-capable installations.[127] Not on that list – and located within the Canal Zone – was the new base at Bruja Point that became Howard Field.

The Bruja Point Military Reservation was established on August 1, 1928 and named Fort Kobbe in 1932. On December 16, 1937, the 16th Composite Wing floated an idea to relocate the 6th Bombardment Group from France Field to a new field at Bruja Point with the move planned to take place in 1942. The Navy opposed, fearing interference with a planned naval communications facility. In early 1939 the War Department submitted a budget proposal that included $14M for construction at Bruja Point Air Base. On July 12, 1939 official approval was received for construction of a new base and after construction started on December 1, 1939 the base was named after Major Charles Howard.[128]

1940-1941 – Expansion and Wartime Footing

By 1940, the Air Corps expansion in Panama was moving at a dizzying rate. On January 27, 1940 all pursuit squadrons in the 16th PG were designated as Interceptor Squadrons. The activation of the 37th Pursuit Group (Interceptor) with its three flying squadrons along with the 43rd Pursuit, 3rd Bombardment and 39th Observation Squadrons on February 1, 1940 created a large logistical problem in Panama. As had become standard, personnel from existing squadrons were assigned and mixed with newly trained personnel, with the new squadrons starting out with only six assigned pilots. These units slowly expanded over the year, with the 43rd Pursuit growing from three to nine assigned officers by the end of 1940. The groups focused on training the new influx of personnel, with ground training for junior officers and recruit drill for

new enlisted personnel.[129] In addition to activating new units, the Air Corps also shifted around existing units to better protect the Canal. The 9th Bombardment Group was ordered to move to Panama from Mitchell Field, NY. On November 13, 1940 the USAT *American Legion* arrived at Balboa with the first part of the ground echelon of the group while the 1st, 5th and 99th Bomb Squadrons ferried their B–18As south via Central America, meeting up with the ground echelon by the end of November.

The next major growth for Canal Zone aviation occurred on November 20 with the activation of the Panama Canal Air Force under Brig Gen Douglas Netherwood, with Maj Gen Frank Andrews assuming command on December 6, 1940. The Panama Canal Air Force became the Caribbean Air Force on August 5, 1941.[130] Also activated on November 20, 1940 was the 12th Pursuit Wing while the 19th Wing was redesignated the 19th Bombardment Wing. Upon activation, the 19th Bombardment Wing was assigned the 6th Bombardment Group (M) and 9th Bombardment Group (H) along with the 7th and 44th Reconnaissance Squadrons. A few weeks after activation, the 6th Bombardment Group and the reconnaissance squadrons were redesignated as heavy. The 54 Group Program published in July 1940 added further units to the mix in Panama. The 20th Transport Squadron was activated at France Field on December 15, 1940 and assigned to PAD on February 1, 1941. On January 1, 1941 the 32nd Pursuit Group (Fighter) and its constituent 51st, 52nd and 53rd Pursuit Squadrons (Fighter) was activated at Rio Hato along with the 59th Bombardment Squadron (Light), which was assigned to the 6th Bombardment Group.[131] In less than one year, a wing, two groups and their six flying squadrons, and two additional squadrons were activated in Panama and a group with three squadrons was transferred – more than doubling the air power in the Canal Zone. In fact, the Canal Zone had become saturated with aircraft and had reached a point where it was not considered practical to expand air forces in Panama beyond what was already planned due to air congestion and lack of suitable terrain. This congestion, along with the concept of expanding the defensive perimeter of the Canal outward, resulted in the 9th Bombardment Group dispersing its bomb squadrons to Caribbean airfields in 1941, leaving only one bomb group at Howard Field.[132]

War Preparation

There was a sense of urgency for the annual training year starting April 1, 1940. The training plan noted that the objective was to "produce units prepared to execute effectively their respective missions, on short notice at existing strength, in combined operations." The Air Corps was directed to work with the Air Warning Service throughout the year and the anti-aircraft artillery of the Coast Artillery at least once a quarter.[133] The 19th Wing alert profile increased on June 7, 1940, with four B–18s, one O–47A and six P–36s and appropriate crews required to be in readiness at all times.[134] On June 17, 1940 Gen Marshall ordered the Panama Canal Department, the Hawaiian Department, and the West Coast of the US to alert themselves against a surprise attack with the Panama Canal Department responding by deploying anti-aircraft forces into defensive positions.[135]

Between June and October 1941 70 P–40s were ferried to Panama for the 12th Pursuit Wing. This included a mix of used P–40Bs and new P–40Cs and P–40Es. The P–40E shown here was considered the state of the art pursuit/interceptor for the Air Corps in 1941 and would see combat service in the Pacific starting December 7. ***(Public Domain.)***

The tenuous balance of the United Kingdom during the Battle of Britain in September 1940 prompted concern out of Washington. The War Department sent a secret radiogram to the Panama Canal Department on October 9, 1940 describing the increasingly unstable political situation and warning the command. The 19th Wing staff assessed the tactical situation and determined that if "intensive actual operations" were to commence, the wing would need to rapidly complete Howard Field as Albrook Field was the only base capable of operating heavily loaded bombers during the wet season. In addition, Chame and Aguadulce needed to be upgraded as they were only capable of operating P–26s and A–17s. Finally, the remaining P–26s in the wing needed to be replaced by thirty P–39s.[136] With respect to concrete actions, the 19th Wing started alert schedules and flights in November 1940, with an Information Center being established the following month for managing the air picture. During February 1941 the Information Center started managing intercept missions using data from radars that were deployed in June 1940.[137] There was also an increased emphasis on passive defenses for air assets. By May 1940 Albrook Field had a plan for defense against ground and air attack utilizing assigned forces and in September the 19th Wing started to investigate the need for a bombproof shelter dug into the side of Diablo Hill on Albrook Field with 8000 square feet of floor space. Albrook Field examined the problem of aircraft survival through the use of sandbag revetments in April 1941 and initiated planning for local defense of air bases.[138]

Radar

The biggest change made to the defenses of the Canal Zone was the introduction of radar. The Army's relationship

A formation of 29th Pursuit Squadron P–12s over Panama in December 1936. P–12s would continue to serve the pursuit squadrons in Panama for another few years, with 16th Pursuit Group rolls noting the 24th and 29th Pursuit each equipped with fifteen P–12s in January 1939. *(US National Archives.)*

with radar technology dates back to early 1930's with a hand-built prototype demonstrated to the Chief of the Signal Corps on May 18-19, 1937. Chief of the Air Corps Maj Gen Oscar Westover was also present at the May demonstration and on June 3, 1937 proposed an operational specification for a long range early warning radar to meet Air Corps needs. Emphasis was placed on the Air Corps requirement and the engineers at Fort Monmouth went back to the drawing board. By early 1939 both a mobile (soon designated SCR–270) and fixed (SCR–271) version of an early warning radar had been developed with an engineering model of the SCR–270 tested in June 1939. On March 10, 1939 the Chief Signal Officer was instructed to prepare a comprehensive plan for the organization and operation of an Air Warning Service for the continental United States and select overseas locations. The final study was completed in February 1940 and provided for 23 radar sites supporting nine information centers.[139] Before the study was completed the first radar unit, the Signal Company, Air Warning, Panama, was activated on January 1, 1940 at Fort Monmouth. In May 1940 it departed for Panama to survey locations and prepare to install radar stations. Aircraft Warning Service (AWS) Station No. 1 received its SCR–271 early warning radar in June 1940 and emplaced the set at Fort Sherman, going operational in September 1940. Station No. 2 was started at the same time at Taboga Island, Bay of Panama, but location issues delayed operations and the radar was not fully operational until November 1941. Another seven Aircraft Warning Service stations were set up between April and July 1941, starting out as ground observer stations but not going operational with their radars until January 1942. Paralleling the deployment of radars was establishment and growth of the Information Center to fuse the radar data and provide command to interceptors. The Information Center started in the basement of the Headquarters Building of the Panama Canal Department at Quarry Heights with a 4 x 5 foot plotting board and a few radio receivers. To oversee the growing air defense operation the Caribbean Interceptor Command was constituted on May 29, 1941 comprised of 12th Pursuit Wing and 16th, 32nd and 37th Pursuit Groups; the radars of the Signal Company were aligned under the command on July 26. By June 1941 a greatly enlarged and enhanced Operations Room was organized on the third floor of the Headquarters Building, 12th Pursuit Wing, replacing the basement Information Center. Feeding the Operations Room were ground observers and AWS Station 1, which started 24/7 operations in June.[140]

Operations

Though technically the primary duty of the Air Corps in Panama was tactical in nature, in truth the majority of its work centered on training new aircrew for combat. Training of bombardiers was a primary consideration for the 19th Bomb Wing due to their scarcity within the Air Corps. Bomber trainers were available at most squadrons, with actual bombing conducted on such targets as Valladolid Rock in Panama Bay and sunken ships in Limon Bay. Squadrons continued to use Rio Hato for an annual two week bombing and gunnery camp; the large number of tactical organizations turned this into a near year-round endeavor. Both ground targets and aerial tow targets were engaged to help refine the skills of the growing number of aircrew. In 1941, the wing started to send each squadron to Aguadulce for a period of intense aerial training, with the Headquarters and Headquarters Squadron of the 6th Bombardment Group serving as training staff.[141]

In between training new personnel, the Panama Canal Air Force continued with the usual training calendar of years prior, though with an increased sense of urgency. The 39th Observation provided artillery spotting support for the Field and Coast Artillery units of the Panama Canal Department while 19th Bomb Wing units flew cooperative training with anti-aircraft units by running day and night tracking missions.[142] One new venture in this area was the use of radio controlled aircraft as targets for anti-aircraft batteries. Douglas O–32s, an upgraded version of the O–2 flown in Panama, were converted to training BT–2s through the addition of dual controls and instruments to the rear cockpit. In 1940 the BT–2 was used as the basis of a radio-controlled anti-aircraft target, with seventeen BT–2s converted to A–4 aerial targets by adding remote control gear to the aircraft. The 39th Observation operated several of these aircraft from France Field to assist in anti-aircraft training.

Next to tactical bombing and gunnery training, cross-country flights were critical to providing experience to the large number of new pilots. Building flight hours and providing familiarization of the unique tropical weather as well as local airfields and runways in neighboring nations, cross-country flights grew in frequency and duration. In the first half of 1940, it was not uncommon for squadron or group size flights to occur once per month, usually a multi-day trip to Central America. 6th Bombardment Group bombers would also wing down to South America; on March 10, 1940 twelve B–18s led by 19th Wing Commander Brig Gen Dargue accompanied Secretary of War Harry Woodring and the Commanding General of the Panama Canal Department on a multi-day good will flight to Lima, Peru. The following month, nine P–26s, nine P–36s, and seven B–18s flew to San Jose, Costa Rica on April 7, 1940, returning on April 9. Beginning in August 1940, the 19th Wing scheduled regular monthly flights following four different routes centered on the Caribbean, Colombia, the west coast of South America, and Central American capitals. The flights were designed to acquaint aircrew with weather, terrain, and different landing fields. Departure and arrival messages were sent

The Northrop A–17 served briefly in its intended ground attack role for the duration of the 74th Attack Squadron's existence from September 1937 to November 1939. After re-designating as a bombardment squadron, within a few months the 74th passed its A–17s on to the 37th Pursuit Group for training purposes until additional fighter aircraft could be sourced. ***(US National Archives.)***

over the Pan-American Airways System and the flights maintained radio contact with one of the radio stations located at France or Albrook Field. Enroute contact on the Air Corps net provided updated positional data of each flight along with weather observations. The Pan American Airways System also provided enroute weather and landing field information.[143]

Exercises

As the Panama Canal Air Force grew, exercises became even more critical to not only train new airmen but to also practice the large-scale employment of air power. In December 1939 the 6th Bombardment Group conducted a series of Group problems in preparation for wartime operations. Through the Cristobal Port Captain, the Group Commander obtained information as to the approximate position and description of a ship between 150 and 200 miles off shore approaching or leaving the Canal. The following morning, the 7th Reconnaissance performed a search for the target vessel, aircraft fanning out and maintaining radio silence. When the target ship was sighted an encoded contact message was radioed to Group Commander, giving the time of interception, course, estimated speed and position. With this information in hand, the Group Commander issued an attack order to the Commanding Officer of the 25th Bombardment, who launched all available aircraft with a full wartime load of bombs and ammunition. The squadron flew to the position reported and released sufficient oil to create a "slick" on the ocean's surface, which served as their target for the problem. In October 1940 the 6th Bombardment Group took to the field as a complete group for five days of maneuvers at Rio Hato. The group carried out numerous tactical missions including a night attack under flares on Albrook Field. The Pursuit Groups also conducted

group-level exercises, with the 37th Pursuit Group running a week-long event that required six pilots and six P–26As on alert from 5 AM to 6 PM from February 23 to March 1, 1941. With a large staff required to coordinate the actions of many subordinate squadrons, in January 1940 the 19th Wing started to run "educational exercises" every Friday. Group staff would examine a tactical problem and develop a solution that was then critiqued by Brig Gen Dargue. Examples included finding an enemy carrier and defending against a carrier air strike.[144]

Joint Army-Navy Exercises continued on an ad-hoc basis. On February 11, 1941 an iteration of one of these exercises was held with the gunboat USS Erie used to represent enemy forces. The exercise started with USN patrol craft siting an "enemy" carrier. The 19th Bomb Wing responded by launching bombers from France and Albrook Fields and Rio Hato. On return, the bombers became "enemy" forces and the 37th and 16th Pursuit Groups flew to intercept the inbound bombers.[145] Annual Panama Canal Department maneuvers were still being conducted as well, with 1941 maneuvers wrapping up on April 5, 1941. Like all other aspects of the Air Corps in the Canal Zone in the 1940-41 period, the aircraft that equipped the units assigned to Panama changed dramatically in technology and numbers.

Modern Aircraft Finally Arrive

1940 started with the 16th Pursuit Group equipped with P–36A aircraft. The addition of the 43rd Pursuit in February saw the P–36A force split among the three squadrons, but since the 43rd Pursuit initially had only three pilots assigned it required less aircraft; the 29th Pursuit had eight of the aircraft assigned on February 1 and the 24th Pursuit ended 1940 with eight P–36As on strength. P–26As, excess to the 16th Pursuit Group, were used to establish the 37th Pursuit Group in February along with A–17s and BC–1s. At activation, the 31st Pursuit had five P–26As, two A–17, and two BC–1; by March 16 the squadron had seven P–26As and one BC–1 and remained as such for 15 months. Attrition aside, the pursuit force remained relatively stable for the rest of 1940. Concerns existed in the 19th Wing on its increasingly obsolete pursuit force, especially with the standing up of the 37th Pursuit Group with no new or additional aircraft but the wing received little more than assurances from Washington that help was on the way in mid-1941. The 32nd Pursuit Group was activated on January 1, 1941. With no additional aircraft on hand, the 12th Pursuit Wing split its available P–26As and P–36As between the three pursuit groups. The new 51st Pursuit was equipped with P–36As and P–26As from the 16th and 37th Pursuit Groups respectively, while the 52nd Pursuit made do with "only a few" P–26As. By April 1941 only twenty P–26As remained, with eight assigned to a pool for use by the 32nd and 37th Pursuit Groups; similarly, only 21 P–36As were left in Panama – both reduced inventories reflective of the heavy attrition from training new pilots. Change was in the air though. By May 1941, several members of the 24th and 29th Pursuit Squadrons were on detached service at Mitchel Field familiarizing themselves with the P–40 in preparation of its entry into service in the Canal Zone. Between June and October 1941 70 P–40s were ferried to Panama for the 12th Pursuit Wing. This included a mix of used P–40Bs and new P–40Cs and P–40Es. In June 1941 two separate ferry flights with 24th Pursuit pilots were made from the US to retrieve P–40C aircraft for the 12th Wing. In July the 16th and 37th Pursuit Groups received their first P–40Cs, fully transitioning to the type in September. The 32nd Pursuit Group was not as fortunate, receiving the cast off P–26s and P–36s as the other two groups went through conversion. By November 1941 the 16th Pursuit Group started to transition to P–40Es.[146]

In October 1939 department commander Maj Gen Stone wrote to Washington asking for long range aviation to cover seaward approaches. He was denied and in consolation a second Sikorsky OA–8 was assigned, the amphibian arriving December 23, 1939. Long-range Consolidated OA–10s were promised in early calendar year 1942. With tensions running high in summer 1941, nine B–17Bs from the 19th Bombardment Group made excess due to the group's upgrade to the B–17D were ferried from March Field to Panama on June 3, 1941. The majority of the B–17Bs were assigned to the 7th Reconnaissance with one going to the 3rd Bombardment which also operated B–18s. During this time frame, the 25th and 74th Bombardment Squadrons operated B–18s. Activated on January 1, 1941 at Rio Hato, the 59th Bombardment (Light) was equipped with thirteen Douglas A–20A that were ferried to Panama in late May 1941.[147]

The newly-formed 39th Observation Squadron was initially equipped with six A–17s but soon transitioned to the North American O–47A in June 1940, a type appropriate for its role of cooperating with the ground forces of the Panama Division.[148] After receipt of ten O–47As, the 19th Wing transitioned the A–17s to a utility role, with six aircraft spread across the 19th Bomb Wing in May 1941. Also new to the Canal Zone were four Vultee A–19s that were ferried from March Field to Panama arriving December 23, 1939. The A–19s had briefly seen service with the 17th Attack Group at March Field before being transferred to the Panama Canal Zone for utility transport and liaison duties. One Douglas C–33, a cargo transport variant of the DC–2, was supplied to Panama in 1940. Between March and August 1941 ten C–39s and a C–49 arrived in Panama, the C–49 for a VIP transport role to free up an existing C–39 for cargo transport. The C–39 was a composite of DC–2 and DC–3 components, with C–33 fuselage and wings and DC–3-type tail, center-section and landing gear. The C–33 was transferred back to the US, leaving the 20th Transport Squadron with eleven C–39s for cargo transport work.[149] In addition, in August 1941 two C–49C and five C–49D aircraft were delivered new from Douglas Aircraft to the 20th Transport Squadron for use in the transportation of airborne infantry.

