

AIR POWER

WINTER 2020 - Volume 67, Number 4
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History

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Center: McConnell.
Clockwise from Top
Right: Doolittle and
LeMay, Chapman,
Leavitt, Phillips, James
and Olds, Pitsenbarger.

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The Air Force Historical Foundation is preparing a book featuring **75 Great Airmen** who served between 1947 and today. Look for the book in 2022 to celebrate the Air Force's 75th Anniversary. Send your nominations to 75Great@afhistory.org

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COVER: The crowded deck of the *USS America* with two A-6A Intruders of Attack Squadron (VA) Thirty-Five just prior to a catapult launch. Aircrews of another Intruder and several A-7C Corsair IIs are awaiting their turn. Note the color variety of the shirts, denoting their task on the deck. (Marvin Baldwin)



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From the President

Dear Members,

This turbulent year continues to bring winds of change—from the predictable arrival of winter, to new initiatives by leaders of the Air and Space Forces, to the recent, remarkable quadrennial election and both resurgent cases and hopeful news associated with the novel coronavirus. Amid all of this, your Foundation marked a very positive cycle as you—our members—responded to the recent election magnificently!

Results of the vote were unambiguous and enthusiastic as you voted *en masse* for a new group of officers to join our Board of Directors. They are:

Major General Paul T. “PJ” Johnson, USAF (Ret)

Major General John L. Barry, USAF (Ret) – (Previously appointed)

Ms. Jonna Doolittle Hoppes (Returning board member)

Lt Joseph Burke, USAFR (Ret)

On behalf of members and Board alike, I welcome them to the exciting work the Foundation will be doing over the next year as we undertake to help the Department of the Air Force celebrate three quarters of a century of air and space power. These new Board members each have their own demanding professional endeavors, and the additional gift of time and energy they have volunteered to share with AFHF is laudable. I join all of you in saying “thanks” to each of them!

On the nuts-and-bolts front, you approved two changes to our bylaws. The first item, driven by pandemic impacts on travel and gatherings, extended normal Board member term limits to allow for continuity through these challenging circumstances. Accordingly, Board members may now continue to serve on an extended basis when extraordinary conditions make it advisable, with notification to members, beyond normal term limits. Secondly, you approved a change permitting (but not requiring) the currently conjoined Chairman and President positions to be filled independently. When separate, the Chairman will guide the Board in charting the Foundation’s mission and vision and represent the Foundation as appropriate, and the President will focus on the mission requirements of the Foundation, orchestrating the Board’s work and directing the staff as necessary. The revised bylaws provide further detail. These changes will significantly add to the Foundation’s flexibility and vitality.

In reviewing of our membership programs, we noted that Life Members—some 275 strong—have not recently received personal recognition for their commendable commitment to the Foundation’s work. Accordingly, our Executive Director led design and production of an attractive credit-card style Life Member card. Though it is a small token, feedback from the recipients has been very favorable. Should you have other ideas on how we can recognize members’ support, please pass them on.

As always, Air Power History editor Richard Wolf has assembled a very thoughtful reflection this quarter on the ways that airpower has made a difference, not just in combat but in innovation to help the United States solve wickedly difficult problems. His faithful work complements steady gains in AFHF’s electronic outreach—Facebook, Twitter, Instagram, LinkedIn, our daily e-mail, and archived journal issues—and we are increasingly focused on charting a path to wider and even more engaging electronic ways to inform the next generation of Airmen and historians. More to follow on this.

Elsewhere in this issue, you will see a notice of a book project specifically designed to contribute to the Air Force’s upcoming 75th anniversary celebration. Tentatively entitled “75 Great Airmen,” it will recount the stories of uniformed Airmen, some highly decorated, some of national stature, and some who were just truly exemplary in serving our nation somehow. This effort is picking up speed quickly, but we are still soliciting suggestions for names of Airmen who should be included. The final list will be selected by a committee that includes a former Chief of Staff, USAF and a number of distinguished air power leaders and thinkers. For more details and to submit suggestions, please go to <https://www.afhistory.org/75-great-airmen>.

Just as soon as we believe we can safely conduct Foundation events in person, we will begin rebuilding our calendar. In the meantime, we are working to organize a webcast conversation with noted historians early next year, in place of an in-person meeting. We will keep you informed.

In my last message, I noted the need for AFHF to be introspective, forward-looking, and bold. Since then, Air



Force Chief of Staff General C.Q. Brown has said very publicly and explicitly that the Air Force must “Accelerate Change or Lose”—and his counterpart, Chief of Space Operations Jay Raymond, has made it clear the new Space Force must also “innovate and outpace our adversaries, [and] build the Space Force as a digital service from the ground up.” These are powerful, demanding words for the nation’s air and space professionals. The Foundation should take them equally seriously, continuing to expertly document air and space power history *and* acting boldly to innovate and accelerate the way we engage, inform, and serve both our members and the broader community of those interested in national security. Now *is* a time to pitch in; I earnestly welcome your ideas to president@afhistory.org. Thanks for your continued support, and every good wish as the holidays draw near.

With Best Regards,



Christopher D. Miller,
Lieutenant General, USAF (Ret)
President and Chairman of the Board

From the Editor

Our issue this time seems to be largely centered on the conflict in Southeast Asia. It wasn’t planned that way, but it does seem to be an area of interest for many of our contributors.

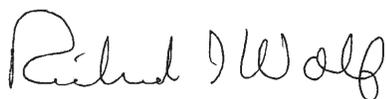
Our first article is a lengthy piece from repeat contributor Theo van Geffen, who in this issue completes his six-part story on the destruction of the Thanh Hoa Bridge. It’s extremely detailed but entertaining. While it was largely a U.S. Navy mission this last time, it was part of an effort that involved large numbers of USAF forces in the years that preceded the final dropping of the bridge span.

Our second article is by first-time contributor James Micheal Young, who writes about the impact that Project MOGUL had when its classified balloon train landed by accident at Roswell, New Mexico. It was this little-known nuclear intelligence effort that has provided the grist for many alien stories.

Our third article is a great explanation of the events surrounding Operation Attleboro by award-winning contributor William Head. In this saga, he explains how a small operation becomes considerably larger than it was supposed to be, and how what appears to be a defeat turns out to be a victory.

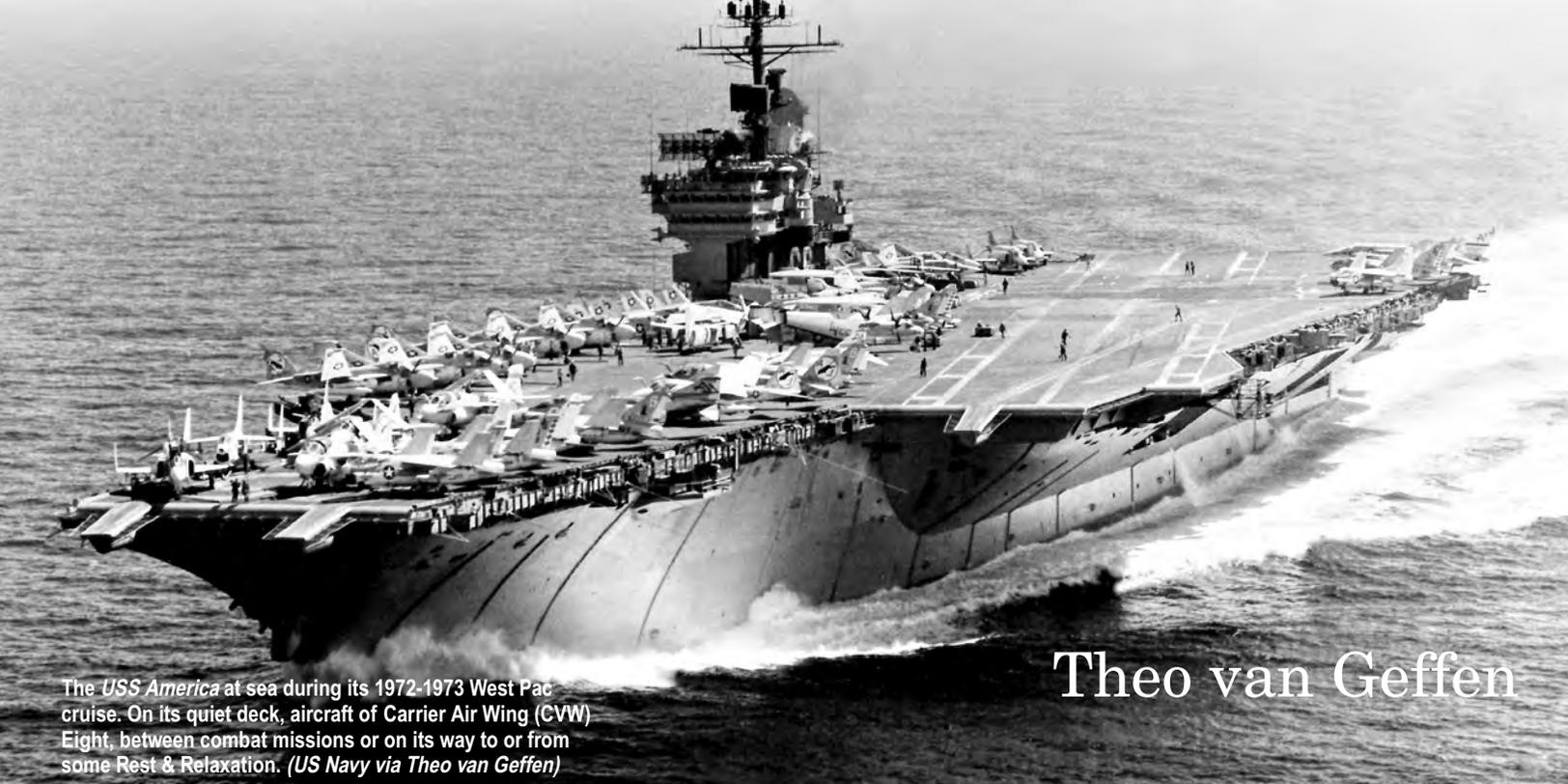
The final article in this issue is by many-times contributor, Darrel Whitcomb, with a small vignette which was part of a much larger book which he has coming out shortly. It’s about search and rescue in the Vietnam conflict, in 1972. Don’t skip by it.

The President’s Message begins on page 3. Don’t miss Upcoming Events on page 62, although I fear you must take all dates in that section as still uncertain at this point. If you see something scheduled, be sure to check with the organization sponsoring the event to ensure it will take place. It’s a most uncertain world today. And the closing story is this issue’s Mystery. Enjoy!



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The Air War against North Vietnam: the Thanh Hoa Railroad and Highway Bridge (Part 6, conclusion)



The *USS America* at sea during its 1972-1973 West Pac cruise. On its quiet deck, aircraft of Carrier Air Wing (CVW) Eight, between combat missions or on its way to or from some Rest & Relaxation. (US Navy via Theo van Geffen)

Theo van Geffen

After what later turned out to have been the final Air Force strike against the Dragon's Jaw, the Thanh Hoa Railroad and Highway (RR & HW) Bridge, on August 8, 1972, the conclusion was justified to say that the Bridge had been battered all over the years, but was still standing. The question now was if the U.S. Navy would be able to finish the job that was begun on April 3, 1965, as that service was 'to take on' Thanh Hoa and its surroundings for the remainder of the Air War against North Vietnam.

USS America

The *USS America* (CVA-66) was built by the Newport News Shipbuilding and Dry Dock and was one of three *Kitty Hawk*-class carriers. Its keel was laid on January 9, 1961, it was christened on February 1, 1964 and commissioned on January 23, 1965 at the U.S. Naval Shipyard in Portsmouth, Virginia. Its name was selected by President John F. Kennedy. On March 16, 1965 the *America* commenced its first operations off the coast of Virginia. The ship's first catapult launch and arrested landing was made on April 5 by an A-4 Skyhawk. *America's* first cruise (to the Caribbean) was begun on May 1, 1965. On board were the aircraft of Carrier Air Wing (CVW) Six.

Although the ship was homeported on the East Coast, spending most of its deployments in the Atlantic Ocean and the Mediterranean, the *America* made three combat deployments to the South China Sea. The first, with CVW-6, started on April 10, 1968 when it left Norfolk, arriving on Yankee Station on May 30. Combat operations were initiated the next day and lasted through October 30, accomplishing four line periods and 112 days of combat operations. On July 10, an F-4J crew of CVW-6's Fighter Squadron (VF) 33, LT Roy Cash and LTJG, (Lieutenant Junior Grade), Ed Kain, shot down a North Vietnamese MiG-21 with an AIM-9G Sidewinder while on a MIGCAP mission off the coast of Vinh. The MiG kill was the first for an East Coast carrier and the J-version of the F-4, and the last Phantom kill of the ROLLING THUNDER campaign. On December 16, the *America* was back home.

After making a deployment to the Atlantic/Mediterranean, the carrier left Norfolk on April 19, 1970 for its second combat deployment. This time CVW-9 was on board. Attack Squadron (VA) 146 and 147 were equipped with the E-version

Editor's Note: This is part 6 of the author's series on U.S. efforts over many years to destroy the Thanh Hoa Railroad and Highway Bridge. Part 1 ran in the Summer 2018 issue of *Air Power History*, part 2, Winter 2018, part 3, Summer 2019, part 4, Winter 2019 and part 5 in the Summer 2020 issue.

of the A-7, its first employment in combat. The C-version of the A-6 Intruder, assigned to VA-165, also made its combat debut. Both types flew their first combat sortie on May 26, with an A-6C flying *America's* first sortie of the cruise. A total of five line periods were accomplished with 100 days on station. Between line period 4 and 5 the *America* conducted operations off the Korean coast. The ship returned home on December 21, 1970.

Engine failures

After arriving in Norfolk on December 16, 1971 from another Atlantic/Med cruise, the *America* went through a 2-month post-deployment stand-down and overhaul, followed by a period of preparation and training for another deployment East with the sailing date set for June 5, 1972. On board this time CVW-8:

Unit	Aircraft
VF-74, VMFA-333	F-4J
VA-82, 86	A-7E*
VA-35	A-6A/C, KA-6D
RVAH-6	RA-5C
VAQ-132**	EA-6B**
VAW-124	E-2B
HC-2/Det 66	SH-3G

* Before deploying, both squadrons converted to A-7Cs.

** Electronic Attack Squadron (VAQ) 132 was the first Navy unit to deploy with the new Prowlers. As the Navy did not want to run the risk to lose one over North Vietnam, with their technology possibly ending up in Soviet hands, the aircraft never went 'feet dry', stayed well offshore and did not fly any direct combat missions. Yet they were able to provide ECM coverage a few miles inland.

In March, several Ling-Temco-Vought A-7Es in other Attack Squadrons had experienced engine failures and even losses, resulting in the Navy's decision to ground the aircraft to fix its TF-41A2 Allison engine. The cause was traced to unequal heating of an epoxy seal inside the engine. The seal would crack, breaking into pieces and going through the engine with catastrophic results. VA-82 and VA-86 were equipped with this type. Because of the upcoming deployment, it was decided to convert both squadrons

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



It is quite standard that a special patch is designed for each cruise of at least a carrier. This patch was designed for the 1972-1973 cruise of the *USS America* (CVA-66) to the Western Pacific, more specifically the South China Sea. (Via André Wilderdijk)

to the A-7C. Although the conversion took just a few days, the weapons system proved to be in horrible condition and required intense and exhaustive actions to work properly. This effort even continued during the transit period to combat operations. As LTJG Rich Clover of VA-86 put it, "My last flight in the Echo was on April 5 and my first one in the Charlie, April 7."

As a young first-tour Naval aviator, LT Frank Staarup of VA-86 was called a 'Nugget'. For the first three months on the ship Frank shared an 8-man bunk room called 'The Jungle'. He was the Material Control Officer for the *Sidewinders* of VA-86. Frank,

Malfunctions in the turbine sections of the engines were occurring and they were grounded for review. The two squadrons were then relieved of the Es and issued twelve A-7Cs each with the more reliable Pratt and Whitney TF30-P408 engines. They were less powerful than the Allison by about 10%, but they would prove themselves trustworthy in combat as I cannot recall a single serious incident with an engine during our nine months of combat operations. The lighter weight of the TF30 compared to the TF41 engine, moved the Center of Gravity (CG) of the A-7C forward, almost to the operational limits under some circumstances. In order to compensate for this, the weapon pylons at station number 3 and 6 were removed. This resulted in reduced drag and moved CG aft slightly. We hung six-station, Multiple Ejector Racks (MER) on stations 2 and 7, and limited the load of the MER on those racks to five Mk-82 500-lb bombs each (the sixth station, the front lower station stayed empty). The usual weight on a mission was about 36,000 pounds.



On November 1, 1968, Heavy Attack Squadron (VAH) 2 was re-designated Tactical Electronic Warfare Squadron (VAQ) 132 and converted from the A-3D to the EKA-3B Skywarrior. As the first operational squadron, VAQ-132 converted to the EA-6B. As part of CVW-8, it was onboard the *America* during its 1972-1973 cruise. However, the Prowler was not deployed directly in combat missions against North Vietnam to prevent the advanced equipment from falling into the hands of the North Vietnamese (Russians/Chinese) in case a Prowler would get lost.

Destination

The annual operational readiness exercise took place in the May 11-15 period in the Virginia Capes Operating Area, directly followed by participation in the exercise EXOTIC DANCER V.

In the meantime, North Vietnamese and Viet Cong forces had initiated large-scale attacks on South Vietnam, creating urgent operational commitments for U.S. forces. This resulted in the June 2 decision by the Joint Chiefs of Staff (JCS) to change *America's* destination to the waters off Vietnam. On the same day, Chief of Naval Operations, Admiral Elmo Zumwalt, visited the carrier to address the crew and to explain why sailing orders had been changed to Southeast Asia.

Three days later, the carrier was on its way for its third combat tour. Escorts were the destroyers *USS Davis* (DD-937) and *Dewey* (DDG-14), and the oiler *USS Waccamaw* (AO-109).

When the *America* sailed, a number of instructors had embarked. As an East coast Air Wing, its units were dedicated and trained with the focus of operating in the Med, with emphasis on Soviet ships and their specific defense capabilities, as well as nuclear warfare responsibilities. Hence there had been almost no training in Close Air Support (CAS) or the type of missions to be flown in SEA.

With support of the 'guests', much of the transit time was spent by the aircrews learning about the threat environment they were to face, Rules of Engagement, and procedures and techniques. Specific targets that might be assigned, were studied as well as known SA-2 Surface-to-Air Missile (SAM) sites and all kinds of Anti-Aircraft Artillery (AAA) and their envelopes. Not only the SA-2 characteristics and maneuvers used to evade them were reviewed, but also the weapons the aircraft were expected to be carrying, including the Walleye II and AGM-45

Shrike. LTJG, Marvin Baldwin, a pilot with VA-82 *Marauders*,

I don't remember much specific training for the Walleye. Its original version, the Walleye I, had been around for a while, and information for it was in the Naval Air Training and Operating Procedures Standardization (NATOPS) manual. Walleye II procedures were identical, as far as the pilot was concerned. The delivery technique was similar to delivering regular iron bombs. The first time I saw a Walleye II, was when I got to my aircraft for a strike Northeast of Hanoi. All A-7 pilots on board were qualified to drop every weapon the plane could carry. When the schedule for the next day was printed, the NATOPS manual was reviewed for the particular weapons we were going to carry.

He added,

I suspect the maintenance crews had a much more involved procedure to be sure each aircraft had the software for the Walleye II loaded in the computer. The software contained the delivery envelope for the weapons. Before each sortie, pilots and weapons personnel selected the code for each station's weapons in the ASCU, Armament Station Control Unit, which was located in the starboard avionics bay. The ASCU fed that information to the computer, so the weapon's profile and envelope would be used to compute the proper impact point. Every A-7 could carry the Walleye, although only stations 2 and 7 were factory-wired for 'special weapons', like nukes or Walleyes. When such weapons were loaded, wiring continuity checks were performed to ensure the delivery would go with no problems. In addition, they had to verify the loading procedures and wiring checks (done before each sortie) to make sure the cockpit switches and displays functioned correctly.

The tremendous stresses on the airframe from catapult and arrested landings sometimes caused loose electrical connections or other malfunctions. These occasionally resulted in 'hung' ordnance, a potentially dangerous landing back aboard the ship.

When the equator was crossed on June 12, King Neptune was welcomed aboard. Cape Horn was rounded on June 21. Some, if not all, instructors left the *America* here by the carrier's COD, Carrier Onboard Delivery, C-1A Trader, which flew into Cape Town several times.

July 1972

The *America* arrived in Subic Bay in the Philippines on July 6. All flight crews attended a jungle survival class. In the meantime the ship received its weapons, including Walleye IIs. After leaving Subic Bay on the 9th, it relieved the *USS Coral Sea* (CVA-63) on Yankee Station and began combat operations three days later, initially near Dixie Station to conduct operations in northern South Vietnam. Each A-7C pilot was to fly two CAS sorties, working with Air Force Forward Air Controllers (FAC).

The first missions over North Vietnam were flown on the 19th. The standard A-7C load for combat operations



When the Walleye I had proven to be a reliable and autonomous weapon under combat operations, the field wanted an improved version to hit larger targets than for instance buildings. Development was initiated in January 1969 and resulted in the Walleye II (Mk-5). It was first expended operationally by A-7E Corsair IIs off the *USS Kitty Hawk*, CVA-63. The photo shows A-4E 154172 of the Naval Weapons Center at NAS China Lake with a Walleye II on the fuselage station. (US Navy via Gary Verver)

was generally ten Mk-82s, 1,000 rounds of 20-mm for the M-61 gun and one AIM-9 Sidewinder. One AIM-9 only, as the chance of a MiG engagement was regarded as small. In addition, the aircraft were configured with the latest ECM equipment, although this was carried internally and not as an external pod. A-7C in-flight refueling was very seldom necessary, as the carrier was usually within 100 miles off the coast and missions were normally about two hours long, including launch and recovery.

Walleye I

In the meantime, the Navy had completed efforts to procure an improved version of its Walleye, the Walleye II. Efforts to develop weapons of the second, 'smarter' generation were undertaken by engineers of the Aviation Ordnance Department (Naval Ordnance Test Station, later Naval Weapons Center) at Naval Air Station China Lake with Jack Crawford and Bill Woodworth taking the effort to the next level by designing a tracking system that would guide an air-to-surface weapon. Ultimately, the concept was given the name Walleye. Although it was given the AGM-62, Air-to-Ground Missile, designation, it was not a missile or a true bomb, but a TV-guided unpowered glide weapon. It could be regarded as the first precision-guided munition or 'smart' bomb.

The second air drop of the Walleye on November 27, 1962 was successful, followed two months later (January 29, 1963) by the first demonstration of the weapon's automatic homing feature against a target, resulting in a direct hit. The first live-warhead Walleye round was expended in April 1966, followed the next month by the start of the operational evaluation by China Lake's Air Development Squadron (VX) 5.

The Orlando Aerospace Division of Martin Marietta received a \$24 million production contract. Being ready for fleet

use of the Walleye I (Mk-1 Mod 0) was declared on January 12, 1967 and two weeks later it deployed with VA-212, which was part of CVW-21 on board the *USS Bon Homme Richard*, CVA-31. The first employment took place on March 10, when two A-4Es of VA-212 expended the weapon against a military barracks near Sam Son in North Vietnam. On March 10 and 11, a total of seven Walleyes were released against two highway bridges and an army barracks, with seven direct hits. Navy aircraft would expend a total of 88 Walleyes in 1967 against targets in North Vietnam.

Walleye II

Once the Walleye I was used in combat, proving it to be a reliable, autonomous, launch-and-leave, standoff weapon, the Fleet indicated that they would like to have a larger version for bigger targets than buildings and other above-ground structures. The goal was a greatly improved weapon in terms of accuracy, lethality, range and ease of use. The result was the Walleye II (Mk-5) or 'Fat Albert'. Development work was initiated in January 1969. The new weapon had a 2,000-pound warhead with 1,070 pounds of explosive (Walleye I, 850 and 470 pounds respectively). In addition, modifications to the guidance section included an advanced integrated-circuit video camera and a rate gyro platform.

Development of a Walleye with a greater range, Walleye II ER (Extended Range) was begun in March 1970, followed in 1971 by an experiment to assess the viability of adding a data link to the ER-version (Mk-13). Two tests combining the extended-range wings with the command data link were both failures.

The AGM-62B Mk-5 Walleye II was introduced to the Fleet, in casu VA-192 and VA-195 (CVW-11) on board the *USS Kitty Hawk* (CVA 63), in June 1972. Both squadrons were equipped with the E-model of the A-7. A six-man China Lake team was flown to the carrier on Yankee Station. They stayed for a month to train the pilots and weapon maintainers in the use of the weapon.

During *Kitty Hawk's* third line period, June 1-27, a total of twenty-three AGM-62 Walleyes were expended, including six Walleye IIs. It was not the first time the Walleye had been expended from an A-7. The Corsair II had been introduced in SEA in December 1967. On January 19, 1968, A-7As of VA-147 off the *USS Ranger* struck rail bridges southwest of Thanh Hoa, dropping four weapons. Two were direct hits, one misguided and one interdicted the rail line.

After the *Kitty Hawk* had received a developmental data link pod, the Mk-13 Walleye Extended Range Data Link (ERDL), three developmental Mk-13s were expended in July, of which two on the 19th. Target for the first weapon was a cave with a coastal defense gun and for the second target, a vehicle bridge. Both were destroyed. Due to adverse weather conditions the third weapon hit the target before the controller in a trailing aircraft was able to recognize the target area and hence could not find it. However, the Mk-13 continued in development and was introduced into the fleet in 1974.



Preflight of an A-7C Corsair II of VA-86 Sidewinders, which is configured on weapon station two with a Walleye II 'Fat Albert'. The A-7 could carry two such weapons, but only one was carried at the time as they were so expensive, some \$16,000 apiece.

Alpha

America's A-7Cs expended Walleyes on July 19 as well. Two Mk-5s were released on a strike against the Xom Ram command site in Route Package III. Their impact sealed the cave located at the site.

The next day, VA-86 participated in an Alpha strike against the new construction of some pontoon bridges in the Thanh Hoa area. An Alpha strike usually involved 18-24 aircraft of the entire Air Wing: eight strike, 4-6 flak suppression, 2-4 IRON HAND, 2-4 MIGCAP and two RESCAP. No joint missions were flown with other Carrier Air Wings. After the E-2B Hawkeyes and the SH-3G Sea Kings were launched, it was the turn of the F-4Js and the tankers (KA-6Ds or A-7Cs), so the Phantoms could be refueled before heading for the target. At least one of the tankers would orbit just off the North Vietnamese coast to refuel (damaged) aircraft. Each A-7 squadron would usually put up six aircraft. When SA-2s were deemed a threat, there was an element assigned for IRON HAND SA-2 suppression, carrying AGM-45 Shrikes.

Marvin Baldwin of VA-82 (126 combat sorties) expended two Walleye IIs, called 'Fat Albert', during his combat tour and states,

The A-7C could carry two, on station 2 and 7, which were wired for special weapons, but not plumbed for fuel tanks. However, only one Walleye II was carried at the time as they were so expensive, some \$16,000 apiece. The weapon had clear TV test video of eight shades of grey. You had to use the small stick forward of the throttle to move the aiming diamond in the Head-Up Display (HUD) over the target, which also moved the TV camera in the nose of the Walleye. The camera displayed its picture with crosshairs on the radar scope in the cockpit. It would take just a few seconds to adjust the crosshairs on the display over the desired impact point and a solution cue was displayed when the target was in range of the Walleye. After its release, the fins on the bomb were moved by the camera to guide it to the target. There was no link to the aircraft, and the picture on the radar screen disappeared

at bomb release. The Walleye was a glide bomb, so the delivering aircraft had to be in a dive, which was initiated at about 10,000 feet, with enough speed to get it to the target.

Marvin expended his first Walleye II on July 24, when A-7Cs of both squadrons participated in three Alpha strikes. On the last one, against a railroad bridge south and a little west of Kep Airfield, two A-7Cs of VA-82 were configured with one Walleye II each. Baldwin about the mission,

We were unable to hit the bridge as AAA was extremely heavy and we never saw where the Walleyes did hit. We suspected that shrapnel from AAA damaged the camera or control fins on the bombs, causing them to go astray.

Three days later, a ruptured main boiler feed pump forced the *America* to sail to Subic Bay for the necessary repairs, which were delayed for almost two weeks while needed parts were rushed to Subic Bay. The ship was back on station on August 9.

August

Linebacker was continued with a coordinated interdiction campaign against the logistics network of North Vietnam. Air Force and Navy aircraft flew a total of 6,604 day/night TACAIR strike and armed recce sorties. The Air Force's part was 1,339 and 682 (2,021) and the Navy's, 3,142 and 1,441 (5,483).

An increased expenditure of non-guided ordnance against area-type targets in Route Package (RP) 5 and 6 was noted. The most significant non-guided ordnance strike was against the Xuan Moi Military Training Complex on August 16, 18 and 26. A total of forty-three F-4D/E aircraft expended 491 Mk-82s. The single most extensive guided ordnance strike was flown on the 25th, when eight F-4s of Ubon's 8th TFW Walnut and Banyan flights struck the Lang Dan Railroad Bridge with eight Mk-84 LGBs.

Air-to-air battles resulted in the downing of four MiG-21s by crews of Air Force F-4D/Es and one MiG-21 by a Navy F-4J crew. However, a Marine Corps F-4J was claimed by a MiG-21's ATOLL. SA-2s claimed an 14th TRS RF-4C and three Navy A-7 and three F-4 aircraft. In addition, AAA claimed an F-4D of the 13th TFS.

Thanh Hoa area targets were struck by Navy aircraft on multiple occasions in August. The first was on the 1st, when six *USS Saratoga* (CVA-60) aircraft struck the Ham Rong Transshipment Point (TSP). Two A-7As expended twelve Mk-20s, two A-6As, twenty-eight Mk-82s and two F-4Js, twelve Mk-82s. *Saratoga's* aircraft returned on the 10th, when eight aircraft (five A-7A and three F-4J aircraft) struck Railroad Ferry #1, the Petroleum Products Storage (PPS) and an AAA site.

August 14 included the Dragon's Jaw, Thanh Hoa Barracks and Storage area, PPS, and Highway Bridge #2. In addition, three flak suppression A-4F Skyhawks of VA-164 off the *USS Hancock* on Mission 9769 struck AAA sites with nineteen Mk-20s. Four other *Hancock* A-4Fs, of VA-212, on Mission 9761 struck the Bridge, expending eight

Mk-82 low-drag and eight Mk-83 general purpose bombs. Due to smoke, results were not observed.

The *USS Midway* (CV-41) paid a visit on the 25th, when eight of her aircraft (five A-6As, one F-4B and two A-7Bs) struck, among others, a pontoon bridge and a ferry. Expended were eighty-six Mk-82 and twelve Mk-83 bombs.

September

Air Force attack and support sorties flown in North Vietnam increased over the August effort, while Navy sortie efforts decreased for the first time since May. Yet, the Navy continued to fly the majority of the sorties with 62 percent of the attack and 58 percent of the support effort. LORAN delivery of non-guided ordnance against area type targets in RP 5 and 6 increased due to poor weather conditions. Laser Guided Bombs continued to be employed against bridges.

Eight North Vietnamese MiG-21s were downed by crews of a similar number of F-4s, four Ds and four Es. Two F-4Es were claimed by MiG-21 pilots. The Navy stayed 'clean', but the crew of a Marine Corps F-4J claimed a MiG-21. SA-2s claimed two F-105Gs, one Navy A-6A and one A-7C, and a Marine Corps F-4J. In addition, AAA claimed three AF (F-4D, F-4E and RF-4C), three Navy (A-4F, A-7A and A-7E) and one MC aircraft (F-4J).

