

AIR POWER

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History





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

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

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Air Force Historical Foundation
P.O. Box 790
Clinton, MD 20735-0790
(301) 736-1959

E-mail: ofcmgr@afhistoricalfoundation.org
On the Web at <http://www.afhistoricalfoundation.org>

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Jacob Neufeld

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Richard I. Wolf

Technical Editor
Robert F. Dorr

Book Review Editor
Scott A. Willey

Advertising
Jim Vertenten

Circulation
Angela J. Bear

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Address **LETTERS TO THE EDITOR** to:

Air Power History
11908 Gainsborough Rd.
Potomac, MD 20854
e-mail: jackneufeld@verizon.net

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

Air Power History
P.O. Box 790
Clinton, MD 20735-0790
(301) 736-1959
e-mail: ofcmgr@afhistoricalfoundation.org

ADVERTISING

Jim Vertenten
P.O. Box 790
Clinton, MD 20735-0790
(301) 736-1959
e-mail: execdir@afhistoricalfoundation.org

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You must have noticed that this is the sixtieth year of publication of *Air Power History*. Accordingly, in this issue our feature articles run the gamut from World War I, to World War II, to Operation Enduring Freedom in 2001.

Forrest Marion leads off with “Ten Seconds to Impact: The B-52 air strike at Bagram, on November 12, 2001.” This event was followed by the retreat of the Taliban and the capture of Afghanistan’s capital, Kabul.

In the second article, Bill Cahill examines “Reconnaissance on a Global Scale: SAC Reconnaissance of the 1950s.” At the end of World War II, the Strategic Air Command possessed a small fleet of aged bombers to use in the reconnaissance role, which was employed to map the periphery of the Soviet Union. At the outbreak of the Korean War, in June 1950, SAC was forced to conduct a realistic test of its reconnaissance doctrine and capabilities. General LeMay found SAC’s reconnaissance capabilities lacking. However, by 1956, the Central Intelligence Agency’s high-altitude U-2 filled the void. Learn of the events and technology that allowed SAC to resume its primary mission.

In “A German Aircraft Downed by Archie,” Charles Bogart recounts the story of how an American machine-gun crew of the 6th Balloon Company shot down the German World War I ace, Unterofficier Hans Marwedefater; after he had torched an American balloon. As Marwedefater crashed behind American lines, he began strafing American troops. Did he get out alive?

Ken Werrell, a prolific historian examines the reasons why the *Luftwaffe* lost air superiority to the United States in World War II. One reason, he concludes, was superior pilot training. Another was the waiver for pilot cadets to complete two years of college.

There are nearly two dozen book reviews in this issue and several books received, Please note that we have relocated the President’s Message to page 5. The departments are in their customary places, including Bob Dorr’s ever-popular “History Mystery” on page 64.



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From the President

Dear Members:

As always, let me thank you for the part each of you has played across the decades in the history and legacy of air power, and for your generous contributions to the Foundation. We are particularly grateful for your support of the annual Awards Banquet held in November 2013. As you will note on our Awards page of the website, this year we honored General John Shaud, Mr. Jack Neufeld, and for the Doolittle Award the 720th Special Tactics Group. Without your gracious assistance, conducting an awards program of this magnitude would just be impossible. We salute your generosity.



Perhaps our most important communication to you concerns this year's **celebration of the Foundation's 60th anniversary**. The celebration will be marked by special awards and activities, and you of course will be invited to participate once dates are firmly established. Please, plan to take this opportunity to meet your fellow members and revel in the Foundation's own proud history!

Of late the Foundation has been promoting awareness of its mission via the use of various electronic media, primarily through a daily broadcast email, Twitter, and Facebook. This has been fruitful in distributing our message throughout a variety of communities, including historians, museums, retirees, and those currently in uniform. If you would like to be included on the "This Day in Air Force History" daily email, please advise our Executive Director at execdir@afhistoricalfoundation.org.

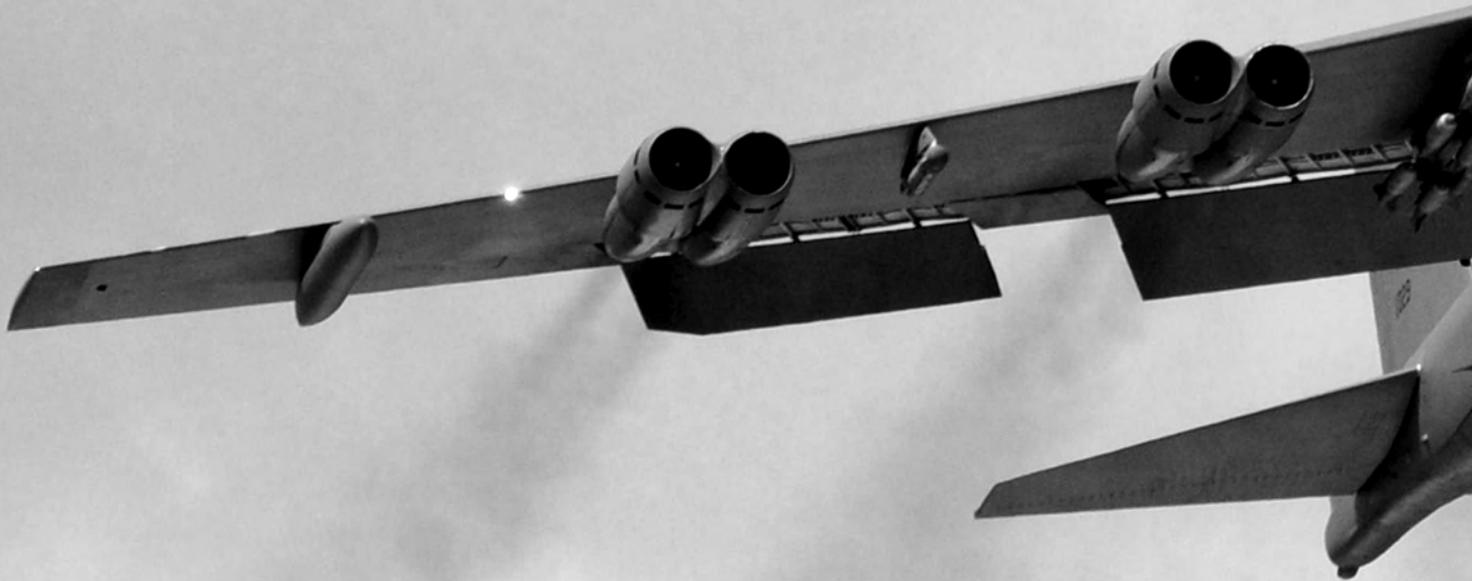
Lastly, as I have noted in previous messages to you that the Foundation has been working on several initiatives that would help achieve our main goal of a stable financial future. Among them, we have been examining the feasibility of joining forces with the Air Force Association in some form of collaboration in order to take advantage of various synergies to sustain and promote mutual support of our Air Force. As a first step at this process your Foundation has now provided AFA input concerning what we would like to see contained in a Memorandum of Understanding. We'll keep you posted on this and our other initiatives.

As always, we ask for your input as we seek innovative ways to make our organization more useful, attract a wider audience and reach broader participation. We need your feedback to guide us; it is of the utmost importance to our success. Please, let us know your thoughts.

A handwritten signature in black ink that reads "Dale W. Meyerrose". The signature is written in a cursive style and is underlined with a long horizontal stroke.

Dale W. Meyerrose, Maj Gen, USAF (Ret)
President and Chairman of the Board

“TEN SECONDS TO IMPACT”
THE B-52 AIR STRIKE AT
BAGRAM, AFGHANISTAN,
NOVEMBER 12, 2001





Forrest L. Marion

(Overleaf) A B-52 flew from Diego Garcia to Afghanistan to provide some close air support in 2001. (USAF photo.)

In the weeks immediately following the surprise attacks on U.S. soil on September 11, 2001, the United States prepared to strike the Taliban-controlled country of Afghanistan that acted as the support base for the al Qaeda terrorist group. Although the Taliban controlled some 90 percent of the countryside, there were still pockets in the far north where anti-Taliban partisans resisted. The main anti-Taliban group had been led by Ahmed Shah Massoud, the “Lion of Panjshir,” of Tajik ethnicity and supported by Tajikistan, until his assassination by al Qaeda on September 9, 2001. Led by Secretary of Defense Donald H. Rumsfeld’s vision of combining air strikes with a small ‘footprint’ on the ground consisting mainly of special operators capable of working with anti-Taliban indigenous forces, the U.S. Air Force’s 720th Special Tactics Group (720 STG) expected to play a major role. Based at Hurlburt Field, Florida, the 720th group consisted mainly of combat controllers, pararescuemen, and special operations weathermen, highly-trained Airmen that usually operated in denied or hostile areas as part of a joint special mission team or task force. Moreover, the new Air Force chief of staff, Gen. John P. Jumper—whose first day on the job was September 11—compared Afghanistan with the 1999 Kosovo conflict. General Jumper stated that if special operations forces (SOF) forces would have proven valuable in Kosovo, it was “absolutely imperative . . . that you start with people on the ground” in Afghanistan. And for the Air Force, that meant Special Tactics.¹

Within hours of the September 11 attacks, then-Col. (later, Brig. Gen.) Robert H. “Bob” Holmes, the 720 STG commander, began preparing to deploy the group’s headquarters and squadrons to the theater of operations. Holmes recognized the importance of “planting the 720th [Special Tactics] flag firmly in the middle of the combat theater.” By November, he established his headquarters at Masirah, Oman, with elements of four squadrons deployed. In his joint role, Holmes also served as deputy commander, Joint Special Operations Task Force–South (K–Bar), and in December he moved the 720 STG headquarters to Kandahar, Afghanistan. One element of the 720th led by Capt. Michael J. “Mike” Flatten “was instrumental in the USMC’s historic Task Force 58 deployment into Objective Rhino in the Afghan desert” and in its subsequent move to Kandahar.²

On the night of October 7/8 (local time), the U.S. military response, Operation Enduring Freedom, began. For the first two months of the operation, although U.S. Navy carrier-based aircraft conducted about 75 percent of all strike sorties, a nearly equal percent of the tonnage dropped came from USAF



aircraft, particularly heavy bombers. By October 15th, combat controller William C. “Calvin” Markham arrived at Karshi-Khanabad (K-2) airfield, Uzbekistan, to the north of Afghanistan. The husky 6’ 1” Special Tactics member from Waukesha, Wisconsin, augmented a U.S. Army Special Forces (SF) team, Operational Detachment-Alpha (ODA) 555, whose primary task was to identify ground targets in support of operations against the Taliban regime. Initially encountering resistance to his joining the detachment, Markham was welcomed with open arms when 555’s team sergeant recognized his “swim buddy” from a SOF SCUBA course twelve years earlier, thereby establishing the credibility and rapport so critical to joint special operations. On the night of October 19/20, two Army SOF MH-47E helicopters belonging to the 160th Special Operations Aviation Regiment inserted ODA 555 into a site in Afghanistan’s Panjshir Valley north of Bagram Air Base. Bagram was some thirty miles north of Kabul. Meanwhile, another Special Forces team, ODA 595, was inserted the same night into an area south of Mazar-i-Sharif, in north-central Afghanistan. The two SF teams, detachments 555 and 595, thus began operations inside Afghanistan on the first night that U.S. forces had ‘boots on the ground’ as part of Operation Enduring Freedom. In an interview in 2007, Master Sergeant (later, Chief Master Sergeant) Markham described how the team’s specific mission determined which member would be the lead:³

You have a twelve-man team and each person . . . brings a ‘piece of the pie’. . . . If this [had] been a

**WITHIN
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Forrest L. Marion graduated from the Virginia Military Institute with a B.S. degree in civil engineering. He earned an M.A. in military history from the University of Alabama and a doctorate in American history from the University of Tennessee. Since 1998, Dr. Marion has served as a staff historian and oral historian at the Air Force Historical Research Agency, Maxwell AFB, Alabama. Commissioned in 1980, he retired from the U.S. Air Force Reserve in 2010. This article was developed from an unpublished manuscript on the history of Air Force Special Tactics, 1953-2003.

(Left) U.S. Air Force Chief of Staff General John P. Jumper. (USAF photo.)

(Right) The runway at Bagram, with a C-17 ready for takeoff. (USAF photo.)

TEAM 555 MEMBERS BEGAN WORKING WITH THE CIA AND WITH NORTHERN ALLIANCE COMMANDERS TO SELECT TARGETS FOR AIRSTRIKES



sniper mission, the sniper on the team would have been the key guy. If this [had] been an engineering project for blowing up a bridge, the engineer would have had it. If this [had] been something medical . . . the medic on the team would have had it. But this particular mission was close air support [CAS], so that was my piece of the pie.

In other words, because of the particular nature of ODA 555's assignment, its lone USAF augmentee, Markham, was unquestionably the team's "key guy."

Markham recalled that during his brief stay in Uzbekistan, some wanted to make the U.S. troops "look like locals" in the Central Asian area of operations:⁴

So they went out and bought these Uzbek civilian clothes, but . . . it is basically like that Saturday Night Live skit with Dan Aykroyd and Steve Martin, and that is how the Uzbeks dress. It was kind of like disco and Dance Fever. They had these tight polyester pants with bellbottoms and these big furry jackets. I just thought to myself, "This is not the way to go." I went . . . and pulled out my rough civvies. I had Columbia pants, my Rockley hiking boots, my REI cold weather gear with the fleece and the wind-stopper jacket over it. Everybody said, "Oh you are going to stand out, and you are going to look like an American." As soon as we got into the Panjshir Valley [Afghanistan], the first guy that walks up to us . . . [says] "Would any of you guys like some sausage?" So right away we knew that we were in friendly territory. . . . [He] had on some Rockley hiking boots and Columbia pants . . . an REI button shirt and fleece, and a ball cap and it had "Fire Department of New York" on it!

In February 2002, a *Washington Post* article noted, "From the night they infiltrated, Team 555 members began working with the CIA and with Northern Alliance commanders to select targets for airstrikes." The ODA's first priority was to destroy the Taliban's forces near Bagram airfield, where the Taliban and Northern Alliance had faced off for between three and five years on account of the Taliban's inability to "penetrate the defensive minefields near the base," according to a U.S. Army study. Soon after arriving in Afghanistan, on October 21, Markham found himself in the control tower at Bagram looking out incredulously at Taliban forces spread out just east of the runway as he prepared to call in air strikes against them. "As a certified air traffic controller," he quipped, "there is no better place to be than in the tower." The Alliance forces held the tower and the west side of the airfield. Sergeant Markham recalled: "It was just surreal and the most un-tactical place to be, and it went against all of my training and my learning. But it just ended up being where we could affect the most damage to the enemy because we had the biggest field of view from there." On that day at Bagram, Markham controlled some six flights of F/A-18 Hornets, with two to four aircraft per flight. All of them carried laser guided bombs (LGBs). He estimated the Taliban's losses at five hundred, probably more Taliban than the Northern Alliance had killed in years. Markham added, "We completely annihilated that whole front line that they had just east of the airfield."⁵

After clearing Bagram of Taliban forces, Markham's team set about clearing the thirty-mile stretch between the airfield and the capital, Kabul, to the south. Markham had at his disposal a variety

The forbidding landscape of Afghanistan. (From the Briscoe collection, courtesy of the author.)



555 SPLIT INTO TWO SECTIONS AND POSITIONED THEMSELVES AT OBSERVATION POSTS SITUATED LESS THAN TWO MILES APART

of Navy and USAF aircraft, mainly F-18s, but also F-14 and F-15 fighters; B-52 and B-1 bombers, and AC-130 gunships. In order to “service all the targets,” 555 split into two sections and positioned themselves at observation posts situated less than two miles apart. From their vantage points, using high-powered binoculars, they could see “small columns of men walking ridge lines, cooking fires burning near trench lines, artillery and mortar pieces and tanks glistening in the afternoon sun. . . . Sometimes they saw black-shrouded figures, which they took to be al Qaeda members.” Whenever Markham identified a potential target, he contacted the combined air operations center near Riyadh, Saudi Arabia, where the request was “vetted” in an effort to ensure civilians or certain prohibited sites remained undamaged. Alluding to Markham without naming him, the *Post* writer credited a combat controller from the 720 STG with teaching the ODA “how to call in close air support using binoculars, a laser target designator, Global Positioning System devices and other equipment.” In the SF tradition, the team lived and worked closely with the indigenous forces, building relationships and trust. Markham recalled many days when his hosts shared the traditional Afghan meal of goat and rice, a fare of which he eventually grew tired.⁶

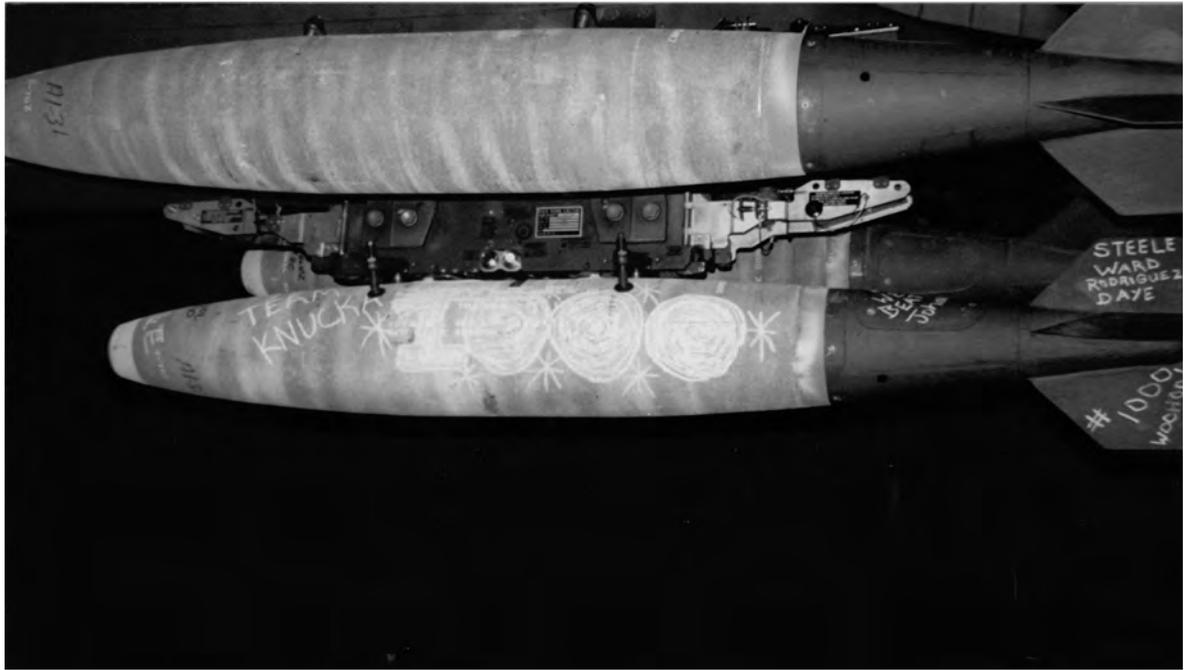
By the first week in November, the numbers of U.S./Coalition aircraft available for close air support (CAS) were on the rise. But some U.S. Army elements were disinterested in USAF combat controllers directing their air support. Markham recalled one incident in which a battalion commander was told by his soldiers, “We don’t need a com-

bat controller, we can do this job ourselves.” Although in one sense the assertion was true, it was a wasteful approach. Markham commented,⁷

They were wasting aircraft. When an aircraft . . . got frustrated . . . they knew right away, hey, come on down to Bagram. I was open seven days a week and twenty-four hours a day and I will get rid of your bombs for you. . . . Our call sign was Tiger-Zero-Zero-One and they were Tiger-Zero-Zero-Two. . . . [CAS aircraft] would come down and [say], “What is the deal with Tiger-Zero-Zero-Two?” “Well,” I said, “they should have a combat controller with them.”

By the second week of November, the Northern Alliance planned an offensive near the town of Bagram. The Taliban, meanwhile, sought to counter the move. Initially, Markham anticipated a significant amount of dedicated air support. Just prior to the offensive, however, he was chagrined to learn that his air support would be minimal. Markham likened it to showing up “to a gunfight with a knife.” On the morning of November 12, 2001, Northern Alliance forces lined up on the north side of the main east-west running road at Bagram. The larger, better-armed Taliban forces, several thousand strong, were situated on the south side of the twelve-foot wide dirt road. The Taliban began firing antiaircraft guns, artillery, mortars, tanks, and small arms, producing significant casualties among the Northern Alliance. It was clear the Taliban were preparing to overrun their adversaries. At one point, one of the Northern Alliance generals jumped on top of Markham to protect him from the Taliban

The 1000th Mark-82 bomb loaded by Scotty Briscoe's B-52 squadron in Diego Garcia, late 2001. After the mission on 12 November, during which that particular bomb was employed, Briscoe gave the fuze pin to Markham. (Photo courtesy, Scotty Briscoe.)



[MARKHAM] WAS SORELY DISAPPOINTED WHEN TOLD THAT THE BOMBER WAS CARRYING ONLY "DUMB" BOMBS

fire. When the surprised combat controller asked what was going on, the general said that if he were killed, another would take his place. But if Markham was killed, the airplanes "would not come." That simple, sobering analysis was quite correct. And at that particular moment, Tiger 01, whom the Northern Alliance called the "minister of air," needed emergency CAS. A lone B-52H bomber, call sign "Rocky 61," contacted "Tiger 01," and offered its assistance.⁸

The B-52 had flown north from its base at Diego Garcia in the Indian Ocean loaded with (unguided) five-hundred-pound Mark-82 bombs, often called "dumb" bombs, rather than the standard mix of Mark-82s and (guided) JDAMs (Joint Direct Attack Munitions, or GBU-31s). The standard load was twenty-seven Mark-82s consisting of three racks of nine loaded internally; and twelve JDAMs attached to pylons, six under each wing. But on November 12, for unknown reasons the B-52 responding to the call carried no JDAMs. Rather, its bomb load was forty-five Mark-82s, including nine under each wing. In an interview in 2008, the radar navigator, "Scotty" Briscoe, recalled both the urgency in Tiger 01's voice and the seriousness of his request, in addition to being able to hear gunfire in the background. After Tiger 01 determined the B-52's bomb load, Briscoe recalled, one of the first things he said was, "I need a two-thousand-meter string of bombs." Briscoe thought to himself, "Wow, that is over six thousand feet . . . what has this guy gotten himself into?" Markham wanted the string on a two-two-zero-degree course just to the east of the main dirt road running from Bagram to the southwest. Although he kept his thoughts to himself, Markham had expected JDAMs. He was sorely disappointed when told that the bomber was carrying only "dumb" bombs, especially given his team's desperate straits. But with no alternative, Markham, positioned on a rooftop near the road for

a vantage point, asked for a string of all forty-five of the five hundred-pounders along the Taliban's front line. The bomber crew realized the desperate situation as well. "We knew whoever we were talking to on the ground was in pretty bad shape," according to Briscoe, "otherwise they wouldn't be calling for unguided bombs from forty thousand feet only about five hundred yards from their [own] position!"⁹

Even more disconcerting to Markham, the B-52 crew would have to make adjustments for the strong winds. In 2008, Lieutenant Colonel Briscoe described the challenges of dropping unguided bombs especially from high altitudes:¹⁰

Everything was focused on maintaining the proper ground speed and the proper heading, because if your ground speed gets off and if you don't have the proper throttle setting then your spacing [between each bomb in the string] changes. . . . So we spent a lot of attention on our headwind/tailwind component to make sure ground speed was good. The other thing was zeroing in our heading. When you drop unguided weapons, the only thing that you can control is the release point and that has to be as accurate as possible. Once you release the weapons it is pure physics and wind.

To assist his crew with an easily identifiable initial point, or IP, for the bomb run, Briscoe chose Bagram airfield, some fifteen miles northeast of Tiger 01's position, clearly visible from the air.¹¹

Tiger 01 was in a "danger close" situation, meaning that his own position was in danger of being struck if the bombs were even slightly off the target. His team expected the Taliban's assault at any moment and so was anxious for the drop. Briscoe completed his calculations and checked them with the other navigator. The forty-five bombs were set to fall in a string one hundred twenty feet apart along

[HE] ASKED FOR A STRING OF ALL FORTY-FIVE OF THE FIVE HUNDRED-POUNDERS ALONG THE TALIBAN'S FRONT LINE

Markham and friends (left-to-right) Shawn Delaney, Calvin Markham, Scotty Briscoe, Phil Fluhr, in northern Wisconsin, undated. (Photo courtesy, Calvin Markham.)



THE AIR STRIKE ENDED THE TALIBAN'S ACTIONS AT BAGRAM

the Taliban's front line. Banking over Bagram airfield, the aircraft commander (AC) started the run-in on a two-two-zero-degree course. Briscoe contacted Tiger 01 and told him they were inbound from the IP. Briscoe recalled that several minutes later, he completed the checklist for the drop and everything looked good. At about twenty seconds prior to the drop, he heard, "Rocky 61, Tiger 01, have you guys dropped yet?" The AC responded, "No, Tiger 01, we are about fifteen seconds out, why, what's wrong?" At precisely fifteen seconds the huge bomb bay doors opened automatically. Briscoe recalled those moments:¹²

Here we are and the bomb bay doors are already open, and we are fifteen seconds to release . . . and Tiger 01 comes back on the radio and says, "Well, I'm just not used to seeing you over my shoulder like that." I was still confident that we had everything set and ready to go. . . . So at eight seconds to release the aircraft commander called "Withhold," which is our code word to stop the bomb run. I hit a couple of switches and we stopped the bomb run with about six seconds to go.

The huge bomber immediately started "a big, right hand turn" back toward Bagram. Though frustrated for the moment, Briscoe knew his AC had made the proper call.¹³

The aircraft commander called Tiger 01 and reported, "We are off dry," meaning they had not released any weapons. Markham relayed his concern that it had looked as though the bomber was flying over his position. Reassured by the AC that

the bomber had to drop from "seven miles back" and that the bombs would actually *overfly* his position prior to hitting the ground, Tiger 01 came back, "Roger that, cleared hot." Six minutes later, Rocky 61 was again on its run-in. Briscoe made sure that the pilot did not cut the turn too short, so as to allow enough time to complete the checklist and "zero out" the heading from the IP inbound. This time the bomber gave a sixty-second-out call and Markham repeated, "Cleared hot." Calvin Markham recalled the several minutes that followed:¹⁴

I gave him "cleared-hot," and it took [one minute] from the time he dropped them to when they hit. I said, "Hey, just give me a ten-second countdown because that way . . . we can at least say 'hey, it was great knowing you' or whatever." He gave us that ten second countdown and I rolled over on my back and I did not see anything. . . . Then it was a five-second countdown and just then I see these objects . . . falling out of the sky. . . . I turned my head and laid it on the side of the roof, and right exactly where we told them to put them, [the bombs] hit. Then this devastating explosion started going off. . . . It was like the A-bomb just went off. . . . We all stand up . . . and the dust settles and there is not one gunshot going on at all. Then all of a sudden . . . the Northern Alliance . . . started cheering. . . . Then they started rushing . . . thousands of Northern Alliance guys started moving across this road.

Briscoe, who of course could not see what was actually transpiring on the ground, recalled it was exactly 55 seconds from bomb release to impact—

after which the B-52 crew did not hear from Markham for at least 30 seconds—a tense wait.¹⁵

Scenes somewhat similar to that which Markham described were echoed by another combat controller in December 2001. Michael C. Stockdale of the 24th Special Tactics Squadron was attached to an Army special mission unit south of Jalalabad, Afghanistan, on the Pakistani border. His unit accompanied a group of anti-Taliban fighters through the mountains; Stockdale handled their close air support needs. In an interview in 2007, Sergeant Stockdale commented, “It was phenomenal to see the difference in their [the anti-Taliban fighters] aggression and their will to fight as soon as planes checked in and started dropping bombs where they wanted them. They started rushing.”¹⁶

On November 12, only minutes after Briscoe’s B-52 dropped its bombs and prepared to depart the area, Markham suddenly came on the radio: “Rocky 61, great hits, great hits, absolutely great hits!” With extreme understatement, Briscoe surmised, “Whatever we had done, it solved their problem and he was quite a bit happier about it.” In fact, Markham’s SF team members were so appreciative that a few days later when they recovered two U.S. flags from the U.S. Embassy in Kabul—abandoned since 1989—they gave one to Markham.¹⁷

In fact, the air strike ended the Taliban’s actions at Bagram: “all enemy action ceased,” one

report stated. The official battle damage assessment from Tiger 01 credited Briscoe’s B-52, Rocky 61, with over 1,200 “enemy killed by air.” From shortly after the strike until the next day, November 13, Northern Alliance forces drove their jam-packed trucks literally “from the trench lines at Bagram” into the capital of Kabul. The Taliban had fled the city. The *New York Times* reported, “. . . the Taliban left Kabul as they arrived five years ago, fading away in ghostly fashion at the dead of night, in their pickup trucks, with all the weapons they could carry.” It was barely three weeks from the start of ground operations in OEF. An Army SOF publication later summarized that on the ground, the unconventional warfare campaign in Afghanistan was directed by a very small number of specialists: about one hundred thirty Special Forces, Civil Affairs, and Psychological Operations soldiers “and a handful of Air Force special tactics [combat] controllers.” Although the fighting in Afghanistan ebbed and flowed for more than a decade, accompanied by changing U.S./allied objectives and attitudes, the November 12, 2001, air strike near Bagram and the subsequent capture of Kabul provided an important early success in Operation Enduring Freedom and encouraged many Americans, friendly Afghans, and allied partners for some months regarding the longer-term prospects in Afghanistan.¹⁸ ■

NOTES

1. Forrest L. Marion, “The Destruction and Rebuilding of the Afghan Air Force, 1989-2009,” *Air Power History* 57 (Sum 2010), p. 27; Charles H. Briscoe, et al, *Weapon of Choice: U.S. Army Special Operations Forces in Afghanistan* (Fort Leavenworth, Kans.: Combat Studies Institute Press, 2003), p. 95; Rebecca Grant, *The First 600 Days of Combat* (Washington: IRIS Press, 2004), Jumper quote on p 49. Massoud was known as the “Lion of Panjshir” for his fierce and successful resistance against the Soviets in the Panjshir Valley during the 1980s. An excellent source for details on Massoud and his resistance is Steve Coll, *Ghost Wars: The Secret History of the CIA, Afghanistan, and Bin Laden, from the Soviet Invasion to September 10, 2001* (New York: Penguin Press, 2004).
2. Note, draft manuscript review, Brig Gen Robert H. Holmes (USAF, Ret.), Aug 8, 2011; email, Lt Col Michael J. Flatten, USAF, to CMSgt Wayne G. Norrad (USAF, Ret.), Oct 11, 2012, copy in AFHRA/OH files.
3. Anthony H. Cordesman, *The Lessons of Afghanistan: War Fighting, Intelligence, and Force Transformation* (Washington: Center for Strategic and International Studies [CSIS] Press, 2002), p. 145; Intvw, F. L. Marion, oral historian, AFHRA, with MSgt. William C. Markham (USAF), Jul 16, 2007; Caspar W. Weinberger and Wynton C. Hall, *Home of the Brave: Honoring the Unsung Heroes in the War on Terror* (New York: Tom Doherty Associates, 2006), pp. 67-76; Dana Priest, “In Air War, Huts And Hard Calls,” *Washington Post*, Feb 20, 2002, p. 1; *Operation Enduring Freedom, October 2001-March 2002*, CMH Pub 70-83-1, at www.history.army.mil/brochures/Afghanistan/Operation%20Enduring%20Freedom.htm#p14b, pp. 14-15 (Oct 18, 2013). Apparently, ODA 595 did not have a combat controller with the team. Seemingly, ODA 555 was short by one member (or Markham replaced one soldier); the normal authorized strength of an ODA was twelve, but Markham referred to a total of twelve men on 555’s

team including himself (rather than thirteen total).

4. Markham intvw.

5. Priest, “In Air War, Huts And Hard Calls”; Markham intvw; *Operation Enduring Freedom, October 2001-March 2002*, pp. 14-15.

6. Priest, “In Air War, Huts And Hard Calls”; Markham intvw.

7. Markham intvw.

8. Markham intvw. For clarification, note that in the interview Markham referred to November 14 as the date; in fact, it was November 12.

9. Intvw, F. L. Marion, oral historian, AFHRA, with Lt Col “Scotty” Briscoe (USAF), Apr 24, 2008; Markham intvw; Discussion, Lt Col “Scotty” Briscoe (USAF) with Marion, Apr 24, 2008. Briscoe recalled his aircraft was at Flight Level 390, or 39,000 feet above sea level.