The Cost of Growth

In January 1940 Brig Gen Dargue, commander of the 19th Wing, wrote a memo to the base commander at Albrook Field highlighting his personal observations of unsafe flight activities around the base that he attributed to "airdrome control." The base issued a memo the following day outlining proper traffic movement around the runway and the need to adhere to instructions from the traffic control tower; this was followed up in June with a multi-page "Airdrome Traffic Control" operations memorandum.[150] Dargue was witnessing the manifestation of rapid expansion of the Air Corps in the Canal Zone – and it would only get worse.

The rush to bring on line new tactical units resulted in operations conducted at breakneck speed. The 43rd Pursuit Squadron was activated on February 1, 1940 with three Second Lieutenants and 93 enlisted men transferred in from existing units in Panama. The squadron flew its first tactical mission, a three ship patrol, on June 23, 1940 and conducted a cross-country flight Guatemala City on June 28. The 37th Pursuit Group, activated on the same date, was flying interceptions and patrols by June even while its component squadrons rotated through Rio Hato to conduct training and gain experience. This rapid mobilization came at a cost. In its first year of existence, the 31st Pursuit crashed or damaged eight P–26As and one BC–1, with the majority returning to service.[151] The 30th Pursuit had a similar record with their assigned P–26As. The activation of the 32nd Pursuit Group on January 1, 1941 added misery to the long-suffering P–26A fleet with an additional spate of crashes occurring in mid-1941 at Rio Hato as new pilots with few flight hours tried to master the intricacies of landing a fighter aircraft.

Even existing squadrons were suffering high attrition from the absorption of many new pilots and the rapid change in technology of assigned aircraft. After converting to the P–36A in October 1939, the 24th Pursuit experienced nine crashes, the majority on landing, over the next 18 months. The aircraft were returned to service, but the toll on maintenance was heavy. More disconcerting were the six aircraft lost due to mid-air collisions or loss of control, with five fatalities. The 43rd Pursuit also had two fatal accidents in February 1941. On February 12, a P–26 crashed into the ocean and a P–36 had its engine quit and the pilot bailed out over the ocean. The first pilot died, the second was recovered. The next day a P–36 dove into the mud flats near Chame Point, killing the pilot. P–36s were grounded the next day for inspection. Losses were not restricted to fighter aircraft. A 9th Bombardment Group, 99th Bombardment Squadron B–18A crashed into Panama Bay on February 27, 1941 with all crew lost. Another B–18A crashed into Gatun Lake a couple months later with no loss of life. In the same time period, yet another B–18A was written off after crashing at Rio Hato on April 1.[152] Just keeping the units assigned to Canal Zone up to strength was a difficult task, much less expanding them to their full complement of aircraft. Critical to this was the continuing support provided by the Panama Air Depot.

Bases

Up until 1939, physical growth of the Panama Air Depot (PAD) had been ad-hoc due to limited budgets. Temporary structures were built to house departments which continued to grow, causing overcrowding. The solution was a new depot, but this would take time. In July 1939 funds were identified but construction of the new depot at Albrook Field was expected to take two years. Work started in April 1940, with some buildings completed by March 1941. The first echelon of civilian employees moved in September 1941, though PAD did not fully transition to Albrook until 1942. PAD organizational structure went through changes as well, evolving from the 1st Depot Squadron in 1939 to the 1st Air Depot Group with 1st Repair and 1st Supply Squadrons on January 1, 1941. By January 1939 175 civilian employees worked at the depot, making up approximately 50% of the work force. This grew to 225 by the end of the year as efforts to civilianize the work force took effect, though low wages and a lack of housing limited total conversion to civilians. By the end of 1940 a 25% pay increase was approved, with the civilian work force growing to 580 by September 1941. In 1940-41 on average the PAD was overhauling fifteen engines per month, increasing to twenty five by late 1941. The PAD performed Depot Inspection and Repair in accordance with Technical Orders and hour limits such as 500 hour inspections as well as reconditioning of aircraft, averaging one aircraft overhaul and six inspections/minor repairs per month, increasing to thirteen in 1940. Critical to increased activity at the depot was adequate transportation. By 1940 the need for a dedicated transportation squadron of two or three modern transport aircraft to ship items between the depot and the operational bases at Albrook Field and Rio Hato was identified as using transport aircraft assigned to the Panama Canal Department and bombers was unable to keep up with need.[153] The 20th Transport Squadron assigned to PAD on February 1, 1941 solved the problem.

France Field, home of the PAD until after the start of the war, was also receiving attention with respect to construction. Three new 300-man capacity temporary barracks were completed in early 1940, along with a new general mess building for the 6th Bombardment Group. On April 19, 1941 the War Department provided funds for the reconstruction of the runway at France Field. It was still under construction at the start of the war. More work, though, was occurring away from France Field. Development continued at Howard Field in early 1940, with Corps of Engineers supervising Air Corps manpower for site and building construction, but by October 1940 work had barely advanced. The 19th Wing prioritized building construction and drainage work at Albrook Field over Howard Field, causing delays with the concrete runway not being poured until July 1941. On May 9, 1941 support airmen were assigned to the 16th Air Base Group and moved to Howard Field with the 44th Reconnaissance and 74th Bombardment moving in July.[154]

Construction continued at Albrook Field with additional officer and NCO quarters as well as completed

hangars being turned over for use. Temporary messing and barracks for 1200 men was also put in place. While housing for men and aircraft was keeping pace with the new units, the runways were not staying abreast of heavier and faster fighters being assigned to Panama. By October 1940 the runway at Albrook Field, paved less than 18 months prior, was already seen as inadequate. The orientation of the current runway required heavily loaded aircraft to take off over thickly populated Balboa and pass between two hills. A plan was put forth to build a new 7000 ft runway oriented away from these hazards and increase the length of the current runway from 4700 to 5600 ft. Like everything, this would take time.[155]

In spring 1940 construction activity continued at Rio Hato, with infrastructure such as additional barracks, exchange, and a dispensary, being built. Rio Hato was seen as an interim operational base for the 9th Bombardment Group, with the field transitioning to become a Department Training area once Howard Field was operational.[156] The arrival of B–17s to Panama emphasized the need to upgrade not only the main airfields in the Canal Zone, but also the emergency and auxiliary runways. On January 8, 1941 the War Department approved the development of auxiliary airdromes at David, Aguadulce, and Chame.

In October 1939 Panama Canal Department commander Maj Gen Stone wrote to Washington asking for long range aviation to cover seaward approaches. He was promised aircraft at some future date but with tensions running high, nine B–17Bs from the 19th Bombardment Group were ferried from March Field to Panama on June 3, 1941. The majority of the B–17Bs were assigned to the 7th Reconnaissance Squadron. ***(US National Archives.)***

Summary

By August 1941 the Panama Canal Air Force was unrecognizable from the 6th Composite Group that existed for much of the pre-war era. Over the intervening twenty years, the organization added tactical units, expanded infrastructure, and incorporated new aircraft technology as well as ground-based radar. Tactics changed over time as well as a growing recognition of the need to work with the US Navy as a joint partner. Through all this change the airmen in Panama maintained a focus on protecting the Panama Canal from foreign threats, keeping safe a strategic line of communication for the United States. The combined arms approach shown by airmen in the Canal Zone, similar to that of other overseas airmen in Hawaii and the Philippines, foretold the way airpower was to be used in the Second World War. ■

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US Air Power 1945-1990 Volume 1: US Fighters and Fighter-Bombers 1945-1949. By John C. Baker. Warwick UK: Helion, 2024. Photographs. Maps. Notes. Bibliography. Index. Drawings. Appendix. Pp. 83. $29.95 paperback. ISBN: 978-1-804513-75-0

This book is the first of a proposed 15-volume set that will discuss all aspects of America's post-World War II military aviation. Much of this volume serves as a stage setter for the following works. Standing alone, it is an overview of the evolution of American airpower in the second half of the 20th century. With a clear focus on strategy, technological innovation, and geopolitical context, Baker offers a narrative that both military historians and general readers will find interesting. Unfortunately given the content constraint of only 83 pages, his narrative is several miles wide and only a few inches deep. It includes many comments to the effect of "I'll cover that in volume 2" or "This is discussed in Volume 4." He introduces topics and ideas and then abandons their discussion for future volumes.

Baker goes to great length to explain that he uses only "primary sources and peer-reviewed reports" and criticizes his peers for using "regurgitated text" which is flawed or erroneous. But then he offers opinions and analyses without a single reference or citation. For example, Baker attributes P–82 delivery delays to faltering engine production without citation. A cursory analysis of War Production Board records shows that production of the V-1710 slowed only when the Board amended and reduced the Allison Contract. In discussing the F–86's development, Baker goes into detail discussing the 1948 Cleveland Air Races and the F 86's record attempts, but he totally ignores Fred Ascani's 1951 flight where he set a speed record of 635 knots and earned the Thompson and McKay Trophies.

As with most Helion products, this volume is image-rich in both photographs and drawings. The imagery is not very well curated: images seldom appear proximate to the relevant text. However, the narrative is clear and active and moves along nicely, even when in the depths of policy and budget discussion. Baker does not hesitate to let the reader know when political and military leaders of the era got it wrong. The Truman Administration is on the receiving end of much of the criticism. Baker makes clear that the Truman-led demobilization when too far too fast and created a military establishment that "couldn't fight its way out of a paper bag."

But somehow the newly independent Air Force found the resources to refine the first generation of jet fighters and move into the second. It is hard to believe how fast the field was advancing in not only design, but also in production, engineering, materials, organization, ancillary weapons, and support equipment. But then those explanations will come in volumes 2-15 with a total price tag for all books of about $450.

If this volume is any example, this proposed series carries potential. It may be of interest to the armchair historian looking for one set of books to answer most of their questions. Baker includes some interesting facts to keep the readers' attention. He notes the first published demobilization plan was prepared by the government in 1943. While America's demobilization avoided many of the pitfalls of its earlier Civil War and Great War demobilization efforts, this iteration happened concurrently with one of mankind's greatest technological leaps.

However, given the lack of citation and incomplete research, I cannot recommend this volume. But perhaps picking and choosing among the upcoming books might reveal some nuggets of knowledge.

Gary Connor, docent, National Packard Museum, Cortland Ohio

Aeronautica Macchi Fighters: C.200 Saetta - C.202 Folgore - C.205 Veltro. By Luigino Caliaro. Manchester UK: Crécy Publishing Ltd., 2023. Photographs. Illustrations. Bibliography. Appendices. Maps. Tables. Pp. 288. $54.95. ISBN: 978-1-80035-280-3

Luigino Caliaro, an Italian aviation photographer and writer, has written an excellent and comprehensive survey of the Italian *Regia Aeronautica*'s three mainstay fighters of World War II: the Aeronautica Macchi C.200 Saetta, C.202 Folgore, and C.205 Veltro. The book is profusely illustrated with photos of all three airplanes, with an astonishing number in color.

Caliaro begins with the history of the Aeronautica Macchi company and its chief designer, Mario Castoldi, who designed the series of racing planes that represented Italy in the Schneider Cup races of the 1920s and 1930s and then went on to design the Macchi fighters of World War II. A chapter on the evolution of the fighter monoplane in Italy in the 1930s notes the Italian aviation industry's inability to develop high-performance aircraft engines and the industry's failure to adopt methods of construction that would allow for quantity production—factors that would limit the effectiveness of Macchi fighters.

The book then traces the history of each of these fighters, beginning with a section on their design, development, and production. A technical description of the airplane goes into considerable detail followed by a section on its operational service during the war with both the *Regia Aeronautica* and the *Aeronautica Nazionale Repubblicana* and in the postwar period. At a time when other air forces were developing multi-gun fighters, the *Regia Aeronautica* remained fixated on aerobatic maneuvering as the key to aerial combat, limiting the armament in its early-war fighters to two 12.7-mm machine guns in the nose firing through the propeller. As Caliaro notes, this made the C.200 and the C.202 almost completely ineffectual against the heavy American bombers flying over North Africa, Sicily, and Italy.

The Achilles heel of Italian World War II fighters was the lack of high-performance engines. When Castoldi wanted to build a fighter with greater performance than the C.200, the only option was to adopt the Daimler Benz DB 601 engine to produce the C.202. When the *Regia Aeronautica* made a belated attempt to improve fighter armament and performance late in the war, Caliaro describes how Castoldi adapted the C.202 to take the more powerful Daimler Benz DB 605 engine as the C.205V. In its later series, this model mounted two 20-mm cannon in the wings in addition to the two 12.7-mm machine guns in the nose. What is remarkable is how few fighter aircraft Aeronautica Macchi actually built during the war. Between 1939 and the end of 1943 the company built some 2560 model C.200, C.202, and C.205 aircraft. In comparison, during 1944 alone, North American Aviation built more than double this number of P–51 Mustangs. The *Regia Aeronautica* pilots fought bravely, with inadequate replacements, in aircraft that, as the war went on, were often outclassed and out-numbered.

The book concludes with several personal accounts of pilots who flew the Macchi fighters, a beautifully illustrated chapter on the camouflage schemes applied to each of these fighters, and a chapter on surviving aircraft in museums around the world. An appendix gives the order of battle from June 1940 to May 1945, listing the units that flew these fighters, their types, and bases. Highly recommended.

Edward M. Young, PhD, volunteer, Museum of Flight, Seattle

Gotha Terror: The Forgotten Blitz, 1917-1918. By Ian Castle. Barnsley UK: Pen & Sword Military, 2024. Photographs. Maps. Appendices. Bibliography. Notes. Index. Pp. xx, 332. $49.95. ISBN: 978-1-3990493-1

If you've read either of Ian Castle's two previous books on "The Forgotten Blitz," you'll know exactly what to expect in this third, and final, volume. Here he covers both Zeppelin and airplane attacks on Great Britain in 1917 and 1918, as well as British raids on the German bases from which they originated.

Castle provides a mission-by-mission, aircraft-by-aircraft (Gotha, Zeppelin, or *Riesenflugzeug*), and bomb-by-bomb (except when several were dropped at once—not customary practice) review of every attack on the British Isles through the period. This includes damage, casualties (including livestock), and the fate of the attackers.

In the course of his research, Castle determined the names of over 90 percent of those killed by the bombings, even though names and locations were withheld during the war for security reasons. As a result, the book also serves as a memorial to the 1414 confirmed victims (1285 of whom he lists in the books' appendices).

Improvements in technology over the course of the war led to developments in offensive and defensive strategies. These improvements included air-raid-warning systems, night flying (both attacking and defending), a precursor of the Dowding System for tracking and responding to raiders, ground-based defenses (barrage balloons and designated areas for anti-aircraft barrage fire), acoustic aircraft detectors, and the more-obvious advances in aircraft altitude and speed performance and weaponry (by war's end, the Germans were using 1000kg bombs, while the British had illuminated gunsights and incendiary/explosive ammunition).

However, bomb aiming was a major problem throughout the war. Zeppelin accuracy deteriorated as the ships were forced to greater altitudes. Transitioning from day- to night-raids made identification of targets largely a matter of guesswork for the aircrews. Also, from reading the mission results, a surprisingly large number of bombs (both high-explosive and incendiary) failed to detonate. By the last part of the war, the *Luftstreitkräfte* had developed a very-light incendiary bomb with a magnesium case; but, as it was clear to the High Command that the war was lost, they were not permitted to use it. An earlier "improved" incendiary proved even less effective than the first ones used.

In conclusion, Castle assesses the effectiveness of the bombing missions. The first (daylight) Gotha raid in 1917 caused more damage than all the Zeppelin raids of 1917 and 1918 combined (which totaled less than the cost of building one Zeppelin—23 of which were lost to all causes in 1917-18). The hoped-for widespread panic never happened (nor did it in the later World War II blitz). Gotha losses from air defenses and accidents were a constant problem for the Germans. Finally, the principal benefit to the German war effort was in the British artillery and aircraft kept at home rather than being deployed to the Western Front.

Appendices list the daily missions including numbers and types of aircraft, damage inflicted, and deaths and injuries for each day/night; annual totals for bombs, damages, dead, and injured; and a raid-by-raid listing of those killed (including unknowns).

This and Castle's other two books—*Zeppelin Onslaught* (covering 1915) and *Zeppelin Inferno* (1916)—are highly recommended for anyone with an interest in World War I aviation or the history of strategic bombing.

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

GRID: The life and times of First World War Fighter Ace Keith Caldwell. By Adam Claasen. Auckland, New Zealand: Massey University Press, 2024. Photographs. Notes. Index. Bibliography. Pp. 439. $55.00. ISBN: 978-0-9951029-3-4

Adam Claasen has produced a magnificent product recounting the life of Air Commodore Keith Caldwell, New Zealand's highest scoring pursuit pilot of the Great War whose actual life leaves many fictional characters in the dust. While researching another work, Classen realized the magnitude of Caldwell's contributions and realized his story had never been told in full. The family was supportive of a biography and gave Claasen access to Caldwell's letters and personal papers. He used those intimate documents to bring Caldwell's story to life. Claasen's ability to move between primary, secondary, and tertiary sources with ease makes this book exceptional. GRID is a solid 400-page read; but the narrative flow is so smooth, simple, and direct and the transitions so seamless that the book is an extremely comfortable experience. Photographs are nicely curated to support the narrative.