The La Danh Storage area was struck on three different days with a total of 72 AF F-4D/E Phantoms in eighteen flights. They expended 586 Mk-82 and 135 Mk-83 bombs. Only on the 12th, pilots were able to check BDA, Bomb Damage Assessment, with two structures destroyed. The Thanh Hoa area saw Navy aircraft 'visiting' on nine different days. Targets included SA-2 site VN 046, the Highway Bridge West, Highway Ferry, Railroad/POL Complex, and PPS. In two separate night missions on September 7, a single A-6A Intruder of VA-115 (*USS Midway*), struck interdiction points, expending fourteen (Arab 501) and sixteen (Arab 510) Mk-36 DST destructor mines respectively.



Within a period of three days, September 11-13, twenty-four A-4F Skyhawks of *USS Hancock's* Carrier Air Wing Twenty-One struck the Thanh Hoa Bridge and surroundings in seven different strikes. The photo shows loaded Skyhawks of *Hancock's* three A-4F squadrons, VA-55, 164 and 212 on their way to the catapult. (US Navy, via Gary Verver)

The PPS and AAA were struck on the 22nd by respectively two VA-82 A-7Cs (twenty Mk-83s) and four Marine Fighter Attack Squadron (VMFA) 333 F-4Js (sixteen Mk-20s) off the *USS America*.

Six aircraft off the *USS Kitty Hawk* (CVA-63), three A-6As, two A-7Es and one F-4J, swung into action on the 28th of the month. The VA-52 Intruders expended thirty-six Mk-82s against a pontoon bridge and destroyed it, one VF-114 F-4J attacked two AAA sites, expending four Mk-20s at each one, and two A-7Es struck a radar and AAA site with one AGM-45 Shrike and eight Mk-20s respectively.

Secondary

Besides being a pilot with the *Sidewinders* of VA-86, LTJG Ron Farlow had a secondary job, like most of his fellow pilots. His was the Squadron's Public Affairs Officer. Ron, as *PAO SNAKE*, published a bulletin, *YE OLDE PAO SNAKE*, for distribution to the enlisted troops in the squadron to give them an idea of what the pilots were doing.

On September 30, VA-86 was part of three Alpha strikes. The first one was a strike against three targets in the Thanh Hoa area: the Highway Ferry, the Highway Bridge West and the TSP. In his bulletin of October 1 Farlow described that strike as follows:

Alpha no. 1 went to that peaceful, fun loving retirement village, Thanh Hoa. The trouble is, all the peaceful, fun loving old codgers have a 37 or 85 in their backyard and start blasting every time their hearing picks up a jet noise. Yesterday's strike drew a big reaction and everybody had fun shooting at all the pretty airplanes. Our bombers were the XO, Lt (jg) Salkeld, Lt Jacobson, Lt Dudderar and Lt Mullan. Iron handing were Lt Ameel and Lt (jg) Borne. A couple of SAMs were also launched but they seemed to be picking on the F-4s this time.

Skyhawks

The Railroad and Highway Bridge was struck on three consecutive days, on September 11, 12 and 13. Involved were A-4F Skyhawks of Carrier Air Wing 21 aboard the *USS Hancock* (CV-19). On the 11th, three aircraft on Mission 9713 and three on Mission 9715, all of VA-164, expended a total of eight Mk-83s. BDA for '9713' was stated as 'damaged' and for '9715', 'no damage, missed'.

The next day another six A-4Fs of VA-164 struck the Bridge on Mission 9714 and 9716. Eight Mk-83s were dropped. BDA for '9714' was 'cut highway approach' and 'damaged' and for '9716', 'structures destroyed'.

On September 13, fourteen A-4F Skyhawks made the trip from the *Hancock*. While two aircraft were on flak suppression Mission 9731, expending eight Mk-20s and destroying one AAA site, twelve A-4Fs appeared in succession over the target, at 08:52 (Mission 9735), 08:53 (9737), and 08:56 (9739). The first two divisions of four aircraft each dropped eight Mk-82s, eight Mk-83s and four

Mk-84s. BDA for the first division was stated as 'highway approach cratered' and for the second division, 'RNO, smoke'. The third division dropped an extra four Mk-84s with BDA reported as 'RNO, smoke'.

The twenty-four sorties against the Bridge in September appeared to have been pretty harmless. October would prove to be a whole different story for the Dragon's Jaw.

On September 9, the *America* witnessed its 90,000th carrier landing when Lieutenant Commander (LCDR) Leighton 'Snuffy' Smith, Operations Officer for VA-82, landed his A-7C Corsair II.

October

The LINEBACKER I bombing termination on October 23 north of the 20th parallel and continuing poor weather conditions contributed significantly to the decrease in attack and support sorties. For the USAF, 2 and 32 percent respectively, for the Navy, 19 and +1. Due to the poor weather, LORAN deliveries of non-guided ordnance increased considerably. Termination was the result of perceived progress in the ongoing peace negotiations, and was intended to demonstrate U.S. sincerity to the North Vietnamese. Unfortunately, the desired effect was not realized. Military leaders like Gen John Vogt, 7AF/CC, thought this bombing halt was a poor move to make in advance of a ceasefire agreement. Henry Kissinger, however, argued that Le Duc Tho and he had agreed on all important points in Paris.

Air Force F-4D/E crews downed one MiG-19 and six MiG-21s, while losing one F-4D. An additional MIGCAP F-4E was lost due to fuel exhaustion following an extended MiG engagement. The two other services did not record kills or losses. SA-2s claimed two F-4Es, and one Navy A-7C, while AAA claimed one AF F-4E and one Navy A-7C. In addition, an AF F-4E FAST FAC and an F-111A, plus a Marine A-6A were lost in RP 1 due to unknown causes. When LINEBACKER I was terminated, U.S. aircraft had destroyed almost all fixed oil storage facilities and 70% of the electric power generating capacity. Enemy defenses claimed forty-six USAF aircraft, fourteen to SAM, three to AAA and twenty-seven to MiGs; one F-111A was lost due to unknown causes.

October (2)

In 'Air Interdiction Message' (AIM) # 1, Adm Noel Gayler, commander of Pacific Command, stated his objectives for a maximum effort by the Air Force and Navy against interdiction targets within the designated 'Integrated Strike Zone' in RP 5 and 6. The effort was initiated on October 16/0001H (awaii time). It was to have ended on October 28/2400H, but the October 23 bombing termination shortened the operation. The area involved, called the Iron Triangle, covered the area Lao Cai (northwest of Hanoi)-Lang Son (northeast of Hanoi)-Nam Binh (southeast of Hanoi). There were three four-day planning cycles. The Air Force was scheduled for 168 F-4 sorties, 140 against the NE Rail Network (twenty-eight flown), twenty-eight against the NW Rail Network (twenty). Yen Bai (twenty-eight flown) and Kep (four sorties flown) Airfields



A-7C Corsair IIs of Attack Squadrons 82 and 86 on *America's* deck. Some personnel are weapon technicians, some are maintenance technicians and the one in the white shirt (right) is a supervisor.

were weather alternates. Due to weather, sixty sorties were diverted to RP1 and Military Region I and II in South Vietnam, while twenty-eight sorties were cancelled. The following are the efforts for the first day of the first four-day planning cycle. Thirty-two F-4s were planned against the Vu Chua Rail Network, northeast of Hanoi. Twelve aircraft delivered ordnance using LORAN, while the other twenty, eight LGB and twelve visual, struck the alternates, sixteen against Yen Bai and four against Kep airfields.

F-4 sorties were not the total AF effort. F-111As were scheduled for 180 sorties, primarily against area type targets. Sorties flown totaled 122, of which twenty 'out triangle', against among others, storage areas, bridges and railroad yards/sidings. There were seven weather cancellations. Of note is that F-111s encountered six ground and thirty air aborts. This reflected the strict abort criteria associated with F-111 avionics and weapon release system. Gen Vogt had directed that if any primary system would not be operational, the backup system was not to be used and the mission had to be aborted. In addition, F-105Gs acted as flak suppressors.

Mining

Thanh Hoa and its surroundings made the frag in October as well, on the 1st, 5th, 6th, and 19th. Navy aircraft struck the Railroad/POL Complex (on three occasions), the Storage Area, the Transshipment Point and the Railroad and Highway Bridge.

On the first day of the month, CVW-8 aircraft returned to the Thanh Hoa area. Sixteen Mk-82 low-drag bombs from a single VA-35 A-6A, on Mission 9915, cratered a road/highway approach, while four VMFA-333 F-4Js, on Mission 9911, also dropped sixteen Mk-82s and damaged an AAA site. The Dragon's Jaw also got attention. In a timeframe of ten minutes four A-7Cs of VA-82, on Mission 9919, struck four different targets. First was the Bridge with a single Walleye II with results not observed. This was followed by a strike at a railroad bridge, dropping seven Mk-83s and damaging it, at a bridge in RP 3 with two Mk-83s expended, which missed and finally at a foot bridge,

also in RP 3, with three Mk-83s, damaging it. On their mission, 9921, two Corsair IIs of VA-86, hit two different targets with the Bridge being the first one. Released was one Walleye II (results not observed). The second target, a railroad bridge, was struck with a single Mk-83, which missed. Both AGM-62 strikes were regarded as not successful.

On the 5th, the *America* ran three Alpha strikes against targets in North Vietnam with all squadrons playing their specific role.

The first one was a coordinated strike to mine the outer channel near Haiphong, which was led by VA-82's LCDR Smith. A total of eleven strings were required and due to the proximity to enemy defenses, a split strike with opposite run-in headings had been briefed. Eight A-7Cs of VA-86 participated, with four aircraft dropping mines, two for IRON HAND support and two for RESCAP. MIGCAP and TARCAP/flak suppression were briefed on position and targets as were other support aircraft.

The launch, rendezvous and enroute portion of the mission was uneventful. When the strike force approached the pre-briefed split point, VA-35's mining division of four A-6 aircraft departed the group and proceeded independently. The four IRON HAND A-7Cs of VA-86 then positioned themselves for the most effective attack against the known occupied SA-2 sites in the immediate vicinity of the target. The TARCAP/flak suppression aircraft detached, accelerated ahead of the group and struck active AAA sites. The two lead aircraft scored direct hits, completely suppressing the sites for the remainder of the attack. At the same time, the IRON HAND aircraft struck radiating radars. In a period of some two minutes, they expended nine AGM-45 Shrikes. The mine field was laid as briefed and all aircraft returned safely to the *America*.

The second target was the Phu Ly Railroad Bridge. Four of the participating aircraft were VA-86 aircraft, two of which were configured with one AGM-62B Walleye II each. One of the weapons could not be expended, while the second one was released, but missed the target.

The third Alpha strike brought *America's* aircraft back

to the Than Hoa area. Once more, VA-86 provided eight aircraft, four bombers and four IRON HAND aircraft, of which one aborted before takeoff. The seven aircraft were led by the Squadron's Skipper, CDR Pete Yonke. Due to a malfunction of his ECM gear, Yonke aborted the mission at the last minute. The remaining three aircraft of his division proceeded and struck a railroad 'Y' near downtown Thanh Hoa. The IRON HAND aircraft stayed idle as the SA-2 sites stayed silent.

In the *Ye Olde PAO Snake Bulletin* of October 6, PAO Snake did not only give a description of the missions flown, but also wrote the following,

First on the agenda is the wonderful news that we can all look forward to 5½ more months of total bliss aboard our favorite steel hacienda. What a relief! I'll bet you were all afraid we might be sent home early. Isn't fine to know you're needed?

Down, finally

The next day, October 6, CVW-8's aircraft were back in the Thanh Hoa area with targets being the Bridge, AAA sites and the Railroad Yard and adjacent POL Complex. The Alpha strike force involved sixteen aircraft, four F-4Js and twelve A-7Cs, of which one aborted before launch. Those aborts were not unusual. If a problem was discovered after engine start, there were only a few minutes to correct the problem before the launch was complete and with the flight deck to be readied for landing aircraft.

In addition, Lt Wes Rutledge (pilot) and Lt Scotty Follett (radar/navigation officer), crew of a RA-5C Vigilante of Reconnaissance Attack (Heavy) Squadron (RVAH)

6, took pre-strike and post-strike BDA photos. They were on Mission UE 3238 and preceded the four VA-82 A-7C Bridge strikers at 16:59H and performed BDA at 17:07H, both times at 10,000 feet.

Mission of the VMFA-333 Phantoms was flak suppression and the Carrier Air Wing commander, CDR Jim Joy, flew the lead Phantom. The four aircraft of this division, on Mission 9900, struck two AAA sites. Their goal was to prevent the gunners from targeting the bombers in their dive, when they were most vulnerable. They expended a



The first of three Alpha missions flown on October 5 by CVW-8's aircraft against targets in North Vietnam was a coordinated strike to mine the outer channel near Haiphong. It was led by VA-82's LCDR Smith. A total of eleven strings were required and due to the proximity to enemy defenses, a split strike with opposite run-in headings had been briefed and executed by four A-7Cs of VA-86 and a similar number of A-6 Intruders of VA-35. Other aircraft performed IRON HAND, RESCAP, MIGCAP and TARCAP/flak suppression. (Via Marvin Baldwin)



Preceding the four VA-82 A-7C Bridge strikers on October 6, Lt Wes Rutledge (pilot) and Lt Scotty Follett (radar/navigation officer), crew of *America's* RA-5C Vigilante of Reconnaissance Attack (Heavy) Squadron (RVAH) 6, took pre-strike photos. They were on Mission UE 3238 with a time over target of 16:59H(awaii time). Their altitude was 10,000 feet. (US Navy via Snuffy Smith)



Eight minutes later Rutledge and Follett were back to make post-strike Battle Damage Assessment (BDA) photos, also from 10,000 feet. The development of their photos led to the astonishing discovery that the Bridge had finally gone down into the Song Ma River. The photo shows the center pier down, the western section cut and the eastern end buckled, with the broken bridge in the river between the stumps of the severed highway and rail line. (US Navy via Snuffy Smith)

total of sixteen Mk-20 Rockeyes. This resulted in a secondary explosion for the first site and RNO (Results Not Observed) due to smoke for the second.

The *Sidewinders* of VA-86 were to supply eight A-7Cs, four bombers and four IRON HAND aircraft. The four bombers, which were configured with ten Mk-82s each, and three of the four IH aircraft, each configured with four AGM-45 Shrikes, made it off *America's* deck. After the bombers had been detached on signal, they struck the Railroad Yard and adjacent POL complex with their Mk-82s. Observed were one secondary explosion and boxcars destroyed or damaged. As the SA-2 sites remained silent, the IH Corsair IIs stayed jobless and returned to the carrier with their Shrikes.

The *Marauders* of VA-82 also supplied four bombers. After the fifteen aircraft had joined overhead the ship, CDR Don Sumner's division led the entire group towards the coast, until the F-4Js and VA-86's A-7Cs split off. The A-7 bombers were always heavily loaded and slower than the F-4s or the IH A-7s, so they led the formation to set the pace. Sumner was VA-82's Skipper. His aircraft were to strike the Bridge itself on Mission 9930. Two of the aircraft (the Navy talks about a division of four aircraft vice the Air Force's flight and a section of two vice element) were configured with one AGM-62B Walleye II each on station 7 and one 1,000-lb Mk-83 on station 1 to maintain balance and control off the catapult at very slow speed. Above about 300 knots, there was no issue with unbalanced loads. Aqs Guy Kemp and Mike Schram of VA-82 had readied the two Walleyes. The other two aircraft each carried two Mk-84 2,000-lb bombs. Pilots of the Walleye-configured A-7Cs were LCDR Smith and LTJG Baldwin. The other two pilots were Sumner and LTJG Jim Brister.

Strike Plan

The Walleye strike had been planned by Smith a few days earlier. He had spent hours studying the shadow aspect, the sun angle and release parameters for the most optimum delivery of the weapons. His wingman had to maintain absolute section integrity as the plan was to have both Walleye IIs impact the eastern abutment and center pier simultaneously. Upon release of the missiles, Joy's flak suppression F-4Js were to strike the most active AAA sites on the south side of the Song Ma with Sumner and Brister being on their run as the Walleyes impacted. Because of the various weapons loads carried, exact timing to effectively accomplish the attack was a must.

It had looked Smith was to lead as Sumner had caught a cold and was in a non-fly status. But he had recovered by the 6th and although Snuffy's strike plan was used, Sumner, as more senior, did lead the Walleye strike division, which was briefed by Smith.

When the strike force approached the coast line south of Thanh Hoa, Joy detached the Walleye element at the pre-briefed point. Marvin Baldwin,

We approached the Bridge as a 4-plane division, with Sumner leading and then split into two 2-aircraft sections. Sumner and Brister went north of the Bridge, for a left turn roll in, heading southeast, or downstream. Snuffy and I split left to the south, for a right roll in, heading northwest, or upstream. The weather was clear and the late afternoon sun shone brightly on the Bridge and the supporting concrete. I flew Snuffy's wing all the way and prayed that AAA would not hit us. I had a good picture of the Bridge displayed on the radar 10-12 miles away. We used about a 30-degree dive, and speed was above 400 knots. Besides refining the



The four A-7C Corsair pilots of Attack Squadron Eighty-Two 'Marauders' who 'did it' on October 6: L to R, Jim Brister, Marvin Baldwin, Don Sumner and Snuffy Smith. (via Snuffy Smith)

crosshairs, I had to maintain formation with Snuffy. Initially, I locked onto the Bridge piling with the aiming diamond in the HUD, which was coupled to the camera in the Walleye.

Snuffy recalled,

Marv and I rolled in, reduced power to 80% and popped our speed brakes to about 50%. The idea was to get stable quickly, but also to have ample time to get a good lock-on. I called "Walleye in", and, after looking around for SAMs, buried my head in the cockpit to get the best lock-on possible. Marv, who had dropped back slightly called "lock-on" and I then counted down, "Walleye, three, two, one, pickle." That was Sumner's signal to roll in, which he did.

The Walleyes impacted within seconds of each other on their pre-assigned points. Marvin continued,

I think Snuffy and I released 6-8 miles away, broke off to the northeast somewhere around 5,000-7,000 feet and the safety of the Gulf of Tonkin. After release of their Mk-84s on the western section of the Bridge, impacting its western span within 15 seconds of the Walleye impact, Sumner and Brister broke off to the southeast. There was no danger of us colliding as we kept visual contact and both sections made very hard turns to the east and the sea. Opposition was very heavy AAA, but as far as I remember, there were no SAMs fired. Our timing was good, and the weapons hit around the same time. Because we broke away after bomb release, we did not really see them hit. Only when we saw the photos made by one of America's RA-5Cs, did we know the Bridge had been destroyed. By the way, when we expended the Walleyes, we did not drop our Mk-83s, but dropped them on some AAA sites on our way out to the Gulf.

The entire strike was on and off the target in less than ten minutes. According to Snuffy, after 'feet wet', Sumner radioed that he was going back and see if he could determine the damage. That he did, but he reported there was so much dust in the area that he could not see the Bridge.

A JCS-initiated document 'Bridge Bombing Information' stated (1) 'No damage, missed' and (2) that the Mk-84s expended were Laser Guided Bombs. As to (1), photos made by Rutledge/Follett's RA-5C showed that the center pier and western span were destroyed, and that the west end of the eastern span was well into the water; as to (2), according to Snuffy and Marvin this is incorrect for the simple reason that the A-7C lacked a laser target designator.

As to the photos taken by Wes Rutledge and Scotty Follett Snuffy Smith stated,

Their photos were developed about 18:00 that evening. I got a call from America's Intel Officer, 'inviting' me to come to the Integrated Operational Intelligence Center and take a look at an 'interesting photo'. When I saw it, I was dumbfounded...and very excited. So was Rear Admiral Jack Christiansen, the Commander of Task Force 77.6, who invited us into his cabin where we all had a shot of vodka. Christiansen was embarked in America for much of the deployment.

The VA-82 Skipper reminisced after the strike that he had already struck the Bridge during his combat tour in 1967. He also gave credit to the Squadron's maintenance personnel who had not only provided the four best aircraft in the Squadron, but had also specially tuned their systems.

As to A-7C maintenance in general, Barry Hendrix said,

The success of the A-7Cs being available for combat missions was enabled by an orchestrated team of highly trained technicians and maintainers who kept the equipment and systems airworthy and operational. This is especially true for the red shirt ordnance crews and pre-load release and control checks by members of the Integrated Weapons Team (IWT), who also verified weapons safety and integrity and maintained the mission-critical systems, such as the AN/APQ-126 Forward Looking Radar, AN/ASN-91 Navigation Weapons Delivery Computer, and Integrated Avionics.

In a 6 October/1505Z message to Commander, Task Force 77.6.1, Commander TF 77.6 stated, among others,

America's Bridge Busting Air Wing has done itself proud over the past two days. You dropped the vital Phu Ly Railroad Bridge yesterday and today your pilots dropped the Thanh Hoa Bridge. This achievement has been claimed numerous times in the past years, but you are the first to actually drop it and back it up with photos. Well Done!

The Admiral requested the message to be passed to the Commanders of CVW-8 and VA-82. The four Corsair II pilots were initially recommended for Silver Stars, but the awards were downgraded to Distinguished Flying Crosses. Two days later, the *America* left Yankee Station and after stopping over briefly at Subic Bay, the carrier steamed to Singapore for R&R, Rest and Relaxation. After leaving the

city on the 20th, the ship returned to the South China Sea to resume combat operations.

One more strike was made by Navy aircraft in October against targets in the Thanh Hoa area: on the 19th, the Railroad/POL complex.

November

No targets north of 20° (RP 5 and 6) were attacked in November, resulting in a significant decrease in TACAIR sorties flown. For instance, AF sorties decreased with 28% to 1,606 and the Navy's, 36% to 1,716. On the other hand, the number of B-52 sorties south of 20° increased considerably, from 622 to 870. Primary targets for the Buffs were truck parks, transshipment points and storage areas. The increase resulted in a higher number of AF CAP/Escort sorties, from 502 in October to 1,222 in November.

No significant MiG activity was observed. Eighty-nine of the 121 SA-2s that were launched against U.S. aircraft, had a B-52 as target. One B-52D was lost, on the 22nd, the first B-52 combat loss since the initiation of ARC LIGHT. The six crewmembers were recovered. In addition, SA-2s claimed an F-105G and a Navy F-4J. AAA did not claim a single AF aircraft, but the Navy lost five aircraft, four A-7Bs and one A-7E. The Bs were all from the *USS Midway* and were lost in a one week period. Two F-111As were lost in RP 1 due to unknown causes.

Adm Gayler issued three more Air Interdiction Messages: # 2 addressing the employment of air power against North Vietnam for the October 28-November 8 period, and AIMs 3 and 4 for the subsequent 12-day periods, November 9-20 and November 21-December 2. Air Force F-4 and F-111 attack efforts were almost exclusively against RP 1 targets. B-52 sorties were flown in RP 2 and 3 during the November 5-27 period in addition to the RP 1 effort. F-4D/E aircraft used the four major delivery systems, visual, LGB, EOGB and LORAN. Sixty-eight of the F-4 sorties were visual strikes. Of the 1,881 scheduled F-4D/E sorties in AIMs 2-4, 1,317 were flown. Numbers for the F-111A were 595 and 492 respectively. B-52Ds flew 996 sorties.

The Summary of Air Operations in Southeast Asia for November stated that primary North Vietnamese targets struck by F-4 and F-111 aircraft included point and area targets. Primary B-52 targets included truck parks, storage areas and TSPs. However, no specific targets were mentioned. As to RP 4 it was only mentioned that the AF flew eleven strike sorties and the Navy 102. Not, if any of those 113 targets included the Thanh Hoa area, although it can safely be assumed the Bridge was not a target as the JCS bridge bombing information did not include any for November.

On November 19, a fire broke out in *America's* number two catapult spaces. As smoke began to fill the 03 level, the ship went to general quarters. Damage control parties soon had the fire extinguished after which clean-up and repair work ensued. However, this time the carrier remained on line despite the loss of one of her four catapults.

December

Until the restriction was lifted on December 18, no attack sorties were flown against targets in RP 5 and 6. On



A total of ten aircraft from the *USS America* participated on December 21 in a mini-Alpha strike against the Thanh Hoa area, including four A-7Cs of VA-86 on Mission 9506 striking a ferry crossing. Thirty-nine Mk-82 low-drag bombs were expended, of which ten by Lt Rich Clover. The KB-18 bomb camera photo shows, what he believes, his Mk-82 hits. According to Rich, the crossing next to the N is the Bridge, obscured by bomb smoke. Crossing 2 looks like there might be a ferry boat or barge near the 2 marking. Crossing 3 clearly shows a pontoon bridge with the end near the 3 marking being damaged. The North Vietnamese would sometimes 'sink' them during the day for concealment. (Via Rich Clover)

that date, Operation LINEBACKER II was initiated. During the twelve days of the Operation, the Air Force applied its airpower almost exclusively against targets in RP 5 and 6, flying over one-half the sortie effort during the six months (May-October) of its predecessor, LINEBACKER I. B-52D/G aircraft flew 729 sorties in LINEBACKER II against thirty-three separate targets, forty-three percent of the AF attack effort, 1,689 sorties. All but one (in RP 4) of the B-52 targets were in RP 5 and 6. It looks like the RP 4 target was Quang Le Airfield, which was struck on December 21 by six B-52s.

December was also the first month since April 1972 Air Force aircraft flew more attack sorties than its Navy counterpart: 1,548 versus 1,383.

Five MiG-21s were downed by U.S. aircrews, two by B-52D tail gunners, two by F-4D crews and one by a F-4J crew. MiG-21 pilots claimed three U.S. aircraft, two F-4Es and a Navy RA-5C.

Of the 1,230 SA-2s launched against USAF aircraft, all but 200 were against B-52D/G aircraft, resulting in fifteen losses, seven Ds and eight Gs. In addition, one RF-4C was lost. The 91 SA-2s launched against Navy aircraft resulted in the loss of one A-6A and A-7C.

AAA claimed one F-111A, two Navy A-6As and an A-7E, one Marine F-4J and A-6A. One F-111A was lost due to unknown causes.

'Ferry Crossing'

After the *America* had arrived in Subic Bay on December 3 for R&R, fire damage repairs were made. Four days later, the carrier returned to Yankee Station for its fifth line

period.

During LINEBACKER II, U.S. aircraft flew 256 attack sorties in RP 4, of which thirty-four by AF and 222 by Navy aircraft. Several of the Navy sorties were flown in the Thanh Hoa area. A total of ten aircraft from the *USS America* participated on December 21 in a mini-alpha strike. According to the JCS bridge bombing information summary, two A-7Cs of VA-82 on Mission 9502 and with a 04:59 Time over Target (TOT) 'struck a bridge and damaged it with one 2.75-inch anti-tank rocket'. One minute later, four F-4Js of VMFA-333 on Mission 9504, flak suppression, struck an AAA site with twelve Mk-20 Rockeyes. Results were not observed. At the same time, four VA-86 A-7Cs on Mission 9506 attacked a ferry crossing and damaged it with thirty-nine Mk-82 low drag bombs. LTJG Rich Clover was one of the VA-86 pilots. He flew 126 combat sorties, of which 53 in North Vietnam. According to Rich, the 2.75-inch rocket does not make sense since no 2.75-inch rocket pods or 5-inch Zuni rocket pods were carried aboard the ship. In his opinion, the two VA-82 Corsair IIs were likely carrying Shrikes for anti-SAM support. As to the mission he stated,

My logbook shows a 1.4 hour sortie in A-7C 156773. I dropped ten Mk-82s at what we were calling a 'ferry crossing'. The strike was part of the continued 24-hour pressure put on North Vietnam during the 'Eleven days of Christmas'. As there was no opposition, I believe the North Vietnamese were shifting all of their defensive resources to the Hanoi area with good reason.

The *America* witnessed a total of 14,374 launches and 14,493 arrested landings in 1972. The ship steamed a total of 67,523 nautical miles.

January 1973

As of 15:00Z on January 15, 1973 all offensive operations and tactical reconnaissance missions over North Vietnam were ceased. While no sorties were flown in RP5 and 6, the USAF flew 716 attack sorties and the Navy, 863. In addition, B-52s flew 533 sorties. The North Vietnamese lost two aircraft, one MiG-17 (Navy F-4B) and one MiG-21 (F-4D). The North Vietnamese supposedly still had SA-2s as 438 were launched at USAF aircraft, of which 355 against B-52s and their escorts. One B-52D was lost with the crew of six recovered. Of the three SA-2s directed at Navy aircraft, one downed a *USS Midway* A-6A Intruder on a B-52 support mission. On January 14, 1973, AAA claimed a Navy F-4B on a BLUE TREE recce escort mission in the Thanh Hoa area. The aircraft, 153068/Rockriver 110 of VF-161 off the *Midway* was the last aircraft to be lost over North Vietnam. Both crewmembers were recovered by a Navy HH-3A. The pilot, Lt Victor Kovaleski, had claimed a MiG-17 two days earlier. Photography indicated the presence of three operational SA-3 Goa sites.

The Thanh Hoa area was not spared in the final days of the Air War with at least three strikes made, all against the same transshipment point. On the 8th, two A-7Es of VA-97 on Mission 9604 expended sixteen Mk-82 low-drag

bombs, ten minutes later followed by another two VA-97 Corsair IIs, dropping a similar number of Mk-82s on Mission 9606. Two days later, a single A-6A of VA-196, on Mission 9678, expended twelve low-drag Mk-82s. In all cases, results were not observed. Both squadrons were part of CVW-14 aboard the *USS Enterprise* (CVN-65).

February / March

After the ceasefire *America's* A-7s started flying missions over Laos, working with Forward Air Controllers. On February 7, the ship's crew received official word that the return to Norfolk would be one month earlier than scheduled. Probably no one aboard objected! A total of seven line periods were spent on Yankee Station. In between, R&R visits were made to places like Singapore, Subic Bay and Hong Kong.

On the 17th, CVA-66 steamed to Subic Bay and three days later the trip home was initiated via the Indian Ocean and the South Atlantic. On March 27, all fixed-wing aircraft flew off to their home stations with the *America* arriving at Naval Station Norfolk the next day.

Sacrifices

The deployment was not without sacrifices. A total of fourteen aircraft were lost, eight A-7Cs, two A-6A/KA-6Ds, and four F-4Js. Six crewmembers were killed, one listed as POW, while thirteen crewmembers were recovered.

Two of VA-86's five A-7C losses occurred on July 17 in northern South Vietnam. A total of four A-7Cs were fragged for a strike mission, number 9545, in I Corps. Flight Purpose Code was 3S2 (3, night visual; S, attack ASC targets; and 2, target assigned after takeoff). Briefing by the flight leader was at 18:00L, launch at 19:30L, and landing at 21:00L. It would be the *America's* 7th launch/landing event of the day (event 7G1) with the first one launched at 09:00L. The tactical call sign for the division was Sidewinder. VA-86's skipper CDR William 'Pete' Yonke was lead in AJ-405/156792, LTJG Art 'Airborne' Borne was #2 in AJ-400/156789, LTCDR Sullivan was #3 and section leader, and LT Dave Anderson was #4 in AJ-401/156771. Normally, Yonke



After all offensive operations and tactical reconnaissance missions against North Vietnam were ended on January 15, 1973, Laos became the operations area for *America's* strike aircraft. The photo shows A-7C 156745/AJ-312 of VA-82 on such a mission. The Corsair II is configured with one Mk-82 on weapon station 1 and 6 and four Mk-82s on 2 and 5. Weapon stations 3 and 4 were used for AIM-9 Sidewinders.