10. Briscoe intvw.

11. Briscoe intvw.

12. Briscoe intvw; Markham intvw. Briscoe did not recall Tiger 01 stating “danger close,” but regardless, the situation was grave enough for the term to apply.

13. Briscoe intvw.

14. Briscoe intvw; Markham intvw.

15. Email, Briscoe to Marion, Nov 15, 2013.

16. Intvw, F. L. Marion, oral historian, AFHRA, with MSgt Michael C. Stockdale (USAF), Jul 16, 2007.

17. Briscoe intvw; Markham intvw.

18. Briscoe, *Weapon of Choice*, pp 102-103; Air Medal citation, Capt “Scotty” Briscoe, May 3, 2004, copy in AFHRA/OH files; email, Briscoe to Marion, Nov 15, 2013; John F. Burns, “The Taliban Fade Away, But Remain A Threat,” *New York Times*, Nov 14, 2001; William Branigin, “Alliance Asserts Control Over Kabul,” *Washington Post*, Nov 14, 2001, p 1. Afghanistan’s second-largest city, Mazar-i-Sharif, fell to the Northern Alliance on November 10.

*Reconnaissance on a Global Scale:
SAC Reconnaissance of the 1950s*





DALAI

William Cahill

(Overleaf) 1st Lt. Roger Smith and the crew of F-13A s/n 44-61961A, 'Miss 'Dalate', circa May 1948. This 16th RS crew and their plane accompanied a squadron of the 92nd Bomb Group to FEAF for a two month TDY, one of many such rotational tours done in this era. (Unless otherwise credited, all photos are USAF photos found at AFHRA.)

From 1949 to 1959 the reconnaissance forces assigned to the Strategic Air Command (SAC) underwent a dramatic transformation that reflected their changing wartime role. Those forces evolved from a fleet of bomber-based reconnaissance platforms to a small group of specialized collection platforms as SAC redefined the intelligence needs associated with its Cold War deterrent strategy. This transformation was based on the emergence of critical aerospace technologies and a shift of SAC's reconnaissance mission from target development to stand-off peace time monitoring of adversary defenses and post-strike damage assessment.

Setting the Stage: SAC Foundations for Reconnaissance

In 1946 the USAAF's headquarters staff envisioned a future based upon the experiences drawn from the world war that had just concluded. From a doctrinal standpoint, these were heady times in the immediate post-war period as strategic bombing had been critical to the success of the allies' campaigns in Europe and the Pacific. Plans were being drawn up for an independent air arm that could build upon the experience gained at the cost of so much blood and treasure over the previous four years.

Unfortunately, post-war cuts to the military starting that year were draconian as America sought to bring home the troops after four years of war and Washington sought to obtain a peace dividend for future budgets. Bomber and fighter units were demobilized and their aircraft scrapped,

while those machines that survived the torch were parked in long-term storage. Post-war plans rapidly changed from building a balanced air arm to simply preserving assets. The few reconnaissance aircraft that remained available to SAC after the draw down had to prove their "utility" in an era of austerity, so SAC Commander Gen George Kenney and his deputy Maj Gen St. Clair Streett focused their efforts on activities such as the Post Hostilities Mapping Program that could benefit the growing commercial aviation sector instead of training crews to prepare for war. This activity was in line with Streett's view that SAC's immediate peacetime mission consisted of basic flying proficiency and mobilization and deployment preparedness rather than combat proficiency.¹ With less than five percent of the Earth's surface mapped in detail, mapping became the priority of United States Air Force (USAF) reconnaissance forces until the outbreak of the Korean War, and SAC assets would play a critical role.²

Activated in March 1946, the 311th Reconnaissance Wing was tasked with carrying out photographic and reconnaissance missions within the U.S. and overseas for SAC and USAF Headquarters. By default, this wing became the USAF's mapping service and was assigned to the Aeronautical Chart Service, an organization that not only made aerial navigation charts but also produced target folders for SAC.³ As for flying units, the wing controlled two overseas units that were conducting mapping operations, along with a third squadron that was mapping the U.S.

The following year, SAC started to get serious

Two 1st SRS RB-29s flying in formation over Midwest farmlands in May 1949, with RB-29A serial number 42-94113 in the foreground. At the time of the photograph, the squadron was based at Topeka AFB, Kansas, as an independent squadron assigned to the 311th Air Division. Within a month the squadron would be assigned to the new 9th SRW at Fairfield-Suisun AFB, California.



Bill Cahill is a retired Air Force intelligence officer who contracts for DoD in the Washington D.C. area. An intelligence weapons officer with squadron and wing-level experience, he has also served on the Air Staff and in an inter-agency capacity outside of DoD. Mr. Cahill is a graduate of San Jose State University and has MS degrees from Embry Riddle Aeronautical University and the National Defense Intelligence College. Mr. Cahill has been published in Air Power History, FlyPast, the USAF Weapons Review, and C⁴ISR Journal.

Brig. Gen. Paul Cullen, commander of the 311th Air Division from June 1947 until March 1949, was the driving force behind SAC's 1949 reconnaissance directive. General Cullen was lost and presumed killed in March 1951, when the C-124A Globemaster II transport he was riding in ditched and sank during a routine Atlantic flight to the United Kingdom. (USAF photo via John Prime.)



MAPPING BECAME THE PRIORITY OF UNITED STATES AIR FORCE RECONNAISSANCE FORCES UNTIL THE OUTBREAK OF THE KOREAN WAR

about reconnaissance. The 311th Reconnaissance Wing was transferred from Fifteenth Air Force to SAC Headquarters and in February 1947, a major subordinate unit, the 55th Reconnaissance Group (RG), was activated with three component squadrons to concentrate on the mapping mission.⁴ In April 1948 the 311th became an Air Division in preparation for a planned expansion of SAC's reconnaissance force. While the wing continued its mapping mission, it also supported atomic tests in the Pacific and started to re-equip its units with the Boeing F-13, the reconnaissance version of the B-29 Superfortress, in preparation for global reconnaissance operations.⁵ The emergence of an F-13 force (re-named RB-29 in late 1948) in 1948 was linked to cooling relations with the Soviet Union. By July of that year the Berlin Blockade was in effect, and SAC started a policy of deploying forces to the United Kingdom (UK) as a signal of U.S. resolve. While the majority of those forces were bombers, the 311th Air Division (AD) was also required to sustain a presence of at least four reconnaissance aircraft in the UK.⁶ The Cold War had started, and SAC now had an impetus to start to refocus the 311th from mapping back to strategic reconnaissance.

Planning a new force

The task of creating a global strategic reconnaissance capability was a daunting one; SAC started by examining its most likely target—the Soviet Union—and developing a force that could be employed against the USSR and its client states. Early studies by the Air Staff discussed the dismal weather often found over the Soviet land mass, and they accordingly recommended a reconnaissance program that centered on radar scope photography, radar mapping and a robust weather reconnaissance capability. Unfortunately, the radar systems of the late 1940s could not provide the resolution necessary to search for targets; those radar sets

could only be used to identify previously imaged facilities.⁷ Lacking the foundational intelligence necessary to use radar imagery for targeting, the USAF had to field imagery sensors on platforms to first seek out the targets; once they were located, radar sets could be aimed and radar images snapped in all weather, day or night.

Between 1947 and 1950 USAF's Air Material Command, working to SAC's requirements, specified and procured the aircraft that would constitute SAC's reconnaissance force through the late 1950s. Developmental challenges troubling the planned strategic reconnaissance aircraft, the Republic XF-12 Rainbow, opened up the field to a modified bomber platform.⁸ The leading contender, the Northrop RB-49, was soon removed from the list due to insufficient range and a two-stage approach followed. In the long run two bomber aircraft in the procurement pipeline, the Convair B-36 and Boeing B-47, would be modified to produce reconnaissance variants; the planned Boeing B-52 aircraft would be purchased with a reconnaissance capability as well.⁹ In the interim, RB-29s and Boeing RB-17s remaining from World War II would soldier on. In time, they would be augmented by reconnaissance variants of the Boeing B-50 aircraft, an outgrowth of the Boeing B-29 that was starting to be delivered to the USAF. In mid-1950, plans were finalized and SAC was ready to move forward with its strategic reconnaissance program.

With aircraft procurement planned and programmed for, SAC needed a new concept to most effectively employ its forces. In June 1948 the commander of the 311th AD, Brigadier General Paul Cullen, wrote a letter to General Kenney expressing his concern over the state of SAC's reconnaissance force. Cullen, commander of the 311th from June 1947 until March 1949, outlined a lack of doctrine and capability, stating his fears that war could erupt at any time and the U.S. needed to have modern equipment and tactics in place and adjusted to the new era of nuclear war.¹⁰ At Cullen's direction, the 311th AD staff established an operations research staff that eventually worked with SAC's Headquarters staff to codify the command's reconnaissance procedures. However, those improvements would take time.

In August 1949, SAC Headquarters promulgated a reconnaissance directive that was little changed from the strategic reconnaissance practices of 1945. The document broke reconnaissance operations into six tasks: 1) radar scope photography; 2) bomb damage assessment (BDA) photography; 3) target verification photography (used to develop target folders and bombing strategy); 4) target development photography (essentially lower resolution broad-area photography to find target sets); 5) weather reconnaissance; and 6) electronic intelligence collection by ferret aircraft. In addition, SAC was to conduct mapping and charting missions to meet requirements levied by the Joint Chiefs of Staff (JCS).¹¹ By the time this doctrine was published, SAC was starting to grow its reconnaissance force.

The 23d SRS was the first 5th SRW squadron to start the conversion from RB-29s to RB-36s. The wing conversion process started in February 1951; by the time this photo was taken in April the 23d SRS had four RB-36 aircraft on strength at Travis AFB, Calif. This RB-36D and one of the RB-29s in the background carry the 5th SRW's Circle X on their tails, while the B-29 carries the 9th BW's Circle R.



Building a new force

While the Berlin Crisis and the growing recognition of the Soviet threat pushed SAC to the forefront of USAF operations, the appointment of Lt. Gen. Curtis E. LeMay as SAC's new commander had a galvanizing effect upon SAC's operations and culture. LeMay set out to create an operational force in being, able to fulfill the task of deterring the behemoth that was the Soviet military—a path quite divergent from the prior focus on simply maintaining flying proficiency. The new SAC Commander expertly led his organization through the ensuing chaos of rapid growth and expanding responsibilities.

In July 1948, the USAF expanded the 55th RG to make it the first of four planned SAC strategic reconnaissance wings. Later that year the 91st Strategic Reconnaissance Wing (SRW) was established, using as a basis the 91st RG which had been transferred to SAC in July. The 91st SRW was unique in that it contained the 324th Strategic Reconnaissance Squadron (SRS). Activated to provide airborne training to electronic warfare officers, the 324th was soon given an additional operational role as the USAF's strategic electronic reconnaissance squadron; it was equipped with RB-29 Signals Intelligence (SIGINT) aircraft.¹² SAC would maintain a SIGINT squadron throughout the Cold War, tasking its aircraft to fly the perimeter of "denied" territory to provide the bulk of detailed analysis on communist electronic capabilities.¹³

There was considerable activity in the years 1949 and 1950 as new SAC reconnaissance wings were activated and assets were transferred from unit to unit to provide aircraft and training. The pattern would see new aircraft entering the inventory which would result in the older aircraft, usually RB-29s, cascading to a newer unit. In some cases, reconnaissance wings would receive the bomber version of the aircraft they were scheduled to fly to allow training and type conversion to start. A simi-

lar birthing process was used with personnel, where an existing unit would give up a cadre of its most experienced manpower to create a new unit.

The 311th Air Division was disestablished in November 1949, and the two independent reconnaissance squadrons that had been assigned to the Air Division, along with a host of new squadrons, were assigned to two new Strategic Reconnaissance Wings—the 5th SRW and the 9th SRW. These wings, along with the 55th SRW and 91st SRW, were assigned to the newly-created Second Air Force. Located at Barksdale AFB, LA its mission was to "execute upon short notice long-range strategic air reconnaissance operations on a global scale."¹⁴ When the 55th SRW was disestablished in November 1950, the remaining SRWs were relocated so that each of SAC's three numbered air forces could become a self-contained force. To better coordinate the resulting forces, SAC created a new Reconnaissance Division within its Headquarters to oversee all reconnaissance operations and requirements.¹⁵

SAC was trying to field a credible deterrent force with interim assets, even as it expanded and equipped newly-activated units in accordance with a continually evolving force structure vision. The 91st SRW provides an excellent example of this. Established in mid-1948, the wing was equipped with a heterogeneous mixture of RB-29s and RB-17s. Within 15 months the antiquated RB-17s were gone as the wing began to convert to an all-RB-50 organization. This plan changed after only one squadron had received RB-50s, and before the end of 1950 all of the 91st's RB-50s had been re-assigned so that the wing could re-equip with RB-45s. Four different aircraft—meaning four different mission profiles, four different training programs, and four different spare parts stocks - were operated within a span of just twelve months!

Even as they were being fielded, the 91st SRW's RB-45s were viewed as temporary gap fillers in SAC's strategic reconnaissance force until such time

IN JULY 1948, THE USAF EXPANDED THE 55TH RG TO MAKE IT THE FIRST OF FOUR PLANNED SAC STRATEGIC RECONNAISSANCE WINGS

The 31st SRS was the last 5th SRW squadron to receive RB-36s. Here crew members adjust parachutes before boarding their well worn RB-29 for a training flight on May 18, 1951. By the end of the month the squadron would receive its first RB-36. RB-29 serial number 45-21773 in the background has insignia red Arctic markings with the 5th SRW's Circle X in yellow and Fifteenth Air Force insignia on its tail.



THE OUT-BREAK OF THE KOREAN WAR IN JUNE 1950 FORCED SAC TO CONDUCT A REALISTIC TEST OF ITS RECONNAISSANCE DOCTRINE AND CAPABILITIES

as more capable RB-47s could be fielded in adequate numbers.¹⁶ However, because the RB-47 seemed to be long in coming, General LeMay pushed for Air Staff consent to equip all three squadrons of the 91st SRW with RB-45s in order for his crews to gain experience in operating multi-engine jet aircraft.¹⁷ The RB-45 had the benefit of greater speed than existing RB-50s, along with the ability to fly under a weather deck to service targets not accessible to high altitude platforms.¹⁸

As would be the case in the coming years, the 91st SRW RB-50 assets were reassigned to a new unit—in this case the reincarnated 55th SRW in late 1950.¹⁹ While the primary mission of SAC's reconnaissance forces during this time period was to train new crews and prepare to receive new aircraft, overseas commitments for mapping and show of force taskings necessitated the sending of squadrons or detachments to Europe, the Far East, and other parts of the globe. SAC continued its practice of cycling RB-29 units through RAF Sculthorpe, UK, for example, and RB-50 detachments were continually dispatched to perform mapping missions in Brazil, Alaska, Cuba, and multiple other locations.²⁰

A Korean Interlude and Vulnerabilities to the Force

The outbreak of the Korean War in June 1950 forced SAC to conduct a realistic test of its reconnaissance doctrine and capabilities. Though the conflict was not one that SAC wanted, it did allow the command to test out equipment and doctrine in a wartime environment. SAC utilized the 31st SRS, its only overseas squadron, to wage the war.

Equipped with RB-29s and augmented with detachments of RB-45s and RB-50G SIGINT aircraft, the 31st SRS (soon to be re-named the 91st SRS) provided SAC with insights into the war it could be fighting with China or the Soviet Union.²¹ Japan-based 91st SRS RB-29s and RB-45s were tasked in accordance with SAC doctrine to conduct target development, target verification and bomb damage assessment missions while RB-50G aircraft monitored radar signals while flying with bombers and mapped communist radar sets while flying off the coast of North Korea.²² Within a year of the start of the conflict, the bomber missions in Korea transitioned to the hours of darkness in order to avoid the increasing threat from communist MiG-15 jet fighters. Soon even SAC's RB-45s had switched to night missions due to their vulnerability. This was all nothing new to SAC—as early as 1950 the Command understood that daylight strategic reconnaissance missions would face high loss rates. Unfortunately, the Korean conflict was proving that the camera technology of the era was not up to the task of night operations. The issue that would eventually spell the demise of the converted strategic bomber as a reconnaissance platform was laid out then and there—survivability.²³

SAC's fears for its RB-29s and RB-45s fighting in the Korean War were part of a much larger problem facing staff planners in Omaha: the reconnaissance platforms programmed in the late 1940s were not living up to their expectations. Though the RB-36 could provide adequate daylight reconnaissance, it was seen as unable to collect BDA imagery due to the prevalence of lower level clouds over planned targets in the USSR. The RB-45, initially lacking a tail gun, was not seen as a survivable plat-



The aerial photographer of RB-36E serial number 44-92013 prepares for lunch during a flight in May 1951. This aircraft was operated by the 5th SRW's 23d SRS and was one of twenty one B-36A bombers converted to reconnaissance in an effort to quickly field a strategic reconnaissance fleet.

SAC DID NOT HAVE A GOOD NIGHT IMAGERY CAPABILITY, AND FOR A NUMBER OF YEARS IT CONSIDERED THE DAYTIME VISUAL IMAGERY MISSION TO BE FRAUGHT WITH RISK

form if it had to operate deep inside the Soviet Union during daylight hours. Neither platform was very capable at night, with sensors and photo flash bombs unable to deliver a quality image.²⁴ SAC did not have a good night imagery capability, and for a number of years it considered the daytime visual imagery mission to be fraught with risk.²⁵ This left only radar scope photography, which could guide bombers to a target but was incapable of doing target development and post-strike battle damage assessment. The same challenges—lack of an all-weather or night capability—made these assets incapable of performing SAC's "blunting" mission: tracking down and destroying the Soviet atomic bomber arsenal. By late 1951 SAC felt that the answer laid with a fighter reconnaissance aircraft that was both survivable and able to fly beneath adverse weather to capture essential photography. The USAF's then most current fighter reconnaissance aircraft, the RF-84F, seemed to fit the bill, and SAC ordered enough examples to equip one wing.²⁶ In the interim, SAC planned to get around its deficit in BDA capability by using theater tactical reconnaissance capabilities. These assets would augment SAC reconnaissance and perform the post-strike mission.²⁷

In early 1951 SAC's reconnaissance force consisted of 85 aircraft divided almost equally between RB-29s, RB-45s, and RB-50s. A handful of RB-36s rounded out the force. A snapshot in March of that year revealed four 91st SRW RB-45s deployed to the UK on indefinite Temporary Duty (TDY) and eight 38th SRS RB-50Es in the UK for a four month tour of duty. SAC's Korean War reconnaissance taskings were being handled mainly by the 91st SRS and its dozen or so RB-29s, along with a small detachment of three RB-45s. While on the surface this was not a large commitment, SAC was being pulled in many different directions and could barely meet this requirement. The 91st SRW's RB-45s were supposed to provide an interim jet reconnaissance capability, but the wing had too

many supply deficiencies to perform its mission over an extended period of time, and it was seen as having an initial limited wartime capability that would diminish fast. In addition, the wing only had 17 combat ready RB-45 crews, since it also had to provide crews to FEAF to support the war effort. The 55th SRW was in better shape, though SAC Headquarters felt it was only capable of sustaining one squadron in the UK for war plan employment. The 5th SRW was in conversion to the RB-36 from the RB-29, and it thus would not be able to contribute much to a wartime effort, leaving the 28th SRW and its ten RB-36s as the sole heavy reconnaissance unit. Even though the Air Force had directed conversion of B-36Bs to RB-36Ds on the production line as early as 1949, the large aircraft took time to build. As a result, SAC could only count on a dozen RB-50s and an equal number of RB-36s for its emergency war plan. Second, with anticipated combat attrition rates of 40 percent during the first month of operations and 25 percent in the next month, this force would be completely extinguished in little more than thirty days.²⁸ To safely guard this small force, SAC stoutly resisted any expansion of its contribution to the Korean War. SAC also fought any deployment of its new RB-47s to Korea, along with FEAF's continual desire to enlarge its in-theater RB-45 and RB-50G detachments.²⁹

The situation slowly improved over the next 18 months, and by the end of 1952 SAC had four heavy strategic reconnaissance wings either fully equipped or equipping with RB-36s. Unfortunately for the medium reconnaissance wings, RB-47 deliveries were running behind schedule. SAC had procured 90 RB-47B as an interim reconnaissance platform while awaiting development and delivery of the definitive RB-47E. The concept was to slightly modify existing B-47B airframes to accept a bomb bay reconnaissance pod containing cameras. Though planned for delivery starting late 1951, supply problems and production slippages delayed deliveries by over a year. The RB-47B aircraft and eighty-eight reconnaissance pods were finally delivered to the 91st and 26th SRWs in the first part of 1953, followed nine months later by the first deliveries of the definitive RB-47E aircraft.³⁰

Planned Wartime Usage

SAC reconnaissance assets were an integral part of wartime planning of the early 1950s. Upon initiation of the Joint Emergency War Plan, heavy reconnaissance units would conduct operations either from their home bases in the continental U.S. or from a forward staging base. Because they would be the first aircraft to reach prospective target areas, the RB-36s would first have to fly pre-strike reconnaissance missions to search for or confirm targets, then recover at a forward base for film processing and prepare for follow-on missions. These "search and seek" missions were critical to the success of SAC's war plans because at the time it still lacked quality imagery for many of its expected



343d SRS RB-50G serial number 47-151 in formation with another aircraft during aerial refueling. One of fifteen RB-50Gs operated by the squadron between 1951 and 1954, visible in this photo are the three APA-17B radomes under the aft fuselage to receive radar emissions and the RURAL-1ST in flight refueling receiver equipment under the tail gunner's position with the receiver hose played out. (Jack Morris via George Cully.)

COMMAND AND CONTROL PROVED TO BE A THORNY CHALLENGE FOR SAC WHEN ITS MEDIUM RECONNAISSANCE WINGS WERE REQUIRED TO DEPLOY

wartime targets. Medium reconnaissance units would have to operate from forward deployed bases due to their range limitations. Consequently, SAC kept up to 25 percent of its medium reconnaissance forces on forward deployments; these units would commence combat operations upon initiation of hostilities and assist the RB-36s in target development and verification photography. Squadrons on rotational duty to the UK were critical in providing U.S.-based bombers with pre-strike reconnaissance during the first 72 hours of hostilities. SAC viewed its early Emergency War Plans as an extension of the strategic bombing campaigns of the Second World War, and it planned for them to last for months if not years. Accordingly, attrition rates were calculated and the base force planned accordingly to sustain air operations until replacement aircrews arrived from training bases and replacement aircraft came from factories.³¹

According to SAC's 1951 war plan, the few RB-36s on hand would be committed to the European theater and recover in the UK for film processing. Medium reconnaissance units would operate from either the UK or Lajes Air Base in the Azores, although Goose Bay and Ernest Harmon AFBs in Canada were to be the points of departure for the mediums' initial strikes. No additional reconnaissance forces were planned for the Pacific, as the wartime scenario envisioned using the 91st SRS' existing assets were already deployed in theater. The plan's overall concept was for a night or all-weather strike. This necessitated that the bomber crews would already have the radar scope photographs required to find their targets. The medium bomber and reconnaissance assets would deploy over a 13 day time period, with the major movement occurring in the first three days after receipt of the war order.³² Although SAC tasked its forces to strike all JCS-named targets, it still did not have all of the exact locational data needed to find every target on JCS' list. As a result, SAC would undoubtedly have had to fly high-attrition daylight missions to visually search for and acquire the targets if called to war.³³ Reconnaissance operations to acquire imagery of the

war plan targets became a high priority mission.

The JCS assigned SAC three wartime tasks: destruction of vital elements of the Soviet war-making capacity, attacking massed advancing Soviet ground forces (or "retardation" in the terminology of the day); and counter-force targeting of Soviet atomic bombers. Target lists in all three categories were developed and assigned to SAC by the JCS. Naturally, each target set had its own unique intelligence challenges. Industrial facilities were the easiest targets to resolve in that they were fixed in place and once located could be accurately attacked. Unfortunately, efforts made since the late 1940s had done little to increase SAC's holdings of target imagery in this category, which relied mainly on German photography captured in 1945.³⁴ Though some industrial targets and military bases would be imaged in the coming years through overflight of denied territory by Department of Defense aircraft, the majority of the facilities on the JCS target lists consisted of little more than names and geographic coordinates.

The retardation mission was tactical in nature and did not require the assembly of pre-hostility target folders per se. Soviet ground forces could be attacked in garrison or, once hostilities commenced, SAC could wait until adversary ground forces were massing for attack to initiate a bombing offensive. Either way, the intelligence requirements were not terribly stressing. The same could not be said for the counter-force targeting ("blunting") of the Soviet atomic bomber fleet. In late 1951, SAC was still unsure of how to locate the Soviet atomic bomber fleet as it shuttled between bases. According to LeMay, in peacetime this task required "a freedom of initiative not likely to be provided a military commander in a democracy."³⁵ The targeting of mobile assets such as bombers would continue to bedevil SAC—and the USAF—throughout the rest of the Twentieth Century.

Command and control proved to be a thorny challenge for SAC when its medium reconnaissance wings were required to deploy to another command. In mid-1951, SAC established two forward headquarters—SAC (X-Ray) in the Far East and SAC (Zebra) in Europe—to control SAC forces deployed to those theaters and "for coordination and control of operations to secure desired prestrike target coverage."³⁶ The coordination staffs not only commanded SAC forces during wartime operations, they also worked the details of the integration of theater air components into SAC's war plan. SAC planners integrated theater tactical reconnaissance capability with their own to develop a complete air campaign that utilized other organization's forces to augment areas of SAC weakness, such as low altitude BDA collection. Operations orders were sent to the theater commands containing both bomber targets and reconnaissance targets to be serviced in the case of an all-out nuclear war with the Soviets.³⁷ Though the Joint Staff outlined SAC supremacy when it came to war plans, friction still abounded between SAC and the geographic theater commanders.

SAC's only hot conflict of the era, the Korean War enabled SAC crews to gain combat experience and planners to see the limitations of their platforms against Soviet fighters. The 58 camera symbols adorning the nose of a Detachment 2, 91st SRW RB-45C at Yokota AB, Japan attest to the high tempo of aircraft in the theater. General LeMay fought hard to keep his reconnaissance forces from being drawn into a war that would limit his ability to carry out his wartime tasking against the USSR. (Photo courtesy of Richard Rodrigues.)



LEMAY BECAME CONCERNED THAT HIS COMMAND LACKED THE MEANS TO TEST ITS ABILITY TO GATHER AND DISTRIBUTE INTELLIGENCE

As wartime plans were being drawn up in late 1950, General LeMay became concerned that his command lacked the means to test its ability to gather and distribute intelligence. In January 1951, LeMay ordered Maj. Gen. Sam Anderson, the commander of the Eighth Air Force, to demonstrate his organization's reconnaissance capability in an exercise in the UK that SAC had scheduled to start just two weeks later!³⁸ The 55th SRW dutifully responded and deployed eight RB-50E aircraft in little over a week for what turned out to be a four-month deployment. SAC continued to exercise its reconnaissance assets thereafter, usually by having aircraft fly long duration missions from their wartime bases that closely simulated wartime taskings.

In addition to overseas deployments, SAC also exercised units at their home stations. Mandatory Unit Simulated Combat Missions (USCM) were mounted often with less than a month's notice and necessitated 70 percent of a wing's assigned aircraft to launched on a single mission to replicate the generation of aircraft for wartime taskings. US-based fighters provided an aggressor force, with a tasked wing's assets flying from either home station or deploying to another base in the United States. In one instance, the 28th SRW had the "good fortune" to conduct a USCM in mid-August 1953, and then send six aircraft to the UK for a ninety day deployment in mid-September. Within a week of receiving its aircraft back from their TDY, the 28th SRW found itself conducting yet another USCM.³⁹ LeMay was *serious* about readiness.

The 1953 plan stated the focal point of the air war was the "heartland of the USSR" and involved attacks against "war sustaining resources" and Soviet bomber assets. However, other than accounting for new fielded forces, the plan was little changed from the 1951 edition.⁴⁰ The Korea War

validated the plan's base doctrine—the necessity of reconnaissance forces to find targets—and highlighted the need to acquire more survivable platforms, but SAC's war plan reflected what was in inventory and what must be done, not what should be in the inventory and what tactics were to be employed. Routine overseas deployments were maintained for both the medium and heavy reconnaissance wings under Project ROUNDOUT, with aircrews practicing flying out of their wartime bases.⁴¹ SAC was still at center stage, conducting strategic air reconnaissance in support of its bombing campaign with Air Force components in Europe and the Far East being directed to support SAC's requirements.⁴²

As SAC continued to plan for wartime employment, the signals intelligence aircraft of the 343d SRS were providing daily intelligence about the Soviet defenses they would face. SAC viewed its electronic reconnaissance mission in two phases: pre-hostilities and wartime. Pre-hostility missions included the development of enemy order of battle, determination of defense networks, and technical information on enemy radars for programming radar jamming systems. Wartime reconnaissance focused on gathering and rapidly evaluating intelligence for use in follow-on bombing missions.⁴³ Beginning in 1953, the 343d SRS maintained a presence in the Far East and Europe to monitor Soviet forces and their client states via six month overseas rotations.⁴⁴ SAC upgraded its SIGINT fleet in 1955 with new RB-47H aircraft, keeping the RB-50Gs for another year in the newly-activated 4024th Bombardment Squadron before passing them on to theater air forces.⁴⁵ The 55th SRW continued to maintain a forward presence, keeping RB-47H detachments with (KC-97 tanker support) in the Far East, the UK, Alaska and Greenland.⁴⁶

5th SRW RB-36H serial number 52-1374 arriving at RAF Lakenheath from Travis AFB for participation in Project Roundout in July 1953. Project Roundout saw medium and heavy reconnaissance wings deploy aircraft to their war plan bases for extended TDYs to allow aircrews to practice flying out of their wartime airfields.

PERPETUALLY CLOUDY DAYS OVER THE SOVIET UNION... CAUSED SAC TO LOOK AT USING DRONES LAUNCHED FROM THE RB-36



Aircraft Deliveries

Though SAC's heavy reconnaissance fleet was young in years, there were concerns about its wartime viability. Even before the RB-36 was delivered, there were rumblings about its inadequate performance. A 1949 memo noted that the RB-36 would operate at "extreme altitudes" and would therefore require excellent weather in order to perform an imagery mission. Perpetually cloudy days over the Soviet Union, coupled with the impracticability of diving an RB-36 under a cloud deck to take photos, caused SAC to look at using drones launched from the RB-36 to perform needed reconnaissance missions.⁴⁷ This drone concept would evolve to become the GRB-36 fighter conveyor or FICON.