The photography deserves special mention. Most of us know the Great War as a black-and-white war. But Central Powers air forces decorated their aircraft in colorful and personalized paint schemes. Most of the photographs in GRID are printed on the same rough paper as that which carries the text. But Classen and his editors included a few pages of high-quality paper to present full-color images of planes mentioned in the text.

Caldwell's story follows a simple chronological order. While it focuses on the man, it well mentions the amazing cast of characters that surrounded him: his family and friends, enemies and allies, and the highest positions and lowest ranks and does so in a way that emphasizes the humanity of Caldwell and his supporting cast.

Caldwell was raised in a comfortably upper-middle-class family and became a product of the Kiwi public school system where "God, king, and country were the holy trinity to which the boys were wedded. Sports were often seen as more important than classroom teaching because they created gentlemen of good character steeped in the virtues of sacrifice, honour, hard work, and teamwork." As Caldwell rose through the ranks, he did not like lone wolves (e.g., Billy Bishop) and was committed to a team-first ethic. He had two rules: "One, always be punctual and two, I do not want to ever see anybody abandon their comrades or mates in the air, even though odds are against you. If I do see that, my boot will be up your backside and need I remind you I have big feet." Caldwell spent 27 months on the front lines, where life expectancy for a pilot was often measured in days. He saw the technology and tactics of the air war change from fragile kites to rugged, dependable fighter-bombers capable of performing air-to-air and air-to-ground missions with equal effect.

The war stories are at times unbelievable. On one sortie, while on patrol over German lines he spotted enemy aircraft and directed his two comrades into attack formation. While maneuvering, one aircraft collided with Caldwell's, damaging the wing and vertical stabilizer and inducing a "death spiral." Caldwell found that he could gain some control by standing in the cockpit with his right foot on the rudder pedal and his left foot outside the cockpit on the wing—all while holding on to the wing struts. The plane slowed as it descended and crossed into British lines. Just before the plane inevitably hit the ground, Caldwell let go and leapt from his perch. He hit the ground and somersaulted. When he stopped, he stood up, brushed the dirt from his clothing, and asked a nearby Tommy if he could use a phone. Caldwell's standing order to his squadron regarding a lost pilot was that there was to be a dinner and party but no mourning. The knee-walking party was well underway when Caldwell bounded into the room!

Caldwell's service to New Zealand did not end with the armistice. He came home and become a gentleman farmer and sportsman. But during World War II, he served in very senior training and support positions, using his skills as a leader and manager. He survived the war, rejoined his wife and family, and died of melanoma in 1980 at age 85.

GRID is a superb book. Claasen's nuanced explanation of New Zealand culture and its relationship to its colonial leadership is interesting. He shows Caldwell dealing with issues of gender and class equality decades before the mainstream. Caldwell was 22 years old when he took command of 74 Squadron. In times of desperate conflict, men such as Caldwell rise to the occasion—and authors such as Claasen emerge to tell their story.

Gary Connor, docent, National Packard Museum, Cortland OH

Proposed Airborne Assaults in the Liberation of Europe: Cancelled Allied Plans from the Falaise Pocket to Operation Market Garden. By James Daly. Barnsley UK: Frontline Books, 2024. Photographs. Maps. Notes. Bibliography. Glossary, Index. Pp. 225. $34.95. ISBN: 978-1-39903-621-4

This is the second in a two-volume set offering a meticulously researched account of Allied airborne operations during World War II, focusing on both executed missions, and proposed, but ultimately abandoned, plans. I did not read volume one on proposed Operation *Overlord* assaults. Both books nominally provide an in-depth analysis of the logistical, tactical, and strategic challenges faced by Allied planners, with attention to the availability of troop-carrying aircraft and gliders, as well as the combat capabilities of airborne troops. A sizable portion of the second volume focused on significant challenges regarding different strategic visions of British and American commanders, highlighting British umbrage at feeling like the junior partner in the highest levels of decision making, and the carryon effects of the failure of *Market Garden*.

One of the book's standout contributions is its detailed examination of the numbers and types of aircraft and gliders available. By *Overlord* in June 1944, the USAAF and

RAF operated over 1200 C–47s, supported by additional transports such as the Stirling and Albemarle. These were critical for delivering paratroopers and towing gliders—the British Horsa and American Waco CG-4A—that played a pivotal role in airborne assaults. The Allies had over 6000 CG-4As and 3800 Horsas available—an unprecedented investment in airborne warfare. All this was driven by the belief that air-delivered forces could decisively disrupt enemy defenses and seize key objectives ahead of conventional ground forces. Daly is careful to point out that the availability of aircraft and gliders often exceeded the Allies' ability to use them effectively due to constraints such as aircrew training, airfield capacity, and weather conditions. But USAAF and RAF transport capacity was sufficient to move multiple divisions within the European Theater should they be required.

Daly explores several abandoned airborne operations such as Operations *Lucky Strike* and *Transfigure* (aimed at disrupting German reinforcements in the Pas de Calais) and a large-scale drop to support the breakout from Normandy. In each case, he provides a clear analysis of why these plans were shelved (logistical hurdles, shifting priorities, or casualty concerns).

Another of the book's strengths is Daly's evaluation of airborne troops. He delves into the rigorous training, versatility, and combat effectiveness of these elite forces, trained for tasks ranging from seizing airfields and bridges to disrupting enemy supply lines. Their ability to operate independently and sustain themselves in hostile territory for extended periods made them invaluable. But they were lightly equipped and, therefore, vulnerable if relief forces were delayed or if the enemy quickly regrouped. *Market Garden* well illustrated these vulnerabilities.

In discussing the strategic thinking behind airborne operations, Daly argues that Allied planners sometimes overestimated the capabilities of airborne forces, leading to overly ambitious missions. However, he balances this critique by acknowledging the undeniable success of *Overlord*, where airborne forces played a critical role in securing the flanks and disrupting German counterattacks despite flawed and chaotic delivery of troops to assigned drop zones.

Tactically, the innovative use of airborne troops in smaller, focused missions such as the successful capture of Pegasus Bridge was a textbook operation that highlighted the strengths of well-coordinated airborne assaults. This contrasts with larger operations such as *Market Garden*, whose scale and complexity strained the limits of airborne logistics and coordination.

Daly assesses the legacy of Allied airborne operations and argues that, while the air assault concept was not without its flaws, airborne forces were a vital component of the Allies' ability to adapt and innovate during the liberation of Europe. The lessons learned from these operations influenced postwar military doctrines and underscored the importance of flexibility and coordination in modern warfare.

Overall, the book is well-researched and engaging and sheds new light on a critical aspect of the Second World War. Daly's focus is on the interplay between command, logistics, technology, and strategy. His book not only honors the bravery and ingenuity of the men who undertook these perilous missions but also offers valuable insights into the complexities of planning and executing large-scale airborne operations. This is a valuable resource for military historians and aviation enthusiasts alike.

Gary Connor, docent, National Packard Museum, Cortland OH

Proposed Airborne Assaults During Operation Overlord: Cancelled Allied Plans in Normandy and Brittany. By James Daly. Havertown PA: Frontline, 2024. Maps. Photographs. Notes. Glossary. Appendices. Bibliography. Index. Pp. xix, 214. $36.95. ISBN: 978-1-39903-743-3

Daly is an historian and museum curator in Portsmouth, England. He is the grandson of an airborne veteran who fought at Arnhem, the Netherlands, as part of Operation *Market Garden* in September 1944. Inspired by his grandfather's experience, he chose to examine airborne operations in Western Europe that the Allies considered but never executed. This work is the first of two. A complementary volume, *Proposed Airborne Assaults in the Liberation of Europe*, covers August 1944; whereas this volume looks at June and July, before the breakout from Normandy.

Daly begins by briefly reviewing the plans for employing airborne forces up to June 6. Here he introduces key personalities. Since he utilizes primary sources found only in the United Kingdom, he understandably focuses on British personnel and units. American forces seldom receive mention except in a supporting role.

British leaders considered employing reserve airborne forces, those that had sat out the initial airborne assault on D-Day, to assist in the breakout from the beaches. They considered three plans (*Tuxedo*, *Wastage,* and *Wild Oats*) for use in June.

Planners viewed *Tuxedo* and *Wastage* (a larger version of *Tuxedo*) as serving the same function—reinforcing troops in contact with the Germans rather than as operational jumps that might achieve tactical or strategic surprise on their own.

Wild Oats, on the other hand, focused on an ambitious objective: the capture of Hill 112 southwest of Caen. The hill offered superb views of the surrounding countryside. The airborne plan called for a drop in the hill's vicinity and a quick link up with armored forces. The plan received considerable attention in the middle of June.

To supply the expected Allied advance, planners con-

sidered the capture of ports in Brittany ports essential to the campaign's success. They considered three operations—*Beneficiary*, *Swordhilt*, and *Hands Up*. In late June, *Beneficiary* (intended to capture the port of St. Malo on the southern Brittany coast) began to take shape. Eventually the plan would include an amphibious assault by US troops as well as the airborne drop. In essence, it was a scaled-down version of D-Day. *Swordhilt* would land forces via sea and air on the north side of Brittany. They would move overland 45 miles to capture Brest.

Hands Up received the most attention. It focused on a combined airborne-airland approach, like the German assault on Crete, with Brest the objective.

In the end, ground forces captured Brest in mid-September. Meanwhile, the Allies moved sufficient supplies across the D-Day beaches (primarily through the surviving artificial harbor) and up the Rhone Valley from southern France to sustain the advance to the German border.

This well-researched book provides an inside look at the complex planning required to mount an airborne operation. Airborne specialists should find it a useful read.

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

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Tuskegee Airmen: Dogfighting with the Luftwaffe and Jim Crow. By Samuel de Korte. Barnsley UK: Air World, 2024. Tables. Diagrams. Illustrations. Photographs. Appendices. Bibliography. Notes. Index. Pp. 207. $34.95. ISBN: 978-1-39904-381-6

As I began to read this well-documented book about the famous Black pilots and support staff who served with distinction in the Army Air Corps during the Second World War, I wondered what new and compelling information de Korte could uncover 81 years after that conflict concluded. And there it was, hidden in plain sight: the Tuskegee Airmen's stories in their own words. Using actual war diaries, narrative mission/combat reports, historical records, and pilot autobiographies, de Korte puts the reader in the seats of P–40s, P–51s, P–47s and other aircraft as the Tuskegee Airmen fought their battles in North Africa and Europe.

de Korte is a graduate of Utrecht University where "he studied for an MA and researches and writes about [B]lack American soldiers during the Second World War." de Korte's interest focuses on the remarkable success of Blacks, especially the Tuskegee Airmen, who "had not one but two enemies to overcome: the German Luftwaffe and Jim Crow."

The book takes us through World War I and the attempt by Blacks to fly for the US, which, to their regret, was denied. The Black American Eugene Bullard, who fought in the French Army and was trained as a pilot with them, tried to enlist in the American Air Service, but was denied. This exclusionary issue was frustrating to many other American Black pilots, as Blacks were flying for France, Italy, and the Ottoman Empire.

In March of 1941, the 99th Pursuit Squadron (renamed the 99th Fighter Squadron in May 1942) was established as the first segregated American fighter unit and the precursor of what later became known as the Tuskegee Airmen. Five months later, the first Tuskegee Airmen cadets were inducted. Benjamin O. Davis, Jr., the son of the first Black US Army general, was among them and later advanced to take command of the 332nd Fighter Group, which included three other all-Black fighter squadrons. It eventually merged with the 477th Bombardment Group (Medium) in June 1945. That group never flew its B–25 bombers in combat. Unfortunately, it is better known for the regrettable 1945 racial confrontation known as the Freeman Field Mutiny at the base in Indiana.

de Korte's narrative includes actual pilot battle reports in unvarnished and vivid detail. Particularly revealing were the frequent number of incidents where pilots, in both combat and training, had either to bail out or crash-land because of engine failure and/or mechanical issues. Stunning, too, were the number of accidents and deaths due to non-combat flying issues. I only wish de Korte had taken the time to include a comparative analysis of the Tuskegee pilots' flying experiences with those of their white fighter pilot counterparts. Did white fighter pilots have similar experiences under comparable circumstances? Unfortunately, de Korte did not address this important issue.

I found the book to be an easy read and, at times, riveting, especially as the reader experiences the Tuskegee Airmen's flying and racial struggles through their own eyes and voices. I regret de Korte did not spend more time analyzing the early political decision to authorize establishment of the Tuskegee Airmen, identifying the political players, and presenting a timeline. For example, he failed to include the date of the momentous and controversial flight that First Lady Eleanor Roosevelt took with a Black pilot at Tuskegee Army Air Field in March 1941. Despite that oversight, this is still a book worth reading.

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

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The Fate of Nazi Germany's Jet Engineers: The Allies' Race for Technology in 1945 and into the Cold War. By Reiner Decher. Barnsley UK: Frontline Books, 2024. Appendix. Bibliography. Index. Photographs. Drawings. Maps. Pp. 245. $34.95. ISBN: 978-1-03611-1-007

Reiner Decker received a doctorate in aeronautical engineering from the Massachusetts Institute of Technology. He is a retired aeronautical engineering professor with an academic career at the University of Washington and industrial experience at the Boeing Company. His expertise

focused on aircraft propulsion. He is also the son of one of the engineers who experienced the post-war turmoil described in this book. Several contributing authors also went through these experiences and documented them for historians to use.

In April 1945, allied forces swept eastwards toward Berlin and the territory that would soon become part of the Soviet occupation zone in Germany. US troops uncovered manufacturing facilities, technicians, and engineers associated with the engines that powered Germany's jet fighters and bombers. This engine technology was of great interest to the allied nations. After the region was militarily secured, the allied technical people quickly went to work.

Their first step was to find the important German personnel who managed jet-engine development and production. The next steps were to explore the physical infrastructure and to interview knowledgeable engineers, technicians, and managers. This information was sent back to the US, and decisions were then made about what needed to be capture and hauled away and whom to convince to leave their homeland and be transported to a western occupation zone or to the US itself. The Americans were the first of the allies to contact the German jet engineers where they were working. American and French governments were interested in transporting the people and data back to their home countries. The British believed their jet knowledge to be on a par with that of Germany and were less interested in transporting engineers. The Soviets were far behind the other allies and more or less kidnapped many engineers and their families and forced them to relocate to the Soviet Union. There they toiled under poor conditions—some for over a decade—to assist the Soviets in building their jet-engine and guided-missile technology and infrastructure.

Decher's book is, in part, the work of several individuals who experienced the chaos at the end of the war and lived to continue their work with aircraft engines in the years that followed. He has pulled their narratives together into an account that explores the post-war scramble for Germany's jet engineering expertise, detailing how the Allies leveraged Nazi advancements for their own Cold War gains. The book blends technical insights with gripping historical narratives, emphasizing the ethical and geopolitical complexities of exploiting former enemy scientists. It is a good read for World War II and aerospace history enthusiasts.

Frank Willingham, NASM docent

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Decades of Rebellion: Volume 1: Mexican Military Aviation in the Rebellions of the 1920s. By Santiago Flores and M. Reyna Garza. Warwick UK: Helion, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Bibliography. Pp. 82. $29.95 paperback. ISBN: 978-1-913336-38-7

Garza and Flores are certainly qualified to tell these stories. Garza served in the Mexican Air Force as an historian and Director of the Military Aviation Museum. Flores, who has published numerous articles and presented the history of the Mexican Air Force at conferences throughout North America, provided extensive research.

The full work will present the history of Mexican military aviation during the 1920s and 1930s, filling a gap in historiography concerning use of aviation by Mexico in the interwar years. Lack of period source documents was a challenge, but the authors well used many personal diaries and letters as well as official records from the time.

During the overthrow of President Carranza in May 1920, Mexican military aviation was very limited in both resources and capabilities. The only three aircraft available helped him escape via rail toward Vera Cruz due to concerns with loyalties of ground crew. Following this successful coup, Alvaro Obregon was elected president and wanted to create more stability. However, he was concerned about some troublesome governors such as Colonel Esteban Cantu Jimenez, who was attempting to create his own air force by purchasing airplanes, along with former combat pilots, from the US. The ensuing military action involved the use of airplanes. Air power was beginning to be seen as a substantial tool of power throughout Mexico.

In 1923, Obregon designated Plutarco Calles to be the next president. This prompted a new rebellion. With air forces fighting on multiple fronts, Obregon was able to quell the rebellion. The several air forces had grown with purchases of aircraft from the US. Not only were airplanes involved, but also airfields and operations were a central concern for both sides.

The next revolution occurred in 1926 and may be a familiar account of the "uprising" of indigenous peoples—in this case, the Yaqui. Following an incident at Vicam, the Mexican government quelled the uprising using aircraft for reconnaissance and attacks.

The final chapter recounts an attempted revolution that was more of a court battle in the United States. In this 1926 incident, exiled Mexican leaders attempted to purchase aircraft to stage an incursion into northern Mexico to establish a new nation. The plot was uncovered by US officials, and the plotters were convicted in US courts.