It did not occur often that aircraft of the Air Force and Navy conducted joint missions. The photo shows an F-4D of the 555th Tactical Fighter Squadron (Udon, Thailand), configured with a LORAN-D antenna. The Long-Range Navigation system made it possible to operate under all weather conditions. The Phantom is leading a quartet of (all-weather!) A-6As of America's VA-35 on a mission over Laos. At the direction of the F-4D's Weapons Systems Officer not only the own ordnance is being expended, but at the same time that of the Intruders. (via Rich Clover)

would have flown his aircraft, #400, but as #405 was the full systems aircraft in his division, he flew '405'. The Corsair II's configuration was a MER (Multiple Ejector Rack) on wing stations 2 and 6 (each with five Mk-82s with conventional fin, a M904-E2 mechanical nose fuse set for .025 second time delay, a Mk-344 electrical tail fuse set for instantaneous detonation and a free fall delivery conventional fin), a Shrike launcher on station 8, and 1,000 20-mm HEI, High Explosive Incendiary, ammunition. Each aircraft carried a full load of internal 10,200 pounds of JP-5.

During his brief CDR Yonke emphasized working with a FAC (Forward Air Controller) and normal procedures for visual attack. Yonke had previous experience with night FAC operations while flying A-4E Skyhawks with VA-212 from the *USS Bon Homme Richard* in 1967.

During the preflight, LTCDR Sullivan experienced mechanical problems and did not launch, forwarding LT Anderson from #4 to #3.

After launch the three aircraft rendezvoused and checked in with USAF's EC-130E *Airborne Command and Control Center* (ABCCC) for mission assignment. Prior to shifting frequency for rendezvous with the F-4D, Yonke instructed his flight over the radio to use nose fuse arming only (6.0 arm delay with .025 second fire delay).

Although configured with electrical tail fuses in their Mk-82s, these could not be legally used in a level flight unretarded delivery. This restriction had been mandated due to the poor fuse performance. If the fuse had been exposed to radio frequency energy, the arming time was unpredictable as the arming signal could be sent at any time after release. Six seconds would normally provide sufficient time to gain a safe distance from a free fall (un-retarded) weapon only in glide/dive release, followed by an immediate pullup. Art Borne,

We rendezvoused with our F-4 FAC at 10,000 feet about

thirty miles west of Hue TACAN, with Anderson taking port and Yonke starboard with me on his right wing. The F-4 was LORAN-configured to direct straight-and-level drops due to the accuracy of the system. He set us up on a heading for the South China Sea. Should anything catastrophic happen, no navigation needed, just fly straight until you run out of airplane and eject. Best chance of recovery. The night was black and the weather bumpy forcing us to work hard to stay in tight formation to avoid losing sight of each other or our FAC.

Shortly after the 3rd minute warning to drop, the FAC's Weapons Systems Operator radioed the call "Quick, Quick, Quick," meaning instantaneous fusing. Skipper Yonke, *Without thinking I automatically activated tail fusing arming in addition to the previous selection of nose fuse arming and turned on the AWW-2B electric control fuse panel and set it as to activate the electric fuse for instantaneous detonation. The other two pilots did not arm their tail fuses. All bombs were programmed for drop on a single pass and would be released individually at 100-foot intervals alternately from both wing stations. Upon receiving the FAC's release command "Ready, Ready, Pickle", we depressed our bomb release buttons to commence the drop. Almost immediately there was a bright yellow flash and a loud boom. Lt Anderson broadcast that Owl Two and I were on fire.*

Immediately following the flash, Yonke observed the flame pattern of the F-4 change to a more brilliant color as though the pilot had ignited the afterburner. The Phantom pitched down and began rolling to the left, completing one fairly tight roll and then increasing the roll radius. The aircraft appeared to impact a ridgeline. No radio calls were heard. Art Borne broadcast a Mayday and observed two ejection seat flashes from Owl 2 during the descent.

A tremendous burst of light could be seen by Borne from below the canopy to his left. The explosion tossed his ride up and to the right, and in front of him was the humongous fireball of the F-4. He pushed hard-over, missed the conflagration, realized that it was eerily dark, but could still hear the 12,000 pounds of thrust that his turbine was putting out. He kept looking for the other A-7s without success, but saw the fire-balling F-4 spiraling towards earth. Airborne,

Dave and I were speaking. He had been hit in his fuel tanks, was quickly losing fuel and continued towards the beach. No word from the skipper though. As soon as I got my heart and breathing under control, I marked our latitude-longitude so search-and-rescue could later be directed.

'Motel' was the 7th Air Force Tactical Air Command Center (TACC) at Tan Son Nut. At 12:45Z 'Motel' informed the 40th ARRS, Aerospace Rescue and Recovery Squadron, at Nakhon Phanom RTAB that *Sidewinder* 405 was 'on fire and heading for Hue or Da Nang'. Three minutes later the Squadron was advised that *Sidewinder* 401 was 'on emergency power and low on fuel, heading for Da Nang'.

In the meantime the *Sidewinders* skipper had turned



Participants in Navy Alpha and mini-Alpha missions in general also included aircraft with an Iron Hand task. The choice then was the A-7 Corsair II or A-6 Intruder. This photo shows A-7C 156745 of VA-82, configured with two AGM-45 Shrikes under each wing. The aircraft also carries an AIM-9 Sidewinder. (Except where noted, all photos by Marvin Baldwin)

toward the coastline with an estimated 7,500 pounds of fuel in the tanks, while maintaining throttle position, altitude (11,500 feet) and airspeed (400 knots). Initially, Anderson continued to fly a loose position on his left wing. Yonke lost visual contact after turning towards the coast line. Very shortly after that he heard '401' broadcast that he had lost his main generator. Smoke began coming up from both side console panels filling Yonke's cockpit. With ram air dumping pressurization the smoke was cleared from the cockpit. Mindful of his motto "If it's flying, stick with it", he pressed on.

Shortly after leveling out towards Hue's lights, the main generator went off line with subsequent loss of all warning lights and electrical equipment. The handle for the Emergency Power Package (EPP) was pulled, but it failed to deploy. Using his gooseneck flashlight, Yonke illuminated the instrument panel to try to assess his flight situation. He noticed that the engine instruments reading was normal and the airspeed and altitude steady. The skipper did not notice any extraordinary sounds or observe any flames. Using the lights of Hue as reference, Yonke continued on planning to get feet wet, turn south along the coastline to Da Nang. South of Hue the aircraft started to roll right with a noticeable down nose pitch. Yanking back and left on the control stick provided little if any control response. After a second feel of roll and tuck, resulting in a slight feeling of disorientation, a quick prayer for Divine help, Yonke decided it was time to go. The skipper,

Ejection was initiated at about 9,000 feet using both hands on the face curtain. Rocket ignition observed, canopy departure heard and the seat cleared the aircraft. The URT-33 beacon was automatically activated at seat separation, broadcasting a distress signal on Guard channel. The opening shock of the MB-10 parachute was immediate and quite pronounced. I had no observation of the aircraft impact. My first realization was the breathing of fresh air. Through a light wind the chute drifted to the east/southeast towards

a large bend in a small river. Ground contact was made left foot first followed by a roll left and back ending up with the left ankle under the seat pan.

At 12:58Z, 'Motel' advised that Sidewinder 405 had punched out. Twelve minutes later, the 37th ARRS at Da Nang, flying HH-53B/C helicopters, were notified. Two of the choppers, Jolly Green 64 and 71 were launched. Rescue Mission #40-034 involved Sidewinder 405 and #40-035, Sidewinder 401.

Yonke's first action was to disconnect the parachute harness and disconnect the seat pan, open it and remove the survival kit. After discarding the parachute, seat pan, life raft container, and helmet, Yonke gathered up the survival gear and started moving away from his initial landing site to seek additional cover. Very little light was available and shortly after moving off, he fell into a hole. His search for the match container was finally successful (his flashlight and penlight were lost during his ejection). The communications equipment was laid out and with one match the emergency beeper was secured and the operation of the other radios checked.

After assuring himself there was no one in the immediate vicinity, he broadcast on his radio, "Any station this net, this is Sidewinder 405, over". Yonke's call was immediately answered by an Air Force C-130 crew who located his position seven miles southwest of Hue along a riverbank. Skipper Yonke,

I managed to bring the C-130 over my general position on the ground and told him I was in the outside bend of the river in a flat area. We periodically kept in radio contact. The C-130 crew estimated my position as being about 6.5 miles 220 degrees from Hue TACAN. A slow FAC then showed up and checked the area out. He informed me not to shoot anyone unless I was absolutely sure who it was as there might be friendlies in the area. He later informed there were none.

Finally, a flight of two HH-53s, Jolly Green 64 (low) and 71 (high), approached the area and contact was established. '64' came in without lights, presenting a different orientation problem. While the helicopter pilot was making several passes checking out the area, Yonke put on his reflective helmet, activated the flashing strobe light and illuminated his night flares. However, the Jolly Green pilot seemed to keep losing ground reference and drift away from his hover. Cdr Yonke,

Trying to run his penetrator down wore me out. I had injured my left ankle on landing and this began to slow me down. I requested assistance from his jumper. The chopper pilot started in again to get the jumper down, but told me he was wound up too tight and would have to pull out. The pilot then asked the high Jolly Green to come down and give it a try. '71', with Capt Dennis Boroczka at the controls, tried a couple of hovers but was having the same problem of losing ground reference. I was asked what I thought about him making a landing and answered it looked good. He then

pulled out, turned on his landing lights and circled my little flat a couple of times. The pilot landed at 15:18Z, dispatched one of the crew members to help me making it into the chopper. I was pretty beat up by that time with my ankle and running through the elephant grass falling into several holes. I started towards the HH-53 and met the crew member. He helped me back to the helicopter and we were quickly on our way to Da Nang. It was then that I realized I was in shock. I took a few deep drinks of water. After my eyes had adjusted to the cabin darkness, I realized that Dave Anderson was also aboard. He did not have anything to say since he had a much harder time of it than I did and had to live through my pickup immediately following his own. Jolly Green 71 had made two successful rescue that night.

After landing at Da Nang at 15:59Z, both pilots were checked by a flight surgeon. Both were flown back to the *America* the next day. Because of his ankle injury, Yonke was not able to fly for several weeks and initially had to walk with a cane.

Sidewinder 401, Dave Andersen, in the meantime had been able to get his Emergency Power Package on line and regained control of all equipment. He started towards Da Nang, but wanted to get feet wet first. He called for assistance and an Air Force F-4 joined him and escorted him out over the water. He then lost his NAVAIDS, electronic aids to navigation, and noticed his fuel drop to about 200 pounds. After ending up with a fuel starvation flameout 20-30 miles off the coast of Da Nang, Dave punched out at about 10,000 feet and 220 knots. Everything worked as advertised with water entry and jettison of the chute being smooth, although he had some trouble getting into his raft. After about an hour, the Jolly Green showed up. A PJ entered the water to expedite the pickup, which was realized at 14:20Z. An Air Force AC-119K Stinger gunship of the 18th Special Operations Squadron (SOS) overhead dropped flares to assist. Skipper Yonke,

Anderson told me later that the HH-53 pilot got or was getting vertigo from the water spray. He had to pick up and get out of the hover while Anderson and the PJ were still attached to the cable down in the water. Hence the resulting pretty wild ride as they were skiing and getting ducked into the water for some distance until the pilot was able to settle it down and got both safely inside. Anderson was on the bottom so he got banged around a bit but suffered only a few stiff muscles. But it was not up to Da Nang yet.

The mission had taken Art Borne 4.4 flying hours. He stated,

*My being the on-scene commander that night had come by default as mine was the only aircraft that made it through the explosion. In my seven-year Navy career, I air-refueled only once for real, that night by an KA-6D Intruder. The concussion of the blast had knocked my generator offline. But no shrapnel holes, although my aircraft was as close to the detonation as the FAC's and skipper's, and closer than Dave's. When I finally returned to the *America*, the Captain had to turn the 85,000 tons of steel into the wind, just for*

me. What a beautiful sight that was!

Air Force perspective

In addition, a FASTFAC PAVE PHANTOM-configured F-4D of Ubon's 497th Tactical Fighter Squadron (68772) was badly damaged as well, forcing the crew to eject.

The first *Night Owl* mission on July 17 from Ubon, *Owl 02*, launched around 17:00L, still in broad daylight. Pilot was 1Lt Gordie Tushek, while his Weapons Systems Operator (WSO or WIZZO) was Capt Wayne Brown. Their ordnance configuration was one SUU-42 flare pod with sixteen LUU-2 flares each on the outboards, two LAU-59/A rocket pods on one inboard pylon each with seven white phosphorous marking *Willie Pete* rockets to mark targets, two CBU-24s on the other inboard and a 600-gallon 'drag bag' fuel tank on the centerline station. They were briefed on a possible SAM site construction in northern Military Region (MR) I, near the Demilitarized Zone (DMZ). The site was found without much problem as it was still twilight in the area. As no ordnance could be expended due to the reigning Rules of Engagement (RoE), they headed into RP 1 looking for traffic. Gordie,

We found several trucks, expended a few flares and rockets to slow them down, advised the ABCCC EC-130E, and requested ordnance. None was available. As we started heading back to Ubon, we received a radio call to head south to Military Region I. A flight of two Navy A-7s needed to expend ordnance fragged for that area, so we were called in to lead the flight to a target using our LORAN navigation system. We were not told of a specific target, but I am guessing it was truck traffic near the Laotian border, which had been picked up on the acoustic sensors in that area. After refueling with a KC-135, we rendezvoused with the A-7s



The first week of combat operations by aircraft of the *USS America* was spent off the coast of northern South Vietnam. For instance, each A-7C pilot was to fly two CAS sorties, working with Air Force Forward Air Controllers. Such a mission went dramatically wrong on July 17, when a premature detonation of one of the Mk-82 bombs resulted in the loss of two A-7Cs and the Air Force FAC F-4D. The three pilots were recovered by HH-53s, but the Phantom's Weapons Systems Officer was killed. The photo shows F-4D 66-8772, the F-4D in question. (via Gordie Tushek)

and led them on a straight and level bomb delivery pass over suspected enemy activity below a solid overcast.

Before we could leave the area, a second flight with three A-7s was inbound for a repeat performance. We picked them up close to the Laotian border. To help them with the join-up, we deployed two flares. But this time was different. Immediately after the A-7s had released their Mk-82 bombs, we knew we had been hit. At first we thought it was a midair collision. Then came the call "Lead, you're on fire."

Although unknown to us at the time, one of the bombs detonated immediately after release, and we were the lead on fire! We learned later that two of the Navy A-7s were also lost to the detonation. Suddenly our cockpit lit up with brightly glowing yellow caution and red warning lights, and worse, the sickening red fire lights for both engines illuminated. Hydraulic pressure went to zero. The controls froze and our F-4 started a climbing left turn. Like too many before us, we ejected and into the jungle of Vietnam via nylon. Quickly looking around, I could see that my chute was good and below me, my back seater's was good also, but clouds obscured the rest of my rapidly-shrinking world. Before entering the clouds, I was able to make a radio call on the emergency frequency: "Owl 02 has ejected with two good chutes." It was 7:45 pm local time. We were about 29 miles west of Hue, just off the A Shau Valley. I had no idea what to expect at ground impact, because after entering the clouds, it was pitch black and I could see nothing. I spent the night in my chute, hung up in the trees with my feet dangling, unable to determine the distance to the ground. My back seater and I established radio contact with each other and eventually with the initial SAR team. Wayne said he was hurt and could not move his legs. We talked to each other until the SAR team recommended we stop, probably to protect our positions. We had no idea how far apart we were in the mountainous area of northern South Vietnam, but we knew we were in an area where the Vietcong did not take prisoners. Throughout that long night, I heard from my squadron buddies who were circling above in solidarity. It was nice to know we were not alone.

I could finally see the ground, so I released my parachute risers and climbed out of the tree. My position was on the side of a mountain and above the cloud bases. SAR forces were soon overhead. Wayne was on the ground in the valley on the other side of the mountain. Because of his injuries, the first rescue attempt by the HH-53 would be conducted for him. That attempt was not successful because of very strong winds and enemy ground fire. About two hours after the rescue attempt, I heard gunshots from the direction that I had last seen the Jolly Green rescue helicopter, well below my position. I knew in my gut what that probably meant. My back seater was never heard from again. As far as I know Wayne's body was never recovered. He left behind a wife and a five-month old daughter.

After that, all SAR forces exited the area to regroup. I was told to save the battery on my radio for later use and check in again when I heard aircraft overhead. It got very quiet, except for the wind.

At approximately 1:30 pm, I heard an aircraft overhead and established contact with an OV-10 Nail FAC. Attempt-



In 1972, nine different Navy carriers operated off the coast of the Vietnam at one time or another. Of the fourteen F-4 squadrons in seven of the Carrier Air Wings, just one was a Marine Corps squadron, Marine Fighter Attack Squadron (VMFA) 333 onboard the *USS America*. The Fighting Shamrocks lost three aircraft, although the crews were recovered. On September 11, Maj Lee Lasseter and Capt John Cummings (Radar Intercept Officer), downed a North Vietnamese MiG-21 with an AIM-9G near Phuc Yen while on a MIGCAP mission. The photo shows F-4J 153856/AJ-212 just prior to being launched.

ing to talk the pilot into my position, I pulled out my trusty signal mirror and began working it to find a little bit of sun for a reflection. It worked. Moments later, after confirming what I was doing, the FAC had a visual on my location. At some point, the A-1 Sandys took over the rescue mission and we were in radio contact. They checked the area and selected the safest approach available for the Jolly Green, marking it with two Willie Pete rockets fired over my head into the mountain.

Once the helicopter arrived, they became my radio contact. I attempted to talk them into my position, but it was hard for them to see me through the thick canopy. At some point they asked me to move up the slope. I'm not sure how far that was, but they were finally able to lower the forest penetrator. I actually remembered to let the penetrator touch the ground first, to discharge static electricity, but then I quickly lowered two of the fold-down arms, straddled them, grabbed the cable, and shook it as best I could. That was the signal to the Jolly crew I was seated and ready to be pulled up. I had intended to watch the scenery around the area while I was being pulled out of the trees. But trying to make my 6'4" frame as small a target as possible, I rode up in the fetal position with a tight grip on the penetrator. I was hoisted up to the Jolly and pulled inside by my harness straps. The last thing I remember is the Jolly nose pitching down to gain airspeed. This was somewhere around 5:30 p.m. on 18 July.

Another "Sierra Hotel" rescue by the 37th Aerospace Rescue and Recovery Squadron under less than ideal conditions! Sadly, I was returning alone. Owl 02 Bravo was the only aircrew member lost on that mission. Probable cause of death: AK-47. To this day I have never forgotten this mission or my good friend, Captain Wayne G Brown.

Starboard

The November 9 A-7C loss (156764) ended with a happy note after all. While on a test flight, LT Steve Jones of VA-86 experienced at least one hydraulics failure in the air, but all controls were stable for approach and landing.

After uneventfully catching the wire, the yellow shirt commanded Steve a routine taxi forward and starboard to park the Corsair II on the bow. However, the nose gear steering apparently malfunctioned and went hard over port. In addition, the brakes failed and the A-7 rolled off the deck at which time Steve successfully ejected as his aircraft went left wing down, maybe 20 degrees, before flipping and went over the port side into the water. Steve's ejection and recovery was successful and he had no physical injury. The loss was categorized as an operational loss. Barry Hendrix,

I was there on the flight deck that day as a systems debriefer. The mishap was so surreal – immediate action and adrenalin.

On a brighter side, a crew of a F-4J of America's VMFA 333, Maj Lee Lasseter and Capt John Cummings (Radar Intercept Officer), downed a North Vietnamese MiG-21 with an AIM-9G near Phuc Yen while on a MIGCAP mission on September 11. However, the aircraft was then hit by a SA-2. The crew was able to reach the Gulf of Tonkin where they ejected and were picked up by a SH-3 which operated from the frigate *USS England* (DLG-22). This was also the fate of their wingman after they had been hit by AAA, resulting in a massive fuel leak. Unable to reach a tanker in time, they ejected over the water and were recovered by the frigate *USS Biddle* (DLG-34).

Losses:

1972			
17 Jul	A-7C	VA-86/SVN	Recovered
17 Jul	A-7C	VA-86/SVN	Recovered
10 Sep	A-7C	VA-82/NVN	KIA
11 Sep	F-4J	VMFA-333/SCS	Two recovered
11 Sep	F-4J	VMFA-333/SCS	Two recovered
13 Sep	F-4J	VF-74/Gulf of Tonkin (GoT),	one recovered/ one killed
16 Sep	A-6A	VA-35/NVN	two KIA
17 Sep	A-7C	VA-82/Da Nang Landing,	Recovered
27 Oct	A-7C	VA-86	KIA
29 Oct	A-7C	VA-86/GoT	KIA
9 Nov	A-7C	VA-86/GoT	Recovered
19 Dec	A-7C	VA-82/NVN	POW
23 Dec	F-4J	VMFA-333/NVN	Two recovered
1973			
24 Jan	A-6A	VA-35/SVN	Two recovered, final loss.

A-7C Launch

The *America* had four catapults, and each cat could launch aircraft with only 3-5 minutes or less between aircraft, so the strike force could be launched in about 15 minutes. Frank Staarup,

Prior to and during a launch, the flight deck of a carrier is an organized chaos with engines running and aircraft taxiing. The flight schedule then is the #1 top priority and takes precedence over nearly everything else. Yet, it is a col-



How do you get as many aircraft as possible onto a small area? America's bow shows it is possible! All squadrons are present except VAQ-132 with its Prowlers and RVAH-6 with its Vigilantes. The *USS America* is on its way back to the US East Coast and home.

orful chaos with folks running around wearing sweaters in some seven different colors, indicating what their job on the deck is. For instance, yellow is for handlers, taxi directors; brown for plane captains; blue for handling crews (tie down and release aircraft); and white for safety and supervisors.

Briefings began normally 90 minutes prior to a scheduled launch. Element leaders would first brief with the strike leader after which they would brief the others in their respective squadrons. For a mini-Alpha, the involvement of more than a single squadron, but not a full Air Wing complement, all aircrews would gather for just one briefing. Briefings would include subjects like lineup, call signs, weapons loading, launch weights, altitudes, speeds, target timing, points of ingress and egress, and communications. About thirty-five minutes before launch, after gearing up and inspecting the maintenance log of his aircraft, the pilot would proceed out onto the catwalk and up to the flight deck on the starboard side of the island, where he would be greeted by the plane captain, who is responsible for servicing and checking the aircraft. The pilot will then pre-flight his aircraft, including comparing and checking the launch weight that had been calculated earlier. Next is strapping on with the plane captain helping him attach his life support equipment. A snappy salute and the pilot is by himself in the cockpit. The most important thing he will need is electrical power. It takes about 15 minutes for a full alignment of the Inertial Navigation System (INS) and weapon delivery system, but there is not much time left. Without the INS, the A-7C would have been an iron sight bomber. A partial alignment takes 2.5 minutes, to be completed in flight with the Doppler.

The pilot has to wait for the yellow shirt, who will get his attention and asks if he is ready. After a thumbs up, the pilot signals the blue shirts to release him from the tie-down chains, while he holds the brakes. The yellow shirt then signals to easy forward as there are only inches from the aircraft next to you. The aircraft then proceeds slowly until the pilot arrives behind the jet blast deflector, knowing he will be next to be launched. When the deflector falls away, another yellow shirt appears and waves his arms for the pilot's attention. He shows the board with the weight of the air-



The pilot of A-7C 156786/AJ-306 of VA-82 'Marauders' has just landed with full power and caught the number four cable. As can be seen, it was not a particularly soft landing, neither for the pilot, nor the aircraft. The man in front is a taxi director. (Via Tailhook Association)

craft. When his number checks with the pilot's, he signals the catapult officer (also called the 'shooter'), who will set the steam setting on the catapult controls. When the numbers do not match, the pilot will signal to raise or lower the weight. In the meantime, a 'swarm' of maintenance personnel run around the aircraft doing final inspections. After they have given their okay for the aircraft to be launched, the yellow shirt authorizes the pilot to going to the catapult. On his signal, the pilot lowers the nose-tow bar and raises the cat launch grip for the throttle to prevent the pilot from pulling the throttle back under the force of the acceleration. The aircraft is then being eased into position on the catapult with the hardware being attached. After the buffer has been fully compressed, the nose tow bar goes over the front of the shuttle and into position on the cat after which the pilot can take his feet off the brakes. The pilot then makes a quick takeoff check, while underneath his aircraft a blue shirt signals to put it in tension. Normally, he will notice the hardware take a light load on the airplane and after being satisfied that the hookup is correct, he gives the signal for full tension. The pilot goes to full throttle and puts his back on the head rest. Some more of the steam pressure is then fed into the catapult to tighten all the mechanical linkages. A brown shirt makes one final check underneath, scurries out of harm's way and gives a thumb to the shooter while doing so. The shooter checks the cat track to make sure all is clear. In the meantime, the pilot has been watching the engine gauges, especially the oil pressure, temperature and EPR, Engine Pressure Ratio. All is well and he then is just a passenger along for the ride, with NO control except the decision to launch. The pilot salutes the shooter and then holds on to a 'towel hanger' with the computer being in charge. The shooter returns the salute, falls to one knee and touches the deck with one hand. On the catwalk, an operator, who until then had both his hands over his head to ensure safety, checks the deck for himself, lowers his hand to the control panel and touches a button. A second later, a portion of the ship's boiler steam is released into two tubes under the deck propelling two cylinders down the length of the bow with the shuttle and aircraft attached to them. In

under two seconds, the pilot and aircraft are accelerated to over 130 knots relative to the deck, while the airspeed indicator is showing nearly 160. After raising the landing gear handle, the flaps, turning on the transponder so they can 'see' you, calling 'airborne', the pilot is heading for the rendezvous circle on the starboard of the carrier.

Is taking off from a carrier already an art in itself for a pilot, the landing is even more. Especially returning from an intensive combat sortie, at night and with a rough sea. For launches and landings, a carrier is steaming into the wind. After arriving at the carrier, the division has to find the last of the aircraft in the pattern and trails behind them. The hook is lowered, right echelon at some 250 knots and level at 800 feet above the water. At the appropriate moment, the division leader turns to #2, taps his head, points to him and breaks left into a tight turn, eighty degree of bank, throttle idle, 4-G pull. #2 starts counting and at the appropriate interval, turns to #3 and does likewise. The airspeed is bleeding off rapidly due to the low power setting and pulling Gs. As the speed bleeds further down to 220 knots, the pilot grabs the gear handle and extend his landing gear and throws the flap handle to the down position. The angle of bank is reduced and the pilot levels out downwind at 600 feet above the water, 135 knots, and decelerating to optimum angle of attack. By now, the aircraft should be about 1¼ miles abeam the ship and heading downwind. The pilot makes sure his shoulder harness is locked. When the aircraft passes abeam the island, the pilot starts a gently turn to the left, gradually descending from 600 to 300 feet. The point in space the pilot will aim for is just to the right of the wake and ½ mile astern the carrier. There the pilot should have become established on the glide slope designated by the Fresnel lens on the carrier's port side. It will also be the pilot's reference for altitude. Coming out of the turn the pilot has to anticipate the lower power needs and to reduce the throttle appropriately. The airspeed will slow and the plane will settle into the correct angle of attack and altitude. The pilot has to ignore the deck, but has to fly the ball. He keeps his aircraft on speed, checks his line up and lets it keep coming. Next is getting through the burble of dead air behind the ship. The aircraft then slams into the deck, snagging one of the four wires on the deck. This is done with the throttle in full power in case a pilot misses all four of them. In just two seconds the aircraft will have been stopped. The wire will then pull the aircraft back a little bit, after which the pilot can raise the hook, clearing the aircraft. The pilot will then engage nose wheel steering, raise the flaps, unlock the wing, switch it in fold position, start the horizontal trim coming down, test the brakes, turn right and watch the yellow shirt. Under his direction the pilot will taxi to his parking spot. Having arrived there, the aircraft is shut down after which the pilot gets out and go debrief.

Rich Clover added the following in this respect,

I still maintain that the carrier landing was the most unforgiven flying I have ever done in thirty-six years of flying for the Navy and Delta Airlines. Night traps, especially in bad weather or with a pitching deck, were especially dif-

ficult to do well. Think late night, fatigue, combat stress and now having to perform at 'top level best' under lots of pressure. I still, to this day, occasionally wake up from a dream repeating the cockpit scan required during a carrier landing: 'Meatball, Lineup, Angle of Attack'. Meatball (yellow light between the green lights) for glideslope, lineup for centerline, and angle of attack for speed control. The acceptable parameters were tight, fifteen feet either side of centerline and tail hook-to-ramp clearance of fourteen feet on centered glideslope. Very demanding, considering a closure rate of at least 100 knots and even up to 130 knots, depending on wind over the deck. I got lots of help from the LSOs, the Landing Signal Officers.

April 1972-January 1973 Summary

According to the Summary Air Operations Southeast Asia, the Air Force flew a grand total of 35,252 sorties, including 16,219 strike and 9,894 CAP/Escort sorties. In addition, B-52D/G aircraft flew 5,063 sorties.

The Navy/Marine Corps flew 70,824 sorties, including 27,670 strike and 14,775 CAP/Escort sorties. It is interesting to note that a total of 33,006 sorties were flown in the Gulf of Tonkin, the USAF only 295.

A total of 155 aircraft were lost. The Air Force lost eighty-three: 50/F-4D/E, 17/B-52D/G, 6/F-105G, 6/F-111A, and 4/RF-4C. The Navy sixty-four: 31/A-7B/C/E, 11/F-4B/J, 10/A-6A/C, 4/A-4, 3/RA-5C, 2/RF-8G, 2/SH-3G, and 1/F-8J. The Marines eight: 6/F-4J and 2/A-6A.

The 155 number included sixty aircraft claimed by SA-2s: USAF, thirty-five; Navy, twenty-four and Marine Corps, one. Of the AF number, seventeen were B-52D/Gs, while the Navy's number included fifteen A-7B/C/Es.

Air Force F-4D/E aircrews claimed forty-seven MiG aircraft: 8/MiG-19 and 39/MiG-21. Navy/MC aircrews, twenty three: 7/MiG-17, 2/MiG-19, and 14/MiG-21.

North Vietnamese pilots claimed thirty U.S. aircraft: 1/F-105G, 7/F-4D, and 14/F-4E (USAF), and 1/RA-5C, 2/A-7B and 5/F-4B/J (Navy).

A total of 4,606 guided weapons were expended, of which 4,058 by the Air Force and 548 by the Navy. An interesting note is that the Navy was the only service to expend the AGM-62 Walleye, 126 Walleye I and IIs.

Dragon's Jaw

According to the JCS Bridge Bombing Summary, U.S. aircraft carried out twenty direct missions against the Thanh Hoa Railroad and Highway Bridge in the 27 April-6 October 1972 period, nine by Air Force and eleven by Navy aircraft.

