

AIR POWER

SUMMER 2017 - Volume 64, Number 2
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History

know the past

.....*Shape the Future*





The Air Force *Historical* Foundation

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

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

The Foundation’s four primary activities include a quarterly journal *Air Power History*, a book program, a biennial symposium, and an awards program.

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All members receive our exciting and informative *Air Power History Journal*, either electronically or on paper, covering all aspects of aerospace history

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Preserve the legacy, stay connected:

- Membership helps preserve the legacy of current and future US air force personnel.
- Provides reliable and accurate accounts of historical events.
- Establish connections between generations.



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This issue's theme, other than interesting articles on little-known part of our air power history, is to highlight the on-going USAF commemorations, the Fiftieth of the Vietnam War, and the one hundredth of U.S. entry into World War I.

Our first article is by William Cahill. It is a substantial article on a fascinating World War II topic, that of radio countermeasures against the Japanese in the Southwest Pacific Area.

Our second article is by Daniel Haulman, and covers the process by which the Air Force disestablished several historic commands, Strategic Air Command, Tactical Air Command, and Military Airlift Command, among others, and brought them back to life. Good coverage on the process by which the Air Force tries to maintain its organizational continuity.

Our third article, highlights the conflict in southeast Asia, in this case, rescue operations in 1972. Darrel Whitcomb, our resident expert in all things rescue-oriented, has compiled a fine record of the services' rescue efforts.

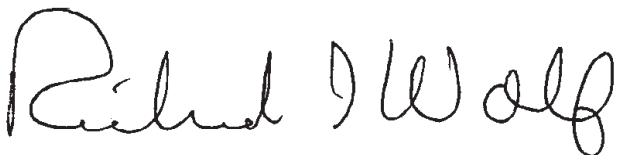
The fourth and final article is a rearrangement of an earlier contribution by Juliette Hennessy, aimed at noting the commemoration of the U.S. entry into World War I, and how it really began before the formal declaration of war.

Once more, we would love to have more of you send in contributions for articles. We can really use more in the way of scholarly pieces, but we also enjoy interesting and less foot-noted articles and memoirs that illustrate history for our readers. If you have a submission, send it forward, please.

Also, a second reminder, we would love to expand our group of reviewers as well, since we find it increasingly focused on a small circle of people. We want to broaden the appeal, and get more of you involved in your magazine.

Of course, we have our customary batch of book reviews once again. We have twelve this time, starting on page 56. We also continue to list upcoming events of an historical nature starting on page 65, reunion happenings on page 66, and we finish up with our New History Mystery on page 68. We hope you enjoy this fascinating issue.

Please go read the Editor's Note on page 66, a completing word on the career of Gen. William Y. Smith, previously our Foundation President, who passed away last year. Lastly, don't pass by the current President's Message on page 4 and the incoming president's first missive on page 5. It's very important. Don't race by them in your haste to peruse the articles.



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Dear Foundation Members and Friends:

In some respects it seems like yesterday that I assumed this position from Lt Gen Mike Nelson. Our bylaws rightly call for term limits on serving on our Board of Directors. I have now reached that time limit and must step aside.

Not to wax nostalgic, but I believe that we benefit from an examination of where we've been in order to have context, not only for where we find ourselves in today's environment, but where we need to go in the future to remain relevant to our *air power* community.

The economic environment of eight years ago, and the simultaneous loss of the Air Force contract to purchase 3,800 copies of *Air Power History*, dealt us a serious financial blow. The Foundation immediately went into a cost-cutting mode; while successful, it was not enough to stem the tide. Little by little, we began to erode our available funds. By 2014 we began to look at the possibility of shutting the Foundation down, developing a plan called "2017 or Bust." In perspective, this was the same dire situation that our Foundation found itself in the early 70s and late 80s and 90s. As in previous times, our membership came to the rescue. In particular, one of our long-time, lifetime members bequeathed to us a large sum, which we subsequently invested into a portfolio to sustain us for the foreseeable future.

Despite this changing environment, we pressed on with our mission of educating the public of the contributions of *air power* to our Nation's defense. We strengthened our awards program by establishing the Doolittle Award, which ties an existing U.S. Air Force unit with its own history and that of the greater *air power* community. This year we will name our sixth recipient. We addressed stewardship issues to promote better governance. Recognizing the need to shorten the learning curve for new board members and make them immediately effective, we produced a board member handbook. This handbook proved to be a good recruiting tool as well.

We were successful in maintaining the reputation of the Foundation, principally by continuing the regular publication of our highly-regarded *Air Power History*. We also conducted three symposia that were well received, and returned to the book publishing arena with Hap Arnold and the Evolution of American Airpower by Dik Daso of our Board. The selections for our annual Spaatz and Holley and many other awards routinely drew wide acclaim.

In late 2013-early 2014 we began to make use of bulk emailing and social media to promote our message. This has been very successful, as we now enjoy 1,250 Twitter followers and are reaching thousands daily via Facebook. The daily "This Day in Air Force History" email list stays constant with an audience of about 500, including many influential leaders and serious historians. In 2017, we completely revamped our website make better use of modern communication techniques and imagery. And, very importantly, the website is now under our complete control to manage as required.

I believe that I hand our Foundation over to my successor in sound shape, ready to explore new avenues in fulfilling our mission. Our organization exists and thrives due to the vitality of our membership. Thanks for letting me play a role in this endeavor. A special note of appreciation to Angela Bear, Jim Vertenten, and the Board of Directors. I know that you will all support my successor as you have me. Thank you for the opportunity, your friendship, and passion for *air power history*!



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



Dear members and friends of the Foundation:

As we start our 63rd fiscal year of operation, it is a profound privilege for me to “take the stick” of this distinguished organization. All of us owe a great deal of gratitude to our departing President and Chairman, Dale Meyerrose. General Meyerrose served throughout his long tenure with energy, vision and dedication—and he made a real and lasting difference in the viability of the Air Force Historical Foundation, putting us on a substantive and financial footing that will sustain AFHF’s fundamentals into the indefinite future. Having served on the Board for the last three years, I am very familiar with our operation and status; and while still in uniform, I was fortunate to be mentored by previous AFHF presidents General Bryce Poe and Lt Gen Mike Nelson. Inspired by them and by the confidence your Board has placed in me, I commit to honoring the tradition of all of my distinguished predecessors in serving our membership and air power community to the best of my ability.



We are pleased to welcome three new and very talented individuals to our Board of Directors. They bring distinguished records of accomplishment, and we look forward to great contributions to our Foundation from retired Lt Gen Chuck Heflebower, retired Maj Gen “TC” Jones, and retired Colonel Chris Brunner. This year’s slate of new directors, as recently elected by the membership, included a second term for our Treasurer, retired Colonel Tom Owens and myself.

Your entire board is united in their intent that our Foundation be a strong, independent voice within the air power community, filling a special role of promoting the legacy of Airmen, and educating future generations to understand the monumental footsteps of those who “soared before.” We must continue to place high emphasis on quality research and writing of history—what really happened, why it happened, and the people and machines who wrote the record. AFHF has done, and will continue to do, just that.

Just as importantly, we must recognize that the *history* of air power is a powerful *heritage* indeed, even more so when it is shared widely and well. Those of us who are members and friends of the Foundation have taken on a special role in passing the torch of air power to the young men and women who are today engaged in making the history that future generations will write about. Increasingly, we are confronted by military history that includes air power in its largest sense—air, space and cyber operations in defense of our nation. The wide-ranging narratives that emerge are important and all are worthy subjects for air power historians to document and share. Our Foundation’s motto is “Know the Past...Shape the Future.” You can expect that I will fully honor the first part of our motto, and energetically pursue the second.

I echo Dale Meyerrose’s cautions over the years: we need to be realistic. This remains a tough economic environment for non-profits like ours. That’s why your continued support is needed now as much as ever. Invite a friend or colleague to join and share in helping our Foundation remain a strong, viable voice within our *air power* community.

As always, let me thank you for the part each of you has played in the history and legacy of *air power* across the decades, and for your generous contributions to the Foundation. Without your support we could not accomplish our mission—and our mission remains important. We are deeply grateful—and welcome your feedback any time.

Respectfully,

Christopher D. Miller, Lt Gen, USAF (Ret)
President and Chairman of the Board

State of the Air Force Historical Foundation

May 2017

Dear Members,

This past year we humbly believe was a good one. The Foundation built on its recently received bequest, investing it appropriately to achieve a return to date of approximately 10%. This is well above our projections due to a surge in stock prices. We hope that this endowment will grow to the point that its annual return might be used as needed to cover operating expenses. At any rate, the financial security of the Foundation has been established for many years to come.

Awards

Contrary to our previous experience, the Foundation split up its awards presentation process into multiple events. The Doolittle Award was presented in our usual fall time-frame, with the 100th Air Refueling Wing as the recipient. Vice Chief of Staff General Stephen “Seve” Wilson made the presentation, and a goodly number of 100th veterans were in attendance.

In November, the Foundation traveled to the Air Force Academy for the presentation of our Spaatz Award to former Secretary of the Air Force Donald Rice. This was our first “outside the beltway” event in a good many years. The setting was spectacular, and the dinner and festivities were enjoyed by all. This success insures there will no doubt be more events of this type “on the road” in our future.

In January at the Ft Myer Officer Club we presented our Holley Award to Dr. Mark Clodfelter of the National War College staff, a man who has spent his life writing the history of the United States Air Force. We were graced by the Chief of Staff David Goldfein acting as our presenting official. The Foundation presented him a picture of P-38 “White 33” on behalf of the National Museum of World War II Aviation. The artwork will hang in the Chief’s office through his tenure and beyond.

The success of these events has emboldened our Board to sustain this diversity going forward. We intend to increase our visibility via these, and at other award presentation venues.

Website

The other major initiative this year was to improve our dated website. After a search for capable companies to conduct this, we chose Appnet to complete the process. As this is being written, this process is complete save the full upgrade of our digital archive of *Air Power History* issues. We hope that will be completed shortly.

Financial Report

If this portion of the report seems like a repeat of earlier years, this is due to our conditions remaining largely unchanged. While our newly established investment portfolio provides us the ability to survive far in the foreseeable future, it is not yet in position to defray significant portions of our operating expenses. We have done much in the past several years to reduce costs and undertake initiatives to increase revenues. Further, the concurrent defense industry belt tightening in the current economic environment could not have come at a worse time for our sponsorship efforts. We currently run at a loss, which we have been covering by the income generated from our investment revenues and reducing the size of the principal.

Here is where we stand with only one month to go in our fiscal year:

This might look better than it really is, as we had a \$34,000 donation this year that we do not expect to have next year. Obviously, we do not want to continue drawing from our investments to cover expenses. Hence, we must continue to enhance our appeal to potential members and sponsors; and increase services for our membership. The bottom line: we need to develop programs to increase membership, stimulate contributions from sponsors, and keep our Air Force relationship relevant for today's airmen, as well as help inspire those of the future.

Looking to the Future

Those of you who are familiar with our organization probably know that we have struggled to survive—almost since our inception. This is no longer the case. Our long-term existence is no longer in doubt—and we will remain an integral part of the *air power* landscape. However, our newly established solvency merely gives us the “runway” to grow into the organization as envisioned by my predecessors as leaders of this organization, which included Spaatz, Vandenberg, Foulois, and LeMay.

Our message is that AFHF will remain a strong, independent voice within our *air power* community, filling a special role of promoting the legacy of airmen, and educating future generations to aspire to follow in the monumental footsteps of those who “soared before.” Your Board of Directors is committed that our Foundation will remain a viable, dynamic organization worthy of your investment and support.

End of Tour

As I conclude my eight-year tour as your president and chairman, I am pleased with the progress we have made. Among them:

Secured resources to insure a long future

Upgraded our awards program to include the Doolittle Award, which ties us much closer to the active force

Strengthened recognition of the Foundation by the continued excellence of Air Power History and our quality awards program, an expansion of social network communication, and an upgraded website

Improved our stewardship via changes to bylaws, developing a board members handbook, and greater financial oversight

Summary

We realize that many worthy causes continually beseech each of us for support. We would hope that in light of our now-bright future, that we might find a place somewhere on your personal priority list of further support, giving, or bequeathing. With the next level of support, we intend to prove even more worthy of increased appeal by expanding our services, outreach, and value to our *air power* community.

As always, let me thank you for the part each of you has played in the history and legacy of *air power* across the decades, and for your generous contributions to the Foundation. Without your support we could not survive. We are deeply grateful—and this annual report is respectfully submitted for your review and feedback as you deem appropriate. Respectfully submitted.

Dale Meyerrose
Major General, USAF, Retired
President and Chairman of the Board

Annual Membership Meeting and Luncheon

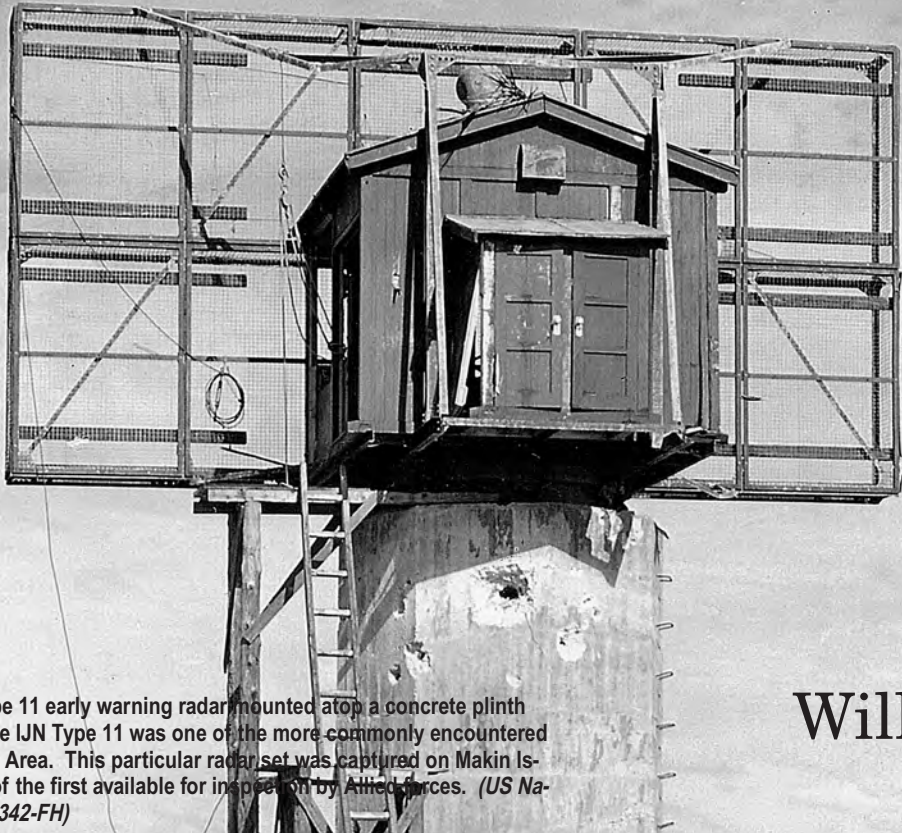
The Annual Membership Meeting was held on Thursday, May 4, 2017, 10:45 AM, at Army Navy Country Club, Arlington, VA 22202, followed by a luncheon. As part of our Oral History initiative, we were thoroughly entertained by Mr. Marlyn Bonacker, (right) World War II tail gunner. He related his very interesting personal history regarding a catastrophic incident in B-17, followed by his capture and subsequent escape from a POW camp. General Frank Gorenc, USAF (Ret) introduced Mr. Bonacker.

At the annual meeting a new slate of board members was elected or re-elected:

Charles R. Heflebower, Lt Gen, USAF (Ret)
Timothy C. Jones, Maj Gen, USAF (Ret)
Christopher J. Brunner, Col, USAF (Ret)
Christopher D. Miller, Lt Gen, USAF (Ret) – Re-election
Thomas A. Owens, Col, USAF (Ret) – Re-election



THIRTEENTH AIR FORCE RADIO COUNTERMEASURES OPERATIONS, 1944-45



An Imperial Japanese Navy Type 11 early warning radar mounted atop a concrete plinth looking out over the ocean. The IJN Type 11 was one of the more commonly encountered radars in the Southwest Pacific Area. This particular radar set was captured on Makin Island in late 1943 and was one of the first available for inspection by Allied forces. (US National Archives, Record Group 342-FH)

William Cahill

It was a beautiful evening with light haze as May 7, 1945 drew to a close in the southwestern Pacific. Lieutenant Everett re-checked the settings on the three APT-1 radar jammers, then powered them up when Consolidated B-24L 44-41464 was 60 miles out from the target. Tuned to 190, 194 and 197 MHz, the jamming pattern covered the Imperial Japanese Navy Type 12 air search radars and Mark IV searchlight radars that were protecting the Japanese naval base at Soerabaja, Java. Eight minutes later the Liberator was within 40 miles of the target – time for the waist gunners to start dispensing ‘rope,’ very long strips of aluminum foil one half inch wide and 400 feet long. Suspended from a paper parachute, ‘rope’ was used against radars below 350 MHz in frequency. With their controlling radars blinded, the Japanese searchlight crews vainly scanned the skies with their beams looking for the inbound bombers they knew were out there. Lt Olsen, piloting Liberator #464, switched his landing lights on to draw the searchlights. As soon as they came close, he switched them off. Olsen continued the game of chicken as six aircraft piloted by his squadron mates barreled in at low altitude, bearing down on the merchant ships at anchor throughout the harbor. These bombers received only inaccurate anti-aircraft fire when attacking one of the best protected Japanese naval bases in the region – a direct result of the past two years of work undertaken by the Allies to understand and counter the Japanese use of the electromagnetic spectrum.

The South West Pacific Area

The South West Pacific Area (SWPA) was the Allied supreme military command that oversaw operations in the Philippines, Borneo, Dutch East Indies, Australia, New Guinea, and the western part of the Solomon Islands. Commanded by General Douglas MacArthur, the SWPA came into being on April 18, 1942, replacing the failed American-British-Dutch-Australian Command (ABDA) and, after the fall of the Philippines in May 1942, became the sole US force in the region. Airpower under MacArthur was organized under a combined command – Allied Air Forces – with Australian and US air components. Australian forces were organized under the RAAF Command which by October 1944 had fielded the Australian First Tactical Air Force. US forces would eventually comprise three numbered air forces.

Fifth Air Force was created from the remnants of Philippine air power and the Far East Air Force in February 1942, while the Thirteenth Air Force was assigned to SWPA under a re-formed Far East Air Forces in June 1944 followed by Seventh Air Force in July 1945.

The fight for New Guinea was the defining action of the first part of the war for the South West Pacific Theater. First



An Imperial Japanese Navy Type 13 early warning radar in a typical site hidden in the tree line. This type of deployment made precisely locating these radars difficult and led to the creation of the hunter-killer ferrets of Thirteenth Air Force. This radar was located on Saipan and was discovered during the invasion in June 1944. (US National Archives, Record Group 80-G)

occupied by the Japanese in January 1942, the battle for the island would be waged for the remainder of the war. The Allied campaign to retake the island started with the defense of Port Moresby and the landing at Milne Bay on the eastern end of the island. The campaign turned into a series of amphibious end runs by MacArthur's forces as the Allies fought westward, with goals of reducing the Japanese base at Rabaul and securing territory to support the liberation of the Philippines.

Japanese Radar Development through 1944

Like many nations in the 1930s, Japanese technical research was split between Army and Navy factions. The Imperial Japanese Navy's (IJN) Naval Technical Research Department started their initial work into what became

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

radar in 1935. Neither the Naval General Staff nor the Bureau of Naval Construction displayed much interest in the effort, so development was slow.¹ A visit in March 1941 to Germany that included inspection of German and captured British radars revealed the state of radar development to Japan, spurring interest and development. Tests in September 1941 led to the production of the first IJN land-based radar, the Mark I Model 1 (Type 11), in early 1942.² A more mobile radar, the Mark I Model 2 (Type 12), appeared at the end of 1942 with the smaller Mark I Model 3 (Type 13) following in 1943.³

The Imperial Japanese Army (IJA) was also sponsoring radar development in the 1930s. The Type A continuous wave radar system was initially deployed on the Japanese Home Islands in 1941, providing longer range but poorer resolution compared to a pulsed radar system. An IJA technical commission spent many months in Germany in 1940, and their summary reports coupled with Japanese research resulted in the production of the Tachi-6 search radar in 1942; the more mobile Tachi-7 followed in 1943. Searchlight and fire control radars based on captured US and British radars appeared with the Tachi-1, -2 and -3 sets in 1943.⁴

Records are scarce, but it appears Japan started to deploy radars to its overseas conquests in mid-1942. The first Tachi 6 overseas deployment was to an airfield in Sumatra in late 1942, followed up with an additional 20 sets to Palambang, Sumatra between December 1942 and spring 1944. At least four sets were deployed to Java as



Ferret VII, 'The Duchess of Paducah'. One of the original ferret aircraft deployed to SWPA, the aircraft is seen later in the war sporting a theater fitted nose turret. (Robert Livingstone)

well. The Tachi 7 started to deploy in 1943, with 20 sets being shipped to the Philippines in October 1944 – the first IJA radars deployed to this former US territory.⁵ Though close to 50 IJA radars were shipped to the Southwest Pacific Area, on average less than 20 were deployed at any given time, the majority likely in depot for future use or to act as reserves for those in the field. The majority of the Japanese radars deployed overseas were the IJN Type 11, 12 and 13. The IJN initiated deployment of radars shortly after the Type 11 went into production, with one set being on Guadalcanal prior to the US invasion in August 1942.⁶

The Japanese air surveillance network in the SWPA consisted of thinly scattered belts of radars to provide early warning of approaching raids.⁷ As the tactical situation changed, the IJA or IJN would shift their radar sites around to increase coverage of critical avenues of approach. As the US moved into the southern Philippines, the Japanese rapidly re-oriented their air surveillance coverage to better screen their southern flank.⁸ Many Japanese radar posts had more than one radar set assigned to them. A review of the February 1945 electronic order of battle for the Netherlands East Indies shows this to be the case with approximately 15 percent of the sites, with a slightly smaller percentage of sites in the Philippines following this rule.⁹ Some Japanese radar sets could also receive US Identification, Friend, or Foe (IFF) signals, a factor likely taken into account when equipment was deployed. The IJN Type 13, along with some variants of the Type 12, the Type 11-3-K, and land based adaptations of the Air Mark VI Mod 4 radars operated in the same frequency band as the US Type III IFF transponders that came into universal service in the Pacific in last 1943. These radars could and did trigger an IFF response that enabled the Japanese to monitor Allied aircraft not only medium altitude but also allowed them to track aircraft at altitudes lower than the radars could normally pick up targets at ranges out to 300 kilometers.¹⁰

While the concepts and countermeasures taken by the adversaries were no different than that of the European Theater, the critical difference was knowledge of the adversary's radar technology. In the Pacific, the Allied knowledge of Japanese radar in 1942 was nonexistent, and the Allies spent the first few years of the war understanding

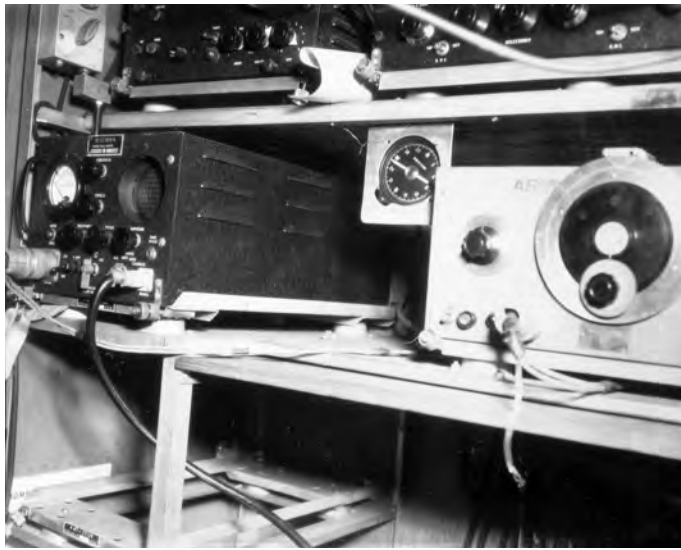
the adversary's technology and tactical employment of radar. Key to this analysis in the SWPA was Section 22.¹¹

Section 22

Founded in Brisbane, Australia in July 1943, Section 22 reported to the Chief Signal Officer of General MacArthur's General Headquarters of the Southwest Pacific Area (GHQ SWPA). Originally named "Radio and Radar Countermeasures Division" until November 1943, Section 22 combined all Allied efforts – not only US Army Air Forces and US Navy but also British Commonwealth and Dutch personnel – in a coalition effort to understand the Japanese use of radar and develop countermeasures to ensure success of Allied operations.¹² Section 22 had its origins with the primary communications intelligence organization in SWPA, the Central Bureau, which among other tasks had been plotting the locations of Japanese visual observer posts. When these posts started to get radar sets, it was natural that a new organization attached to GHQ SWPA should take over the work. Geographically separated subordinate elements called "Field Units" provided information to the headquarters through a myriad of reports. Some of the intelligence was actual 'hands-on' exploitation of captured Japanese equipment while other was electronic intelligence – intercepts of Japanese radar signals from air, land or sea-based platforms. Section 22 collated all information and circulated weekly and monthly reports on Japanese radar technology and current radar deployment locations.¹³ Section 22 also requisitioned and assigned radio counter-measures (RCM) personnel and equipment. As the theater expert in radar countermeasures, Section 22 was also involved in the development and installation of radar interception and jamming equipment and worked closely with US based organizations such as the Radio Research Laboratory at Harvard University. But all of this was in the future; the first task assigned to the unit was to determine the type, accuracy and location of Japanese radar stations. With the theater being a broad expanse of water populated with many small islands, the easiest and fastest method to accomplish such a task was with an airborne platform.¹⁴

Initial SWPA RCM Activities

History is never clean and simple with clear cut start and stop dates. The emergence of airborne signals intelligence (SIGINT) operations in the Pacific in the early days of the Second World War was no different. Though records of such activity from this hectic time period are scarce, prior to the formation of Section 22 GHQ SWPA loosely orchestrated a group of British, Australian and New Zealand RCM observers who rotated through available assets, including 90th Bomb Group (H) B-24Ds, 403rd and 435th Bomb Squadron Boeing B-17s, and RAAF Consolidated Catalinas and Lockheed Hudsons. The first aircraft outfitted with this equipment was likely a 435th Bomb Squadron B-17 in early September 1942, with other aircraft being added one at a time in the following months.



The electronics rack of Ferret VII, 'The Duchess of Paducah', B-24D-20-CF s/n 42-63991 while undergoing modifications at Archer Field, Brisbane, Australia in April 1944. An AN/APA-6 pulse analyzer is at left on the lower shelf and barely visible at right on the upper shelf is an early civilian Hallicrafter S-27 receiver that has been conscripted into the US Army and painted black. (US National Archives via Peter Dunn)

The RCM observers would lug aboard their heavy Halli-crafter S-27 or Australian SN-2 radar intercept receivers and ride along for the mission. Soon this activity with USAAF units would be formalized with the 'ad-hoc' ferrets found in many SWPA Bomb Groups.