This book is a wealth of information with tremendous detail about aircraft types used as well as the personalities of pilots and Mexican leaders. Many of the pages contain sidebars to help with background, and original photos from personal collections which lend a great deal to the stories. For those who may not be familiar with Mexican geography, maps are provided that show pertinent areas being covered in that portion of the text. I found many of the notes interesting, but the source citations (where the authors gathered their quotes or other facts) were sometimes

unclear or missing, leaving researchers unable to build upon this work. There were some areas in the text that were a little hard to read because of sentence structure. Overall, however, this book can be a very quick, yet valuable, read.

Robert J. Shipp Jr, Ph.D., Maj, USAF (Ret)

Fw 190 Sturmjàger: Defence of the Reich 1943-45. By Robert Forsyth. Oxford UK: Osprey, 2024. Photographs. Maps. Diagrams. Illustrations. Pp. 80. $23.00 paperback. ISBN: 978-1-4728-5746-0

This book describes the Luftwaffe's sturmjäger (assault-fighter) tactics to intercept US heavy bombers over Europe in World War II. As Eighth Air Force strength grew in the bomber air war in 1943, the Luftwaffe adopted increasingly aggressive interception techniques to more effectively fight US heavy bombers. Among those techniques was sturmjäger. Entering combat in January 1944, sturmjäger pilots attacked US B–17 and B–24 bombing raids in massed formations of heavily armed and armored Fw 190s, closing to point-blank range and colliding with their targets if necessary. Pilots signed an oath to bring down at least one enemy bomber per mission. They scored their first victory on the Eighth's mission to Oscherlesben on 11 January 1944. Only one squadron (staffel) operated until the end of April, when elements of Luftwaffe fighter wings Jagdgeschwader 3 (JG3) and JG4 were also equipped and trained for the mission. The sturmjäger enjoyed some successes. Even after the USAAF established air superiority in early 1944, the Luftwaffe was, on occasion, able to down large numbers of B–17 and B–24 bombers. For example, on the mission of 7 July, 44 Sturm Fw 190s of IV (Sturm)/JG3 downed eleven bombers on their initial pass through a formation of 492BG B–24 Liberators. They subsequently claimed a majority of the total 28 2nd Bomb Division losses that day, but lost nine planes in return. Such loss rates, however, meant little to the swelling US Eighth and Fifteenth Air Forces by the summer of 1944. The growing effectiveness of US fighter escorts and a lack of fuel combined to curtail sturmjäger impact by August 1944.

Robert Forsyth is an authority on the Luftwaffe's battles with Allied bombers over Germany, with such titles as *Jagdwaffe Defending the Reich* (2005) and Osprey's *Fw 190 Sturmböcke* (2009) to his credit. Intended as a stand-alone volume, this book covers the background of the Eighth Air Force's bombing campaign over Europe and the Luftwaffe's increasingly desperate attempts to stop it—modification of the Fw 190 for the assault fighter mission and the sturmjäger pilots. The focus is on air combat during the first eight months of 1944.

Forsyth's extensive collaboration with sturmjäger pilots lends this book an air of wartime urgency and immediacy. Use of Luftwaffe wartime terminology and organization designations imparts authenticity; but, as this book is addressed to a general audience, a glossary and list of units assigned the sturmjäger mission would have been nice. There are no footnotes, although sources are mentioned on occasion. Readers wanting more detail on sturmjäger can consult Mombeek, Creek, and Forsyth (1999) and Lorant and Goyant (2005).

Author Forsyth is an artist as well and illustrated this book with schematic diagrams and paintings of key moments of air combat. Photos depict pilots, ground crew, planes, and technical details of sturmjäger Fw 190s. Maps and diagrams of bases, targets, and bomber routes enable a clear understanding of how aerial combat action evolved over the course of a mission. This book is a fine addition to historiography of the air war over Europe in World War II.

Steven Agoratus, Hamilton NJ

Westland Aircraft & Rotorcraft: Secret Projects & Cutting-Edge Technology. By Jeremy Graham and Ron Smith. Horncastle UK: Tempest Books, 2024. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. 286. $70.00. ISBN: 978-1-91165895-5

This book is a deep dive into experimental and developmental projects undertaken by the British company from its roots in World War I as the Westland Aircraft Works of Petters, Ltd. Because of the book's focus, Westland's most well-known product, the Lysander, receives very little attention, In fact, only about 30 pages are devoted to fixed-wing design efforts. Rather, the emphasis is on Westland's rotorcraft work, an area which the authors are well qualified to write about, having been research engineers at Westland since 1975.

The story of Westland as a manufacturer of rotorcraft predates World War II, with early Cierva Autogiro teaming. It came to the fore when the company licensed manufacturing of Sikorsky's helicopters with rights to make such changes as Westland thought advantageous. This resulted in upgraded engines for the S-55 and S-58 (as the Whirlwind and Wessex), with Westland's WS-58 being manufactured only with gas turbine engines, significantly improving performance over the basic Sikorsky. Westland also used the rotor head and drive train of Sikorsky CH-37, but with gas turbines positioned over the cabin, in a design resembling the later S-61. The company also pursued more independent designs, however, with tandem-rotor studies and proposed high-capacity (up to 100-passenger) helicopters. Not all these were based on Sikorsky designs. One 1970's heavy-lift helicopter design bore a striking resemblance to the CH-46 Sea Knight, although it was about the size of the CH-47 Chinook. But British government pol-

icy left Westland sidelined with respect to the new designs.

In the late 1950s, however, Westland achieved some successes with smaller rotorcraft, notably the Saunders-Roe-originated Scout (British Army) and Wasp (RN). This gave them a toehold to design and produce the Lynx, which set—and still holds—the pure-helicopter FAI speed record. Proposed advanced developments of this (in capacity or performance), however, fell through due to loss of government interest or restructuring of partnerships. The same was true of many of Westland's (by this time incorporating Bristol and Fairey in addition to Saunders-Roe) later design efforts.

Later studies incorporated many of Westland's more innovative ideas but were generally rejected in the government and/or commercial marketplaces. It was mainly in teaming with Agusta, Sikorsky, or Aerospatiale that Westland continued to manufacture marketable helicopters. Westland's later work on vibration reduction, performance modeling as an aid to establishing design parameters, and operational analysis also merits coverage.

The book's layout makes its numerous diagrams and plans (reduced 3.25-inch width) unreadable, even under magnification. Further, the authors are possibly too close to their subject matter: they use multiple acronyms for which there is no single reference location and assume the reader is aware of Westland's history. In addition, cancelled projects never seem to be Westland's fault. I recommend reading Appendix A—a short history of Westland's aircraft types—first. Because the main chapters are themed by category of aircraft/project and frequently refer to work covered in other chapters, a general, chronological, understanding of Westland's history will make this story less confusing.

Jon Barrett, Volunteer Photographer / Researcher, National Air & Space Museum

Nine Lives of the Flying Tigers Volume 1: America's Secret Air Wars in Asia 1945-1950. By Albert Grandolini and Marc Koelich. Warwick UK: Helion, 2023. Photographs. Illustrations. Maps. Bibliography. Tables. Notes. Pp. x, 96.; $29.95 paperback. ISBN: 978-1-915070-59-3

Albert Grandolini is an aviation journalist and military historian whose interests are the military histories of Asia and Africa as well as contemporary military conflicts. He has authored 12 books for Helion and numerous articles for various British, French, and German magazines. Marc Koelich's interests lie in the less-covered, post-Second World War conflicts. He has published articles in German, French, and Indonesian magazines.

Together the two have written an information-packed and fascinating book. Narratives and photographs fill 21 chapters covering the 1920s, Second Sino-Japanese War, World War II, and the immediate post-World War II period in China. The latter has often been neglected and/or relegated to secrecy. This is the first in a multi-volume history that leads to the birth of Civil Air Transport (CAT), its involvement in the Chinese civil war, and its activities during the eventual Nationalist withdrawal to Taiwan.

The story begins with the arrival of the first US air units in China in the late 1920s. The fighter and observation squadrons did not engage in combat (Chiang Kai Shek was attempting to reunify China) but performed observation, photo-reconnaissance, mail-transport, and liaison missions. In the late 1930s, the Chinese accepted a US offer to help restructure the Chinese National Air Force (CNAF) in response to a growing Japanese presence in Mukden. Claire Chennault had arrived in China from the US in June 1937 (one month before the start of the Second Sino-Japanese War) as a foreign civilian advisor under contract to the Chinese government. By September 1937, he was acting as de-facto CNAF Chief of Staff. He went on to create the American Volunteer Group (AVG) in 1941, which waged the air battle against the Japanese until it was disbanded in July 1942. Chennault, reinstated in the US Army Air Corps, was put in charge of the air units combating Japan in China (China Air Task Force). This became the Fourteenth Air Force in 1943.

After World War II, Chennault returned to China and stood up CAT. It started out as an airline performing refugee relief missions. By 1947, it was competing in the Chinese air transport (passenger and freight) market with five C–47s and 15 C–46s. The renewed Chinese Civil War, and its heavy reliance on air bridges, took its toll on CAT aircraft as they provided paramilitary operations and troop and supply transport to augment CNAF operations. The Nationalists, however, were routed and withdrew to Taiwan in late 1949. There, a near-bankrupt CAT found a new investor in the form of a newly created US clandestine service.

The book's text and images are outstanding and well researched and curated (even de-classified files are referenced in the bibliography). The detail provided is quite extensive and led to several new bits of history to me: the presence of US Marine Corps aviation units in China in the 1920s; Chenault's close contact with US intelligence services; and information on the new Curtiss P–40s used by the AVG (not hand-offs). The authors' in-depth coverage of the politics, policy, personalities, and military actions often had me confused as to whether this was a history of CAT, a biography of Chenault, or a history of Chinese military aircraft. However, all things considered, it is a great addition to any historian's library. It is well worth your read.

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

The Cactus Air Force: Air War Over Guadalcanal. By Eric Hammel and Thomas McKelvey Cleaver. Oxford UK: Osprey, 2022. Glossary. Photographs. Maps. Diagrams. Illustrations. Index. Pp. 336. $22.00. ISBN: 978-1-4728-5108-6

This fine addition to South West Pacific war historiography focuses on the Marine, Army Air Forces (AAF), and naval aviation units that fought the air war over Guadalcanal from the initial arrival of US Marines on August 7, 1942, to the Second Naval Battle of Guadalcanal on November 12, 1942. During that time, the Marines, Navy, and AAF fought enemy fighters and bombers of superior performance with F4F Wildcats, SBD Dauntlesses, and a few P–39 and P–400 Airacobras. Reinforcements, replacements, and supplies came in irregularly. Planes, pilots, and ground crews were stretched to the limit. This book is about the struggles, inspired improvisations, and desperate efforts to prevail against overwhelming odds by the aviators involved in that fateful struggle. Master historian Eric Hammel used his deep well of interviews, collected over a lifetime, to relate—in the participant's words—the resourcefulness, perseverance, and courage of the personnel who fought this crucial air war.

The authors are both experienced military historians with many publications to their credit. This is the late Eric Hammel's last book. It draws on his previous works on this topic, particularly *Guadalcanal: Starvation Island* (2009). Cleaver, author of such airpower histories as *MiG Alley* (2019) and *The Tonkin Gulf Yacht Club* (2021), helped finish and prepare this work for publication.

The epic battle for Guadalcanal is a familiar topic. Frank (1990), Leckie (2010), Stille (2015), Wheelan (2017), Hornfischer (2011) and the redoubtable Coggins (1972) as well as many others have told the story before. This book makes fresh connections with familiar material. Hammel interweaves several themes: the ability of Cactus Air Force personnel to scrounge, improvise, and innovate when regular equipment was not available; and the effectiveness of combined arms operations among Marine, Navy, and AAF units that had never trained together. Hammel attributes the shoe-string nature of the battle to the lengthy time it took to prepare and deploy units urgently needed on Guadalcanal. Once a squadron was raised, equipped, and trained stateside, shipping (along with accompanying naval escorts) needed to be arranged to deploy it. Upon arrival, additional theater-specific training was required before the new units could enter combat.

Hammel has a lively, engaging, and conversational style. He weaves a narrative that shows how different influences—some great, some small—combined to affect the outcome of a military campaign. The book is illustrated with photos, maps, and diagrams of combat forces. Unfortunately, there are no footnotes or bibliography.

At a time when the focus of US forces in the Pacific was on the ability to do more with less, the Cactus Air Force may hold some lessons for Agile Combat Employment: how to operate on an unimproved airfield; how to service and repair aircraft with makeshift tools and infrastructure; and how to rapidly rebuild a capability after the enemy destroys it are all potential lessons of the fight for Guadalcanal. This timely volume should be on everyone's shelf.

Steven Agoratus, Hamilton NJ

Solo2Darwin: In the Footsteps of Amy Johnson. By Amanda Harrison. London: Grub Street, 2024. Maps. Photographs. Appendix. Index. Pp. 240. 20 pounds. ISBN: 978-1-911714-04-0

In May 1930, Britain's Amy Johnson flew a flimsy de Havilland Gypsy Moth biplane from London to Darwin, Australia—the first woman to solo from England to Australia. In 2019, 89 years later, commercial pilot Amanda Harrison attempted to duplicate Johnson's extraordinary achievement in a Tiger Moth (an improved version of the Gypsy Moth), an aircraft used to train World War II pilots.

In this work, Harrison describes her adventure. Having learned to cope with dyslexia and to overcome breast cancer, she chose a new challenge. To prepare for the flight, Harrison and her supporters obtained the necessary political clearances and scheduled aviation gas and mineral oil to be available at the airports at which she planned to stop. Hoping to encounter favorable weather, she departed Britain in May.

Almost from the beginning, however, Harrison found the weather difficult. Time and again forecasts would turn out to be inaccurate. For much of her flight, she encountered chilly temperatures, poor visibility, or both.

Lacking major sponsors, Harrison paid most of her own expenses. Unexpected delays because of weather, bureaucratic entanglements, or mechanical issues increased the cost. Despite some delays, Harrison flew across Europe to Turkey. Along the way, she attracted considerable attention. Two stops in Turkey proved to be far more expensive than expected. Furthermore, the fighting in Syria convinced her that she should deviate to the Greek island of Rhodes and then continue to Cyprus and Beirut, Lebanon.

Departing Rhodes, G-AXAN (British registration for her aircraft) lost power from the Gipsy Major engine. Harrison managed to make it back to the airport, but repairs took four days. She then flew to Cyprus, spending an extra day there to ensure the engine operated properly before going on to Beirut.

Beirut proved to be her farthest point east. Tensions in the Persian Gulf convinced her that it would be unwise to risk flying through an area where she might be attacked. More than two weeks after arriving in Beirut, Harrison returned to Britain with her first stop in Cyprus. After seven days of unfavorable weather, she flew to Rhodes. The next

day her trip came to an end as she had to declare "mayday" after losing power on takeoff. The following day she decided to transport her aircraft back to Britain by container ship.

Two weeks passed in Rhodes before workers safely stowed the disassembled aircraft in a container. On July 6, Harrison boarded an airliner for home.

In this easy-to-read book, Harrison takes the reader into the cockpit and to many interesting places when she unexpectedly found herself delayed. The book is as much about flying as it is about traveling. She also recalls serious difficulties encountered dealing with some airport and customs officials. Harrison appropriately points out the differences between her flight and that of Johnson.

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

Laugh or Fly: The Air War on the Western Front 1914-1918. By Peter Hart and Gary Bain. Barnsley UK: Pen & Sword Military, 2024. Photographs. Bibliography. Notes. Index. Pp. xii, 259. $49.95. ISBN: 978-1-39905-014-2

This book deals with British (RFC, RAF, and, to a lesser extent, RNAS) activity. It's almost entirely made up of anecdotal quotes from RFC/RAF/RNAS personnel, from ground crew to senior RFC/RAF personnel, with an emphasis on pilots and observers. Some are from Imperial War Museum (IWM) or RAF Museum original documents, but most are excerpted from memoirs, biographies, or histories written (or at least published) later. Among the frequently-quoted familiar names are McCudden, Mannock, Cecil Lewis, Arthur Gould Lee, Sholto Douglas, and W.E. Johns (of "Biggles" fame). There are also a (very) few quotes by German pilots such as Boelke and von Richthofen from encounters with British pilots.

Hart and Bain present a generally chronological sequence of British aviation activities in the Great War, with chapters covering the pre-war development of the RFC, the early days, developments in training methods over time, and the various campaigns. There is also a chapter devoted to the Independent Forces strategic bombing campaign. The authors' personal opinions come through at various levels, ranging from the relative merits of the Lewis and Vickers machine guns (ignoring the reduced firing rate of the Vickers with synchronizer gear vs. the Lewis used outside the propellor arc) to the "foolish knee-jerk recommendation" to merge the RFC and RNAS in April 1918 (presumably, based on the quotes provided, because the British army regiments and the Royal Navy had different traditions and uniforms, although RNAS and RFC squadrons already shared numerous airfields).

The quotes generally fit in with the topics of the chapters; although, sometimes, the bridging text can be muddled, as with a reference to the "first German all-scout *Jagdstaffel*" (at best, describing a *Jagdstaffel* as "all-scout" is redundant). There are some slips in editing as well. The notes for Chapter 3 are included with those for Chapter 2, so the notes for the following chapters are also misnumbered. There is no mention of where most of the photos were sourced, leaving one to wonder who is responsible for the misidentification of the Albatros D.III in flight that is identified as an Albatros DV [sic]. The photo of a group of airmen on the cover isn't repeated inside and is not otherwise identified.

Presumably the title is a reference to life on the front, where air crew were either on missions or trying to forget them. However, especially for the first part of the book, examples of the latter are few and far between. The subtitle is also somewhat misleading, since the book addresses only British operations. It's heavily footnoted, a necessity since quotes make up half of the book.