They were as follows:

Date	Number/ Aircraft	Unit	Base/ Carrier	Call Sign	Ordnance Expended
4/27	4/F-4D	435TFS	Ubon	Senior	5/Mk-84 EOGB
4/27	4/F-4D	8TFW	Ubon	Brushy	6/Mk-84 LGB
4/27	4/F-4D	8TFW	Ubon	Dudley	8/Mk-84 LGB

5/13	4/F-4D	433TFS	Ubon	Dingus	5/Mk-84 LGB 3/M-118 LGB
5/13	4/F-4D	25TFS	Ubon	Jingle	Identical
5/13	4/F-4D	435TFS	Ubon	Goatee	4/Mk-84 LGB 3/M-118 LGB
5/13	4/F-4E	8TFW	Ubon	Cowsip	48/Mk-82
7/30	4/F-4D	8TFW	Ubon	Redwood	6/Mk-84 LGB
8/8	4/F-4D	8TFW	Ubon	Maple	2/Mk-84 LGB 2/M-118 GPB
8/14	2/A-7C	VA-82	America	Streetcar	1/Mk-82 LD
9/11	3/A-4F	VA-164	Hancock	Magicstone	4/Mk-83
9/11	3/A-4F	VA-164	Hancock	Magicstone	4/Mk-83
9/12	3/A-4F	VA-164	Hancock	Magicstone	4/Mk-83
9/12	3/A-4F	VA-164	Hancock	Magicstone	4/Mk-83
9/13	4/A-4F	VA-164	Hancock	Magicstone	8/Mk-82 8/Mk-83, 4/Mk-84
9/13	4/A-4F	VA-55	Hancock	Garfish	Identical
9/13	4/A-4F	VA-164	Hancock	Magicstone but	Identical 8/Mk-84
10/1	2/A-7C	VA-86	America	Sidewinder	1/AGM-62A
10/1	4/A-7C	VA-82	America	Streetcar	1/AGM-62A
10/6	4/A-7C	VA-82	America	Streetcar	2/AGM-62B 4/Mk-84

Other Thanh Hoa Targets

The Thanh Hoa area knew several other (JCS) targets that included SAM sites VN 046 and 079, the Army Barracks (Complex), Petroleum Products Storage (PPS), Thermal Power Plant (TTP), Pontoon Bridge/Highway Ferry, Railroad/POL Complex, Transshipment Point, Storage area, Highway Bridge East #1, the Vehicle Repair Facility.

With the help of information from 'Analysis of Air Operations Southeast Asia' (Volume I through V), 'Statistical Summary Air Operations Southeast Asia' (Volume VI through XI), and Summery Air Operations Southeast Asia (Volume I through 102), the author has tried to determine how many *strike/armed recce* sorties were flown against the Dragon's Jaw:

Year	Air Force	Navy	Total
1965	182	161	343
1966	2	81	83
1967	0	124	124
1968	27	15	42
1972	35	40	75
Total	246	421	667

It was very hard to determine the exact number of aircraft that were downed by North Vietnamese air defenses on direct strike/armed recce sorties against the Dragon's Jaw. 100% losses included:

Date	Type	Unit	Call Sign	Base	Pilot's fate
1965					
April 4*	F-105D	354TFS	Zinc 01	Takhli	KIA
April 4*	F-105D	354TFS	Zinc 02	Takhli	KIA
April 4	F-105D	67TFS	Steel 03	Korat	POW
May 7	F-105D	354TFS		Takhli	Recovd



The Thanh Hoa Railroad and Highway Bridge on April 20, 2016 as seen through the lens of the author's camera. The Dragon's Jaw is used by local traffic only and the Vietnam Railways System uses the one narrow gauge for four trains that leave Hanoi daily for the 1,073-mile long trip to Ho Chi Minh City and vice versa. (*Theo van Geffen*)

May 31 F-105D 35TFS Buick 02 Takhli POW
 Aug 2# F-105D 12TFS Oak 04 Kadena POW
 1966
 May 31**C-130E 61TCS Radium 01Da Nang 8/MIA

*The two aircraft were downed by MiG-17s while orbiting and awaiting their turn to bomb the Bridge.

** The aircraft was loaded with five floating mines to be dropped over the Song Ma River; it looks like the Hercules was lost before mission execution.

The aircraft was configured with two M-118 3,000# bombs; the second such strike against the Bridge.

Indirect' losses with regard to Bridge strikes included:

Date	Type	Unit	Base/ Carrier	Mission	Pilot's fate
1965					
April 3	F-100D	613TFS	Da Nang	Flak support	KIA
1967					
May 14	F-4B	VF-114	<i>Kitty Hawk</i>	Flak support	2/MIA
1972					
June 16	RF-8G	VFP-63	<i>Midway</i>	Recce	Recovered

The other side

Hàm rồng, Dragon's Jaw in English, is the Vietnamese nickname for the Thanh Hoa Railroad and Highway Bridge. It was built in 1904 by the French and was the most modern bridge in Indochina at that time. The Viet Minh sabotaged it in 1945. In 1957, the North Vietnamese started reconstruction which was completed in 1964. In, as the Vietnamese call it, the American war, the Dragon's Jaw was an important link in the transportation of supplies and weapons to the south. The Bridge became the symbol of the North Vietnamese people's will to defend their country.

The Bridge was repaired in 1973. This not only symbolized the patriotism of Thanh Hoa's residents and soldiers, but also the feeling not to be defeated. However, deterioration over the years started to bother Bridge traffic. Plans

were made to completely repair it and after more than 100 workdays the project was completed on March 21, 2010.

On April 3, 2010, Vietnam's president Nguyen Minh Triet reopened the Bridge in a ceremony which also marked the 45th anniversary of Hàm Rồng victory in Thanh Hoa Province. Nguyen stated the victory was not only the pride of the Thanh Hoa people, but also the triumph of Vietnamese war tactics. It was commemorated that on April 3 and 4, 1965 locals and the military had downed forty-seven U.S. aircraft in the 454 sorties flown against the Bridge.

The Vietnamese claim that during the more than 1,500 days and nights the Bridge was defended, a total of 117 U.S. aircraft were shot down while many of their crewmembers were killed or taken prisoner. For their part in the battle, anti-aircraft gunners were rewarded with the Military Exploit Order and the Victory Order.

Hàm rồng still plays an important role in the North-South and vice versa traffic. Not so much for car traffic as two new road bridges were built down river, but for local traffic and especially the Vietnam Railways System. The rail line from Hanoi to Ho Chi Minh City, the former Saigon, uses the Bridge. The line has one narrow gauge. Four trains leave Hanoi daily for the 1,073-mile long trip to Ho Chi Minh City. Travel time is 32-35 hours with twelve staging points between the two cities, including Nam Dinh, Thanh Hoa, Vinh and Dong Hoi.

It seems that the danger for the Dragon's Jaw now comes from an unexpected enemy: erosion! Dan Tri International stated on November 18, 2018 that the Bridge was facing serious erosion which was threatening its safety. Floods in September and October badly damaged the embankment and land around the abutments. The embankment cracked and a part of it dipped by some three feet, separating from the Bridge. This even resulted in some pieces of it falling into the Song Ma River. Measures were taken quickly to prevent further and future erosion. ■

In memory of Frank Staarup, who passed away on July 6, 2020.

NOTES ON SOURCES

Thanks to

Marvin Baldwin, Art Borne, Rich Clover, Ron Farlow, Barry Hendrix, Steve Jones, Sandor Kocsis, Rich Powell, Leighton 'Snuffy' Smith, Frank Staarup, Gordie Tushek, Gary Verver, Pete Yonke, the Air Force Historical Research Agency and the History Support Division.

Sources

Ron Farlow's *YE OLDE PAO SNAKE*
 K143.042-4, Analysis of Air Operations Southeast Asia/Statistical Summary Air Operations Southeast Asia
 K178.203-23, JCS, Bridge Bombing Information
 K717.0414-42, CHECO Report #147, Linebacker: the First 120 Days
 K717.0413-102, CHECO Report #146, Linebacker Operations, September-December 1972
 K717.3063, Summary Air Operations Southeast Asia
 DTINews

The U.S. Air Force's Long Range Detection Program and Project MOGUL



Brigadier General Roger Ramey and Colonel Thomas Durbose pose with the Roswell debris on July 9, 1947.

James Michael Young

In April 2014, the Air Force Technical Applications Center (AFTAC) conducted a formal ribbon cutting ceremony for its new headquarters building at Patrick Air Force Base, Florida. AFTAC's guest speaker for the ceremony was the Honorable James R. Clapper, Director of National Intelligence and a former AFTAC commander. In addition to Clapper, many other former commanders attended the event. It was a solemn ceremony as AFTAC memorialized the new building to honor the memory of AFTAC's most revered scientist—Walter Singlevich.

Walt Singlevich was an expert in the field of radiochemistry, a branch of chemistry concerned with radioactive substances. More specifically, he pioneered important techniques in the collection and analysis of nuclear materials. In doing so, he connected with Project MOGUL and its subsequent spawning of alien conspiracy theories at Roswell, New Mexico.

During the Second World War, Singlevich worked for DuPont but was assigned to the Manhattan Project at Oak Ridge, Tennessee, both for graduate-level training under the auspices of the University of Chicago, and for pilot-plant studies prior to full-scale construction of the Hanford plutonium production facility at Richland, Washington. His mentors for his graduate studies included Nobel laureate Dr. Enrico Fermi and Dr. Arthur Compton. In 1945, Singlevich transferred to the Hanford Engineer Works, the producer of weapons-grade plutonium for the U.S. nuclear program. As chief of the Radiological Sciences Department, he remained at Hanford until 1951, when he returned to DuPont headquarters at Wilmington, Delaware. During his last year at DuPont, he participated in the design and construction of the Savannah River Atomic Energy plant near Augusta, Georgia.

Singlevich left DuPont in early 1952 to lead Technical Directorate 4 (TD-4), Radiometrics, at AFOAT-1. AFOAT-1 was the abbreviation for "Atomic Energy Office, Section One," under the Air Force Deputy Chief of Staff for Operations. The field component of the new unit was designated as the 1009th Special Weapons Squadron, commanded by a major general. The Air Force, in 1948, created AFOAT-1 to leverage emerging technologies to detect nuclear detonations at extremely long distances. That strategic mission of long range detection (LRD) was a concept born in 1946 when the U.S. sought to understand the status of the Soviet nuclear weapons program. Knowing when the Soviet Union developed a nuclear weapon, thus ending the American monopoly, would mark a turning point in formulating U.S. national security strategy and international relations. With human intelligence unable to penetrate the Soviet nuclear program, understanding the scope of the technological challenge proved daunting. AFOAT-1's job was to innovate new technologies to detect nuclear detonations originating within the Soviet Union and, if possible, to collect nuclear debris from such a test for subsequent analysis. To accomplish this, AFOAT-1 was tasked to establish a worldwide monitoring system that soon became known as the Atomic Energy Detection System (AEDS).



Walter Singlevich, AFTAC Director, Nuclear Technology. (AFTAC Archives.)

Although the Air Force did not activate AFOAT-1 until July 1948, many scientists had already studied the technological challenges associated with the long range detection of nuclear detonations. In late 1945, preeminent geophysicist and oceanographer Dr. W. Maurice Ewing theorized that a sound channel existed in the upper atmosphere that could easily carry sounds across extremely long distances. Before and during the war, Ewing had pioneered research of seismic reflection and

Lt Col James Michael Young, USA, Ret., is the historian for the Air Force Technical Applications Center at Patrick Air Force Base, Florida. He holds a B.A. in International Studies and a M.A. in History from the Ohio State University, a M.S. in Strategic Intelligence from the Defense Intelligence College, and a Ph.D. in Leadership and Change from Antioch University. His Army career included assignments with the 82nd Airborne Division, the 5th Special Forces Group, the 11th Armored Cavalry Regiment, and as an instructor in the Department of History, United States Air Force Academy. Shortly before his retirement from the Army in 2005, he served as the Deputy Commander, Joint Detention Operations Group, Joint Task Force Guantanamo. His publications include a country study and a military capabilities study for US-SOUTHCOM, and several articles for the AVFForum.org and DefensePolicy.org. His book, entitled Nuclear Vigilance: the Creation of the Atomic Energy Detection System and its Impact on Nuclear Arms Control Goals during the Eisenhower Administration, is currently under prepublication review.



Dr. Maurice Ewing, who hypothesized the existence of a sound channel in the stratosphere that led to Project MOGUL. (<https://ig.utexas.edu/>)

refraction in ocean basins, and explored submarine sound transmissions for the Navy. He discovered a deep sound channel in a horizontal layer of water in the ocean that acted as a waveguide for sound. Within this channel, low frequency sound waves could travel thousands of miles. The channel was called SOFAR for Sound Fixing and Ranging channel.¹

Ewing suspected that a similar channel existed in the upper atmosphere. Just as SOFAR had aided submarine warfare, he speculated this high-altitude channel could similarly assist the Army Air Force (AAF). In late 1946, he presented the idea in a letter to General Carl Spaatz, Commanding General of the Army Air Forces, who had just returned from the Pacific following the bombing and subsequent surrender of Japan. Spaatz was intrigued. After assuming command of the AAF from General Hap Arnold in February 1946, Spaatz initiated Project MOGUL—a top secret LRD program that experimented with high-altitude acoustics as a possible LRD technique.²

In short, Project MOGUL sought to develop a technique capable of recording the sound of a nuclear detonation within the Soviet Union. The idea was to place acoustic sensors (i.e. quasi-microphones) on balloons that operated at a steady state within the stratosphere.³ MOGUL flights were conducted at Alamogordo Air Field in New Mexico between summer 1947 and spring 1949. MOGUL was a highly compartmentalized project, meaning that only a few people with a “need to know” were involved.

MOGUL had two R&D goals. The first and most sensitive goal was the attempt to place the acoustic sensors as balloon payloads to record sounds in this “acoustic duct.”



MOGUL crew preparing a balloon train, 1947.

crewed B-29s for penetrating the clouds until Operation RANGER in January 1951.

After the Air Force activated AFOAT-1 in July 1948, AFOAT-1 scientists took great interest in the MOGUL experiments. If Project MOGUL could develop steady-level balloons capable of carrying sound recording equipment into the stratosphere, then it would certainly seem feasible they could carry a capturing device to collect nuclear debris at much higher altitudes than the maximum altitudes of the modified B-29 aircraft. As the 1994 official report on the Roswell incident described, controlling the altitude of the balloon required either the use of a servo-mechanism or a non-extensible balloon capable of withstanding a high internal pressure. In regard to the latter, at the time of the MOGUL flights from Alamogordo, the Army and the NYU researchers were transitioning from balloons made of neoprene to polyethylene. By the mid-1940s, the chemical company DuPont was just beginning to develop a polyester film referred to as “BoPet” for biaxially-oriented polyethylene terephthalate, a polymer.⁹ Several years after Roswell, DuPont would commercially sell it under the name “mylar.” Mylar was a material known for its toughness and high tensile strength, viscoelasticity, chemical and dimensional stability, and its reflectivity. It was also extremely lightweight and aerodynamic. In sharp contrast to neoprene, it was very “alien looking” with its light, silver reflective surface. Though speculative, it is conceivable that an experimental BoPet balloon was used in launch #4.

In sum, during the MOGUL experiments, LRD researchers recognized the potential of collecting air samples in the stratosphere with high-altitude balloons. The relationships formed between the MOGUL participants and the AFOAT-1 scientists were significant. This was especially true for Dr. Charles B. Moore, the NYU Constant-Level Balloon Project Engineer who was associated with AFOAT-1’s Project FITZWILLIAM in Operation SANDSTONE, the second series of nuclear tests conducted in the Pacific in 1948.¹⁰ His close association also included a working relationship with AFOAT-1’s technical director,



Doyle Northrup, Technical Director of AFOAT-1 and AFTAC who ran the Air Force’s LRD program from 1948-1972. (AFTAC Archives.)

Mr. Doyle Northrup, and AFOAT-1’s primary radiochemistry lab for LRD, TracerLab, Inc. “The people I was involved with [at AFOAT-1] were civilian scientists . . . [and] later on Project Grab Bag and others . . .”¹¹ Dr. Albert Crary from Watson Laboratory and a recent graduate student of Maurice Ewing, had conducted acoustic LRD experiments on Ascension Island during Operation CROSSROADS alongside LRD (and future AFOAT-1) researchers. Dr. Athelstan F. Spilhaus, NYU Director of Research, recalled how AFOAT-1’s involvement was highly classified, and that MOGUL and AFOAT-1 were directly connected (“the acoustic detection relates with the atomic debris collection.”) Spilhaus noted the “service flights” (i.e., the Watson Lab balloons) were likely not recorded at Alamogordo because they were related to MOGUL and later AFOAT-1.¹² Albert Trakowski, the Army Signal Corps officer who became the project officer of MOGUL in November 1946, had already participated in the LRD acoustic experiments in Operation CROSSROADS. Trakowski remained in that position through the end of the project that also included AFOAT-1’s involvement. At one point he was officially assigned to AFOAT-1.¹³

Collectively, the MOGUL and AFOAT-1 scientists and engineers succeeded in developing steady-level balloons and mechanisms to control payloads. Ten months after the Roswell Incident, Project MOGUL personnel continued to test their sonic-equipped balloons during Operation SANDSTONE in the Marshall Islands. During that three-shot operation, from April 14 to May 14, 1948, MOGUL crews at Alamogordo reported a positive signal from the SANDSTONE shots at 50,000 feet. AFOAT-1 researchers,



Offloading a “hot” sample from a B-17 drone at Operation SANDSTONE in 1948. (Harry S. Truman Library photo 59-1611-28.)

also at SANDSTONE, detected fission products up to 60,000 feet, thus offering the first real test of balloon sampling (later designated the “Db” Technique in the AEDS). For Operation GREENHOUSE in 1951, a four-shot series that included the first test of a thermonuclear device, AFOAT-1 experimented with balloons to quickly detect atomic bomb debris. The objective of that experiment was to test equipment reliability and to determine the feasibility of measuring at long range the concentration of atomic debris from ground level to 90,000 feet.

Although a high-altitude LRD acoustic sensor never achieved the degree of fidelity that would enable it to become an AEDS component, the experiments allowed AFOAT-1 to develop a reliable means of collecting nuclear debris at high altitudes. An exact description of the actual device used to capture an air sample is not known other than it was called an “armored vessel” or “armored bag.” However, the MOGUL balloons contained mechanisms that allowed in-flight activities to occur (i.e., ballast flow, pressure switches, etc.). AFOAT-1 perfected the “armored bag” shortly after the Project MOGUL flights from Alamogordo ended in 1949.¹⁴

Soon after the Roswell Incident, LRD researchers utilized the polymer material that DuPont had produced because it could create a balloon that was approximately 80 feet in length and only 0.001 inch in thickness, a vast improvement over the neoprene balloons. They used helium gas to partially inflate the balloon on the ground; as it rose into the upper atmosphere, the helium expanded until the balloon was fully inflated. At a predetermined altitude, a blower automatically filled a plastic collection bag of air, and the balloon would begin to descend. At approximately 30,000 feet, a fan transferred the air from the collection bag into the “armored bag.” Once on the ground, recovery personnel compressed the air into standard cylinders.

From AFOAT-1’s perspective, those achievements would never have been possible without the leadership of its most respected scientist, Walter Singlevich. At the time

of Project MOGUL, he had become one of the U.S. government’s leading experts on nuclear fission materials. Within weeks of joining AFOAT-1 in early 1952, he led the LRD materials experiments in the nuclear test series Operation TUMBLER-SNAPPER (April—June 1952) and all subsequent U.S. nuclear tests. In early 1954, high altitude balloons officially entered the AEDS as the Balloon Technique, designated “Db.”

While the balloon technique became an important component of the AEDS during the 1950s, it did suffer from several drawbacks. First, a balloon launch was expensive, both in terms of materiel costs and operational requirements such as manpower, logistics, etc. Second, the flight path relied on unreliable wind predictions. Meteorology was a critical component of LRD, but its precision was in its infancy during this time. Finally, while the balloons initially proved invaluable in collecting high altitude samples, they offered only a time-constrained vertical catch. Importantly, their effectiveness relied on detailed knowledge of the date and time of a nuclear detonation; conditions that would be nearly impossible to predict in the case of a secret Soviet nuclear test. In retrospect, the Db Technique proved invaluable in advancing LRD science and radiochemical analysis, as used in U.S. tests, but held little operational value for its primary *raison d’être*—to confirm a Russian nuclear detonation.

AFOAT-1 would not overcome those limitations until the Air Force Strategic Air Command (SAC) participated in LRD with modified aircraft that could sample at high altitudes, namely the WB-52 (in October 1958) and the WU-2 (in December 1958).

During the 10-year interlude between the activation of AFOAT-1 in July 1948 and the allocation of SAC’s high altitude sampling aircraft, the AEDS heavily depended upon the balloon technique. In 1952, AFOAT-1 contracted with General Mills for the use of balloons to conduct high-altitude sampling under a program codenamed GRAB-BAG. General Mills had created its aeronautical research



RB-29—Note the foil on top of the fuselage. (NMUSAF photo.)

laboratory in 1946, and soon developed the Skyhook balloon capable of reaching altitudes above 100,000 feet. In the fall of 1953, General Mills conducted the first successful air sampling flight above the stratosphere (the mesosphere). Beginning in January 1954, AFOAT-1 flew an average of three collection flights each month in the vicinity of Minneapolis, Minnesota. By July 1954, the balloon sampling capability, now designated “Db,” was added to the AEDS and routinely performed three sampling collections per month. By 1955, balloon sampling operations expanded to San Angelo, Texas. “Sky Hook” type balloons, which could collect samples in the mesosphere, were now used on a routine basis.¹⁵ On April 1, 1957, the 1110th Air Support Group, re-designated the 1110th Balloon Activities Group (BAG) on March 1, 1958, assumed operation of the balloon stations from General Mills. On July 1, 1958, the Air Force moved the 1110th BAG from Minneapolis to Sioux City AFB, Iowa. However, in late 1958, AFOAT-1 reduced the balloon sampling program as SAC aircraft became available.

In July 1959, the Air Force inactivated AFOAT-1 primarily because the mission of establishing the AEDS was complete. Stewardship over the AEDS then passed to a new organization—the Air Force Technical Applications Center (AFTAC)—which was activated to monitor the impending nuclear arms control treaty with the Soviet Union. By the end of the decade, AFTAC wanted to retain a balloon capability although the B-52s and U-2s were much more efficient. While the Sioux City balloon detachment was inactivated on December 31, 1959, the detachment at Goodfellow AFB near San Angelo, Texas, continued to operate. On January 1, 1962, the 1110th BAG was reduced to a squadron and transferred to the Air Weather Service (the airborne flying arm of the AEDS). The 1110th BAG was then re-designated as the 1212th Balloon Activities Squadron. That same year, balloon sampling operations were temporarily initiated at Ellsworth AFB, South Dakota. On June 8, 1963, the 1212th was re-designated the 59th Weather Reconnaissance Squadron, and yet again on May 8, 1964, as Det 1, 6th Weather Squadron. High-alti-



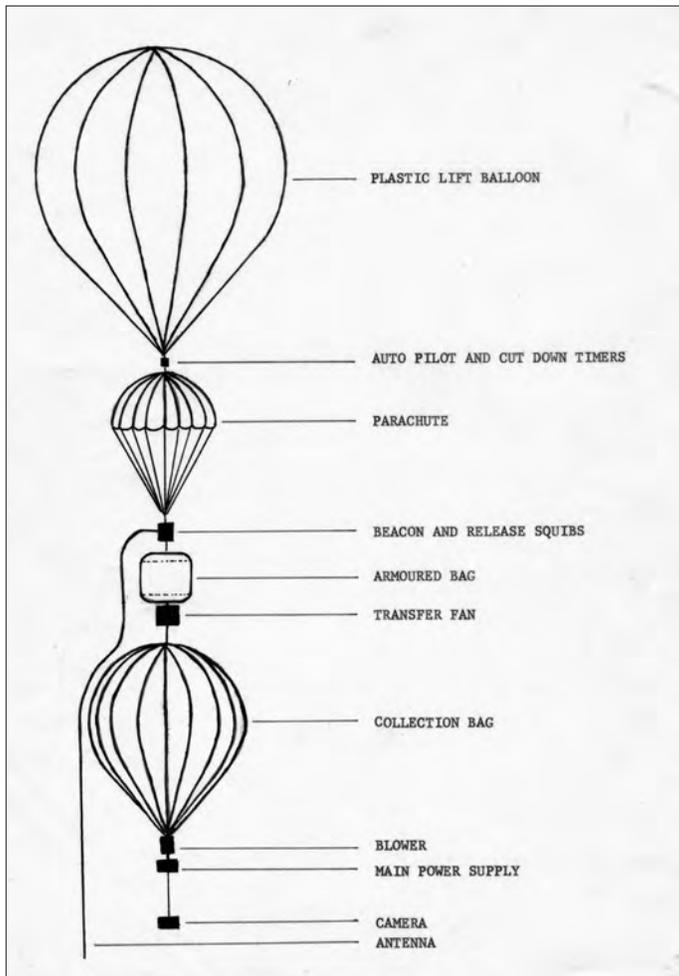
The WU-2 — modified for air sampling. (<http://donhollway.com/u-2/>)



World's first communications satellite was an inflatable mylar sphere called "Echo," launched in 1960. (NASA Photo.)

tude balloon sampling operations were terminated on July 1, 1966, and AFTAC officially dropped the Db technique from the AEDS in November 1967.

Walt Singlevich directed R&D sampling experiments in almost every U.S. nuclear test series throughout the 1950s to refine LRD techniques and to build the AEDS. Collecting noble gases by air sampling consumed much of his attention. During the U.S. nuclear tests at Nevada, Sin-



Original diagram of the Db technique. (AFTAC Archives.)



Launching of a Balloon Air Sampler (1950s). (AFTAC Archives)

glevich sometimes found himself back in the Roswell region as his high-altitude balloons collected samples in the radioactive clouds and sometimes descended into that area. In his later years, Walt humorously reflected on those events. He once told of a balloon recovery mission that made him think that the Roswell residents may still have believed in aliens.

During one nuclear test, as the prevailing winds pushed the nuclear cloud southeast towards Texas, the contaminated balloon landed close to a ranch in the Roswell area. Singlevich flew out to recover the debris, and his pilot landed the helicopter in a small, adjacent valley out of sight of the ranch. Both donned their protective gear that included a suit, hood, and respirator. As luck would have it, the two neared the debris just as a woman from the ranch arrived on the scene. According to Walt, she took one look at the two, gasped, and then fainted. They both ensured she was OK, then gathered the debris and ran for the helicopter. Singlevich surmised that with his height, approximately five feet two inches, and outfitted in his strange protective gear, he must have appeared to her as an alien being.¹⁶

Singlevich died on August 7, 1992, while still working at AFTAC. Although his retirement was nowhere in sight at that time, his work reflected a long and distinguished career. In the early 1960s, after a decade of invaluable contributions in the creation and expansion of the AEDS, he participated in the planning and negotiations leading up to ratification of the Limited Test Ban Treaty (LTBT) of 1963. He was detailed to the White House Arms Control and Disarmament Agency (ACDA) in its early stages and was a member of many ACDA panels. As AFTAC contin-



The WB-52 — note the extended F-52 sampling foil. (AFTAC Archives.)

ued to serve as the nation's premier nuclear treaty monitoring organization, Singlevich provided critical information that contributed to the formulation of other nuclear treaties. The White House, the Arms Control and Disarmament Agency, and the National Academy of Science recognized his 38 years of service to the U.S. Government. The Air Force twice awarded him the highest Air Force award available to civilians, the Air Force Exceptional Service Award. He also received the Presidential Award for Meritorious Executive and the Presidential rank of Distinguished Executive.



Mrs. Walter Singlevich and Director James Clapper cut the ribbon on AFTAC's new headquarters, memorialized as the Singlevich Building

In his later years, Walt found the encounter with the woman from the ranch humorous and would joke that he was one of the Roswell aliens. Given his remarkable expertise in nuclear materials, and his vast knowledge and innovations that advanced the LRD program and the AEDS, perhaps he was.

In 2014, AFTAC memorialized Walt Singlevich by naming AFTAC's new headquarters at Patrick AFB, Florida, the Singlevich Building, with the opening by Director of National Intelligence James Clapper attending. ■

NOTES

1. Walter H. Munk, Robert C. Spindel, Arthur Baggeroer, and Theodore G. Birdsall, "The Heard Island Feasibility Test," *The Journal of the Acoustical Society of America*, Vol. 96, No. 4, October 1994: 2330—2342.
2. Rprt, Maurice Ewing for General Carl Spaatz, "Long Range Sound Transmission in the Atmosphere," n.d., as cited in the *Roswell Report*.
3. The *Roswell Report*, 2. Airborne debris collection and seismology, as techniques of LRD, were first tested in the nuclear tests at Operation CROSSROADS, in July 1946, in the Marshall Islands.
4. Ewing had recently joined Columbia.
5. The Army Signal Corps had already established stations with ground-based acoustic sensors immediately after the war. Those acoustic stations began sending reports to AFOAT-1 headquarters on September 1, 1948, and in April 1952, this capability became an important component of the AEDS (designated as the "I" technique). The Army would continue to operate the I technique until April 1969, when the Air Force assumed responsibility for the systems.
6. *Roswell Report*, "Report of Air Force Research Regarding the Roswell Incident."
7. S.E. Berkhouse, F.R. Davis, J.H. Gladeck, C.B. Hallowell, E.J. Jones, F.W. Martin, F.W. McMullan, and M.J. Osborne, *Final Re-*

port of Operation Crossroads - 1946 (Washington, DC: Defense Nuclear Agency, May 1984), 1-2, 63, 78-81.

8. *Ibid*, p. 79.

9. Polymer is a substance composed of macromolecules. A macromolecule is "a molecule of high relative molecular mass, the structure of which essentially comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass." See <http://goldbook.iupac.org/html/M/M03667.html>. Last accessed April 1, 2019. In the 1960s, DuPont also developed Kevlar.

10. FITZWILLIAM was AFOAT-1's code word for the strongly compartmented LRD experiments.

11. Moore interview in the *Roswell Report*, pp. 24—25.

12. Spilhaus interview, Section 20, *Roswell Report*.

13. Trakowski interview, Section 24, *Roswell Report*.

14. The techniques of the AEDS were readily identifiable by alphabetic abbreviations. For example, the collection of atmospheric debris by aircraft were designated as the "A" technique, seismic as the "B" technique, "I" as the acoustic technique, etc.

15. *History of AFOAT-1: 1947—1953*, 42, 97—98, 112, AFTAC archives.

16. Charles McBrearty, written speech narrative given at the February 2012 AFTAC Awards Ceremony, AFTAC archives.

The Triangle of Iron and Rubber: Ground Actions and Airpower during Operation Attleboro



U.S. Army mechanized infantry soldiers in action during Operation Attleboro.

William Head

During 1966, as the American military involvement in the Vietnam War grew, so did the size and expanse of U.S. ground actions. These same Army campaigns also brought into focus the absolute need for some sort of tactical concept of operations on the part of United States combat leadership. It should have also demonstrated the potentially vital role airpower could have played in support of these ground attacks. Instead of becoming part of a theory of strategic victory, operations like Operation Attleboro, and the larger ones to follow, became part of a stagnant standard operating procedure which paralyzed U.S. military tactical processes throughout the remainder of America's participation in the war.

At a time when the American buildup afforded an opportunity to engage and utterly defeat the Southern insurgency or Viet Cong (VC), with a policy of continual offensive attacks, they resorted to search and destroy tactics that responded to enemy initiatives and fought the war in fits and spurts. Instead of a dedication to all out combat operations, and/or a focus on the existing pacification program in South Vietnam, they allowed the North Vietnamese Army (NVA) the time to send sufficient forces south to reposition large numbers of troops that eventually allowed them to carry out the Tet Offensive of 1968.

The American military actions in 1966-1967 also should have afforded U.S. military leaders with lessons about the need to increase not only Close Air Support (CAS) but, also the overall use of U.S. air forces against enemy troop concentrations. Ultimately, instead of using ground engagements to lock the enemy in the open and then annihilate them with airstrikes, Military Assistance Command, Vietnam (MACV), used airpower like long range artillery. Indeed, there were battlefield commanders who wanted to use the aforementioned tactical concepts, however, at this point in history, they were not in positions of authority sufficient to bring such policies to bear except on individual occasions.