'Ad-hoc' ferrets (a contemporary term used by aviation historians) are standard bomber aircraft field-modified with racks, cabling, and antennas that enable them to carry radar receivers and other SIGINT equipment on an a-periodic basis, usually as a secondary mission to a primary function of bombing. Shortly after arriving in theater at Fenton Field, Australia in May 1943, the 380th Bomb Group (H) started flying its first 'ad-hoc' ferret missions. Initially, a handful of Group B-24D aircraft were fitted out with racks, cabling and antennas to support radar receivers operated by Royal Air Force, Royal New Zealand Navy, or Royal Australian Air Force (RAAF) RCM observers on loan to the unit.¹⁵ Section 22 soon organized Field Unit 6 to work with the 380th Bomb Group (H), the unit operating a dozen or so 'ad-hoc' ferrets before the war was through. The 380th Bomb Group (H) was just the tip of the iceberg.

The plan required detailed knowledge of Japanese defenses in the region

In December 1942 Cast Mike #1, a small group of sailors trained at the Naval Research Lab, started experimental flights with an XARD receiver in VP-72 PBV-5A Catalinas in the South Pacific. After a couple months of flights in the Solomon Islands without finding any radar signals, the team upgraded the receiver to the AN/ARC-1 and started to meet with success.¹⁶ The PBV Catalina ferret flight operations continued through 1943 with the team



Right side view of B-24J-185-CO s/n 44-40899 'Lady Luck II' of the 868th Bomb Squadron. #899 was one of the 868 BS 'ad-hoc' ferrets, flying RCM missions starting in October 1944 and continuing through at least June 1945. T/Sgt Leonard William Cavalier, radar observer and right waist gunner of Lt Robert James Albert's crew, took this undated photo. (Darryl Ford)

and equipment bouncing between PBY squadrons resident in the South Pacific, but in late 1943 Cast Mike #1 was disbanded as the Navy searched for a more permanent solution.¹⁷ The Army Air Forces had come to the same conclusion as well, reacting favorably to a Section 22 request.

The Introduction of Ferrets

MacArthur's planned offensive against Rabaul, a key Japanese base on New Britain, was given approval by the Joint Chiefs of Staff in spring 1943. Executed as Operation CARTWHEEL, the plan required detailed knowledge of Japanese defenses in the region. This action likely galvanized the creation of Section 22 and provided the impetus and priority to move from an ad-hoc approach of radar reconnaissance to a more formal structure with proper equipment. Backed by a Joint Chiefs directive, the staff at GHQ SWPA soon went calling to Washington. In July 1943 Brigadier General Spencer Akin, Chief Signal Officer for SWPA, flew to Washington to meet with Major General Harold McClelland, the newly appointed Air Communications Officer at Headquarters Army Air Forces. At a meeting on July 22, the Army Air Forces agreed to build two ferret aircraft to aid GHQ SWPA in gathering SIGINT for current and proposed operations.¹⁸ This was a rush job, with SWPA desiring the receipt of the aircraft little more than a month after Material Command was notified. With no time to build a prototype, Air Staff recommended Material Command use Ferret I as a starting point for installation of the necessary radar equipment. Ferret I, a B-24D modified for the radar reconnaissance role in February 1943, was the first USAAF purpose-built radar intelligence aircraft and had flown missions in the Aleutians starting in March 1943.¹⁹



The November 3, 1944 attack on the IJN Type 13 radar located on Sibago Island, west of Mindanao, PI, by 868th BS 'ad hoc' ferret B-24J 44-40902. This photo of the radar perched on a ridge was likely taken from one of the waist gun windows of #902 during one of the bomb passes made on the radar. (Air Force Historical Research Agency, IRIS 50367)

Plans for Project 96288R – the production of two ferrets for SWPA – were quickly drawn up and sent to the First Proving Ground Electronics Unit of the Air Service Command at Eglin Field, Florida. Two new production B-24D aircraft allocated to SWPA left the Tucson Modification Center after having post-production work performed on them and arrived at Eglin in late September for their transformation into ferrets. A plywood compartment was built in the aft section of the bomb bay to house two RCM observers, with seats on the right side and equipment racks on the left. Personnel from Wright Field and the Radio Research Laboratory assisted in the modifications.²⁰

While Material Command was building two new ferret aircraft for SWPA, Section 22 looked what it could do in-theater. In late July it asked Headquarters Army Air Forces staff for any information they could provide on design and performance data on radar search receiver antennas for B-24 aircraft.²¹ With nothing being available from Thirteenth Air Force, Field Unit 13 of Section 22 started to acquire the necessary equipment – receivers, pulse analyzers, antennas, etc – from other units in theater, mainly US Navy squadrons. The equipment was gathered at Thirteenth Air Force and sorted out while waiting for a host aircraft. When the 868th Bomb Squadron arrived in theater in January 1944 one of the squadron aircraft was configured as an 'ad-hoc' ferret with an AN/ARC-1 radar receiver, but since the plane was still assigned bombing duties the ferret equipment was removed every time she flew a 'standard' bombing mission to preclude unnecessary loss. In late February and early March 1944 the aircraft flew only three electronic reconnaissance missions.²² In the interim, the new ferrets arrived in theater and started to map out Japanese radar sites.

In January 1944 the two modified B-24Ds, now identified as Ferrets VII and VIII, arrived in theater. Flight personnel for ferret aircraft were not available in theater, so



42nd Bomb Group (M) B-25J s/n 43-27983 'Beautiful Ohio' was converted to a radar-hunting ferret by Field Unit 13 personnel in October 1944. This photo was likely taken in September 1945 at Palawan's Puerto Princessa airfield. (Air Force Historical Research Agency)

four countermeasure operators and four enlisted mechanics joined the ferrets in the US and were assigned to V Bomber Command.²³ In addition, a Radio Research Laboratory Technical Observer, Clark Cahill, accompanied the ferrets to theater at the request of SWPA to observe and report on the performance of the aircraft.²⁴ Although administratively assigned to the 63rd Bomb Squadron, 43rd Bomb Group (H) for maintenance, the mission tasking of the ferrets was controlled by Section 22.

The first 28 operational ferret missions were flown around New Britain, New Ireland, and the north coast of New Guinea. These missions, combined with earlier efforts, greatly contributed to understanding of the eleven Type 11 and Type 12 radars protecting Rabaul and aided Fifth Air Force and US Navy air strikes on the base. Once the ferrets were able to precisely locate the sites they were targeted for attack. Destruction of Japanese radar sets started in April or May of 1944, with half the radar sites out of action by August.²⁵ In early April the ferrets moved from Nadzab, New Guinea to Fenton Field, Australia and were temporarily assigned to the 530th Bomb Squadron of the 380th Bomb Group (H). While Ferret VII was undergoing modification, Ferret VIII flew eight missions and plotted five radar sites on Timor, Ambon Island and western New Guinea.²⁶ The upgrade to the ferrets – Ferret VIII would follow Ferret VII once she had returned to flight operations – was something that had been planned for a while. Section 22 had noted that the direction finding antennas on the aircraft required improvement and the SCR-587 radar receiver was of little utility.²⁷ The search radar was also considered inadequate for navigation and storm avoidance.²⁸

The ferrets were modified in Brisbane, Australia by a group in Section 22 responsible for development work and adaptation of existing equipment. Equipment location within the RCM observer compartment was changed around to ease operation while flying. The SCR-587 was retained,



Detail shot of the direction finding antenna fitted to B-25J s/n 43-27983 'Beautiful Ohio' of the 42nd BG (M). Once an RCM observer like Lt Alderman had a fix on a site, the pilot could fly over the radar and either take photographs or attack the installation. (James Alderman via Jim Alderman)

likely due to the lack of suitable replacement at hand, while the C-2100 Direction Finding Assembly was kept in place pending improvements shipped from the US.²⁹ The navigation radar was also upgraded from the SCR-521 to the SCR-717B. Section 22 would continue to modify SWPA ferrets through the end of the war, tweaking antennas and equipment to optimize performance and passing results back to the US for incorporation into future ferret development.

By the end of August the Fenton Field-based ferrets had mapped the Banda Sea and Borneo region and were ready to join the fight for the Philippines. The Allied liberation of Owi Island enabled the ferrets to move northward and rejoin the 63rd Bomb Squadron in early September, arriving in time to survey Morotai and the Palaus before the allied landings.³⁰ With their assignment to the 43rd Bomb Group (H), the ferrets would be linked to Fifth Air Force operations for the rest of the war, leaving the Netherlands East Indies without a dedicated USAAF ferret platform. Thankfully the Navy patrol community was able to cover some of this gap.

In late 1943 the replacement for the USN Cast Mike #1 team, teams of officer aircrews dedicated to the radar search missions, started to arrive in the South Pacific. A VP-104 Consolidated PB4Y-1 was modified for the ferret mission and flew about twenty missions in February 1944

against radars at Truk, Caroline Islands, and New Britain. The missions proved successful and VPB 116, a PB4Y-1 squadron flying out of Eniwetok, was tasked with performing electronic reconnaissance of the region with three aircraft fitted out with receivers.³¹ The Navy saw success in this endeavor and expanded the deployment of RCM equipment. By August 1944 13 of the 18 land based patrol squadrons had aircraft fitted out with AN/APR-1, AN/APA-6, direction finding (DF) antennas, and AN/APT-1 jammers.³²

In April 1944 two PBY Catalinas were fitted out as dedicated ferret aircraft with AN/ARC-1 radar receivers at Palm Island near Townsville in Australia and assigned to the operational control of Section 22. Operations began in May 1944 with missions based out of Port Moresby searching for Japanese radars in New Guinea, Halmaheras, and the Philippines.³³ Like B-24 Ferrets VII and VIII, they were administratively attached to various units for support, including VP-33, VP-34 and VP-71.

Section 22 Evolves

As the organization grew, Section 22 asked War Department for additional RCM-trained personnel to perform non-ferret work, likely planning and tactics development.³⁴ Section 22 endeavored to stay abreast with developments in electronics that were occurring on an increasingly faster pace, requesting shipment of prototype RCM equipment to Australia so the theater would be ready to fully utilize the new receivers when they came into production.³⁵

Section 22 was also building its inventory of operational equipment as well. Likely driven by the memory of having to borrow equipment from the US Navy for outfitting its first 'ad-hoc' ferret, Section 22 requested a long laundry list of equipment from War Department ranging from AN/APR-4 and Hallicrafter S-36 receivers to test equipment.³⁶ By mid-1944 Section 22 had the personnel and equipment in hand to start addressing the needs of the theater. Ferrets VII and VIII, coupled with the other elements of Section 22, were gathering details on Japanese radar deployment and employment to enable staff planners to start developing ways to counter Japanese air surveillance. Radar jammers and window were on hand from shipments earlier in the year, giving SWPA aircraft the ability to mask their actions from Japanese radars.³⁷ On September 10, 1944 air commander Lieutenant General George Kenney sent an urgent message to General MacArthur requesting assistance in circumventing Japanese radar coverage of Goerango Point on Morotai Island in preparation for upcoming bombing operations. Section 22's exhaustive response noted that any bombers would need to be masked from both the Goerango Point and the Cape Petak radars; while jamming or window could be used, it was recommended that the offending radars be precisely located and bombed.³⁸

South West Pacific Strategic Picture – Fall 1944

In September 1944 the staff in SWPA was tense. The



A Morotai-based US Navy PV-1 Ventura of VPB-130 imaged this IJN Type 13 radar station at Cape Mangkalihah, eastern Borneo while preparing to attack the site on January 17, 1945. This photo highlights the efforts the Japanese took to camouflage their radar sites. (*Air Force Historical Research Agency, IRIS 261620*)

years of slow fighting along New Guinea were about to change as MacArthur was poised to return to the Philippines through an amphibious landing on Leyte Island – an operation accelerated two months in mid-September to an October 20th assault date. The seizure of western New Guinea also opened up air bases for operations against the Philippines and the Netherlands East Indies. In September 1944, the island of Noemfoor was captured and two 7,000 foot runways were completed. This action set in motion air boss Lieutenant General Kenney's next move – a series of five raids by his Far East Air Forces against the major oil refinery complexes at Balikpapan and Lutong, Borneo. The first raid was on September 30 – hence his interest in Japanese radars in the region. That month, Ferrets VII and VIII started flight operations from Owi Island, positioning them to range deep into the Philippines and over Borneo. As the fighting dragged on in the southern Philippines SWPA planners charted out follow on actions for the theater. In February 1945, GHQ SWPA outlined operations for the next six months, with plans centering on clearing the remainder of the Philippines and the Aus-

tralian invasion of Borneo.³⁹ Japanese forces in the Netherlands East Indies, though bypassed by MacArthur, were still prevalent and considered dangerous. GHQ SWPA looked to the Thirteenth Air Force to soften up the enemy to support the operations planned for the next six months.

By this time, Thirteenth Air Force had three bomb groups assigned to XIII Bomber Command – the 5th Bomb Group (H), the 42nd Bomb Group (M), and the 307th Bomb Group (H) – along with the 868th Bomb Squadron. In September, the 307th Bomb Group (H) commenced operations in the Netherlands East Indies, hitting targets in the Halmaheras, Ceram and at Balikpapan, Borneo. The 307th would continue flying missions in this region through mid-1945, targeting Japanese shipping, oil refineries, and airfields. The 5th Bomb Group (H) followed a similar course of action, alternating between oil refineries of Borneo, Japanese shipping from Morotai through the Sulu Sea, and airfields throughout the Philippine Islands, Celebes, Halmaheras, and Borneo. In between these missions, the 'Bomber Barons' of the 5th Bomb Group (H) supported clearing operations in the Philippine Islands (Luzon and



B-24L-5-CO s/n 44-41464 'Lady June II' was the Thirteenth Air Force ferret aircraft built by Field Unit 13. She was operated by crews of the 868th BS, including that of Lt Robert James Albert. Shown are some of the crew members, including T/Sgt Leonard William Cavalier, radar observer and right waist gunner, standing second from left. (Darryl Ford)

Mindanao) and the Australian invasion of Borneo. The 42nd Bomb Group (M) and the Australian First Tactical Air Force played similar roles, keeping pressure on Japanese forces and supporting clearing operations throughout the region. Though bypassed by the main war effort, the Japanese forces in the Netherlands East Indies were far from pacific and, supplied with fuel from Borneo, were able to aggressively resist Allied incursions. It was up to Section 22 to help the allied airmen thread through the Japanese air defenses to successfully strike their targets.

The Rise of the Ad-Hoc Ferrets

The split of SWPA into two lines of effort – north through the Philippines and west into the Netherlands East Indies – split the airborne RCM effort. Ferrets VII and VIII and the ferret PBYs could only cover so much territory and by the end of September 1944 were mainly devoted to missions against the Philippines. This left the Netherlands East Indies – which had received some radar reconnaissance from the ferrets during their stay at Fenton Field – lacking dedicated airborne collection. A requirement for two “radar investigational search” aircraft for service with the Fifth Air Force in the Southwest Pacific Area was passed on to Material Command in late March 1944.⁴⁰ These two aircraft, designated Ferrets X and XI, arrived in Ohio in mid-July 1944 from a pool of B-24J but it would not be until early 1945 that these aircraft would be ready to depart the US. With the hard use of Ferrets VII and VIII,

the new aircraft were likely just going to replace old airframes vice add new capacity. Something clearly needed to be done – and the solution lay with the Field Units of Section 22.

It was realized that only by searching during a strike could it be determined how the Japanese used their radars against enemy aircraft, be it searchlight, gun-laying, or ground controlled intercept by fighter aircraft. For this reason, before ‘ad-hoc’ ferrets proliferated, Ferrets VII and VIII accompanied several strike missions.⁴¹ The 380th Bomb Group (H) ‘ad-hoc’ ferrets were still operating and had actually received six ‘updated’ aircraft by mid-1944.⁴² By this time Section 22 had accumulated a large number of AN/APR-1s receivers and AN/APA-6 pulse analyzers and work started to create ‘ad-hoc’ ferrets for all the bomb groups in Fifth Air Force.⁴³ Seventh Air Force had taken a similar approach to the vexing problem of too many SIGINT requirements and not enough ferrets. In November 1944 Headquarters Seventh Air Force set forth a Radio and Radar Reconnaissance Plan that required that provisions be made for rack, power and antenna installations in four aircraft per heavy bomb squadron to carry radar receivers.⁴⁴ The Thirteenth Air Force, left to cover the ‘backwater’ Netherlands East Indies, needed its own ‘ad-hoc’ ferret force – and Field Unit (FU) 13 of Section 22 provided a solution.

FU 13 had been assigned to Headquarters Thirteenth Air Force since mid-1943. Attached to FU 13 in September 1944 were two physicists and New Zealand Army officers,



Right side view of B-24L-5-CO s/n 44-41464 'Lady June II' captured between missions at Morotai airfield, March 1945. (AG-989; Hocken Collections, University of Otago, Dunedin, NZ)

Major Edward 'Ted' Collins and Lt. Robert 'Bob' Unwin. After looking at the resources available to them, they determined the 868th Bomb Squadron's operations – single aircraft going in at night that could stir up Japanese radar activity – as the perfect fit. The Field Unit joined the 868th in the Admiralties in August 1944 but did not 'send out any missions' until September 18, 1944 after the squadron was settled and flying operations from Noemfoor, Dutch New Guinea. In the interim, the Field Unit had fitted out one of the squadron's B-24J aircraft as an 'ad-hoc' ferret. Equipment racks and cabling were installed as well as antennas; the aircraft was then fitted with the appropriate receivers and analyzers before a mission. The concept was pretty simple; the bomber would fly its standard night anti-shiping or strike mission but on board would be a Section 22 RCM observer who would monitor the gear and record signals of Japanese radars. Eventually six 868th BS B-24 aircraft would be equipped to perform in the 'ad-hoc' ferret role, with Field Unit technicians performing the work on-site.⁴⁵ FU 13 also constructed homing antennas and cockpit displays to enable the pilots of these aircraft to make bombing runs against Japanese radar sites.⁴⁶ 'Ad-hoc' ferret aircraft differed from traditional ferret aircraft not only in their equipment fit but also by their tasking; operations were controlled not by Section 22 but by subordinate commands such as XIII Bomber or Fighter Command.

The US Navy was also helping with the reconnaissance mission over the Celebes Sea. By October 1944, each land based squadron was authorized three aircraft fitted

out with a variety of receivers and ordered to maintain a "continual RCM survey" of the enemy, with tasking from fleet commanders.⁴⁷ In the SWPA, Section 22 Field Units 3 and 11 supported Navy patrol units. Field Unit 3 worked with multiple squadrons, but with the exception of two ferret PBY missions flown against Celebes in October the thrust of the units work was in the Philippines. Field Unit 11, based out of Morotai, started to support missions in October 1944. Initially working with three VPB-146 Lockheed PV-1 aircraft that flew dedicated SIGINT missions, the unit switched to supporting VPB-101 and VPB-104 PB4Y-1s. The nine Ventura flights fanned out in the northwest quadrant from Morotai, with the majority of the missions covering the Celebes Sea. The ten PB4Y-1 flights in November 1944 covered similar territory, reaching out to Palawan and Makassar Strait. Reporting from both Field Units dies off by the end of 1944, but the Navy VPB squadrons continued to send reports on Japanese radar activity to Section 22. By this time most of the Navy patrol community was no longer flying in the Celebes Sea region; after supporting the invasions of Mindoro and Luzon they were ranging between Formosa and Indo-China along the western edge of the China Sea, leaving the 868th BS to cover the Celebes Sea.

The 868th BS 'ad-hoc' ferrets were fitted out with one AN/APR-1 receiver and one pulse analyzer – either an AN/APA-6 or AN/SPA-1 – with both instruments operated by a dedicated RCM observer. The squadron flew 36 missions with 'ad-hoc' ferrets before the end of the 1944, with



Lt Jim Alderman, Section 22/Field Unit 13 RCM observer. Jim flew 40 combat missions between January and July 1945, the majority on 42nd BG (M) ferret B-25 #983 but also a mission with B-24 ferret #464 and two missions with US Navy Privateer squadrons. (James Alderman via Jim Alderman)

approximately 2/3 of them associated with armed shipping search missions ranging across the Celebes Sea, Sulu Sea and around Borneo to include Makassar Strait. The remainder of the missions was bombing missions against the Balikpapan refinery complex or Japanese airfields on Celebes, Cebu or Palawan Islands. The missions averaged 2-3 radar intercepts, usually composed of IJN Type 12 and Type 13 radar sets. Both Major Collins and Lt Unwin would fly missions with the 'ad-hoc' ferrets – an activity that enabled them to see firsthand how their equipment was working as well as stay connected with the operational side of Section 22. RCM Mission #16, flown the night of 23-24 October, was a typical sortie for an 868th BS 'ad-hoc' ferret. Taking off at 2230, pilot Lt Wadsworth flew B-24J s/n 44-40899 northwest from Noemfoor, Dutch New Guinea across the Celebes Sea. The crew was on a solo armed shipping search mission of the northeast coast of Palawan Island, using not only their SCR-717 radar but also RCM observer Technician Fourth Grade Kunhart's radar receivers to scan for Japanese maritime activity. Kunhart was one of the enlisted soldiers that FU 13 had been training at Noemfoor to fly as RCM observers. Like everything else in the SWPA, the theater was low in priority for trained RCM officers from the US – so just as they built their own ferret aircraft, Section 22 did their own training. Kunhart did not have much to do this mission – only three signals were reported for the nineteen hour sortie. With no shipping found, Lt Wadsworth attacked the dock area at

Jolo Town, Jolo Island enroute home. The bombs missed, but they let the Japanese staff know they were being watched – and kept #899 from lugging the bombs back across the Celebes Sea.⁴⁸ Kunhart's work, though unglamorous that night helped build a better understanding of Japanese radar activity.

The mission flown the night of 2-3 November 1944 was a little different. Taking off at 1500 from Noemfoor, B-24J 'ad-hoc' ferret s/n 44-40902 recovered at Morotai by 1845. The aircraft was refueled and the crew rested for a couple hours before climbing into the air at 2300. Turning northwest, #902 crossed the Celebes Sea alone enroute to the Mindanao Sea for an armed shipping search. The sky was overcast, interspersed with showers and lightning, making the trip across the open sea a little challenging both for pilot Captain Wallace and navigator Lt. Carp. Back in the waist section, Ted Collins chatted with Major Ken Newbury, RCM officer for the Thirteenth Air Force. As the Liberator approached Illana Bay on Mindanao's west coast at 0130 they received a weak signal at 149 MHz. Within 10 minutes the three direction finding cuts intersected west of the aircraft in the open sea, but with the SCR-717 showing no maritime activity in the region Collins chalked it up to a radar site further west of the aircraft. As soon as the RCM observers dropped this signal, another at 161 MHz appeared. Five bearing cuts placed it to the east of #902 on Mindanao near Leback. Three additional signals were heard through the night as the B-24 patrolled the Mindanao Sea and Sulu Sea on her return flight, but no shipping was found. As #902 turned southeast towards Morotai, Ted Collins once again picked up the 149 MHz signal he had received at the beginning of the mission. Passing the eastern tip of Basilan Island, the signal was strong – but his receiver was giving a bearing of 190 degrees into the Celebes Sea. Directing Captain Wallace to turn the aircraft, Collins soon located the radar on a reciprocal heading on Sibago Island. Wallace overflew the island at low altitude from north to south and there it was – a Type 13 radar, perched on the spine of a 700 foot ridge, 100 yards from an old lighthouse. Captured in images from the K-20 camera shot out the B-24's waist window the radar quickly powered up and starting tracking the receding aircraft. Wallace racked the Liberator into a hard turn as the bombardier hunched over his Norden bombsight. Wallace made three runs on the radar, dropping single 500 lb general purpose bombs on the first two attacks and two on the third. The bombs appeared to miss the radar by a few hundred feet each time.⁴⁹ By the time the crew landed at Noemfoor at 1145 the adrenalin from the attack had long since dissipated from their tired bodies – but for the RCM observers, there was work to do.

After each mission, the Field Unit would review the hand-written logs of the RCM observer and type up a message to be sent to Section 22 for analysis. The headquarters element reviewed all intercepts for new signals and tactics and combined intercepts to produce an updated electronic order of battle that was circulated in weekly or monthly 'statements' throughout SWPA. Thirteenth Air Force, desiring a more rapid refresh of its radar data, had Field Unit



Consolidated PB4Y-2 Privateer attributed to VPB-106 parked between missions at Puerto Princessa, Palawan. VPB-106 started flying missions from Palawan in May 1945, joining VPB-109 and VPB-111 in maritime patrols and contributing to radar reconnaissance efforts around Borneo. (Air Force Historical Research Agency)

13 set up a local analysis shop to support the headquarters staff.⁵⁰ As Section 22 gained experience and confidence in working against the Japanese radar sites, it started to provide feedback on reconnaissance operations. In November 1944 a message sent to the 868th BS admonished the squadron from altering their flight path to enable precise direction finding against a radar; such activity would either allow the Japanese to develop a track on the aircraft and enable them to bring anti-aircraft (AA) fire to bear or cause the radar operators to turn off their set. Field Unit 13 worked to educate Thirteenth Air Force on such tactics and how to work against the Japanese radar system, but it soon became apparent that the best tactic against the radars was to kill the radar site vice jamming or spoofing them.⁵¹

Radar Destruction

In the past, Japanese radar sites in the SWPA had been viewed as targets of opportunity or had been struck when viewed as a particular problem. Thirteenth Air Force P-70s and P-38s had targeted the Japanese radar installation protecting Rabaul at Cape Saint George, New Ireland on at least three occasions between January and March 1944, using data from Ferrets VII and VIII. The 868th Bomb Squadron's nascent 'ad-hoc' ferret work in the same time period was also tied to radar destruction efforts. Commander, Aircraft, Solomons, subordinate to Allied Pacific Ocean Areas Command, directed the squadron to confirm the location of the radar site at Merai, north of Adler

Bay, New Britain, with imagery to aid in its destruction – the pilot of the 'ad-hoc' ferret even making a bomb run on the target once he thought he had visually acquired it!⁵² Starting with the November 3 attack on the Sibago radar site, the 868th Bomb Squadron 'ad-hoc' ferrets performed strikes against Japanese radar sites, but this was not the primary function or mission of these aircraft.