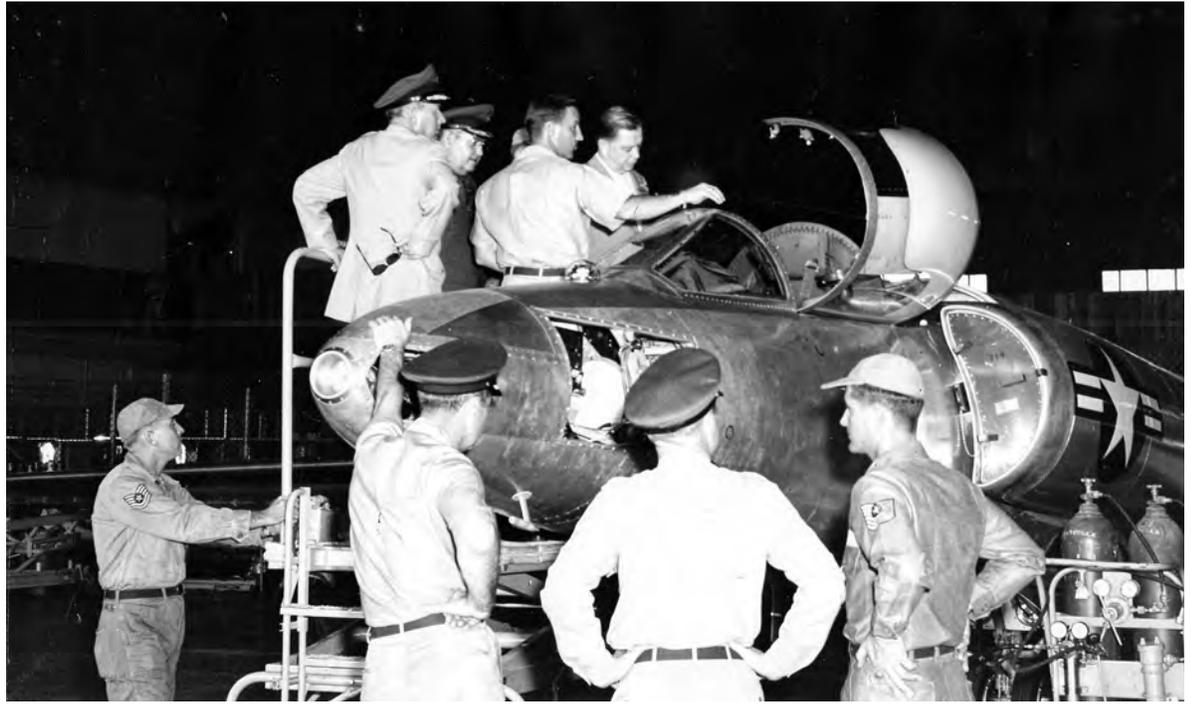
U.S. interest in the FICON concept dated back to the 1930s. The U.S. Navy had two rigid airships, the USS *Akron* and USS *Macon*, which operated small scout aircraft that were carried within their fuselage.⁴⁸ After the Second World War, the concept was revived for use with large fixed wing aircraft. First generation jet aircraft were range-limited and the USAF looked into the concept of equipping long range bombers with their own escort fighters. The original FICON aircraft, the purpose-built XF-85 Goblin, proved to be unable to mate with its carrier due to severe aerodynamic challenges. The USAF had more successes in follow-on testing using an F-84E and an RB-36F beginning in 1952. Though the tests were never spectacular, SAC saw them as a way ahead not for an escort fighter, but as a way to field a survivable reconnaissance platform that could get under Russian cloud cover. RB-36s modified to GRB-36D configuration would carry the nuclear-capable RBF-84F to the border of the Soviet Union, launch the fighter for either a reconnaissance or a nuclear strike mission, and then

recover it while remaining at a safe, standoff distance. In January 1954, the USAF ordered ten RB-36Ds to be modified to support 25 newly-ordered RBF-84Fs. The RBF-84Fs would be integrated with the rest of SAC's fighter reconnaissance order of RF-84F aircraft to form a fighter reconnaissance wing.⁴⁹

The FICON RBF-84F soon turned out to be a technological dead-end, and the concept was terminated within six months of delivery of the first aircraft.⁵⁰ The death of the FICON concept left SAC squarely in the bomber reconnaissance business with no other viable options. In September 1953, RB-47E aircraft started to flow to SAC reconnaissance units, with the initial production aircraft using an interim camera suite which caused multiple headaches.⁵¹ The same month the last RB-36H was delivered, and SAC was already in the middle of planning for a replacement heavy reconnaissance aircraft. By mid-1954, the USAF had 85 B/RB-52B/C aircraft on order with an anticipated delivery to the heavy reconnaissance wings in Fiscal Year (FY) 1959. The RB-52 was built as a bomber aircraft that, like the initial RB-47B aircraft, could accommodate a reconnaissance capsule in the bomb bay.⁵²

While the RB-52s were being put on the order books, SAC came up with a procedure it called "Indirect Bomb Damage Assessment". After a bomber had committed its weapon to a target, it would take a photograph of the radar scope. In theory, this would indicate where the bomb would land (assuming it functioned as advertised) and BDA could be drawn from the image. SAC staffers reckoned that one bomber successfully performing this task could obviate the requirement for five-to-ten follow-on reconnaissance sorties.⁵³ This method seemed to be an answer to the many reconnaissance woes

Lt. Col. Curry, commander of Detachment 3, 4080th SRW, showing the U-2 cockpit to (L to R) Gen. Thomas Power, CINCSAC; Gen. Curtis LeMay, VCSAF; Lt. Col. Curry; and Mr. James Douglas, SECAF. The visit to Detachment 3 at Ramey AFB, Puerto Rico, on January 13, 1958, enabled the visiting brass to see one of SAC's High Altitude Sampling Program bases.



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SAC was facing in the spring of 1954. In April 1954, the Air Staff issued a message that deemed the RB-47E and its interim camera suite unable to perform the peacetime reconnaissance missions, let alone its wartime tasking.⁵⁴ That same month, the Aircraft and Weapons Board at USAF Headquarters struck a killing blow to SAC's imagery reconnaissance fleet. The Board noted that reconnaissance variants of fighter aircraft could carry sufficient reconnaissance equipment to perform target photography and unlike their bomber brethren they could perform both high- and low-altitude operations. Further, fighter reconnaissance aircraft had "considerable greater survival expectancy than RB aircraft." The Board determined that due to the "meager ability" of the RB-52 to perform the reconnaissance mission, no further development was justified.⁵⁵ The planned testing of the RB-52 reconnaissance capability never came to pass, and the camera pod only flew once before it was placed in storage.⁵⁶

The realization that bomber reconnaissance aircraft were neither survivable nor entirely useful in a reconnaissance role soon had a chilling effect on the existing heavy reconnaissance wings. On May 1, 1954, SAC decided to modify all its RB-36 aircraft to carry nuclear weapons and by June 16 the primary mission of the four heavy reconnaissance wings was bombardment, with reconnaissance as a secondary mission. On the following October 1, 1955 the RB-36 wings' mission was changed to bombardment only, retaining only a latent reconnaissance capability.⁵⁷ By the time the RB-36 was retired in 1958, it had been completely stripped of its reconnaissance capabilities and was essentially just another B-36 bomber. The heavy reconnaissance force, used to target conventional bombs and low-yield nuclear weapons, fell by the wayside as SAC followed an approach that appeared to center on mass vice precision.

SENSINT and a Shift in Focus

The decision in 1954 to not pursue a replacement bomber reconnaissance platform started the transformation of SAC reconnaissance, but other external factors were also acting upon the Command. After the Chinese intervened in the Korean War in December 1950, President Truman agreed to approve overflights of China and Pacific Russia to monitor communist forces. These overflights enabled the national leadership to monitor the situation and to ensure that the fighting was not going to extend beyond the Korean Peninsula. His successor, President Dwight Eisenhower, continued the flights, now called the Sensitive Intelligence Program or SENSINT, based on the utility demonstrated by the initial overflight missions.

SENSINT missions were conducted in one of two variants—either USAFE or FEAF theater assets flying shorter length missions into the border areas of the Warsaw Pact, China, and the Soviet Union or SAC-conducted longer range strategic reconnaissance missions over the Soviet Union to support its war planning requirements. Operations commenced in 1954 and soon after SAC planned a bold daylight sortie over western Russia. The mission, flown on May 8 by Maj Hal Austin in an RB-47E of the 91st SRW, resulted in a running gun battle between his aircraft and Soviet MiG-17s.⁵⁸ Though Austin survived, this action highlighted the questionable wartime survivability of the still-new RB-47 platform in these types of scenarios, and it underscored the need for a special aircraft to perform such missions.

In May 1953, the Air Force Council directed the Air Research and Development Command to undertake a new program to meet USAF special reconnaissance needs. This resulted in the ordering of six twin-jet RB-57D high altitude aircraft in June

The face of SAC reconnaissance for a decade, the RB-47H provided stand-off electronic reconnaissance of denied territory. RB-47H serial number 53-4296 is seen parked on the ramp at Offutt AFB, Nebraska, in the twilight of her career in June 1967. The last USAF B-47 in service, she was retired to storage in December 1967.



**BEGINNING
IN 1956, U-2
IMAGERY
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THE SOVIET
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FIND ITS WAY
INTO SAC'S
TARGET
FOLDERS**

1954. The RB-57D program took Tactical Air Command's B-57B aircraft and extended the wings from sixty-four feet to 106 feet, inserted reconnaissance systems, and added more powerful engines. After much politicking by General LeMay, SAC was designated as the sole operator of all USAF special reconnaissance platforms (to include the RB-57D) in February 1955.⁵⁹

In parallel to SAC's RB-57D program was a much more sensitive, closely-held program called Project Aquatone—the Central Intelligence Agency's U-2 spy plane. Developed in a rapid manner by the CIA and Lockheed's Skunk Works, the program (and overflight operations in general) received the President's personal attention. Eisenhower insisted the U-2 program remain a civilian intelligence collection program, rather than a military reconnaissance operation, in order to better reduce tensions if an aircraft was shot down over Soviet territory.⁶⁰ Beginning in 1956, U-2 imagery taken over the Soviet Union started to find its way into SAC's target folders.⁶¹ This helped immensely with the targeting of fixed military and industrial facilities, thereby closing a large gap in SAC's strike intelligence requirements.

As SAC's target folders filled up with current imagery, the pre-strike reconnaissance missions envisioned for the medium and heavy reconnaissance forces rapidly became unnecessary. The U-2 program also aided SAC in an unintended way: CIA's imagery analysis from its overflight missions put to death the myth of vast fleets of Soviet bombers waiting to strike the US.⁶² With only a small Soviet bomber force to deal with, and a robust air defense posture in the US, the pressure for SAC reconnaissance to find the Soviet atomic bomber fleet was greatly diminished.

This was all still in the future when the first RB-57D was delivered to SAC's 4080th SRW on

May 1, 1956. Activated coincident with the arrival of the first RB-57D, the 4080th SRW was similar to the 55th SRW in the sense that it, too, was given a special global reconnaissance mission, though the 4080th's included very high altitude pre- and post-strike imagery reconnaissance.⁶³ Command of the unit was initially kept within SAC's fighter community: the first commander was Col Gerald Johnson, a World War II fighter veteran who reported to the 40th Air Division, commanded another World War II fighter veteran (and Johnson's former commander from when they had served in the 56th Fighter Group), Col Hubert Zemke.

Even though SAC was starting to be concerned about the survivability of the RB-57D, planning for operational employment continued apace.⁶⁴ The 4080th SRW's 4025th SRS deployed in September 1956, to Yokota AB, Japan to operate against the Soviet Union under the BLACK KNIGHT program.⁶⁵ On December 11, 1956, the 4025th SRS flew a bold daylight mission involving three RB-57Ds over Vladivostok, which caused a massive political protest from the Soviet Union.⁶⁶ President Eisenhower, who approved the concept of the mission, was angry with its aggressive execution. After enduring the political storm it had caused with Soviet diplomats, he cancelled the SENSINT program in December 1956.⁶⁷ The RB-57D aircraft would return home in August 1957, after spending eight months flying nothing more than pilot proficiency missions while waiting to see if permission for further sorties would be given.⁶⁸ In June 1957, SAC started to receive its own U-2 aircraft, which were also assigned to the 4080th SRW. After the termination of the SENSINT mission, the 4080th SRW's U-2s concentrated on high altitude air sampling and training for their wartime imagery mission while its RB-57D-2 SIGINT birds conducted two deployments to Europe and one to Alaska to fly

IN THE END,
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peripheral collection missions against the Soviet Union. With the U-2 established as SAC's high altitude reconnaissance platform, SAC shed its RB-57D imagery aircraft in June 1959, and its RB-57D-2 SIGINT aircraft in April 1960.⁶⁹

The emergence of high altitude reconnaissance platforms gave SAC imagery reconnaissance a way forward. Even though the FICON concept was dead, SAC's fleet of three RF-84F squadrons continued to fly in a conventional role, but their utility to SAC due to their rather short range was limited. The 71st SRW (Fighter), activated on January 14, 1955 to operate the RF-84F, was deactivated effective July 1, 1957, along with SAC's other four fighter wings.⁷⁰ Though the official reason for deactivation of the 71st SRW (F) and SAC's other F-84 wings was the impending retirement of the B-36 and its requirement for escort fighters, the USAF was also under pressure by DoD to shrink by nine wings by the end of FY 58. The fact that the RF-84F was late in delivery, short of range, and only existed at a single wing made it an easy target for SAC budgeters.⁷¹

Death and Rebirth

In late 1957, with an aging RB-47 fleet and concern over the U-2's vulnerability to Soviet defenses, SAC Commander General Tommy Power wrote to Air Force Chief of Staff General Tommy White to ask about the prospects for a replacement reconnaissance aircraft. General White responded that "the programming exercises of recent months have indicated a reduced priority for reconnaissance forces in the future," and that SAC would be reduced to one light and one medium reconnaissance wing by FY 1962.⁷²

General White's predicted future for SAC reconnaissance actually happened faster than he stated in his memo. In November 1957, the 91st SRW was inactivated. The pace started to quicken, and by the end of June 1958, the 70th and 90th SRWs converted to a training mission with a secondary reconnaissance capability, but with no war plan tasking. On July 1st, the 26th SRW was deactivated, leaving the 55th SRW as one of only two remaining reconnaissance wings—and the only bomber reconnaissance wing—in SAC. This dramatic downfall was driven by the SAC need to increase aircrew training in support of SAC's new bomber alert concept. Given the strict fiscal and manpower limitations imposed by the Eisenhower Administration, reprogramming the personnel associated with an RB-47E fleet facing questionable survivability in a wartime scenario seemed the

easiest solution at hand.⁷³ Though there were ongoing studies for new reconnaissance aircraft, no decision had been made as of yet, and there was a reason for delaying it.⁷⁴ What was offered was another choice—satellite reconnaissance from above the atmosphere.

During the same time that the CIA's U-2 was starting to fly over the Soviet Union, the USAF began to investigate the concept of a satellite reconnaissance system. Designated WS-117L, the program started development in October 1956, with a contract to Lockheed, but it soon slowed as technical difficulties were encountered. Eventually a low resolution mapping camera was pulled from the program and separately funded as Project CORONA. Test launches started in June 1959, and by August 1960, the first successful mission was accomplished after a trying series of 13 failures.⁷⁵ With the U-2 collection in hand, CORONA's priority target list was already refined and centered on Soviet ballistic missiles, heavy bombers, and nuclear research and test facilities.⁷⁶

In the end, SAC's reconnaissance evolved to meet changing circumstances. Though the USAF had invested in large numbers of reconnaissance platforms such as the RB-36, RB-47, and RB-50 to support a drawn-out strategic air campaign, within the span of a decade nuclear war plans evolved into a shorter brute force slugging match. Once the large industrial centers and bases of the Soviet Union had been found with CIA U-2 missions, it was a simple matter of monitoring their development and evolution with newly-fielded imagery satellites. There was no need for a vast fleet of reconnaissance systems to seek out targets for follow-on strike forces; what SAC needed was a large bomber force to be able to muscle through Soviet defenses to deliver a killing blow. Manned, medium-altitude airborne assets taking precision photographs were extraneous to the mission and in an era of reduced budgets, were slashed in order to provide a larger nuclear bomber force. The reconnaissance force that did emerge was composed of specialized platforms that could monitor Soviet defenses from international airspace and be used for limited pre- and post-strike high altitude photography.

Air Force leadership of the 1950s recognized this shift in requirements and altered the force structure accordingly. As the USAF shifts away from fighting a counterinsurgency in South Asia and enters yet again an era of constrained budgets, hopefully its leaders and staff will be able to divine the reconnaissance requirements of the coming decades and alter the current fielded force accordingly. ■

NOTES

1. John Farquhar, *A Need to Know* (Maxwell AFB, Ala.: Air University Press, 2004), p. 32.
2. *Ibid.*, p. 37-38.

3. 311th Air Division. Monthly History, Sept - Dec 1948. N.d., p. 8. AFHRA, DIV-311-HI, Sep-Dec 1948, Maxwell AFB, Ala.

4. *Ibid.*
5. Alwyn Lloyd, *A Cold War Legacy* (Missoula: Pictorial Histories Publishing, 1999), pp. 63, 68; SAC History - 1946 Organization, Mission, Training and Personnel, Vol. 1, April 1948, p. 25. AFHRA, K416.01 V.1, Mar 21, 1946-Dec 31, 1946, Maxwell AFB, Ala.
6. SAC History 1948, Vol. I. 1949, p. 240-45. AFHRA, K416.01 V.1, 1948; SAC History Jan-Jun 1951, Volume II. N.d., p. 1. AFHRA, K416.01 V.2, Jan-Jun 51.
7. Maj. Gen. Partridge, Dir of Trng & Rqmnts. Memo for General McDonald, Dir of Intel, DCS/OPS. Subj: Strategic Reconnaissance. Jan. 31, 1948. TS Control 2-848, Folder 3, Box 40, Entry 214, Intel General File, Jun 45—Dec 54, RG 341, NA
8. DCS, Material. Memo to other Deputy Chiefs of Staff, Dec. 7, 1948. Subj: B-49 and RB-49 Presentation to Chief of Staff. Reconnaissance Aircraft, Strategic Folder, Box 27, Entry 170 DCS, Development; Dir. of Research and Development, Strategic Air Group, Correspondence 1949-51, RG 341, NA
9. DCS, Material; Dir. of Research and Development. Memo for Record. Nov. 17, 1948. Subj: Tentative Equipment for New Strategic and Tactical Reconnaissance Aircraft. Reconnaissance Aircraft, Strategic Folder, Box 27, Entry 170 DCS, Development; Dir. of Research and Development, Strategic Air Group, Correspondence 1949-51, RG 341, NA; DCS, Material; Dir. of Research and Development. Memo to Requirements Division, Dir. of Research and Development. Jan. 18, 1949. Subj: Review of Strategic Reconnaissance Aircraft Program. Reconnaissance Aircraft, Strategic Folder, Box 27, Entry 170 DCS, Development; Dir. of Research and Development, Strategic Air Group, Correspondence 1949-51, RG 341, NA; DCS, Material; Dir. of Research and Development. Memo to CG, Air Material Command. Mar. 25, 1949. Subj: Strategic Reconnaissance Aircraft Development. B/RB-50 Folder, Box 28, Entry 170 DCS, Development; Dir. of Research and Development, Strategic Air Group, Correspondence 1949-51, RG 341, NA.
10. HQ 311th Air Division, letter to Headquarters SAC dated Jun. 4, 1948 with the subject, "Proposal for Study of Reconnaissance," located in SAC History 1948, Volume IV. 1949. AFHRA, K416.01 V.1, 1948.
11. SAC History 1949, Vol. 1, May 10, 1950, page 121. AFHRA, K416.01 V.1, Jan—Dec 1949.
12. 311th Air Division. Monthly History, May—August 1948. N.d., p. 32-33, p. 58-59. AFHRA, DIV-311-HI, 1 May—31 Aug 1948.
13. A-2, Headquarters SAC Appendix C, Photo Reconnaissance Requirements Conference Notes. 18 August 1949. Located in SAC History January—June 1950, Volume 1. Unknown. AFHRA, K416.01 V.1, January—June 1950.
14. SAC History 1949, Vol. 1. May 10, 1950, pages 7-8. AFHRA, K416.01 V.1, Jan—Dec 1949.
15. SAC History Study No. 5—Reconnaissance Activities. Oct. 15, 1950, p. 3, 6-8. AFHRA, K416.01-5, 1 Jan 1950—30 Jun 1950.
16. SAC History Jul—Dec 1952, Volume 1, 2, 3. Unknown. AFHRA, K416.01 V.1, 2, 3, Jul—Dec 1952.
17. John Fredriksen, *The B-45 Tornado* (Jefferson, NC: The McFarland & Co., 2009), p. 97.
18. SAC History Study No. 5—Reconnaissance Activities. Oct 15, 1950. AFHRA, K416.01-5, Jan 1, 1950—Jun 30, 1950, pp. 16-17.
19. Geoffrey Hays, *Boeing B-50* (Steve Ginter, 2012), p. 227-28.
20. SAC History Study No. 5—Reconnaissance Activities. 15 October 1950. Pages 6-12. AFHRA, K416.01-5, 1 January 1950 - 30 June 1950; Rodrigues, p. 86-87
21. SAC History July-December 1950, Volume 2. Unknown., p. 23. AFHRA, K416.01 V.1, 2, 3, July-December 1950.
22. William Cahill, "The Korean War and the Maturation of SAC Reconnaissance," *Air Power History*, Vol. LIX, No. 3, Fall 2012, p. 38-53
23. DCS, Development; Dir. of Research and Development. Memo to CG, Air Material Command. Nov. 28, 1950. Subj: Development of Night Strategic Reconnaissance System. Reconnaissance Aircraft, Strategic Folder, Box 27, Entry 170 DCS, Development; Dir. of Research and Development, SAG, Correspondence 1949-51, RG 341, NA; Stratemeyer to Vandenberg. Personal message from CG FEAF to HQ USAF. Dec. 26, 1950. Hoyt S. Vandenberg Papers, December 1950 Folder, Box 86, MD, LC; Stratemeyer to Vandenberg. Personal message from CG FEAF to HQ USAF. Dec. 26, 1950. Hoyt S. Vandenberg Papers, December 1950 Folder, Box 86, MD, LC; Weyland to LeMay. Personal message from CG Far East Air Force to CG SAC Jul. 13, 1951. Curtis LeMay Papers, B12642, Box 198, MD, LC.
24. According to LeMay, unfavorable weather will preclude high altitude photography at least 85 percent of the time in the area of Russia. See LeMay to Twining, Personal message from CG SAC to Acting CSAF. Jul. 24, 1952. Curtis LeMay Papers, B19503, Box 201, MD, LC. As late as December 1952 the commander of Eighth AF wrote CG SAC, noting the SAC (ZEBRA) Reconnaissance Forces committed against 91 European night targets in the current Emergency War Plan could not accomplish this tasking due to issues with RB-36 flash bombs and cameras. See CG, Eighth Air Force. Memo to CG, SAC, Dec. 9, 1952. No subject. Curtis LeMay Papers, B22324, Box 202, MD, LC. LeMay to Vandenberg. Personal message from CG SAC to CSAF, Aug. 3, 1951. Curtis LeMay Papers, B12453, Box 198, MD, LC; CG, Eighth Air Force. Memo to CG, SAC Dec. 9, 1952. No subject. Curtis LeMay Papers, B22324, Box 202, MD, LC. The RB-45 did not receive proper tail guns until March 1953; its bomb bay was not modified to drop flash bombs until April 1952.
25. DCS, Development; Dir. of Research and Development. Memo to CG, Air Material Command. Nov. 28, 1950. Subj: Development of Night Strategic Reconnaissance System. Reconnaissance Aircraft, Strategic Folder, Box 27, Entry 170 DCS, Development; Dir. of Research and Development, SAG, Correspondence 1949-51, RG 341, NA
26. SAC Report of Deficiencies Affecting Combat Capability. November 15, 1951. Curtis LeMay Papers, B13999, Box 198, MD, LC; LeMay to Vandenberg. Personal message from CG SAC to CSAF. 5 December 1952. Curtis LeMay Papers, B22149, Box 202, MD, LC; CG, SAC Memo to DCS, Operations, HQS USAF. May 7, 1953. No subject. Curtis LeMay Papers, B26400, Box 203, MD, LC.
27. Power to Coleman. Personal message from Deputy Commander SAC to Office Chief of Staff, GHQ, FEC, Mar. 14, 1952. Curtis LeMay Papers, B16973, Box 200, MD, LC.
28. By early 1951, SAC's reconnaissance force consisted of the following: twenty-one RB-50s, thirty-one RB-29s, twenty-three RB-45s, and ten RB-36s. Deputy IG, USAF. Report on SAC Capabilities to Initiate and Sustain Combat Operations. Mar. 19, 1951. Curtis LeMay Papers, B10647, Box 197, MD, LC; DCS, Operations; Dir. of Plans. OPG 52-2. Feb 1, 1952. Box 30, Entry 337—DCS, Operations: Dir. of Plans, Executive office, records branch, RG 341, NA.
29. Weyland to LeMay. Personal message from CG Far East Air Force to CG SAC Jul. 13, 1951. Curtis LeMay Papers, B12642, Box 198, MD, LC; Twining to LeMay. Personal message from VCSAF to CG SAC, Mar. 28, 1952. Curtis LeMay Papers, B17203, Box 200, MD, LC; LeMay to Twining. Personal message from CG SAC to CSAF. Jan. 1, 1953. Curtis LeMay Papers, B23446, Box 203, MD, LC; Twining to LeMay. Personal message from CSAF to CINC SAC, May 6, 1953. Curtis LeMay Papers, B26814, Box

203, MD, LC.

30. Headquarters Air Material Command, Dir. of Procurement and Production. Memo to Dir. of Procurement and Production Engineering, HQS USAF. June 27, 1952. Subj: Model RB-47B Aircraft—Photographic Systems Configurations. Box 3—B-47. Entry 454—Air Force—Material; Bombardment-Configuration Data, 1949-1957, RG 341, NA; Headquarters USAF. Message to Commander, SAC Jan. 16, 1954. No subject. AFOOP OPS-4 Special Projects Folder, Box 71, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.

31. DCS, Operations; Dir. of Plans. OPG 52-2. Feb 1, 1952. Box 30, Entry 337—DCS, Operations: Dir. of Plans, Executive office, records branch, RG 341, NA; SAC History of SAC, January-June 1951, Volume II. n.d., p. 21. AFHRA, K416.01 V.2, Jan-Jun 51.

32. Deputy IG, USAF. Report on SAC Capabilities to Initiate and Sustain Combat Operations. Mar. 19, 1951. Curtis LeMay Papers, B10647, Box 197, MD, LC; Curtis E. LeMay. Lecture at the Air War College. Jan. 9, 1952. Subj: Essential Considerations in the Conduct of Strategic Air Operations. Curtis LeMay Papers, B15376, Box 199, MD, LC.

33. Lecture at the Air War College. Jan. 9, 1952. Subj: Essential Considerations in the Conduct of Strategic Air Operations. Curtis LeMay Papers, B15376, Box 199, MD, LC; CG, Eighth Air Force. Memo to CG, SAC Dec. 9, 1952. No subject. Curtis LeMay Papers, B22324, Box 202, MD, LC.

34. SAC Report of Deficiencies Affecting Combat Capability. November 15, 1951. Curtis LeMay Papers, B13999, Box 198, MD, LC.

35. Curtis E. LeMay. Lecture at the Air War College. Jan. 9, 1952. Subj: Essential Considerations in the Conduct of Strategic Air Operations. Curtis LeMay Papers, B15376, Box 199, MD, LC.

36. Anderson to LeMay. Personal message from CG 8th ADVON, England to CG SAC Feb. 3, 1951. Curtis LeMay Papers, B9590, Box 197, MD, LC; Briggs to LeMay. Personal message from CG FEAF BC to CG SAC Mar. 1, 1951. Curtis LeMay Papers, B10122, Box 197, MD, LC; LeMay to Briggs. Personal message from CG SAC to CG FEAF BC. Mar. 21, 1951. Curtis LeMay Papers, B10311, Box 197, MD, LC; Power to LeMay. Personal message from SAC element in Japan (SAC X-Ray) to CG SAC May 2, 1951. Curtis LeMay Papers, B10856, Box 197, MD, LC. The differing views between Far East Command and SAC on the exact timing of wartime transfer were resolved with the JCS approval of SAC EWP 1-51, the global atomic war plan for SAC, and further discussions between FEC and SAC that resulted in the May 1, 1951 agreement. Under this agreement, CG FEAF BC was dual-hatted as DC, SAC (X-Ray), with verbal instructions given personally by CG SAC

37. Power to Coleman. Personal message from Deputy Commander SAC to Office Chief of Staff, GHQ, FEC. Mar. 14, 1952. Curtis LeMay Papers, B16973, Box 200, MD, LC; Deputy Commander, SAC Memo to Col Close, HQS SAC (XRAY). 21 June 1951. No subject. Curtis LeMay Papers, B11702, Box 198, MD, LC.

38. LeMay to Anderson. Personal message from CG SAC to CG 8th AF. Jan. 4, 1951. Curtis LeMay Papers, B9066, Box 196, MD, LC.

39. 8th Air Force. Semi-Annual History, July-December 1953. N.d., p. 241-46, 282-87, 300-03. AFHRA, K-520.01, Vol 1, Jul-Dec 1953, IRIS 508551.

40. DCS, Operations; Dir. of Plans. OPG 52-2. Feb 1, 1952. Box 30, Entry 337—DCS, Operations: Dir. of Plans, Executive office, records branch, RG 341, NA.

41. CINCSAC Message to CG, 7th Air Division, South Ruislip, England. Aug. 26, 1954. No subject. Curtis

LeMay Papers, B39157, Box 205, MD, LC; 8th Air Force. Semi-Annual History, July-December 1951. N.d., p. 256-57. AFHRA, K-520.01, Vol 1, Jul-Dec 1951, IRIS 508535; 8th Air Force. Semi-Annual History, July-December 1953. n.d., p. 241-46, 282-87, 300-03. AFHRA, K-520.01, Vol 1, Jul-Dec 1953, IRIS 508551; 15th Air Force. Semi-Annual History, January-June 1953, Volume II. n.d., P. 401. AFHRA, K-670.01-14, Vol 1, Jan-Jun 1953, IRIS 511340.

42. DCS, Operations; Dir. of Plans. Worksheets for WPC 54-1. Jan 1, 1954. Box 24, Entry 337—DCS, Operations: Dir. of Plans, Executive office, records branch, RG 341, NA; DCS, Operations; Dir. of Plans. WPC 54-1. Jan 1, 1954. Box 30, Entry 337—DCS, Operations: Dir. of Plans, Executive office, records branch, RG 341, NA; Headquarters USAF. Minutes of Aircraft and Weapons Board Meeting #11. Mar 27, 1954. Box 1, Entry A1 (1032)—Minutes of Aircraft and Weapons Board Meetings, 1952-1957, RG 341, NA.

43. SAC History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. n.d., “Medium Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, 1 Jul 54—30 Jun 56; Headquarters USAF. Message to Commander ATRC. Nov 4, 1954. No subject. AFOOP OPS-6-8 Reconnaissance Folder, Box 72, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.

44. Hays, p. 110; SAC History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. n.d., “Medium Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, 1 Jul 54—30 Jun 56; Headquarters USAF. Message to Commander ATRC. Nov 4, 1954. No subject. AFOOP OPS-6-8 Reconnaissance Folder, Box 72, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.

45. DCS, Material; Dir. of Procurement and Production Engineering. Memo to Commander, Air Material Command. Feb 18, 1954. No subject. Box 3—B-47. Entry 454—Air Force—Material; Bombardment-Configuration Data, 1949-1957, RG 341, NA; Hays, p. 111; Lloyd, *A Cold War Legacy*, pp. 214, 222-24.

46. SAC History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. n.d., “Medium Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, 1 Jul 54—30 Jun 56; Headquarters USAF. Message to Commander ATRC. Nov 4, 1954. No subject. AFOOP OPS-6-8 Reconnaissance Folder, Box 72, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA; SAC History of SAC, Jan. 1—Jun. 30 1957, Volume 1. N.d., p. 94-96. AFHRA, K416.01 V.1, Jan-Jun 57.

47. 311th Air Division. Memo for HQS SAC 29 March 1949. Subj: Development of Strategic Reconnaissance Drone. Located in SAC History 1949, Volume 1. May 10, 1950. AFHRA, K416.01 V.1, January - December 1949.