With these facts in mind it is the intention of this paper to re-examine both the ground operation designated Attleboro, named for a town in Massachusetts and, then, examine the limited use of airpower which was so successful that it begs the question why not repeat said tactics in spades. Ironically, what was, at the time, hailed as a ground action that snatched victory from the jaws of defeat, was also a missed opportunity to have destroyed an entire VC/NVA army by incorporating more airpower. It also proved to be one early ground battle which provided an opportunity for U.S. commanders to learn important lessons about the efficacy of CAS in standard ground combat during Vietnam.¹

Operation ATTLEBORO itself began as a limited operation to acclimate the newly-arrived 196th Light Infantry Brigade (196 LIB) to combat conditions in Vietnam. After encountering heavier resistance than expected, it quickly changed from a minor search and destroy mission to a major battle. By the time it ended, a total of about 22,000 U.S. and



South Vietnamese soldiers had participated in the first large-scale, multi-unit operation of the American involvement in the Vietnam War.²

Beginning in 1940, with the Japanese invasion of Indochina and its seizure from the French, the heavily forested area stretching to the northwest of Saigon became a haven for guerilla forces first fighting the Japanese and, then, the French. Ho Chi Minh and General Vo Nguyen Giap's Viet Minh forces had used it against the Japanese and the French from 1940 to 1954 not only because of the terrain but because of its proximity to Saigon. With the arrival of the U.S., the area became a key Communist supply and troop staging complex. The U.S. designated it War Zones C and D or the Iron Triangle.³

By 1966, Southern Communist rebels better known as the People's Liberation Armed Forces (PLAF) or VC, employed the same Iron Triangle area to attack the heartland of the Republic of Vietnam (RVN). It was also the head-

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quarters and sanctuary location of the Central Office South Vietnam (COSVN) and the main base of the VC 9th Division. Comprised of the 271st, 272nd, and 273rd Regiments, the 9th was one of the most effectual and dreaded Communist forces in South Vietnam. It had realized a nearly unbroken series of victories. One of its most important engagements took place on December 1, 1964, when it became the spearhead of the first multi-regiment VC attack of the war. Aimed at Binh Gia, a district capital in Phuoc Tuy Province, they temporarily overran this district capital and inflicted heavy losses on the Army of the Republic of Vietnam (ARVN) forces. In late November and early December 1965, they had followed this with the Michelin Rubber Plantation Campaign, during which three regiments ambushed and nearly annihilated the 7th ARVN.⁴

Communist Plans

Following these successes against the ARVN, COSVN officials directed the 9th PLAF units, commanded by Senior Colonel Hoang Cam, to initiate a new offensive. Preparations took place from mid-September until early October 1966. The main battle of the offensive began on November 3, when two VC main force and one People's Army of Vietnam (PAVN) or NVA regiments, reinforced by one Viet Cong local force battalion, confronted American units entering the Iron Triangle. At the same time, another PLAF unit assaulted U.S. forces of the 196th Light Infantry Brigade at their newly established base camp near Tay Ninh City. This action was designed to draw out an American reaction force so they could be obliterated by the VC 9th Division. They also planned to send other units across the Saigon River to attack the territorial force outposts at Suoi Cao, twenty miles to the southeast. The remaining forces would then conduct the primary attack on the Suoi Da Special Forces camp, northeast of Tay Ninh City.⁵

American Deployments

To quote the official Contemporary Historical Evaluation of Combat Operations (CHECO) report, "With the advent of the infusion of U.S. ground forces into the war in South Vietnam in 1965 and 1966, Communist success had waned." American search and destroy operations such as Silver City, Birmingham, and El Paso II, had bloodied the Communists and established a pattern of combat the Americans "believed" would ultimately "defeat the VC in the Iron Triangle." As the CHECO authors declared, "Once again, air support—especially close air support (CAS)—was a decisive factor in at least three of the five major battles."⁶ Major General William E. DePuy, Commander of the 1st Infantry Division, went so far as to declare, "This is the way we kill the VC around here. We find them, take two steps back, and let the Air Force kill them. Then we go pick up the bodies."⁷

The Setting of the Battle

What was designated Operation Attleboro officially



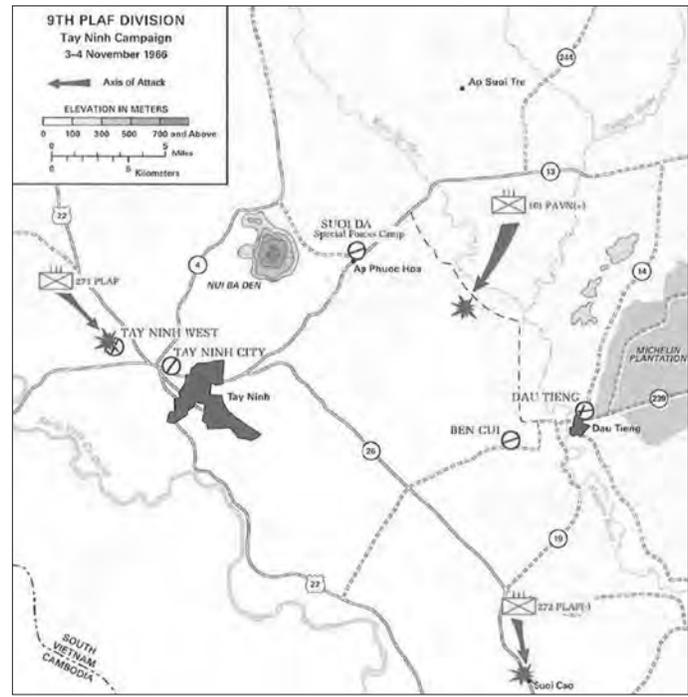
An armored personnel carrier moving through the Michelin Rubber Plantation.

took place between September 14 and November 25, 1966, in the northern 75 percent of Tay Ninh Province. The most intense ground engagement took place from November 3-5, with a U.S. sweep lasting from November 6 to 24. Most of the fighting occurred near Tay Ninh City, close to the Cambodian border, just east of the Michelin Rubber Plantation. The heaviest combat occurred in the southeast quarter of this Area of Operations (AO). The area was covered with thick forests with a few cleared forest spots along the Saigon River. Around Tay Ninh City were a few more open areas and swamps. Attleboro officially began on September 14, as a standard search and destroy operation against VC supply areas in War Zone C.⁸

Officials gave forces of the 196 LIB operational control of Attleboro. Other units involved included the 25th Division and units of III Corps' "Mike" Forces or Nung Chinese mercenary soldiers led by U.S. Special Forces personnel. For the first month and a-half, there was no major contact with the enemy. Between October 4 and November 1, only 140 preplanned air sorties took place. As they used to say in Hollywood movies, things were "quiet, too quiet!" Allied military leaders suspected something was up. They were right. The Communist's 9th Division was preparing for a winter offensive. They had already moved into prepared jumping off points northwest of the Michelin Rubber Plantation. In addition, the 101st North Vietnamese Army Regiment had slipped across the Cambodian border to support the VC. With American Congressional elections in the offing, enemy political leaders hoped to effect a major attack and win a massive propaganda victory. To this end, Communist plans called for their offensive to begin on November 2, 1966.⁹

Plotting the Communist Attack

During the summer of 1966, General Nguyen Chi Thanh, Viet Cong commander of COSVN, was locked in a bitter argument with the Democratic Republic of Vietnam's (DRV) Defense Minister, Senior General Vo Nguyen Giap, in Hanoi. The latter publically criticized Thanh for ordering what Giap described as "near suicidal, stand-up battles with American combat forces in the South during the past



9th PLAF Division, Tay Ninh Campaign, November 3-4, 1966 (CMH article)

year instead of choosing less costly hit and run guerrilla tactics." The disagreement reached its zenith in July when Thanh, an ideological Marxist purist, famous for imbuing the troops under his command with class hatred, convinced the Politburo the VC could only win in the South if they increased the number of American casualties and helped the growing U.S. antiwar movement so leaders in Washington would pull out of the war.¹⁰

Flush with his political triumph, Thanh ordered his best and most experienced division to prepare for a November offensive. As noted, he aimed his campaign at the sparsely populated region of Tay Ninh Province, just south of the Cambodian border, northwest of Saigon. Many Communist leaders saw this area as the gateway into the Saigon region and the locus of the bulk of the country's population, the vast majority of its industry and agriculture, and its political capital. Not only was the 9th VC Division directed to seize this area, but they were also supposed to protect the hidden VC storage and supply facilities in Tay Ninh Province, disrupt the RVN's increasingly successful program to win the hearts and minds of the rural population, and destroy "a vital element" of the enemy forces in the III Corps area.¹¹

As noted, the commander of the 9th VC was Col. Cam, and he determined to focus his attack on the newly arrived 196 LIB based at Tay Ninh West. To him, this was the "vital element" which had to be destroyed. The battle-hardened VC Colonel decided to employ a local force battalion, two of his division's regiments, and the 101st North Vietnamese Army (NVA) Regiment to execute the offensive. He assigned 1,500 troopers from the 271st Regiment, to assault 196 LIB's base camp, while two battalions of the 272nd Regiment and the local force unit attacked the South Vietnamese home guard unit at Soui Cao, ten miles southeast of Tay Ninh. Concurrently, soldiers of the 3rd Battalion,

272nd Regiment, and the 101st NVA Regiment were to strike the American Special Forces and “Mike” units at Suoi Da, northeast of Tay Ninh.¹²

Allied Preparations

The commander of the 196 LIB was Brig. Gen. Edward H. de Saussure, who had served as an artilleryman in World War II and later became a guided missile expert. This was his first infantry command and first experience in combat. His total lack of experience would prove to be a fatal flaw. Even though Allied intelligence had reported that elements of the 9th VC were gathering in War Zone C, U.S. leaders had no knowledge the main COSVN headquarters were located in the area nor what Col. Cam’s actual intentions were. With this intelligence gap in place, de Saussure had little reason to expect what was coming. That September, while the Communist arrived at their staging areas, the General was supervising two of his battalions in building the brigade’s base camp. He was also preparing to launch Operation Attleboro. He expected to execute a battalion-size series of probes into the sparsely populated region around Tay Ninh. It was supposed to be a familiarization training operation focused on searching for VC supply caches and “getting the brigade’s feet wet.” Instead, the two commanders were about to embark on a bloody, three-day engagement which began on 3 November.¹³

Ultimately, what began as a minor scrap with limited aims on September 14, unexpectedly evolved into a protracted general engagement that unfolded in phases. The first phase lasted from September 14 to October 31 and involved minor combat. The second lasted from November 3-5 during which time the most brutal fighting occurred, and the VC nearly won. The final phase began with a change in U.S. leadership and an American offensive which beat back and bloodied the enemy. It lasted from November 6 to 24-25. In total, the November phases involved skirmishes, firefights, and pitched battles that spread across thousands of miles. All totaled, 22,000 Allied troops fought 5,000-6,000 NVA and VC combatants. In spite of all the planning by Col. Cam, this wide-ranging struggle was initiated, guided, and fashioned not by these complex plans but, rather, by one intense and unexpected fight that lasted three days in a thickly wooded area just northwest of Dau Tieng. During those seventy-two hours, a small number of U.S. ground troops won a struggle for survival in which these units suffered close to forty percent of the total U.S. battle deaths during the entire three weeks of combat in November. Ironically, many of the American survivors had little clue of what they had achieved.¹⁴

Leading Up to the Battle

During the last part of October, Gen. de Saussure’s training and acclimatization incursion seemed to be working as planned. The troops under his command located, confiscated, or destroyed significant stashes of COSVN’s secret logistical stocks and gathered considerable useful intelligence data. For days on end, the Allies worked their



Soldiers of the 1st Battalion, 28th Infantry, 1st Infantry Division, ask for artillery support (SP5 Glenn Rasmussen/National Archives)

way through the heavily forested areas and across sweeping expanses of savannas and elephant grasses that grew from waist deep to nearly over their heads. As they did, they found food, medical supplies, and military equipment essential to the survival of VC and NVA military personnel. Often the Communists hid these caches in sheds under camouflaged roofs. One such storage facility contained 843 tons of rice—enough to support several of General Thanh’s campaigns. Soldiers of the 196th immediately commenced gathering, bagging, and moving the contraband out of the AO, so it could be returned to the local peasants from whom Communist forces had seized it. Besides the food stuffs, they found small arms and crew-served weapons, enormous amounts of ammunition as well as hospital supplies and equipment. What really caught de Saussure’s attention were the reams of vital documents also discovered. The main part of this area proved to be a vast, concealed depot complex where the Suoi Ba Hao stream flowed into the Saigon River, roughly five miles northwest of one of the 196th’s forward command post at Dau Tieng, only three miles southeast of the Suoi Da Special Forces camp.¹⁵

With these key enemy documents in hand, General de Saussure crafted an operations plan designed to exploit this intelligence windfall. Unfortunately for the Americans, it proved to be an overly complex scheme. It seemed clever on paper, but the General’s lack of experience dulled his instincts for combat, and what he planned would soon put his troopers in dire circumstances. The plan, itself, involved the employment of parts of four battalions. The first battalion was the 1st Battalion, 27th Infantry Regiment (1/27) from the 25th Infantry Division. It was commanded by Major Guy “Sandy” Meloy. The other three battalions came from the 196th Brigade which was under the 1st Division. They were: the 2nd Battalion, 1st Infantry Regiment (2/1), commanded by Lt. Col. Charles “Pete” Weddle; the 4th Battalion, 31st Infantry Regiment (4/31), led by Lt. Col. Hugh Lynch; and the 3rd Battalion of the 21st Infantry Regiment (3/21), commanded by Lt. Col. Charles Nulsen. As the planning unfolded, it was Meloy, a talented and experienced 36-year-old infantryman, who argued against the plan. His pleas fell on deaf ears.¹⁶

For the ground troops of the 196 LIB and 1/27, Operation Attleboro, which began on September 14, like a walk in the park, soon would become their worst nightmare. Almost like Custer ignoring advice not to attack the native

encampment on the Little Big Horn, Gen. de Saussure charged ahead toward visions of glory. His tactical plan called for four widely separated units flanked on both sides by elements of the 1/27th to clear the dense wooded area to their front. Thus, Meloy's battalion, was separated into two parts by 2 1/2 miles. This endangered unit cohesion. Many years after the battle, the Major described the plan as "ludicrous." He argued that, "command and control of the separate attacks was impossible." At the time, he tried to warn de Saussure the plan would preclude mutual support and make it extremely hard to maintain control of the columns once they entered the forest. Worse still, deep under the three-canopy jungles of the AO, air cover would be nearly impossible to provide, even though airmen gave it their best shot. In the end, the general's view prevailed.¹⁷

The climactic combat commenced on November 3, at 0900, when American forces launched their ill-fated four column assault. Weddle and Lynch's battalions entered the tree line. Company B of the 1/27 landed twenty-two minutes later, east of the attacking columns. At 0950, Company C landed to the west, moved to the tree line, and sent a point patrol into the woods. Having advanced only a few hundred yards, the patrol ran into a skillfully camouflaged camp manned by members of the 9th VC Division's Reconnaissance Company. A vicious firefight ensued, with Company C's commander, first sergeant, and four others killed with six more wounded. Meloy wasted no time making his way to the besieged unit. He soon, called in reinforcements, artillery support, and CAS. He also evacuated the wounded. At 1245, Company A joined the ever expanding engagement. Flying overhead in an observation aircraft, General de Saussure ordered a reserve company from Nulsen's 3/21 battalion, stationed at Tay Ninh, to be sent in. They arrived via helicopter drop in Meloy's rear at 1445. De Saussure also ordered two companies from Weddle's 2/1 battalion to move forward. They did not arrive until 1800 hours. Before long, Meloy was commanding eleven companies of 1st Division soldiers and 25th Division soldiers. Confusion soon reigned.¹⁸

Finally, darkness fell, and the fighting began to wane. The overall situation had become confused within the fog of war. Both sides were faced with chaotic circumstances. At this point, de Saussure apparently forgot to tell Meloy what he planned to do next. As a result, it was not until well into the night that Meloy realized his defenders included Weddle's two infantry companies. While he had more men and was, thus, better off in this way, they were not used to his way of doing things. In fact, while Weddle's troops gave the Major five more companies under his command, he had never commanded or even worked with three of them. In addition, the vegetation they were groping through was so thick, many units became separated, losing their own unity and contact with their comrades. This meant the Americans normal ace-in-the-hole, firepower, was largely nullified for fear of hitting friendly forces whose exact location could not be determined. All the while, U.S. casualties kept increasing, mostly due to the skillful resistance being put up by Col. Cam's troops.¹⁹

The VC enclave which the Americans had stumbled



A CIDG troop prepares to ambush the VC during Operation Attleboro. (Sgt. Bernie Mamgiboyat/National Archives)

into was not only artfully camouflaged but made of concrete and defended by heavy machine guns. There were also well-hidden snipers, many in the larger trees, who targeted American soldiers who could not see them. While Meloy's forces fought the enemy they faced, Company B, which had landed at 0920 about two miles east of the four column advance, progressed rapidly toward a blocking position where they uncovered an unoccupied fortified VC position. By late morning, de Saussure finally realized just how large the Communist forces actually were and chucked his original plan directing his remaining five companies to circle up several miles to the northeast under the command of Lt. Col. Lynch.²⁰

Almost simultaneously, Col. Cam changed the disposition of his entire offensive. To this end, his assault on the 196th Brigade headquarters at Tay Ninh West was reduced to an exchange of mortar fire. The raid on South Vietnamese forces at Suoi Cao became only a feint. The following day, troops of the 272nd VC Regiment made an all-out frontal attack which cost them fifty-three dead. Cam, then, canceled the strike against Suoi Da and focused on the total annihilation of U.S. forces along the Suoi Ba Hao, pouring troops from the 101st NVA Regiment into the fight.²¹

After a relatively quiet night, on the morning of November 4, Meloy initiated a two-company flanking movement to the east. An hour later, believing he had flanked the enemy, he began an advance through the heavy vegetation to the northeast and, soon, ran into a battalion of North Vietnamese regulars manning defensive bunkers. The engagement was so savage, in many places the two sides were firing at each other only a few yards apart. Faced with such withering fire, Meloy called for CAS and artillery support and directed two company-size flanking attacks which were both repelled. Enemy fire was so thick, just standing up invited a quick death.²²

Even as the shelling began to have an effect, NVA soldiers began attacking in waves. The hard pressed Americans held firm. They could neither attack nor retreat! The number of casualties was staggering. All but one enlisted trooper in Meloy's command party were wounded including the Major. With the attackers and defenders so entangled, air and further artillery support was dangerous. The only



U.S. Army infantrymen conduct an air assault as part of Operation Attleboro. (Source: AHEC.)

solution considered was to inject more forces in an effort to strike the Communist's flank or rear. Late that afternoon, after a third NVA attack failed, forces from the 2/27 Company C landed, by helicopter, about 400 yards behind what they believed to be the enemy's right flank. From the minute they landed, they too took heavy fire from snipers and "fire tunnels."²³

The Communists had formed narrow firing lanes into the tall elephant grass bending the tops to obscure the open lanes below waist level. At the beginning of each "tunnel" was a bunker with a machine gun crew aiming through the length of the tunnel and shooting down any unsuspecting person in the firing lane. Company C's commander was an early victim. Only thirty minutes later, the commander of the 2nd Battalion was killed. Soon, the rescuers were trapped like Meloy's men. As the situation became increasingly dire, the Americans realized that not only was the enemy fire preventing them from maneuvering but, even worse, they could not evacuate their ever growing numbers of wounded. That night, Meloy, with the newly arrived company, commanded eight infantry companies. He now determined to send some of his force forward in an attempt to reach and relieve the beleaguered 2nd Battalion. In spite of heroic efforts by those sent, the action failed to advance more than a few dozen yards. In total, it cost five dead and eight wounded. The Major ordered artillery support all through the night to keep the enemy from overrunning his lines. Periodically, through that very tense night, Maj. Meloy ordered long range rounds placed on the area around his penned down units to keep the enemy at arm's length until additional forces could be injected into the fight in daylight. Throughout this intense three-day conflict, artillery and airstrikes proved critical in assuring the survival of these American troopers. During the engagement the U.S. fired 14,000 artillery rounds and sortied several dozen airstrikes.²⁴

As dawn broke on November 5, Company A, 2/27 arrived and Maj. Meloy directed them to make haste to link up with, and rescue, Company C. Company A's Commander, Captain Robert Foley, "a tall, 25-year-old level-



General DePuy in later years at TRADOC.

headed and fearless infantryman from Newton, Massachusetts, immediately launched his assault." Within moments, they ran into withering fire. After establishing a base of supporting fire, Foley personally led an attack that overran three bunkers, but he could not take the last NVA positions. The Captain and Private John Baker, who took one bunker alone, later received Medals of Honor. Foley's effort cost the lives of eight Company A soldiers and still did not relieve Company C.²⁵

Things soon changed for the better. To the northeast, Captain Robert Garrett, Company B Commander, was stationed in a defensive position with two 196th Brigade companies. Lt. Col. Lynch was the overall commander. Garrett decided, rather than sit on his hands, "to march to the sound of the guns." After a brief discussion, a reluctant Lynch, allowed Garrett to lead a three-pronged attack to the southeast. As this makeshift unit moved forward, they found surprisingly light resistance. After radioing Meloy he was on the way, Garrett's force finally relieved C Company around 1200 hours. The rescuers evacuated Company C's six killed and nineteen wounded. To everyone's amazement, it now seemed the NVA had simply vanished. It would be weeks later that the reasons for this withdrawal would be known.²⁶

Even while the battle was underway, senior American military officials, appalled by the lack of basic leadership and tactical combat acumen on the part of de Saussure, acted to re-organize the combat command structure. The first indication of this took place on the afternoon of November 5, when Maj. Gen. William DePuy, commander of the U.S. 1st Infantry Division, "suddenly appeared at Meloy's command post." As Meloy recalled, "He asked if I really had eight companies. I told him that since I had been



Tending to the wounded.

given three more, I was now up to 11. He was rather astonished and he asked when I had last talked with de Saussure on the radio, and I told him it had been at least 48 hours.” DePuy went on to inquire, “when was the last time I actually had physical contact with de Saussure, and I told him it had been on the evening of November 2 at Dau Tieng.”²⁷ At this point, DePuy, as de Saussure’s boss, had decided to assume overall command of the operation believing significant changes were needed. By the time the General arrived at Meloy’s headquarters, he had decided to take drastic action in order to unravel the mess he found. Being an experienced and decisive infantry officer, basic ground tactics were second nature to DePuy. His ability to observe the situation, evaluate his options, and act quickly, soon changed the bloody log jam into an American victory.²⁸

To no one’s surprise, “General de Saussure’s lack of contact with his most engaged subordinate,” meant his “tenure as a brigade commander was going to be considerably shortened.” However, before he made this change, DePuy, as the new operational commander, directed all of the American forces in the woods to withdraw and return to their original battalions. Once they were all accounted for, they were flown back to their bases of origin.

While the exhausted troops were glad to be out of the enemy’s trap, they were in a somber mood having not won the day. Most of the soldiers believed they had been “ambushed” and defeated. In fact, the Americans had contacted a Communist base camp and forced the enemy to withdraw. The U.S. losses added to the gloomy feelings. These units had never suffered such losses. The official tally came to sixty killed in action and 159 wounded. What few Americans realized was the Communists had suffered more

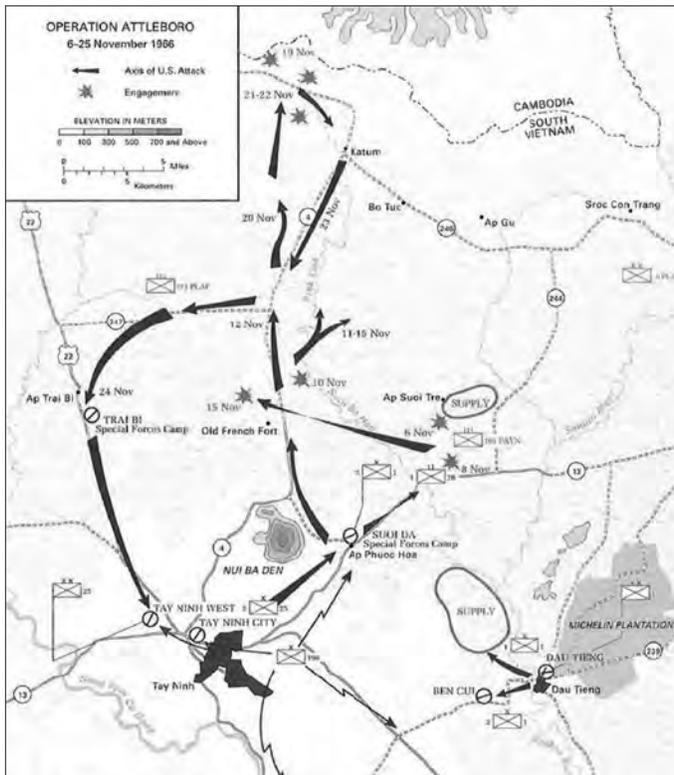
than 200 killed. In addition, General de Saussure’s performance had not inspired confidence. As Lt. Col. Charles Nulsen declared later, “One battalion commander was commanding eleven companies while another battalion commander was left to command only his headquarters elements.”²⁹

The Next Phase

Even as these original troops withdrew, other brigades of the 1st Infantry Division, specifically the 11th Armored Cavalry Regiment, the 173rd Airborne Brigade, and three Army of the Republic of Vietnam (ARVN) infantry battalions, arrived at several locations in Tay Ninh Province in preparation for the final phase of Attleboro. Later, they would be joined by elements of the 25th Infantry Division. On the morning of November 6, these new forces initiated an extensive search for the 9th VC Division’s surviving troops. This time it was DePuy in command. He had had “a superb record as an infantry battalion commander in World War II and a stern intolerance of incompetence.” This more dynamic officer shaped the final 19 day of Attleboro employing the maxim: “Find the enemy with the least number of men and destroy them with the maximum amount of firepower.” This meant using airpower when possible to minimize the risk to the ground troops. One standard method called for Army units to lock the enemy in an open engagement exposing itself. At this point, airstrikes were called in to annihilate opposition forces.³⁰

After spending most of the 6th searching for the enemy, that evening, a squad from the 1st Division located “a column of enemy troops moving along a trail.” Firing from their ambush position, they called in artillery. The resulting engagement left seventy enemy dead. Everywhere during this first day of Attleboro’s new phase the Americans experienced similar success. By the end of the day, the 1st Division’s casualties totaled one killed and twenty-three wounded while VC losses came to 170 killed. As this trend continued, Col. Cam’s Division began to lose cohesion. On November 8, he directed the badly mauled 101st NVA Regiment to reposition in order to guard ammunition stores being transported by a COSVN rear service group. Before they could complete the move, they were struck by American air and artillery assets that caused both the NVA unit and the logisticians in their charge to abandon their equipment and ammo, withdrawing in panic. This general pattern continued over the intervening weeks, with the Allied forces finding significant caches of rice, clothing, communications equipment, and ordnance abandoned by Communist forces in their haste to flee certain death.³¹

With organization finally restored, Col. Sidney Berry’s 1st Brigade advanced to Dau Tieng where his men secured the 1st Division’s forward base. At the same time, troopers of the 2nd Brigade, commanded by Lt. Col. Sam S. Walker, and soldiers from Col. Edwin H. Marks’ 3rd Brigade established a cordon around the area and initiated a search mission that turned up additional stores of supplies and hurriedly abandoned VC base camps. After having encountered so much resistance in the early phase of the opera-



Operation Attleboro, November 6-25, 1966.

tion, this action faced almost no appreciable enemy resistance. From November 6 to 24, American units continued to root out hidden Communist units, capture enemy weapons, equipment, and supplies as well as uncover vital intelligence data. All of this proved important in bolstering the South Vietnamese government since it demonstrated concern for the local indigenous population both rural and urban.³²

In one final desperate effort to regain the initiative and restore order among his forces, Colonel Cam decided to re-supply his troops and attack his tormentors. As alluded to, only days earlier he had ordered one NVA regiment to protect his cache of ammunition and other supplies. What he learned, too late, was this unit was in full retreat. As the afternoon of November 8 unfolded, the terrified Communist's rear service troops were swept up in the general panic and fled their posts. As a result, when Cam tried to rearm the combat troops of his 9th Division, there was no one there to deliver these essential supplies. Either in a show of defiance or desperation, all the 9th could do was fire several rounds of mortar shells and overrun a territorial outpost which was quickly recaptured. Total defeat came swiftly!³³

While troops from the 1st Division continued to the search for the VC, units of the 25th Division's 2nd Brigade joined Operation Attleboro by crossing into War Zone C to search for Communist forces. By this point, the 196 LIB had been returned to the chain of command under the 25th Division. They were directed to open a ground supply route from Tay Ninh to Bau Co. To execute this order, Col. Thomas M. Tarpley commander of the 2nd Brigade, 25th Division, quickly moved north along Route 4 toward the

Cambodian border near Katum to provoke an enemy reaction. He believed his unit might be able to find the COSVN headquarters and additional VC supply centers near the border northwest of Tay Ninh City.³⁴

On November 14, the men of the 2nd Brigade advanced with two mechanized infantry battalions on the point. At first, they found almost no evidence the enemy was, or had been, in this area. This continued to be the situation for the next five days. Finally, on May 19, one of the lead companies stumbled onto an entrenched VC position. The weary enemy unit put up little resistance and was soon overrun. Almost simultaneously, a mechanized infantry company crashed into a Communist infantry force, supported by anti-aircraft units. While this halted the American advance temporarily, after a brief firefight, the enemy withdrew during the night. As the Brigade closed in on the VC, the Communists fired mortar rounds at Tarpley's Brigade command post. However, this proved to be the only contact Tarpley's units encountered during the remainder of the operations. Concurrently, one of Col. Marks' battalions contacted a significant Communist unit near Bau Co. The VC chose not to put up a major struggle. Perhaps this was because, no sooner than they engaged these Americans, the remainder of that brigade arrived. Supported by concentrated air and artillery support, the U.S. force had a considerable advantage. Again, the enemy withdrew during the night. The next day, as the U.S. troopers entered the enormous VC base camp, they found the ground "littered with bodies, shattered emplacements, and abandoned training facilities, supply stores, and a major hospital."³⁵

As noted earlier, by the time U.S. combat operations came to an end on November 24, eighteen U.S. and three ARVN infantry battalions as well as twenty-four artillery batteries had been engaged. In spite of the poor start, the Allied forces had succeeded in forcing the Cam's 9th Division to abandon its planned attack on Suoi Da by making them defend their base areas and supply depots. Allied commanders, on the scene, were convinced they had won a great victory. While they had counted 1,106 dead bodies, they were certain the casualty count was greater, given the Communist's practice of carrying off their dead after a battle. At first, Gen. DePuy advocated Field Force II continue its pursuit of the VC and NVA forces in order to finish the complete destruction of the retreating division. However, 25th Division commander, Gen. Frederick Carlton Weyand, was reluctant to conduct such a major maneuver campaign given the lack of intelligence he had at that moment. Instead, he ordered his troops involved in Attleboro to return to their operational areas which encircled Saigon. They were to support the pacification campaign by rooting out guerillas. When Gen. Johnathan O. Seaman resumed command of the Field Force II units at the end of November, he agreed with Weyand's decision.³⁶

Still, one wonders what the results might have been had Weyand and Seaman continued the fight. Of course, acting without good intelligence would have been risky. That was something Gen. Robert E. Lee discovered at the Battle of Gettysburg when he was drawn into battle not knowing the strength or disposition of his enemy since



Arc Light B-52 three-cell flight.

Gen. J.E.B. Stuart's cavalry was not present to provide intelligence. However, in the case of Attleboro, why not incorporate aerial reconnaissance and/or air attacks to first gather data on the enemy and then continue the assault on the 9th Division? Air assets were available. They had been used, albeit sparingly, throughout the operation. Might the use of these combat aircraft given ground commanders time to obtain and analyze new information on the Communist forces and their location, so they could have resumed the attack and totally destroyed the VC/NVA? We will never know since such an alternative was never considered. Weyand was a devout advocate of the pacification campaign and it is little wonder he chose to return his troops to that task.