One of the challenges in precisely locating Japanese radar sites was the use of camouflage. As compared to sites in Europe where German radars were placed in the open with minimal obscurity, the Japanese worked hard to hide their radar emplacements. Radar towers were camouflaged with palm fronds and sometimes antenna elements were attached to live trees. Location via electronic means was not good enough – photographs were needed to definitively place the radar to enable follow-on bombers to find and strike the target. Ideally, a dedicated aircraft would perform this function. On October 1, 1944 Section 22 requested information on an antenna fit for a B-25 aircraft to enable it to home in on an enemy radar set. Though the Radio Research Laboratory was working on such a set for the US Navy for installation in a Grumman F6F Hellcat, the time delays likely were not to the liking of the theater.⁵³ Field Unit 13 personnel started working on modifying a 42nd Bomb Group (M) B-25 in November 1944 using equipment on-hand that was being used with the 868th BS 'ad-hoc' ferrets – the AN/APR-1 receiver and AN/SPA-1 pulse analyzer. The resultant aircraft - 100th Bomb Squadron B-25J s/n 43-27983 - flew her first mis-

sion on November 28, 1944 with two RCM observers.

XIII Fighter Command tasked the B-25 "ferret" to assist in the systematic destruction of enemy radar installations.⁵⁴ The aircraft's first ten missions, flown in November and December 1944 from Sansapor, Dutch New Guinea, concentrated on locating strategically important radars on Halmahera Island. By December 11th the 100th Bomb Squadron was ready to go on the offensive against the Japanese radar net. XIII Fighter Command was undertaking a major strike against Japanese facilities at Goeroea, Halmahera, with eleven A-20s, twenty four B-25s, and twelve P-38s. To support this operation, the ferret B-25 was teamed up with another 100th BS B-25 for the mission of suppressing the Japanese radar at Cape Petak, 30 miles away from the target area. With the ferret B-25 providing direction, the two bombers arrived one hour prior to the strike and dropped bombs singly or in pairs for a period of 50 minutes, then dropped down to low altitude and made six strafing runs against the radar site. The initial surprise at Goeroea was so complete that the A-20 strikers received no AA fire until they were departing the target area. Additional strikes were flown against the Cape Noesanive radar on December 14th with six B-25s and a follow-up attack against Cape Petak on December 17th, both strikes flown at the behest of XIII Fighter Command.⁵⁵ With the Halmaheras apparently cleared out, the B-25 ferret was directed to operate further south against Ceram Island on Banda Sea. Key to these missions was the two dedicated RCM observers who flew #983 – 1Lt Dylowski and Sgt. Plant. Dylowski (promoted to Captain in December) would continue to fly with #983 until mid-January, when he trained up two lieutenants as replacements – 2d Lt James Alderman and 2d Lt Fenn.

The success of the Thirteenth Air Force ferret B-25 was readily apparent

B-25 ferret #983 would spend the next two months operating in the Ceram Island area, investigating radars and radio towers for future strike operations.⁵⁶ During this time period, the B-25 ferret flew 28 sorties including a dozen that resulted in attacks against radar sites. On December 28th, #983 and another B-25 were tasked with suppressing the Japanese radar site on the southeast side of Laoet Island to prevent detection of a XIII Fighter Command strike headed for Ambon and Haroekoe Islands. The bombers dropped fragmentation bombs at 15 minute intervals to keep the radar off line.⁵⁷

On February 6th, the ferret was accompanied by another B-25 to attack the Japanese radar site at Boela, Ceram. This installation had led a charmed life, being attacked six times previously by the ferret. The ferret separated from the bomber to work bearings on the site, though after a few minutes the site was off the air. Both bombers dropped their bombs from medium altitude and departed the area. The results were unknown, but the Boela site would reappear on the air later in the month.⁵⁸ While the

strike missions were exciting, the majority of the missions flown by #983 were orders from XIII Fighter Command and XIII Bomber Command to "obtain intercept and photographic information on radar activity" at specific tasked locations. The job of finding Japanese radars was getting a little harder. Soon enemy radar operators learned to recognize the homing runs flown by #983 and would switch off the radar when the aircraft was miles from the coast, making this manner of taking bearings of little use. Still, the B-25 ferret helped contribute to a better understanding of radars in the region, being credited with finding installations on Eastern Ceram at Boela, Banda Islands south of Ceram, and at Ambelau Island.⁵⁹ This information, fused with data gained from local scouts in the region controlled by the Dutch, gave Section 22 specific radar locations that not only aided in coverage diagrams but also helped in the radar destruction campaign.⁶⁰

The last mission flown by the ferret B-25 from Sansapor was of note. On February 16, the ferret accompanied a strike mission of twenty four 42nd Bomb Group (M) B-25s against the Kendari supply area and adjacent Mega village on southeast Celebes Island. The ferret flew along to gather information as to the effectiveness of the low level ingress planned to evade Japanese radar detection. RCM observer 2Lt Alderman heard no Japanese signals after the formation dropped down to 500 feet, validating the mission plan and the mapping of the Japanese radars in the region by Section 22.⁶¹ Up to this time, the B-25 ferret averaged three radars intercepted per sortie, the majority being IJN Type 13 radars.

With this mission complete, the crew packed up and deployed to Puerto Princessa, Palawan, situated between the Sulu Sea and the South China Sea. Packing his belongings for Palawan, 2Lt Jim Alderman must have paused to contemplate the strange world he was now in. A native of Wartrace, Tennessee, he would spend the next few months flying with #983 as her dedicated RCM observer, racking up 40 operational missions by the end of the war. The flying was exciting as was the challenge of locating Japanese radars. B-25 ferret #983 was one of a kind, and she had made a dent in the Japanese air picture in the Southwest Pacific.

The success of the Thirteenth Air Force ferret B-25 was readily apparent, and soon another ferret B-25 was being built by Section 22 – but for use with Fifth Air Force. Section 22 staff officer Captain Victor Tatelman, a veteran B-25 pilot on his second tour to the SWPA, worked with RRL technical representatives to modify a B-25D into a ferret configuration. Tasked by V Bomber Command, he flew anti-radar missions out of the Philippines with maintenance support from the 499th Bomb Squadron, 345th Bomb Group (M). Starting in February 1945, Tatelman flew his B-25D 'Dirty Dora II' for a few months until radar targets started to dry up.

As the Field Unit 13 Detachment associated with the ferret B-25 packed their belongings for the trip to Palawan, just recently liberated on February 28, the remainder of the unit continued to work with the 868th BS. Joining them in February was 2Lt Fenn, who after flying



A few weeks after the war ended, Lt Alderman went down to the Puerto Princessa flight line and found 42nd Bomb Group (M) B-25 ferret #983 with weeds growing around it. He took a few photos for posterity and as a reminder of the missions he flew on this aircraft. (*James Alderman via Jim Alderman*)

nine missions with #983 switched over to the B-24 side of FU 13 to fly in 'ad-hoc' ferrets. Sgt. Plant, veteran of B-25 ferret missions from the beginning, also switched to B-24s at the same time. The 'ad-hoc' ferrets of the 868th BS flew six missions in January but for unknown reasons did not fly in February. The missions were all armed shipping searches along northwest Borneo near Miri or north in Brunei Bay with secondary targets of infrastructure at Jesselton or Lutong. Only 2-3 signals were received on each mission, usually IJN Type 12 and Type 13 radars. Upgrades were made to the 'ad-hoc' ferret fleet as new equipment was made available, with new direction-finding antennas being installed in the aircraft in January 1945. Since there were only 2-3 boxes of each type of electronic equipment on hand at the base, receivers were loaded onto the 'ad-hoc' ferrets before each mission and pulled post-flight.⁶²

Thirteenth Air Force Ferret

By the winter of 1944-45 the Ferrets VII and VIII were showing their age. They still completed the mapping of the Philippines and had started on Formosa, though did take one spin through their former haunting grounds with a single mission by Ferret VII to Halmahera on January 15, 1945.⁶³ Ferret VII's mission confirmed the location of radars plotted by the 'ad-hoc' ferrets and cemented the need for a dedicated ferret for Thirteenth Air Force. As strikes by XIII Bomber Command against Borneo and the southern Philippines increased, the command became more aware of the need to make a concerted effort against Japanese radar sites like what was occurring with the XIII Fighter Command in the Halmahera and Ceram Island region. Though US Navy patrol aircraft were starting to use

Section 22 radar data to attack radar installations around the Celebes Sea, XIII Bomber Command personnel recognized the need to have a long range ferret aircraft that could positively locate radars through imagery to enable successful strikes.⁶⁴ While the 'ad-hoc' ferrets of the 868th BS contributed to a much greater understanding of Japanese radar employment and tactics, the RCM search mission was still a secondary tasking. If a radar site was to be located with any degree of accuracy, a dedicated aerial platform was required. A test orchestrated by Field Unit 13 commander Major Collins during a November 1944 'ad-hoc' ferret mission confirmed that when the aircraft was dedicated to ferret work a radar site could be located within a half mile radius and attacked. Vindicated in his convictions, Collins started to lobby for a B-24 fitted out as a ferret but capable of dropping bombs for attacking radars. The Commanding General of Thirteenth Air Force concurred and released a new B-24 that had been in theater a couple months to Field Unit 13 for conversion to a ferret.⁶⁵

Collins immediately started fitting out the aircraft as both a radar reconnaissance and radar attack platform. Radar jammers were fitted out in the aft fuselage and waist gunners were enlisted to drop window. As opposed to the purpose-built ferret aircraft coming from the States, Field Unit 13 did not locate any electronic gear in the bomb bay, leaving it available for weapons.⁶⁶ Two RCM observer positions were installed in the aircraft, one in the nose and one in the waist position. Each location had an AN/APR-4 receiver and an AN/APA-11 pulse analyzer to allow reconnaissance against multiple signals simultaneously. K-17 and K-20 cameras were also carried to enable radar installations to be photographed. Finally, homing gear and displays for the pilot similar to those in B-25 ferret #983 were installed in the cockpit. Once the aircraft was fitted out,



Lt Alderman exploring the inside of 42nd Bomb Group (M) B-25 ferret #983 one last time before shipping out to Japan as part of the Air Technical Intelligence Group. Returning to the US in early 1946, Alderman went on to graduate from the Engineering Department of Vanderbilt University – putting to use all the hands-on training he received as an RCM observer. (James Alderman via Jim Alderman)

operators were needed – so Field Unit 13 started to train enlisted personnel already on base to operate the equipment. The first operational mission was flown on March 1, 1945 though only one RCM position had a complete equipment installation for the flight.⁶⁷

The Thirteenth Air Force ferret – B-24L-5-CO s/n 44-41464 – flew dedicated RCM reconnaissance missions with the 868th BS. Between March 15 and April 13 she flew six sorties across the SWPA, including two missions to Makassar Strait, two to Mindanao, and two to Halmahera and Ceram Islands. Major Collins flew on the first three missions of #464, joined by Lt Unwin on her second flight; this helped validate their design work as well as get them out from behind the desk and into the action. The endurance of the B-24 coupled with two dedicated RCM observers and the mission flexibility to loiter enabled #464 to be used in a verification role, confirming suspected radar positions and coverage or investigating odd activity such as Japanese night fighters. Low level visual and photographic runs were made to precisely locate radars installations. On April 9 #464 took a run at the hapless radar site at Boela, Ceram, but cloud cover kept her from going in on the final bomb run to drop her belly load of five 100 lb M47 A-2 napalm bombs and ten 260 lb fragmentation bombs. Two days later #464 tried her luck again against another radar site. Five bombing runs were made against the radar site at Donggala, Celebes but all bombs burst 100 to 250 feet

short and to the right of the station. Undoubtedly frustrated, the pilot lined the aircraft up and made two strafing runs against the radar post. The secondary target, the radar site at Kabaladoea Island, was strafed seven times.⁶⁸

After taking the month of February off, the 868th BS ‘ad-hoc’ ferrets flew three missions in March and five through mid-April 1945. The March missions continued to be anti-shipping, now concentrating on the east coast of Borneo to include the Makassar Strait. Two of the April missions continued this trend, while two other missions expanded beyond the Makassar Strait into the south Celebes Sea. Additional signals were observed on these sorties, the average being four to five Type 12, Type 13, and Type 11 Modification 2 radars – the latter a new signal for the unit. On April 17, ‘ad-hoc’ ferret B-24 #899 was accompanying another B-24 in an anti-shipping search of southern Makassar Strait. Unfortunately, the RCM observer turned out to be in for the ride as the antenna feeder short circuited, making his gear inoperative. After chasing down two schooners and one small cargo ship Lt. Everett, the RCM observer, recommended #899 attack the Type 13 radar at Balabalangan Island. Lt. Olsen, #899’s pilot, dropped the B-24 down to low altitude and made two bombing runs. On the first run, five 250 lb. general purpose bombs were dropped on three buildings near the radar tower while four bombs were dropped on the tower on the second run – both accompanied by machine gun fire. Two additional strafing runs were made with fire concentrating on the radar tower. For her efforts, #899 received holes in 14 places from AA fire and had her hydraulics were knocked out – but Lt. Everett blandly noted in the mission report, “this radar may be considered as at least temporarily out of service.”⁶⁹

Low level visual and photographic runs were made to precisely locate radars installations

The mission for April 6 was a different role for the ‘ad-hoc’ ferrets and was a portent of things to come with the 868th BS. ‘Ad-hoc’ ferret B-24J #025 was tasked with B-24J #462 to bomb Sepinggan Airfield at Balikpapan, Borneo and remain in the area as a diversion for a low flying Lockheed F-5 reconnaissance plane taking photos on the area. The weather was cloudy and the bombing run at 10,000 feet was made with radar assistance. After flying in the area for 40 minutes, the bombers were released – but not after seven different radars were observed and plotted. The ferret then dropped beneath the cloud cover and took low altitude oblique photos of the Donggala radar post with a K-17 camera before returning to Morotai.⁷⁰ Soon the 868th BS would start to utilize their ferret and ‘ad-hoc’ ferrets in this type of strike support role – an expansion of the pioneering work done by B-25 ferret #983.

On April 17, 1945 Ferret #464 took off from Morotai with the mission of accurately locating radars on Tarakan Island off northeast Borneo and obtaining photo coverage of the Lemo and Donggola areas. When complete, she

landed at Puerta Princesa, Palawan where the Field Unit 13 Detachment was working with 42nd Bomb Group (M) B-25 ferret #983. Major Collins accompanied the ferret as one of the RCM observers – he had not flown on her for three weeks and this trip enabled him to stay current in the job as well as check up on operations of the FU 13 Detachment. #464 remained for three days, flying a mission along the coast of French Indo China before taking off on April 21 for a mission to inspect Balikpapan and Tarakan Island en route to home at Morotai. #464's mission to the Indo China coast was likely to augment #983's work from the past month.⁷¹

B-25 ferret #983 flew her first mission from Puerta Princesa, Palawan, on March 26. The first five missions were mainly along the northeast and northwest coast of Borneo and surprisingly revealed no radar signals between 40 MHz and 1000 MHz. On the night of 27/28 March, the commanding officer of the 42nd Bomb Group (M) ordered #983 aloft to help look for two Japanese battleships that were thought to be roaming in the area; it was hoped that they would have their surface search radars on and be visible to the ferret, but the tired RCM observers on #983 saw nothing. The Japanese battleships turned out to be two Royal Navy destroyers mis-identified by a fighter pilot. On March 31, #983 ventured into the South China Sea to look for a reported radar installation on Itu Aba Island, but again the receivers picked up no signals. Searches of the Turtle Islands and the China Coast in early April also provided similar results though range limitations kept #983 150 miles off of China. The RCM observer for the ninth Palawan flight, Lt. Alderman, must have been ecstatic as the mission on April 14 actually had signals to record! With a bomb bay full of fuel tanks and escorted by six P-38s, the intrepid #983 took off at 0735 and with the sun at her back flew due west to Saigon, French Indo China. Alderman noted seven radars active during the mission, including Type 11 Modification 2, Type 12, Type 13, and IJA Tachi 6 radars. While the April 21 flight to Brunei revealed no radar activity, the flight activity over the next two weeks provided a change of pace for the crew of #983. Between April 22 and May 6, five missions were flown to Indo China, with #983 acting as a pathfinder for fighter sweeps into the area and taking advantage of the extra air activity acting as a stimulus to note radar activity. A similar mission was flown on April 26 with the target being Kuching on the west coast of Borneo. The day prior, #983 tried to stir up Japanese activity in northwest Borneo by flying near the Japanese airfields at Kudate, Jesselton and Labuan, but no radars were heard operating.⁷²

End Game for Field Unit 13 - Late April missions

When B-24 ferret #464 returned from Palawan big plans lay in store for her. First up was a strike on Soerabaja Harbor, Java on the night of April 24, 1945. The harbor was a major naval base for the Japanese and also a shipping terminal for oil from local refineries. The planned attack featured #464, fitted with three radar jammers and carrying CHH-2 'rope' window, entering the target area at

14,000 feet, jamming searchlight and fire control radars and dropping rope at 5 second intervals. 90 seconds later, B-24 #397, flown by Major Harris, flew 500 feet under #464 and dropped napalm bombs on the Naval Base Warehouse area. The idea was for the fire to light up the target area for the following low altitude attack, but a bomb rack malfunction kept the weapons in the bomb bay. Lt Putnam in B-24 #129 pressed on his attack at 300 feet, using radar to augment what he could see from the cockpit windows to attack shipping tied up to the wharf. The bombs went long, landing in the warehouse complex. #464's support was perfect, the Japanese AA response inaccurate and searchlights randomly scanning the sky until they by chance swept across the medium altitude aircraft. Seven radar signals were intercepted, the majority Type 12 radars. After being in the air for 16.5 hours, the snoopers recovered at Morotai at 6 AM on April 25.⁷³ The mission against Soerabaja was good practice for what was in store for the intrepid #464.

When B-24 ferret #464 returned from Palawan big plans lay in store for her

On April 27 the 868th BS returned to Soerabaja. A more aggressive mission was planned with #464, crewed by veteran FU 13 operators Lt Everett, Sgt Plant, and Sgt Powers, once again playing a lead role in supporting the strike. Though it was planned for B-24 #397 to light up the target area with flares, her H2X radar was inoperative and #464 quickly made two passes, dropping ten flares over the target area. Five 'snooper' Liberators then came in for the attack at one minute intervals, originally planning on hitting ships in harbor but instead attacking port facilities due to visibility in the harbor area. The searchlights and AA appeared to be visually controlled, with the bombers only encountering inaccurate ground fire. Though Japanese radars started tracking the bombers at 225 miles out from the target area, jamming did not commence until 75 miles from the target area. Starting at 20 miles out, window was dropped, with one of the three RCM observers on #464 noting jamming as "very effective." "Ad-hoc" ferret #899 with NZ Lt Unwin as the RCM observer joined the mission as one of the strikers, leading the bombers over the target area and dropping window when 7 minutes out from the target area and monitoring the jamming coverage of #464. Fourteen signals were noted on the mission by ferret #464 including Type 11, Type 12, and Type 13 radar sets. The snoopers then set course for Truscott, Australia, landing just before 6 AM. That evening the snoopers returned to Morotai, conducting an armed shipping search of south Makassar Strait en route to home.⁷⁴

On May 7 the 868th BS returned to Soerabaja with a vengeance. Ten snooper B-24s set out to attack shipping in the harbor. B-24 ferret #464 led three other aircraft coming over the target at 13,000 feet. #464 jamming both early warning and AA fire control radars and dropping rope window. 15 minutes later six low altitude strikers fanned out separated by 2 degrees of azimuth and 30 sec-



Detail shot of the direction finding antenna fitted to an early 868th Bomb Squadron B-24 'ad-hoc' ferret, Noemfoor, December 1944. (AG-989; Hocken Collections, University of Otago, Dunedin, NZ)

onds in time. The final three medium altitude aircraft then departed the holding point at 1 minute intervals, dropping window as they progressed towards the inner harbor. The medium altitude aircraft hit harbor facilities while the low altitude aircraft scored hits on five ships. Three aircraft received moderate damage from AA, which was viewed as inaccurate but with a high volume of fire.⁷⁵

Signals intelligence within the 868th BS – and the SWPA in general – had come a long way in one year, but more was on the horizon. The monitoring and copying of enemy radio communications in the SWPA had been occurring since before hostilities had started with radio interception sites on Corregidor. This capability had slowly matured and by 1945 SWPA had a number of units performing radio communications intelligence. Among the units assigned to Thirteenth Air Force was the 7th Radio Squadron (Mobile), based at Morotai until April 1945, when it transferred to Leyte. The squadron maintained a detachment at Palawan and even after the move to Leyte maintained a group of airmen at Morotai. The squadron was tasked with running a net of ground-based radio intercept stations that targeted Japanese air-ground communications, to include the detachment at Puerta Princesa, Palawan.

The Palawan detachment was receiving little in the way of Japanese radio traffic. Believing the difficulty was weak signals due to distance, the detachment coordinated with XIII Fighter Command to fly with ferret B-25 #983. 7th RS (M) linguist Sgt Yukio Tamura climbed aboard #983 and flew missions on April 24 and 25 to monitor Japanese radio frequencies along the coast of northwest Borneo.⁷⁶ After the two Palawan missions, there appeared to be some strife as the squadron issued an order to cease and desist as flying was “not an authorized function.”⁷⁷

Either the squadron overcame its difficulties or the men at Morotai received updated guidance, as ferret B-24 #464 flew a mission with a radio intercept operator on April 27 for the attack on Soerabaja harbor. Using a BC-348 receiver for this purpose, the radio intercept operator was able to copy several new frequencies and four new call signs. On May 2, flying with an RBK-9 receiver as well as the BC-348, ferret #464 was tasked to reconnoiter Soerabaja and search between 2 and 10 MHz. Intercepting a new station at 10.1 MHz handling traffic between Singapore and Makassar, the operator forwarded the data to GHQ SWPA for further analysis. On the May 10 mission to northeastern Celebes, the radio intercept operator noted light activity, only capturing one piece of traffic on the BC-348.

The ferret B-25 continued to fly from Palawan through mid-1945, but even before B-24 ferret #464 had departed Navy radar receiver-equipped aircraft were flooding the island. First to arrive were detachments from two PBM-3D Mariner squadrons, VPB-17 and VPB-20, operating from the seaplane tender USS Pocomoke. The aircraft arrived on March 11, with flights mainly ranging to the west into the China Sea. VPB-17 departed on April 22, but within one week VPB-20 and the USS Pocomoke moved to Tawi-Tawi, Sulu Archipelago. The squadron provided convoy coverage and reconnaissance flights in support of the invasion of Borneo. In the month of June VPB-17 sent a detachment to join in and operations were concentrated on mine spotting for convoys and task groups involved in operations around Borneo at Brunei Bay and Balikpapan.

Between mid-April and early May the US Navy re-located three land-based patrol squadrons to Puerto Princessa, placing them under the operational control of Fleet Air Wing 10. VPB-106, flying PB4Y-2s, flew in from Iwo Jima and started flying anti-shipping patrols along the Malay coast in May 6. VPB-109 deployed to the island from Hawaii, starting to attack land and maritime targets in Borneo and Celebes in late April. VPB-111 arrived on April 11 from Tacloban with PB4Y-1s, but started conversion to the Privateer on May 1 and joined VPB-109 in hitting Borneo and Malayan targets. VPB-117, flying from McGuire Field, Mindoro, starting in February 1945 under the operational control of FAW-17, also contributed sorties over the northwest coast of Borneo, the coastline of Indochina and the waters in between. The RCM A-kit wired into the Privateers during production enabled great flexibility in the missions they were assigned, with many reconnaissance missions flown in support of the upcoming invasion of Borneo. The addition of these long range aircraft, many with radar receivers, literally flooded the region with aircraft able to map the remaining Japanese radars. In addition to the large increase in US Navy receiver-equipped aircraft, the USAAF heavy bomber groups were also seeing an influx of aircraft wired for radar receivers and jammers.⁷⁸

By mid-1945 V Bomber Command was able to field dozens of RCM aircraft equipped with a single receiver and

up to two jammers but the two XIII Bomber Command heavy bomber groups were not that robust. A victim of low placement behind Europe and the main push towards Japan, the XIII Bomber Command also had to contend with theater logistic priorities. There is no indication that 5th Bomb Group (H) had any RCM equipped aircraft, while the 307th Bomb Group (H) only fielded two such aircraft. These aircraft carried older AN/APR-1 receivers and two AN/APT-1 jammers but did not start flight operations until late May.⁷⁹ By then, the main fight was in Luzon preparing for the final push into Japan and Section 22 was changing its mission.

Conclusion

On May 1, 1945, operational control of the RCM mission passed to Far East Air Forces and 7th Fleet. With this transfer, the Field Units were dissolved and their personnel and equipment turned over to their respective commands. Day to day operations continued as before, with flying squadrons continuing to report back to Section 22 all the data that was collected. Section 22 transitioned to more of a theater planning/intelligence unit, acting as the central RCM intelligence organization of the theater and maintaining control of Army Ground Force RCM units.⁸⁰ This transition was hardly felt in the field as most of the Field Units had fully embraced the units they reported to - RCM had become an accepted way of life for the airmen. On 7 May 1945 HQ RAAF took over operational control of Field Unit 15 from Section 22. Later that day, it directed the Field Unit to fit out two B-24s of 12 Squadron, RAAF with equipment similar to the 'ad-hoc' ferrets of Thirteenth Air Force. Field Unit 15, bereft of any RCM-equipped aircraft, had already been working on modifying a 24 Squadron B-24. This aircraft flew three missions in May before the 12 Squadron aircraft took over. These two B-24s flew operational missions from Darwin over the Celebes Sea region, usually shipping searches or strike missions against land targets in the region. Plans were made to equip two aircraft from 99 Squadron with a similar equipment load.⁸¹ The Australians - who had started it all with RCM observers assigned to the 380th BG - were fully transitioned to independent operations. ■

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THE RESURRECTION OF TACTICAL AIR COMMAND AND MILITARY AIRLIFT COMMAND

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September 26 and October 1, 2016 were very historic dates in the history of the Air Force. After more than 24 years, Tactical Air Command and Military Airlift Command, two of the most historic of the Air Force's major commands, became active again. This is the story of how they went away, and how they came back.

In the summer of 1992, as the Cold War ended, the leadership of the United States Air Force undertook an organizational revolution, to streamline itself and to save federal dollars. It inactivated five of its major commands: Strategic Air Command (SAC), Tactical Air Command (TAC), Military Airlift Command (MAC), Air Force Logistics Command (AFLC), and Air Force Systems Command (AFSC). In their places, it activated three new major commands: Air Combat Command (ACC), Air Mobility Command (AMC), and Air Force Materiel Command (AFMC).

The three new commands were not redesignations of any of the five commands they replaced. They were starting from scratch in 1992, with no years of service and no honors. While they had some of the same personnel, aircraft, bases and functions of the old commands, they were not lineally connected with any of them. All five of the inactivating major commands, each with more than 40 years of active service, was placed on the shelf, with the possibility that one day the Air Force might activate them again.