As Peter Hart had a 40-year career as an oral historian with the IWM, he had ample opportunity to locate commentary from lesser-known personnel and has made wide use of IWM material. Still, most of the quotes are from post-war books that World War I aficionados will already have read, rather than from material actually written at the time. As an introduction to the roots of the RFC, the quoted material is generally good. Readers, however, would be well advised to take the authors' opinions with a grain of salt.

Jon Barrett, Volunteer Photographer/Researcher, National Air & Space Museum

Manfred von Richthofen: The High Price of Glory. By Tim Hillier-Graves. Barnsley UK: Pen & Sword, 2024. Photographs. Bibliography. Index. Pp. xvi, 277. $42.95. ISBN: 978-1-03610-026-1

For many years, Hillier-Graves specialized in writing books about British railroading and associated personalities. More recently, he has turned to military aviation. First, he detailed in *Heaven High, Ocean Deep* the experiences of a British Fleet Air Arm fighter unit in the final year of the Pacific War. He followed that work with an operational analysis of the Vought F4U Corsair in *Widowmaker: Living and Dying with the Corsair*. In this current work, he examines the life of World War I's best-known airman.

Hillier-Graves proceeds chronologically, tracing the career of the legendary "Red Baron." Early chapters discuss von Richthofen's upbringing and his pursuit of a military career.

The outbreak of World War I found him serving in a calvary unit. He saw considerable action on the Eastern Front before the German high command transferred him

and his comrades to France. There he became a staff officer in an infantry division.

By May 1915, he decided he could better serve Germany as a flyer. Here Hillier-Graves devotes about 20 pages to the state of the air war. Von Richthofen's flying career began as an observer in two-seaters on the Russian front. By the fall, he returned to France to fly missions in Gotha bombers.

He switched to fighters in the spring of 1916, supporting the German offensive at Verdun. That summer, he returned to the Eastern Front to monitor a potential Russian offensive. Only two months later, Oswald Boelcke, Germany's then-leading ace, summoned him back to France. Under Boelcke's guidance, von Richthofen learned basic tactics that he would later master and impart to his subordinates as a unit commander.

At this point, Hillier-Graves recognizes the significance of nationalistic propaganda. The German leadership, with little progress in the West after more than two years of war, mounted an information campaign to bolster the public's spirits. Von Richthofen, as the war's leading ace, figured prominently in that effort.

In July 1917, British fighters shot down von Richthofen. Lucky to have survived, he suffered a significant brain injury. Hillier-Graves argues he should have been banned from flying. Research in aviation medicine was only just beginning. Hillier-Graves examines some of the issues (oxygen deprivation, severe cold, and almost daily combat) and the toll they took on a pilot's health.

Various factors prompted von Richthofen to resume flying. He believed in Germany and felt obligated to bring out the best in his men. Furthermore, German leaders valued him for propaganda purposes until his death on April 21, 1918.

This book is best suited for readers unfamiliar with the von Richthofen story and World War I aerial combat. While citations are unavailable, Hillier-Graves usually mentions his sources when excerpting lengthy passages from various books and oral interviews. Readers familiar with the topic may be disappointed.

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

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Two-Man Air Force: Don Gentile & John Godfrey: World War Two Flying Aces. By Philip Kaplan. Barnsley UK: Pen & Sword Aviation, 2023 (reprint of 2006 original). Photographs. Index. Abbreviations. Glossary. Bibliography. Pp. 170. $24.95 paperback. ISBN: 978-1-39902074-9

World War II generated heroes whose exploits and lessons are applied to modern-day military instruction and training. Two such heroes are American ace pilots Major "Don" Gentile of Piqua, Ohio, and Major "Johnny" Godfrey of Woonsocket, Rhode Island. Anxious not to miss any action, both men entered the war before the United States formally did so and developed skills in airmanship that marked them not only as exceptional fighter pilots, but also as major threats to their German adversaries. On the occasions they flew as a team, they proved to be a most deadly duo. As each tallied kills, there was speculation that both airmen would surpass famed Captain Eddie Rickenbacker's World War I record.

Philip Kaplan adroitly packed a big story into a small package. As he introduces the two Americans, Kaplan walks the reader through their entrance into World War II via the Royal Canadian Air Force (RCAF). For many American young men seeking to partake in the action as pilots, the RCAF was a convenient option. With their respective RCAF enlistments being offset by months, Gentile had already completed flight training, earned his wings, and chalked up two kills in the famed Eagle Squadron before Godfrey arrived in England. When the United States entered the war, Gentile requested and received approval to transfer to the newly arrived United States Army Air Forces. He reported to the 4th Fighter Group in 1942. Godfrey, having his own transfer request approved, joined the group in 1943.

At this stage, Kaplan's story moves very quickly, highlighting the 4th Fighter Group's pilots and leadership and Gentile and Godfrey's experiences (including combat in the large and powerful P–47 Thunderbolt and, later, the sleek and nimble P–51 Mustang). Woven into the fabric of the story are passages from pilots' diaries and letters—entries describing the terrors of combat, anticipation of the next mission, losses of comrades, and accounts of the pilots blowing off steam in on-base and London clubs. These personal narratives lend a great deal to helping the reader witness the culture and climate of a fighter group at war.

As the story progresses, the reader observes Gentile and Godfrey's paths converge as warriors, occasional wingmen, and, later, close friends. Flying together, with Godfrey as Gentile's wingman, the duo perfected tactics that in later years would become standard practice among wingmen: the pilot in the best position to engage an adversary took lead with the other taking responsibility for covering the lead's six. With this tactic, the group's tally of victories climbed quickly as did Gentile's and Godfrey's kills. Gentile's and Godfrey's war ended differently, with one on a bond tour and the other as a repatriated prisoner of war.

Kaplan touches on their post-war lives as well. Gentile died tragically in a USAF flight-training accident in 1951. He was 30 years old. Godfrey left the service at the war's end, entered his wife's family's business in Rhode Island, and later served in the state senate. Diagnosed with Lou Gehrig's Disease, he died in June 1958 at the age of 36.

The book concludes with an excellent summary of

these extraordinary airmen's impact in the air war over Europe.

Col Anthony J. MacDonald, USA (Ret)

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Aces at Kursk: The Battle for Aerial Supremacy on the Eastern Front 1943. By Christopher A. Lawrence. Barnsley UK: Air World, 2024. Photographs. Diagrams. Tables. Illustrations. Maps. Appendices. Bibliography. Pp. xxix, 399. $42.95. ISBN: 978-1-39908-143-6

This is a hefty 400+ page work on the air component of the Battle of Kursk (and associated Battle of Prokhorovka). Comprising ten chapters, four appendices, and an exhaustive bibliography, it explains an extensive amount of data and provides numerous sidebars that look at associated issues.

Christopher Lawrence is Executive Director and President of the Dupuy Institute, a company that uses its vast stores of historic data to generate scholarly analyses on lessons-learned and related decision-support studies. His other Kursk-related works include the 1662-page megabook, *Kursk: The Battle of Prokhorovka*, and the 665-page "shorter" version, *The Battle of Prokhorovka: The Tank Battle of Kursk, The Largest Clash of Armor in History.* Beyond studies of the Kursk battle, he produced analyses for the Congressional Office of Technology Assessment, Vietnam Veterans of America Foundation, and articles for various newsletters as well as analytic reports for the Department of Defense.

The Battle of Kursk is well known for being the largest tank battle in history. In the midst of the ground conflict, there was also an air battle that rivaled the scope and scale of the Battle of Britain. The Luftwaffe VII Air Corps and Soviet 2nd and 17th Air Armies started July 1943 with 1100 and 1600 aircraft, respectively. These aircraft included types for a variety of air sorties: reconnaissance, ground attack, air-to-air combat, level bombing, night harassment, et al. The tempo was intense. The first day alone saw up to 2387 Luftwaffe and 1688 Soviet sorties with approximate losses of 27 Luftwaffe and 189 Soviet aircraft (these are high-end numbers—records vary). Air-to-air combat included those who would become the Luftwaffe's top aces: Walter Krupinski (197 claimed victories), Gunther Rall (275), and Erich Hartmann (352), all in the 52nd Fighter Wing. They faced five top Soviet aces: Kirill Yevstigneyev (53), Nikolai Gulayev (55), and Ivan Kozhedub (62). Aerial ground-attack support was provided by Luftwaffe Ju 87 Stukas (some fitted with 37mm antitank guns), Hs 129s, and Fw 190s. These competed against Soviet Il-2 Sturmoviks to remove the most enemy armor from the field. Hans-Ulrich Rudel, the most decorated Third Reich soldier at the end of World War II, flew a Stuka fitted with 37mm guns in this combat arena. The battle culminated in a Soviet victory at the end of July 1943, ended effective German offensive capability on the Eastern Front, and set the stage for subsequent Soviet advances.

Aces at Kursk is largely an explanation of the compiled historical data collected by the Dupuy Institute. However, there is little compelling narrative. The majority of the data are from German reporting with Soviet data providing lesser detail. Mechanically, the work would have benefitted from a closer copy edit. There is very little discussion of actual aces (save for that found in Appendix II). Likewise, there is little examination of decisions by various levels of operational command before and during the battle. The lack of an index makes it difficult for those not intimately familiar with the battle to identify and access specific information efficiently. The numerous sidebar texts, all interesting, often extend to multiple full pages and can be distracting. Nevertheless, it is a robust reference work that can be a valuable resource component for in-depth study of the battle and for serious wargamers.

Tim Hosek, USG (Ret)

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Admiral VAT Smith: The Extraordinary Life of the Father of Australia's Fleet Air Arm. By Graeme Lunn. Warwick, Australia: Avonmore Books, 2024. Photographs. Illustrations. Maps. Glossary. Bibliography. Index. Pp. 248. $48.95. ISBN: 978-0-64570048-0

A favorite quote of mine attributed to Albert Einstein is, "Try not to become a man of success, but rather try to become a man of value." This quote is very aptly applied to Admiral Sir Victor Alfred Trumper Smith, Royal Australian Navy (RAN). A man whose nearly 50-year career took him from a Royal Australian Naval College (RANC) cadet at age 13 to his finish as the first RANC cadet to be promoted to Admiral and to become Chairman, Chiefs of Staff Committee.

Lunn is also an RANC graduate, former naval aviator, and seaman officer in the RAN. He began his naval career while Sir Victor was still serving and is an admitted fan. He later had a 33-year career as a British Airways pilot and, after mandatory retirement (22,000 flying hours), applied his education in military history to increase awareness of Australia's naval aviators from 1911 on.

Thirteen chapters cover Smith's life. Beginning with his grandparents, the story moves from his early childhood through entering the RANC at the age of 13. There he learned all aspects of naval life and spent time at sea as a junior officer under training. In 1937, Smith began his specialization in aviation entering the naval observer's course in the United Kingdom. Trained in navigation, air-to-air gunnery, spotting, bombing, reconnaissance/photography, and the use of radio equipment for communications, he was

posted to HMS *Glorious* on graduation to complete consolidation training.

Smith acquitted himself well in consolidation training and, in World War II, was a naval observer in aircraft as diverse as the Fairey Swordfish, Fairey Fulmar, and Supermarine Walrus. Notably, he led one of the first torpedo strikes against a major warship in World War II when his squadron attacked the *Scharnhorst* off Norway in 1940. He was shot down twice: he narrowly escaped when HMS *Ark Royal* was sunk in the Mediterranean in 1941, and he survived the sinking of HMAS *Canberra* at Savo Island in 1942. Later he oversaw air operations aboard the carrier HMS *Tracker* in the Atlantic and Arctic Oceans and off France during the D-Day landings. As World War II wound down, Smith was selected to assist in the development of Australia's Fleet Air Arm. While shepherding this task, he was promoted and assigned duties that included executive officer aboard the carrier HMAS *Sydney* during the Korean War and command of an air station, a frigate squadron, and the carrier HMAS *Melbourne*. He was Chief of Naval Staff during the Vietnam War and, finally, chairman of the Chiefs of Staff Committee from 1970 to 1975. Sir Victor Smith retired 23 November 1975.

In retirement, Smith mainly officiated at naval events and became a patron in the Fleet Air Arm Association. He refrained from public comments on defense policy but added his voice to those of other retired chiefs in opposing the Hawke-government policy to essentially end the RAN's Fleet Air Arm. He passed on 10 July 1998, his wife of 54 years at his side.

I commend this work to everyone. The clear and concise prose and Lunn's technical knowledge make for an accessible read. The narrative flows easily and is ably aided by the outstanding images and graphics. In the end, the narrative clearly illustrates how Sir Victor's career led him to become a man of considerable value and significance to the success of the RAN and Australian Defense Force.

Tim Hosek, USG (Ret)

Churchill's Eagles: The RAF's Leading Air Marshals of the Second World War. By: Richard Mead. Barnsley UK: Pen and Sword, 2024. Photographs. Appendix. Bibliography. Pp. 296. $49.95. ISBN: 978-1-03610-413-9

In 2007, Mead released *Churchill's Lions*, a 600-page tome providing biographical sketches of 125 British general officers and marshals who served in World War II. Reviews were universally laudatory in praising the book. The book appears occasionally in the secondary market for $200. *Churchill's Eagles* is a similar biographical treatment of 30 senior aviators.

Mead admits the selection of 30 was purely personal but moderates the capriciousness of his selection process by including a short appendix with other senior aviators; but the list is far from complete. I was especially disappointed that Air Chief Marshall REC Peirse, early-war Air Officer Commanding-in-Chief Bomber Command, was omitted. Peirse was noteworthy for a single selfless act. When Her Majesty's government became aware of the Auschwitz death camp, the information eventually made its way to Peirse's desk. He directed his staff to plan a mission to bomb the camp to facilitate an uprising and mass escape by the prisoners. When he briefed the plan to his commanders, he was shut down and relieved of command shortly after. I know of no other senior allied commander who proposed any action that early in the war to stop the Holocaust. At face value, Peirse's proposal was a rare example of innovative thinking by the "Eagle" leadership class.

A notable focus is exploration of how British public schools shaped the RAF's leadership and decision-making culture, particularly concerning the development of an "officer class." British public schools, such as Eton and Harrow, ingrained values of conformity, discipline, and a sense of duty in their students, many of whom went on to become RAF officers. These institutions favored a rigid hierarchy and cultivated a homogenous group of leaders who adhered strictly to established rules and norms. Mead argues that this system of education effectively created an officer class that was risk-averse and more inclined to maintain the status quo than to encourage creative thinking or innovative tactics.

The book discusses how this culture impacted the RAF's performance during critical moments of the war. Officers trained in these schools often prioritized decorum and tradition over adaptability and ingenuity, leading to a preference for standardized approaches. This was particularly evident in strategic decision-making, where unconventional tactics or creative problem-solving were often sidelined or even punished if they deviated too far from established protocols. Mead highlights instances where innovative officers faced resistance or outright obstruction from their superiors, reflecting a broader institutional bias against change.

Overall, *Churchill's Eagles* offers a critical perspective on how the socialization of RAF officers in public schools influenced the force's operational culture. Mead provides compelling evidence that, while the system produced leaders of character and discipline, it could also stifle innovation, with consequences that reverberated throughout the RAF's wartime efforts.

There were significant issues Mead chose not to address, such as the influence of the monarchy on identification and selection of senior leaders within the RAF. The self-perpetuating nature of formal and informal mentorship and sponsorship meant that radical ideas would come from the civilian sectors, not the RAF. For example, Frank Whittle was forced to found a civilian company to advance his jet-engine design when the RAF ignored his research.

Despite this, Mead is an accomplished writer whose narrative flows smoothly throughout. I was quite satisfied with what he said.

Gary Connor, docent, National Packard Museum, Cortland OH

Hitler's RAF Collaborators: Agents or Traitors: RAF Prisoners of War Alleged to Have Assisted the Third Reich. By M. S. Morgan. Barnsley UK: Air World, 2024. Photographs. Index. Bibliography. Pp. 241. $42.95. ISBN: 978-1-39903-952-9

A very superficial level of research indicates that between 10-20 percent of all prisoners of war (PoW) collaborate with their captors. The number varies because of a large number of factors (e.g., conditions of captivity, cultural and ethnic factors). Over 170,000 British personnel were held as PoWs by Germany during World War 2. It was clear, therefore, that Morgan was going to have to be selective in choosing the people he would describe as Hitler's RAF collaborators. I found that his selectivity weakened his narrative in the end.

Morgan selected a number of RAF aircrew who were shot down and captured. He then used information drawn from post-war interrogations and interviews to demonstrate that some of these people acted against British interests by giving the Germans information and "aid and comfort." Several even held jobs with, and were paid by, the Reich. A few even joined the Waffen SS and British Free Corp. Some of the information used to build cases against them was derived from secret messages embedded in correspondence sent home by "loyal" PoWs.

Not surprisingly, the individual stories became very convoluted. The collaborators often used aliases and contrived fictitious service histories. And, as Morgan strenuously points out, the grammar included in the source documents is sometimes of such poor quality that the reader should not hold him responsible for any confusion that may arise.

As a summary, Morgan offers the reader a chapter focusing on the trials and courts martial of many of the "collaborators." While all committed offences that carried a maximum penalty of capital punishment, none paid that price. Most received periods of incarceration that were usually reduced significantly. And, upon release, they lived out their lives. Many returned to Germany, where some married and raised families. I found it interesting that many of the culprits explained their actions as being anti-Communist in nature. While some may have been members of the British Fascist Union and/or antisemitic, they universally believed that Britain and Germany would have to unite against the Communist threat Russia presented.