48. Hill Goodspeed, *Curtis F9C Sparrowhawk*, Wings of Fame Volume 17 (1999), pp. 198-205.

49. Dennis Jenkins, *Magnesium Overcast* (North Branch, MN: Specialty Press, 2001), p. 171-77.

50. On Jan. 14, 1955 the 71st SRW (Fighter) was activated under the command of Col Charles McKenna and assigned two squadrons equipped with RF-84Fs and one with RBF-84Fs (later re-designated RF-84K). The first RBF-84F aircraft were delivered to the wing in July 1955, conventional RF-84F deliveries following at a slow pace. Slipping delivery schedules and poor weather impacted training for the 71st SRW (F) and it wasn't until January 1956 that FICON training could start in earnest. On January 13, the Wing tried its first large scale check-out of FICON pilots with ten aircraft working with one GRB-36. Turbulent weather and pilot inexperience resulted in damage to three RF-84Ks and the

- GRB-36 probe receiver, forcing Col McKenna to suspend FICON operations. SAC terminated the program in February due to poor performance and the planned conversion of the 99th BW from RB-36/GRB-36 aircraft to the B-52. See 71st Strategic Reconnaissance Wing (Fighter). History, Nov. 1955. n.d., p. 23, 34. AFHRA, K-WG-71-HI, Nov 55; Headquarters, 99th Bombardment Wing. Memo to Commander, 57th Air Division. Nov. 10, 1955. Subj: FICON Phase II Training; Attachment 10 to 71st Strategic Reconnaissance Wing (Fighter). History, Nov. 1955. N.d.. AFHRA, K-WG-71-HI, Nov 55; 71st Strategic Reconnaissance Wing (Fighter). History, Jan. 1956. N.d., p. 40-59. AFHRA, K-WG-71-HI, Jan 56; 71st Strategic Reconnaissance Wing (Fighter). History, Feb. 1956. n.d., p. 44-45. AFHRA, K-WG-71-HI, Feb 56.
51. Headquarters Air Material Command, Dir. of Procurement and Production. Memo to Dir. of Procurement and Production Engineering, HQS USAF. June 27, 1952. Subj: Model RB-47B Aircraft—Photographic Systems Configurations. Box 3—B-47. Entry 454—Air Force—Material; Bombardment-Configuration Data, 1949-1957, RG 341, NA; Headquarters USAF. Message to Commander, SAC Jan 16, 1954. No subject. AFOOP OPS-4 Special Projects Folder, Box 71, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA; DCS, Operations; Dir. of Operations and Commitments Division. Memo to DCS, Operations. Apr 5, 1954. Subj: RB-47E Reconnaissance Capabilities. AFOOP OPS-6-8 Reconnaissance Folder, Box 72, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.
52. History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. n.d., “Heavy Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, Jul. 1, 54—Jun. 30, 56.
53. SAC, Notes for Gen. LeMay. Jun. 10, 1953—Mar. 25, 1957. Curtis LeMay Papers, Box 104b, MD, LC.
54. Headquarters Air Material Command, Dir. of Procurement and Production. Memo to Dir. of Procurement and Production Engineering, HQS USAF. Jun. 27, 1952. Subj: Model RB-47B Aircraft—Photographic Systems Configurations. Box 3—B-47. Entry 454—Air Force—Material; Bombardment-Configuration Data, 1949-1957, RG 341, NA; Headquarters USAF. Message to CINCSAC Jan. 16, 1954. No subject. AFOOP OPS-4 Special Projects Folder, Box 71, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA; DCS, Operations; Dir. of Operations and Commitments Division. Memo to DCS, Operations. Apr. 5, 1954. Subj: RB-47E Reconnaissance Capabilities. AFOOP OPS-6-8 Reconnaissance Folder, Box 72, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.
55. Headquarters USAF. Minutes of Aircraft and Weapons Board Meeting #12. Apr 3, 1954. Box 1, Entry A1 (1032)—Minutes of Aircraft and Weapons Board Meetings, 1952-1957, RG 341, NA.
56. DCS, Operations; Dir. of Operations. Memo to DCS, Operations; Assistant for Programming. Nov 3, 1954. Subj: Requirements for RB-52 Aircraft. Box 78, Entry 345 (1954)—Air Force—Operations; Operations subject numeric files, 1954, RG 341, NA.
57. History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. N.d., “Heavy Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, 1 Jul 54—30 Jun 56.
58. Harold Austin, “A Daytime Overflight of the Soviet Union,” in *Early Cold War Overflights 1950-1956, Symposium Proceedings, Volume 1: Memories* (Washington: Office of the Historian, National Reconnaissance Office, 2003).
59. SAC acquiring the RB-57 was due in no small part to Gen. LeMay securing concurrence from VCSAF Lt. Gen. Thomas D. White that SAC would perform all such special pre-hostilities reconnaissance missions. See CSAF, USAF, Memo to CINCSAC 10 August 1953. No subject. Curtis LeMay Papers, B29239, Box 204, MD, LC; Chairman, Air Force Council. Memo to CSAF. Nov. 29, 1954. Subj: Special Reconnaissance Systems. Nathan F. Twining Papers, TS General File Folder, Box 79, MD, LC; Headquarters Air Material Command. Memo to Assistant for Production Programming, HQS USAF. Jun 26, 1956. Subj: BLACK KNIGHT Program. Box 9—RB-57D. Entry 454—Air Force—Material; Bombardment-Configuration Data, 1949-1957, RG 341, NA.
60. Stephen Ambrose, *Ike's Spies* (Garden City: Doubleday & Company, 1981), p. 270.
61. Dino A. Brugioni, *Eyes in the Sky* (Annapolis: Naval Institute Press, 2010), p. 161-63.
62. Gregory Pedlow and Donald Welzenbach, *The CIA and the U-2 Program, 1954-1974* (Langley: CIA Center for the Study of Intelligence, 1998), p. 316-17.
63. History of SAC, Jan. 1—Jun. 30, 1957, Volume 1. n.d., p. 97-102. AFHRA, K416.01 V.1, Jan-Jun 57; History of SAC, Jul. 1, 1954—Jun. 30, 1956, Volume 1. N.d., “Light Reconnaissance Force” section page numbers redacted. AFHRA, K416.01 V.1, Jul 1, 54—Jun 30, 56.
64. LeMay to Power. Personal message from CINCSAC to Commander, ARDC. Jul. 5, 1956. Curtis LeMay Papers, B55115, Box 206/7, MD, LC.
65. History of SAC, Jan. 1—Jun. 30, 1957, Volume 1. n.d., p. 97-102. AFHRA, K416.01 V.1, Jan-Jun 57; 4080th Strategic Reconnaissance Wing (Light). Monthly History, Nov. 1956. n.d. AFHRA, K-WG-4080-HI, Nov 1956.
66. Robert Hines, “Project Heart Throb in the Far East,” in *Early Cold War Overflights 1950-1956, Symposium Proceedings, Volume 1: Memories* (Washington: Office of the Historian, National Reconnaissance Office, 2003).
67. Robert Jackson, *High Cold War* (Somerset: Patrick Stephens Limited, 1998), p. 100-01.
68. 4080th Strategic Reconnaissance Wing (Light). Monthly History, Aug. 1957. n.d., p. 5-6. AFHRA, K-WG-4080-HI, Aug 1957. The aircraft certainly did not fly SIGINT flights as some articles indicate - this was only capable in the RB-57D-2 aircraft—nor did they fly air sampling missions as the RB-57D's deployed for HARDTACK sampling at Eniwetok Atoll had to be modified by Martin Aircraft Company for the mission.
69. 4080th Strategic Reconnaissance Wing (Light). Monthly Histories for Jul. 1957, Nov. 1958, March 1959, Jun. 1959, Jul. 1959, Feb. 1960, and Jun. 1960. N.d. AFHRA, K-WG-4080-HI, Jul 1957—Jun 1960.
70. 71st Strategic Reconnaissance Wing (Fighter). History, Jan. 1957. n.d., p. 2. AFHRA, K-WG-71-HI, Jan. 57.
71. History of SAC, Jan. 1—Jun. 30, 1957, Volume 1. n.d., p. 82. AFHRA, K416.01 V. 1, Jan-Jun 57.
72. Chief of Staff, USAF. Memo to CINCSAC Nov. 15, 1957. No subject. Thomas D. White Papers, TS General File - 1957, Box 7, MD, LC.
73. History of SAC, Jan. 1—Jun. 30, 1958, Volume 1. N.d., p. 181-83. AFHRA, K416.01 V.1, Jan-Jun 58; History of SAC, Jun. 1958-Jul. 1959, Historical Study No. 76, Volume 1. n.d., p. 220-21. AFHRA, K416.01-76 V. 1, Jun 58-Jul 59.
74. CSAF. Memo to CINCSAC Nov. 15, 1957. No subject. Thomas D. White Papers, TS General File - 1957, Box 7, MD, LC.
75. Kenneth Greer, “Corona,” published in *Corona: America's First Satellite Program* (Langley: CIA Center for the Study of Intelligence, 1995).
76. James Reber, “List of Highest Priority Targets, USSR,” Aug. 18, 1960, published in *Corona: America's First Satellite Program* (Langley: CIA Center for the Study of Intelligence, 1995).

A German Aircraft Downed by Archie





Charles H. Bogart

(Overleaf) Unteroffizier Marwede aircraft lies on its back after his crash landing. Guards have been posted by the 304th to keep souvenir hunters away from the aircraft until it can be inspected by intelligence officers. (All photos courtesy of the author.)

ONE OF THE FEW GERMAN AIRCRAFT SHOT DOWN DURING WORLD WAR I BY AMERICAN ANTI-AIRCRAFT FIRE ... INVOLVED THE 6TH BALLOON COMPANY

During World War I the U.S. Army activated 102 balloon companies for use in aerial observation of the enemy's front line, and of these balloon companies thirty-six saw service in France. The balloon companies were at this time one component of the U.S. Army Air Service. One of the few German aircraft shot down during World War I by American anti-aircraft fire is fully documented. It involved the 6th Balloon Company and took place on October 3, 1918. The following account of this downing is from the unit histories of the 304th Engineers and the AEF Balloon Section.

The 6th Balloon Company was activated as Company B 3d Balloon Squadron at Ft. Omaha, Nebraska, in November 1917, and arrived in France on February 20, 1918, under the command of 1st Lt. George R. Nixon. The Sixth's T&OE allocated it one balloon and six anti-aircraft machine guns.

The 6th Balloon Company first saw action in the Saint Mihiel Offensive from September 12 to 16, 1918. On September 20, 1918, the Sixth deployed to Montzeville, France, for the Meuse-Argonne Offensive. They first inflated their balloon for this offensive on October 1, 1918, in a forest located two kilometers southeast of Montfaucon, France.

The 304th Engineer Regiment was organized at Camp Meade, Maryland, in 1917 and in 1918 was assigned to the 79th Infantry Division. Among the actions the regiment supported was the 79th Division in the Meuse-Argonne Offensive. During this offensive, the 79th Division was in action in the Montfaucon Sector from September 26 to October 11, 1918. On October 3, 1918, the 304th was operating in the vicinity of Nantillois, France. Flying nearby was the observation balloon of the 6th Balloon Company.

On October 3, 1918, the 6th Balloon Company's balloon was attacked by a German Fokker flown by Unteroffizier Hans Heinrich Marwede of Jagdstaffel 67. The Balloon Company's After Action Report states: "An ace in a Fokker came over the lines for the balloon. The Observer jumped, the balloon burned, but the machine gun crew of the Sixth jumped into fame by shooting down the plane."

As stated above, Unteroffizier Marwede was successful in shooting down the Sixth's Balloon Company's balloon. Unteroffizier Marwede was credited with five kills during his flying career. On September 14, 1918, he reportedly shot down three balloons within a five-minute period southeast of



Verdun. However, the balloon company's six defending machine-guns damaged Marwede's aircraft's engine, forcing him to land behind the American lines. As he glided his aircraft for a landing, Marwede took the opportunity to fire on some of the men of the 304th Engineers who were working on the ground. While many of the 304th had a close call, only Lt. Herbert L. Thompson was hit, receiving a bullet wound to his thigh.

Upon landing on a hillside, Marwede's aircraft struck rough ground and flipped onto its back. Thrown forward by the aircraft's flipping, Marwede suffered a cut on his right cheek as he struck the instrument panel. The first American soldiers on the scene of the crash pulled Marwede from his aircraft and some of these men were all for killing him. Officers arriving on the scene, however, soon had the situation under control and Marwede was escorted to the 304th Headquarters. Here he received medical treatment, was processed, and sent on his way to a POW camp.

The 6th Balloon Company history also reports on October 4, 1918, that "Having no balloon to protect didn't keep the machine gunners under cover. On the morning of October 4, a second enemy Fokker fell to the earth from their fire. Flying the bright colors of an ace, he came over in quest of battle and met more than his match; this being the second plane officially credited to the machine gunners of the Sixth." I suspect that this aircraft is the decorated Hannover CL III aircraft that has appeared in many publications standing on its nose, with a note that it was shot down by ground machine-gun fire on October 4, 1918.

The 6th Balloon Company received a new balloon on October 5 and was back in action from that date to October 16. The 6th on October 17, due to

Charles H. Bogart is a Civil War park interpreter for the Frankfort Parks and Historical Sites at Ft. Boone, Kentucky and a walking tour guide for the Frankfort City Museum. He earned a BA in history from Thomas More College and an MA in city planning from Ohio State University. He has written numerous articles on military, naval, and railroad history, and has self-published three books on Kentucky railroad history. Mr. Bogart is also the Western Rivers columnist for the magazine Powered Ship and the U.S. correspondent for Casemate. Additionally, he is a book reviewer for Civil War News, Powered Ship, and the Journal for America's Military Past. Mr. Bogart has taught at Kentucky State and Eastern Kentucky University (urban planning). He serves on the Board of Directors of the Chessie System Historical Society, CSXT historical Society, International Nava; Research Organization, Frankfort Civil war Round Table, and Coast Defense Study Group. He is a volunteer conductor at the Bluegrass Railroad Museum in Versailles, Kentucky.

(Left) It is thought that this Hannover CC III is the aircraft shot down on October 4, 1918, by the machine gunners of the 6th Balloon Company.

(Right) Soldiers of the 304th Engineers and others converge on the wreck site of Unteroffizier Marwede's aircraft.



Unteroffizier Hans Heinrich Marwede being led away from his aircraft by men of the 304th Engineer Regiment. Marwede is wearing an Iron Cross 2d Class on his tunic. Note that the man behind Marwede, armed with the .45 M1911A, appears to be carrying part of Marwede's flying uniform.



the loss during that week of thirty-five men to sickness, was pulled out of the line and moved to Barbant, France, for rebuilding. It was still there when the Armistice went into effect on November 11, 1918.

The 6th Balloon Company returned stateside on May 4, 1919, and was assigned to Brooks Field, Texas. The Sixth was inactivated at Brooks Field on September 13, 1921, and disbanded on May 14, 1943.

The 304th Engineers would continue to support the 79th Division until Armistice Day. The Regiment returned stateside in May 1919 and stood down in June 1919 at Fort Dix, New Jersey. The 304th was reclassified as the 304th Engineer

Combat Battalion in 1942 and again saw service in France with the 79th Division during 1944-45. ■

A Signal Corps silent movie of the October 3, 1918, action can be viewed at www.criticalpast.com/video/65675029598_observation-balloon_German-airplane-crashes_antiaircraft-guns_pilot-captured

Sources:

Ovitt, S.W., ed., *The Balloon Section of the American Expeditionary Forces*, (New Haven, Conn.: Spalding West Ovitt, 1919).

Barber, J. Frank, *History of the 304th Engineers, 79th Division USA in the World War 1917-1919*, (Philadelphia: The Regiment, 1920).

Flying Training: The American Advantage in the Battle for Air Superiority against the Luftwaffe





Kenneth P. Werrell

(Overleaf) The scene at Randolph Field as several flights of student pilots approach their planes and the training day begins.

THE MOST SIGNIFICANT AMERICAN ADVANTAGE IN [WORLD WAR II] WAS THE NUMBER AND QUALITY OF ITS PILOTS AND THUS THE KEY ELEMENT WAS THE AMERICAN FLYING TRAINING PROGRAM

A number of factors explain why Germany lost air superiority in World War II. These include the aircraft, associated equipment (such as gunsights, drop-tanks, "G" suits), and numbers. However, probably the most significant American advantage in this epic battle was the number and quality of its pilots and thus the key element was the American flying training program. During the war the Army Air Forces (AAF) produced 193,000 pilots, just over half as single-engine pilots, of which 35,000 were fighter pilots. America ramped up its output of pilots at an astounding rate, from a mere 225 men who pinned on pilot wings in the last half of 1939, to 2,500 in the last quarter of 1941, rising to a peak of 29,000 in the second quarter of 1944.¹ Pilot quality is more difficult to describe.

Prior to the great expansion, an applicant had to have completed two years of college to be eligible for flying training. This requirement was waived prior to the attack on Pearl Harbor, replaced by a test that attempted to determine the individual's suitability for flight training. Later psychologists developed the stanine (standard nine) series of tests that proved very effective in assessing aptitude for successfully completing the pilot training program.² One result of this admission policy was to produce pilots who were young. The two-year college requirement meant that most of the graduates were in their early twenties; the elimination of that requirement pushed the age down into the teens, as high school graduates were eligible, and even some without a high school diploma. Thus many, if not most, of the trainees were in their teens, and many pinned on their wings before they reached their majority.

Phases

As part of the New Deal and to stimulate interest in aviation, in early 1939, Congress passed the Civilian Pilot Training Program (CPTP). It gave students in select colleges seventy-two hours of ground school and thirty-five to fifty flying hours, permitting these students to earn their private pilot's license. However, the military apparently did not like the program. There was a belief among pilot trainees that having, and certainly admitting to having, a private pilot's license was a negative, because the Army wanted to teach prospective pilots, "the Army way."³

The Army's pilot training program was conducted at bases located from coast-to-coast, in the southern half of the nation, where better weather could be expected. It was organized into three geographic commands, at first named: Southeastern; Gulf Coast; and West Coast and then Eastern; Central, and Western. The flying training consisted

of three phases: primary, basic and advanced, each initially of four months duration.⁴ In July 1939, the program was cut from twelve to nine months and then, in May 1940, further reduced to seven months. Another decrease in 1942, shrank each phase from ten to nine weeks, however in March 1944, the phases were increased to ten weeks. The graduates were awarded their wings and rank after completing the advanced course. The new pilots then went through a phase of transition before they arrived at their unit.⁵

Students in primary usually soloed with about eight to ten hours of flying time, usually with no more than twelve hours. Primary students received about sixty-five flying hours until March 1942, when the requirement was cut to sixty flying hours. About forty to fifty percent of these were dual hours and each student was to make at least 175 landings. Prior to 1940, all instruction was conducted by military personnel, but with the great expansion of the training program, in July 1939, a system of contract schools was initiated employing civilian instructors with military check pilots.⁶ In May 1943, the primary phase was conducted at fifty-six civilian primary schools. The AAF saw a building surplus of pilots by 1944, consequently it began to be cut back the primary contract program, and phased it out by the end of the war. During the period from July 1939 through August 1945, 233,000 graduated from the primary phase, surviving an elimination rate of twenty-eight percent.⁷

The would-be pilots then went on to the basic phase, where all the instructors were military. Until July 1939, the students received 103 flying hours, which was then cut to seventy-five flying hours. The next May it was reduced to seventy hours. In all, 203,000 graduated from the basic phase that had an elimination rate of twelve percent.⁸

The student further honed his skills in the advanced phase of pilot training, in which he was shunted toward his eventual aircraft type. The AAF based aircraft assignment on the requirements of the service along with aptitude, physical standards, and student preference. In mid 1944 the latter was largely disregarded. About thirty-five to forty percent of the pilot trainees preferred fighter assignments and about fifty-five percent bomber assignments. The demands of the service varied over time, which resulted in some men being put into cockpits they did not desire, but in fact the actual overall assignments mirrored these desires with about thirty-five percent going into fighters.⁹ However, while this might have worked at the macro level, it sometimes did not work at the micro level. It was noted at a training command conference that forty percent of those trained in fighters, wanted to fly another aircraft type.¹⁰ Trainees who were considered to be middle of the road students, that is with

Kenneth P. Werrell earned degrees from the USAF Academy and Duke University and taught history at Radford University. He has lectured at both U.S. and foreign military schools and authored numerous articles and several books on aviation history, the most recent of which is Death from the Heavens: A History of Strategic Bombing.

As the demand for flying personnel increased dramatically in early 1940, increased activity became the norm at Randolph Field.



THE AAF BASED AIRCRAFT ASSIGNMENT ON THE REQUIREMENTS OF THE SERVICE ALONG WITH APTITUDE, PHYSICAL STANDARDS, AND STUDENT PREFERENCE

abilities to handle either fighters or bombers with no special bent to either, were usually assigned to twin engine schools. The documents indicate that the AAF believed certain traits were pertinent for piloting the two major types of aircraft, one report, for example, writing that “if a prospective pilot is indifferent or if he has a good memory for charts and procedure he is sent to a twin engine school. Those weak in air discipline or interested only in flying and stunting are usually placed in a single engine school.”¹¹ There were also comments that older more mature students would be better suited in bombers, along with those who lacked initiative.¹²

Size played a major role in aircraft assignment. There were stories, and anecdotal evidence, of classes of students being lined up by height with the shorter and lighter men assigned to fighters and the taller and heavier ones to bombers. As one history states, “cadets were frequently assigned to pursuit training merely because they were relatively small and frequently against their own wishes.”¹³ Although crude and perhaps ineffective, this method had some merit considering the cramped fighter cockpits and the strength needed to handle some of the bombers (particularly the B-24).¹⁴ The AAF imposed physical requirements for aircraft assignments. A regulation in July 1942, put the upper physical limits for pursuit assignments at five feet nine inches, raised to five feet ten inches in October and 160 pounds, and then in May 1943, to six feet and 180 pounds. There was a tendency to disregard the limits and fudge if the fighter quotas were not met. In addition, some of the flying centers established their own limits, for example, Southeast Flying Training Center in October 1942, set the limit for fighter assignment at six feet in height and 180 pounds in weight, prior to the above mentioned AAF change.¹⁵ This determination of aircraft type (single engine; twin engine) was made early in the phase.

Not all the trainees in the single engine program were to fly fighters. A directive in May 1943

ordered that seventy percent of the students in single engine training were to receive gunnery training and become pursuit pilots, the remaining thirty percent were to receive instead additional training in instrument, navigation, and formation flying and would fly other types of aircraft. The latter route was to be less arduous and provide the AAF with pilots for instructor, ferry, transport, and multi-engine copilot duties. This regulation was abolished in July 1943.¹⁶

In May 1940, flying time in the single engine advanced phase was cut from seventy-five hours to seventy hours. By December 1940, advanced fighter training was broken down into single-engine and twin-engine components in which, for a time, the twin-engine students got eighty-six flying hours. Although unclear, it appears that by May 1942, all advanced fighter students were to fly seventy flying hours.¹⁷ The program of April 1943, added ten flying hours, notably increasing instrument time to nine hours and gunnery hours to twenty-two (seven air-to-ground and fifteen air-to-air).¹⁸ In November 1943, the P-38 transition program required eighty flying hours distributed between transition and fundamentals (twenty-four hours), formation (ten hours), navigation (eleven hours), instrument (nine hours), aerobatics (four), and gunnery (twenty-two hours, of which seven was air-to-ground and fifteen air-to-air). Of these hours, eight were to be flown at night and in addition ten hours were to be in the Link trainer. These hours were flown in the AT-6 (sixty-six hours), AT-9 (four hours), and P-38 (ten hours).¹⁹

The students graduated having logged between 210 and 225 flying hours. Many of them also had received about ten flying hours in the P-40 before graduation, and then went on to further training flying the P-39 and P-40. The new pilots usually got additional training in the type of aircraft they would fly in combat, although this varied. This was complicated by units transitioning from one aircraft to another and the need for replacement pilots.²⁰

Basic training included instruction in blind flying.



THE LACK OF COMPETENT INSTRUCTORS WAS ESPECIALLY ACUTE DURING THE 1940-41 TIME-FRAME

Problems

With a program that grew so big, and so fast, major problems had to be expected and they certainly were encountered. Near the end of the war (March 1945) Central Flying Training Command sent a report forward with a cover letter which stated: "As evidenced in the inclosed report, fighter pilot replacements are arriving at the overseas theaters not fully qualified to assume the duties and responsibilities assigned them."²¹

One difficulty in the training program was the quality of instructors. The lack of competent instructors was especially acute during the 1940-41 timeframe when the experience level, and we might infer the quality, of the instructors was low. In mid 1943 the overwhelming majority of instructors had less than one year's experience; in June 1943, the Southeast Training Center had nineteen instructors with more than a year's flying experience and 352 with less than that. According to one study of the training program, these new instructors, with little experience in tactical aircraft, instilled fear in the students.²² Perhaps most of all, there were few instructors who had seen combat, thus lacking both the skills and the stature to enhance instruction. One returnee in June 1944 (and thus probably trained in 1943) forcefully made the point: "I learned more in ten hours of combat flying with my squadron than I did in training school. None of the instructors at my [training] school had ever been in combat a situation which should be remedied to prepare the men better for combat."²³ Matters got worse in 1944, as the best of the instructors were sent into combat.²⁴

Unlike the GAF, the AAF rotated aircrew out of combat after a set number of missions. Thus, the AAF had numbers of combat experienced pilots available for training duties. While one might expect, and the official history of the AAF in World

War II states, that the return of pilots from combat to flying instructor slots would ease the instructor problem, this was not always the case. Although combat veterans had the respect of students and practical skills to pass along, not all were willing or able to teach the student fighter pilots. Some of the returnees believed they had made their contribution to the war effort, and some just did not have the temperament or maturity required for this duty. There were those who wanted to fly, not instruct, and had difficulty making the adjustment to training duties. They also brought back from combat a host of issues and attitudes. Some needed rest and others had problems including expectation of promotion, fatigue, need for medical attention, disrespect for domestic flying regulations, martial situations, and personal desires. Some of the returnees were belligerent, others tended to be cynical and "possibly overanxious to find fault with the flying training program."²⁵ In late 1942, the program received a token number of veterans, but it was not until 1944, rather late in the war, that a satisfactory system was put into place that selected the best candidates for instructor duty from the returnees. By March 1945, when the training program was declining in numbers, over 90 percent of the instructors were combat veterans.²⁶

Other issues involved fuel and aircraft. In late 1943 and early 1944 there was a shortage of high octane fuel that limited training at higher altitudes, one of the program's deficiencies.²⁷ A more persistent problem involved aircraft. The transition from training aircraft into fighter aircraft was hampered by the aircraft available. The absence of two place fighter training aircraft was one shortcoming. The first flight in the better performing, more complex, and less forgiving single-place fighter aircraft was solo. An effort to deal with this situation was the appearance of a "piggy back" P-38 in late 1942, in the P-38F model (TP-38J). While it could carry a

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second man in place of a radio mounted behind the pilot, this cramped second man could only observe (not fly) as the aircraft lacked dual controls. It was a simple conversion, probably had some usefulness, and saw service both stateside and overseas. Attempts with other fighter aircraft were more complex, more suitable, but did not see service. Bell built a few two seat P-39s (RF-39Q) and P-63s (TP-63C) with dual controls. The AAF also modified thirty P-40s into two seat and dual control aircraft (YP-40N), but Training Command rejected them as its program only called for ten hours of P-40 time. Only after the war did the USAF rectify this situation with the superb T-33 and T-38 trainers.²⁸

The airmen did use combat fighter aircraft in training. Initially the airmen used what they had on hand, the older, obsolete, prewar P-35s, P-36s, and P-43s; some as late as 1942. But these aircraft were inadequate in numbers and performance and one AAF document stated that the P-35s and P-43s were “unsuitable for students.”²⁹ By March 1941, the schools were getting front line aircraft that equipped AAF units at the outset of the war—P-39s and P-40s. Later these were employed along with the latest combat aircraft, P-38s, P-47s, and P-51s, but these were always in short supply. Some aircraft that had seen action were used, but these were well worn and added maintenance problems to the other training woes.³⁰

Using combat aircraft was not altogether a smooth process. The P-39 especially presented problems. The Bell fighter had a tendency to fall into flat spins which was a difficult flying attitude to correct, especially by inexperienced pilots. The P-39 reportedly tumbled end over end, which, although disputed, was a maneuver not seen in other aircraft. There is no dispute that it was a difficult aircraft to handle as demonstrated by the fact that it had the highest stateside major accident rate of all the American fighters during the war.³¹ In November 1943, the Third Air Force recommended that the P-39 be withdrawn from basic fighter training and only be used by pilots who had completed eighty fighter training hours in other aircraft. Use of the Bell fighter was greatly reduced early in 1944. Because of a sharp increase in P-39 accidents in August and September 1944, a number of steps were taken to remedy the situation including a redesigned landing pattern, removing weight, limiting the center of gravity, prohibiting acrobatics, limiting air speed, and slowing the rate of turn.³² These measures indicate both the problems of the aircraft and its limitations for training purposes.

The P-38 was another aircraft that caused concern in the training program. In 1942 and early 1943, there were unfavorable comments and distrust regarding the Lockheed fighter, related to its safety. Problems cited included difficult dive recovery, engine malfunctions, and structural failures, that led to low morale and the belief that the fighter was dangerous. This was a case of mistaken perceptions as in fact the P-38's accident rate in 1942 was lower than that of the P-39, P-40, and P-47 and in 1943 lower than the first two and essentially the

same as the third. Nevertheless these beliefs may help explain why students were reluctant to fly the P-38. For example, in September 1942 an AAF request for 100 volunteers for P-38 service to a class of 400 at Luke netted only sixty takers, therefore the remaining forty were chosen from the smaller men.³³

Another deficiency of the training program was insufficient instrument training. As late as December 1943, large numbers of rated, instrument certified pilots proved to be unsatisfactory (some to the point of being dangerous) under instrument conditions. One reason was that AAF students were taught to rely mainly on their basic instruments (needle and ball, rate of climb indicator, air speed indicator, magnetic compass, and altimeter) although aircraft since the mid-1930s had been equipped with the more modern and effective gyroscopic instruments: the artificial horizon and gyro compass. In 1942, the Navy adopted a full panel approach to instrument instruction followed by the Army in June 1943.³⁴

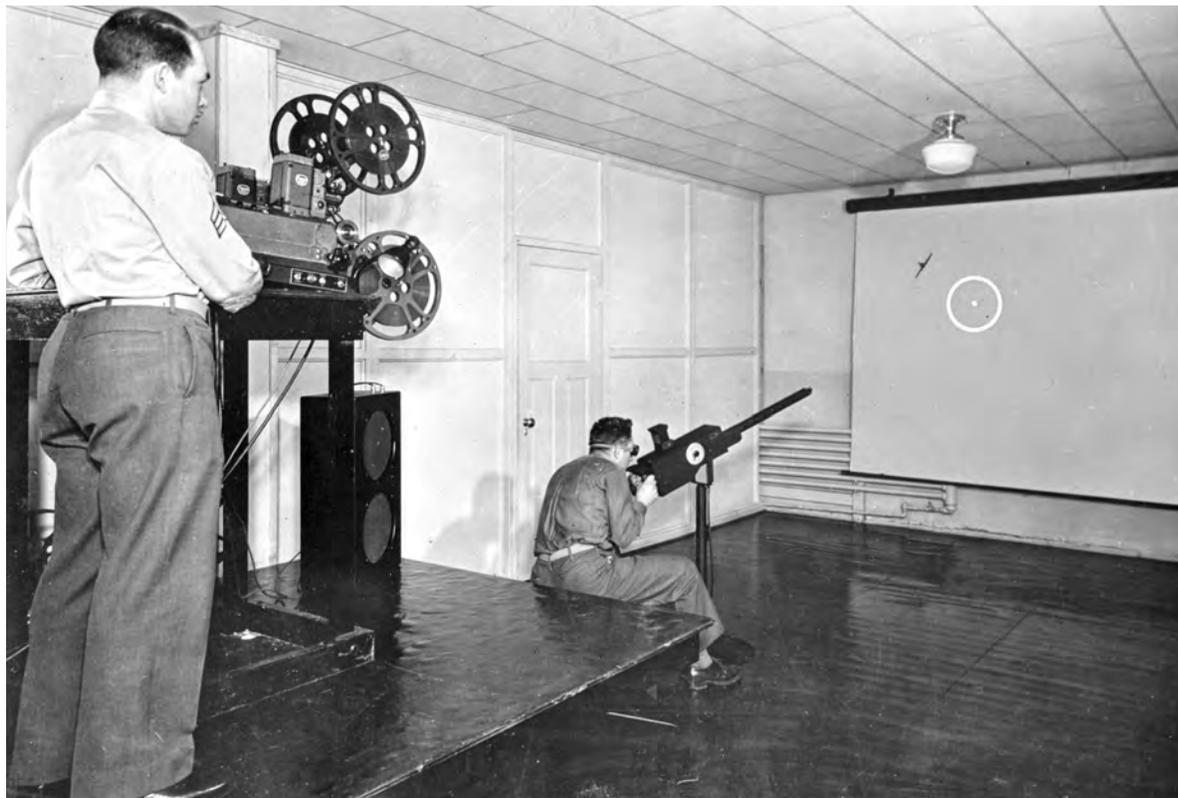
Another issue was the padding of hours, that is, logging more student hours than actually were flown. Investigation in mid-1942, revealed that at more than six basic and advanced training bases there were more than 100 students with as many as thirty fraudulent dual time hours. Undoubtedly there were more.³⁵ However, the most serious fighter pilot training issue was gunnery.

Gunnery

There was widespread agreement that good gunnery was a prime requisite for a fighter pilot, and to a large degree the key to successful results (victory credits). Good marksmanship separated a poor fighter pilot from an average one, an average pilot from a good one, and most especially, a good one from an excellent one. The complication was that the greatly improved performance of fighters since World War I made aerial gunnery more difficult. As early as 1937, an American military observer of the Spanish Civil wrote that despite their training, fighter pilots of the major powers “once exposed to the realities of modern aerial warfare . . . quickly learned that their previous [peacetime] records had shown a false gunnery efficiency.”³⁶ Five years later a Royal Air Force (RAF) gunnery instructor and double ace noted, that if a fighter pilot “cannot shoot, his whole training is wasted, therefore, his gunnery training is the most important.”³⁷

To put fire-power on a foe, a fighter pilot had to master two gunnery problems: determining proper range and deflection. Analysis of Eighth Air Force fighter gun camera film in three months of 1943 showed an underestimation of range by a third, and as late as 1945 the AAF reported that pilot's opening bursts were usually out of range. Firing within range was critical as the closer the shooter got to the target the more likely he was to get the kill. Firing out of range was not only less accurate, it wasted ammunition and also warned the foe that he was under

The curriculum for advanced training during the expansion program included ground classes in flexible gunnery.