The inactivations and activations came in two stages. First, Strategic Air Command, Tactical Air Command, and Military Airlift Command were inactivated on Jun 1, 1992, while Air Combat Command and Air Mobility Command were activated. Air Combat Command received the fighters of Tactical Air Command and the bombers and missiles of Strategic Air Command, while Air Mobility Command received the transports of Military Airlift Command and the tankers of Strategic Air Command. One month later, Air Force Logistics Command and Air Force Systems Command were inactivated, while Air Force Materiel Command was activated. Air Force Materiel Command assumed the functions of the two inactivating commands, but the new command was not the redesignation of either of them.

The revolutionary changes of 1992 had merits. By dropping five major commands and establishing three new ones to take over their functions, the Air Force reduced its number of major commands by two. The move was expected to improve the administration of the Air Force and to save enormous amounts of money. But there was a problem in the transition.

Although Air Combat Command had absorbed resources and functions of Strategic Air Command and Tactical Air Command, it was not a redesignation of either. Still, it was inexplicably directed to use the emblem of Tactical Air Command, as if it were the Tactical Air Command transformed into the Air Combat Command. If that is what the leadership wanted, it could have merely redesignated Tactical Air Command as Air Combat Command, instead of ending the first



and starting the second. From a lineage and honors history perspective, Tactical Air Command had no connection with Air Combat Command, despite their use of the same emblem.

The same problem emerged with Air Mobility Command. Although it had absorbed resources and functions of Strategic Air Command and Military Airlift Command,

and had no lineal connection with either of those inactivated commands, it was directed to use the emblem of Military Airlift Command, as if it were the Military Airlift Command transformed into the Air Mobility Command. If that is what the leadership wanted, it could have merely redesignated Military Airlift Command as Air Mobility Command, instead of ending the first and starting the second. From a lineage and honors perspective, Military Airlift Command had no connection with Air Mobility Command, despite their use of the same emblem.

There should have been two options. One was to let the new commands have new emblems, since they were not redesignations of the old commands whose emblems they got, but brand new commands with no previous heritage. The other option was to simply redesignate Tactical Air Command as Air Combat Command and Military Airlift Command as Air Mobility Command. There was reason not to go that way. Strategic Air Command would have been the only one of the three major commands to be inactivated on June 1, 1992. No one wanted to offend the veterans of Strategic Air Command by keeping Tactical Air Command and Military Airlift Command, even if they were redesignated under different names. If SAC was going away, TAC and MAC were also going away.

What happened instead was a sort of cross between the two alternatives. The Air Force leadership did not favor Tactical Air Command and Military Airlift Command over Strategic Air Command, so it inactivated all three of them. Yet by directing Air Combat Command to use the Tactical Air Command emblem and Air Mobility Command to use the Military Airlift Command emblem the Air Force leadership inadvertently made it appear that the Air Force was discarding only Strategic Air Command on June 1, 1992.

Why did Gen. Merrill McPeak, then Chief of Staff of the Air Force, allow the new Air Combat Command to use the emblem of Tactical Air Command when it was not the

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redesignated Tactical Air Command but a new command not lineally connected with the old one? Perhaps it was because the last commander of Tactical Air Command, Gen. John Michael Loh, became the first commander of Air Combat Command, and he wanted to keep the same emblem, since the headquarters would be in the same place, and a new emblem would be costly. Why did General McPeak allow the new Air Mobility Command to use the emblem of the Military Airlift Command when it was not the redesignated Military Airlift Command but a new command not lineally connected with the old one? Perhaps it was because the last commander of the Military Airlift Command, Gen. Hansford T. Johnson, became the first commander of Air Mobility Command, and he wanted to keep the same emblem, since the headquarters would be in the same place, and a new emblem would be costly. When Strategic Air Command was inactivated, its last commander was Gen. George Lee Butler, who became the first commander of a new joint Strategic Command. Not surprisingly, the new emblem of the Strategic Command looked much like the old emblem of Strategic Air Command, although it was not strictly identical. Apparently, McPeak wanted the last commanders of TAC, MAC, and SAC, who were the first commanders of ACC, AMC, and STRATCOM, to keep their old emblems, despite the fact that the new commands were not the old ones.

A month later, the same mistake was made. Air Force Materiel Command might have inherited the functions of Air Force Systems Command and Air Force Logistics Command, but it was a new organization entirely. Both Air Force Systems Command and Air Force Logistics Command were inactivated on July 1, 1992, while Air Force Materiel Command was activated, but Air Force Materiel Command was directed to use the emblem of the Air Force Logistics Command, which made it appear that Air Force Logistics Command was remaining active while Air Force

Systems Command was going away. If Air Force Materiel Command was not the redesignation of either Air Force Logistics Command nor of Air Force Systems Command, but an entirely new command starting from scratch, it should have had its own emblem. The alternative would have been to simply redesignate Air Force Logistics Command as Air Force Materiel Command, since the emblem of one was to be the emblem of the other. But that would have meant choosing Air Force Logistics Command over Air Force Systems Command, and the Air Force did not want to do that. As a result, it inactivated both of the commands whose functions were being taken over by the new Air Force Materiel Command. Despite the Air Force's intent not to choose one of the older commands over the other, that is exactly what appeared to have happened when Air Force Materiel Command was directed to use the emblem of Air Force Logistics Command.

How [Tactical Air Command and Military Airlift Command] ... went away, and how they came back

Air Force Materiel Command was not a merger of the two older commands. Air Force Logistics Command and Air Force Systems Command could not be consolidated, since they had been active at the same time. Either a choice had to be made between them, or both had to go away as Air Force Materiel Command was activated. Some in Air Force Materiel Command might have thought their command was a combination of Air Force Logistics Command and Air Force Systems Command, since it assumed the functions and resources of both, but in an organizational sense, it was neither. Despite that fact, Air Force Materiel Command began with the emblem of the inactivated Air Force Logistics Command, suggesting that Air Force Logistics Com-



mand had been renamed as Air Force Materiel Command.

The use of the emblem of one organization by another organization violated heraldic policy, yet that is what was happening. In three cases, one command was using the emblem of another command with which it had no lineal connection. One way to correct the error was to consolidate Tactical Air Command with Air Combat Command, Military Airlift Command with Air Mobility Command, and Air Force Logistics Command with Air Force Materiel Command. That would involve the merger of three pairs of major commands. Such a move would justify Air Combat Command's use of the Tactical Air Command emblem, Air Mobility Command's use of the Military Airlift Command's emblem, and Air Force Materiel Command's use of the Air Force Logistics Command emblem. No one wanted to do that at first, for fear of offending the veterans of the other commands inactivated in 1992: Strategic Air Command and Air Force Systems Command.

In 2009, the story changed. Strategic Air Command, which had been inactivated in 1992, was redesignated as Air Force Global Strike Command and activated again. It eventually got back the bombers and missiles it had at first lost to Air Combat Command, if not the tankers it had lost to Air Mobility Command. With Strategic Air Command back, there was no longer any reason to not bring back Tactical Air Command and Military Airlift Command too, by consolidating them with Air Combat Command and Air Mobility Command respectively.

After the return of Strategic Air Command as Air Force Global Strike Command, historians at the Air Force Historical Research Agency, recommended the consolidation of Tactical Air Command with Air Combat Command and Military Airlift Command with Air Mobility Command. In each case, consolidation would in effect merge two commands into one. There were five good reasons to do so:

1. The consolidations would justify the Air Combat Command's use of the Tactical Air Command emblem and Air Mobility Command's use of the Military Airlift Command's emblem.

2. The consolidations would increase the years of service of both Air Combat Command and Air Mobility Command by more than 40 years, allowing them to trace their heritages back to the 1940s instead of only back to 1992.

3. The consolidations would increase the number of honors of Air Combat Command and Air Mobility Command by giving them also the honors of the older commands that would be merging with them.

4. The missions of Tactical Air Command and Air Combat Command were similar, if not identical, and the missions of Military Airlift Command and Air Mobility Command were also similar, even if the former did not have tankers.

5. Because Strategic Air Command was back, there was every reason to also bring back Tactical Air Command and Military Airlift Command.

Although it took seven more years for the consolidations to go forward, they happened in one crucial week in 2016. Between September 26 and October 1, Tactical Air Command was consolidated with Air Combat Command and Military Airlift Command was consolidated with Air Mobility Command. The mergers of the two pairs of commands has all advantages and no disadvantages. Bringing back Tactical Air Command and Military Airlift Command not only greatly enhances the heritages of Air Combat Command and Air Mobility Command, but also the heritage of the Air Force. We should rejoice that the Tactical Air Command and Military Airlift Command, both of which died in 1992, are alive again in Air Combat Command and Air Mobility Command. The heritage of the Air Force is enhanced, at no cost. ■

Rescue—1972: A year of challenge for rescue forces in the violent skies of Southeast Asia



Darrel Whitcomb

The HH-53. Even fighter pilots needed to have heroes.

We call it the Vietnam War. But that is a misnomer, for in the 10-plus years that the American military was engaged in that conflict, they faced enemy forces across the breadth and depth of Southeast Asia. Nobody knew that better than the airmen who flew across those vast regions. That was especially so in 1972, a most eventful and dramatic year. As it began, U.S. forces continued their withdrawal from the conflict, provided support to allied forces in South Vietnam, Cambodia and Laos, and interdicted supplies and troops along the Ho Chi Minh Trail in Operation Commando Hunt VII. However, on March 30, 1972, the North Vietnamese unleashed a massive invasion of South Vietnam with massed conventional and guerilla forces. South Vietnamese ground units faced the invaders. Remaining U.S. aerial and naval forces provided initial support to the South Vietnamese, and then prosecuted Operations Freedom Train, Linebacker (LB) I, and LB II.¹

These operations were supported by dedicated USAF and USN rescue forces who stood ready to attempt to rescue isolated U.S. and allied personnel throughout the Southeast Asia theater of operations. Additionally, USMC and U.S. Army helicopter and ground forces as well as special operations elements assigned to the MACV Studies and Observation Group, could conduct recovery missions in their areas of operations. Lastly, Air America (AirAm), a contract airline directly supporting our operations throughout the theater had rotary and fixed-wing aircraft which provided immediate recovery capability in many areas. This article presents a macro view of rescue operations. It will briefly discuss the build up of rescue forces starting in 1962, and their organizational and technological evolution up to 1972. It will discuss in general terms their operations during 1972 and highlight several specific rescue operations representative of our motivations, capabilities, and limitations at that time. Lastly, it will outline subsequent developments of rescue capability. It is based upon historical work done by Dr. Earl Tilford, Dr. Wayne Thompson, U.S. Navy veterans George Galdorisi and Tom Philips, Mr. Chris Hobson, and this author, and operational research done at the Historical Research Agency, Maxwell AFB, Ala.

Development of rescue capability in SEA

The first rescue personnel were assigned to South Vietnam in early 1962. Prior to that, some rescues of U.S. military assigned to advisory roles in Laos were conducted by Air America, or through diplomatic means. But with the deployment of significant military forces to South Vietnam, the commander of the Pacific Air Rescue Center dispatched three officers and two enlisted airmen to Tan Son Nhut Air Base near Saigon to establish a rescue center inside the newly established air operations center. Dedicated recovery forces were not deployed, and this small team initially established direct liaison



with primarily U.S. Army and Marine aviation units who could provide rotary aircraft recovery capability.² However, as forces grew in the theater and combat actions increased, the Joint Chiefs of Staff (JCS) directed the U.S. Air Force to deploy rescue aircraft to Southeast Asia specifically for search and rescue (SAR), which, up until that time, was being conducted by Air America assets on an almost ad hoc basis. Subsequently in May 1964, HH-43s and HU-16s deployed and assumed recovery duties. The HU-16s performed rescues at sea and also airborne command and control. However, both aircraft were of limited capability and were eventually replaced with HH-3s for recovery tasking in October 1965. The HH-43s were kept in theater for local base rescue and immediate area recoveries, and the HU-16s were utilized for C2 purposes until they were replaced with HC-130s. These aircraft had much longer range, loiter, and communications capabilities, and performed outstandingly as airborne mission commanders (AMCs) who coordinated rescue operations for the tactical aircraft involved in the incident. Additionally, the HC-130s

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were modified to provide inflight refueling for the HH-3s. This radical development gave these helicopters the ability to operate theater wide.³

The U.S. Navy also provided assets to the theater for SAR operations. In early 1965, they deployed helicopter elements to SEA for SAR duty from several different squadrons, flying the SH-2 and the SH-3. They could stage off of several different types of ships, and maintained a presence aboard ships as long as Navy strike forces were in the theater. The Navy could also utilize their SEAL Teams for recovery operations.⁴

Early on, the naval helicopter crews discovered that the skies over North Vietnam could be very dangerous, and they began requesting escort by U.S. Navy A-1s stationed aboard the aircraft carriers. The A-1s were very compatible with the flight characteristics of the helicopter. They would also escort the USAF HU-16s when requested. Learning from their example, the U.S. Air Force began using its A-1s stationed in Thailand and South Vietnam for the same purpose. They developed the ability to serve as on-scene-commanders (OSC) for actual pickups. In this role, they adapted the call sign "Sandy," a most revered moniker from that war.⁵ Subsequently, forward air controllers (FACs) flying O-1s, O-2s, and OV-10s were trained to assume initial OSC duties when aircraft were downed.

USAF and USN ... elements ... routinely rescued American and allied personnel as the need arose

Conversely, the U.S. Army and Marines did not have specified rescue units. Recovery operations were considered integral to the operations and capabilities of tactical units. Their aviation units and, when necessary, ground units would respond to rescue and recovery operations when called upon to do so, especially early in the conflict before USAF and USN rescue forces were in place.⁶ Throughout the conflict, elements from both routinely rescued American and allied personnel as the need arose. On September 12, 1968, USAF Capt Ron Fogleman was flying an F-100 on a close air support mission in South Vietnam when his aircraft was mortally damaged by ground fire. He ejected and landed in a mangrove swamp. A U.S. Army AH-1 working in the area quickly diverted to his location and picked him up before enemy forces could capture him.⁷

Air Force and Navy rescue units would also respond to calls for help from Army and Marine units. USAF pararescueman SSgt Bill Pitsenbarger, aboard an HH-43, was awarded the Medal of Honor for defending and facilitating the recovery of nine wounded soldiers near Saigon, South Vietnam, on April 11, 1966.⁸ From 1962 through 1973, USAF recovery forces saved, respectively, 838 USAF, 421 USN/USMC, 720 U.S. Army, 440 foreign military, and 181 civilians.⁹ Many of these rescues were facilitated by the simplest of expedients - all U.S. military and Air America aircraft were equipped with auxiliary 243 megahertz (mhz) receivers on their UHF radios - called "Guard" frequency - which enabled aircrews to instantaneously make contact



A-1s of the 1st SOS performed escort and on-scene-commander duties.

with other aircraft or control agencies in emergency situations.

As the war effort expanded, the USAF rescue forces continued to grow. On January 8, 1966, the 3rd Aerospace Rescue and Recovery Group (ARRG) was activated. By 1969, the 3rd ARRG commanded the 37th Aerospace Rescue and Recovery Squadron (ARRSq), equipped with HU-16s, HH-3, and later, HH-53s; the 38th ARRSq, equipped with HH-43s; the 39th ARRSq, equipped with HC-130s; and the 40th ARRSq, equipped with HH-3s and later, HH-53s.¹⁰ The commander of the 3rd ARRG also served as the 7th AF Director of Aerospace Rescue and oversaw the operations of the joint rescue coordination center (JRCC), located within the 7th AF Command Center. The JRCC directed Rescue Control Centers (RCCs) at Son Tra, near Da Nang Air Base, South Vietnam, and Udorn Air Base, Thailand, where SAR controllers would control recovery missions. The JRCC and RCCs would maintain constant communications with the HC-130 AMCs to facilitate the actions of the OSCs, and the support and recovery forces.¹¹ The 3rd ARRG directed all overland rescue operations and coordinated for overwater recoveries by the U.S. Navy rescue forces of Helicopter Squadron – 7 (HC-7) operating aboard U.S. Navy ships operating in the Gulf of Tonkin. The naval forces were also the primary rescue asset for rescues up to five miles inland in North Vietnam above 18 degrees North latitude.¹²

In the winter of 1967, the commander of the 3rd ARRG directed a review of their performance to date. In determining that 101 airmen had been denied rescue in the Hanoi and coastal areas of North Vietnam because of the intense enemy defenses, it concluded that a new recovery aircraft beyond the capabilities of the HH-3 was needed for the unique requirements of combat recovery in Southeast Asia. It needed to be faster, better protected, capable of precision navigation to the survivor's location and able to make recoveries in night and all weather conditions. To fulfill this requirement, the USAF procured the first six of eventually 52 HH-53B/C helicopters to supplement and then replace the HH-3s. However, the technology which would enable precision navigation under all weather con-

ditions did not yet exist, and was designated SEA Operational Requirement #114 (SEAOR #114) for future development.¹³ When the developmental work did not provide the desired results, engineers combined existing auto-pilot and navigation technologies with a Limited Night Recovery System (LNRS) which coupled a Doppler navigation system with a Low-Light Television system. Flight tests at Eglin AFB, FL, in 1970 showed that the aircraft did provide some night recovery capability, and six aircraft were modified for duty in SEA, arriving at the 40th ARRSq in late 1970 and 1971. However, the aircraft proved to have significant limitations, and could only be fully utilized in a permissive threat environment, over relatively flat terrain, and in visual meteorological conditions.¹⁴

The development engineers at Eglin were also busy developing LASER designation systems for use in combat. These amazing devices would give aircrews the ability to designate a target to which a LASER guided bomb could be precisely delivered. Fifteen OV-10s assigned to FAC duty with the 23rd Tactical Air Support Squadron at Nakhon Phanom (NKP) Air Base, Thailand, were modified with LASERS for this purpose. The aircraft were also equipped with LORAN navigational systems which could be used to determine the coordinates of the target being designated for strike, and the FACs immediately realized that these aircraft could be effectively utilized in SARs to determine survivor location coordinates, destroy enemy forces opposing the SAR, and if necessary, lead the recovery forces to the survivor(s). Called Pave Nails, they quickly became a key element of the theater SAR force, although the OV-10s could not be used in high threat areas.¹⁵

By 1972, the USAF rescue force in SEA was a mature force. The USAF rescue helicopter call sign was "Jolly Green," a proud moniker, known and revered by all. However, reflecting the withdrawal of U.S. forces from Vietnam which began in 1969, the 38th ARRSq was inactivated in 1971, and its HH-43 detachments were transferred to the 3rd ARRG.¹⁶ As the year began, the 37th, 39th, and 40th ARRSq stood prepared to respond to downed airmen across the span of the theater with their HH-53s and LNRS aircraft now also modified with Electronic Location Finders



An HH-53 approaching the hover.

(ELF) to home in on survivor radios; Radar Homing and Warning receivers, to alert them to enemy activity; flare dispensers to protect them from heat seeking-missiles; and first generation night vision goggles to facilitate night flying.¹⁷ The A-1 pilots of the 1st Special Operations Squadron (SOS) were trained and equipped to serve as “Sandy” rescue escorts and OSC’s. However, they would be replaced by USAF A-7s in November when their war-horse A-1s were given to the South Vietnamese Air Force.

All fighter pilots and FACs knew how to initiate and conduct a SAR. En masse the combat aviators of the U.S. forces in SEA were ready and able to provide top cover for our ground forces as the nation withdrew from Vietnam. The rescue forces were their guardian angels. **To the helicopter pilots, Jolly Green was a call sign. To the FACs, and fighter pilots, and all of the crew dogs who flew combat missions in SEA, “Jolly Green” was a prayer.**

Statistical trail for 1972

Theater support & Operation Commando Hunt VII (January through March)

U.S. aerial forces provided direct support to allied forces in South Vietnam, Cambodia, and Laos, and continued to interdict the flow of men and material down the Ho Chi Minh Trail. They also conducted limited interdiction strikes into North Vietnam.

Fixed-wing aircraft Lost:¹⁸ USAF – 21, USN - 10

Results: 29 KIA / 40%
 5 POW / 7%
 39 recovered / 53%

Recovery by:¹⁹

Air America helicopters	5
U.S. Army helicopters	2
USAF helicopters	20
U.S. Navy helicopters	6
Unknown	6

USAF OV-10, Nail 31, March 18-19

A Pave Nail OV-10 searching for targets along the Ho Chi Minh Trail in central Laos, was shot down by heavy AAA. The pilot and weapons system operator (WSO) ejected. Another FAC in the area established voice contact with both and reported their location. The initial A-1 OSC was also shot down. The pilot ejected and was quickly picked up by an Air America helicopter. However, multiple AAA sites precluded recovery of the Nail 31 crew. For the next 18 hours, multiple airstrikes reduced the threat. The next morning, A-1s escorted an HH-53 from the 40th ARRS which recovered both crewmembers. *A classic SEA SAR task force operation with an Air America assist.*²⁰

USAF AC-130, Spectre 22, March 30-31.

Shot down by AAA near the Ho Chi Minh Trail in southern Laos. FACs, and A-1s, located all 15 crewmembers. 40th ARRSq HH-53s recovered 13, and Air Am helicopters recovered 2. *Classic SEA SAR task force operation with Air America assistance.*²¹

Freedom Train – Initial counter-invasion operations (April– 9 May)

U.S. aerial forces focused their efforts against invading North Vietnamese forces, and increased airstrikes in North Vietnam.



An HH-53C and its escorts.

Fixed-wing aircraft Lost: USAF - 25, USMC - 5, USN - 9

Results: 38 KIA / 43%
9 POW / 10%
42 recovered / 47%

Recovery by: ²²

Army helicopters	8
USAF helicopters	14
USN helicopters	10
USN ship	1
Special operations forces	2
unknown	7

**USAF EB-66C / OV-10 / OV-10;
Bat 21B / Nail 38B / Covey 282A,
April 2-18**

The EB-66 aircraft was shot down while escorting a B-52 strike on advancing North Vietnamese forces near Cam Lo, South Vietnam. Only the navigator, Bat 21B, survived. He was down among 30,000 enemy troops. USAF, USN, USMC, USCG and South Vietnamese personnel mounted five attempts to rescue him with the loss of two OV-10s, an HH-53C, and three U.S. Army helicopters. Additionally, 11 individuals were killed and two taken prisoner in the efforts. After General Creighton Abrams

forbade any more helicopter recovery attempts, a Special Forces team from MACVSOG, directed by a USMC Lt Col but led by a USN SEAL, recovered Bat 21B and Nail 38B. Covey 282A was killed before recovery. The operation was supported by over 800 airstrikes and naval gunfire. It highlighted the fact that *there were places where helicopters could not survive.*²³

USAF C-130, April 18

The C-130 was conducting daylight low-level drops of critical supplies to South Vietnamese units near An Loc, when it was hit by multiple rounds of AAA. The pilot aborted his run and departed the area. However, the aircraft was mortally damaged and the pilot made a crash landing in a marsh near Lai Khe. U.S. Army helicopters from the 229th Aviation Battalion and F Troop of the 9th Cavalry, recovered all eight crewmembers. *Ubiquitous U.S. Army helicopters provided a quick recovery capability in most areas of South Vietnam.*²⁴

Evacuation of Quang Tri Citadel, May 1

HH-53s from the 37th ARRSq evacuated 149 U.S. and South Vietnamese troops from the fortress as enemy units swarmed in and around the city. A-1s provided cover and FACs directed supporting airstrikes. *Largest single evacu-*



The Pave Nail OV-10s became a key partner in rescue operations.

ation of the war. Multi-role capabilities of rescue units. Note: Over the next 24 hours, an O-2, 3 A-1s, and 4 UH-1s were downed by SA-7s. Most personnel were recovered by US Army helicopters. *Deadly new threat.*²⁵

USAF SR-71, May 2/4

Two sonic booms over Hanoi at the same time each day. This was a signal from national leaders to the POWs below – escape attempts are approved. SEAL elements were deployed in Gulf of Tonkin for recovery as part of Operation Thunderhead. The effort was unsuccessful, with one SEAL killed. This was a clear example of *national commitment* for recovery of our personnel.²⁶

Linebacker I (May 10 – December 17)

This was an interdiction campaign directed primarily at the North Vietnamese supply system and designed to attrit their forces so that the military of South Vietnam could defend its nation.²⁷

Fixed-wing aircraft lost: USAF-101, USMC-14, USN-60.

Results: 184 KIA / 46%
 69 POW / 17%
 149 recovered / 37%

Recovery by:²⁸

Army helicopters	8
USAF helicopters	49
USMC helicopters	2
USN helicopters	40
USN ships	11
Ground forces	18
VNAF helicopters	2
Crash recovery home base	10
AirAm helicopters	3
Unknown	6.