When I joined the Air Force during the Southeast Asia conflict, the issue of standards of conduct and PoW behavior was receiving a lot of attention. That attention translated into periodic training on what was and was not acceptable behavior as a prisoner. Survival training included an escape-and-evasion exercise as well as a "model" PoW camp. The training felt a bit over the top at the time, but Morgan's book explains how easy it is for prisoners to be exploited by their captors or their own weaknesses.

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A Century of Aerospace History By: C Wayne Ottinger. Bloomington IN: Archway Publishing, 2023. Photographs. Appendices. Pp: 253. $53.83. ISBN: 978-1657-5037-0

Many years ago, a popular game was Seven Degrees of Kevin Bacon. Players would attempt to link a thespian to the actor Kevin Bacon through no more than six collaborations. *A Century of Aerospace History* feels like Ottinger is playing a version of the game focusing on himself and the aerospace industry. This ambitious work promises a comprehensive overview of aerospace advancements over the last hundred years. On closer inspection, however, it falls short of its promise. It comes across less as a serious historical analysis and more as a vanity project. While Ottinger's experience is undeniable, his work is riddled with inconsistencies, a lack of academic rigor, and an overemphasis on personal anecdotes that detract from the broader narrative.

Ottinger treats historical events unevenly. He claims to cover a century of aerospace history, but his focus is heavily skewed toward American achievements, ignoring or underplaying other countries' significant contributions. For instance, the book has extensive chapters on the Wright brothers and American innovations in World War II; but it barely mentions critical Soviet advancements, such as development of the MiG fighters or the launch of Sputnik (with its profound impact on the space race). This lack of balance raises questions about the book's objectivity and thoroughness.

Moreover, Ottinger's tendency to focus on personal stories rather than substantive technical developments detracts from the academic value of the book. In many chapters, instead of delving into the technological nuances that made certain aircraft or missions significant, he veers off into lengthy anecdotes about personal acquaintances and experiences that add little to the reader's understanding of aerospace history. For example, in the chapter on the Apollo program, instead of a detailed exploration of the technological innovations that made lunar landings possible, readers are treated to multiple pages of Ottinger's personal memories of attending NASA events and meeting astronauts. While interesting in another context, they de-

tract from what should be a rigorous examination of one of the most significant achievements in aerospace history.

The book also lacks a cohesive organizational framework, jumping from one topic to another without clear transitions or logical flow. For example, the transition between the development of military aircraft during World War II and the exploration of commercial aviation in the post-war years feels abrupt and disjointed. Ottinger misses the opportunity to explore how military innovations influenced commercial aviation in a more structured way, leaving readers with fragmented insights rather than a comprehensive understanding.

The lack of sourcing and citations undermines the book's credibility as a historical text. Ottinger often makes over-generalizations or presents technical information without providing references to primary sources or expert analysis. This is especially problematic in a field as complex and technical as aerospace history, where precision and accuracy are crucial. The absence of a bibliography or footnotes suggests less scrutiny than one would expect from a serious historical work. The book appears to be more of a personal project than a contribution to academic discourse.

Lastly, the writing itself leaves much to be desired. Ottinger's prose is often clunky and repetitive, with certain phrases and concepts reappearing multiple times without adding new insights. This lack of editorial refinement adds to the impression that the book was rushed into publication without sufficient review.

In conclusion, this is a disappointing attempt at chronicling the development of one of the most fascinating fields of human endeavor. Readers looking for a thoughtful, well-researched account of aerospace history would do better to look elsewhere.

Gary Connor, docent, National Packard Museum, Cortland OH

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Into the Endless Mist; Vol 1: The Aleutian Campaign Jun-Aug 1942 and **Vol 2: Sep 1942-March 1943.** Both by Michael A Piegzik. Warwick UK: Helion, 2023. Photographs. Appendix. Index. Maps. Bibliography. Drawings. Charts. Pp: 98. Cost: $22.58 paperback. ISBN: 978-1-80451365-1 and 978-1-80451462-7 respectively

These volumes delve into the initial stages of the Pacific War, focusing on the Japanese strategic vision to seize American territory and the United States' lack of preparedness in defending isolated and exposed areas of strategic importance. Set against the backdrop of the crushing defeats at Pearl Harbor and the Philippines, Piegzik's narrative paints a vivid picture of how the Japanese military seized the initiative while American forces struggled to regroup. However, the Doolittle Raid, Coral Sea, Midway and Guadalcanal exposed the glaring limitations within the Japanese empire's capabilities; and Piegzik is forced to document their long, slow, and painful demise. After reading Piegzik's *Darkest Hour* and these two volumes, I would not classify him as an apologist for the Empire, but he is not a neutral reporter either.

The reader should recognize that the words they are reading were first written in one of two forms of Japanese, then translated into Polish and, then again, into English. So, subtleties of word choice, grammar, and syntax are lost. For example, when Piegzik describes American pilots as "greedy," is his use of the word intended to be an insult or merely a function of a poor translation sequence? When he describes the murder of an American missionary as being the result of the missionary's "uncompromising attitude" and "refusal to collaborate," is Piegzik criticizing the victim or excusing his killers? Piegzik is a masterful researcher, but when he abandons facts to express opinion, he shows his true colors, and his credibility suffers.

The heart of Piegzik's work lies in explaining Japan's aggressive expansionist strategy. He details how Japan sought to control vital territories across the Pacific to create a defensive perimeter that would secure vital resources, protect the homeland, and deter future American counter-attacks; i.e., reshape the strategic landscape. Capturing Guam, Wake Island, and parts of the Aleutians extended Japanese influence and established forward bases. These bases would allow them to protect their newly acquired territory while pushing the fight closer to the American mainland. The goal was to force the US into a negotiated settlement that would legitimize Japanese control over the Pacific Rim.

Piegzik claims that fellow historians' analyses of Japan's Northern Pacific strategy have been unduly influenced by S.E. Morison's belief that Japanese attention on Alaska was merely a strategic feint to draw American attention away from Midway. He supports his own opinion that the Japanese Alaskan initiative was the product of a sophisticated strategic vision that suffered only because Japan did not have the requisite resources to execute the plan, regardless of American weakness.

In contrast to Japanese strategic preparations, Piegzik highlights the severe vulnerabilities in American defense planning and readiness. Pearl Harbor and the Philippines were not just tactical defeats: they were evidence of a larger failure in strategic foresight. The US was not fully prepared for the scope of the Japanese advance. Inadequate reinforcements, insufficient air power, Army-Navy disfunction, and outdated doctrines left key territories exposed to quick Japanese occupation. Guam and Wake Island were left to fend for themselves with minimal defense forces. When Japanese forces descended upon them, American defenders fought valiantly, but the strength of the Japanese quickly overwhelmed these outposts. Japanese success in these battles explains their interest in executing similar efforts in Alaska.

These books offer a detailed description of a peripheral area of the early Pacific War. The Japanese demonstrated a cohesive and forward-thinking strategy, while the US suffered from a lack of preparation and an underestimation of Japan's capabilities. As the war progressed, early defeats and missteps would shape American strategic planning; but, in the initial stages, the US was forced into a reactive posture, attempting to recover from the devastation inflicted by a prepared and determined foe. Eventually, the "Sleeping Giant" awoke, and the Japanese butcher's bill was paid.

Piegzik is a skilled researcher. But his narrative is dry and unmoving and suffers from either bias or an artless chain of translations lacking subtlety or humanity. While the books follow Helion's superb formula regarding format, artwork, and citation, the publisher usually does a better job accomplishing mundane editorial tasks. Pictures and profiles contain factual errors, and spelling and grammatical errors are common. Even an editor's cursory fact-check would have exposed Piegzik's incorrect analysis of the exploitation of the Akutan Zero. The Flying Tigers found the initial chink in the Zero's capabilities, and the Thatch Weave levelled the F4F's playing field against the Zero. By the summer of 1942, development of the Hellcat and Corsair were well underway and included performance capabilities that surpassed the A6M family.

Are these books worth the cost? I would offer a qualified maybe. A serious researcher could build on the extensive sources and notes to construct a more balanced narrative. A purely recreational reader, however, would quickly recognize the unbalanced arguments and incomplete analysis and feel the books were not worth the cost.

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Cold War Virginia, by Francis Gary Powers, Jr. and Christopher Sturdevant. Charleston SC: The History Press, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Bibliography. Index. Pp. 176. $24.99 paperback. ISBN: 978-1-46715665-3

Informative and rich in historical detail, illustrations, and pictures! *Cold War Virginia* provides a compelling and insightful exploration of Virginia's role during the tense Cold War era. Powers, son and namesake of the famous U–2 pilot Francis Gary Powers, brings a unique perspective to the narrative, blending personal insights with historical analysis.

The book delves into Virginia's strategic significance during the Cold War, examining key military installations, intelligence operations, and the everyday lives of Virginians living under the shadow of nuclear confrontation. With the location of the Central Intelligence Agency, the Pentagon, and many other Federal agencies in Virginia, the state was the epicenter of decision-making.

One aspect covered by *Cold War Virginia* is the impact the commonwealth had on air- and space-power history during the period. The numerous examples include Langley AFB, which played a significant role in the development of military aviation as it transitioned from propeller-driven to jet-propelled aircraft. Langley also hosted the headquarters for Tactical Air Command, the unit responsible for deploying and managing USAF tactical air forces during the Cold War. Its contributions to space exploration through the NASA Langley Research Center included Project Mercury. Virginia was a center for intelligence and Reconnaissance, as it hosted CIA headquarters and the National Reconnaissance Office (the major center for developing and supporting various aerial and space reconnaissance programs). U–2 pilot Gary Powers was a native Virginian.

Moreover, *Cold War Virginia* goes beyond military and intelligence operations to explore the social and cultural impact of the Cold War on Virginians. In 1960, the Soviet Union's shoot-down of Gary Powers U–2 over USSR territory "created a superpower crisis of epic proportions" and is described in detail. The authors further discuss the fear and uncertainty felt by families of servicemen and intelligence officers, as well as the technological advancements and economic changes in the state spurred by the defense industry.

The writing style is engaging and accessible, making complex historical events and military operations understandable for readers without a deep background in Cold War history. The inclusion of personal anecdotes and interviews adds a human touch to the narrative, enhancing the reader's connection to the subject matter.

Overall, *Cold War Virginia* is a well-researched and informative book that sheds light on an often-overlooked aspect of Cold War history. It serves as both a tribute to the contributions of Virginians during this pivotal time and a valuable resource for anyone interested in understanding the broader impact of the Cold War on American society.

Col Charles P "Chuck" Wilson, USAF (Ret), KC–135Q and U–2 Pilot, NASM docent

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Mosquito Special Operations of the Second World War. By Peter Saxton. Philadelphia: Pen & Sword, 2024. Photographs. Pp. 143. $36.95. ISBN: 978-1-39905-948-0

Saxton, a former Royal Air Force pilot, previously wrote books on railway history and the impact of helicopters supporting the North Sea oil industry. He also has written a book on the role of destroyers in naval warfare.

Many aviation historians consider the de Havilland DH98 Mosquito the most cost-effective and versatile aircraft of World War II. Powered by two Merlins, the wooden

Mosquito in its many variants performed almost any mission imaginable with its two-man crew of pilot and navigator.

Saxton establishes a context for the aircraft before reviewing some of its more conspicuous uses. He notes that between World War I and World War II, the RAF turned to the bomber as its primary tool for defeating an enemy. He follows that chapter by briefly discussing de Havilland's development and production of the DH98. Since the RAF wanted bombers, de Havilland built the first DH98 for that purpose. However, it independently constructed the second prototype as a fighter. The third and final prototype emerged as an unarmed reconnaissance aircraft.

Chapters 5 through 15 introduce the reader to the aircraft's various operational uses. Saxton begins with a brief look at reconnaissance. He also describes specially modified Mosquitos equipped with a cramped passenger seat for transporting British agents one at a time.

Chapters 6 and 7 examine the aircraft's role as a night fighter defending Britian's skies. The emergence of aircraft-based air-intercept radar enabled the navigator to better locate enemy aircraft.

In Chapter 8, Saxton drops operations to introduce readers to the challenges of training Mosquito pilots. As in Chapter 7 and, later, in Chapters 9 and 12, he fabricates conversations among fictitious personnel to dramatize the challenges of a wartime environment.

After using the Mosquito in a defensive role early in its career, the RAF turned the aircraft into a night intruder engaging German aircraft over the continent and attacking bases. Chapter 10, which discusses the operations of No. 605 and No. 418 (Royal Canadian Air Force) Squadrons, the first two to operate as night intruders, has the most specific information.

The RAF's Coastal Command used a wide range of aircraft, including Mosquitos. As Saxton points out, the RAF planned to use Mosquitos to sink the German battleship *Tirpitz* but, instead, employed Avro Lancasters.

Chapter 12 deals with what today would be identified as armed reconnaissance. Some Mosquito units attempted to attack targets of opportunity by operating in a particular area.

The Mosquito's use in special operations involved precise strikes on German facilities in urban areas in occupied Europe. Saxton looks at five of these missions. He concludes by asking whether the aircraft best served as a tactical or strategic asset.

This book is best suited for a general audience, particularly young adults with a growing interest in World War II aviation. Mosquito enthusiasts are unlikely to discover anything new here.

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

The Berlin Airlift and the Making of the Cold War. By John M. Schuessler, Adam R. Seipp, and Thomas D. Sullivan, eds. College Station TX: Texas A&M University Press, 2022. Illustrations. Index. Notes. Pp. vii, 232. $45.00. ISBN: 978-1-64843060-2

This book is the collected papers given in a workshop held in April 2019 at Texas A&M University. The intention of the organizers was to gather a group of both historians and international relations (IR) scholars to consider the *conduct* and *legacies* of the Berlin airlift. Col Gail Halvorsen, USAF (Ret) also attended as a guest.

While it is an excellent read, it is very hard to review here, since Schuessler and Seipp have, in effect, reviewed the book in their introduction. The third organizer, Sullivan, died before the book could be completed. As they point out: "our IR scholars all chose to focus on balance-of-power politics surrounding the Cold War, as opposed to the Berlin Airlift itself. Our historians, in contrast, tended to focus on either the operational context of the Airlift or the relationship between the Airlift and the project of German reconstruction in the wake of the war."

Very usefully, in Part I, the book opens with an overview of the Airlift itself. The confrontation really started on 30 March 1948 when the Soviet military governor ordered Soviet troops to inspect all cargo entering Berlin. Until then, they had accepted the various rail and truck cargo manifests in good faith. When Gen Lucius Clay, the US military governor, tried testing the Soviet policy, the Soviets just shunted the train on a siding and let it sit rather than confront the train crew. At that point Clay telephoned Lt Gen Curtis LeMay, Commander USAFE, and asked if the Air Force could deliver the required cargo. In effect, LeMay said, "Yes," and the Berlin Airlift started. Ultimately, it was run by Maj Gen William Tunner, the premier logistics expert in the USAF.

To quote from the introduction, "Part II places the Berlin Airlift in the context of the early Cold War." The author of one chapter "examines the origins of US policy toward the Soviet Union." In the next chapter, its author homes in on the German Question: the future of Germany. Another author argues that the Berlin Crisis was more of an "exclamation mark" than a "turning point" in the Cold War. The chapters in Part III focus on the experience of Germans before, during, and after the airlift. The final chapter carries this story decades into the future by examining the activities of the West Berlin Tourist Office.

Overall, I believe the book achieved its objectives: It is interesting, well written, thought provoking, and without conclusions.

Leslie C. Taylor, NASM docent, Smithsonian Institution, Washington DC

Hiroshima: The Last Witnesses. By M.G. Sheftall. New York: Dutton, 2024. Maps. References. Notes. Index. Pp. 545. $36.00. ISBN: 978-0-59347225-5

On August 31, 1946, *Esquire* magazine devoted its entire issue to a work by journalist John Hersey simply entitled *Hiroshima*. Subsequently published as a book, it was one of the earliest examples of new journalism, was judged the finest work of American journalism of the 20th century by New York University, and has never been out of print since. The book was a compilation of firsthand accounts by the first people in the world to experience nuclear warfare.

Fast forward to today. Sheftall's book, with virtually the same title, may be the *last* compilation of firsthand accounts by wartime victims of the bombing. Like Hersey's book, Sheftall's tells stories that are hard to put down and—at least for me—help one to visualize quite literally what it was like to watch an entire community disappear.

I volunteer at the National Air and Space Museum and daily show *Enola Gay* to people of all sorts of backgrounds and beliefs. I read this book to enhance my depth of understanding and to be able to do that better. It really helped.

Like Hersey, Sheftall chose a number of survivors and painstakingly collected their stories. Unlike Hersey, Sheftall is an American professor who has taught in Japan for over 30 years, is absolutely fluent in Japanese, and has been fully accepted into the culture. I think he got more of the story than Hersey did. I had recently read his book *Blossoms in the Wind: Human Legacies of the Kamikaze* (2005), based on his interviews of survivors of Japan's kamikaze program. I learned a lot from that, so I pounced when I heard about *Hiroshima*.

What Sheftall adds to previous books is that he continues the story into the present. He adds details that help form a better all-around perspective of what happened then and has happened since. For example, he explains the physics of the nuclear bomb; the medical effects of radiation; and the Japanese cultural characteristics that governed their austere wartime lifestyles and acceptance of the war, and made postwar lives of the survivors (who experienced much discrimination by their countrymen) very difficult. He explains how the city of Hiroshima emerged after the war and how and why it adopted its new mantra of "peace." As a college professor, he includes 20 pages of references and 30 more of notes to back himself up.