GUNNERY WAS ACKNOWLEDGED TO BE ONE OF THE WEAKNESSES OF THE FIGHTER TRAINING PROGRAM

attack. That same Eighth Air Force study quantified this observation; in an analysis of 882 encounters over a four to five month period it determined that pilots who claimed aerial victories opened fire at an average of 541 yards, while those who did not register a claim, opened fire at 809 yards.³⁸

The deflection issue is more difficult to assess. We have no figures on the number of engagements in which deflection was a factor, but do have some figures on the results. A study of 550 RAF fighter victories, mainly in the second half of 1942, found only eleven percent were deflection kills. The above mentioned Eighth Air Force analysis showed that seventy-two percent of the attacks for which there was data were at angles of twenty-five degrees or less.³⁹ As late as 1945 the AAF reported that "Due to the inability of most pilots to hit at high deflection shots, they usually attempt to close around to an astern shot."⁴⁰ This despite improved training and the introduction of the computing (K-14) gun sight.

Thus gunnery was acknowledged to be one of the weaknesses of the fighter training program. An AAF historian wrote during the war that:⁴¹

rapid strides forward were made in fixed gunnery, a category of training which had been baffling from the very first; in the early days it was not considered an exact science, and the few personnel in the Air Corps who knew anything about deflection shooting proceeded pretty much on a trial and error basis.

Although the training command historian noted a dramatic, positive change and wrote that by mid-1943, aerial gunnery was no longer considered a "guessing game," nevertheless as late as January 1944, Training Command concluded that gunnery

was the weakest element of its training.⁴²

The most known aspect of air-to-air gunnery training was the use of a towed (sleeve) target, constructed of wire or canvas, approximately ten by forty feet in size. The student approached at an angle (for safety purposes and to train in deflection shooting) and attempted to hit it with colored .30-caliber machine gun bullets (to distinguish the hits by different students). The AAF took a number of measures to improve the training including increasing the number of rounds of ammunition each student was authorized to fire in both air-to-air and air-to-ground exercises. Other efforts to improve gunnery training included more skeet shooting, a change in instruction, use of gun cameras as well as better tow targets, different gun-sights, and establishing a Command wide gunnery competition. The AAF also experimented with synthetic trainers, as simple as recognition cards to more elaborate equipment such as the "Gunairstructor" which included a simulated aircraft cockpit, an aerial background, sound, and the projection on a screen of an enemy aircraft "flown" by an instructor. There were other devices as well such as a Link trainer fitted with air powered machine guns and in the field overseas, a Link trainer fitted with a K-14 computing gun sight,⁴³ and the Gunsight Aiming Point Camera.⁴⁴ If the metrics are credible, gunnery training, improved. One measure of the improvement was the increasing percentage of pilots who qualified in gunnery and their increasing scores. For example, at Luke Airfield (West Coast) in early 1942, air-to-air gunnery scores increased from 5.5 percent in (class 42B),⁴⁵ to 10.8 percent (class 42K). In 1944, all trainees in the classes 44A through 44C at Luke and Williams qualified.⁴⁶ However, it was not until

ALL OF THE PROSPECTIVE PILOTS DID NOT SUCCESSFULLY COMPLETE THE PROGRAM

the fall of 1944 that Training Command believed that the most difficulty gunnery school problems were “nearing solution.”⁴⁷ Nevertheless feedback from the combat zones indicate that this training improvement gave inadequate results in combat.

Eliminations

Despite the efforts of those working in the flying training organization and the trainees, all of the prospective pilots did not successfully complete the program. Some were killed in training, others resigned, and some failed along the way. The overwhelming reason for elimination was flying deficiencies (eighty-four percent), with perhaps fourteen percent for non-flying reasons, and two percent killed.⁴⁸ Overall, forty percent of those who entered the pilot program failed to complete it. The total elimination rate (preflight through advanced) held fairly steady in the low to mid-forty percent range from 1940 until January 1944, when it fell to about thirty-three percent for 1944 with a nadir of twenty-five percent in April. It then began to rise. About a quarter (twenty-seven and one-half percent) of those who entered primary training didn't complete that phase. The rate of elimination, however, dropped from a prewar average of over thirty-five percent to a low of twenty percent in 1944. In basic training, the elimination rate averaged just over twelve percent and remained relatively constant during the war, between ten and thirteen percent, until 1945 when it hit twenty percent. At the advanced phase the elimination rate was 3.6 percent.⁴⁹

The elimination rate varied by both chronology and geography. The classes that graduated in mid-to late-1943 (classes 43F-43I) had the highest elimination rates (over forty-five percent), the highest in 43G with fifty-five percent.⁵⁰ There is less data on elimination by location. It does indicate that for those in single-engine advanced schools in 1944, Eastern Command had the highest elimination rate, followed by Western, with Central having the lowest rate. Elimination rates also varied by base within these Commands. For example the elimination rates at the single engine advanced fields at Craig and Spence for classes 44A through 44I were fourteen percent, while the rate for those classes at Napier was 9.5 percent, which always had a lower elimination rate. Napier's advantage was attributed to a better landing surface which allowed more landing per flying hour than at the other fields, better selection of instructors from overseas assignments which resulted in a higher experience level, a Post Commander and supervisory personnel more closely associated with the students, and better physical facilities.⁵¹ A broader view is possible by looking at the ten classes (43G through 44E) training in the Western Flying Training Command, 43G beginning primary training in January 1943 and 44E graduating in May 1944. These classes had an overall graduation rate of seventy-nine percent at the thirteen primary schools. This average ranged considerably with the highest average graduation rate at Ontario (eighty-eight percent) to the lowest

at Thunderbird Number Two (seventy-four percent). Both schools reached their lowest and highest average graduation rates with the same classes, the lowest 43H⁵² (Ontario seventy-four percent and Thunderbird Number Two fifty-one percent) and the highest 44D (Ontario ninety-five percent and Thunderbird Two eighty-nine percent). The eight bases training basic students in the Western Command for these same classes had an average graduation rate of eighty-nine percent. This varied between Lancaster with the highest average rate (ninety-five percent), to Minter with the lowest (eighty-five percent). They both recorded their lowest graduation rates with class 43H, respectively eighty-nine percent at Lancaster and seventy-seven percent at Minter (the lowest rate registered for all the basic schools during this period). During this period nine schools for advanced students were in operation, however only six served all ten classes. The average graduation rate was ninety-seven percent with the highest graduation rate at Yuma (ninety-nine percent for eight classes) and the lowest at Luke at ninety-four percent.⁵³

Critique of the Flying Training Program

The need for improvement of the flying training program was known throughout the war and, for that matter, even before America's entry into the war. Following the North Carolina field maneuvers in fall 1941, Brig. Gen. Clarence Tinker noted the “very sad deficiency” in the pursuit groups and a need for better training in gunnery, night and instrument flying, and combat operations.⁵⁴ Changes were made to the program but they proved inadequate. In September 1942, the Eighth Air Force, just beginning combat operations, noted failings in gunnery, navigation, large formation and instrument flying. Other overseas commands agreed. In 1942, there were complaints from the combat theaters that replacement pilots were arriving with as little as thirty-five flying hours in fighters, and with serious deficiencies in gunnery and in both high altitude and low level flying. As late as 1943, large numbers of new pilots did not receive gunnery or high altitude training. And until mid-1943 many replacement pilots arrived at their units with only half of the mandated training and less than the required “minimum” flying hours.⁵⁵ Reports from three fighter groups in June 1943, spelled out the deficiencies. The 1st Fighter Group criticized the training establishment for teaching show (close) formations rather than combat (loose) formations, lack of high altitude training, inadequate knowledge of the aircraft and aircraft identification, and problems with both gunnery and radios. In addition, the 14th Fighter Group noted difficulties with high altitude flying and gunnery. The 82d Fighter Group observed that as a whole, all of the last nine pilots that joined the unit were “highly unsatisfactory.”⁵⁶

These criticisms continued into the last months of the war. The AAF interviewed returnees in 1944 and early 1945, querying them on a variety of sub-

jects. Many of these returning pilots made clear that there was a need for more and better training. As one pilot put it, “the quality of the replacements left nothing to be desired as far as human values were concerned . . . but their training had not fitted them for immediate combat. In other words the pilots were ‘eager’ but insufficiently trained.”⁵⁷ Of approximately 140 returning fighter pilots who flew over Europe and commented on flying training, the majority of their criticisms concerned, in numerical order: insufficient formation, low level, and instrument flying, the need for further training, overemphasis of flying safety, and inadequate gunnery training.⁵⁸ About one-third of the returnees emphasized the need for more formation practice, both loose for combat and tight for weather flying. One quarter of the respondents noted the requirement for low level training made more important by the increased strafing later in the war. (A good number saw the need for more attention to high altitude flying as well.) A returning P-38 pilot, who flew 128 missions between March 1943 and November 1944, bluntly stated that:⁵⁹

We received replacement pilots who had never flown a plane upside down, nor had they received sufficient training in low altitude flying. As a result they possessed neither the judgment nor the ability for instinctive decisions which are the fundamental attributes of an efficient fighter pilot. I have seen too many pilots fly into the trees on strafing attacks for no other reason than sheer lack of ability. Fighter pilots should receive more training in low level flying over difficult terrain.

Poor weather over Europe made instrument flying critical. However, stateside instrument training was considered incomplete and inadequate. Gunnery training was another area that the returnees criticized. As one pilot put it: “Too much emphasis cannot be placed on gunnery training for fighter pilots. I have seen many new pilots under highly favorable circumstances, miss comparatively easy targets by wide margins.”⁶⁰ One pilot asserted that “the importance of wingmen sticking to their flight leaders, and always let flight leaders initiate an attack [should] be stressed to pilots now in training. It is his observation that replacement pilots have a tendency toward individual action which, he says, proved almost invariable to be fatal in combat.”⁶¹

Another problem was thrusting replacement pilots into combat with little to no experience in their specific aircraft. In November 1944, none of fifteen replacement pilots assigned to the 20th Fighter Group had ever flown the P-51 that the group was flying. Therefore, the unit was forced to give these men about fifteen hours of training on a busy combat airfield. Other combat units also conducted additional training for new pilots before thrusting them into action. This was a necessary, but unwanted solution. The AAF knew that pilots should be thoroughly trained stateside for “The frontline is no place for training.”⁶²

Flying Safety

Flying safety is a major consideration in flying training. It is always of importance, but is a more complicated subject in wartime when there is a premium on getting large numbers of good pilots into the field as quickly as possible. It is difficult to simultaneously achieve rapid, large, and quality production of pilots and there is clearly a different balance between these goals in peacetime and wartime training. Simply put, flying always has its dangers, and more realistic, rigorous training is dangerous. Pilots killed or maimed in training are of no use against the foe, yet pilots poorly trained are not only vulnerable in combat but also less effective, if not ineffective, and also a potential danger to their comrades. In short, the desire for more rigorous training is contrary to the commander’s efforts to save lives and (sometimes) to promote careers.

Flying safety greatly improved in the army air arm after World War I. The Army’s accident rate (continental U.S.) fell steadily from 467 major accidents per 100,000 flying hours in 1921 to fifty-one per 100,000 flying hours in 1940. But with the wartime expansion and pressures the major accident rate rose, peaking in 1942 at seventy-four per 100,000 flying hours and then falling to forty-two accidents per 100,000 flying hours in 1945. Surprisingly, the accident rate in the flying schools was lower than the overall AAF accident rate during the war. Nevertheless almost 5,000 training aircraft were wrecked.⁶³

Flying school had a greater percentage of lethal accidents than the AAF average. A comparison of fatal accidents in fiscal year 1942 shows, as might be expected, that the percentage attributed to pilot error decreased from primary, to basic, to advanced, all of which were higher than the AAF’s overall percentage.⁶⁴ This surely stems from a lack of experience. Spins and stalls accounted for half of the fatal accidents in primary, forty-three percent in basic, and twelve percent in advanced. (The AAF attributed 23 percent of its fatal accident to stalls and spins.) Midair collisions were the cause of nine to fourteen percent of the fatalities in flying school, compared with eight percent overall.⁶⁵ There was a difference in accident rates based on geography. During the period July 1943 through May 1945, the Eastern Command had the highest accident rate in fourteen months, Central Command in eight, and Western Command in five.⁶⁶

The emphasis on flying safety is understandable, however, it had its drawbacks. A good number of returning combat fighter pilots believed that safety concerns were overdone and noted that the focus on safety in training had a cost in combat. As one returning pilot made clear in mid 1944,⁶⁷

the emphasis here [stateside] seems to be the maintenance of a high safety record rather than turning out capable and efficient pilots. As a consequence, the replacements we are receiving are of very poor quality and have no knowledge of tactics and maneuvering, hence proving useless and even dangerous to

The curriculum during advanced training for single-engine pilots included coursework in formation flying.



FOR ALL OF THIS CRITICISM THE AAF'S FLYING TRAINING PROGRAM TURNED OUT AN OVERWHELMING NUMBER OF SKILLED PILOTS

themselves as well as the other pilots in combat duty.

Three ranking officers of a P-47 unit concurred with this view, stating that an⁶⁸

[o]ver emphasis on flying safety is . . . defeating the purpose of the fighter pilot training program. Combat flying, they pointed out, is, in many ways, the direct antithesis of what is characterized in the United States as "safe flying." Aerobatics and buzzing are essential combat tactics.

Buzzing was strictly forbidden, although there were attempts to introduce low-level flying (the more proper term for buzzing) into the training curriculum. In December 1944, such an attempt was made at Craig Field. It consisted of 140 flights, and, despite planning, testing, and briefings, suffered a large number of accidents; major damage to seven aircraft and minor damage to three more, although no injury to any of the pilots. While the official histories do not note instances of buzzing and other unauthorized flying, certainly that took place and accounted for a portion of the accidents. Flying under bridges and low over the houses of family and girlfriends was not uncommon. Expectedly, this is not mentioned in the official histories although it does appear in interviews and memoirs. The histories do mention that at least one student was court martialed for buzzing. Another pilot, guilty of flying aerobatics below 5,000 feet in a P-39 in violation of regulations, was court martialed, convicted, and sentenced to dismissal from the AAF and six months of hard labor.⁶⁹

Yet, for all of this criticism the AAF's flying

training program turned out an overwhelming number of skilled pilots. The American victory in the air can be largely attributed to higher skills of their fighter pilots. Certainly the American flying training program was superior to that of her enemies.

German Air Force Flying Training

As the quality of fighter pilots was crucial to the battle for air superiority, a comparison of the flying training programs of the belligerents would be useful. Unfortunately we have little information on the German Air Force (GAF) flying training program (at least in English). Early in the war the *Luftwaffe* produced well trained air crew as demonstrated by their combat record. But there is little or no doubt that by mid-1944 most German fighter pilots, certainly the average, and surely the new ones, were inferior to their Anglo-American foes. The demands of the air war increased the requirements for more fighter pilots and the Germans attempted to meet this need in two ways. First, they shifted pilots from other aircraft into fighters and to begin to close down bomber training in June 1944, except for jets, and began to disband bomber units the next month. It must be said that pilots trained in bombers are trained differently than those in fighters and develop different skills and consequently are usually less able to succeed in fighter combat.⁷⁰ The other attempt was to increase fighter pilot production by reducing flying training given to each pilot before thrusting them into combat.

While there is no objective way to judge the quality of instruction, we can assume that the qual-



A BT-9 trainer circles over Randolph Field.

THE KEY TO ALLIED AIR VICTORY WAS NOT TECHNOLOGY, BUT NUMBERS, AND MOST ESPECIALLY BETTER TRAINED PILOTS

ity of the training programs is related to the amount of flying hours. At the outset of World War II and through September 1942 the *Luftwaffe's* flying training program consisted of about 240 total flying hours compared with 200 in the Royal Air Force and the Army Air Forces. But by the period October 1942 to June 1943, the German advantage had reversed, with pilots in the British program getting some 340 flying hours and those in the Americans program some 270 flying hours whereas the German pilot training flying hours fell to 200. This trend continued for the rest of the war; with flying hours in the GAF's program declining, the flying time in the RAF program remaining constant, and those in the AAF program increasing. In brief, Anglo-American fighter pilots were receiving more flying hours than German pilots after October 1942, almost twice as many flying hours after July 1943, and almost three times the amount of flying time after July 1944. That same trend held for the number of training hours in combat aircraft. Prior to October 1942, the German fighter pilot logged eighty such flying hours compared with a little over fifty in the RAF. From October 1942 to the end of the war RAF fighter pilots flew seventy hours in fighters, while GAF fighter pilots received forty-five hours or less during that same time period. AAF fighter flying hours increased from seventy-five during October 1942 to June 1943, to 120 in the period July 1943 to June 1944, and then to 160 for the remainder of the war.⁷¹

Flying hours in the German program was curtailed for a number of reasons. Fuel shortages hit the training program in 1942, perhaps as early as June, although the fighter program was given pri-

ority.⁷² Instructors were another issue. The Germans stripped the training schools of 600 instructors during the Stalingrad battle and closed down bomber training to bolster production of fighter pilots. By 1943 there was a shortage of instructors as well as training and operational aircraft for the program.⁷³ There was also a problem of training bases: bases in areas where there was better flying weather, southern France and Italy, were vulnerable, first to marauding fighters, later to ground assault. This forced the movement of training bases to "safer" areas in eastern and southern Germany. As the war progressed, even these bases were subject to attack.⁷⁴

Some brief, last points on the German flying training program. After the war the AAF concluded that "All available information indicates that aerial gunnery was probably one of the most neglected phases of GAF training. Preliminary schools offered no gunnery and advanced schools a bare familiarization minimum of from two to four flights with one to two hours." But this was strictly air-to-ground gunnery; no air-to-air training was indicated.⁷⁵ Another similarity with the AAF training program was the elimination rate. The washout rate in the initial German flying schools (called "A school") is identical to that of the comparable American primary phase. Sparse anecdotal data indicates that the Germans suffered a higher accident (and fatality) rate than suffered by the Americans.⁷⁶ For all of the lack of knowledge about the German training program, we do know the result: the *Luftwaffe* failed to produce adequate numbers of well-trained fighter pilots required by the war. While the GAF planned to produce 1,000 fighter pilots a month during 1944, the actual rate was only 525 by December 1944. In contrast the AAF turned out 13,500 fighter pilots in 1944, producing more than 1,000 fighter pilots a month in nine months of that year. And the AAF program had been cut back from 1943, when it produced 17,000 fighter pilots, because of a surplus of pilots.⁷⁷

Perhaps the best summary of the German flying training program appears in an interrogation of a veteran German pilot in late 1944. He stated:⁷⁸

[t]hat the training of fighter pilots today is pitiful; he complained that the pupils arrived from different schools having been taught by different methods according to [the] personal choice of the instructors, he complained that blind-flying instruction was totally inadequate for interception in cloud and indeed that the majority of new pilots were afraid of cloud flying. He stated that in his staffel [unit] he had no pilot to whom he could entrust the leadership of a section of four. The seasoned veteran summed up, "things are not what they were in my days."

They certainly were not. And despite the efforts of German industry that produced record numbers of fighter aircraft (with a peak in the summer of 1944),⁷⁹ including superior aircraft (jets), the GAF lost the battle of the air. It should be emphasized that the GAF had growing numbers of fighters not only

comparable in performance to those flown by the Anglo-American pilots, but with the introduction of jets, some which were superior. The key to Allied air victory was not technology, but numbers, and most especially better trained pilots. For the German flying training program was only able to minimally train pilots to fly these aircraft in the last years of

the war. Unlike the American flying training program, the German program failed to produce sufficient numbers of adequately trained, skilled fighter pilots. The contrast in pilot quality was the major factor in Allied aerial victory which highlights the American (and British) key advantage in the battle for air superiority: superior flying training. ■

NOTES

1. The figures are for graduates of advanced school, after completion of which the men received their wings and most were commissioned as second lieutenants, a few were appointed as flight officers, and some retained their enlisted status. *Army Air Forces Statistical Digest: World War II* (Washington: Office of Statistical Control, 1945), pp. 64-66; Wesley Craven and James Cate, eds., *The Army Air Forces in World War II*, v. 6, *Men and Planes* (Chicago: University of Chicago, 1955), p. 608.
2. The stanine tests placed the applicants into nine groups. These tests were quite effective; elimination rates at primary training for the 10,376 members of the class 43J mirrored the test scores in a linear pattern. Specifically, the ninth category (the highest scores) had an attrition rate of 5.9% and the 1st category (lowest) 71.2%. "Pilot Class 43-J" Historical Research Agency [HRA] 220.7192-4.
3. Rebecca Cameron, *Training to Fly: Military Flight Training 1907-1945* (Washington: Air Force History and Museums Program, 1999), p. 318; Intvw, C. E. Anderson, Oct 1990, American Airpower Heritage Museum/Commemorative Air Force; Intvw, Alwin Juchheim, Mighty Eighth Air Force Museum. Also note that there is only one terse mention of CPTP in the AAF's official history, Craven and Cate, v. 6, p. 223.
4. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, 971,1071 HRA 221.01 Jan 39-Jul 43, v. 4.
5. Craven and Cate, v. 6, pp. 566-67; Air Training Command, Major Changes in Undergraduate Pilot Training, 1939-1990 HRA K220.04-63.
6. ATC, Major Changes in Undergraduate Pilot Training; Craven and Cate, v. 6, pp. 458-60, 568-69.
7. ATC, Major Changes in Undergraduate Pilot Training. The elimination rate included deaths, self elimination, and washouts. The overall trend was a decline in the elimination rate over the course of the war. *AAF Statistical Digest*, 62,64; Craven and Cate, v. 6, p. 568.
8. AAF Training Command History, Jul 1943 to Dec 1944, v.3, 631 HRA 220.01 Jul 43-Dec 44, v.3; Craven and Cate, v. 6, 569,571; *AAF Statistical Digest*, pp. 64, 67.
9. Headquarters AAF Central Flying Training Command, Report on the Assignment of Basic Graduates to Advanced Schools, p. 7, Dec. 20, 1943; Coffeyville, KS, Assignment of Flying Cadets, Dec. 11, 1943; Headquarters Independence Army Air Field, Independence, KS, Historical Data on Assignment, Dec. 19, 1943; Waco [Airfield] Historical Data: Assignment of Basic Students to Advanced Schools, Dec. 8, 1943; Garden City, KS [untitled] Dec. 11, 1943 all in HRA 223.282-2.
10. History of III Fighter Command: Aviation Activities, Dec. 7, 1941 to Apr. 30, 1944, installment 2, part 3, 504 HRA 442.01 Dec 41-Apr 44, v. 3.
11. Central Flying Training Command, Report on

- Assignment of Basic Graduates to Advanced Schools, 11; Coffeyville, Assignment of Flying Cadets; Garden City, [untitled]; Waco, Historical Data.
12. Perrin Field, Assignment of Basic Training Graduates to Advanced Training Schools, Dec. 11, 1943 HRA 223.282-2; Waco, Historical Data.
 13. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, p. 1064.
 14. Assignment by height: Intvw, James Brooks, Feb 1977, 26 HRA K239.0512-1073; R. A. Hoover, *Forever Flying: Fifty Years of High-Flying Adventures from Barnstorming in Prop Planes to Dogfighting Germans to Testing Supersonic Jets* (NY: Pocket, 1996), p. 22; Intvw, William Hovde, Jan 1977, p. 5 HRA K239.0512-1062; Nathaniel Raley, "P-38 Pilot," Veteran's History Project; Intvw, Jack Bradley, Feb 1993, p. 14 American Airpower Heritage Museum/Commemorative Air Force. Other pilots mention selection by weight: Paul Sailer, *The Oranges are Sweet: Major Don M. Beerbower and the 353rd Fighter Squadron Nov 1942 to Aug 1944* (Wadena, MN: Loden, 2011), p. 56; alphabetically: Intvw, George Andrews, Mar 1999, p. 15 University of North Texas; Intvw, Harry Strawn, Aug 1997, p. 13 University of North Texas; by instructor: Intvw, O'Brien, p. 2 357thfightergroup.com; and from the top ten percent of the class: Juchheim Intvw. One tall pilot slated for bombers, bribed an enlisted clerk to change his assignment to fighters. Hoover, *Forever Flying*, p. 22.
 15. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, pp. 1065-66; Central Flying Training Command, The Assignment of Basic Graduates to Advanced Schools, p. 6.
 16. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, pp. 1040,1121; AAF Training Command History, Jul 1943-Dec 1944. v. 3, p. 574; History of the Flying Training Department, Moore Field, TX, 1 Jan 1943 -31 Dec 1943, p. 2 HRA 286.61-1 v. 11, Jan 43-Jan44.
 17. Craven and Cate, v. 6, p. 614; ATC, Major Changes in Undergraduate Flying Training.
 18. History West Coast Flying Training Command, Jan-Dec 1943, v.2, 260 HRA 224.01 Jan-Dec 1943, v. 2.
 19. The Link trainer was a simulator developed for instrument and navigation training. Program of Instruction Advanced Flying Training, Single Engine, Pilot Trainees, Mar. 15, 1942, HRA 221.7121-2; Air Training Command History, Jul 1943-Dec 1944, v. 3 HRA 220.01 Jul 43-Dec 44, v. 3.
 20. Intvw, Staryl Austin, Sep 1995, p. 3 HRA K239.051-2195; Intvw, Carl Bellis, Mighty Eighth Air Force Museum; Intvw, Robert Boyette, Apr 1990, p. 2 American Airpower Heritage Museum of the Confederate Air Force; Brooks Intvw, p. 27; Intvw, Harold Brown, American Airpower Heritage Museum of the Confederate Air Force, Nov 1995, pp. 6,71; Bill Colgan, *World War II Fighter-Bomber Pilot* (Manhattan, Kans.: Sunflower University Press, 1985), p. 23;

- William Foard, WWII Experience of William Williams Foard, p. 2 Mighty Eighth Air Force Museum; William Gatling, *Critical Points: WWII Fighter-Bomber Air-to-Ground Support* (Shoskie, N.C.: Pierce, 1997), pp. 1, 74; Robert Goebel, *Mustang Ace: Memoirs of a P-51 Fighter Pilot* (Pacifica, Calif.: Pacifica, 1991), p. 38; Peter Hahn, Winging it in WWII: Recollections of a Mental Pack Rat, peterhahn@yahoo.com; Intvw, James Hall, Nov 1999, p. 15 University of North Texas; Robin Hansen, *Recollections of Life and WWII* (Baltimore: Gateway, 2001), p. 44; Intvw, William Hess, Feb 1999 University of North Texas, p. 10; George Loving, *Woodbine Red Leader: A P-51 Mustang Ace in the Mediterranean Theater* (N.Y.: Ballantine, 2003), 54; Intvw, Robin Olds, Feb 1977, 30 HRA K239.0512-1079; Intvw, Fred Selle, American Airpower Heritage Museum of the Confederate Air Force, 1990, p. 4; Intvw, Robert Volkman, Mighty Eighth Air Force Museum, Jun 2004, p. 3; Robert Vrillakas, Flight Training and Combat, p. 33 U.S. Army Military History Institute.
21. The report (Harrington, Liaison Report) was on gunnery. LTC James W. Porter for the Commanding General 1st Indorsement, Headquarters AAF Central Flying Command, Randolph Field, Tex., to Commanding General AAF, Apr. 28, 1945 in Headquarters Foster Field, Apr. 19, 1945 Sub: AAF Fighter Gunnery School Liaison Officer's Activities in the ETO, To: Commanding General AAF HRA 248.282-16A.
22. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, 1039, 1042-43, 1214; Betty McNarney, *Pilot Transition to Combat Aircraft*, [1944] Army Air Forces Historical Study No. 18, p. 112.
23. Intvw, Daniel R. Teachworth, Jun. 15, 1944 HRA 142.053T.
24. AAFTC History, Jul 43-Dec 44, v. 3, p. 596.
25. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, 1031; History III Fighter Command: Aviation Activities, Dec 1941 to Apr. 30, 1944, installment 2, part 3, 500 HRA 442.01 Dec 41-Apr 44, v. 3.
26. Craven and Cate, v. 6, p. 614; Jerry White, *Combat Crew and Unit Training in the AAF, 1939-1945*, AAF Historical Study No. 61, 1949, p. 65.
27. The aircraft could operate at 25,000 feet with 100 octane gas, but only at 16,000 feet with 91 octane. Historical Study No. 61, p. 57.
28. AAFTC History, Jul 1943-Dec 1944, v. 3; Historical Study No. 61, p. 54; Enzo Angelucci with Peter Bowers, *The American Fighter* (N.Y.: Orion, 1985), pp. 47, 54, 76, 268; William Green, *Famous Fighters of the Second World War* [v.1] (N.Y.: Hanover House, 1958), p. 75; Gordon Swanborough and Peter Bowers, *United States Military Aircraft since 1908* (London: Putnam, 1971), pp. 58, 324.
29. History Foster Field, Oct 1940-Feb 1944, v. 1, p. 176 HRA 283.21-1.
30. There were shortages due to shipments of P-39s to the Soviet Union in early 1943. Historical Study No. 18, pp. 207, 212, 218; Historical Study No. 61, pp. 52, 54, 55; AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, pp. 1049-51, 1063.
31. The P-39 suffered 245 major accidents per 100,000 flying hours, the P-40 188, both higher than the major accident rates for the AAF's three mainline fighters: P-38 139, the P-47 127, and the P-51 105. *AAF Statistical Digest*, 310. These are stateside statistics for 1942 through August 1945.
32. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, pp. 659-60, 663, 1058; AAFTC History, Jul 1943 to Dec 1944, v. 3, p. 588.
33. See footnote 31. *AAF Statistical Digest*, p. 310; Cameron, *Training to Fly*, p. 548; 450.01-4 pp. 42-45; Historical Study No. 18, p. 112; Historical Study No. 61, p. 52; Fourth Air Force History Study No. II-2: Fighter Training in the Fourth Air Force, 1942-1945, v. 1, pp. 73-74 HRA 450.01-4; Selle Intvw, p. 4.
34. AAFTC History, Jul 1943 to Dec 1944, v. 3, p. 631; Craven and Cate, v. 6, pp. 569, 571.
35. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, 1066-67.
36. Capt Townsend Griffiss, Assistant Military Attache, "Spain (Aviation) Sub: Organizational Training, Tactics Employed," M.A. Valencia, report no. 6530, 25 Apr 1937, 7 HRA 248.282-23.
37. E M. Donaldson, "Notes on Air Gunnery and Air Fighting," HRA 248.282-25.
38. Whereas the pilots who made destroyed claims stopped firing at an average of 293 yards, those who did not make a claim stopped firing at 696 yards. The respective opening and closing firing distances of those making claims of "probably destroyed" and "damaged" fell in between these distances. Headquarters VIII Fighter Command, Analysis of Recent Combat Film, Sep. 24, 1943; VIII Fighter Command, Combat Gunnery, 15 Aug-15 Sep 1943, 11 Oct 1943; *Ibid*, 15 Sep-20 Oct 1943; *Ibid*, 20 Oct-30 Nov 1943; *Ibid*, Dec 1943, 10 Feb 1944 all five in HRA 520.310; Headquarters AAF Fighter Gunnery School, Office of Director Training, Research and Liaison, Foster Field, TX Mar. 29, 1945, Sub: AAF Fighter Gunnery School Liaison Officer's Activities in the ETO, To: Commanding Officer, AAF Fighter Gunnery School, Foster Field, TX, Capt. Ralph H. Harrington, Director of Liaison, 7 HRA 248.16A. This report covers the first three months of 1945. Hereafter cited as Harrington, Liaison Report.
39. The RAF study classified the kills into three categories: stern, front (head-on), and beam. Unfortunately no measure of deflection is given, but we can assume there was no deflection in the head-on kills (12% of the total) and little to no deflection (77%) in the stern kills. "Analysis of Combats," 1 HRA 248.282-26A Jan-Dec 1942; VIIIIFC, Combat Gunnery, 20 Oct-30 Nov 1943.
40. Harrington, Liaison Report, p. 7.
41. AAF Training Command History, Jul 1943-Dec 1944, v. 3, p. 502.
42. AAF Training Command History, Jul 1943-Dec 1944, v. 3, pp. 502, 592.
43. Harrington, Liaison Report, pp. 6, 16; History of the Flying Training Department; AAF Advanced Single Engine Pilot School, Moore Field, TX, Nov. 7, 1941-Jan. 1, 1943, HRA 286.61-1 v. 5; AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943; Norman Fortier, *An Ace of the Eighth: An American Fighter Pilot's Air War in Europe* (N.Y.: Random House, 2003), 27; Peter Hahn, Winging it in WWII; Edward Neyland, *One Small Cog: The Personal Diary of a P-47 Thunderbolt Pilot in World War II* (Austin, Tex.: M.J. Neyland, 2004), p. 28.
44. While these devices are described in gunnery school pamphlets, there is no mention of them in unit histories, pilot intvws, or memories. The researcher is left to wonder if this discrepancy is from their ineffectiveness or to sparse or non-use. "Fixed Gunnery Synthetic Training Syllabus," part II, 3-14 HRA 248.282-1.
45. Eight classes graduated in 1940 (A through H), nine in 1941 (A through I), and eleven a year in 1942-44 (A through K), about one a month. Pilot Training Elimination Rates: Preflight through Advance by Class U.S. Students Only [1940-1944] HRA 220.7192-4.