USAF F-4D, Oyster 01B, May 10 - June 2

On the first day of Linebacker, Oyster 01 was shot down near the Yen Bai MiG base. The pilot was killed and the WSO, Capt Roger Locher, ejected. He did not make radio contact with orbiting aircraft because he believed that he needed to move away from the base to facilitate a recovery. He evaded until June 1, when he then contacted U.S. forces passing overhead. A rescue task force of HH-53s and A-1s orbiting over northern Laos attempted to reach him. They were driven away by defending forces including MiGs. The rescuers planned a maximum effort the next day. The 7th AF Commander, General John Vogt, supported the effort saying, "The one thing that keeps our boys motivated is the certain belief that if they go down, we will do absolutely everything we can to get them out. If there was ever a doubt, morale would tumble." *Guided by that moral imperative*, the rescue task force, supported by over 100 other aircraft, flew deep into North Vietnam and rescued Locher.²⁹

USN A-7A, Canyon Passage 407, August 6

The aircraft was on a night interdiction mission 20 miles southwest of Vinh, when it was hit by an SA-2, and the pilot ejected. His wingman reported his shootdown and location. A USN SH-3 launched from the *USS England*, ingressed at low level to avoid the SAMs and made a night recovery of the downed aviator in a high-threat area. *The dark night afforded protection from the AAA.*³⁰

USAF F-105G, Bobbin 05, November 15-17

While escorting a B-52 on a night strike near Thanh Hoa, the aircraft was shot down by an SA-2. The two crewmembers ejected and landed on a ridge. The next morning, an F-4 Fast FAC contacted them and determined their location. USAF A-7s had assumed the Sandy role and tried to initiate a rescue. However, low ceilings and massed AAA guns along the coast precluded an attempt. At first light on the 17th a package of 47 aircraft launched. The A-7s utilized their inertial navigation system and projected



U.S. Army helicopters operated everywhere in South Vietnam.

map display to guide the Jolly Greens into the area and then suppressed the enemy gunners with ordnance and a smoke screen while both men were recovered and the Jolly Greens egressed back to Thailand. *The A-7s with their modern navigational systems brought some much needed technological improvement to combat rescue. However, their higher speed as compared to the old A-1 dictated that they could not maintain visual contact with the Jolly Greens and overall situational awareness of rapidly changing SAR situations.* These challenges would beguile them soon over the skies of Hanoi.³¹

Linebacker II (December 18 – 29)

U.S. and North Vietnamese delegations had been meeting to conclude a peace agreement. When the North Vietnamese leadership balked, heavy airstrikes "...aimed at sustaining maximum pressure through destruction of major target complexes in the vicinity of Hanoi and Haiphong," were initiated to force the North Vietnamese to agree to resume the cease-fire process.³²

Fixed-wing aircraft lost: USAF – 22, USMC – 3, USN - 5

Results: KIA - 54 / 42%
POWs - 43 / 34%
Recovered - 30 / 24%

Recovered by:³³

USAF helicopters	18
USMC helicopters	6
USN helicopters	2
Crash recovery home base	2
Unknown	2

USAF AC-130, Spectre 17, December 21

Laos – Ho Chi Min Trail, 25 miles west of Saravan. 14 killed, 2 saved by Jolly Green 32, an HH-53 from the 40th ARRSq. Overall navigation was by TACAN and visual location of survivor infra-red strobes. Another AC-130

served as the OSC and provided on-call AAA suppression. *This was the first successful night recovery by LNRS system. Ambient light facilitated use of Low Light TV. Stated the aircraft commander: "[Darkness] protected us from ground fire in the SAR area."*³⁴

USAF F-111, Jackel 33, December 22

Post strike, shot down 17 miles SW of Hanoi. Sandy A-7s determined general position of both survivors on December 24. Poor weather and enemy threat precluded an LNRS recovery. The pilot was captured by search teams. On December 24, rescue forces attempted a recovery of the WSO but were blocked by bad weather. On December 26, Sandy A-7s escorted two Jolly Greens for an early morning rescue attempt. Jolly Green 73 came to a hover over the survivor as he scrambled to get on the jungle penetrator, he was blown back by the rotor wash. The aircraft was taking heavy fire which severely damaged the machine and wounded the copilot, and the crew had to abandon the attempt. The Jolly's refueling system had been damaged and they could not take fuel from the escort HC-130. The Jolly crew landed the aircraft along the Laotian border and the second Jolly Green picked up the crew. The A-7s destroyed the aircraft. The WSO was captured. He and the pilot were released by the NVA in March 1973.³⁵ *The immediate Hanoi area was just too dangerous for helicopters.*

Nobody was rescued from the Hanoi area (25 miles radius) during 1972. All of the rescued B-52 crewmembers were either in Laos or Thailand.³⁶ Our rescue efforts during LB II were of limited success.

However, from a rescue perspective, there is another way to look at this. The all-out effort of LB II convinced the North Vietnamese to agree to the peace agreement negotiated over the last two years. The "Agreement on Ending the War and Restoring Peace in Viet-Nam," was signed by representatives of the United States, North Vietnam, South Vietnam, and the Viet Cong in Paris on January 27, 1973. Within it, Article 8 stipulated "the return of captured military personnel and foreign civilians" In February and March, 591 prisoners, including those captured during LB II, were returned to U.S. control. Perhaps it can be argued that LB II, was our greatest SAR effort of the war, because it precipitated the return of those Americans held by the North Vietnamese.³⁷ The returning POWs seemed to feel that way. Remembered USAF Col John Flynn, the senior POW officer, "When I heard the B-52 bombs going off, I sent a message to our people. It said, 'Pack your bags – I don't know when we are going home, but we're going home.'"³⁸

1972 totals

Fixed-wing aircraft lost:
USAF – 169,
USMC – 22,
USN - 79

Results: KIA – 305 / 44%
POWs - 126 / 18%
Recovered 261 / 38%



Air America, the CIA's private airline, was of critical importance to rescue operations. Here, they are shown re-supplying some Hmong soldiers.

Recovered by:³⁹

Air America	8
Army helicopters	18
USAF helicopters	101
USMC helicopters	8
USN helicopters	59
USN ships	12
Spec Ops	2
VNAF helicopters	2
Ground forces	18
Crash recovery home base	12
Unknown	21
Rescue Helicopter losses:	
USAF HH-3	1
USAF HH-53	4. ⁴⁰
USN	0. ⁴¹

Awards for 1972 actions:

Medals of Honor, 3 – all were for actions which led to the recovery of personnel in distress.⁴² (All occurred in a relatively small area north and east of Quang Tri.)

Service Crosses:

Air Force, 20 – 7 awarded for rescue efforts: HH-53 pilots – 2, PJ – 1, A-1/A-7 pilots – 4.⁴³
 Army, 27 – 12 awarded for rescue efforts.⁴⁴
 Navy, 13 – 5 awarded for rescue efforts.⁴⁵

Other awards:

The number of Air Medals, Commendations Medals, Distinguished Flying Crosses and Silver Stars is unknown.

However, from 1966 through 1973, USAF rescue personnel were awarded almost 17,000 individual awards.⁴⁶

During 1972, the commander of the 3rd ARRG was Col Cecil Muirhead. He gave up command on January 9, 1973, to Col Herbert Zehnder. In their end-of-tour reports, both discussed rescue operations in 1972, citing successes and failures and suggestions for the future.

The A-7s with their new technology brought new capabilities to the Sandy role. However, their higher speeds impacted their compatibility with rescue helicopters and necessitated modifications to classic escort tactics. The A-7s also needed to be equipped with the ELF for quicker survivor location.

Overall, the rescue forces needed an ability to more quickly locate survivors.

NVGs enhanced the performance of the aircrews at night and should be exploited.

AC-130s, with their sensors and firepower, could very effectively serve as OSC in a low threat environment, especially at night.

Rescue needed a better, smaller and faster helicopter which could survive in a high threat environment. Zehnder added: "Recovery by air of survivors downed in extremely heavily defended areas, such as Hanoi itself, is generally impossible."⁴⁷

Additionally, SEAOR #114, the requirement for a night/all-weather rescue capability was still on the books.

Further considerations:

The totality of rescue asset available, either dedicated



Capt. Dale Stovall (above) was awarded the Air Force Cross for the Oyster 01B rescue and was a participant in the other six Air Force Cross rescue missions in 1972.

—like the USAF and U.S. Navy units, or designated like the U.S. Army, USMC, Air America, or MACVSOG teams, created a ubiquitous presence of recovery assets across the theater.

The addition of auxiliary receivers on military UHF radios tuned to frequency 243.00 mhz, provided an immediately available conduit for those in distress to call for and receive timely assistance. It facilitated countless rescues across all service elements.

In noting these results, Dr. Earl Tilford, in his seminal book, *Search and Rescue in Southeast Asia*, wrote, “The rescue crews gave each mission all they had. Nevertheless ... there was only so much the helicopters could take.”⁴⁸

The motto of the USAF rescue forces was and remains, “These things we do - that others may live.” That statement encompasses the moral imperative so clearly stated by General Vogt during the Oyster 01B recovery. However, aircraft — especially helicopters operate according to the immutable laws of physics and no amount of moral imperative can override those inviolate limits. There were just places where helicopters could not go in the violent skies of Southeast Asia in 1972.

Postscript

After our return from Southeast Asia, the USAF’s Military Airlift Command, which commanded the Air Force rescue units, directed the full development of a night — all weather rescue capability under a program called Pave Low. In the late 1970s, nine HH-53Cs were modified with inertial navigation systems and terrain following radars which provided this capability for rescue forces. The aircraft were slated for service with the 41st ARRSq at McClellan AFB, California. However, when the Iranian hostage rescue failed, these aircraft were transferred to the 20th Special Operations Squadron (SOS), at Hurlburt Field, Florida, to serve as lead aircraft for a second rescue effort. That effort was never executed. However, the aircraft stayed with the 20th SOS and became a bedrock element of the buildup of our special operations forces which culminated with the activation of the Special Operations



The U.S. Navy’s SH-3 provided rescue from the sea.

Command in 1987, and its subordinate Air Force Special Operations Command, in 1989. Subsequently, the aircraft were modified with global positioning systems, integrated navigation systems, electronic countermeasures and jamming systems, and were re-designated as MH-53J aircraft. In addition to their special operations duties, these aircraft served as primary combat search and rescue aircraft in Operations DESERT STORM, DENY FLIGHT, and ALLIED FORCE. In DESERT STORM, Pave Low crews conducted a rescue mission for a downed F-16 pilot in day-time low visibility conditions. The crew flew to the location of the downed pilot in Iraq, but he had already been captured. They also conducted a successful rescue of a USN F-14 pilot in daytime and clear skies. In Serbia, MH-53s led recovery task forces which included MH-60s, for the successful night recoveries of an F-117 pilot, Lt Col Dale Zelko, and an F-16 pilot, Lt Col David Goldfein. The recovery of the F-117 pilot was under low visibility conditions and the ultimate validation for a night all-weather recovery capability requirement (SEAOR #114) first drafted in SEA in 1967. The MH-53s also saw service in Afghanistan and Iraq, primarily in their special operations role, and were inactivated in 2008. Of the block of 52 HH-53s and 20 CH-53s which served in SEA, and were later designated for conversion to Pave Low aircraft, only 30 actually made it to retirement.⁴⁹

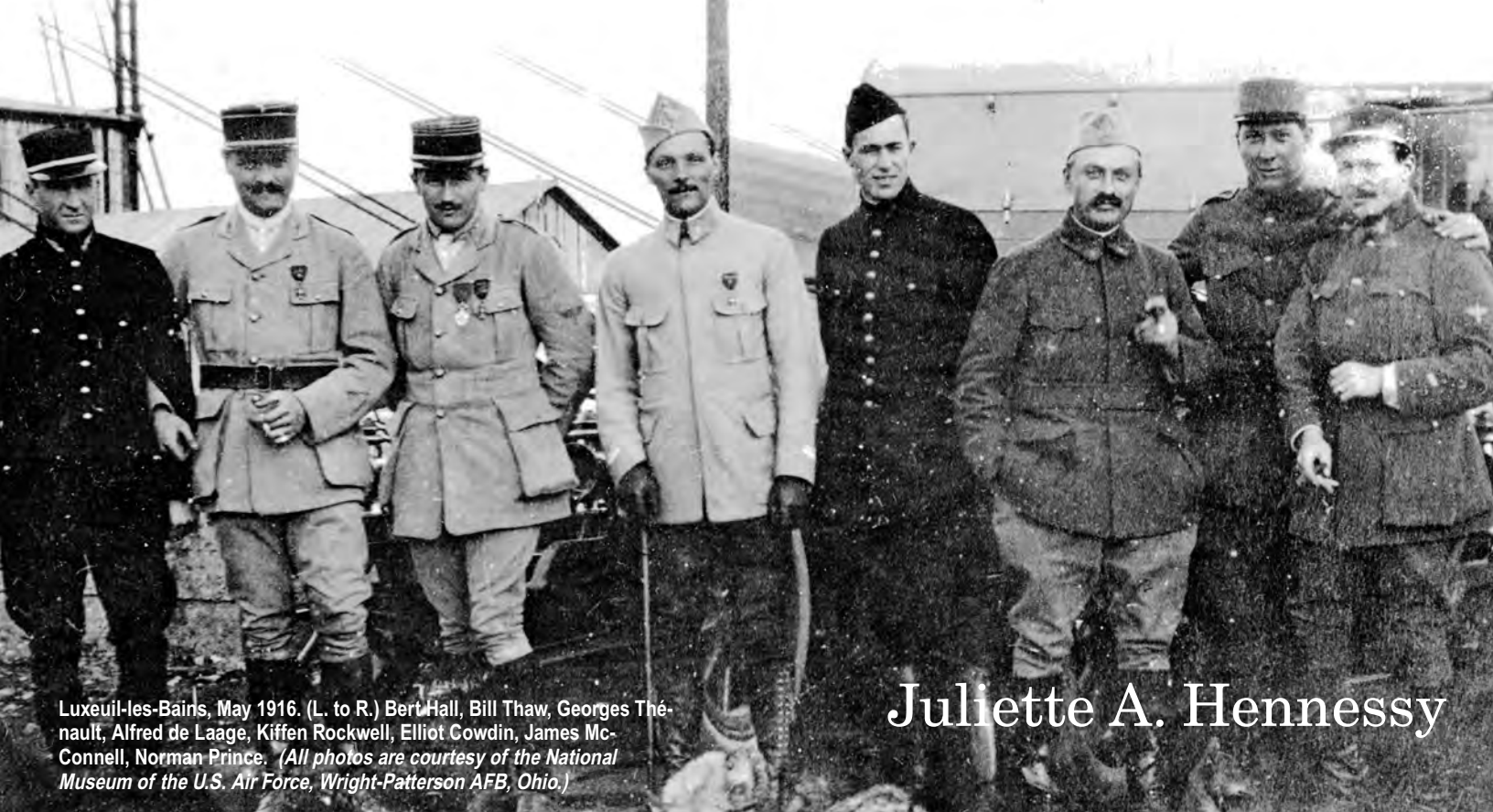
On July 1, 2016, General David Goldfein became the 21st Chief of Staff of the U.S. Air Force. The rescue saga continues.⁵⁰ ■

A pre-takeoff reminder to the aircrews.



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MEN AND PLANES OF WORLD WAR I AND A HISTORY OF THE LAFAYETTE ESCADRILLE



Luxeuil-les-Bains, May 1916. (L. to R.) Bert Hall, Bill Thaw, Georges Thénaulf, Alfred de Laage, Kiffen Rockwell, Elliot Cowdin, James McConnell, Norman Prince. (All photos are courtesy of the National Museum of the U.S. Air Force, Wright-Patterson AFB, Ohio.)

Juliette A. Hennessy

This article was originally printed in *The Air Power Historian* in two parts in 1956 and 1957. It is reprinted here as part of the 100th anniversary of World War I.

The establishment of the concept of the airplane as a new and revolutionary weapons system was slow indeed. To many of the early believers in aviation as air power it must have been frustratingly slow.

It is true that even in the very beginning, following the Wright Brothers' invention, there were a few outstanding visionaries, among them, H. G. Wells, Dr. Alexander Graham Bell and Prime Minister Jan Christian Smuts, who foresaw the tremendous potentialities of the airplane. Later on came such staunch advocates of Air Power as Giulio Douhet and Count Caproni of Italy. Still later we had our own disciples in Captain Paul W. Beck and in General Billy Mitchell. All were voices in a minority; they were considered by the more practical military men of the day as hopeless visionaries and daydreamers." The opinions of such as these could not be held in very high esteem by the conservative military mind.

Although the airplane was invented in America, it may be considered ironic that the United States was one of the slowest nations to really accept it. As a matter of fact, by the time of entry of the U.S. into World War I in 1917, the United States ranked seventh in strength as an air power. France, England, Italy, and even Russia outranked us in this category.

In spite of the proven capabilities of the airplane as a weapons system during World War I, crude though the systems and procedures may have been, and in spite of the proven potentialities of the airplane as a bomber in the strategic concept following World War I, it was not until World War II was well under way that the airplane actually came into its own.

Perhaps the slow growth of air power may be attributed to human nature and to the fact that the military mind has always been geared to tradition and is reluctant to change. For instance, the cavalry was actually outmoded when the first good repeating rifle was invented and was doomed when the Gatling gun of 1862 became a military weapon. Yet, the cavalry was considered a vital part of the military structure until just prior to World War II, when it had to be supplanted by tanks.

The pattern for conservation was followed by Congress, as evidenced by the scant attention paid to aviation prior to 1913. In March 1911, Congress allocated the first specific appropriation for Army Aeronautics in the amount of \$125,000 for the following fiscal year; for the next year Congress allotted \$100,000 for aeronautics.

Congress passed little air legislation and promoted very little interest in aviation. However in December of 1912, President Taft appointed a commission to report to Congress on a National Aerodynamic Laboratory. After three meetings



The Lafayette Escadrille, July, 1917.

the commission recommended the establishment of such a laboratory patterned after the one in Great Britain and to come under the Smithsonian Institute in Washington, D.C. Then in January 1913, the Senate passed a bill authorizing the establishment of a National Aerodynamic Laboratory and on May 9, 1913 President Woodrow Wilson approved twelve advisory members. After much studying and investigation on the part of this committee, legal technicalities prevented the actual formation of the laboratory. It was not until about two years later on March 3, 1915 that President Wilson was authorized by the Congress to appoint the National Advisory Committee for Aeronautics.

The author was a historian in the USAF Historical Division, Research Studies Institute, Air University, (now known as the Air Force Historical Research Agency) Maxwell Air Force Base, Alabama, and labored for a number of years in writing a history of the United States Air Force from the days of balloons in the Civil War, 1861, until World War II. Part of the story of the Lafayette Escadrille is taken from her files of that history. Mrs. Hennessy received a B.S. degree in Education from the University of Arkansas, and did graduate work at the University of Missouri and Washington University (St. Louis). She has written Statistical Summary of Air Action in the Philippines and Netherlands East Indies, 7 Dec. 1941-26 March 1942; Tactical Operations of the Eighth Air Force, 6 June 1944-8 May 1945; The Air Service in World War I; and The United States Army Air Arm, 1861-1917.

Representative Hay as an Air Advocate

Representative James Hay of Virginia became an advocate of legislation to promote a better Air Service early in 1913. Representative Hay tried early that year to separate the Air Service and to give it greater stature and importance. The War Department did not favor the bill as introduced by Representative Hay. Many of the officers felt at that time that the air arm had not developed sufficiently to be placed in the Army line as a separate unit. Others objected because it made no provisions for certain captains and lieutenants already on active duty. These objections to a separate corps were upheld by the officers of the Air Service. In the face of such opposition from the officers most closely associated with aviation, the bill was abandoned by the Military Affairs Committee. This was one of a series of frustrating attempts through the years to make the air service a separate and distinct unit with its own command structure. It must be pointed out that Captain Paul W. Beck, later killed in a military accident, was one of the very few staunch advocates for a separate service.

On May 16, 1913, Representative Hay again introduced an air resolution, which became known as H. R. 5304. In many respects it was identical to his previous proposal. But again there was opposition from within the corps of officers to separate the Air Service and again Captain Beck was just about the only supporter of the bill. Captain Beck wanted aviation removed from the Signal Corps because he felt that if it remained under the Signal Corps it would probably never achieve any size or importance; further, he believed that the longer the Signal Corps had con-



U.S. Representative James Hay, (D. Va.)

trol of aviation the more difficult it would be to break away in later years. But as of this time, even the few staunch advocates for a separate air arm did not contemplate the airplane as a powerful war weapon of the future; apparently the main issue was the growth of the service rather than its importance to the Army, and to the country in particular.

H. R. 5304 was passed by the Congress on July 18, 1913 and was the most important measure yet approved on air legislation. It authorized the Aviation Section under the Signal Corps and provided many of the benefits which had been advocated. Then finally, this same Congress appropriated for the Fiscal Year 1914 \$250,000, or twice as much as had heretofore been granted.

The Men—1913, 1914

With the termination of 1913 official historical records indicate that there were twenty officers on duty at the Signal Corps Aviation School in San Diego. This was the only official school in existence for many years during those periods of early growth of military aviation. These twenty were:

- 1st Lt. T. F. Dodd, CAC
- 1st Lt. B. D. Foulois, Inf.
- 1st Lt. Harold Geiger, CAC
- 1st Lt. L. E. Goodier, Jr., CAC
- 1st Lt. R. C. Kirtland, Inf.
- 1st Lt. H. LeR. Muller, Cav.
- 1st Lt. W. C. F. Nicholson, Cav.

- 2nd Lt. J. E. Carberry, Inf.
- 2nd Lt. C. G. Chapman, Cav.
- 2nd Lt. V. E. Clark, CAC
- 2nd Lt. H. A. Dargue, CAC
- 2nd Lt. J. P. Edgerley, Inf.
- 2nd Lt. B. Q. Jones, Cav.
- 2nd Lt. T. D. Milling, Cav.
- 2nd Lt. J. C. Morrow, Inf.
- 2nd Lt. D. B. Netherwood, CAC
- 2nd Lt. H. B. Post, Inf.
- 2nd Lt. Fred Seydel, CAC
- 2nd Lt. W. R. Taliaferro, Inf.
- 2nd Lt. R. H. Willis, Jr., Inf.

By early February, 1914, only eighteen officers were on active duty with the Aviation Section of the Signal Corps. Prior to this date eighteen other officers had been relieved from duty with the Aviation Section and twelve others had been killed. This meant that for a period from 1909 when the first flying machine was purchased by the Army until 1914, only forty-eight officers had been detailed to flying duties, or assigned to duties involved with flying.

A short tribute is hereby paid to the twelve officers who had been killed up until this date:

- 1st Lt. Thomas E. Selfridge
- 2nd Lt. G. E. M. Kelly
- 2nd Lt. L. W. Hazelhurst
- 2nd Lt. L. G. Rockwell
- 1st Lt. Rex Chandler
- 1st Lt. Joseph D. Park



Benjamin D. Foulois, seen here as a brigadier general.

1st Lt. Loren H. Call
 1st Lt. Moss L. Love
 2nd Lt. Perry C. Rich
 2nd Lt. E. L. Ellington
 1st Lt. Hugh M. Kelly
 2nd Lt. Henry B. Post

Lt. Post was killed on February 9, 1914, in a Wright model "C" when he crashed into San Diego Bay. He had just reached a height of 12,140 feet for a new altitude record and which was about 500 feet higher than Lincoln Beachey's official altitude record. The accident investigators reported that from that altitude Lt. Post descended to approximately 1,000 feet without incident, and from about 1,000 feet to 600 feet at an increasingly steeper angle. At about that altitude the plane assumed a vertical nose-down position and crashed into the Bay.

This incident is recorded here because it was one of several which gave the "C" model quite a bit of notoriety and one of the concluding incidents which helped to condemn that particular airplane. The government had originally purchased six "C" models and five of them killed six men. The sixth one was destroyed in Manila Bay, when Lt. Frank P. Lahm had attempted a water takeoff and nosedived into the Bay after he had attained a height of about fifty feet. Also this was the same model which nearly killed Lt. H. H. "Hap" Arnold at Fort Riley, Kansas in 1912.

All of the accidents in which the "C" models were involved had a common characteristic—the nosing over of the airplane as it picked up speed. An investigating board after the Post accident concluded that the elevator of the "C" was too weak and as the speed of the airplane increased, so did the angle of dive. This caused the airplane to nose over, and apparently the effect could not always be overcome by the pilots.

The actions of this investigation board were historic in another way. This board officially recommended that all future airplanes purchased by the Army be of the tractor type; this in effect, sounded the official death knell of the pusher-type airplane and which was not to be used again successfully until the B-36 of the mid-forties.

In the early days of the Aviation Section all the personnel assigned to aviation duties came from other line units of the Army such as the Infantry or the Cavalry. This was true also of the enlisted personnel who were assigned to the Aviation Section as a result of indicated desires or because of some mechanical aptitudes or abilities. Some of the enlisted men even learned to fly the airplanes, although there were no specific provisions in regulations authorizing such flying; but then, neither were there provisions prohibiting it. By 1914, some fourteen enlisted men had learned to fly, including Sgt. Vernon L. Burge who was the first enlisted man taught to fly—by Lt. Lahm in the Philippines.

The Machines—1913, 1914

The competition in the airplane building industry accelerated slowly, keeping pace only with the development of aviation interests in the military. For a long time only the Wrights built successful airplanes, although there were many inventors who announced and claimed that they had invented the machine which solved all the problems of flying. Gradually, however, other companies did produce successful flying machines, among the most notable of which were the Burgess Company and the Curtiss Company. Being younger and more energetic than the older Wright Company both researched new ideas. As a result, both were soon producing the tractor-type airplane which quickly outmoded the pushers, still being built by the Wrights.

However, while the tractors developed greater inherent stability, the engine up front greatly reduced visibility, and for a while this was considered detrimental especially since the airplane was to be used for reconnaissance. Further, the tractor engine was required to produce greater horsepower in order to achieve a satisfactory range of speed.

At the Signal Corps Aviation School most of the airplanes being used for training purposes were of the Wright pusher models. Curtiss established an operating section on the south end of the field at North Island and conducted an energetic campaign of instruction for and assistance to the Army school. Gradually there developed intense rivalry between the factions of instructors who tried to promote the Wright system and those who tried to promote the Curtiss system. This competition became so intense that school officials considered it detrimental to the good efficiency of



The Curtiss flying school at North Island, San Diego, California, in 1911.

the school and combined the two sections. In order that the government be under no obligation to Curtiss, all the Army airplanes were removed to the north end of the field and all instruction under Curtiss stopped.

As we have seen, however, in a very short time, the tractor airplane gained great preference over the pushers.

Glenn Martin, who learned to fly in 1908, and who was an exhibition flyer and designer-builder of airplanes became a producer in 1914. His products were given favorable encouragement by the Inspector General of the Army for flying units. In 1911, Martin established his first factory at Santa Ana; his company later merged with the Wrights to form the Wright-Martin Aircraft Corporation in 1917. In 1918, Martin dissolved this partnership and again established his own aircraft plant which has been producing airplanes for the government ever since.

On July 2, 1914, the first of a series of Martin "T" tractors was bought through local purchase; this plane featured the new Martin landing gear and shock absorbers. The instruments consisted of a gasoline gauge, an air gauge, an oil gauge, an electric tachometer and a thermometer. The plane cost the government \$4,800 without the engine. (Contrast this with the cost of current aircraft.) The Army put on a Curtiss 100 horsepower engine.

Curtiss began delivering the famous "J" models on September 15, 1914. This was the forerunner of the famous "Jennie" series. Captain Muller used this first Curtiss plane to establish a new altitude record of 16,798 feet; later Lt. B. Q. Jones used it to develop acrobatic techniques. In it, Jones executed the first deliberate stalls and stalled loops. It was in this same airplane, about one year

later, that Lt. Taliaferro was killed while performing acrobatics.

Burgess-Dunn was another manufacturer supplying the government with airplanes and in December 1914, delivered an armored tractor airplane which cost \$6,025. It was on this airplane that experiments were conducted with the Benet-Mercier machine gun. (Incidentally, the gun alone weighed 1,700 lbs.) The plane was equipped with a powerful 120 hp. Salmson engine.

Activities of the Flying School at North Island, San Diego

The original personnel of the Aviation Section of the Signal Corps created by the Act of July 18, 1914, consisted of nineteen officers and 101 enlisted men. The following were the first officers to be put on flying status:

Capt. B. D. Foulois
 Capt. L. E. Goodier
 Capt. H. LeR. Muller
 Capt. T. F. Dodd
 1st Lt. W. R. Taliaferro
 1st Lt. T. DeW. Milling
 1st Lt. Carleton G. Chapman
 1st Lt. Joseph C. Morrow
 1st Lt. Joseph E. Carberry

All were rated as Junior Military Aviators on July 23, 1914, according to the provisions of the law.