The End of Ground Operations

Officially Operation Attleboro concluded on November 25. In the after action report, officials made note of the aforementioned 1,106 bodies found and the fact the U.S. had lost 155 of their own. Not long after, a South Vietnamese government agent reported Communist losses had been at least double the reported number. He based this on his first-hand observations. All this data was contradicted by "captured enemy documents, unearthed several

months after the operation ended, placing VC/NVA losses at roughly half the number U.S. leaders claimed." To be exact, the Communist report "claimed the 9th Division's 101st NVA Regiment suffering heavy losses while the 272nd and 271st VC regiments experienced moderate and slight losses respectively."³⁷ Then again, the enemy officer who penned this report probably had good reason not to want to report the real number of casualties to his superiors.

All this disagreement over casualty figures aside, what cannot be argued is the fact General Nguyen Chi Thanh's Dry Season Offensive had been blunted. As noted earlier, upon Col. Cam's initial contact with Meloy's battalion on 3 November, he altered the Dry Season Offensive plan in an effort to annihilate the 196 LIB. However, additional captured Communist documents make it clear that, while American's suffered heavy casualties during the early November engagements, so did Col. Cam's forces. The VC/NVA suffered so many, they had to abandon the battle on 5 November in the face of Capt. Foley's determined attack and Garrett's thrust to relieve Meloy's position. These same papers revealed that the troops in 3rd Battalion, 101st NVA Regiment, had been "so ravaged by the American attacks and firepower that—without withdrawal orders—its troops simply fled the battlefield."³⁸



Arc Light 500-pound bombs impacting on suspected enemy targets.

When Operation Attleboro ended, the surviving elements of the 9th VC Division were left to elude the very Allied units they had been sent to destroy. The dogged resistance of the two U.S. battalions, imprudently deployed into the Iron Triangle by Gen. de Saussure, allowed the ensuing efforts by the 1st Infantry Division to thwart enemy plans for a major offensive in the Saigon Corridor during the dry season of 1966. What began as an action aimed at getting the 196 LIB's "feet wet" resulted in a massive corps engagement supported by 22,000 troops, 12,000 tons of bombs dropped by tactical air support aircraft, 35,000 artillery rounds, and eleven B-52 Arc Light strikes. It killed 1,106 Communists with forty-four captured. The Allied lost 155 killed and 494 wounded. At end of 1966, Allied victories during Operation Attleboro and, later, 1967 operations such as Cedar Falls and Junction City, dealt the enemy a string of major setbacks. However, each time the Allies had the enemy on the run, they stopped short of total victory. Oh sure, they picked up the fight again, later, but the enemy continued to be a viable force which fought well. All the while, the NVA was taking over the war, sending thousands of troops and tons of supplies down their infiltration routes into South Vietnam. They skillfully pre-positioned these troops and, by early 1968, they were able to launch the massive Tet Offensive.³⁹

An Epilogue: Air Power's Role

In the aftermath of the action, airpower was shoved into the background. It should not have been! In the subsequent CHECO report on Operation Attleboro, one of the more revealing aspects proved to be the recounting of Air Force sorties, specifically that of B-52s. Throughout the campaign, CAS had supported ground troops even prior to the formal initiation of combat actions on September 14. With the fierce combat of November 3-5, Air Force fighter and attack aircraft had been employed, along with artillery support, to keep the VC and NVA from overrunning American positions. In the aftereffects of this fighting, American units sweeping the area discovered significant evidence of a continued enemy presence, including twenty-two bodies, several freshly dug graves, and "an 80-bed VC hospital." Close by was "an extensive tunnel complex, which con-



Lt. Gen. Weyand, later General and Army Chief of Staff.

tained eight sub-machine guns, eleven machine pistols, and thousands of grenades of various types." With such a potentially large enemy concentrations in the AO, and Gen. DePuy dedicated to employing airpower whenever practical, on November 8, the Allies initiated B-52 Arc Light raids for the first time during Operation Attleboro. During the next seventeen days, B-52s flying out of Thailand flew more than 200 sorties and dropped more than "4,000 tons of ordnance on the jungles of War Zone C." In talking with ground troops, the author of this report concluded, "The results of this continuous bombardment, in both physical and psychological damage to an already badly beaten enemy," was clearly significant.⁴⁰

In summarizing the operation, the CHECO authors reiterated the 1,106 VC body count and, that "hundreds more dead were estimated to have been carried away from the battlefields, and additional hundreds may have been killed in the numerous B-52 strikes." They concluded that, "the role of airpower in Operation ATTLEBORO was outstanding." Between November 1 and 25, 1966, airmen flew a total of 1,629 strike sorties and expended 11,757.3 tons of ordnance. On November 20, at the Military Assistance Command, Vietnam (MACV) Commander's Conference at Nha Trang, many of the Army leaders praised the role of airpower.

During one briefing, the presenter announced "that 30 enemy were found dead in a trench - all without wounds - killed by bomb concussion." Maj. Gen. Weyand, went so far as to declare, "We had wonderful luck with the B-52 strikes... used them like close air support or long range ar-



Major General Edward H. de Saussure

tillery. A B-52 strike severely damaged COSVN headquarters and another landed directly on the 9th Division's headquarters. These strikes severely disrupted the enemy's command chain."⁴¹

While combat strikes proved decisive in many ways, "tactical airlift [Tac Air] also played a tremendous, if not quite so spectacular role." In the CHECO report, the authors pointed out "that C-123 Providers flew 2,712 sorties, while the C-130 Hercules contributed an additional 602 sorties." They had "transported 8,902 tons of cargo and 11,403 passengers, for a grand total of 10,270 tons of cargo and passengers airlifted between 18 October and 26 November." The whole time, Tac Air provided support, from bombing enemy evacuation routes to preparing landing zones and flying CAS missions. To this end, they "could rightly claim a large share of the KIAs attributed to these actions." Lastly, Tac Air quickly and constantly responded to the need to inject more troops and supplies at key moments during the ground fight.⁴²

All in all, the B-52 missions clearly played a decisive role in breaking the back of the Communist's resistance. Numerous intelligence reports submitted by military reconnaissance teams between November 24 and December 11, clearly confirmed that a major reason for the Allied success in War Zone C was American airpower. A report dated 8 December, determined that during the total expanse of Operation Attleboro, VC killed in action totaled 2,130 with 1,096 killed by bombs. In addition, 618 were seriously wounded, 269 slightly wounded and 216 captured or missing. Moreover, B-52s bombed the COSVN headquarters on November 10, 14, and 15, annihilating combined elements composed of five sections of COSVN. In fact, "during these



Major General Hoang Cam in 2009. He passed away in 2013 at age 93.

attacks, Lt. Gen. Lu, Deputy Chief of the Research Section of COSVN, was seriously wounded" with four COSVN cadre members killed, and large "quantities of documents, supplies and equipment" incinerated. Said items included "typewriters, printing presses, mimeograph machines, radios, large quantities of spare parts, maps, and currency consisting of VN\$ 15 million and US\$ 300,000." Other reports, as of 18 November, determined "a total of four battalion commanders and five company commanders were also reported killed as a result of the operation." Many sources provided hard evidence that "General Nguyen Chi Thanh was posthumously promoted to the rank of senior general after reportedly being killed in a 1967 B-52 bombing attack." Based on this data, "the overall enemy casualties for Operation ATTLEBORO were in excess of 3,000 personnel, with severe damage being inflicted upon enemy leadership, facilities and supplies." Perhaps most revealing was the CHECO report's last words, "In summation, there can be no doubt that airpower was truly one of the outstanding contributors to the success achieved by Operation ATTLEBORO."⁴³

Some Final Notes

Of note is what happened to some of the key players in Operation Attleboro. Frederick Weyand, born on Sep-

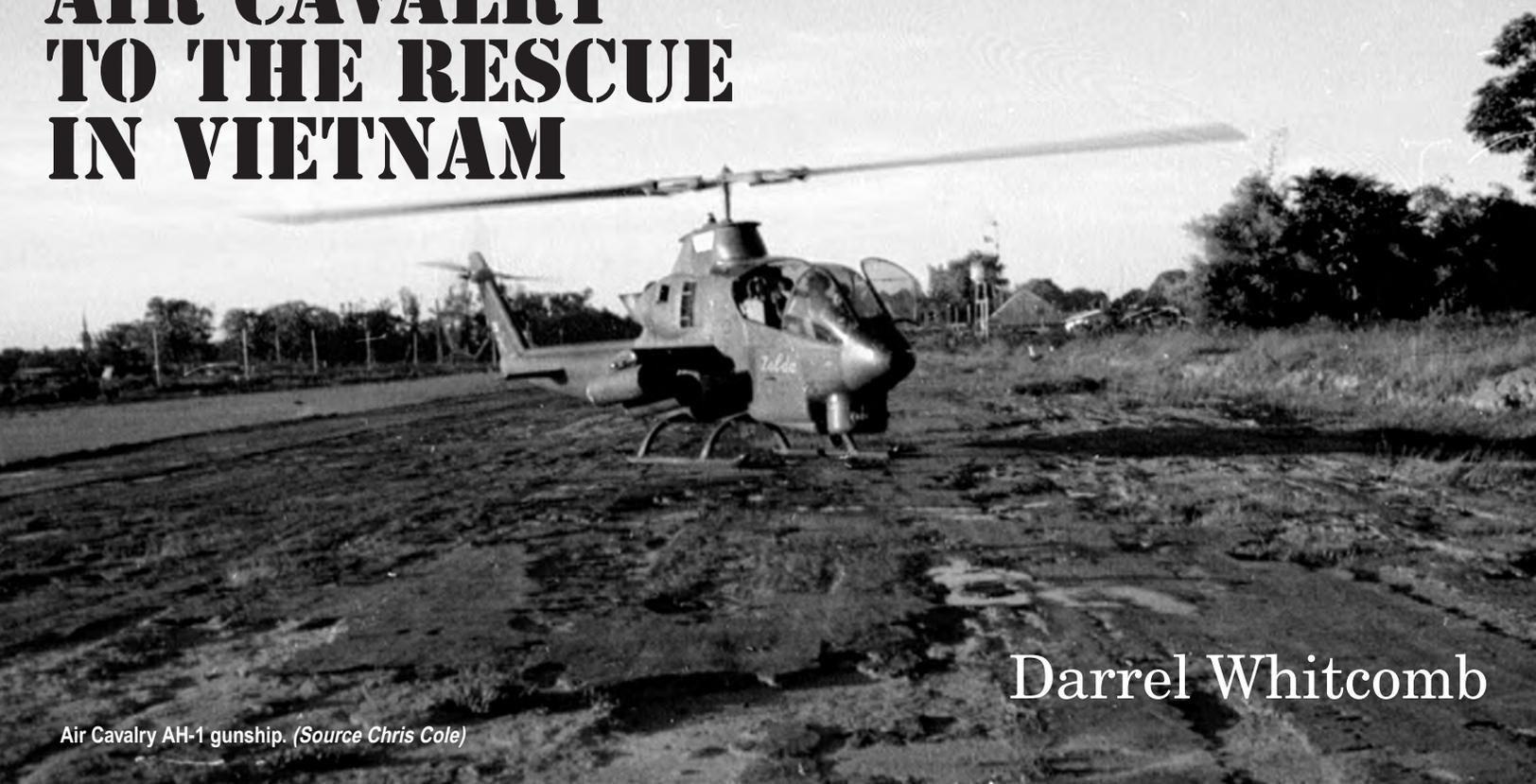
tember 15, 1916 in Arbuckle, California, served in the U.S. Army from 1938 to 1976. He eventually became a four-star general, being the last MACV commander, and finally serving at the Army Chief of Staff. He died on February 10, 2010, at age 93, in Honolulu, Hawaii. General DePuy, who commanded the Big Red One in this action, later became famous for his modernization of the United States Army Training and Doctrine Command (TRADOC). It was during his command they developed an innovative fighting doctrine for the Army. His alteration in combat development and the way the Army trains led to a debate that led to the generally accepted Air Land Battle Doctrine. Of course, DePuy relieved Brigadier General Edward H. de

Saussure of his command of the 196th LIB. In order to remove him from combat, he was booted upstairs making major general after the war. He died in 2002. Sandy Meloy survived to make major general and retired in 1982. Robert Foley made it through the war and retired as a lieutenant general in 2000. In 1989 Master Sergeant John Baker retired, later becoming the vice president of America's most prestigious veteran's group, the Medal of Honor Society. Roughly nine years after Operation Attleboro, in April 1975, by then Maj. Gen. Hoang Cam commanded the NVA's IV Corps which, after enormous difficulty, defeated the ARVN 18th Division at the last major battle of the Vietnam War—the Battle of Xuan Loc.⁴⁴ ■

NOTES

1. For more on Close Air Support (CAS) and airpower during this period see, Donald J. Mrozek, *Air Power and the Ground War in Vietnam, Ideas and Actions* (Oxford, United Kingdom: Pergamon-Brassey International Defense Publishers, 1989); John Schlicht, *The War in South Vietnam: The Years of the Offensive 1965 – 1968* (Washington, D.C.: Office of Air Force History, 1988).
2. Article, by Glenn Williams, "Operation Attleboro, 2 to 24 November 1966," Center for Military History (CMH) Remembers, December 2015, http://www.history.army.mil/news/2015/151200a_opAttleboro.html, [hereafter CMH—Attleboro].
3. For more on the Iron Triangle, see James Pickney Harrison, *The Endless War: Fifty Years of Struggle in Vietnam*, (New York: The Free Press, 1982); Wilbur H. Morisson, *The Elephant and the Tiger: The Full Story of the Vietnam War*, (New York: Hippocrene Books, 1990); Robert D. Schulzinger, *A Time for War: The United States and Vietnam 1941–1975*, (New York: Oxford University Press, 1997); Tang Truong Nhu, *A Vietcong Memoir*, (Orlando: Harcourt Brace Jovanovich, 1985).
4. Report, Project Contemporary Historical Evaluation of Combat Operations (CHECO), by Lawrence J. Hickey and Capt. James G. Bruce, Jr. HQ PACAF, CHECO Division, "Operation Attleboro," 14 April 1967, K717.0431-13, p. 1, [hereafter CHECO Rpt, Attleboro].
5. Williams, CMH—Attleboro.
6. CHECO Rpt, Attleboro, p. 3.
7. *Ibid.*, p. 4.
8. *Ibid.*, pp. 5-6.
9. *Ibid.*, pp. 6-7.
10. Article, by Rod Paschall, "Operation Attleboro-From Calamity to Crushing Victory," *HistoryNet*, July 20, 2001, <http://www.historynet.com/operation-attleboro-from-calamity-to-crushing-victory.htm>, [hereafter Calamity to Victory].
11. *Ibid.*; CHECO Rpt, Attleboro, pp. 2-3.
12. Paschall, Calamity to Victory; CHECO Rpt, Attleboro, pp 3, 7.
13. Paschall, Calamity to Victory.
14. *Ibid.*; Article, by Col. Charles K. Nulsen, Jr., "Operation Attleboro: The 196th's Light Infantry Brigade Baptism By Fire in the Vietnam War," *HistoryNet*, <http://www.historynet.com/operation-attleboro-the-196ths-light-infantry-brigade-baptism-by-fire-in-the-vietnam-war.htm>, [hereafter Baptism By Fire]. The original article was published in the October 1997 issue of *Vietnam Magazine*.
15. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
16. *Ibid.*
17. *Ibid.*
18. *Ibid.*
19. Paschall, Calamity to Victory.
20. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
21. *Ibid.*
22. *Ibid.*
23. Paschall, Calamity to Victory.
24. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
25. *Ibid.*
26. Paschall, Calamity to Victory.
27. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
28. *Ibid.*
29. Paschall, Calamity to Victory.
30. *Ibid.*
31. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
32. *Ibid.*; Mike Hughes, "Ozzie' Conners, BSC, '65 and Operation Attleboro, Vietnam, '66," found in *Selections from Archives and Special Collections, Bridgewater State University*, Item 3, [hereafter Vietnam, '66]. Original reporting on these actions are found in, After-Action-Report by 25th Infantry Division, 26 Apr 67, by order of Kenneth G. Wickham USA Adjutant General. Declassified 8 Mar 68, file AD387619, DoD Directive 5200.10, [hereafter AAR 25th Division].
33. Williams, CMH—Attleboro; Hughes, Vietnam, '66; AAR 25th Division.
34. *Ibid.*
35. Williams, CMH—Attleboro; AAR 25th Division.
36. *Ibid.*; Paschall, Calamity to Victory.
37. Nulsen, Baptism By Fire; Paschall, Calamity to Victory; Williams, CMH—Attleboro.
38. Paschall, Calamity to Victory.
39. *Ibid.*; Williams, CMH—Attleboro; CHECO Rpt, Attleboro.
40. CHECO Rpt, Attleboro, pp. 28-29.
41. CHECO Rpt, Attleboro, pp. 32-33. For more on the B-52 Arc Light operations flown during Operation Attleboro and other ground operations during 1966-1967, see William P. Head, *War From Above the Clouds: B-52 Operations during the Vietnam War*, (Maxwell AFB, Alabama: Air University Press, 2002).
42. CHECO Rpt, Attleboro, pp. 33-34.
43. *Ibid.*
44. Paschall, Calamity to Victory.

1972—U.S. ARMY AIR CAVALRY TO THE RESCUE IN VIETNAM



Air Cavalry AH-1 gunship. (Source Chris Cole)

Darrel Whitcomb

*We all knew the war was about over. ...
No one wanted to be the last casualty or POW.*
Capt Pete Barber

A Summer of War

On March 30, 1972, North Vietnam began a massive invasion of South Vietnam with a modernized force of 150,000 troops equipped with modern Soviet and Chinese tanks, mechanized vehicles, artillery, surface-to-air missiles (SAMs), and masses of anti-aircraft artillery (AAA) guns. The SAM forces included the large SA-2 missiles which were radar guided and fairly effective against most American aircraft, and the smaller heat-seeking SA-7s. These shoulder-fired weapons were being dispersed amongst the enemy infantry battalions and were particularly effective against low-flying aircraft like the O-2 and OV-10s being flown by Air Force forward air controllers (FACs) and the ubiquitous helicopters being flown by American and South Vietnamese forces.

The invasion consisted of three prongs. A corps-sized force would invade from southern Laos and attack Kontum and possibly Pleiku in a drive to split the country. Another force would invade out of Cambodia and drove through Loc Ninh and An Loc to threaten Saigon and the South Vietnamese government. The northern most component of the North Vietnamese force, consisting of over 30,000 troops, would invade through the demilitarized zone (DMZ) and from also Laos to seize the strategic objectives of Quang Tri, and Hue.

As part of the national withdrawal from the war, the big U.S. Army and Marine divisions with their huge supporting artillery and logistical units had been removed or dramatically reduced throughout South Vietnam, but especially the area of Quang Tri and Hue. Consequently, the northern most



B-52 strike below the DMZ. (Source Author.)



invading force was met by South Vietnamese ground forces consisting of the 3rd ARVN Division reinforced with several Ranger units, and a Vietnamese Marine brigade. They were directly aided by residual U.S. Army aviation units who provided them support for air assaults, resupply, area reconnaissance, force screening, medivac, and rescue of downed aircrews or cutoff ground forces. Additionally, aircraft from the 7th Air Force fighter and bomber units in the theater, augmenting U.S. Marine air units, and Navy aircraft carriers in the Gulf of Tonkin would provide air interdiction and close air support. U.S. Navy cruisers and destroyers were also available day and night to provide direct gunfire support with their heavy guns.

Throughout the spring and summer, the massive North Vietnamese forces were able to overrun the province

Col. Darrel Whitcomb, USAF (Ret.), flew the OV-10 and O-1 as a Nail and Raven Forward Air Controller in Southeast Asia from 1972-1974. He is a prolific and award winning writer of Air Force aviation and rescue history, and a frequent contributor to Air Power History. He recently completed his fifth book on rescue: Moral Imperative 1972, Combat Rescue and the End of America's War in Vietnam.

capital of Quang Tri before being stopped by the South Vietnamese forces north of Hue. The South Vietnamese forces then started a series of offensive operations to push back the invaders. On 11 July, U.S. Army aviation units in the area and U.S. Marine aviation elements from U.S. Navy ships in the Gulf of Tonkin were directed to support the insertion of a Vietnamese Marine Corps battalion into two landing zones (LZs) north and east of Quang Tri. The action would be preceded by "Arc Light" B-52 missions in the area and numerous airstrikes against known enemy positions located by U.S. Air Force FACs who constantly patrolled the area of operations (AO). The actual insertion would be conducted by OH-6, UH-1, and AH-1 helicopters from F Troop, 4th Cavalry (F/4), F/8 Cavalry, F/79 Artillery, and the 48th Assault Helicopter Company (AHC). They would assist several U.S. Marine CH-46 and CH-53 helicopters from the U.S. Navy ships off-shore as they delivered the South Vietnamese marines. The commander of F/4 Cavalry, Capt James Elder, would lead the entire operation. His F/4 Cavalry team also included a search and rescue (SAR) team from the F/8 Cavalry. This unit had recently completed several successful rescues in the Hue area in the last few months, were well versed in the enemy threat in the AO, and also how to integrate operations with standing U.S. Air Force rescue assets on call to respond to any aircraft downed in the area.



Destroyed NVA tank. (Source Pete Barber.)



F/4 Cavalry OH-6. (Source Pete Barber.)

However, air assault operations of this magnitude were now a rare occurrence as Army assets in the AO continued to dwindle. Regardless, one U.S. Army air cavalry

pilot, 1st Lt Ken Mick from F/4 noted that the overall operation was, “the biggest and scariest mission I was involved with.” “Frag” orders also directed Air Force, Navy, and Marine F-4s, A-7s and A-6s from the large airbases in South Vietnam, and Thailand and from the aircraft carriers in the Gulf of Tonkin to be available. These strike assets would be directed by the FACs who would orbit above the fleet of helicopters and coordinate the direct fire support with the ensuing battle below.

This would be a dangerous operation. To avoid the North Vietnamese gunners, the Army helicopters would be flying a very low-level employing “nap-of-the-earth” techniques to provide the enemy with minimum opportunities to shoot them down. This would also protect them from the dangerous SA-7 missiles. Additionally, all of the Army machines had been modified with heat exhaust suppression kits to defeat the heat-seeking guidance system for the weapons. Soldiers in several of the helicopter units had also performed “local modifications” to their helicopters, adding armor plating and multiple machine guns to better deal with the enemy AAA.

Air Assault

As the dust cleared from the B-52 bombs, Capt Elder ordered in his scouts in their OH-6s to ensure that the area was safe for the heavier helicopters. The AH-1s buzzed around them as they inspected potential enemy positions and attacked anything which looked lucrative. When the scouts determined that the LZs were quiet enough, the AH-1s from F/79 Artillery flew line-abreast and shot open a corridor from the ARVN front lines north to the LZ, and the AH-1s from the two cavalry units patrolled on each side of the lumbering U.S. Marine helicopters. The 18 troop-laden CH-46s began landing in pairs to disgorge their troops. Enemy forces and anti-aircraft-artillery (AAA) began to fire at the mass of helicopters. When this first wave of CH-46s were empty and outbound, Elder cleared in the second wave of 10 more CH-46s and 5 CH-53s into the second LZ 500 meters further south. This time, the OH-6s were met by increased AAA and several heat-seeking, SA-7 missiles. They were able to avoid the missiles, but several helicopters were damaged by the enemy AAA. Above, the U.S. Air Force FAC O-2 and OV-10 aircraft had to climb to higher altitudes



USMC helicopters inserting ARVN forces. (Source USMC.)

and utilize decoy flares to avoid the SA-7s. But the larger helicopters were still very vulnerable to the missiles.

Inbound, two CH-46s were heavily damaged by the fire, but were able to successfully insert their troops. As they pulled out, though, both aircraft were just too heavily damaged to proceed, and the crews put the aircraft on the ground a few hundred meters away from the LZ. The SAR aircraft from the F/8 Cavalry picked up both crews.

Lady Ace 21

The third section of aircraft consisted of two CH-53s which were carrying more troops and also sling-loaded supplies. As they approached the second LZ, the number-two aircraft, Lady Ace 21, was hit by an SA-7 and caught fire. The crew was able to continue to an adequate landing, and all of the troops were able to safely unload. However, the helicopter was destroyed. Two crewmembers were killed and five remained at the LZ. The last three CH-53s were also able to land. Their troops rushed off into what was now a raging battle. The entire insertion had taken 18 minutes. As hand-to-hand combat raged around the entire LZ, the AAA and SA-7 firings were continuous.



The wreckage of Lady Ace 21. (Source Pete Barber.)

Capt Elder decided that the area was just too dangerous for an attempted recovery of the crew. He directed all of the supporting helicopters to return to base to re-arm and refuel. The enemy forces had taken a toll on the helicopters. At least eight other CH-46s, and 4 CH-53s, had received at least moderate damage. F/4 had five damaged helicopters, and the 48th AHC had three damaged. Additionally, NVA forces in the area mounted a counter-attack with armor and artillery support to push out and / or destroy the South Vietnamese units. The crews in the AH-1s went after the tanks and armored vehicles. But the downed CH-53 crew was trapped in the middle of that maelstrom.

Rescue

Just a few miles west, a U.S. Air Force rescue HC-130, King 26, was orbiting and its crew was aware of the unfolding battle at Quang Tri. When the crew heard the frantic calls on the emergency “Guard” frequency detailing the loss of Lady Ace 21, they notified the 7th Air Force Rescue Coordination Center (RCC) in Saigon via their long range

high-frequency radios. The RCC was the command center for theater-wide rescue operations and could call in rescue forces from three Air Force and one Navy rescue squadron. Co-located with the larger, U.S. Air Force Tactical Air Control Center, they could quickly coordinate with theater Air Force or Navy units for FAC or fighter support as necessary to conduct any rescue operation. The rescue controllers there were also aware of the big battle raging north of Quang Tri and the increased risk for U.S. and South Vietnamese aircraft. To provide a quicker rescue response for downed aircrews, they had diverted King 26 from its normal orbit over Laos to its current orbit near Quang Tri. It was a fortuitous action.

The RCC rescue controllers began alerting and scrambling other U.S. Air Force rescue forces. At the large Danang Airbase, seventy miles south of Quang Tri, two U.S. Air Force A-1s, TDY from the Thailand-based 1st Special Operations Squadron (SOS), Sandy 07, 1st Lt Tex Brown, and 08, Capt Lee Mazzarella, were scrambled. They took off with two U.S. Air Force HH-53 rescue helicopters assigned to the 37th Aerospace Rescue and Recovery Squadron, Jolly Green 72 and 64, and headed north to the Quang Tri area. There, Nail 24, an OV-10 FAC, had been capping the overall operation and directing airstrikes as requested by Capt Elder. When Lady Ace 21 went down, he assumed duties as the on-scene-commander (OSC) to initiate and coordinate the rescue operation for the downed crew. He directed naval gunfire onto enemy positions to the west of the landing zone. When Tex Brown arrived, he assessed the situation and assumed OSC for the rescue and Nail 24 continued to direct supporting airstrikes. Brown made several low-level passes over the survivors as his wingman, Mazzarella covered him from above and called out two SA-7 launches which Brown was able to avoid with evasive maneuvers. Brown then decided that because of the heavy presence of mixed AAA and SA-7s in this area, and the confused nature of the pitched battle being waged, it was too dangerous for the Jolly Greens to attempt a recovery. Brown directed them to hold off the coast.

Above, the crew of King 26 closely monitored the battle and received intelligence updates on the enemy forces in the area. They were notified that a platoon of South Vietnamese marines had reached and secured the crew of Lady Ace 21. However, they had also moved them to another location, adding further chaos to an already highly confused mess. Concerned that approaching darkness would preclude any more recovery efforts until the next morning, they contacted Capt Elder in his tactical operations center at their base at Tan My, just a few miles east of Hue, and asked if F/4 Cavalry could conduct a recovery before night-fall. Elder called for volunteers. Crews for two OH-6s, four AH-1s, and two UH-1s immediately stepped forward. All had already flown in the battle and knew the terrain, array of friendly and enemy forces, and the threat.

Elder quickly gathered with his crews and developed a simple plan. Two OH-6s would be the primary recovery birds. They would be escorted by two AH-1s. Two UH-1s would accompany them as secondary recovery aircraft, or SAR birds if anybody else was shot down, and Elder would



Sandy A-1s (Source Byron Hukee.)

fly one of the UH-1s. They would also be escorted by two more AH-1s. When everybody was ready, Elder called the two A-1 pilots, Brown and Mazzarella, and briefed them on the plan. Brown agreed to it. The two A-1s would provide top cover as the helicopters executed the recovery of the crew of Lady Ace 21. Because of the encroaching darkness, the A-1s would operate with their external lights on to better deconflict with the mass of helicopters in the operation. Two more U.S. Air Force HH-53s, Jolly Green 71 and 65, were now on station and would provide recovery back-up from their holding point out over the water.

As darkness fell, the Army helicopters of F/4 Cavalry took off and headed directly to the survivors. The OH-6s were flown by Centaur 16, Capt Frederick Ledfors and crew, and Centaur 17, 1st Lt Wesley Walker and crew. They checked in with the Sandys and made their run-in with their two AH-1s flying cover. At one mile from the survivors, all four aircraft began to receive heavy fire from automatic weapons, and 23mm and 37mm AAA. They had to be very discerning with return fire because friendly forces were intermixed with the enemy forces. All helicopter crews also witnessed several SA-7 missiles which missed all aircraft. As the Sandys engaged several targets from above, Centaur 16 and 17 landed near the survivors and quickly picked up three individuals each (a wounded Vietnamese marine was also taken out). As they loaded, their covering AH-1s and the Sandy A-1s silenced several enemy AAA sites and destroyed an NVA vehicle. After minimal time on the ground, the now overloaded OH-6s lifted off and headed south. Once clear of enemy forces, they landed and transferred their loads to the two UH-1s.

En route back to their base at Tan My, Capt Elder called King 26 and asked them to have the *U.S.S. Tripoli*, which was just a few miles off-shore, dispatch a U.S. Marine CH-46 to meet them there so that they could take the Lady Ace 21 crew back out to their units.¹

Sandy 07 and 08 and the Jolly Greens returned to Danang. In route, the Sandy pilots inspected each other's aircraft. Sandy 08 was undamaged. But Sandy 07's aircraft was riddled with holes and the engine was running rough. After landing, 1st Lt Brown discovered that his aircraft had suffered 210 hits and two of the cylinders on his engine were not functioning. Regardless, the maintenance troops of the 1st SOS had the aircraft back on full flight status just a few days later.²

The performance of F/4 Cavalry during the Lady Ace 21 recovery mission was just amazing. Two of its soldiers, Capt Frederick Ledfors and 1st Lt Wesley Walker were awarded the Distinguished Service Cross for their actions that day. However, their and the unit's actions replicated recent actions of the F/8 Cavalry crews during several rescues in the Quang Tri area and the recent actions of the Army crews engaged in comparable battles at An Loc and Kontum. While performing their assigned Air Cavalry duties, the inherent capabilities of the units as equipped, manned and organized, gave them a unique capability to recover downed personnel in their assigned AO. The recovery of the Lady Ace 21 crew and several other of these recent rescues suggested several salient learning points:

The unit was equipped with helicopters of varying capabilities which could be quickly formed into ad-hoc task forces to accomplish whatever needed to be done. Their use in this arena instead of the larger and lumbering HH-53s was a brilliant tactical call by the Sandy pilots and possibly prevented the loss of a U.S.AF HH-53. Remembered Tex Brown, "There was no way that I could safely commit the Jolly Greens – we had lost a Jolly back in April near [this location]."³

The unit was assigned / allowed to operate in a fixed area of operations for a sufficient length of time so that all personnel became well familiar with the terrain, weather, and characteristics of both friendly and enemy forces.