46. AAF Flying Training Command and Its Predecessors, Jan 1939 to Jul 1943, pp. 1060, 1104-09, 1120; History West Coast Flying Training Command, Jan-Dec 1943, v. 2, pp. 287, 289, 292; AAF Training Command History, Jul 1943-Dec 1944, p. 599, v. 3. For reasons not found in AAF documents, the service did not adopt the frangible bullet for fixed gunnery training, a device that was used successfully in flexible gunnery training. James Baxter, *Scientists Against Time* (Cambridge, Mass.: MIT, 1946), pp. 192-93.
47. AAFTC History, Jul 43-Dec 43, v. 3, p. 617.
48. This is based on a breakdown of ten flying training classes (43G-44E) who graduated from the advanced phase between August 1943 and May 1944 in the Western Flying Training Command. Overall, 69 percent of the men in these classes earned their wings. Pilot Classes Histories [43H-44E] Western Flying Training Command History, v. 6 HRA 224.01, v. 6.
49. *AAF Statistical Digest*, pp. 64, 67.
50. Classes 44E through 45A suffered the highest elimination rates in the single-engine advanced phase, over 5 percent. In a similar fashion the highest elimination rates in the two-engine advanced school came at the end of 1944 (for the period July 1943 through December 1944) with classes 44H through 44J losing over 5 percent. *AAF Statistical Digest*, pp. 64, 67; AAFCFTC, Confidential Data Book, Jan 1944, p. 73; AAF, CFTC Command Data Book, Jun 1945, 63 both in HRA 223.197; Major Changes in Undergraduate Pilot Training 1939-1990, table 29; EFTC Year Book, A Summary Report of Training, Operations, and Activities AAF Eastern Flying Training Command for the Year 1944, HRA 222.7101 1944.
51. Craig Field History, 1945, pp. 11-12 HRA 281.90-6; Major Changes in Undergraduate Pilot Training 1939-1990, table 29.
52. The ten classes had an overall graduation rate of 68 percent, the lowest of which was 43H (52 percent) and the highest 44D (82 percent).
53. The highest average graduation rate was 97 percent at Lancaster (44A, which was the highest graduation rate for the eight schools during this period.) Western Flying Training Command, Pilot Classes Histories [43H-44E].
54. Historical Study, No. 61, p. 7.
55. Cameron, *Training to Fly*, p. 543; Craven and Cate, v. 6, pp. 613-14; Historical Study No. 18, 111; Historical Study No. 61, p. 60.
56. Report on the Training of Replacement Pilots, Jun 1943, HRA 286.22-1, v. 1.
57. Intvw, William H. Waldheim, 78FG, Jan. 4, 1945 HRA 142.053T.
58. Air Intelligence Contact Unit, Hq AAF Redistribution Station No. 1, Atlantic City, NJ HRA 142.053T. The overwhelming majority of these pilots had served in combat in 1944, most completing their tours in September through December.
59. Intvw, William Sieber, 8FG; Intvw, Joseph Laughlin; 362FG; Intvw, Edward J. Fox, 358FG; Intvw, Anthony T. Grossetta, 406FG all in HRA 248.507-22.
60. Intvw, Olin E. Gilbert, 78FG, Nov. 20, 1944 HRA 142.053T.
61. Intvw, Glenn E. Bach, 359FG, Dec. 18, 1944 HRA 248.507-22.
62. Intvw, Binkley, 20FG, Feb. 10, 1945 HRA 248.507-22; Harington, Liaison Report, p. 13.
63. *AAF Statistical Digest*, pp. 308,310.
64. Respectively 65, 54, 51, and 49 percent.
65. AAF, Accident Facts HRA 220.3913-1, v. 2.
66. AAF, CFTC Command Data Book, Jun 1945, 36 HRA 223.197.
67. Intvw, Kenneth R. Williams, 355FG, Jun. 22, 1944. Also see Intvw, Fred Christensen, Jr., 56FG, Oct. 14, 1944; Intvw, J. J. Hockery, 78FG; and Intvw, Ralph C. Jenkins, 405FG, Dec. 27, 1944. All in HRA 142.053T.
68. Intvw, Joseph E. Kirkup, 36FG; Intvw, Richard W. LaRoque, 36FG; Intvw, William E. Bethea, 36FG, 5 Jan 1945 HRA 248.507-22.
69. AAFTC History, Jan 1939-Jul 1943, v. 4, p. 662; Craig Field History, pp. 4-5,15.
70. Aside from my personal experience, obviously from a different (peacetime), later period and strictly anecdotal, I would point to the record of World War II AAF pilots who finished their bomber tours and flew fighters. "Fighter Pilot Training," HRA 220.6093-1 1940-45, v. 2; USSBS Intvw, No. 36, [Gen Walter Kreipe], Sub: Interrogation of Officers of the Luftwaffe, n.d., 2 HRA 137.315-36. Kreipe commanded all GAF flying training August 1944 to November 1944.; "Emphasis on Fighter Training," *Air Intelligence Summary No. 36, for Week Ending 16 Jul 1944*, 4 HRA 519.6074-36; Donald Caldwell and Richard Muller, *The Luftwaffe over Germany: Defense of the Reich* (London: Greenhill Books, 2007), pp. 204,214.
71. *The United States Strategic Bombing Survey: Over-all Report (European War)* (Washington: GPO, 1945), p. 21.
72. USSBS, Lt. Gen Karl Koller Interrogation, 23 and 24 May 1945, 8 HRA 137.315-8; "Fighter Pilot Training," v. 2; Caldwell and Muller, *The Luftwaffe over Germany*, pp. 57, 230-31.
73. Headquarters AAF Training Command, [GAF] Fighter Pilot Training HRA 240.6096-1; Air P/W Int Unit 2nd Air Disarmament Wing (Prov), Preliminary Interrogation of General Der Flieger Werner Kreipe Captured at Achensee on 8 May 1945, Jun. 17, 1945 HRA 240.6096-1; [GAF] Fighter Pilot Training; [RAF] *The Rise and Fall of the German Air Force (1939 to 1945)*, (Old Greenwich, Conn.: WE, 1969), p. 315; Caldwell and Muller, *The Luftwaffe over Germany*, pp. 82,117.
74. *Rise and Fall of the German Air Force*, p. 315; Caldwell and Muller, *The Luftwaffe over Germany*, p. 205.
75. Hq AAF Training Command, [GAF] Pilot Training; A. I. (K) Report No. 163/1943 G.A.F. Training: Training of a Fighter Pilot, 10 HRA 240.6096-1.
76. Both programs washed out about 40 percent of those who entered. However the fatality rate in the GAF appears to be much higher than that in the AAF training program. A GAF class in 1940 suffered twenty-seven killed and two nervous breakdowns in a class of sixty; a class in August 1941 to May 1942 suffered four killed and fifteen washouts in a class of sixty-two; and in a course in the summer of 1942 two killed and three others failed in a class of twelve. AI (K) Report 163/1943, pp. 6, 7, 11; *AAF Statistical Digest*, 64,67,310; Appendix 1, p. 2 USSBS Intvw, No. 28 with Lt Gen Werner Kreipe, Jun. 4, 1945 HRA 137.315-28.
77. [GAF] Fighter Pilot Training; *AAF Statistical Digest*, pp. 78-80; *The Rise and Fall of the German Air Force*, p. 33.
78. Caldwell and Muller, *The Luftwaffe over Germany*, p. 206.
79. The Germans produced 40,000 aircraft in 1944, of which 25,000 were fighters. The highest number of single-engine fighters accepted in one month was just over 3,000 in September 1944. USSBS, *Over-all Report*, pp. 12, 28.

Breach of Trust: How Americans Failed Their Soldiers and Their Country. By Andrew J. Bacevich. New York: Metropolitan Books, 2013. Notes. Index. Pp. xii, 238. \$26.00 ISBN: 978-0-8050-8296-8

Bacevich explains in his most recent book that we, the American people, need to recognize, from a national security perspective, that the United States is not the benevolent nation we imagine. In support of his position, he touches on a selection of imprudent national security policies emanating from “inside the beltway.” His central theme in this book, however, is that the all-volunteer army is disconnected from mainstream America—he calls it a dysfunctional relationship—and is, consequently, subject to misuse. This is the fault of all Americans and not just Washington. He goes on to say that this is just one of a number of manifestations of abuse of power in Washington: “. . . by no stretch of the imagination did the all-volunteer army qualify as—or seek to be—an army of the people. Now culturally in step [with the current social agenda], it was content to march alongside, but at arm’s length from the rest of American society.”

He describes the willingness of presidents—supported by members of government and acting in the absence of a military draft environment—to employ military force without fear of resistance from the American public. The result is a “free pass” to use military force rather than diplomacy. Said more directly, the mindset in Washington is one of perpetual war. To support his charge of perpetual war, Bacevich points to recent history: the Persian Gulf tanker war of the mid-1980s, Desert One, the recent Libya campaign (and the retaliatory attacks on Libya in the mid-1980s), Desert Storm, the 1983 Beirut tragedy, Bosnia, Serbia, Kosovo, Panama, Yemen, Somalia, Operation Iraqi Freedom, the war in Afghanistan, and on and on. One can add to that list the threat of war in Syria and Iran—wars that are only a short decision away.

In this relatively short book, Bacevich takes on a number of related issues in a rush to address the many faults of a flawed civil-military relationship “inside the beltway.” As he peels away the “onion layers,” he speaks to the inappropriate relationship between the military and the contractor industry and, likewise, that industry’s relationship with the political leadership. Bacevich focuses on the shortsightedness of leadership within the military and their efforts to justify a large military force by self-servingly embracing force projection without regard for the consequences. The American public does not

remain blameless. It has culpability because of its willingness to pass on civil responsibility while divorcing itself from any meaningful involvement in the process of national security policy.

What solutions are embedded in this book? Bacevich says we should either limit the nation’s ambitions to those that a relatively small professional army can manage (and give up on globalism) or revive the citizen soldier tradition. Shared sacrifice should mean fewer wars.

He even proposes the unimaginable: a concept of citizenship in which privileges entail responsibilities including a personal obligation to contribute to the nation’s defense. Americans should insist, writes Bacevich, upon fielding a citizen army drawn from all segments of society.

This is a very interesting book if the reader is able to remain focused on the central theme, while balancing all the tangential arguments that jump out of the pages without any preparatory lead-in.

Col. John Cirafici, USAF (Ret.), Milford Delaware



Normandy: From D-Day to the Break-out, June 6-July 31, 1944. By Dominique François (translated from the French by Gayle Wurst). Minneapolis, Minn.: Zenith Press, 2013. Photographs. Maps. Appendices. Bibliography. Index. Pp. 300. \$26.50 ISBN: 978-0-7603-4558-0

Dominique François is a noted French historian and writer of fifteen books specifically covering D-Day and the subsequent Normandy campaign during World War II. Mr. François has served as a consultant for the History Channel, NBC, and Inertia Films. He lives in Normandy and dedicated this book to his grandfather, Joseph François, a French cavalry officer in World War I, who was killed on June 6, 1944, at Saint-Marcouf, France.

Over the past seventy years, the D-Day invasion carried out by Allied forces at Normandy has become one of the most famous historical components of World War II. This book is a pictorial description of the Normandy invasion itself and the period of the Allied breakout from the Cotentin Peninsula. Specifically included are numerous photos and a detailed description of the critical events that preceded this battle, including the German occupation of Normandy and the construction of the Atlantic Wall by Field Marshal Erwin Rommel’s forces. François provides the greatest number of wartime pictures I have ever seen on this subject. These pictures are the means used to convey the

message of the book. Without question, the pictures are the true worth of the book. The majority of the pictures are from US and Allied files; however, there is a significant number of German military photos that depict the event from their perspective.

François begins with the pre-invasion period on both sides of the English Channel. Here he describes the Allied and Nazi buildups: one side offensively focused, while the other side is building a defensive fortress to repel the imminent invasion. Part of this activity involves the use of General George Patton and his command of a phony army designed to deceive the Germans into believing he will lead the invasion against Calais.

I have to get back to the rare collection of remarkable period photographs. These accompany François’ verbal descriptions and place the reader directly in the middle of the wartime action well described by his narrative. Through viewing this pictorial guide with the accompanying insightful, pithy, and useful descriptions, the reader gains an appreciation for the environment faced by the combatants in these battles. Without this large array of pictures, the book would be much less informative. The words and pictures flow well together, enabling the reader to become even more informed on these topics.

I recommend this work as part of any historical collection on this extraordinarily important and pivotal piece of the history of the Second World War.

Col. Joe McCue, USAF (Ret.), Leesburg, Virginia



Fortress Rabaul, The Battle for the Southwest Pacific January 1942-April 1943. By Bruce Gamble. Minneapolis, Minn.: Zenith Press, 2013 [reissue of 2010 book]. Maps. Photographs. Notes. Bibliography. Index. Pp xvii, 398. \$19.95 paperback ISBN 978-0-7603-4559-7

Fortress Rabaul, the second of a trilogy by author Bruce Gamble, chronicles the longest air battle in World War II. It takes readers from the fall of the small Australian garrison on a lonely and isolated corner of New Britain in January 1942 to the successful interception of Admiral Isoroku Yamamoto by USAAF P-38s on April 18, 1943. Gamble is the nephew of a B-17 navigator who flew many missions during the early campaign to hold the Japanese on the western slopes of the Owen Stanley Mountains. He does an excellent job of

weaving the stories of the hard-pressed Allies to defend the toehold surrounding Port Moresby with the initially triumphant and then increasingly desperate Japanese.

Gamble takes great pains to show how the Allies, using their limited and mostly outdated and out-classed equipment, waged an increasingly successful holding action against a superior force. The stories of the missions flown by P-39s and P-400s, early models of the B-17, and Australian Catalinas against an increasingly heavily defended target emphasize the dedication of a small group of airmen. Gamble details the efforts to perfect attack profiles, particularly the development of skip-bombing.

The book also relates conflicts within the leadership on both sides. On the Allied side, MacArthur's views toward the efforts of airmen and the views of his chief of staff toward the efforts of the Air Force are addressed in detail. The internal conflicts between Kenney and Walker, Kenney's desire to implement skip-bombing, and Walker's insistence on high-level precision bombing are also addressed.

Gamble makes good use of source material from all of the combatants—American, Australian, and Japanese—to fill out the story. He names perpetrators of some of the more gruesome atrocities of the war. Of the more than 1,400 Australian and other Allied personnel captured at Rabaul, fewer than 400 lived to the end of the war. The discussion of claims versus actual kills reinforces the well-known issue of reporting what happened during aerial combat. A discussion of the loss of perspective on the part of the Japanese high command as a result of taking reported kills as fact is also excellent.

Overall this is an excellent read. Gamble tells a gripping story. His attention to detail and descriptions of aerial battles are as good as any I have read. Particular mention should be made of his description of the aerial Battle of the Bismarck Sea.

Having said that, however, there are shortcomings that do detract from an otherwise excellent book. The most glaring is the method of footnoting. Although footnotes are provided, they are not scripted, so there is no way to identify where a point is being expanded or of citing references. Frankly, although the story of the treatment of prisoners is necessary, it is overdone. Although there are some maps, they are mostly in the front of the book. More and better-detailed maps spread through the book would allow a reader not familiar with the area described to better understand the flow of the action.

Msgt. Al Mongeon, USAF (Ret.)



History of Rocketry and Astronautics: Proceedings of the 42d History Symposium of the International Academy of Astronautics, Glasgow, United Kingdom, 2008; v. 39 of the IAA History Series, and v. 28 of the IAA History Symposia. By John Harlow, ed. (Series Editor Rick W. Sturdevant). San Diego Calif.: Univelt [for the American Astronautical Society], 2013. Photographs. Illustrations. Notes. Index. Pp. xiii, 345. \$95.00 (paperback \$75.00) ISBN: 978-0-87703-589-3

In characteristic IAA fashion, the papers presented are organized according to a theme (in this case, the 50th Anniversary of the International Geophysical Year): memoir pieces, reviews of specific programs, and the history of astronautics in the host nation (the UK).

In some respects, this volume is a companion (even somewhat of a prequel) to its immediate predecessor, which was organized around the theme of Sputnik and its influence. It gets off to an excellent start with a masterful essay by Roger Launius on the tangled story of Eisenhower, Sputnik, and the fallout and circumstances leading to the subsequent creation of the National Aeronautics and Space Administration, arguably the most important as well as most visible result of the shock America experienced with the launch of the first artificial earth satellite. Hervé Moulin follows with an excellent study that reminds readers the IGY had a genuinely international character, and that its implications were significant for the formation of other national spaceflight research and development programs—in this case, that of France.

The memoir section of the volume has several notable essays. I found Frank Winter's study of James Wyld particularly compelling, but all are of uniformly high quality: Anne Coleman's study of polymath Robert L. Forward (a onetime gravitational research associate of University of Maryland physicist Joseph Weber); Jean-Jacques Serra (et al.)'s study of Casimir Coquilhat, an unappreciated Flemish pioneer who enunciated a general theory of rocket propulsion decades in advance of similar work by Konstantin Tsiolkovskiy; Pablo de León's survey of the work of Argentine guided missile designer Ricardo Dyrigalla (Polish by birth and a wartime RAF reconnaissance pilot); Daniela Cipollone's survey of Luigi Broglio, an Italian aeronautical engineer who pioneered high-speed wind tunnel design, was a colleague of the legendary Theodore von Kármán in NATO's Advisory Group for Aeronautical Research and Development, and promoted Italy's first

ventures into space research; and Irina Fedorenko's glimpse into the still-unknown world of Soviet-era anti-ballistic missile defense and the development of reentry body penetration aids.

The Scientific and Technical Reviews section includes a number of most interesting project histories, particularly veteran astronautics historian Å. Ingemar Skoog's study of Alfred Nobel's rocket camera; Christian Lardier's study of the Soviet Meteo rocket program; and Charles Lundquist's fascinating account of the 1958 Argus experiment, which involved measuring space radiation from three separate atomic detonations via the satellite Explorer 4 (with warheads carried by X-17A research missiles) at 300 miles above the Earth.

Finally, the national section on contributions to astronautics in the UK has four excellent essays including a historiographical survey by Douglas Millard, a political survey by Colin Hicks, an industrial perspective by John Allen, and a "site study" of Stevenage by Alistair Scott. All are excellent, and I found the last two particularly fascinating.

Again, as with all the volumes in this series, this volume is steeply priced, but the quality of the research more than justifies it. Highly recommended!

Dr. Richard P. Hallion, Research Associate in Aeronautics, National Air and Space Museum



Berlin on the Brink: The Blockade, the Airlift, and the Early Cold War. By Daniel F. Harrington. Lexington: The University Press of Kentucky, 2012. Maps. Photographs. Notes. Bibliography. Index. Pp. 414. \$40.00. ISBN: 978-0-8131-3613-4

As an iconic event that signaled the final disintegration of the Grand Alliance of the Second World War and the beginning of the decades-long Cold War between the Soviet bloc and the capitalist West, the Berlin Airlift has been the subject of numerous studies, commentaries, and analyses. Virtually all of its key Western participants—from U.S. President Harry Truman, to U.S. Army Gen. Lucius Clay, to USAF Maj. Gen. William Tunner—wrote memoirs that sought to portray their actions and decisions in the best possible light. Historians and political scientists have scrutinized the airlift in detail, emphasizing its stature as the product of calm, rational, dispassionate strategic calculation that allowed Western statesmen and military leaders to harness the inherent flexibility of non-kinetic airpower to

the requirements of national policy. Finally, in the popular historical consciousness, the airlift remains an inspirational tale of democratic defiance in the face of authoritarian aggression and belligerence.

With so many interpretations of the airlift already in existence, why another book on the subject? Daniel F. Harrington, deputy historian at United States Strategic Command, makes clear that the established “master narrative” of the Berlin crisis of 1948-1949 rests on a set of problematic foundations. First, he argues, previous accounts have tended to view the airlift in isolation from its broader context: namely, the escalating confrontation between former allies of the Second World War. Second, scholars have been much too enthusiastic in depicting the airlift as the product of deliberate strategic choices. Third, earlier analyses of the crisis provide a highly compartmentalized view of this key historical event, treating high-level diplomatic and policy deliberations in isolation from the operations of the airlift itself and from the realities of daily life in Berlin.

Harrington broadens the analytical aperture through which the events have been traditionally viewed. By tracing the origins of the blockade and the airlift to 1943—when the Allies first began to think seriously about how they would carve up Germany and its capital into zones of occupation and control, and how they would negotiate access and transit rights to and through those areas—Harrington offers important insights into the “prehistory” of the crisis and situates its dynamics in the fundamentally divergent visions that the Soviet Union and the Western powers embraced with respect to the reconstruction and rehabilitation of Germany. It was precisely these conflicting and irreconcilable visions of Germany’s future, Harrington reminds us, that fueled the diplomatic crisis that framed the blockade and the airlift.

More important, the notion that the airlift represented a deliberate, well-reasoned strategy that the Western powers implemented as the optimal response to the blockade is fundamentally flawed, Harrington claims. While key players like Truman and Clay, America’s military pro-consul in Germany, would, in the years to come, claim the credit for adopting an “airlift strategy” to circumvent Stalin’s high-stakes gambit, Harrington’s reading of the historical record indicates another, more nuanced reality. Few Western leaders realistically believed that the airlift would succeed. Neither Truman nor Clay nor any of their British and French counterparts ever “decided” to make the airlift the cen-

terpiece of a coherent strategy. On the contrary, the implementation of an airlift allowed the top decision-makers to delay making some really tough choices, such as breaking the blockade through armed force (thus risking World War III) or withdrawing Western garrisons from Berlin (thus leaving Stalin with a propaganda victory, if nothing else). At best, Western statesmen and high-ranking military brass believed the airlift would buy time for diplomatic negotiations with the Soviet Union.

In short, the airlift’s success in keeping nearly two million people fed, clothed, and warm for close to a year was as much of a surprise to the West as it was to Stalin. In the end, the operation proved a masterpiece—but one of improvisation, not of strategic planning. What made Operation “Vittles” work were the exertions of ordinary, low-level participants of the effort—most of them long forgotten by history—including air- and ground-crews, air traffic controllers, logistics specialists, and staff planners without whom the airlift would not have been able to function. Harrington highlights the importance of this aspect of the airlift by interspersing his analysis of high-level diplomatic initiatives and national security deliberations with an examination of how the day-to-day operational realities of the air effort influenced, and were influenced by, the political dimensions of the crisis.

On the whole, *Berlin on the Brink* is scholarship of the highest order. It provides a persuasive reassessment of a major international crisis that, for too long, has been subject to simplifications and misconceptions. Its conclusions are based on in-depth research in an impressive array of primary sources, including American, British, and Canadian archives, that provide a welcome antidote to interpretations based on the problematic testimony found in the pages of political and military leaders’ memoirs. As Harrington himself freely admits in the book’s introduction, his research does not extend to Russian, German, and French language sources. This deficiency may be regrettable but does not appear to substantially dilute the explanatory power of the book’s key conclusions. The analytical insight, intellectual rigor, and breadth and depth of research that characterize this volume ensure that its arguments will continue to set the tone of historical debates about the Berlin airlift for a long time to come.

Sebastian H. Lukasik, Air Command and Staff College



Distant Thunder: A Helicopter Pilot’s Odyssey from the War in Iraq and Afghanistan. By Don Harward. London: Grub Street, 2012. Photographs. Index. Pp. 189. \$35.00 ISBN: 978-1-908117-28-1

This may be one of the most fascinating personal accounts to emerge from America’s recent wars. Its title does not really render justice to the richness and variety of experience that Harward chronicles in its pages. While his experiences as a helicopter pilot in Iraq and Afghanistan provide the central narrative framework of the memoir, his stories of flying combat missions against Iraqi insurgents and the Taliban are interspersed with reminiscences of a long and distinguished military career that began in the mid-1970s. Harward enlisted in the U.S. Army while the Vietnam War was in its final phases. Initially a tank commander and gunnery instructor, Harward became an Army aviator in the early 1980s. Qualified on a wide range of platforms, he saw combat in Operations Just Cause and Desert Storm and served with the Army’s now-famous 160th Special Operations Aviation Regiment (160 SOAR) and 101st Airborne Division. Retiring in 1999 as a Chief Warrant Officer 4 (CW4), Harward worked several years as an airline pilot before leaving the industry to fly helicopters in Iraq and Afghanistan from 2005 to 2010. This volume offers a window onto virtually all aspects of Harward’s career, from field exercises intended to prepare him and his fellow soldiers to confront a Soviet armored thrust into West Germany in the 1980s, to the challenges of flying helicopters over Afghanistan’s Red Desert nearly three decades later.

The diversity of experiences and professional opportunities that his career afforded him represents the chief strength of Harward’s memoir. While its overall tone is intensely personal—an attribute that makes it the engrossing read it is—the book offers fascinating insights into a variety of broader issues that transcend its specific context. Foremost among them are the dynamics of the aviator culture of which the author is a member. Harward illustrates in vivid fashion the nature of the bonds that link aviators, irrespective of their parent service or nationality, into a cohesive professional community. As Harward makes clear, a shared love of flying; an abiding fascination with the technical challenges of operating various airframes and with the mechanics of flight; and a deep, almost spiritual relationship with their aircraft remain at the forefront of aviators’ sense of personal and professional identity.

The exclusive nature of that identity

is reinforced by the cultural alienation from civil society and from the larger institutional culture of the military which Harward's book repeatedly manifests. His critiques of combat support personnel, politicians, and journalists are at times humorous and at times resentful, but always irreverent. Their tenor is consistent with grievances that those on the front lines of virtually all modern conflicts have voiced about those who do not belong to the fraternity of arms. Equally timeless is the emphasis that Harward places on the emotional links with his family and comrades-in-arms as the principal source of his motivation to serve and fight. *Distant Thunder* is a chronicle of warfare in the early twenty-first century, but the cultural outlook behind it would be easily recognizable to most American veterans of the Vietnam War, or British veterans of the First World War.

What makes *Distant Thunder* even more valuable is that its insights into military culture, combat motivation, and the relationship between battle-space and home front are integrated into an exciting—if somewhat episodic—narrative that reveals Harward's impressive talents as a skilled storyteller. His absorbing descriptions of combat missions flown over the deserts and mountains of Afghanistan are the central and most dramatically exciting part of that narrative. Historically, rotary-wing aircraft have been among the most versatile airframes available to counterinsurgent forces. Harward's account bears witness to their enduring value in conflicts of this kind, while illuminating the unique challenges and dangers that these temperamental machines present to even the most skilled practitioners of the aviator's craft.

Harward writes in a conversational tone whose colloquial nature endows his memoir with a visceral immediacy. Based on personal letters, the book's individual chapters might have benefitted from additional contextualization for the benefit of readers who may want to fit Harward's gripping accounts of combat into the broader strategic picture of the war in Afghanistan. This, however, is a minor quibble: Harward's book deserves a wide readership and is likely to emerge as a classic first-person account of helicopters in modern warfare.

Sebastian H. Lukasik, Air Command and Staff College



Bomber Command. By Max Hastings. Minneapolis, Minn.: Zenith Press, 2013. Maps. Tables. Diagrams. Illustrations.

Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. xxix, 370. \$19.99 paperback ISBN: 978-0-7603-4520-7

This is a reprint of a classic text of the air war in Europe. Hastings not only chronicles the efforts of Bomber Command throughout World War II but also delves into the ongoing debate about the usefulness and morality of area bombing. Hastings accessed many of key personalities including Sir Arthur Harris, wartime commander of Bomber Command and then crafted a well-documented, but controversial, perspective on the campaign. Many airmen did not welcome his conclusions; Gen. Ira Eaker urged Harris to sue Hastings for libel.

The narrative in many ways parallels those of writers today who praise the courage of the troops while decrying the ends and, in some cases, methods they were called upon to use. This is interesting: in 1979, there was not the nearly universal impetus among the U.S. and British publics to show support for their fighting men and women. Hastings recognized the crews' courage and sacrifices while questioning, as any thoughtful observer must, whether desired goals were met. Hastings argues they were not. Area bombing did not accomplish Sir Hugh Trenchard's vision, shared by Harris, of demoralizing the enemy civilian population to the point they either openly rebelled or, at the very least, refused to continue to work, thereby crippling the regime.

Hastings provides personal stories and background for his discussions of tactics and strategy. Thus, he kept the very human face of the average bomber crew before the reader while developing his theme concerning the efficacy and morality of RAF bombing. The reader meets leaders such as Leonard Cheshire, VC, and Micky Martin—men who not only survived the war but also contributed throughout to developing tactics and procedures in a never-ending quest to make bombing more effective. We also meet faceless replacements who never made it past their first sortie—men who, within just a few days survivors could not even recall.

However, the book's most important contribution is not aircrew stories but Hastings's discussion of area bombing's strategic impact. He attacks it from several perspectives: civilian and military morale in both the UK and Germany, the propaganda impact, the economic impact of Britain committing to building her own indigenous bomber force, and the more commonly considered military impact. He acknowledges British leaders arguments that, in the first years of the war when Britain had no other way to strike back and her bomber forces had been decimat-

ed in daylight raids, nighttime area bombing was the only alternative to a strategy of doing nothing. He does not excuse the targeting of civilians, but recognizes the military and propaganda arguments used by British political and military leaders to justify behavior they condemned in their enemies. Hastings convincingly demonstrates that Harris persisted in his single-minded "dehousing" policy even though area bombing was not having the desired effects and, thus, wasted tremendous effort that could have been better used elsewhere. He shows how the RAF in general, and Bomber Command in particular, consistently failed to face the facts of their ineffectiveness and adjust accordingly. Sir Charles Portal, Chief of the RAF, did eventually recognize this (as did many in the Allied command); but he lacked the decisiveness to stand up to Harris, force a change, or remove him. The worst part is that, later in the war, Bomber Command had both the numbers and expertise to have a major impact by focusing their efforts on specific targets; but Harris refused to allow any diversion from his objective of laying waste to every built-up area in Germany—even when Germany's defeat was virtually inevitable.

Despite his criticisms, Hastings does not apologize for or demonize anyone. His discussion is measured and logical, and he recognizes good where it existed (Harris's concern for his crews) and assigns blame where it belongs (again, Harris's dogmatic refusal to change). He also disagrees that area bombing (and the entire strategic bombing campaign by extension) rises to the level of a war crime on a par with those of the Nazis. He argues it was, at first, an expedient use of existing technology and, in the end, a misguided effort to contribute to the German war machine's destruction. This perspective will not satisfy some; but it is realistic in that it accounts for the fact that, in war, bad decisions are made that hindsight recognizes as counterproductive, wasteful, and excessively destructive.

The book is well documented and provides the reader with data on aircraft, loss rates, targets and armaments production. The few maps illustrate the text well; a few more, particularly at the beginning, would help the reader frame distances and routes more clearly. This is a must-read for any student of air warfare. It joins other significant works on the subject, such as Richard Overy's *The Bombing War*. Entertaining, informative, and thought provoking, it is as relevant today as when first published.

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



The Battle of Midway: The Naval Institute Guide to the U.S. Navy's Greatest Victory. By Thomas C. Hone, ed. Annapolis, Md.: Naval Institute Press, 2013. Maps. Illustrations. Photographs. Appendices. Notes. Bibliography. Index. Pp. xx, 360. ISBN 978-1-61251-126-9.

With the seventieth anniversary of the epic Battle of Midway just passed, this compilation is a well-timed addition to the rich body of works on this crucial turning point in the Pacific War. Hone, a former Naval War College faculty member and author of numerous works on naval topics, has drawn together such diverse sources as articles, books, official documents and after-battle reports, diaries, oral histories, participant recollections, and even letters to the editor to provide a well-rounded, analytic perspective on the battle. Here are all the well-known hinges of fate: McClusky's extended search, Buckmaster's decision to abandon *Yorktown*, Nagumo's repeated switching of bombs and torpedoes. Newly prominent, however, are such crucial topics as the battle's effect on global war strategy and a critical look how Midway is regarded today. Critiques of skills, styles, decisions, and motivations of both sides' leaders provide valuable insights into the planning, execution, and assessment of military campaigns. Directed in particular to naval professionals, this book is intended to enhance leadership skills.