It might be interesting to note, in general, the mission



The first of the new Curtiss JN-2s at the Signal Corps Aviation School, North Island California. Sgt Vernon L. Burge stands under the propeller. The figure in the cockpit appears to be Capt. Foulois. (Vernon L. Burge Collection, Airman Memorial Museum.)

of the Aviation Section as outlined for us at that time. The mission of the Aviation Section was the operation of, or the supervision of operation of all military aircraft, including balloons, and airplanes, all appliances thereon, and for the training of officers and enlisted men in military aviation.

On September 17, 1914, the Army paid the first official flying visit to the Navy when the commander of the School at North Island, Captain Cowan, together with a civilian instructor, Mr. Francis Wildman, landed a flying boat in San Diego Harbor along-side the *USS San Diego* and was hoisted aboard. After the official formalities, Captain Cowan and Wildman took off from the water, circled the *San Diego* several times and then returned to the landing field.

Prior to the establishment of the altitude record in Sept. 1914, Capt. LeR. Muller had conducted several test flights to determine the best climb angles and speeds, as well as the rates of consumption of fuel and oil. The flight to 16,798 feet required 2 hours and 27 minutes. The airplane was equipped with a tachometer, gravity needle oil gauge, clock, aneroid barometer and a large registering barograph. Between 12,500 feet and 13,000 feet Muller reported that the engine suddenly lost about fifty revolutions per minute, but that he was able to compensate for the loss by adjusting the mixture needle of the carburetor. Between 14,000 and 15,000 feet he encountered violent turbulence which forced him to hold the airplane level on several occasions, and even to nose down to prevent from stalling. At about 16,000 feet he reported that he had a suggestion of nausea; which wore off, and then finally he experienced a

feeling of exhilaration just at the peak of his climb. (No oxygen was used in those days.)

On November 5, 1914 occurred what is officially believed to be the first tail spin. Glenn L. Martin was demonstrating a new tractor to the Army, with Captain Goodier as passenger. Martin was trying slow speeds when at the end of a mile straight-way he turned too slowly and stalled. The airplane hit the ground on one wing and folded up like an accordion. Goodier, who was in the front seat, was thrown forward with such force that his nose was almost severed on the aluminum cowling and an old skull fracture was re-opened. The engine telescoped back and broke both his legs. The fuel tank broke loose, flooded him with gasoline, and the engine shaft bored a hole through his right knee. Martin, in the meantime, received only a scalp wound, for as he slid forward through the thin wall between the cockpits, Goodier served as a bumper to soften the blow.

Goodier was sent to Letterman General Hospital in San Francisco; was relieved from active duty in 1916, but was recalled a short time later.

During the summer of 1914, at the Aviation School, many experiments and tests were conducted by the pilots and men of the school with armaments and ordnance of various kinds, including bombs, artillery shells, grenades, bomb sights and dropping mechanisms. As a result of some of these tests Capt. Muller and others urged the development and purchase of special bombing devices after proving the practicability and accuracy of dropping live bombs from an airplane.



The Burgess Model H tractor aircraft.

General George Scriven, head of the Signal Corps, did not agree with his ambitious young officers, however, and no bomb sights were purchased. He held the view that the airplane was to be used primarily for reconnaissance work.

On November 25, 1914, Brig. Gen. William Crozier of the Ordnance Department suggested to the Chief of Staff that the Signal Corps consider mounting machine guns on airplanes for offensive use and offered his help to design mounts. The Army at the time was using two types of guns; an automatic 30 cal. 1909 machine rifle which was air-cooled and weighed 29 pounds, and a recently adopted Vickers water-cooled gun weighing 36 pounds. One each of these was used for tests at San Diego.

In December, 1914, the Signal Corps attempted to enter six airplanes and twelve pilots in the Mackay Trophy Contest scheduled for Los Angeles on December 21. Only two of the six planes managed to reach Los Angeles from San Diego. One of the planes was forced down into the Pacific Ocean; the others made forced landings because of engine or fuel failures. Only one officer was killed, however.

The contest was actually held on December 23, and of the two Army airplanes only one was able to finish the requirements of the contest and won the coveted trophy. This was a Burgess tractor flown by Capt. Dodd and Lt. Fitzgerald.

World War I, Summer of 1914

Meanwhile, World War I had broken out in Europe during the summer of 1914. Unprecedented attention was given to the airplane as a weapon. At the outbreak of the

war the British had approximately forty-eight airplanes; the French had 136 and the Belgians had twenty-four, while the Germans had a total of 180.

General Scriven took advantage of an opportunity to appear before the first congressional hearing held after the outbreak of the war in Europe to plug for a larger aviation budget. He pointed out that the year before Germany had appropriated \$45,000,000; Russia, \$22,500,000; France, \$12,800,000; Austria, \$3,000,000; Great Britain, \$1,080,000; Italy, \$800,000 and the United States, \$250,000. (On March 4, 1915, Congress appropriated \$300,000.)

When it was seriously accepted by the nations waging war in Europe that the airplane did greatly aid the armies in battle, the frantic race to develop the air forces began. Thousands of planes were hastily built in Europe and orders were issued to manufacturers in America.

The first bombing from airplanes took place in August 1914, not long after the start of hostilities. Bombs and hand grenades were dropped manually from planes without benefit of bomb sights or accurate dropping devices. In August, German planes bombed Paris, and this event probably marked the first time that the airplane was used against civilian targets as contrasted against strictly military targets. The German Zeppelins did not begin bombing London until March and April of 1915, although they appeared over the city as early as January 1915. The Zeppelins were not too successful. It is difficult to imagine an easier target to shoot down.

The action of the airplane in combat in European skies followed a natural development and evolution. At first, the



William Thaw II and Whiskey, mascot of the Lafayette Escadrille. Paul Pavelka in the background.

planes were used almost solely and primarily for reconnaissance in conjunction with ground forces action. Within a very short time the airplane was being used for strategic reconnaissance purposes as well. Out of this action developed the necessity to prevent enemy planes from using their planes for reconnaissance of the friendly forces. This led to the development of the "protector" airplane, which more or less escorted the reconnaissance planes.

Airplanes then had to be developed to destroy the "protector" in retaliation, and still others had to be developed to fight those fighting the protectors. This was the evolution of the fighter plane.

Consequently, shortly after the outbreak of hostilities in Europe, the airplane fell into three categories, which became the forerunners of our different categories of combat planes. The reconnaissance plane was usually a tractor of about 150-200 hp and carried fuel for about seven hours flying time. The speed varied around ninety mph. The second type plane was the protector or combat plane and was generally a pusher with up to 500 horsepower. It was a

heavy plane and usually carried two or three light machine guns and one heavy rapid-fire gun. In general, it was clumsy and slow. It was used to carry bombs too, as was the reconnaissance plane. The third type was the fighter. This pursuit plane was always a tractor, light, fast and very maneuverable and manned by one skilled pilot.

The Lafayette Escadrille

Long before America entered World War I, the Lafayette Escadrille, a group of American fliers in the French aviation service, was organized. Norman Prince, a pioneer American civilian aviator who learned to fly in 1911 under the name "George W. Manor,"* seems to have conceived the idea of an all-American squadron in the French service. Prince arrived in France in January 1915, and immediately went to work to put his idea into effect. The first Americans to join him in his efforts to get the French Government to organize such a squadron were Frazier Curtis, Elliot Cowdin, William Thaw, Bert Hall, and James Bach. The last three were members of the French Foreign Legion who had transferred to aviation in December 1914, and had begun flying training at Bue, France. Cowdin had been in the American Ambulance Service in France; he, Prince, and Curtis signed their enlistment papers in the French aviation service on March 9, 1915, and were sent to Pau, where they were soon joined by Bach and Hall for flying training. Thaw elected to go to the front as a member of a French squadron to gain actual combat experience, with the idea of joining the others later if the American escadrille became a reality.

Meanwhile, another American, Dr. Edmund Gros, one of the heads of the American Ambulance Service in France and later a Major in the United States Air Service, was also dreaming of an American squadron. A number of Americans had already distinguished themselves in the French Foreign Legion and dozens were arriving in France to drive ambulances; this gave Dr. Gros the idea that they might take an even more active part as members of a flying unit. Then he happened to meet Frazier Curtis, who introduced him to Monsieur de Sillac, an official in the French Department of Foreign Affairs. Dr. Gros joined forces with Prince, Curtis, and the others in the effort to get an American squadron organized. Through de Sillac, the Americans were able to present their ideas to French officials who ultimately saw the advantages of having an American flying unit in the French forces. However, it was not until March 14, 1916, that the French Government finally agreed that an American squadron would be organized. The unit was authorized on March 21st.

On April 20, 1916, the *Escadrille Americaine*, officially N 124, was placed on duty at the front. It was commanded by French officers: Capt. Georges Thenault was in charge, with Lt. de Laage de Meaux as second in command; but all the pilots were Americans. The first seven members of the new unit were Norman Prince, Victor Chapman, Kiffin Rockwell, James McConnell, William Thaw, Elliot Cowdin, and Bert Hall. Frazier Curtis had had an accident in training which incapacitated him for further flying, and James



Dr. Edmund Gros.

Bach had been captured by the Germans in 1915. Many Americans were later added to the ranks, among them Raoul Lufberry, Chouteau Johnson, H. Clyde Balsley, and Didier Masson, the latter having flown with Villa's forces in Mexico.

The *Escadrille Americaine* was from the beginning a chasse or pursuit squadron. Originally provided with 13 metre Nieuports mounting a Lewis gun on the top plane, the squadron changed successively to the Vickers-armed 15 metre Nieuport and then to the Spad. It was customary for the French to recruit their pilots from among the veterans of bombing and observation squadrons, and they paid the Americans a very high compliment in sending them directly to the pursuit units.

As soon as the American escadrille arrived on the front the exploits of the American fliers began to attract worldwide attention, and many Americans were anxious to join the unit. Although the French escadrille was the equivalent of an American squadron, it was much smaller consisting of only about six airplanes. It was evident that this small unit could not possibly take care of all the Americans

who wanted to volunteer, and this brought about the formation of the Lafayette Flying Corps, a larger organization consisting of all American volunteers in the French aviation service, a number of whom were not in the *Escadrille Americaine* but flew as individual members of French *Groupes de Combat*. As replacements were needed in the escadrille they were furnished from the Lafayette Flying Corps, which was headed by a committee composed of Dr. Gros, Monsieur de Sillac, and W.K. Vanderbilt. The latter, an American millionaire, was made honorary president of the organization and furnished most of the funds to keep the organization going, contributing as much as ten thousand dollars a month. In addition to paying for the passage and hotel accommodations for prospective American fliers, the committee made a modest monthly allowance to each to supplement his pay after he entered the French service, as most of the fliers were noncommissioned officers in the French aviation service and their pay was very small. There was also a system of monetary awards set up for citations and decorations.

As time went on, an elaborate and smoothly running organization came into being. The American aspirant reported to the American representative of the committee, Philip A. Carroll, well-known in American air service history, who passed on his credentials, had him physically examined, and sent up for an hour's flight test at Mineola, New York. If satisfactory, he was then sent to France, where he reported to Dr. Gros, was given a second physical examination, and signed his papers of enlistment. He did not have to pledge allegiance to the French Government, so did not lose his American citizenship. If he was found to have no aptitude for flying he was released.

Most of the men of the Lafayette Flying Corps went through an interesting form of training under the old Bleriot system. In this type of training the pilot was always alone in the machine. Beginning with the three cylinder "penguins," incapable of flight, the student was taught to roll straight at full speed. When this was mastered, he passed to the six-cylinder "rouleurs" and from them to a machine capable of low flights, in which he did straight-aways, rising to a height of three or four yards. From this point it was an easy step to real flying, banks, spirals, serpentine and finally the cross-country and altitude tests for the French military brevet or pilot's license. This system was strongly reminiscent of the early training on the Curtiss machine in the United States.

From the Bleriot school, the Lafayette men were usually sent for a brief preliminary training on Nieuports at Avord, and thence to Pau, where they were taught to fly the service Nieuports, do acrobatic flying, and practice combat tactics. When they finished the course at Pau, the pilots were considered ready for the front and were sent to a pool at Le Plessis Belleville. Here they had a chance to fly service types of machines, and sooner or later were assigned to a squadron on the front, in some cases to the *Escadrille Americaine*, but usually, as the Corps increased in size, to a Spad squadron in one of the *Groupes de Combat*.

By the end of 1917, there were Americans scattered among the French fighting squadrons from the Channel to



Gervais Raoul Lufbery. (USAF Photo)

Belfort. They had enlisted as privates, been made corporals on receiving their pilot's license, and were made sergeants after thirty hours over the lines. Some, after 100 hours and a certain number of combats and victories, were made adjutants, and a very few attained commissioned rank. The great majority, however, were corporals and sergeants and lived with the noncommissioned pilots who constituted the great majority of the French Flying Corps.

The total enlistment in the Lafayette Flying Corps was 267, of whom forty-three were released because of illness, inaptitude, or injuries received in flying accidents before receiving the French military brevet. Of the remaining 224, five died of illness and six by accident; fifteen were taken prisoners (of whom three escaped to Switzerland), nineteen were wounded in combat, and fifty-one were killed in action at the front. Those who actually served at the front in French uniform numbered about 180 and fought with the *Groupes de Combat* of the French. These members of the

Lafayette Flying Corps, which included the Lafayette Escadrille, shot down and had officially confirmed 199 enemy aircraft.

Many of the Lafayette Flying Corps members gave their lives heroically in the service of France. Vernon Booth, wounded by an explosive bullet and shot down in no man's land, forty yards from the German lines, calmly set fire to his wrecked Spad under a storm of rifle and machine gun fire, before dragging himself to friendly territory to die; Stephen Tyson was killed in a bitter singlehanded combat against a swarm of Fokkers; Brank Bayries, always the aggressor, always outnumbered, was shot down while attacking a strong enemy patrol many miles behind the enemy's lines.

There were among the Lafayette pilots a number of brilliant fighters. Lufberry, a member of the Lafayette Escadrille and the greatest figure of the Corps, was one of the keenest and most skillful fliers. Baylies, a member of the Cigognes, the squadron of the famous French aces Dorme and Guynemer, was considered a prodigy, even in this band of aces. He was a dead shot and attacked at such close quarters and so bitterly that each combat was a duel to the death. Putnam was another famed for his reckless attacks. Always on the offensive, he cruised far inside the enemy lines on the prowl for iron-crossed prey, who he attacked with a ruthless disregard of odds, which ran up his victories but in the end led to his death. There were many others too, men like Cassady, Ponder, Lamer, Connelly, Parsons, Baer, and J.N. Hall, whose names often received mention in dispatches.

Kiffin Rockwell shot down the first enemy plane credited to the *Escadrille Americaine* on May 18, 1916, on the Alsatian front. It was his first combat, the first time he had encountered an enemy machine in the air, and the first time he had fired a gun at a German plane. With four shots he killed both pilot and observer and sent the enemy reconnaissance plane down in flames. Rockwell was also probably the first American to offer his services to France, for on August 3, 1914, he had written the French Consul at New Orleans volunteering his own and his brother's services.

In the fall of 1916, the German ambassador to the United States protested that Americans were fighting with the French and that communiqués contained allusions to an "American Escadrille," whose planes bore the insignia of the head of a Sioux Indian in full war-paint and feathers. Since America had not yet entered the war, it was deemed advisable not to use the name *Escadrille Americaine* and for a period after November 16, 1916, the squadron was simply called by its official number, N 124. Sometime later, however, the name was changed to *Escadrille Lafayette* at the suggestion of Dr. Gros.

In April 1917, America declared war and in June, General Pershing, with the first contingent of Americans arrived in Paris. It was soon rumored that Americans in the French service were to be transferred to their own Army, and in September a board was appointed to examine Americans who desired to make the change. Since they were to be given both physical and mental examinations to ascer-

tain their fitness to hold a United States' commission another board was appointed in October to conduct the actual exams. This board, composed of Majors R.H. Goldthwaite, Robert Glendinning, Edmund Gros, and William W. Hoffman, travelled from Verdun to Dunkerque, stopping at all airdromes where Americans were fighting with the combat groups, and examined those who wished to transfer. A list was compiled and the board made its recommendations on October 20, 1917.

A number of the Lafayette men who were recommended had to have waivers because they were considered old for flying—Maj. Raoul Lufberry was thirty-two and Capt. Robert Soubiran was thirty-one. Others had physical defects. Maj. William Thaw's vision in the left eye was 20/80, his hearing was defective, and he had a knee injury. Capt. Walter Lovell was thirty-three years old, color-blind, and had a slight defect in his hearing. Capt. Dudley L. Hill's vision in the right eye was limited to finger perception only. But these officers were valuable because of their experience with the French and they were all commissioned in the American Air Service with the ranks as given above.

In December 1917, ninety-three members of the Lafayette Flying Corps were transferred to the United States Air Service, while twenty-six transferred to United States Naval Aviation. The remainder chose to stay and continue fighting under the French flag. Many of the men who transferred did not receive notice of their American commissions until January or February 1918, and they continued to serve at the front as civilians still wearing their French uniforms and remaining with the 13th French Combat Group as a French unit. On February 18, 1918, the Escadrille Lafayette became the 103d Pursuit Squadron of the United States Air Service. This squadron had been organized at Kelly Field on August 31, 1917, and sent to France minus its pilots. A detachment of French mechanics was retained to instruct the newly arrived American non-flying personnel in their duties. The squadron, commanded by Maj. William Thaw, still under French orders, was attached to Groupe de Combat 15, for at that time there were no other American squadrons ready for service at the front. Seventeen former Lafayette Escadrille pilots were assigned to the 103d Aero Pursuit Squadron, while others were sent to new pursuit squadrons as they arrived at the front. Many served as commanding officers and flight leaders in the American squadrons.

Of the seven original members of the Lafayette Escadrille, four lost their lives while serving under the French as did Lt. d'Laage de Meaux. Victor Chapman was the first casualty of the escadrille, with Prince and Rockwell following shortly thereafter. McConnell was the last to be killed under the Lafayette colors. By the end of the war Elliot Cowdin had become a major and William Thaw, a lieutenant colonel in the American Air Service. When the American pursuit squadrons arrived in France the 103d Squadron became a training unit at the front for the new pilots. It continued to operate with the French until July 1, 1918, when it was made a part of the 2d Pursuit Group and later became the nucleus of the 3d Pursuit Group. But

this did not mean that the 103d didn't do its part in combat. On March 11, 1918, 1st Lt. Paul F. Baer destroyed an enemy airplane near Cervey-les-Rheims. This was the first victory for the 103d and the first scored by an American Squadron on the front. Lieutenant Baer* became an American Ace within a very short time, piling up a score of nine enemy aircraft downed before hostilities were over. Lt. Frank O'D. Hunter also shot down nine enemy airplanes, while Capt. G. Defreest Larner* got seven. Other aces of the 103d were Lt. William T. Ponder,* Capt. Edgar G. Tobin, and Lt. George W. Furlow. None of the Lafayette men received credit in the American Air Service for the enemy aircraft they shot down while in the service of France.

On May 6, 1918, the 103d Squadron was authorized to carry the American Indian Head of the Lafayette Escadrille as its insignia, for distinguished service with the French Fourth and Sixth armies. On July 29, Maj. William Thaw was made commanding officer of the 3d Pursuit Group at Vaucouleurs and was succeeded as commanding officer of the 103d by Capt. Robert I. Rockwell, who was in turn relieved by Capt. Robert Soubiran on October 18, 1918. These men were all former members of the Lafayette Escadrille. The squadron turned in its best performance on September 13, 1918, the second day of the St. Mihiel offensive, when Lt. George Furlow destroyed three Fokkers, Lt. H. D. Kenyon destroyed two, and Lt. Frank O'D. Hunter got one and aided Lt. G. D. Larner in downing an Albatross. All seven victories were confirmed and the squadron suffered no losses. On September 27, the 103d was commended by General Hunter Liggett for shooting down twenty-eight airplanes since February.

After the signing of the Armistice, the 103d Squadron was one of several air units ordered to Germany with the Army of Occupation, but the order was rescinded and the personnel returned to the United States. On March 21, 1919, the French Fourragere in colors of the French Croix de Guerte was awarded to the 103d signifying that the entire squadron was twice decorated with the French Croix de Guerre.

The Squadron was disbanded on August 18, 1919 at Mitchel Field, but it was reconstituted and consolidated with the 94th Squadron, Pursuit, on April 8, 1924. The 94th, whose insignia had been the Hat-in-the-Ring, took the well-known Indian Head of the 103d as its insignia. Thus the two most distinguished squadrons of World War I were joined, perpetuating the history and traditions of both.

At the end of the war the 94th Aero Squadron was considered the most outstanding American squadron. It had participated in 296 combats and gained sixty-nine victories. When this squadron entered combat on the front in March 1918, it was commanded by Maj. J.A.F.W. Huffer, who had downed four enemy aircraft while serving with the Lafayette Escadrille. In April the three flight commanders in the squadron were all former Lafayette Escadrille men—Capt. Kenneth Marr, Capt. David McK. Peterson, and Capt. James Norman Hall.

On April 14, 1918, Lieutenants Douglas Campbell and



Eddie Rickenbacker (left) and a group of mechanics.

Alan F. Winslow of the 94th Squadron each brought down an enemy airplane. These were the first two victories scored in France by a squadron which had been trained in America. Lieutenant Campbell became the first American Ace on May 31, 1918, and later in the same day Lt. Edward Rickenbacker became an ace. Before the war was over, Rickenbacker not only had become the American Ace of Aces with twenty-five enemy aircraft to his credit, but he had also been made commanding officer of the 94th Squadron. Other famous aces of the 94th were Maj. James A. Meissner and Capt. Hamilton Coolidge, both of whom shot down eight enemy aircraft (Coolidge was killed by a German antiaircraft shell); and Maj. Reid Chambers and Capt. Weir Cook, each credited with seven enemy aircraft. The 94th had the distinction of shooting down the last enemy aircraft of the war on November 10, 1918. This feat was accomplished by Maj. Maxwell Kirby.

In May 1918, the squadron became a part of the newly formed 1st Pursuit Group commanded by Maj. Raoul Lufberry, acclaimed as the originator of such fighter tactics as the Lufberry circle. Although he had seventeen enemy aircraft to his credit while operating with the French, Lufberry had never downed an enemy plane within the allied lines. Shortly after assuming command Lufberry was killed. In an attempt to keep an enemy plane from escaping to its own lines, Lufberry jumped into an unfamiliar plane (his own was undergoing repairs) and attacked the intruder. His gun jammed and he swerved away. Clearing the gun he rushed the enemy from behind, when suddenly his machine burst into flames and Lufberry leaped to his death rather than die by fire. He did not have a parachute for they were not used in allied airplanes in World War I.

At the end of the war, the 94th was the only American pursuit squadron chosen to serve with the Army of Occupation. It was transferred from the First Army to the Third Army in November 1918. The squadron returned to the United States in June 1919, and was demobilized and sent to Selfridge Field, Mt. Clemens, Michigan, where it was re-

organized in July 1919, and went to Kelly Field in August, remaining in Texas for three years. It returned to Selfridge Field in July 1922, and was stationed there until December 1941. During the years between the wars the squadron took part in testing new equipment, training personnel, and developing pursuit tactics. During World War I, the 94th Squadron had used Nieuports and Spads; in the twenties and thirties it was equipped with a number of different planes, among them the Curtiss P-6, Boeing P-26, Curtiss P-36, and Republic P-43. In July 1941, the unit received its first Lockheed P-38s, which it used throughout World War II.

On December 7, 1941, the Japanese attacked Pearl Harbor, and on December 9, the 94th Squadron was sent to the Naval Air Station at San Diego, California, to help guard the west coast against an expected attack by carrier-based Japanese planes. The attack failed to materialize and in the summer of 1942, the air echelon of the squadron flew with other members of the 1st Pursuit Group to England, accomplishing the first mass air movement over the North Atlantic. In England the squadron was trained by the famous Polish RAF Squadron No. 303 and began its operations with the Eighth Air Force on September 1, 1942, when it flew its first offensive sweep over German-occupied France.

On August 11, 1942, the 94th Squadron gave up the Indian Head for its original Hat-in-the-Ring insignia, and on September 30, Eddie Rickenbacker, former World War I commander, visited the unit, bringing with him individual silver Hat-in-the-Ring insignias. By special arrangement with General Arnold the squadron was allowed to wear these pins, which were put on the officers and men by Rickenbacker. For some reason he pinned the insignia above the pilots' wings and, although nothing was ever worn above the wings, the 94th's pilots wore the Hat-in-the-Ring there throughout the war.

Shortly thereafter the Squadron moved to North Africa with the invasion forces, thus completing the second mass

movement of its aircraft across the seas, and here it began escort duty for the Twelfth Air Force. The Luftwaffe greatly outnumbered the Allies in North Africa at that time and the fiercely contested air battles caused many losses in the squadron. The pilots flew every day it was possible to get their aircraft off the ground. They had little relief and their forty-mission combat tours were usually over in four months—if they were lucky enough to survive. It was an unusual coincidence that soon after the 94th Fighter Squadron, descendant of the Lafayette Escadrille, arrived in Africa, a French squadron known as the Lafayette Squadron joined the American forces in Northwest Africa and the two units fought side by side in the same theater as elements of the Northwest African Air Forces. The Americans furnished the Lafayette Squadron with hard-to-get P-40's in January 1943, and supplied and equipped it in the same manner as American squadrons. This was the first French unit to be equipped with American planes and it provided efficient air support to its American sponsors.

By the middle of February 1943, the Luftwaffe's strength was on the wane in Africa, but it struggled manfully to cover Rommel's forces as he stabbed furiously through the Kasserine Pass against allied ground forces. The 94th Squadron's P-38's tangled frequently with FW 190's and Bf 109's in that crucial battle. Losses were heavy but they were compensated by the many air victories; the 94th knocked down enemy aircraft almost daily. On April 10, when the Tunisian Campaign was drawing to a close, the 94th Squadron with other members of the 1st Fighter Group, had one of its biggest days, when twenty-five P-38's of the Group shot down twenty-four enemy aircraft near Cape Bon.

Early in 1944, the 94th joined the Fifteenth Air Force in Italy and its P-38 Lightnings were engaged in escorting the heavies on strategic missions against the Germans. Fighter cover was provided in three phases—penetration, target cover, and withdrawal. The targets ranged from Central Romania across the Balkans, over Austria and Czechoslovakia, Southern Germany, and Southern France, and enemy fighter opposition was heavy. At most of the targets, particularly the oil refineries, there was a great deal of flak, which took its toll of the fighters. The Ploesti oil fields in Romania constituted a first priority target and they were hit again and again. On the June 10, 1944, raid on Ploesti, 1st Pursuit Group pilots shot down twenty-eight enemy aircraft, the largest number ever shot down in one day by a single group; the Group losses were only a fraction of those inflicted on the Germans.