Its young officers and soldiers possessed keen creativity which allowed them to improvise during chaotic situations.

All U.S. military aircraft and key command centers had access to the common "Guard" frequency which allowed disparate elements to communicate with others very quickly. And the King HC-130s were always above to respond to a call.

The young cavalry soldiers and aviators understood the unique "moral imperative" of rescue and were willing to "ride to the rescue," because they knew that in turn, their brothers would come for them when they were shot down.

During 1972, tactical U.S. Army units such as these were an integral part of our rescue capability in South Vietnam, and quite possibly, some of our best "rescue" units. The rescue airmen / controllers in 7th Air Force knew it:

The numerous helicopters operated in South Vietnam

by the U.S. Army and Marines provide immediate capability for aircrew recovery. The A-1, Sandy pilots knew it. Stated another 1st SOS A-1 pilot, Capt Fred Boli:

I have never known the Army [helicopters] to turn us down. And the U.S. Army crews themselves knew it. Said Capt Mike Rosebeary with F/8 Cavalry:

[It] was just the natural thing that when anyone had trouble, if you were in the area, and you had the capability, you just responded. It was SOP. There were no questions asked.⁴

Said Capt Pete Barber of F/4 Cavalry of those times in 1972:

Anyone who went down was lost unless rescue was immediately available. We all knew the war was about over. We could listen to the English language broadcasts from China and the BBC and knew what was going on in Paris. No one wanted to be the last casualty or POW. It was unspoken, but we weren't going to leave anyone out on their own. You never gave it a thought. You just do it. I suspect we all had the same thought - If I don't go for you, You won't come for me.⁵

During the retreat of our ground forces from Vietnam in 1972, our aviators from all of our services provided top cover, and the "rescuers" from all services watched out for the aviators. That was the deal. In the colloquial terms used by the fighter pilots, the Air Cavalry soldiers were "Shit Hot!" And fighter pilots never lie.

So it was in the dangerous skies of Vietnam in 1972. ■



The devastation of the Battle of Quang Tri. (Source Pete Barber.)

NOTES

1. Joint Rescue Coordination Center Log, AF Historical Research Agency, Maxwell AFB, Alabama; Rescue Report, Doc 6A1, History of the 56th SOW, Jul – Dec 1972, Vol II, AF Historical Research Agency, Maxwell AFB, Alabama; ; Melson, Charles, *U.S. Marines in Vietnam: The War that Would Not End*. History and Museums Division, Headquarters, U.S. Marine Corps, Washington, District of Columbia, 1991, 114; National Archives, Record Group 472, Records of US Forces in SEA, F Troop 4th Cavalry, Box 92; <http://www centaursinvietnam.org/Memorial/InfoMemorial/InfoDFCLedfors-Fredrick.html>; <http://centaursinvietnam.org/Roster/infoNotes-Roster/InfoDFCWalkerWestley.html>

2. Lt Gen (ret) Richard "Tex" Brown, email to author, October 4, 2017.

3. *Ibid.*

4. Whitcomb, Darrel, *The Rescue of Bat 21*, Naval Institute Press, Annapolis, Maryland, 1998, p. 32.

5. Email to author from Pete Barber, July 27, 2017.

The Desperate Diplomat: Saburo Kurusu's Memoir of the Weeks before Pearl Harbor. By J. Garry Clifford and Masako R. Okura, eds. Columbia MO: University of Missouri Press, 2016. Photographs. Notes. Bibliography. Index. Pp. vi, 188. \$35.00 ISBN: 978-0-8262-2201-5

I was eight years old when I heard that the Japanese had bombed Pearl Harbor. Having seen many newsreels of German air raids on London, I expected our home to be bombed that night. Word on the street claimed that “two dirty back-stabbing Jap ambassadors” had lulled America to sleep by preaching peace while their army and navy massed for war.

Seventy-five years later, historians Clifford and Okura present the memoir of one of those Japanese ambassadors in this book. Clifford won awards as an historian and edited several books about politics in America. Okura is an associate professor of political science at Columbus State University in Georgia.

Their 18-page introduction with 10 pages of notes recreates the negotiations between the United States and Japan during the last three weeks before Pearl Harbor. The introduction leads to Kurusu's memoir, *The Inside Story of the Japanese-American Negotiation: Our Diplomatic History*, which he translated into English. Clifford and Okura say they edited the memoir only for “punctuation, grammar, and wording.”

In 1941, hampered by relations that had deteriorated over a number of years, the US and Japan were negotiating two plans: (1) Japan's role in world military power and (2) oil supply between the two nations, which the United States controlled. Basically, Japan sought economic independence and uncontested land grabs across Asia.

Forgoing self-imposed seclusion based on disagreement with government policies, Kurusu accepted Foreign Minister Togo's request to rush to Washington in mid November in aid of Ambassador Nomura. Togo shared Kurusu's desire to avert war with the US; but, at the same time, he accused Kurusu of identifying too much with American interlocutors (Kurusu had an American wife and three children).

Because of US unwillingness to compromise, Japanese militarists led by Prime Minister Tojo stopped negotiations on November 26 and formalized a decision for war on December 1. Lacking knowledge of the facts (because war plans were restricted to a select few within the Japanese Navy), Kurusu continued to pursue peace.

That situation is the crux of Kurusu's memoir. He explains his interactions with leaders from both sides amid a vacuum of influence with his superiors. His ideas for some sort of a new plan, such as direct contact between President Franklin Roosevelt and Emperor Hirohito, were close to fruition when Japan attacked Pearl Harbor.

Kurusu's memoir delves into explaining the pre-Pearl Harbor weeks with details and a sincerity that override presumptions made against him long ago on the street. He pursued US Secretary of State Cordell Hull and political advisor Bernard Baruch for collaboration in preventing war. One

might question Kurusu's earlier signing of a Tripartite Pact with Germany and Italy (which he later disparaged); but, during the weeks in question, he believed that war with the US was suicide for Japan. Historians have largely concluded that Kurusu was a dedicated diplomat who worked indefatigably for peace.

Kurusu apologized in his memoir for accepting the last-minute assignment because he “had very few friends within the administration” and “was practically an unknown to the army and navy men who were actually running the government of Japan then.” He evaluates himself as “powerless against the army and the navy.”

By 1954 when he died at age 68, Kurusu also had written two other accounts of the time not published in English.

Kurusu's memoir illustrates the limits within which negotiators work. They often are at the mercy of their leaders as well as their opponents. Since World War II, American negotiators—most evidently, Henry Kissinger during the Vietnam War—have operated under fluctuating political needs of US presidents along with negative attitudes of foreign delegates that walk away from the bargaining table on a whim. Present-day unproductive confrontations between Americans and Taliban chieftains clearly prove the limited power of peace-seeking negotiators.

Henry Zeybel, Lt Col, USAF (Ret), Austin TX



Love and War: A Father and Son in Two World Wars. By Robert Huddleston. New York: Austin Macauley, 2020. Pp. 108. ISBN 978-1-6457511-5-1

This novel is the latest effort from P-47 combat pilot Robert Huddleston, a prolific writer, playwright, and *Air Power History* book reviewer. It is a story of a family's endeavor to survive war, the loss of loved ones, and readjustment to peace. As in his *An American Pilot with the Luftwaffe: A Novella and Stories of World War II (APH, Fall 2015)*, Huddleston continues his exploration of families separated by war; the camaraderie of shared goals; the coming of peace; reunion with loved ones; and looking, at last, to a shared future.

The setting is the battlefields of Europe of both world wars. Born and raised in Chicago, Fred Brown served in World War I as an infantry officer. Employed after the war at the American Legation in Bern, Switzerland, as an analyst of German political and social developments, his job required frequent trips to Germany. There he met his wife-to-be, Anna Waldermann, at her family's art gallery in Berlin. They married and had a son, Ernest Michael Brown. Fred soon became involved with his in-laws' business, eventually buying it. As a result, his son grew up on two continents. He spent considerable time in pre-war Germany flying gliders in clubs sponsored by the reborn Luftwaffe. As the Nazis came to power, the Brown and Waldermann families observed the steady rise of militarism with growing ap-

prehension. Ernest worked with his father to keep art out of the hands of Nazi looters. Eventually he married Lady Claire Woodcastle, whose father, Sir Clarence Woodcastle, was late of the British Foreign Office. Sir Clarence's insights into European political developments of the late 1930s fueled thought and doubt on the part of Ernest and Claire. Will there be war? Should Ernest serve if it does? What of their family members in Germany?

When war inevitably came, Ernest enlisted in the RAF, as did so many other Americans. He flew combat in the Battle of Britain, eventually becoming an ace. Once the US entered the war, he transferred to the USAAF. Rising to command a P-47 fighter group, he led fighter-bomber attacks on bridges in occupied France in preparation for D-Day. Wounded in combat, Ernest was grounded from flying. With peace, he resumed an interrupted college education and started a family with Claire. The conclusion reflects the relief of the Greatest Generation at the coming of peace, and their happiness at resuming their lives.

The outbreak of war trapped Ernest's mother, Anna Waldermann Brown, and her parents in Germany, where the Nazis held them. The effort to learn their fate grew to a consuming passion for the worried Fred Brown. He joined a unit tasked to find art looted by the Nazis so that he could enter Germany to search for them. Eventually he learned they did not survive.

As in *Novella and Stories*, Huddleston's characters efficiently relate a lot of information in a relatively few hyper-articulate sentences. Conspicuously absent is the hesitation, the false starts and stops of formulating thoughts that characterize conversation in real life. Although a bit didactic at times, the professorial-like dialogue moves the narrative along at a lively pace. Huddleston mixes real events, places, and names with the fictional plot and characters for an authentic effect. The air combat passages ring true, as Huddleston speaks from experience.

The novel vividly explores the private lives of the characters, their careers, courtships, marriages, triumphs and tragedies. It continues several themes from *Novella and Stories*. The fate of art looted by the Nazis—a consistent Huddleston concern—appears here. So does the Nazi rocket and ballistic missile program, which looms large in Huddleston's mind perhaps because he himself was involved in postwar US efforts to exploit that technology.

The book appears to have suffered somewhat in the typesetting process and contains a number of typographical errors. Hopefully a second edition will clean those up. However, this does not detract from its value. This rumination of a member of the Greatest Generation on the meaning of war and its effects on his place in the world is likely one of the last testaments of the World War II combat generation. It is well worth reading.

Steven Agoratus, Hamilton NJ



German Fighter Aircraft In World War I; Design, Construction and Innovation. By Mark C Wilkins. Havertown PA: Casemate Publishers, 2019. Photographs. Drawings. Illustrations. Pp. 192. \$37.95. ISBN: 978-161200619-2

Wilkins sets an extraordinarily high bar for this book. While committing to discuss design, construction, and innovation of German fighter aircraft in World War I, he expands his mandate to include technology borrowed from Allied aircraft. He even delves into post-war technology shifts when German aircraft manufacturers sought copyright protection for their wartime advances. And Wilkins proposes to do this in just 190 pages. The result is more of a survey of the topics than a true in-depth analysis. Granted, it is a lavishly illustrated survey that draws on archival photographs of German factories and period technical drawings. Uniquely, he also includes extensive photographs of current shops building reproductions of German fighters using original manufacturing techniques.

While receiving full credit for a colorful and entertaining read, Wilkins' effort is inconsistent in achieving his objectives. Throughout the book, he frequently cites the importance of the German transition from rotary engines to more-capable conventional water-cooled inline engines. But pertinent presentation of engine-related technology is lumped together with armament and inserted at the end of the book as something of an afterthought. However, he does build a case for a German aircraft industry that transitions from small, low volume concerns to mass-production industries capable of producing airframes in numbers that were more than the operators could employ. In that sense, the parallels to the state of the Luftwaffe at the end of World War II were clear, when there were large quantities of airframes sitting idle for want of fuel and pilots.

Wilkin's editors did him no favors in preparing the book for publications. Typographic errors are numerous in both the body of the book and photo captions. None of the errors confuses the content; but they are, nonetheless, bothersome. There are several photo duplicates throughout the book, usually with different captions and without citation. While the book is presented on high-quality paper showing the color photography in high resolution and excellent detail, the book itself feels flimsy. The spine cracks with every page turn and feels as though it will come apart at any moment.

Thanks to its lavish and copious illustrations, the book covers a broad range of topics quickly and lays a foundation of information that the curious reader can use to seek additional information from other sources. The text is clear and easy to read, avoiding overly technical language. Wilkins adeptly navigates the complexities of presenting technical terms from German to English which is no mean feat. *German Fighter Aircraft In World War I* is a useful read for any aviation historian.

Gary Connor, docent, NASM's Udvar Hazy Center



Stuka Attack!: The Dive-bombing Assault on England During the Battle of Britain. By Andy Saunders. London: Grub Street, 2013. Photographs. Appendices. Bibliography. Index. Pp. 224. \$22.95 paperback. ISBN: 978-1-911621-47-8

For more than thirty years, Andy Saunders has studied the 1939-1945 air war over Europe. He has written twenty-two books on the subject. The richness of his research is clearly demonstrated in the republishing of this book in paperback.

The German Luftwaffe's Junkers 87 Stuka built a fearsome reputation as a spearhead during the early stages of World War II, particularly in the German blitzkrieg across France and the Low Countries. But between July 1940 and February 1941, while operating from France during the Battle of Britain, for the first time Stuka pilots encountered a well-organized air defense force and its integrated command and control structure along with a hazardous two-way sea crossing. The outcome was the Stukas' most bitter fighting of the war, to date. The result was extremely high losses.

Saunders explains the good and bad results produced by combatants from both sides by describing their personal experiences. He supports all of this with ten appendices of documentation.

Aficionados of statistics should delight in comparing two of the appendices: "RAF Fighter Command Claims for Ju87s July-December 1940" and "Junkers 87 Operational Losses July-December 1940." Contradictions flourish between the two. Details related to destroyed and damaged Stukas provide information that could stand alone as a book.

Nevertheless, the text overflows with interesting war stories. Each chapter highlights a climactic event. Stukas concentrated on bombing RAF bases and shipping until stood down when the Luftwaffe bomber force began its around-the-clock blitz of London and other cities.

Saunders belies myths related to Stuka tactics, such as their terroristic bombing of fleeing civilians in Belgium, Holland, and France. He also addresses the suggestion that Stuka forces withdrew from duty over Britain because of an unacceptable attrition rate. He makes a first class appraisal of the role and effectiveness of the Stuka as related to its protection by friendly fighters. Unfortunately, in a strategic role over Britain, the Stuka's slow speed and limited range handicapped it in ways not encountered when it provided tactical air support on the continent. Furthermore, in designating targets in Britain, German planners failed to capitalize on the Stuka's pinpoint bombing accuracy.

Throughout the book, excellent photographs of people and airplanes complement the text. We can be thankful that Grub Street chose to reprint this book in paperback form to make it available to an even wider audience.

Henry L. Zeybel, Lt Col, USAF (Ret), Austin TX



Caudron-Renault CR.714 Cyclone: The Ultimate Story. By Bartomiej Belcarz. Havertown PA: Mushroom Model Publications. 2019. Photographs. Illustrations. Maps. Pp. 456. \$85.00. ISBN: 978-836142126-9

For those unfamiliar with the Caudron-Renault CR.714, a brief introduction will prove helpful. The aircraft was an attempt to convert a series of successful French sport-racing designs into a lightweight fighter. It was thought that lightweight fighters could be produced more cheaply and in greater numbers to offset the numerical and technical superiority of an adversary. Unfortunately, the resulting CR.714 was not a successful design. Its flight performance was lacking in most categories. Mechanically, it was plagued by engine, propeller, and airframe issues. As Belcarz notes, "The allocation of the Caudrons to the Poles resulted from the French action aimed at getting rid of the unwanted airplane." Belcarz spends almost 500 pages and over a thousand illustrations proving this point in mind-numbing fashion.

Belcarz makes his case easily on the technical shortcomings of the "Cyclone," so a reader's interest might turn to the activities of the Polish I/145 Squadron in the spring of 1940. These pilots could have decided to wait until a more suitable aircraft became available. Instead, they were so eager to strike a blow against Germany that they decided to go to war in an airplane that was barely safe to fly in a peacetime environment. They were able to win twelve confirmed victories against the Messerschmitt Bf 109 and Bf 110 and Dornier's Do 17. When France fell, most of the I/145 Squadron made its way to England and the RAF where they constituted No. 302 (City of Poznan) Polish Fighter Squadron, one of the highest scoring RAF squadrons in the Battle of Britain.

The book is in many ways a monumental achievement. It offers something to everyone: students of aircraft design and production, model builders, Second World War aviation historians, aficionados of Polish and Finnish aviation, and even genealogists. The photographic research and analysis alone were a massive undertaking. Even the book's physical size is daunting. However, with its abundance of illustrations comes a huge amount of redundancy. The book could have easily been half as long. This is not a tome that the casual reader may want to experience. But to a researcher investigating one of the book's main topics, Belcarz has created a wonderful tool.

Gary Connor, docent at the Smithsonian National Air and Space Museum's Udvar Hazy Center



Heroes of Coastal Command 1939-1945. By Andrew D. Bird. London: Frontline Books, 2018. Photographs. Notes. Bibliography. Index. Pp xii, 277. \$44.95. ISBN: 978-152671069-7

World War II aviation historians have tended to leave

the Royal Air Force's Coastal Command in the shadows cast by Bomber Command and Fighter Command. Andrew Bird, who has been studying Coastal Command for many years, has attempted to increase awareness of the command's contributions. Previously he penned two other works—one on Coastal Command's Banff Strike Wing in 1944 and 1945 and the other on the command's Bristol Bleinheims during the first year of the war. In this volume, he examines the careers of eleven different crewmembers over nine chapters.

A typical chapter begins with a biographical sketch of the featured individual. It usually includes his upbringing and accomplishments prior to enlisting in the Royal Air Force or, in some instances, the Royal Australian Air Force or Royal New Zealand Air Force. The action or actions that resulted in special recognition are described in detail along with references to other pertinent squadron operations. Typically a chapter concludes when the individual leaves flying status or becomes a casualty.

Focusing on these individuals at the expense of others surely required some difficult choices. Those that appear in print certainly make for interesting reading.

Two of the more unique stories involve the Consolidated PB4Y Catalina and B-24 Liberator. Regarding the former, a chapter is devoted to Flight Lieutenant Denis Healy's efforts to pilot a Catalina carrying several weather experts into the Arctic to gain insight into the impact of pack ice on convoy routes to the northern Soviet Union. The other concerns Flying Officer Lloyd Triggs, recipient of the Victoria Cross (the British Empire's highest decoration for bravery), for his and his crew's success in sinking *U-468*. Triggs' aircraft crashed with no survivors after its depth charges mortally wounded the U-boat. A few members of the U-boat crew survived. Their testimony resulted in the posthumous award, the only time (according to Bird) that the basis for the decoration's merit has come only from the words of the enemy.

While this book contains a tremendous amount of information and anecdotes, it disappoints in several ways. Hardly a page goes by without significant errors in syntax, grammar or punctuation. Then there is the use of fabricated dialogue. Bird conducted extensive interviews over the years with several of the featured personalities so it is understandable that direct quotes could have been lifted from them or letters or diaries. However, the very inconsistent use of notes makes it impossible to determine what is historical fiction and what is fact. The final two chapters contain no notes whatsoever. Then there is the rapid shifting from one squadron or airfield to another. An appendix listing units, the aircraft flown, and where they were based at times pertinent to the incidents discussed would have been most helpful. Also, maps showing the various installations and perhaps ranges to potential targets would have been most appreciated.

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



The English Electric Lightning. By Martin W. Bowman. Barnsley UK: Pen and Sword, 2019. Photographs. Illustrations. Pp. 144. \$29.95 paperback. ISBN: 978-152670556-3

Martin Bowman is a renowned and prolific British author with over 60 books to his credit. His latest effort on the English Electric Lightning follows several other books on the same aircraft. This book follows the standard Pen and Sword Images of War format (of which a substantial number have been reviewed in APH): a short introduction followed by a large number of photographs—with an expanded caption for each photograph.

The introduction is a useful snapshot of both the Lightning and the era of aviation that saw its creation. The Great Britain of the late 1940s-early 1950s witnessed a period of great innovation in aviation. Captured German research was combined with homegrown propulsion technology; this resulted in the birth of extraordinary aircraft. English Electric conceptualized the Mach 2+ Lightning in 1947 and first flew the prototype in 1954. The type served as an all-weather, point-defense interceptor for 28 years. Existing at the cutting edge of aircraft design is a perilous place to be. Bowman praises the Lightning by pointing out that its significant loss rate was somewhat less than that of its competitor, the Lockheed F-104 Starfighter, called the "Widow-maker" by some of its pilots.

There are more than 100 black-and-white images that are clear and would be of most use to model builders. The Lightning had few significant variants and only two foreign users, so the images run together after a while. The expanded captions contain a wealth of information, particularly regarding the cause of the losses of aircraft and—all too frequently—the aircrew. Bowman offers an interesting discussion of the installation of a post-production gun system to augment the primary air-to-air-missile systems. This discussion points out that the Lightning was envisioned as a high-altitude interceptor countering the Soviet bomber threat. But, by the time the fighter was operational, the threat had evolved into low-level penetrators that the Lightning was poorly suited to oppose.

The English Electric Lightning is a quick and quality read with few surprises. It would be a worthwhile addition to the library of a reader interested in post-World War II British aviation or early Cold War jet fighters.

Gary Connor, docent, Smithsonian National Air and Space Museum's Udvar Hazy Center



Images of War: The F-4 Phantom, Rare Photographs from Wartime Archives. By Martin W Bowman. Haverstown, PA, Pen and Sword Books, 2019. Photographs. Pp. 125. \$24.95 paperback. ISBN: 978-152670576-1

This book introduces the general reader to the career

and variants of the McDonnell F-4. It features a multitude of black-and-white photos with descriptions of this remarkable aircraft both in and out of combat.

The F-4 Phantom was developed for the US Navy as a long-range, all-weather fighter. It first flew in May 1958 and became operational in 1961. The USAF realized it was better than any aircraft in its inventory and ordered it as well. It was adopted by the Marine Corps. By the mid 1960s, it had become a major part of US military air. Beginning in 1959, it set 15 world records for in-flight performance, including an absolute speed record and an absolute altitude record. Phantom production ran from 1958 to 1981 with a total of 5,195 built, making it the most-produced American supersonic military aircraft.

The Phantom is a large fighter with a top speed of over Mach 2.2. It can carry more than 18,000 pounds on nine external hard points including air-to-air missiles, air-to-ground missiles, and various bombs. It is a tandem two-seat, twin-engine, all-weather, long-range, multi-role aircraft. The F-4, like other interceptors of its time, was designed without an internal gun; however, later models incorporated an M61 Vulcan cannon.

As the principal fighter for the USAF, USN, and USMC, it became an important player in the air-to-air, ground-attack, and aerial reconnaissance roles. It was used throughout the Southeast Asia area of operations. During the war, one pilot and two weapon systems officers from the USAF and one pilot and one radar intercept officer from the Navy became aces by achieving five aerial kills against enemy aircraft.

F-4 Phantoms served in both the reconnaissance and Wild Weasel (suppression of enemy air defenses) roles in the 1991 Gulf War before finally leaving US service in 1996 (the F-4 was gradually replaced by more modern aircraft such as the F-15 Eagle and F-16 Fighting Falcon in the USAF, the F-14 Tomcat in the Navy, and the F/A-18 Hornet in the USN and USMC). It was the only aircraft used by both the USAF Thunderbirds and USN Blue Angels demonstration teams.

In 1964, there were orders from Britain for their Navy and Air Force. One of the Royal Navy's Phantoms set the record for the fastest Atlantic crossing that stood until taken by an SR-71 Blackbird. Eventually, the F-4 was operated by the armed forces of 11 other nations. Israeli Phantoms saw extensive combat in several Arab-Israeli conflicts, while Iran used its large fleet of Phantoms (acquired before the fall of the Shah) in the Iran-Iraq War. As of 2020, 62 years after its first flight, the F-4 remains in service with Iran, Japan, South Korea, Greece, and Turkey.

Based on the title, I expected a book with lots of color photographs. If you are interested in high-quality reference images and data on the Phantom, spend time on your computer—not on this book. While *The F-4 Phantom* is a compact overview of this subject, there are other books that contain more diagrams, notes, sources, and photos in

both color and black and white.

Joseph D. Yount, USAF (Ret) and National Air and Space Museum docent



Flashpoint Russia: Russia's Airpower: Capabilities and Structure. By Piotr Butowski. Vienna, Austria: Harpia Publishing, 2019. Photographs. Glossary. Maps. Appendices. Pp. 142. \$ 39.95 paperback. ISBN: 978-0-9973092-7-0

This exceptional monograph is a superlative reference for anyone interested in the nature of Russian airpower. It is a first-rate guide to the present state of Russian military aviation and is clearly based on peerless scholarship and extensive research. It possesses a richness of data on aircraft, facilities, key personnel, and operations and addresses Russian military aviation's organizational structure, basing, operational competencies, airframes, and operational philosophy. The discussion of air assets is fully supported by high-quality photographs, easy to follow organizational charts, and informative maps.

Readers familiar with the continual reorganization of the US Air Force's structure will appreciate parallel goals behind a similar cycle of restructuring in Russia. Of particular note are Butowski's insights on the 2015 creation of the Aerospace Forces component which, beyond traditional air force functions, includes combat operations in space. Butowski also addresses the air components of the Federal Security Service (the former KGB) and the Federal National Guard Service.

On a personal level, I was able to fully appreciate the book's value as a reference for Russian aviation because of my firsthand, if limited, experience with the Russian Air Force. I had spent time at Tiksi (the forward base for strategic bombers on the Siberian coast) and at Anadyr (also a forward base for strategic bombers and interceptors) on the Far East coast opposite Nome, Alaska. I visited Semipalatinsk as well. I have flown on board Russian aircraft and worked with them on global operations. This book answered many questions that I had and has greatly expanded my knowledge.

There is only one minor fault. Because of the incredible wealth of information, I believe the inclusion of an index would be greatly appreciated by anyone using this book as a reference. Among the book's many pluses, however, is the inclusion of a glossary in both Cyrillic and English. This is the go-to book on the state of Russian airpower.

John Cirafici, Milford DE



Lebanese Civil War Volume 1: Palestinian Diaspora, Syrian and Israeli Interventions, 1970-1978. By Tom Cooper and Sergio Santana. Warwick UK: Helion and Com-

pany, 2019. Notes. Bibliography. Tables. Photographs. Illustrations. Maps. Pp. 96. \$29.95. ISBN 978-1-91-162820-0

Helion's War Series has produced yet another quality monograph. As readers have come to expect of this publisher's works, this one is flush with excellent illustrations, maps, orders of battle, technical data for aircraft and armor, and photographs that nicely complement the narrative.

Cooper and Santana apparently recognized that many readers might find it difficult to grasp the complexities of conflict in the Middle East without an introductory overview of past wars leading up to the Lebanese Civil War. In this brief monograph, they tackled this admittedly difficult task and provided the necessary backdrop to the Lebanese civil war and to all its various players, participating factions, splinter groups, and sects and their respective objectives.

In the same way, the authors address the seemingly endless conflicts through the viewpoints of most, if not all, of the players. They seek to correct what they assess as commonly held misperceptions about the Palestinian diaspora (the dispersion of the Palestinian people) and its connection to continual conflict between Israel, its neighbors, and non-state entities. Consequently, Israel is not seen through rose-colored glasses and receives its share of criticism.

As one reads about the various participants, there is a sense that conflict in the Middle East is an endless parade of the same groups, periodically rebranded or with changed affiliations. As the authors point out in one case, Syria is a sponsor of the Palestinians and then—when its interests are challenged—intensely opposed them and their allies in Lebanon. Yet, a reader will discover on an earlier page that the Syrians previously invaded the Hashemite Kingdom of Jordan on behalf of the same Palestinian Liberation Organization (PLO). Needless to say, one must pay careful attention as the authors explain the changing direction of events in order to not be confused by the fluidity of political allegiances and military cooperation that seemingly shifts from moment to moment. Adding to the confusion are the indirect roles played by the Soviet Union and the United States and by extremist groups such as the Abu Nidal Organization, which engaged in acts of terrorism against Israelis, Europeans, and Americans. In light of the number of players and the frequency of armed engagements, readers should appreciate the authors' ability to make sense of it all and present it in minimally complicated terms.

The only faults with this monograph are the lack of an index and some grammatical errors in the text. The editorial staff should have corrected the manuscript. The index would be especially useful when trying to "connect the dots" as players appear and later reappear in the narrative. Otherwise, this is a very useful reference for anyone attempting to sort out the Middle East conundrum.

John Cirafici, Milford DE

Enemy Coast Ahead: The Illustrated Memoir of Dambuster Guy Gibson. By Guy Gibson. Barnsley UK: Greenhill Books, 2019. Tables. Photographs. Notes. Appendices. Pp. xxvi, 435. \$17.95 paperback. ISBN: 1784384909

This story was written in the midst of World War II with all the freshness and vividness of reflection and recollection inevitably lost when writing many years after the fact. Wing Commander Guy Gibson is not a well-known name in the US, but his achievements in a very short life rival those of any aviator from any country during that conflict. He was not yet 25 years old when he was tapped to create the famous Dambusters unit, train for an entirely new method of attack, and work with designers to perfect a new and untried bomb. To say he had a giant task is a gross understatement. His success is a testament to his skills as a leader and organizer and to the tremendous support he received.

This is not an autobiography; it covers only Gibson's activities and life during the war through the end of the dam busting mission (he died later in the war flying a Mosquito in combat against orders). Gibson melds all the disparate elements of tactics, science, aircraft, weapons, personalities, bureaucracies, and combat into an engrossing and engaging narrative that shows the good and bad of early RAF bombing efforts. Gibson's first wartime mission was the first time he'd ever taken off with a load of bombs and featured his first-ever night landing! He relates all this without any self-consciousness or attempts at self-justification for himself, Bomber Command, or the RAF. Gibson describes the bombing of Kiel Harbor where—an on many other early missions—crews had to determine their own tactics and timing. He and his crew decided to delay takeoff so they could first go to the cinema and then, on their own initiative, quite successfully experimented with dive bombing in their Handley Page Hampden. There was no effort to deconflict timing with other crews or to later share the results of their success with dive bombing. It all seems so random and haphazard. Comparing these stories with the focus and efficiency put into the efforts to destroy the Möhne and Eder dams, one has to wonder whether it was the same RAF separated by a mere four years.

Extensive discussion of the development of the special bomb; the new tactics required to fly large bombers at the precise low altitudes, at night, and over featureless water; the critical crew selection; and a myriad other details form the heart of this interesting book. Gibson's tone is casual—not bombastic or boastful—and he acknowledges mistakes without deflecting blame or making excuses.

His leadership was not without issues, and this is where the notes are most useful. The editors were careful to ensure that a knowledgeable and objective historian could comment on the various aspects of both the book and facts and opinions contained therein. While the notes contain the usual amplification of information, the most useful ones comment on things that Gibson might have left out or glossed over or where information about Gibson himself is useful. While the

tone is casual and not self-serving, there are spots where Gibson inadvertently or intentionally conflated or confused events and there are other spots where it is useful to have context outside his perspective. The notes also provide information on his personal life that contributes to understanding Gibson and his thought processes.