Before giving the impression of documentary perfection, let me also point out that the book, which consists of many chapters grouped into several sections, has no table of contents. I was lost several times as it wandered through those many twists and turns. Its only illustrations are three maps, covered with little numbers. I was hoping to use them to trace the survivors' movements. Unfortunately, there is no map key to tell what any of the numbers mean! The names of many Japanese people in the book are hard to follow, but Sheftall doesn't explain his naming conventions until the very end of the book—not the beginning. Finally, he seems to want to impress readers with big words, so it's a book you need to read with a dictionary handy. That's unfortunate.

Do I recommend it? Yes (especially if you have a reason to be knowledgeable about Hiroshima history). It is also well balanced—neither hawkish nor dovish—and factual. So, it's not full of judgmental assessments about what we did by dropping the bomb. I look forward to reading Sheftall's next book—about Nagasaki—which is in the works now.

Maj Gen John B. Handy, USAF (Ret), NASM docent

Boeing B–52. By Ben Skipper**.** Barnsley UK: Pen and Sword Aviation Books, 2024. Photographs. Illustrations. Pp. 96. $29.95 paperback. ISBN: 978-1-39908-003-3

Ben Skipper, an RAF veteran, is an avid modeler, professional photographer, illustrator, and podcaster. He is also a freelance writer with over 21 years of experience. He has authored numerous articles on art, history, and social and countryside themes. He has also written several books for Pen & Sword that focus on military history, transport, and aviation subjects.

The iconic Boeing B–52 Stratofortress has evolved significantly since its inception in the early 1950s. Initially designed as a long-range nuclear bomber during the Cold War, the B–52 has been transformed into a versatile aircraft capable of executing a wide array of missions, including conventional bombing, reconnaissance, electronic warfare, and standoff missile delivery.

In this book (the 31st in Pen and Sword's FlightCraft series), Skipper explores the development, design, and evolution of the B–52, focusing on its adaptability and role in both Cold War and modern military operations. He covers conceptual design, introduction of the prototypes and initial variants, operational changes to meet Cold Wat and Vietnam requirements, technological advancements, modernization in the post-Vietnam era, Desert Storm, twenty-first-century operations, and future prospects.

Skipper provides a technical breakdown of the B–52's design, highlighting its robustness, long-range capability, and ability to carry various weapon types, including nuclear ordinance. He also details the bomber's versatility, from strategic bombing to conventional warfare support, and its continuous updates that keep it relevant even in this century.

A key strength of Skipper's work is his ability to weave technical detail with operational history. He covers missions across decades, shedding light on the bomber's role in Vietnam, the Gulf War, and its modern-day contributions. The book also provides insights into the challenges of maintaining and updating a fleet of aging aircraft and the strategic implications of the B–52's presence.

As an interesting adjunct to the story of the Stratofortress, the book also contains a good chapter on modeling the B–52. Skipper describes how the aircraft has been, and remains, an extremely popular subject with modelers and is well-served by manufacturers who have produced a range of kits in many scales over the years. He covers the merits of and issues with several kit manufacturers and describes the various scales available along with model materials and processes, such as polyurethane resin, vacuform, and injection molding. He provides many model photographs of individual component details and full-up completed models.

Skipper has an open-narrative style and has conducted thorough research on B–52 evolution. His book provides an excellent overview of this aircraft, valuable to aviation enthusiasts, military historians, and general readers interested in the role of strategic airpower in modern conflict.

Frank Willingham, NASM docent

Reggiane Re 2001, Re 2005 and Beyond. By Przemyslaw Skulski. Sandomierz, Poland: MMP Books, 2024. Tables. Diagrams. Illustrations. Photographs. Pp. 176. $34.35 paperback. ISBN: 978-83-67227-63-6

There have been a number of books in the last several years that deal with Italian military aviation in World War II. This is particularly true regarding the fighters of Macchi and Reggiane. I'm not sure what has prompted this spurt of interest, but it very welcome, since so little has been written on this particular facet of airpower during the war.

In the Spring 2024 issue of the *Journal*, I reviewed Skulski's book on the Reggiane Re 2000, Re 2002, Re 2003—the radial-engine-powered Reggiane fighters. In that previous review, I said, "Perhaps MMP will come out with a companion volume on the more successful inline-engine Re 2001, 2004, 2005, and 2006 aircraft at a later date." They did, and this book is it.

Even while developing the Re 2000, a proposal emerged to equip the basic airframe with the German Daimler-Benz DB 601A inline engine. This would give the aircraft more power, better reliability, and improved aerodynamics. By July 1939, design work was underway, and first flight took place on 14 July 1940. As seems to be typical of Italian aircraft production, redesigns and industrial problems ended up putting the aircraft over a year behind schedule; and only about 250 of this model were produced—less than a month's worth of P–47 production! These were used extensively in the Malta campaign and in North Africa. When Italy switched sides in September 1943, only 33 Re 2001s were still operational.

First flight of the improved Re 2005 took place on 10 May 1942. Equipped with the DB 605 engine licensed from Germany, it was the best of the Reggiane fighters. Even so, it was slightly inferior to the other Italian competitors, the Macchi C.205 and FIAT G.55. In the end, fewer than 50 were built, and these were used exclusively in defense of Italian airspace (and, later, in defense of the Reich).

When combined with the earlier volume, readers can learn just about everything they could ever want to know about the Reggiane company and its products. The photographic coverage is excellent. And the technical drawings are plentiful and very good as well. There is so much information, that one could practically build a replica aircraft! The development and combat history texts are well done. In fact, the combat histories approach boring because of all of the detail provided. One thing that does become evident from reading these is the vast exaggeration of combat kills claimed in official reports.

As with the first volume, this book is a marvelous source for modelers. I prayed for information such as this when I was active in the hobby. But most AFHF readers are interested in the history. While certainly covered—and covered well—I'm not sure that the cost is worth it, unless the reader is really interested in the markings, camouflage, and aircraft technical details as well. And then these books are a steal.

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

Manned and Unmanned Flights to the Moon. By Terry C. Treadwell. Philadelphia: Pen & Sword Books, 2024. Photographs. Appendices. Bibliography. Glossary. Pp. 208. $42.95. ISBN: 978-1-39903927-7

Terry Treadwell's book offers a familiar story for me, whose life has spanned virtually every space mission he recounts. Readers of similar age even might be tempted to mutter the famous phrase attributed to Yogi Berra: "It's like *déjà vu* all over again." Admittedly, however, some old-timers might find his book refreshes their memories with long-forgotten trials and triumphs from the past. On the other hand, youngsters who never experienced the television viewer's anxiety over manned Mercury, Gemini, or Apollo launch countdowns or shared the awesome thrill of witnessing the first humans on the Moon, might benefit vicariously from reading this narrative history.

After a surprisingly brief first chapter spanning from the Greek foundations of astronomy in 624 BC to Jules Verne's publication of *From the Earth to the Moon* in 1865, Treadwell's second introductory chapter focuses on development of rockets, giving Robert Goddard undue credit for Wernher von Braun team's perfection of the Redstone. Only a single word mentions US Air Force responsibility for the Atlas, not to mention the Titan II and Thor launch vehicles. Contrastingly, the influence of former Nazi rocket engineers on Sergei Korolev's Soviet team is somewhat overblown.

The remaining chapter titles indicate well-known NASA programs, beginning with Mercury—gratuitously mentioning the "lady mathematicians"—and culminating with Apollo. As one might expect, this arrangement led Treadwell to pay less attention and provide far fewer details about Soviet manned and unmanned missions compared to US missions. As a matter of fact, it also resulted in far fewer details about US unmanned lunar missions compared to manned flights. Inclusion of two chapters about NASA's non-lunar Skylab and Apollo/Soyuz Test Project—albeit efforts that used hardware developed for the lunar program—also puzzled me.

A closing, six-page chapter titled "The Next Generation" too briefly identifies post-Apollo lunar exploration efforts from China's *Chang'e-1* and Japan's *Kaguya* in 2007, through India's *Chandrayaan-3* in 2023, without mentioning—except in the "Lunar Spaceflight Chronology" appendix—three more-recent, flawed attempts: a private consortium's *Peregrine 1*; Japan's *SLIM*, without explaining it as the acronym for *Smart Lander for Investigating Moon*; and the commercial *Nova C* or *Odysseus*. Although Treadwell once mentions NASA's Lunar Reconnaissance Orbiter, he provides no details about its amazing accomplishments. This chapter exhibits a disappointing lack of information about unmanned, post-Apollo missions to the Moon.

Like his earlier book, *Stepping Stones to the Stars*, Treadwell's newest product lacks some of the most basic features of a solidly professional study, such as an index and notes informing readers about where he found specific details. On the book's next-to-last page, he simply identifies his sources as "personal correspondence" with a half-dozen astronauts and provides a next-to-useless skeletal bibliography of nine items. While a novice might find the book interesting and informative, scholarly space historians almost immediately will begin cautiously perusing it for factual inaccuracies, ignored details, and misinformed conclusions. Like practically all of Treadwell's previous works, this one obviously is intended for a popular audience.

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

The B–24 Liberator Haulers: Transport & Personnel Variants During WW2. By William Wolf. Barnsley UK: Air World, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. xiii, 295. $52.95. ISBN: 978-1-39903-161-5

This is one heck of a story! The title indicates that it's going to present a couple of B–24 variants that were used as cargo and people haulers. It does that in spades. But—and to me, this is an equally important part of the story—it also presents what was really the genesis of today's USAF transport capability.

I have read a number of Wolf's books. A former dentist, he changed career paths to write about aviation. He's churned out some 25 books that are the result of his skill at collecting stuff: books, photos, microfilm, drawings, handbooks, and the like. Every book he writes is loaded with detailed pictures, diagrams, drawings, and the like. This one is no exception.

As I indicated, this book really covers two subjects. The first is the variants of the B–24 that provided America's first real heavy airlift during World War II. Twin-engine Douglas C–47s (and related variants) and many fewer Curtiss C–46s were available, but they were limited in cargo and personnel capacity and range. The US and Great Britain needed something bigger. The boxy fuselage of the long-range Consolidated B–24 bomber provided an answer. From the early LB–30s and B–24s, Consolidated developed the C–87 Liberator Express (in a number of different configurations). Along with minimally modified LB–30s and early B–24s, these provided most of the early cargo and VIP transport capability of the USAAF and RAF early in the war. Eddie Rickenbacker, Averell Harriman, Ike, Churchill, and FDR were among the many VIPs who travelled to far-flung corners of the globe on these transports.

To support upcoming B–29 operations from China, the USAAF needed to move a lot of fuel. Over 200 B–24s were converted into C–109 fuel transports—another example of an urgent military need being met through a quick aircraft mod program.

The Naval Air Transport Service also received a number of these aircraft as the RY and R2Y series. All of these Liberator models were the backbone of air transport until the Douglas C–54 entered service. Wolf provides a phenomenal amount data on all of them. Without question, this is the sourcebook for information on transport Libs.

The second major topic is the system in which these aircraft operated, and it's woven throughout the aircraft story. Large-scale air movement of people and materiel was in its infancy at this time. Routes had to be established, and trained people were needed. Airlines such as BOAC, American, TWA, and PanAm stepped in with crews under contract or in uniform. It was an early form of today's Civil Reserve Air Fleet (CRAF). Even Consolidated itself set up its own airline and operated its planes in the overall system. Ferrying and Air Transport Commands eventually led to MATS, MAC, and today's AMC. The B–24 variants were truly instrumental in forming what is now the world's greatest military air transport system.

The only deficiency in the book is what appears to be Wolf's prolific output. Quality has suffered. A picture of BG Robert Olds, Ferrying Command's first commander, is really his son, World War II and Vietnam fighter pilot Brig Gen Robin Olds. A captioned C–54 photo shows a C–46. Along with numerous typos, the book and its editing appear to have been a bit rushed. But for the story of the early development of US military air transport and the Libera-

tors that were its backbone, nobody has provided anything to match this book.

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

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Special Operations Consolidated B–24 Liberators: The Unknown Secret and Specialized Duties Aircraft. By William Wolf. Yorkshire UK: Air World, 2023. Tables. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. 235. $37.95. ISBN: 978-1-39905-776-9

This is a superb book—except for the title! Wolf goes far beyond "secret and specialized duties" B–24s. It could easily have been titled, *Everything You've Ever Wanted to Know About USAAF B–24s Except for Their Bombing Missions*. The reason is that Wolf presents details on everything else Air Force B–24s did during World War II and for a few years afterwards.

Wolf has previously written the definitive works on the B–29, B–32, and XB–19 bombers. I've never understood how his career as a dentist prepared him for authorship of aircraft histories, but he can certainly conduct research and find masses of photographs. This book is absolutely loaded with pictures of B–24s that have never been published before.

There are ten chapters in the book, each of which covers a different aspect of B–24 uses. The first covers the assembly ships used in the Eighth Air Force. While hardly secret, war-weary aircraft were used to facilitate assemblies of groups over the UK. Wolf's coverage is very comprehensive and even covers the B–17s used in this mission.

TB–24 crew trainers are covered in a short chapter, but the photo-reconnaissance F–7 variants receive more pages. In that chapter, Wolf ably covers not only the aircraft and where cameras were installed, but also provides details of the camera equipment used.

Chapter four does cover a secret and specialized mission that has been covered very little in the past: the *Carpetbagger* missions that resupplied resistance forces in Europe and delivered US and British special operations personnel into occupied territory. Most of these missions were done at night flying at low altitudes. These were harrowing, to say the least.

Leaflet delivery was another of the specialized missions conducted by B–24s and has its own chapter. But another very secret mission was electronic warfare (EW): intelligence gathering and electronic and radar countermeasures. In my decades of docent service, I found that most people thought EW (and precision weapons) all started in Vietnam. Nothing could be further from the truth. The vast EW effort and equipment used during the Second World War are very well covered. Similarly, most people are sure that aerial refueling is a product of the Cold War. Very important experiments were performed during 1943 with a B–24 tanker and B–17 receiver. These are covered in another chapter.

Nearly a third of the book covers interned and captured B–24s. While many readers are aware of diversions to Sweden and Switzerland by aircrew trying to save their lives, none has seen the kind of coverage that Wolf provides. How these crews were treated and what was done with their aircraft in the many countries where B–24s diverted is very well covered and very interesting.

The final two chapters cover late- and post-war testing and civilian uses of B–24s after the war. As in the other chapters, Wolf provides a great deal of previously uncovered detail.

For anyone interested in the B–24 and some of its more unusual applications, details that most books gloss over, and in some interesting tales of little-known aspects of the air war, this is certainly a book to read—and read closely.

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

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Hamburg 1940-45 The Long War Against Germany's Great Port City. By Richard Worrall. Place. Oxford UK: Osprey, 2024. Photographs. Maps. Illustrations. Index. Bibliography. Pp. 96. $25.00 paperback. ISBN: 978-1-47285926-0

My brother-in-law married a woman who emigrated from Germany in the early 1950s. The woman's father was an NCO in the Heer who often joked that Hitler gave him the chance to walk to Moscow and back. While he was fighting in Russia, his wife was trying to raise two toddlers in a suburb of Hamburg. The young mother had her own stories, and one was especially evocative. She said she and the girls got caught outside a shelter during an Allied bombing raid, They took cover as they could and in a quiet moment, she heard tinkling bells. Stunned and already shocked, she eventually realized the tinkling was the sound of brass bullet cartridges falling through the trees and onto the ground. Forty years later, the sound of wind chimes would still trigger those memories.

Worrall brings those kinds of stories to the reader in a superb book that is an object lesson on how to author a proper military-history book. His narrative is economical and direct. Artwork, charts, and photographs support the narrative and are effectively curated to advance his story. His index and bibliography are meticulous and practical.

Most impressive was his ability to present both senior-leader and junior-aircrew perspectives. He is equally comfortable discussing the policy and thought behind the campaign as well as what it felt like to be on the receiving end. This ability to bridge the gap between the theoretical abstract and the resultant smoke, fire, dirt, and death is

exceptional. Worral tracks the RAF's attacks on Hamburg from the earliest raids by 12 antiquated medium bombers dropping leaflets on estimated time of arrival to thousand-bomber, day-and-night raids employing early blind bombing systems. He even includes a chart showing every offensive and defensive modification made to Bomber Command platforms to enhance their effectiveness and survivability. And he includes USAAF Eighth Air Force missions as well.

Inevitably, he turned his attention to the massive physical destruction and human casualties the campaign caused for Hamburg's residents. Readers may compare numbers for similar campaigns against German and Japanese cities. Worall offers numerous quotes from folks who warn against assigning "blame" for deaths using 21st century morals to judge 20th century actions. But the reader should be prepared for some shocking photographs, numbers, and narrative. Some readers may take solace in knowing that not all decision makers were in favor of the methodology used to destroy Hamburg and other cities and will find Harris' and Portal's actions distasteful.

While I was impressed with the limited focus of Worral's work, I made a positive effort to put the thought behind the campaign against Hamburg into the context of strategic bombing writ large. Theorists assumed that bombing of commercial, cultural, and urban/civilian targets could break the will of the populace. History has shown that Stanley Baldwin was correct: the bomber will always get through and civilians will always pay a horrible price. Guernica, Rotterdam, Coventry, Berlin, Hamburg, Dresden, Tokyo, and Hiroshima/Nagasaki attest to that. But I had the chance to visit Hamburg 40 years after the end of the campaign. St Pauli and Sternschanze were vibrant and alive as were every other city on the list that I visited. Munich hosted a summer Olympic games 27 years after the last bombs fell on the Hofbrau House. The resilience of the human spirit will somehow find a way to survive and thrive. Even as we continue to expend enormous energy and resources to prove Douhet, Mitchell and Trenchard correct, all we have really done is raise the stakes on our gamble. Time will prove Churchill right: air power will either end war or end civilization.