In August 1944, the 1st Fighter Group, operating under the 87th Fighter Wing, took part in the invasion of Southern France. The 94th Squadron, based on the island of Corsica with other units of the group, flew fighter sweeps over the Riviera, up the Rhone Valley, and over the enemy airfield complex at Istres, and strafed railroads and highways. After the successful completion of the invasion, the Group returned to Salsola, Italy, one of the Foggia satellites, and resumed fighter escort duty. Occasionally the fighters were assigned to air-sea rescue missions and to es-

cort transports on supply drops to Partisans resisting German occupation, particularly in Yugoslavia. The Group also furnished fighter protection to C-47's evacuating liberated allied aircrews from the Balkans. Early in 1945, the Group escorted the C-54's carrying President Roosevelt and Prime Minister Churchill to Yalta and back.

In March 1945, when the Russian offensive was sweeping through the Balkans and Hungary, the American and British forces were surging through the Rhineland, driving east to meet their Russian allies. By this time the 94th Squadron had moved to Lake Lesina in south central Italy and its P-38s were equipped with long-range wing tanks. Consequently, the Squadron was frequently assigned to tactical missions—strafing communications in the German rear and dive-bombing important bridges and railways. Besides the actual damage they did, the fighter attacks helped destroy enemy morale. But these low-level strafing attacks were not accomplished without losses. On one foray between Zell am See, Austria, and Regensburg, Germany, all three squadron leaders of the 1st Pursuit Group were lost.

In April, two P-80 Shooting Stars were brought to the 1st Fighter Group headquarters at Lake Lesina, by an experimental group from Wright Field for testing under combat conditions. This was months before the existence of these new jet planes was made public in the United States. After VE Day, May 7, 1945, the Group began training preparatory to deployment to the Far East and many of the pilots thought they would fly P-80's against the Japanese. However, the war in the Pacific ended before the 94th Squadron left Italy. For a short time after the war, in September 1945, the 1st Pursuit Group operated C-47's over the Italian peninsula, transporting Air Force personnel to rest camps and replacement depots, but the officers and men were soon returned to the United States and the Group was inactivated on October 16, 1945.

The 94th Fighter Squadron, Jet Propelled, was reactivated at March Field, California, on July 3, 1946. It was chosen as the first jet-propelled squadron to operate in Arctic regions and was sent to Ladd Field, Alaska, in August 1947. Its mission was to conduct a large scale Cold Weather Operations Test involving equipment, planes, and men in sub-zero arctic temperatures; however, because of the malfunctioning of the P-80's, the plane test could not be accomplished and the 94th Squadron returned to March Field on February 19, 1948, leaving its jet planes behind. In 1949 the Squadron was one of the first to be equipped with F-86's, and by July 1950, it was stationed at George Air Force Base, Victorville, California. This unit did not see action in Korea, but it had already piled up in two world wars as distinguished a record as any squadron has ever had.

In August 1955, the 1st Fighter Group (AD) returned to its old home at Selfridge Air Force Base, Michigan, where it was joined by the 94th Fighter Squadron. This change was made under Project "Arrow," a program organized to bolster unit esprit and prestige, in this case by bringing together at their old base a historic group and its famous squadrons. ■

Flying to Victory: Raymond Collishaw and the Western Desert Campaign 1940-1941. By Mike Bechthold. Norman OK: University of Oklahoma Press, 2017. Maps. Photographs. Notes. Bibliography. Index. Pp. xiii, 231. \$34.95 ISBN: 978-0-8061-5596-8

Professor Bechthold teaches history at Wilfrid Laurier University in Ontario, specializing in World War II airpower and Canadian military history. In this expansion of his doctoral dissertation, he covers Canada's second-highest-scoring ace of the First World War, Raymond Collishaw. But the focus is not on Collishaw's early fighter service. Rather, the subject is his command of what was later to become the Desert Air Force in North Africa early in World War II.

To understand the then-commander's service in Egypt-Libya, Bechthold gives the reader an overview of Collishaw's military experience beginning with his service in the Royal Naval Air Service (and, after its formation, the Royal Air Force) from 1916 to the end of the war. With 61 aircraft and 8 balloon credits, he is remembered primarily as a fighter pilot; but he also became one of the early practitioners of low-level missions supporting the army. High losses on these missions greatly affected his later command philosophy. After the Great War, he flew in Russia supporting the Whites; served in Egypt, Iraq, Syria, and the UK; and was aboard an aircraft carrier for a number of years. These postings required working in cooperation with both the Army and the Navy—interservice cooperation and relationships were important in his professional development.

At the start of World War II, Collishaw was given command of No 202 Group. The Italians in Libya posed a threat to Egypt and the Suez Canal. Although outnumbered, the British decided to attack westward and push the Italians away. Operation Compass was a high point in air, naval, and ground forces cooperation. Collishaw believed the best use of airpower was in stopping the enemy's ability to push supplies and forces to the front—hit his airfields, logistics centers, ports, and moving columns—not the artillery pieces in front of friendly forces. His forces gained air superiority and then went after the rear. The ground commander and he worked well together.

But forces were soon sent off to Greece and Crete and depleted available RAF forces. There was a counterattack spearheaded by the new German Afrika Korps, and the ground gained was lost (as were Greece and Crete). Army commanders blamed the RAF for lack of support, and subsequent operations reverted to some of the old thinking of keeping airpower right there with the ground troops. These operations gained nothing until Collishaw was once again unleashed to go after deep support areas.

However, command personnel had also undergone major changes, and—for reasons that are not really well understood—the new theater air commander, Air Marshal

Tedder, didn't think much of Collishaw's command abilities and had him sent home. But he and Collishaw's successor, Air Vice-Marshal Coningham, developed what became the general form of Allied air support for the rest of the war—but they built it on the base that Raymond Collishaw had laid.

Bechthold is, without question, a great admirer of Collishaw and ably shows that some previous historical analysis of Collishaw in the desert was flawed. In the end, Collishaw went the way of Hugh Dowding after the Battle of Britain. Both were forced out of the picture, but both deserve great accolades for their contributions to the Allies' final victory. This book is a must for those who wish to understand the evolution of air support and some of the problems that commanders such as Pete Quesada faced.

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Making the Unipolar Moment: U.S. Foreign Policy and the Rise of the Post-Cold War Order. By Hal Brands, Ithaca NY: Cornell Press, 2016. Endnotes. Index. Pp vii, 469. \$29.95 ISBN: 978-150170272-3

A third of Americans today have few—or no—memories of the Cold War's bipolar era when the very survival of America was seriously threatened. America's younger generations have known only a time in which their country has had a unipolar grasp on global power. How America got there is the subject of this book.

In the period following the Vietnam War humiliation it seemed that the Soviet Union was practically unrestrainable. It was deploying mobile theater nuclear-weapons systems in Europe while Cuban troops, acting as an arm of Soviet power projection, were fighting in Africa. Soviet forces invaded Afghanistan and began a war there that lasted nearly a decade. Extremist ideologues, often with training in Warsaw Pact member states, were terrorizing Europe and the Middle East; and the Soviet Union had gained the upper hand in the Horn of Africa when it forged a close alliance with Ethiopia, a previously dependable friend of the U.S. In America's backyard, Nicaragua fell to Marxist guerrillas, and control of the Panama Canal passed out of America's hands. In 1979 the pro-U.S. shah of Iran was deposed and replaced by a bitterly anti-American regime, further destabilizing the Middle East.

Henry Kissinger lamented that “never had America been weaker.” James Schlesinger, a senior member of the Carter Administration, worried in 1979 that “the retreat of American power” could become a rout. Global economic leadership in the post-World War II world, represented by the dollar-centric Bretton Woods International Monetary System, began to impose an unsustainable financial burden on the U.S., as competing world economies grew

stronger. In 1971, the Nixon Administration yielded to the new reality of America's shrinking economic dominance and ended the system. The 1973 oil embargo went even further in demonstrating the decline of America's global power.

Yet, the "end" of America's preeminence did not happen. In just over a decade after Schlesinger expressed his fears, the United States had gone from apparent decline to reinvigorated and multidimensional primacy in the post-Cold War era. How did the global balance of power shift from that uncertain time to the present where this country is the most powerful nation on earth? This book addresses the turn of events by focusing on fundamental questions: How was the transition made from malaise to primacy in a relatively short period? Are major changes in the international order driven by deep structural forces over which policy makers have little direct control or, in contrast, were these changes driven by concrete strategy? Brands' goal, then, is to make sense of a critical period of transformation and renewal in the U.S.'s role as first among all nations. In support of his thesis that unipolarity resulted from a complexity of forces and not simply the collapse of the Soviet Union, Brands constructs solid arguments that address the symbiotic interaction between historical forces and conscious policy decisions. He makes clear why the 1970s, in retrospect, did not represent the twilight of the American Age and how they were the prologue to America's post-Cold War unipolar moment. He goes on to remind readers that America's return to preeminence is, however, not without emerging challenges such as Islamic radicalism and terrorism.

What especially makes this book timely are the quandaries confronting policymakers in Washington because of the resurgence of Putin's Russia as an aspiring global power in competition with this country, the challenge of China's aspirations in Asia, and the growing appeal of radical Islam. This is an important, informative, and stimulating book.

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The Bakers Creek Air Crash: America's Worst Aviation Disaster of the Southwest Pacific War. By Robert S. Cutler. Bloomington, IN: Xlibris, 2016. Photographs. Maps. Diagrams. Tables. Notes. Bibliography. Pp. 263. \$29.99 ISBN: 978-1-5144-8961-1

This book details a 1943 non-combat aviation disaster in the Southwest Pacific and the efforts many years later to remember the victims. Returning some troops to New Guinea from rest and relaxation (R&R) in Australia, an ex-19th BG B-17C crashed on takeoff, killing 40 men. This work honors those who died serving their country.

B-17C 40-2072 survived the desperate fighting of the

war's early days. Removed from combat as modern B-17E replacements arrived, it was assigned as a transport in May 1942 to the 22nd Troop Carrier Squadron (TCS). The B-17C's capacity and range made it a valuable part of the airlift capability hastily assembled for the defense of Port Moresby. By January 1943 the heavily used aircraft required frequent repairs. It probably should have been retired; but, deemed too valuable to spare, it soldiered on.

The recapture of Kokoda in early 1943 took the pressure off Port Moresby. Hard-pressed troops soon were given leave. The Army set up Red Cross-operated R&R centers in Australia. One such facility was in MacKay, on Australia's eastern coast. In March 1943 the well-worn 40-2072, now with the 46th TCS, began an almost daily run from Port Moresby to MacKay. It was makeshift: over three dozen men per trip sat on the floor, unsecured in the stripped interior. On June 14, 1943, the aircraft crashed just after takeoff from Mackay in a remote spot known as Bakers Creek, killing all but one of the 41 men aboard. Wartime secrecy prevailed, and the men's families were told only that they had died in an aircraft crash in the Southwest Pacific.

Hushed up for years—the records were classified until 1958—the accident faded from sight in America. In Australia the story was different. The aircraft crashed in view of many MacKay residents, horrifying and saddening them. After the war, their annual tributes to the men culminated in dedication of a monument at Bakers Creek in 1992. The U.S. effort to remember the victims started that year when a friend of some of those who died, two retired Army genealogy experts, and author Cutler combined their talents to locate and contact families. Their work inspired further efforts. 46th TCS veterans formed the Bakers Creek Memorial Association (BCMA) in 2000. USAF's Fifth Air Force laid a wreath at MacKay in 2000 and sent official Letters of Remembrance to the families. The first public ceremony in the U.S. was June 14, 2004. Gathering Congressional support, and with the assistance of their MacKay counterparts, the BCMA dedicated a memorial at Fort Myer's Selfridge Gate to Arlington National Cemetery on June 11, 2009.

A retired National Science Foundation policy research analyst and USAF navigator, Cutler is the son of the officer who supervised preparations for the fatal flight. He has written extensively on the crash, including "Deadly WW II B-17C Air Crash Uncovered," in the Spring 2003 *Air Power History*. This book first appeared in 2003 as *MacKay's Flying Fortress*. The current edition includes more background and details the latest commemorations.

The book is arranged in three sections. The first details 40-2072's combat career, with background on the B-17 program and the war in the Pacific. The second section describes MacKay, the R&R center, the crash, and the investigation of its cause. The third section recounts memorial services and biographical sketches provided by the

families. These warm reminiscences retrieve the fallen from an anonymous and forgotten past.

This book is profusely illustrated with rare and never-before-seen photos. It does contain numerous typos, misspellings, and grammatical errors. Sentences and even whole paragraphs are repeated. But these really don't detract from Cutler's struggle to painstakingly assemble a cohesive, credible narrative from a fragmentary trail of evidence long gone cold.

Cutler's sources, skillfully exploited, include his dad's diary, USAF records, letters, ground crew, family members, and private archives. He interviewed Australian witnesses and reviewed local newspapers and records of the civil police investigation. Among sources cited on the war in the Southwest Pacific and the Fifth Air Force are Craven and Cate, General Kenney's autobiography, *General Kenney Reports* (1987 imprint); Edmonds' classic *They Fought with What they Had* (1951); and Shores, Cull, and Izawa's *Bloody Shambles* (1992). Details on the B-17 come from Jablonski's classic *Flying Fortress* (1965) and Bowers' meticulous *Fortress in the Sky* (1976). This book nicely complements the 54th Troop Carrier Wing's *Moresby to Manila via Troop Carrier* (Richard S. Jacobson, ed., 1945).

No index is provided, but the topical arrangement enables the reader to easily find references. I recommend it for anyone's airpower history library.

Steve Agoratus, Hamilton New Jersey



Wings of the Fleet: 50 Years of the Canadian Sea King. By W.A. March, ed. Ottawa, Canada: Canadian Forces Aerospace Warfare Centre, 2015. Tables. Maps. Illustrations. Abbreviations. Notes. Pp. 140. Free at <http://publications.gc.ca/site/eng/9.557299/publication.htm> | ISBN: 978-1-100-25697-9

2013 marked the 50th anniversary for the CH-124 Sea King helicopter in Royal Canadian Navy (RCN) and Air Force (RCAF) service. And with that, the Aerospace Warfare Centre published a commemorative compilation of 11 essays—part history and part lessons learned on Canada's use and operation of the Sea King. Each essay relates some of the salient moments in the roles and missions performed by the Sea King during its successful Canadian service.

Canada received 41 Sea Kings in 1963, basically similar to the US Navy's Sikorsky SH-3. Their primary role was to detect and, if necessary, destroy enemy submarines while operating from a new class of naval vessels. As a maritime nation, Canada faced the very real threat posed by new and more successful designs of Soviet submarines. Sea Kings deployed aboard RCN destroyers proved to be

a successful weapon system.

The initial essays offer up an effective historical overview of the situation Canada found itself in in the Post-World War II era. Changing governments and fiscal realities necessitated realistic balancing of defense priorities such as home defense and Canada's commitment to NATO. Unification of the Canadian Armed Forces in 1968 gave the Sea King a new parent, the Royal Canadian Air Force under the Maritime Group, being dual tasked by the Naval Service and the Air Force.

By the 1980s, with expected life of the Sea King becoming a concern, the Department of National Defence (DND) began the process to select a successor. Initially, European Helicopter Industries' EH-101 was selected; but the collapse of the Soviet Union and election of a new government in 1993 resulted in cancellation of the EH-101. It was characterized as an overly expensive "Cadillac" holdover of the previous government. Canada is finally fielding the Sea King's replacement: the CH-148 Cyclone (a development of the Sikorsky H-92).

No one foresaw Sea Kings remaining in service for such a long period. Over the years, the logistics required to keep the CH-124s serviceable have proven to be one of the most remarkable achievements in Canadian military aviation history. As the type matured, each airframe became a uniquely Canadian product lacking commonality with many sister airframes in service worldwide. Many improvements and just-in-time modifications were needed to keep Sea Kings mission capable and meet the needs of the day. In order for the CH-124 to perform in the threat environment envisioned for operations in the Persian Gulf, a number of modifications were required prior to sailing and operating in a unique wartime theater. For example, the Sea King's sonar equipment was removed, as the need to counter submarines was considered low. Teams of engineers and maintainers also fitted and test flew a commercially available forward-looking-infrared pod, chaff and flare dispensers, radar warning receivers, an infrared countermeasures system, GPS, and several other additional systems.

I found Chapter 9, written by Jim Cottingham, to be one of the most compelling essays. A 34-year veteran of the Sea King, he presents a worthy description of Sea King's operations in Somalia (1992–1993) where unanticipated roles and missions never envisioned at the outset of service were undertaken. Personnel had to adapt to missions never visualized prior to the chaos and instability in Somalia. Canada deployed three Sea King's that operated primarily from a replenishment ship. Given the small number of aircraft available and the varied missions flown in support of UN efforts, the Sea King and the crews assigned to support operations did a remarkable job under severe constraints.

While much more information is presented, the definitive history of the Sea King is yet to be written. Sea King's full retirement is planned for 2018, bringing total service

time to 55 years—a remarkable achievement. The RCAF and the individual contributors are to be commended for sharing their perspectives. I found this to be an enjoyable read.

Mike R. Semrau, MSgt, PaANG (Ret), Annville Penn.



Churchill's Ministry of Ungentlemanly Warfare. By Giles Milton. New York: Picador, 2017. Photographs. Notes. Bibliography. Index. Pp. 306. \$28.00 ISBN: 978-1-250-11902-5

Giles Milton writes an accessible and lighthearted history of what became the World War II British Special Operations Executive (though always referred to by a number of benign-sounding aliases), with a distinctly anti-establishment point of view. The key player in its independence (and, according to Milton, its success) is Winston Churchill. Fascinated with unconventional schemes, activities, and weapons, Churchill provides “top cover” to an unlikely group of inventors, assassins, spies, and saboteurs.

Not surprisingly, the British military establishment had little use for this group. Milton recounts various bureaucratic squabbles as the establishment attempted to reign in the non-traditional upstarts. Much of this is described as typical organizational behavior; although some senior officers, especially early in the war, had significant questions over the morality of the SOE's aims and methods.

Two of the more surprising antagonists were Air Chief Marshals Sir Charles Portal and Sir Arthur Harris. Both were vigorous proponents of strategic bombing; and both saw the SOE—especially its call on RAF resources to supply unconventional forces—as a diversion from their more important missions. While many readers know of the daring flights into occupied Europe using the Westland Lysander, larger resistance and sabotage efforts did require large aircraft; and the bomber commanders complained long and loud to the Prime Minister about the “amateurs” diverting critical resources.

The book highlights four missions and a recurring Resistance campaign. SOE planned, trained, and supplied the assassination of *SS-Obergruppenführer* Reinhard Heydrich in Czechoslovakia. In Greece, SOE-led partisans destroyed railroad viaducts, cutting off supplies to Field Marshal Rommel's Afrika Korps. The destruction of the Norsk Hydro plant, where German heavy-water production was conducted, may be considered the telling blow to German attempts to develop a nuclear weapon. And the attack on the Normandie Dock at St. Nazaire, France, deprived the German Navy of the only facility on the coast that could have repaired its largest ships.

The book's greatest praise is for the French Resistance, armed with both conventional weapons and various devices invented by the SOE. It points out the difficulty German reserves and reinforcements had in reaching the Normandy beachheads following the D-Day invasion. Not only were the Germans unable to bring a critical mass together to attack the rapidly building Allied armies, but also stranding these forces on sabotaged French roads, bridges, and railroads made them prey to the overpowering Allied tactical air forces.

Much of the book, and much of its appeal, deals with the SOE's culture and its fascination with unconventional weapons. Much like its American counterpart, the OSS, the SOE included many wealthy upper-class Britons—and a few outright less-savory persons. Milton implies that it apparently functioned on 14-hour workdays and vast amounts of whisky. Some of its unique weapons were well-deserved failures, while others, such as time-delay explosives, shaped charges, and the “Hedgehog” anti-submarine mortar, have had impacts far beyond the “garage inventors” who made them work.

For fans of offbeat military history, this book is a treat. Milton likes his subject, applauds its indifference to the established order, and brings some unique personalities to life. It is an enjoyable read that shines light on some neglected World War II history.

Lt Col Ron Davis, USAF (Ret) is a former NASM Docent and former Director of the Valiant Air Command Warbird Museum



Kiffin Rockwell, the Lafayette Escadrille and the Birth of the United States Air Force. By T. B. Murphy. Jefferson NC: McFarland & Co, 2016. Maps. Photographs. Notes. Index. Pp. x, 187. \$35.00 paperback ISBN: 978-1-4766-6401-9

T.B. Murphy is a USAF officer with nearly 15 years of fighter aircraft experience. He is an avid student of history with a particular interest in exploring the links between early combat aviation and the fighting spirit that characterizes today's Air Force.

This relatively short book is, fundamentally, an argument. Murphy's thesis is that the Lafayette Escadrille created (and has never truly received credit for) the character of the Air Force—its spirit. And Kiffin Rockwell, more than any other man in the group, epitomized the spirit that now defines the USAF.

To support this thesis, Murphy covers a great deal of ground briskly. The first three chapters are a brief biography of Kiffin Rockwell up to the time he and his brother went to France at the start of World War I to enlist in the French Foreign Legion. Chapters 4-7 chronicle their time

in training and as infantrymen in the Foreign Legion. In chapters 8 and 9, their training as pilots and the creation of what became the *Escadrille Lafayette* are described. The history of the *Escadrille Lafayette* is recounted in Chapters 11-13, and its transition to the US Air Service is described in Chapters 14-15. In the final two chapters, Murphy attempts to defend his thesis based on the previous chapters. He fails to do so.

One can easily agree that Kiffin Rockwell epitomized the spirit of a fighter pilot in the USAF or any other first-class air force. However, this is not the same as saying that he is the origin of the spirit or character which flows in an unbroken line to the present day USAF.

Kiffin Rockwell was wounded in the Battle of Artois. When recovered, he transferred to aviation and eventually became one of the first seven American members of the *Escadrille Americaine* (N.124), five of whom had previously flown in other French squadrons. Rockwell was apparently a natural pilot and was the first member of the *Escadrille* to shoot down an enemy aircraft. In general, the narrative of the creation of the *Escadrille Lafayette*, its operations in combat, and its very messy transfer to the US Army Air Service is well told. However, small errors crop up at times and make one cautious about accepting everything at face value.

Murphy's views on the creation of the US Air Service are overdrawn when he says, "It is absolutely false and historically negligent to trace the roots of the United States Air Service back to the U. S. Army Signal Corps." Granted, the men who flew for France, and for the UK as well, before the US entered WWI, made major contributions to upgrading the unprepared US Air Service to combat effectiveness. Nevertheless, the statement is excessive.

In the end, Murphy undermines his own assertion. Rockwell was killed in action on 23 September 1916. The *Escadrille Lafayette* was transferred to the US Army on 14 February 1918. This is a very long time in World War aerial combat. Murphy attempts to bridge the gap by saying the spirit was passed via Raoul Lufbery. Lufbery did not get "spirit" from Rockwell. Lufbery is usually described as having quite a grim approach to his flying to avenge the death earlier in the war of his friend Marc Pourpre. Lufbery was an outstanding fighter pilot and combat leader, but a transmitter of "spirit" seems very unlikely. He was killed in combat in the US Air Service on 19 May 1918. If, indeed, just one person *had* to be identified as the person who brought the *Escadrille Lafayette* and its ethos into the US Army Air Service, it should probably be William Thaw—the only American of officer rank in the *Escadrille Lafayette*, the only American to serve in it from start to finish, and the first commander of the 103rd Aero Squadron (which the *Escadrille Lafayette* became in the US Air Service). Further, Thaw went on to become the commander of the 3rd Pursuit Group before the war was over. More importantly, the contributions to the US Air Service by others in the Lafayette Flying Corps and men

who flew in the RFC and RNAS cannot be overlooked.

Murphy's Procrustean attempt to connect the creators and their creation of the independent USAF to the ethos of the *Escadrille Lafayette* must also deal with the fact that the independent USAF was created by the bomber barons, not the fighter mafia. Long-range bombing, attacking targets far from the sea, was the one thing that the Army and the Navy could not do; an independent air force could. Murphy's effort is not persuasive.

Leslie C. Taylor, Docent, NASM's Udvar-Hazy Center



The Projects of Skunk Works: 75 Years of Lockheed Martin's Advanced Development Programs. By Steve Pace. Minneapolis, MN: Voyageur Press, 2016. Tables. Diagrams. Illustrations. Photographs. Appendices. Bibliography. Index. Pp. 256. \$40.00 ISBN: 978-0-7603-5032-4

Steve Pace's coffee-table-size book pays tribute to the aviation creativity of engineers—or more accurately, geniuses—at the Skunk Works. The book's subtitle tells all: 75 Years of Lockheed Martin's Advanced Development Programs (ADP), an organization that focuses primarily on developing military aircraft and associated hardware, such as high-speed strike weapons.

Skunk Works is Pace's thirty-third book about airplanes and, perhaps, his best. His enthusiasm for conceptualizing, building, and flying aircraft is evident on every page. An "insider" at the Skunk Works, he assembled photographs and drawings of the finest quality to complement his history of the ADP. Pace passed away last year several months before the book's release.

"About eighty percent of the group's work is classified," Rob Weiss, Vice President and General Manager of the Skunk Works, said. "The other twenty percent we can talk about." Despite such restrictions, Pace managed to explain each project to its limit, thereby including recently declassified information. In all, he covers over 50 of the myriad projects that have come out of the ADP.

Pace unfolds the history of the ADP, "the most clandestine entity of the Lockheed Martin Corporation," chronologically by individual decades beginning with the 1940s. Each decade's chapter talks about not only well-known aircraft but also those that are less familiar or were barely publicized. The facts of the matter subtly reminded me of ADP's broad involvement in building America's military inventory.

Even the chapter titles captivated me. Examples are "The 1970s: Era of Wizardry," "The 1990s: Manned versus Unmanned," and the future-looking chapter on "The 2010s: The Quantum Leaps." On the other hand, opening the book to any page delighted me. I would have been

pleased by just looking at the picture and reading their captions. Accounts of triple-sonic aircraft flights in the SR-71 and stories of other well-known aircraft (e.g., F-104, F-80, U-2, and F-117) and some more obscure projects relate awesome tales without breast beating. Purely and simply, *The Projects of Skunk Works* provides a wealth of knowledge about American airpower.

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



Spyplanes: The Illustrated Guide to Manned Reconnaissance and Surveillance Aircraft from World War I to Today. By Norman Polmar and John F. Bessette with Hal Bryan, Alan C. Carey, Michael Gorin, Cory Graff, and Nicholas A. Veronico. Minneapolis MN: Quarto Publishing Group, 2016. Tables. Illustrations. Photographs. Notes. Index. Pp. 240. \$40.00 ISBN: 978-0-7603-5031-7

Norman Polmar, among the most distinguished naval historians of his generation, and John Bessette, a former Air Force intelligence officer, along with four other contributors, have produced what amounts to an encyclopedia. Culling various archives and other sources, they have collected an impressive selection of photographs to support their efforts.