Hone emphasizes the influence of strategic forces on battle planning. Concerned about global implications of potential U.S. ship losses, Chief of Naval Operations Admiral King instructed Admiral Nimitz to minimize risk to the fleet. Nimitz accordingly ordered the U.S. carrier commander, Admiral Spruance, to use the "principle of calculated risk." Spruance subsequently steamed east on the night of June 5. Had he pursued Nagumo's wounded strike force to the west, Spruance would have exposed the U.S. carriers to Yamamoto's battleships, the presence of which was unknown to the U.S. at the time.

Certain facets of this book are interestingly oriented to helping the intended audience link the lessons presented to their own careers. One essay applies a model of fleet tactics to the battle. Others explore how experience and professional judgment aided leaders in making crucial decisions with incomplete or inadequate information. Rather than illustrating the text, photo captions describe the tactical situation and commanders' decisions, encouraging insights to which the reader may relate. Assessments of the ability of chance and coincidence to influence a battle's outcome conclude (reassuringly) that

military training, tactics, and planning reduce or, indeed, eliminate the influence of random factors. Less theoretical are the implications of the *Hornet* air wing's tragic "flight to nowhere." Failing to find the enemy and with dwindling fuel, squadron leaders headed to Midway or back to *Hornet* over the objections of the strike group commander (Torpedo 8 had departed much earlier). This is noted as a point to ponder: given the circumstances, did those decisions qualify as mutiny? How would the reader handle a similar situation?

A prime purpose of historical readings is to inform the present. A case in point is the Army B-17s which aimed 322 bombs at moving warships during the battle and scored no hits. Questions of tactics and technology aside, the focus is on a larger lesson. There was no Joint Forces Air Component Commander (today's terminology) coordinating Army and Navy/Marine air operations at Midway. Such a role might have used the heavily armed, durable, long-ranged B-17 for surveillance instead of bombing, potentially benefitting the battle's outcome.

The book notes that U.S. torpedoes sometimes did not explode but does not cover the background. Unreliable torpedo triggers, which took time to correct, impacted the war's progress. Some exploration of this would have been welcome.

Printed on heavy stock and bound in cloth, this book has the pleasing heft of a standard reference. Bibliographic annotations describe each work's unique contribution. The significance of sources quoted is explained. A very useful General Chronology reflects almost seventy years of research. Sources tapped understandably focus on those suitable for continuing naval education. However, quotation of Air Force references might have buttressed certain points. Although appearing relatively soon after the war, Craven and Cate's *The Army Air Forces in World War II* (Vol. 1) significantly points out the potential benefits of a combined or coordinated airpower command. Gene Salecker's, *Fortress Against the Sun* details the B-17's exploits in the battle.

This book is very useful in learning how to gather, analyze, and assess evidence, and how to understand a subject from a variety of perspectives. I highly recommend it.

Steven Agoratus, Hamilton, New Jersey.

The Development of Propulsion Technology for U.S. Space-Launch Vehicles, 1926-1991. By J. D. Hunley.

College Station: Texas A&M University Press, 2013. Photographs. Drawings. Notes. Index. Pp. 383. \$34.95 paperback ISBN: 978-1-60344-987-6

This is the second printing of an earlier 2007 work that is now rightly considered an aerospace classic. It is Number 17 in The Centennial of Flight Series whose general editor is Roger D. Launius. An historian of wide-ranging experience and expertise, Hunley has written an erudite, authoritative reference work—one that captures the essential history of American large rocket development while avoiding the pitfalls of producing a narrowly focused specialist work of value only to practitioners.

The book is based on Hunley's wide range of contractor, government, and private research materials as well as on a wide spectrum of published works. The result of his research is a book that ranges across the history of American rocket development from the time of Robert Goddard's first tentative experiment on March 16, 1926 (the "Kitty Hawk" of liquid fuel rocketry) through the development of engines for the launch vehicles that took Americans into orbit, to the Moon and back, and launched deep space probes into the cosmos.

Hunley writes with verve and a commanding confidence, conveying the technical and administrative challenges involved in America's quest to develop meaningful rocket propulsion for military, civilian, and scientific purposes. The text is well illustrated with very appropriate and illuminating examples of rockets, rocket technology, and technical options and choices. Hunley thoroughly documents his study, which makes the book of particular value for students and others seeking to locate sources, expand upon his work, or to undertake their own research in the field.

The Development of Propulsion Technology for U.S. Space-Launch Vehicles, 1926-1991 is, quite simply, the definitive text on the evolution of American large rocket propulsion, a work that is foundational and indispensable for anyone interested in the evolution of the field.

Highly recommended!

Dr. Richard .P Hallion, Research Associate in Aeronautics, National Air and Space Museum

Blowtorch: Robert Komer, Vietnam, and American Cold War Strategy. By Frank Leith Jones. Annapolis, Md.: Naval Institute Press, 2013. Notes. Bibliography. Index. Pp. xi, 401. : \$52.95 ISBN: 978-1-61251-228-0

Former Department of Defense (DoD) policy and strategic planner Frank Jones is Professor of Security Studies at the Army War College and holds the General Dwight D. Eisenhower Chair of National Security. In this work, he has carefully detailed the professional life of Robert Komer from his initial employment by the Central Intelligence Agency (CIA) through a career that eventually culminated as a high-ranking DoD official in the Carter administration. More than anything else, Komer is best remembered as the architect of President Lyndon Johnson's ill-fated program—"pacification" it was called in the mid 1960s—to woo the hearts and minds of South Vietnamese peasants away from the Communist Viet Cong.

Part One deals with Komer's career before representing Johnson in Vietnam; Part Two covers his experiences in Vietnam, and Part Three discusses his career after Vietnam.

Komer served as historian with the U.S. Fifth Army at Anzio, the hard-pressed Allied beachhead on the west coast of Italy, before completing his master's degree in business from Harvard after the war. After that, he moved on to the newly organized CIA where he helped prepare national intelligence estimates as a strategic analyst. He then joined President Eisenhower's National Security Council (NSC) staff. President John Kennedy retained Komer after taking office in 1961. In those years, Komer focused on building better relations with Egypt and India and refining U.S. foreign-aid policy.

Johnson asked Komer to remain on the NSC staff following the Kennedy assassination. Working with other high-ranking officials in the second half of 1966, Komer formulated a policy for gaining the initiative against the Viet Cong under the overall auspices of Military Assistance Command Vietnam, commanded by General William Westmoreland. In May 1967, Komer arrived in Vietnam to implement the pacification program. Over the next nine months or so, Komer forged a positive relationship with Westmoreland and South Vietnamese leaders to the point where he believed he was making solid progress. Along the way, however, he antagonized many of his peers by his straightforward, no-nonsense approach—hence the nickname "Blowtorch."

The Tet Offensive, of course, doomed the Johnson administration's pacification efforts. Even though the Viet Cong and North Vietnamese Army suffered horrendous losses, the American public, misled by very inaccurate press reporting, lost their confidence in Johnson's ability to prosecute the war to a successful conclusion. Komer, meanwhile, was outmaneu-

vered by Westmoreland's successor, Gen. Creighton Abrams.

With Republican Richard Nixon taking office in 1969, Komer eventually found himself working for the beltway think tanks. However, he did return to public service under the Carter administration, during which time he heavily influenced NATO's policy concerning the Soviet and Warsaw Pact arms buildup. He successfully developed the concept of prepositioning U.S. Army equipment in depots that could be quickly mobilized by troops airlifted from the United States.

This is a detailed account of one man's life in government as he influenced U.S. presidents and U.S. policy. It is probably best suited for students of the Vietnam War seeking another perspective on U.S. decision making.

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



Pacific Blitzkrieg, World War II in the Central Pacific. By Sharon Tosi Lacey. Denton: University of North Texas Press, 2013. Maps. Illustrations. Notes. Bibliography. Index. Pp. xvii, 213. \$29.95 ISBN 978-1-57441-525-4

Lacey, a West Point graduate and serving U.S. Army officer, examines integration of two culturally distinct land forces (Marines and Army) into a joint force. She uses as her canvas five major battles: Guadalcanal, Gilberts, Marshalls, Saipan, and Okinawa. For each, she considers the strategic setting, operational planning, pre-combat training, operations, and a battle summary. While combined arms require integrating the air, land, and sea facets of a battle, she emphasizes development of the land components. A sub-text throughout is the importance of command personalities to the success of the operations themselves and the ultimate success of a joint force.

This is not a book about the totality of World War II in the Pacific. It is an examination of "the mechanics behind the creation of the joint army-marine [sic] force" and is a development of an earlier article, *Smith vs. Smith*, first published in *World War II Magazine*, and her dissertation.

Operations in the Pacific—whether in Gen. MacArthur's or Admiral Nimitz's areas—required large-scale combined arms operations emphasizing amphibious operations that used both Marines and Army forces. Interestingly, in the Central Pacific, this meant combined operations under the ultimate command of, and

heavy dependence on, the Navy.

Lacey emphasizes the importance of personalities and the command chain to the ultimate success of joint operations. She pays particular attention to the roles of Lt. Gen. Holland Smith, USMC, and Maj. Gen. Ralph C. Smith, USA, on Saipan. She is also quick to emphasize the ability of lower ranks to create a functioning joint operation in spite of the acrimony and seeming dysfunction at the top. Lacey presents the facts in a very balanced manner, giving each their due where appropriate and calling them out when actions were questionable.

The title of the book, unfortunately, seems to be the idea of a publisher rather than the author. An area that would have benefitted from more attention was inter-war doctrine, especially the attention paid to development of amphibious operations by both services. Much is made of differences in operational philosophy between the Marines (quick strike, light infantry) and the Army (more deliberate, heavy infantry). Saipan—although rightly cited as an example of how far joint planning and execution had come from Guadalcanal—is also used as an example of this contrast in operational styles. Where the Marines pushed ahead rapidly with frontal assaults and moved past strongpoints and obstacles while trailing units dealt with bypassed strongpoints, the Army dealt with strongpoints as they were encountered, leaving nothing in the rear and using flanking movements when necessary to envelop the enemy. This contrast was sometimes played out in the media where Marine Lt. Gen. Smith was portrayed, unfairly, as a butcher of his men. Nowhere is this difference highlighted more than in the ultimate relief on Saipan of Army Maj. Gen. Smith by Marine Lt. Gen. Smith, who continually complained about what he perceived as a deliberate hesitancy and slow progress of the Army units assigned. Lacey makes this simmering relationship a sub-text throughout the story.

Lacey makes good use of primary sources to support her basic thesis that creation of this joint force was successful. However, she also illustrates how success was often the result of individual courage and initiative within the ranks, no matter what the leadership was doing. The story is well put together, although the book could have benefitted from tighter editing, there being a few typos and one or two misspellings. Overall, a good read.

MSgt. Al Mongeon, USAF (Ret.)



Cold Days in Hell: American POWs in Korea. By William Clark Latham, Jr. College Station: Texas A&M University Press, 2012. Maps. Photographs. Notes. Appendix. Bibliography. Index. Pp. xiii, 30. \$28.80 ISBN: 978-1-60344-073-8

William Latham is a retired U.S. Army lieutenant colonel who was an instructor at the U.S. Army Command and Staff College and is currently the course director at the U.S. Army Logistics University, Fort Lee, Virginia. His book is well worth reading, as he offers a synopsis of the Korean War and focuses on the conditions faced by American prisoners of war. He details Army unit movements and presents insights on the battles fought. Latham accumulated this in-depth knowledge via interviews with American soldiers who fought in Korea. The result of these is a work that speaks from personal experiences of those who did survive the war.

Korea is sometimes called “The Forgotten War.” The basic sequence of events was the initial onslaught of the North Koreans across the demarcation line; the ensuing assault landing at Inchon; rapid movement of UN forces to the north of Korea; mass attacks by Chinese forces south across the Yalu River; two years of seesaw battles; and the final ceasefire agreement at the 38th parallel—where we sit today, some sixty years later. Latham describes the surprise of the initial North Korean onslaught to U.S. forces including Gen. MacArthur and the staff exchanges between him and Washington (President Truman and Joint Chiefs of Staff). He covers the flurry of messages concerning the northern push by UN forces including the reluctance of the Joint Chiefs of Staff for the Inchon landing. The decision by MacArthur to bomb the Yalu River bridges (against the wishes of the Joint Chiefs) and everyone’s surprise over the mass attack south of Chinese soldiers are also described.

One section describes the air war and addresses the early aircraft assigned to the conflict. Latham speaks to the arrival of the MiG-15 fighter, the upgrading of U.S. aircraft types, and the dogfights that took place in “MiG Alley” in the northwest corner of Korea. Of special interest to me was the condition of B-29 bombers that flew in the war. These aircraft flew from Okinawa, and many aborted combat sorties before even entering Korean airspace. With the advent of the atomic weapons in 1945, America thought a nuclear monopoly would deter any adversary. Yet, a mere five years later, the United States was thrust onto the Korean peninsula fighting a land war for which it was unprepared.

Task Force Smith, an inadequately trained and equipped unit, was sent into battle in 1950 as a stopgap measure to curtail the North Korean onslaught. This led to many captured, wounded, and dead Americans. Latham describes in detail the condition of the U.S., South Korean, and civilian prisoners of war held by the North Koreans and the Chinese throughout the war. The book also describes the process for a negotiated end to the conflict and concludes with comments on the repatriation of POWs and the criminal allegations against some Army soldiers for collaboration with the enemy.

I recommend this book for its detailed coverage of the conditions of American POWs, the military strategy employed, and the interplay between the military and political elements within our government.

Col. Joe McCue, USAF (Ret.), Leesburg, Virginia.

Evolution of the Secretary of Defense in the Era of Massive Retaliation: Charles Wilson, Neil McElroy, and Thomas Gates, 1953-1961. Special Study 3 in the Cold War Foreign Policy Series. By Erin R. Mahan and Jeffrey A. Larsen, series eds. Washington, D.C.: Historical Office, Office of the Secretary of Defense, 2012. Notes. Pp. 41. \$34.95 paperback. Available as a free download from <http://history.defense.gov/resources/SpecStudy3.pdf>

This little booklet is a very useful introduction to three early Defense Secretaries who served in the Eisenhower administration. Each faced different challenges and circumstances in the years between Korea and Vietnam. The third in a special studies series issued by the Office of the Secretary of Defense, it offers readers a brief survey of each individual, sketching their actions and placing them within the larger context of Department of Defense history and the history of the Cold War. If necessarily succinct, Mahan and Larsen nevertheless have done a remarkably thorough job of discussing the strengths and weaknesses of each of these important political figures and the implications of their styles and decision-making upon defense policy and the direction of national security affairs.

Finally, this study offers further evidence that some of the most useful publication efforts governmental history offices can undertake are shorter, more-focused works that serve as introductions and which meet the needs of students and

practitioners from high school through the Joint Staff. Meticulously documented, this is an admirable work, and the authors and office are to be commended for having undertaken this most useful series. Highly recommended!

Dr. Richard P. Hallion, Research Associate in Aeronautics, National Air and Space Museum.



Churchill and his Airmen: Relationships, Intrigue and Policy Making 1914-1945. By Vincent Orange. London: Grub Street, 2013. Photographs. Bibliography. Index. Pp. 314. Hard cover \$49.95 ISBN: 978-1-908117-366-6

Readers of *Air Power History* are undoubtedly familiar with the late Vincent Orange, a noted biographer of some of the most significant (if often neglected) commanders in British and Commonwealth military aviation including Arthur Coningham, Hugh Dowding, Keith Park, John Slessor, and Arthur Tedder. Orange, a scholar of air power history who, sadly, died during the proofing of this book, has left a rich legacy to the field. His last book is one which adds further luster (if some poignancy) to his memory. It is an essential reading for the student of air power, without question a most valuable study that offers both provocative insights and challenging judgments, and a fitting capstone to a well-lived life of scholarship.

The book is sweeping in scope, covering the periods of the Great War and the interwar years that followed and carrying its story through the dark early days of the Second World War and to ultimate victory in August 1945—a victory that Churchill, recently defeated, could not fully savor. There are several ways in which Orange could have structured this book, and another author might have decided upon a series of individual chapters on each airman and their relationship with Churchill. Orange, wisely, rejected such an approach (which would be more about the air commanders and their relationship with Churchill, not the other way around) in favor of an integrated work of twenty-three chapters. It runs from formation of the Royal Flying Corps and the Royal Naval Air Service in the wake of Blériot’s 1909 Channel crossing (that forever ended Britain’s providential defensive isolation from the Continent); through the wartime years and the formation of the Royal Air Force in the wake of Germany’s airship and bomber raids; the battles after the war to keep the RAF as a separate service in an era of extreme stringency; across the

great issues of the interwar period, including planning the defense of Singapore; the debate over the bomber; awaking Britain to the German air threat; the outbreak of the Second World War and Churchill's return to power; and then all the campaigns of that global war up through the defeat of Japan.

Throughout, Orange draws on a rich body of scholarship; and his bibliography both confirms his command of the subject and offers a most useful reference for those pursuing their own research. He writes commandingly as well. While no uncritical admirer of Churchill (who had, at best, imperfect judgment, evidenced in his belief that air attack would accomplish little against capital ships, or against ground forces), he accepts that Churchill had "endless energy, powerful personality, and exceptional capacity for leadership, especially in the blackest days of the war." Overall, the book is much more than its title would indicate, for Orange places the activities of Churchill and "his" airmen within a much larger European (and eventually global) context and continues his story well after the Second World War through the deaths of all his principal actors. It is a remarkably comprehensive study.

Still, there are some surprising omissions in the otherwise extraordinarily complete bibliography: David Edgerton's provocative *England and the Aeroplane: An Essay on a Militant and Technological Nation* (1991), Alfred Gollin's magisterial *The Impact of Air Power on the British People and their Government, 1909-14* (1989); Robin Higham, *Britain's Imperial Air Routes 1918 to 1939: The Story of Britain's Overseas Airlines* (1960); Robin Higham; *The British Rigid Airship, 1908-1930: A Study in Weapons Policy* (1961); Robin Higham, *Two Roads to War: The French and British Air Arms from Versailles to Dunkirk* (2010); Sir Samuel Hoare's memoir *Empire of the Air: The Advent of the Air Age, 1922-1929* (1957); and C. S. H. Vane-Tempest-Stewart's apologia, *Wings of Destiny* (1943). All of these offer relevant perspectives that would have added to the work.

As well, I could not find mention of Sir Robert Vansittart, Permanent Under-Secretary of State for Foreign Affairs from 1930-38, and a key advocate of British air rearmament. Sir Eric Geddes is mentioned only in connection with his Great War duties as First Lord of the Admiralty and not as the chief of Imperial Airways, a public-private company so badly managed that it fell far behind foreign airline standards and was incapable of playing any sort of effective role in supporting Britain's military operations in France in the first

nine months of the Second World War. Again, I did not find mention of Imperial Airways in the text, even though civil and military aviation were inextricably intertwined, and their acquisition priorities often clashed. The book could have benefited from closer proofing—readers are reminded, in fairness to Orange, that he died before he could complete this—as there are some errors of dates and identifications, though none so bad as to mar the value of the book.

The book's only great deficiency stems from Orange's decision not to include reference notes "to make it more easily accessible to the general reader." But this is hardly a book a "general reader" is likely to select, and the sort of readers likely to consult it would, in most cases, wish to see the sources for interpretations and quotes, particularly when dealing with controversy and speculation. Many of these may be found by relating the subject to various memoirs and biographies in the bibliography; but, in other cases, the quotes are clearly drawn from archival documents. That, of course, is a different matter.

This is an essential study for anyone examining the history of British aviation from the immediate post-Wright period to the advent of the early jet age and the Cold War. We should be most thankful that Vincent Orange saw fit to pursue this highly recommended work.

Dr. Richard P. Hallion, Research Associate in Aeronautics, National Air and Space Museum.



Meeting the Challenge: The Hexagon KH-9 Reconnaissance Satellite. By Phil Pressel. Reston, Va.: American Institute of Aeronautics and Astronautics, 2013. Photographs. Illustrations. Appendices. Index. Pp. xxviii, 297. \$39.95 ISBN: 978-1-62410-203-5

When the National Reconnaissance Office (NRO) declassified Corona the first U.S. photoreconnaissance satellite program in February 1995, a spate of official studies and scholarly books almost immediately deluged the general public with previously top-secret details. While declassification of Hexagon, the exceedingly more complex successor to Corona, in September 2011, sparked a transitory buzz across the news media, there seemed to be scant scholarly interest in analyzing its details. Those thirsting for something more than the nitty-gritty found themselves, more often than not, searching the internet for official postings on the NRO or Central Intelligence Agency (CIA) web-

sites. Historians of national-security and military space hoped the publication of *Meeting the Challenge* would deliver a less constrained, unofficial perspective.

Pressel is a mechanical engineer who worked more than thirty years for Perkin-Elmer Corporation, the company that designed and built the Hexagon camera system under CIA contract. As a project engineer, he was intimately involved with design, development, and production of the Hexagon camera assembly and its various subsystems in the late 1960s and with analysis of its on-orbit performance through the 1970s–1980s. Pressel set out in 2004, with CIA permission, to write the story of the KH-9 satellite code named Hexagon and identified by the media as Big Bird and its unprecedented technological complexity. To augment his firsthand knowledge, he gathered information from more than two dozen former coworkers.

Meeting the Challenge is the result of Pressel's nearly decade-long undertaking and is, fundamentally, an engineering history. It delves into how scientists and engineers resolved mind-numbing technical challenges, how innovative sometimes amazingly ingenious processes contributed to seemingly unsolvable design problems, and how a government-industry team struggled cooperatively to build and launch a fifteen-ton payload that measured sixty feet long and ten feet in diameter. The most sophisticated satellite in the world, it carried four reentry capsules, each capable of transporting more than 80,000 feet of exposed film back to Earth for aerial recovery by the U.S. Air Force and stereoscopic interpretation by intelligence analysts. In nineteen chapters and six appendices, Pressel and his collaborators test a lay reader's patience and comprehension with detailed explanations of the looper, twister, optical bars, platen assemblies, image motion compensation, focus control, servo-control systems, film characteristics, functionality testing, S-cubed sensor, and more.

A unique aspect of the book is inclusion of personal anecdotes. Mindful that people, not machines, are the ultimate contributors to any historical drama, Pressel assures readers that his Hexagon narrative "contains some human-interest stories about its participants and their feelings and experiences." Collectively, they represent the most informative nontechnical contribution thus far to the Hexagon literature. From Joe Prusak's telling how he started working on Hexagon's film path to Oscar Berendsohn's version of meeting with Beryllium Corporation representatives to discuss breakage of a crucial take-up component, personal recollections bring Hexagon's history alive. These stories offer

refreshing interludes from the otherwise pervasive tedium of programmatic or hardware technicalities.

Those familiar with official histories of Hexagon might quibble with Pressel's prefatory contention that his is the first publication by anyone who actually worked on the program. Indeed, another Perkin-Elmer mechanical engineer, Richard J. Chester, wrote a top-secret volume titled *A History of the Hexagon Program The Perkin-Elmer Involvement* in 1985. The NRO declassified and published it, with some redactions, in April 2012. Regardless of what a comparison of the two narratives might reveal, *Meeting the Challenge* definitely belongs on every space historian's bookshelf.

Dr. Rick W. Sturdevant, Deputy Director of History, HQ Air Force Space Command.



Apollo: The Epic Journey to the Moon, 1963-1972. By David West Reynolds. Minneapolis, Minn.: Zenith Press, 2013. Maps. Diagrams. Illustrations. Photographs. Bibliography. Index. Pp. 272. \$40.00 ISBN: 978-0-7603-4452-1

It was a joy to review this book. Well written and researched with stunning photographs (both number and quality), it is more than a coffee-table book. It covers its subject comprehensively in a very engaging format. Reynolds aims at the average reader, avoiding excessively technical jargon, and takes the time to explain concepts in sufficient depth to ensure understanding. The result is not only a better understanding of Apollo itself but also, more importantly, a sense of wonder at the awesome technical achievement that was man's landing on the Moon. I reviewed another book on our space program, *Into the Silent Sea*, which gave a human face to the quest for space; but this book really brought home the challenges and amazing accomplishments of this country in safely landing a man on the Moon.

The book is arranged chronologically starting well before the modern era with the people who first fired man's imagination about the Moon: men like Galileo, who began to lift the veil of mystery from the Moon, and Jules Verne, who wrote of travelling to our nearest neighbor but did so with a basis of reason and logic. Reynolds then discusses development of thought in space travel and rocketry and the pioneers who set the stage for the Apollo team's achievements: the Surveyor unmanned lunar probes, Mercury, Gemini, and Soviet space programs all receive attention, as

they impacted Apollo development. This section is well written and, despite its brevity (the first sixty pages), sets the stage for the later narrative.

The meat of the book covers the Apollo program including the personalities, technical challenges, and science involved in space travel and lunar exploration. Reynolds is at his best as he describes the challenges facing the nation as we tried to figure out how to accomplish this gargantuan task. His narrative conveys the sense of urgency and highs and lows associated with this massive undertaking. Throughout the story, he inserts discussions including the technical aspects of building and launching the most powerful device short of the atom bomb ever built and what it took to explore the surface of the Moon. These are accompanied by detailed illustrations helping the reader better understand and appreciate the subjects. Reynolds weaves together the technical with the personal in an engaging and informative manner.

There is no doubt he believes Apollo marked a high point of achievement for American society. He argues we face similar challenges here on Earth that we could tackle if we had the determination and sense of community that were hallmarks of the Apollo program. This argument borders on preachy at times but isn't so strident that it detracts from the book's readability. He also believes, with Von Braun and others, that continued space exploration is not only possible but has many benefits we've given up when U.S. leaders turned their gaze back to the Earth. Interestingly, Reynolds is not a professional historian, although he is a trained academic holding a doctorate in archeology. He has wide ranging interests and demonstrates that his talents definitely include storytelling of the first order.

The book is tremendously well put together, but the jewel is the photos. Their choice, clarity, and amazing quality are worth the price without any text whatever. Some of them are familiar, but many more were new to me and provide perspective and contribute to the sense of wonder that we managed to put men into space. This book is well worth the price for its concise telling of Apollo's story and, most especially, for the exceptional pictures.

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



Hero of the Angry Sky: The World War I Diary and Letters of David S. Ingalls, America's First Naval Ace. By Geoffrey L. Rossano, ed. Athens: Ohio University Press, 2013. Photographs. Notes.

Appendices. Bibliography. Index. Pp. xx, 377. \$28.95 ISBN: 978-0-8214-2018-8

Geoffrey L. Rossano is a noted World War I Naval Aviation historian who won the 2013 Admiral Arthur Radford Award for Excellence in Naval Aviation History and Literature presented by the National Naval Aviation Museum Foundation. The award recognizes an historian's broad body of work. As editor of David Ingalls' diary and letters, Rossano lets those documents tell the story of a young Yale University student's emergence as a combat pilot. This is the inaugural volume in the publisher's War and Society in North America Series.

At the beginning of each chapter, Rossano provides an overview of what is to follow by establishing an historical context—a useful guide for readers unfamiliar with the U.S. Navy's role in the air in World War I. The letters, most of which were written to Ingalls' parents, proceed in chronological order beginning with the spring and summer of 1917 when he trained with the First Yale Unit in Florida and New York. Along the way are excerpts from his diary or journal. Rossano frequently cites his own and others' works to better identify Ingalls' friends and associates. In fact, Rossano's use of footnotes to elaborate on personalities, places, and aircraft is one of the book's strengths.

From September 1917 to December 1918, Ingalls served in Europe with a variety of units as he passed through several different stations for training and operations. Before Ingalls made his mark flying Sopwith Camels with the Royal Air Force's No. 213 Squadron in August and September 1918, he was already an accomplished pilot in a wide range of aircraft from flying boats to the Airco D.H.9.

By today's standards, Ingalls would be considered an exchange pilot—an American serving with a British unit. In August and September he flew almost daily combat, weather permitting. His letters and diary entries record his victories in detail. Interestingly, Ingalls recorded only one unshared victory, against a Fokker D.VII on September 20. But the standards for becoming an ace in World War I were different. A shared victory counted as one complete victory, so Ingalls officially was credited with six kills, including one balloon. Eddie Rickenbacker, America's leading ace, was credited with 26 victories; three of which were shared with other pilots.

As the Allies began to roll back the Germans in Flanders in southwest Belgium, Ingalls and his mates increasingly engaged in ground-attack missions. During this time, the tone of his diary

entries changed dramatically. He realized his chances of surviving the war had greatly diminished.

Because Ingalls flew all his combat missions from bases near or on the coast in northwest France against German opposition in southwest Belgium, a map of the area would have been most useful for understanding the distances involved. Otherwise, Rossano has done a superb job of introducing the life and times of this legendary World War I pilot.

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



On Alert: An Operational History of the United States Air Force Intercontinental Ballistic Missile Program, 1945–2011. By David M. Spires. Colorado Springs: Air Force Space Command, 2012. Index. Photographs. Appendices. Bibliography. Pp. 348. Available as a free download at <http://afmissileers.com/onalert.pdf>

This book is an outstanding history of the land based intercontinental ballistic missiles that make up a vital part of the Triad (USAF ICBMs, USAF bombers, and USN Polaris/Poseidon/Trident ballistic missiles) that provided a nuclear deterrent to aggression by the USSR during the Cold War, and still are on guard against a nuclear attack on the United States.

Spires begins at the end of World War II with the Army Air Forces' look into the future under Gen. Hap Arnold's direction. Initially the Army Air Forces, like the Navy, concentrated on cruise missiles with the reverse-engineered German V-1 "Buzz Bomb" as their model. However, RAND, the Army Air Forces think-tank established in 1946, came up with a report comparing air-breathing and ballistic missiles that favored the latter. That led to another look at Convair's proposal for a long-range rocket. Convair had named their long range rocket "Atlas," and it went on into development and production as the first American ICBM.

Each of the Air Force ICBMs is described in detail, including the development process, and the politics—both national and intra-service—in bringing each missile into operational acceptance. He deals with Atlas and Titan I and II, both liquid-fueled missiles, and describes in detail the hazards of handling the volatile fuels and oxidizers. Those missiles were phased out in favor of solid-rocket propelled missiles, Minuteman and Peace-

keeper, which promised higher reliability and fewer hazards.

Spires goes into great detail about the design and construction of missile sites and the command-and-control arrangements. He also covers the personnel problems that developed with alert crews dealing with shift work, the requirement to master and comply with detailed checklists, and the boredom that inevitably resulted.

As a naval officer, I made three deterrent patrols in a guided missile submarine during 1960-1961 after being a war-head officer and missile guidance officer in the Regulus cruise missile program. I found Spires' book fascinating and well worth the time to read, although the shift work problems involved didn't quite seem to measure up to the hardships of sixty-nine to seventy-day patrols at sea.

*Capt. John F. O'Connell, USN (Ret.),
Docent, National Air and Space Museum.*



Airship: Design, Development, and Disaster. By John Swinfield. Annapolis Md.: Naval Institute Press, 2012. Photographs. Glossary. Bibliography. Notes. Index. Pp. 336. \$45.95 ISBN 978-1-59114-034-4

If you want to understand some of the complex history of airships, dirigibles, and blimps, read this book. Swinfield has included much detailed research into the technology, development, marketing, politics, nationalism, and key people involved in airship history. There are some good technical explanations throughout the book. This is not an engineering design book on airships; however, newly discovered first-hand material adds interesting history and depth to the stories of this beginning of global flight.

Swinfield is a well-known BBC/TV journalist who produced a film for British ITV over thirty-five years ago about *Europa*, a new airship then being built in Cardington, England. He never forgot his flight in *Europa*, and the "siren call" etched in his mind the special allure of flying, or "sailing," in an airship. Even with this emotional bias, Swinfield has tried to convey a balanced history (positive and negative) of airship development. He defines the three types of airships: the largest, rigid airships (internal skeleton); the smallest, blimps (no internal skeleton); and the semi-rigid with a rigid bottom keel. There are challenges to the reader, with some chapters' timelines and background overlapping one another.

Development history of the airship is

very interesting. "Though pioneering work had been conducted in France, it was in Germany that the airship found its spiritual home." The German military and civilian uses created the technology base for all countries to follow and build upon. The first half of the book is very heavy on British airship development, including military and civilian-passenger business. Swinfield well describes the sometimes excessive governmental interference and political involvement is a very human and sobering story. Even though the British always trailed the Germans in technology, they did develop the mooring mast in 1919. This allowed safer docking and embarking for all airships in all countries.