Gary Connor, docent, National Packard Museum, Cortland OH

Building Engines for War: Air-Cooled Radial Aircraft Engine Production in Britain and America in World War II. By Edward M. Young. Warrendale PA: SAE International, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Bibliography. Index. Pp. 331. $115.00. ISBN: 978-1-4686-0664-5

"The Arsenal of Democracy" is one of the most telling descriptions about American participation in World War II. Much has been written about the thousands of fighters, bombers, tanks, ships, and armaments produced for the US and allied forces that overcame the Axis powers. But how much has been written about what it took to make that materiel for the warfighters? Very little history has been written on production of the engines needed to power many of the bombers and fighters.

Young has substantially helped fill in that gap. This history is derived from his doctoral dissertation and covers the major radial engines produced by the US and the UK. Left for another study are the big Vee engines (notably the V-1710 and Merlin) and the smaller radials, in-lines, and opposed engines that powered the trainers and liaison aircraft. But this is the story of how an industry that turned them out big radials by the dozens before the war eventually cranked out 114,000 R-2800s, 32,000 R-3350s, 47,000 R-1820s, 170,000 R-1830s, and 60,000 Bristol Hercules engines.

Most histories offer a top-line summarization that the automobile industry stepped in and introduced high-volume, mass-production processes they used for the thousands of cars they made. Not quite that simple. While both automobile and radial aircraft engines turned gasoline into rotary power, that's about where the similarities ended. Aircraft engines required much closer tolerances, more robust design, more exotic materials and heat treatments, frequent design changes, and far more inspections. As everyone quickly discovered, you didn't just hand over blueprints to Chevy and crank out an R-2800 on their production line!

Young well describes and analyses the vast work required to accomplish this production miracle. Austin, Rover, Chevrolet, Dodge, Ford, and Studebaker didn't just convert existing production lines into aircraft-engine producers. Essentially, all (with great infusions of government funds) built new factories, applying their expertise in mass production to the new types of products. But Curtiss-Wright, Pratt and Whitney, and Bristol also enlarged their own factories and built new facilities as well. Behemoth facilities were built, all of which needed new tooling and materials-handling equipment. Tooling, alone, would be another ripe study subject.

These new factories were wonders of their own. Thanks largely to the work of Albert Kahn and his architectural firm, huge single-story factories that relied mostly on non-strategic materials sprang up all over the US. At one time, the Dodge-Chicago factory that supported Curtiss-Wright was the largest manufacturing facility in the world.

Having spent decades as a financial-industry analyst, and with his interests in aerospace history, Young was the right person to tackle this subject. His charts are superb, and he analyses resource utilization on both sides of the Atlantic. In the end, thanks to his impressive research and analytical capabilities, a reader should understand how

one part of the huge and complex materiel problem facing the Allies was met and overcome. Anyone interested in the "back-home" story of how we won the war should read this excellent volume. It is not light reading, but it is worth every bit of time spent reading it.

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

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Russian Aces of WWI. By Anton Zhukov and Viktor Kulikov. Reno NV: Aeronaut Books, 2024. Photographs. Illustrations. Bibliography. Tables. Diagrams. Pp. 424. $74.99 paperback. ISBN: 978-1-964637-12-9

In this book, Viktor Kulikov and Anton Zhukov present a meticulously researched and thematically structured exploration of the fighter aces of the *Rossiyskiy Imperatorskiy Voyenno-Vozdushnyy Flot* (RIVVF—Imperial Russian Military Air Fleet). *Russian Aces* provides a comprehensive account of the lives and achievements of 24 aviators who shaped the combat history of Russian aviation, bridging gaps in English-language literature on this often-overlooked facet of World War I.

The book is exceptionally well organized, with each chapter focusing on an individual aviator, beginning with biographical details and tracing each pilot's early life, military progression, and combat achievements. Detailed attention is given to air battles, tactics, and aircraft types, supported by archival excerpts and visual documentation. These accounts are further enhanced by annotated photographs and detailed color profiles, offering a visually engaging experience for the reader.

Notably, the book provides an in-depth account of the development of Russian fighter aviation, describing the establishment of *Boevye Otryady Istrebiteley* (Fighter Aviation Detachments) and later *Boevye Aviatsionnye Gruppy* (Battle Aviation Groups). These units arose to counter the growing threat of German and Austro-Hungarian reconnaissance, bombers, and fighters, which gathered critical intelligence, attacked key infrastructure, and disrupted Russian troop movements and logistics on the Eastern Front. This shift reflected the increasing importance of protecting assets and countering aerial threats during the war. The narrative outlines their formation, beginning with the organizational separation of fighter aviation from reconnaissance units in 1916, and highlights the ingenuity and resourcefulness of Russian aviation leaders in creating these specialized combat formations despite numerous challenges.

The authors' dedication to archival rigor is another standout feature. Drawing from Russian, Austrian, and German military archives, they corroborate aerial victories and reconstruct detailed battle accounts. The inclusion of a table summarizing aces and their victories enhances accessibility, while insights into the operational and personal challenges faced by Russian pilots underscore their courage and determination.

Russian Aces of WWI is an essential addition to the library of any aviation historian or enthusiast, particularly those interested in the Great War. The book stands as a vital contribution to, and illuminates a pivotal, yet underrepresented, chapter of World War I aviation history.

Carl J. Bobrow, Research Associate, National Air and Space Museum

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Eugene Ely: Pioneer of Naval Aviation. By John H. Zobel. Annapolis MD: Naval Institute Press, 2023. Photographs. Notes. Bibliography. Index. Pp. xiv, 344. $35.00. ISBN: 978-1-68247837-0

The impact of Eugene Ely's brief, 18-month flying career on the development of aviation cannot be overstated. As the first pilot to take off from and land on the deck of a ship, Ely foreshadowed the immense potential of aircraft in the maritime domain. Nonetheless, while his exploits and name are widely known to aviation enthusiasts, his life has thus far eluded a serious biography. The late John Zobel's magnificent book rescues Ely from this obscurity by examining the famed aviator's brief life in the wider context of the history of early aviation.

The product of impressively thorough research, Zobel's work focuses on Ely's stature as a member of the small but vibrant community of aviation pioneers that rapidly emerged in the US in the decade following the Wright brothers' historic 1903 flights. An automobile enthusiast and racecar driver, Ely transitioned to piloting aircraft as an employee of the Glenn Curtiss aerial exhibition team. In that capacity, Ely earned a reputation as a highly skilled flyer who quickly became a crowd favorite at air meets across the country. In surveying this aspect of Ely's life and career, Zobel provides fascinating insight into the culture of early aviation, including relatively unglamorous but crucial elements such as the patent battles between Curtiss and the Wrights, the economics of exhibition flying, and the birth pangs of America's aviation industry at a time when the precise purpose of heavier-than-air flight was still a subject of intense debate.

Ely's foray into the world of naval aviation is the core of Zobel's superb book. His historic takeoff from the deck of USS *Birmingham* (Nov 1910) and his equally historic landing aboard USS *Pennsylvania* (Jan 1911) reflected the Navy's recent interest in exploring the potential of aircraft as naval reconnaissance platforms. Its genesis rooted in the *New York World*'s suggestion that Curtiss arrange for an airplane to fly off the deck of a German ocean liner. The experiment soon caught the attention of the Navy, whose senior leadership—along with President Taft—preferred

that the first flight toward American territory be made from the deck of a US naval vessel, rather than an ocean liner that served as an auxiliary in the Imperial German Navy. Ely's selection as the pilot to make the historic flights owed much to chance. The Navy first approached the Wrights; but Wilbur refused, apparently doubting the feasibility of an aircraft safely taking off from a ship. By contrast, Glenn Curtiss agreed to one of his fliers making the experiment, and agreed to allow Ely to execute the historic flight.

More than any other aspect of his aviation career, Ely's double exploit catapulted him to celebrity status, one he accepted with reluctance. But he did not live to enjoy it for long. Even as he basked in the adulation, the culture of aviation was undergoing profound changes. The public increasingly demanded more spectacular (i.e., risky) aerial displays, which claimed a growing number of aviators' lives. Ely himself had developed a reputation as a careful, "scientific" flier who eschewed dangerous aerial maneuvers in favor of making meaningful contributions to the development of flight. But given the treacherous nature of aviation technology, it was only a matter of time before the law of probabilities caught up with Ely: he was killed in a plane crash while flying in an air meet in Macon, Georgia, cutting short a promising career in its prime.

Ely's tragically short life was fascinating, but its significance and impact transcended his brief moment of fame. Zobel's book is testimony to Ely's stature as the exemplar of the heroic age of American aviation. Seen in this light, this biography does an excellent job capturing the zeitgeist of an era when heavier-than-air flight captured the popular imagination. As such, it should be required reading for anyone interested in the dynamics of this crucial but frequently misunderstood era.

Sebastian H. Lukasik, Air Command and Staff College

Polish Air Force Fighter Aircraft 1943-1945: On the Offensive, D-Day, and Victory in Europe. By Peter Sikora. Barnsley UK: Pen and Sword Books, 2024. Photographs. Appendices. Notes. Pp. 253. $44.95. ISBN: 978-1-39903-289-6

Peter Sikora is a noted historian and researcher who specializes in the history of the Polish Air Force between 1918 and 1946. He is particularly interested in the achievements of Polish airmen during World War II. Sikora writes articles for leading Polish aviation magazines and is a member of the Polish Air Force Memorial Committee at RAF Northolt. He has published five books related to his main area of interest.

Polish fighter pilots were exceptionally skilled and fierce warriors. They operated in British and American commands during World War II from the first day of the war until the end. They fought in Western Europe, Italy, North Africa, and Asia. About 550 were lost to enemy action—either killed, wounded, or missing in action—but they recorded well over 700 enemy aircraft destroyed. Their achievements are legendary.

Sikora's work is a nearly all-photographic book with only three pages of actual text related to the title. Readers must be prepared for the lack of informational text, as there is very little. The book is divided into five chapters: Freeing Europe, Mediterranean Operations, Poles in RAF Squadrons, Poles in American Squadrons, and Aircraft of the Aces and High Rank Officers. While there is no "story" here, each chapter is subdivided into squadrons with photographs, each with extensive captions related to that particular theater of operations and the respective squadron. Appendix 1 is a detailed list of the various aircraft and their variants (12 in all) that were flown by the Poles.

In typical Pen and Sword fashion, this is a handsome book with high-quality glossy pages, binding, and a dust jacket. As noted above, this is a book of photographs, and the reader needs to know that the true history of Polish Fighter pilots and their heroic exploits are better described in other books. In addition, the book itself appears too small. This book would be a better large coffee-table-style book; this would make the photographs much more impactful.

Sikora should be congratulated on compiling such a vast collection of photographs, which required tremendous work. However, this book's title is misleading. It should have been titled according to its contents: all pictures with captions. This book would be an excellent companion for other, more detailed books on the topic and period. On its own, it does little to place this vital topic into the proper context.

John Hladik, MA, Research Division / MUA, National Museum of the United States Air Force

Compiled by
George W. Cully

March 20-22, 2025
The **American Astronautical Society** will offer its 61st annual Goddard Space Science Symposium at the University of Maryland in College Park, Maryland. This year's theme "Space 2040: Pathways to the Future". For further details, see the Society's website at Goddard Space Science Symposium | American Astronautical Society.

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. For further details, see the Society's website at Welcome to the Society for Military History (smh-hq.org).

April 3-6, 2025
The **Organization of American Historians** will hold its annual gathering at the Sheraton Grand Chicago River Walk Hotel in Chicago, Illinois. For a presentation schedule and registration, see the Organization's website at OAH | 2025 OAH Conference on American History.

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 10-13, 2025
The **Vietnam Center** and the **Sam Johnson Vietnam Archive** at Texas Tech University in Lubbock, Texas will hold a conference entitled " 1975: The End of the Vietnam War." For more details, see the Center's website at The Vietnam Center and Sam Johnson Vietnam Archive: Calendar of Events (ttu.edu).

May 14-16, 2025
The **Army Aviation Association of America** will hold its 2025 Mission Solutions Summit at the Gaylord Opryland Hotel and Convention Center in Nashville, Tennessee. This annual event is the largest single gathering of the U.S. Army aviation community. For registration and other details, see the Association's website at AAAA 2025 Summit.

May 21, 2025
AFHF Symposium and Museum Conference, Chantilly, VA, Smithsonian National Air and Space Museum, Udvar-Hazy Center Executive Board Room (8 AM to 5 PM). Details: afhistory.org/events

May 22, 2025
AFHF Annual Awards Banquet and Celebration of the US Space Force 5th Anniversary. Chantilly, VA, 6-10 PM, Smithsonian National Air and Space Museum, Udvar-Hazy Center, Space Hangar. Details: afhistory.org/events

May 29-30, 2025
The **Society for History in the Federal Government** will hold its annual meeting in Washington, D.C.; this year's theme is "History as Dialogue." For further details, see the Society's website at Society for History in the Federal Government - 2025 Annual Meeting.

June 29-5 July, 2025
The **International Committee for the History of Technology** will hold its 52nd annual congress in Dunedin, New Zealand. The general theme of the congress is "Peoples, Places, Exchanges, and Circulation." For additional information, see the Committee's website at International Committee for the History of Technology (icohtec.org).

July 9-13, 2025
The Women Pilots Organization, better known as **The Ninety-Nines**, will hold their 2025 International Conference in Burlington, Vermont. See their website at Join 99s | Conference (The Ninety-Nines, Inc.) for more details.

July 15-17, 2025
The **American Astronautical Society** will again offer its annual Glenn Space Technology Symposium meeting at Case Western Reserve University in Cleveland, Ohio. The theme of this year's meeting is "Increasing the Thrust of Space Sustainability." For more particulars, see the Society's website at Glenn Space Technology Symposium | American Astronautical Society.

September 20-24, 2025
The **Air & Space Forces Association** will hold its national convention in National Harbor, Maryland to be immediately followed by its 2025 Air, Space & Cyber Conference at a location yet to be announced. For additional details as they become available, see the Association's website at Events Archive - Air & Space Forces Association.

October 28-30, 2025
The **American Astronautical Society** will offer its 17th annual von Braun Space Exploration Symposium at the University of Alabama in Huntsville, Alabama. This year's theme is "Expanding Exploration:From Vision to Reality." See the Society's website at von Braun Space Exploration Symposium | American Astronautical Society for further details.

November 13-15, 2025
The **History of Science Society** will hold its annual symposium in New Orleans, Louisiana. See the Society's website at Future and Past Meetings - History of Science Society (hssonline.org) for details as they become available.

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

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Answer: The German city that the Soviets cut off land access beginning in June 1948 was Berlin. As part of the World War II peace settlement, Berlin was divided into four occupation zones that were controlled by Great Britain, France, the Soviet Union, and the United States. When in June 1948, the Soviets cut off Western ground (river, road, and rail) access to West Berlin, the United States, Great Britain, and France began airlifting supplies into Berlin. The Western powers effort became known as the Berlin Airlift. The American portion of the Berlin Airlift operation was called: Operation Vittles and it lasted 464 days. While the Soviets ended their blockage in May 1949, the Western nations continued until September 1949. The four final months of the operation, after the Soviets had stopped their blockade, were used to build up a stockpile of supplies. In total, the Western powers airlifted over 23 million tons of cargo. During the Berlin Airlift, the Western Forces airlifted everything the residents of West Berlin needed to survive. This includes 1.5 million tons of coal. The airlift also included dismantled industrial equipment, food, and all the daily necessities of life. This also included candy and "Clarence" the Camel (mascot of the 525th Fighter Squadron) as a morale effort for the children of Berlin. The United States' main transport was the C–54 Skymaster. While the airlift began with the C–47 primarily providing the airlift, it was quickly surpassed by the more capable C–54.

Use the following links to learn more about the Berlin Airlift and the C–54

Berlin Airlift "A City Held Hostage":
https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197518/berlin-city-held-hostage/
The Berlin Airlift:
https://www.jbsa.mil/News/News/Article/3920966/lessons-from-the-berlin-airlift-75-years-later/
https://www.afhistory.af.mil/FAQs/Fact-Sheets/Article/458961/1949-the-berlin-airlift/
To Save a City: The Berlin Airlift: 1948-1949 by Roger G. Miller:
https://media.defense.gov/2010/Oct/01/2001329741/-1/-1/0/AFD-101001-053.pdf
C–54:
https://amcmuseum.org/at-the-museum/aircraft/c-54m-skymaster/
C–54: https://www.aerospaceutah.org/museum/our-collections/aircraft-collection/c-54-g-skymaster/

New History Mystery

by Dan Simonsen

This Issue's Quiz:

Question: Just three years after the end of World War II, in June 1948, the United States and its allies faced one of its greatest Cold War challenges. The Soviet Union cut off Western (Great Britain, France and the United States) access to this German City. Soviet leader, Joseph Stalin hoped that cutting off land access to this city, would humiliate the United States, Great Britain, and France and force residents of this city to accept Soviet Aide and Soviet terms. Rather than acquiesce to the Soviet pressure from a ground blockade, the United States, Great Britain and France began an airlift operation to supply this German city with all of its material needs. The Operation would go on for over a year. Can you name the Operation and the city it rescued? During the operation, one U.S. transport aircraft carried a majority of the cargo. Can you name that aircraft?

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