The first third of the book examines reconnaissance operations. Of these 75 pages, 15 are devoted to World War I and earlier, two for between the wars, and 11 to World War II. The remaining 47 pages cover the Cold War and beyond. America's Peacetime Aerial Reconnaissance Program (PARPRO) dominates the discussion, though the Korean and Vietnam Wars receive some attention.

While the subtitle suggests unmanned aircraft are beyond the scope of this work, they are mentioned.

The balance of the book examines individual aircraft from four countries: Germany (five entries, all from World War II); Great Britain (eight from World War I to the Cold War); Russia (12 from World War I to the Cold War), and the United States (more than 40 from World War II to the present). As might be expected with the lead author's expertise in naval operations, that service is well represented in the United States' section. Also included are entries and illustrations for "paper" airplanes—mostly Lockheed designs—that never entered production.

Overall, this work is reminiscent of the classic efforts by historians such as William Green and Kenneth Munson from the 1960s and 1970s. In the digital age, however, it's difficult to justify the \$40 price tag for a few interesting images. The World War I coverage is disappointing. Terrence Finnegan's *Shooting the Front*, at least on the Allied side, offers an excellent option. For World War II operations, Robert Ehlers' *Targeting the Third Reich*, once again from the Allied side, is highly recommended. William Bur-

rows' *By Any Means Necessary* is a fine source for the early Cold War PARPRO missions.

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



Finding Dorothy Scott: Letters of a WASP Pilot. By Sarah Byrn Rickman. Lubbock TX: Texas Tech University Press, 2016. Photographs. Notes. Appendices. Bibliography. Index. Pp. xxiii, 243. \$24.95 ISBN: 978-089672972-8 (hard cover); 978-089672973-5 (e-book).

Sarah Byrn Rickman has established herself as the foremost expert on the women who flew for the Army Air Forces during World War II. This work, her sixth on the subject, examines the brief, but very full life of the 25th of the original 28 women recruited for what became known as the Women's Auxiliary Ferrying Squadron. Thanks to a suggestion from Nancy Harkness Love, William Tunner, who would later manage airlift operations over the Himalayas to China (the Hump) and the Berlin Airlift, accepted the idea in 1942 that highly experienced women pilots could replace desperately needed men for moving factory-fresh aircraft to operational bases throughout the United States.

In Rickman's earlier books, she discusses in considerable detail how the women's contributions evolved over two years until the decision was made to terminate their services in December 1944. During that time, 38 women would perish in accidents while flying for the military. Other writers already had published biographies of the two "originals," Evelyn Sharp and Cornelia Fort, who died before Scott in 1943. With access to Scott's numerous letters to family members, Rickman decided it was time to share this woman's story.

Placing Scott's contributions in context, Rickman begins by discussing the role of American women in aviation up to World War II. From there, she details Scott's upbringing in the remote community of Oroville, Washington, just south of the Canadian border and east of the Cascade Mountains. Scott's father hugely influenced his daughter's outlook on life.

After Scott enrolled at the University of Washington in Seattle, she was accepted into the Civilian Pilot Training Program. She soloed in a float plane from nearby Lake Union in March 1941. In 1942, she contacted a former University of Washington student, Barbara Erickson, who had preceded her in the training program in Seattle. Erickson, now working for Love as a WAFS pilot, encouraged Scott to apply.

Thanks to Scott's letters, Rickman was able to do an excellent job of weaving Dorothy's observations on life as a WAFS pilot with the bigger picture—the unrelenting de-

mands of the military to move airplanes as quickly and efficiently as possible and the turf war between Love and Jacqueline Cochrane over the control and role of women pilots working for the military.

Over the next year, Scott ferried trainers, first from the East Coast and later from the Southwest. During this time, she steadily qualified to fly increasingly powerful aircraft. Grounded briefly for physical reasons, she mastered the Link trainer and instrument flying.

As the demand for moving trainers lessened, fighters took over. Eventually, Scott qualified for pursuit training, hoping to fulfill her dream of flying the Army Air Forces' hottest aircraft. Sadly, she died in a midair collision along with her instructor pilot and another student.

Rickman concludes the work with a summary of the recognition and honors bestowed on the WAFS pilots and their successor organization, the Women Air Service Pilots. Readers interested in good, solid biographies of aviators or the contributions of American women pilots in World War II should find *Finding Dorothy Scott* highly satisfactory.

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



Stillwell and Mountbatten in Burma: Allies at War, 1943-1944. By Jonathan Templin Ritter. Denton: University of North Texas (UNT) Press, 2017. Maps. Photographs. Notes. Appendices. Bibliography. Index. Pp. 274. \$29.95 ISBN: 978-1-57441-674-9

This is apparently Ritter's first book. As an archivist and historian, he has chosen to examine two of the more colorful characters that emerged from the Second World War—Admiral Louis Mountbatten, RN, and General Joseph "Vinegar Joe" Stilwell, USA. It is an apt subject for the American Military Studies Series from UNT Press. While primarily looking at the relationships between these two leaders, Ritter could not ignore a number of other major players in the South-East Asia Command (SEAC) drama: General Claire Chennault, Generalissimo Chiang Kai-shek, British General Bill Slim, General Albert Wedemeyer, Prime Minister Churchill, and President Roosevelt.

Nominally at the same level as Admiral Nimitz, General MacArthur, and General Eisenhower, Mountbatten was an ambitious young officer put in command of an area rife with competing and divergent goals. The British sought to preserve their empire in SE Asia after the war, and the US wasn't too sure what it wanted in the long run but thought it highly desirable to keep China and its military in the war effort. Mountbatten had to follow the desire of his government—but he was also a pragmatist who saw the coming of independence for the empire's colonies.

He was also interested in avenging the humiliating loss of Singapore in 1942 and, therefore, looked to a maritime strategy in the area.

Stilwell had endured the humiliating retreat of the British, American, and Chinese forces through Burma into India in 1942. His main goal was to meet the US desire to keep China in the war by supplying its troops overland via the Burma and Ledo Roads. He was in charge of all US Army forces in the area, including the airpower of Chennault—with whom he did not get along. He was also nominally the commander of the Chinese army but greatly disliked and distrusted Chiang Kai-shek. Added to these problems was his dislike of the British in general (not unusual for the time). Another hat that he wore was as deputy to Mountbatten. Given competing national goals in the area and Stilwell's dislike of the British, relations got dicey early in the relationship.

Stilwell went on to fight a land battle in northern Burma, capture the vital logistics center of Myitkyina, and reopen the land route from India to China. Meanwhile, British General Slim was defeating the last Japanese offensive that tried to advance into eastern India. Mountbatten, unable to obtain enough naval vessels and landing craft from higher-priority theaters, did not get to mount his seaborne invasion to retake Singapore.

Eventually, Stilwell was recalled, and Wedemeyer took over. Chennault was recalled. Mountbatten's area was expanded at the end of the war, and he got the Japanese out of SE Asia while laying the groundwork for post-war independence of many new countries.

Ritter's research skills are well displayed. He employed about every book ever written on the war in that part of the world as well as personal diaries, official documents, and the like. The book's only major disappointment was the maps. There are several, but they are completely inadequate: too small, print in about 6-point, and lacking many of the place names in the text. The map problem aside, this is a good book on a less-well-known area of the war where many men died fighting for ambiguous goals. Its leaders were good men operating under tremendous disadvantages. Ritter has done a good job telling their story.

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



War Birds: Diary of an Unknown Aviator. By Anonymous. New York: George H. Doran Company. 1926. Illustrations. Pp. 276. \$3.95 (Kindle) ISBN: none; **and War Birds: The Diary of a Great War Pilot.** By Elliott White Springs. Barnsley, UK: Frontline Books, 2016. Appendices. Notes. Bibliography. Pp. 185. \$24.82 (Kindle) ISBN: 978-1-47387-959-1

The diary of the “unknown aviator” began on September 20, 1917. Following the last entry there is an editor’s note: “Here the diary ends due to the death of its author in aerial combat. He was shot down by a German plane twenty miles behind the German lines. He was given a decent burial by the Germans and his grave was later found by the Red Cross.”

The unknown aviator and diarist was John MacGavock Grider, who went missing in action on June 18, 1918. Yet the diarist continues noting that he and [Elliott White] Springs went on an early patrol and shared a victory over a two seater before returning to base.” The diary continues on June 19 and runs through the end of August. Obviously a second diarist took over.

Following publication of *War Birds* in 1926, Elliott White Springs was revealed to be the second diarist. He stated that before Grider went missing, he expressed the desire that the story be told. Evidently Springs was determined to keep his own contributions secret. One of the outstanding features of the book is the excellent illustrations (both color and black-and-white) by artist Clayton Knight that introduce the reader to the aircraft involved and, in many instances, depict events described in the diary.

Grider and Springs were two of over 200 Americans who volunteered to train and fly with British units until America’s Army Air Service became combat ready. These two, plus six others, were posted to the Royal Flying Corps’ No. 85 Squadron. John Grider was born in 1882, a resident of Arkansas, married with two sons but divorced the year before volunteering for military service. “I’m coming out of this war a big man or in a wooden kimono,” he wrote on May 13, 1918. “I know I can fight, I know I can fly, and I ought to be able to shoot straight. If I can just learn to do all three things at once, they can’t stop me.” The diary might be John Grider’s way of proving himself to the two sons he left behind. Springs survived the war with 16 credited victories and became a successful businessman.

A Great War Pilot is an extended reprint of the original book. It includes a “Foreword to the Original Edition” by Springs, dated July 1927, in which he makes clear that he was *not* the author of the diary, though he does not name Grider. “[His] entries concerning his loved ones at home had no place in a public document. . .such references were omitted. His identity was of no public concern.” There is also an informative introduction by Mark Hillier, a brief history of No. 85 Squadron, a complete list of the squadron’s officers, and appendices listing the combat reports of both British and American pilots. So, *A Great War Pilot* covers more than the exploits of a pair of pilots. It really covers the 85th Squadron, a unit commanded by the legendary Major “Billy” Bishop (72 victories) and, later, Major “Mick” Mannock, both of whom were awarded the Victoria Cross.

My sense is that the credited author of this latest volume is not really Elliott White Springs but actually

Mark Hillier. He placed the earlier writings in context with a brilliant “Introduction to the New Extended Edition.” Grider’s diary is an important part of the book: Hillier pays tribute by including an excerpt from a news report following publication of the initial book: “. . . with all its careless phrasing and lack of literary style, burns its way into the very soul of the reader, for within its pages are lined the thoughts and hopes, the aspirations and bitter cynicism, the follies and the gay courage of youth in time of war and as a participant in its grim game.” Had Grider been writing for publication, a completely different book would probably have emerged.

War Birds: The Diary of a Great War Pilot is a worthy addition to an understanding of the introduction of aircraft to warfare and to the dedication of those Americans who chose to fly and fight before American units were prepared. Readers should first read Grider’s diary, as extended by Springs, then read the excellent history of No. 85 Squadron as its young and courageous fighter pilots battled the Hun.

Robert Huddleston, WW II P-47 fighter pilot, Chapel Hill, author of the novella An American Pilot in the Luftwaffe



The Way of the Strangers: Encounters with the Islamic State. By Graeme Wood. New York: Random House, 2017. Endnotes. Index. Chart. Pp xv, 317. \$28.00 ISBN: 978-0-8129-8875-8

Extremist Islam, much like any other fanatical philosophy, cannot be fully engaged, contained, and neutralized if it is not properly understood. Unfortunately, there is too little awareness of the factors that have inspired millions to support Islamic State and its Salafist form of Islam that have led many thousands to fanatically embrace a struggle to the death against a world that they have totally rejected. As Graeme Wood points out, the irony is that the terrorists themselves, surprisingly, often lack a comprehensive and sophisticated understanding of Islam; yet, they have absolute and unswerving confidence in their legitimacy. To outsiders, their commitment to extreme and brutal violence is unjustifiable and pointless. Amongst supporters, however, it is a popular and inspiring demonstration of who they are and the power that they wield. The question that needs to be answered, then, is what is the appeal of Islamic State (IS) all about? Graeme Wood, a noted Canadian journalist and lecturer, has responded to this lack of knowledge about IS’s attractiveness, inspiring rhetoric, and philosophical underpinnings with this incredibly informative book.

Through Wood’s well researched and extensively footnoted tome, one enters the mind and persona of followers of extreme Islam. Wood strips away the mystery and confusion surrounding the magnetic appeal of al-Baghdadi’s

Islamic State and explores the logic driving its followers. Through one-on-one interviews with extremists—especially self-styled scholars, ideologues, and proselytizers of Salafist Islam—Wood explores the mindset that attracts thousands to a pathway leading to almost certain death.

This is a brilliant primer on the seemingly implausible appeal of a very violent and myopic philosophy that seems to belong to a long-past era.

Wood takes the reader on a journey that looks back on the birth of Islam 1400 years ago to discover the world that present-day extremists believe they are re-establishing with the creation of Islamic State. The Jihadists are driven by a conviction that the world has entered the end of times and are awaiting the imminent return of Jesus to bring non-believers into the faith as they envision it. Wood goes on to argue that Salafist Islam should be challenged intellectually in the Muslim community, based on theology, scriptural interpretations, and the legal methodology contained within Islam. In other words, the Muslim community should be in the lead in de-legitimizing and defeating IS.

Why is this book of interest to readers of *Air Power History*? Like it or not, American airpower is deeply committed to this struggle, so this book is a must. No one concerned about the threat of Salafist Islam can remain uninformed about the nature of its extremist viewpoint after reading it.

Col John Cirafici, USAF (Ret), Milford Delaware



Books to Review

Dunn—Gear Up, Mishaps Down: The Evolution of naval Aviation Safety, 1950-2000. 204p
Powell—Wave-Off! A History of LSOs and Ship-Board Landings. 190p.

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FLYING TO VICTORY Raymond Collishaw and the Western Desert Campaign, 1940-1941

By Mike Bechthold

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George W. Cully

July 23-29, 2017

The **International Congress of History of Science and Technology** will hold its 25th meeting in Rio de Janeiro, Brazil, on the Praia Vermelha campus of the Federal University of Rio de Janeiro (UFRJ). This Congress' theme will be "Science, Technology and Medicine between the Global and the Local". More details can be had on the ICHST's website at <http://hssonline.org/the-25th-ichst-meeting-in-rio-de-janeiro/#more-5876>.

July 23-29, 2017

The **International Committee for the History of Technology** will hold its 44th annual meeting in conjunction with the ICHST meeting to be held in Rio de Janeiro, Brazil. For details, see the Committee's website at <http://www.icohtec.org/annual-meeting-2017.html>.

September 7-10, 2017

The **Mars Society** will host its 20th annual International Convention in the Student Center on the campus of the University of California, Irvine in Irvine, California. For registration and other details, see the Society's website at <http://www.marssociety.org/conventions/the-20th-annual-international-mars-society-convention/>.

September 7-10, 2017

The **Tailhook Association** will hold its annual meeting and naval aviation symposium at the Nugget Resort Hotel in Sparks, Nevada. For registration and more details, see the Association's website at <http://www.tailhook.net/>.

September 12-14, 2017

The **American Institute of Aeronautics and Astronautics** will host SPACE 2017, its premier annual space and astronautics forum and exposition, in Orlando, Florida. For more information as it becomes available, see the Institute's website at <http://www.aiaa.org/Forums/>.

September 18-20, 2017

The **Air Force Association** will hold its annual convention and exhibition at the Convention Center in National Harbor, Maryland. For details and registration, see the Association's website at <https://www.afa.org/airspacecyber/delegates/ataglanceconv>.

September 20-23, 2017

The **Society of Experimental Test Pilots** will hold its 61st Symposium and Banquet at the Grand Californian Hotel in Anaheim, California. For registration details, see the Society's website at <http://www.setp.org/annual-symposium-banquet/60th-annual-symposium-banquet-registration-2.html>.

October 3-6, 2017

The **Aviation Engine Historical Society** will hold its fourteenth annual convention at the Pima Air and Space Museum and the Titan Missile Museum in Tucson, Arizona. For registration, see the Society's website at <http://www.enginehistory.org/Convention/Convention2017.shtml>.

October 4-8, 2017

The **Oral History Association** will hold its annual meeting at the Hilton Minneapolis Hotel in Minneapolis, Minnesota. For further details, see the Association's website at <http://www.oral-history.org/annual-meeting/>.

October 9-11, 2017

The **Association of the United States Army** will hold its annual meeting and exposition at the Walter E. Washington Convention Center in Washington, D.C. For registration details, see the Association's website at <http://ausameetings.org/2017annualmeeting/>.

October 19-20, 2017

The National Security Agency's **Center for Cryptologic History** will present its biennial Symposium at the Johns Hopkins Applied Physics Laboratory's Kossiakoff Center in Laurel, Maryland. Following the Symposium, on Saturday, October 21, participants will be given an opportunity to tour the National Cryptologic Museum and participate in a workshop on sources for research in cryptologic history. The theme for the 2017 Symposium is "Milestones, Memories, and Momentum." For more information, contact Program Chair Betsy Rohaly Smoot at history@nsa.gov or to her care at The Center for Cryptologic History, Suite 6886, 9800 Savage Road, Fort George G. Meade, MD 20755.

October 24-26, 2017

The **American Astronautical Society** will host its annual Wernher von Braun Memorial Symposium at the University of Alabama – Huntsville in Huntsville, Alabama. For more details as they become available, see the Society's website at <http://astronautical.org/calendar/>.

October 26-30, 2017

The **Society for the History of Technology** will hold its annual meeting and symposium in Philadelphia, Pennsylvania. For further details as they become available, see the Society's website at <http://www.historyoftechnology.org/index.html>.

October 28-29, 2017

The **National Aviation Hall of Fame** will hold its annual enshrinement ceremony during the Alliance Air Show to be held at the Alliance Fort Worth Airport in Fort Worth, Texas. For additional information, see their website at <http://www.nationalaviation.org/national-aviation-hall-fame-hold-2017-enshrinement-ceremony-alliance-air-show-fort-worth-texas-2/>.

November 9-12, 2017

The **History of Science Society** will hold its annual meeting in Toronto, Canada. For more details as they become available, see the Society's website at <http://hssonline.org/meetings/annual-meeting-archive/>.

November 16-18, 2017

The **National WWII Museum** will host its 10th International Conference on World War II at the Museum complex in New Orleans, Louisiana. The schedule includes a pre-conference symposium on the theme of "Hitler in History." For registration and other details, see the conference website at <http://www.ww2conference.com> or call (877) 813-3329, ext. 511.

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

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

In Memoriam

General William L. Kirk 1932-2017

General Kirk passed away on April 26, 2017. His last duty assignment, from which he retired in 1989, was Commander in Chief, U.S. Forces Europe.

General Kirk was born in Rayville, Louisiana, went to high school there, and attended Northeast Louisiana State College. He enlisted in the Air Force in 1951 and became an aviation cadet in February 1953. He was commissioned as a second lieutenant and awarded his pilot's wings in April 1954.

The first half of his career was spent in tactical reconnaissance before transitioning to combat fighters. During his tour in Vietnam, he downed two MiGs.

After completing the Air War College in June 1971, he began a series of increasingly responsible staff and command assignments, rising to four-star rank in 1987, as CINCEUR before retiring.

The Rest of the Story.....

Gen. William Y. Smith (USAF, Ret.) was honored with an obituary in *Air Power History* in the electronic Spring 2016, issue, and the printed Summer 2016 issue. But, while the story listed all of his assignments in chronological order, it failed to capture the spirit of the man. He deserved a fuller tribute, including his historical impact on the USAF and national defense policy. For example, during the 1962 Cuban Missile Crisis, he served as special assistant to Gen. Maxwell Taylor and simultaneously worked with McGeorge Bundy, President Kennedy's National Security Advisor. Subsequently, Gen. Smith was invited to join the support staff which helped negotiate the 1963 Limited Nuclear Test Ban Treaty with the Soviet Union. In 1975, he was named assistant to the Chairman of the JCS. At the time, the position of Vice Chairman did not exist, so in fact, "Bill" filled both positions. He held that position under Gen. George S. Brown and Gen. David C. Jones. Yet another oversight in the *Air Power History* piece were "Bill's" combat medals and decorations, principally, the Silver Star, the Distinguished Flying Cross, the Purple Heart, the

Defense Distinguished Service Medal with oak leaf cluster, and the Air Medal with three oak leaf clusters. Inexplicably, his 33-year civilian career was also omitted. After retiring from military service, he was named a scholar at the Woodrow Wilson International Center. Next, after serving as a board member for three years at the Institute for Defense Analyses (IDA), he served as President for five years. "Bill" Smith co-authored *Operation Anadyr*, a book on the Cuban Missile Crisis, with the former commander of the Warsaw Pact. He participated in several international conferences on that crisis conducted by Brown University. And he participated in several oral history interviews on deterrence and nuclear arms control. From the 1990s until his death, he was a board member of the George Washington University's National Security Archive, where he worked to safely expedite the release of previously classified government documents to benefit scholars and the general public. Finally, his persona as a scholar and historian, in addition to his combat valor and administrative abilities, made him the logical choice for president of the Air Force Historical Foundation.

Reunions

1st Fighter Assn. Sep 7-10, 2017, Dayton, OH. Contact:

Bob Baltzer
1470 Foxtale Ct,
Xenia, OH 45385
937-427-0728
robertbaltzer@sbcglobal.net

4th Fighter Group Assn. Sep 28 - Oct 1, 2017, Fairborn, OH Contact:

Keith Hoey
120 Bay Breeze Dr,
Belleville, Ontario ON K8N 4Z7
613-962-2461
khoey98@hotmail.com

38th Tactical Recon Sqdn. Oct 3-6, 2018, Dayton/Fairborn, OH Contact:

Greg Hartley
4304 Beaumont Ct,
Fairfax, VA 22030
571-238-6273
pghartley@hotmail.com

58th/60th Fighter Interceptor Sqdn. Sep 20-23, 2017, Fairborn, OH. Contact:

Richard Doritty
5598 St Rt 37,
Sunbury, OH 43074
740-965-2455
voodoo101b@gmail.com

302nd Buckeye Wing Assn. Aug 16-18, 2018, Fairborn, OH. Contact:

Jerry Millhouse
6715 Yorkcliff Pl,
Dayton, OH 45459
937-433-3156
jmillhouse@aol.com

366th Fighter Assn. Sep 19-24, 2017, Fairborn, OH. Contact:

Paul Jacobs
2409 Mallard Ln, Apt. 1,
Beavercreek, OH 45431
614-906-4470
paul@jacob.net

425th Tactical Fighter Training Sqdn. Oct 3-4, 2017, Fairborn, OH. Contact:

Richard Kaercher
P.O. Box 446,
Cedarville, OH 45314
937-766-2502
rlmjkaercher@reagan.com

531st Transportation Unit. Sep 29 - Oct 1, 2017, Fairborn, OH Contact:

George Biehle
1507 Woodland Dr,
Loveland, OH 45140
513-575-3795
gfbiehle@fuse.net

548th Recon Technical Grp. Jul 12-14, 2018, Fairborn, OH. Contact:

Cecil Brown
2459 S Old Oaks Dr,
Beavercreek, OH 45431
937-426-0948
cecilb211@ameritech.net

610th Military Airlift Support Squadron. August 23-25, 2018, Fairborn, OH. Contact:

Harold Mitchell
354 Sussex Cir,
Vacaville, CA 95687
707-447-3536
mitch610mass@aol.com

6694th Security Sqdn. Aug 17-20, 2017, Fairborn, OH. Contact:

Richard Krejsa
121 Crestfield Place,
Franklin, TN 37069
615-791-9012
rkrejsa@bellsouth.net

AF Officer Candidate School. Oct 5-9, 2017, Seattle, Wash. All classes (1943-1963) are encouraged to attend. Contact:

Dave Mason
757 820-3740
blokemason@verizon.net

Cam Rahn Bay AB. Sep 28 - Oct 1, 2017,
Dayton, OH. Contact:

Diana Westphal
673 West Rock River Circle,
De Pere, WI 54115
920-609-5672
dwestphal8@new.rr.com

PTC-68H (Moody AFB). Jun 7-9, 2018,
Fairborn, OH. Contact:

Tom Crowley
9168 Woodstream Ln,
Dayton, OH 45458
937-885-5286
tj-bj@woh.rr.com

UPT Class 69-05E (Webb AFB). Oct 26-
29, 2017, Fairborn, OH Contact:

A. J. Thrush
186 Skyline Dr,
Lancaster, OH 43130
740-653-7585
ajthrush@sbcglobal.net

PTC-68A. Oct 16-19, 2017, Fairborn, OH
Contact:

Bil Fitzpatrick
2869 N. Teetime Ct,
Wichita, KS 67205
316-640-1373
wfitzpatrick1@att.net

PTC-69-03. 28 Sep 28 - Oct 1, 2017,
Dayton, OH. Contact:

Emery Kiraly
9221 Aldershot Dr,
Bethesda, MD 20817
301-469-0838
madlazlo@yahoo.com

List provided by:

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

History Mystery Answer



Lt John A. Macready is the only person to receive the Mackay Trophy three times. The San Diego native served as a Test pilot at Army Signal Corp's McCook Field in Dayton Ohio. Macready received the trophy annually from



1921 to 1923. In 1921, Macready received the Mackay Trophy for setting a world altitude record of 40,800 feet. In 1922 Macready along with Lt Oakley Kelly received the Mackay Trophy for setting a world flight endurance record of 35 hours, 18 and one-half minutes. Finally in 1923, Macready and Kelly received the trophy for the first nonstop U.S. transcontinental flight. They flew from New York to San Diego in just under 27 hours. Their Fokker T.2 is now on permanent display at the Smithsonian's Air and Space Museum. Macready was inducted into the National Aviation Hall of Fame

To learn more about John A. Macready and his Mackay Trophy flights go to:

John Macready: <http://www.nvahof.org/hof/hof-2010/john-a-macready/>

High Altitude Flight: <http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197387/flights-to-high-altitude/>

First Transcontinental Nonstop Flight: <http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197378/first-transcontinental-nonstop-flight/>

To watch an Army Silent movie about the flight: <https://www.youtube.com/watch?v=BhdgN5tjezc>

Endurance Record: <http://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197385/first-air-to-air-refueling/>



Test your knowledge of air power history by trying to answer this quarter's history quiz. Since the goal is to educate and not merely stump readers, you should find the question challenging but not impossible. Good Luck

Established in 1911 by Clarence Mackay, the Mackay Trophy is annually awarded to an Air Force person, persons, or organization for the "most meritorious flight of the year." The list of Mackay Trophy recipients is a long and distinguished list that includes Air Force legends such as Hap Arnold, who was the first recipient and a two time recipient, Jimmy Doolittle, and Chuck Yeager and units such as the USAF Thunderbirds. Of all the recipients, only one recipient received the Mackay Trophy three times. Who is the only three-time Mackay Trophy recipient? What aerial achievements led to his receiving the trophy?

You can find the answers on page 63.



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