Because the book was written in the midst of a war, it does not have the benefit of hindsight to see how events unfolded. Gibson had a strong belief in the eventual Allied victory and shares his opinions—in some cases framed in conversations he supposedly had with friends and colleagues. The detail and tone of these seems contrived—more like he was inserting opinions rather than recounting a real event. But they add to the interest by showing firsthand what young men like Gibson were thinking about the war, leadership, the enemy, and their peers.

This is a fascinating account of one of the war's most daring missions written by the man most responsible for its success. Flaws are minor, and the notes that accompany this edition add tremendously to understanding Gibson and the Dambusters. This is the edition to read.

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



Thunderchief: The Complete History of the Republic F-105. By Dennis R. Jenkins. Forest Lake MN: Specialty Press, 2018. Photographs. Illustrations. Diagrams. Appendices. Notes. Pp. 300. \$60.00. ISBN: 978-1-58007-259-5

Dennis Jenkins formerly worked with NASA as an engineering contractor on the space shuttle program. Here he provides the aviation enthusiast with a comprehensive look at the evolution, development, and use of the Republic F-105, one of the century-series fighters built in the 1950s when the possible use of tactical nuclear weapons was much in vogue.

In the first chapter, Jenkins takes us through Republic Aviation's development of the USAF's first supersonic interceptor. He takes us through the reasoning behind Republic's design to meet the needs for supersonic flight and capability to carry nuclear weapons internally. This includes the "concurrency" concept. While the B-29 had been built as a complete system, later USAF programs involved separate Air Force procurement of components (airframe, avionics, engines) on separate timelines. As a result, they often did not adequately mesh as a system. Under the Cook-Craigie concurrency concept, new aircraft would go from drawing board to preproduction.

The book got really interesting starting with the third chapter, "The Real Thunderchiefs." During this phase, the D models began to be modified for a more conventional role with the block-25 aircraft coming off the assembly line. Jenkins also discusses development of the two-seat F-105F and G. Leading into the next chapter, he points out that the Air

Force reopened the D model program in early 1968 with a new block-35 series of aircraft. The service believed this was a necessity due to the high number of losses the aircraft was experiencing in Vietnam.

That follow on chapter focuses on the war in Southeast Asia. Jenkins discusses the role of the F-105s flying out of bases at Korat and Takhli in Thailand and their participation in both Rolling Thunder and the subsequent route package system. He covers the initial problems faced in dealing with MiGs and, later, the SA-2 missile system. By the end of the war, almost half of the F-105D fleet had been lost in combat operations. Those remaining were pulled out in favor of the F-4 Phantom, with the exception of the G-model Wild Weasels. Jenkins chronicles the early efforts to suppress SAMs in Iron Hand operations and others. The Wild Weasel program was very successful in reducing a major threat to USAF, USN, and USMC aircraft.

The book ends with a thorough description of the aircraft and its systems. Lastly, Jenkins provides a complete list of every serial number ordered and, finally, a complete—and sobering—list of all aircraft lost along with their crews.

Clearly the F-105 was developed during a crossroads of sorts for military aviation. Moving from aircraft that were key to the war in Korea to those who would see service during the early, and volatile, years of the Cold War and into the skies over Southeast Asia, the F-105 was constantly being modified and tested. Ultimately, however, the very nature of war in Vietnam doomed it as a combat aircraft.

This is a thoroughly researched, well-written, and beautifully illustrated work. It is also the ultimate aviation-gearhead manual for the F-105. Despite having a background in aircraft maintenance, I found it hard not to be overwhelmed by the sheer volume of technical detail that Jenkins provided. This book is not for everyone, especially the casual aviation enthusiast. Yet, it will serve as a valuable research tool for the more devout aviation lover.

MSgt Dennis Berger, USAF (Ret), Ph.D., Lubbock TX



The Zeppelin Offensive: A German Perspective Through Pictures and Postcards. By David Marks. Barnsley, UK: Pen & Sword Books, 2019. Photographs. Illustrations. Bibliography. Pp. 168. \$29.95 paperback. ISBN: 978-152673319-9

A good friend and bibliophile once described the similarity between eating and reading. He said that sometimes you have an appetite for a seven-course meal with a fine wine; and, sometimes, a tasty fresh summer salad will hit the spot. To fill your reading appetite in the first case, you might choose *War and Peace*. In the second case, I would strongly recommend *The Zeppelin Offensive*. World War One saw the first use of strategic bombing platforms against civilian populations when Germany unleashed her Zep-

pelins against England, France, and Belgium. Uniquely, the medium Marks has used to tell these Zeppelin stories are German postcards.

At the turn of the century, postcards were a mass-media tool that reached large segments of the German population. Using national characters, such as “Deutsch Michel,” and featuring rhymes and songs with satirical lyrics and German scatological humor, Marks demonstrates how postcards propagandized the use of the Zeppelin as a weapon and deified its designer, Count Ferdinand von Zeppelin. The book includes over 100 examples of these cards, with translations and analysis for each. While a paperback, the imprint uses high-quality paper that shows the cards in vivid color and high detail.

The narrative accompanying the illustrations is equally strong and includes several stories that were new to me. Especially noteworthy was the story of the “King Stephen” incident. Briefly told, Zeppelin L 19 crashed into the North Sea on 2 February 1916. The survivors found refuge amongst the wreckage, where they were found by a British fishing trawler. The trawler refused to rescue the survivors and left them to their fate. While Her Majesty’s government found no fault with the trawler crew’s action, the incident provided prime propaganda fodder for the German government and their postcard-propaganda machinery.

The story Marks tells has a low-key ending. The English developed anti-Zeppelin technologies that were effective in countering the raids. The Zeppelin heroes’ places on postcards were supplanted by heavier-than-air pilots such as the Red Baron and Hermann Göring. But the Zeppelin story lives on as a brief, but significant milestone, in the use of aircraft in war and in the historical culture of Germany. *The Zeppelin Offensive* is a story that is fresh and crisp and is told in a light, but satisfying, style that leaves the reader hungry for more.

Gary Connor, docent, Smithsonian National Air and Space Museum’s Udvar Hazy Center



Early Jet Fighters: 1944-1954. By Leo Marriott. Barnsley UK: Pen and Sword Aviation, 2019. Photographs. Bibliography. Glossary. Pp. 144. \$26.95 paperback. ISBN: 978-1-52675-393-9

The two decades encompassing the 1940s and 1950s was an extraordinary period in aircraft design and production. Designers perfected piston engine aircraft to wring every ounce of performance from proven platforms and engines while simultaneously shifting to jet and rocket propulsion systems and new airframes. While Marriott titled his book *Early Jet Fighters: 1944-1954*, the period he covers is really the early 1940s to the late 1950s. This book specifically addresses jet aircraft programs in the Soviet Union, France, Germany, and Sweden. It also briefly touches on Italy, Ar-

gentina, Switzerland, and The Netherlands. An earlier book covered Great Britain and the United States.

Marriott’s thesis is clear: European jet aircraft design of this period depended on British engines and German aerodynamic advancements. The entire Soviet post-war jet aircraft program was built on the 1946 decision of Britain’s socialist government to sell Rolls-Royce Nene and Derwent engines and design data to the USSR. This technology transfer bought 10 years for the Soviets to develop their own engines while fielding such iconic designs as the MiG-15/17 and Yak-15/17/23. German jet engines were relatively plentiful in the immediate postwar period; and, when paired with unemployed German designers and engineers, these engines provided immediate power sources to many designs. But the German engines lacked the reliability of the British engines. Equally as important as engine development, German research into swept and delta wings encouraged designers to move immediately into more efficient aerodynamic platforms.

Marriott does offer the occasional nugget of new information. Much of the unique information involves French post-war programs. While it is well known that the French aviation industry quickly converted to building German aircraft during the occupation, Marriott shows the French operated a shadow design program unknown to the occupiers. Once liberated, the French had a catalogue of designs combining proven German concepts and their own innovations. For example, the SNCASE S.E. 5000 Baroudeur married the Me 163’s detachable take-off trolley to a conventional swept-wing attack aircraft. Unlike the Komet, the Baroudeur could take off and land with the trolley attached or release it. The Baroudeur could also take off and land on some surfaces using three skids on the bottom of the fuselage.

There is little “new” information in this book; but it is clearly written, profusely illustrated, and well organized and can serve as a solid introduction to the subject.

Gary Connor / Docent / Smithsonian National Air and Space Museum – Udvar Hazy Center



The Dawn of the Drone: From the Back-Room Boys of World War One. By Steve Mills. Philadelphia PA: Casemate, 2019. Maps. Diagrams. Illustrations. Photographs. Notes. Appendices. Bibliography. Index. Pp vi, 297. \$34.95. ISBN: 978-1-61200-789-2.

Steve Mills, a former aerospace engineer involved with the Brooklands (UK) Museum since his retirement, has coupled his passion for technology with an exhaustive examination of weapons innovation before and during World War I. Along the way, he introduces the reader to long-forgotten personalities who helped develop the aerial torpedo (AT), the world’s first successful unmanned aerial vehicle.

One of the motivators for his exhaustive research was

the discovery of numerous artifacts, along with supporting documents, stored in London's Imperial War Museum (IWM). In the 1950s, the IWM temporarily displayed the devices that made the first drone controllable. Archibald Montgomery Lowe, the inventor of the control system, assisted the IWM in presenting the story. Like the "tank," the term "aerial torpedo" was a deception effort. The aerial torpedo actually was an unmanned airplane intended to ram and destroy German Zeppelin airships attacking England. As it turned out, the AT flew only once. However, the remote-control technology was later used on the Royal Navy's coastal motor boats known as distance control boats.

The story unfolds somewhat like a ship without a compass, bouncing from one topic to another with little or no transition. It covers an amazing array of subjects and personalities. Included is a cursory history of the Royal Flying Corps and its founding fathers. Lowe, who publicly demonstrated in 1914 a means to transmit and receive images using a device he labeled "televista," receives the most attention. But several chapters deal with other individuals with virtually no mention whatsoever of this amazing inventor. In the end, the book effectively becomes the life and times of Lowe, with an extensive supporting cast.

As it turned out, the AT was overtaken by events—primarily, development of the incendiary bullet. Mills ends up devoting only about one third of the book to the AT.

The absence of transition and context in some instances made me feel like the information would have been easier to absorb in an encyclopedic format rather than a straight narrative. Mills also sets off on tangents such as repeating the frequent misunderstanding of the United States' failure to introduce any domestically designed aircraft into combat during World War I. While this was true of the US Army Air Service, Curtiss sold nearly 150 H-class flying boats to the Royal Naval Air Service. Some readers may also find his chiding of the Wright brothers' refusal to stage public flights between 1903 and 1908 unnecessary. In full public view at a field near their Dayton, Ohio, home, the duo conducted a series of tests flights in 1905 that culminated in the final one lasting 39 minutes and covering 24 miles in a series of circuits or laps.

Nevertheless, readers curious about some of the technical innovation in Great Britain during World War I will be rewarded by Mills' incredible research, particularly with regard to patents.

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



The Great Escape from Stalag Luft III: The Memoir of Jens Müller. By Jens Müller. Annapolis MD: Naval Institute Press, 2019. Maps. Photographs. Diagrams. Pp. 145. ISBN 978-1-78438-430-2

The Stalag Luft III POW camp at Sagan, Poland, scene of the Great Escape and the subsequent tragic murder of fifty recaptured officers, has captured popular imagination since the end of World War II. It has spawned a library of works, starting in 1950 with Sagan veteran Paul Brickhill's *The Great Escape*. This latest addition was written by one of the three successful escapees of the 78 who tunneled out on the night of 24 March 1944. It first appeared in 1946 in Müller's native Norway. It has taken three quarters of a century for the English translation to appear, but the wait has been well worth it.

Studying in Switzerland when the war started, Jens Müller made his way to England via a ship from Marseilles when the Nazis invaded Norway. There he enlisted in the RAF and was trained in Canada. A motorcycle racer before the war, he was mechanically minded, independent, and fearless, the perfect makings for a fighter pilot. Flying a Spitfire on a strafing mission on 19 June 1942, he was shot down off the Belgian coast. Clambering into his dinghy, Müller coolly calculated his position, optimistically planned a course to friendly shores, and rowed for three days against strong currents.

Apprehended promptly upon making his way ashore in Belgium, the enemy subjected him to the familiar interrogations and searches, followed by a railroad trip under the scrutiny of pistol-gripping guards. Not all was work, however. Midway to Germany, Müller and his erstwhile companions stopped for an outdoor lunch and an afternoon of convivial conversation with enemy fighter pilots—a genteel Luftwaffe tradition—yards from Fw 190s ready to scramble. Hospitality notwithstanding, after the obligatory sojourn at the Dulag Luft interrogation center, Müller was lodged in Stalag Luft III. Questioned closely by his peers upon arrival to be sure he was not an enemy plant, Müller soon blended into the POW hierarchy.

A seasoned combatant, Müller reflects on his often hair-raising experiences in a matter-of-fact, almost laconic manner. Students of Stalag Luft III will recognize the camp routine: regular headcounts, perimeter "warning wire," evening lockup, and searchlights probing the night. Soon the POW escape organization gained enough trust in Müller to tell him of their effort to dig three tunnels. Shortly he was building and maintaining the air pumps that enabled tunnelers to breathe while digging. Others dispersed sand dug from the tunnels, fashioned disguises, and forged identity cards and passes. Further details may be found in Jonathan F Vance and Simon Pearson's *The True Story of the Great Escape* (2019), Alan Burgess, *The Longest Tunnel* (1990), and Tim Carroll, *The Great Escape from Stalag Luft III* (2005).

Müller's labors earned him a place on the mass breakout lineup. He effectively relates the tension of that night—the waiting, the claustrophobic tunnel, the exit behind the sentry's back, and relief at the initial getaway. Müller and his traveling partner, Pete Bergsland, successfully navigated their way to the port of Stettin, surviving numerous checks of false papers.

Müller and Bergsland planned to contact merchant sailors on shore leave at a location provided by the escape committee, hoping to be smuggled aboard a ship to Sweden. Once well underway, they would give themselves up to the captain. They finally succeeded in stowing away after a false start or two. They survived both a pre-departure search by enemy soldiers and the possibility that the captain would simply turn them over to the authorities. Once in Sweden, they reported to the British consulate. The narrative ends with his return to England.

Besides Müller and Bergsland, the only other man successful in the escape was Bram Van der Stok, who related his epic four-month journey across western Europe to Gibraltar in his memoirs, *The True Story of My Successful Great Escape* (1980). As time went on, personal accounts appeared from numerous survivors on both sides, including the camp Commandant Colonel von Lindeiner, *From Commandant to Captive* (2015).

Maps detail where the camp was located and show the routes of the three successful escapees. Diagrams detail the barracks, camp layout, and tunnel locations. Readers familiar with Sagan accounts will recognize many of the photos, including those of the guard towers that have come to symbolize the World War II POW experience. Readers whose curiosity Müller has piqued will recognize many places and people in Charles Messenger's photo essay *Stalag Luft III* (2019). Similarly, Walton and Eberhardt's massive compilation of photos and stories, *From Interrogation to Liberation: A Photographic Journey Stalag Luft III* (2014) provides an anecdotal eyewitness account of the rank-and-file POW experience.

Müller's son intended that this reissue of his father's memoir serve as a permanent memorial to his wartime experiences. Bound in cloth, the book is printed on archival quality acid-free paper. This volume is a welcome addition to the extensive body of works on the World War II POW experience and is recommended reading.

Steven Agoratus, Hamilton NJ



The Burma Air Campaign 1941-1945. By Michael Pearson. Havertown PA: Pen & Sword, 2019. Maps. Photographs. Notes. Appendices. Index. Pp xvii, 194. \$22.95 paperback. ISBN: 978-152674380-0

Pearson's lifelong interest in maritime history and a career in shipping served him well in researching and writing this work, first published in 2006 and recently reprinted.

All aspects of the air war are discussed from the point of view of both sides: the Allies and the Imperial Japanese Army. As is usually the case in works written in English, the emphasis is on the Allies, particularly the British, and especially the Royal Air Force.

For much of World War II, the Allied high command con-

sidered Burma a tertiary theater at best with resources allocated on a very limited basis. As the Allied situation in the Mediterranean improved in 1943, assets were increasingly transferred to what the United States referred to as the China-Burma-India Theater. From a geopolitical standpoint, British Prime Minister Winston Churchill and US President Franklin Roosevelt held very different views concerning the theater's priorities. Churchill aimed to prevent the fall of India and regain control of the resource-rich Malay peninsula. Roosevelt, on the other hand, focused US policy on supporting Chinese Generalissimo Chiang Kai-Shek's battle with the Japanese.

The Allied high command eventually agreed that both the British objectives and the American approach justified the creation of an effective coalition, ultimately commanded by Admiral Lord Louis Mountbatten. In the campaign's early years, American air assets concentrated on China, so the RAF dominated operations in Burma. By the end of the war, however, both air forces had committed about the same number of squadrons.

What makes the air campaign in Burma unique is the importance of air transport and supply. Pearson rightfully credits Lieutenant General William Slim—perhaps the Allies' best ground commander of the entire war—with recognizing how air supply would be the force multiplier that would ultimately defeat the Japanese. Local air superiority (initially achieved by Supermarine Spitfires) and later air supremacy (thanks to Lockheed P-38 Lightnings and North American P-51 Mustangs) preceded an extensive interdiction effort conducted by both British and American bombers and fighter-bombers. Aerial reconnaissance, forward air controllers, and aerial evacuation of wounded all played critical roles in the campaign's success.

This concise history is highly recommended for anyone interested in the impact of an integrated air campaign and the challenges of coalition warfare. It certainly should be considered as required reading for Air University students. Because there are so many dimensions to the application of air power in a relatively well-defined geographic area, the Burma air campaign is worthy of further research and discussion. It also could provide the basis for a training simulation on how to manage an air war.

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



Images of War; The Normandy Air War 1944. By Anthony Tucker-Jones: Pen & Sword Military, 2019. Photographs. Pp.132. \$22.95 paperback. ISBN: 978-1-52673-005-3

Anthony Tucker-Jones is a well-published author of military history books and articles, has a 20-year background in defense intelligence as an analyst and defense

subject-matter expert, and is relied on by major media outlets for his expertise.

This book is a must read for any World War II air-warfare enthusiast. *The Normandy Air War* appears to be Tucker-Jones first book focused on Second World War air warfare. His past books primarily dealt with tank warfare in World War II, modern warfare, and terrorism. Given the book's title, I was expecting it to be filled with never-before-published photography of air warfare. To my delight, however, the book was equally filled with the details of both Allied and Axis air-warfare strategies, the key actors, and air units and their aviation composition going back well before the Normandy Invasion—back to the inception of the Pointblank directive (the document that authorized the primary portion of the Allied Combined Bomber Offensive intending to eliminate the Luftwaffe's fighter capability).

When thinking of the Normandy invasion, one typically pictures the ground campaign most often reminiscent of the movie *The Longest Day*—the two lone Luftwaffe aircraft attacking the beach but, otherwise, absent any focus on air warfare. Tucker-Jones' attention to detail of the Pointblank directive and Operation Overlord completes the picture of how aviation paved the way to the invasion, achieving superiority over the Luftwaffe as early as 1943. Pointblank operations supported the Operation Overlord ground war in June 1944—slowing the Germans from advancing reinforcements, while Allied troops solidified their hold on the beaches of Normandy.

While most people recognize the most notable fighter aircraft of World War II (for example, the Spitfire, Mustang, and B-17 bomber), this book provides a great review of the many other combat and support aircraft (both Allied and Axis) including their strengths and weaknesses, how they were employed, and the changing tactics as the war evolved. Many other examples could be given about the people and the planes, but then you would miss how Tucker-Jones stitches together this tapestry within the overall context of the air war.

Most of the rare photographs presented are from wartime archives in context with the written history—many were new to me. For any aircraft model enthusiasts, the photos provide a rich source of insignia and squadron liveries for reference.

This soft-bound book is very reasonably priced and compact. It is full of historical facts and a great addition to one's Second World War historical reference library.

Mr. Michael B. Deitchman, USN SES (Ret), National Air & Space Museum docent



Fire-Step to Fokker Fodder: From the Trenches to the Red Baron: The First World War Diaries of William "Jack" Lidsey. By Andrew White. Stotfold UK: Fighting High, 2019. Maps. Photographs. Notes. Index. Pp.

vii, 190. \$34.95. ISBN: 978-1-9998128-7-4

This book recounts the journey of one young Englishman from public school, through the trenches of the Somme, to the bloody skies above that dismal battlefield. It is built around the diaries of Jack Lidsey and covers his service as an infantryman and Royal Flying Corps (RFC) observer, ending just before his death at the hands of the Red Baron. His timing could not have been worse; he volunteered for the RFC in the months just prior to Bloody April 1917, the period of the RFC's greatest losses of the entire war. It was his great misfortune to become von Richthofen's 29th victim (KIA in a B.E.2e on 21 March 1917).

White is a military man versus a trained historian and wrote Lidsey's story because of their shared school history. As a boy, he had been intrigued by the four large wooden crosses on his school's chapel wall, original grave markers of the four alumni lost in World War 1. After many years, he decided to write this book. It is hard for Americans to understand the place the Great War has in British history and the British psyche. On the first day of the Somme (a battle Jack Lidsey survived), the British had 57,470 casualties—19,240 dead. So the memory of those events and the people who fought is immediate, even 100 years on.

The diaries are a framework around which White builds the story. Rather than quote long passages, he instead uses them to develop the story he tells as the narrator. Lidsey didn't begin his diary until he left for France; so the first two chapters draw on letters, school records, and the regimental history to provide background for his early life and military career. The next six chapters cover Lidsey's experiences through a year and a half of combat in some of the worst conditions imaginable. Lidsey was not terribly graphic in describing his experiences; but, in a matter-of-fact way, he still conveyed images so vivid it's no wonder he opted for an uncertain future in the sky.

The last four chapters cover Lidsey's service as an observer in the RFC. The dairies don't provide much of his thought process, but the conditions on the ground were horrific enough to drive anyone to seek other options. White does a good job of discussing the transfer process. A curious element of this to an American is the concept of being accepted as a gentleman before his transfer was approved. Lidsey was vetted by his commander and an RFC colonel (he was only a lance corporal at the time) on his family background, schools attended, and prospects. Despite the terrible losses the British officer corps was suffering, they still attempted to maintain some traditional class distinction. Men like Lidsey were accorded "temporary gentleman" status that allowed those from the ranks to move into roles normally reserved for those higher on the social scale. After initial acceptance, these men were given a trial period after which, if they performed well (and survived), they became officers. When later mustered out, they lost their privileged status and were expected to return to their prewar circumstances.

This story compares favorably to other histories and memoirs covering the RFC during the same time period—a service flying obsolete equipment, usually with minimal training, against well-trained and equipped adversaries. The aircrews willingly risked their lives in spite of the odds. The tables eventually turned, but not before many men died. The book is well written and provides an interesting glimpse into a side of the British military (Great War transition from enlisted to officer) seldom seen. There are excellent maps (both modern and contemporary) with modern photos of many of the battlegrounds Lidsey fought over as an infantryman.

For anyone interested in World War 1; the RFC; and, particularly, the fighting man's perspective, this is a very good book. I would also recommend the memoirs *Horses Don't Fly* by Frederick Libby, *Open Cockpit and No Parachute* by Arthur Gould Lee, and *Lionel Morris and the Red Baron: Air War on the Somme* by Jill Bush.

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



Hot Spot of Invention: Charles Stark Draper, MIT and the Development of Inertial Guidance and Navigation. By Thomas Wildenberg. Annapolis MD: US Naval Institute Press, 2019. Maps. Tables. Photographs. Notes. Sources. Appendices. Glossary. Index. Pg. 351. \$48.00 ISBN: 978-168247469-3

This book is both a biography of Draper and a history of what we know today as the Charles Stark Draper Laboratory. Wildenberg shows that their stories are indivisible.

Draper is often referred to as “The Father of Inertial Navigation.” He was not only a scientist, but also an engineer, inventor, teacher, and leader. This is well demonstrated in this book through numerous examples.

His pre-war work with Jimmy Doolittle to create instruments for weather flying evolved into gyroscopically-controlled gunsights. When one sees World War II pictures of US ships using their anti-aircraft weapons to protect the ship, their effectiveness (close to 80%) against attackers was because they were equipped with these sights.

He tested his early inertial navigation system on a trans-continental flight. On 8 February 1953, in a B-29 owned by MIT, he and his team proved one could fly across America relying solely on an inertial navigation system. After 2590 flight miles with no control input by the pilots, the aircraft was only 10 miles off course.

He and his teams developed inertial navigation systems for both missiles—both land (Atlas and Thor) and sea based (Polaris, Poseidon, and Trident for submarines)—and aircraft.

His team developed computers for Apollo's Lunar Modules.

He and his students made an impact on the first US space-based reconnaissance satellites, the Corona series.

In 1950, he was asked to leverage his experience in radar-directed and air-to-air gunnery to help design the first US air-defense system, the Semi-Automatic Ground Environment System, better known as SAGE. Throughout his life, Draper was called upon at the national level to be on committees working on national defense issues.

The book is more than just a recap of the development of inertial navigation or a history of the man behind what we know today as Draper Laboratory. Draper not only founded and ran the institution which brought inertial navigation to fruition for use in a wide variety of vehicles, but he also helped make MIT into one of the nation's leading centers for government research. The book also shows that success often brings change, in this case the eventual divestiture of the lab from MIT. This is a chronological accounting of the evolution of MIT's Instrumentation Laboratory and its contributions to our country. It is also a testimonial to a man who knew how to lead and how to get people to follow him towards achievement of a common objective.

Hot Spot of Invention is a superb study of an engineer and leader; I couldn't put the book down. It captures the spirit of engineering from the 1930s through the 1970s while focusing on one of the period's most influential practitioners. It was a fascinating read.

Joseph D. Yount, USAF (Ret) and National Air and Space Museum docent



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:

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Coming Up



Compiled by
George W. Cully

January 11-15, 2021

The **American Institute of Aeronautics and Astronautics** will offer its annual Science and Technology Forum and Exhibition in virtual form. This event is the world's largest presentation of current aerospace research, development, and technology. For details, see the Institute's website at <https://www.aiaa.org/events-learning/events>.

February 24-26, 2021

The **Air Force Association** will host its annual Air Warfare Symposium at the Rosen Shingle Creek Hotel in Orlando, Florida. For more information, see the Association's website at www.afa.org/events.

March 4-6, 2021

The **National Museum of World War II** will present its latest annual Conference on WWII at the museum in New Orleans, Louisiana. This event had been previously scheduled for the fall of 2020, but was reset in response to COVID-19. For registration and other details, see the Museum's website at <https://www.nationalww2museum.org/programs/international-conference-world-war-ii>.

March 18-21, 2021

The **Society for Military History** will hold its 87th annual meeting in Norfolk, Virginia. This year's theme will be "Turning the Tide: Revolutionary Moments in Military History." For additional details as they become available, see the Society's website at <https://www.smh-hq.org/smh2021/index.html>.

March 24-27, 2021

The **National Council on Public History** will host its annual meeting at the Hilton Salt Lake City Center in Salt Lake City, Utah. This year's theme will be "The Presence and Persistence of Stories." For details, see the Council's website at <https://ncph.org/conference/2021-annual-meeting/>.

April 15-18, 2021

The **Organization of American Historians** will hold its annual meeting and conference at the Sheraton Grand Hotel in Chicago, Illinois. The theme of this year's gathering will be "Pathways to Democracy." For further information, see their website at <https://www.oah.org/meetings-events/oah21/>.

April 21-23, 2021

The **Army Aviation Association of America** will host its annual Mission Solutions Summit at the Gaylord Opryland Hotel and Convention Center in Nashville, Tennessee. For more details as they become available, see the Association's website at <https://s15.a2zinc.net/clients/aaaa/aaaa21/Public/Enter.aspx>.

July 7-10, 2021

The **International Womens Pilot Association**, better known as **The Ninety-Nines**, will hold their annual meeting on board the SS Queen Mary moored in the harbor of Long Beach, California. For registration, see their website at <https://travelplannerstexas.swoogo.com/99s2021/333555>.

August 23-26, 2021

The **Space Foundation** will host its 36th annual Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. For registration and other details, see the Foundation's website at <https://www.spacesymposium.org/>.

September 18-21, 2021

The **Air Force Association** will host its annual convention at the Gaylord Convention Center in National Harbor, Maryland. This will be immediately followed by the Association's annual Air, Space & Cyber Conference at the same site. For more details as they become available, see the Association's website at <https://www.afa.org/events>.

October 5-6, 2021

The **Aviation Engine Historical Society** will conduct its annual gathering at the Hilton Doubletree Hotel in Dearborn, Michigan. Expected site visits include the Henry Ford Museum, Greenfield Village, Automotive Hall of Fame and the Yankee Air Museum. For further information as it becomes available, see the Society's website at <http://www.enginehistory.org/>.

In light of the coronavirus pandemic, the events listed here may not happen on the dates listed here, or at all. Be sure to check the schedules listed on the individual organization's web sites for the latest information.

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

History Mystery Answer



Jimmy Doolittle (1896-1993) was born in Alameda California. He began his studies at only to enlist in the Army during World War I. He would become a pilot and serve as an instructor. His numerous requests to be transferred to a combat unit were all denied. He would become a test pilot and record breaker. In 1922, he would be the first person to complete a transcontinental flight across North America in less than 24 hours. Jimmy Doolittle set an air speed record during his winning of the 1925 Schneider Cup Competition. He holds the distinction of being the first person to flight “blind” when in 1929 he flew a Consolidated PY-2 using only instruments. He took off, flew a set course and landed without the benefit of seeing outside the cockpit. He flew the entire flight underneath a canvas hood. After leaving the active military during the interwar years, he would work for Shell Oil where he convinced the oil industry to develop and produce high-octane aviation fuel.

At the start of World War II, he led the high-risk mission to fly B-25 bombers off of the *U.S.S. Hornet* to bomb Japan. Aviators involved in the mission are known as “Doolittle’s Raiders.” For this mission, President Roosevelt presented him with the Congressional Medal Honor. During World War

II he would command both the 15th and 8th Air Forces. He holds the distinction of being one of the few airmen present on board the *U.S.S. Missouri* to witness the Japanese surrender. In 1985, President Ronald Reagan promoted Jimmy Doolittle to the rank of four-star General. In 1993, Jimmy Doolittle passed away at the age of ninety-six.

To learn more about:

Jimmy Doolittle biography: <https://media.defense.gov/2010/Oct/28/2001329735/-1/-1/0/The%20Air%20Force%20Warrior-Scholar.pdf>

“Jimmy Doolittle: An Appreciation,” *Air Power History*. Vol. 40, No. 4, winter, 1993. The entire issue of seven articles is dedicated to James Doolittle. <https://www.jstor.org/stable/i26279312>

The Doolittle Raiders: www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196211/doolittle-raid/

Explaining the images on the questions page: When Jimmy Doolittle set his transcontinental flight record he was flying a DH-4B. For the bombing raid on Japan, he was awarded the Army’s Medal of Honor, because a separate Air Force had not been established yet.

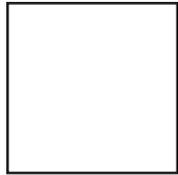


This issue's quiz:

This record setting aviator was a pioneer, test pilot, combat proven leader, and record setter. He served during World War I as a flight and gunnery instructor. Not just a good stick, he holds degrees from both the University of California and advanced degrees from MIT. During the interwar years he convinced the American petroleum industry to invest in the production of high-octane aviation fuel. This would later provide American and allied pilots a performance advantage over their enemies who used lower-octane aviation fuel. During World War II, he commanded two numbered Air Forces rising to the rank of Lieutenant General. Over two decades after he retired from the Air Force Reserves he was promoted to the rank of four-star general. Can you name this airman?



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