Swinfield reviews the many milestones of global airship development, giving data and background on the key airships of the world from the early 1900s to late 1930s: Britain (R33, R34, R100, R101), Russia, Italy, France, Spain, United States (*Shenandoah*, *Los Angeles*, *Akron*, *Macon*), and Germany (*Graf Zeppelin*, *Hindenburg*). The history of these important airships and details on their construction, problems, flights, and disastrous endings are covered in varying degrees.

In many respects, this is a very sad story: overconfidence, poor judgment, politics, and the always critical dependence on weather determined the outcome. Who can forget the news headlines and news-reel images of the *Hindenburg* disaster in 1937 in New Jersey? Or the losses of *Macon* in 1935 and *Hindenburg* that signaled the collapse of the airship dream worldwide. This book also features an Appendix with five major items of interest including a log of the First Officer of the R101.

Mr. Swinfield's Epilogue: "Will the Airship Sail Again?" is thought provoking and realistic. We have many new and special technologies that can be applied to airships; however, commercial, technical, and the always critical weather problems remain to be solved. This aeronautical story has many more ups and downs in its still developing future.

Paul D. Stone, Docent, NASM's Udvar-Hazy Center



World War II London Blitz Diary. By Ruby Side Thompson, edited by Victoria Aldridge Washuk. Charleston, S.C.: Self published, 2011. Photographs. Pp. 209. \$14.99 ISBN: 978-146378369-3

Diaries are often some of the most revealing records of times past, since they

contain the writer's perceptions of events as they occur rather than how they are remembered. If the diary is passed to the reader without revision by the writer or others, a unique window into the past is opened that is often at odds with histories published later. This diary is such a window.

Ruby Side Thompson kept a total of forty-three diaries throughout her life, not so much as a record of events but rather as an outlet for her creativity and frustrations over what she deemed an unhappy marriage. It is a testament to her ability to reveal her feelings in these diaries that her editor, and great-granddaughter, was surprised and dismayed to read what her ancestor had to say about her home life. The reader is fortunate, though, in that Ruby did not feel the need to speak in euphemisms or talk around subjects in these diaries. We see her happy, sad, angry, frightened, and ultimately determined to persevere through whatever might happen.

This volume covers the start of World War II through the first part of the German Blitz against England. Thompson kept house for her husband and two grown sons (when they were on leave from the RAF) in a small community on the outskirts of London. She describes the routines of life in a small community and details her interactions with her husband and in-laws at length. This provides an interesting view of life in what might be considered a not atypical English household of the time. Thompson, though, is no passionate supporter of the war. She has much more in common with more modern feminists and antiwar activists in her opinions, although they are never expressed beyond the confines of the diary. She sees the war as the work of obstinate and stupid men bent on destruction. She greatly fears this will include the deaths of her two youngest sons. Her descriptions of enduring the repeated bombings are immediate and straightforward providing a clear picture of the pain and fear that was the lot of so many civilians around the world who suffered attack from the air. In spite of this, the routines of life went on. She shopped for clothes and went to the hairdresser and planned to travel to the United States to visit her other children and grandchildren. Through all this we see the impact of bombing civilians, terrifying in its immediacy but ultimately no more useful in bringing about peace by itself than any other tool of war.

The book is essentially the diary printed and published as is. There is a forward and afterword where Wahuk explains her perspective and reasons for publishing the diary; but there are no notes and, based on the numerous gram-

matical errors, apparently no effort to correct the original. Ruby's mistakes are minor and in no way detract from the readability. There is a "cast of characters" at the beginning identifying key family members mentioned in the book and some pictures of Ruby at various ages, her husband, and several sons. As is often the case with diaries the author never intended to publish, Ruby made no effort to moderate her feelings as she wrote and, so, expressed some extreme views. These serve to show the humanity of someone caught in a terrible situation—both her marriage and the war. As a record of one woman's experience, it is enlightening and counteracts the propaganda of the stoic Britisher willing to sacrifice all to defeat Hitler's evil. Students of airpower will find it useful in its depiction of war from the civilian viewpoint, one too often lost in official histories of the great air campaigns of World War II.

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



A Chronology of Aviation: A Day-by-Day History of a Century of Powered Flight. By Jim Winchester. London: Amber Books, 2013. Tables. Illustrations. Photographs. Index. Pp. 160. \$24.35. ISBN: 978-1-78274-067-4

There have been quite a few chronologies of aviation or aerospace published over the years. Most are primarily just what they say: a chronological listing of whatever the author considers major events in the history of aviation—not terribly useful unless one just wants to know what happened on some date in the past.

Winchester is a British aviation author who has taken the genre an order of magnitude further. Of course, the subtitle "Day-by-Day History" is ridiculous, just as are those titles wherein authors claim to have written "The Complete . . ." No one can write a complete history of anything, and no one can compile a day-by-day history, either. But Winchester has included hundreds of events from A.D. 1010 through early 2013 in one of the best chronological histories of aviation I have seen—albeit at the overview level.

And that's probably where this book excels. If some visitor to the National Air and Space Museum were to ask me to recommend a one-book history of man's quest to conquer the air, I think this would be it. And, with a quite good narrative and over 260 photos and illustrations, it isn't just a dry listing of things that happened. Winchester breaks the history of aviation into eight periods: first steps, pioneers and

perils, 1914-1918, the birth of passenger aviation up to World War II, the war years, breaking records, the Cold War, and the modern era. Within each of these chapters is a narrative covering the world situation, the social context of the aviation advances, technology improvements, and the major events associated with the period. The pages are in two-column format with the timeline occupying the outer half of the right-hand page of each pair. Many of the events listed are discussed in the narrative; others are additional items that Winchester considers significant to tell the aviation story.

The photos were very well selected. We've all seen books where it looks like the author felt he had to have some photos and put some in no matter whether they added anything to the book or not. Each of Winchester's many photos is useful in illustrating the events discussed or the technology of the period; and all are reproduced in quite excellent quality. Together, they represent a nice collection of both the people and the machines involved in aviation's history.

There are several errors that should have been caught in a review or editing process. In one instance, a date in a photo caption disagrees with the date given in the narrative. As this occurred at the beginning of the book, I was immediately a bit wary of how much of this I was going to find. But I found only one other error, in which case an event was double listed on the same date in two successive years. Overall, then, Winchester has done a good job of presenting a lot of information in a useful, chronological format.

I recommend the book for a novice who wants a concise primer on the subject and for those of us who do know something about the subject but would like an easy-to-read reorientation of the many events stored in our memories.

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



Float Planes & Flying Boats: The U.S. Coast Guard and Early Naval Aviation. By Capt. Robert B. Workman, Jr. USCG (Ret.). Annapolis, Md.: Naval Institute Press, 2012. Photographs. Index. Appendices. Glossary. Notes. Bibliography. Pp. xx, 253. \$27.95 ISBN: 978-1-61251-107-8.

Captain Workman exhibits "frustration" (his word) with the lack of solid information regarding his Coast Guard aviation heritage and the concurrent develop-

Books Received

Barzilai, Yaniv. *102 Days of War: How Osama bin Ladin, al Qaeda & the Taliban Survived, 2001*. Dulles, Va.: Potomac Books, 2013. [An imprint of the University of Nebraska Press.]. Maps. Bibliography. Index. Pp. xxxvi, 167. \$24.95 ISBN: 978-1-61234-533-8

Dorr, Robert F. *Fighting Hitler's Jets: The Extraordinary Story of the American Airmen Who Beat the Luftwaffe and defeated Nazi Germany*. Minneapolis, Minn.: Zenith Press, 2013. Notes. Photographs. Appendices. Bibliography. Index. Pp. 298. \$30.00 ISBN: (78-0763-4398-2

Farley, Robert M. *Grounded: The Case for Abolishing the United States Air Force*. Lexington: University Press of Kentucky, 2014. Photographs. Notes. Bibliography. Index. Pp. 230. \$26.95 Paperback. ISBN: 978-0-8131-4495-5

Yarborough, Tom. *Da Nang Diary: A forward aircraft Air Controller's Gunsight View of Flying with SOG*. Philadelphia and Oxford, UK: Casemate, 2013. [originally published by St. Martin's Press, 1990] Map. Photographs. Bibliography. Index. Pp. 356. \$32.95 ISBN: 978-1-61200-220-0

PROSPECTIVE REVIEWERS

Anyone who believes he or she is qualified to substantively assess one of the new books listed above is invited to apply for a gratis copy of the book. The prospective reviewer should contact:

Col. Scott A. Willey, USAF (Ret.)
3704 Brices Ford Ct.
Fairfax, VA 22033
Tel. (703) 620-4139
e-mail: scottlin.willey@gmail.com

ment of naval aviation as a whole. He particularly emphasizes the close collaboration between services from the initial efforts in the second decade of the twentieth century to the years immediately preceding World War II. Using as a literary vehicle the professional biography of Coast Guard Aviator #1 and U.S. Navy Aviator #38, Commander Elmer F. Stone, Workman has remedied his frustration.

Quite honestly, I was unaware of the close collaboration and frequent cross-pollination of ideas between the naval services—Coast Guard, Navy, and Marine Corps—when it came to aviation, its development, and its implementation. Workman has done an excellent job of righting that shortcoming in aviation literature. He describes many examples such as the Navy loaning aircraft to the Coast Guard; the training of over 500 Naval aviators at NAS Key West during World War I under a Coast Guard commanding officer; and assignment of Coast Guard officers to

Navy engineering projects, operational commands, and training centers.

Slightly more than the first half of the story covers the period from 1898 through the first transatlantic flight by the NC-4. Workman covers Stone as he and a host of early aviation greats, such as Chambers, Towers, Byrd, Mitscher, Rickenbacker, and others who knew each other, worked to move aviation forward. He pays special attention to the development of the NC series of flying boats that were intended to make the first transatlantic crossing. The story of the development, use, testing, and eventual success of the NC-4 is filled with stories of individual initiative and daring. That's what it took to cross the Atlantic in 1919 from the U.S. to the Azores, continue to Portugal and Spain, and ultimately reach the intended goal of England.

The use of vintage pictures and reports of test results and supporting correspondence adds significantly to the story. The development of catapults, for

instance, is documented in depth. Interestingly, the significant part in this development work played by a pilot who would not use the system—since he was a Coast Guard aviator his entire career—only adds to the story of cross-service collaboration.

The last two chapters detail the acquisition of the early aircraft used by the Coast Guard and serve as a useful reference for aircraft and air stations during the period up to 1938.

Overall, the book is a good and easy read. The appendices add quite a bit to it and make significant information easy to find. Workman follows a reasonable timeline with some understandable overlap, since the history and development of aviation missions within the individual services is discussed.

Msgt. Al Mongeon, USAF (Ret.)



Exciting Modern Work on the Tuskegee Airmen



The Tuskegee Airmen, An Illustrated History: 1939-1949, by Joseph Caver, Jerome Ennels, and Daniel Haulman, is a comprehensive account of the pioneering group of African-American pilots beginning prior to World War II. Using many never-before-published photographs, the exploits of the pilots—as well as their support personnel—are chronicled in fine detail. An important feature of this book is a chronology detailing missions flown. The facts presented here debunk some of the myths and legends surrounding this exceptional group. A complete pilot roster is also included.

Available from NewSouth Books: www.newsouthbooks/tuskegeearmen, (334) 834-3556, ISBN 978-1-58838-244-3, \$27.95

Coming Up



Compiled by
George W. Cully

April 14-17, 2014

Global War Studies and the **Royal Military Academy Sandhurst** are pleased to announce "1944: Seventy Years On," an international conference on the Second World War with 1944 as its core theme. The conference will be held at the Academy. For more details, contact Robert von Maier via e-mail at globalwarstudies@gmail.com.

April 17-19, 2014

The **Vietnam Center and Archive at Texas Tech University** will present its 8th Triennial Vietnam Symposium at the Overton Hotel and Conference Center in Lubbock, Texas. For additional information, contact director Steve Maxner at steve.maxner@ttu.edu.

April 28-May 4, 2014

The **American Society of Aviation Artists** will host its 2014 Forum at the San Diego Air and Space Museum in San Diego, California. The Forum will also mark the opening of an aviation art exhibition at the Museum which will run for three months. For additional information, see the Society's website at www.asaa-avart.org/visitors/news.php.

April 29-May 2, 2014

The **Aviation Engine Historical Society** will hold its eleventh annual convention in San Diego, California. This year's program features visits to the San Diego Air & Space Museum, the Planes of Fame Air Museum, and the Yanks Air Museum plus a great round of presentations. For further details, see the Society's website at www.enginehistory.org/

May 1-3, 2014

The **Association of Former Intelligence Officers** and the **National Geospatial-Intelligence Agency** will co-host their 2014 Intelligence Symposium at the National Geospatial-Intelligence Agency located in Springfield, VA. Attendees must be U.S. citizens, and Friday's panels, speakers, and luncheon will be held at the Crowne Plaza Hotel in Vienna/Tysons Corner, Virginia. For more details, see the AFIO website at http://www.afio.com/05_events_2014.htm.

May 4-7, 2014

The **Army Aviation Association of America** will host its annual Professional Forum and Exposition in Nashville, Tennessee. For further information, see the Association's website at www.quad-a.org/.

May 7-9, 2014

The **National Naval Aviation Museum Foundation** will host its annual Naval Aviation symposium at the museum in Pensacola, Florida. For more details as they become available, visit the Foundation's website at www.navalaviationmuseum.org/news-and-events/60-symposium.

May 12-15, 2014

The **Association for Unmanned Vehicle Systems International** will host its annual Forum and Exhibition in Orlando, Florida. More details are posted on the Association's website at www.auvsi.org/AUVSI/Events1/AUVSIEvents.

May 19-22, 2014

The **Space Society** will present its 30th annual symposium at the Broadmoor Hotel in Colorado Springs, Colorado. For further information, see the Society's website at www.spacefoundation.org/node/43.

May 20-22, 2014

The **American Helicopter Society** will hold its 70th Annual Forum & Technology Display at the Palais des congrès de Montréal in Montréal, Quebec, Canada. The theme of the conference is "Celebrating International Cooperation in Vertical Flight Technology." For more details, see the Society's website at <http://www.vtol.org/events/ahs-70th-annual-forum-and-technology-display>.

June 6-8, 2014

The **National D-Day Memorial**, located in Bedford, Virginia, will host a 70th anniversary commemoration ceremony, a parade, and an ecumenical service to honor one of WWII's most significant events. For more details, visit the Memorial's website at www.dday.org.

June 16-20, 2014

The **American Institute of Aeronautics and Astronautics (AIAA)** will sponsor its 20th International Space

Planes and Hypersonic Systems and Technologies conference and its 21st Lighter-Than-Air Systems Technology conference in parallel at the Hyatt Regency Atlanta Hotel in Atlanta, Georgia. For more info, see the AIAA's website at www.aiaa.org.

July 9-12, 2014

The **Ninety-Nines**, the international organization for women pilots, will host its annual meeting in New Orleans, Louisiana. For additional information, see their website at http://www.ninety-nines.org/index.cfm/conference_dates.htm.

July 29-August 2, 2014

The **International Committee For The History of Technology** will hold its 41st annual symposium in Brasov, Romania. The theme of this year's symposium is "technology in periods of transition." For further details, see the Committee's website at www.icohtec.org.

August 7-10, 2014

The **Mars Society** will hold its 17th annual convention at the South Shore Harbour Resort in League City, Texas, just minutes from NASA's Johnson Space Center. The gathering will bring together key experts, scientists, policymakers and journalists to discuss the latest news on Mars exploration and efforts to promote a human mission to the Red Planet. For details, see the Society's website at www.marssociety.org/home.

September 4-7, 2014

The **Tailhook Association** will hold its annual gathering at John Ascuaga's Nugget Hotel and Convention Center in Reno, Nevada. For more information, visit the Association's website at <http://tailhook.net/>.

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

George W. Cully
3300 Evergreen Hill
Montgomery, AL 36106
(334) 277-2165
E-mail: warty@knology.net

Reunions

3389th Pilot Training Squadron Apr 9-13, 2014, Dayton, OH Contact: Don Schmenk
5049 South Agner St,
Ottawa, OH 45875-9797
419-306-3383
dschmenk@bright.net

Vietnam/Thailand Air Force "Sky Cops." Apr 11-13, 2014, Fairborn, OH Contact: Pat Houseworth
540 West Livingston St,
Celina, OH 45822
419-586-3076
pathouseworth@gmail.com

12th TFW (Vietnam), 12th FEW/SFW (Korea) 12th FTW (Randolph), 306th FTG (12 FTW) USAFA, 479th FTG (12 FTW) Pensacola. Apr 23-26, 2014, Pensacola, FL. Contact: "E J" Sherwood
480-396-4681
EJ12TFW@cox.net

B-58 Hustler Assn May 1-4, 2014, Ft Worth, TX Contact: Richard Bolcer
817-249-5019
rich92437@sbcglobal.net

4950th Test Wing/Aria 328 Memorial. May 6, 2014, Fairborn, OH. Contact: Bob Beach
1616 Ridgeway Dr,
Springfield, OH 45506-4023
937-325-6697
w81cz@woh.rr.com

95th Bomb Grp Mem Foundation. May 7, 2014, Dayton, OH. Contact: Meg Brackney
216 Northwood Dr,
Yellow Springs, OH 45387
937-767-2682
meggyjb@aol.com

Blindbat C-130A Flarebirds May 19-21, 2014, Las Vegas, NV Contact: Dennis Miller
2014 Desert Quail Dr,
Las Vegas, NV 89128
702-363-4231
dmillerrr@embarqmail.com

449th Bomb Group Aug 6-9, 2014, Fairborn, OH Contact: Mary Crowley
16292 Content Circle,
Huntington Beach, CA 92649
714-840-1805
tcrow16@aol.com

AC-119 Gunship Reunion Sep 18-21, 2014, Albuquerque, NM Contact: Col Steve Mac Isaac, USAF (Ret)
6449 Coventry Hills Dr, NE
Rio Rancho, NM 87144
505-867-3367 or 302-249-1499
colmacmac@mac.com

384th Bomb Group. Oct 16-19, 2014, Fairborn, OH. Contact: Frank Alfter
1306 Adams Way,
Beavercreek, OH 45434
937-306-2142
fjalfter@gmail.com

496th Tactical Fighter Squadron. Oct 23-26, 2014, Fairborn, OH. Contact: J. Kevin Roll
677 Todd Trail,
Newport News, VA 23602
918-815-2629
rolljk@yahoo.com

496th TFS/50th TFW - Hahn AB, Germany (1970-75) Oct 23-26, 2014, Fairborn, OH Contact: Bill Flanagan
9233 East Ave T-12,
Littlerock, CA 93543
661-944-3125
flapsflanagan@roadrunner.com

345th TAS/Yokota-CCK-Kadena May 2-4, 2014, Orlando-Kissimmee, FL Contact: Mike Petraszko
6445 Brookview Dr,
Saline, MI 48176
734-330-5259
reunion345yokota@aol.com

91st Bomb Group Assn May 21-25, 2014, San Francisco, CA. Contact: Mick Hanou
607 Blossom Ct,
Pleasanton, CA 94566-7783
925-425-3220
mhanou@comcast.net

8th Aerial Port Squadron Mobility Teams Jun 26-28, 2014, Springfield/Columbus, OH. Contact: R. S. Lewis
225 Fair St,
Pounding Mill, VA 24637
276-963-9122
lisaim@live.com

91st Strategic Recon Wing Assn Aug 11-16, 2014, Fairborn, OH Contact: Jerry Haines
2411 South Tecumseh Rd,
Springfield, OH 45502
937-325-9306
gerald_haines@yahoo.com

504th Bomb Group Assn Aug 27-31, 2014, Omaha, NE Contact: Ann M. Cacich
6600 131st St, West,
Apple Valley, MN 55124
612-414-9436
blanche1129@frontiernet.net

49th Fighter Squadron Assn Sep 11-14, 2014, Fairborn, OH Contact: John Jannazo
238 E Dixon Ave,
Dayton, OH 45419
850-974-4459
jannazo@aol.com

509th Composite Group Sep 11-14, 2014, Dayton, OH Contact: Robert Krauss
366 E. Wagner Rd
Buchanan, MI 49107
www.the509thremembered.com

91st Tactical Fighter Squadron Sep 24-27, 2015, Fairborn, OH Contact: Dion Makris
7152 Hartcrest Ln,
Centerville, OH 45459
937-938-7767
phantombcde@gmail.com

86th Fighter-Bomber Group Assn, WWII Oct 1-5, 2014 Fort Walton Beach, FL Contact: Dallas Lowe
850-319-0047
fighterbomberpilot@yahoo.com

4th Fighter Group (WW II) Oct 1-5, 2014, Fairborn, OH Contact: Keith Hoey
120 Bay Breeze Dr,
Belleville ON Canada K8N 4Z7
613-813-2727
khoey98@yahoo.com

63rd AAF-FTD Oct 12-17, 2014, Douglas, GA Contact: John A. Herrmann
3562 West Fork Rd.,
Cincinnati, OH 45211
513-481-0130
irmaandjohn@yahoo.com

1st AACS MOB Squadron Oct 16-19, 2014, Fairborn, OH Contact: James Mumaw
5748 Mallard Dr,
Huber Heights, OH 45424-4148
937-236-5323
bigmawmu@aol.com

List provided by:

Rob Bardua
National Museum of the U.S. Air Force
Public Affairs Division
1100 Spaatz Street
WPAFB, OH 45433-7102
(937) 255-1386

Letters

Kudos

The article, "The First Atomic Bomb Mission: Trinity B-29 Operations Three Weeks before Hiroshima," by Darrell Dvorak, was selected among the 2013 literature of nuclear history scholarship by Alex Wellerstein, a historian of science with the American Institute of Physics. Dvorak's biography of Col. Clifford Heflin, published in the winter 2012 issue, was likewise honored. See: <http://blognuclearsecrecy.com/2014/01/06/nuclear-history-bibliography-2013/#comments>.

I was particularly impressed with two articles in the winter 2013 issue: Darrell Dvorak's on nuclear testing and Michael Weaver's on Top Gun and Red Flag. I had a little to do with College Prom. Great work; keep it up.

Dick Hellier, former board of directors member of Air Force Historical Foundation

Editor's Note

Corrections

Last issue we had a couple of typographical errors that marred the magazine. There were 3 errors in Michael Weaver's article on College Prom/Dart. The author's biography on page 20 should have read 28th Infantry Division, not the 20th. In addition, on page 28, the first paragraph in the right column was missing the following text, "toward a common goal. College Dart was phased out in May as the Air Weapons Defense Weapons Center 1983 was retired." The accompanying footnote 115 was also skipped: History of ADCOM/ADC, 1 January-31 December 1979, p143.K410.011 Jan-Dec 1979, Vol. 1 USAFIWS Farewell and Reunion, "Operation Snowman. 1954-1983 K410.012 Jul-Sept 1983, Vol. 3

In Darrell Dvorak's article, "The First Atomic Bomb Mission: Trinity B-29 Operations Three Weeks before Hiroshima," on page 11; the photo was miscaptioned. It should have read "Clyde Stanley Shields, commanding officer of the flight test section of the 216th Army Air Forces Base Unit (Special)." Also, on page 14, caption should read "Major Clyde 'Stan' Shields wearing his Legion of Merit award." Both photos courtesy Keith Shields. The corrections have been included in the electronic version available for download.

In Memoriam

Col. Robert Sigethy, USAF, (Ret.) 1932=2014

Robert Sigethy, who served in the U.S. Air Force for thirty years, died of cancer on February 8, 2014. He was eighty-two.

Colonel Sigethy grew up in Jersey City, N.J. and was graduated from Lehigh University, Pennsylvania, in 1953. He earned a Ph.D. in Public Administration from American University in 1980.

He was assigned to research and development and education positions for most of his Air Force career. At the time of his retirement, in 1983, he was the Dean of Faculty and Academic Programs at the Industrial College of the Armed Forces. From 1982 to 2004, he taught at Marymount's School of Business Administration. He was the dean of the school from 1989 to 2002.

Colonel Sigethy is survived by his wife of sixty years, Jacqueline Burns, and daughters Alexis Slobodnick and Alison Sigethy.

Guidelines for Contributors

We seek quality articles—based on sound scholarship, perceptive analysis, and/or firsthand experience—which are well-written and attractively illustrated. The primary criterion is that the manuscript contributes to knowledge. Articles submitted to *Air Power History* must be original contributions and not be under consideration by any other publication at the same time. If a manuscript is under consideration by another publication, the author should clearly indicate this at the time of submission. Each submission must include an abstract—a statement of the article's theme, its historical context, major subsidiary issues, and research sources. Abstracts should not be longer than one page.

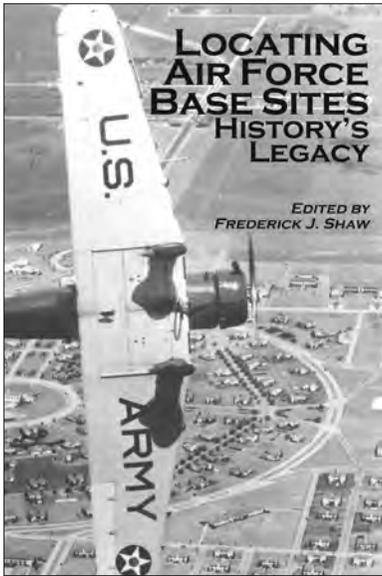
Manuscripts should be submitted in triplicate, double-spaced throughout, and prepared according to the *Chicago Manual of Style* (University of Chicago Press). Use civilian dates and endnotes. Because submissions are evaluated anonymously, the author's name should appear only on the title page. Authors should provide on a separate page brief biographical details, to include institutional or professional affiliation and recent publications, for inclusion in the printed article. Pages, including those containing illustrations, diagrams or tables, should be numbered consecutively. Any figures and tables must be clearly produced ready for photographic reproduction. The source should be given below the table. Endnotes should be numbered consecutively through the article with a raised numeral corresponding to the list of notes placed at the end.

Computer-produced articles should be submitted on a CD-R in Microsoft Word or equivalent format, for the PC. Disks should be labelled with the name of the author, title of the article, and the software used.

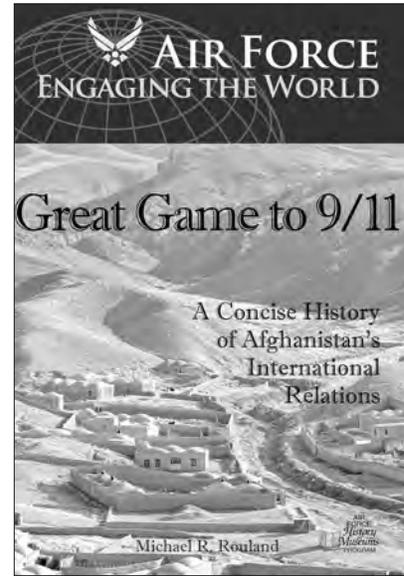
There is no standard length for articles, but 4,500-5,500 words is a general guide.

Manuscripts and editorial correspondence should be sent to Jacob Neufeld, Editor, *c/o Air Power History*, 11908 Gainsborough Rd., Potomac, MD 20854, e-mail: jackneufeld@verizon.net.

New Publications from the Air Force Historical Support Division

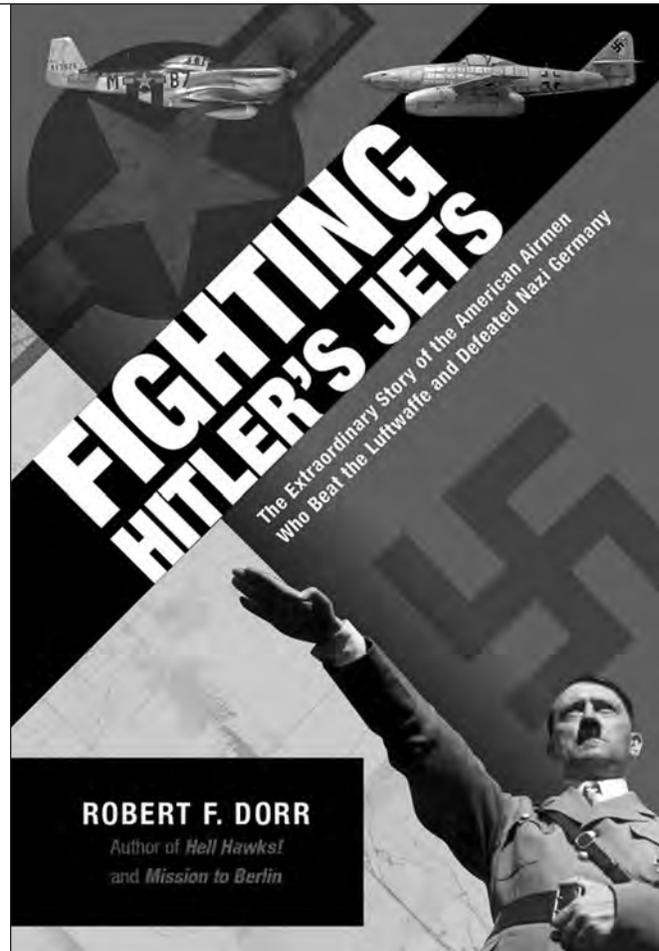


Two new works from the Air Force Historical Support Division. First, an update to Fred Shaw's 2004 volume *Locating Air Force Base Sites*. Requested by the Air Force Secretary's office, the update covers the 2005 BRAC and the introduction of Joint Basing. The second work is by Dr. Michael Rouland, a former intern in the Air Force Historical Studies Office now working for the Naval Historical Center. His study focuses on the tangled history of Afghanistan and how it has ended up mired in the current turmoil.



Available for download in PDF format at www.afhso.af.mil

Technical editor Robert F. Dorr is offering signed, first-edition copies of his new book "Fighting Hitler's Jets" at a reduced price to readers of this magazine on a not-for-profit basis. The book is a character-driven narrative of the experiences of Americans battling Germany's "wonder weapons" during World War II. Contact Bob at (703) 264-8950 or robert.f.dorr@cox.net





The mystery aircraft in our last issue was the Air National Guard C-38A Courier, a military version of the co commercial, mid-sized cabin Israeli Aircraft Industries/Galaxy Aerospace Corp. Astra SPX executive jet. The Air Force acquired two of the planes in a \$20.8 million contract awarded in 1996. A formal acceptance ceremony took place on April 18, 1998.

After the U.S. manufacturer Gulfstream acquired Galaxy, the civilian version of the plane was re-named the Gulfstream G100 in 2002.

The two C-38As (serial numbers 94-1569/1570, initially flown on the civil registry as N398AG/N399AG) are assigned to the 201st Airlift Squadron of the District of Columbia Air National Guard at Joint Base Andrews, Maryland. They were the 88th and 90th Astras on the IAI production line. They replaced C-21A Lear Jets in the squadron.

Two Honeywell TFE731-40 turbofan engines power the C-38A. The cabin seats up to eight passengers and can be converted rapidly for medical evacuation duty. The aircraft converts to medevac configuration with removal of up to 6 seats and

installation of one or two Spectrum 500 life support units. The aircraft is more commonly used for VIP transportation for small parties of government or military officials.

The C-38A differs from its civilian counterpart in having a military-grade global positioning system unit, Tactical Air Navigation, UHF and VHF secure command radio, and an “identification, friend or foe” system.

An improved civilian version, the Gulfstream G150, is “quickly becoming a favorite in the mid-sized market,” according to its maker. A G150 test aircraft established a city-pair speed record on a flight from Tel Aviv to Geneva.

Our follow-up C-38A portrait was taken at Andrews in 1998 by Bill Crimmins, who spent decades photographing aircraft in the Washington area.

Our “History Mystery” winner is Dave Wentzel of Charlotte, North Carolina. His prize is a copy of the just-published book “Fighting Hitler’s Jets,” a history of American pilots battling German jet aircraft in World War II.

So is the “History Mystery” contest too easy or too difficult? As we pass the quarter-century mark with this feature, readers are encouraged not only to enter the contest but to provide feedback. And, of course, it’s time to challenge you to identify our new “History Mystery” aircraft. Remember the rules:

1. Submit your entry via e-mail to robert.f.dorr@cox.net. Entries may also be submitted on a postcard to Robert F. Dorr, 3411 Valewood Drive, Oakton VA 22124.

2. Write a sentence about the aircraft shown here. Include your address and telephone number. One person had to be disqualified this time around because they did not include a phone number.

3. A winner will be chosen at random from among correct entries and will receive an aviation book.

And let’s get serious about those historical treasures in your attic or basement. Some readers say

they just don’t remember where their color slides are. That’s won’t assure the preservation of history. Dig out your slide or snapshot of a rare aircraft and lend it to *Air Power History* for this contest.



This Issue’s Mystery Plane



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